

REPORT

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FOR THE YEAR 1854.

ARTS AND MANUFACTURES.

VOLUME II.—ILLUSTRATIONS.

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IN THE SENATE OF THE UNITED STATES, *February 8, 1855.*

Ordered, That there be printed, in addition to the usual number, twenty-seven thousand copies of that portion of the Report of the Commissioner of Patents which relates to Arts and Manufactures, two thousand of which shall be for the use of the Commissioner of Patents; and fifty-five thousand copies of that portion of the Report which relates to Agriculture, five thousand of which shall be for the use of the Commissioner of Patents.

Attest:

ASBURY DICKINS, *Secretary.*

INDEX.

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 358	Improved Machines for Sawing Beveled Surfaces.....	185	12
359	Improvement in Feathering Paddle-wheels.....	185	2
360	Improvement in Running Gear of Wagons.....	185	3
361	Ruling Machine.....	186	11
362	Straw-cutter.....	186	5
363	Method of forming plates for Polychromatic Printing.....	186	None.
364	Steam-boiler Furnaces.....	187	1
365	Improvement in Quartz-crushing machines.....	187	8
366	Improved Method of Operating two Saw-gates by one Pitman..	187	3
367	Tuyere.....	188	3
368	Improvement in Screws and Nuts.....	188	29
369	Improved Machines for cutting Screws and Nuts.....	188	1
370	Floor-plates for Malt-kilns.....	189	5
371	Hot-air Register.....	189	3
372	Pin Machines.....	189	5, 6
373	Improvement in lowering, raising, and fastening Carriage Tops.	189	10
374	Banding Pulleys for Driving Saws.....	190	12
375	Improved Machine for Drying Bookbinders' Boards.....	190	8
376	Corn-sheller.....	190	21
377	Improvement in Machines for Casting Type.....	191	9
378	Improvement in Bedstead Fastenings.....	191	6
379	Improvement in Machines for Polishing Leather.....	191	3
380	Improvement in Guitars.....	192	9
381	Apparatus for Turning the Leaves of Books.....	192	3
382	Improvement in Power Looms.....	192	4
383	Screw-cutting Machine.....	'93	7
384	Hay and Manure Fork.....	192	12
385	Pin Machine.....	193	14
386	Improvement in Hemming and Cording Umbrellas.....	193	14
387	Controlling and regulating fuel used in Steam-boilers.....	194	11
388	Gold Separator.....	194	11
389	Spring-hinges.....	194	21
390	Corn-sheller.....	194	11
391	Improvements in Breech-loading Fire-arms.....	194	8
392	Improved method of Nailing Washboards.....	195	1
393	Corn-planter.....	195	14
394	Improvement in Ratched Catch for Head in Saw-mills.....	195	27
395	Machines for Cutting Mouldings and Caps of Hand-rails.....	195	13
396	Sealing Preserve-cans.....	196	6
397	Improvement in Cross-cut Sawing-machines.....	196	2
398	Self-adjusting Cut-off.....	197	10
399	Improvement in Oil-cups for Steam-engines.....	197	8
400	Improved Press for Veneering.....	197	13
401	Improvement in Cotton-gins.....	198	11
402	Improvement to prevent Dust from entering Railroad Cars.....	198	2
403	Improvement in Machinery for mortising Window-blinds.....	198	10
404	Improvement in Clamps for holding Steel Plates, to prevent them from warping during the operation of hardening and tempering.....	199	12
405	Improvement in securing the Doors of Banks, Vaults, and Safes.	199	27
406	Improvement in Cotton-gins.....	199	21
10, 407	Improvement in Machines for Pegging Boots and Shoes.....	199	None

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 408	Improvement in Heaters for Smoothing-irons	201	10
409	Improvement in Self-heating Smoothing-irons	201	9
410	Toggle-joint Squeezer for squeezing metallic and other sub- stances.....	201	13
411	Improvement in Flexible Cordage.....	201	None.
412	Machine for Cutting Ellipses	202	6
413	Machine for Matting the ends of Match-blocks	202	5
414	Gold-separating Cylinder.....	202	5
415	Saw-gummer.....	203	12
416	Apparatus for Discharging Condensed Water from Steam- pipes or Vessels.....	203	
417	Improvement in Steam-ports, in Valve-seats, and Slide-valves for Steam-engines	203	14
418	Improvement in Bedsteads	203	14
419	Torch Lamps.....	204	4
420	Improvement in Filters	204	13
421	Improved Mortising Chisel	204	11
422	Device for reversing a Mortising Chisel.....	205	4
423	Magnetic Toy, called the Magnetic Cupid	205	9
424	Paddle-wheel	206	4
425	Improved method of Constructing Hinges.....	206	8
426	Saliva Pump.....	206	7
427	Improvement in Machine for pegging Boots and Shoes.....	206	25
428	Diaphragm Pump	208	24
429	Improvement in the Manufacture of Boot and Shoe Soles of Gutta Percha or India Rubber	208	24
430	Improvement in Machines for Mincing Meat.....	209	26
431	Pill Machine.....	209	15
432	Apparatus for supplying Water to Steam-boilers.....	210	34
433	Improved Photographic Plate Vise	210	37
434	Tonsil Instrument, to remove elongated Tonsils.....	210	34
435	Amputating Apparatus.....	211	42
436	Improvement in Clasps.....	211	42
437	A Truss	211	42
438	Improved Copying Press.....	211	32
439	Improved Saw	212	31
440	Improvements in Railroad Car Brakes	212	39
441	Improvement in Dumping Cars	212	19
442	Improvement in Fancy Check Looms	212	19
443	Improvement in Rosin-oil Lamps.....	213	22
444	Improvement in Washing Machines	213	18
445	Bee Hive.....	213	19
446	Improved Attachment to Piano Fortes.....	213	45
447	Improvement in Air-heating Furnaces	214	17
448	Improvement in Stoves.....	214	22
449	Improvement in Ventilating Railroad Cars.....	215	18
450	Forming Hollow Slabs or Plates.....	215	22
451	Straw-cutter	215	19
452	Improvement in Mills for Grinding Sumac	215	18
453	Improvement in Fulling and Scouring Cloth	216	98
454	Balanced Steam-valves.....	216	110
455	Thresher and Cleaner of Grain in the Field.....	216	96
456	Improvement in Piano Fortes.....	217	110
457	Improvement in Attaching Shafts to Wagons.....	217	106
458	Machine for Wetting Paper.....	217	116
459	Grain Harvester.....	218	9
460	Rolling Car Axles.....	218	7
461	Thresher and Separator of Grain.....	218	13
462	Improved Machine for making Window Blinds.....	219	12
463	Distilling Apparatus.....	219	13
464	Improved Mortising Machine	219	10
10, 465	Improvement in Presses for making Miniature Cases.....	220	8

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 466	Daguerreotype Plate Holders.....	220	11
467	Cultivator.....	220	8
468	Mode of fixing Likenesses in Monuments.....	220	6
469	Improved Fountain Pen.....	220	16
470	Improvement in Presses for Moulding Glass.....	221	30
471	Improvement in Divided Railroad Axles.....	221	21
472	Improvement in Cotton Presses.....	221	26
473	Improvement in Saw-mills.....	221	27
474	Propellers.....	222	29
475	Apparatus for Cleaning and Buffing Daguerreotype Plates.....	222	24
476	Improvement in Quartz-crusher.....	222	23
477	Shutter Hinge.....	222	18
478	Improvement in Machinery for Scarfing the edges of Skelps for Lap-welded Tubes.....	223	25
479	Improvement in Steam Hammers.....	223	16
480	Improvement in Electro-magnetic Engines.....	223	21
481	Water-Gauge for Steam-boilers.....	224	16
482	Improvement in making Sheet Iron.....	224	None.
483	Improvement in the construction of Printing Blocks.....	225	15
484	Improvement in Carpet Bags.....	225	28
485	Machine for Paging Books.....	225	25
486	Steam Hammer.....	226	47
487	Improvement in Churns.....	226	45
488	Improvement in Furniture Casters.....	226	47
489	Rotary Engines.....	227	37
490	Dental Chair.....	227	48
491	Improvement in Turning Lathes.....	227	46
492	Improved Machine for Ruling Paper.....	228	15
493	Machine for making Nuts.....	229	18
494	Winnower.....	229	24
495	Winnower.....	230	21
496	Improvement in the mode of making Battery Connection with an Electro-magnetic coil on the Travelling Carriage of a Telegraphic Register.....	230	21
497	Improved Machine for Polishing Plough-Handles and other articles.....	230	27
498	Improvement in Machines for Cleaning and Assorting Bristles..	231	29, 30
499	Bit or Drill Stock.....	232	28
500	Awl-Haft or Tool-holder.....	232	17
501	Manufacturing Tin Foils or Sheets.....	233	None.
502	Improvement in Blocks for Horse Collars.....	233	26
503	Improvement in Omnibus Registers.....	233	None.
504	Tool-holder.....	234	15
505	Plough Point.....	234	17
506	Improvement in Metallic Hubs.....	234	30
507	Improved Machine for Dressing Spokes.....	234	19
508	Improved Daguerreotype Plate Holders.....	235	17
509	Improvement in Sewing Birds.....	235	17
510	Improvement in Lime-kilns.....	235	20
511	Portable Door-lock.....	236	19
512	Improvement in Planing-machines.....	236	None.
513	Improvement in Picking and Cleaning Flax.....	236	22
514	Heating Feed-water for Steam-boilers by the waste-heat of the exhaust-steam.....	236	19
515	Improvement in Machine for Cleaning Wool.....	237	17
516	Improved Valve-cock.....	237	18
517	Fire-proof Safes.....	238	17
518	Treating Vegetable Fibre for Spinning.....	238	None.
519	Improvement in making Thick Paper.....	238	20
520	Improvement in Fire-arms.....	239	20
521	Improvement in Machines for Pegging Boots and Shoes.....	239	None.
10, 522	Improvement in Dyeing Cloth.....	240	17

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 523	Ship Ventilators.....	240	22
524	Machinery for Rolling Iron.....	241	22
525	Improvement in Planting-hoes.....	241	20
526	Preventing Explosions in Steam-boilers.....	241	17
527	Improvement in Drop-bridges.....	241	22
528	Machine for making Links for Chains.....	242	20
529	Gas-burner.....	242	18
530	Improvement in Saddle-trees.....	242	23
531	Improvement in Water-closets.....	242	15
532	Improvement in Horse-bells.....	243	23
533	Improvement in Machinery for Paging Blank Books.....	243	28
534	Improvement in Machines for Stuffing Horse-collars.....	244	24
535	Improvement in Fire-arms.....	244	27
536	Improved Machine for Scraping and Tothing Veneer.....	244	23
537	Pump Valves.....	245	21
538	Improved Saw-mill.....	245	28
539	Improvement in the Mode of Attaching Hose-bells to Straps.....	245	18
540	Improvement in Window-cord Pulleys.....	245	23
541	Window-sash Stopper.....	246	23
542	Stone-picking Machine.....	246	40
543	Oar-locks.....	246	48
544	Improvement in Derricks.....	246	50
545	Improvement in Stretching and Drying Cloth.....	247	46
546	Improvement in Weaving Wire Screens.....	247	48
547	Improvement in Contrivances for Protecting Passengers in Railroad Cars.....	248	53
548	Prepared Tool for Dove-tailing.....	248	46
549	Improvements in Machinery for making Corrugated Beams of Sheet Metal.....	248	50
550	Cancelled.....		
551	Improvement in Whiffletree Hooks.....	248	45
552	Improvement in Attaching Hubs to Axles.....	249	40
553	Machine for Slitting Clothes-pins.....	249	186
554	Improvement in Seal Presses.....	250	173
555	Improvement for Treating Hair for Weaving.....	250	174
556	Improved Machine for Cutting Laths.....	250	148
557	Improvement in Spooling Yarn from the Cop.....	250	174
558	Thresher and Separator of Grain.....	251	148
559	Improvement in Machinery for making Cordage.....	251	184
560	Parti-coloring Machine.....	251	176
561	Improvement in Applying Colors to Stone.....	252	None.
562	Improvement in Scythe-fastenings.....	252	177
563	Improved Machine for Splitting Hoops.....	252	49
564	Salt Kiln.....	252	54
565	Combined Seed-planter and Cultivator.....	253	49
566	Improvement in Churns.....	253	55
567	Improvement in Machines for Pulverizing Ores.....	253	55
568	Improvement in Snow-ploughs for Railroads.....	253	56
569	Improved Die for making Seamless Tubes.....	254	54
570	Improvements in Quartz-crushers.....	254	53
571	Machine for making Railway Chairs.....	254	57
572	Improvement in Seed-planters.....	254	43
573	Fusible Disks for Steam-boilers.....	255	54
574	Improvement in Zinc-white Furnaces.....	255	60
575	Table to hold Bank Notes while cut and trimmed.....	255	49
576	Improvement in Air or Gas Engines.....	255	58
577	Improvement in Machines for making Bed-pins.....	256	55
578	Improvement in Cotton-picking Cylinders.....	257	57
579	Improved Bench-hook.....	257	56
580	Improvement in Organs.....	257	57
581	Improvement in Harvesters.....	258	112
10, 582	Improved Tool-rest for Turning Lathes.....	258	73

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 583	Improvement in Seed-planters.....	259	178
584	Bank-locks.....	259	167
585	Automatic Chuck.....	259	176
586	Improvement in Vulcanizing India Rubber and other Gums....	260	None.
587	Saw-set.....	260	148
588	Improvement in Printing Presses.....	260	160
589	Fusible Plugs or Disks for Steam-boilers.....	260	184
590	Improvement in Machines for Plastering.....	261	175
591	Valve-gearing for Locomotives.....	261	148
592	Straw-cutter.....	261	182
593	Improved Method of Opening and Closing Gates.....	261	184
594	Improved Apparatus for Rounding and Beveling Barrel-heads..	262	182
595	Improvement in Cotton-seed Planters.....	262	172
596	Sash Fastener.....	263	167
597	Improvement in Sewing-machines.....	263	159, 160
598	Improvement in Sash-sustainers.....	263	170
599	Improvement in Reeling-machines.....	264	173
600	Improvement in Sectional Dry-docks.....	264	171
601	Cancelled.....		
602	Improvement in Tail-stocks for Turning Lathes.....	264	178
603	Improvement in Machines for Boring and Mortising Carriage-hubs.....	265	50
604	Improvement in Carriage-brakes.....	265	48
605	Machines for Paying Vessels, seams or joints.....	266	33
606	Improvement in Suspending Eaves-troughs.....	266	64
607	Improvement in Corn-planters.....	266	45
608	Improvement in Seed-planters.....	266	36
609	Improvement in Sewing-machines.....	267	38
610	Improved Method of operating Hydraulic Rams.....	267	50
611	Improvement in Artificial Legs.....	267	36
612	Improvement in Brick-machines.....	268	38
613	Improvement in Machines for Splitting Ratans.....	268	45
614	Improvement in Machines for Splitting Ratans.....	268	47
615	Improvement in Sewing-machines.....	269	47
616	Britannia Tea and Coffee Pots.....	269	48
617	Improved Joint for Air-heating Pipes.....	270	46
618	Improvement in Machines for Drilling Stone.....	270	48
619	Improvement in Hinging Gates.....	270	47
620	Improvement in Water-closets.....	271	46
621	Improvement in Self-acting Switches.....	271	50
622	Improvement in Sewing-machines.....	272	60
623	Improvement in Wire Heddle-eyes for Looms.....	272	38
624	Improvement in Rotary Cultivators.....	272	36
625	Saw-set.....	273	35
626	Improvement in Excluding Dust from Railroad Cars.....	273	35
627	Machine for Damping Printing-paper.....	273	38
628	Improvement in Form of Scythes.....	274	45
629	Improvement in Mould-boards for Ploughs.....	274	33
630	Improved method of Constructing Moulds for making Printing Blocks.....	274	38
631	Machine for making Shovel-handles.....	275	None.
632	Improvement in Seed-planters.....	275	40
633	Improvement in Faucets for Measuring Liquids.....	276	37
634	Movable Nozzles to the Exhaust-pipes of Locomotives.....	276	40
635	Improvement in Spring Clamps for Clothes-lines.....	276	29
636	Improvement in Machine for Dressing Stone.....	277	24
637	Process for Gilding or Plating Fibrous Substances.....	277	None.
638	Improvement in Faucets for Measuring Liquids.....	277	28
639	Metallic Grummet for Sails.....	278	18
640	Improved Stop-cock.....	278	21
641	Improved Faucet.....	279	26
10, 642	Improvement in Rotary Engines.....	279	25

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 643	Improvement in Machine for Grinding Card-teeth.....	279	23
644	Improvement in Seed-planters	280	39
645	Hanging the Griping Jaws of Spike-machines in Weighted Lever.....	280	30
646	Improvement in Rotary Cultivators.....	280	26
647	Improvement in Steam-engine Faucet Valves.....	281	20
648	Improvement in Folding-blinds.....	281	23
649	Improvement in Obstetrical Supporters.....	281	23
650	Smut-machine.....	281	72
651	Improvement in Securing Window-sashes.....	282	97
652	Improvement in Grain Harvesters.....	282	105
653	Improvement in Machines for Drilling Stones.....	283	109
654	Process for making Varnish.....	283	None.
655	Improvement in Seed-planters.....	283	107
656	Improved Machine for Distributing Types.....	284	73
657	Improvement in Grain and Grass Harvesters.....	284	107
658	Compounds for Extinguishing Fire.....	284	66
659	Improvement in Machines for Rubbing Type.....	284	93
660	Improvement in Safe-locks.....	285	98
661	Improvement in Iron Safes.....	285	104
662	Spoke-machine.....	286	102
663	Improvement in Lifting-jacks.....	286	96
664	Improved Dyeing Process.....	286	94
665	Hydraulic Engines.....	287	95
666	Improvement in Screw-wrench.....	287	93
667	Improvement in Concaves of Clover-hullers.....	287	96
668	Improvement in Dredging-machines.....	287	98
669	Grain-threshers.....	288	92
670	Improved Nippers for Printing Presses.....	288	100
671	Improvement in Harvesters.....	289	104
672	Improvement in Railroad Car Wheels.....	289	104
673	Shutter-fastening Hinge.....	289	104
674	Improvement in Machines for Dressing Mill-stones.....	289	108
675	Hen's Nest.....	290	91
676	Improvement in Air-friction Boxes.....	290	160
677	Dyeing Apparatus.....	290	108
678	Method of Adjusting the Tension on Belt-saws.....	291	108
679	Improvement in Shoe-lasts.....	291	108
680	Barrel Machinery.....	291	100
681	Portable Punch for Railway Bars.....	291	100
682	Improvement in Seed-planters.....	292	100
683	Improvement in Machines for Jointing Staves.....	292	93
684	Improvement in Crozing Machines.....	292	86
685	Improvement in Quartz-crushers.....	293	95
686	Rotary Smoothing-iron.....	293	94
687	Stone-jointer.....	293	88
688	Improvement in Ship-blocks.....	293	93
689	Improvement in Process for Treating India Rubber.....	293	None.
690	Improvement in Churns.....	294	108
691	Improvement in Discharging Apparatus of Harvesters.....	294	89
692	Improvement in Belt-clasps for Machinery.....	294	34
693	Grain-harvester.....	295	31
694	Seed-planter.....	295	32
695	Steam-boiler Feeder.....	296	32
696	Improvement in making Zinc White.....	296	39
697	Smut-machine.....	296	32
698	Portable Head-rests for Chairs.....	297	39
699	Improvement in Sub-marine Scoops.....	297	31
700	Hot-air Furnaces.....	297	177
701	Improvement in Machinery for Operating Car-brakes.....	297	None.
702	Improvement in Machinery for Operating Car-brakes.....	298	None.
10, 703	Fixed Device for Tonguing, Grooving, and Tapering Boards.....	299	174

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 704	Improvement in Stereotype.....	300	168
705	Method of Regulating Feed-motion to a gang of Saws.....	300	None.
706	Machine for Forming Cultivators' Teeth.....	300	177
707	Improvement in Harvesters.....	301	176
708	Pumps.....	301	162
709	Shingle-machine.....	301	171
710	Machine for Tenoning and Wiring Blind-slats.....	302	172
711	Furnace for Zinc-White.....	302	42
712	Oil Cup for Steam-engines.....	302	43
713	Machine for Bending Sheet-metal.....	303	31
714	Improvement in Railroad-Car Wheels.....	303	39
715	Improvement in Track-cleaners for Railroads.....	303	31
716	Improvement in Cooking Stoves.....	303	48
717	Improved Hand Printing Press.....	304	39
718	Improvement in Sacket's Braiding Machine.....	304	42
719	Improved Method of Operating the Doctors of Calico Printing Cylinders.....	305	57
720	Drop and Bed Die Machine for Forging and Punching.....	305	215
721	Improvement in Railroad Cars.....	305	166
722	Improvement in Treating Cane Fibre for Paper and other pur- poses.....	305	None.
723	Improvement in Carriage Tops.....	306	171
724	Improved Chain-cable Stopper.....	306	173
725	Improvement in Chain-cable stoppers.....	306	162
726	Water Wheels.....	307	176
727	Improvement in process for obtaining Cellulose from vegetable substances.....	307	None.
728	Improvement in Cops for Sewing-machines.....	307	None.
729	Water Wheel.....	308	168
730	Improvement in Machine for making Candles.....	308	177
731	Improvement in Bedstead Fastenings.....	308	173
732	Improvement in Machinery for Corrugating Sheet-metal.....	308	180
733	Hydrant Cock.....	309	158
734	Improvement in Amalgamating and Washing Gold and Silver...	309	153
735	Improvement in Railroad Frog-guards.....	309	185
736	Improvement in Cranberry Winnower.....	309	160
737	Match Machine.....	310	158
738	Improvement in treating Vulcanizable Gums.....	310	None.
739	Veneering Machine.....	311	149
740	Combined Table and Chair.....	311	181
741	Improvement in treating Caoutchouc and other Vulcanizable Gums.....	312	None.
742	Improvement in Syringe.....	312	189
743	Machine for making Wire Netting.....	312	None.
744	Improvement in Metal Drills.....	313	175
745	Improvement in Training the Grape Vine.....	313	174
746	Improvement in Pumps.....	313	179
747	Mode for Manufacturing Wrought Iron Tools.....	314	155
748	Bench Plane.....	314	157
749	Crozing Staves.....	314	154
750	Improvement in Drying Tobacco.....	315	146
751	Railroad-chair Machine.....	315	156
752	Improvement in the Construction of Tea and Coffee Pots.....	315	153
753	Improvement in Seed-planters.....	316	157
754	Improvement in Mills for Grinding Ores.....	316	170
755	Improvement in Seed-planters.....	317	152
756	Improvement in Iron Buildings.....	317	188
757	Improvement in Sewing-machines.....	317	188
758	Improvement in Rat-traps.....	318	152
759	Improvement in Brick-machines.....	318	189
760	Improvement in the Apparatus for Street Gas Lamps.....	318	166
10, 761	Improvement in Fish-hooks.....	319	187

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10,762	Improvement in Machines for Cleaning Cotton.....	319	169
763	Improvement in Sewing-machines.....	320	181
764	Improvement in Rat-traps.....	321	155
765	Improvement in Truss for Iron Bridges.....	321	165
766	Life Car.....	321	169
767	Lubricator.....	322	179
768	Boring and Mortising Machine.....	322	156
769	Improvement in the Construction and Combination of Foot- stoves and Lanterns.....	322	90
770	Improved Iron-frame Upright Piano-forte.....	323	98
771	Improved Attachments for Fish-hooks, and Artificial Baits.....	323	93
772	Improvement in Dressing Flax and Hemp.....	323	98
773	Improved Swell-mute Attachment for Piano-fortes.....	324	96
774	Improved Hinge.....	325	94
775	Improvement in Earth Cars.....	325	95
776	Improvement in Piano-forte Actions.....	325	91
777	Improvement in Brick-machines.....	326	85
778	Improved Circular Sawing-machines.....	327	84
779	Improvement in Tailors' Measures.....	327	91
780	Improvement in Machines for Bleaching Flax.....	328	33
781	Improvement in Iron Fences.....	328	33
782	Improvement in Machines for Winding and Folding Cloth.....	329	33
783	Improved Turning-lathe.....	329	35
784	Improvement in Spiral Springs for Railroad Cars.....	330	55
785	Improvement in Machines for Paring Apples.....	330	35
786	Improvement in Gas Regulators.....	331	105
787	Improvement in Car-couplings.....	332	49
788	Improved Box Machine.....	332	53
789	Improved Apparatus for Painting Window-blinds.....	332	40
790	Mode of Attaching Propellers.....	332	53
791	Improved Water-wheel.....	333	49
792	Machine for Cleaning Blinds.....	333	38
793	Improvements in Heating, Warming, and Cooking.....	333	56
794	Improved Landing-net for Anglers.....	334	40
795	Improvement in Fishing-rods and Floats.....	334	35
796	Improvement in Potato-washing Machines.....	335	54
797	Improved Portable Ladder or Fire-escape.....	335	53
798	Oyster-knife.....	335	40
799	Improved Slitting-gauges.....	336	36
800	Improved Faucet.....	336	85
801	Improved Fly-trap.....	336	85
802	Improvement in Grass-harvesters.....	337	90
803	Improvement in Cleaning Cotton and other Fibrous Substances.....	337	87
804	Improved Ticket-box for Railroad Cars.....	338	86
805	Improvement in Operating Dumping Cars.....	338	92
806	Improvement in Cooking.....	338	83
807	Improved Fire-escape.....	338	131
808	Improvement in Process for Bleaching Flax.....	339	85
809	Improved Machine for Filling Match-frames.....	339	86
810	Improved Machine for Opening Oysters.....	340	62
811	Improvement in Maize Harvesters.....	340	62
812	Improvement in Revolving-breech Fire-arms.....	340	62
813	Improvement in Distilling and Condensing Apparatus.....	341	62
814	Improvement in Vinous Fermenting Close Vessels.....	341	64
815	Improved Ditching Ploughs.....	342	63
816	Improvement in Cast-iron Car-wheels.....	342	63
817	Improvement in Travelling Bridges.....	342	64
818	Improvement in Railroad Car Seats.....	342	64
819	Improved Method of Securing Stones in Foundations.....	343	62
820	Improved File or Bill Holder.....	343	59
821	Improvement in Repeating Fire-arms.....	343	75
10,822	Improved Rotary Pump.....	343	63

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 823	Improvement in Machinery for Laying Rope.....	344	63
824	Improved Machine for Feeding Sheets of Paper to Printing Presses.....	345	62
825	Improvement in Portable Folding Chair-bedsteads.....	345	63
826	Improved Wedge Machine.....	346	64
827	Improved Mode of operating the Feed-Tables of Printing Presses.....	346	74
828	Improvement in Apparatus for Feeding Paper to Printing Presses.....	347	64
829	Improved Field-fence.....	347	62
830	Improvement in Glass Furnaces.....	347	64
831	Improvement in Brick-making.....	347	121
832	Improvement in Forming and Hardening Hat-bodies.....	348	97
833	Improvement in Roofing.....	348	66
834	Improved Bullet-Moulds.....	348	74
835	Improvement in Machine for Cutting and Skiving the Counters of Boots and Shoes.....	349	127
836	Improvement in Pilers for Machinery.....	349	66
837	Improvement in Railroad Car Seats.....	349	114
838	Improved Syringe for Eye Baths.....	350	71
839	Improved Reaction Water-wheels.....	350	101
840	Improvement in Invalid Bedsteads.....	350	183
841	Improvement in Guard-fingers of Harvesters.....	351	179
842	Improvement in Sewing-machines.....	351	151
843	Improved Method of Discharging Cargo from Canal Boats.....	351	191
844	Certain Devices in Tonguing and Grooving.....	352	153
845	Improved Device in Constructing Strap-iron Railing.....	352	165
846	Improvement in Chargers for Fire-arms.....	352	177
847	Improvement in Plates for Artificial Teeth.....	352	105
848	Improvement in Reed Boxes for Musical Instruments.....	352	49
849	Improvement in Process for Distilling Rosin Oil.....	353	None.
850	Improvement in Distilling Apparatus.....	353	79
851	Improvement in Spinning Cotton.....	353	74
852	Improvement in Railroad Horse-power.....	354	49
853	Improved Socket for holding Tools.....	354	77
854	Improvement in making Ships' Knees.....	354	77
855	Improved Hydraulic Heater.....	354	77
856	Improvement in Piston Packing.....	354	77
857	Method of Setting the Valves of Locomotives.....	355	78
858	Improved Metal Cutter.....	355	155
859	Improved Machine for Making Bed Pins.....	355	78
860	Improvement in Straw-cutters.....	355	155
861	Improvement in Car-trucks with Adjustable Axles.....	356	152
862	Trunk-lock Hasp.....	356	157
863	Improvement in Harrow.....	356	179
864	Improvement in Machinery for the Manufacture of Clinch Rings.....	356	165
865	Improvement in Flexible Harrow.....	357	166
866	Improvement in Making Rope.....	357	188
867	Improvement in Violins.....	357	49
868	Improved Air-engine.....	357	53
869	Hydraulic Engine.....	358	60
870	Milkers' Protector.....	358	55
871	Improved Rotary Planing-knife.....	358	54
872	Improved Expanding Bit.....	359	91
873	Second Improved Slating Machine.....	359	53
874	Improvement in Hay-knife.....	360	63
875	Improvement in Sewing-machine.....	360	104
876	Improvement in Machinery for Dressing Flax.....	360	82
877	Improvement in Bee-hives.....	361	106
878	Improvement in Sewing-machines.....	361	94
879	Improvement in Sewing-machines.....	361	111
10, 880	Improvement in Sewing-machines.....	362	104

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 881	Improvement in Seed Planters	362	56
882	Improved Hub-borers	363	56
883	Extension Bit Key	363	55
884	Improved Felloe Machine	363	58
885	Improved Pump	363	66
886	Improvement in Cultivators	364	57
887	Improvement in Bridges	364	56
888	Improved Journal-box for Saw-mill Carriages	364	58
889	Improvement in Machine for Cutting Paper	364	58
890	Improved Mortar and Pestle	365	41
891	Improvement in Mode of Unloading Canal Boats	365	44
892	Manure and Sand Loader	365	43
893	Improved Machine for Reducing Wood to Slivers	366	41
894	Improvement in Bleaching Apparatus	366	44
895	Improved Machine for Marking out Sash	366	44
896	Machine for Weighing and Printing Butter	367	63
897	Improvement in the Flues of Steam-boiler Furnaces	367	43
898	Improvement in the Construction of Pistons for Steam-engines	367	44
899	Self-acting Safety Hatch	367	43
900	Improvement in Hinges	368	43
901	Improvement in Locomotive Fire-box	368	41
902	Improvement in Screw Jacks	368	44
903	Joints for Clap-boards	368	43
904	Improvement in Harvester-rakes	368	43
905	Improved Lath-machine	369	44
906	Improved Rotary Shingle-machine	369	112
907	Improvement in Self-heating Smoothing-irons	370	75
908	Improvement in Tables for Ships' Cabin	370	67
909	Improvement in Surgical Splints	371	65
910	Improvement in Knitting-machines	371	68
911	Improvement in the Manufacture of Couplings for Clay Pipes	372	65
912	Improvement for Water-gauge for Steam-boilers	373	67
913	Improvement in Machinery for Combing Wool	373	71
914	Method of Coating Metals	374	74
915	Improvement in Knitting-machines	374	None.
916	Water-wheel	375	79
917	Improvement in Machine for Pegging Boots and Shoes	375	66
918	Improvements in Ox-yokes	376	74
919	Improvement in Shower-bath	376	75
920	Improvement in Cotton and Hay Presses	376	65
921	Improved Fastening for Ear-rings	377	71
922	Lathe for Irregular Forms	377	101
923	Atmospheric Trip-hammer	377	49
924	Improved Carpenters' Brace	377	97
925	Machine for Cutting Glaziers' Points	378	77
926	Improvement in Potato-diggers	378	72
927	Improvement in Gun Locks	378	77
928	Hanging Gates, &c.	378	65
929	Improvement in Machinery for Composing Type	379	75
930	Improvement in Fire-arms	379	78
931	Improvement in Portable Mills	379	78
932	Saw	380	71
933	Improved Machine for Paging Books	380	75
934	Improvement in Guitars	380	75
935	Improved Mode of Attaching Blankets to Cylinders for Printing Presses	380	76
936	Improved Mitre-box	380	70
937	Improvement in Ox-yokes	381	71
938	Improvement in Self-heating Smoothing-irons	381	79
939	Lathe-dog	382	74
940	Saws	382	71
10, 941	Improved Case for holding Railway and other Tickets	382	78

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
10, 942	Hydraulic Heater for Warming Buildings	383	74
943	Improved Machine for Making Hinges.....	383	69
944	Improvement in Magazine Guns.....	383	79
945	Improvement in Constructing Ships for Safety and Escape.....	384	76
946	Lathe for Turning Hollow Ware.....	384	76
947	Improved Machine for Printing Railway and other Tickets.....	384	69
948	Improved Piano-forte Action.....	385	67
949	Improvement in Smut-machines.....	385	73
950	Improved Primer for Fire-arms.....	385	105
951	Improved Puppet-valves for Pumps.....	386	109
952	Improved Excavator for Fence Posts.....	386	72
953	Improved Apparatus for the Manufacture of Daguerreotype Cases.....	386	107
954	Improvement in Metallic Hones.....	387	66
955	Improved Ratchet Lever.....	387	109
956	Improvement in Cheese Hoops.....	387	66
957	Improved Sash Balance	387	74
958	Improvement in Counterpoise to Cast Locomotive Wheels....	388	107
959	Improved Windmills.....	388	127
960	Improvement in Self-acting Power-press.....	388	103
961	Improved Machine for Making Book Covers.....	389	99
962	Hot-air Furnace.....	389	114
963	Feed-water Apparatus	389	101
964	Preventing Incrustation in Steam-boilers	389	121
965	Improved Machine for Sawing Thin Boards.....	390	121, 123
966	Improved Apparatus for Making Palliasses.....	390	113
967	Improvement in Clover Harvesters.....	390	91
968	Improvement in Process for Treating Hemp.....	391	None.
969	Improved Hydraulic Ram	391	106
970	Improved Tire-bender.....	392	106
971	Improvement in Locomotive Tender for Feeding the Furnaces of Locomotive Engines.....	392	114
972	Improvement in Button-hole Cutters.....	392	66
973	Improved Bracelet Clasp.....	392	101
974	Improvement in Sewing-machine.....	393	None.
975	Improvement in Sewing-machine.....	393	111
976	Improvement in Process for Galvanizing Metals.....	394	95
977	Improvement in Process for Treating Gutta Percha	395	None.
978	Improvement in Dyeing Process.....	395	102
979	Machine for Cutting and Grinding Corn, Cobs, Bark, &c.....	395	205
980	Improvement in Knitting-machines	396	94
981	Improved Mode of Manufacturing Turbine Wheels	396	104
982	Improvement in Hot Water Apparatus.....	396	93
983	Improvement in Fastening the Disk and Rim of Car Wheels....	397	110
984	Improvement in Hooks and Eyes.....	397	86
985	Improved Chuck.....	397	95
986	Improved Machine for Cutting out Cloth	397	143
987	Improvement in Cameras for taking Stereoscope or other Da- guerreotypes.....	398	96
988	Improved Stave-machine	398	100
989	Improvement in Hay Elevators.....	399	102
990	Ventilator Window for Railway Cars.....	399	110
991	Improvement in Neck Yokes.....	399	110
992	Improvement in Quartz Crushers.....	400	108
993	Improvement in Knitting-machines	400	51
994	Improvement in Sewing-machines.....	400	52
995	Improved Typograph	400	59
996	Improvement in Furnace Grate Bars	401	80
997	Improvement in Self-acting Nipper-blocks.....	401	51
998	Improvement in Knitting-machines	401	145, 146
999	Improvement in Steam-engines relating to the Valve.....	403	186
11, 000	Improvement in Machines for Washing Bottles.....	403	185

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11,001	Improvement in Instruments for taking Deep-sea Soundings.....	403	81
2	Improvement in Brick and Pottery Kilns.....	404	192
3	Improvement in the Combination of Railroad Tracks and Wheels.....	405	144
4	Improvement in Threading Screws.....	405	117
5	Berth-knee Former.....	405	116
6	Improved Machine for Dressing Polygonal Timber.....	406	117
7	Improvement in Ship Timbers.....	406	116
8	Improvement in Cultivator.....	406	118
9	Making Seamless Metal Tubes.....	406	81
10	Improvement in the Arrangement of Dampers in Rotary Stoves.....	407	125
11	Improvement in Grain Mills.....	407	125
12	Improved Rivet-clamp for Wire Fences.....	407	112
13	Improvement in Moth-killers.....	407	125
14	Improved Machine for Cleaning and Watering Streets.....	408	99
15	Improvement in Flouring Mills.....	408	119
16	Improved Method of Turning Hubs.....	408	113
17	Improved Device for Operating Cutter-heads of Planing-ma- chines.....	409	97
18	Improved Vault Covers.....	409	116
19	Improved Hydrant Cap.....	409	116
20	Improved Mechanism for Operating Pumps.....	409	118
21	Road-scraper.....	410	116
22	Improvement in Machines to Print Subscribers' Names, &c., * on Newspapers.....	410	141
23	Improved Mode of Disconnecting Horses from Vehicles.....	410	81
24	Improved Lubricator.....	410	91
25	Steam Generator.....	411	190
26	Improvement in Sofa Bedsteads.....	411	115
27	Improvement in Eyelet Machines.....	411	82
28	Improvement in Excavators.....	412	118
29	Improvement in Seed-planters.....	412	120
30	Water-level Indicators for Steam-boilers.....	412	118
31	Improvement in Feathering Paddle-wheels.....	412	82
32	Improvement in Seed-planters.....	413	117
33	Apparatus for Filing Mill-saws.....	413	115
34	Gold Amalgamator.....	413	130
35	Improved Lath-machine.....	414	106
36	Improved Method of Operating Saw-mill Blocks.....	414	118
37	Lathe for Figured Work.....	414	106
38	Improvement in Weaving Cut-pile Fabrics.....	414	82
39	Improvement in Cleaning Bolts for Flour.....	415	117
40	Improvement in Grinding-mills.....	415	120
41	Improvement in Securing Car-wheels upon Axles.....	415	91
42	Improvement in Joint-bodied Buggies.....	416	115
43	Improvement in Cotton and Hay Presses.....	416	81
44	Moulding Hollow Ware.....	416	133
45	Improvement in Grinding-mills.....	416	120
46	Improvement in Drying Flour.....	417	137
47	Fan-blower.....	417	203
48	Improvement in Cooking Range.....	417	117
49	Railroad Wheel Tires.....	418	115
50	Improvement in the Manufacture of Sulphuric Acid.....	418	81
51	Improvement in Threshers.....	418	203
52	Suspended.....		
53	Cut-nail Plate-feeder.....	419	120
54	Improvement in Bed-bottoms.....	419	118
55	Improvement in the means for controlling the operations of Cut-offs of Steam-engines.....	420	118
56	Improvement in Cast-iron Car-wheels.....	420	115
57	Spark-arrester.....	420	116
11,058	Improvement in Insulating Telegraph Wires.....	420	92

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 059	Improvement in Stills for Distilling Fatty Bodies.....	420	81
60	Improvement in Lens Lamp Chimney.....	420	82
61	Improvement in the Construction of Tanning Apparatus.....	420	82
62	Improvement in the Construction of Accordions.....	420	149
63	Improved Carriage-axle.....	422	163
64	Improved Printing Press.....	422	207
65	Improved Tail-board for Wagons.....	423	192
66	Improvement in Bed-bottoms.....	423	214
67	Improvement in Vices.....	423	132
68	Improvement in Saddle-trees.....	423	203
69	Improvement in Win-owing-machines.....	424	192
70	Improved Mode of making Cards.....	424	161
71	Improvement in Exhaust Fans.....	424	110
72	Improvement in Printers' Friskets.....	424	102
73	Improvement in Valves for Steam-pumps.....	425	123
74	Improvement in Couplings for Carriages.....	425	125
75	Improvement in Mills.....	425	103
76	Improvement in Harvester-cutters.....	426	127
77	Improved Mode of Closing Wickets in Canal Gates.....	426	125
78	Instrument for Trimming the Welts of Boots and Shoes.....	426	97
79	Improvement in Adjustable Rails for replacing Cars on the Track.	426	113
80	Cable-stoppers.....	426	101
81	Improvement in Crushing and Grinding Quartz and Minerals....	427	123
82	Improvement in Railroad Odometers.....	427	102
83	Improvement in Bridle-Bits.....	427	112
84	Spoke-machine.....	428	103
85	Riding Vehicles.....	428	114
86	Improvement in Harvesters.....	428	99
87	Improvement in Processes for Hardening Tallow.....	428	None.
88	Steering Apparatus.....	429	101
89	Steam-boiler.....	429	97
90	Improvement in Buckles.....	429	121
91	Improvement in Locking up Printers' Forms.....	429	119
92	Improvement in Tightening Windows.....	430	113
93	Controlling Plurality of Doors with one Key.....	430	113
94	Spark-arrester.....	430	97
95	Feed-water Apparatus for Steam-boilers.....	430	99
96	Improvement in Composition for Coating Telegraphic Wires, and for other purposes.....	430	None.
97	Improvement in Soap Compounds.....	431	None.
98	Improvement in Soap Manufacturing Processes.....	431	None.
99	Improved Mode of Fastening Shoemakers' Tools to Handles....	431	112
100	Improvement in Looms.....	431	121
101	Improvement in Railroad Car Ventilators.....	432	125
102	Steam-boilers.....	432	127
103	Improved Canal Lock Gates.....	433	108
104	Improvement in Endless-chain Horse-power.....	433	127
105	Improvement in Machinery for Napping Cloth.....	433	79
106	Improvement in Machinery for Spinning Wool.....	433	78
107	Machine for Polishing Veneers.....	434	80
108	Grommet for Sails.....	434	74
109	Improvement in Quartz Crushers.....	434	67
110	Improvement in Setting Steam-boilers.....	435	80
111	Improvement in Process for Treating Paint.....	435	None.
112	Improvement in Paint Composition.....	435	None.
113	Method of Governing the Action of Valve-cocks.....	436	107
114	Cut-nail Machine.....	436	68
115	Flour-sifter and Renovator.....	436	107
116	Improvement in Grain Winnowers.....	436	80
117	Improvement in Steam-engines.....	437	67
118	Machine for Printing Woollen and other Goods.....	437	70
11, 119	Double Cylinder Engine.....	437	80

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 120	Improvement in Weaving Double Cloth.....	437	None.
121	Improvement in the Construction of Reed Musical Instruments.....	438	65
122	Tool Handle.....	438	74
123	Improvement in producing Continuous Circular from Reciprocating Rectilinear Motion.....	438	59
124	Improvement in Cast-iron Car-wheels.....	439	71
125	Extra Yard to Topsails.....	439	96
126	Carriage Tops.....	439	61
127	Improvement in the Mode of making Bricks.....	439	51
128	Improvement in Gas Meters and Regulators.....	439	59
129	Improvement in Painters' Brushes.....	440	101
130	Improvement in Radial Arms for Car Brakes.....	440	59
131	Burglars' Alarm.....	440	51
132	Steam-engine Regulator.....	441	61
133	Improved Watch-chain Swivel.....	441	59
134	Slate Frame.....	441	52
135	Improvement in Breast Pumps.....	441	59
136	Turning Bodies of Barrels, &c., out of Solid Blocks.....	442	77
137	Improvement in Cast-iron Vices.....	442	54
138	Improvement in Railroad Car Brakes.....	442	52
139	Windlass for Ships.....	442	61
140	Machine for Drying Grain.....	443	59
141	Improvement in Tenting Cloth.....	443	61
142	Mode of Protecting Gas Retorts of Iron.....	443	61
143	Application of Ordinary and Superheated Steam for Heating Purposes.....	444	59
144	Carriage Tops.....	444	61
145	Improvement in Machines for Folding and Measuring Cloth.....	444	191
146	Mode of Setting and Holding Pens for Paper Ruling.....	445	103
147	Improved Machine for Stamping out Soles of Boots and Shoes.....	445	168
148	Improvement in Omnibus Registers.....	445	185
149	Padlock.....	445	191
150	Improvements in Steam-boiler Furnaces.....	446	183
151	Improved Cider Mill and Press.....	446	184
152	Improvement in Coffee and Spice Mills.....	446	176
153	Improved Grape Frame.....	447	185
154	Improvement in Regulators for Equalizing the Flow of Gases and Fluids.....	447	183
155	Improvement in Mowing-machines.....	447	123
156	Improvement in Reversible Capstans.....	448	114
157	Breech-loading Gun.....	448	103
158	Door Locks.....	448	106
159	Improvement in Seed Planters.....	449	112
160	Improvement in Suspender Ends.....	449	73
161	Improvements in Sewing-machines.....	449	119
162	Improved Rotary Cultivator.....	449	73
163	Improvements in Machinery for Tenting and Drying Cloth.....	450	169
164	Improved Mitering-machine.....	450	196
165	Improved Hydro-pneumatic Force Pump.....	450	165
166	Improvement in Coffins.....	451	164
167	Improvement in Gas-burners.....	451	196
168	Improvement in Gas-burners.....	451	164
169	Improved Double-acting Force-pump.....	452	170
170	Improved Fruit Picker.....	452	180
171	Improvement in Inhaling Tube.....	452	164
172	Brad Cutting Machine.....	453	170
173	Improvement in Road Scrapers.....	453	164
174	Improved Charger for Fire-arms.....	453	174
175	Trap for Animals.....	453	184
176	Improvement in the Manufacture of Wooden Buttons.....	453	164
177	Improved Mortising-machine.....	454	155
11, 178	Improvement in Grain Separators.....	454	166

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 179	Improvement in Carriage Axles.....	454	182
180	Callipers.....	455	173
181	Improvement in Corn and Flour Mills.....	455	166
182	Steam-hammer.....	455	167
183	Improved Head-gate for Water-wheels.....	455	171
184	Ventilating Sewers.....	456	177
185	Improvement in Coffins.....	456	167
186	Improved Mode of forming Wire-frames for Bonnets.....	456	173
187	Improvement in Whistling Tops.....	457	173
188	Machine for Feeding Paper to Printing Presses.....	457	174
189	Process of Engraving or Printing upon Glass.....	457	148
190	Powder Channel for Doors of Safes and Vaults.....	457	175
191	Machines for Forming Moulds for Castings.....	458	216
192	Improved Pump.....	458	272
193	Apparatus for Desiccating Alimentary Substances.....	458	166
194	Mode of Preparing the Extract of Archil.....	459	None.
195	Machine for Scouring and Cleaning Grain.....	459	177
196	Improved Machine for Cutting Heels for Boots and Shoes.....	459	186
197	Magazine, Repeating, and Needle-gun.....	459	179
198	Improvement in Breech-loading Gun.....	460	157
199	Improvement in Preparing Cotton and other Fibres.....	460	136
200	Ventilated Flour Barrels.....	461	130
201	Improvement in Ploughs.....	461	183
202	Improvement in Cordage Machinery.....	461	185
203	<i>A. Kerocene</i> , for illuminating, and other purposes.....	462	None
204	<i>C. Kerocene</i> , for illuminating, and other purposes.....	462	None.
205	<i>B. Kerocene</i> , for illuminating, and other purposes.....	463	None.
206	Improved Machine for Digging Potatoes.....	463	136
207	Improvement in Evaporating Pans.....	463	136
208	Screw-wrench.....	463	129
209	Improved Machine for Bending Felloes.....	463	189
210	Improved Mechanism for Operating Saw-mill Carriages.....	464	187
211	Improved Machine for Creasing and Beveling Barrels.....	464	136
212	Improvement in the method of constructing Sofas, Settees, Cradles, and Cribs, or Crib-bedsteads.....	465	89
213	Improvement in the preparation of Collodion for Photographic Pictures.....	465	None.
214	Improvement in Pressing or Finishing Palm-leaf Hats.....	465	83
215	Improved Valve for Wind Musical Instruments.....	466	83
216	Improvement in Dressing Mill-stones.....	466	85
217	Improvement in the Application of Lightning Conductors to Ships or other Navigable Vessels.....	466	89
218	Sub-marine Battery.....	467	89
219	Improvement in Quartz and Ore-brushers.....	467	92
220	Steam-boiler.....	468	91
221	Improved Milk-strainer.....	458	85
222	Machine for Punching Rivet-holes in Hose.....	468	90
223	Improvement in Steam-engines.....	468	87
224	Improvement in Reading and Writing stands.....	469	87
225	Improvement in Spike-machines.....	469	88
226	Improved Distributer of Seed-drills.....	469	83
227	Improvement in Vault-cover Fastenings.....	470	91
228	Improved Wash-board.....	470	90
229	Improvement in Ore-stamping Machines.....	470	92
230	Improvement in Regulating the Draught in Stacks or Kilns for Burning.....	470	90
231	Improvement in Paddle-wheels.....	471	90
232	Improvements in Horse-powers.....	471	87
233	Improvement in Cast-iron Car-wheels.....	471	91
234	Improvement in Brick-kilns.....	472	f
235	Improved Beveling-plane.....	472	
11, 236	Mode of Hanging Bells.....	472	

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II
11, 237	Improved Cement.....	472	None.
238	Improvements in Machinery for making Looped or Netted Fabrics.....	473	88
239	Method of Purifying Oils.....	473	None.
240	Improvement in Sewing-machines.....	473	175
241	Improvement in Cheese-presses.....	474	165
242	Improvement in Excavating-machine.....	474	169
243	Process for making Car-wheels.....	475	167
244	Improvement in Gas-heating Apparatus.....	475	171
245	Improvement in Coal-lifters.....	475	218
246	Slide-valve motion.....	475	178
247	Clothes Refiner.....	476	None.
248	House for Mooring and Managing Balloons.....	476	162
249	Improvement in Machines for Harvesting Grain.....	476	162
250	Improved Implement for Blasting Rocks.....	477	168
251	Improvement in Foundation for Pavements.....	477	176
252	Parallel Motion.....	477	165
253	Improved Machine for Mortising Sash-stiles.....	477	180
254	Improvement in Trap-doors.....	478	172
255	Method of Applying Water to Cuniform Buckets of Flutter- wheels.....	478	162
256	Apparatus for Plating Metals.....	478	324
257	Improved Sawing-machine.....	478	162
258	Improvements in Horse-power.....	479	172
259	Improvement in Gas-stoves.....	479	164
260	Improvement in Eyelet-machines.....	479	168
261	Improvement in Lightning-rods.....	479	170
262	Improvement in the Method of Detaching Harness from Horses	480	169
263	Ornamenting Metallic Buttons.....	480	178
264	Improved Mode of Connecting Water-pipes.....	480	180
265	Improved Mode of Arranging Arch-boards for Cistern-arches...	480	167
266	Improvement in Compositions for making Photographic Pictures	481	None.
267	Improvement in Photographic Pictures on Glass.....	481	None.
268	Improvement in Ventilating and Heating Railroad Cars.....	481	175
269	Fusible Marble.....	482	None.
270	Improvement in the Construction of Ink-stands.....	482	138
271	Improvement in Walking-canes convertible into Chairs.....	482	129
272	Improvement in Diaper-locks.....	482	134
273	Improvement in Cow-catchers.....	483	132
274	Improvement in Condensers for Steam-engines.....	483	134
275	Improvement in Machines for Planing Stone and Metal.....	483	133
276	Improvement in Ship Ventilators.....	484	124
277	Improved Machine for Hackling Corn-husks.....	484	131
278	Improvement in Hot-air Furnaces.....	484	128
279	Improvement in Self-acting Mules for Spinning.....	485	122
280	Improvement in Augers, Gimlets, &c.....	485	127
281	Improvement in Machines for Bottling Mineral Waters or Liquids under Pressure.....	485	140
282	Improved Adjustable Bearings for Circular Saws.....	486	131
283	Improvement in Fire-arms.....	486	126
284	Improvement in Sewing-machines.....	486	124
285	Improved Machine for making Heddle-eyes of Wire.....	486	142
286	Improvement in Machinery for Carving Marble.....	487	134
287	Improvement in Boot and Shoe Pegging Machines.....	487	131
288	Improved Machine for making the Heads of Shovel Handles...	488	124
289	Improvement in Lanterns.....	488	122
290	Improvement in Constructing Iron Houses.....	488	132
291	Improved Grapnel for Raising Sunken Vessels.....	488	132
292	Improved Mode of Constructing Metallic Roofing.....	489	128
293	Freeing Canal Boats from Water.....	489	142
294	Improvement in Cut-off Valves of Steam-engines.....	489	126
	Improvement in Elevated Ovens used with Cooking-stoves.....	489	135

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 296	Improved Water-wheel	489	128
297	Improvement in Hermetical Sealing	490	124
295	Improvement in Lifting-jacks	490	144
299	Improvement in Whale-blubber Press	490	144
300	Improved Valvular Arrangement for Diaphragm Pumps	491	144
301	Improved method of Stretching Shoes	491	137
302	Improved Hat-shaping Machine	491	124
303	Improvement in Lifting-jacks	492	135
304	Mode of taking Daguerreotypes for Stereoscopes	492	203
305	Improved Bedstead Fastenings	492	141
306	Improved Chain-hook	493	161
307	Improved mode of Ringing Bells by Steam	493	205
308	Improved Screw-wrench	493	122
309	Improvement in Mills	494	141
310	Improvement in Brakes for Light Vehicles	494	190
311	Improved mode of Manufacturing Iron Slats for Window-blinds	494	205
312	Improvement in Flouring and Bolting Process	494	161
313	Improvements in Machine for Manufacturing Paste-board	495	141
314	Improved Pen and Pencil Case	495	158
315	Improved Iron Picket-fence	495	153
316	Improvement in Steam-boiler Furnaces	495	147
317	Improvement in Ribs of Cotton-gins	496	141
318	Improvement in Preparing Flock for Felting	496	139
319	Process for Coating Iron with Copper or Brass	496	147
320	Improvement in Slide-valves	497	207
321	Improved method of Making Printing-blocks	497	163
322	Improvement in Iron Bridges	497	192
323	Improvement in Excavating Machines	498	207
324	Improved Wind-mill	498	144
325	Improvement in Process of Tanning Leather for Shoes	498	None.
326	Process for Preparing and Separating Impalpable Powder for Paint	498	190
327	Improved Mode of Raising Vessels	499	163
328	Improvement in Horse Power	499	190
329	Improvement in Apparatus for Washing Fabrics in Continuous Sheets	499	147
330	Improvement in Cutting Tobacco	499	None.
331	Improved mode of Manufacturing Lampblack	500	161
332	Improvement in Hermetical Sealing of Preserve Canisters	500	161
333	Improvement in Steam-gauges	500	143
334	Improvement in Washing-machines	501	146
335	Improvement in Weavers' Heddles	501	205
336	Improvement in Buckles	501	130
337	Improvement in Railroad-car Trucks	501	131
338	Improvement in Manufacturing Steel directly from the Ore	502	None.
339	Apparatus for Describing the Curve of the Arm-holes of Coats	502	129
340	Improvement in Metallic Fire-places	502	190
341	Machine for Holding Docks of Horses	502	144
342	Improvement in the Reeling Apparatus of Rope Machine	503	152
343	Improvements in Pulping and Disintegrating Vegetable Sub- stances	503	None.
344	Improvement in Screw-cutting Machines	504	154
345	Improved Carriage Springs	504	120
346	Improvement in Boot and Shoe Pegging Machines	504	205
347	Improvement in Machinery for Sewing-machine	505	163
348	Improvement in Labels for Mailing and other uses	505	205
349	Improved Device in Machines for Cutting Round Tenons	505	203
350	Improved method of Securing Helves in Axes, &c.	506	147
351	Improvement in Nutmeg Graters	506	205
352	Improvement in Looms	506	141
353	Improvement in Bottles	506	207
11, 354	Improvements in Section Globe-lanterns	507	205

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
14, 355	Improvement in Cotton-gins.....	507	190
356	Improvement in Ploughs.....	507	128
357	Improvement in Bottles.....	508	207
358	Improved Door-spring.....	508	143
359	Substitute for Sperm or other Oils for Lubricating purposes...	508	None
360	Omnibus-step Protector.....	508	137
361	Improvement in Cultivator.....	509	141
362	Improvement in the striking part of Eight-day Steeple Clocks...	509	138
363	Improvement in Machines for Making Metallic Rings.....	509	107
364	Improved Arrangement for Lathe-chuck.....	509	72
365	Improved Mode for Driving and Straining Saws.....	510	105
366	Improvement in Library Tables.....	510	105
367	Improvement in the Mowing-machine.....	510	109
368	Improvement in Quartz and Ore Crushers.....	511	73
369	Improvement in Vehicles.....	511	109
370	Improvement in Butter-workers.....	511	103
371	Improvements in Portable Grates.....	511	73
372	Improvement in Dressing Mill-stones.....	512	73
373	Improved Water-wheel.....	512	109
374	Improved Lock.....	512	151
375	Improvement in Windows.....	512	156
376	Improvement in Shirt Collars.....	512	None.
377	Improvements in Steam-boilers.....	513	159
378	Improved Device for securing ends of Wires in Fence-posts...	513	154
379	Improvement in Cultivator.....	513	145
380	Improvement in Eyelet-machines.....	513	179
381	Improved Coupling for Carriages.....	514	191
382	Improvement in Ditching Ploughs.....	514	146
383	Improved Mode of Securing Staples to Walls.....	514	181
384	Improvement in Portable Soda-water Fountains.....	515	153
385	Improved Mode of Stopping Mineral-water Bottles.....	515	150
386	Improvement in Regulating the Heat of Stoves.....	515	187
387	Improvement in Machines for Working Butter.....	515	156
388	Improvement in Platform Scales.....	515	181
389	Improvements in Sheet-metal Candlesticks.....	516	188
390	Improvement in Corn-cob Cutters.....	516	189
391	Improved Ditching-spade.....	517	183
392	Improvement in Horse-shoes.....	517	152
393	Method of ascertaining Draughts of Boats.....	517	150
394	Improvement in Paddle-wheels.....	517	143
395	Improvement in Seed Planter.....	517	143
396	Spring Polishing Wheel.....	518	133
397	Improved Mode of Fitting Heads in Boxes.....	518	181
398	Improvement in Bedsteads.....	518	138
399	Improvement in Hot-air Furnace and Cooking Range.....	518	137
400	Improvement in Hedge Trimmers.....	519	147
401	Improvement in Cider-mills.....	519	147
402	Improvement in Stove-pipe Thimbles.....	519	131
403	Improved Mortising-machine.....	520	139
404	Improvement in Cable Stopper.....	520	137
405	Improvement in Machinery for Making Matches.....	520	139
406	Lubricating Material.....	521	None.
407	Wood-carving Machine.....	521	144
408	Improvement in Brick-machines.....	521	143
409	Improvement in Steam-boiler Tubes.....	521	115
410	Improvement in Saws or Blades for Sawing Stone.....	522	139
411	Improved Machine for Drying Thick Paper.....	522	122
412	Improvement in Door-locks.....	522	178
413	Punching Apparatus for Uniting Metallic Plates.....	523	166
414	Improved Cover for Hot-air Furnaces.....	523	184
415	Improvement in Magneto-electric Machines.....	523	172
41, 416	Improvement in Draughting and Modelling Vessels.....	523	148

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 417	Improved Machine for Sawing Fire-wood	524	164
418	Improved Machine for Working and Moulding Dough for Crackers	524	168
419	Improved Revolving-breech Pistol	524	173
420	Improvement in Callipers, Compasses or Dividers	525	181
421	Improved Pen	525	183
422	Improvement in Brick-machines	525	155
423	Improvement in Lathing Buildings	526	187
424	Mode of Attaching Thills and Poles to Vehicles	526	153
425	Mode of Attaching Whiffle-trees to Vehicles	526	186
426	Improvement in Wash Boards	527	160
427	Improvement in Shot Pouches	527	153
428	Improvement in Railroad Car Couplings	527	187
429	Improvement in Propellers	528	189
430	Improved Mortising-machine	528	182
431	Improvement in Houses for Switch Tenders	528	150
432	Improvement in Saws for Sawing Stone	528	129
433	Improvement in Feed Apparatus for Steam-boilers	529	158
434	Improvement in Machinery for Sticking Card-teeth	529	129, 130
435	Improvement in Measuring Cloth on Looms	530	135
436	Improvement in the Process of Warping and Dressing Yarn	530	138
437	Improvement in Fastening Lanterns	531	154
438	Improvement in Car-wheels with independent Flange and Tread	531	133
439	Improvement in Threshing-machines	532	136
440	Improvement in Moulds for Cement or Earthen Pipes	532	131
441	Improved Dumping Car	532	132
442	Self-loading and Dumping Cart	532	140
443	Improved Mode of Cleaning and Feeding	533	133
444	Improvement in Saw-mills	533	128
445	Improvement in Slips for Pulling on Shoes	533	131
446	Improved Tires for Carriage-wheels	534	122
447	Improvement in Fire-arms	534	132
448	Improvement in Machinery for Cleaning the Top Cards of Card- ing-machines	534	135
449	Improvement in Bedsteads	534	133
450	Method of Applying Power to Fire-engine	534	133
451	Improvement in the Manufacture of Brooms and Brushes	535	135
452	Improvement in Harrows	535	142
453	Improvement in Machine for Lasting Boots	535	136
454	Improvement in Cultivators	535	138
455	Improved Hydraulic Press	536	179
456	Improvement in Ploughs	536	170
457	Improvement in Horse-power Hoisting-machinery	536	148
458	Improvement in Machinery for Cleaning and Drying Grain	537	214
459	Screen for Clover-seed Huller	537	164
460	Improvement in Cultivator	537	226
461	Improvement in Withes for Masts of Vessels	538	162
462	Improvement in the Manufacture of Hats	538	None.
463	Improvement in Machines for Planing Metal	538	182
464	Seed-planter	538	182
465	Improvement in Brick-presses	539	202
466	Improvement in Dumping Wagons	540	198
467	Improved Wooden Tubular Bridge	540	200
468	Improvement in Imitating Marble	540	None.
469	Improvement in Stoves	540	202
470	Improvement in Fire-arms	541	201
471	Improved Carriage-clip to Prevent Rattling	541	208
472	Improvement in Cotton-presses	541	201
473	Improvement in Sawing and Planing Machines	541	201
474	Improvement in Rozin-oil Lamps	541	202
475	Improvement in the Stop Motion of Speeders, &c	542	204
476	Improvement in the Manufacture of Pigments from Iron Ore	543	None.
11, 477	Improvement in Fire-arms	543	197

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 478	Improved Device for Grooving Boards	543	204
479	Improvement in Melodeons	544	206
480	Improvement in Machinery for Packing Salt	544	194
481	Improvement in Radiators	544	204
482	Improvement in Brick Machines	544	254
483	Improvement in Fire-arms	545	206
484	Improvement in Spring-bottoms of Bedsteads	545	194
485	Improvement in Condensers	545	238
486	Improvement in Buggies	545	208
487	Improvement in Brick Machines	546	217
488	Improvement in Sofa Bedsteads	546	199
489	Improvement in Method of Graduating Carpenters' Squares, Rulers, &c.	547	234
490	Improved Spring-body Carriage	547	197
491	Improvement in Wooden Pavements	548	202
492	Improvement in Machinery for Dressing Stone	548	212
493	Improvement in Clover Separators	549	194
494	Improvement in Railroad Car Ventilators	549	208
495	Improvement in Machines for Cutting Soles of Boots and Shoes.	549	206
496	Improvement in Carriages	550	193
497	Improvement in Lard Lamps	550	201
498	Improvement in Car Coupling	550	201
499	Improvement in Window-sash Springs	551	200
500	Improvement in Machinery for Cutting out Boot and Shoe Soles.	551	206
501	Improvement in Fastenings for Hames	552	
502	Improvement in the Rollers of Furniture Casters	552	193
503	Improvement in Self-heating Smoothing-irons	552	196
504	Improved Document File or Holder	553	204
505	Improvements in Shuttle-guards	553	194
506	Improvement in Furniture Casters	553	194
507	Improvement in Sewing-machines	553	208
508	Improvement in Blasting Rock, Timber, &c.	554	194
509	Improved Mode of Constructing Iron Buildings	554	234
510	Improvement in Ship-blocks	554	202
511	Improvement in Fan-blowers	555	197
512	Improvements in Braiding-machines	555	199
513	Improvement in Bottles, Jars, and other similar articles	555	199
514	Improvement in Pegging-machines for Boots and Shoes	556	193, 194
515	Improvement in Moulds for Glass Insulators	557	195
516	Improvement in Hot-air Ranges and Elevated Side-ovens	557	208
517	Improvement in Railroad-car Brakes	557	196
518	Improvement in Machines for Turning Irregular Forms	558	227
519	Improvement in Rake	558	194
520	Improved Hand-press	558	197
521	Securing Carriage-wheels to Axles	558	193
522	Improvement in Punches for making Watch-hands	559	193
523	Improvement in Ploughs	559	197
524	Improvement in Lamps	559	201
525	Improved Safety-gauge for Steam-boilers	559	195
526	Improved Grindstone Frame	560	195
527	Improvement in Railroad-car Brakes	560	199
528	Cultivator	560	193
529	Improvement in Lime-kilns	561	202
530	Improved Mode of Unloading Coal and other Cars	561	204
531	Improvement in Sewing-machines	561	200
532	Improvement in Turn-tables	562	195, 196
533	Improvement in Machine for Cutting Irregular Forms	562	202
534	Improvement in Machines for Combing and Stapling Wool	562	274
535	Improvement in Railroad-car Windows	563	263
536	Improvement in Fire-arms	563	241, 242
537	Seed-planters, Cotton	564	242
11, 538	Horse-rake	564	270

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 539	Improved Mode of Insulating Lightning-rods and securing the Insulators	565	239
540	Process for Printing Long-napped Fabrics	565	None.
541	Improvement in Machines for Amalgamating Gold-bearing ores with Quicksilver	565	237
542	Improved Machine for Pegging Boots and Shoes	565	303
543	Improvement in Winnowers	566	263
544	Improved Centrifugal Pump	566	267
545	Improvement in Hot-air Furnaces	567	266
546	Improvement in Rotary Engines	567	264
547	Improvement in Hominy-mills	568	242
548	Straw-cutter	568	250
549	Improvement in Steam-engines	568	228
550	Improvement in Stop and Waste Cock	568	254
551	Improvement in Portable Bureaus	569	236
552	Improvement in Machinery for Coating Telegraph Wires	569	254
553	Bisulphuret of Carbon Engines	570	218
554	Improvement in Warp-knitting Looms	570	252
555	Improvement in Floating Anchors	570	230
556	Apparatus for Balancing and Hoisting Sashes	570	209
557	Manure and Lime Spreader	571	226
558	Improvement in Grain-mills	571	238
559	Pumps	571	248
560	Wood-gas Generator	571	252
561	Improvements in Umbrellas	572	240
562	Improved Instrument for Manufacturing Door-knobs	572	252
563	Hose Hydrant	572	240
564	Improvement in the Manufacture of Carpets	573	None.
565	Improved Daguerreotype-holder	573	236
566	Improvement in Tuning Forks	573	256
567	Improvement in Preventing Boiler Explosions	573	252
568	Improved Machine for Sawing Clapboards	573	248
569	Improved Saw-set	574	238
570	Improvement in Securing the Glass Sides of Lanterns	574	216
571	Improvement in Sewing-machines	574	228
572	Improved Carpenter's Gauge	574	240
573	Improvement in Harness-saddle Trees	575	230
574	Catamenial Ameliorator	575	218
575	Ploughs	575	240
576	Improvement in Harness-saddles	575	254
577	Improvement in Registers for Numbers applicable to Steam-engines	575	271
578	Improvement in Self-feeding and Discharging Ovens	576	327
579	Track-clearers for Grain and Grass-harvesters	576	329
580	Improvement in Cheese and other Presses	577	266
581	Improvement in Clamps for Sewing-machines	577	327
582	Improved Machine for Planing Lumber out of Wind	577	266
583	Improvement in Dampers for Furnaces and Stoves	578	270
584	Method of making Wrought-iron direct from the Ore	578	330
585	Improvement in Cog-gearing	578	327
586	Improved Tool-rest for Turning Lathes	578	271
587	Tool for Boring Legs of Pianos	578	331
588	Improvement in Sewing-machine	579	330
589	Machine for Forming Heddle-eyes	579	230, 276
590	Machinery for Rolling Shoulders on Axles	579	325
591	Steam-cock	580	196
592	Improvement in Hog-pens	580	271
593	Cultivator for Cotton	580	270
594	Improvement in Washing-machine	580	243
595	Maize-harvester	581	210
596	Improvement in Carpenters' and Masons' Bar-level	581	218
11, 597	Improvement in Window-blind Fastenings	582	212

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 598	Improvement in Manner of Fastening Saddle-shirts to the Tree.	582	212
599	Stave-machine	582	222
600	Stave-machine	582	223
601	Improvement in Ploughs.....	582	220
602	Improvement in Manure and Lime Spreaders.....	583	212
603	Method of Grinding Cross-cut Saws.....	583	209
604	Improvement in Machines for Splitting Leather.....	583	224
605	Improvement in Bedsteads for Invalids.....	583	220
606	Improvement in Washer-hinges	584	251
607	Improvement in Slide-valves.....	584	220
608	Improvement in the Manufacture of India-rubber.....	584	212
609	Seed-planter	585	219
610	Manure-excavator.....	585	214
611	Seed-planter and Manure-spreader.....	585	255
612	Improvement in Safety-fillers for Lamps.....	585	224
613	Improvement in Auger-dies.....	586	223
614	Improvement in Harrows.....	586	211
615	Improvement in Binding Folders.....	586	249
616	Cultivator for Potato Planting.....	586	269
617	Improvement in Seed-planters.....	587	221
618	Improved Saw-mill Dog.....	587	272
619	Improved Method of Tenoning Spokes	587	213
620	Corn-sheller	587	247
621	Hydraulic Ram.....	588	219
622	Chair for Exercising Young Children.....	588	209
623	Improvement in Breast-cups.....	588	224
624	Improved Horse-shoeing Apparatus	588	214
625	Improved Machine for Cutting Tenons.....	589	221
626	Improved Hydraulic Ram.....	589	231
627	Improvement in Counter Twist-speeders.....	590	222
628	Improvement in Nail-machines	590	229
629	Improved Governor for Wind-mills.....	590	229
630	Method of Operating Wind-mill Sails.....	590	219
631	Improvement in Sewing-machines.....	590	224
632	Improvement in Glass Lanterns	591	216
633	Improvement in Lard Lamps.....	591	224
634	Machinery for Dressing Ship timber.....	591	213
635	Improved Multiform Moulding-plane.....	591	269
636	Improvement in Mill-stone Dress for Cleaning Grain.....	592	224
637	Improvements in Bolting-machines.....	592	245
638	Improvement in Spring-rollers for Window-curtains, &c.....	592	217
639	Improvement in Attaching Pulleys to Shafts.....	593	233
640	Improvements in Chimney-caps.....	593	235
641	Improvement in Seed-planters.....	593	217
642	Improvement in Seed-planters.....	593	217
643	Improvement in the Manufacture of Ribbons of Velvet.....	594	236
644	Method of Reefing Topsails from Deck.....	594	237
645	Machine for Worming Rigging	594	239
646	Portable Door-fastener.....	594	216
647	Hemp and Flax Brake	594	217
648	Hanging Plane-stocks	595	237
649	Machine for Riving Lumber for Shingles.....	595	237
650	Improved Driving Wheels of Locomotives for ascending In- clined Planes.....	595	233
651	Improvement in Ice-cream Freezers	596	237
652	Improvement in Tables.....	596	227
653	Machine for Feeding Paper to Printing Presses.....	596	235
654	Improvements in Dressing Flax.....	597	198
655	Improvement in Stringed Musical Instruments.....	597	193
656	Improvement in Doors for Baggage-cars.....	597	235
657	Improvement in Argand Solar Lamps.....	597	198
11, 658	Improvement in Brick Presses.....	598	204

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 659	Improvement in Machines for Cleaning Wool.....	598	197
660	Apparatus for Turning the Leaves of Books.....	599	225
661	Improvement in Surface Condensers.....	599	237
662	Improvement in the Method of Manufacturing Boots and Shoes.....	599	236
663	Metallic Slat Shutter.....	600	215
664	Improvement in Oscillating Steam-engines.....	600	228
665	Improvement in Dressing Mill-stones.....	600	256
666	Valve or Piston for Rotary Pump.....	600	239
667	Improvements in Straw-cutter.....	601	239
668	Couplings for Vehicles.....	601	240
669	Improvements in Ship Ventilators.....	601	225
670	Truss for Hernia.....	601	235
671	Improved Method of Applying Heat to Dilate Gases for the purpose of Elevating Water.....	602	239
672	Corn Sheller.....	602	255
673	Improvements in Ranges and Cooking Stoves.....	603	245
674	Improvement in Regulators for Gas-burners.....	603	251
675	Improvement in Apparatus for Distributing Fluids.....	603	259
676	Improvement in Means of Weighing the Cargo in Canal-boats and other Vessels.....	603	253
677	Improved Spoke-machine.....	604	247
678	Breech-loading Cannon.....	604	272
679	Improvement in Tailors' Shears.....	605	211
680	Improvement in Sewing-machines.....	605	269
681	Improvement in Portable Grist-mills.....	605	255
682	Plate for Artificial Teeth.....	606	251
683	Improvement in Curtain Fixtures.....	606	227
684	Fire-engines.....	606	237
685	Breech-loading Fire-arms.....	607	215
686	Improvement in Machines for Dressing Mill-stones.....	607	216
687	Improvement in Generating Steam.....	608	227
688	Improvement in Maize Harvesters.....	608	220
689	Shingle-machines.....	608	239
690	Improvement in Telegraphic Keys.....	609	225
691	Improvement in Bee-hives.....	609	215
692	Improvements in making Slag Ware.....	610	None.
693	Machine for Sawing Timber.....	610	254
694	Portable Staging.....	610	226
695	Vault Lights.....	610	225
696	Improvement in Caloric Engines.....	611	239
697	Hydraulic Ram.....	611	235
698	Revolving Fire-arms.....	611	236
699	Mode of converting the backs of Car-seats into Beds or Lounges.....	612	228
700	Breech-loading Cannon.....	612	225
701	Improvements in Lamps for burning Rosin-oil.....	612	227
702	Water-meter.....	613	278
703	Improvements in Counting-machines, and Machines for Indica- ting Motion.....	613	225
704	Pumps.....	614	233
705	Safety-washer for Wheels.....	614	228
706	Improvement in Sausage-stuffers.....	614	233
707	Machines for Sawing Wood.....	615	218
708	Improved mode of Operating Guide-rollers and Feed-clamps in Sawing-machines.....	615	256
709	Apparatus for Polishing Daguerreotype Plates.....	615	236
710	Improvement in Grain and Grass Harvesters.....	615	232
711	Improvement in Calendar Clocks.....	616	243
712	Improved Gold Separator.....	617	238
713	Improvement in Calendar Clocks.....	617	269
714	Improvement in Gas Generators.....	618	209
715	Repeating Fire-arms.....	618	223
11, 716	Improvement in Porous Elastic Cloth for Gaiters.....	619	209

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11,717	Neck-yoke for Horses.....	619	221
718	Improved Hot-air Furnace.....	619	231
719	Harness Clasp.....	619	253
720	Improvement in Knitting Machinery.....	619	211
721	Improved Parrel and Bow.....	620	213
722	Improvement in Bedstead Fastenings.....	620	229
723	Improvement in Electric Clocks.....	620	210, 233, 250
724	Improvement in Railroad Car Seats.....	621	259
725	Improvement in Chair Frames.....	622	255
726	Improvement in Machines for Adding Numbers.....	622	214
727	Whiffletree.....	623	218
728	Improved Machine for Paging Books.....	624	232
729	Improvements in Scales.....	624	233
730	Improved Safety Lamp.....	624	198
731	Improvement in the Method of Felting Hat-bodies.....	625	211
732	Improvement in connecting a Series of Car-brakes.....	625	198
733	Improvement in the Running Gear of Locomotive Engines.....	625	198
734	Improvement in the Springs to the Knives of Straw-cutters.....	626	198
735	Improvement in Harvesters of Grain and Grass.....	626	256
736	Improvement in Washing-machines.....	626	226
737	Improvement in Washing-machines.....	627	240
738	Machine for Cutting Irregular Forms.....	627	213
739	Improvement in the method of Uniting Bats in the Process of Manufacturing Seamless Felt Garments.....	627	None.
740	Improvement in Process of Making Illuminating Gas from Wood.....	628	256
741	Improvement in Paddle Wheels.....	628	234
742	Improvements in the Form of Gas Retorts.....	628	236
743	Improvement in Steam-gauge.....	629	248
744	Machine for Manufacturing Frames for Wood-saws.....	629	252
745	Improvement in Revolving Brick-presses.....	629	253
746	Improvement in Machinery for Cutting and Dressing Stone.....	630	231
747	Improvement in Warming Houses by Steam.....	630	224
748	Improvement in Machines for Drying Woollen Goods.....	630	251
749	Improvement in Buttons.....	630	219
750	Dumping-car.....	631	324
751	Improvement in Knitting-looms.....	631	222
752	Improved Pen and Pencil Case.....	631	270
753	Improvements in Brick-machines.....	632	255
754	Improvements in Stone-cutting Machines.....	632	257
755	Self-acting Mule.....	633	258
756	Hat-bodies.....	633	286
757	Improvement in Curtain Fixtures.....	633	322
758	Improvement in the Manufacture of Daguerreotype Cases.....	634	258
759	Improvement in Apparatus for Starting Railroad Cars.....	634	331
760	Improvement in Brick-machines.....	634	308
761	Improvement in the Feeding-hoppers of Threshers and Separators of Grain.....	635	328
762	Improved Pen and Pencil Case.....	635	330
763	Improvement in Railroad Draw-bridge and Switch Telegraph.....	635	322
764	Improvement in Mosquito-curtains.....	636	270
765	Improved Printing Press.....	637	256
766	Improvement in Processes for Purifying Fatty Bodies.....	637	332
767	Improvement in Gas-meter Movement.....	638	332
768	Improvement in Moving-box Loom.....	638	332
769	Improvement in the Construction of Needles.....	638	332
770	Improvement in Stoves.....	638	303
771	Improvement in Piano-forte Stools.....	639	316
772	Improvement in Railroad-car Seats.....	639	314
773	Improvement in Machinery for Making Hat-bodies.....	640	290
774	Shingle-machine.....	640	297
11,775	Improvement in Spinning Rope and Cordage.....	640	301

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 776	Rotary Pump	641	309
777	Improved Machine for Turning Hubs and Tool Handles, &c.	641	309
778	Cutter-heads for Planing-machines	641	305
779	Improvement in Stone or Rock Drills	641	211, 262
780	Improvement in Magnetic Alarm Bells	642	393
781	Improved Sewing-pin	643	295
782	Improvement in the Construction of Sugar-making Apparatus ..	643	301
783	Improvement in Machines for making Railroad Chairs	644	223
784	Improvement in the Construction of Ships	644	221
785	Improvement in Brakes for Checking and Starting Cars	645	231
786	Improvement in Compounds for Neutralizing Chlorine	645	None.
787	Improvement in Pawl Drills	645	272
788	Improvements in Saw-gummers	645	245
789	Improvement in Cans for holding Liquids	646	245
790	Improvement in Looms	646	247
791	Improvement in Cutting Shingles	646	245, 249
792	Improvement in Buttons	646	245
793	Improvement in Horn and Shell Splitting Machines	647	272
794	Improved Damper for Ovens	647	231
795	Improvement in Ginning and Cleaning Cotton	647	253
796	Improvement in Rotary Steam-engines	648	270
797	Polishing-machine	648	253
798	Improvement in Turning-lathes	648	249
799	Improvement in Locomotive Lamps	648	255
800	Improvements in Smut-machines	648	247
801	Improvement in the Construction of Sugar Boilers	648	229
802	Improvement in Process for the Manufacture of Salt	649	219
803	Loom for Weaving Cut-pile Fabrics	649	246
804	Improvement in Power Looms	650	261
805	Improvement in Machine for Forming Hat-bodies	650	265
806	Improved Water Meter	651	260
807	Smoke-consuming Stove	651	265
808	Improvement in Shoemakers' Edge-planes	652	264
809	Iron Buildings	652	242
810	Improvement in Grain and Grass Harvesters	652	259
811	Grinding-surface in Mills	653	266
812	Improvement in Roving Tubes	653	244
813	Improvement in Sawing-machine	653	260
814	Improvement in the Mode of Constructing Pipes	653	242
815	Improvement in Process for Enamelling Iron	653	None.
816	Improvement in Joints for Toilet-glasses	654	262
817	Improvements in Brick Presses	654	244
818	Iron Truss Bridge	655	268
819	Improvement in Vessels for Holding Liquids	655	244
820	Improved Pen and Pencil Case	656	267
821	Improvement in Ploughs	656	267
822	Improvement in Lifting and Bolting	656	267
823	Improvement in Smut-machines	657	262
824	Improvement in Straw and Grain Separators	657	259
825	Machine for Softening Hemp, Flax, &c.	657	260
826	Improvement in Machinery for Cleaning Cotton	658	267
827	Improvement in Chairs for Round Rails	658	261
828	Improved Mill Bush	658	264
829	Improvement in Seed-planters	658	260
830	Improvement in Granaries	659	266
831	Improvement in Gutta Percha Stereotype Composition	659	None.
832	Improved Bran-duster	660	257
833	Improvement in Looms	660	257, 258
834	Improvement in Manufacturing Carpets of Rugs	661	258
835	Prussian Needle-gun	661	266
836	Pen-holder	661	258
11, 837	Improvement in Machinery for Polishing Paper	661	304

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 838	Improvement in the Process of Making Iron Direct from the Ore	661	296
839	Improved Sliding Pen and Pencil Case	662	317
840	Improvement in Pen and Pencil Cases	662	273
841	Improvement in the Square, Scale, Level, and Bevel	662	275
842	Improvement in Safes	662	306
843	Improvement in Fastening Lamps to Lanterns	663	275
844	Improvement in Stoves	663	285
845	Improvement in Mills	663	323
846	Improvements in Rotary Steam-engines	663	325
847	Improvement in Air-heating Furnaces	665	289
848	Improvement in Bearings for Loose Pulleys	665	208
849	Securing Lamps to Lanterns	665	278
850	Improvement in Roller-catch for Self-acting Mill	665	328
851	Improvement in Steam-engines	665	329
852	Turning-keys for Pianos	666	328
853	Printing Press for Printing in Colors	666	324
854	Improvement in the mode of cutting gradually tapering strips of Raw and Tanned Hide for Whips	666	326
855	Improvement in Grain Winnowers	667	325
856	Burglars' Alarm for Money-drawers	667	331
857	Improvement in Apparatus for Tempering and Flattening Hardened Saws	667	327
858	Shingle Machine	668	323
859	For Ringing Alarm Bells	668	330
860	Machine for Filling Match-frames	669	322
861	Improvement in Toothed Clothing for Picking Cylinders	669	282
862	Breech-loading Fire-arms	670	329
863	Improvement in Machinery for making Rope and Cordage	670	279
864	Wagon Seats	670	306
865	Improvement in Machinery for Picking Cotton and other fibrous substances	670	312
866	Improvement in Tailors' Measures	671	320
867	Syphons	671	311
868	Improvement in Flexible Measures	671	312
869	Improvement in the Construction of Hollow Railroad Axles	671	310
870	Breech-loading Cartridge	671	310
871	Breech-loading Powder-flask	672	318
872	Improvement in Apparatus for Sawing Off Piles under Water	672	305
873	Improved Pen and Pencil Case	672	311
874	Cancelled	672	None.
875	Machine for Manufacturing Mast-hoops	672	313
876	Improved Soldering Furnace	672	314
877	Improvement in Odometers	673	316
878	Improvement in Odometers	673	310
879	Improvement in Grate Bars	673	306
880	Improvement in Spark Arresters	674	314
881	Water-meter	674	312
882	Improvement in Machinery for Culling Rags for making Paper	674	316
883	Improvement in Surface Condensers for Steam-engines	675	320
884	Improvement in Sewing-machines	675	307
885	Improvement in Locks	676	311
886	Improvement in the Method of Polishing Stone	676	307
887	Improved Rat-trap	676	318
888	Water-wheel	676	309
889	Improvement in Machines for Dressing Stone	677	310
890	Improvement in the Art of Manufacturing Glass	677	313
891	Corn-sheller	677	314
892	Improvement of Buckles	678	316
893	Improvement in Glass Furnaces	678	314
894	Barrel-machine	678	310
895	Improvement in Bottle-stoppers	678	306
11, 896	Improvement in Furnaces for Warming Buildings	679	306

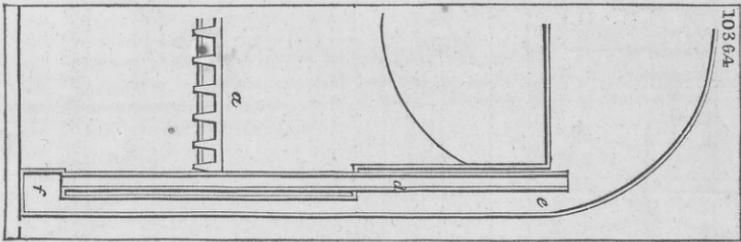
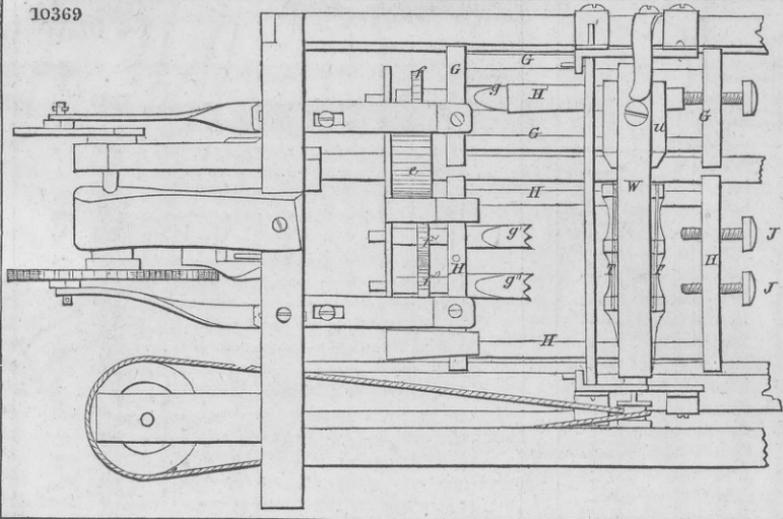
No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 897	Improvement in Vulcanizing Elastic Gums	679	None.
898	Improvement in Coal-hods	679	310
899	Improvement in Potato Diggers.....	679	308
900	Sawing Bolts for Staves.....	680	306
901	Bomb-shell	680	314
902	Improved Manufacture of Round Banding	680	310
903	Slate-frames	680	305
904	Improvement in Railroad Car Brakes.....	681	307
905	Farm Gates	681	305
906	Improvement in Sulphurizing Gutta Percha and like gums.....	681	None.
907	Machine for Tenoning Blind Slats.....	681	309
908	Improvement in Steam-engine Valves	682	315
909	Improvement in Rotary Steam-engines.....	682	316
910	Improvement in Machine for Hat Bodies.....	682	320
911	Improvement in Harness Saddles.....	682	313
912	Circular Saw.....	682	312
913	Improvements in Corn-sheller.....	683	314
914	Improvement in Blast Furnaces.....	683	310
915	Machine for forming the opening in the Heads of Shovel-handles.....	683	305
916	Improvement in Locks.....	684	311
917	Repeating Pistol.....	684	315
918	Improvement in Straw-cutters.....	684	312
919	Improvement in Loom-beams.....	685	310
920	Improvement in Lifting-jacks.....	685	314
921	Improvement in Machines for Cutting and Dressing Stone.....	685	320
922	Improvement in Machinery for Carving Stone.....	685	318
923	Improvement in Smut-machines	686	306
924	Improvement in Cultivators.....	686	316
925	Improvement in Slide-valves.....	686	315
926	Improvement in Double-cylinder Boilers.....	686	310
927	Improvement in Apparatus for Making Iron.....	687	317
928	Improvement in Lamp-caps.....	687	265
929	Improvement in Cultivator.....	687	263
930	Device for Adjusting Mill-stones.....	688	246
931	Improved Multigrade Iron-fence.....	688	268
932	Mode of Holding Vessels by the Keel, in Sectional Dry and Floating Docks.....	688	242
933	Improvement in Looms.....	688	241
934	Improvement in Sewing-machines.....	689	246
935	Improvement in Ploughs.....	689	261
936	Machine for Paging Books.....	689	282
937	Improvement in the Method of Engaging and Disengaging Self-acting Car-brakes.....	690	321
938	Breech-loading Gun.....	690	319
939	Improvement in Omnibus Registers.....	691	287
940	Improvement in Railroad-car Coupling.....	691	281
941	Improvement in Grain-winnowers.....	691	263
942	Tape-worm Trap.....	691	244
943	Operation for Removing Tape-worm from the Stomach.....	692	None.
944	Method of Controlling Logs in Saw-mills without a Carriage.....	692	271
945	Improved Method of Hanging Saws.....	692	263
946	Improved Method of Controlling the Log for Carved and Bevel Sawing.....	692	261
947	Improvement in Overshoes.....	693	323
948	Ditching Plough and Excavator.....	693	325
949	Excavating-machine	694	265
950	Shingle-machine	694	246
951	Improvement in Grain and Grass Harvesters.....	694	265
952	Improvement in Machinery for Stretching and Drying Cloth.....	695	213
953	Saw-gauge	695	212
954	Improvement in Method of Constructing Printing-blocks.....	695	221
11, 955	Improvements in Casting Type.....	696	213

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
11, 956	Improvement in the Rollers of Pattern-chains for Looms	696	221
957	Improvement in Draw-irons for Tow-lines of Boats	696	264
958	Improvement in the mode of Lubricating the Cylinders and Bearings of Steam-engines.....	696	251
959	Improvement in Brick-moulds.....	696	253
960	Machine for Papering Walls	697	216
961	Improvement in Sauce-pans.....	697	251
962	Improvement in Machines for Closing Sheet-metal Boxes.....	697	251
963	Improvement in Valve-gear.....	697	267
964	Improvement in Carding-machines.....	698	270
965	Shingle-machine	698	268
966	Improvement in Kettles for Calcining Plaster of Paris	698	271
967	Improvement in Seed-planters	699	264
968	Improvement in Slide-valves.....	699	260
969	Improvement in the mode of Attaching Life-preservers to Vests	699	264
970	Improved Arrangement of Pencils for Drawing-machines	699	263
971	Improvement in Sewing-machines.....	699	266
972	Improvement in Spinning-machines	700	265
973	Improvement in the Manufacture of Wire Rope.....	700	277
974	Improvement in Machinery for Threading Screw-blanks.....	701	328
975	Improvement in Furnaces.....	701	306
976	Improvement in Inhaling Apparatus.....	701	326
977	Improvement in Clothes-clamps.....	701	327
978	Dressing Millstones.....	702	331
979	Improvement in Rosin-oil Lamps.....	702	298
980	Improvement in Seed-planters.....	702	331
981	Improved Process of Rotting Hemp, &c.....	703	322
982	Improvement in Surgical Forceps.....	703	326
983	Improvement in Scythe-fastenings	703	281
984	Planing-machine.....	704	260
985	Improved Apparatus for Drying Clothes.....	704	273
986	Improvement in Hay and Cotton Presses	704	262
987	Fire-engine.....	705	324
988	Improvement in Quartz-crushers	705	324
989	Improvement in Towel Stand or Clothes Horse.....	705	298
990	Improvement in Clover-hullers.....	706	322
991	Improvement in Seats for Public Buildings.....	706	326
992	Paddle-wheel.....	706	327
993	Improvement in Converting Reciprocating into Rotary Motion.	706	None.
994	Improvement in Rotary Cooking-stoves.....	707	329
995	Improvement in Knitting-machines.....	707	269
996	Improvement in Dies for Pressing Bonnet-fronts.....	707	296
997	Improvements in Steam-boilers.....	708	269
998	Method of Supplying Tanks of Locomotives with Water	708	330
999	Improvement in Stoves.....	708	326
12, 000	Improvement in Manufacture of Metal Rods and Tubes	708	328
1	Breech-loading Fire-arm.....	708	275
2	Machine for Boring the Chambers in the Revolving Cylinders of Fire-arms.....	709	279
3	Improved Piano-forte Action.....	709	273
4	Improvement in Machine for Pressing Bonnet-frames	709	285
5	Improvement in Looms for Weaving Bags	710	302
6	Improved Mitre-box.....	710	273
7	Inclined Sliding-valves.....	710	275
8	Improved Rotary Lathe.....	710	298
9	Planing-machine.....	711	274
10	Improvement in Self-feeding Metal Drill.....	711	291
11	Improvement in Sewing-machines.....	711	296
12	Improvement in Washing-machines.....	711	275
13	Improvement in Ships' Windlasses.....	712	298
14	Improvement in Binding-guides for Sewing-machines.....	712	296
12, 015	Improvement in Sewing-machines.....	712	294

No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
12, 016	Improvement in Machinery for Making Rope and Cordage.....	712	295
17	Improvement in Seats for Public Buildings	713	292
18	Oven for Baking.....	713	306
19	Improvement in Steam-boiler Alarms.....	714	285
20	Improved Method of Reefing Sails from the Deck.....	714	306
21	Improved Steering Apparatus.....	714	281
22	Rotary Pump	714	275
23	Improvement in Railroad-car Seats	715	281
24	Improvement in Railroad Switches.....	715	287
25	Improvement in Machinery for Separating the Fibre from the Woody Portion of Tropical Plants.....	716	273
26	Machine for Rounding the Backs of Books	716	323
27	Improvement in Paper-making Machines.....	716	279
28	Improvement in Paper-making Machinery	716	273
29	Improvement in Washstands.....	717	306
30	Improved Mill for Shelling and Grinding Corn.....	717	319
31	Improved Machine for Crushing Ores.....	718	298
32	Improvement in Steam-boilers	718	276
33	Improvement in Railroad-car Brakes.....	718	316
34	Dry-docks.....	718	319
35	Method of Casting Window-sashes.....	718	277
36	Improvement in Running-gear of Railroad-cars.....	719	287
37	Improvement in the Manufacture of Brushes	719	319
38	Method of Extinguishing Fire in Inaccessible Places.....	719	285
39	Regulating Furnaces of Hot-water Apparatus.....	720	277
40	Improvement in Covering Cotton Thread with Wool.....	720	280
41	Improvement in Lanterns.....	720	317
42	Hydraulic Ram.....	720	283
43	Improvement in Churns.....	721	273
44	Improvement in Grain and Grass Harvesters.....	721	320
45	Improvement in Gas-meters.....	721	313
46	Improvement in Knitting-machines	722	291, 312
47	Lubricating Apparatus.....	722	289
48	Improvement in Polygraphs.....	722	292
49	Improved Polygraph.....	722	312
50	Improvement in Operating Looms by Electricity.....	423	306
51	Improved Mode of Hanging Carriage Bodies	723	294
52	Improvement in Oscillating Engines	723	301
53	Improvement in Machine for Bending Metal.....	724	None.
54	Machine for Crushing and Grinding Minerals and other Sub- stances.....	725	273
55	Improvement in Thristles for Spinning Cotton	726	293
56	Improved Method of Destroying Vermin.....	726	289
57	Improved Method of Constructing Hoes.....	726	321
58	Improvement in Coffins.....	727	325
59	Harrow Improvement in Securing Adjustable Teeth	727	304
60	Fishing-line, Sinkers, and Floats.....	727	283
61	Improvement in Securing Carpets to Floors	727	273
62	Improved Hub-bands for Carriages	728	292
63	Improvement in Flyers	728	283
64	Improvement in Cut-off Regulators for Steam-engines.....	728	304
65	Feed-motion for Re-sawing, &c.....	729	287
66	Improvement in Sewing-machines	729	311
67	Improvement in Propellers	729	297
68	Improvement in Dock-holders.....	729	312
69	Improvement in Gold collectors	729
70	Improvement in Cheese-vat.....	730	292
71	Hygrometric Regulator for Hot-water Apparatus.....	730	275
72	Improvement in Jacquard Machine	730	310
73	Improved Ratan Machine	731	280
74	Improvement in Sewing-machine	731	277
12, 075	Improvement in Cultivators.....	731	319

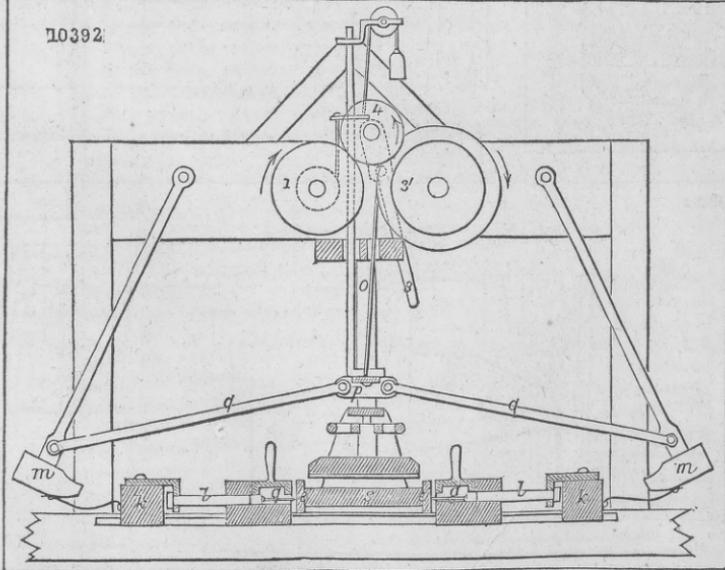
No.	Invention or discovery.	Folio, Vol. I.	Folio, Vol. II.
12, 076	Improvement in Metal-scraping Machine	732	318
77	Improvement of the Process of Treating the Mother-water of Salines	732	275
78	Boring-machine	733	273
79	Improvement in the Joints of the Tubing of Surface Condensers.	733	292
80	Improvement in Hot-air Furnaces	733	279
81	Improvement in Locks	734	288
82	Machine for Dressing Spokes	734	283
83	Improvement in Windlasses	734	302
84	Seed-planter	734	284
85	Improvement in Water-proofing Cloths, &c	735	None.
86	Improvement in Making Tea-pot Spouts	735	300
87	Improvement in Trussing Yards to Masts	735	302
88	Feeding Apparatus to a Machine for Cutting Irregular Forms.	735	296
89	Improvement in Condensers.	736	302
90	Improvement in Gold Separators	736	323
91	Improvement for Cleaning Seed-cotton and Feeding it to the Gin.	736	285
92	Double-acting Force-pump	736	285
93	Bilge-supporter	736	287
94	Ferry-boat Guards	737	321
95	Improvement in Clover Harvesters	737	317
96	Improvement in Grain Mills	737	296
97	Impact Water-wheel	737	300
98	Improvement in Machines for Straightening Metal Bars	738	321
99	Improvement in Registering Dynamometers	738	317
100	Improvement in Sash-fastener	739	319
101	Improvement in Making Sugar-moulds	739	304
102	Improvement in Composition for Tanning	739	None.
103	Improvement in Nail-feeding Machines	739	288
104	Method of Holding Vessels by the Keels in Docks	740	304
105	Shingle-machine	740	286
106	Improvement in Revolving Fans for Apartments	740	300
107	Improved Machine for Packing Flour	741	287
108	Improvement in Life-preserving Seats	741	294
109	Improvement in Boot-cripping Machines	741	283
110	Oven Cooking-range	741	284
111	Improvement in Spring-bed Bottoms	742	289
112	Improved Machine for Making Horse-shoes	742	289-290
113	Improvement in Grain and Grass Harvester	742	289
114	Improvement in Leather-splitting Machines	743	318
115	Machine for Turning Prismatic Forms	743	299
12, 116	Improvement in Sewing-machines	744	294
ADDITIONAL IMPROVEMENTS.			
107	Improvement in Bog-cutting Cultivators	762	273
108	Improvement in Smut-machines	763	277
109	Improvement in Ploughs	763	310
110	Apparatus for Opening and Closing Gates	763	319
111	Improvement in Grinding Mills	763	275
112	Improvement in Looms for Weaving Colored Fabrics	764	300
113	For Harness Saddle-trees	764	281
114	Improvement in Machines for Polishing Raw Hide Whips	764	323
115	Improvement in Whiffletree Hooks	765	323
116	Improved Safety Washer for Securing Wheels to Axles	765	321
117	Improvement in the Construction of Reed Musical Instruments.	765	325

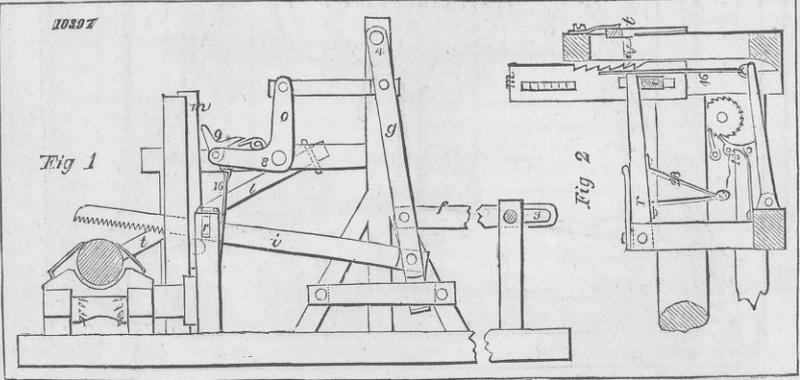
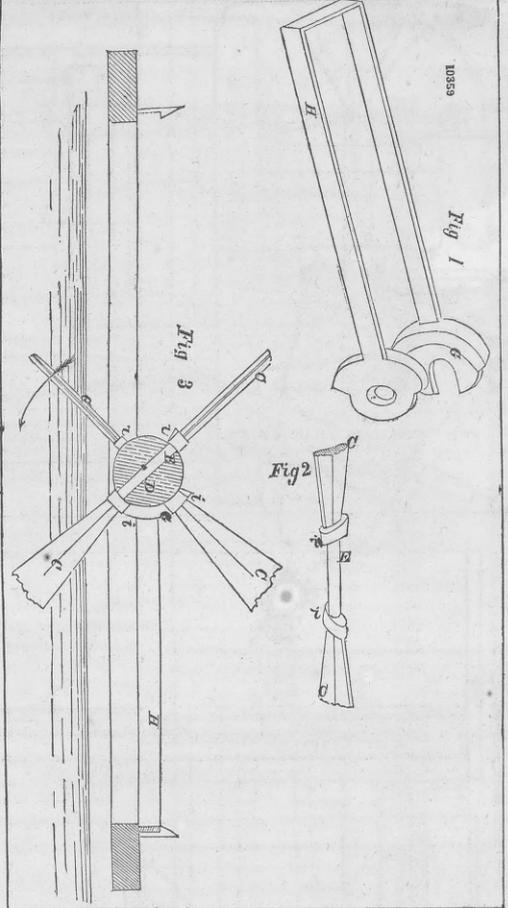
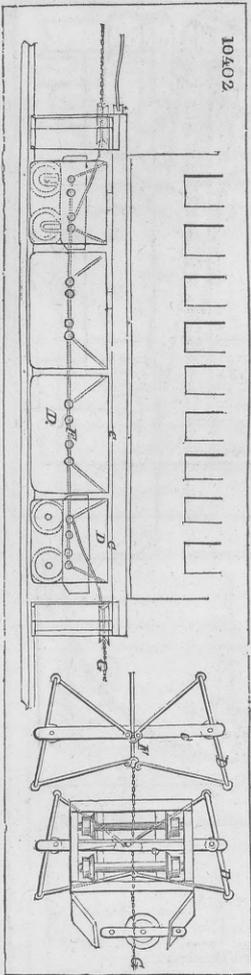
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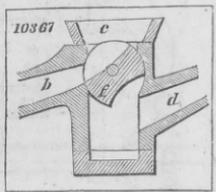
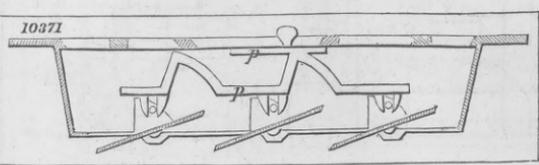
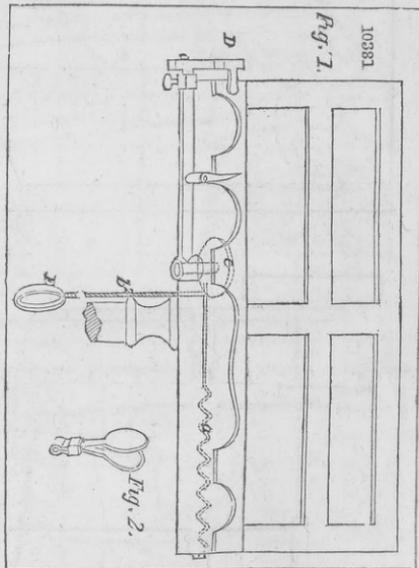
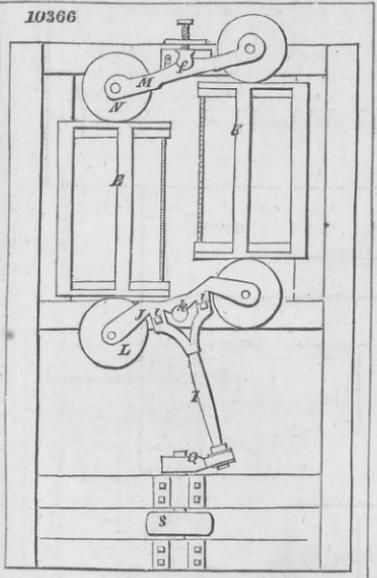
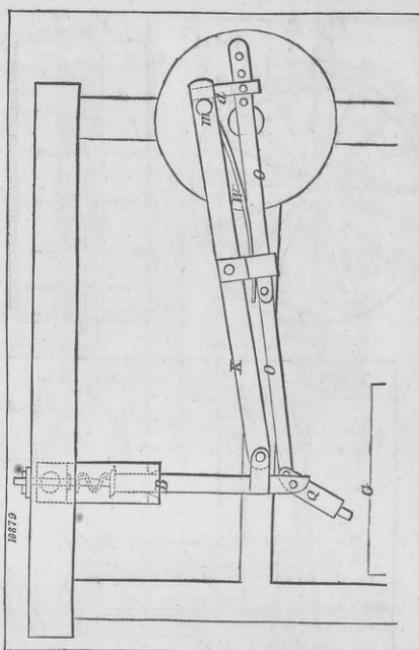
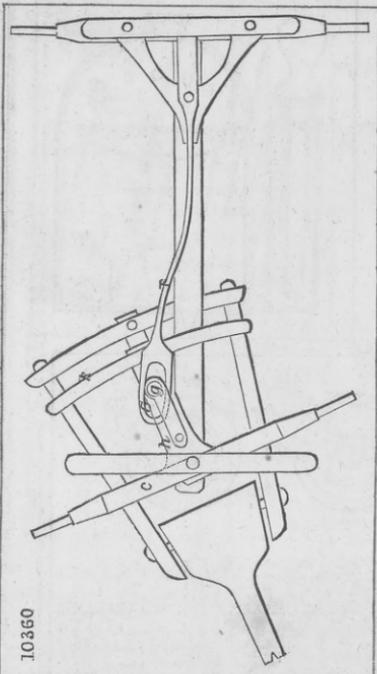


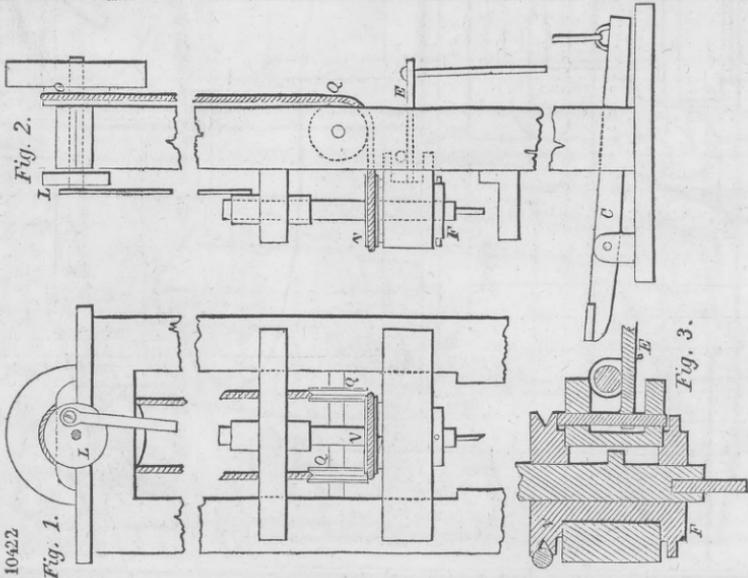
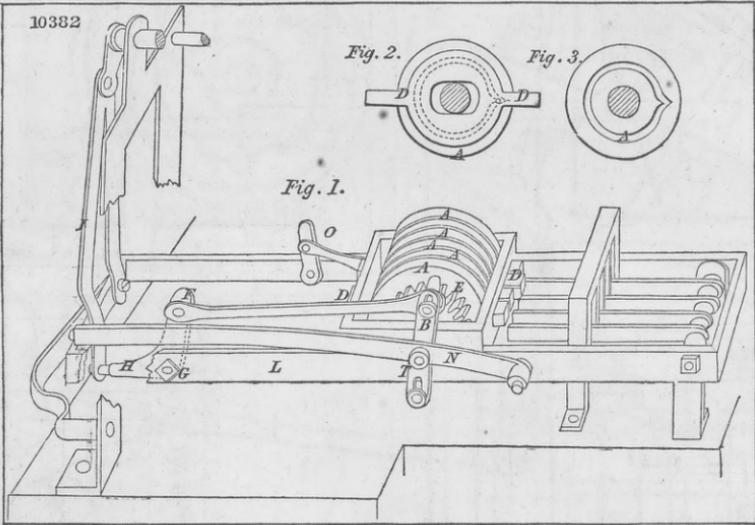
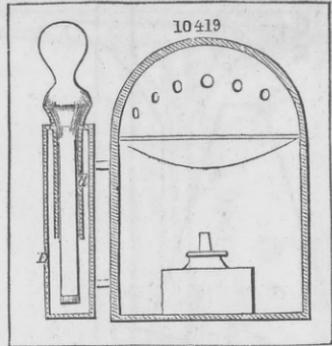
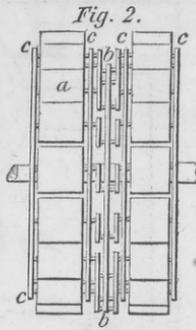
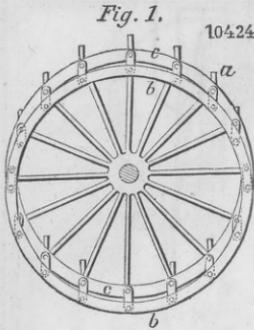
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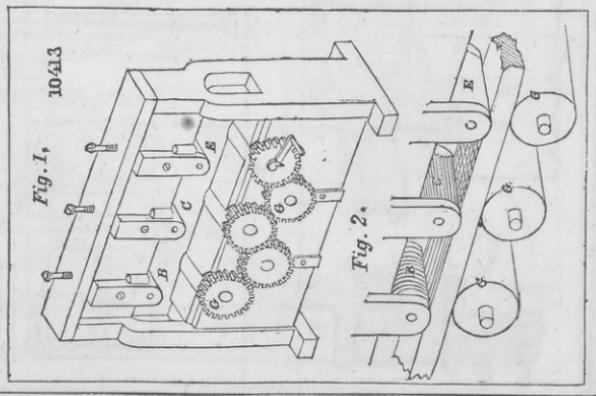
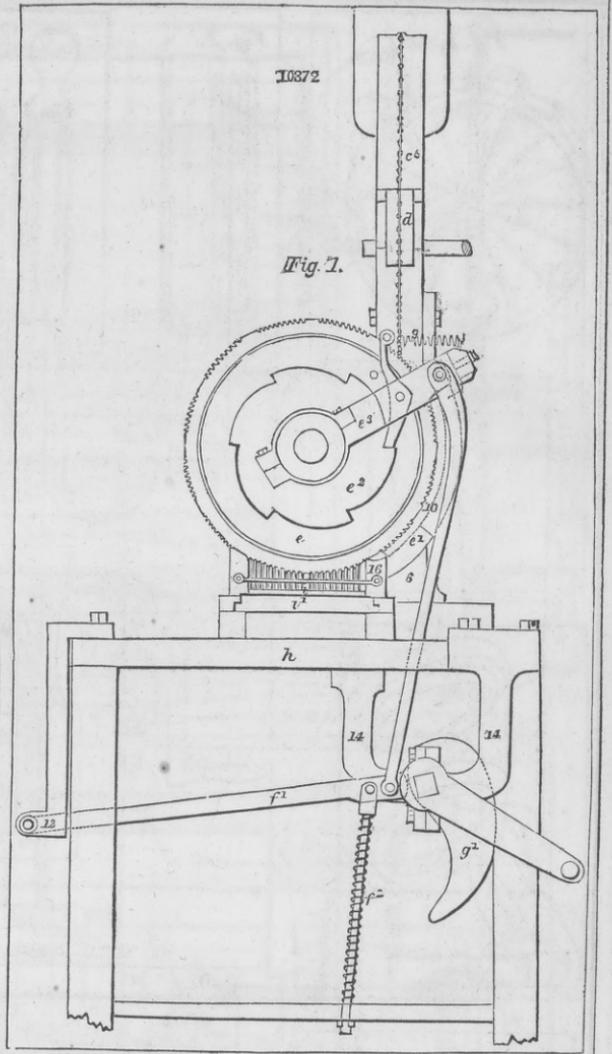
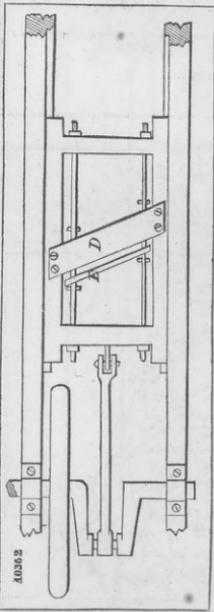
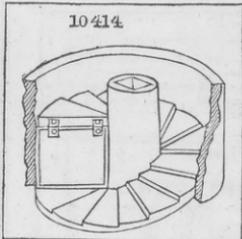
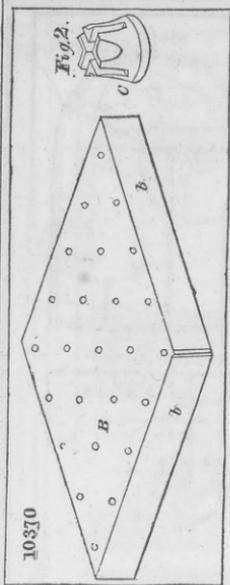
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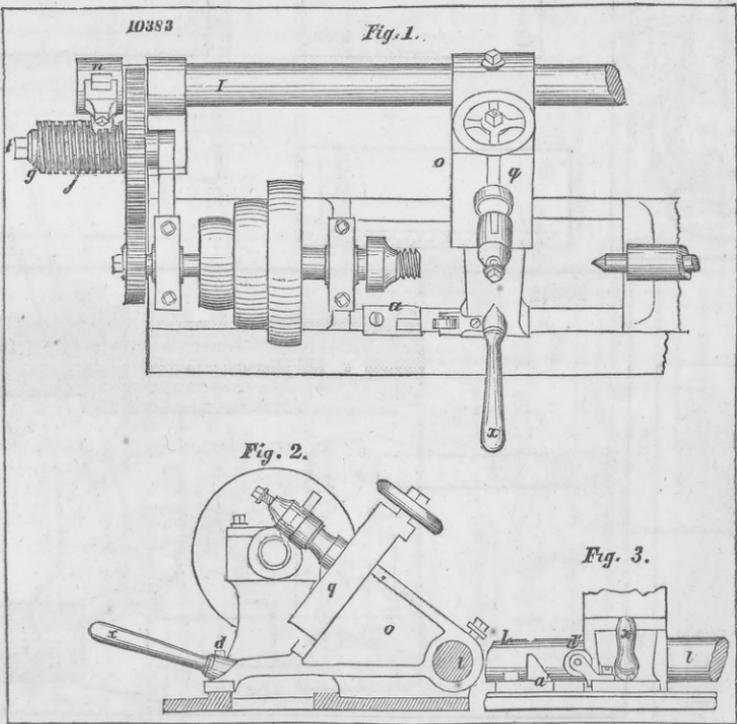
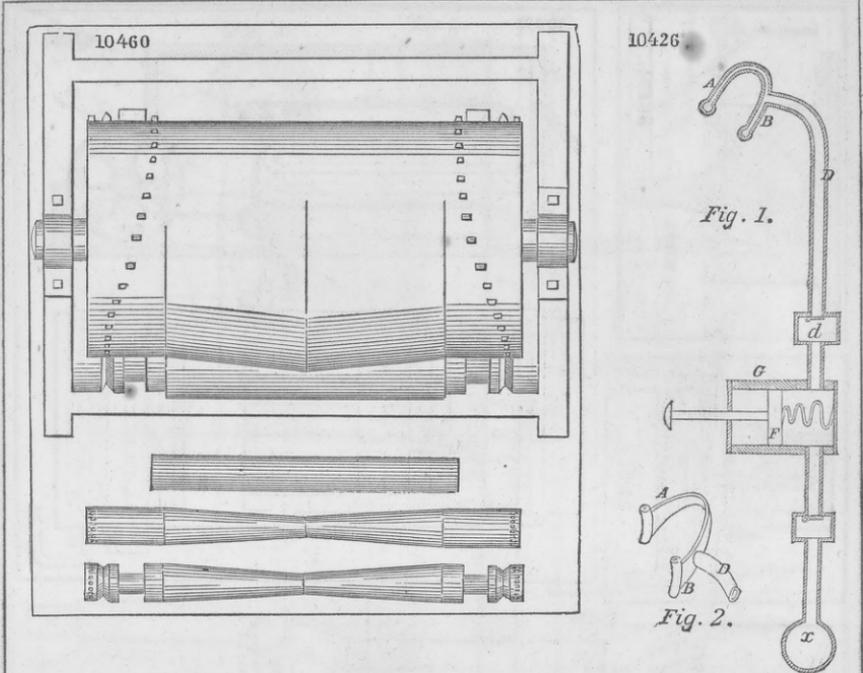


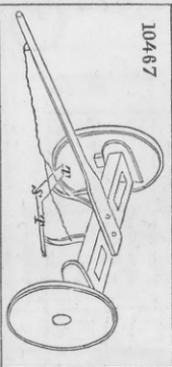
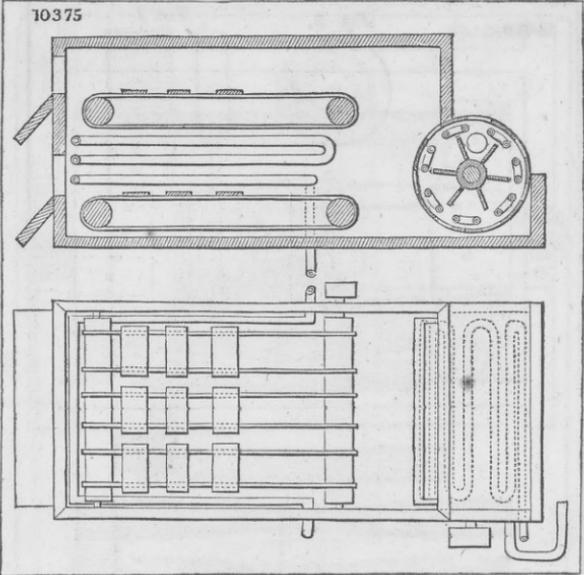
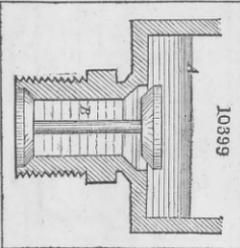
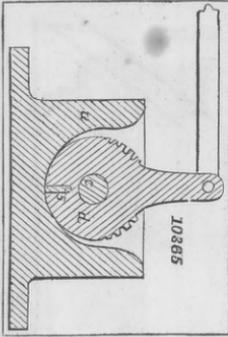




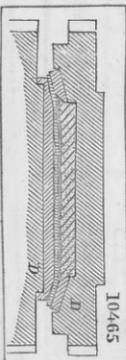
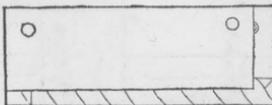
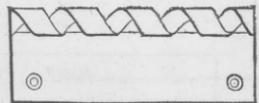
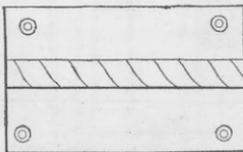








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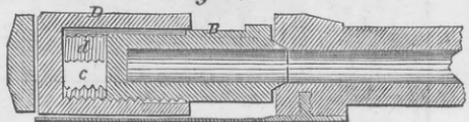
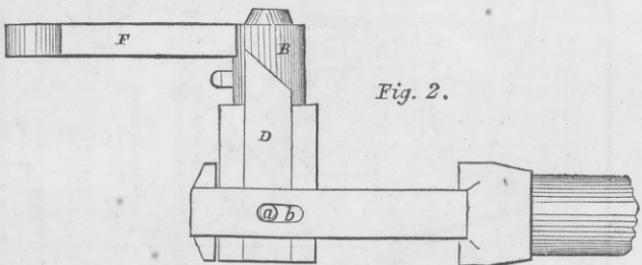


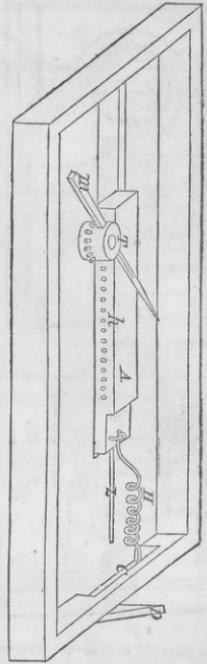
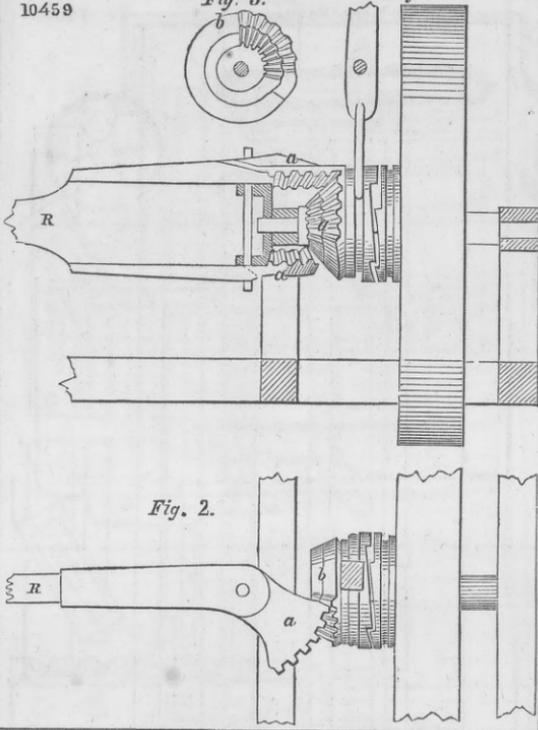
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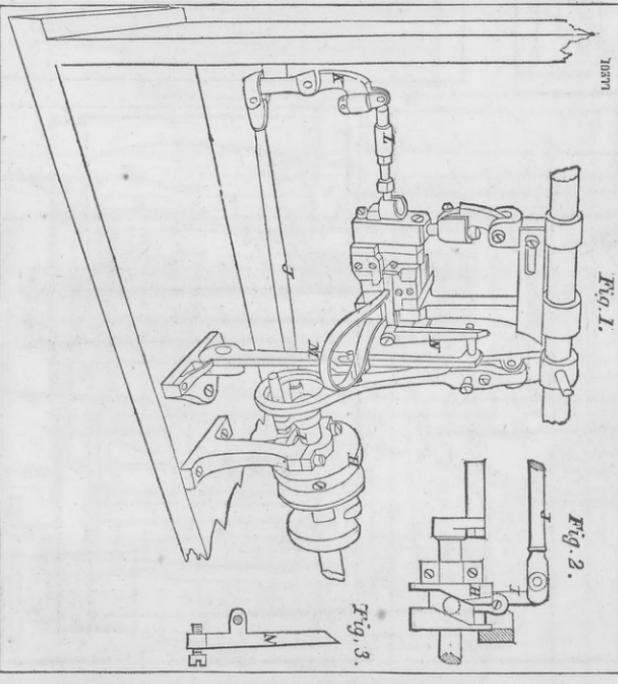
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Fig. 3.

Fig. 1.



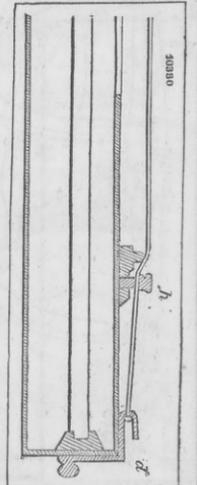
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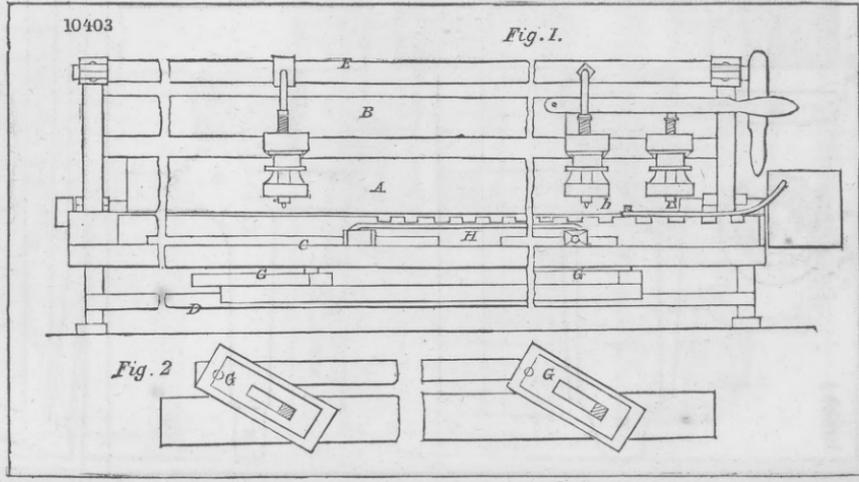
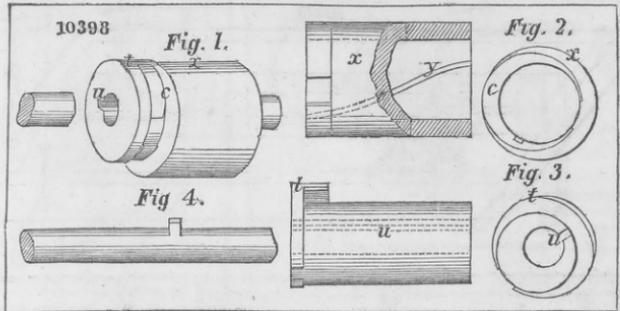
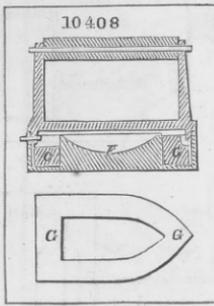
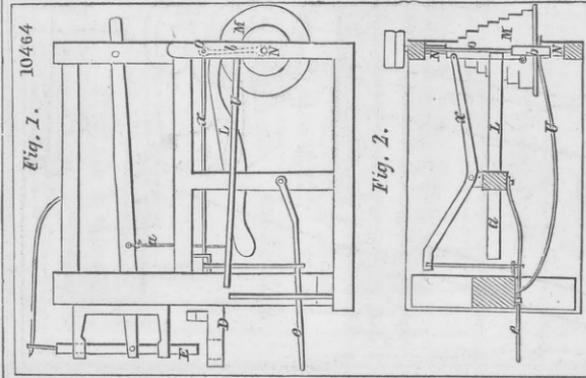
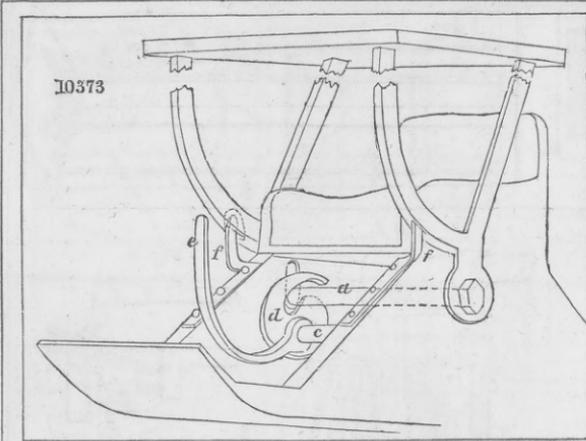


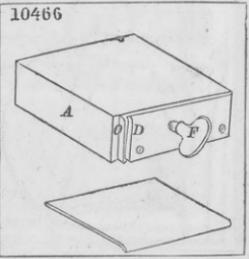
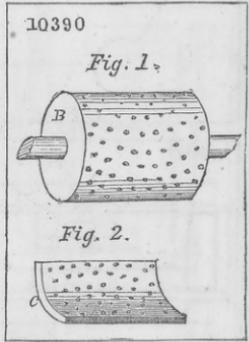
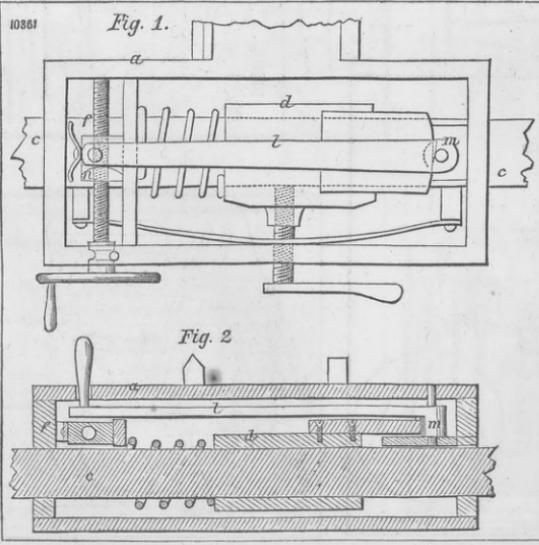
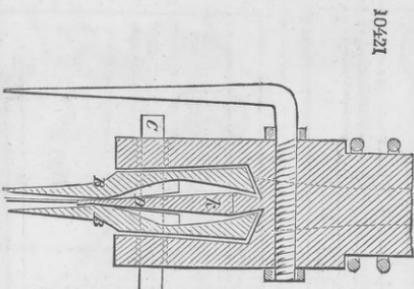
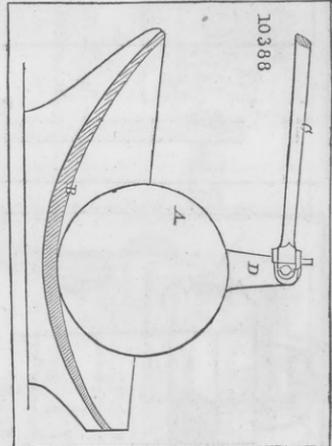
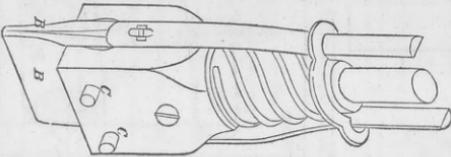
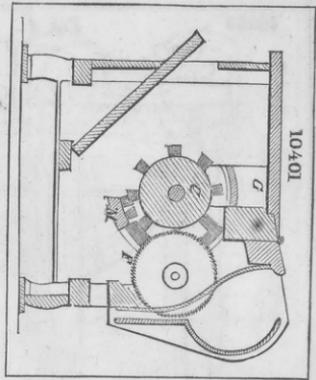
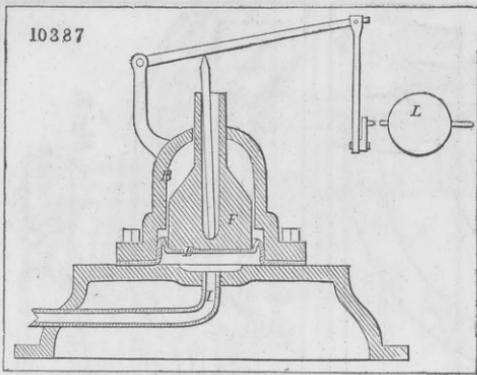
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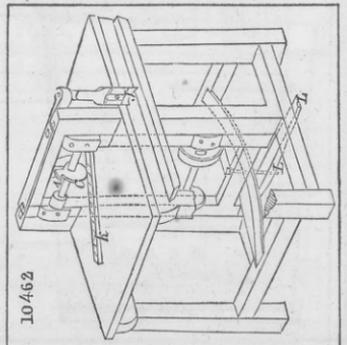
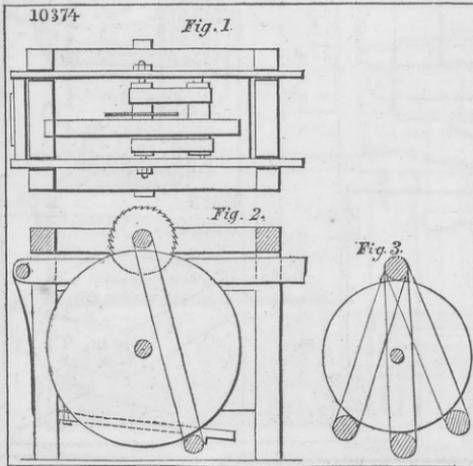
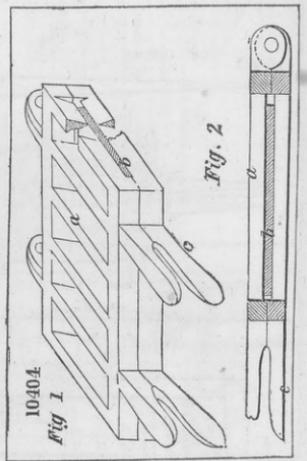
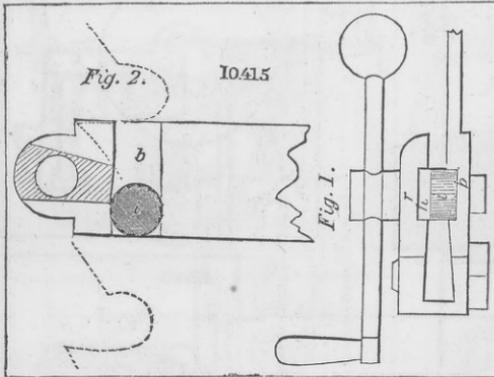
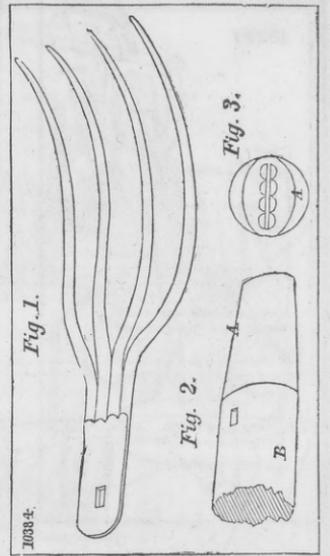
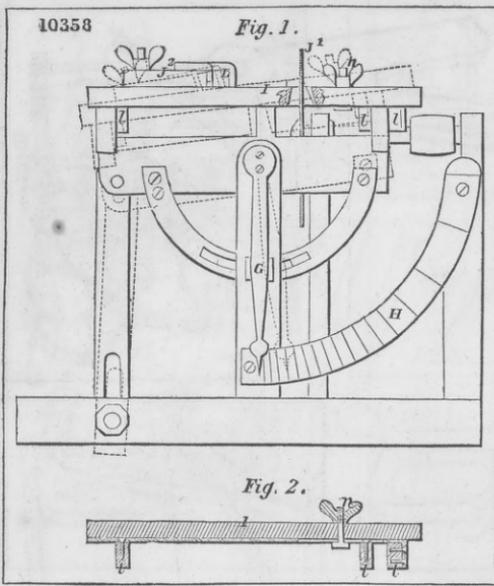


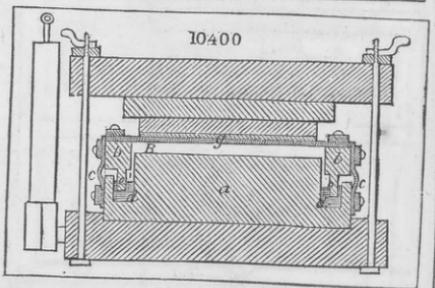
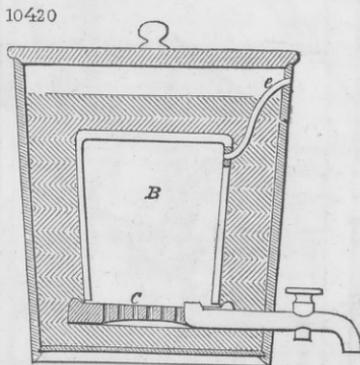
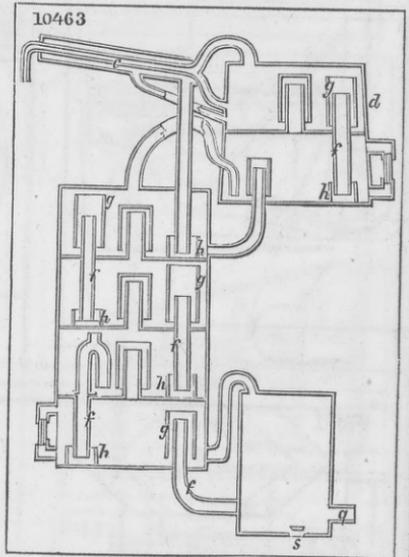
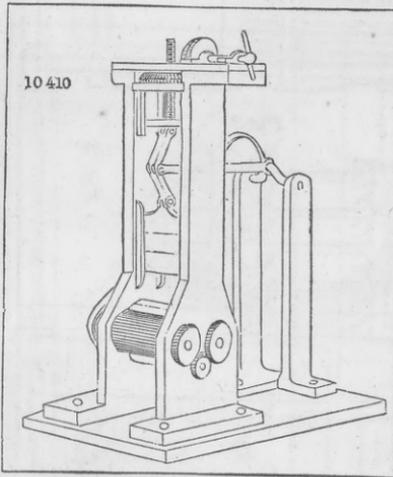
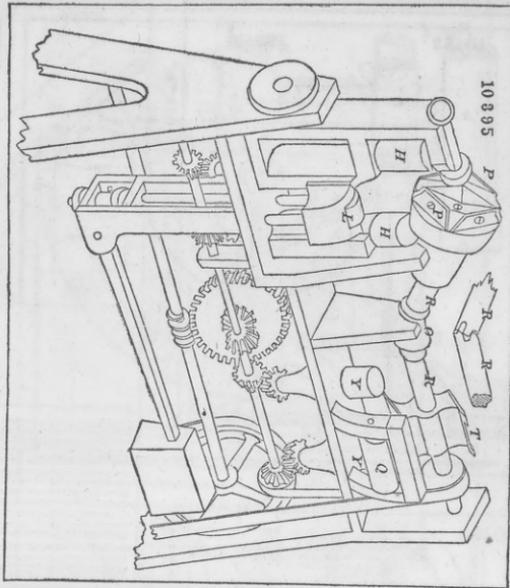
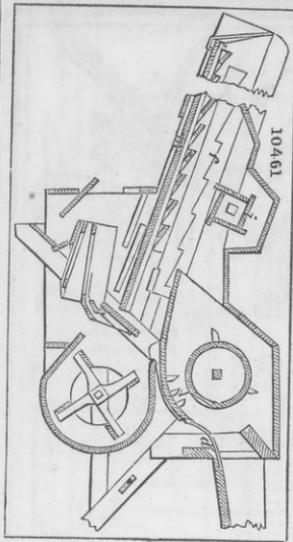
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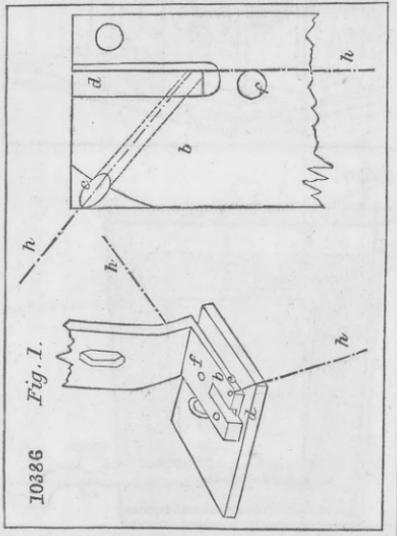
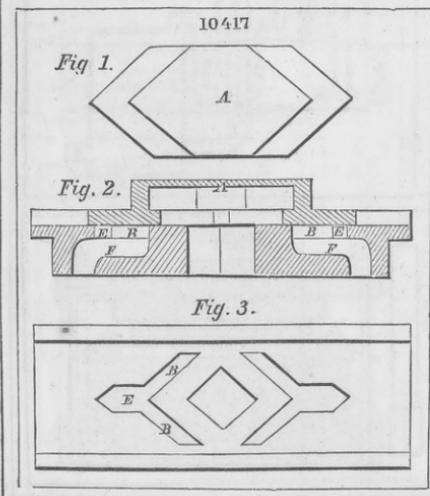
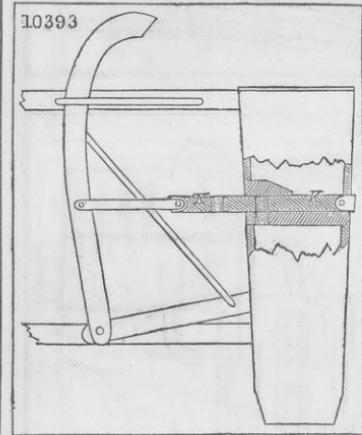
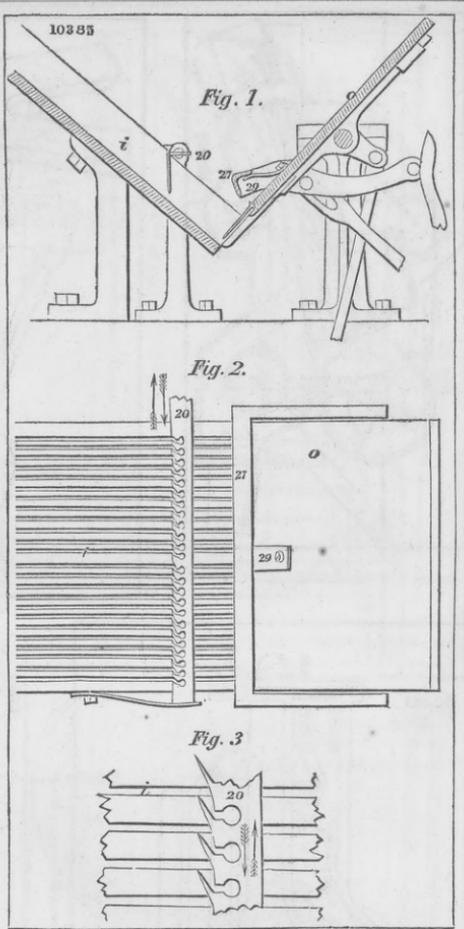
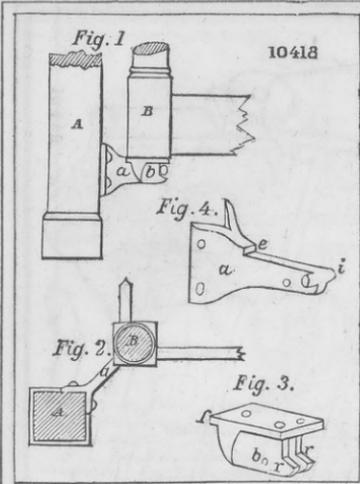












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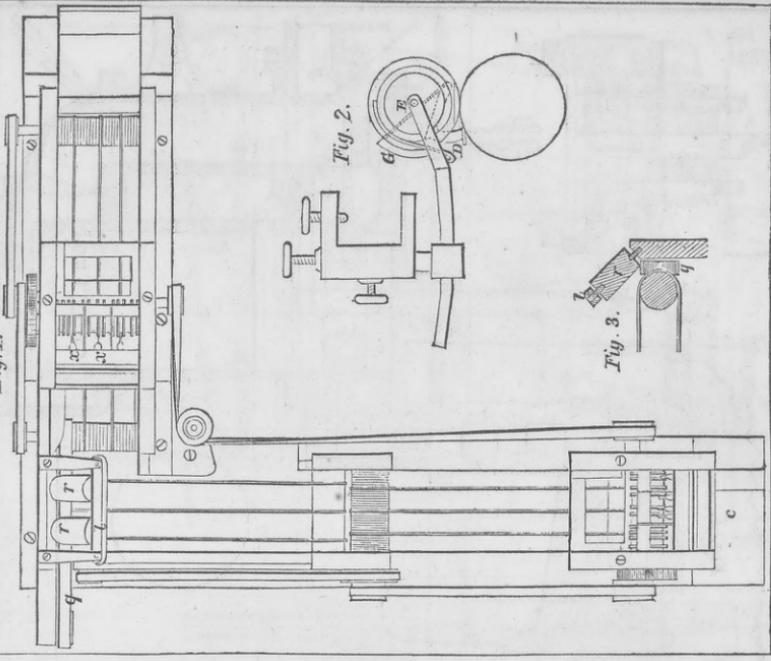


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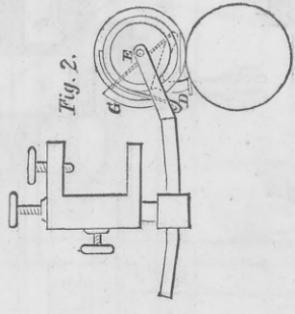
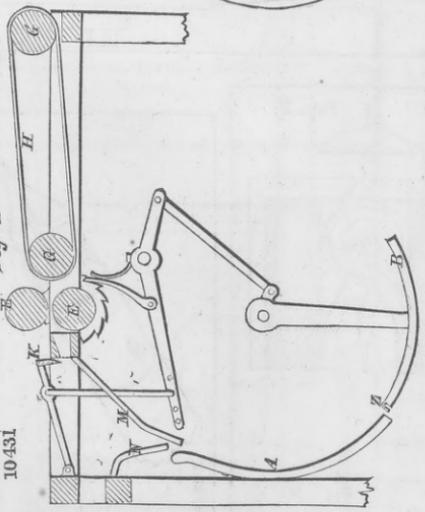


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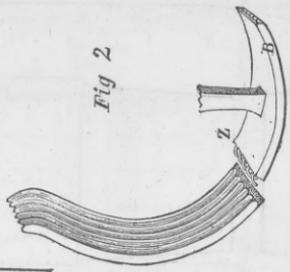


Fig. 1

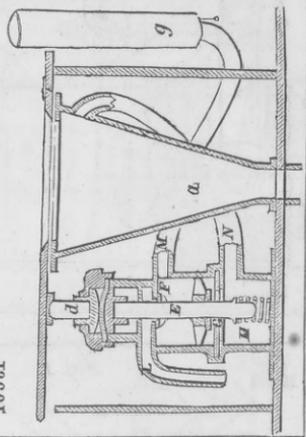


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Fig. 2



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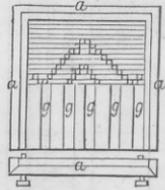
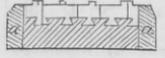
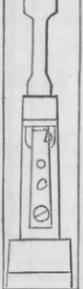
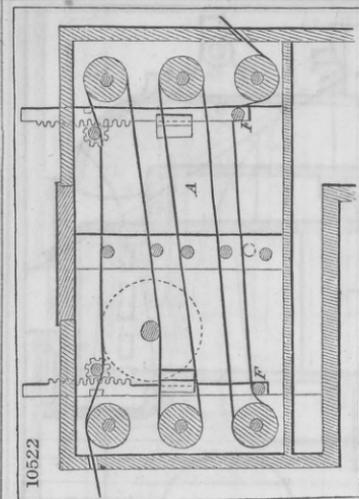


Fig. 2.



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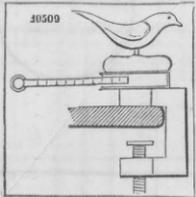




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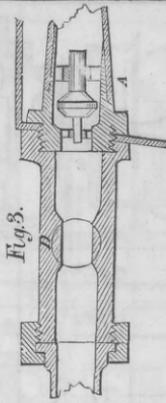


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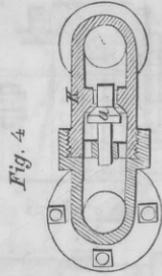
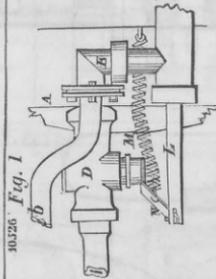


Fig. 4.



10326 Fig. 1

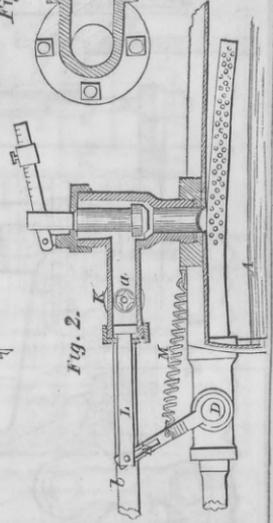
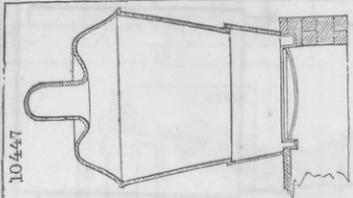
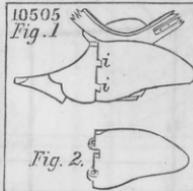


Fig. 2.

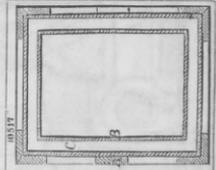


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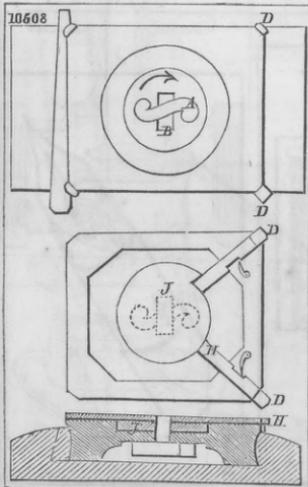


10505 Fig. 1

Fig. 2.



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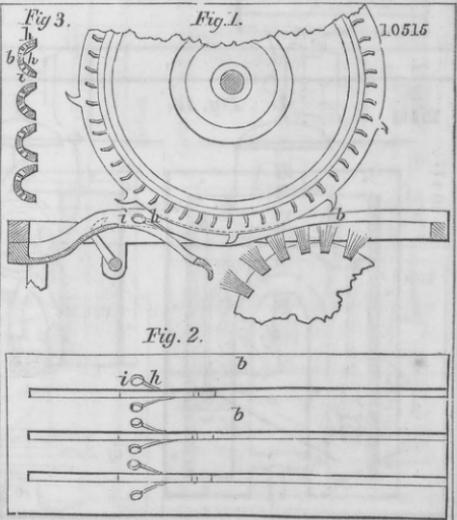


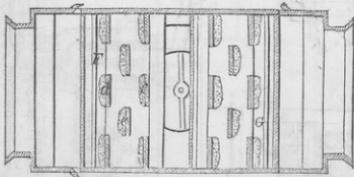
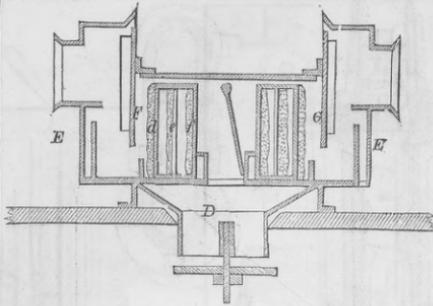
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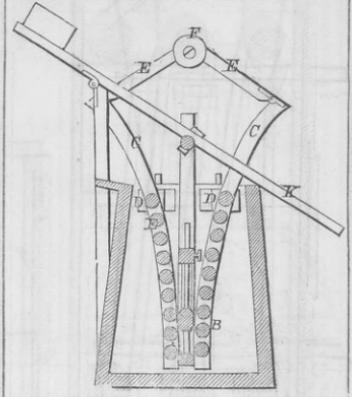
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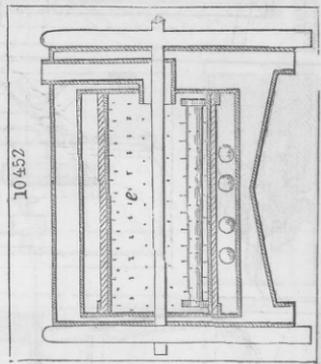
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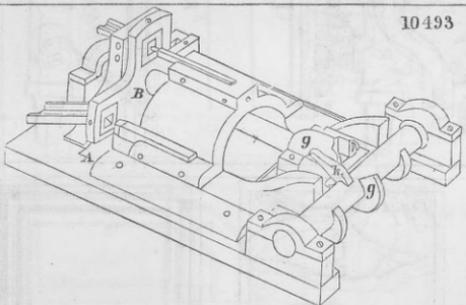
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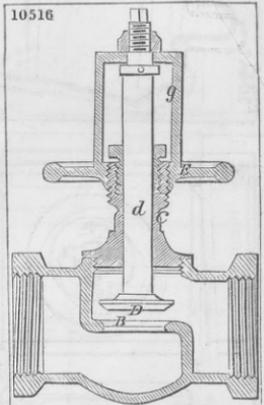


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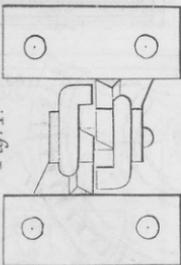
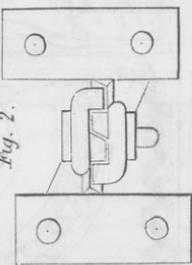
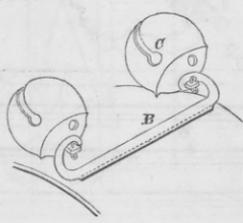


Fig. 2.



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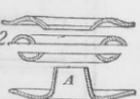
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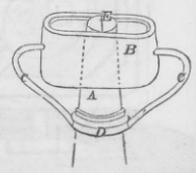
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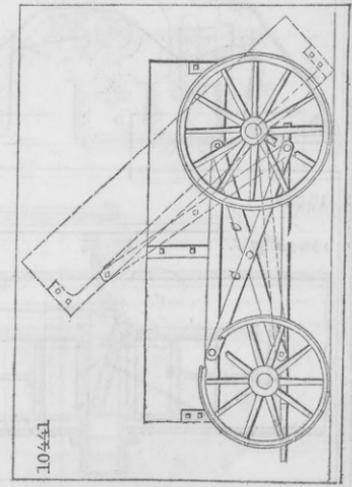
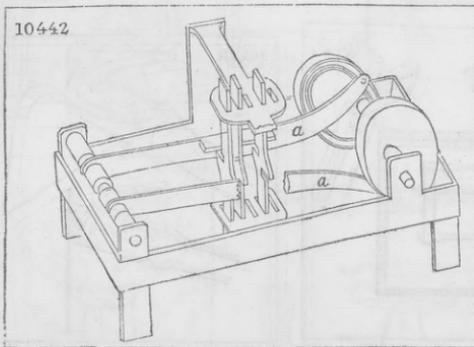
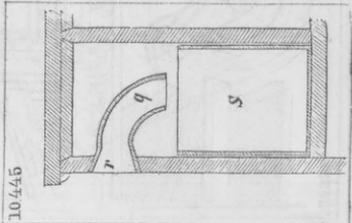
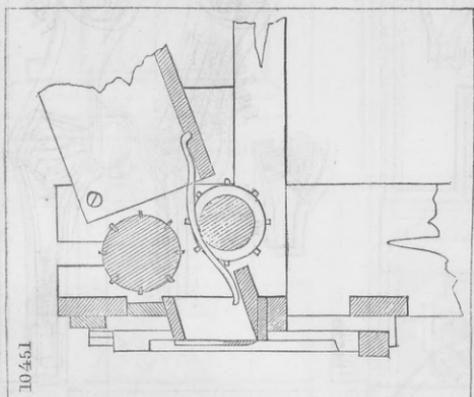
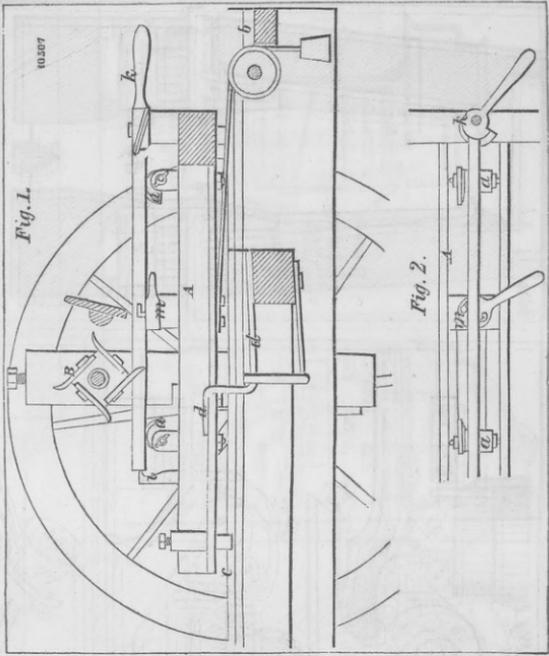
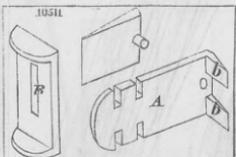
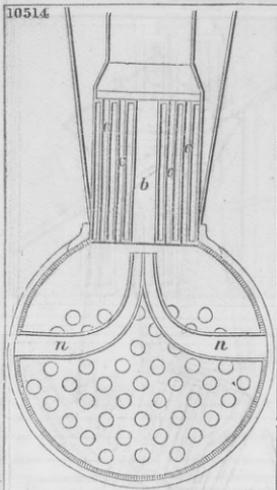


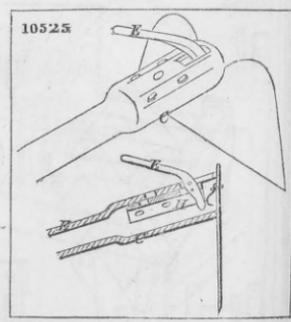
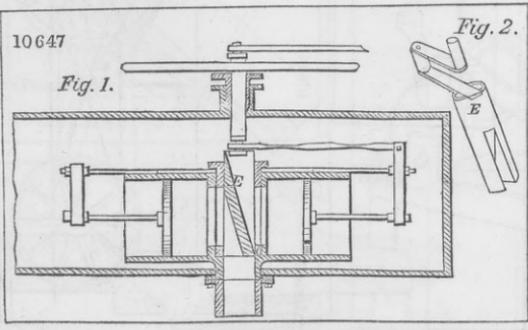
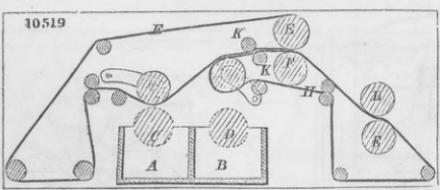
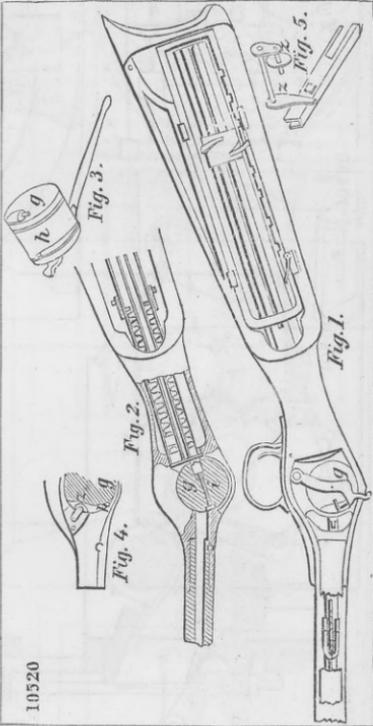
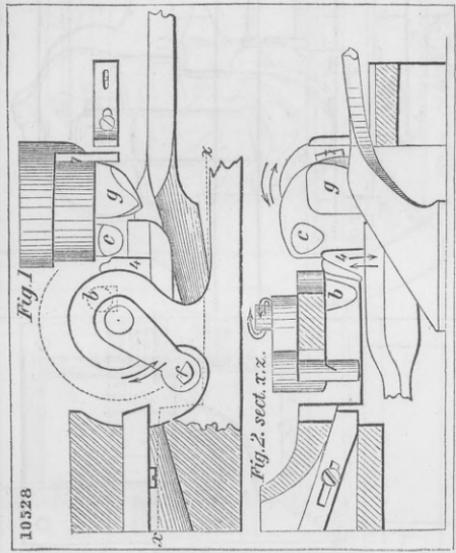
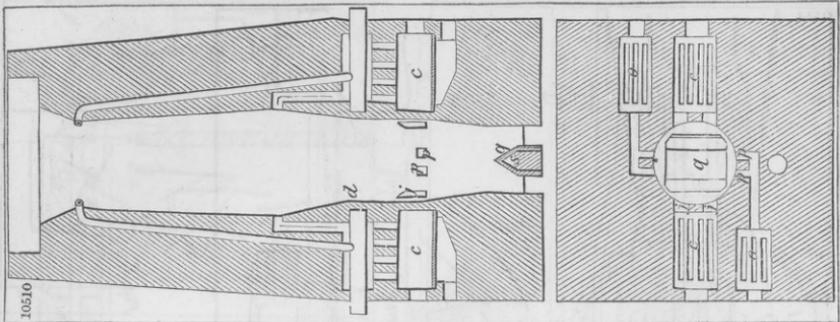
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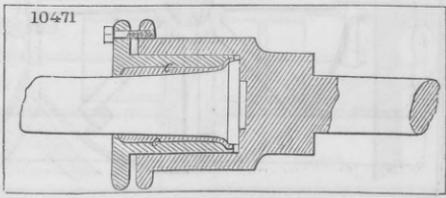
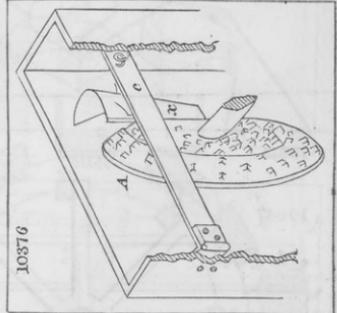
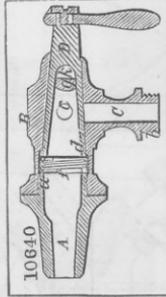
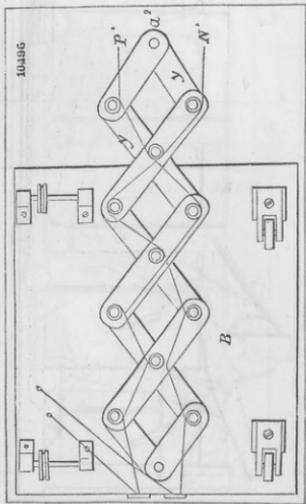
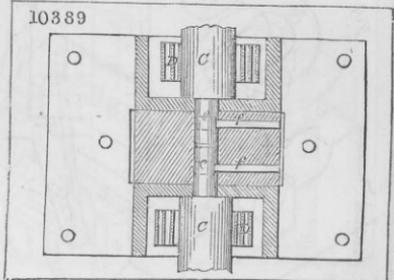
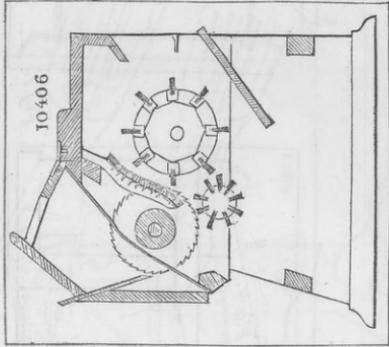
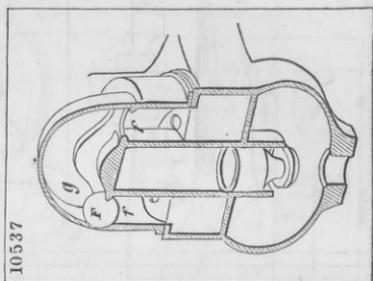
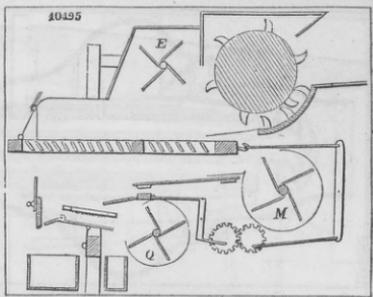
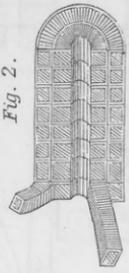
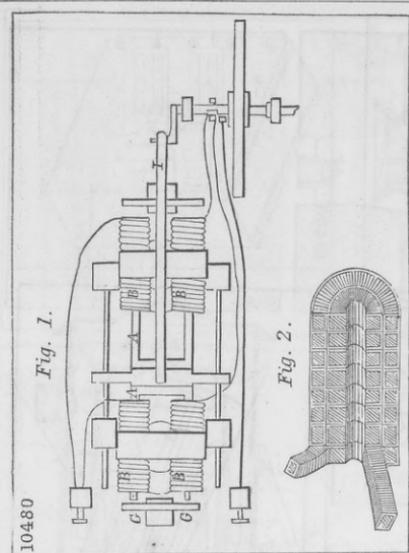


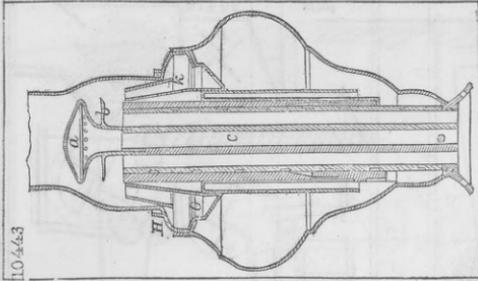
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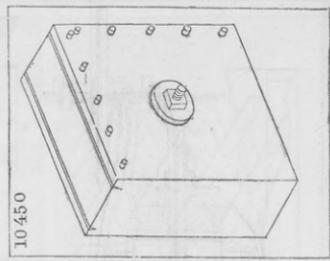




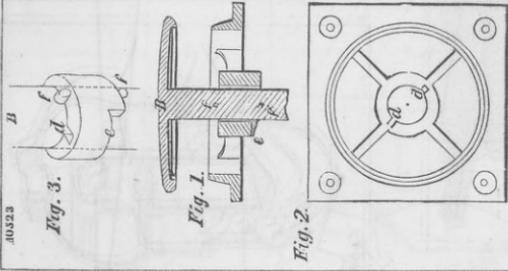




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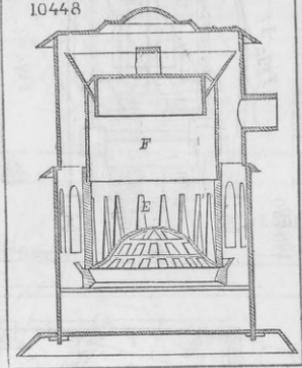


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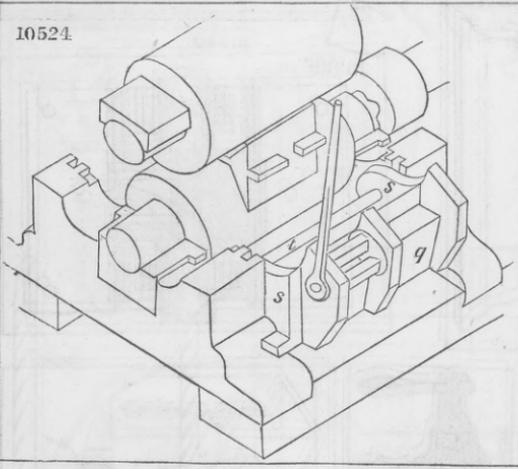
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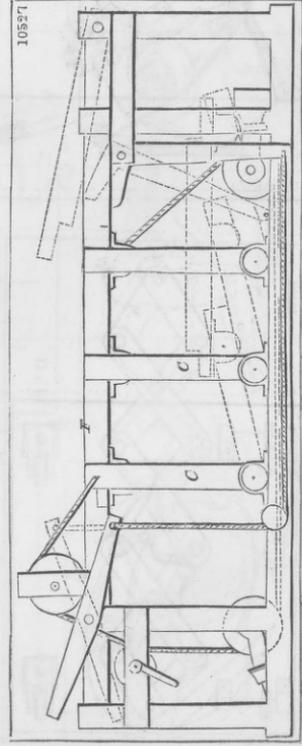
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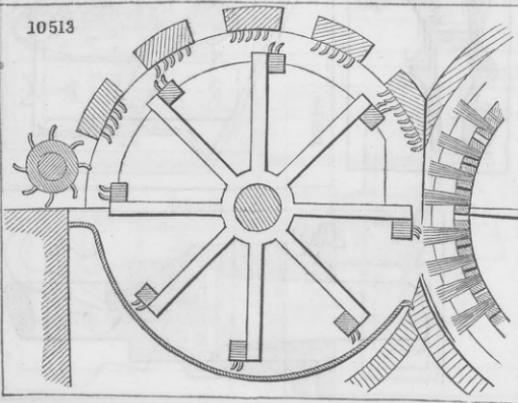
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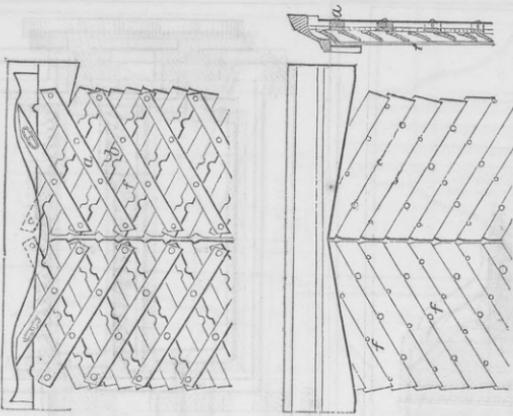


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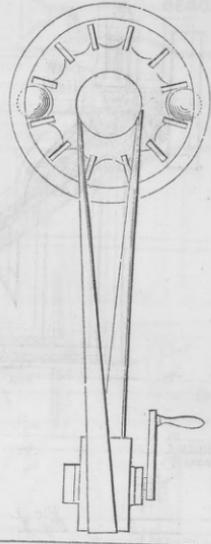


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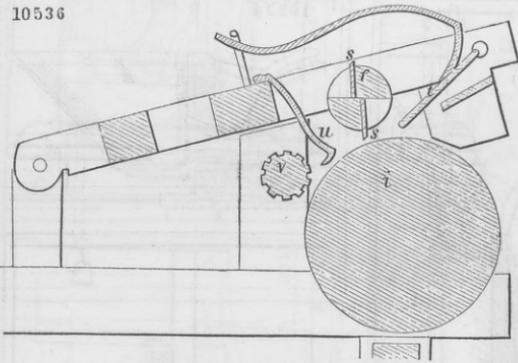
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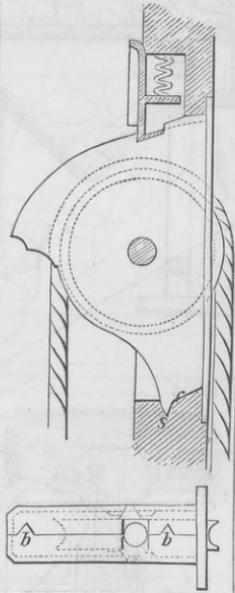
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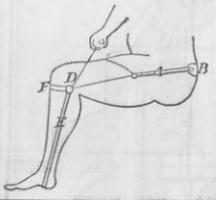
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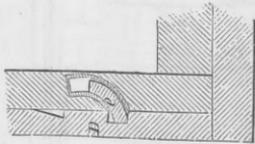
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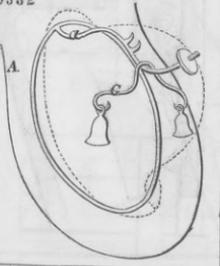
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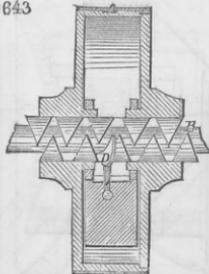
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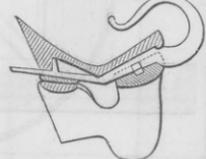
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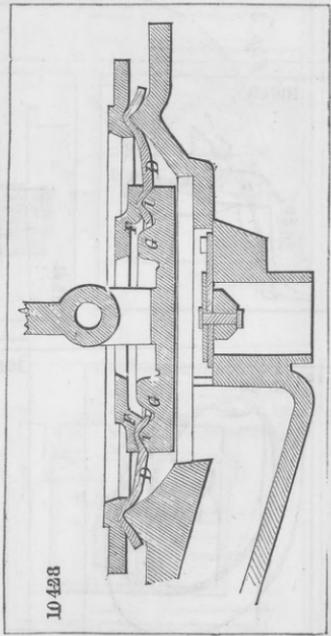
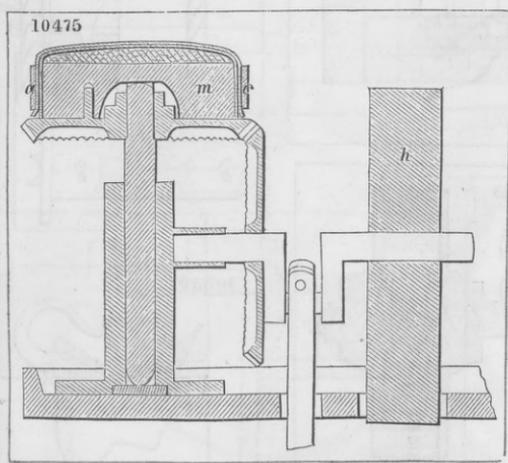
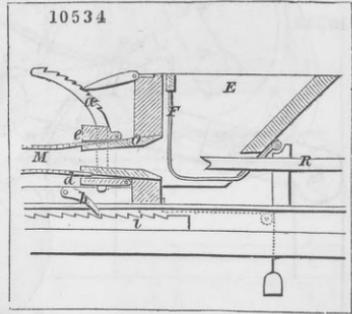
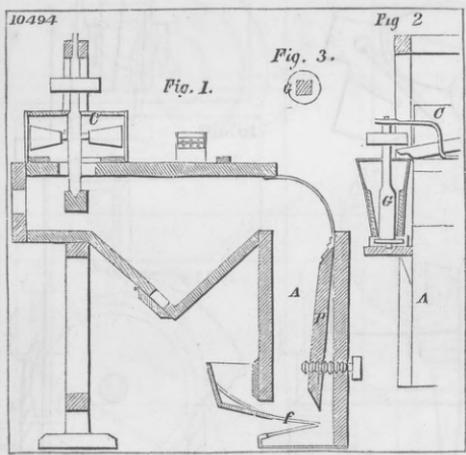
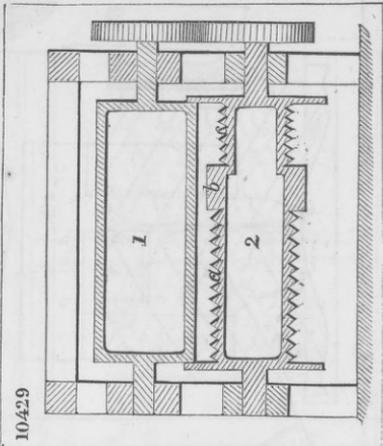
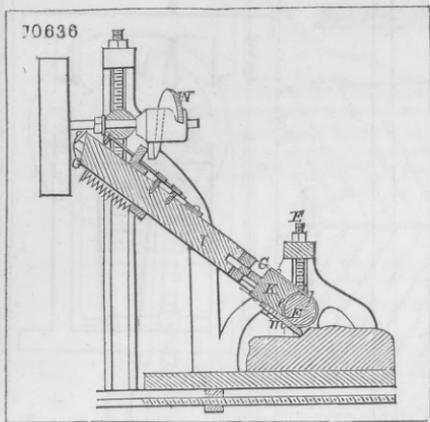


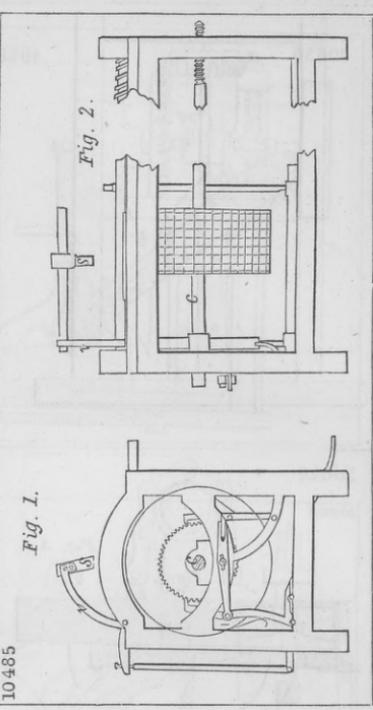
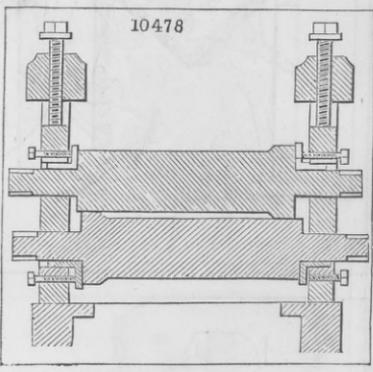
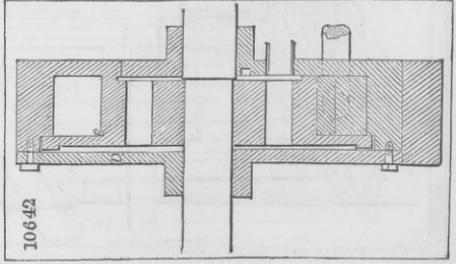
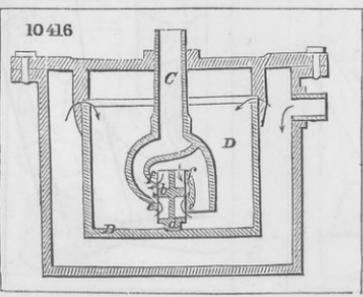
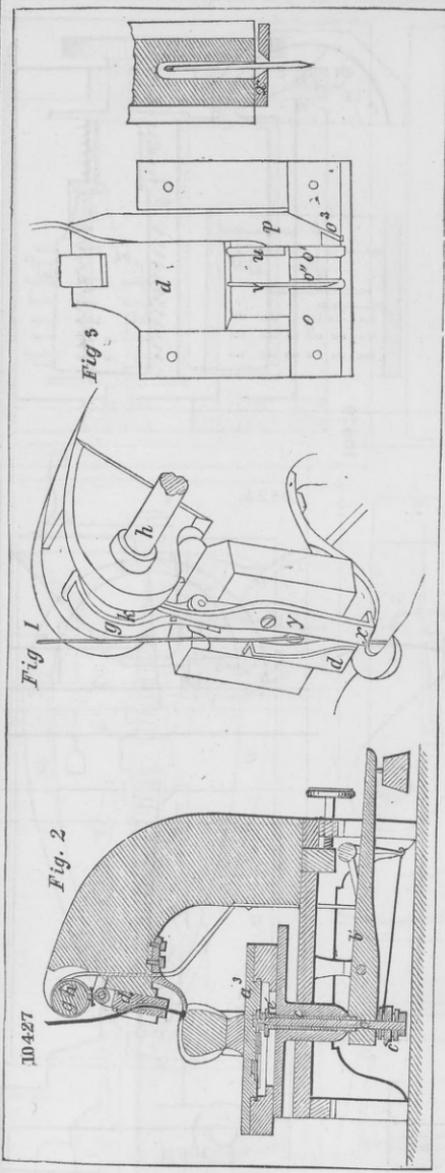
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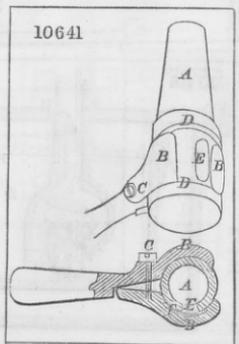
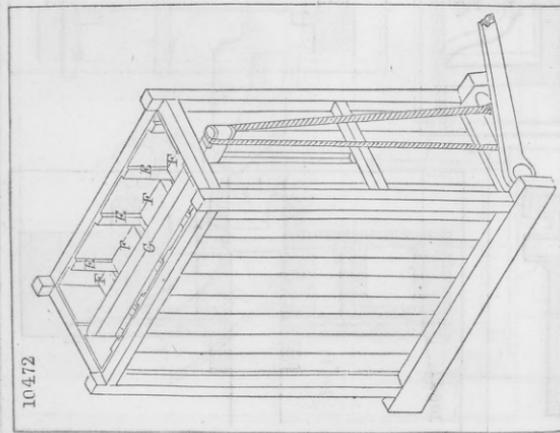
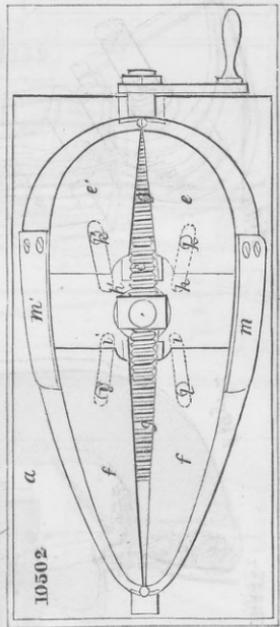
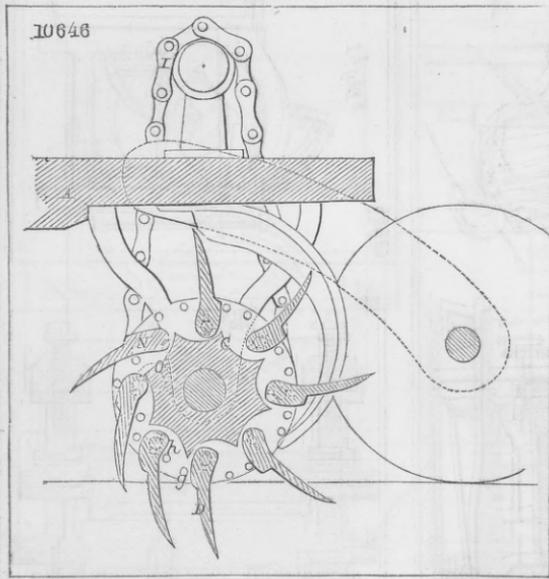
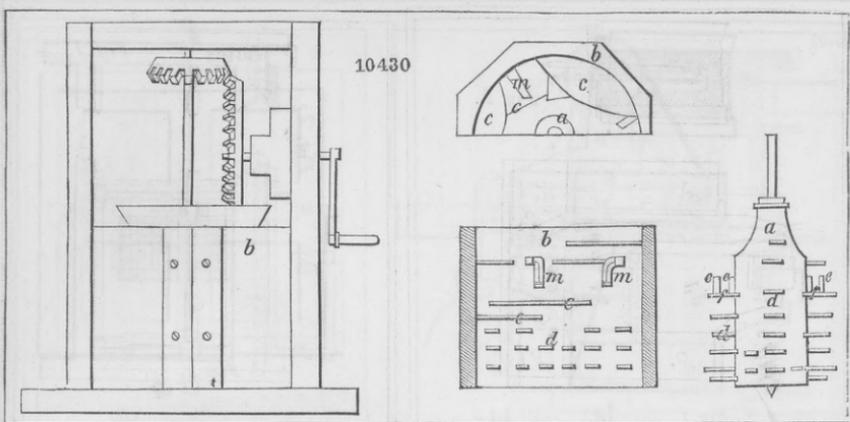


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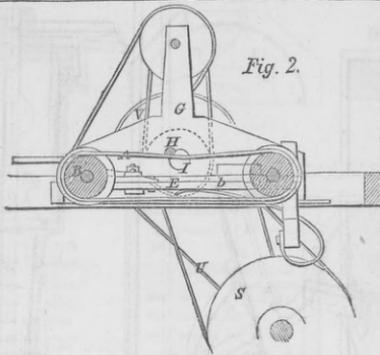
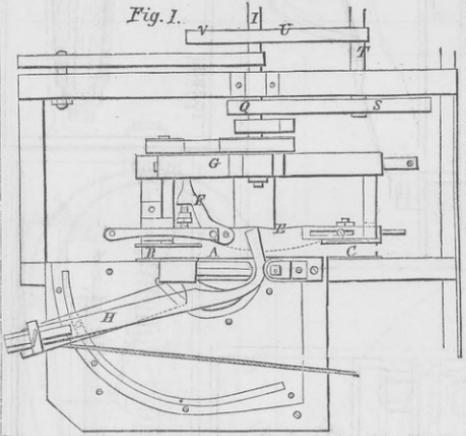


Fig. 1.



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Fig. 1.

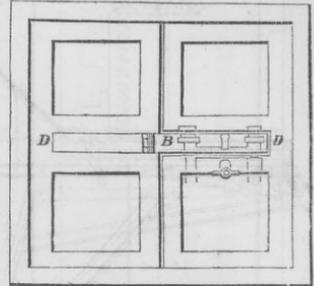
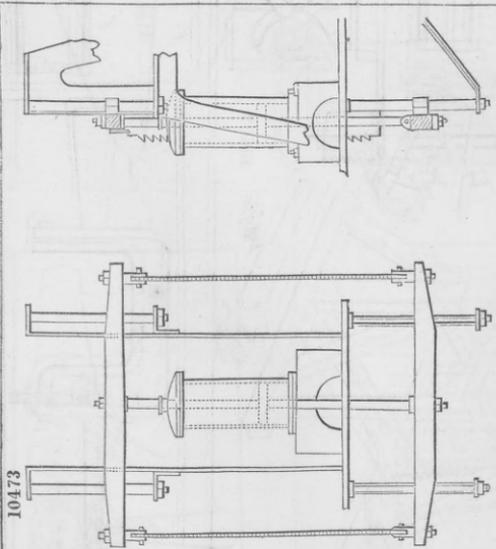
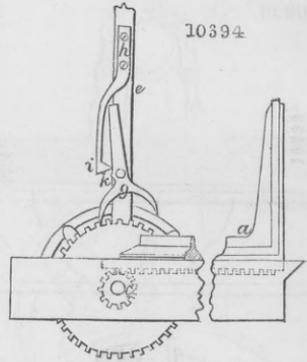


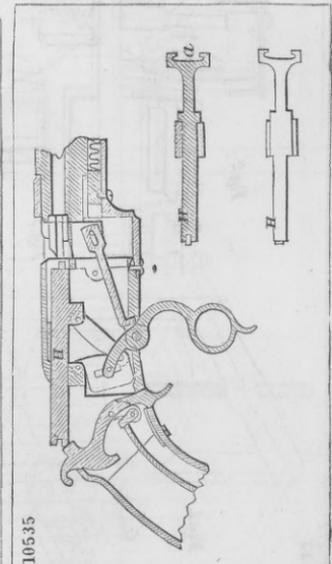
Fig. 2.



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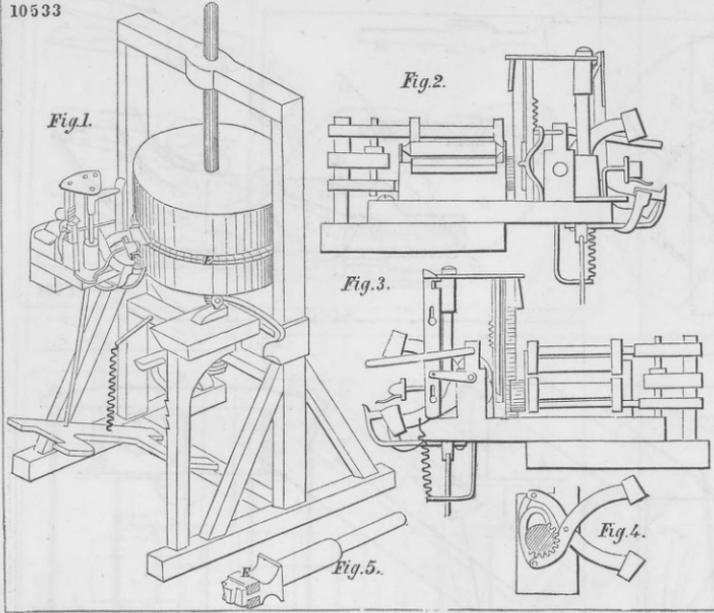


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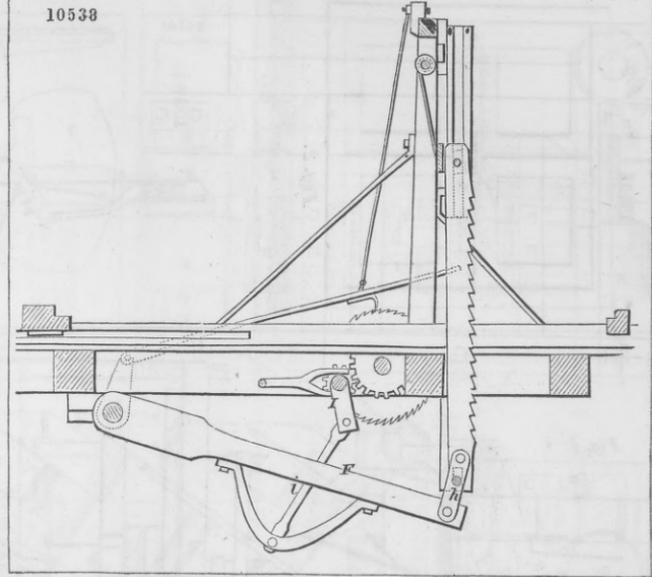


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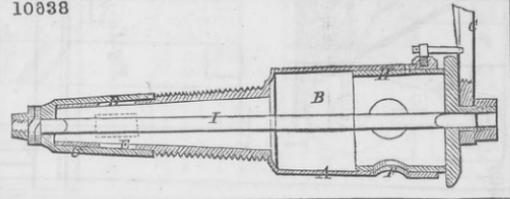
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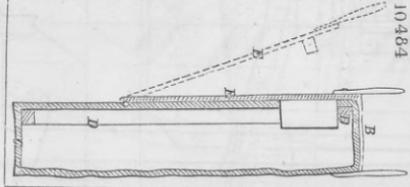
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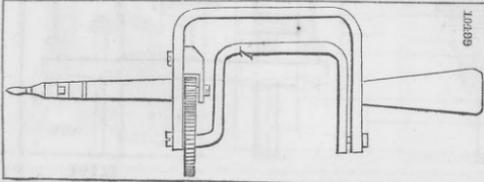
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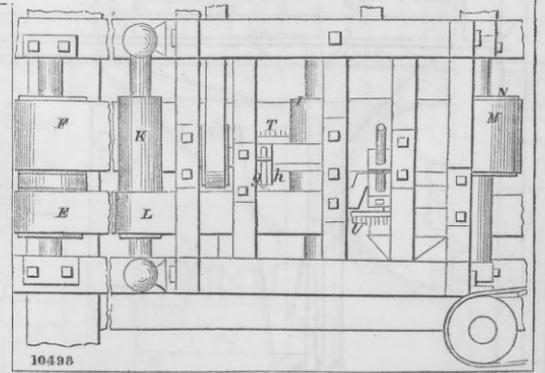
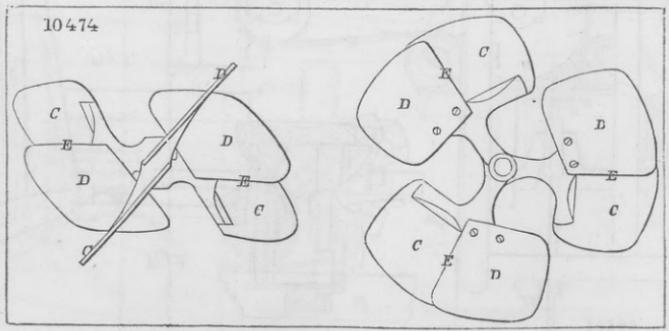
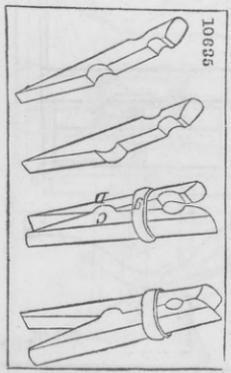
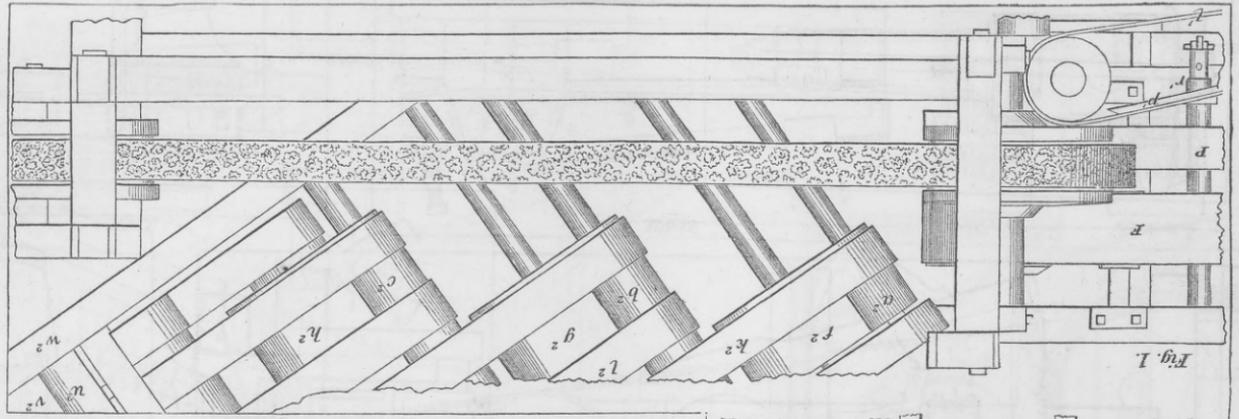
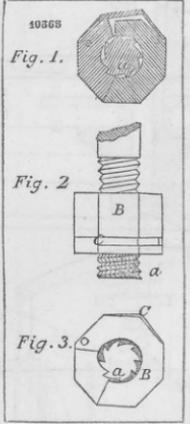


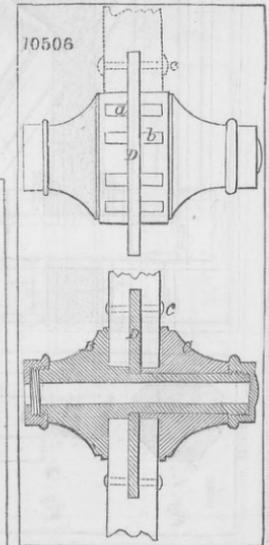
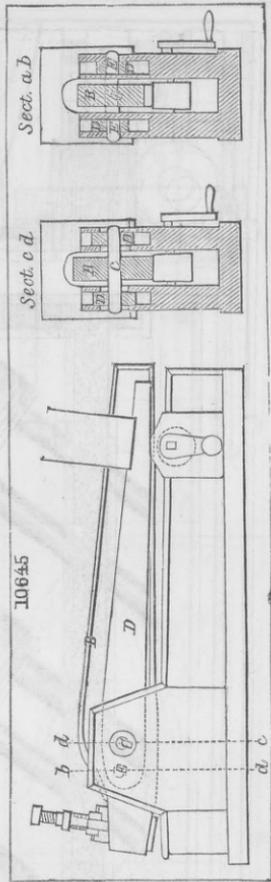
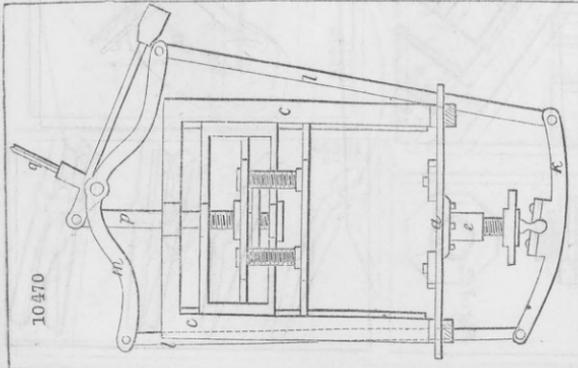
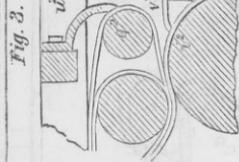
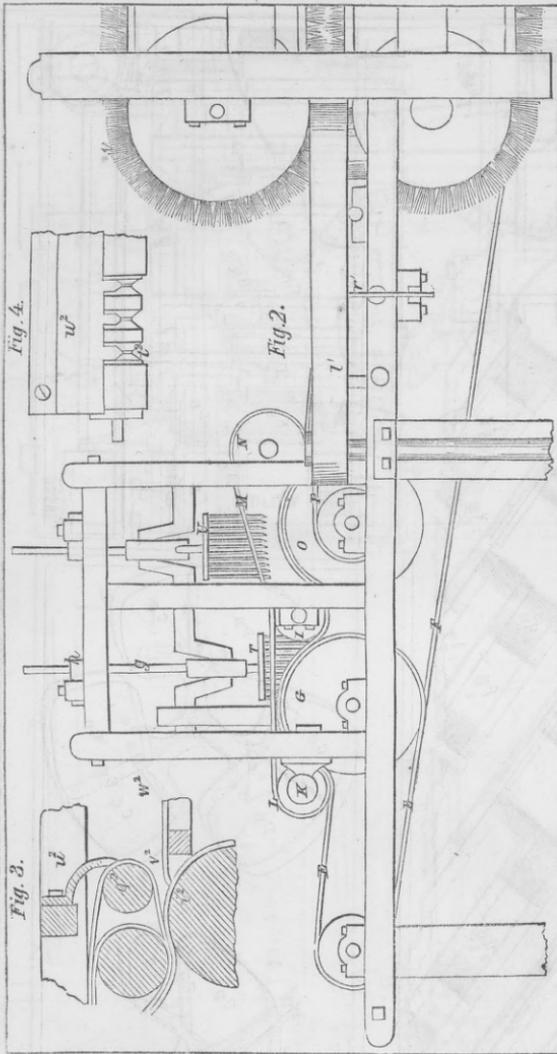
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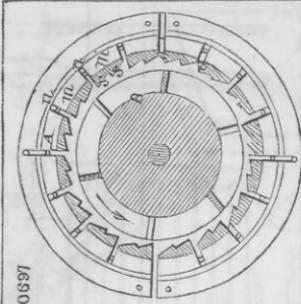




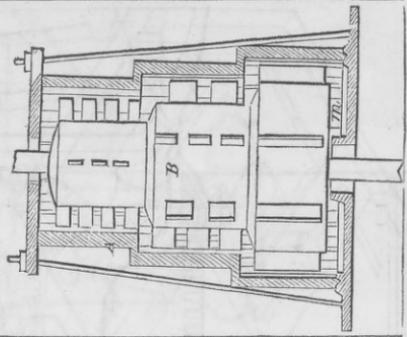


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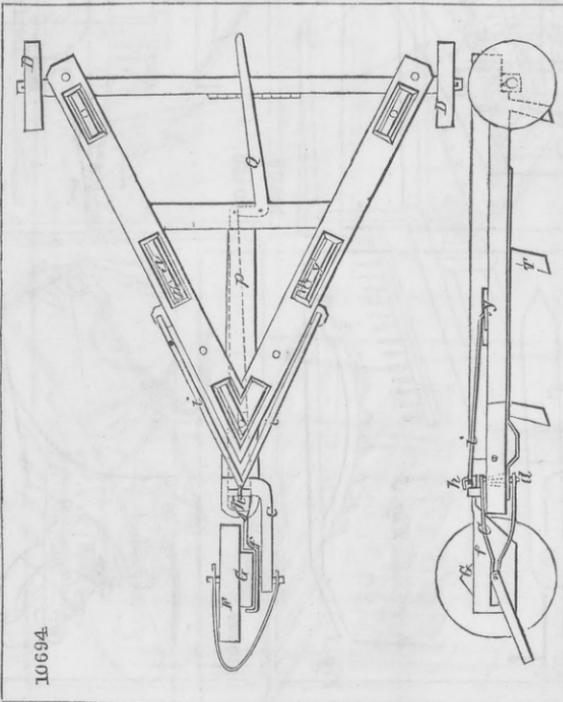
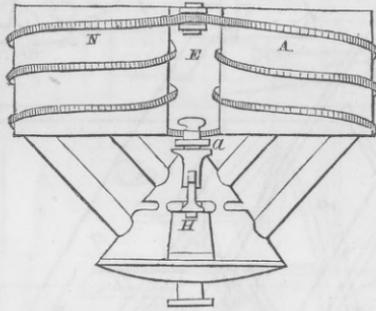
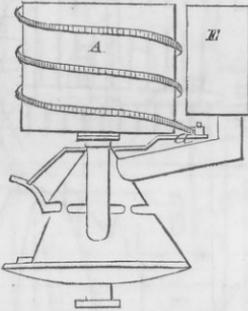
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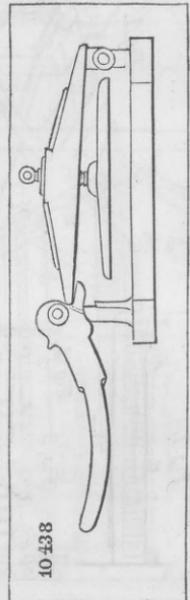
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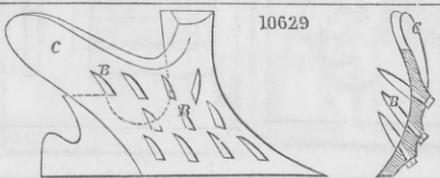
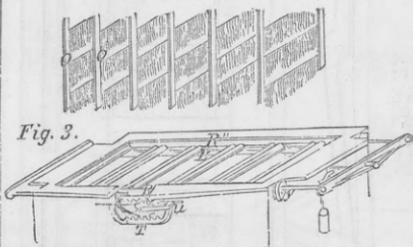
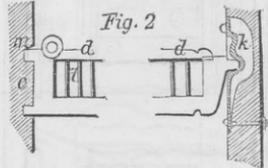
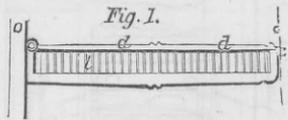


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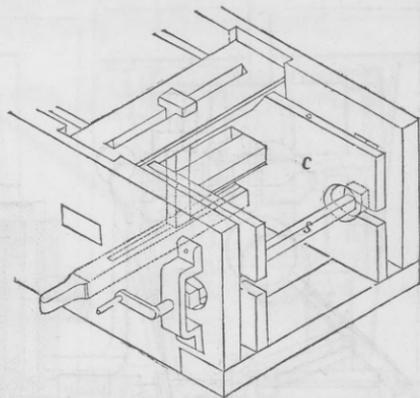
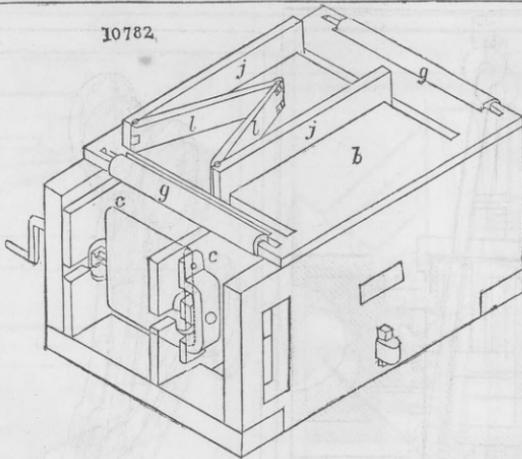


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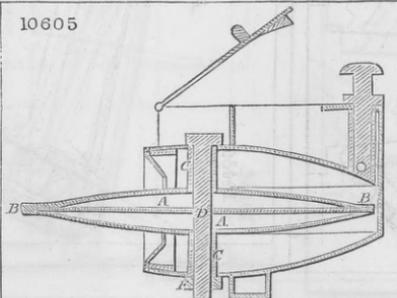
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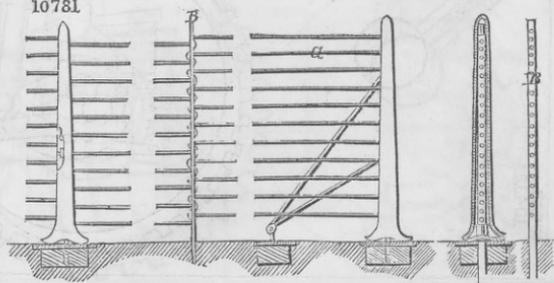
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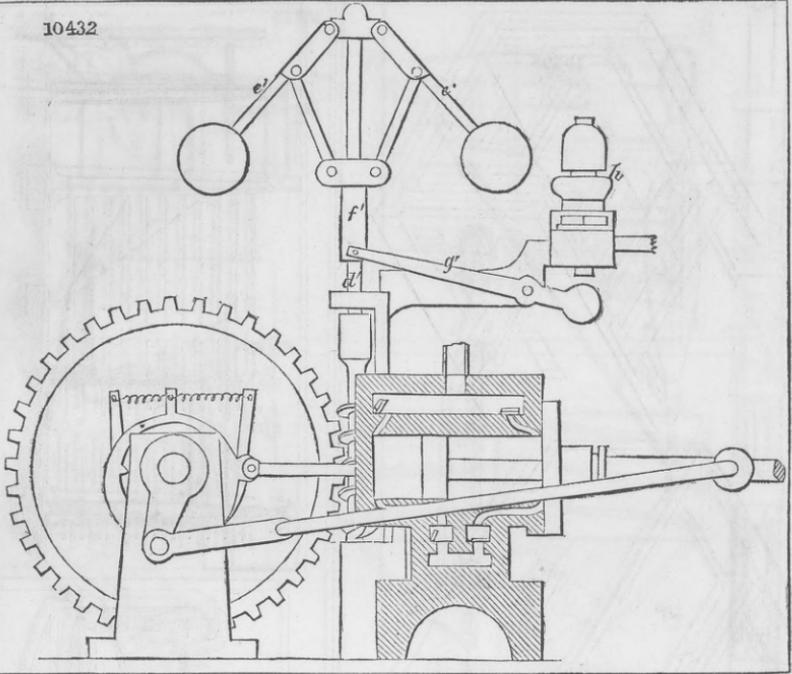
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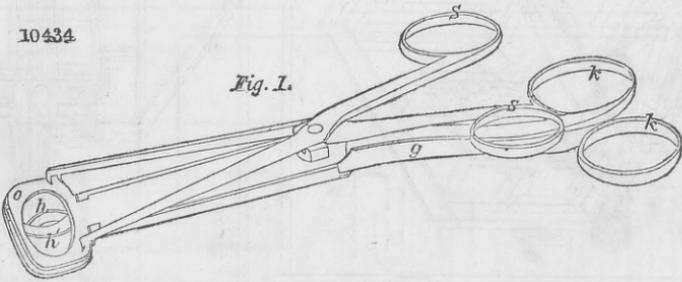
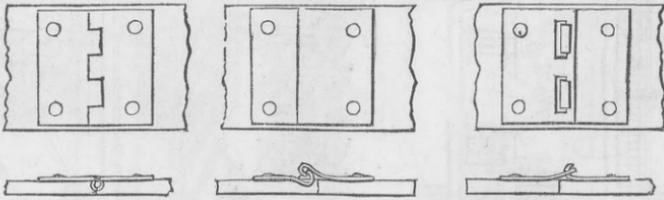
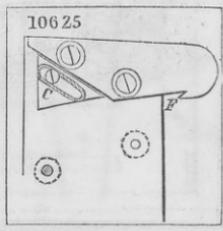
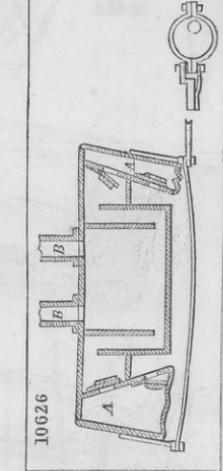
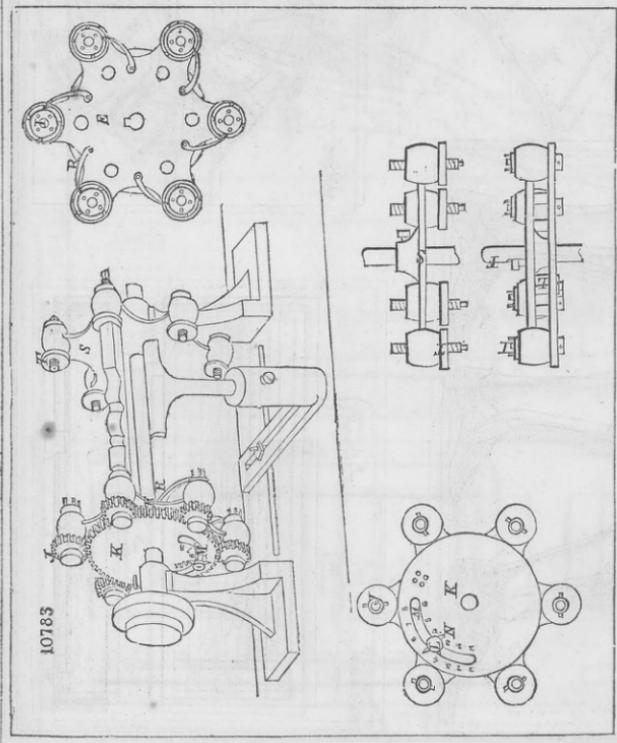
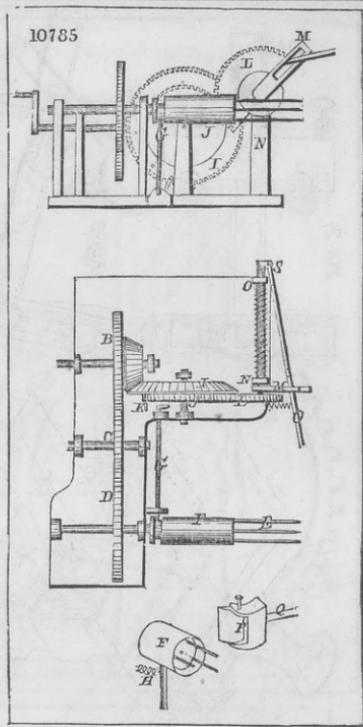
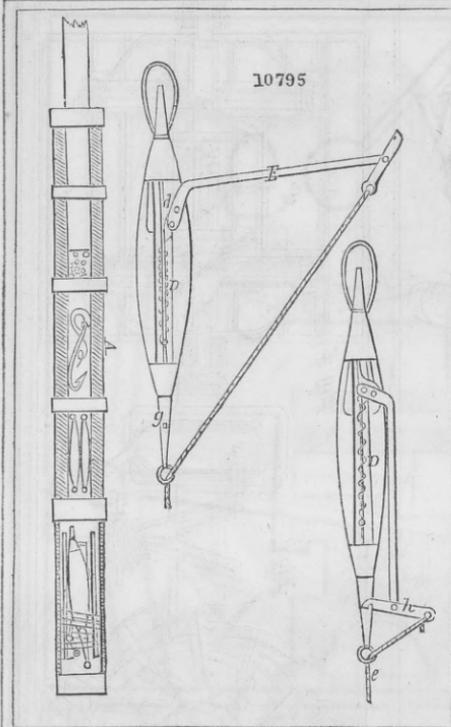


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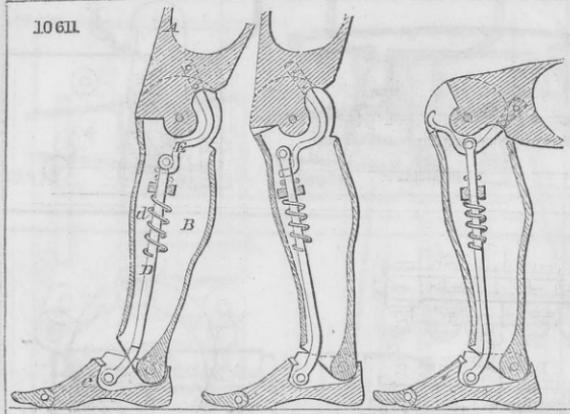


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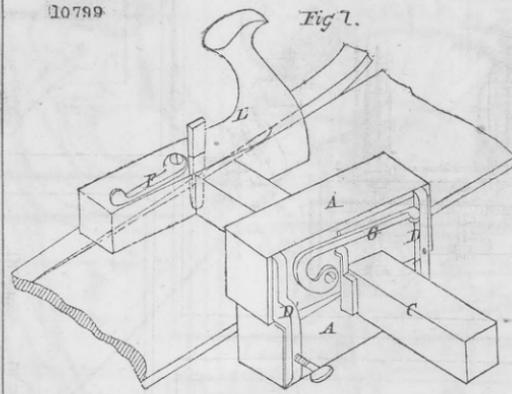


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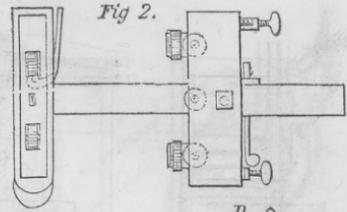
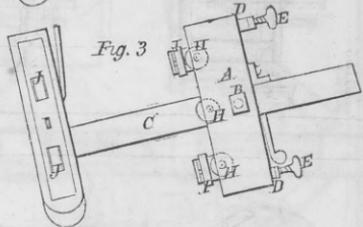
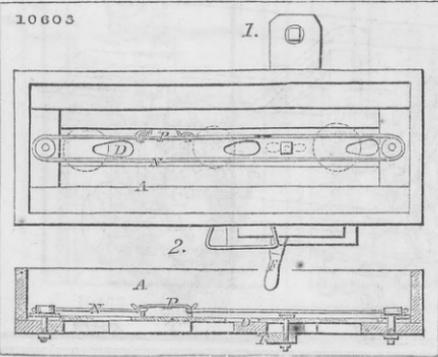


Fig. 3



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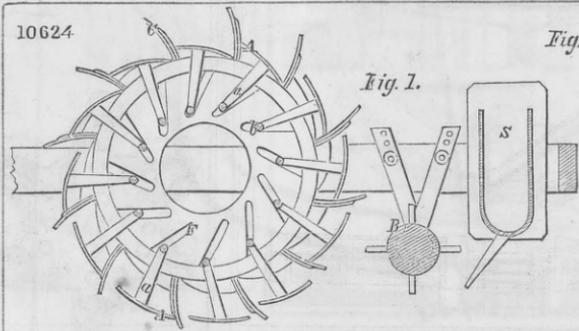
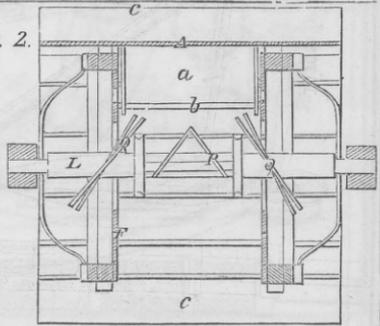


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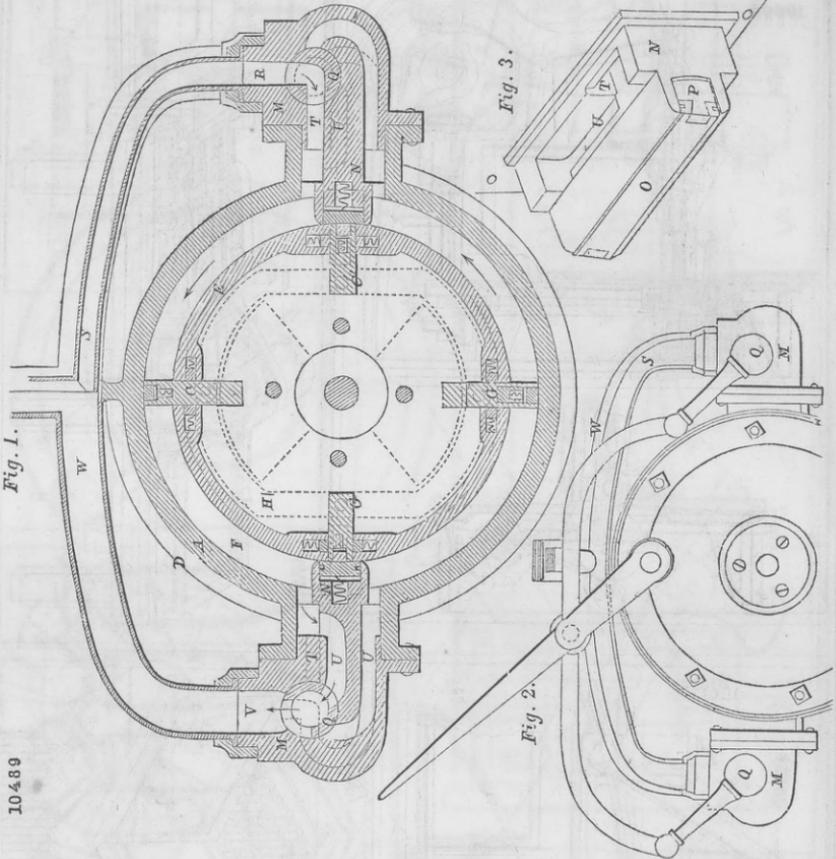


Fig. 1.

Fig. 3.

Fig. 2.

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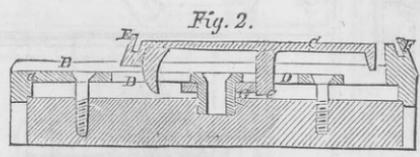


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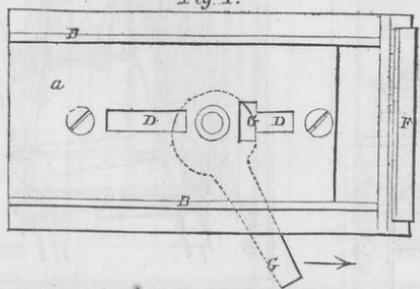
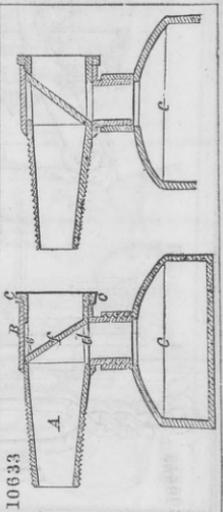
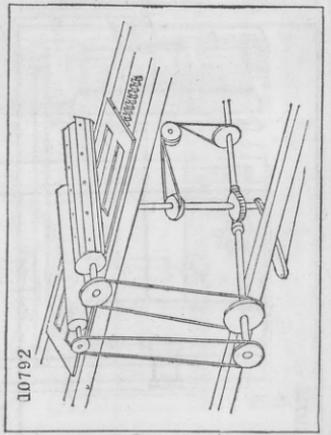
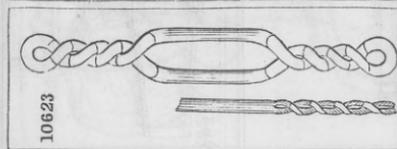
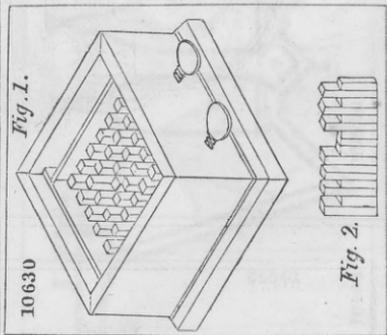
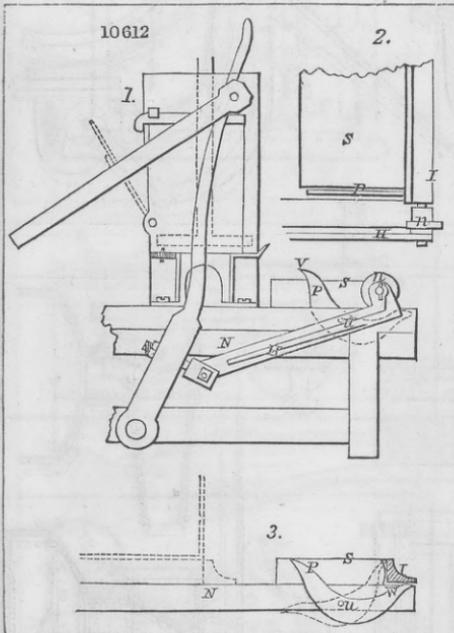
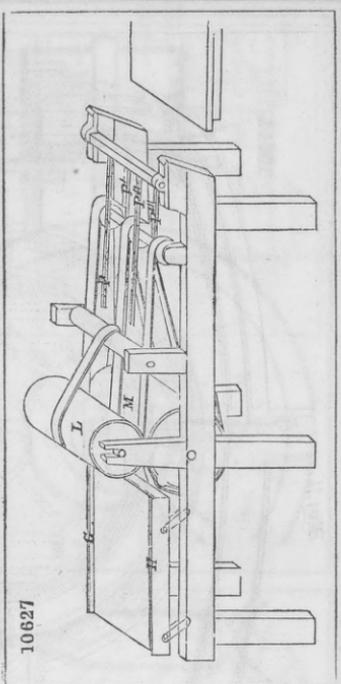
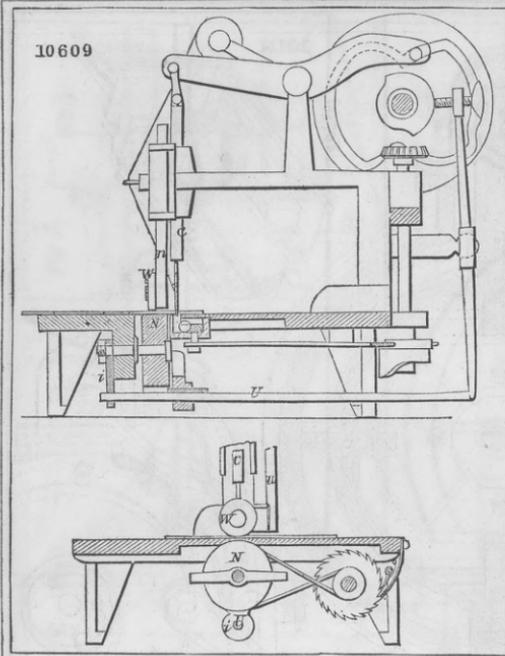


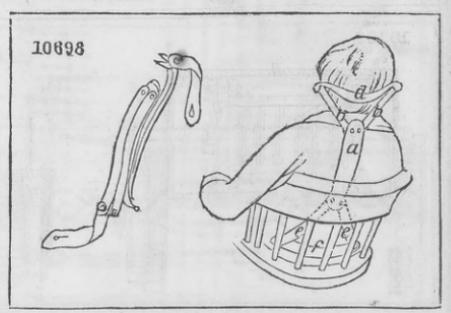
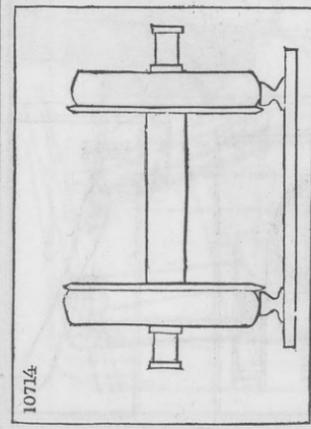
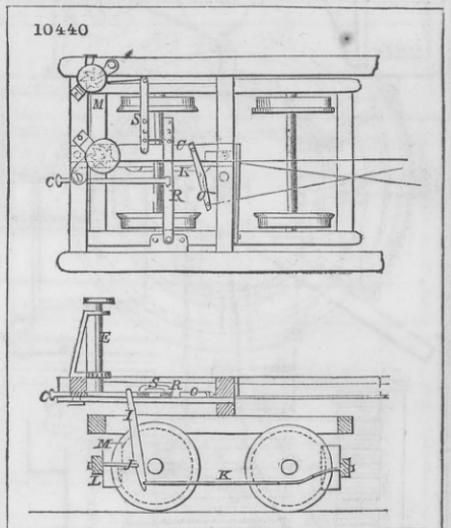
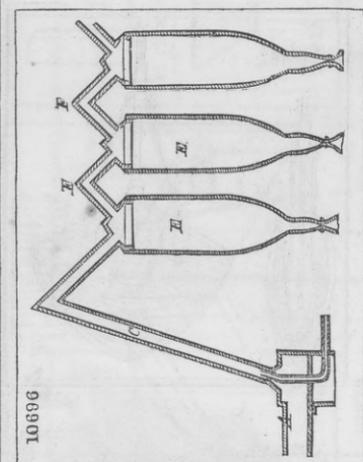
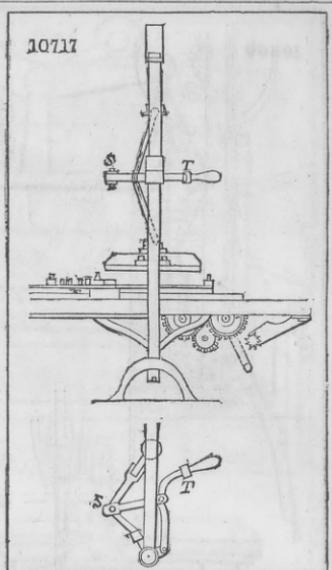
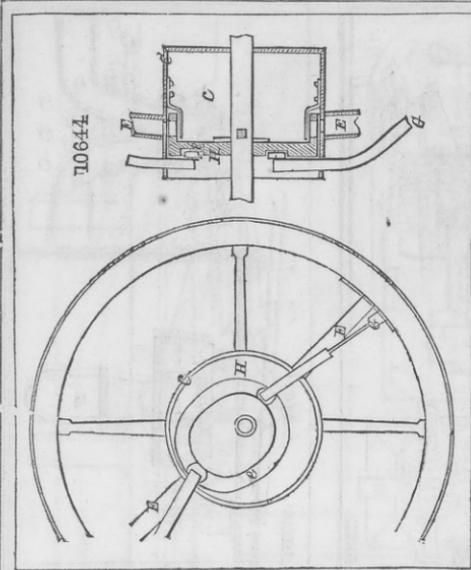
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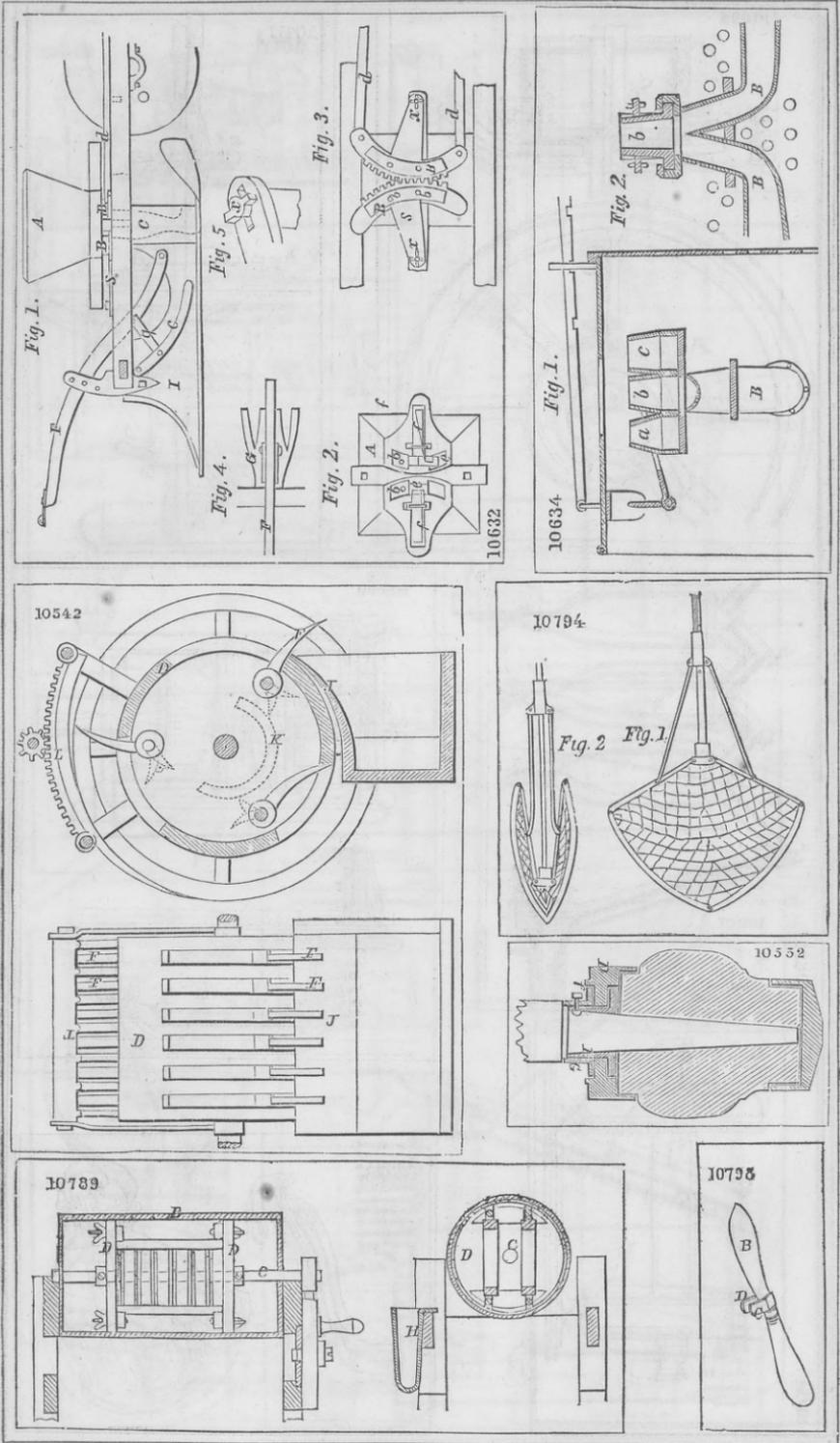
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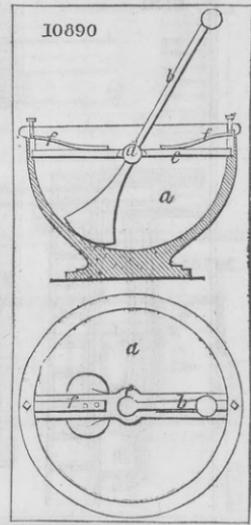
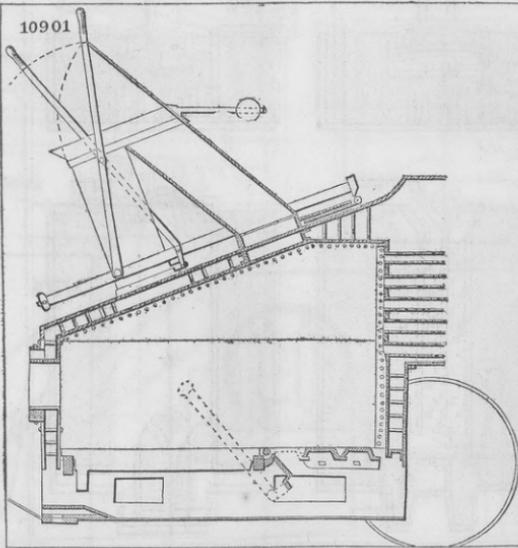
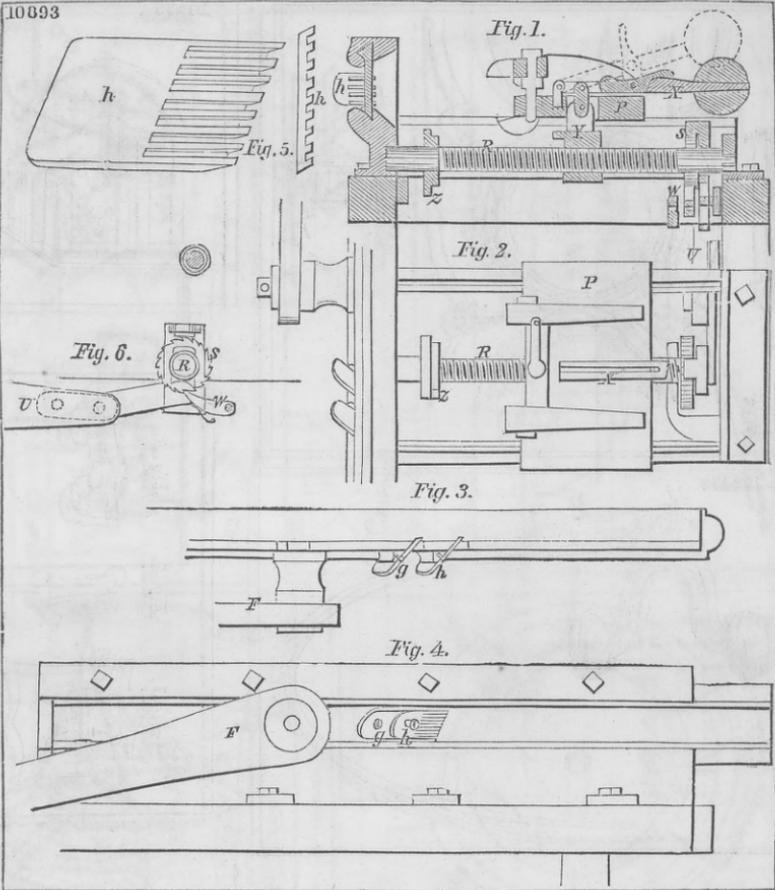
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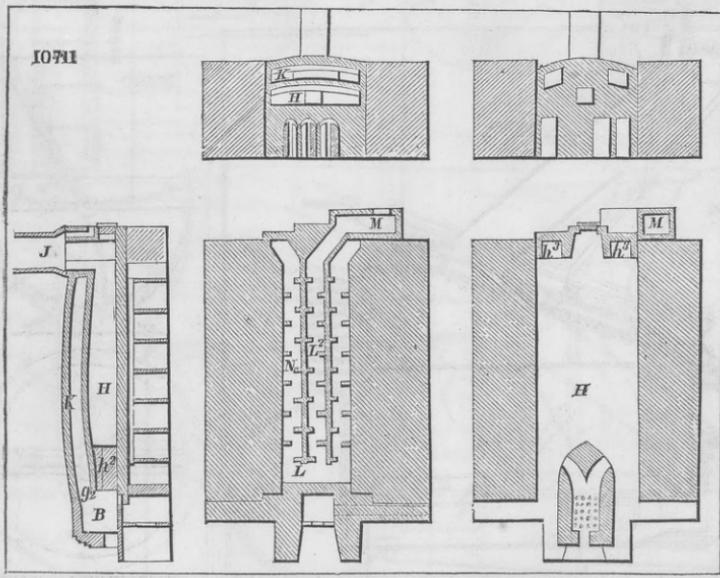
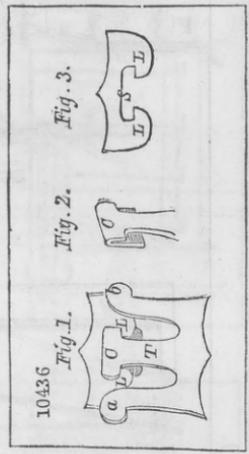
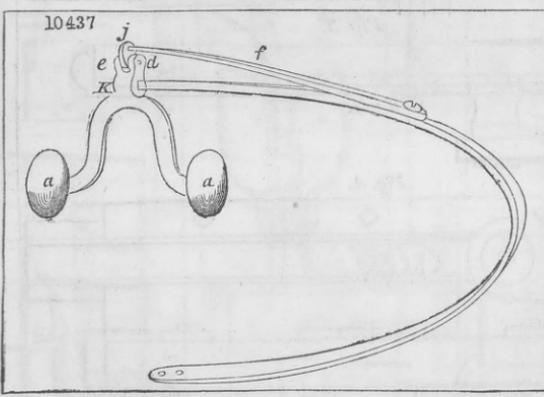
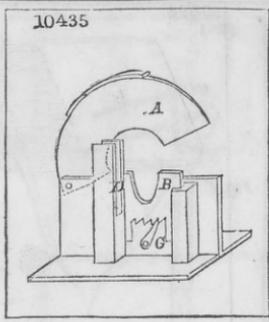
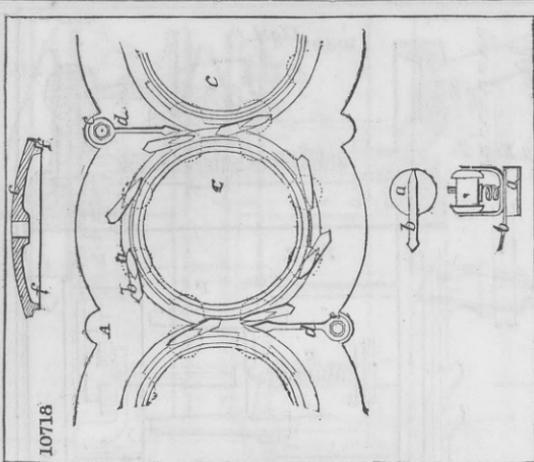


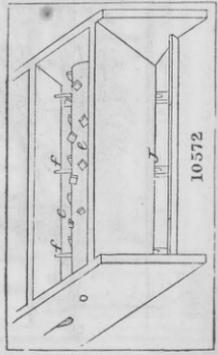
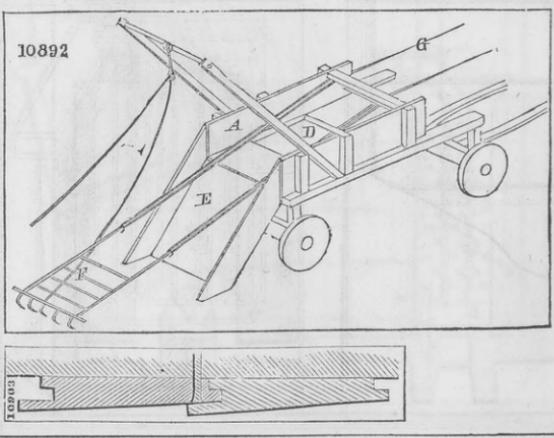
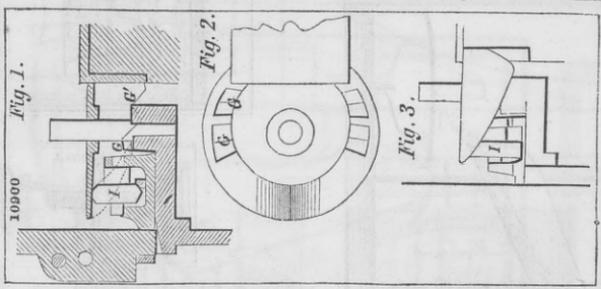
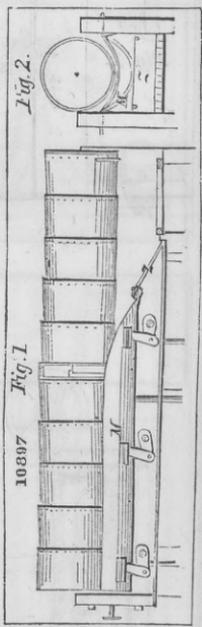
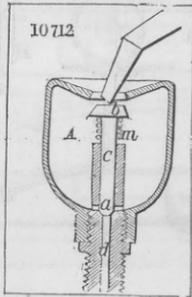
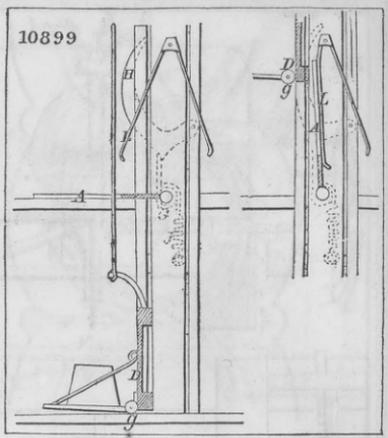
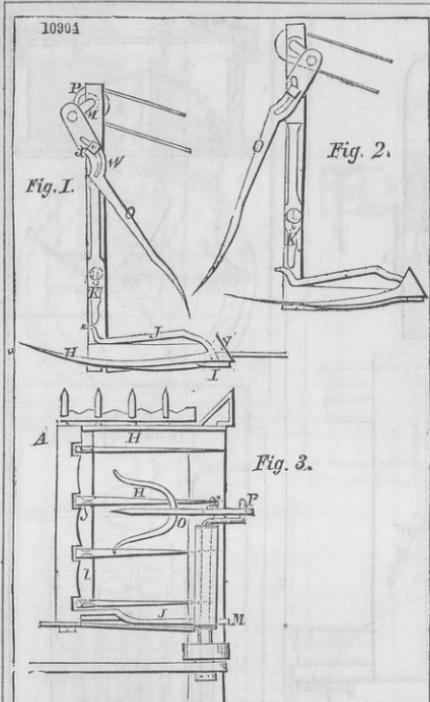


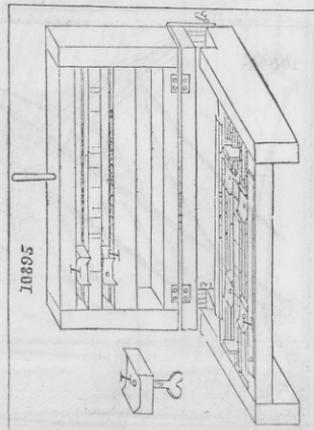
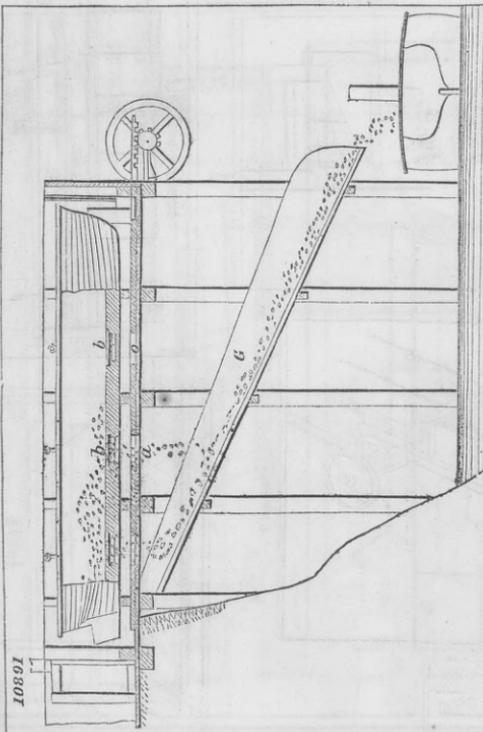
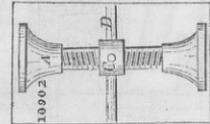
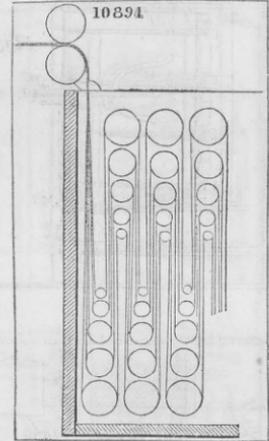
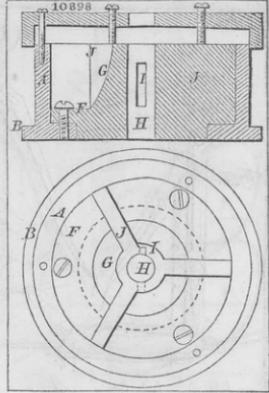
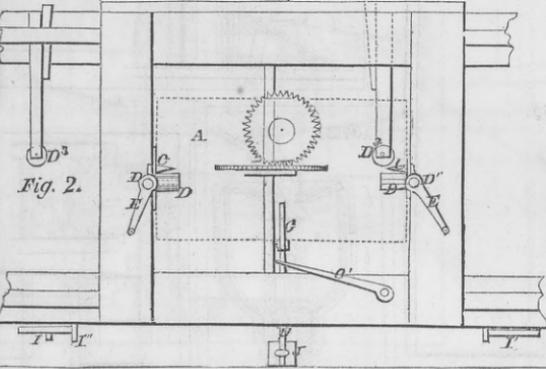
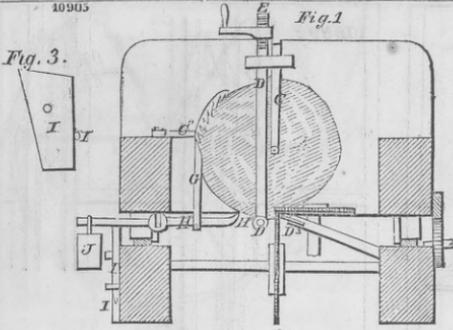


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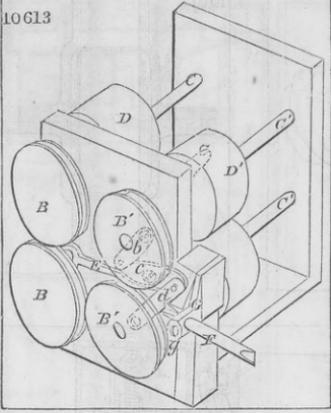




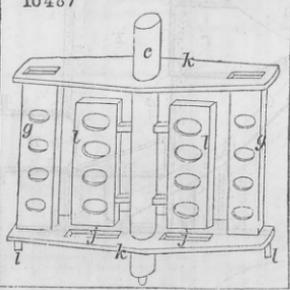




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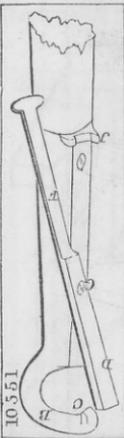
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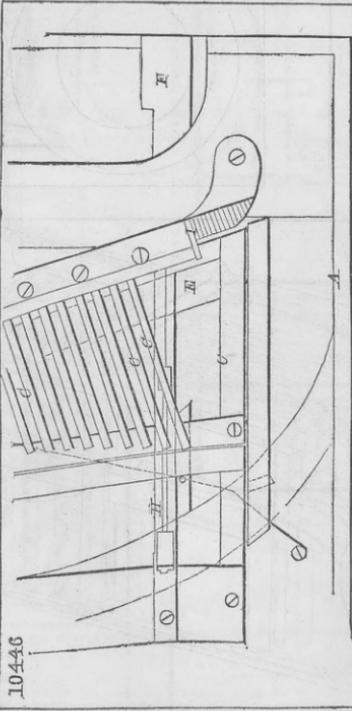
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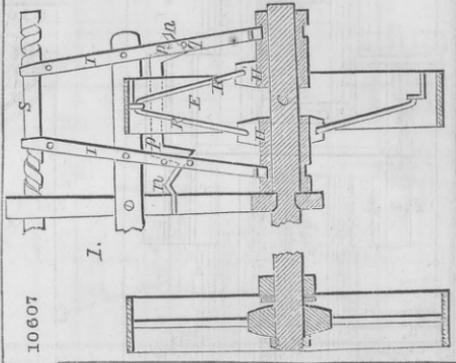
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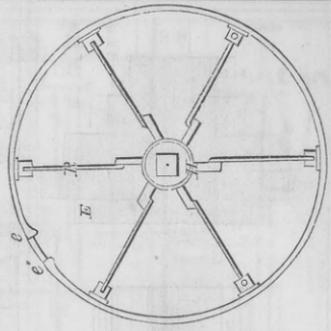
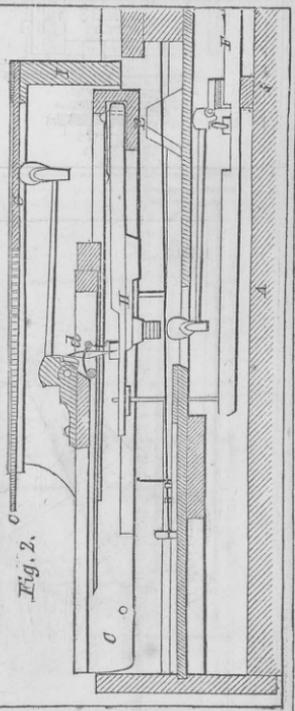
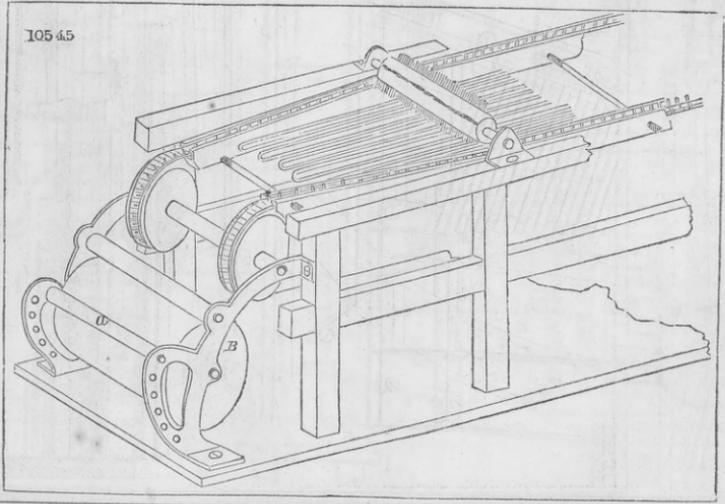
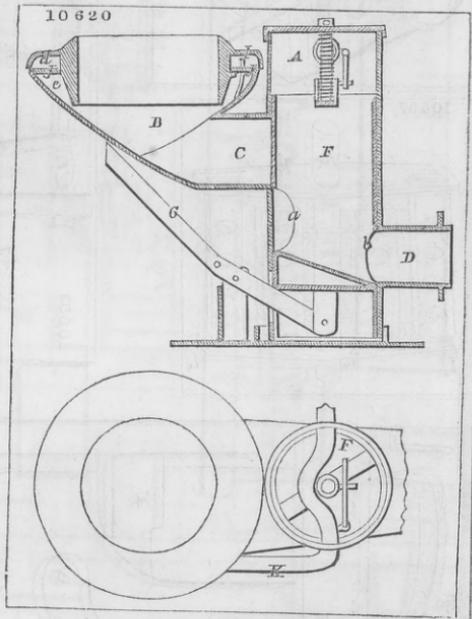
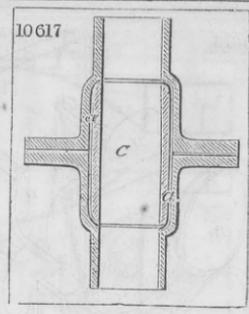
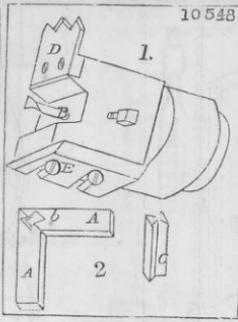
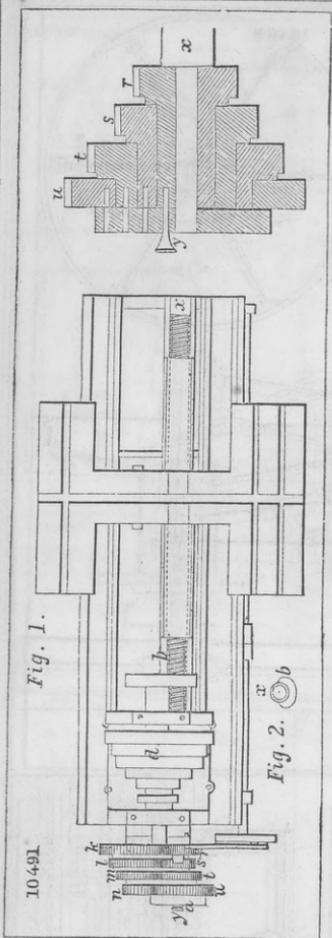
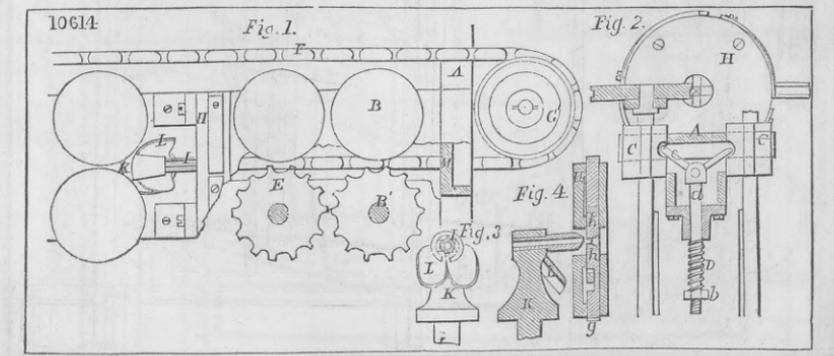
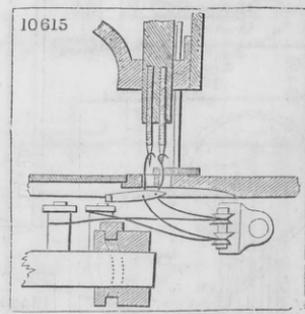
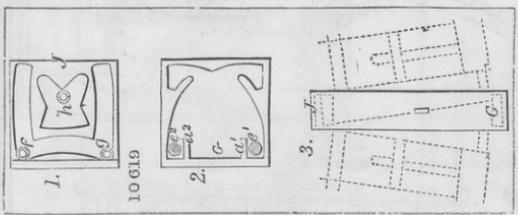
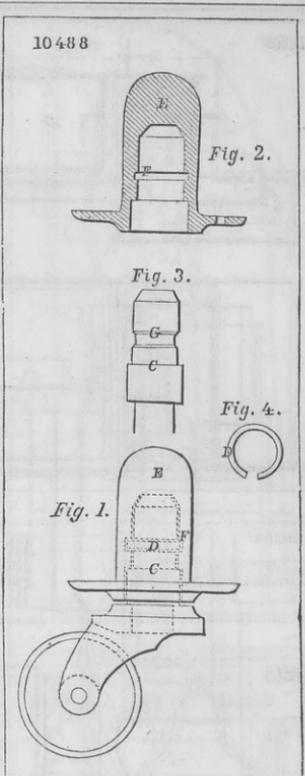
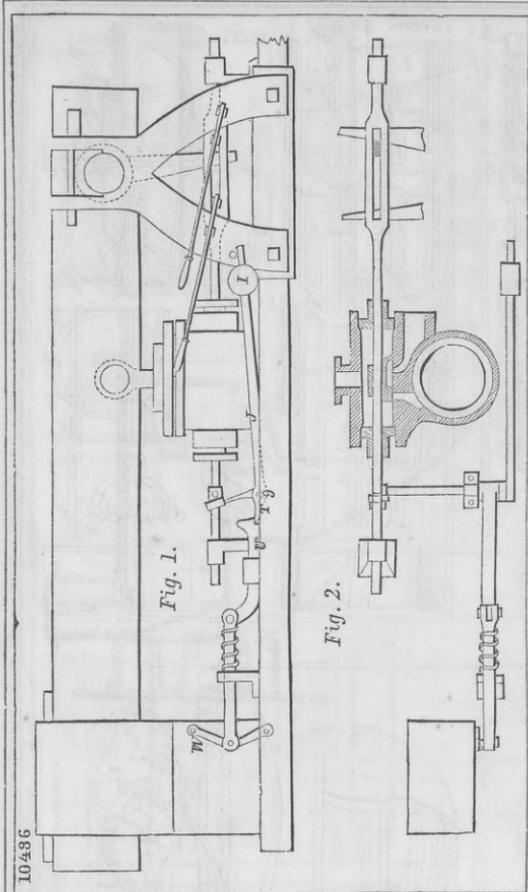


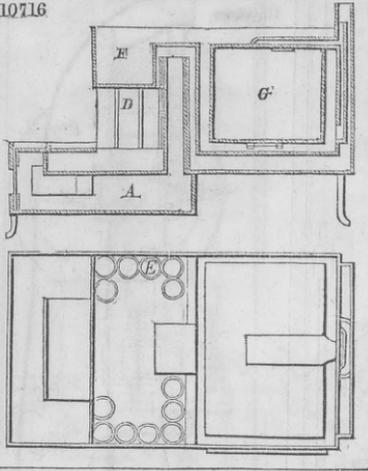
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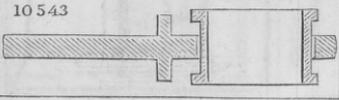




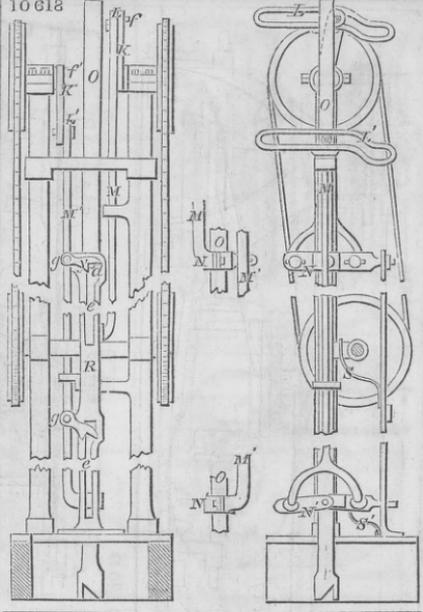
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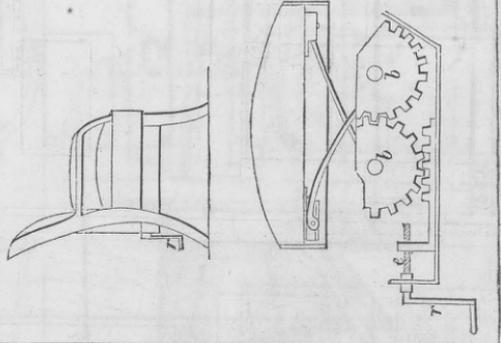
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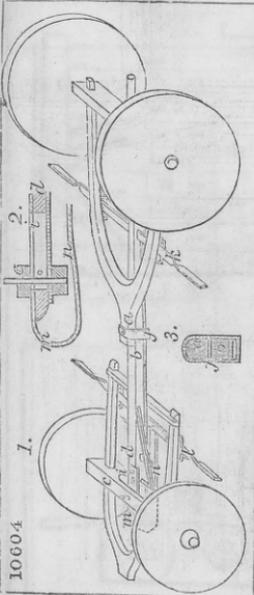
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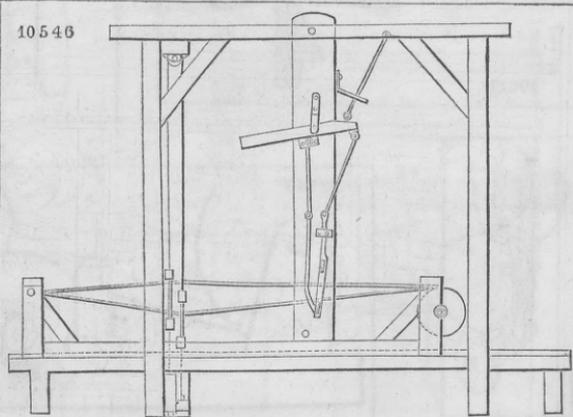
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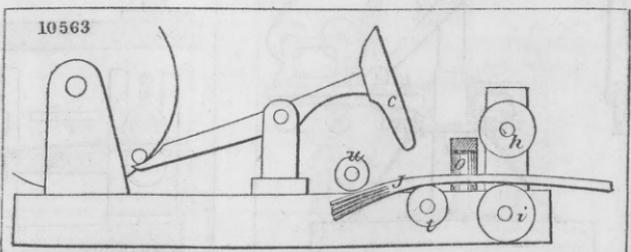
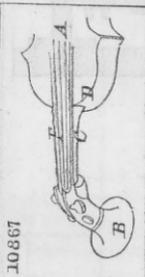
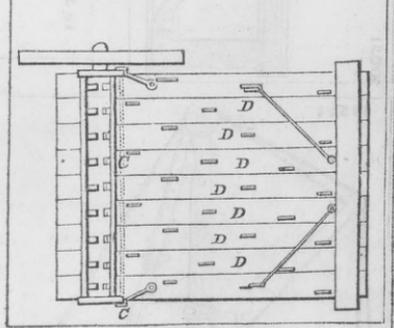
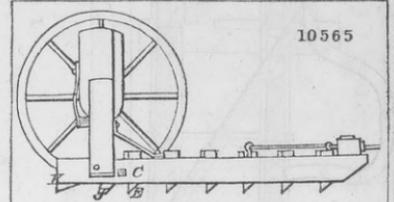
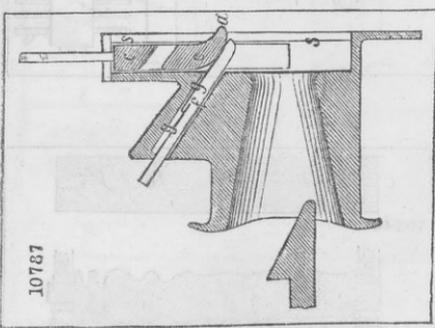
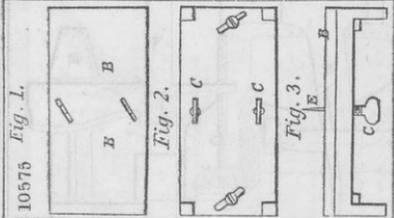
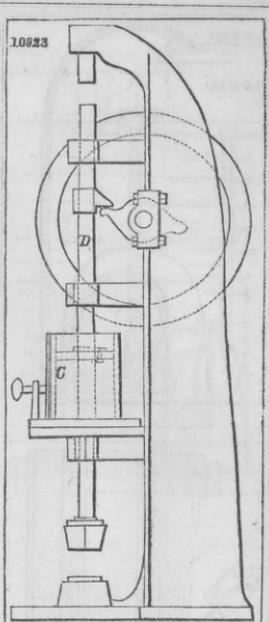
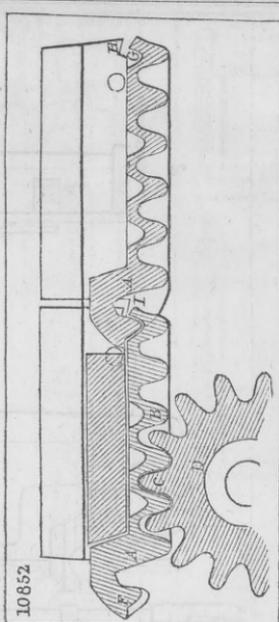
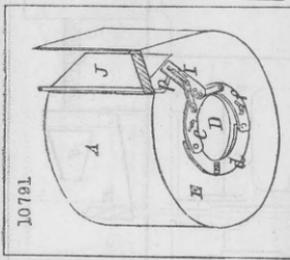
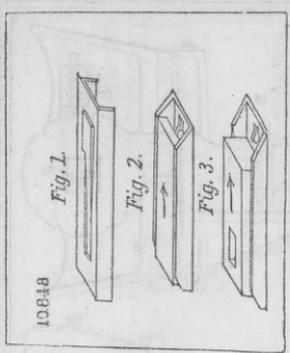


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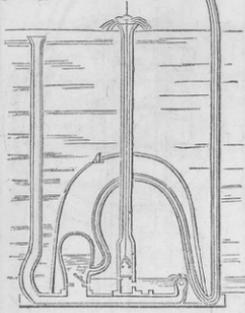


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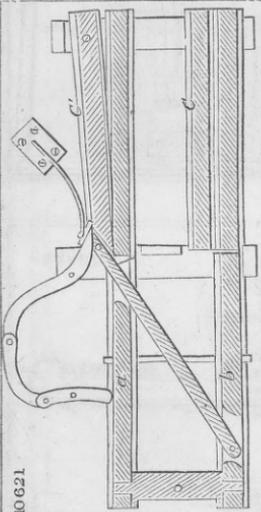




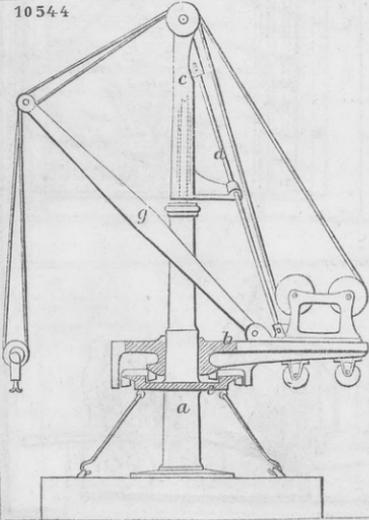
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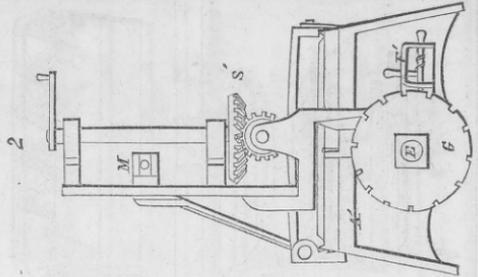
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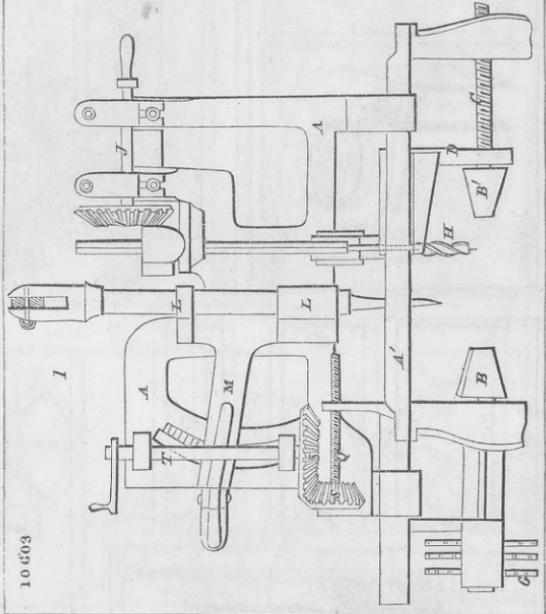
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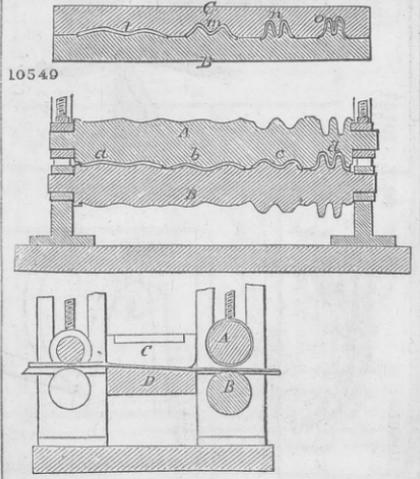
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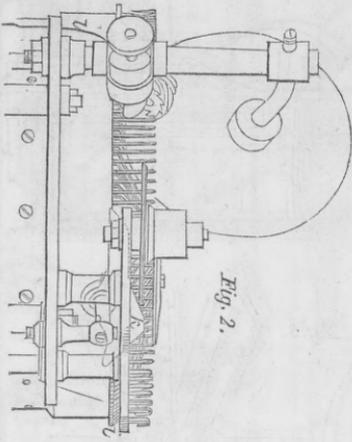


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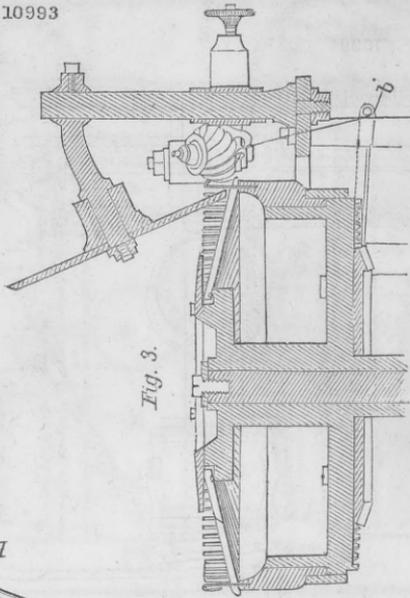


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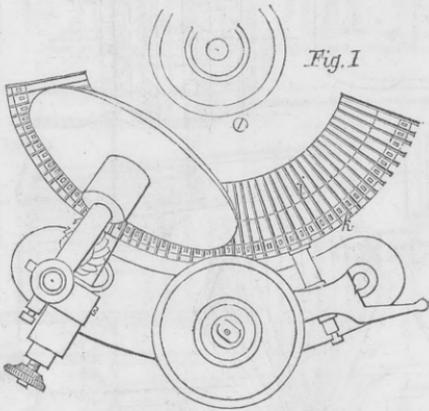
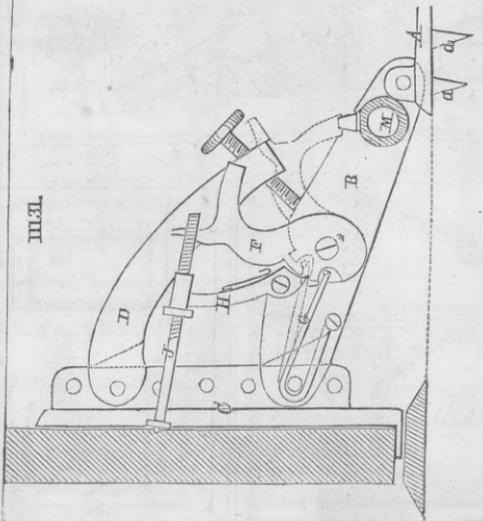
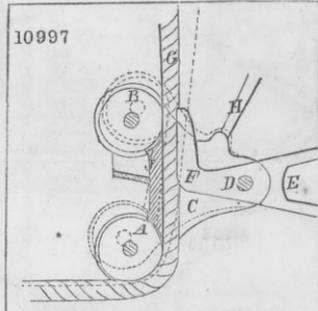


Fig. 1

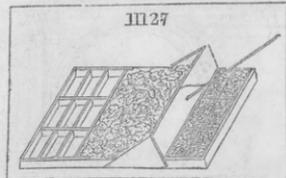
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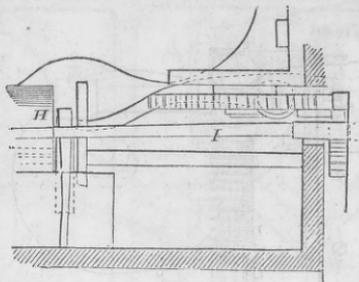
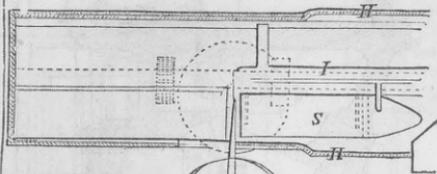


Fig. 1

Fig. 3.

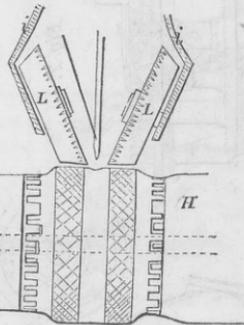
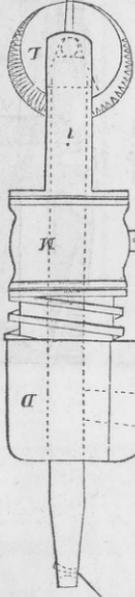
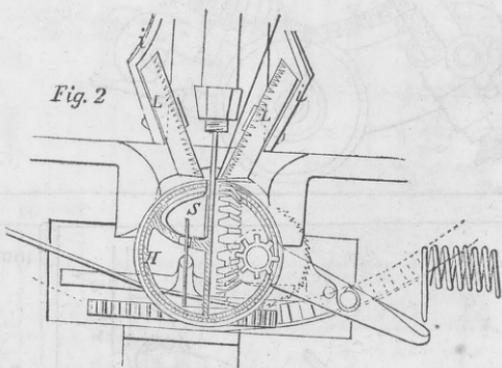
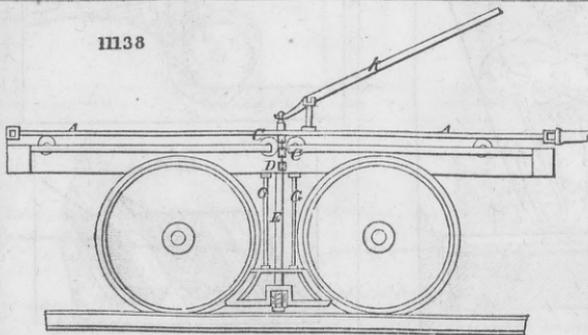


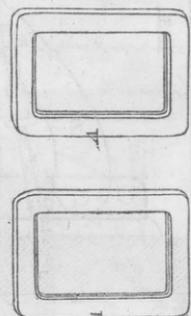
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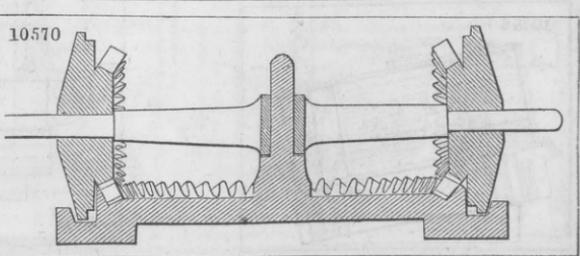
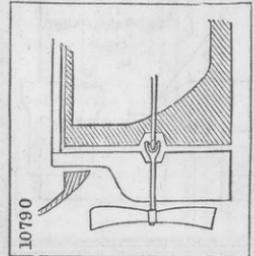
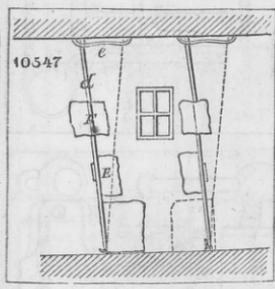
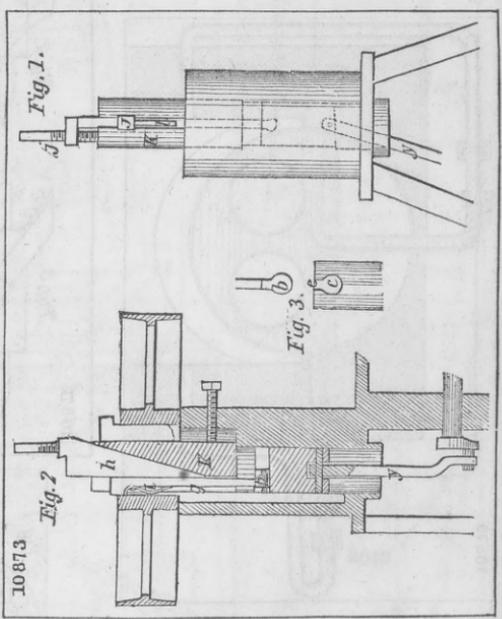
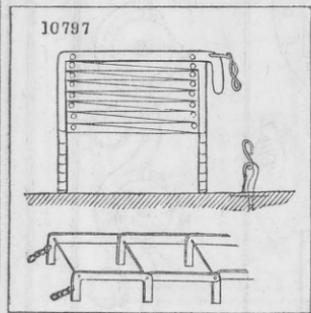
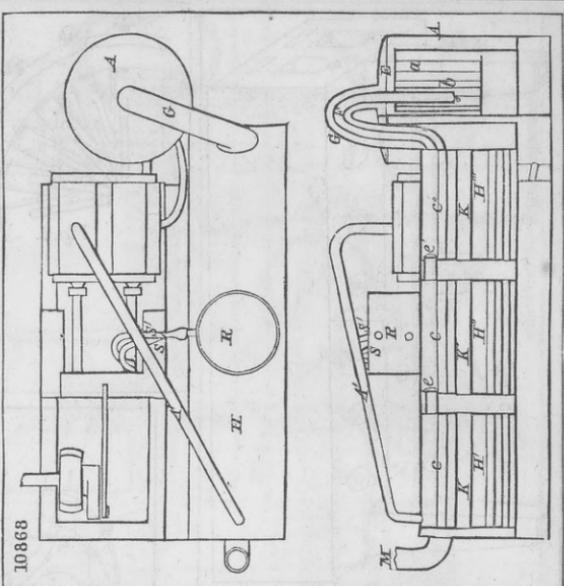
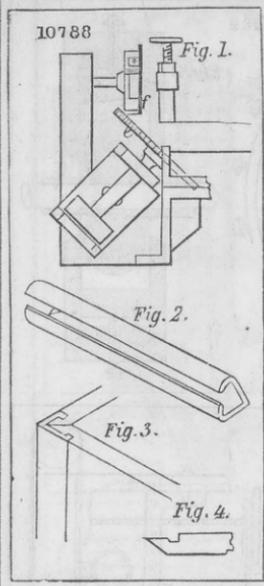


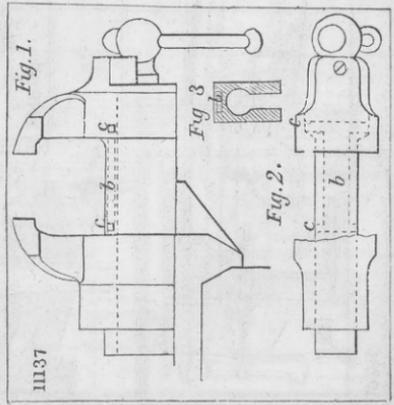
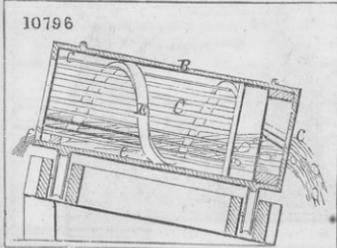
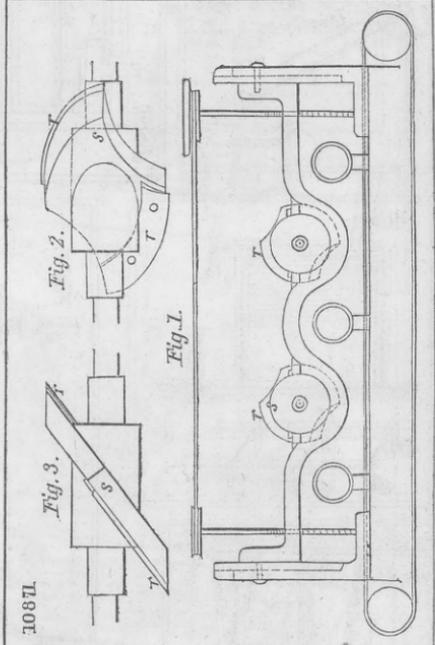
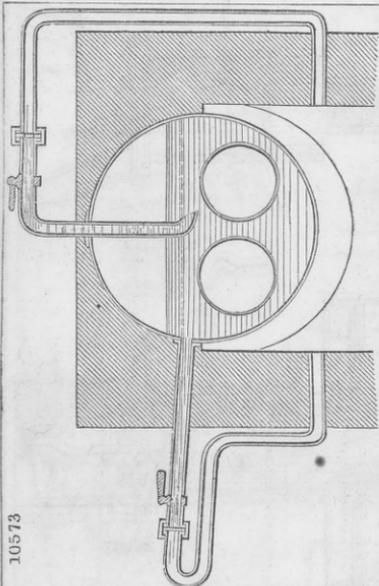
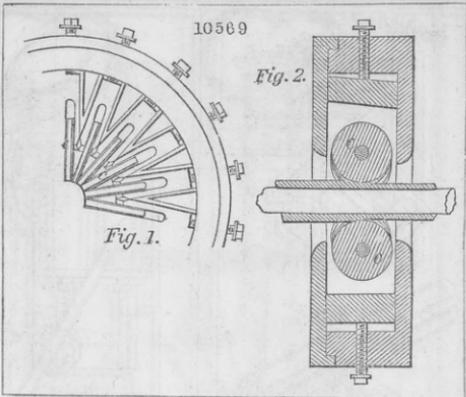
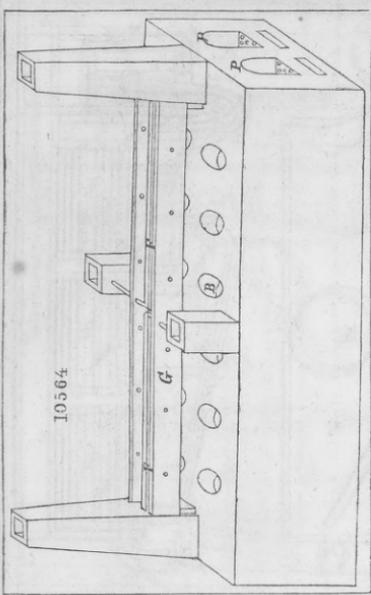
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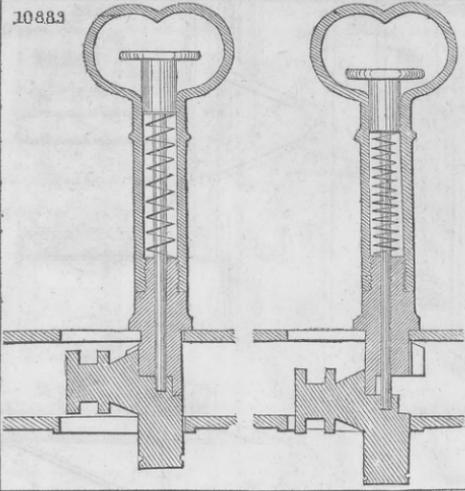
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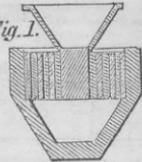


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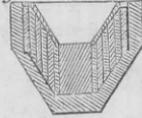
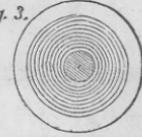


Fig. 3.



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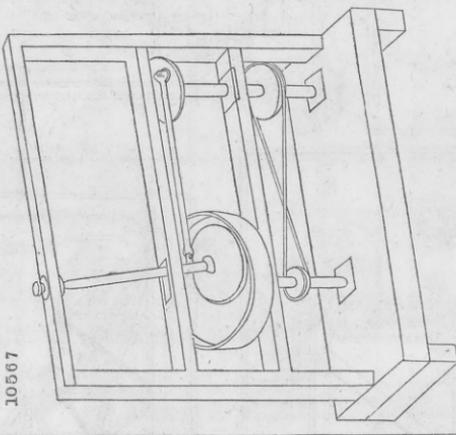


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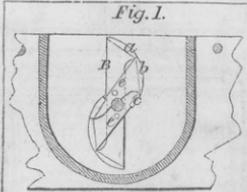
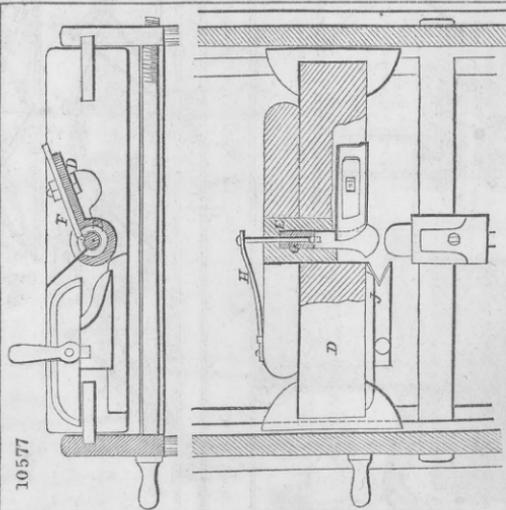


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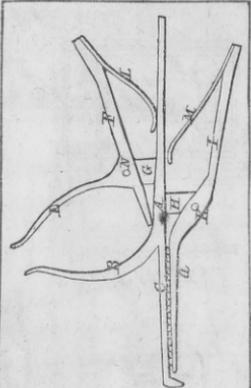


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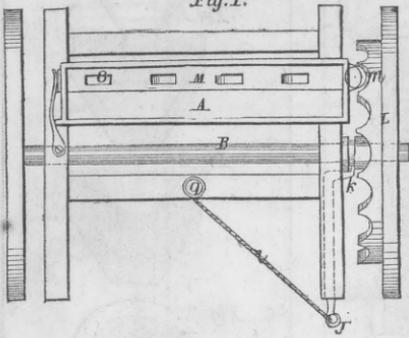


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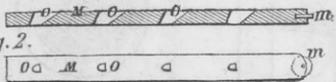
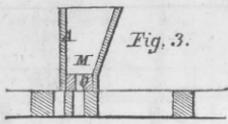


Fig. 3.



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Fig. 1.

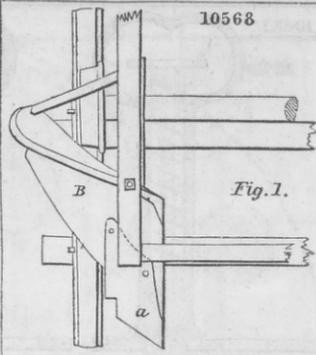
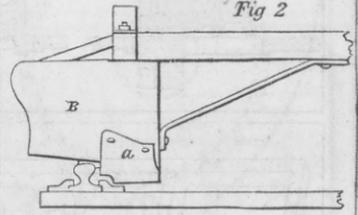


Fig 2



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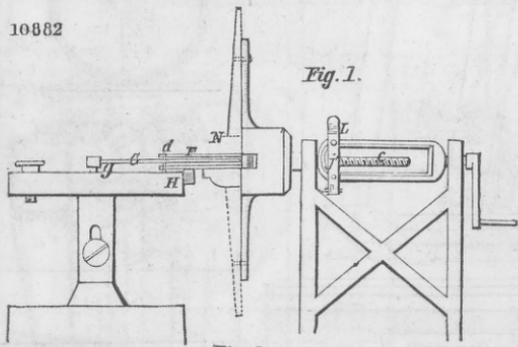


Fig 2

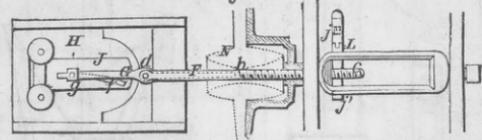


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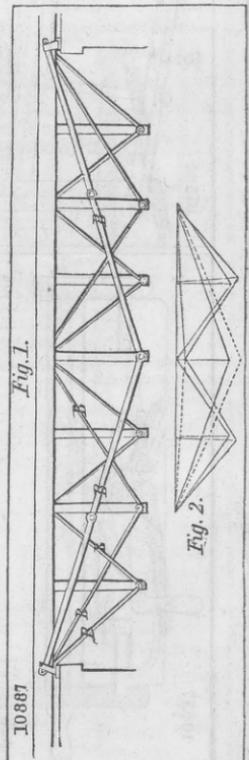
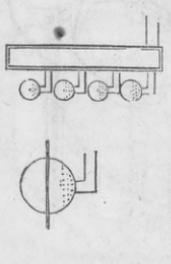
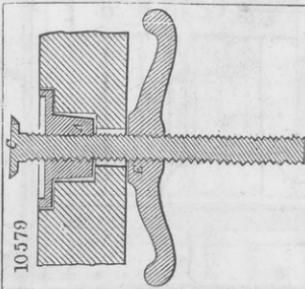


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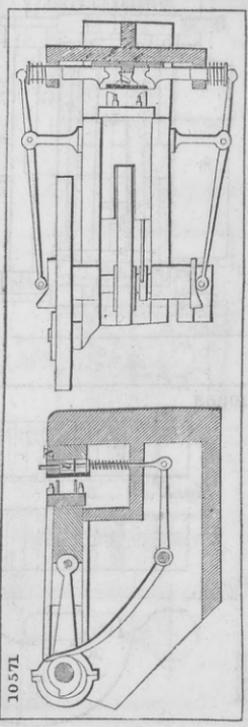
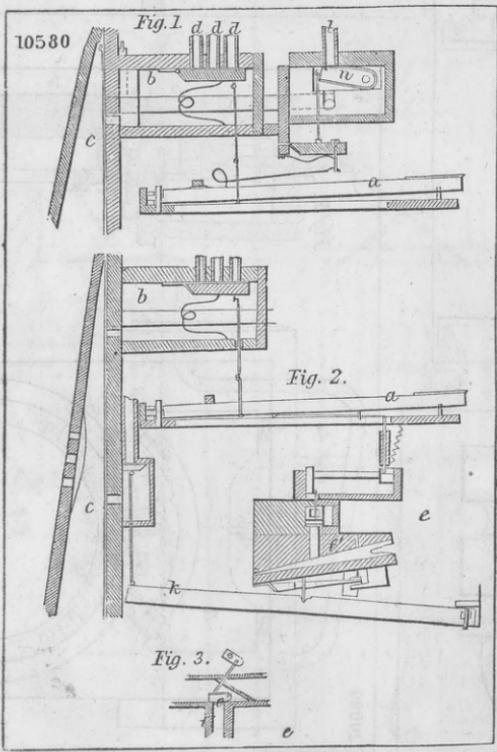
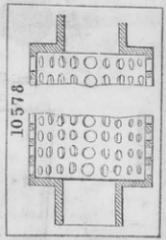
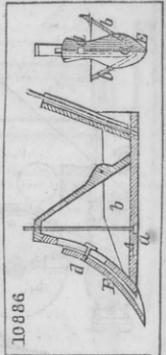
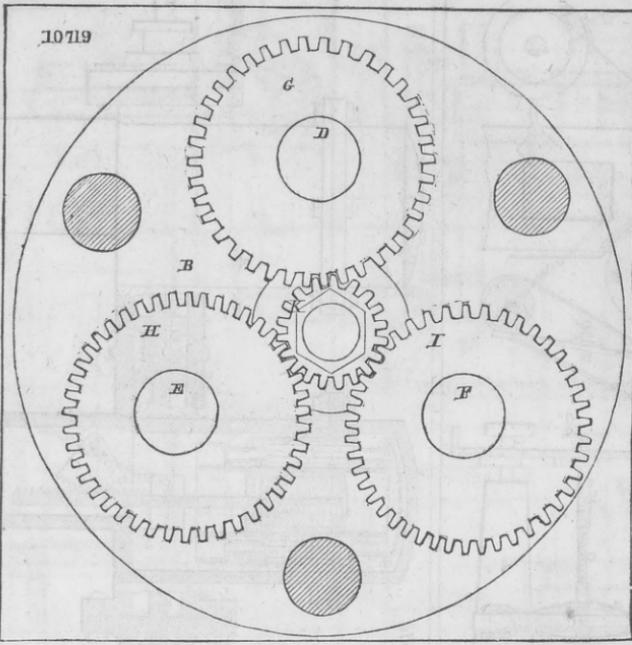
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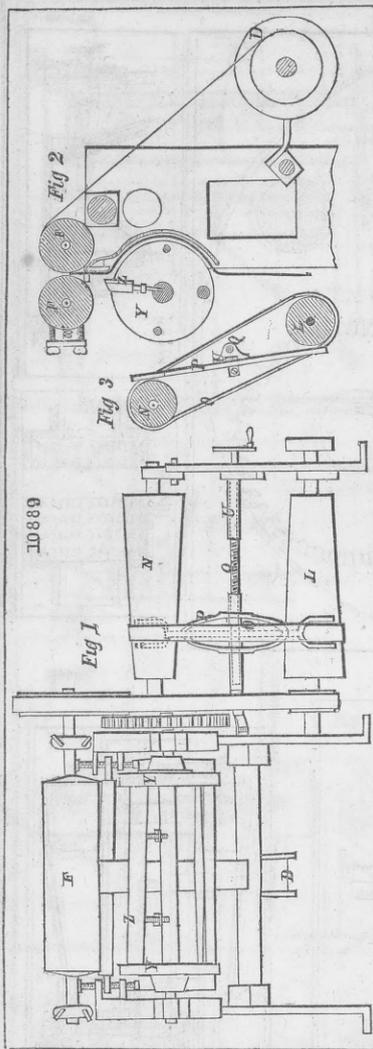


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Fig. 2

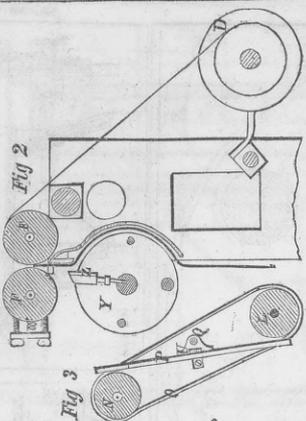
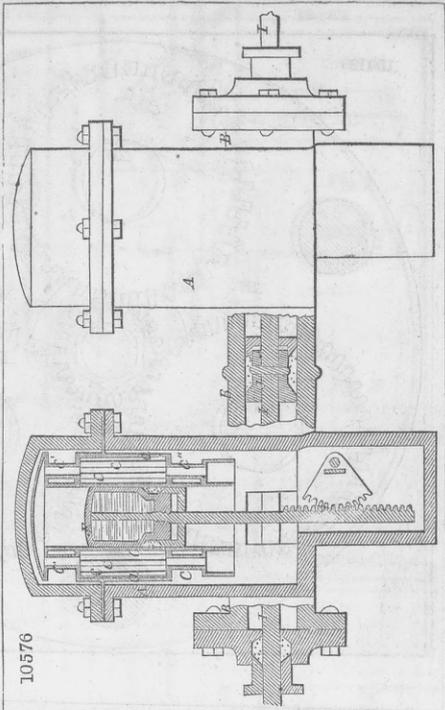
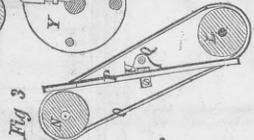
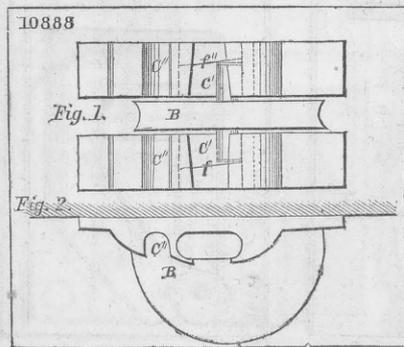


Fig. 3



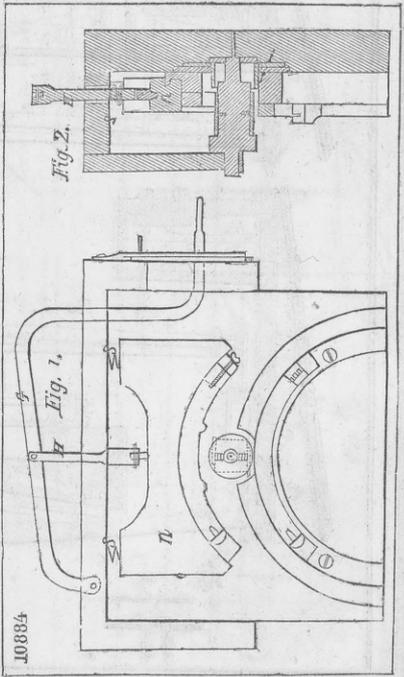
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Fig. 1.

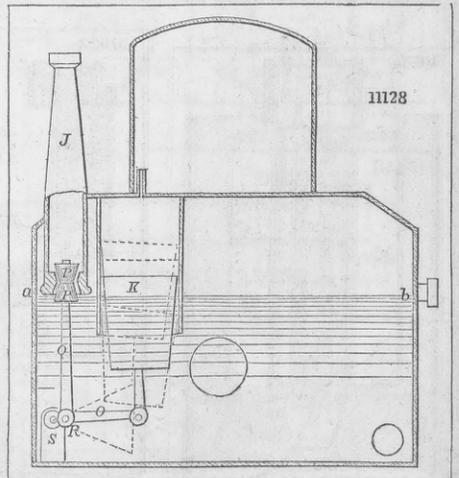
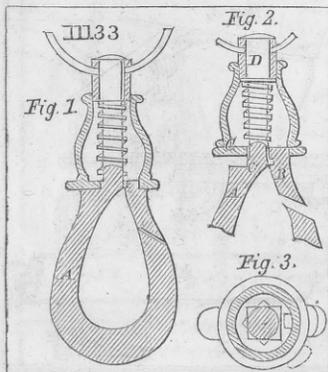
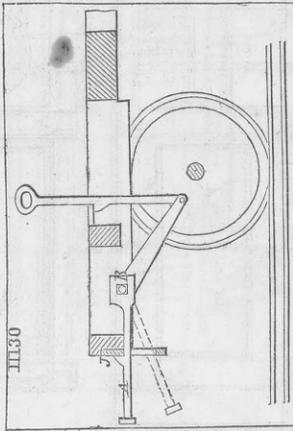
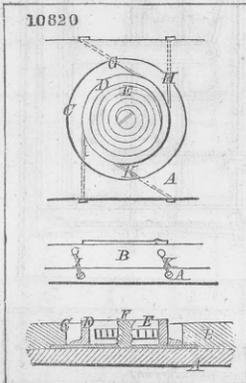
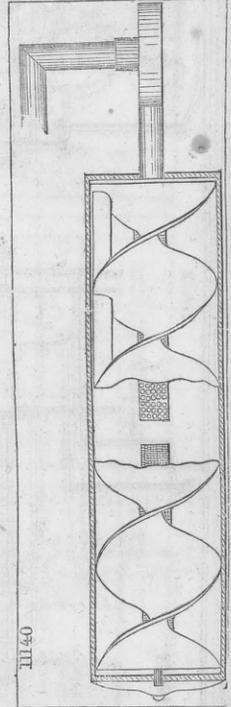
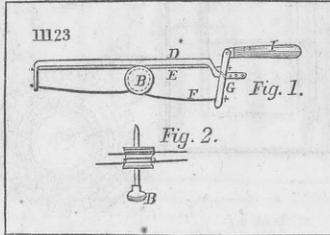
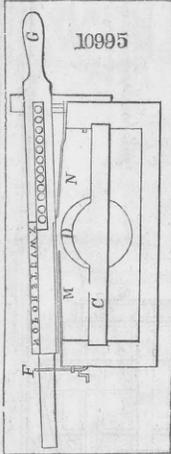
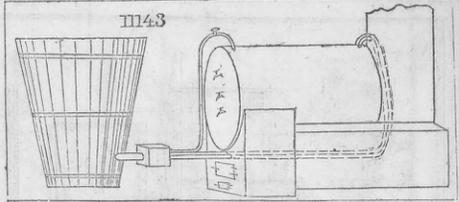
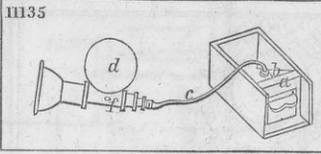
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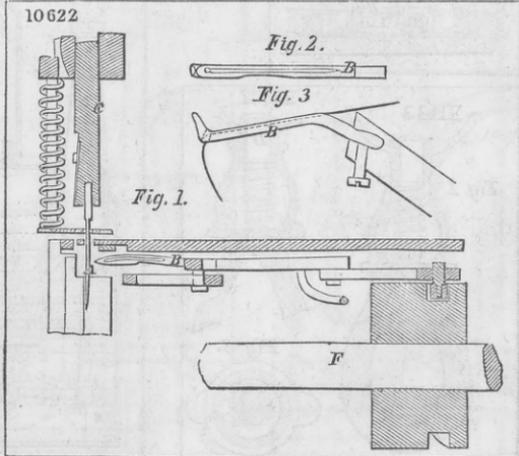
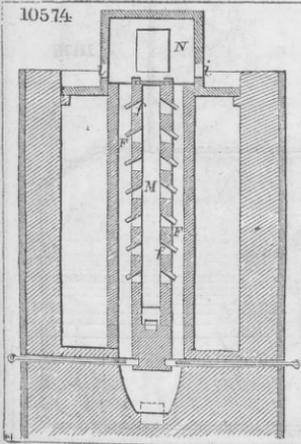
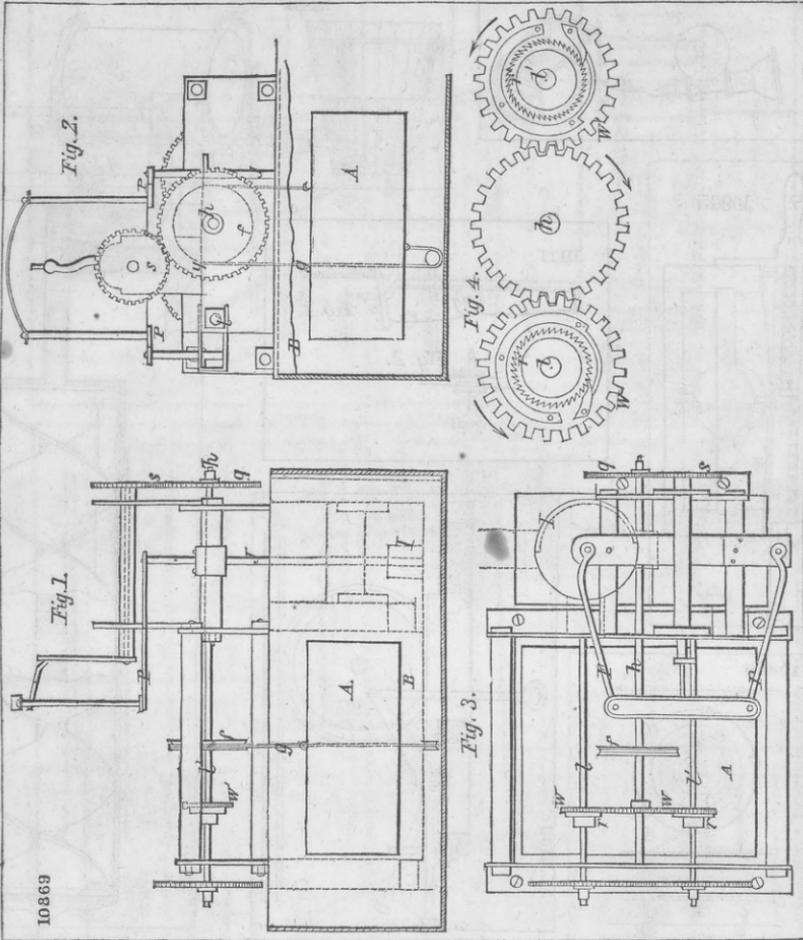


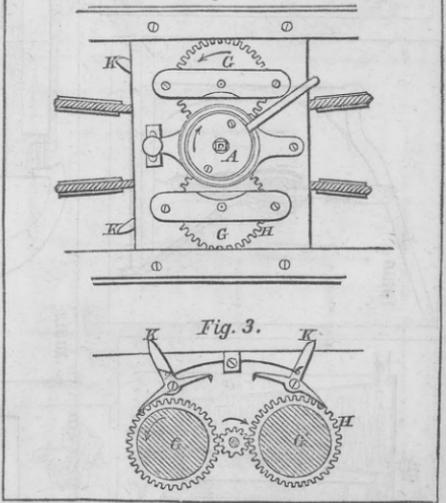
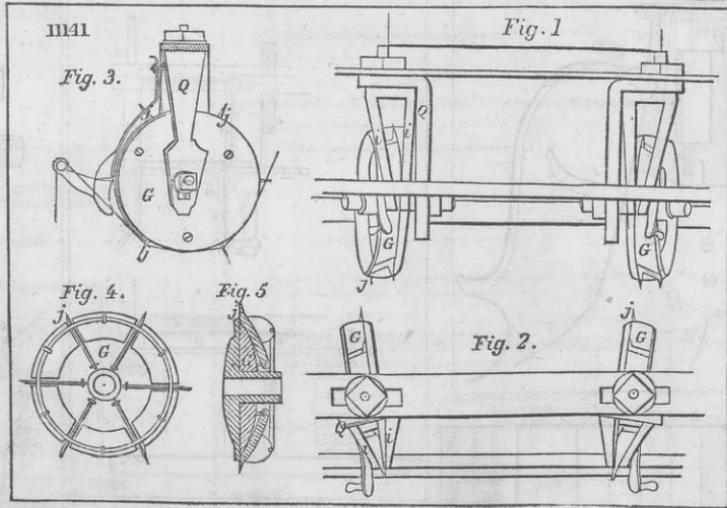
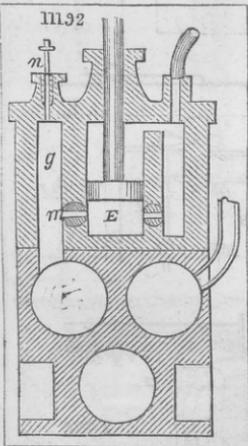
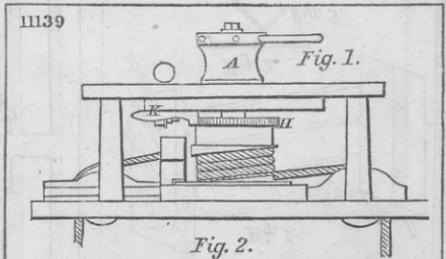
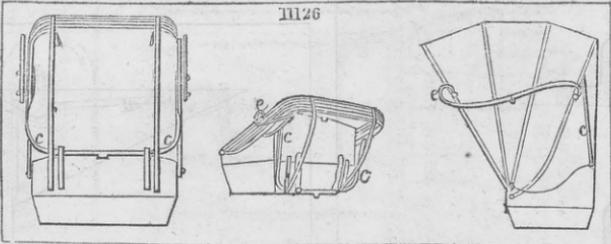
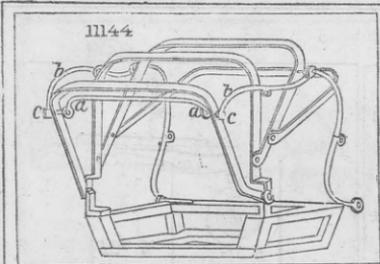
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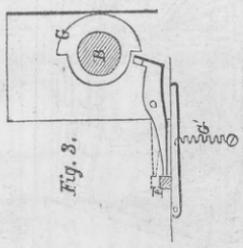
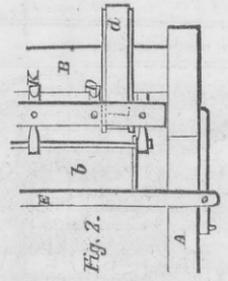
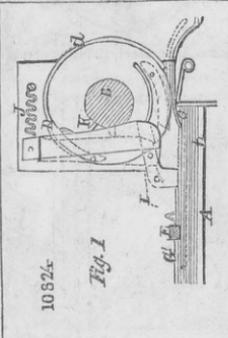
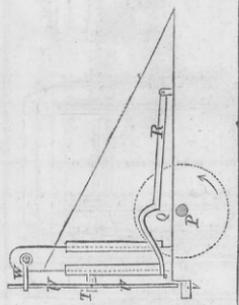
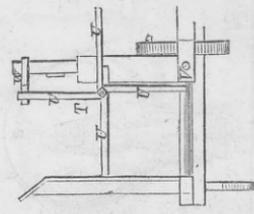
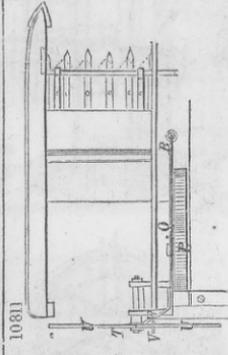
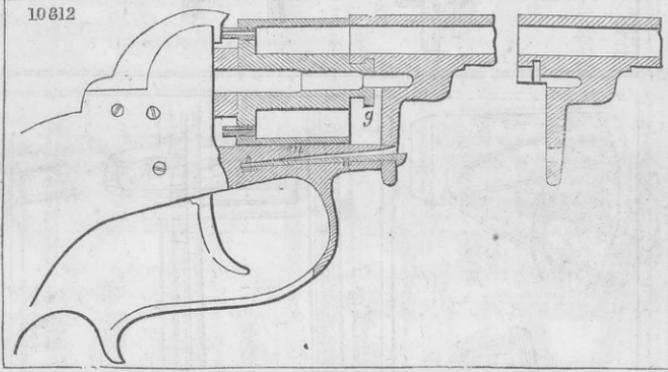
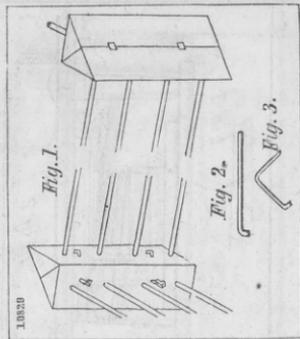
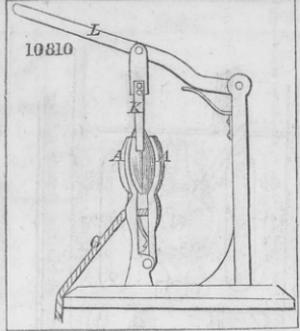
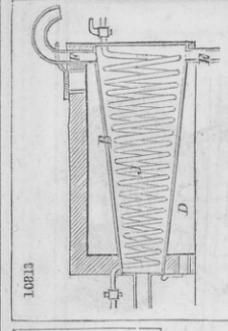
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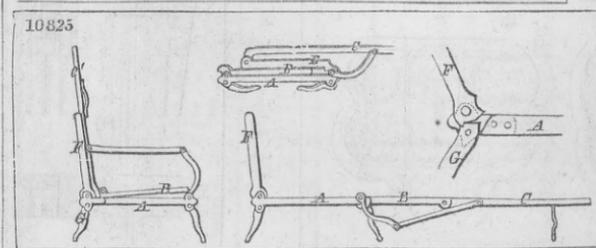
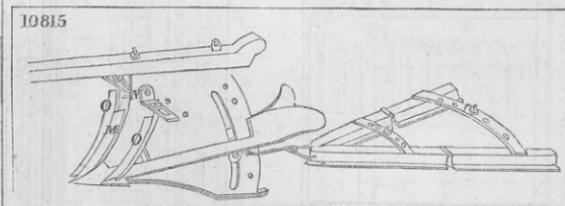
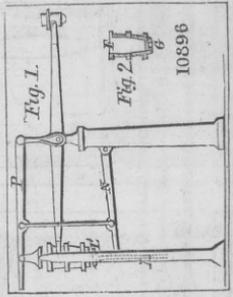
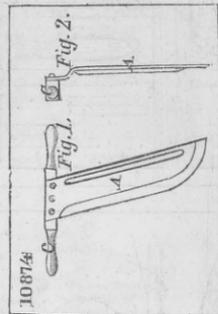
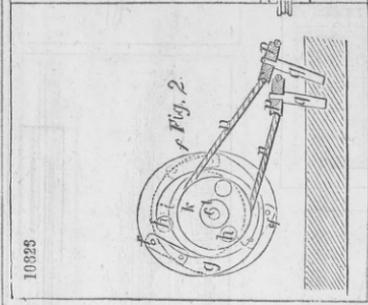
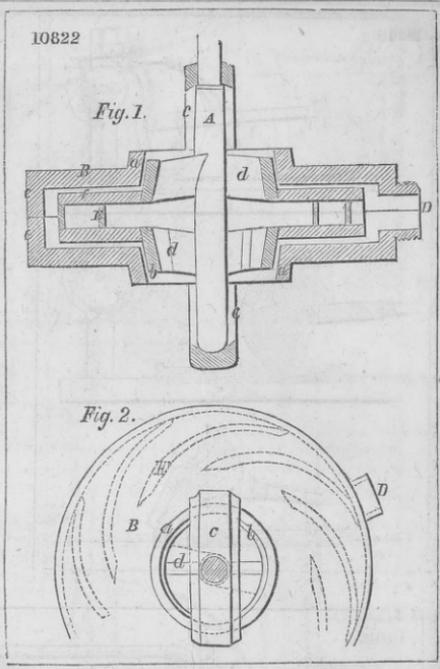
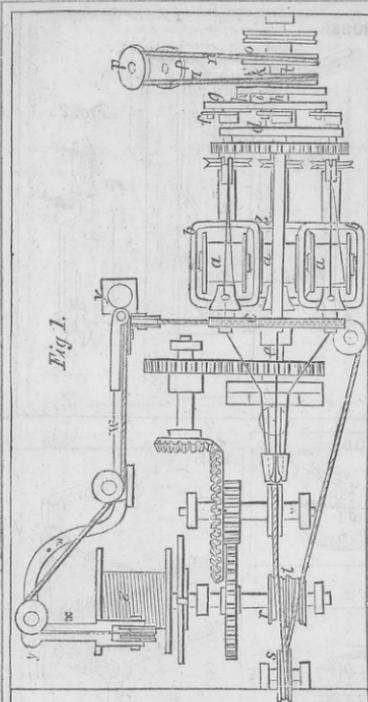
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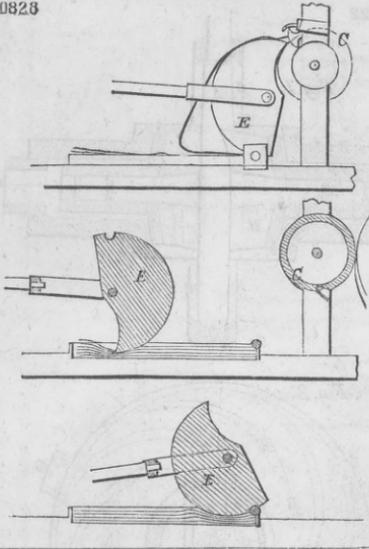




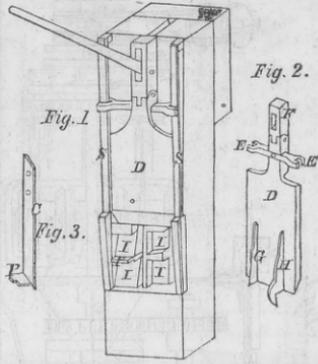




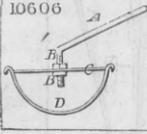
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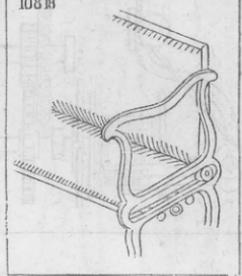
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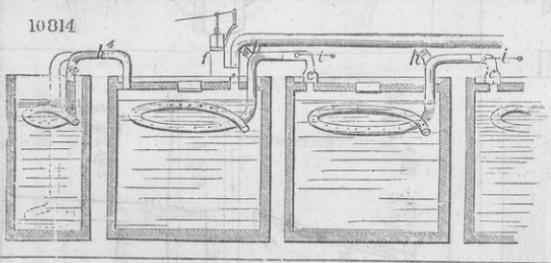
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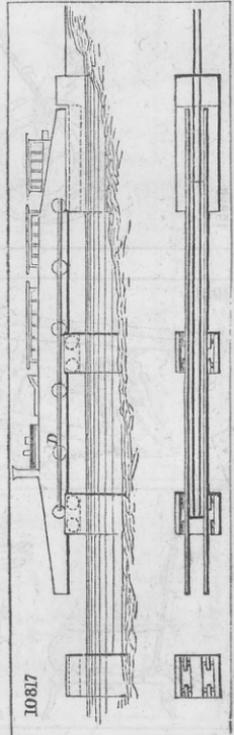
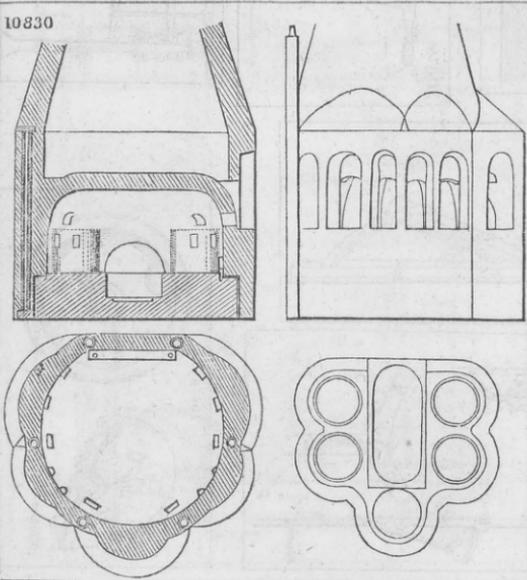
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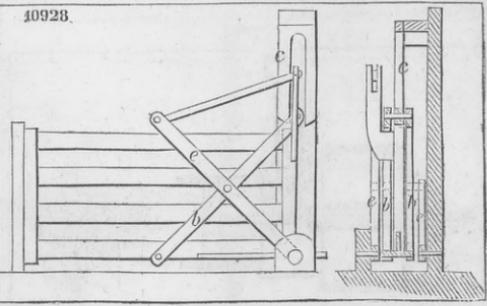
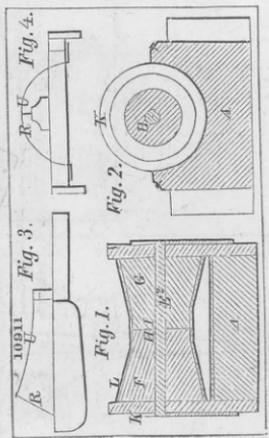
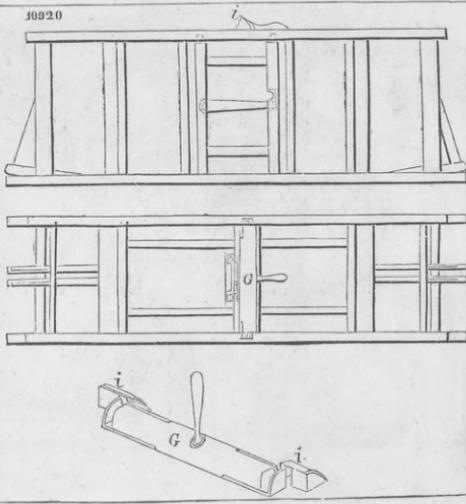
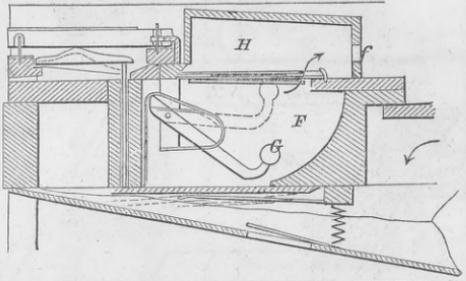
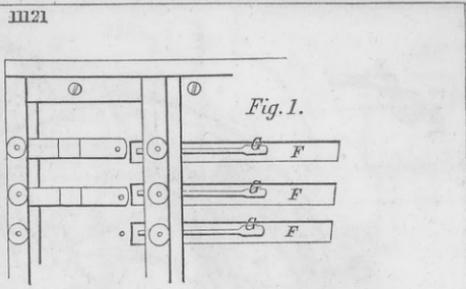
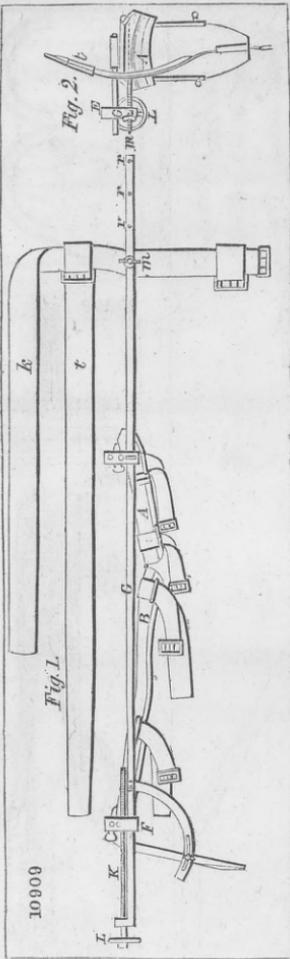
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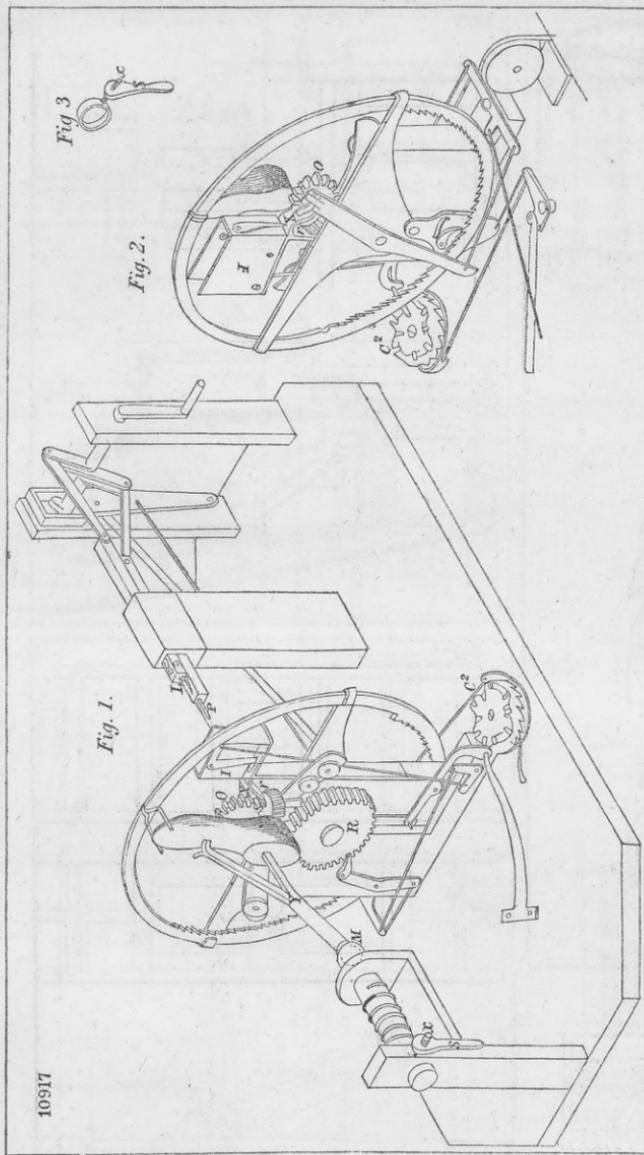
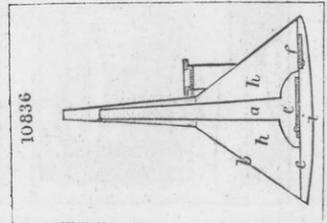
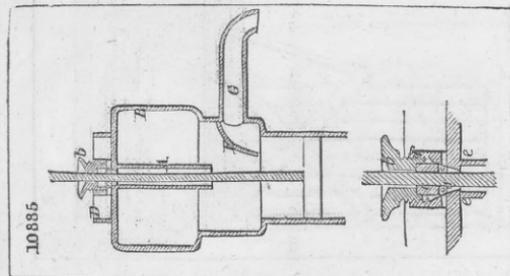
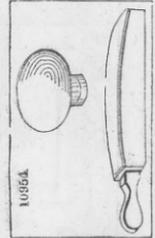
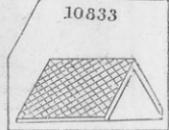
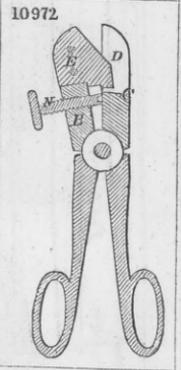
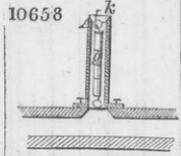
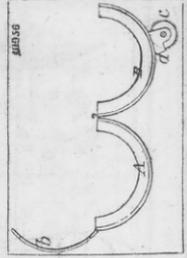
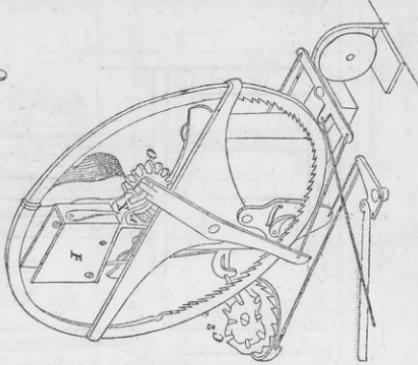


Fig. 2.



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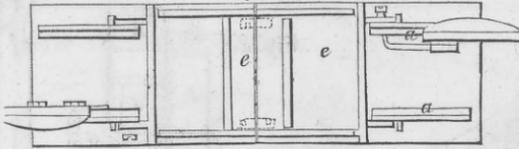


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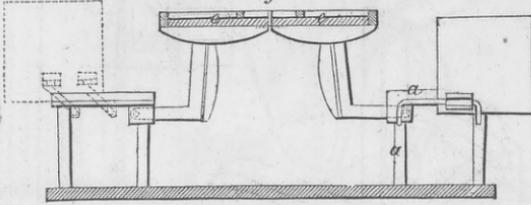
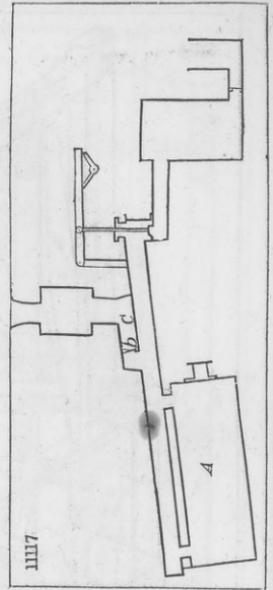
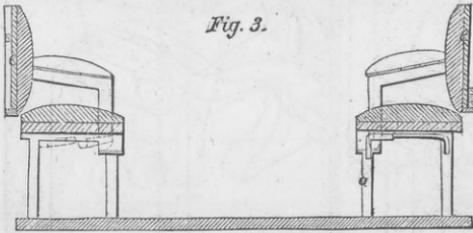
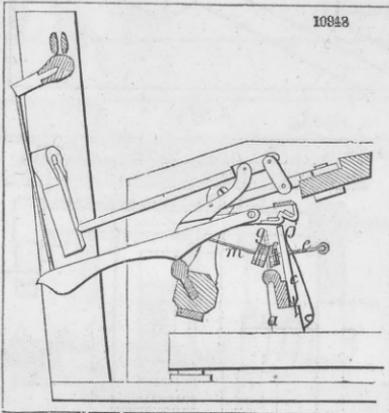


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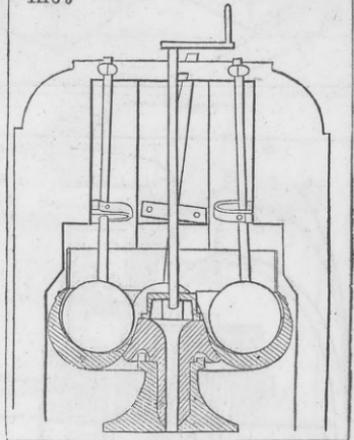


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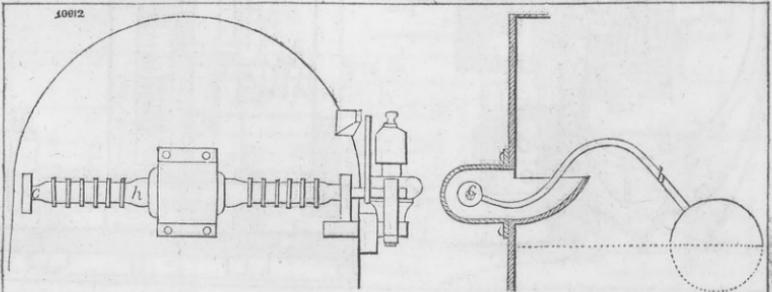
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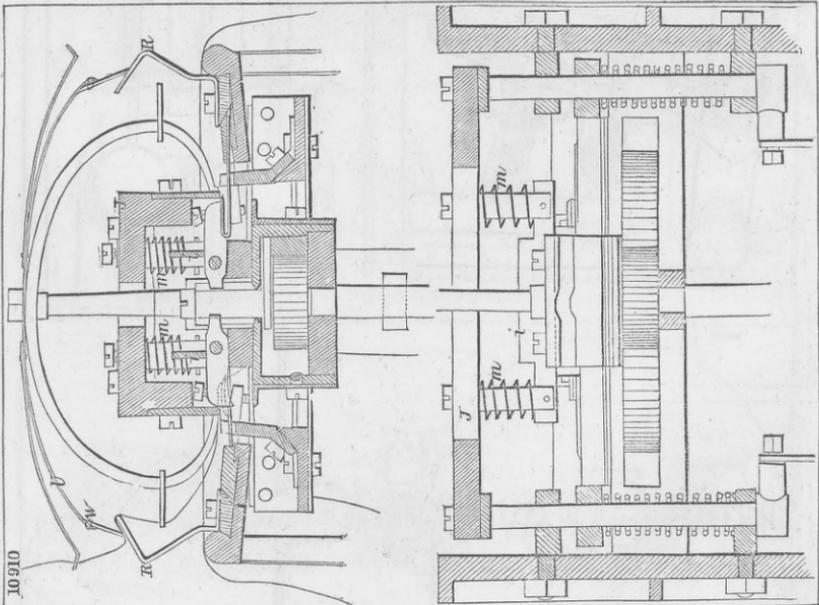
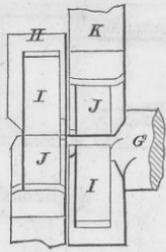
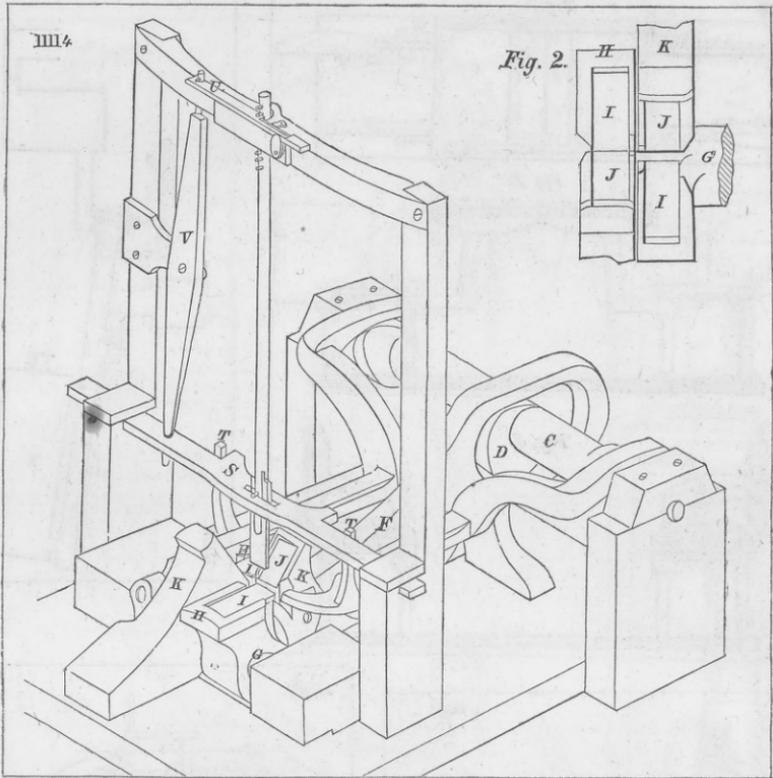


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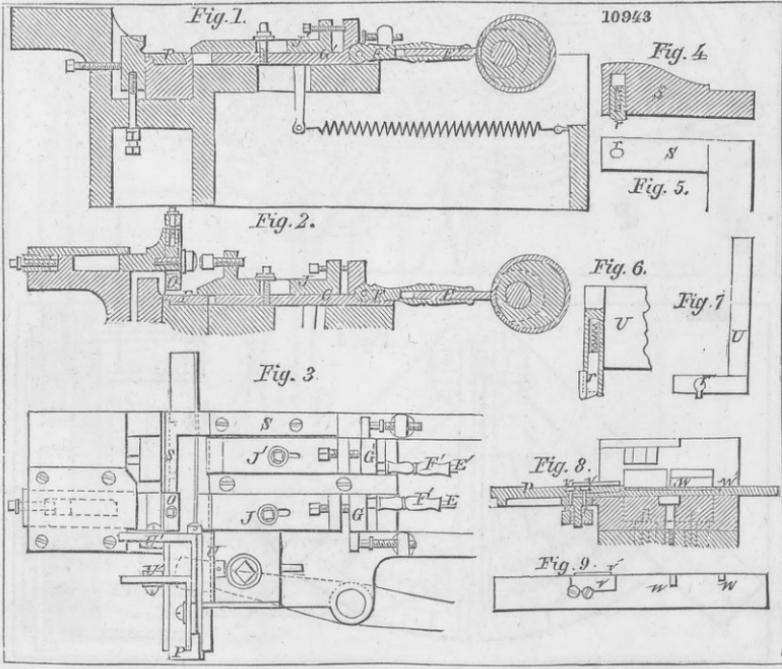
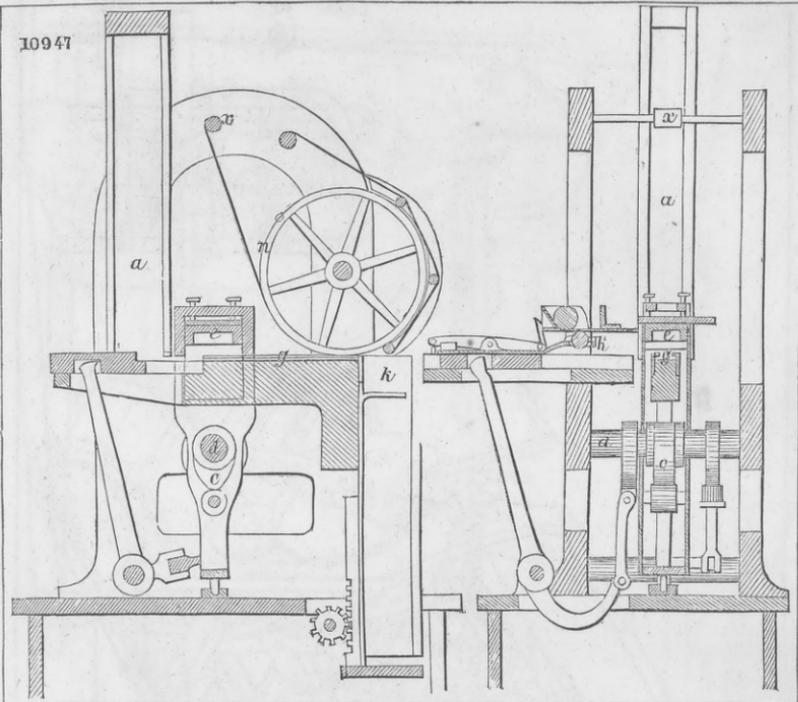


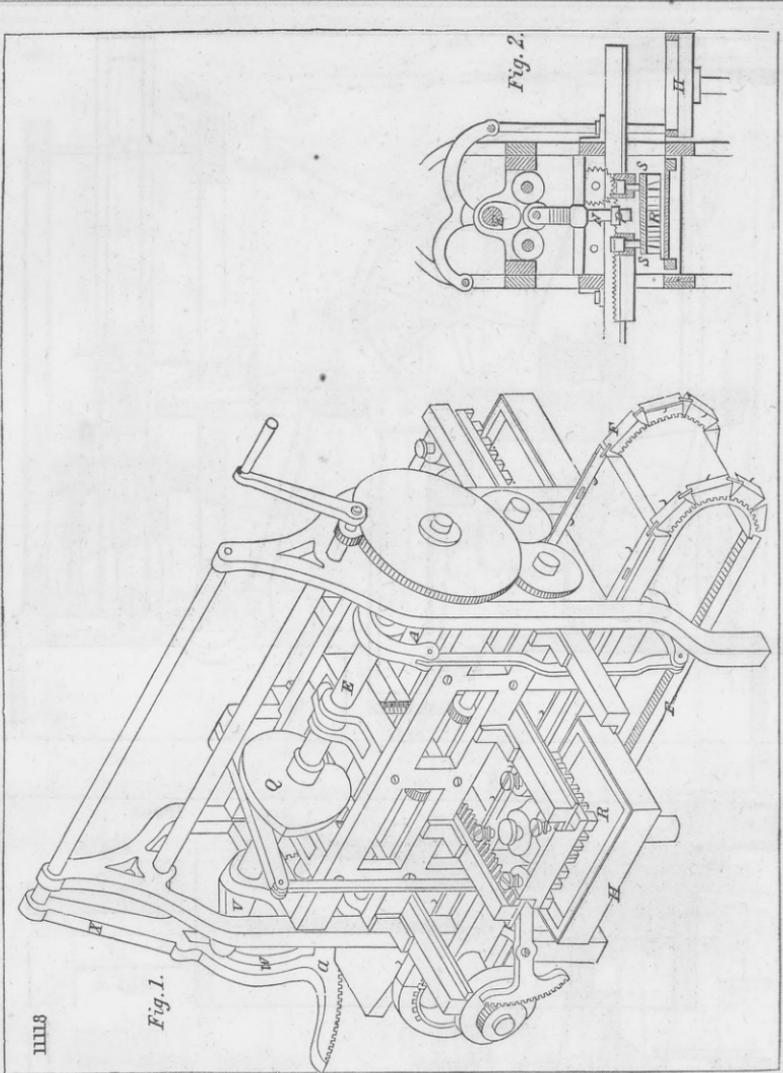
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Fig. 2.

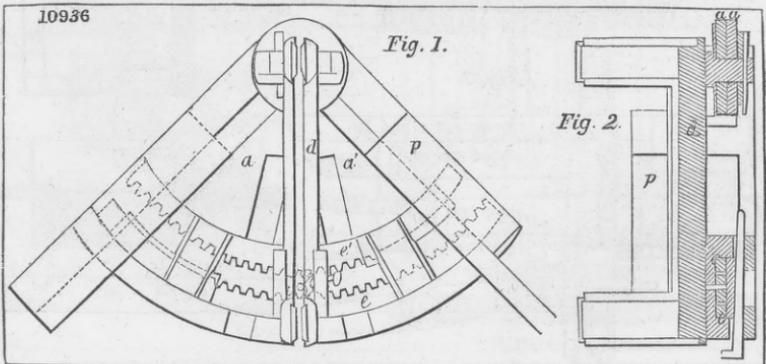
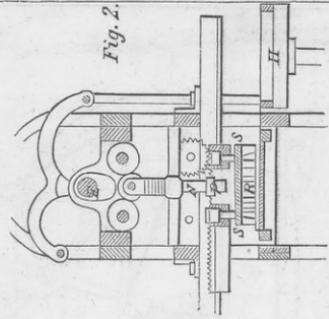


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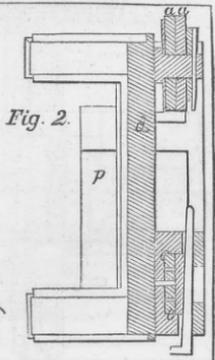


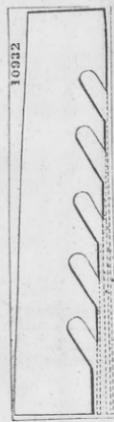
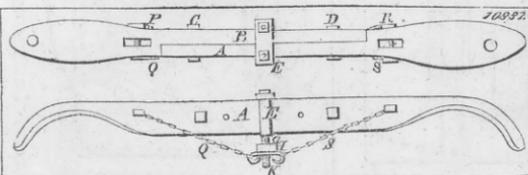
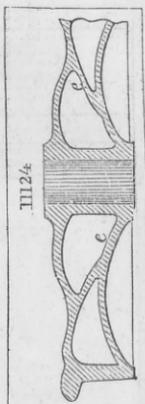
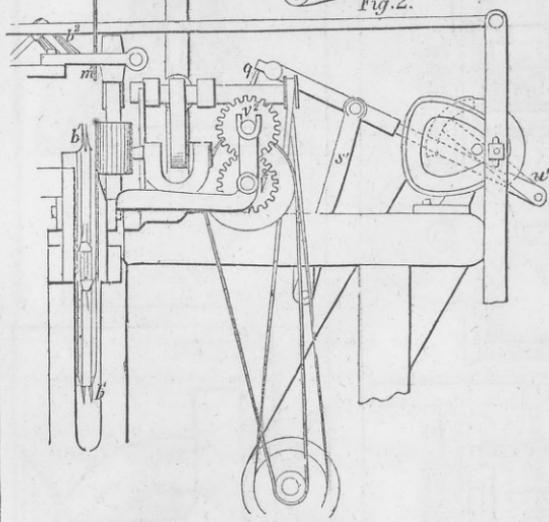
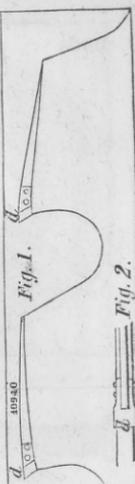
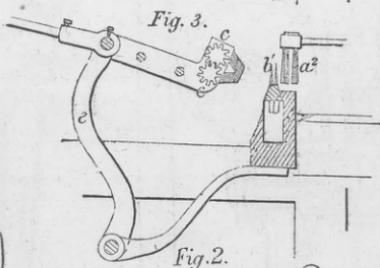
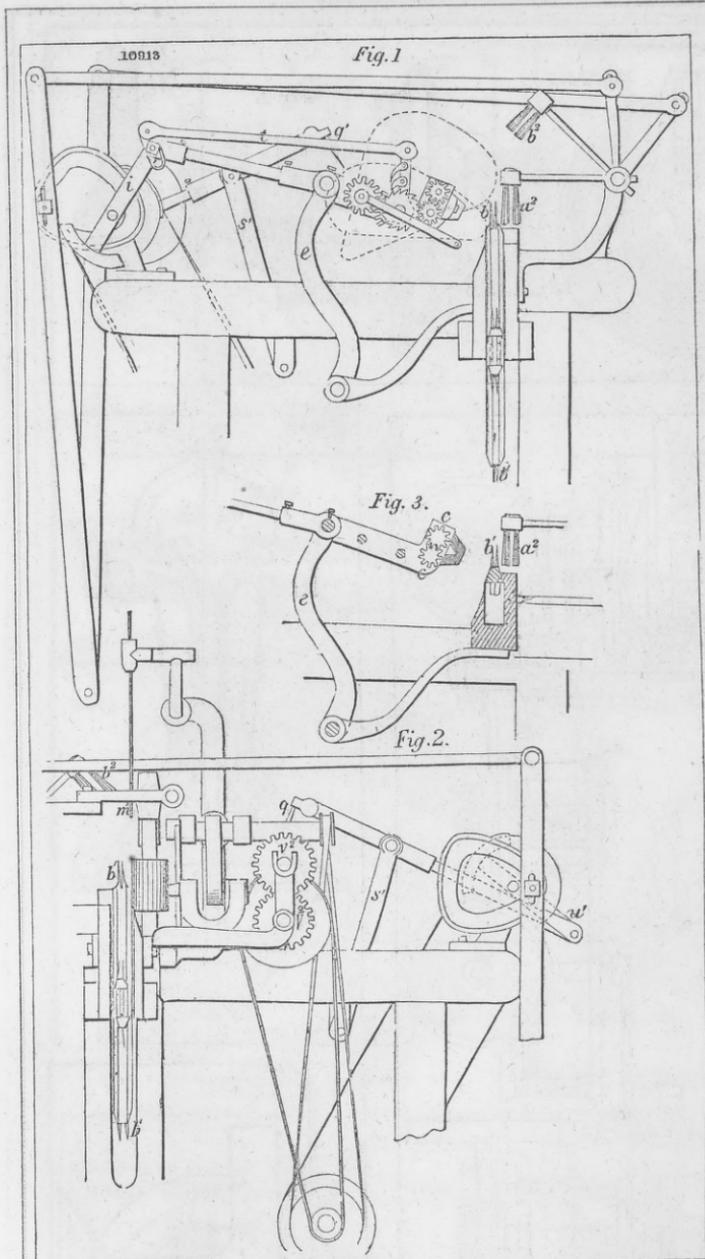


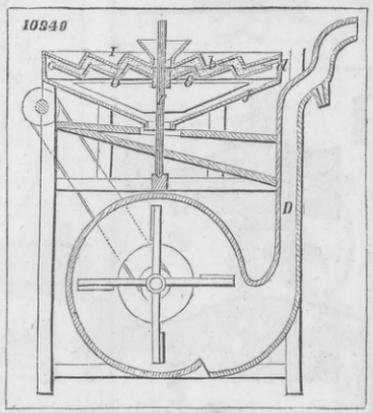
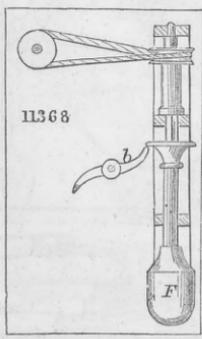
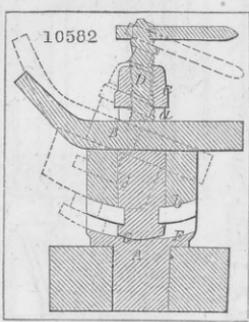
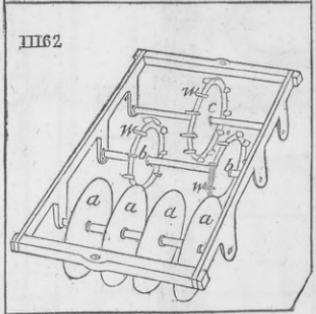
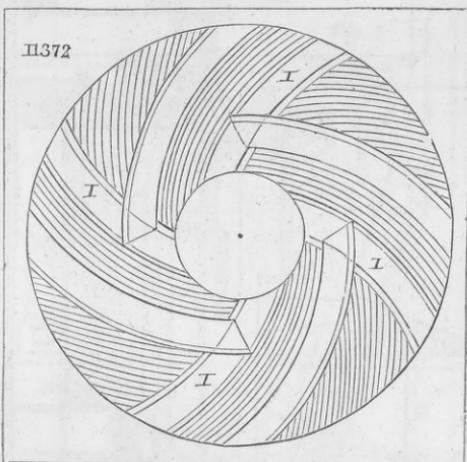
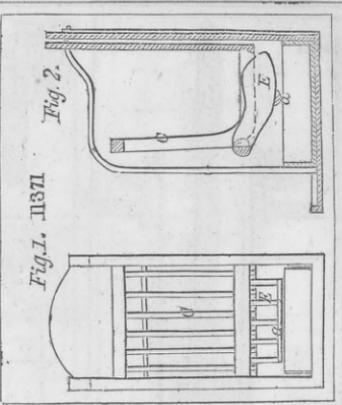
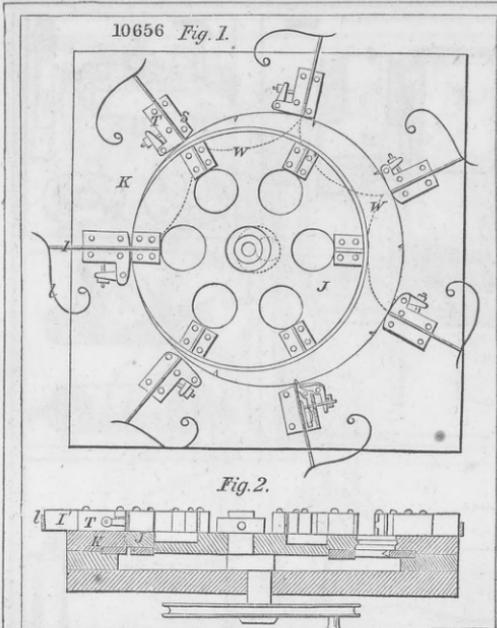
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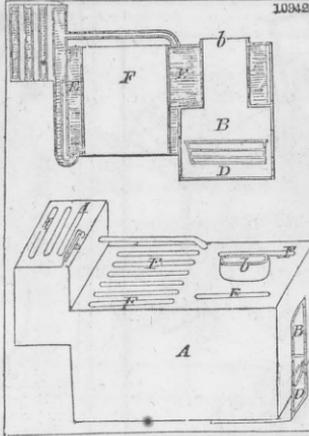
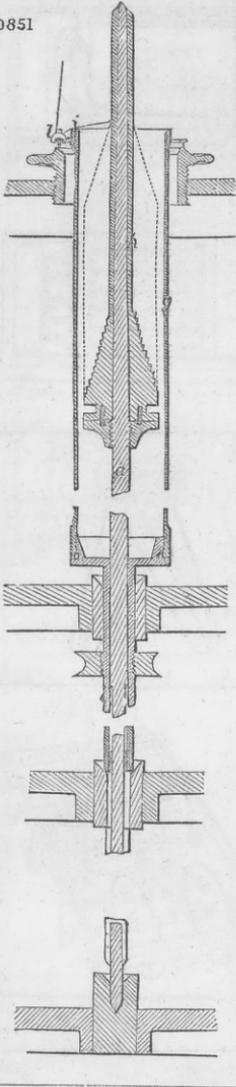
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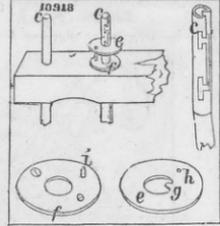




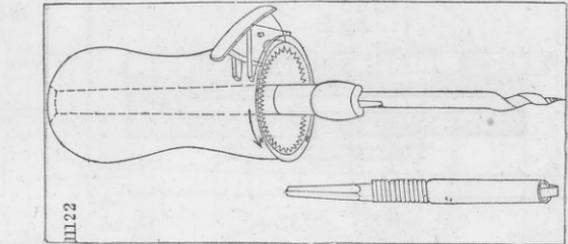
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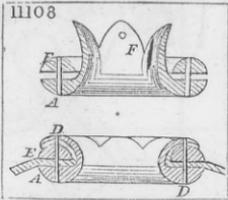
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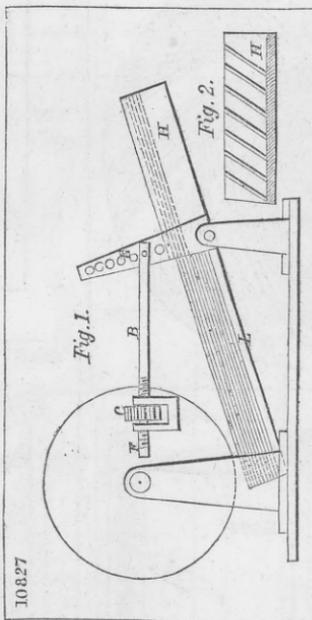
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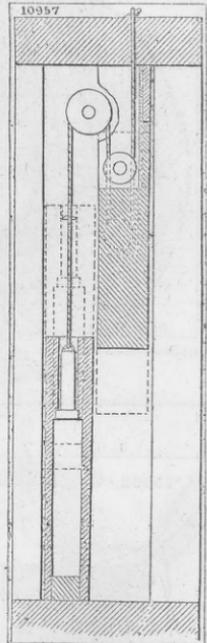
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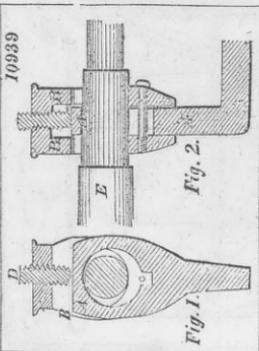
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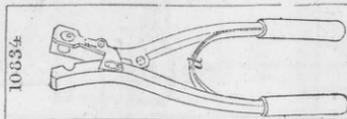
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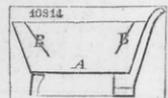
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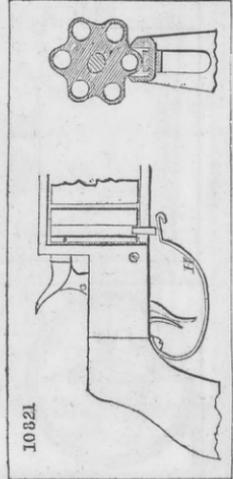
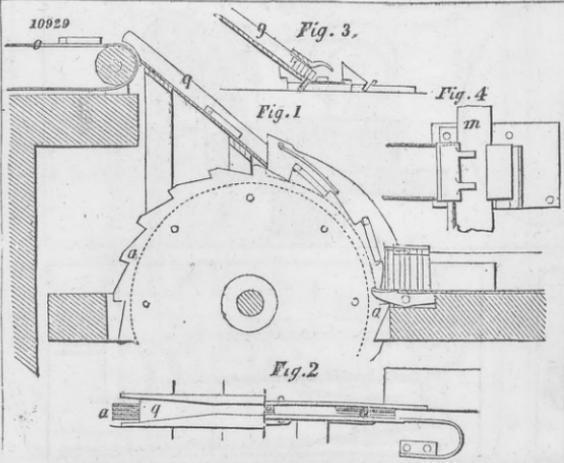
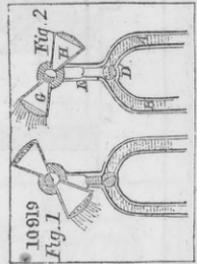
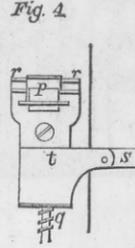
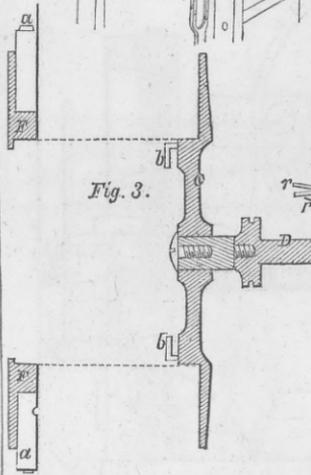
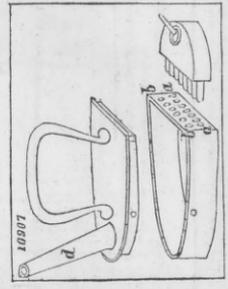
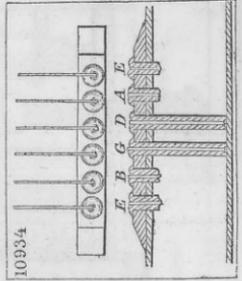
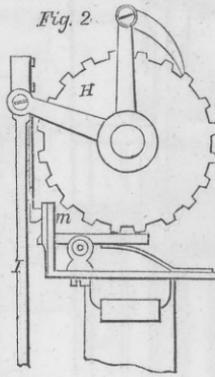
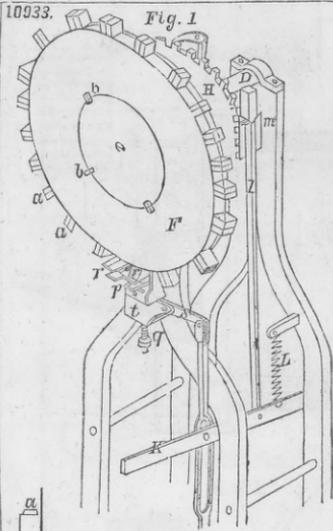
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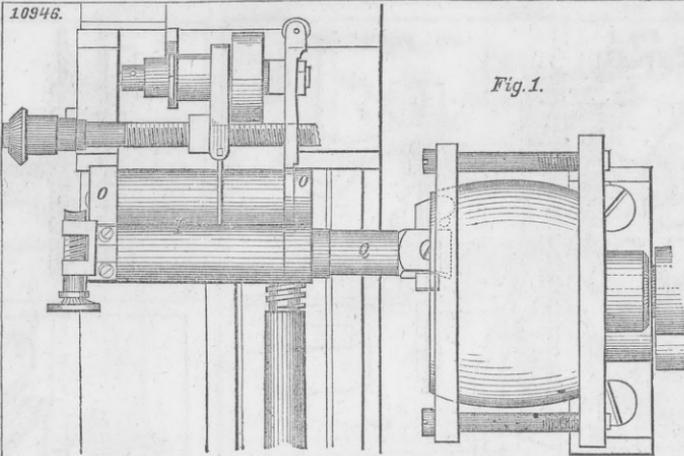


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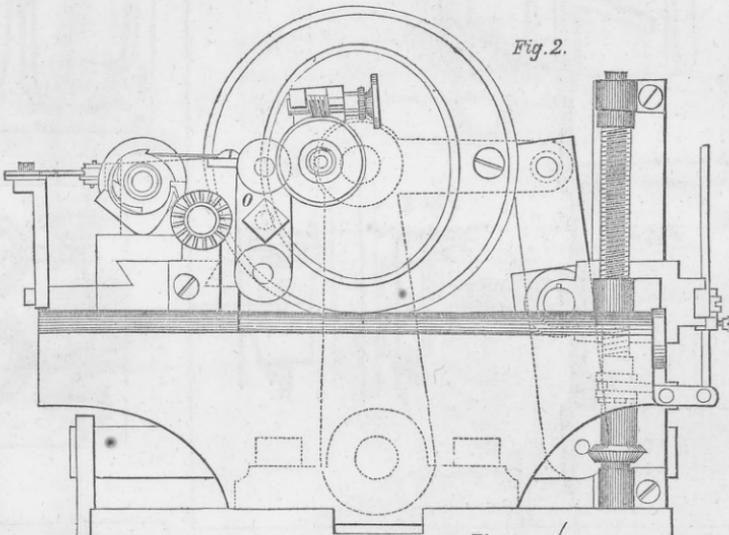


Fig. 2.

Fig. 4

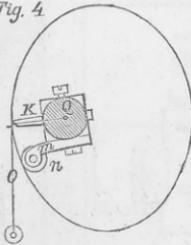
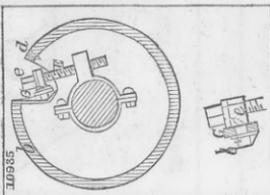
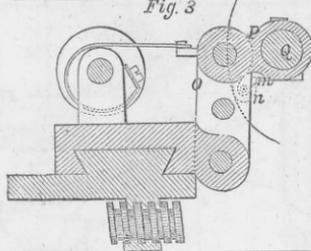
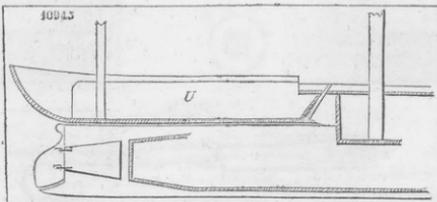


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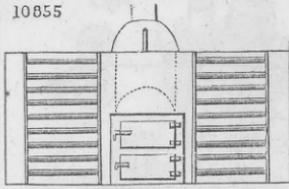


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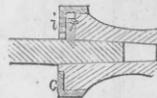


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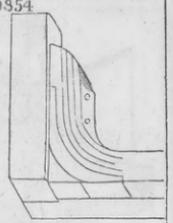
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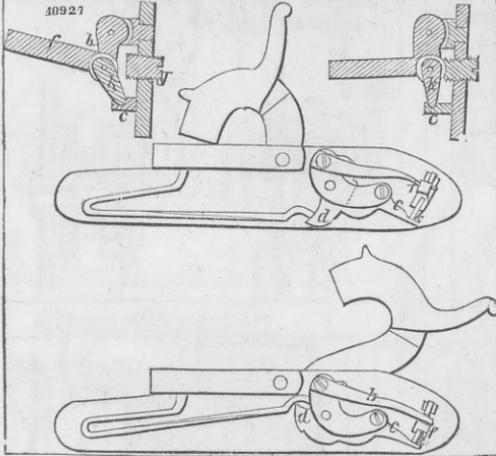
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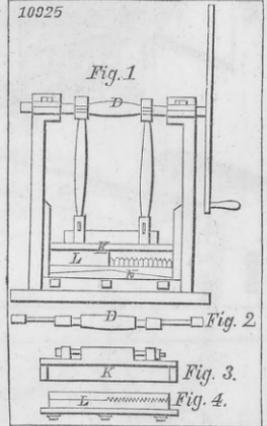
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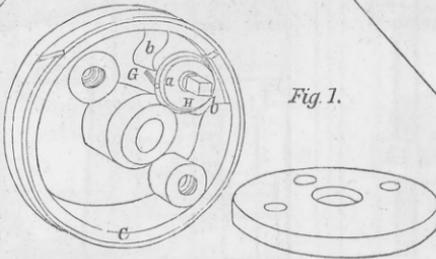


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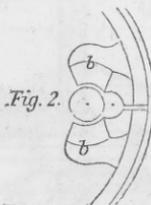


Fig. 2.



Fig. 5.

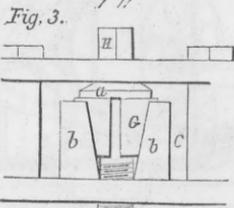


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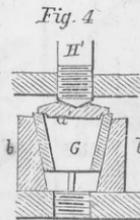
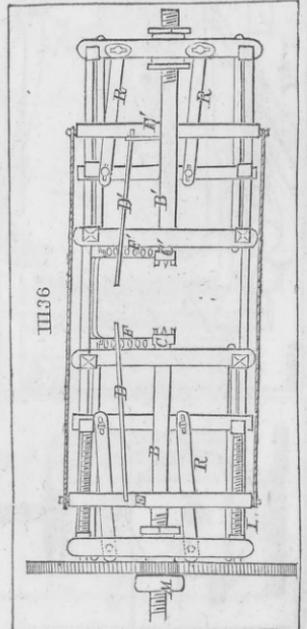
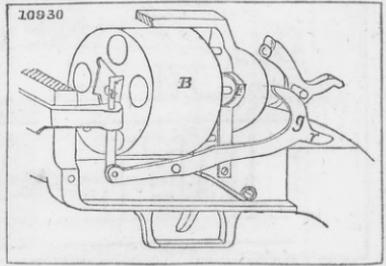
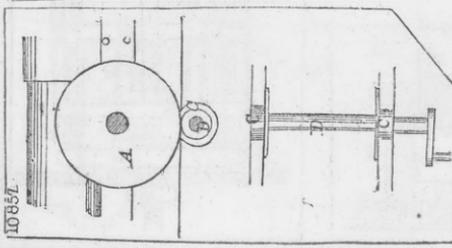
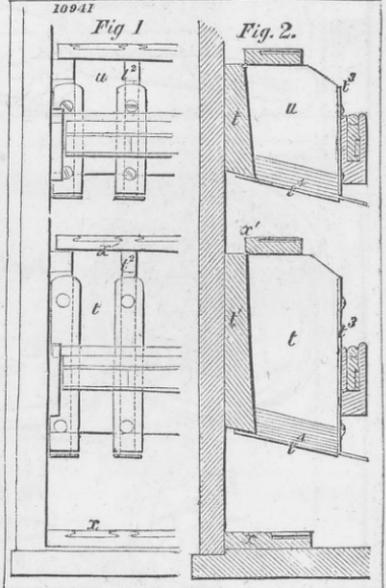
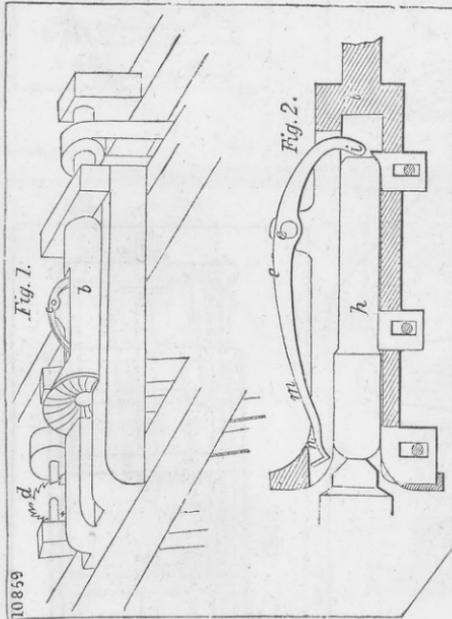
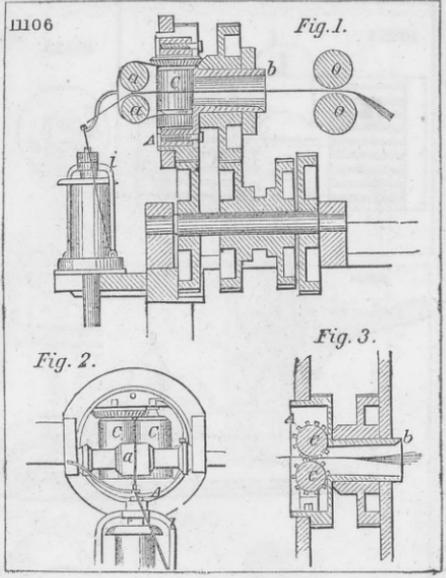
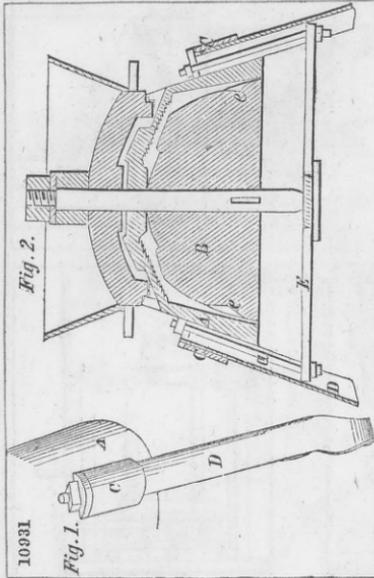
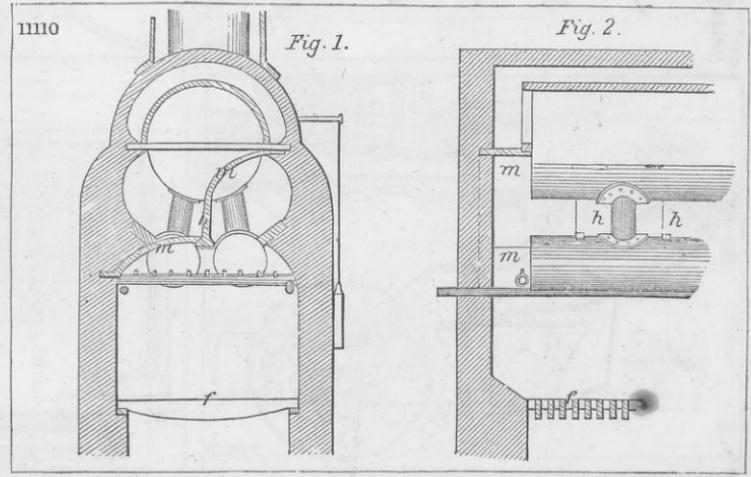
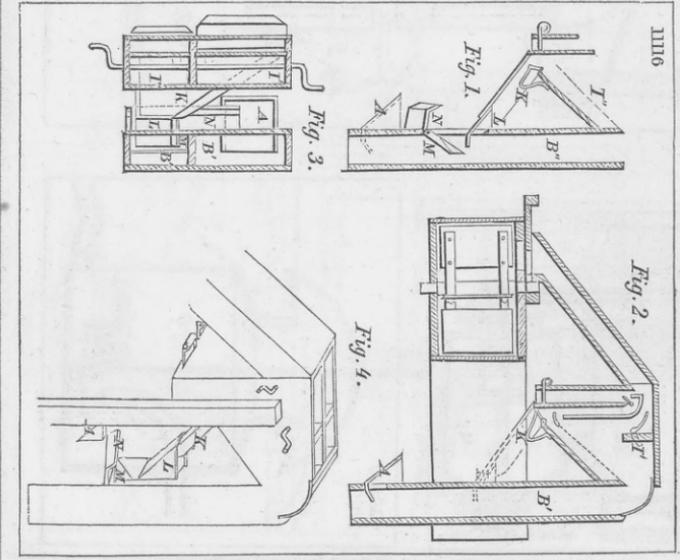
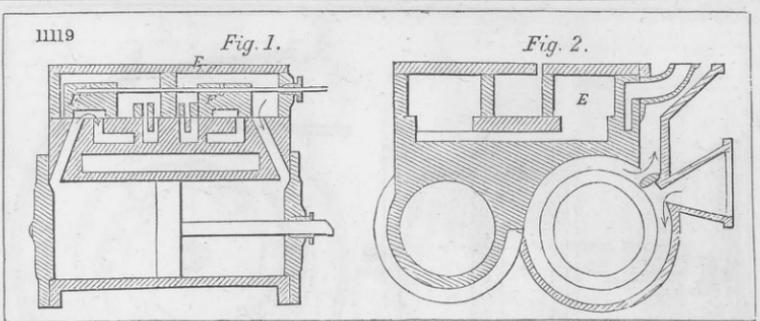
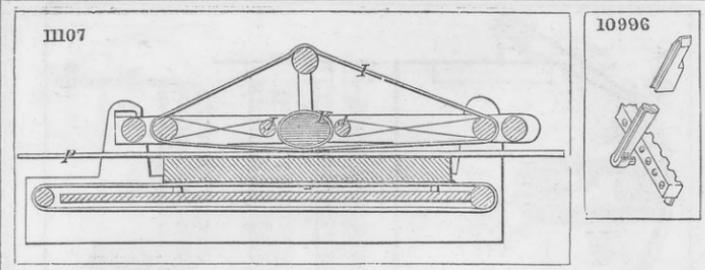


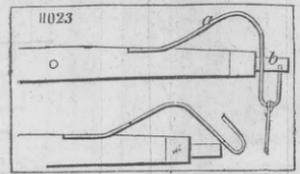
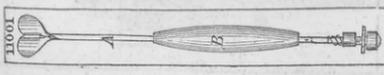
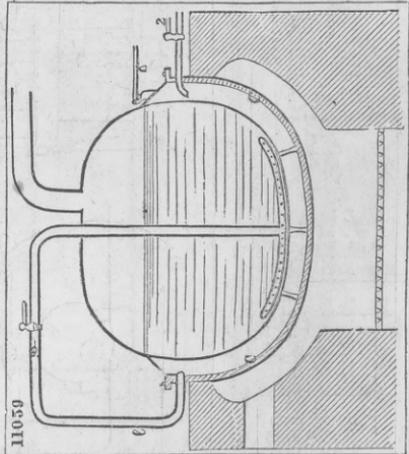
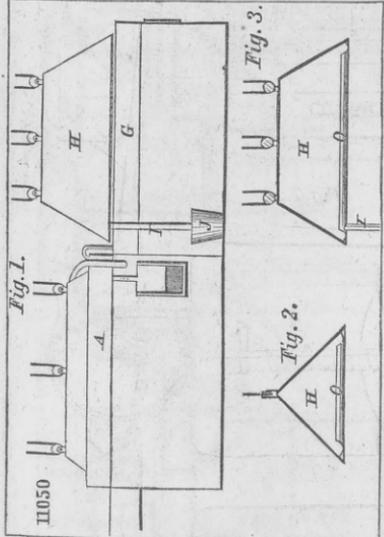
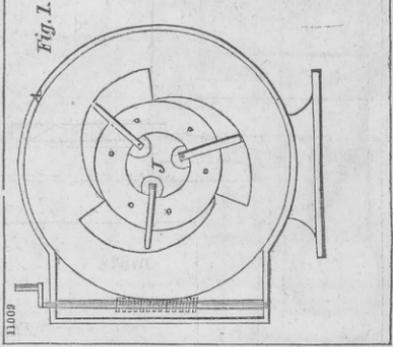
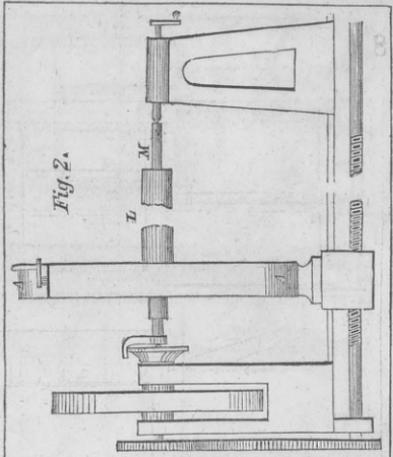
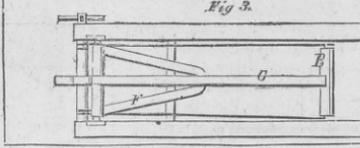
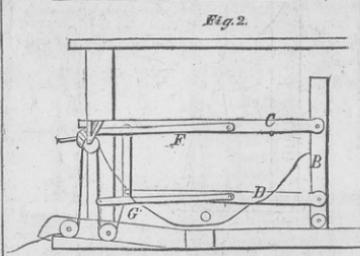
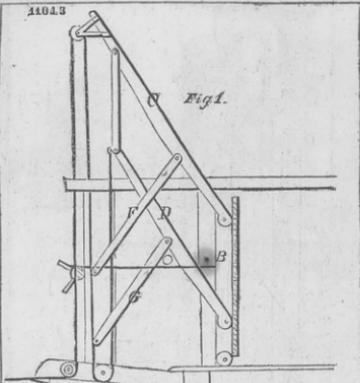
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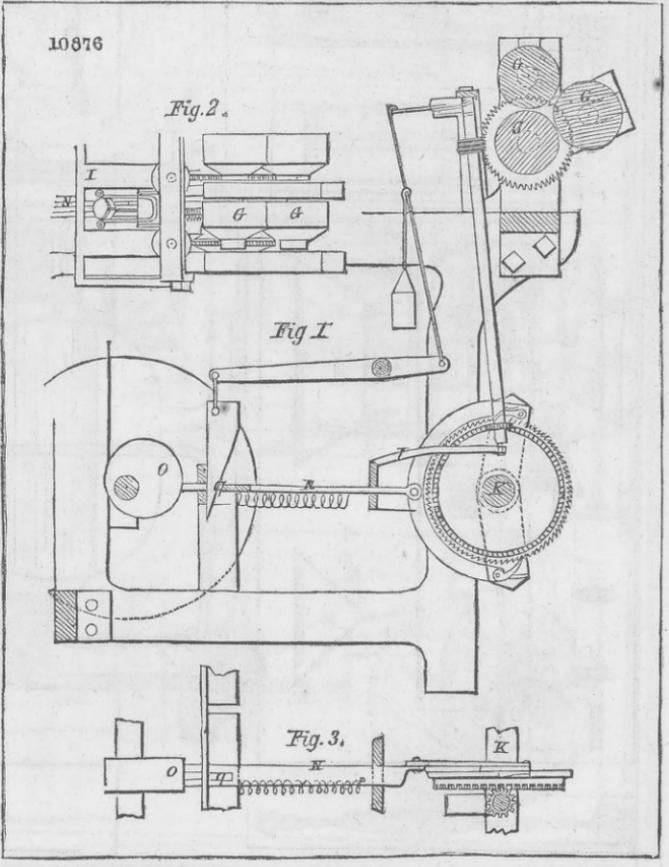
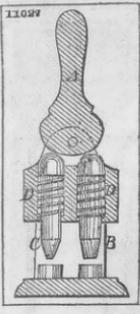
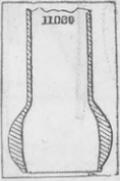
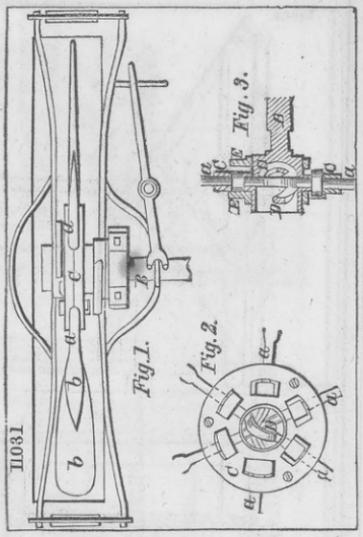
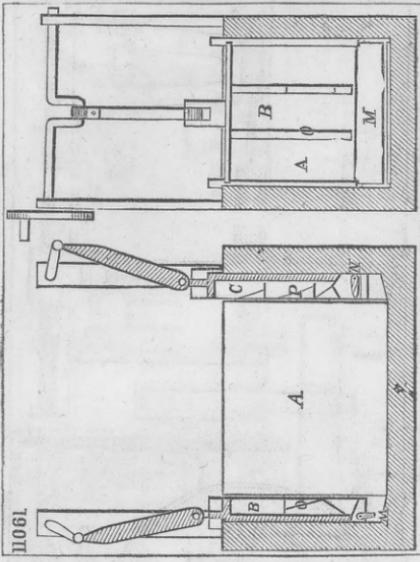
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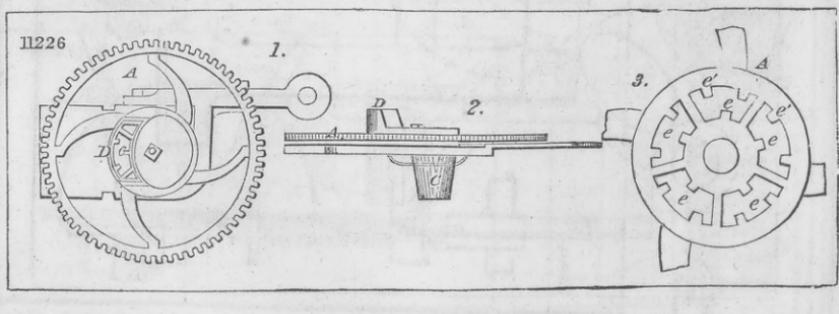
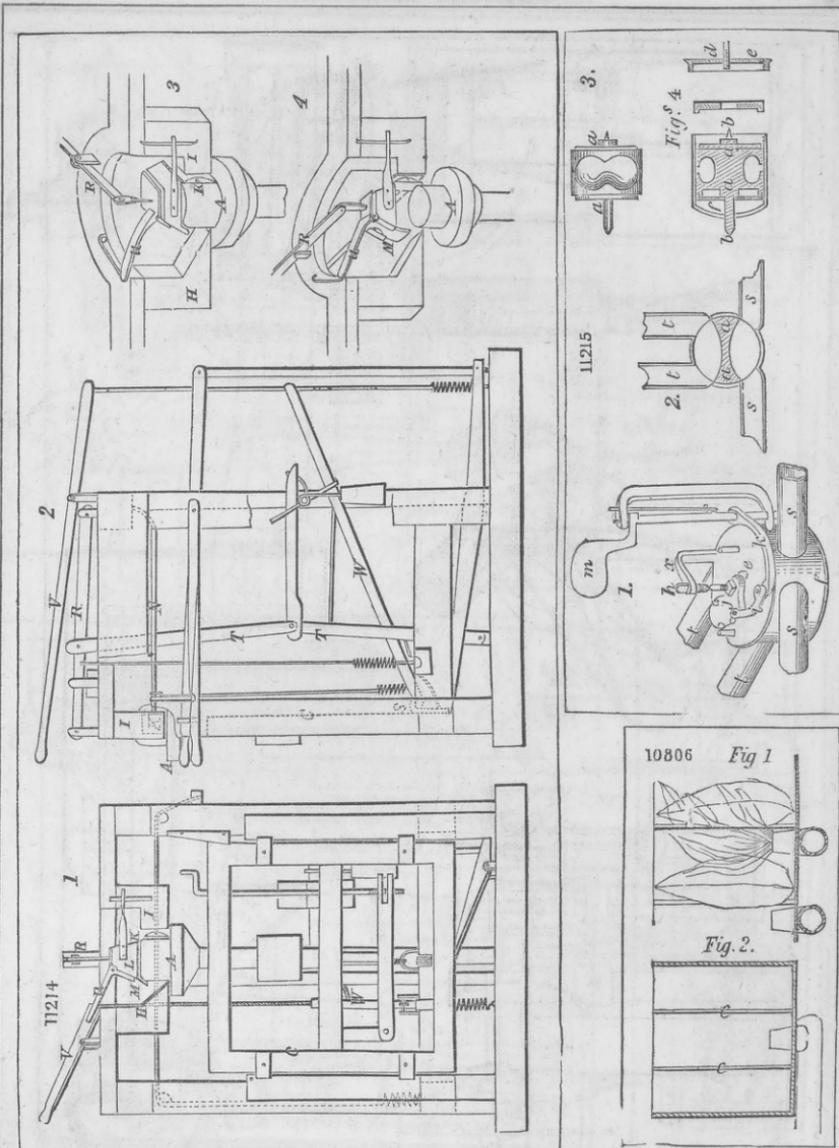












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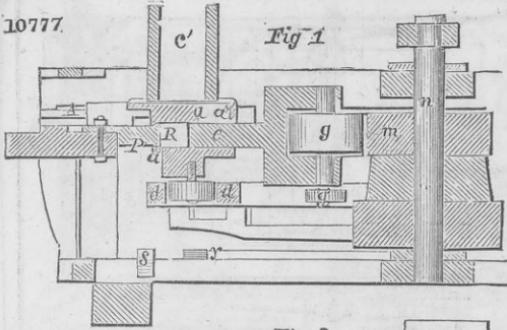


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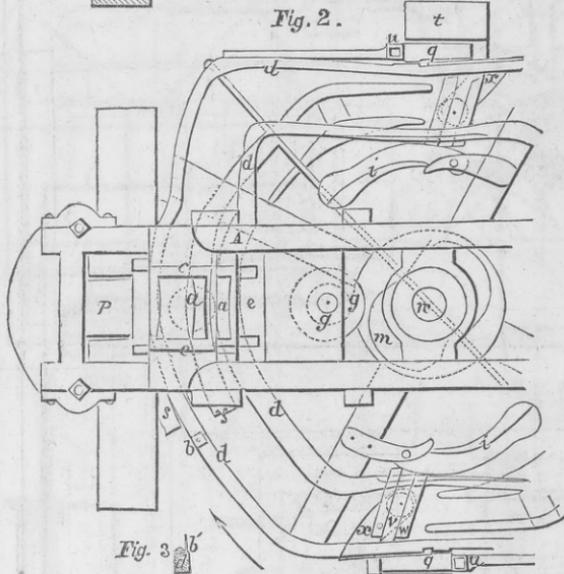


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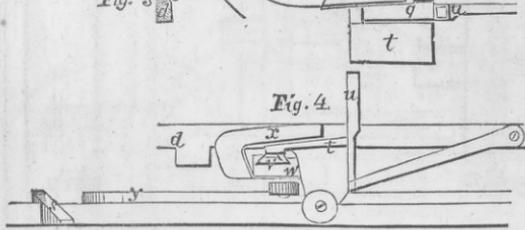


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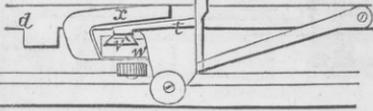
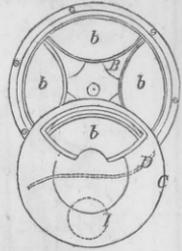
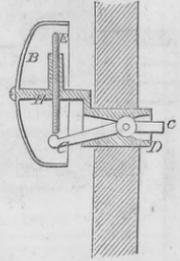


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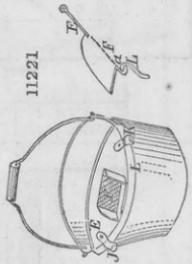
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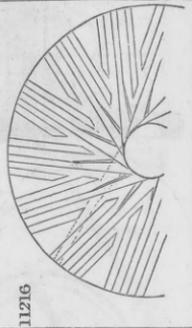
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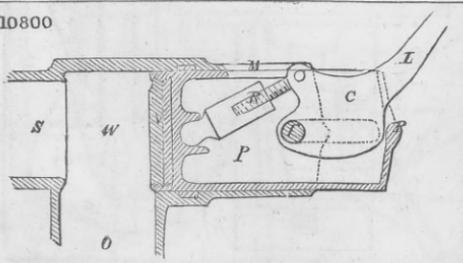
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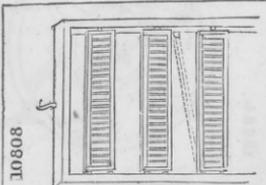
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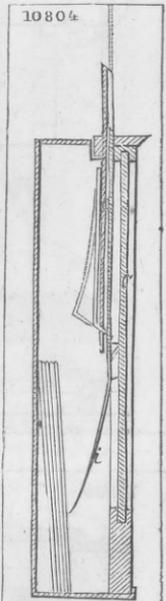
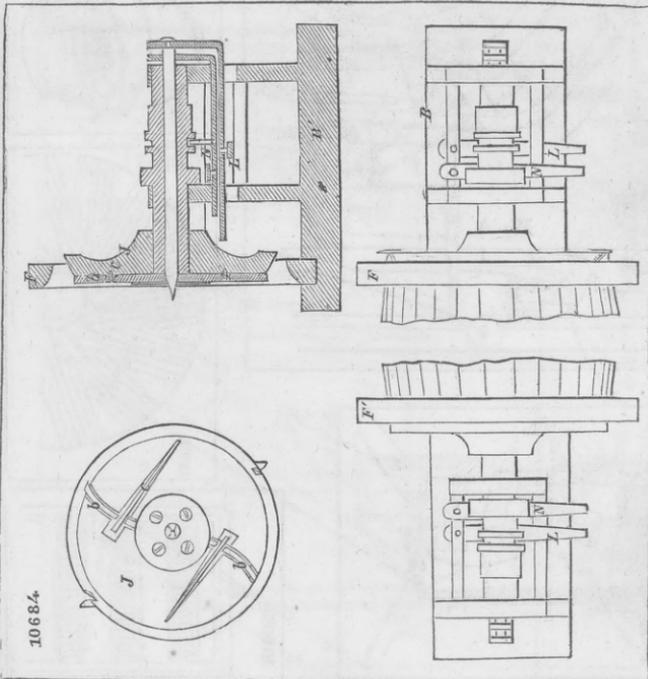
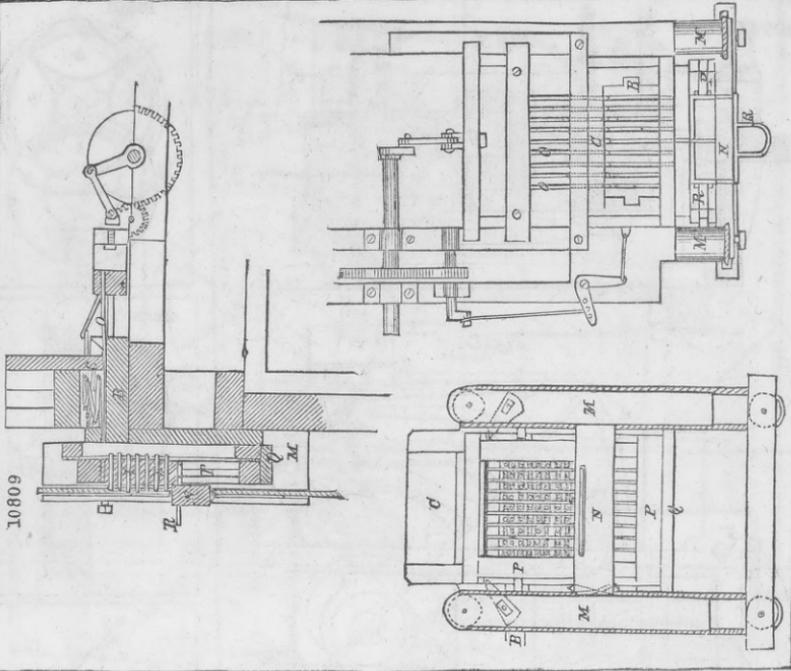


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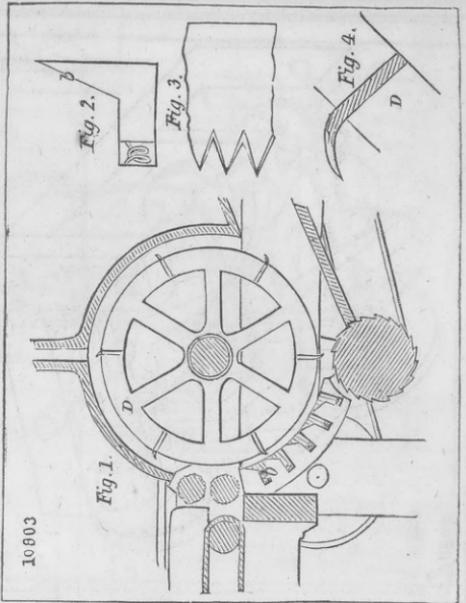
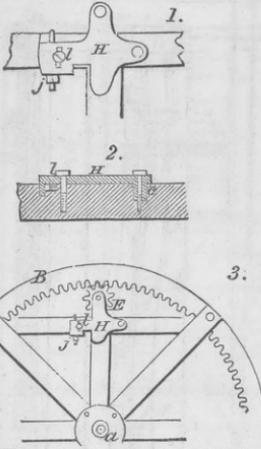




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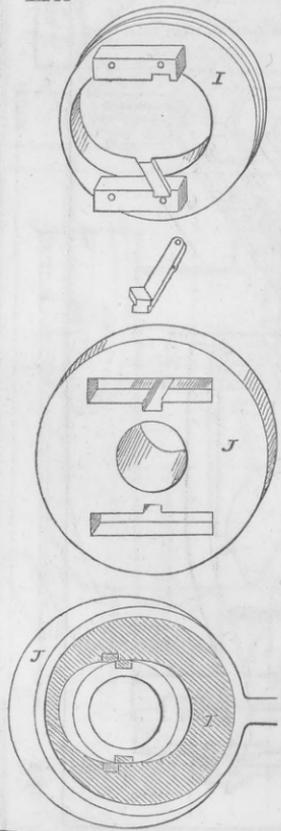
Fig. 1 
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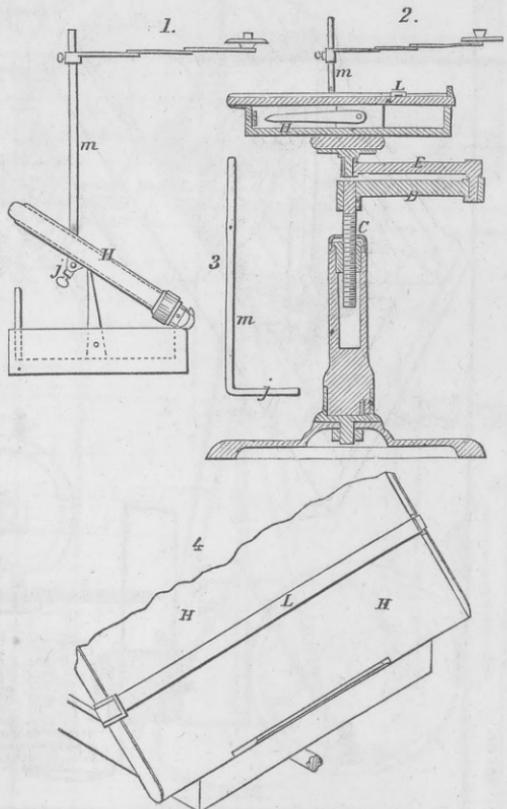


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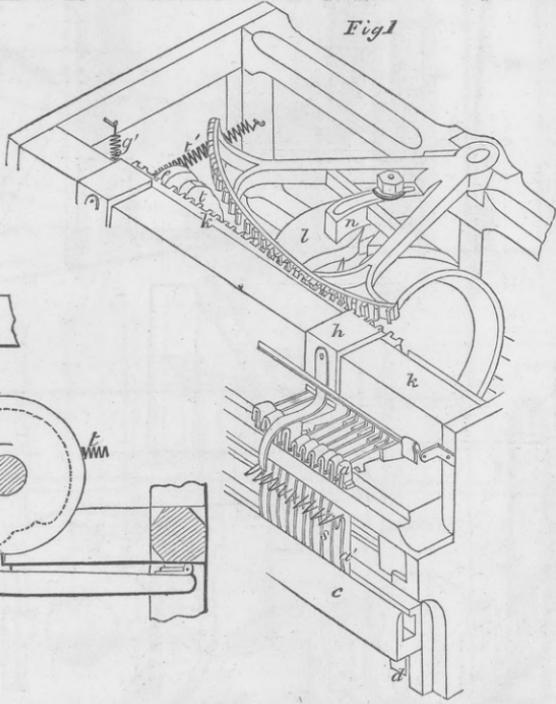
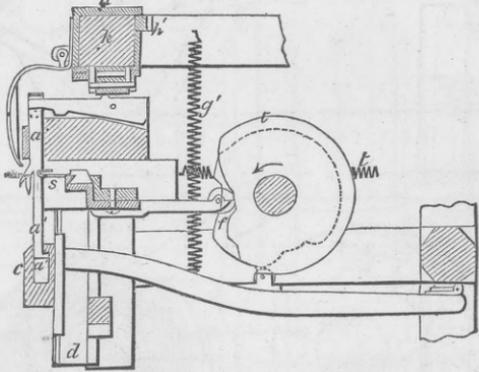
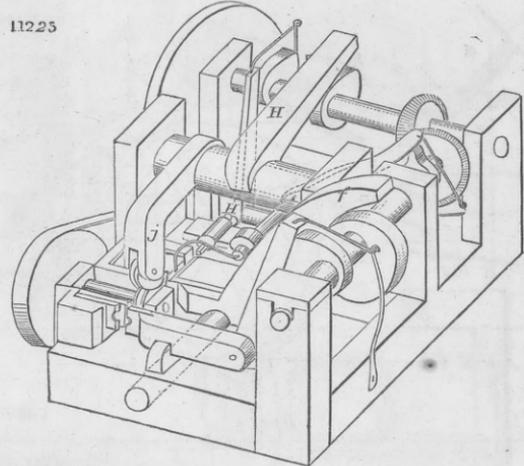


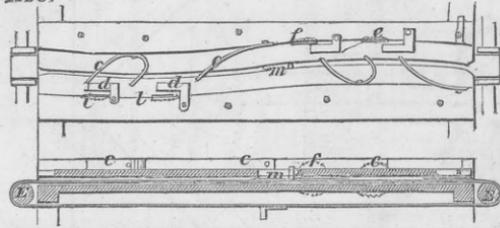
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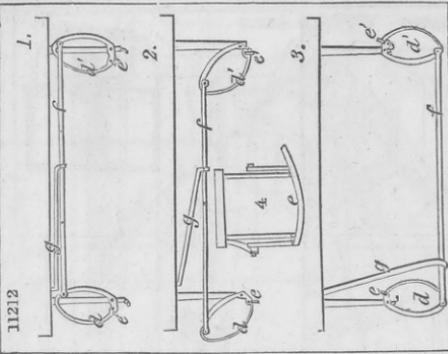
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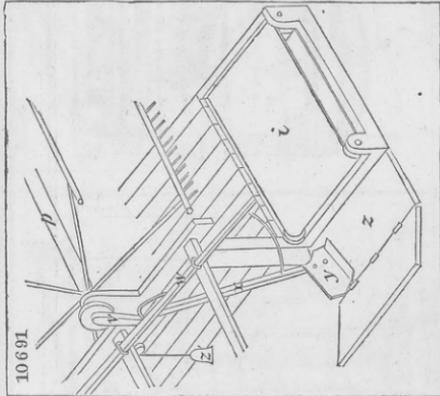
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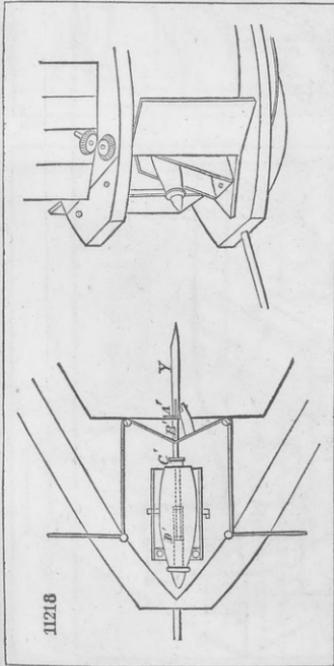
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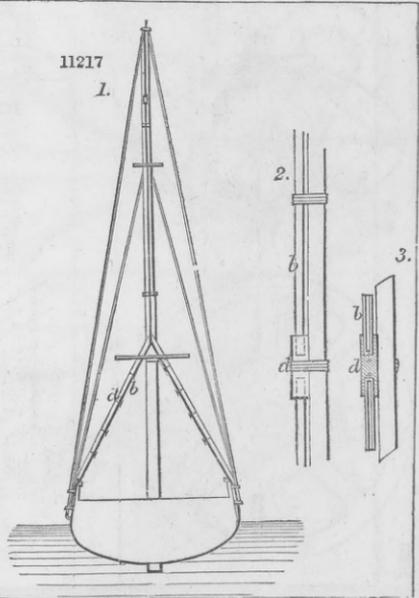
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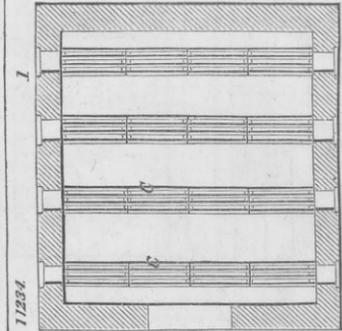
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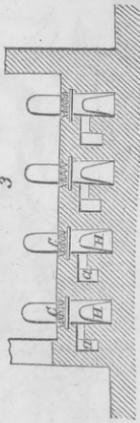
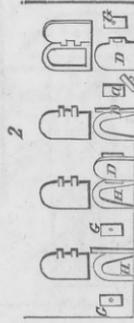


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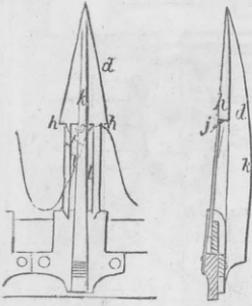


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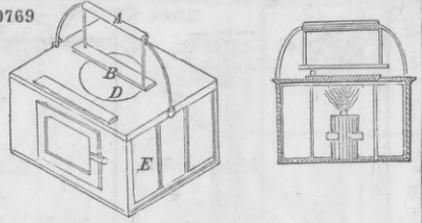
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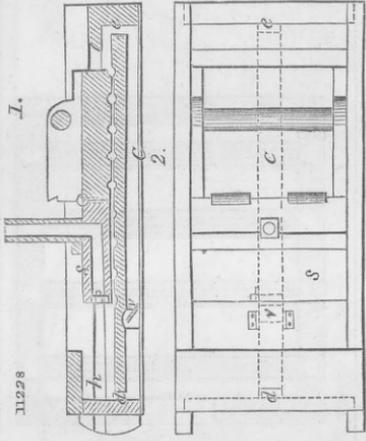


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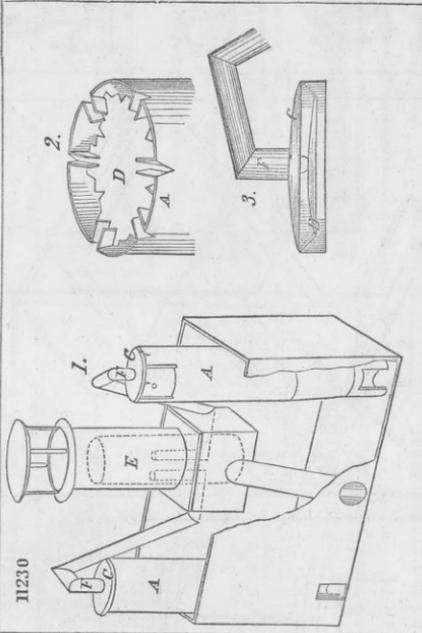
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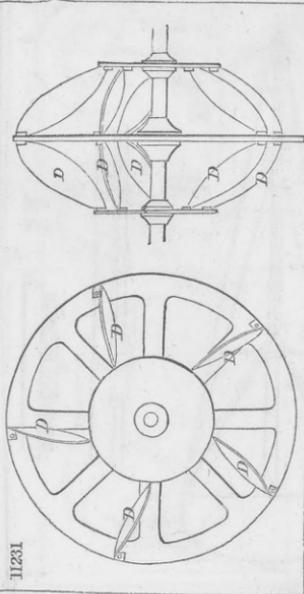
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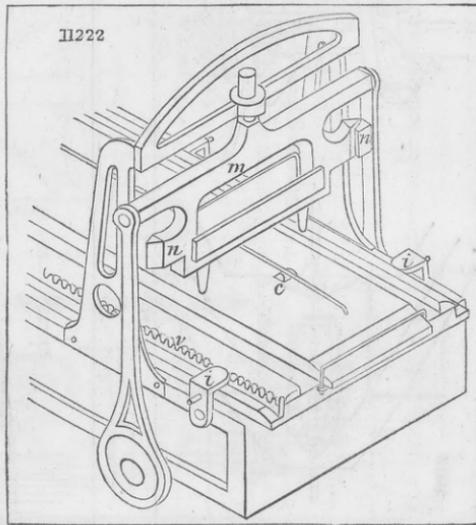


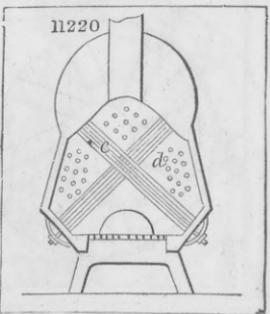
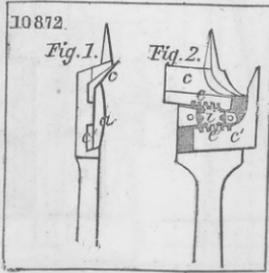
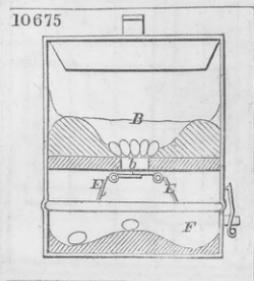
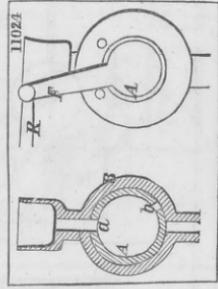
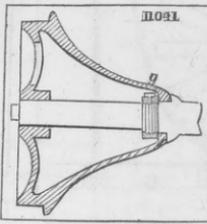
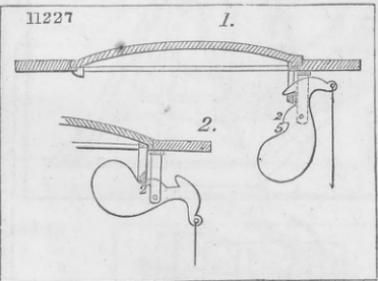
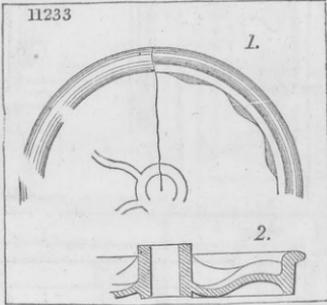
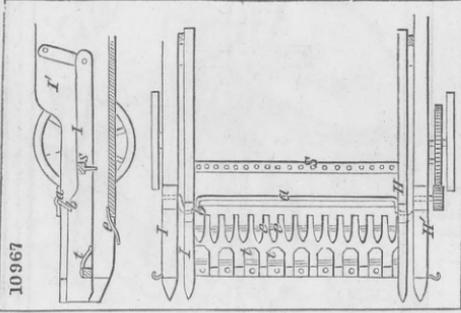
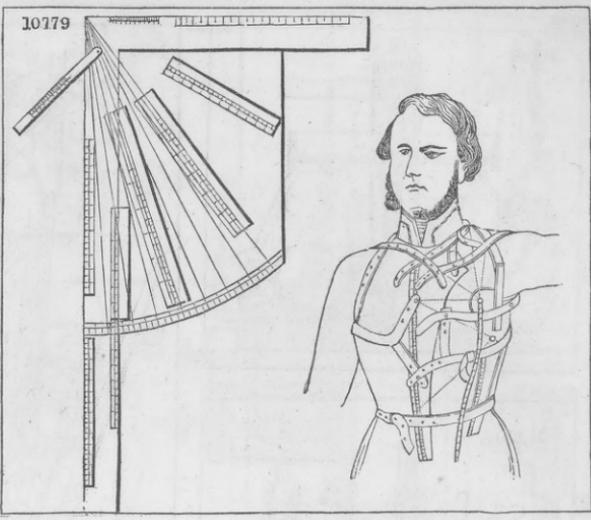
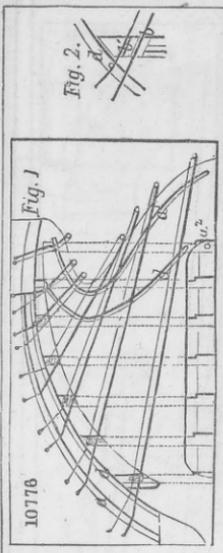
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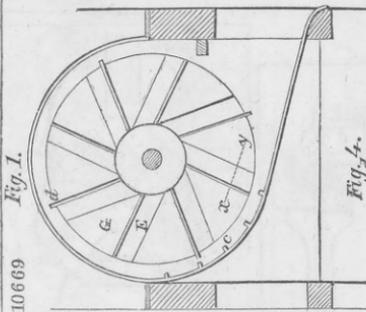
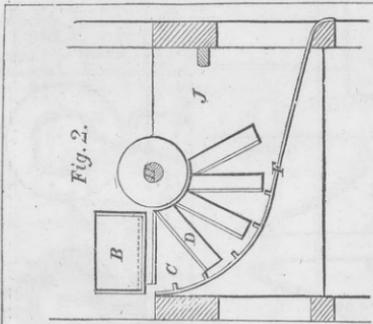
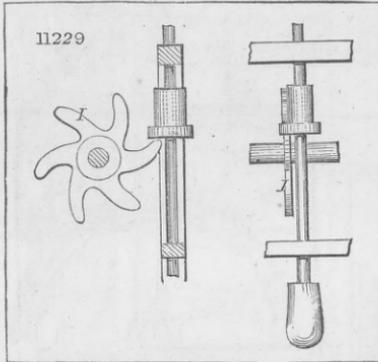
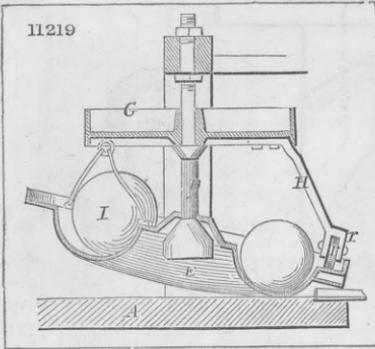
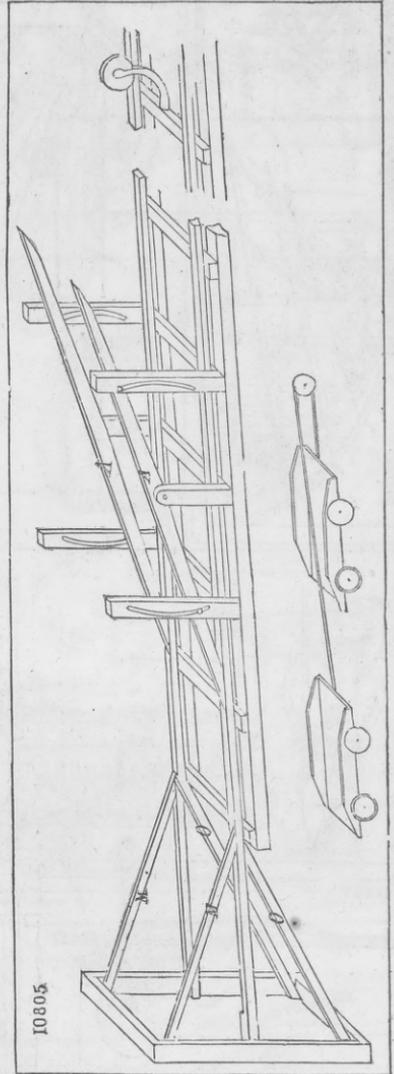
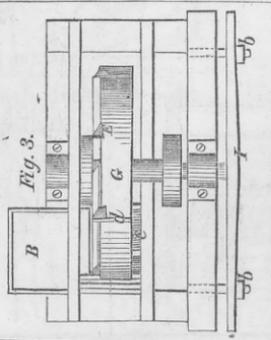
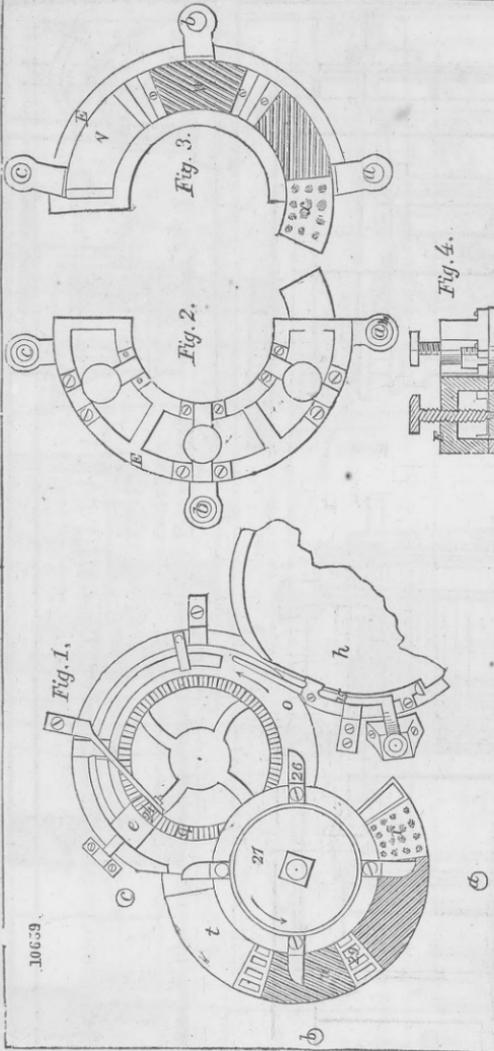


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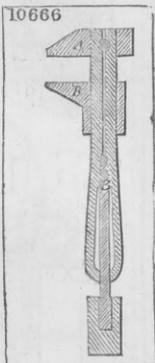




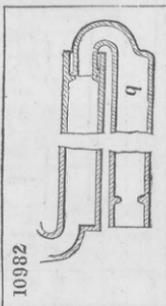
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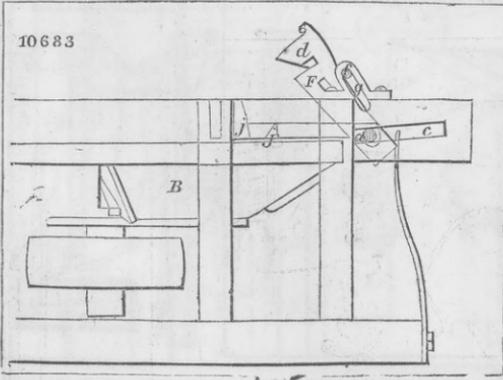
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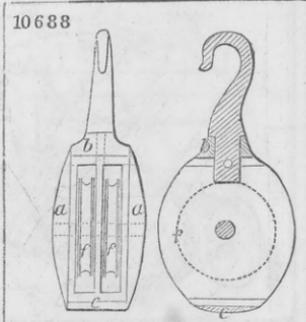
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Fig. 1.

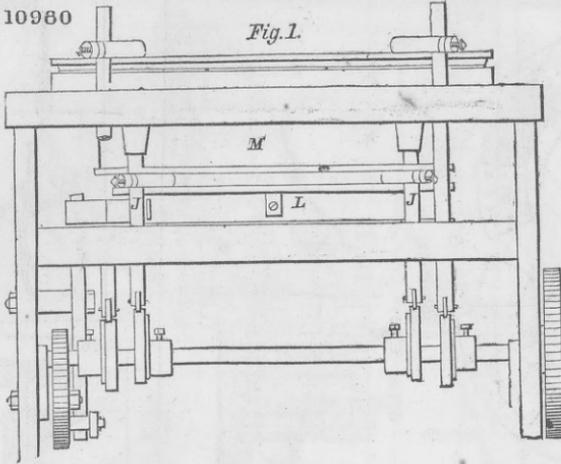
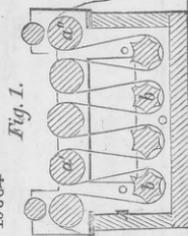
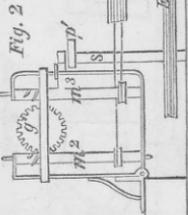
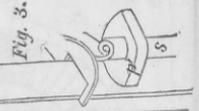
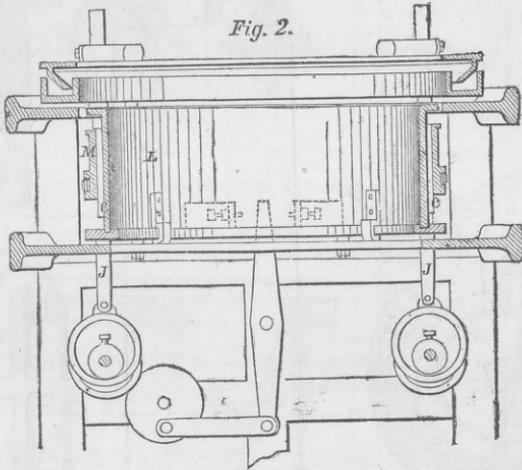
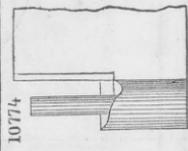
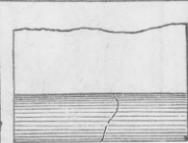


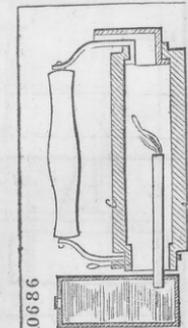
Fig. 2.



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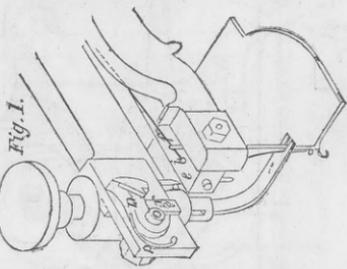


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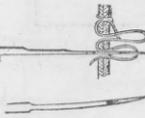
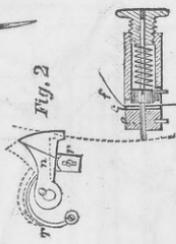
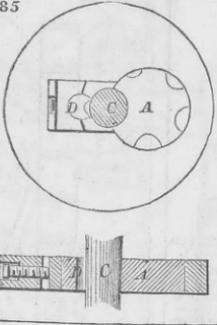


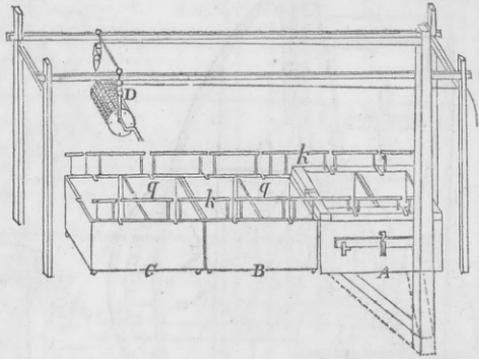
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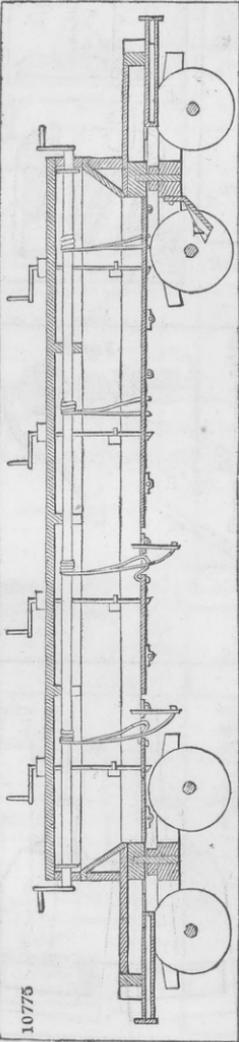
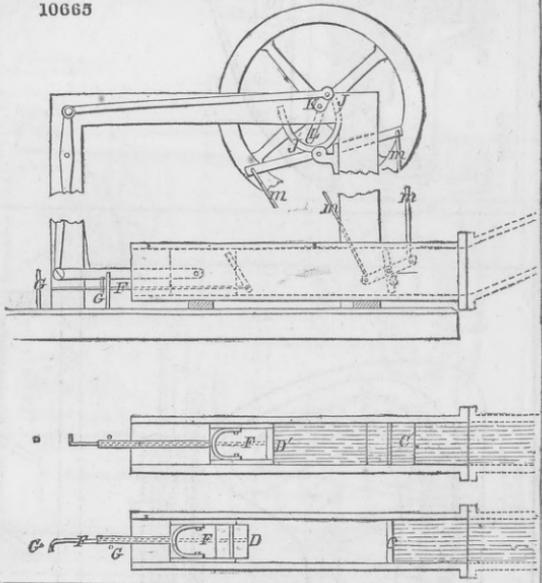
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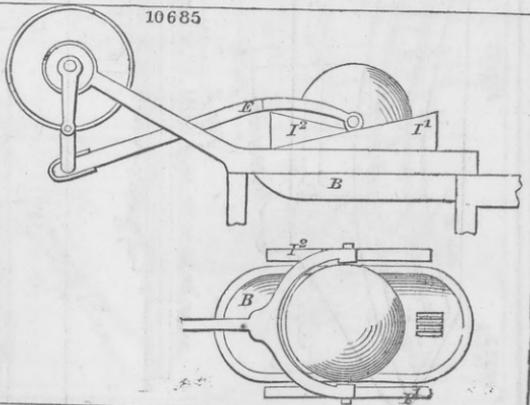


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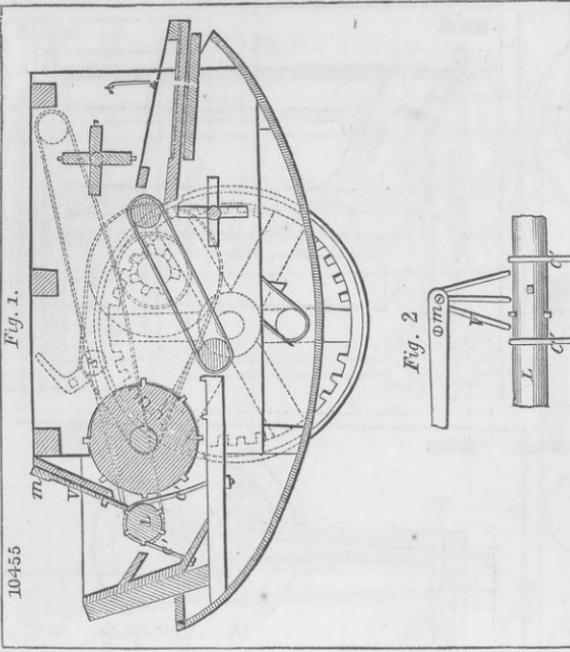


Fig. 1.

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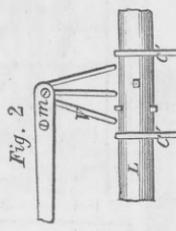
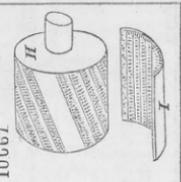
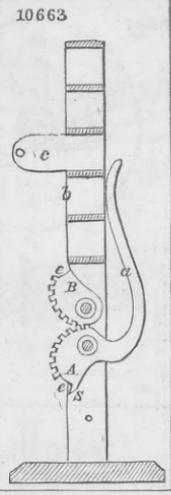


Fig. 2.



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10663

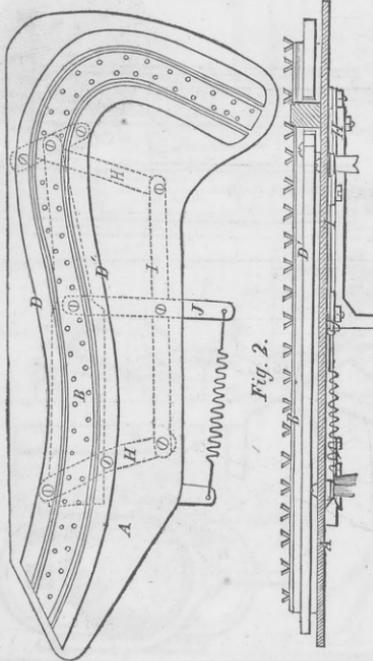
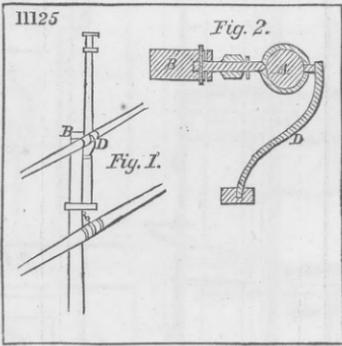
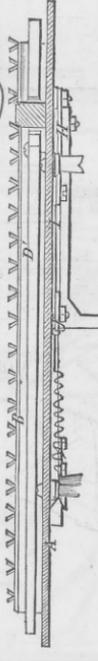


Fig. 1.

10773

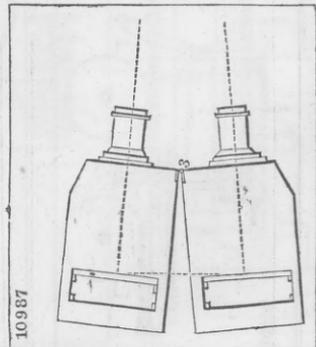
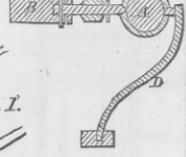
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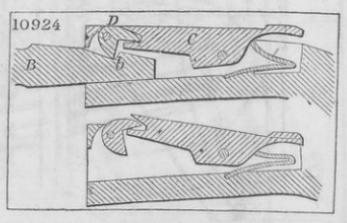
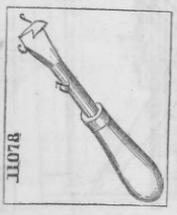
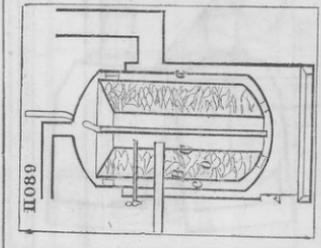
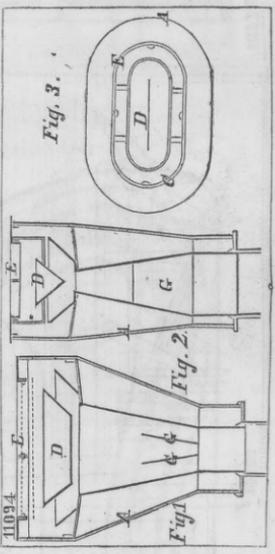
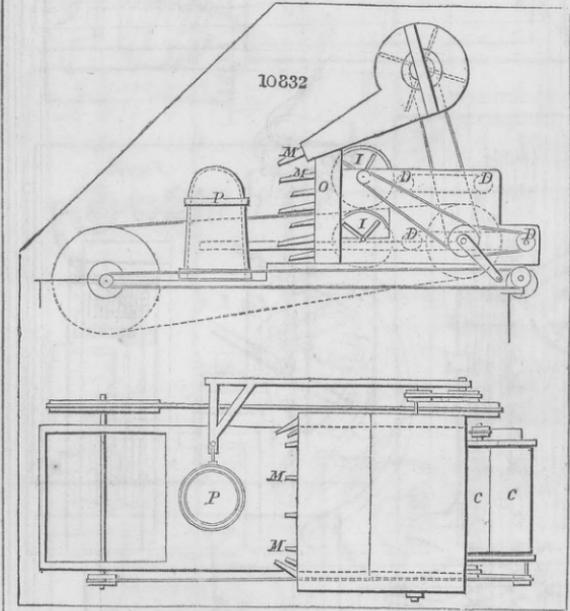
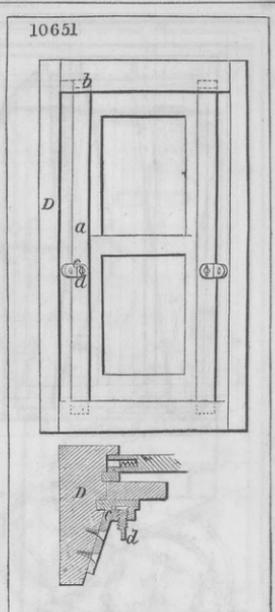
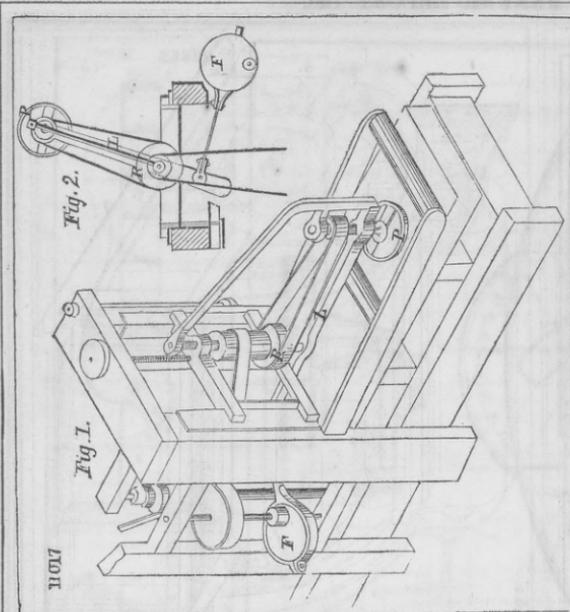
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Fig. 1.

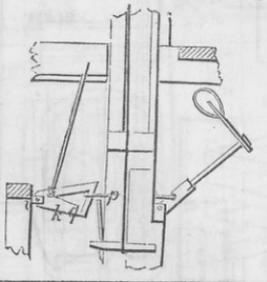
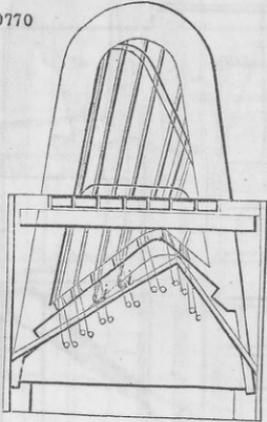
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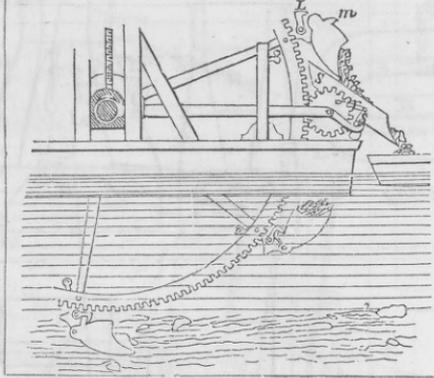
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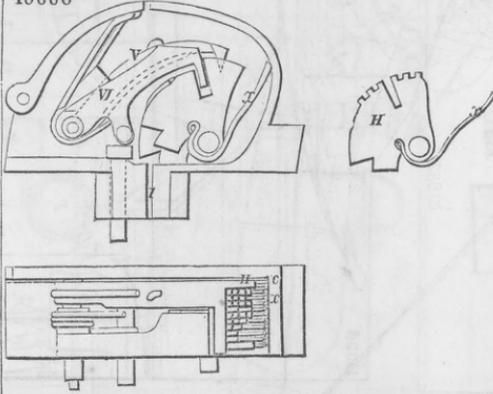
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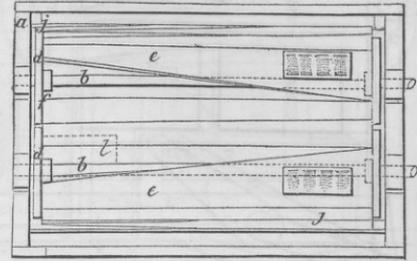
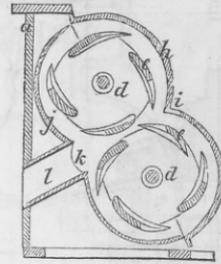
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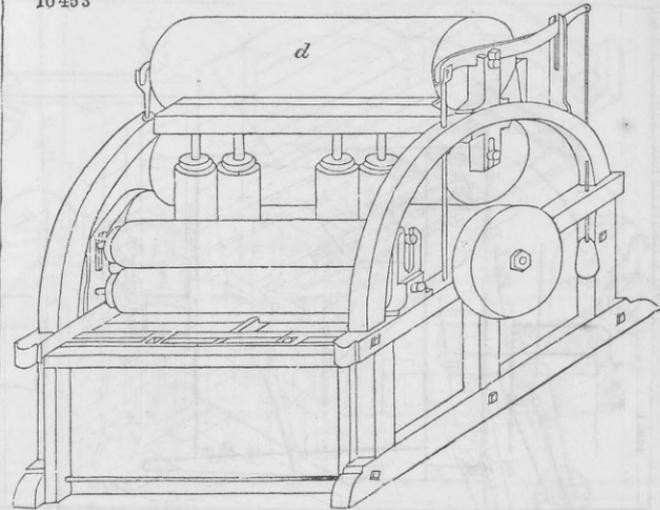
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Fig. 1.

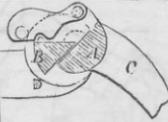


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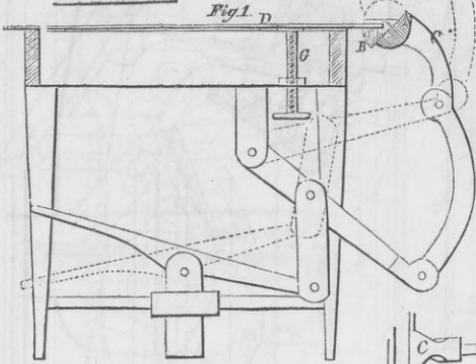


Fig. 3.

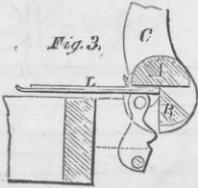
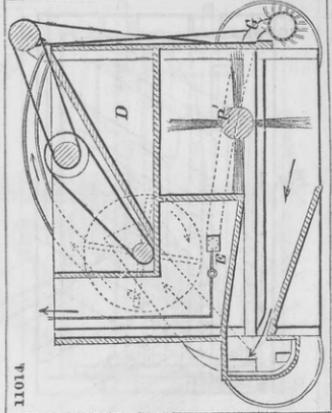
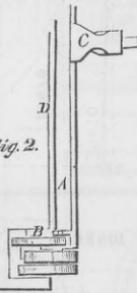
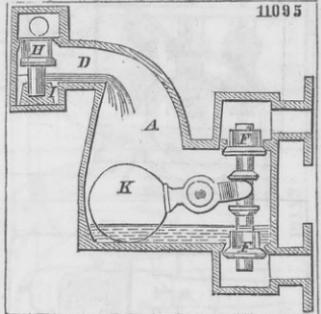


Fig. 2.



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Fig. 1.

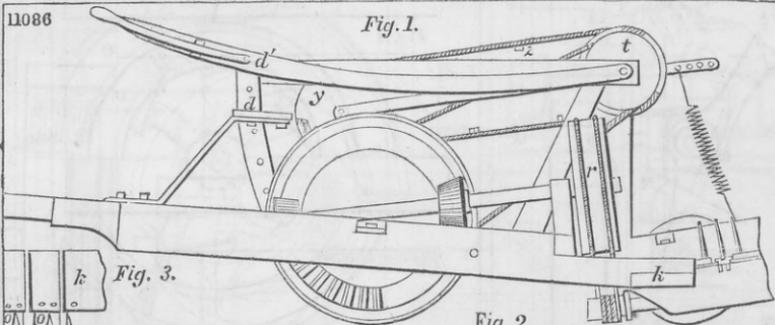


Fig. 3.

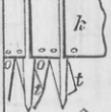


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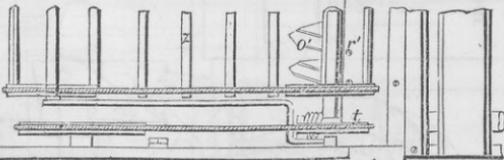
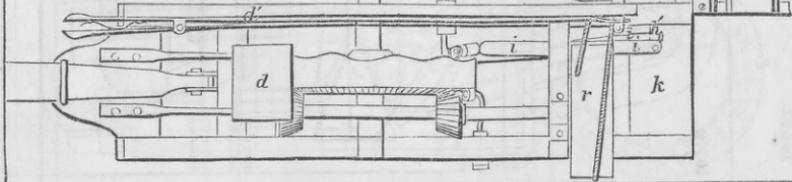
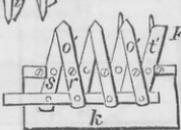


Fig. 4.



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Fig. 1.

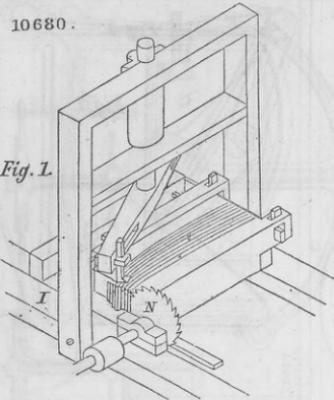


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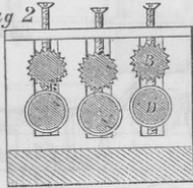
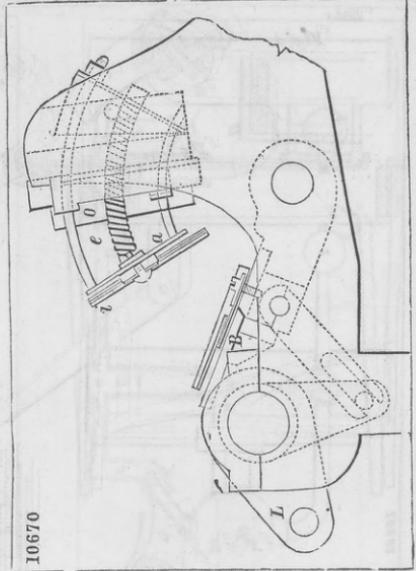
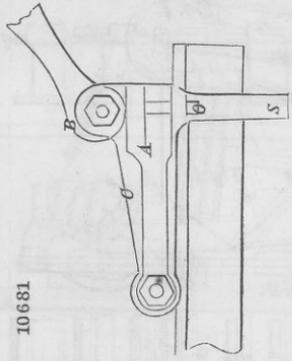
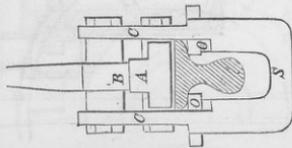


Fig. 3.



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Fig. 1.

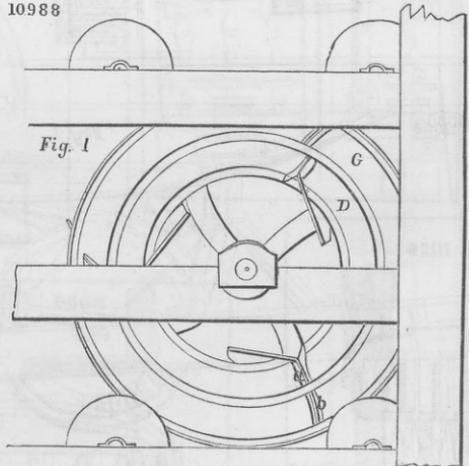
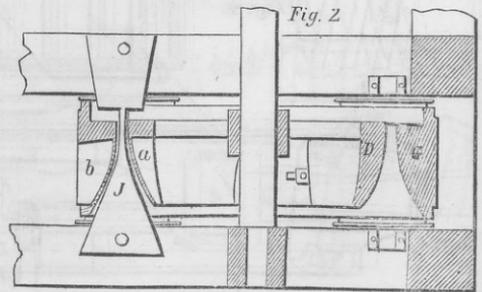
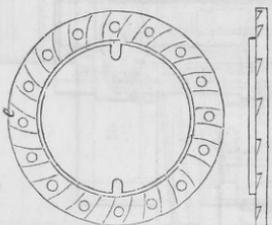
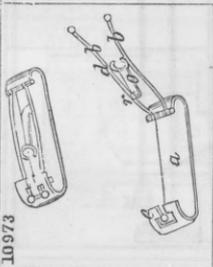
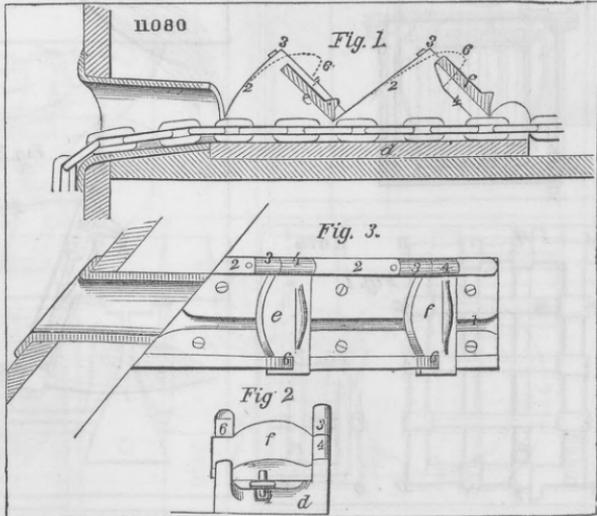
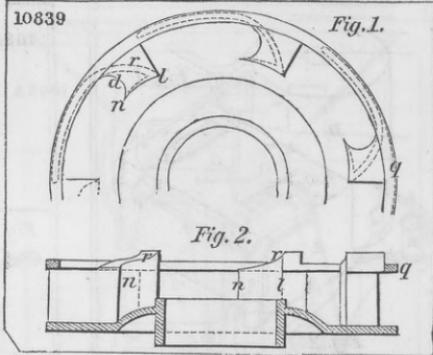
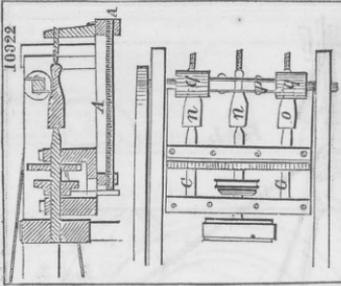
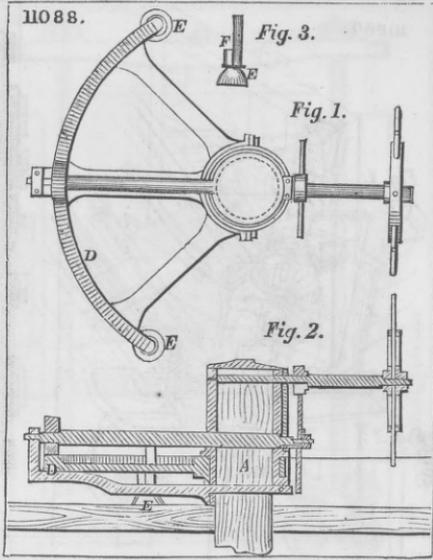
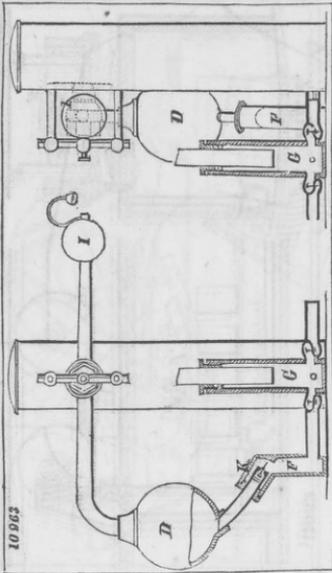


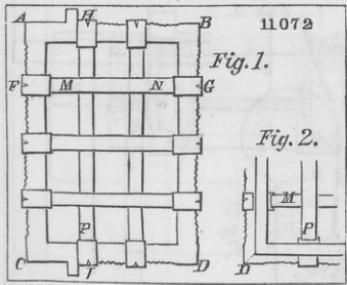
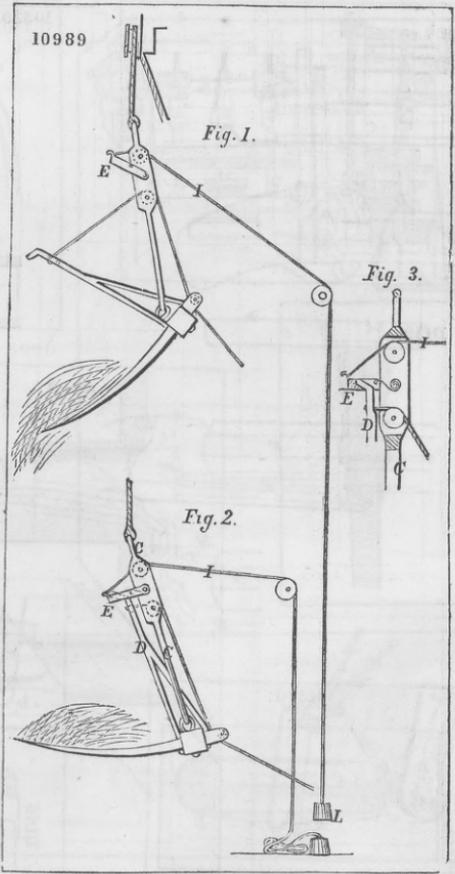
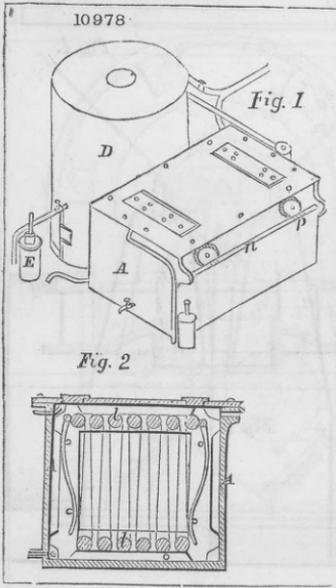
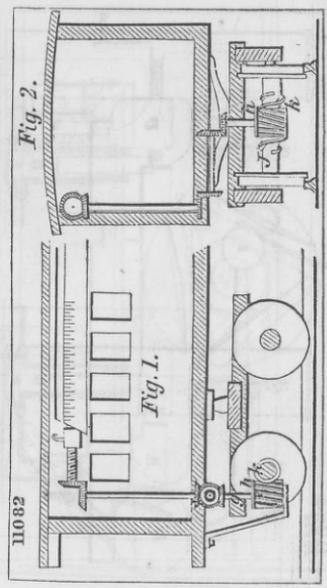
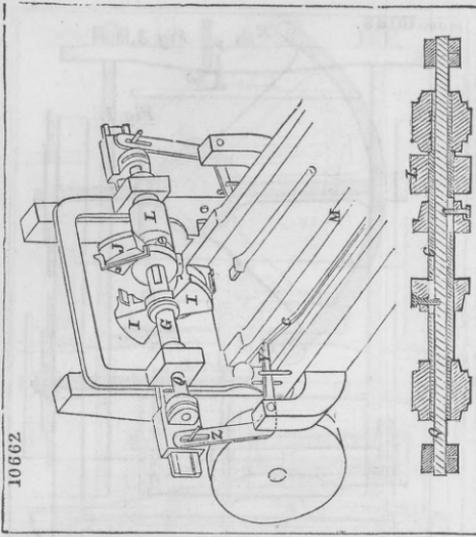
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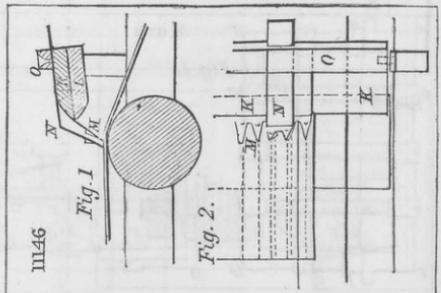
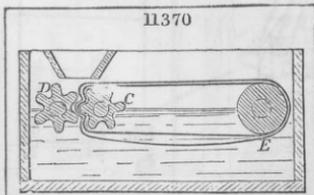
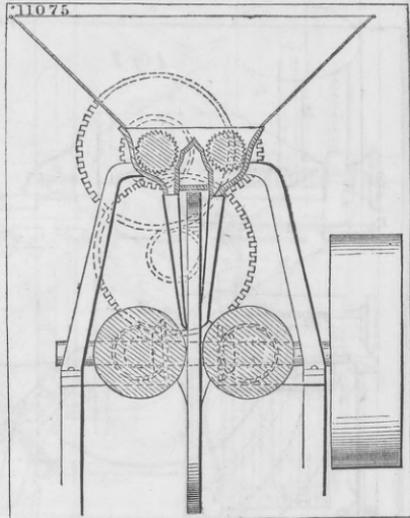
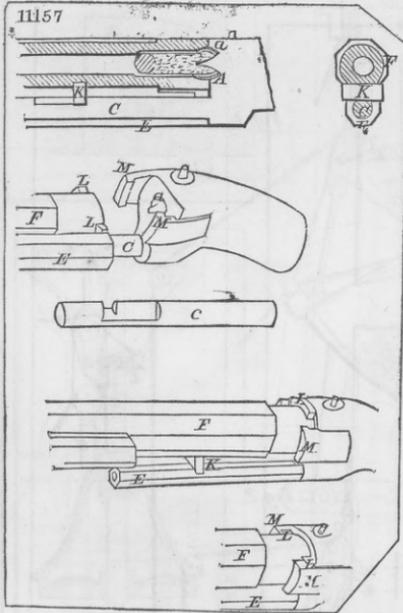
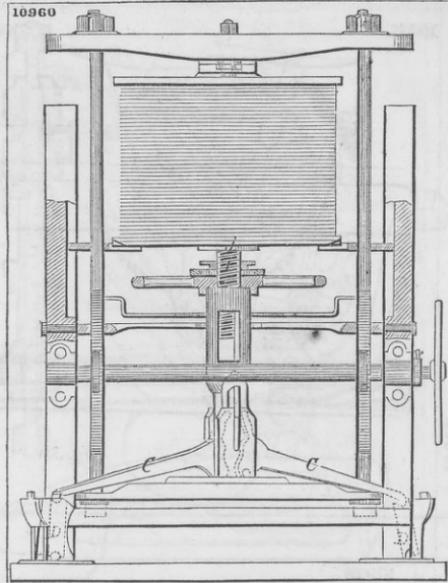
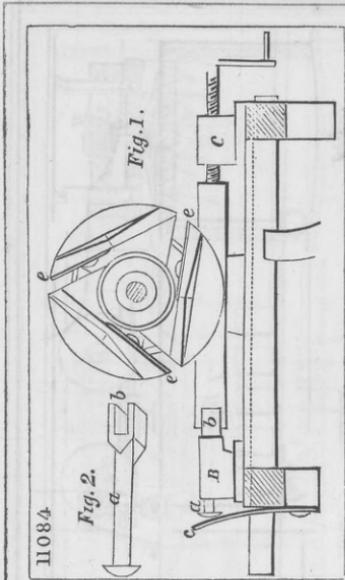


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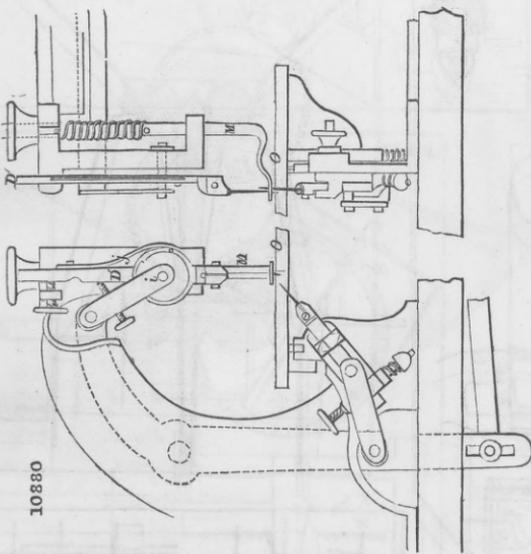
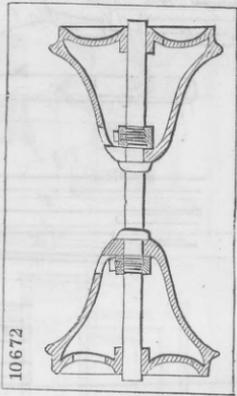
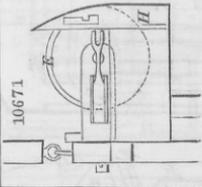
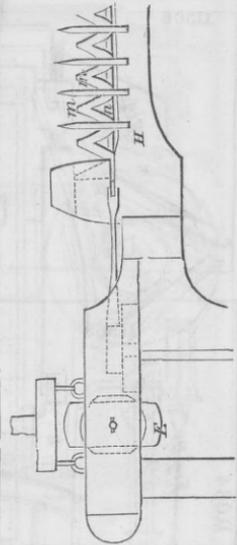
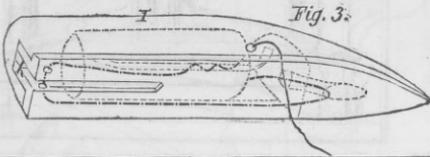
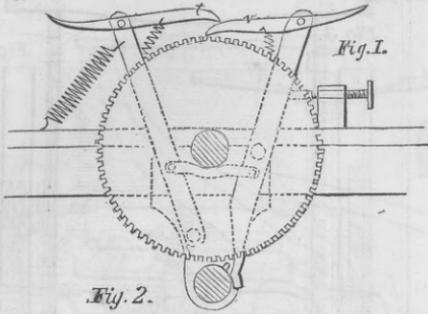




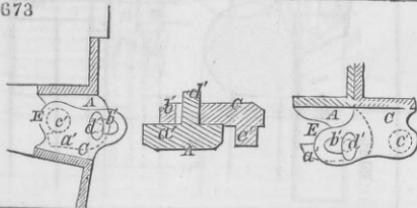




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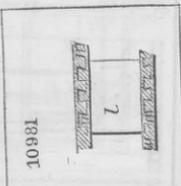
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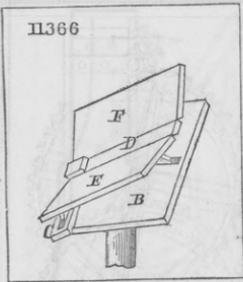
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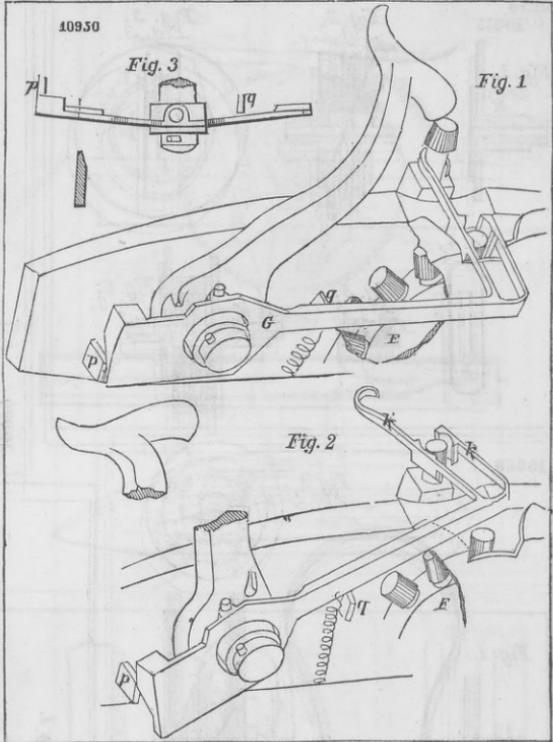
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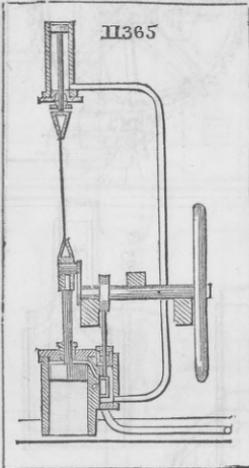
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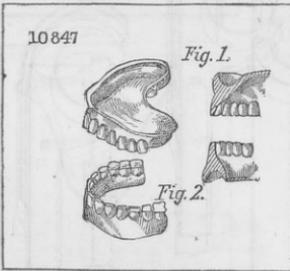
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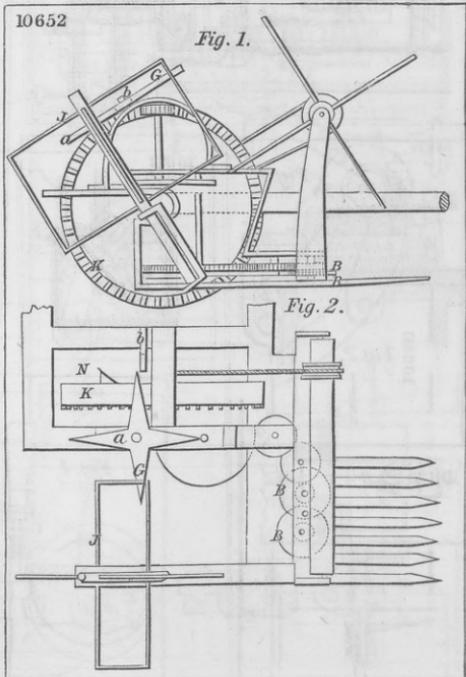
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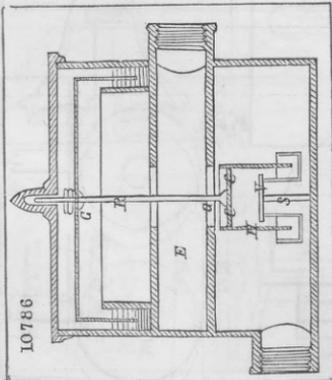
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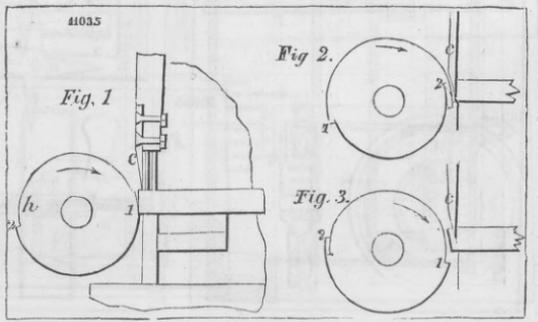
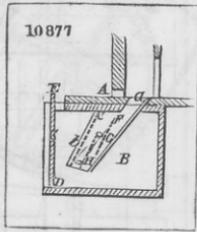
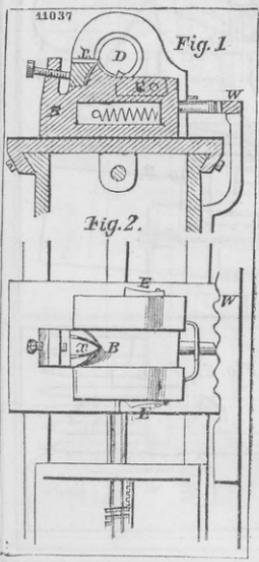
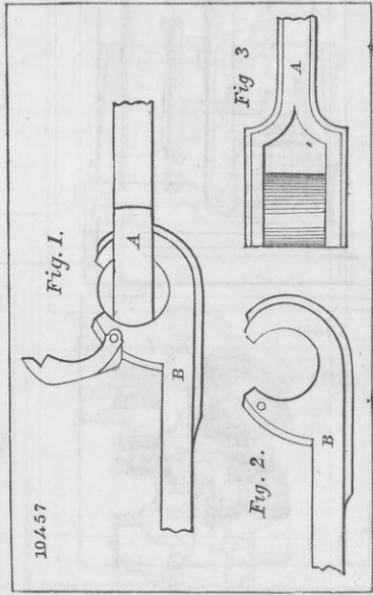
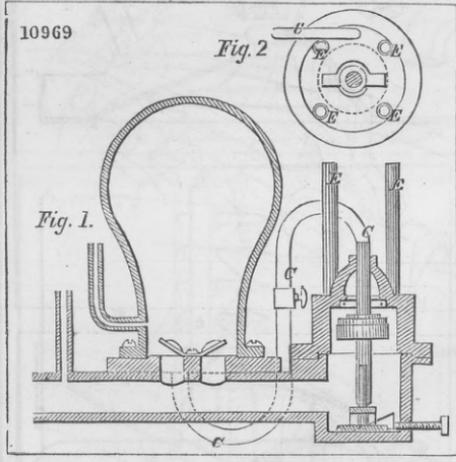
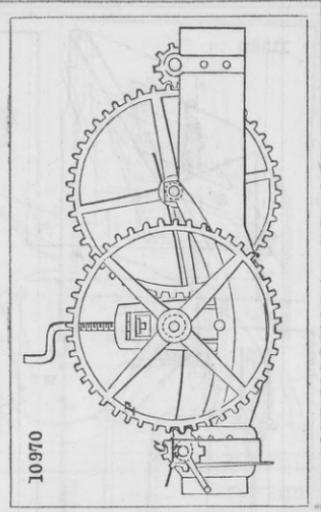
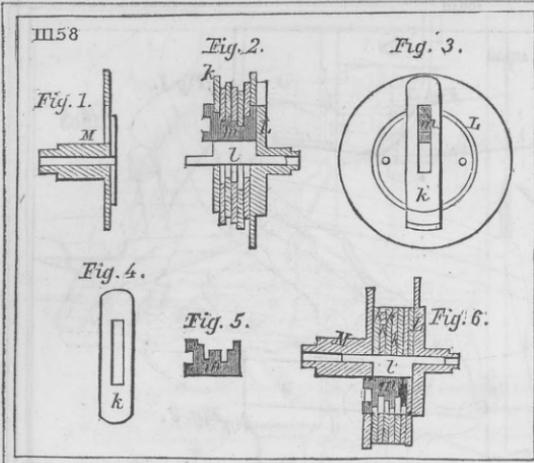


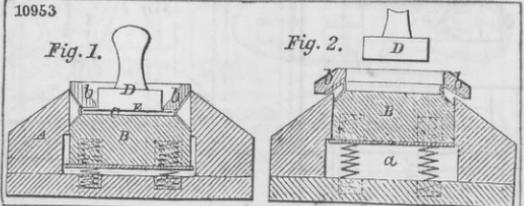
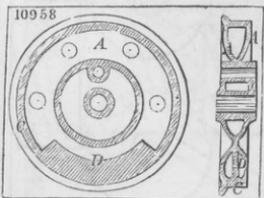
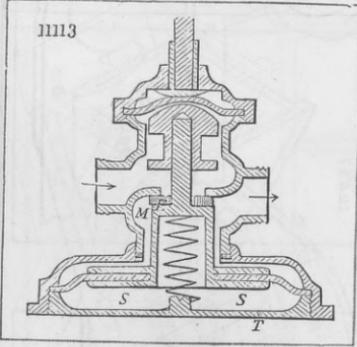
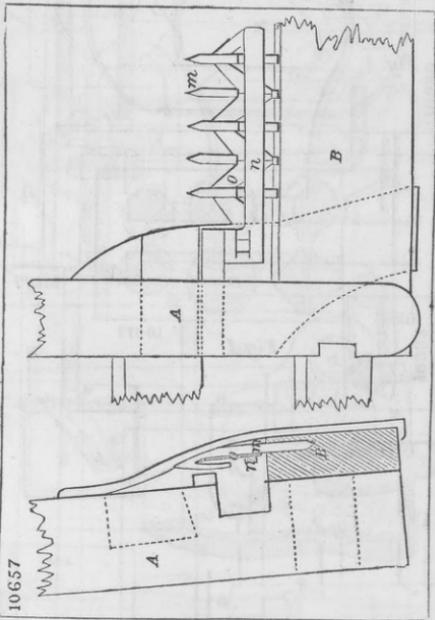
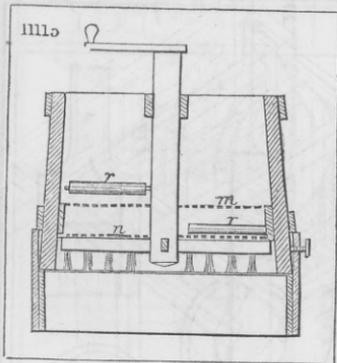
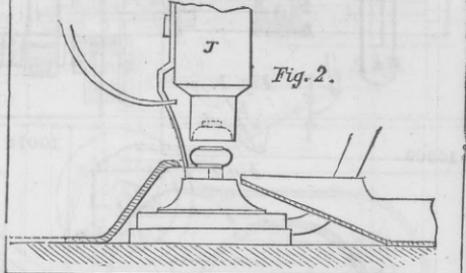
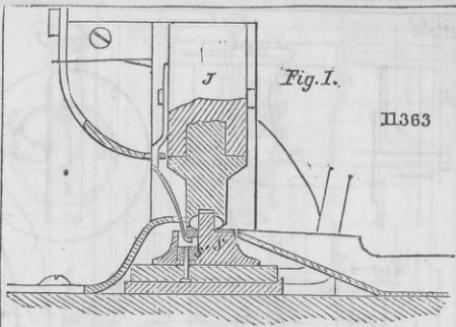
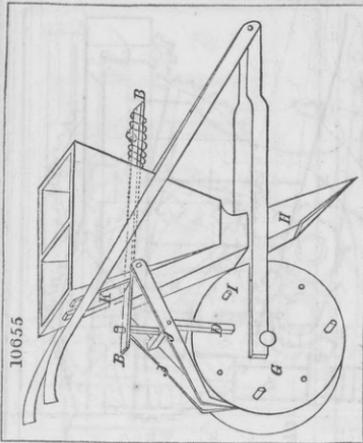
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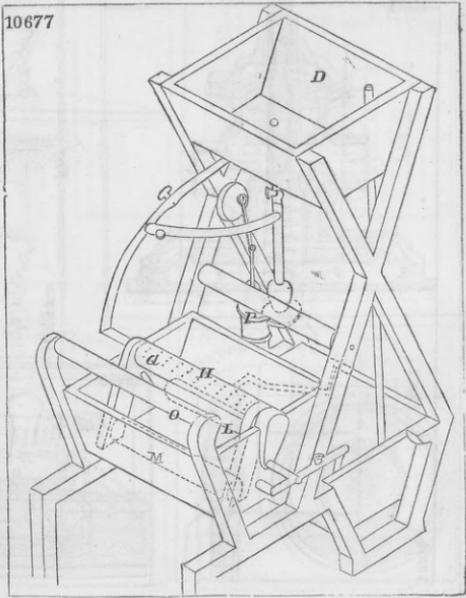
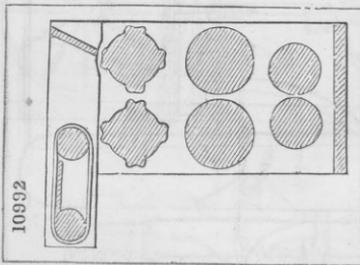
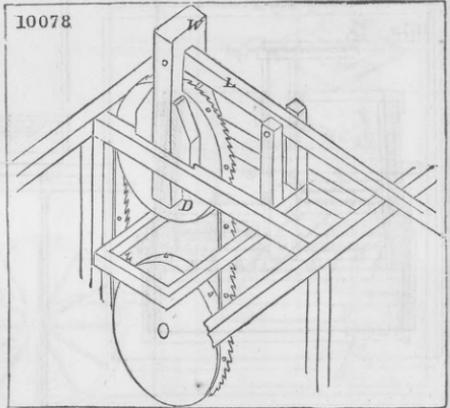
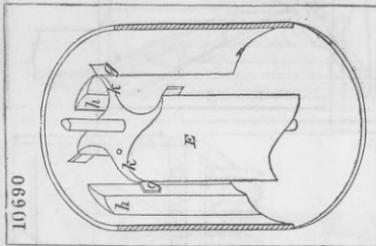
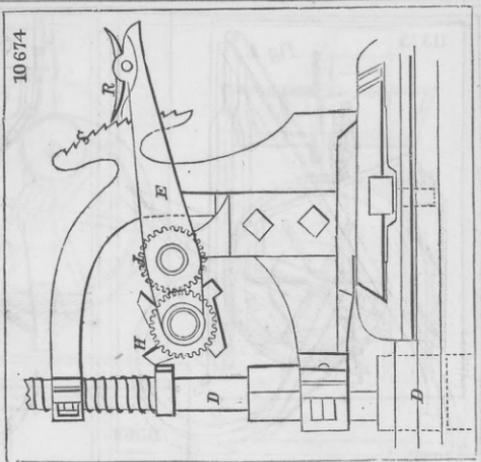
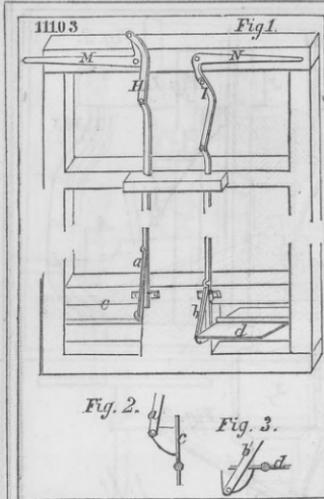


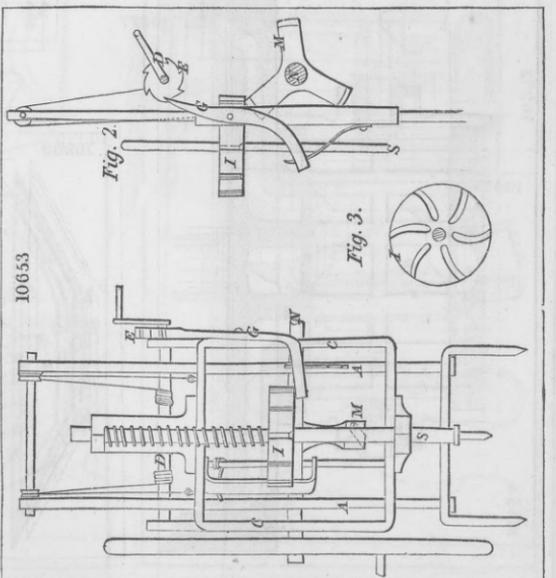
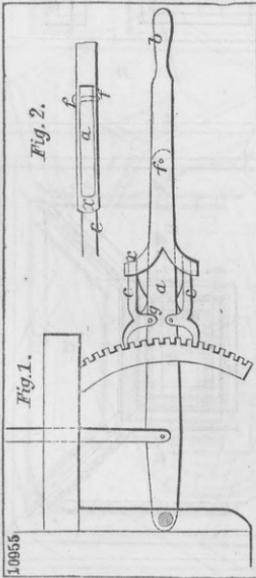
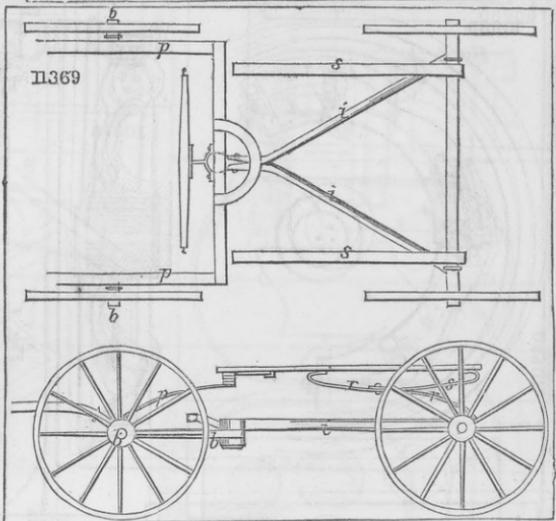
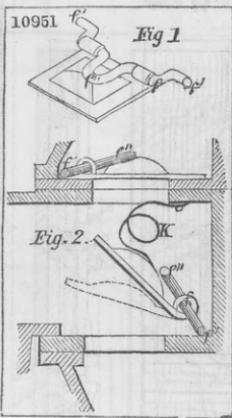
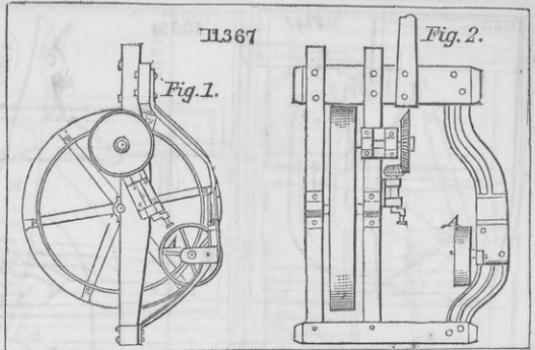
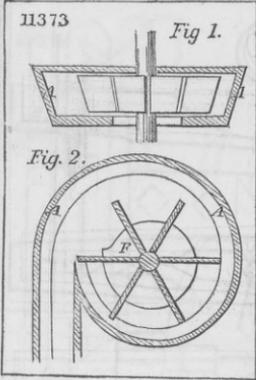
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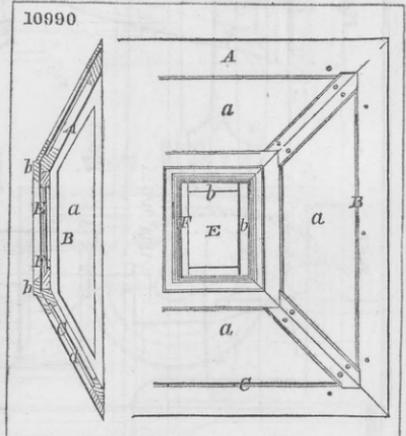
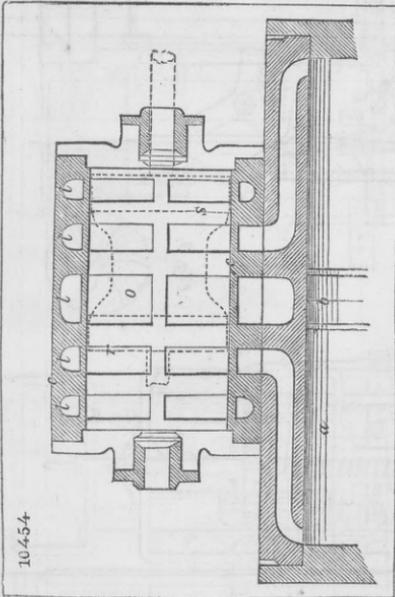
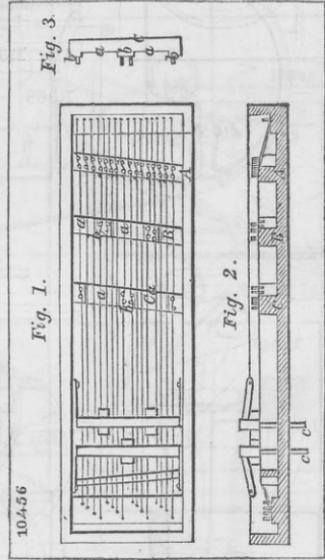
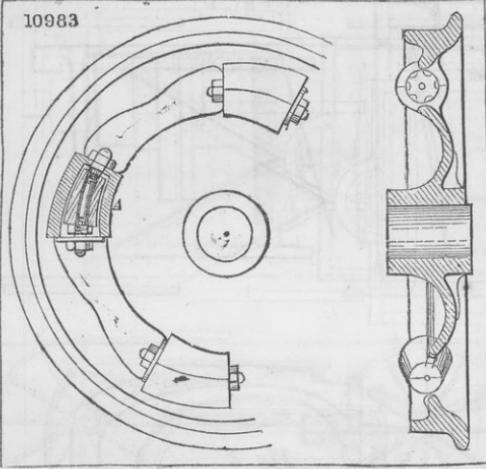
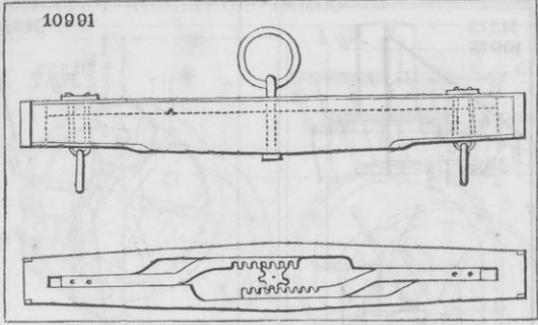
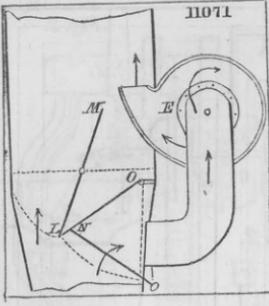












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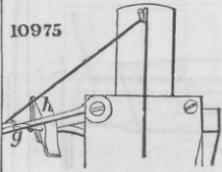


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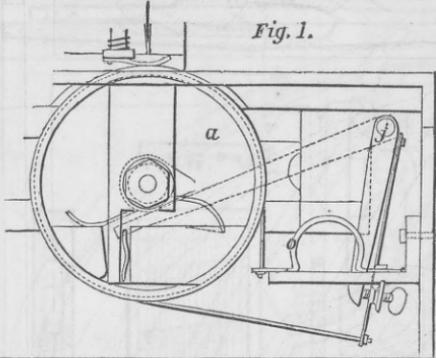
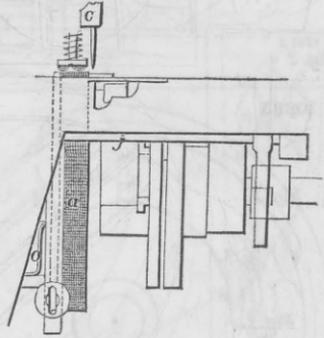
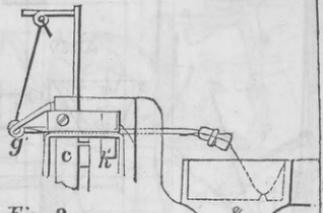


Fig. 2.



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Fig. 1.

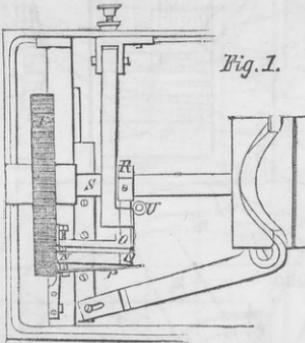


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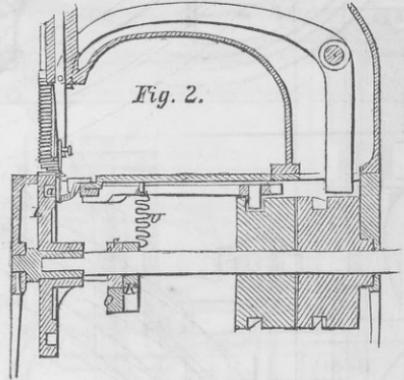
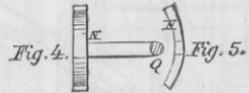
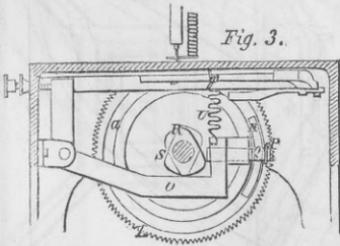
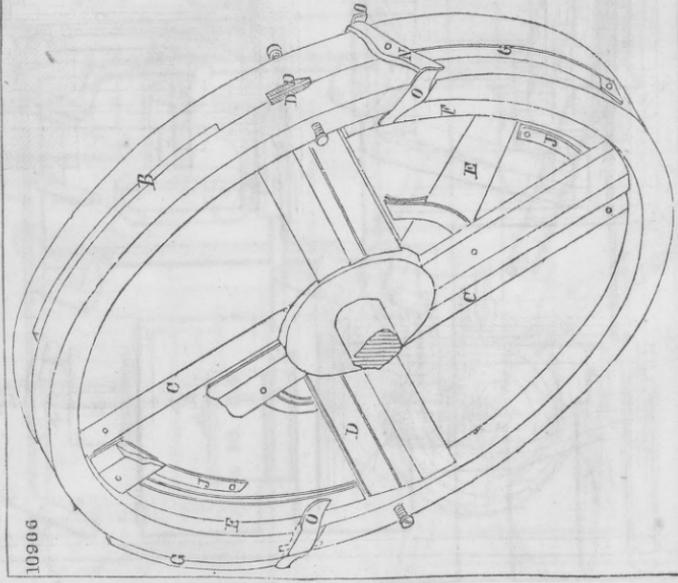
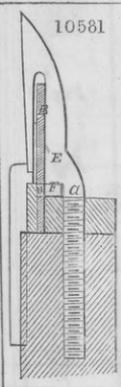
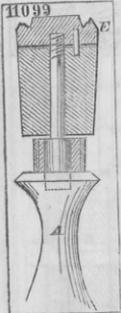
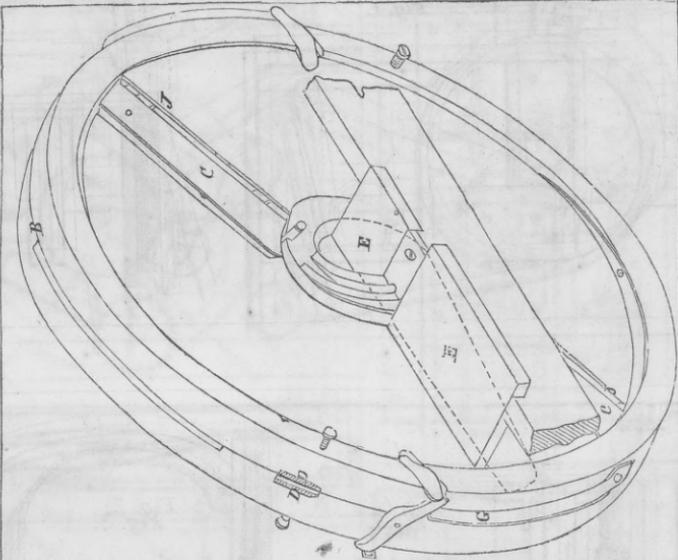
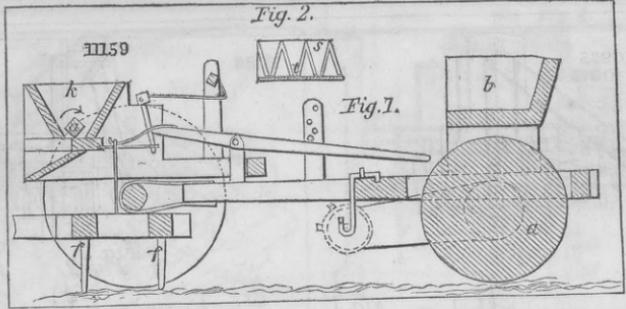


Fig. 3.





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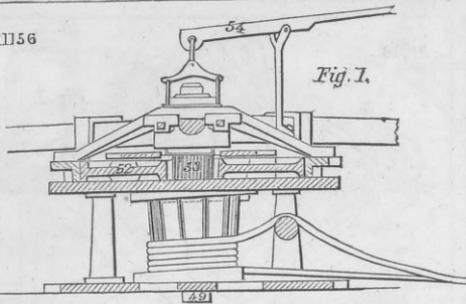


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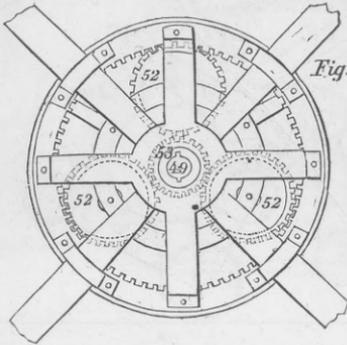


Fig. 2.

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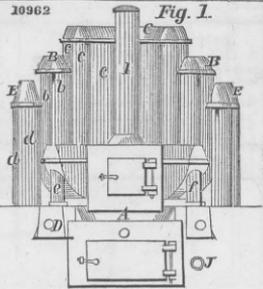


Fig. 1.

Fig. 2.

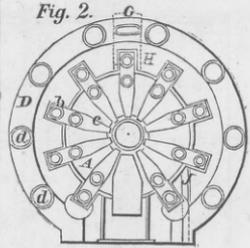
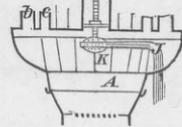


Fig. 3.



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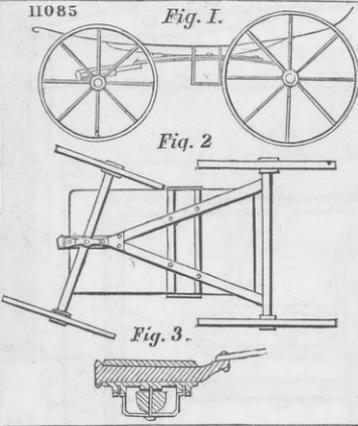


Fig. 1.

Fig. 2

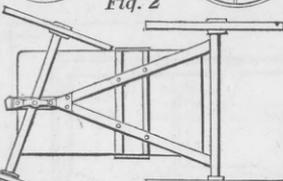
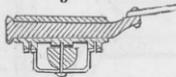
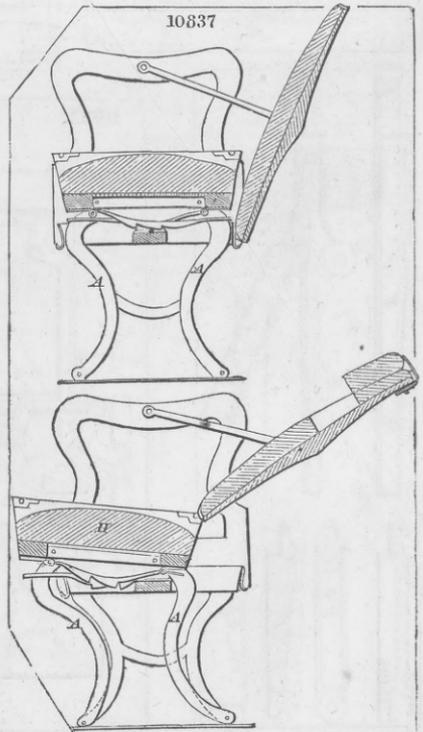


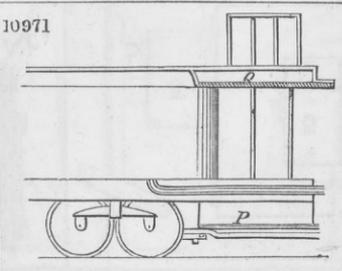
Fig. 3.

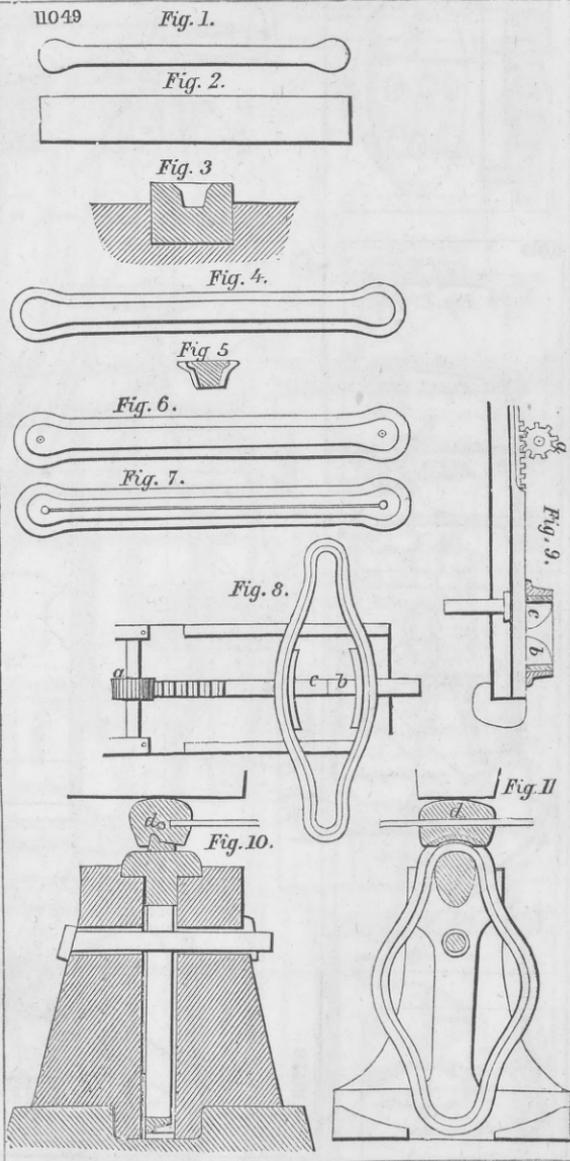
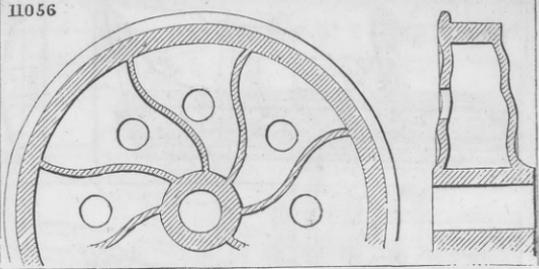
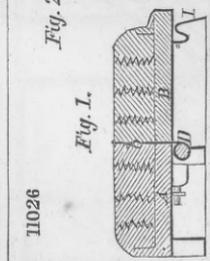
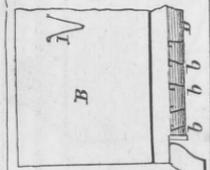
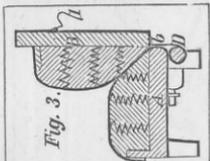
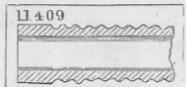
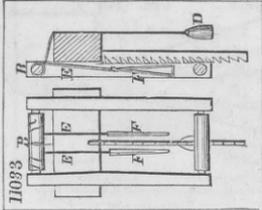


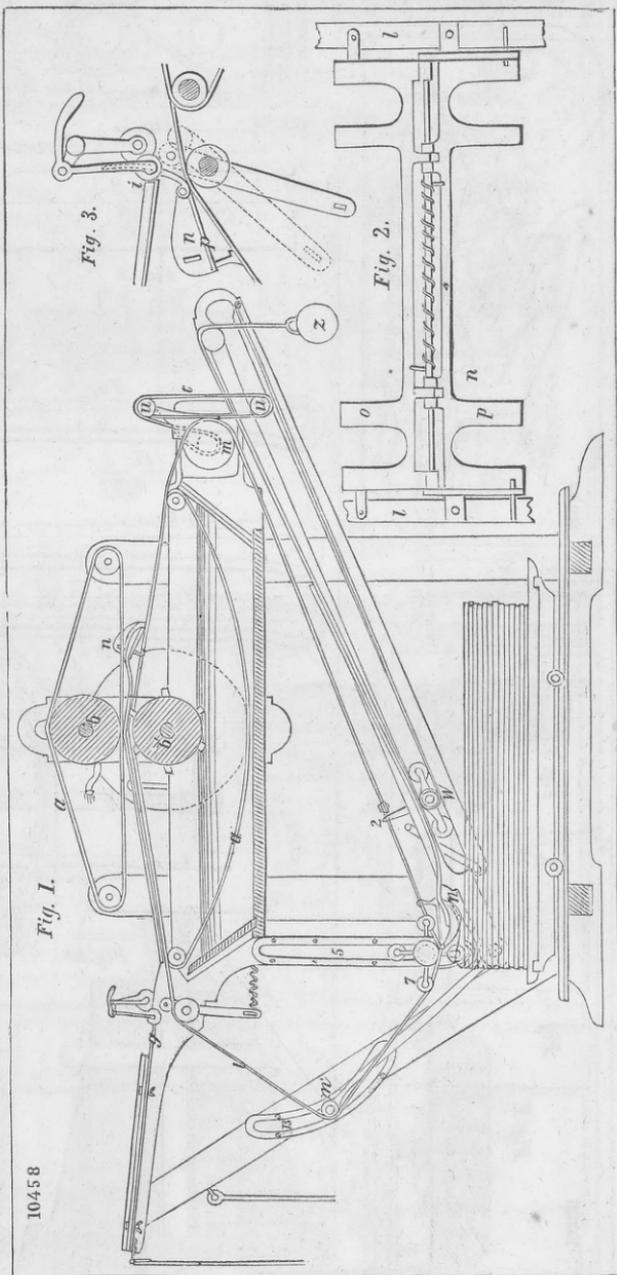
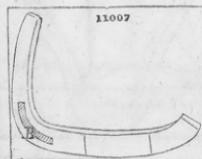
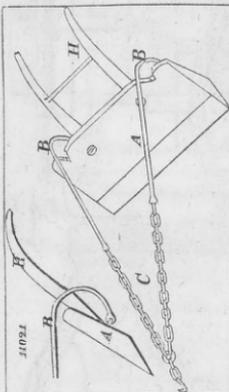
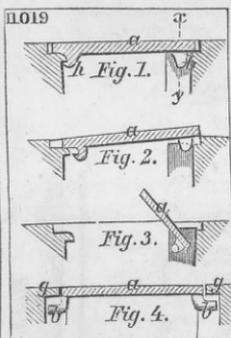
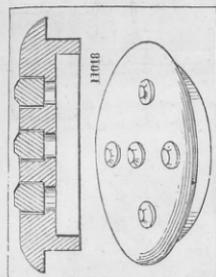
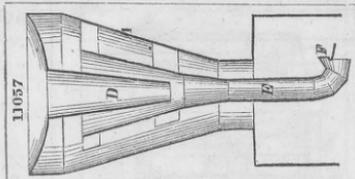
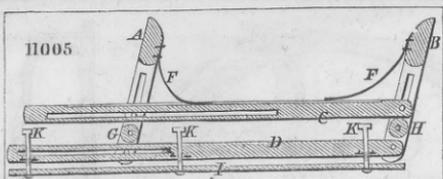
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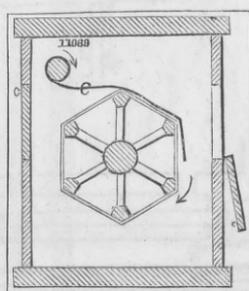
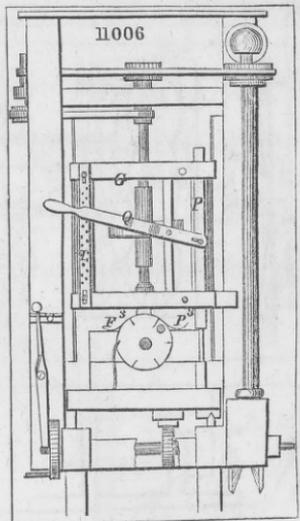
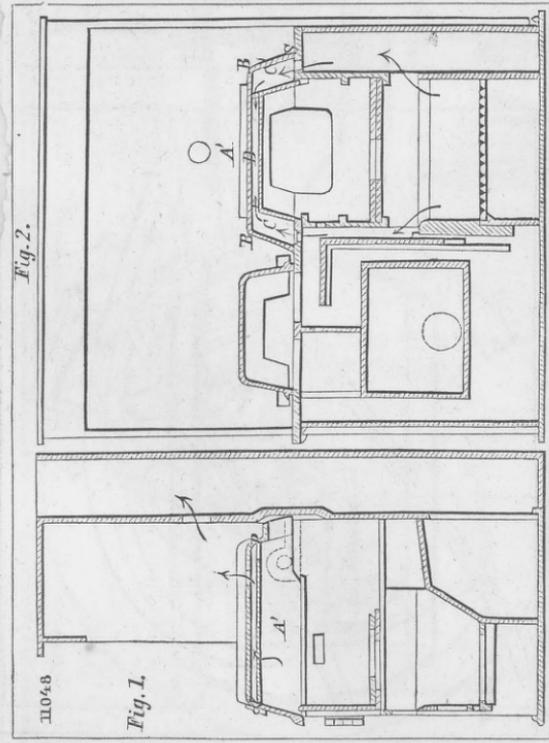
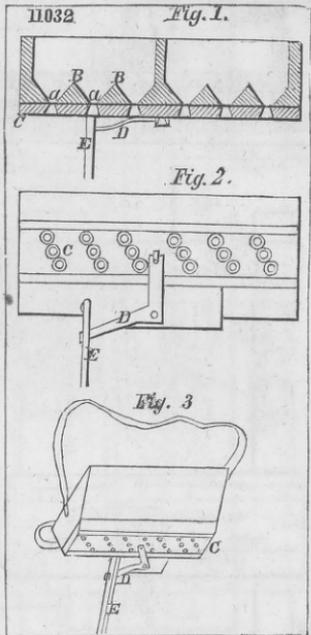
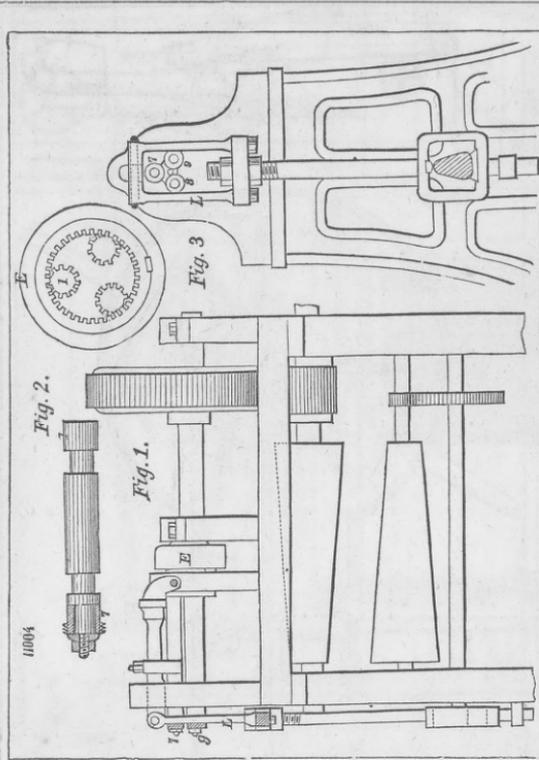


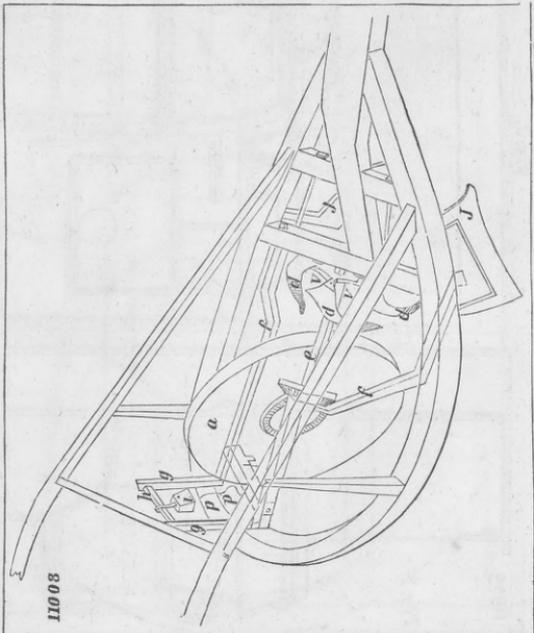
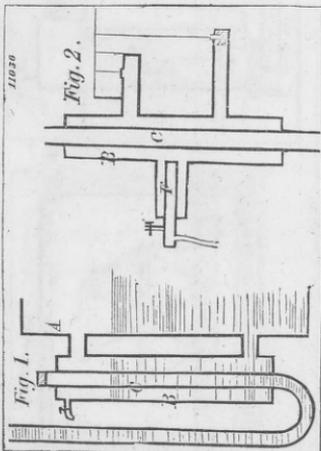
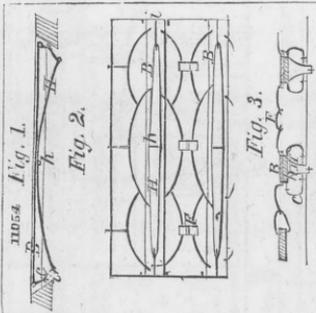
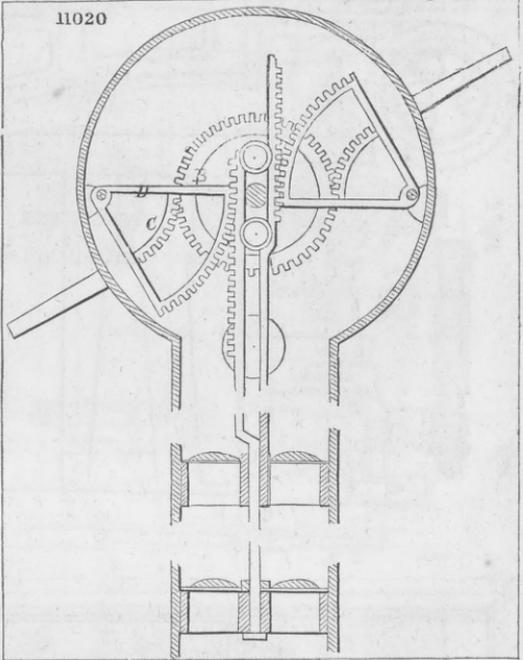
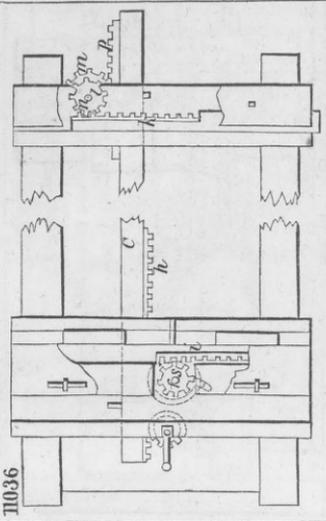
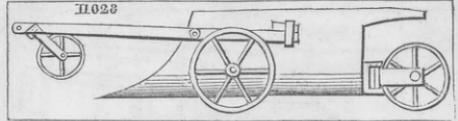
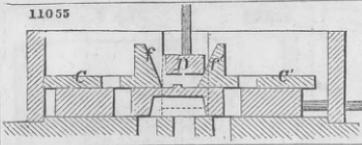
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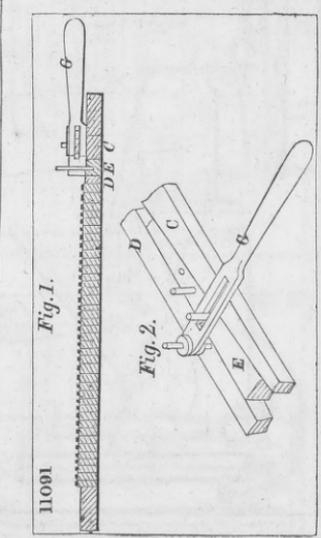
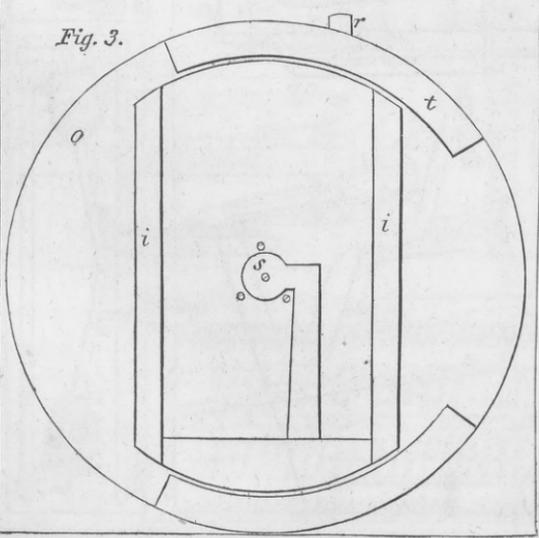
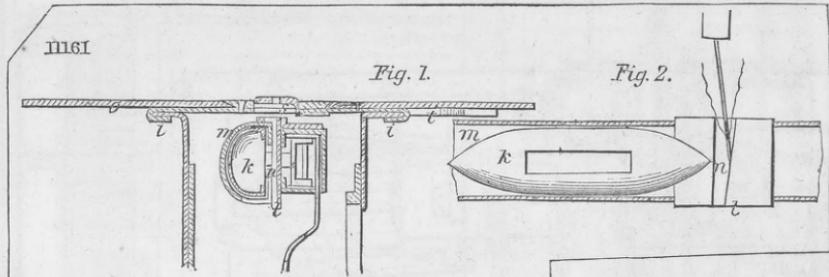
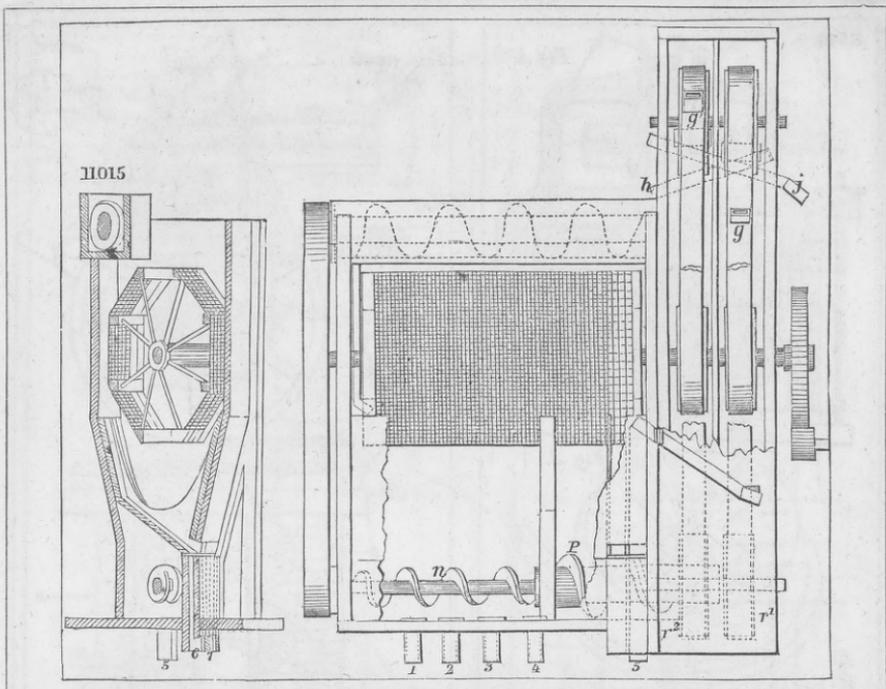


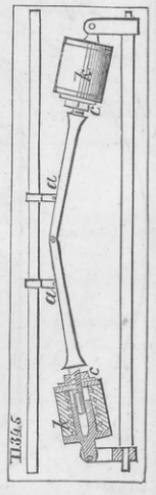
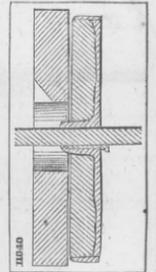
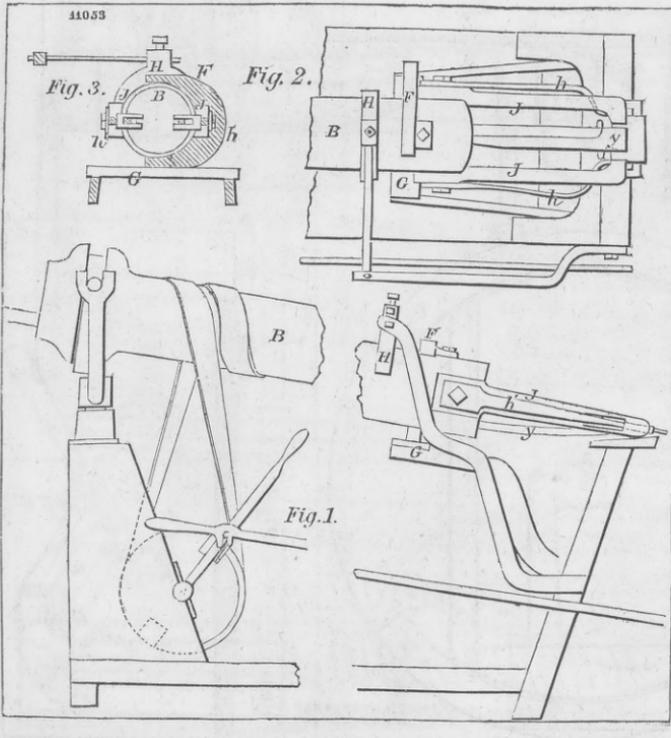
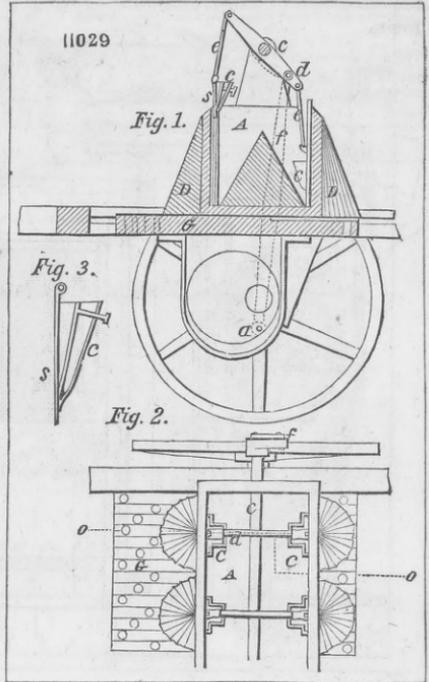
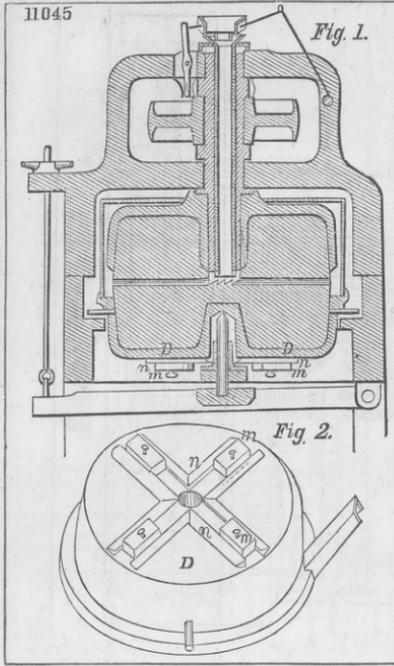


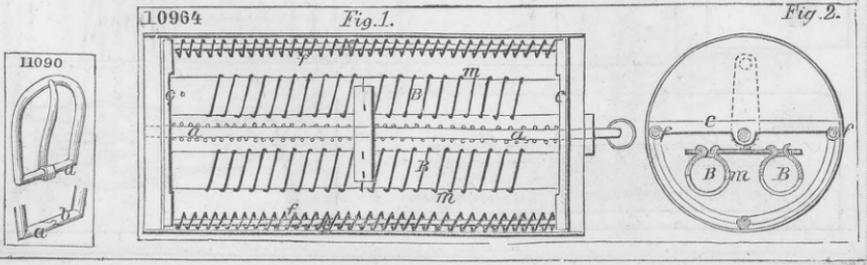
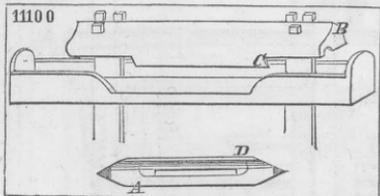
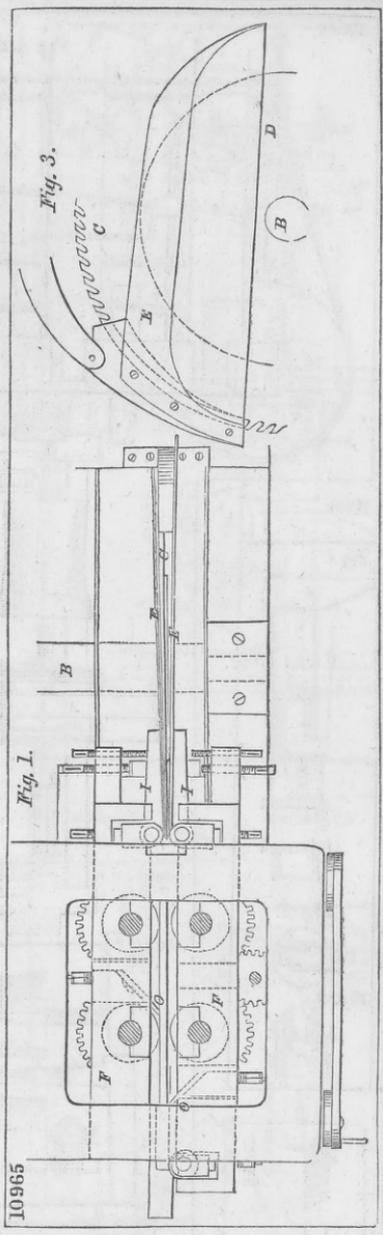
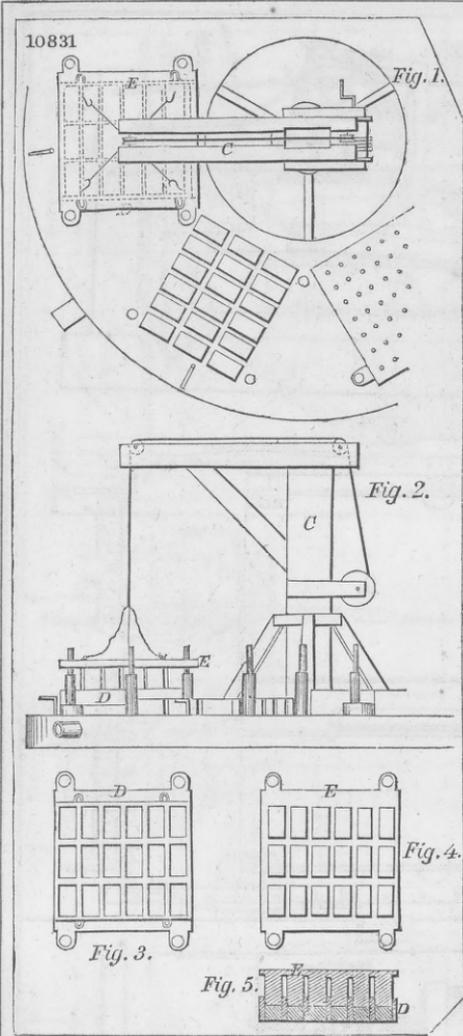


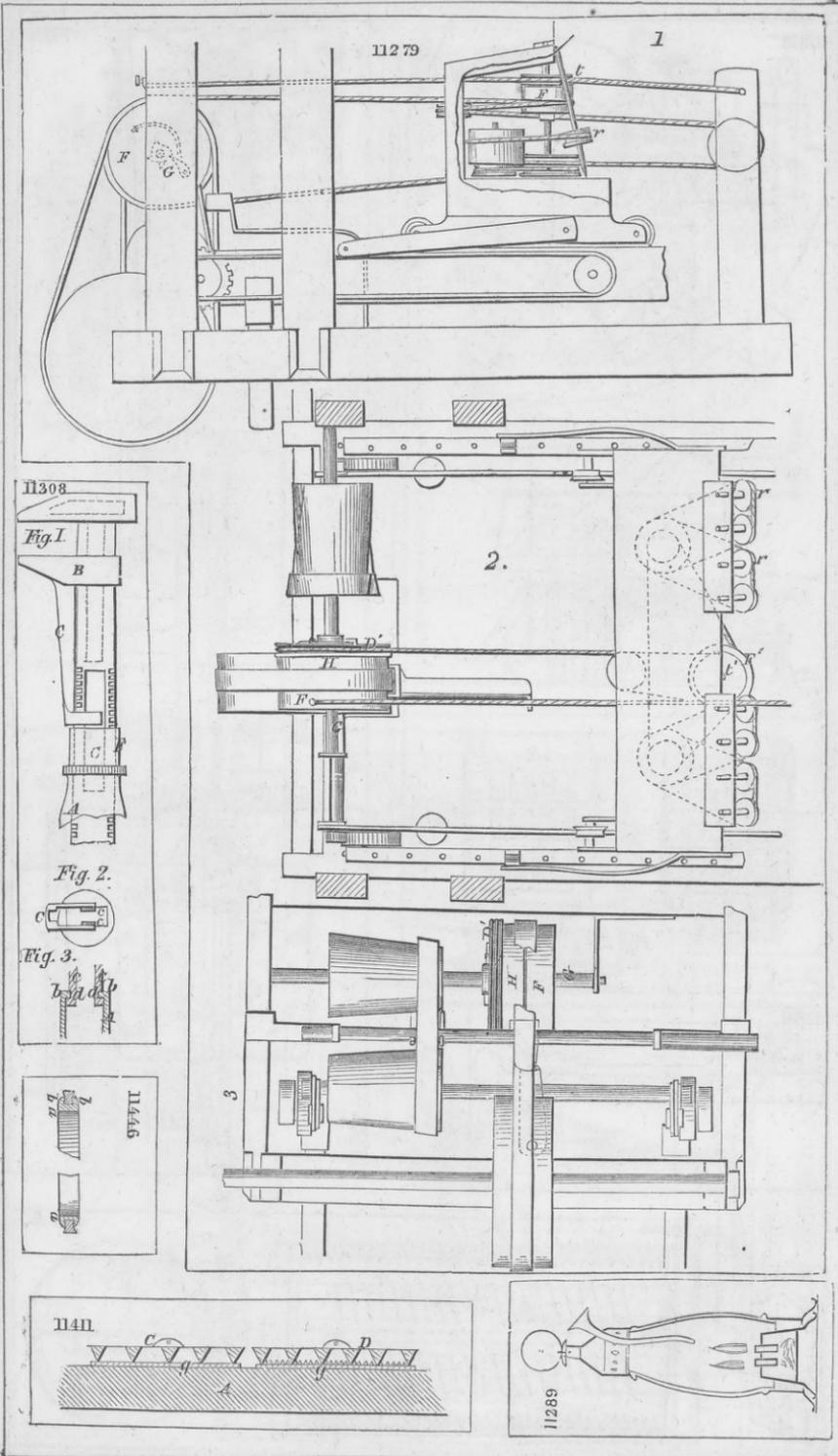












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Fig. 2.

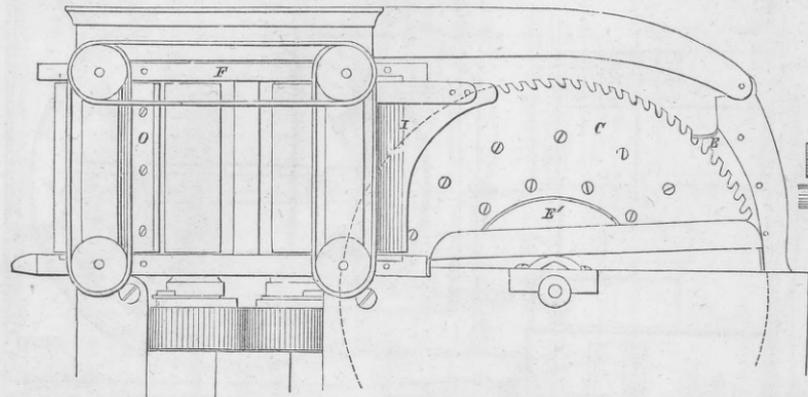
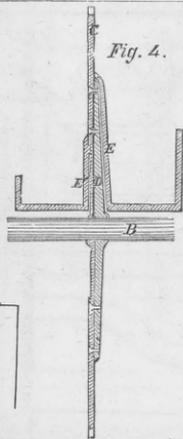
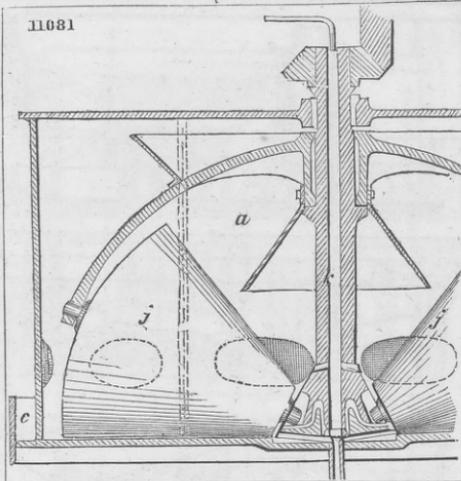


Fig. 4.



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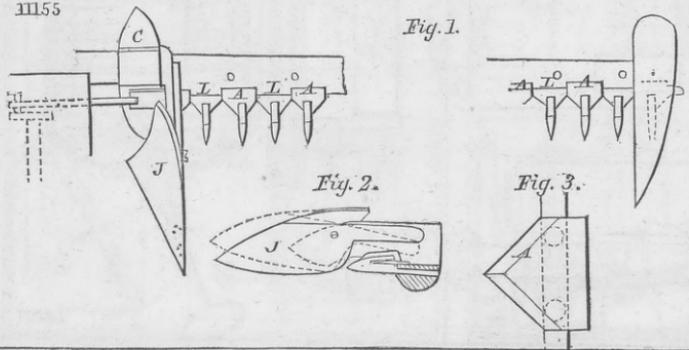


Fig. 2.

Fig. 3.

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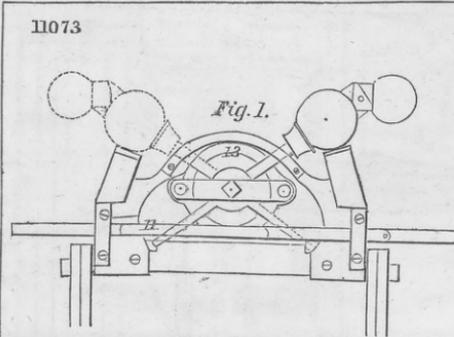
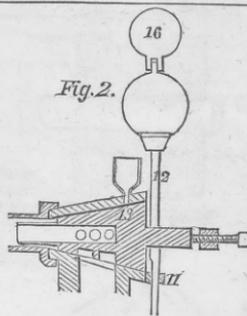
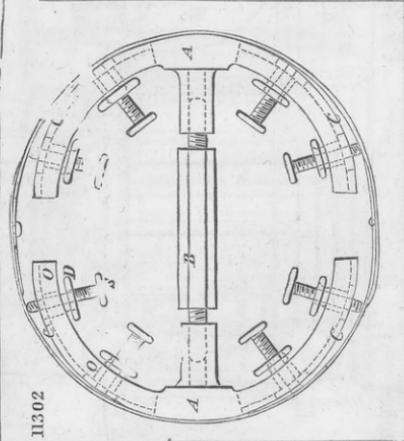
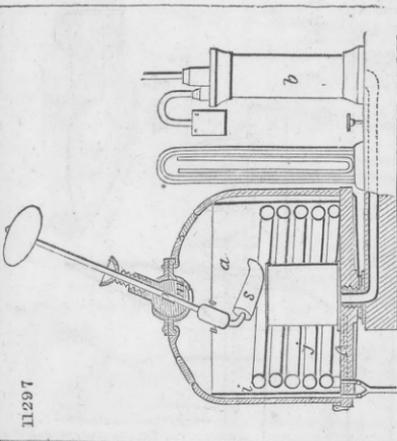
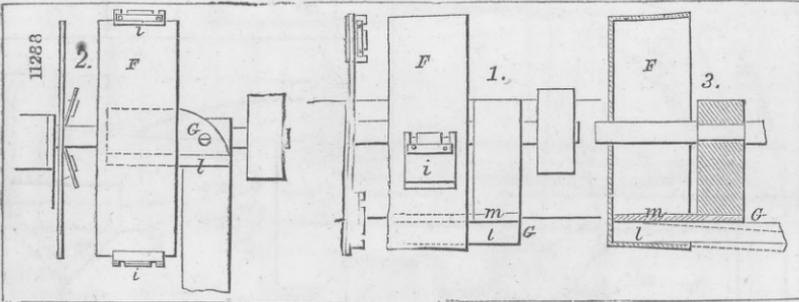
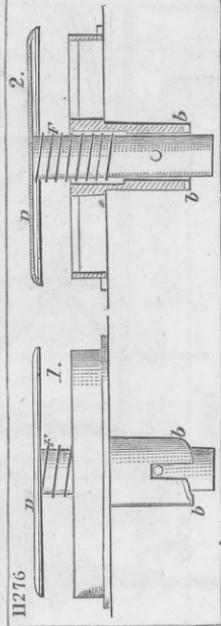
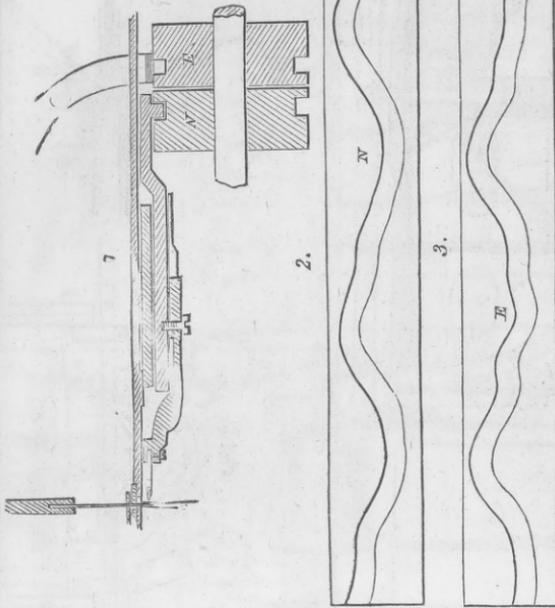


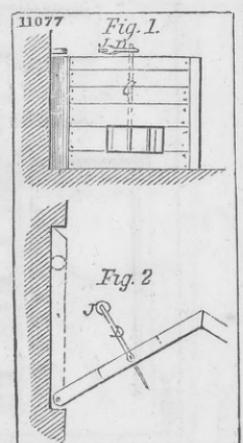
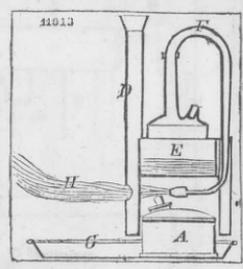
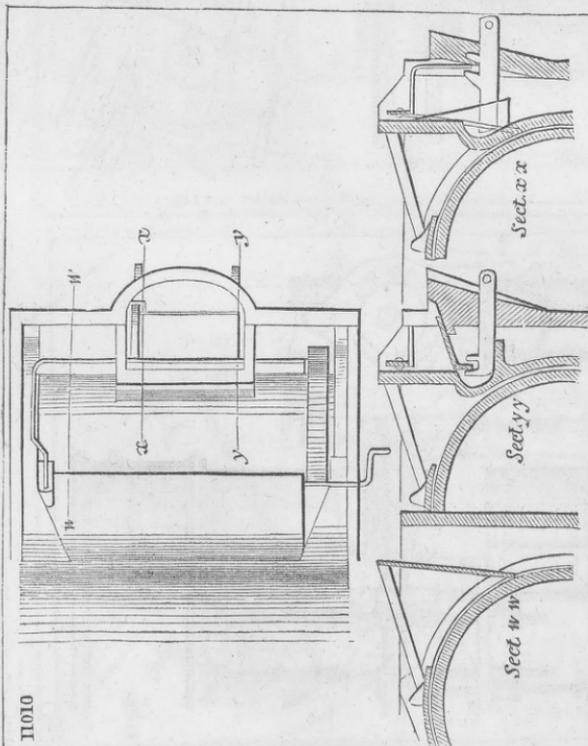
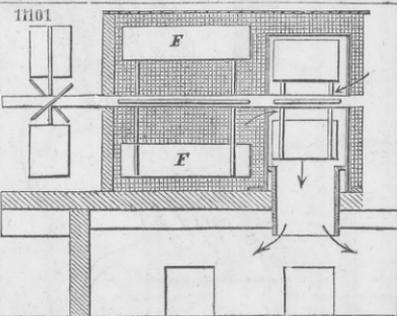
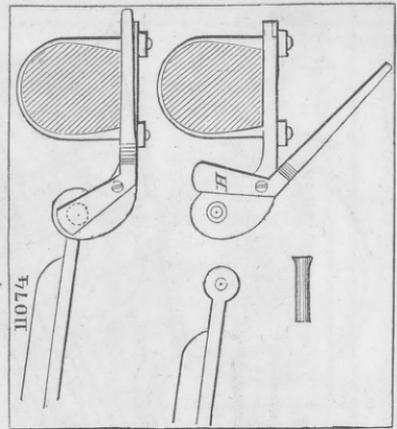
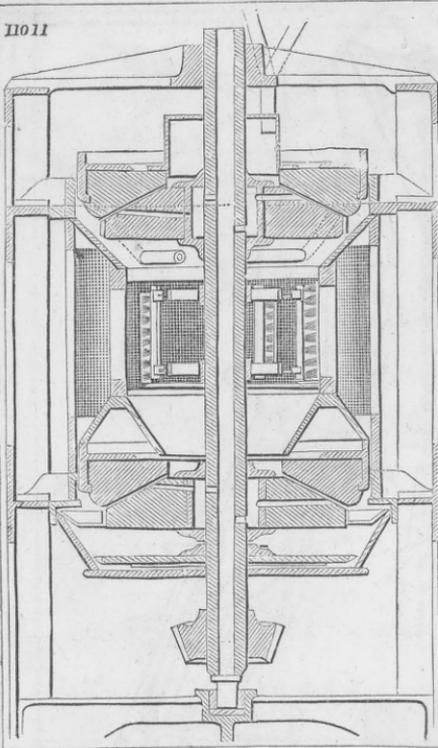
Fig. 2.



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Fig. 1

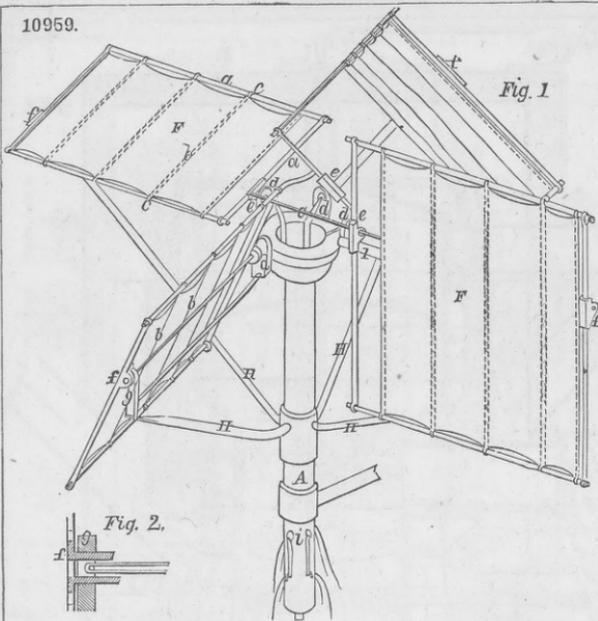
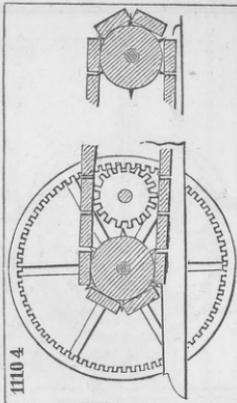
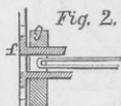
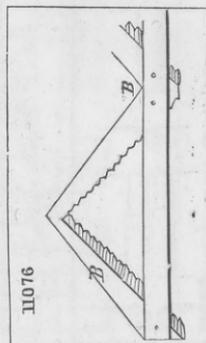


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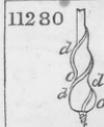


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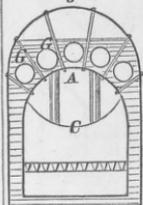


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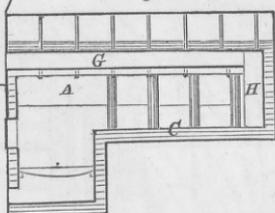


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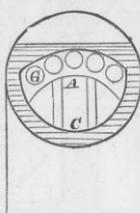
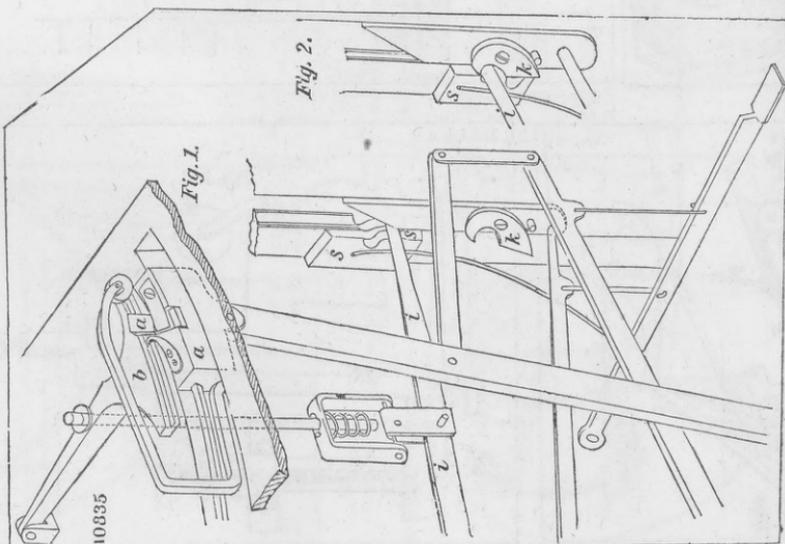


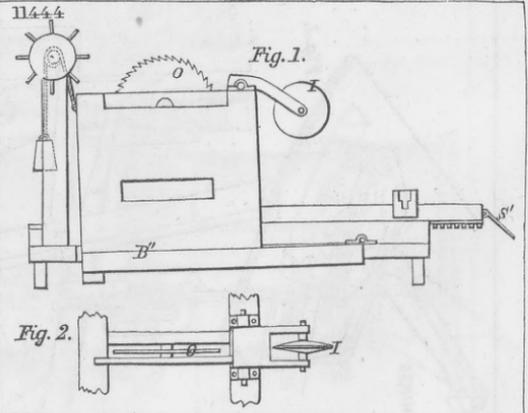
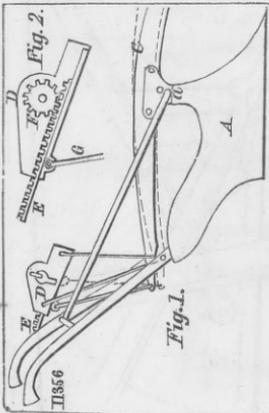
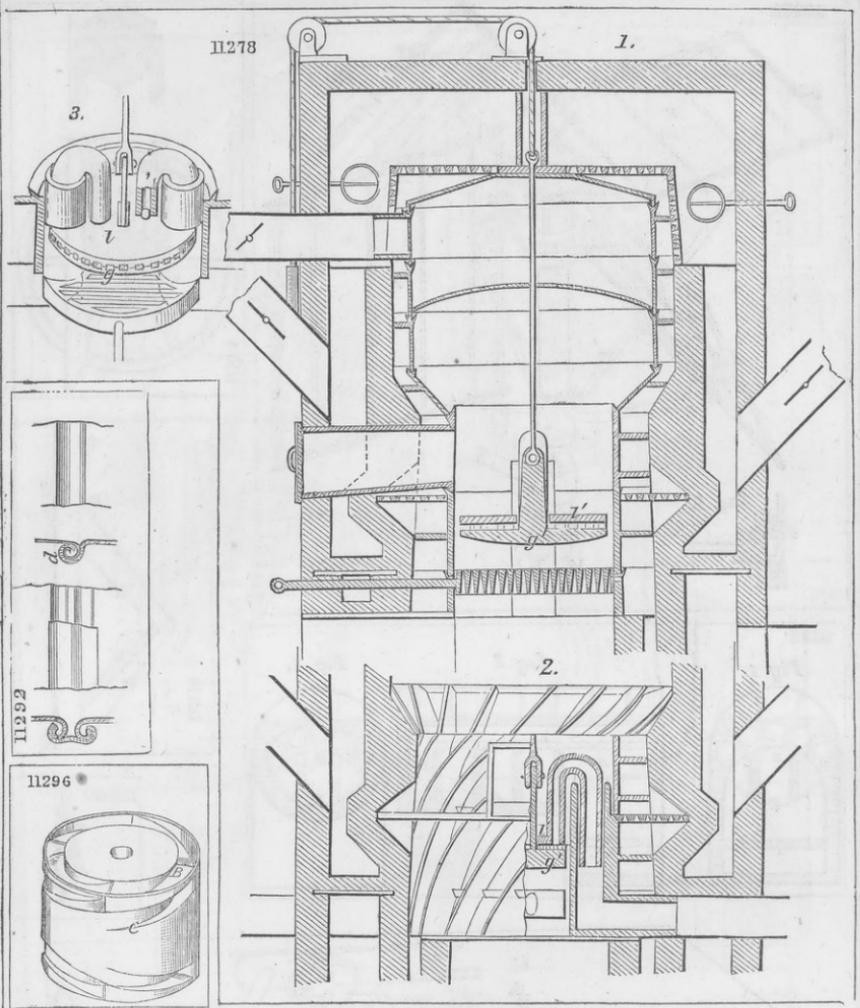
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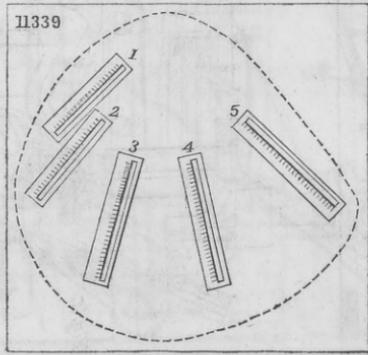
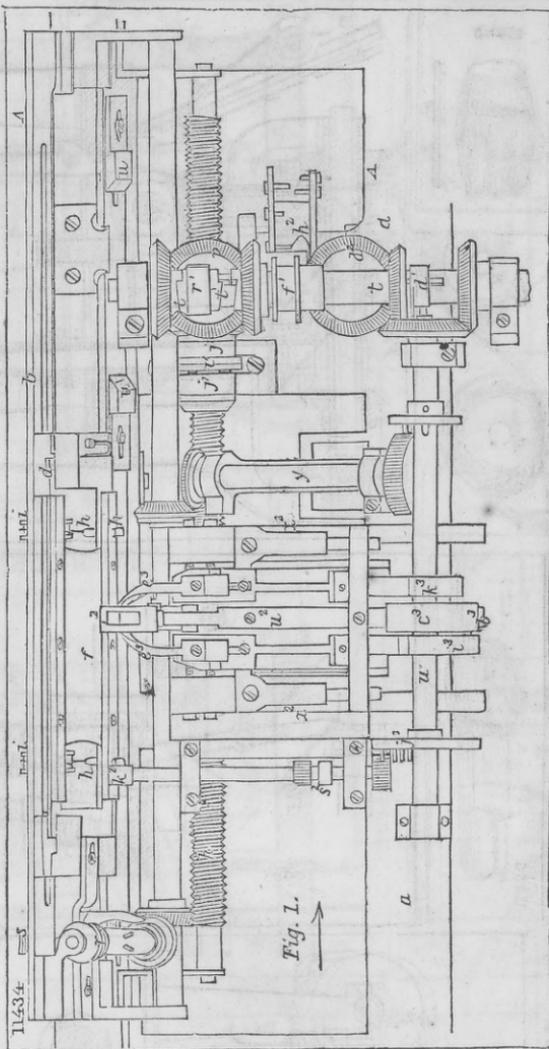
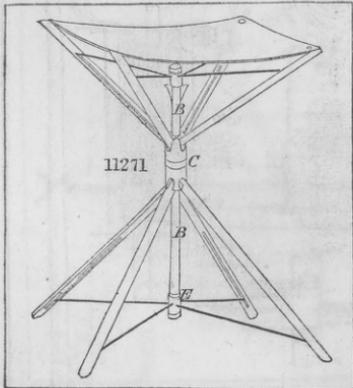
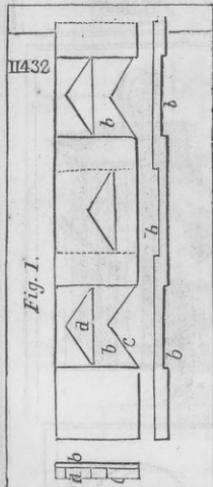
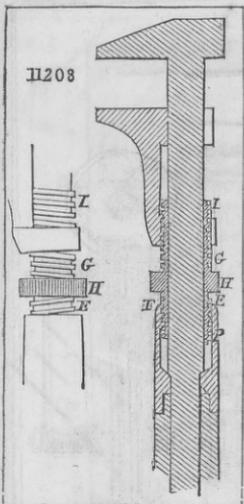


Fig. 1.



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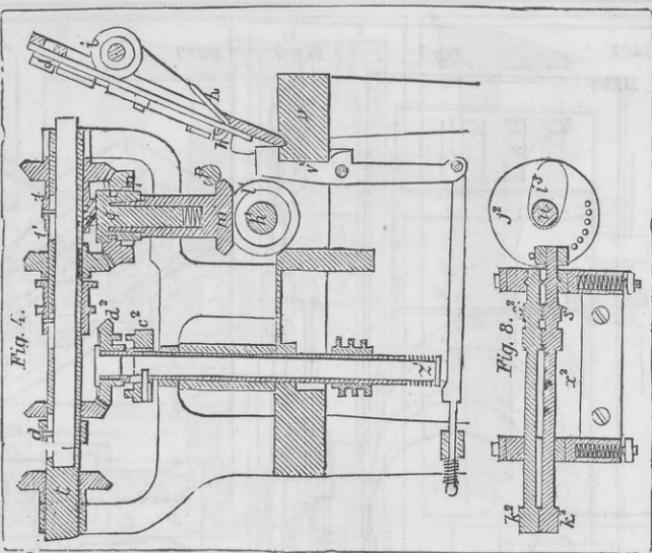


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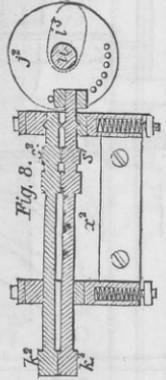


Fig. 8.



11336

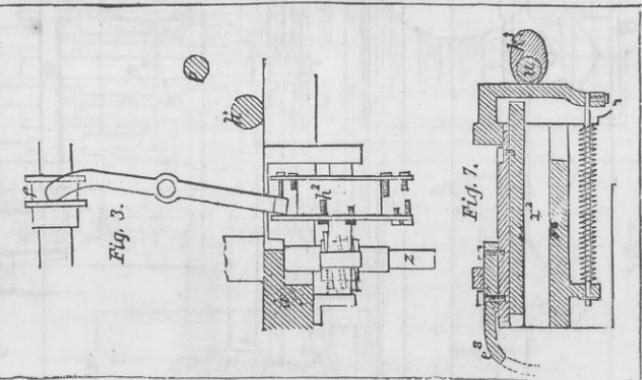


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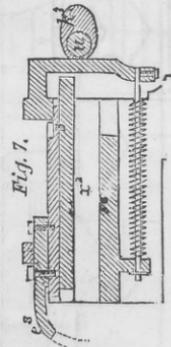


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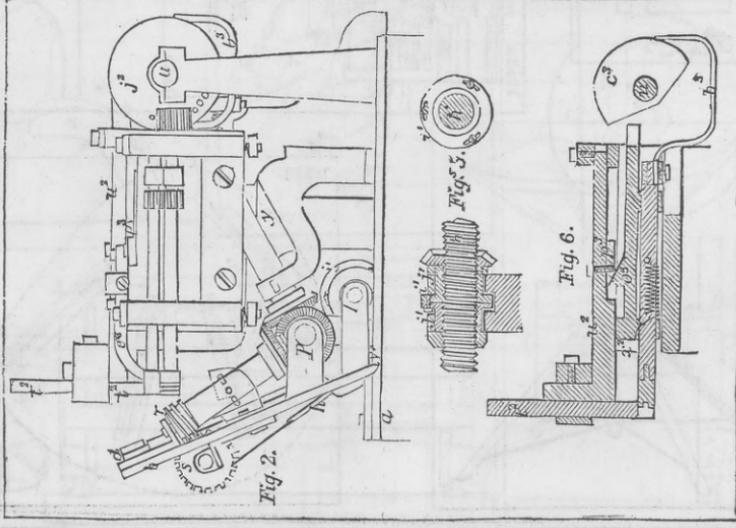


Fig. 2.



Fig. 5.

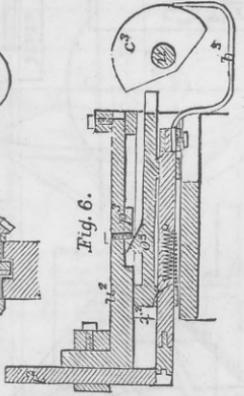


Fig. 6.

11402

Fig. 1

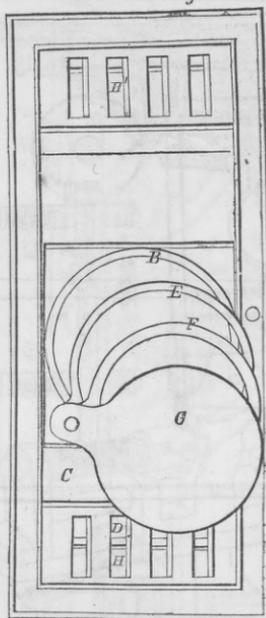
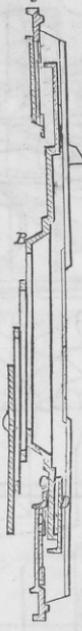
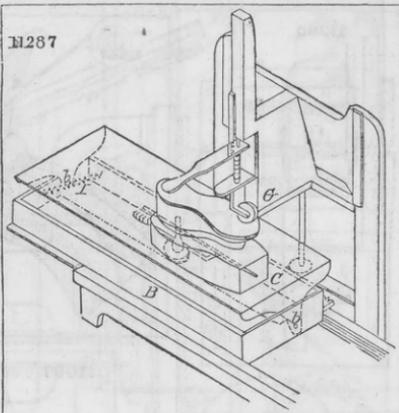


Fig. 2



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Fig. 1.

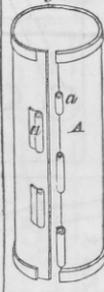


Fig. 2.

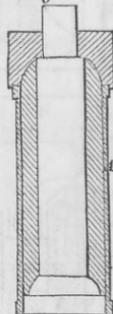
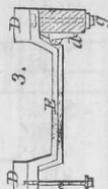
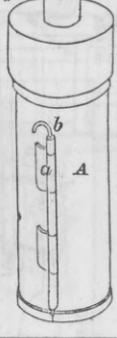


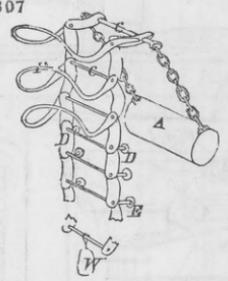
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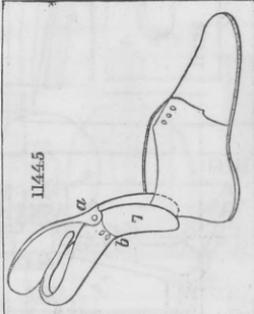
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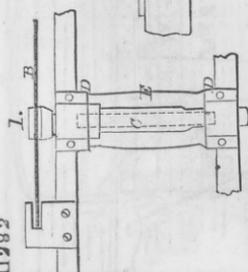
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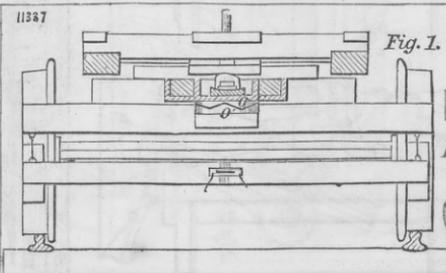
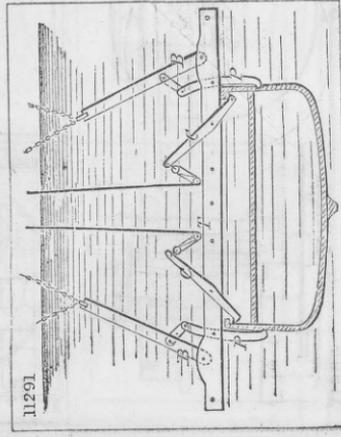
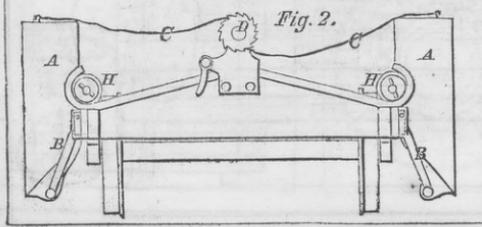
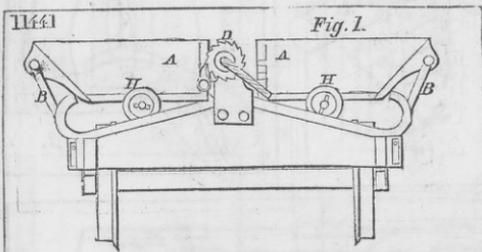
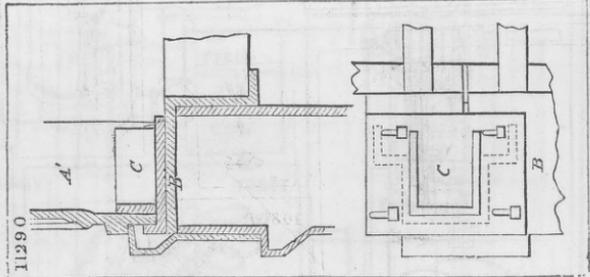
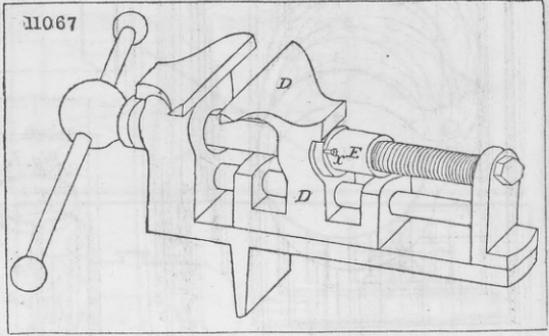
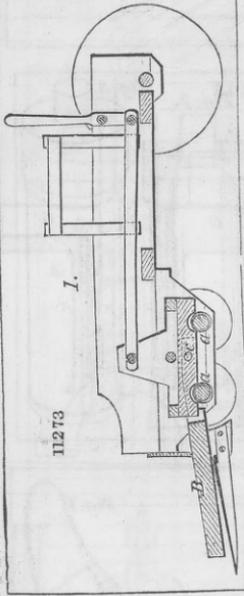
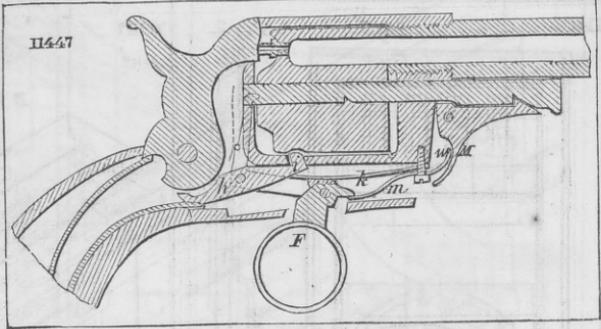
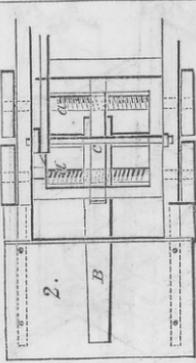


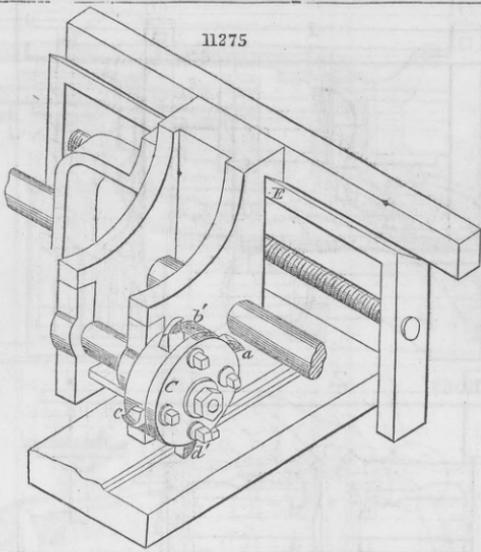
Fig. 1.

Fig. 2.





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11449

Fig. 1.

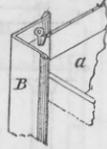


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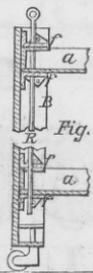
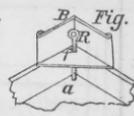
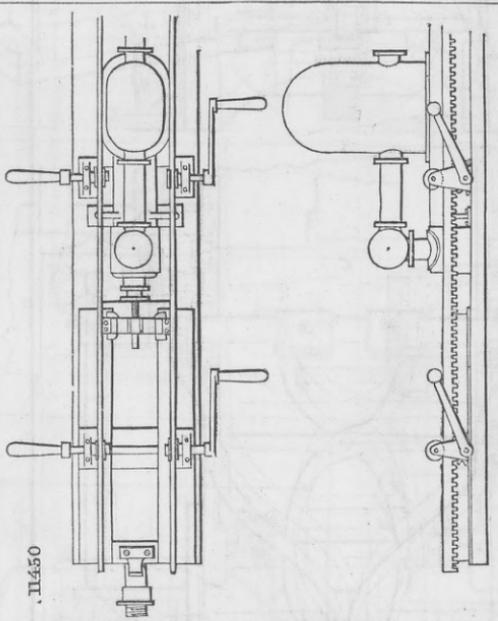
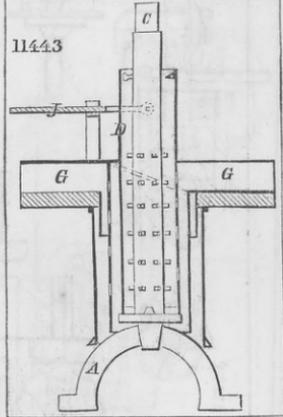


Fig. 3.

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Fig. 1.

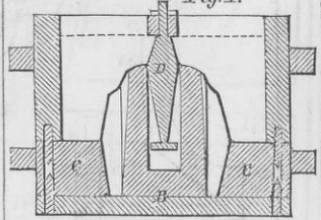
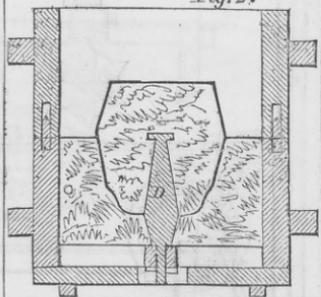
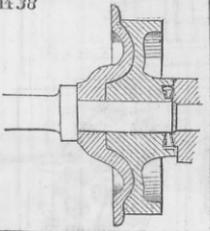


Fig. 2.



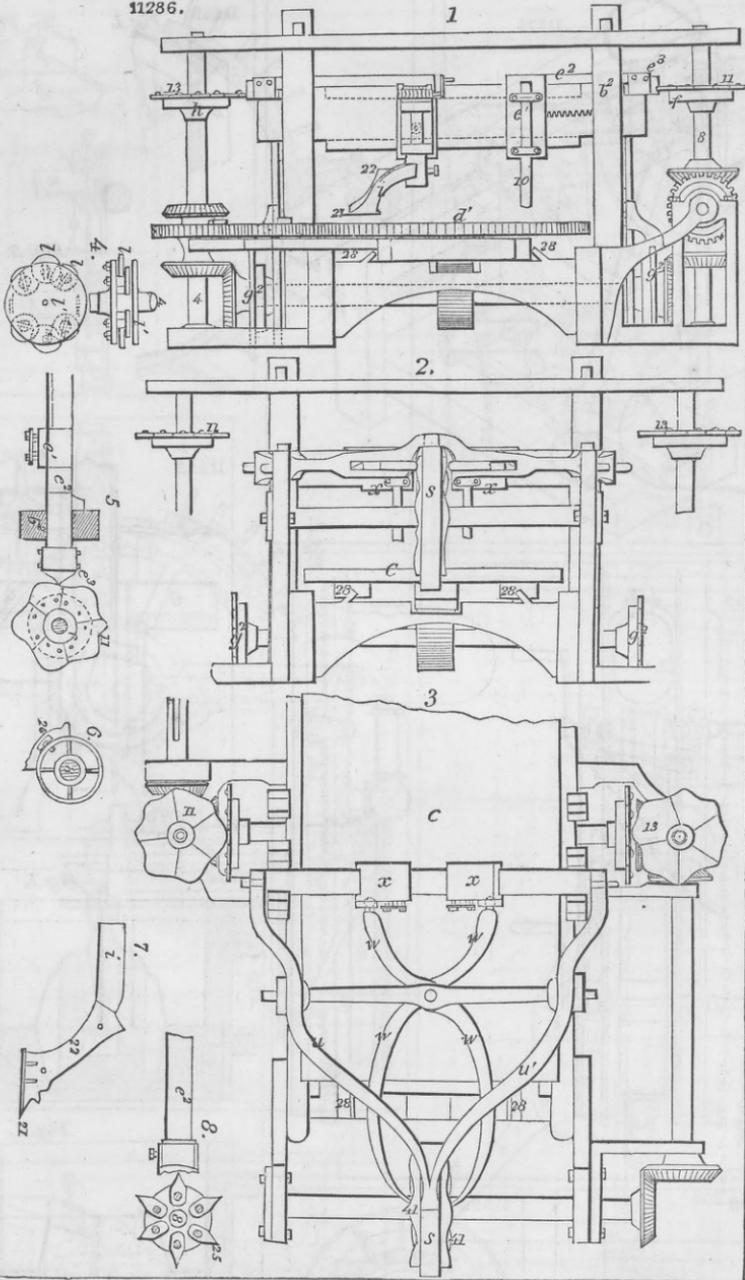
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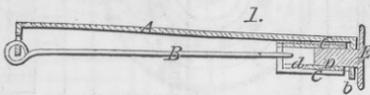
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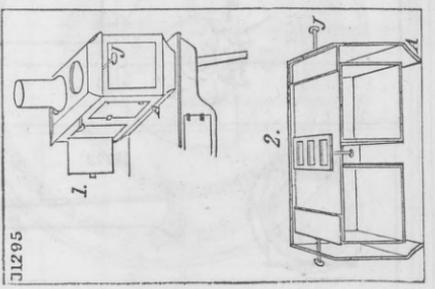
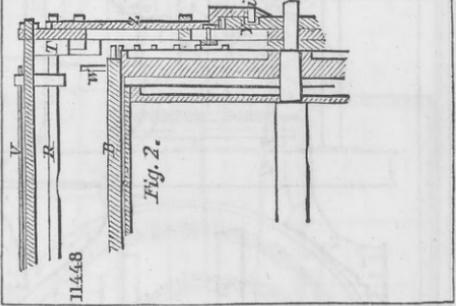
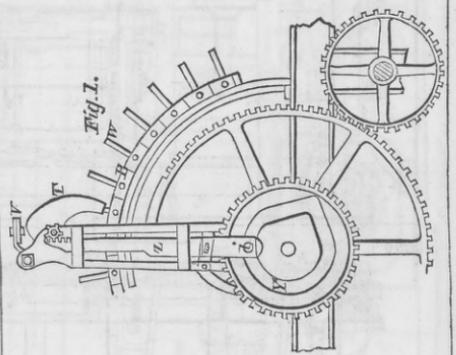
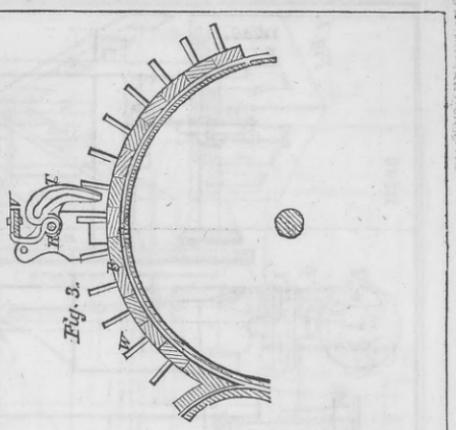
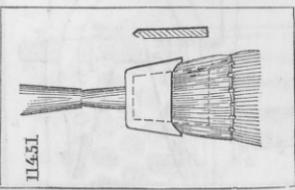
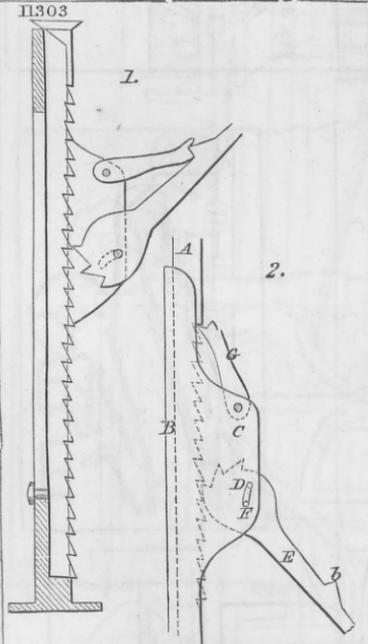
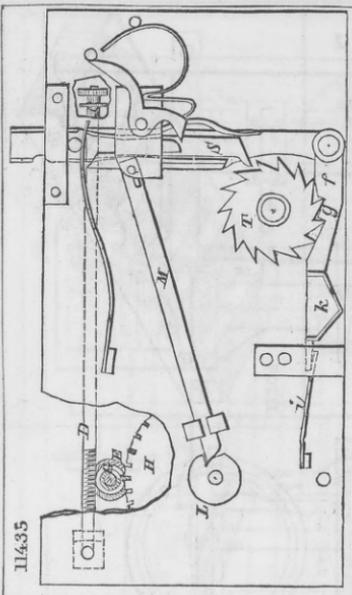


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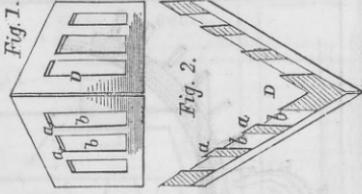


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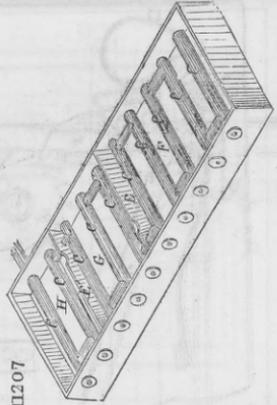




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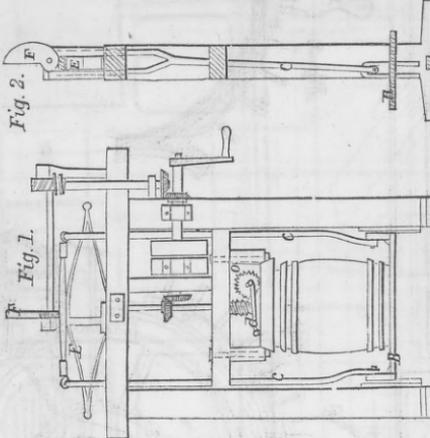
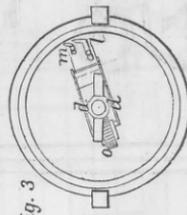
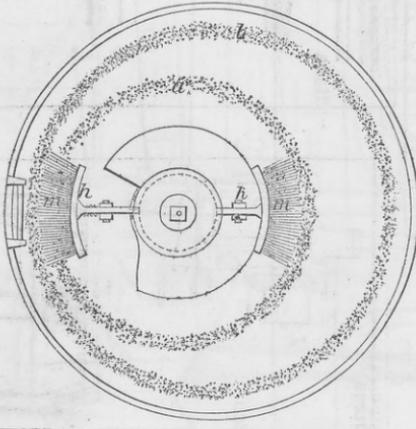
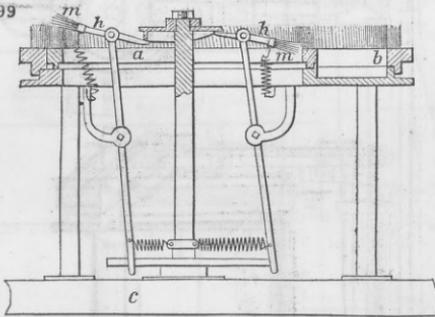


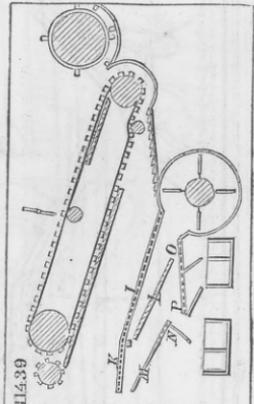
Fig. 3



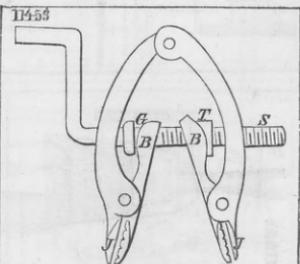
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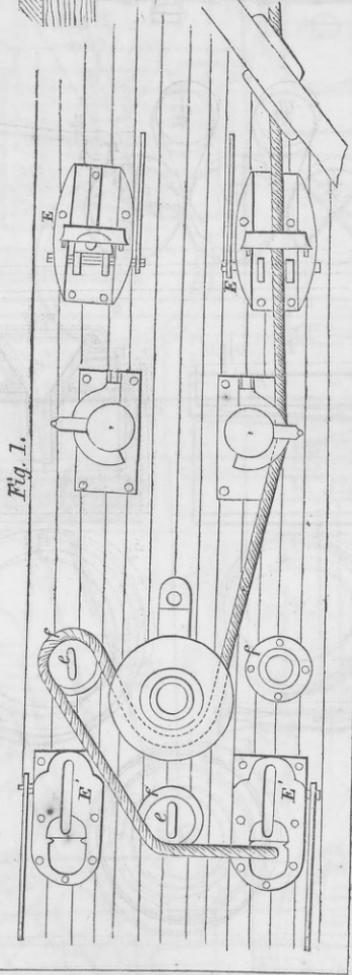
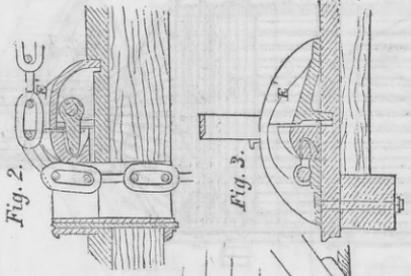


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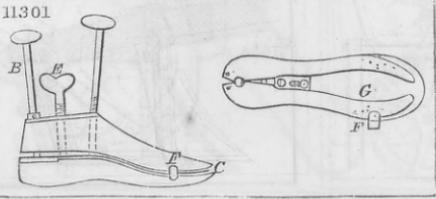


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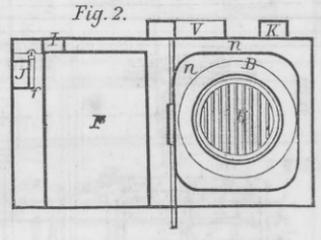
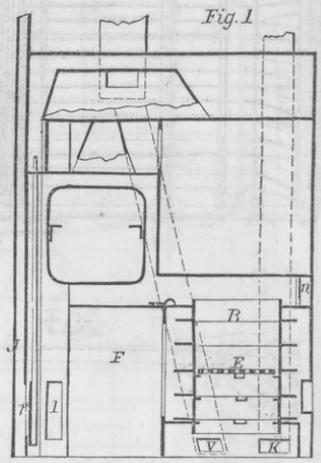




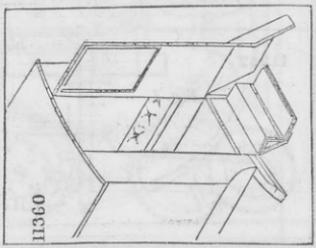
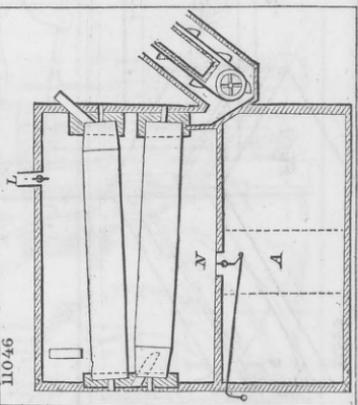
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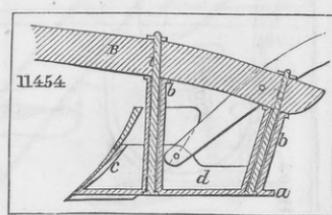
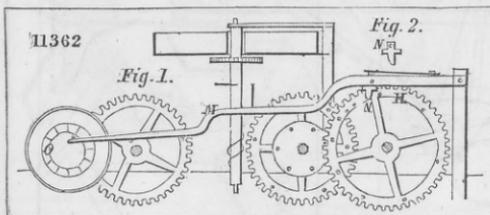
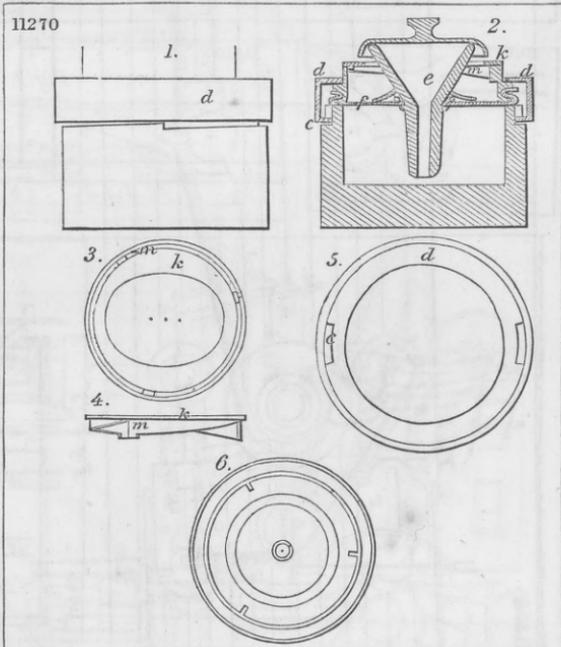
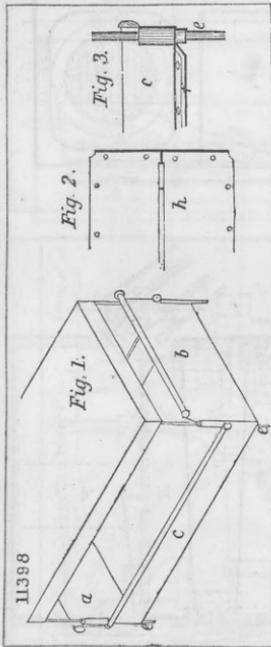
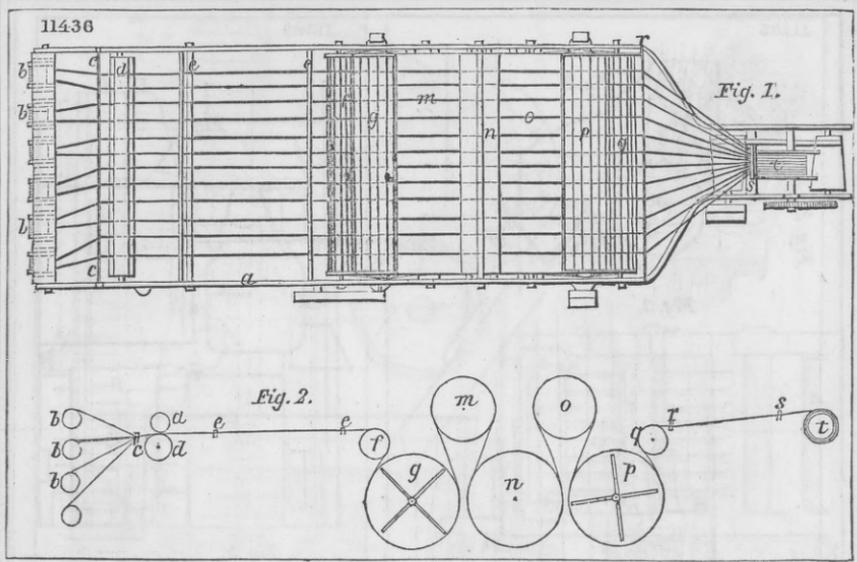


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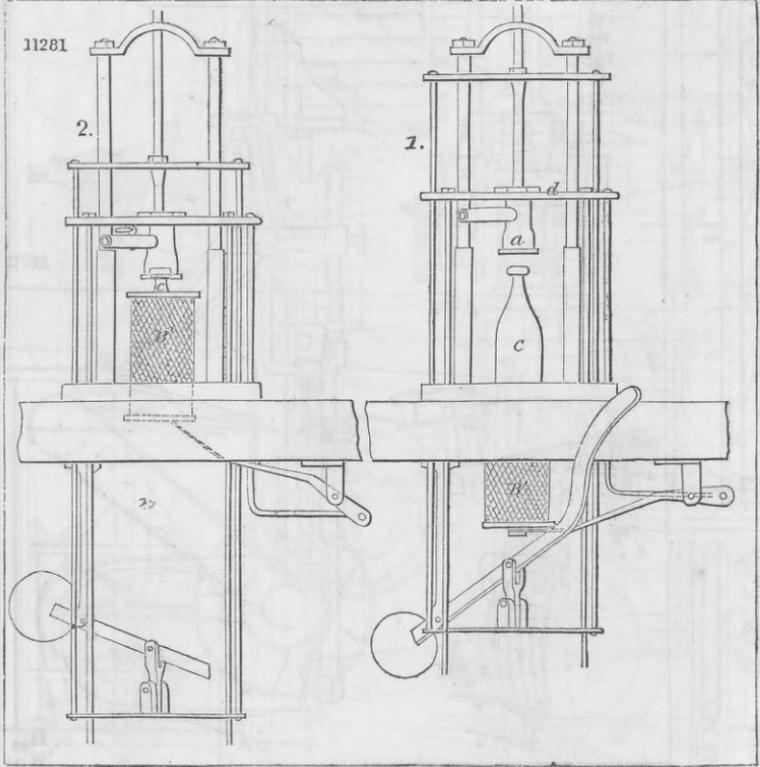




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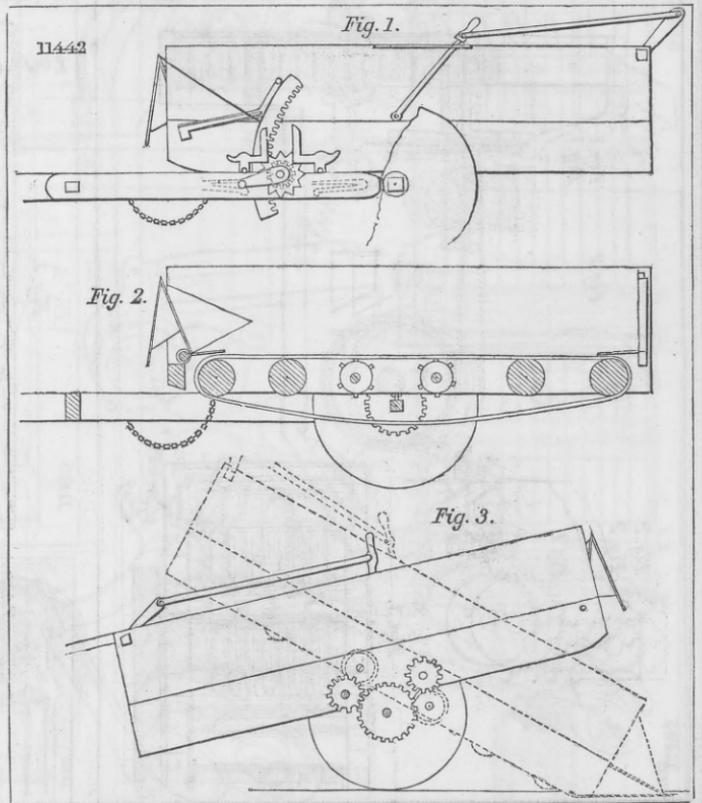


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Fig. 1.

Fig. 2.

Fig. 3.



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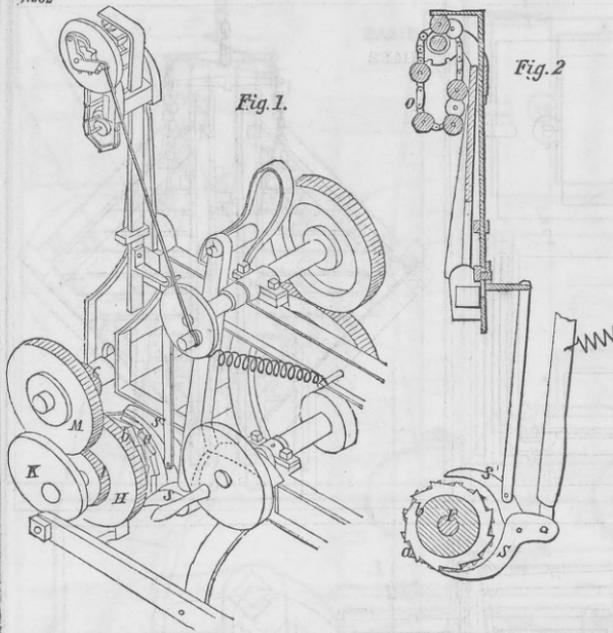
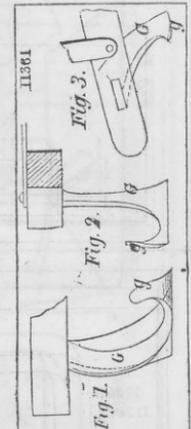
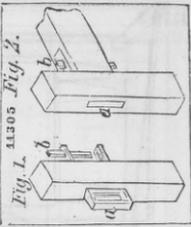
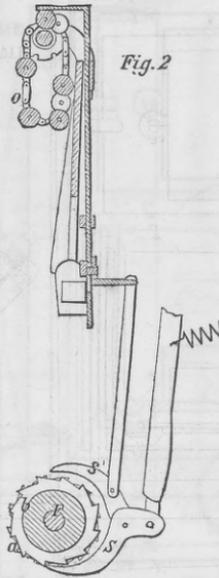


Fig. 2



11309

Fig. 2.

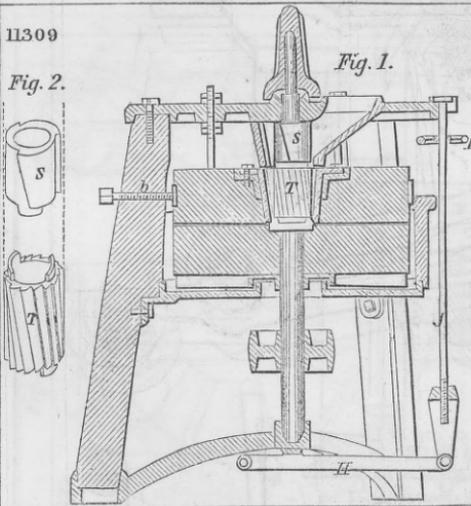


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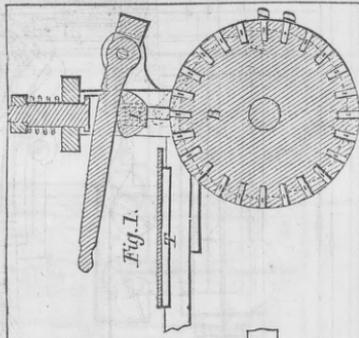
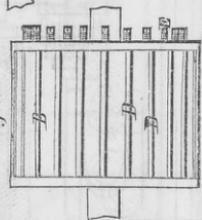


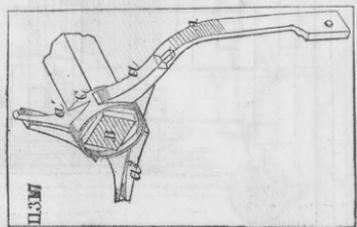
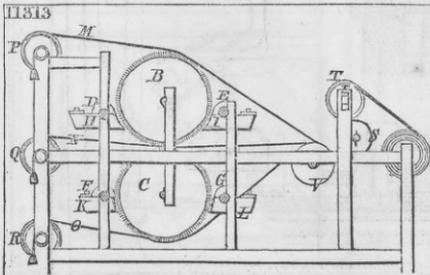
Fig. 1.

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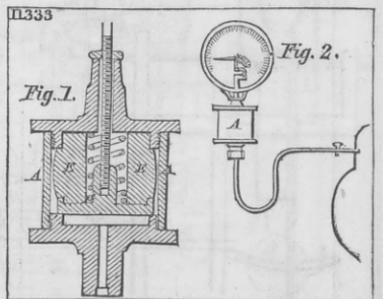
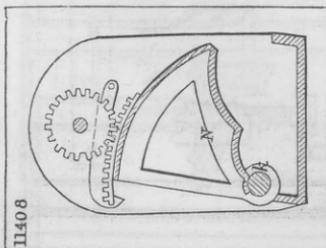
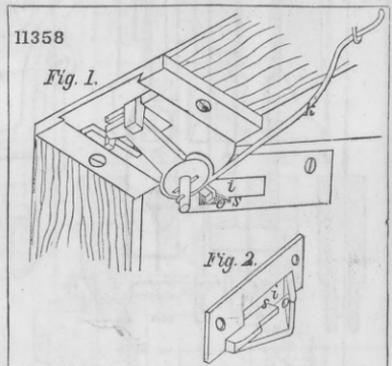
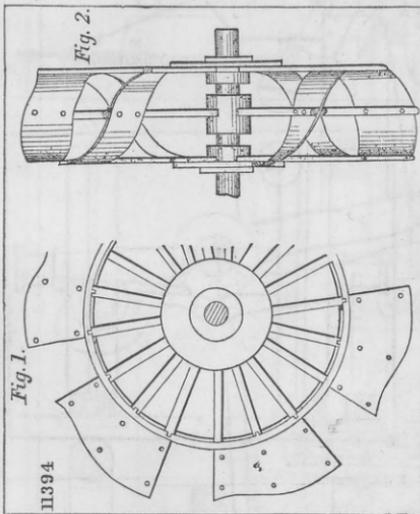
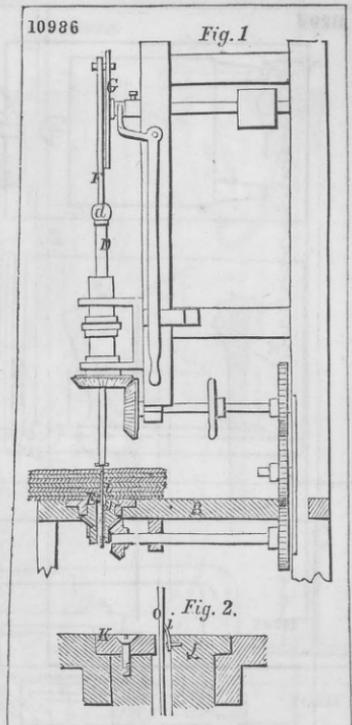
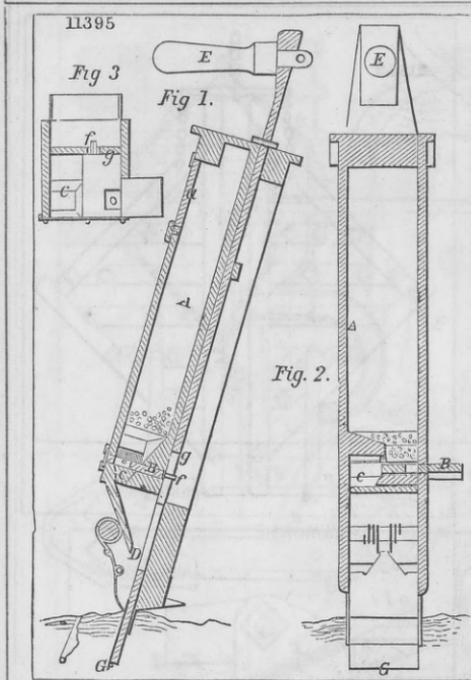
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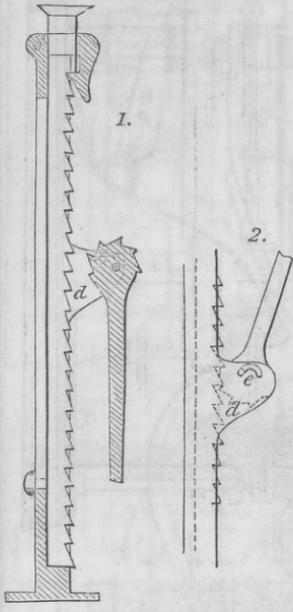
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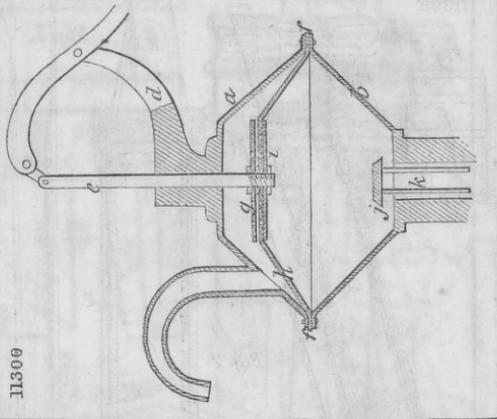
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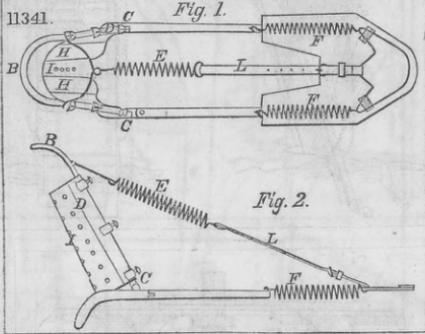
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Fig. 1.

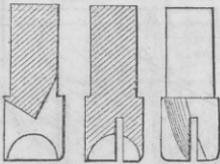
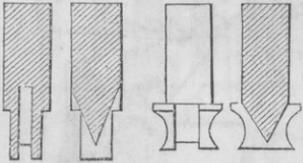
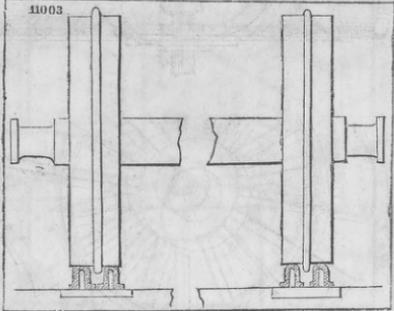


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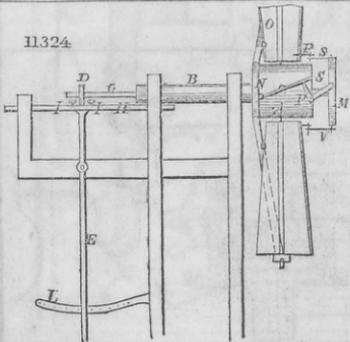
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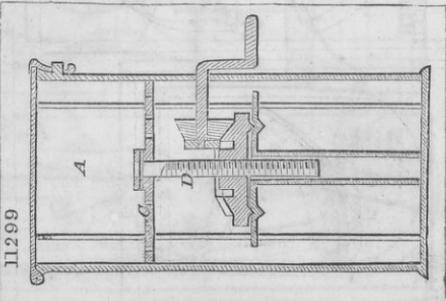
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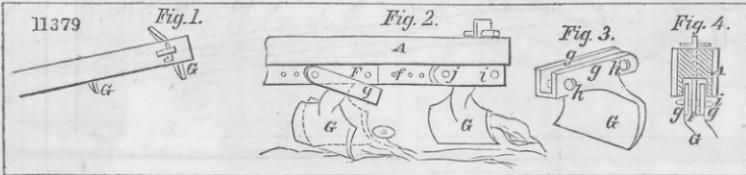
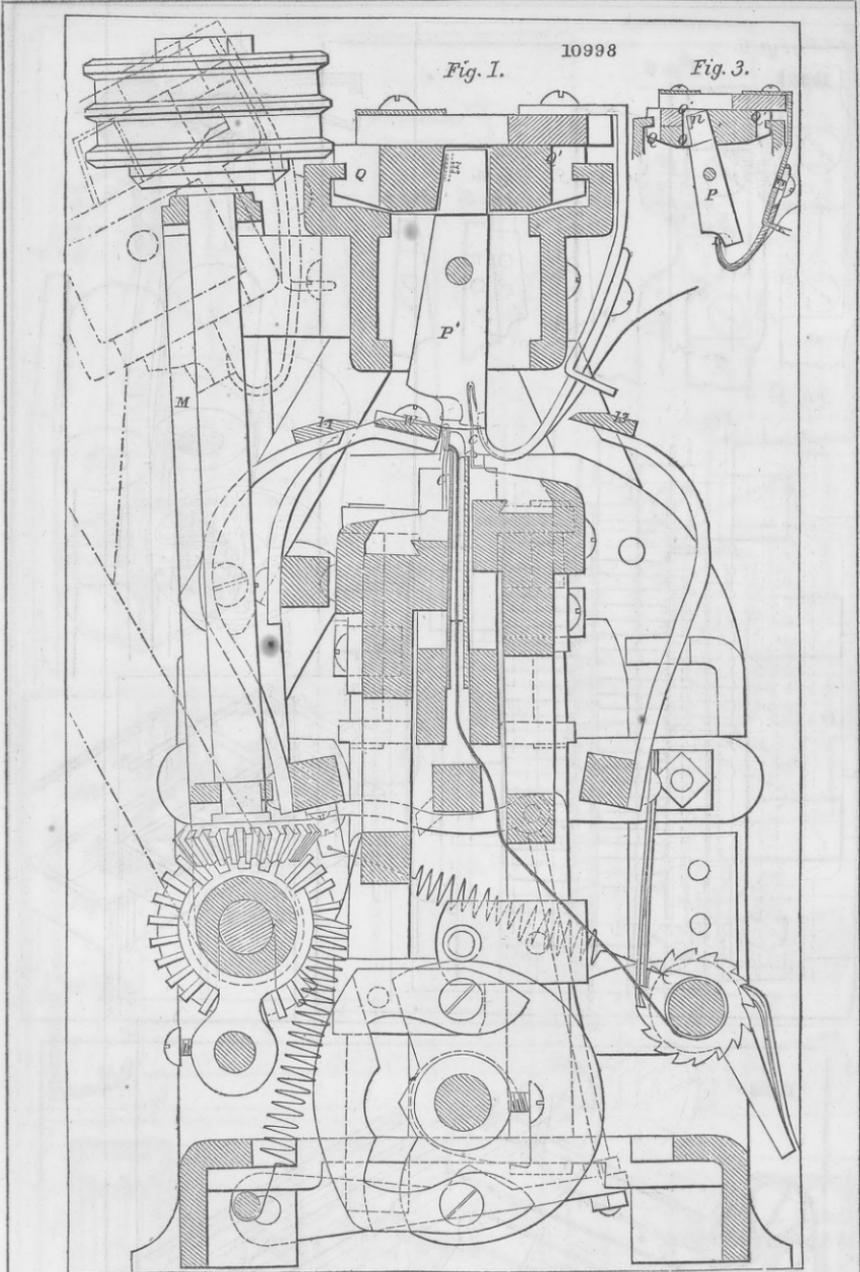


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Fig. 6.

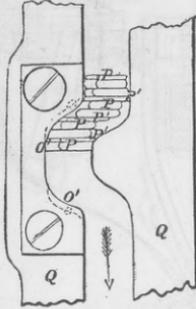


Fig. 5. Fig. 4.

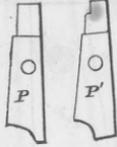
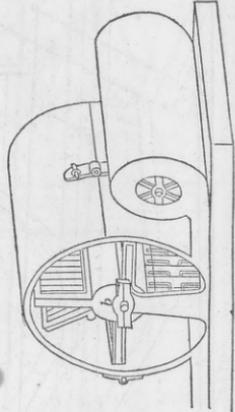
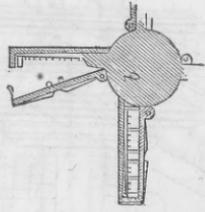
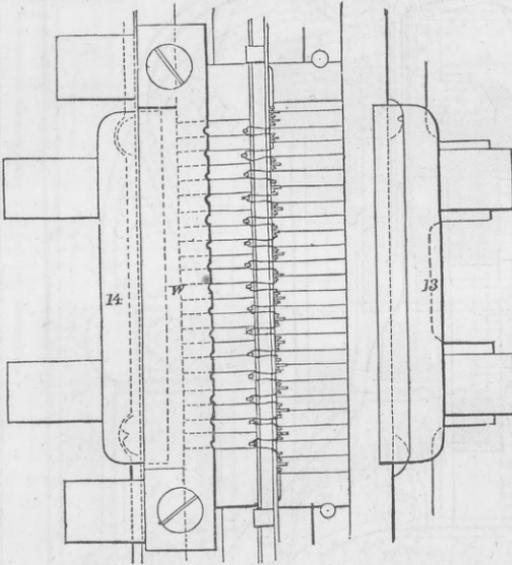
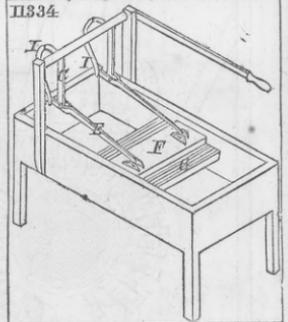


Fig. 2.

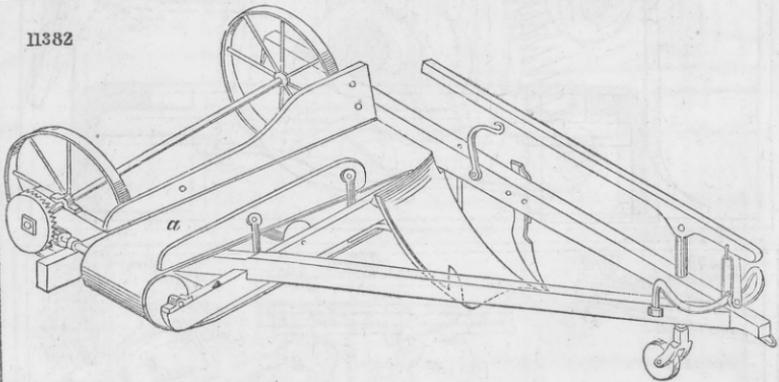


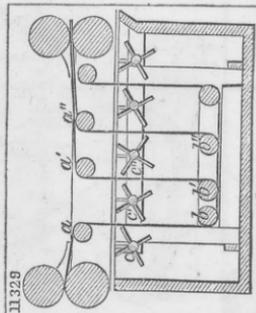
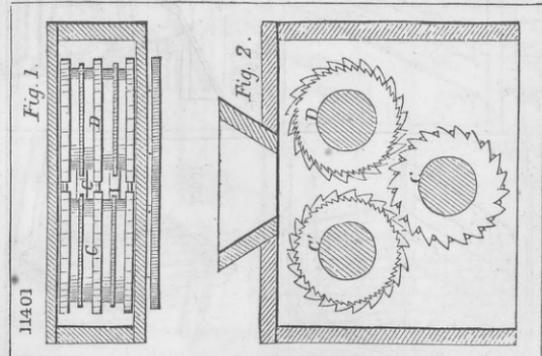
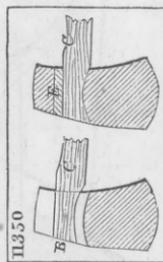
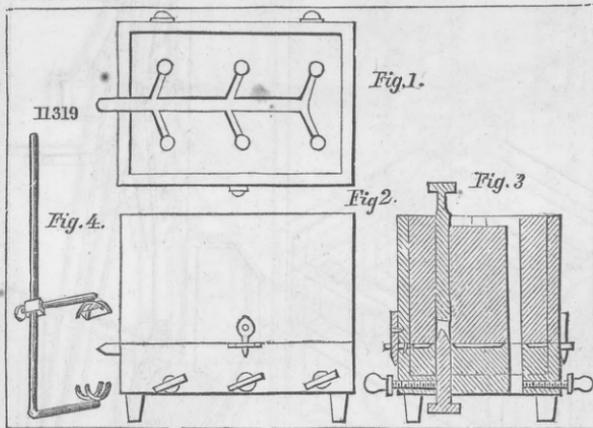
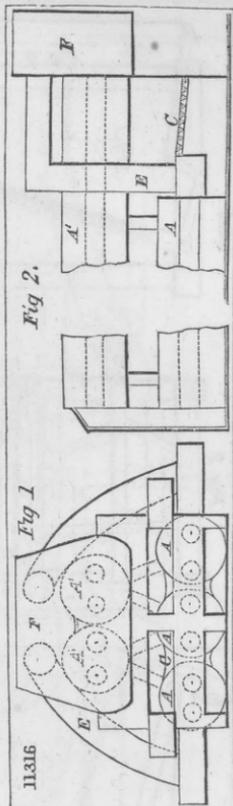
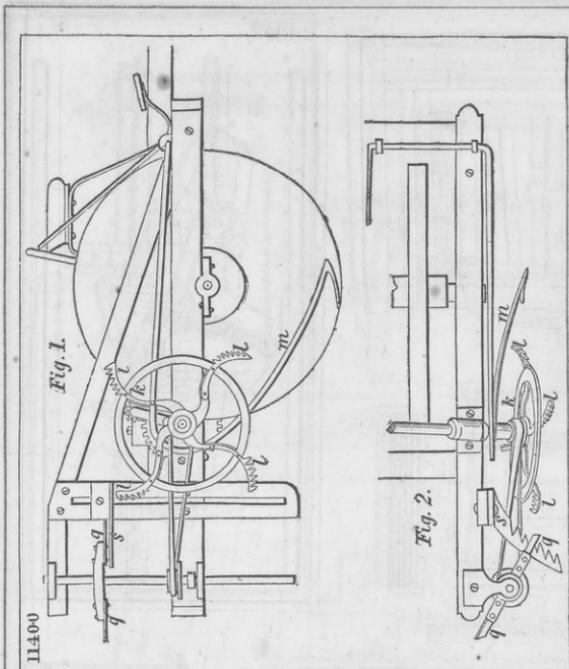
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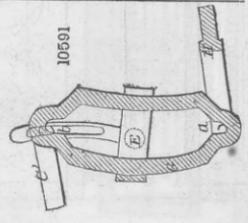
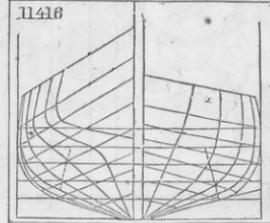
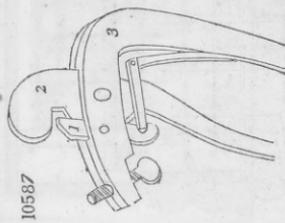
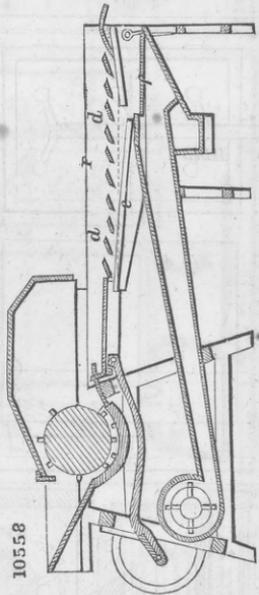
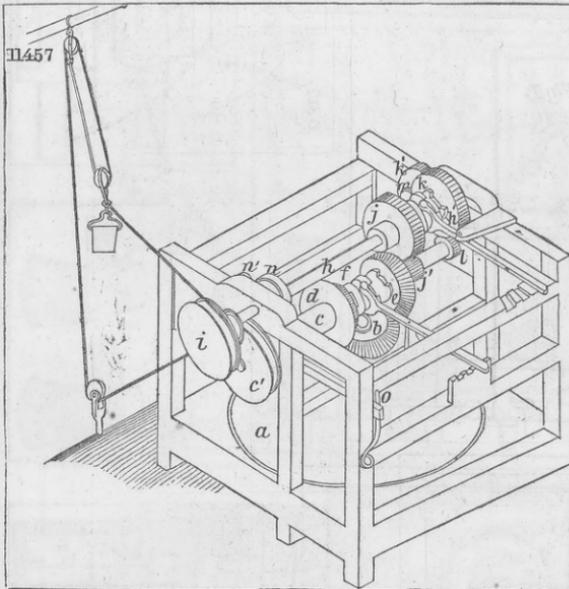
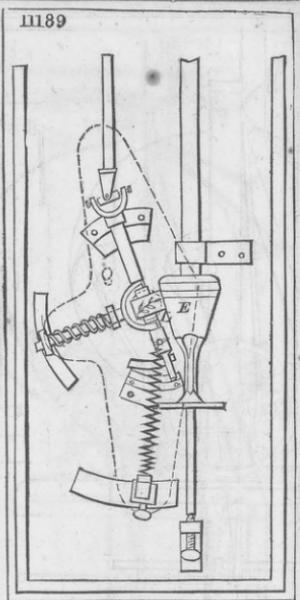
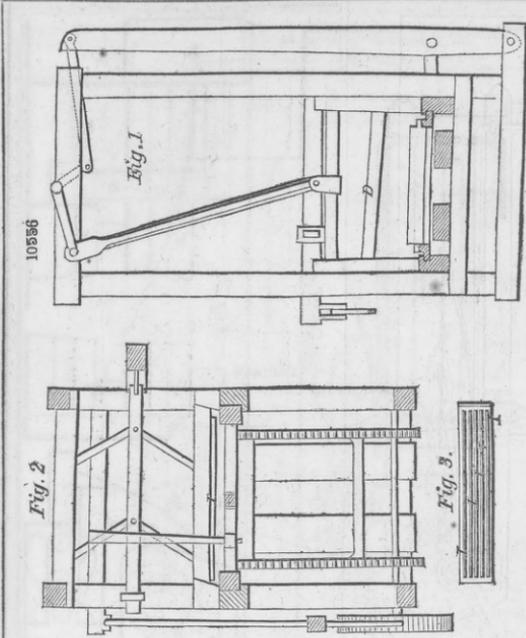
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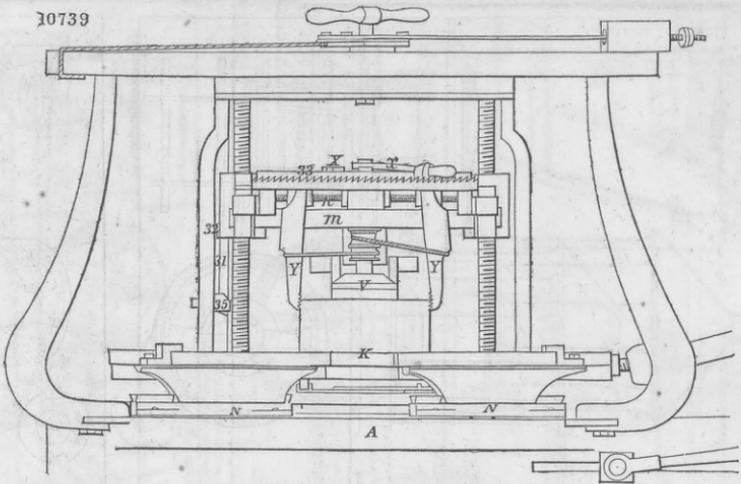


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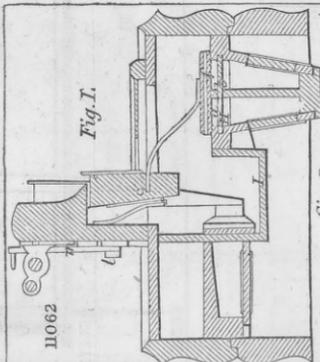
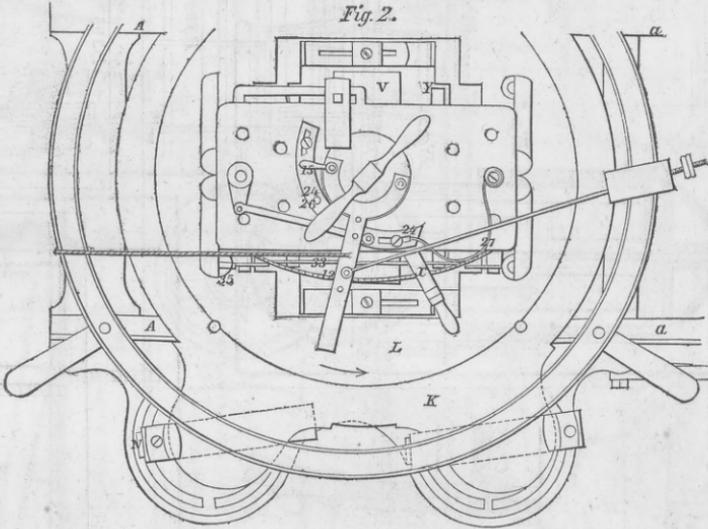


Fig. 1.

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Fig. 2.

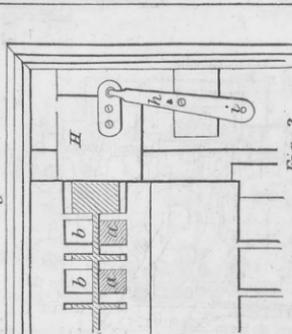
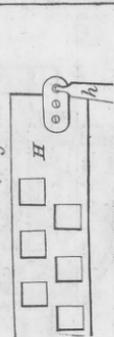
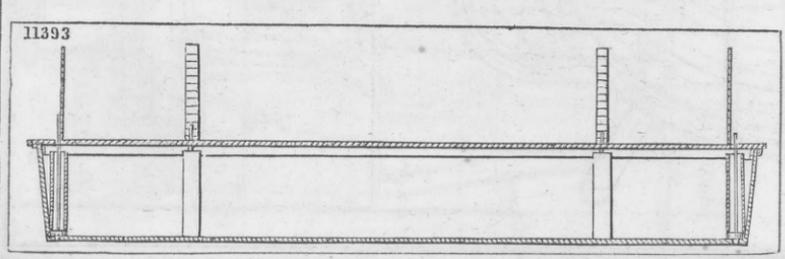
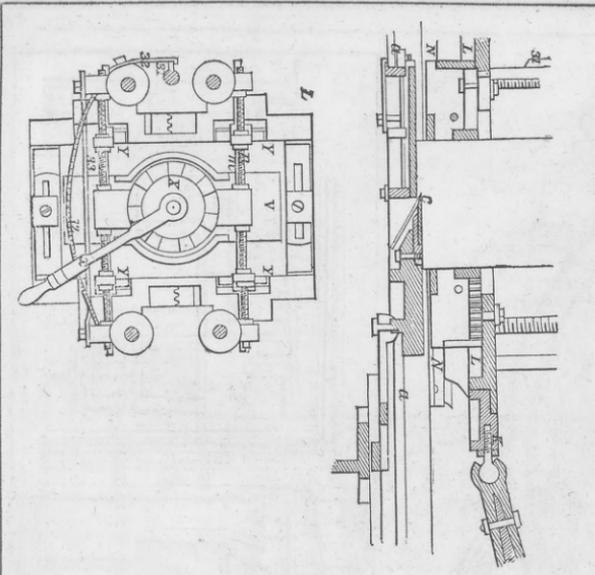
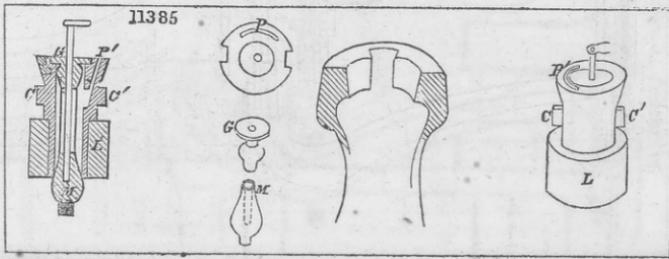
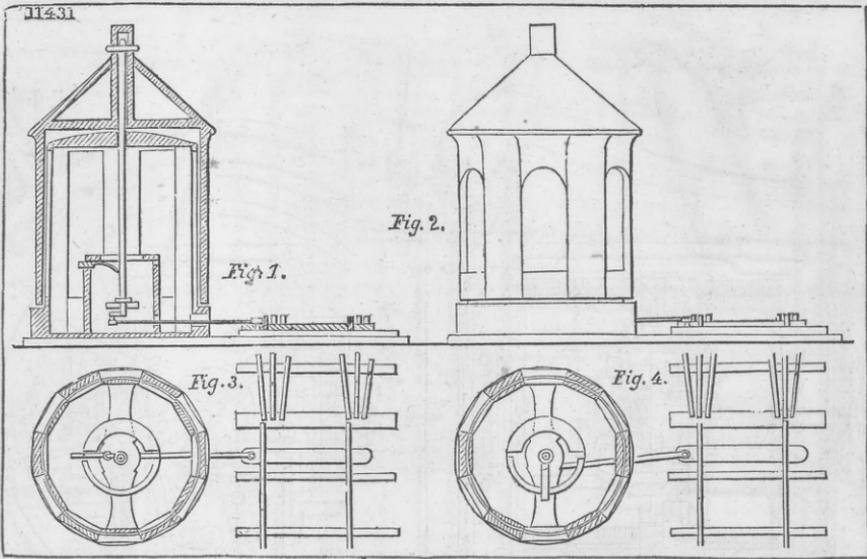


Fig. 3.





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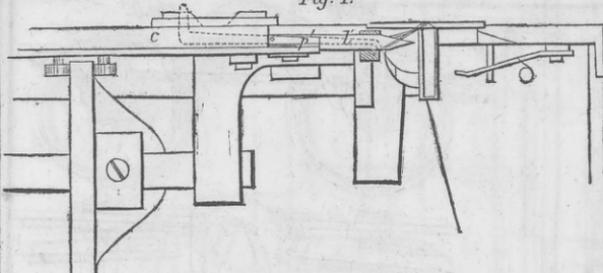


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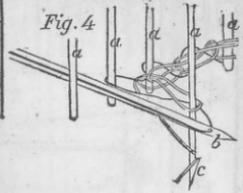


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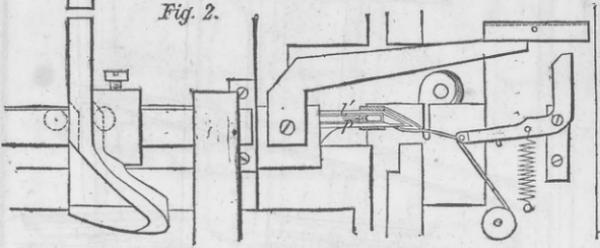


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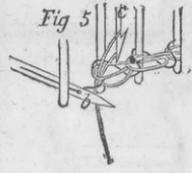


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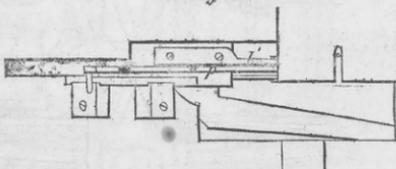


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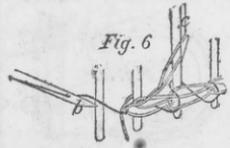


Fig. 1

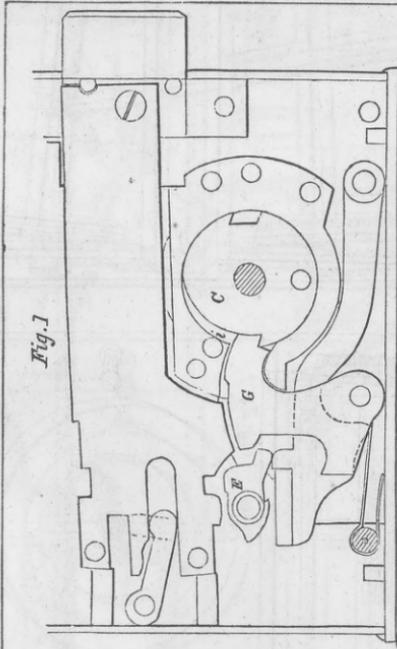


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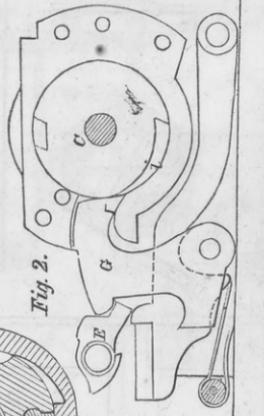


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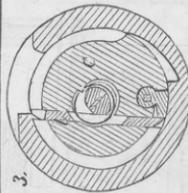
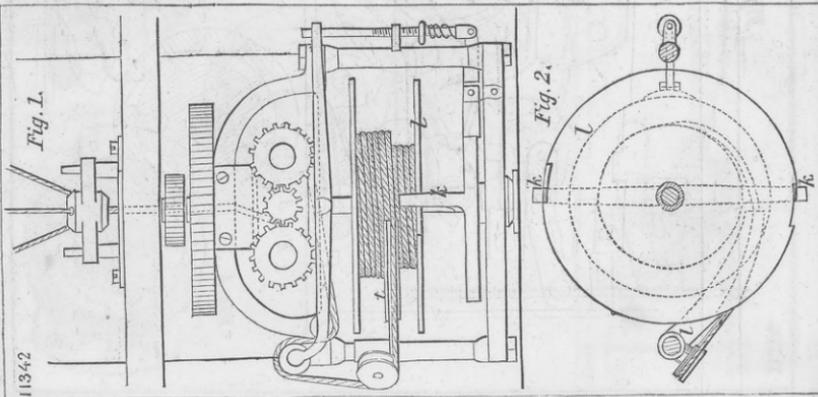
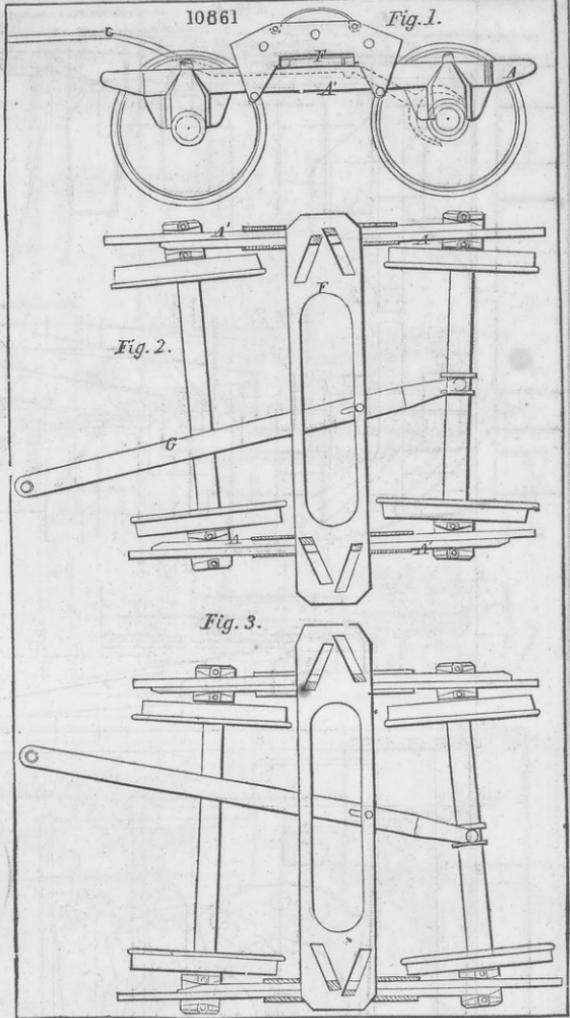
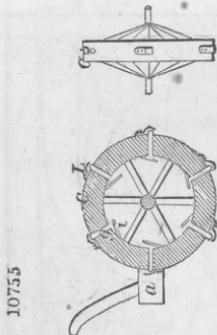
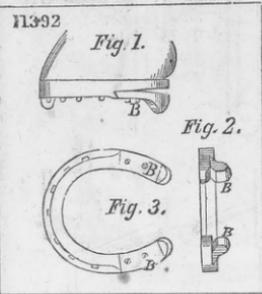
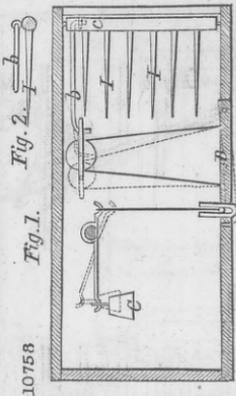
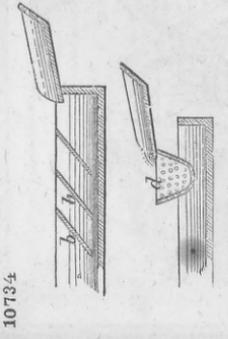
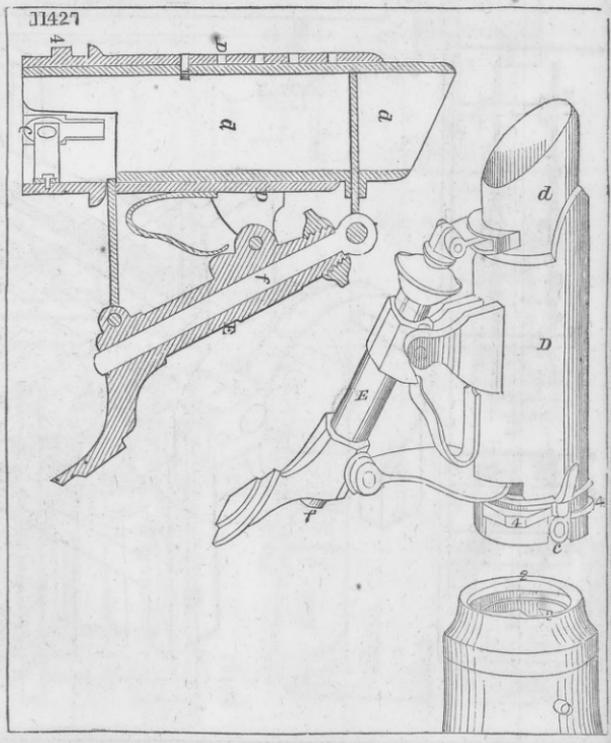
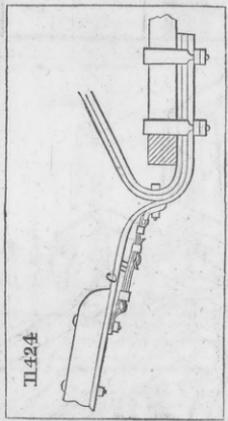
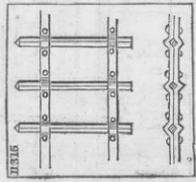
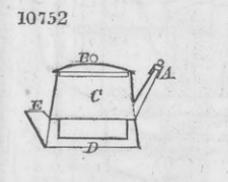
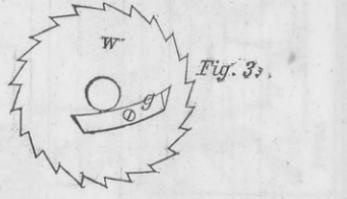
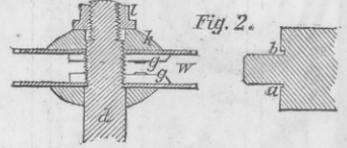
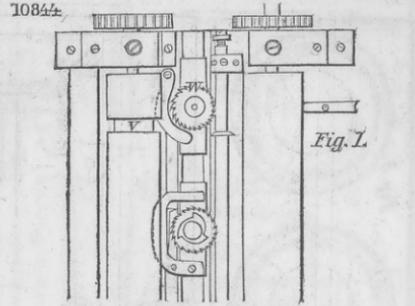
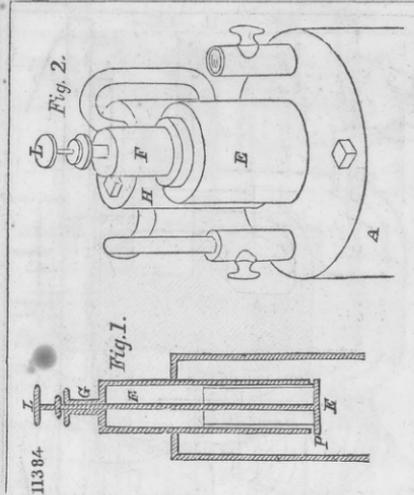


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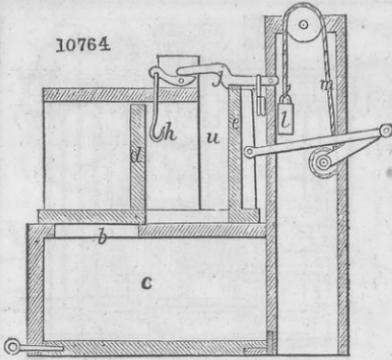


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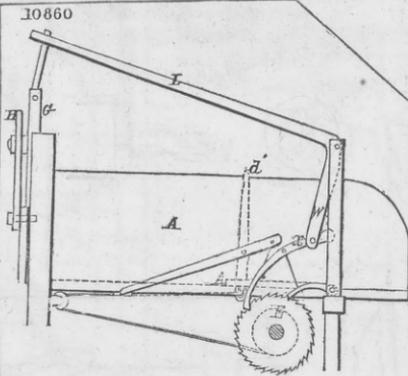




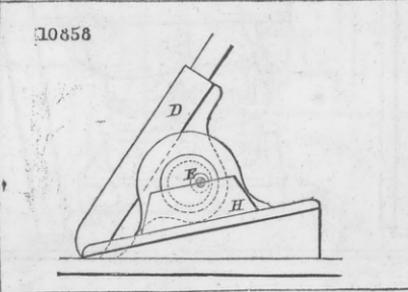
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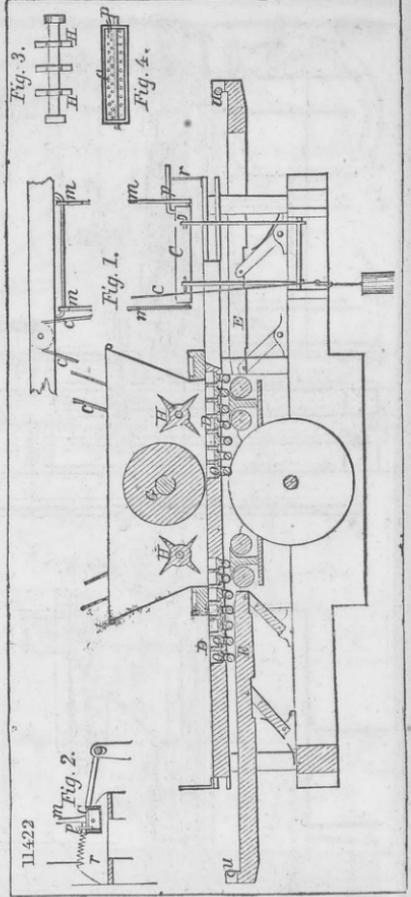
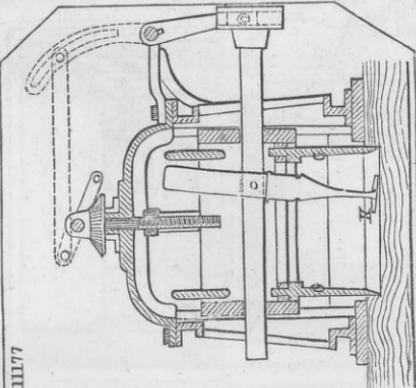
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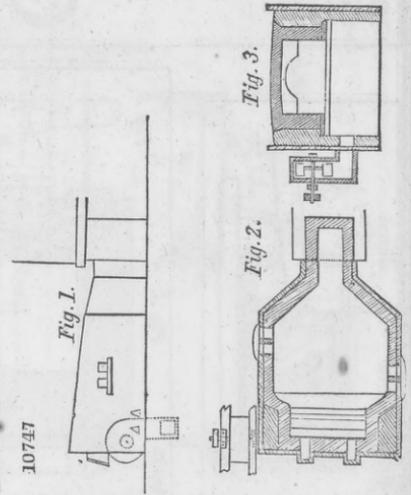
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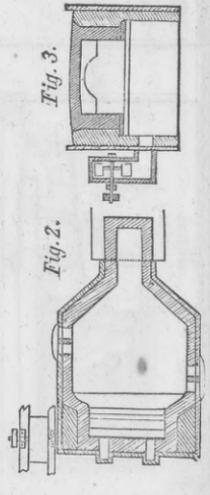
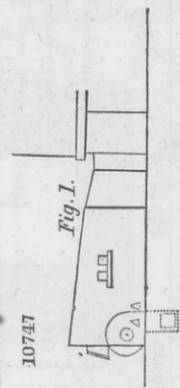
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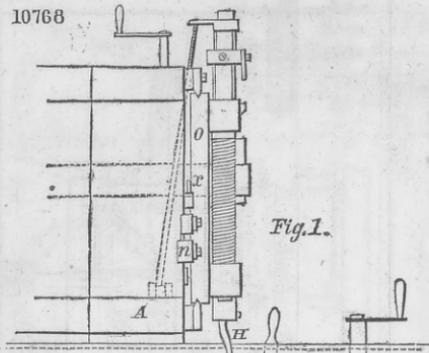


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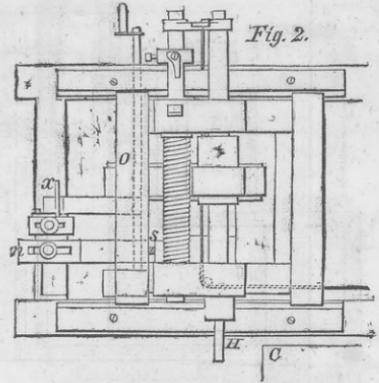


Fig. 2.



Fig. 5.

Fig. 4.

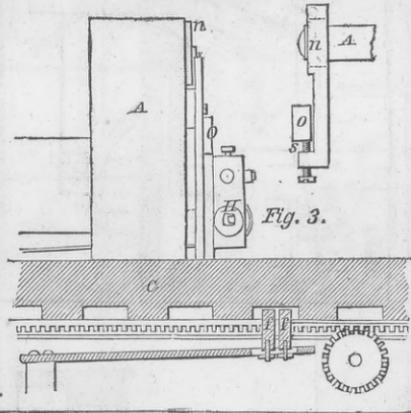
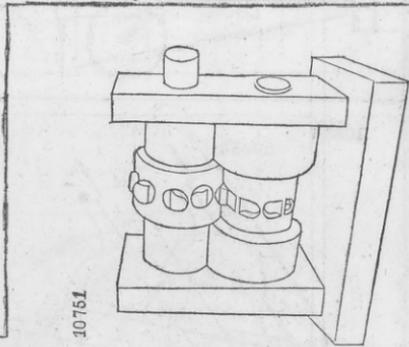
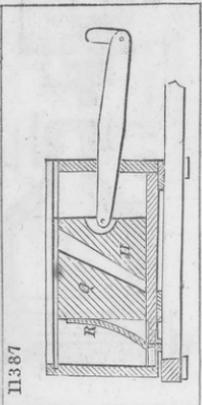


Fig. 3.



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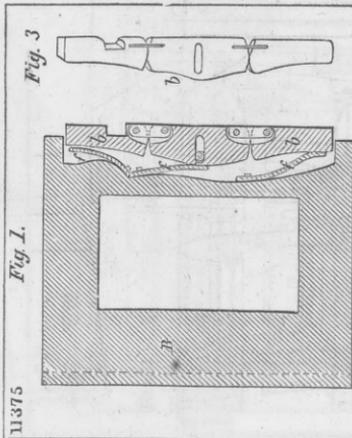


Fig. 1.

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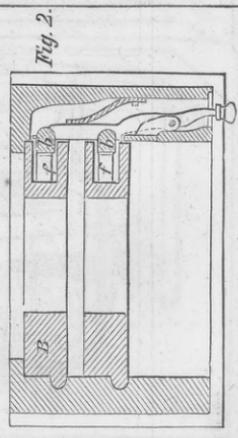
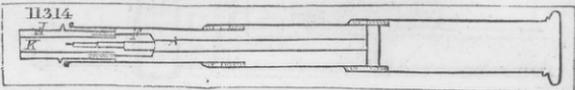
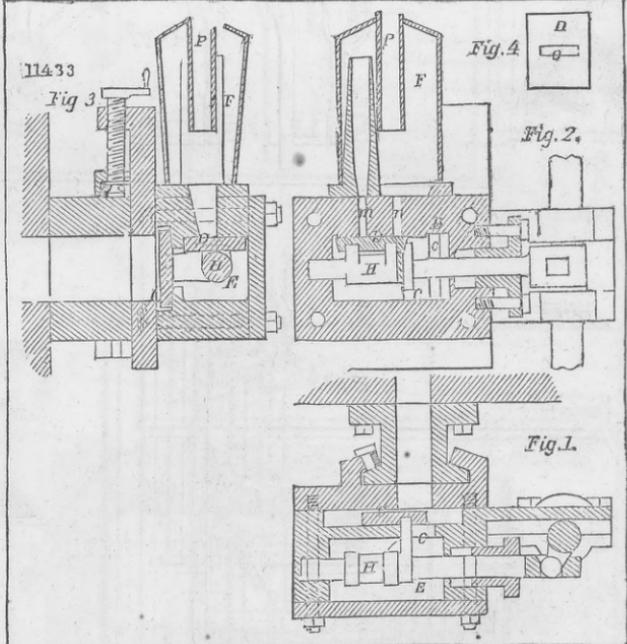
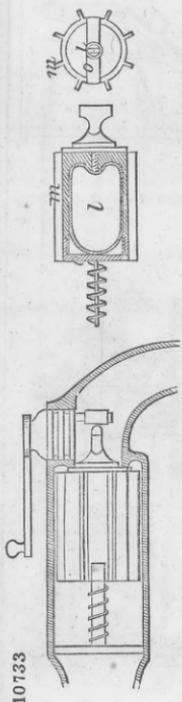
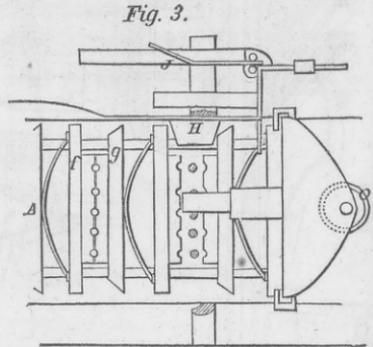
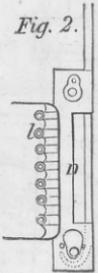
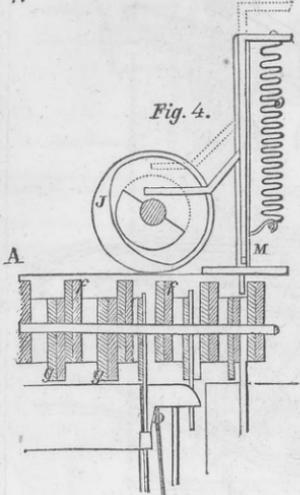
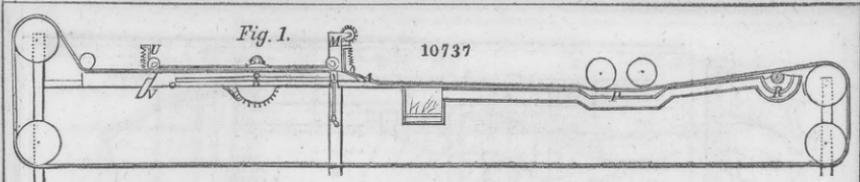
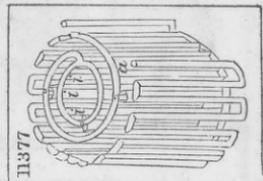
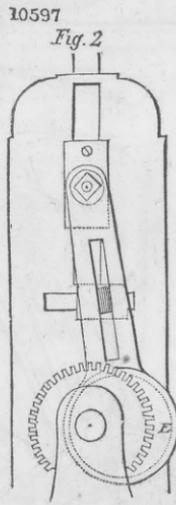
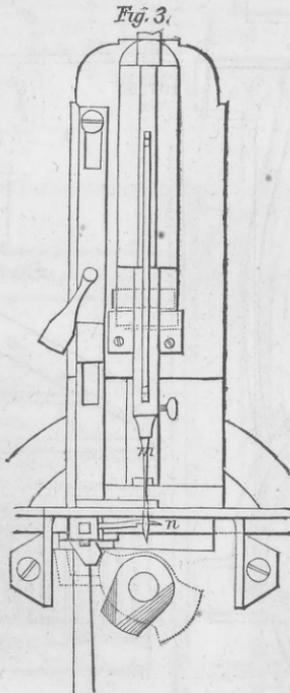
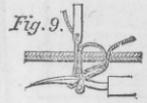
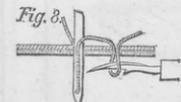
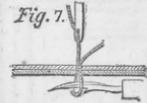
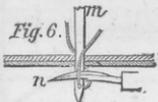
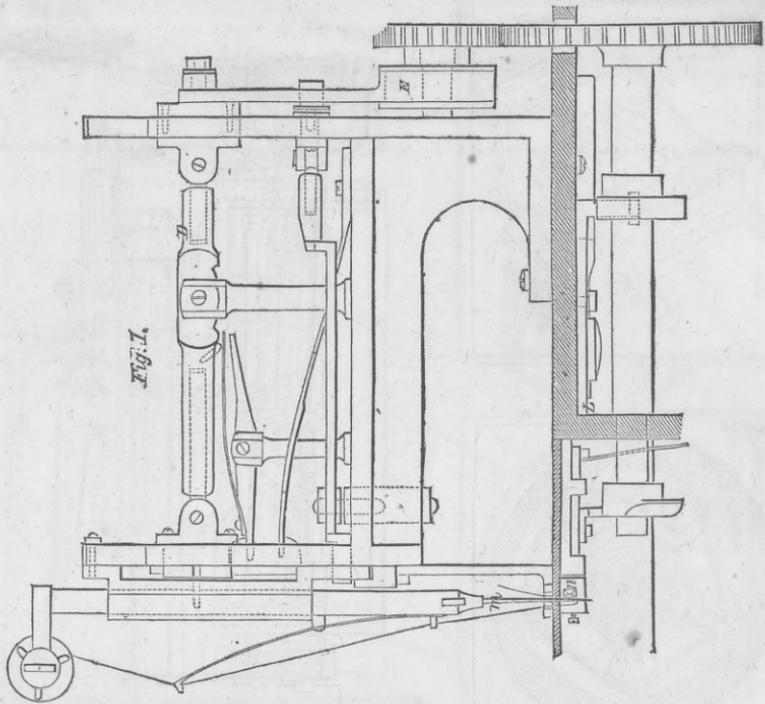


Fig. 2.





11426

Fig. 1.

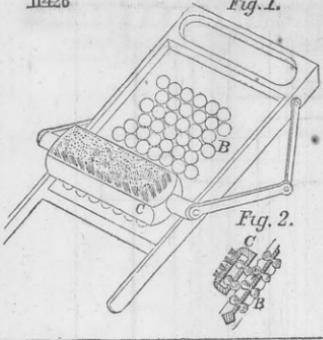


Fig. 2.



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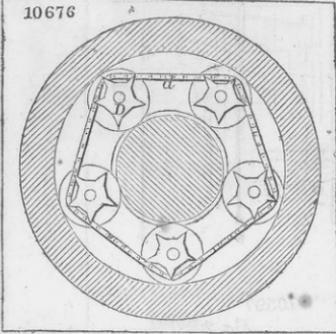
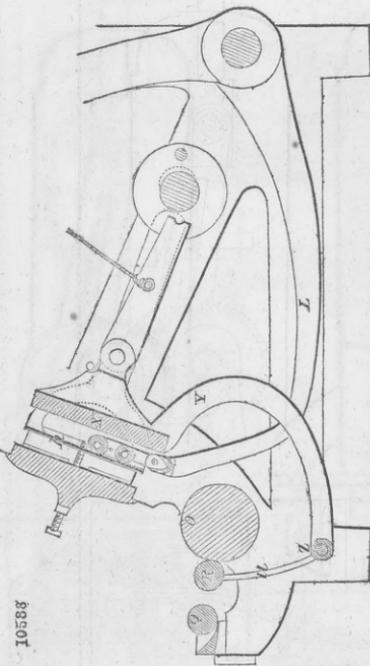
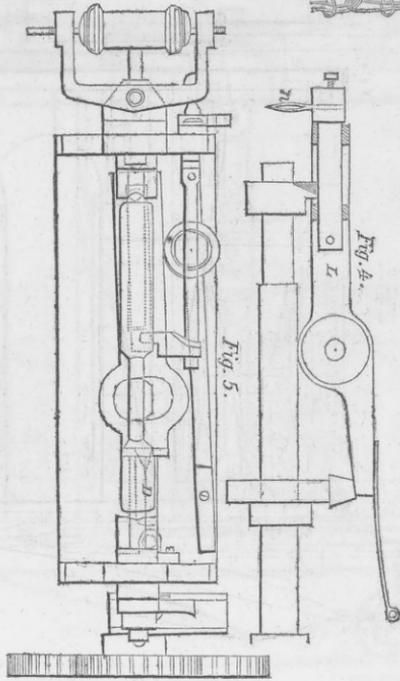


Fig. 12.



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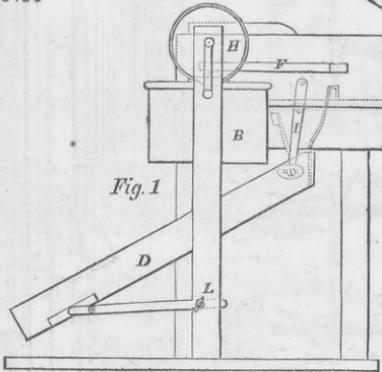


Fig. 1

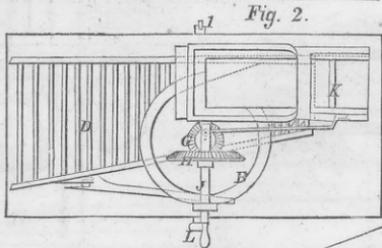
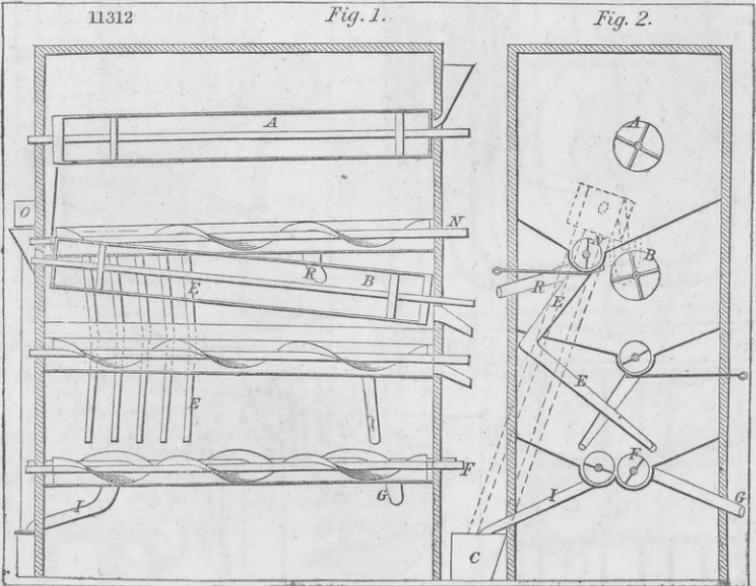
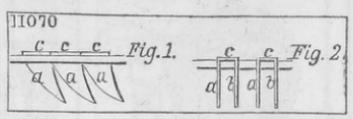
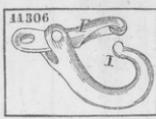
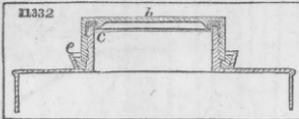
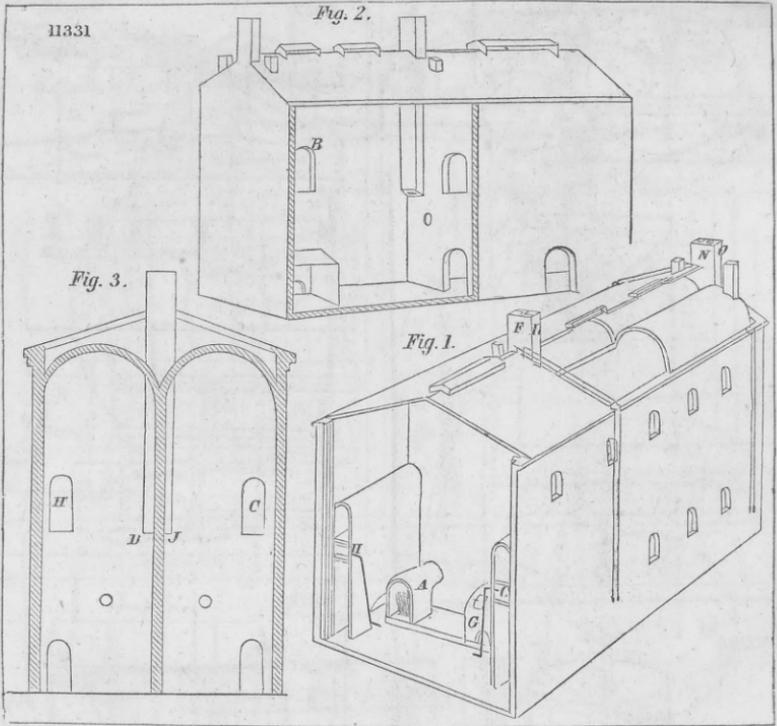
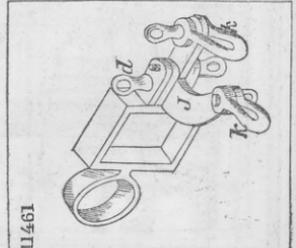
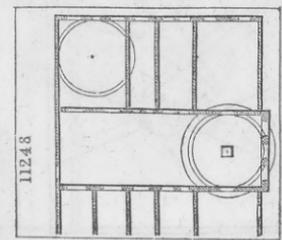
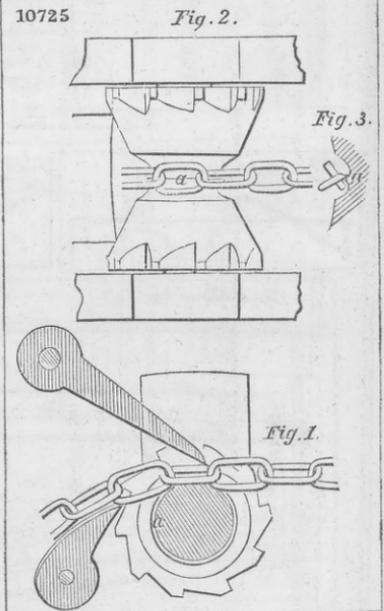
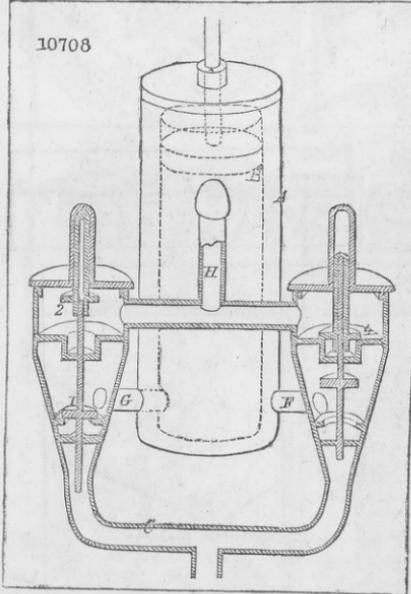
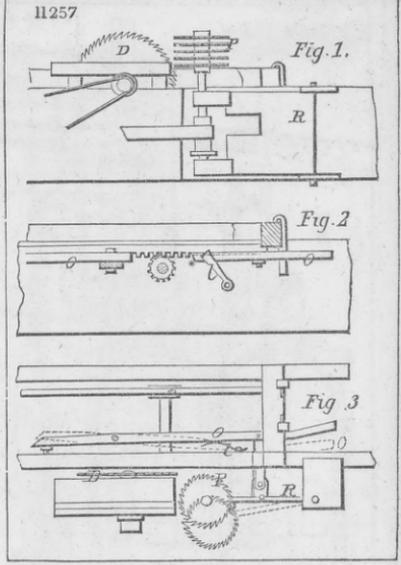
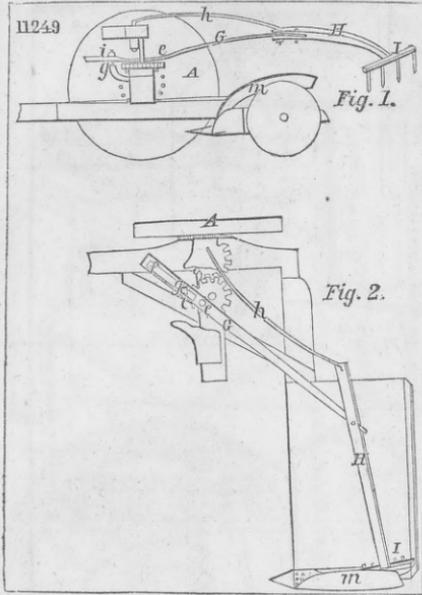
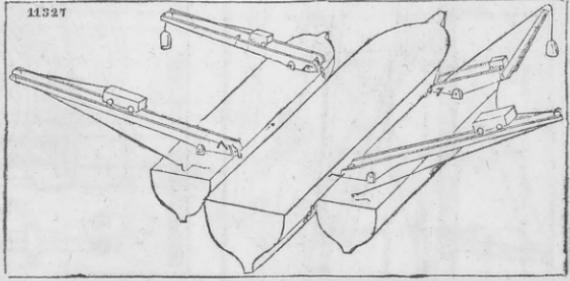
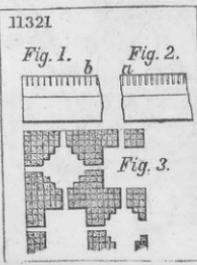
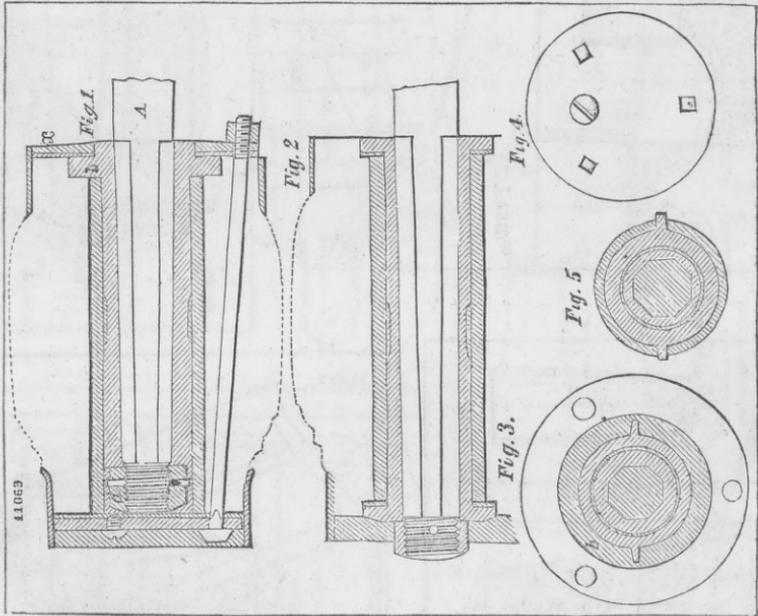
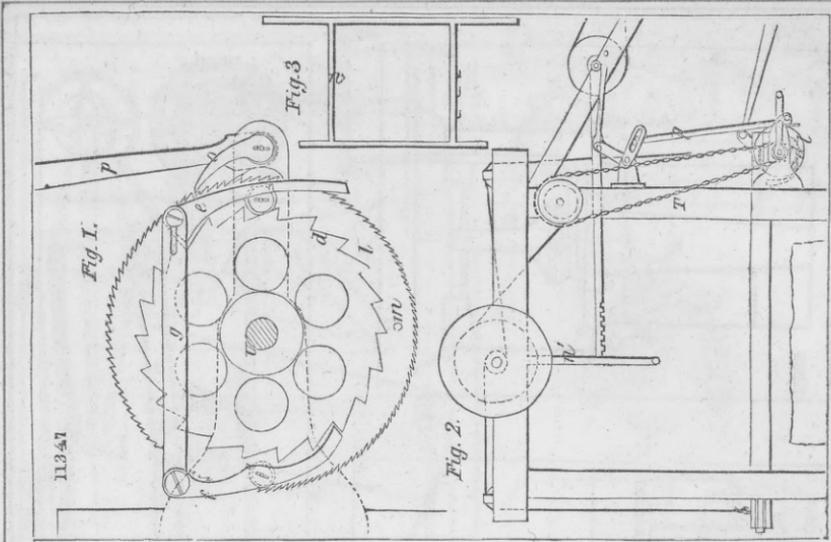


Fig. 2.







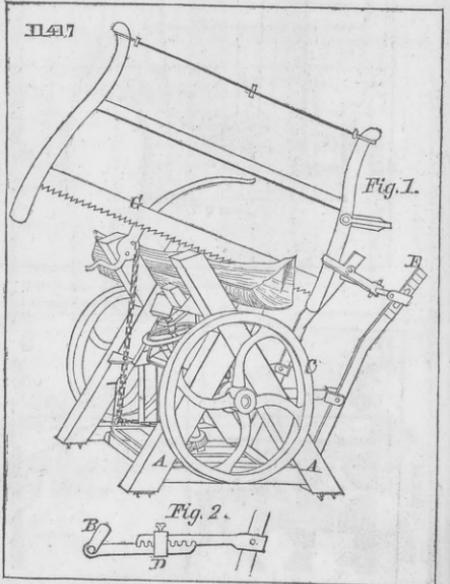
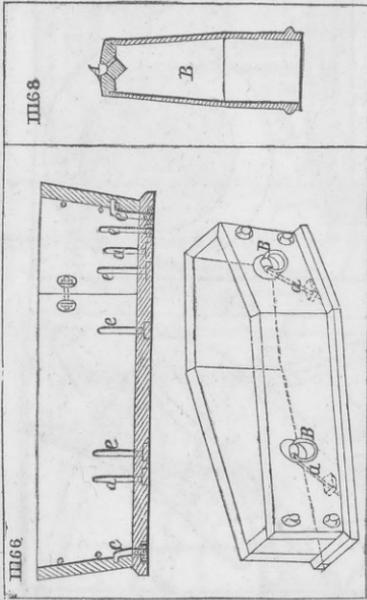
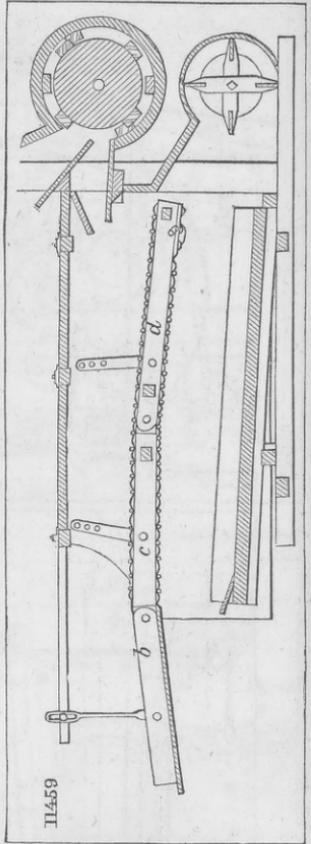
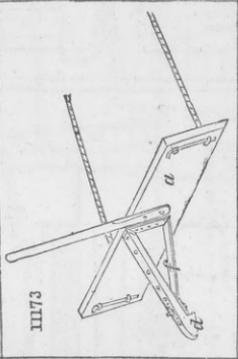
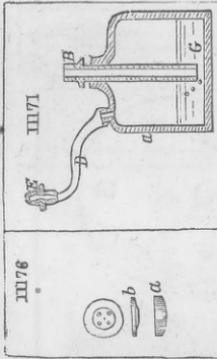
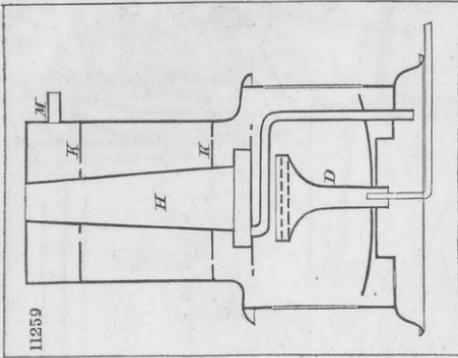


Fig. 1.

11252

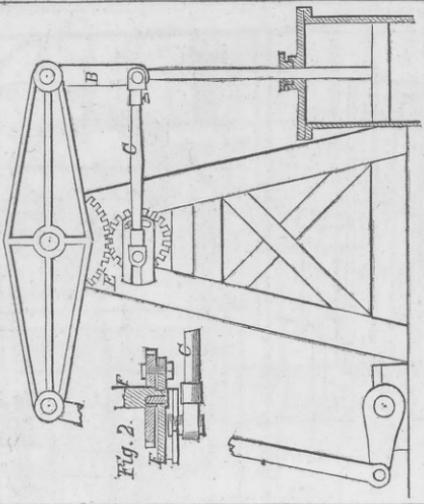
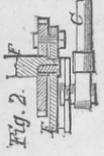


Fig. 2.



10765

Fig. 1.

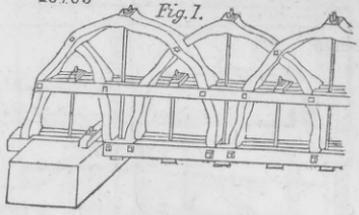
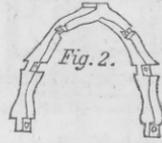


Fig. 2.



10864

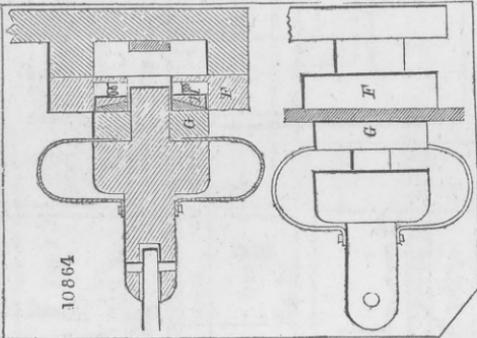


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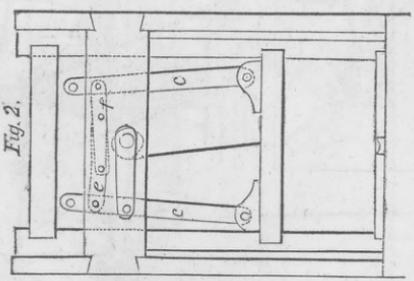
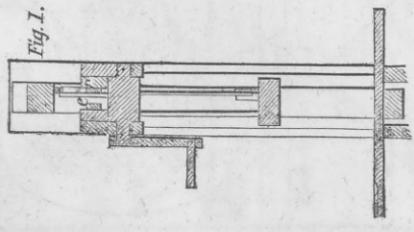
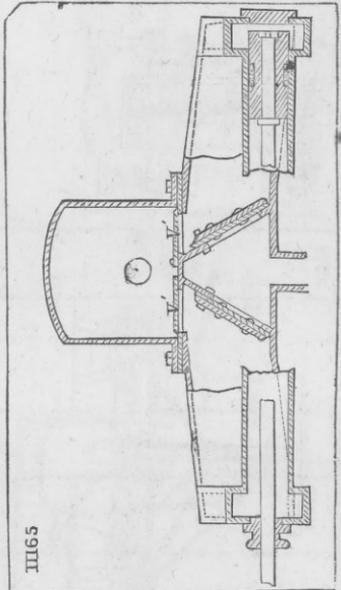


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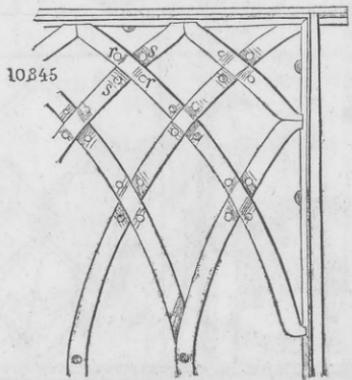


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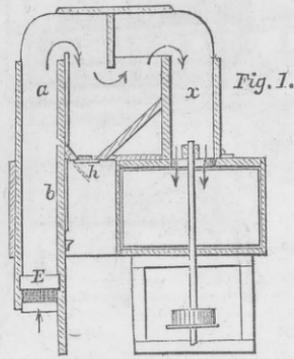


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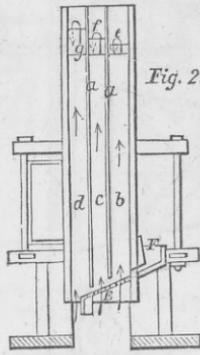
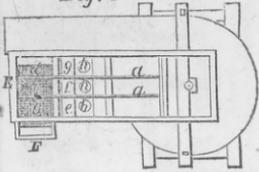
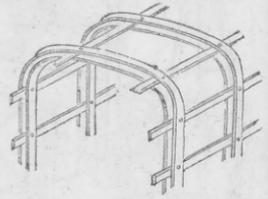


Fig. 2.

Fig. 3.



10721



11413

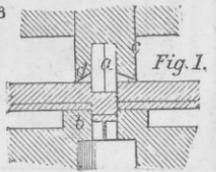


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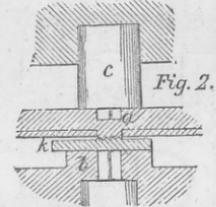


Fig. 2.

11193

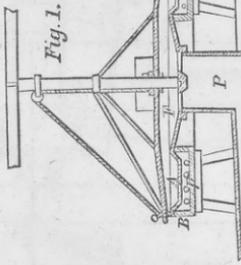


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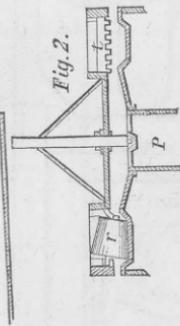


Fig. 2.

11181

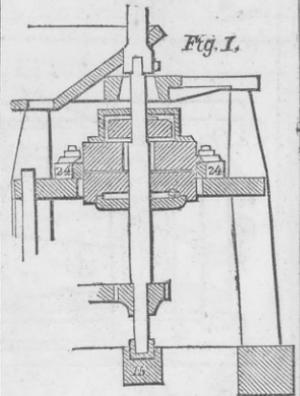
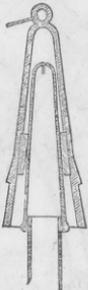


Fig. 1.

10760



10865

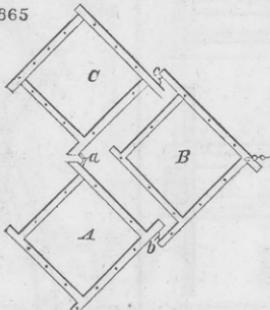
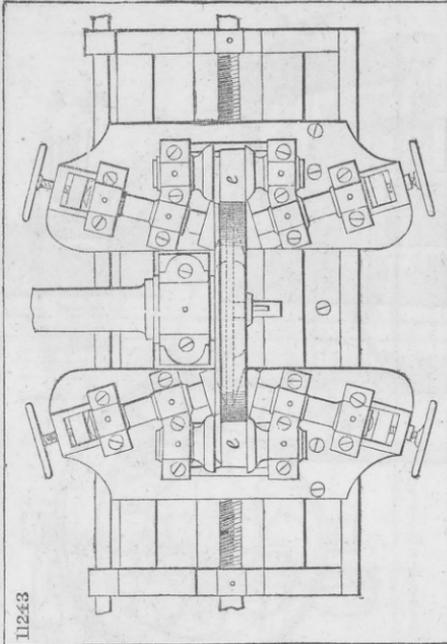
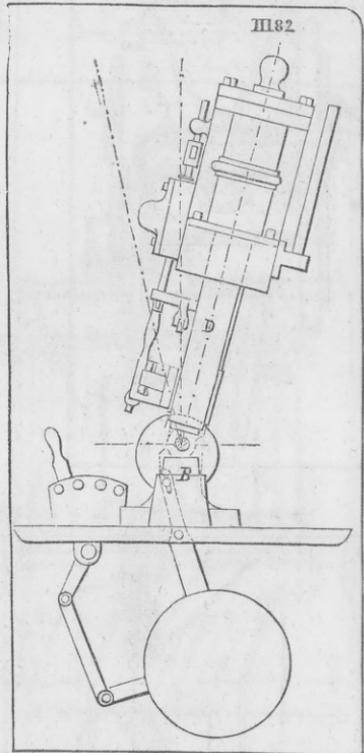
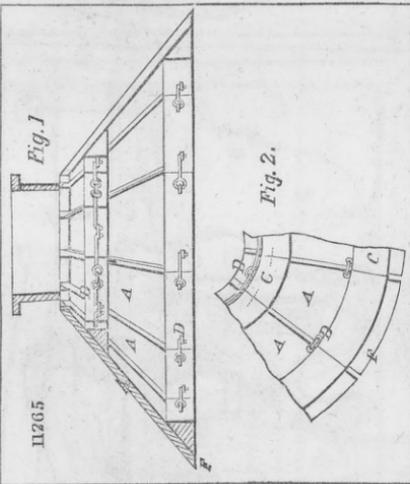
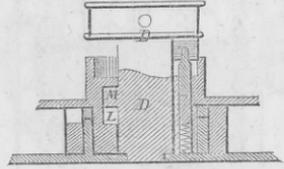
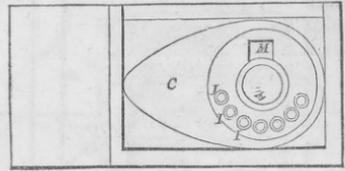


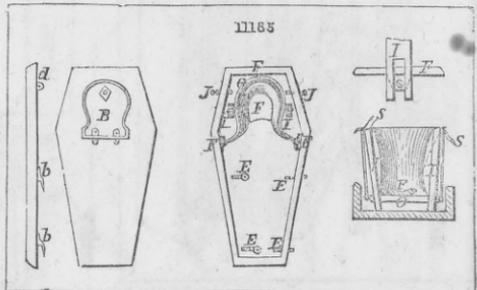
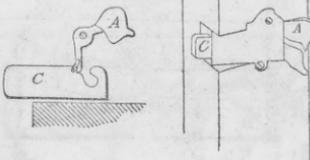
Fig. 2.



10584



10596



11418

Fig. 1

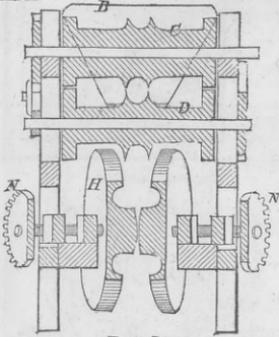


Fig. 2

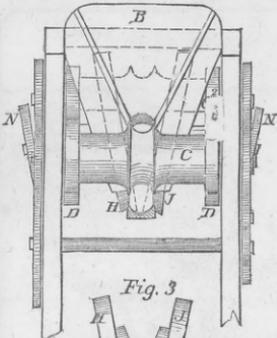
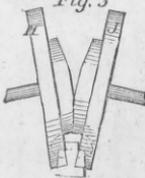


Fig. 3



1147

Fig. 1.

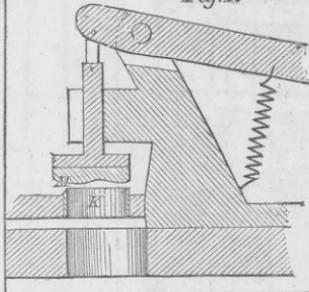
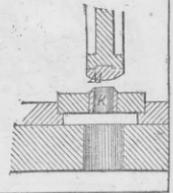
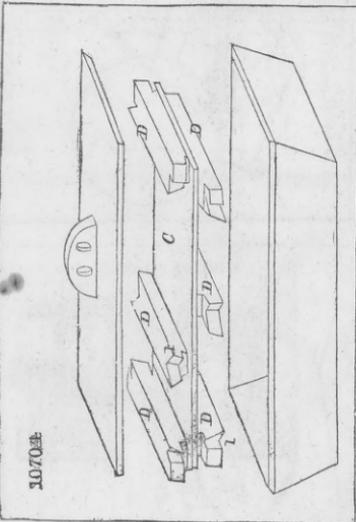
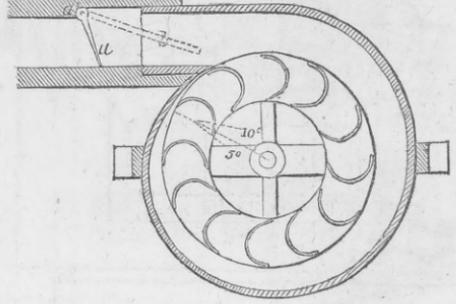


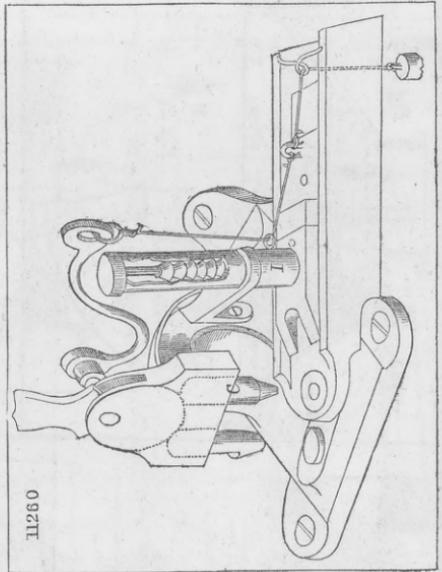
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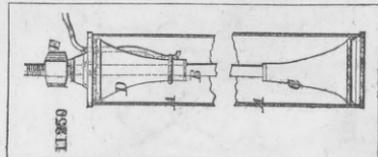
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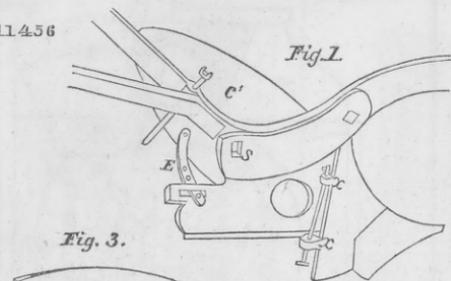


Fig. 3.

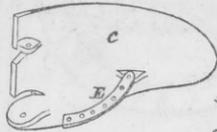
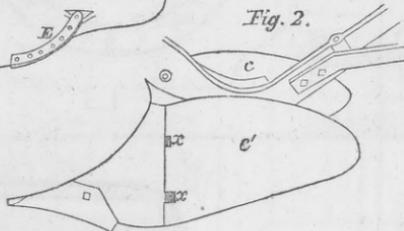


Fig. 2.



10754

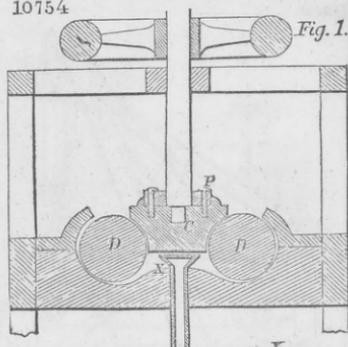


Fig. 2.



11172

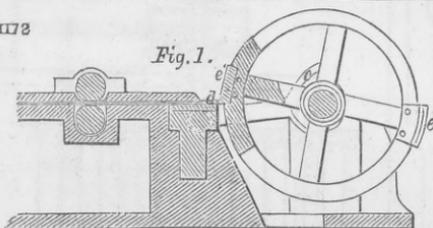


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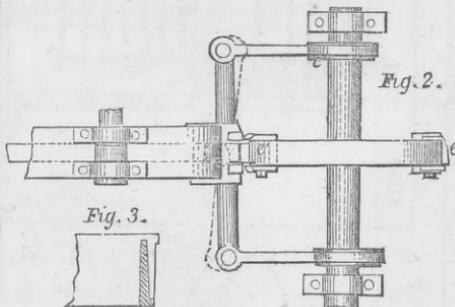
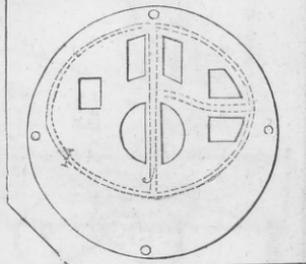
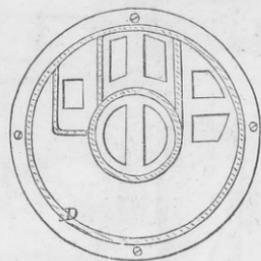
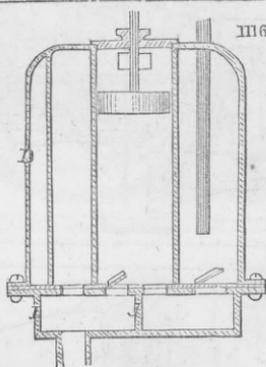


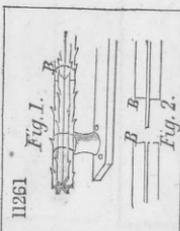
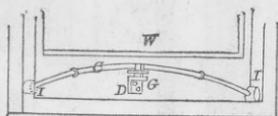
Fig. 3.



11169

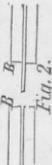


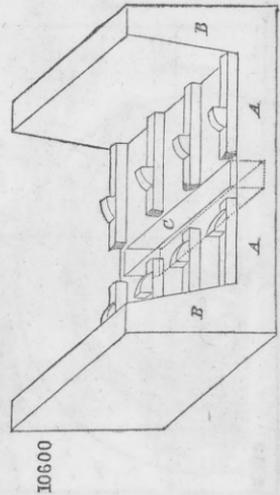
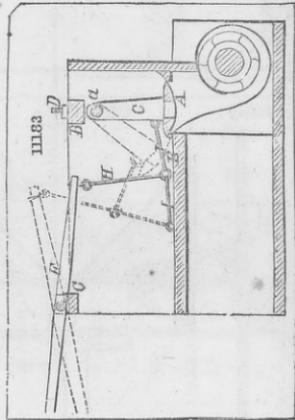
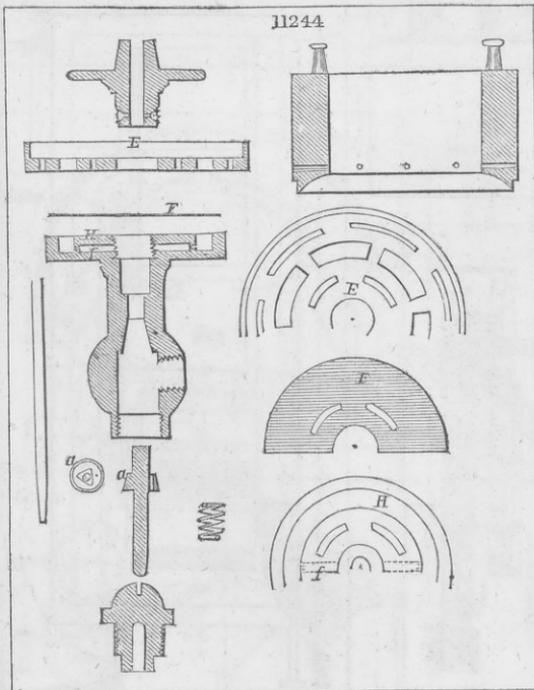
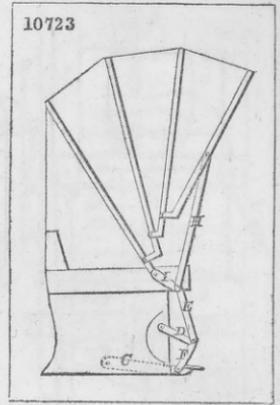
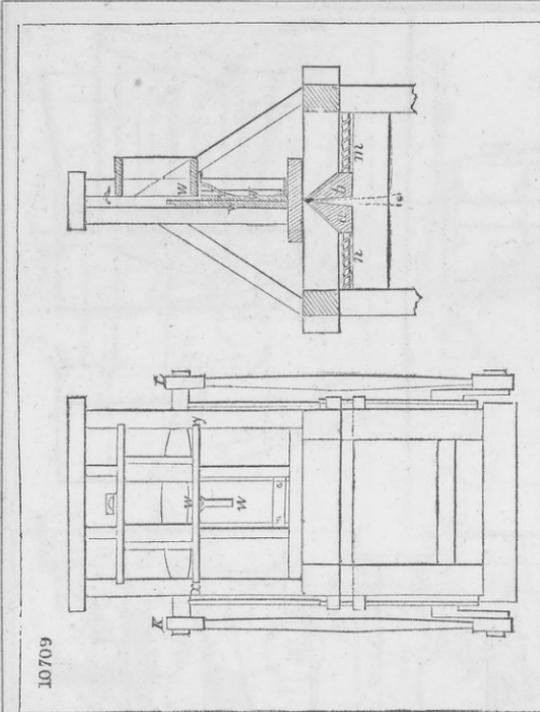
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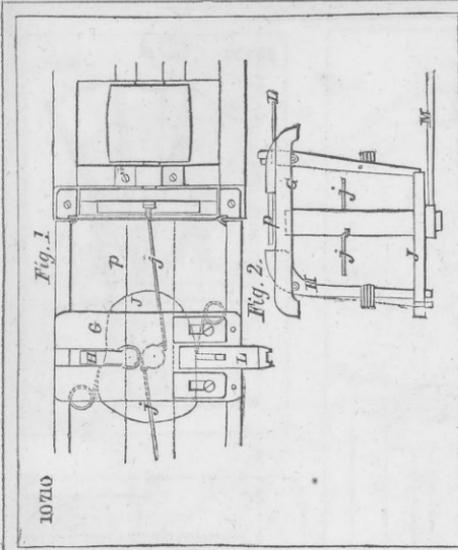


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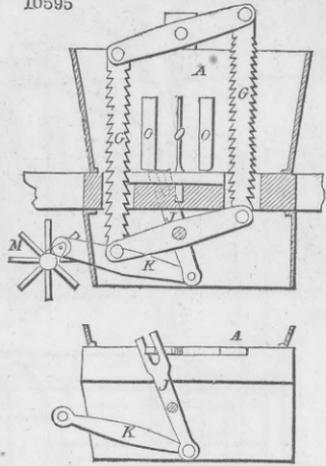
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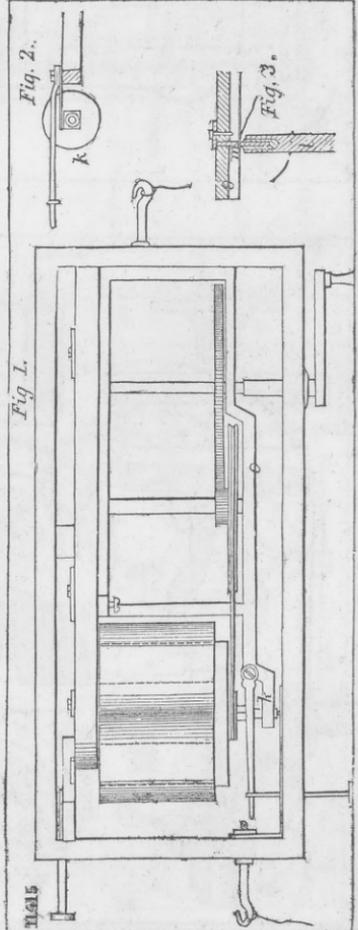
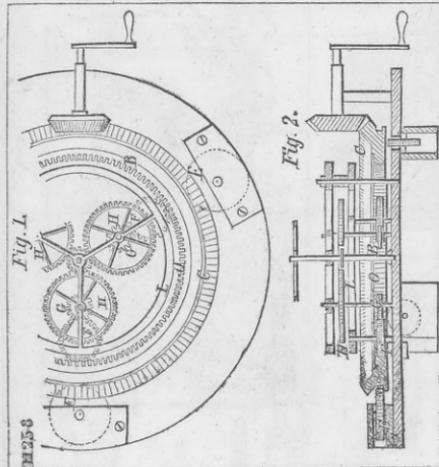
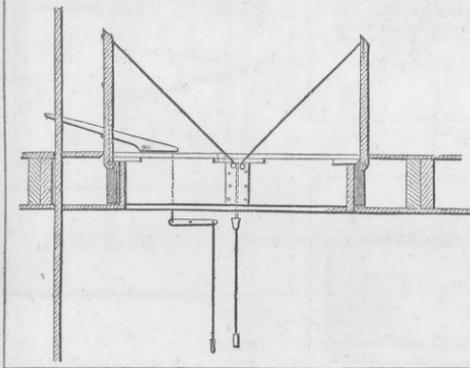


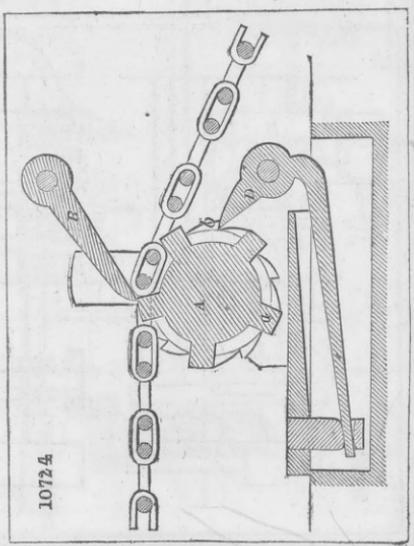
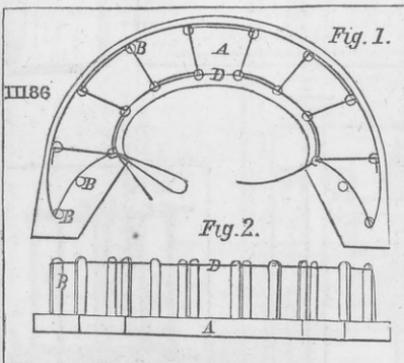
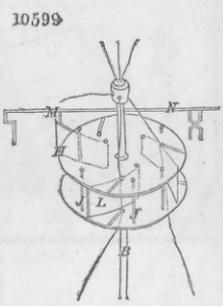
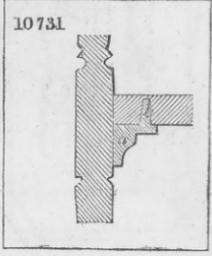
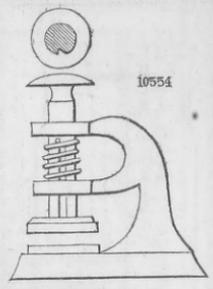
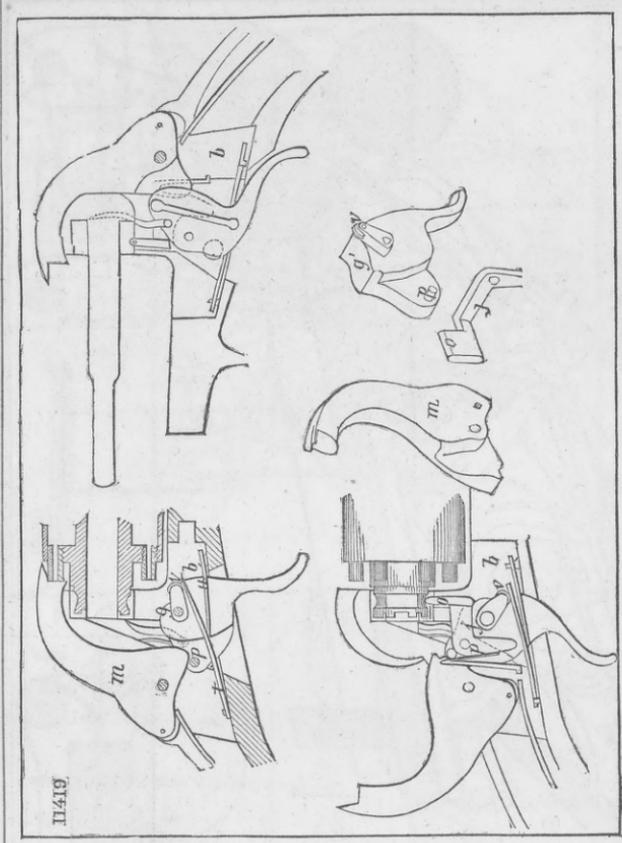


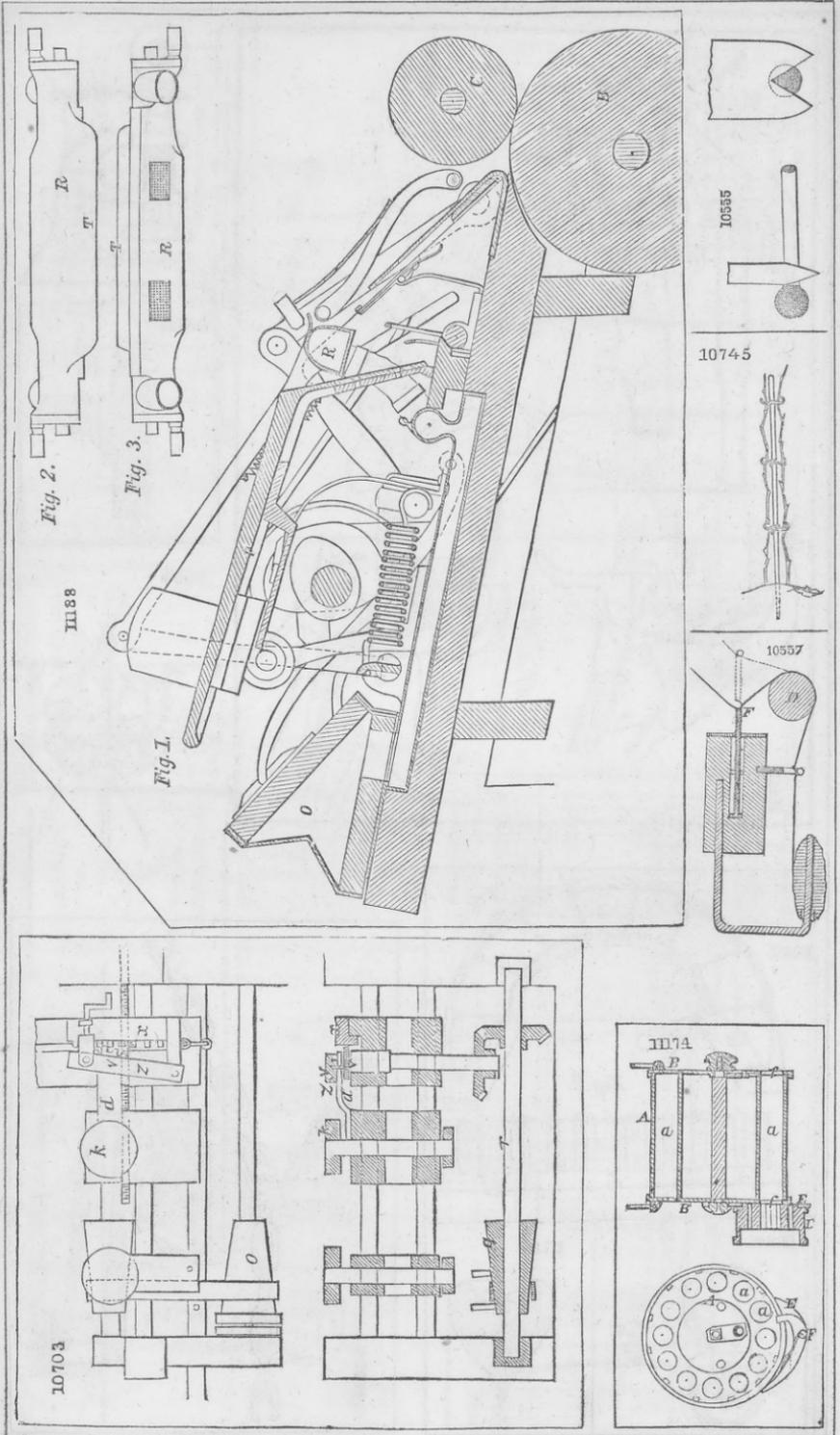
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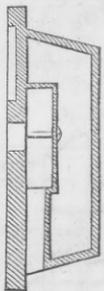
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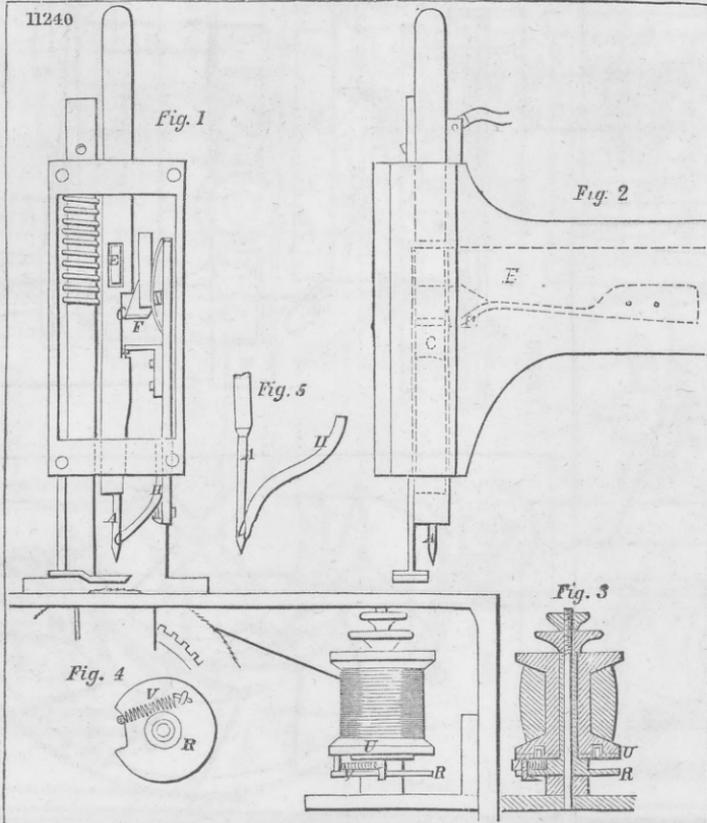


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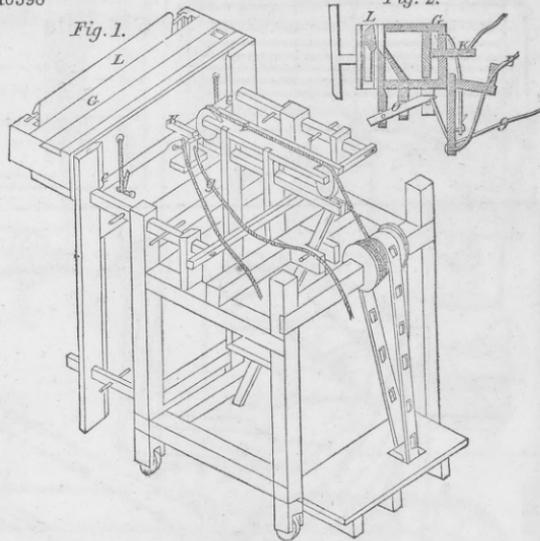
Fig. 1



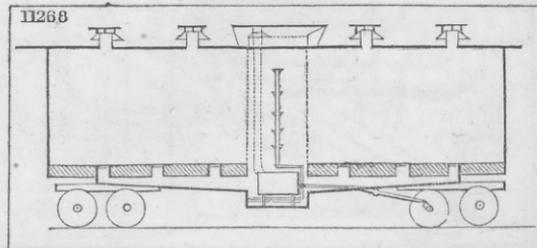
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Fig. 1.

Fig. 2.



11268



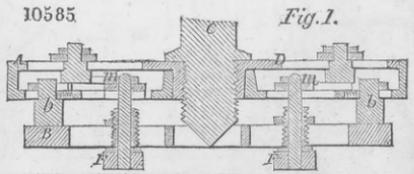
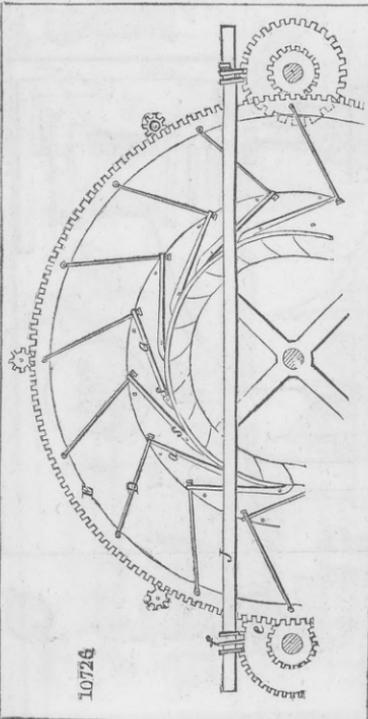
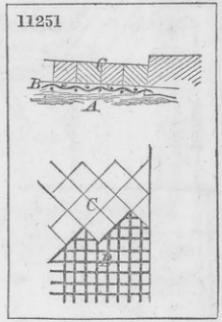
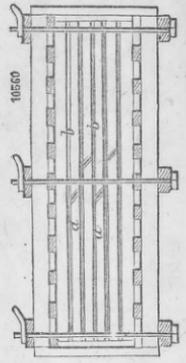
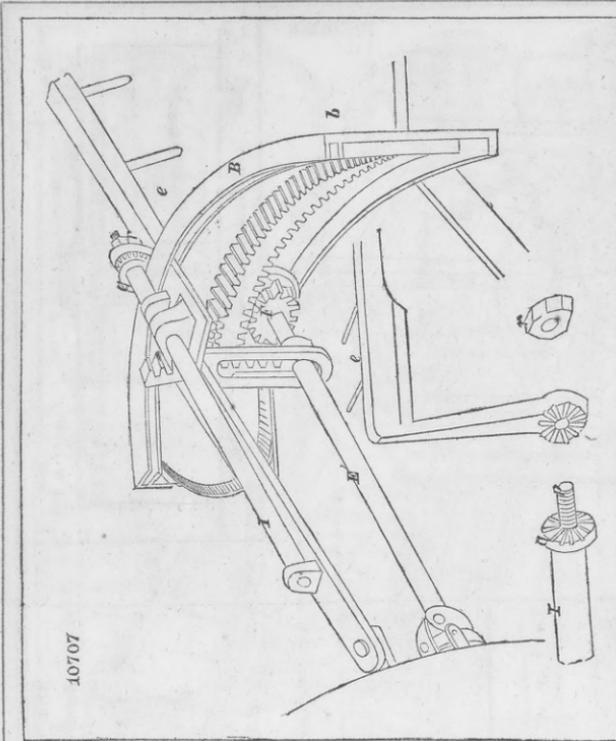


Fig. 1.

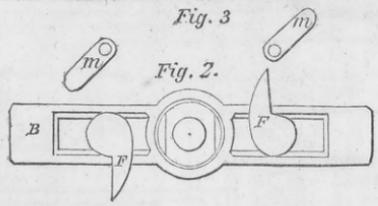
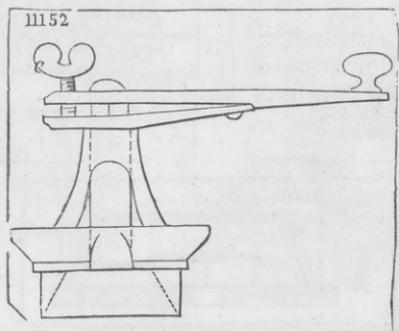
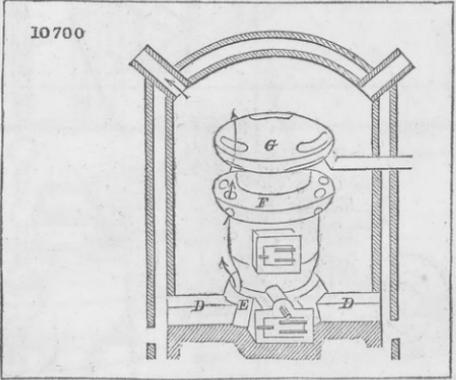
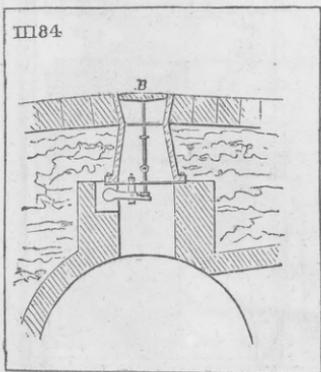
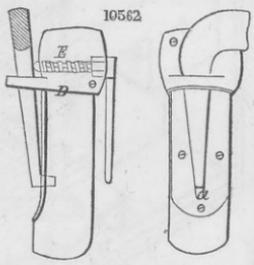
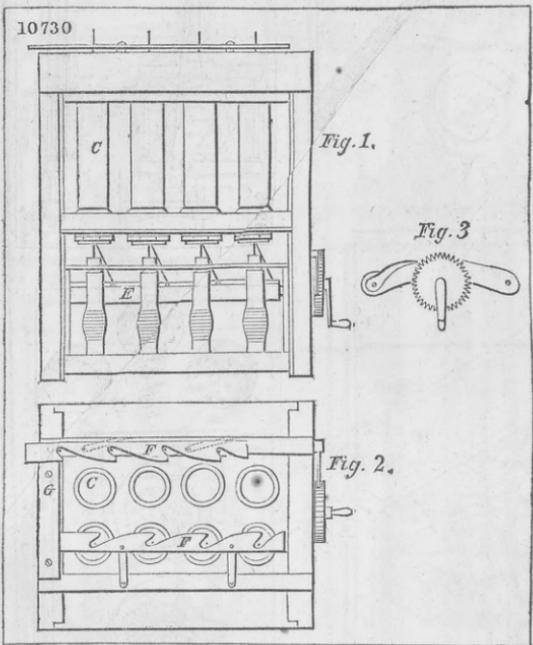
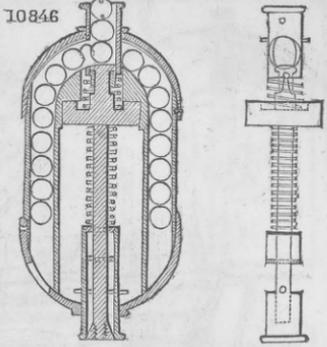
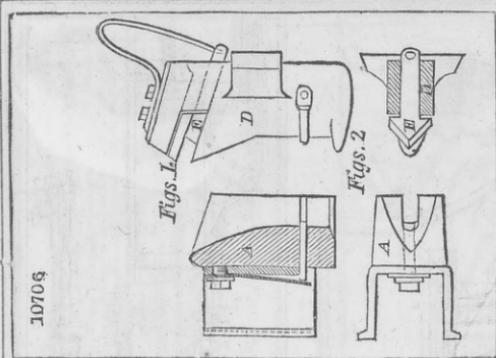
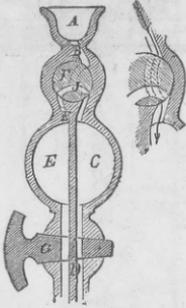


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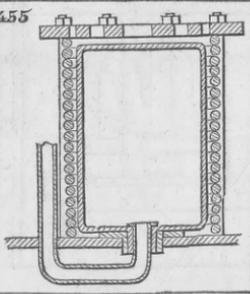




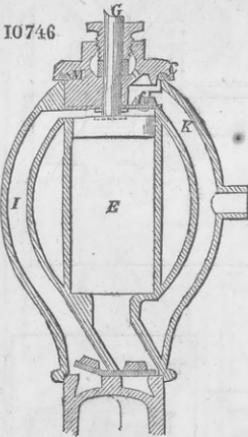
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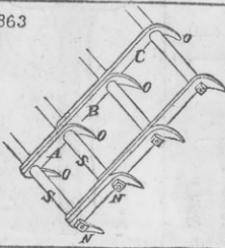
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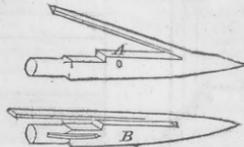
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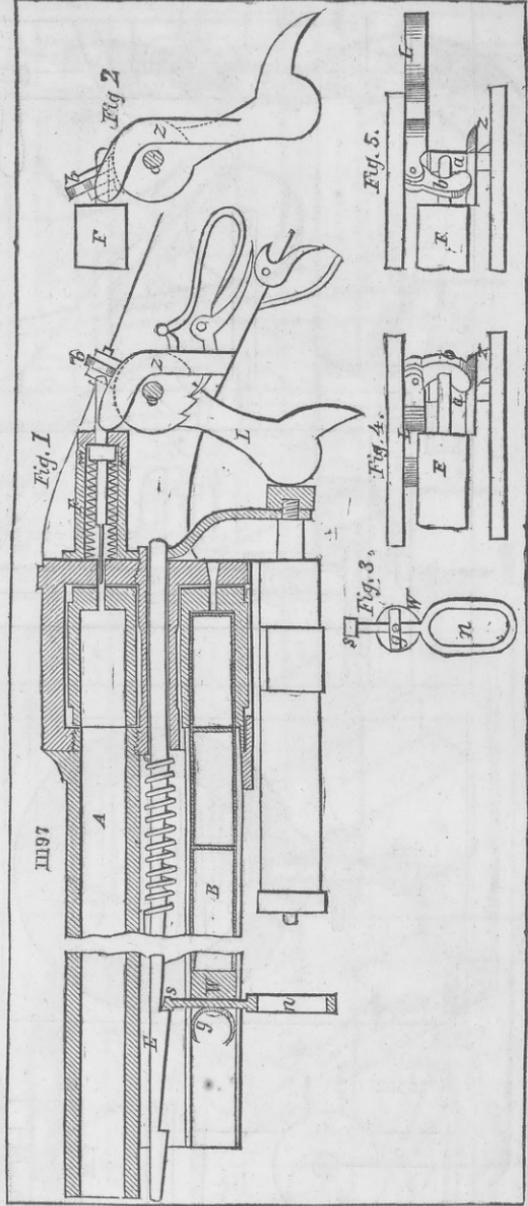
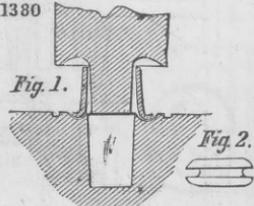
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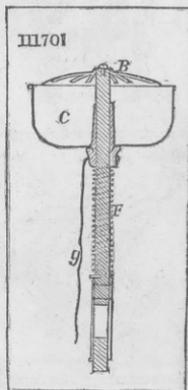
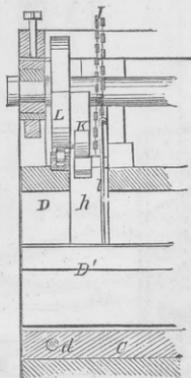
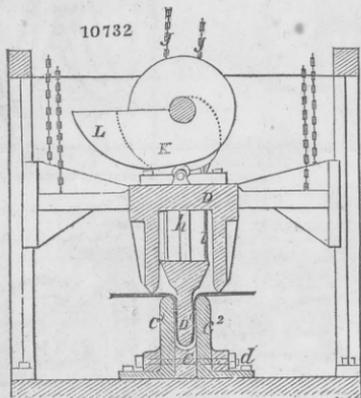
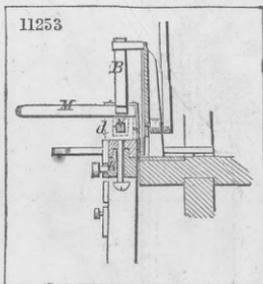
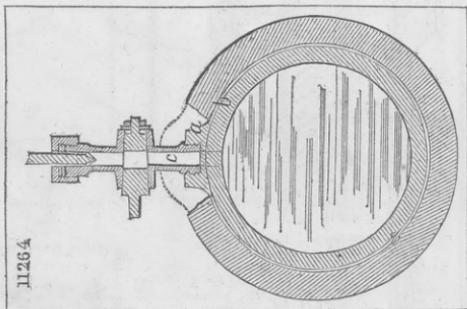
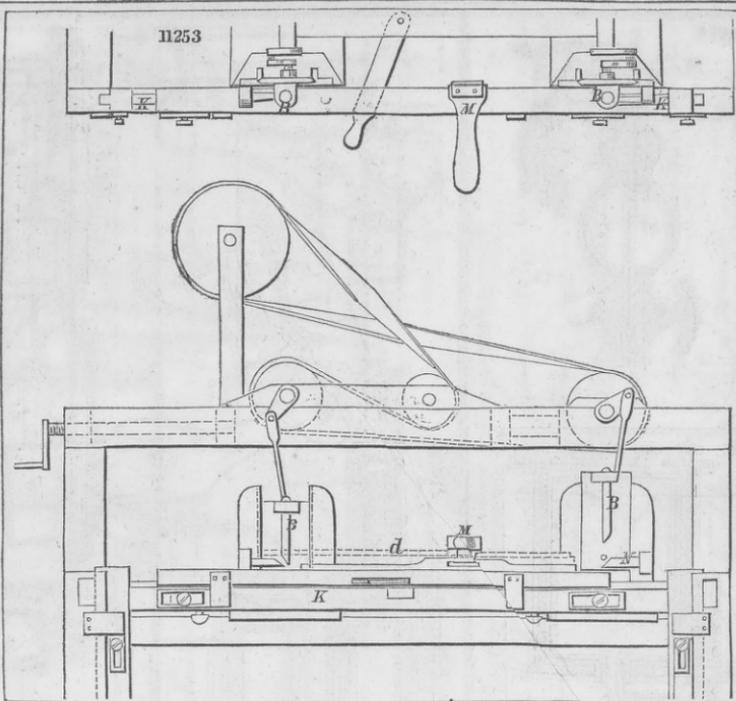


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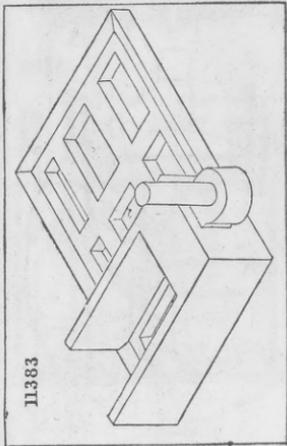
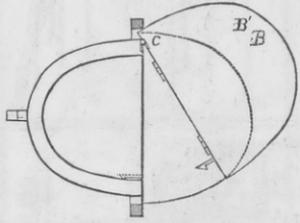
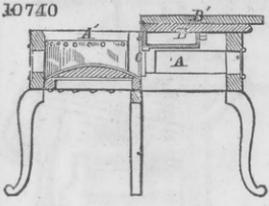


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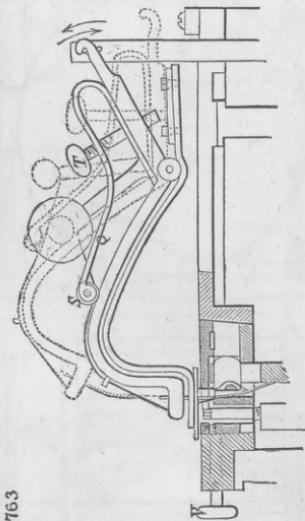




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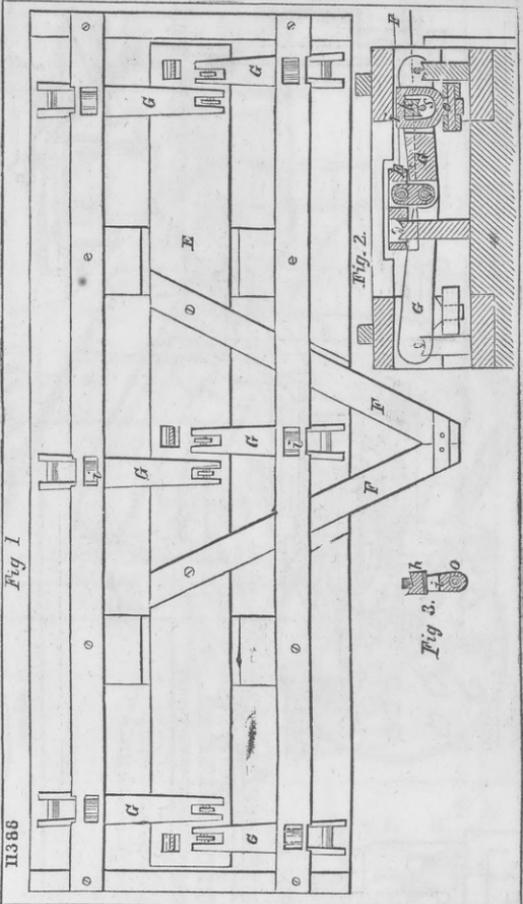
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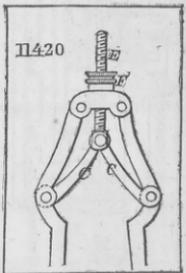
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Fig 1

11386



11420



11397

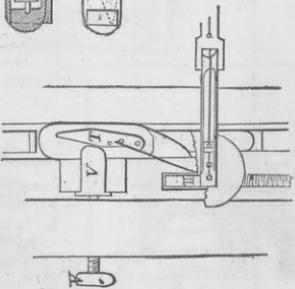
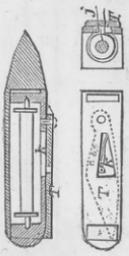
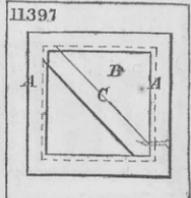


Fig. 2

Fig. 3

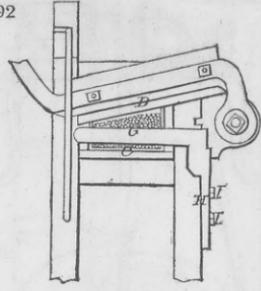
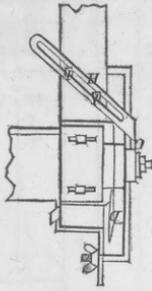
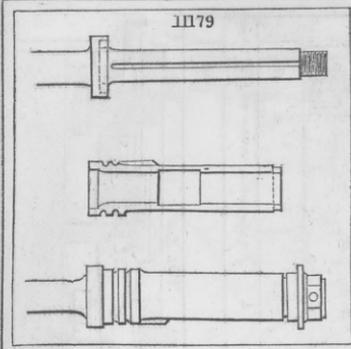


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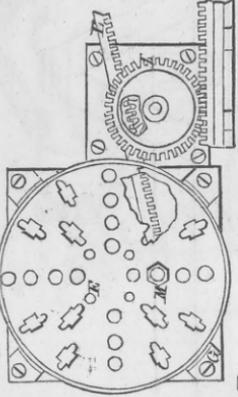
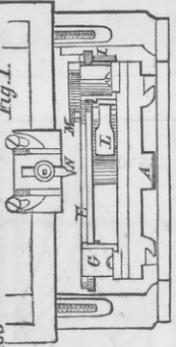


Fig. 1.



11463

Fig. 3.

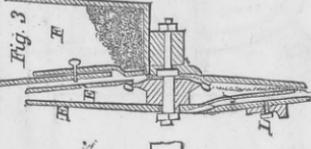
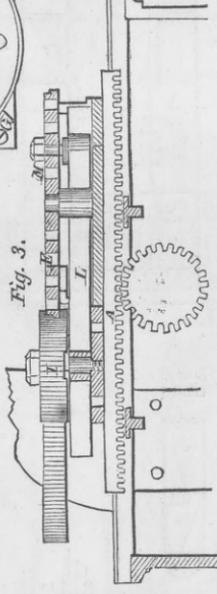


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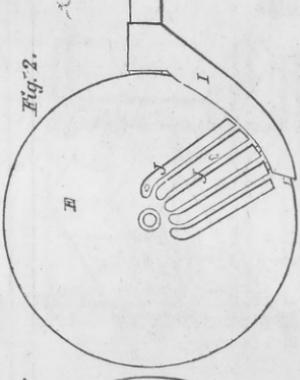
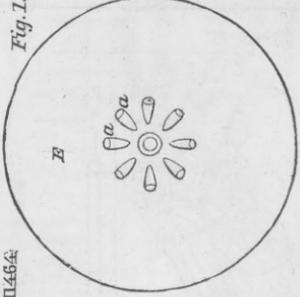
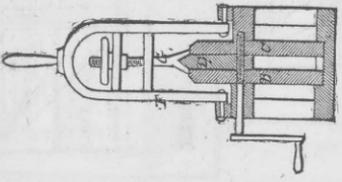


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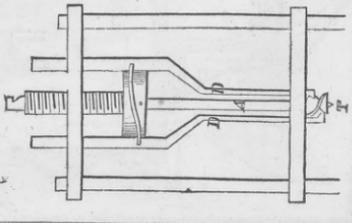


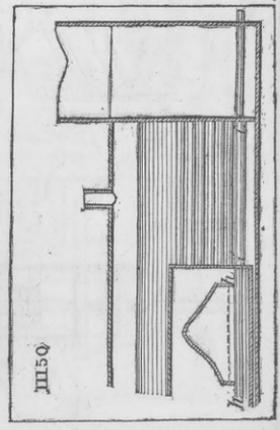
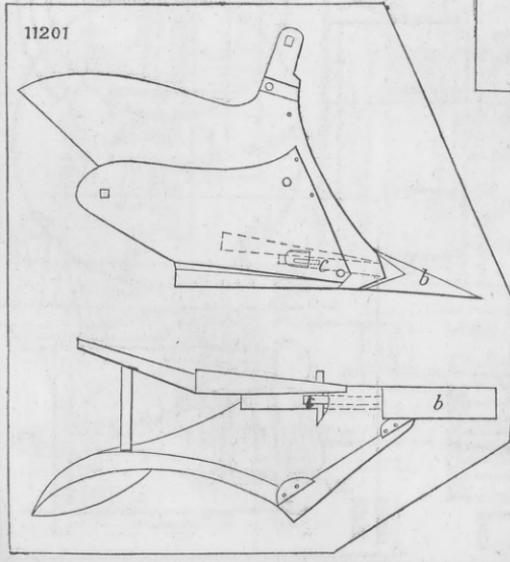
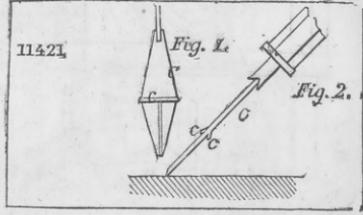
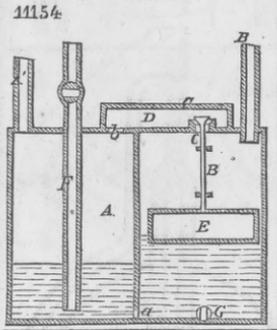
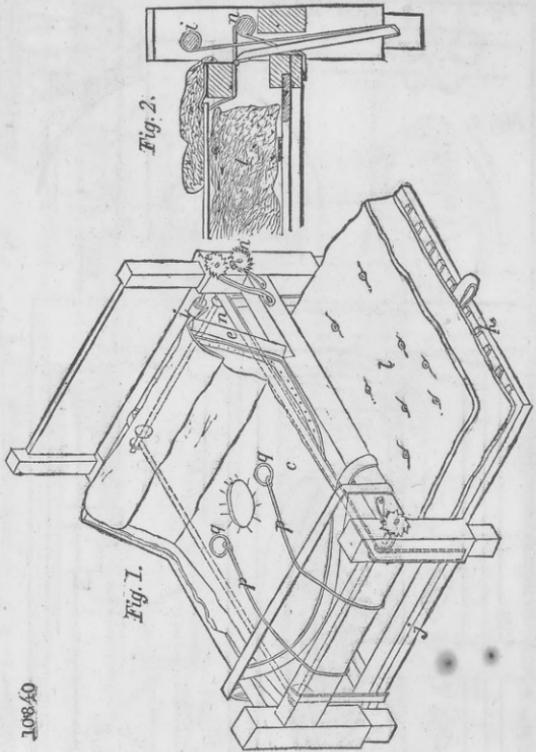
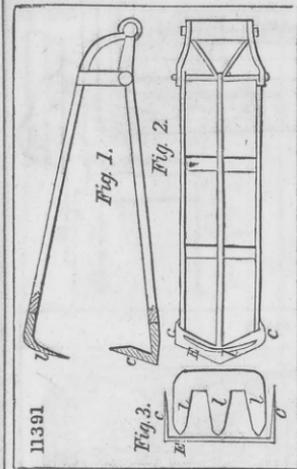
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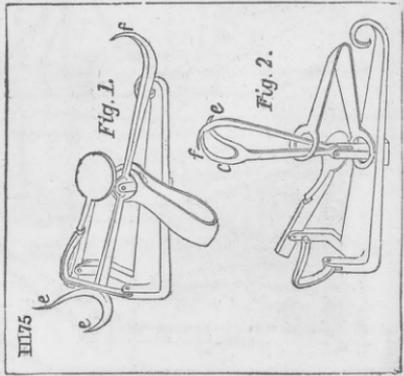
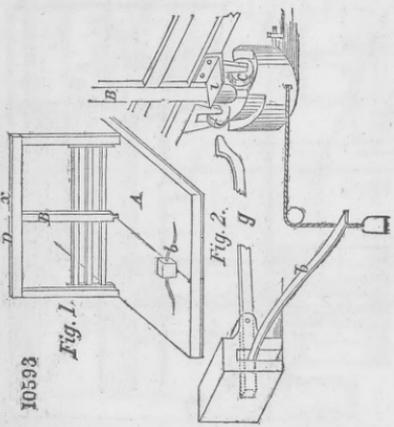
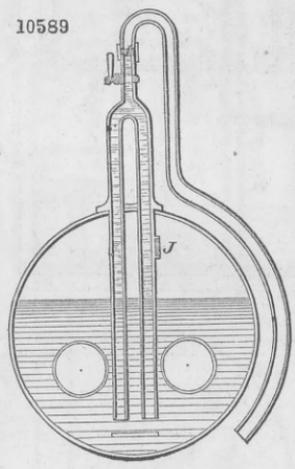
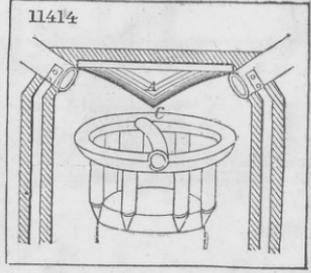
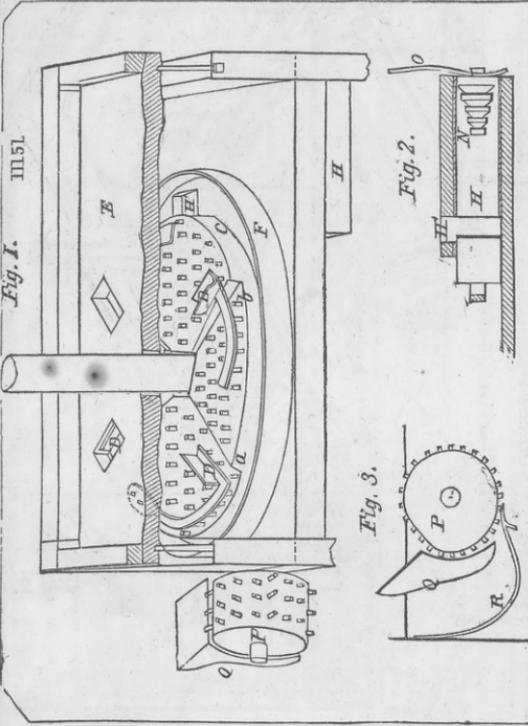
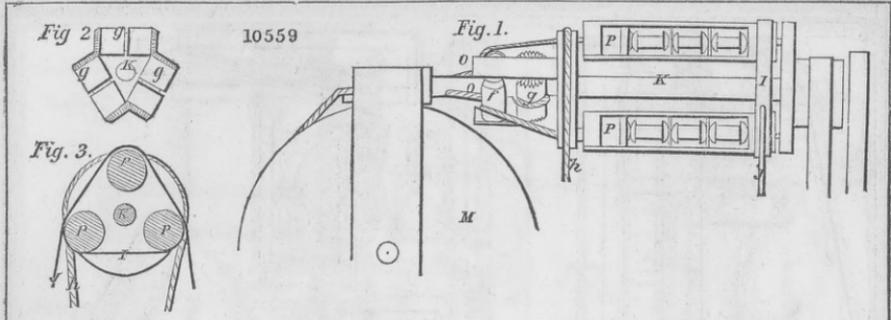
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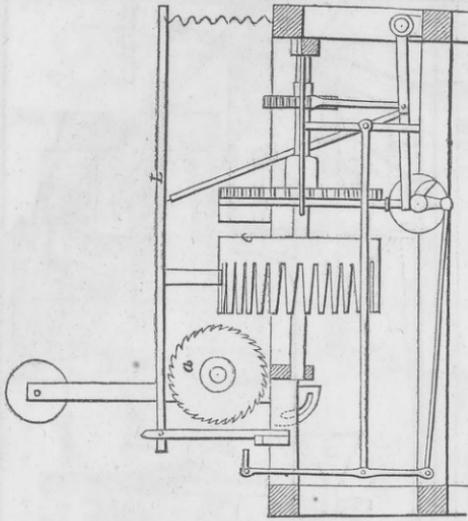


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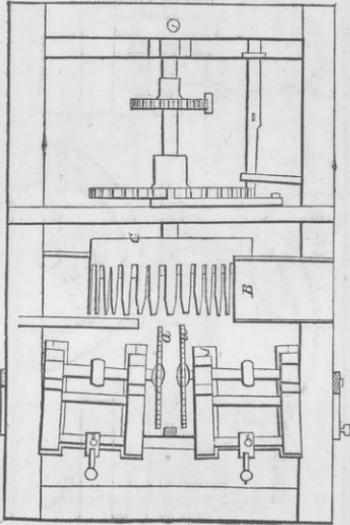
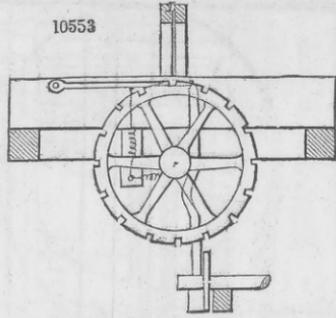




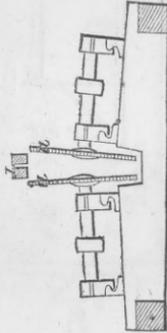
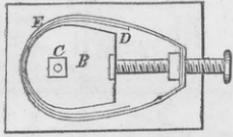
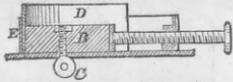




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Fig. 2.

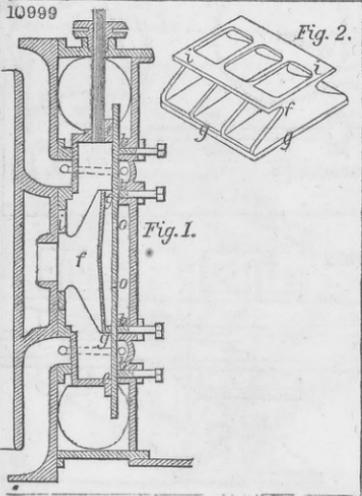
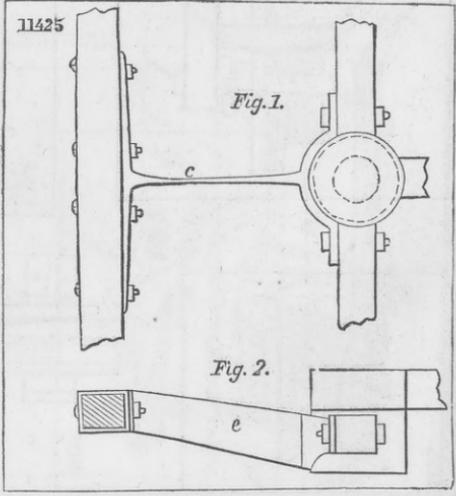


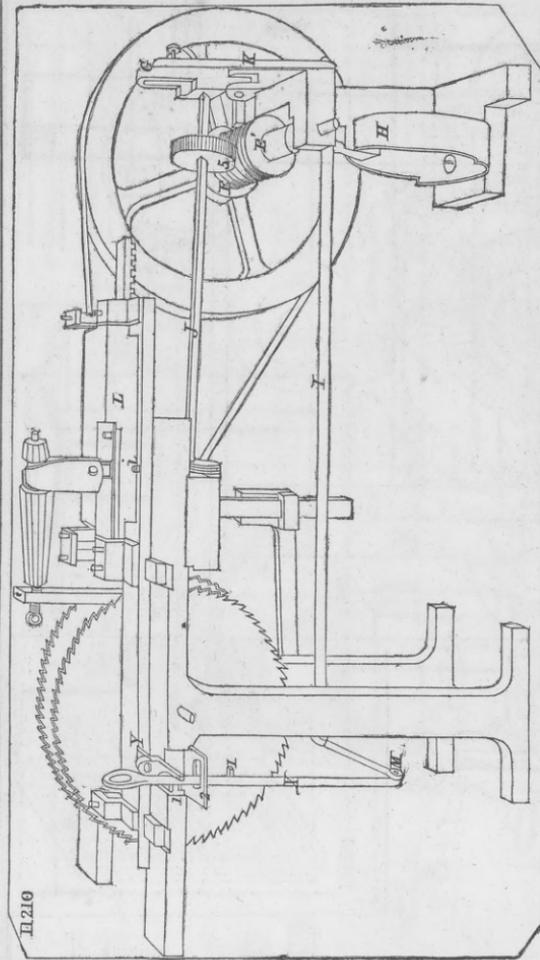
Fig. 1.

11425

Fig. 1.

Fig. 2.





11219

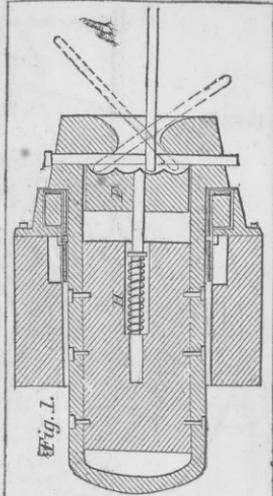
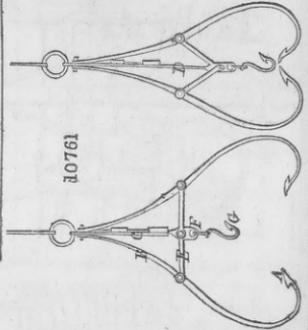
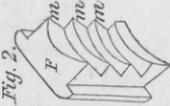


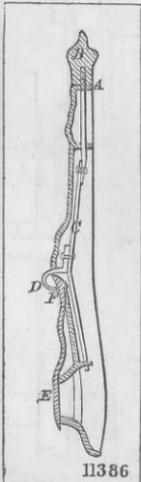
Fig. 1.

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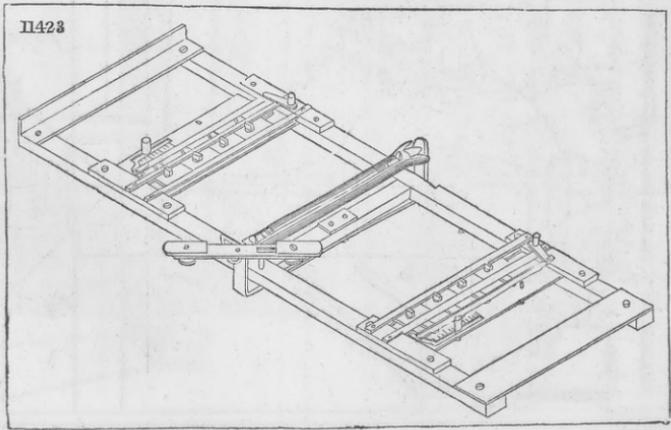
Fig. 2.



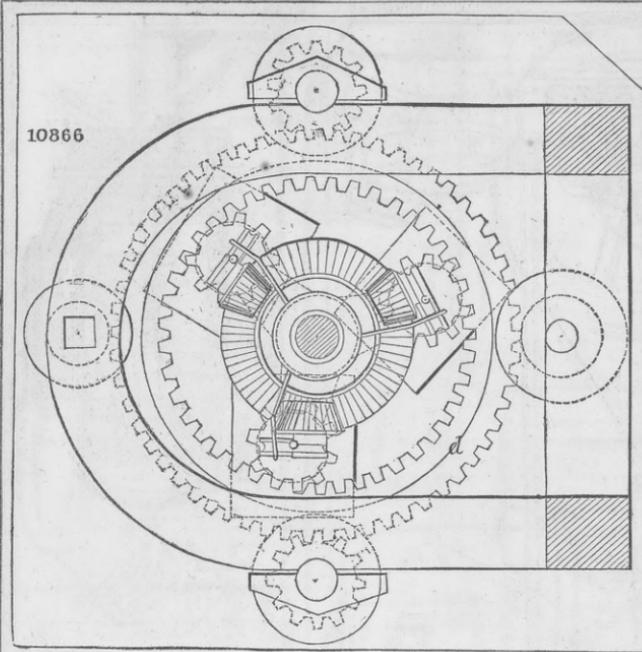
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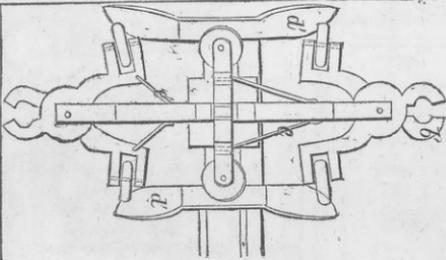
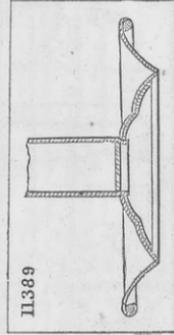
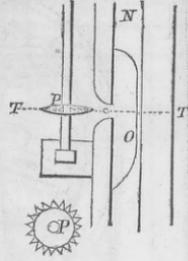
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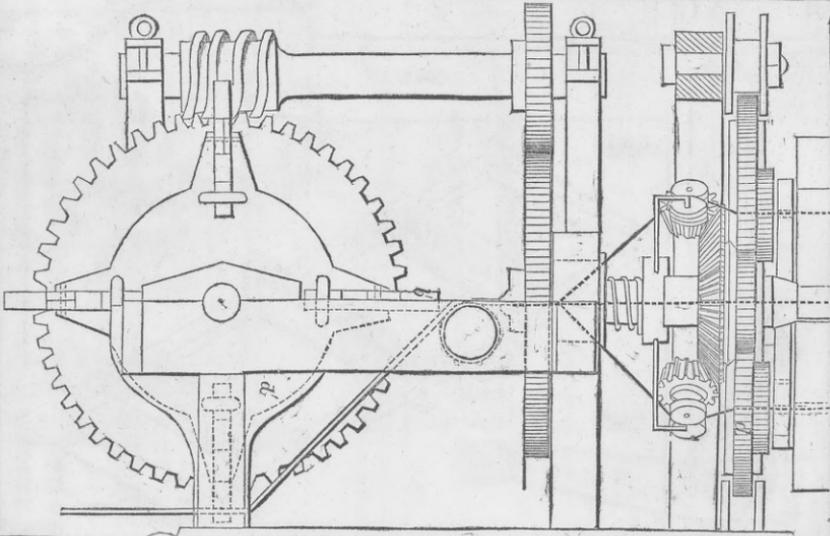
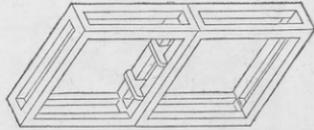


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II

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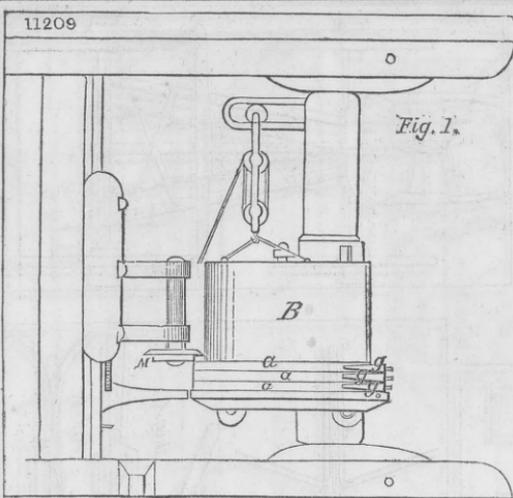


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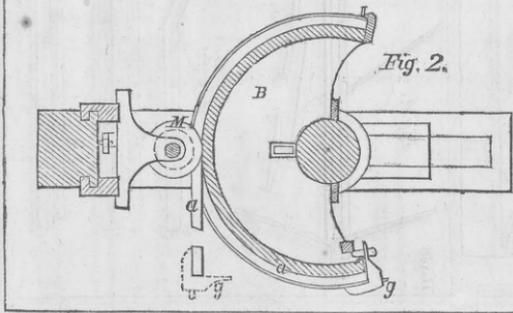


Fig. 2.

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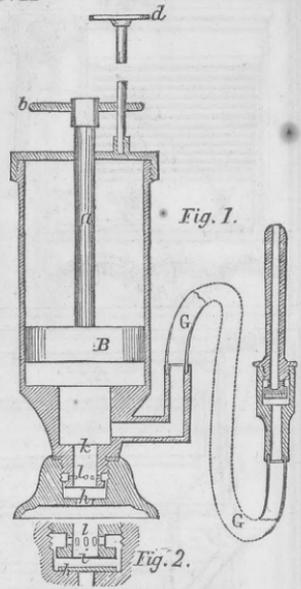


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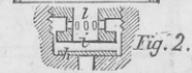
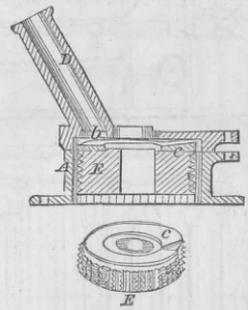
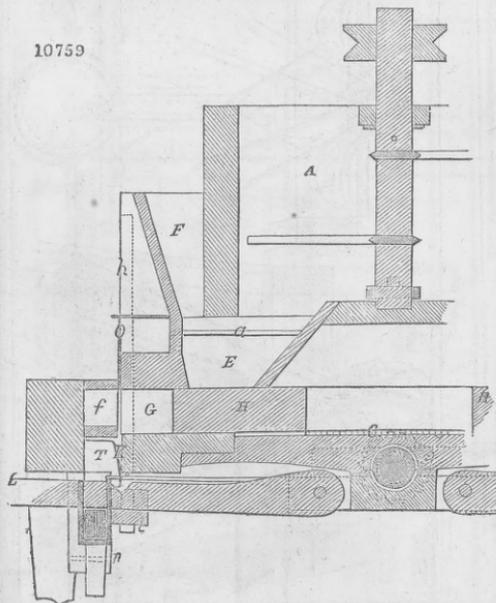


Fig. 2.

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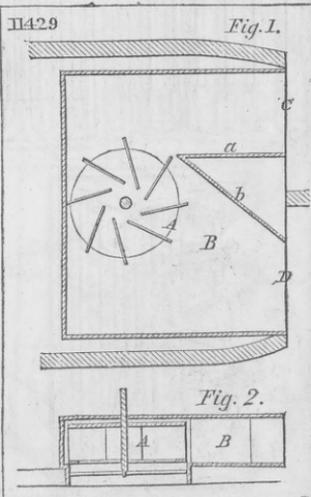


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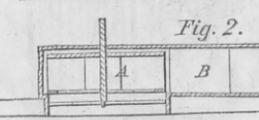
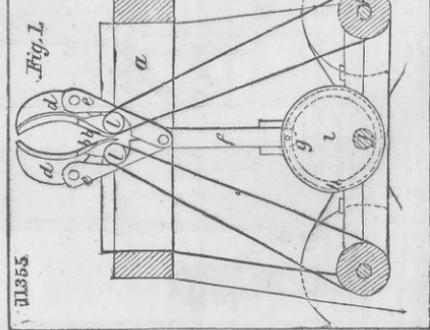
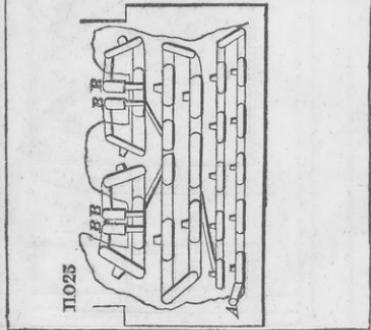
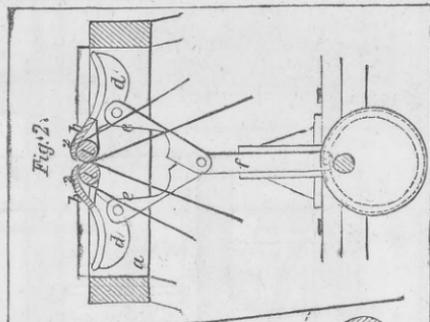
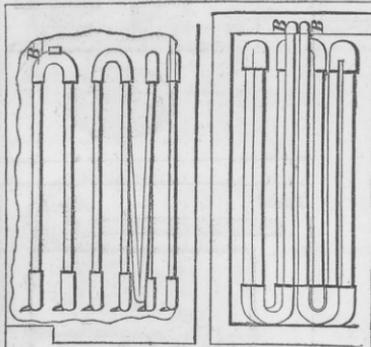
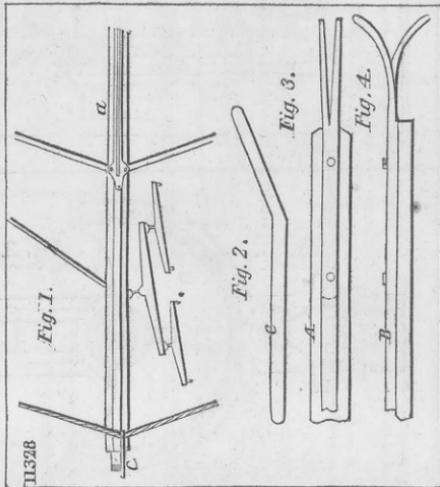
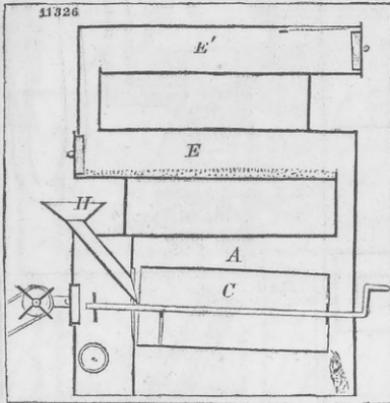
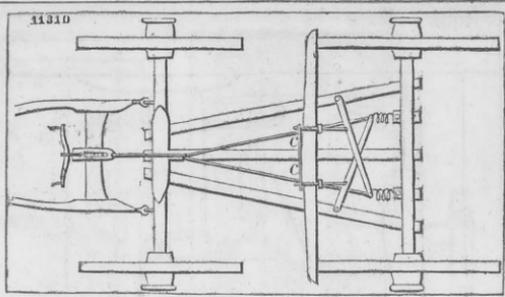
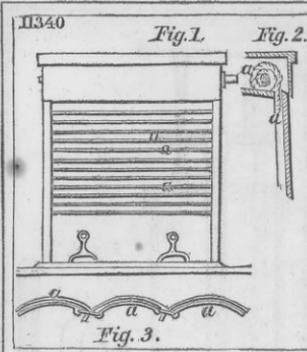
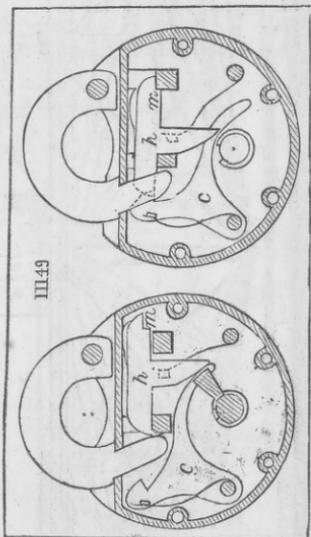
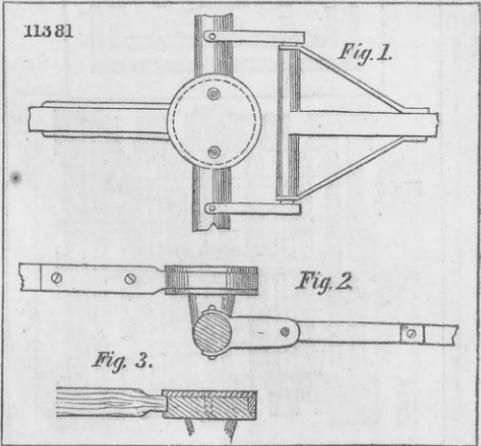
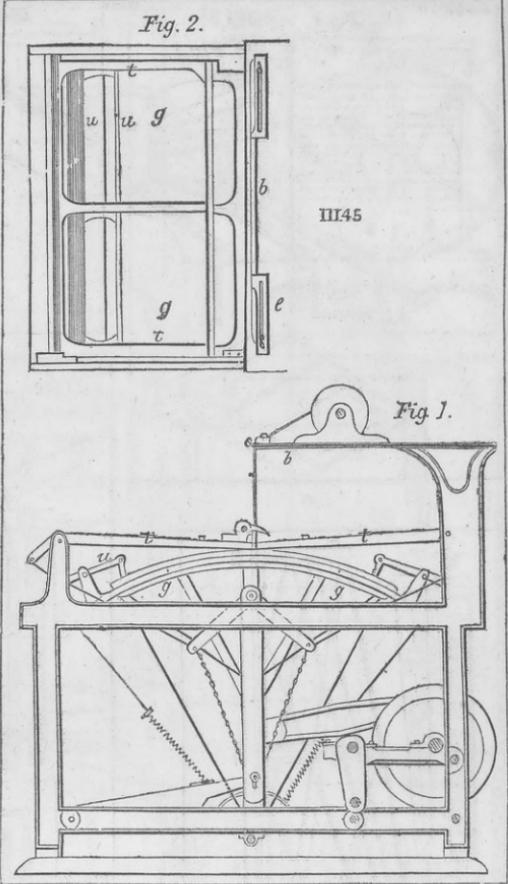
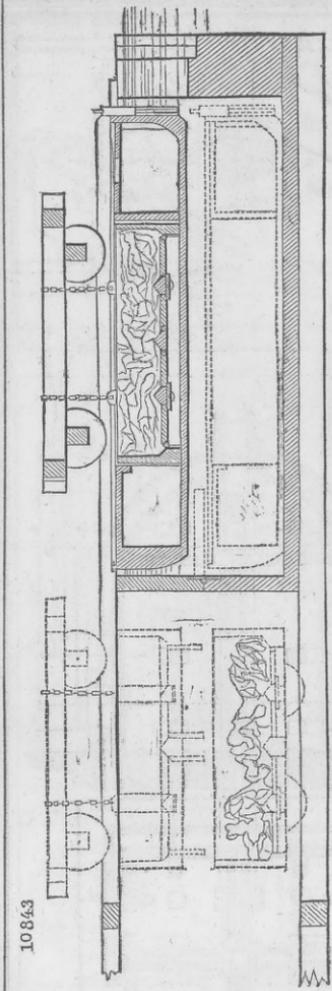
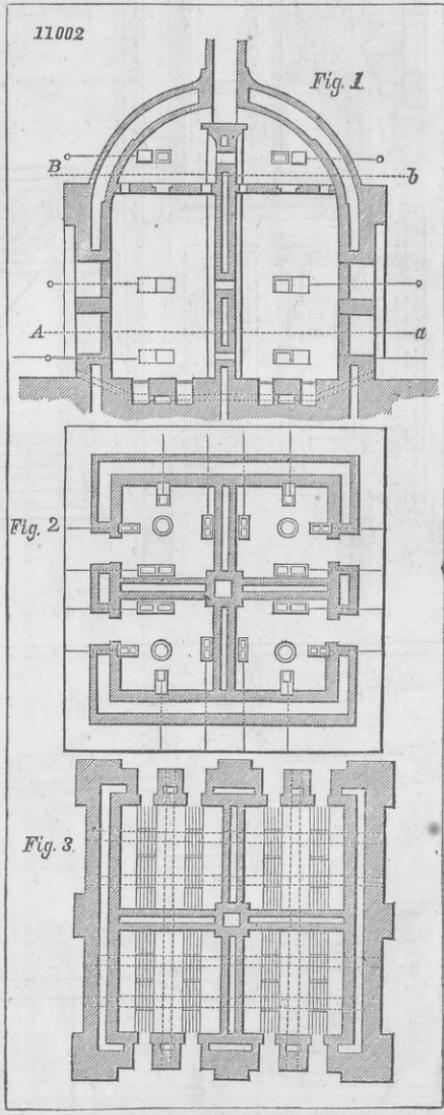
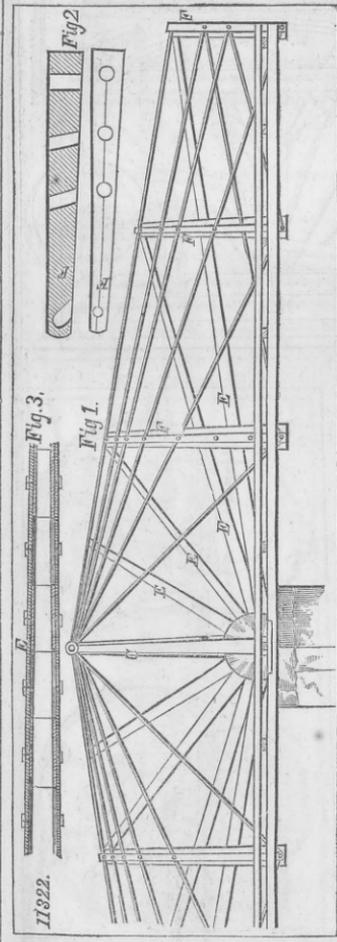
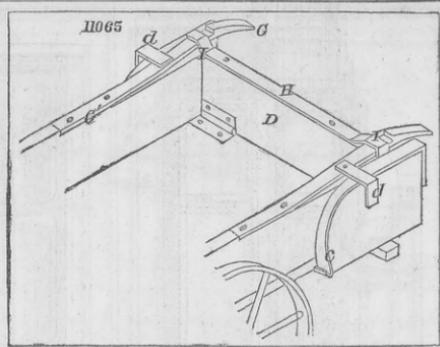
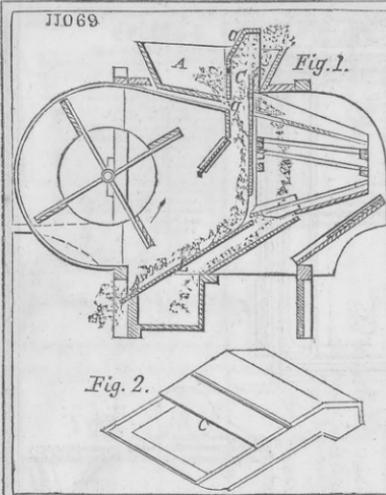
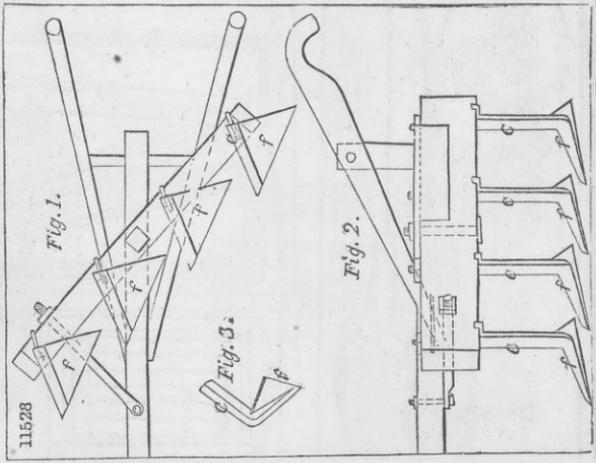
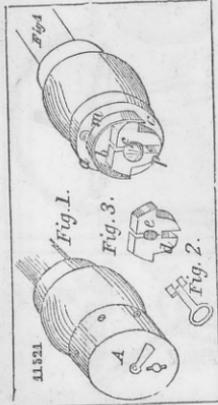
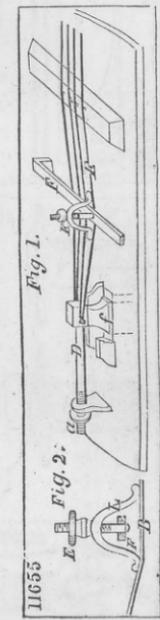
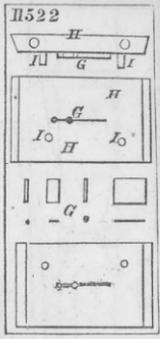
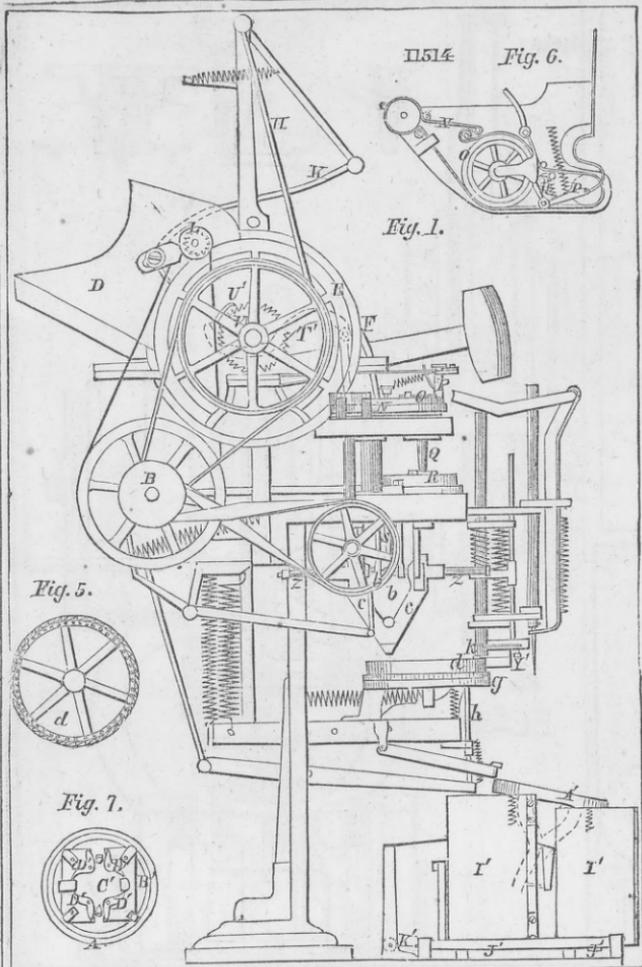


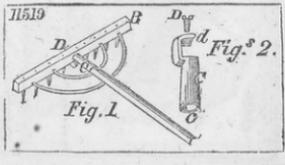
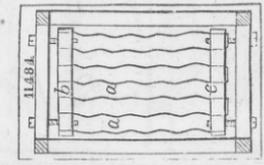
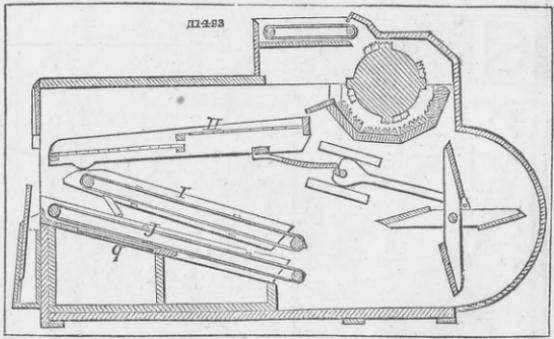
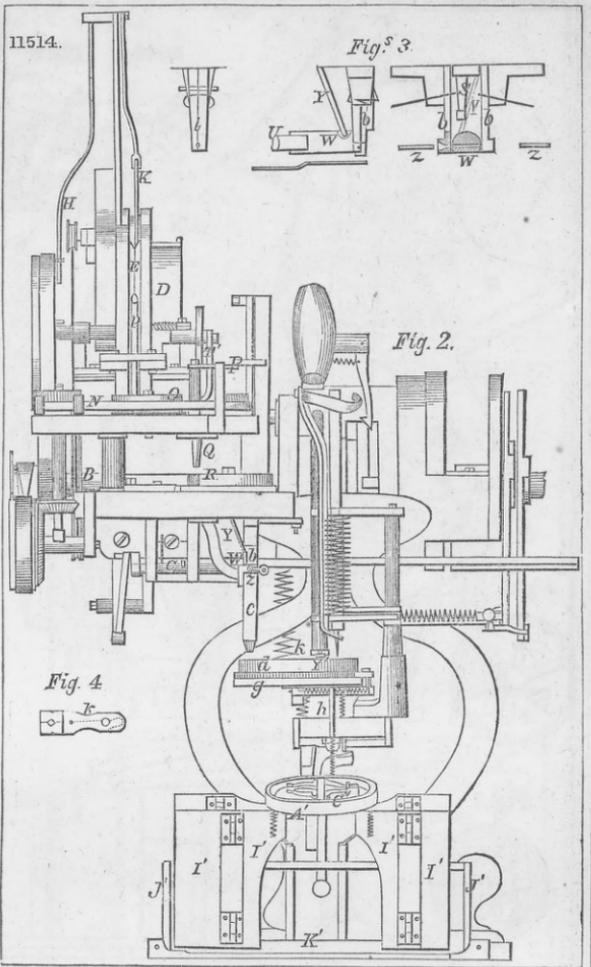
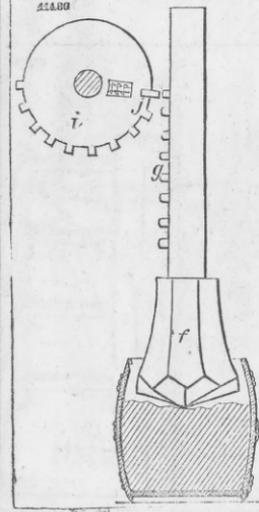
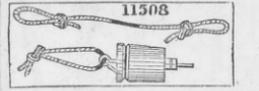
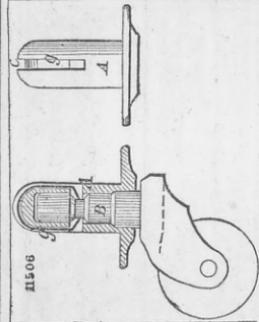
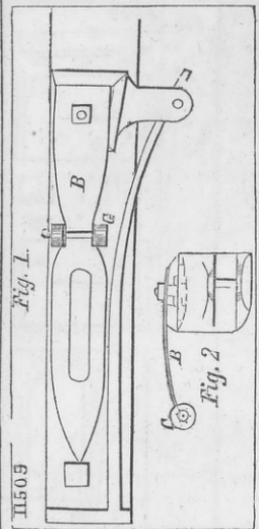
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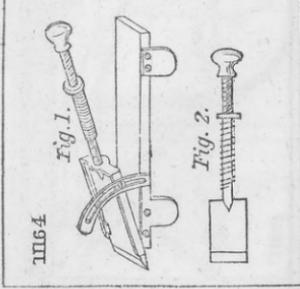
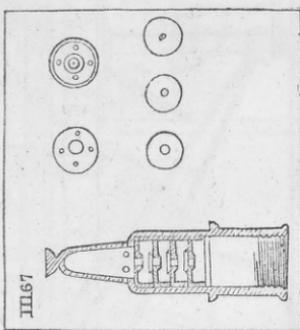
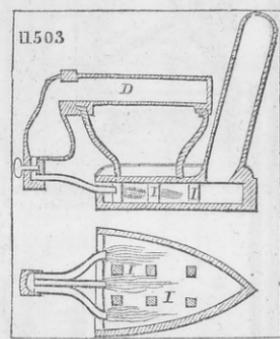
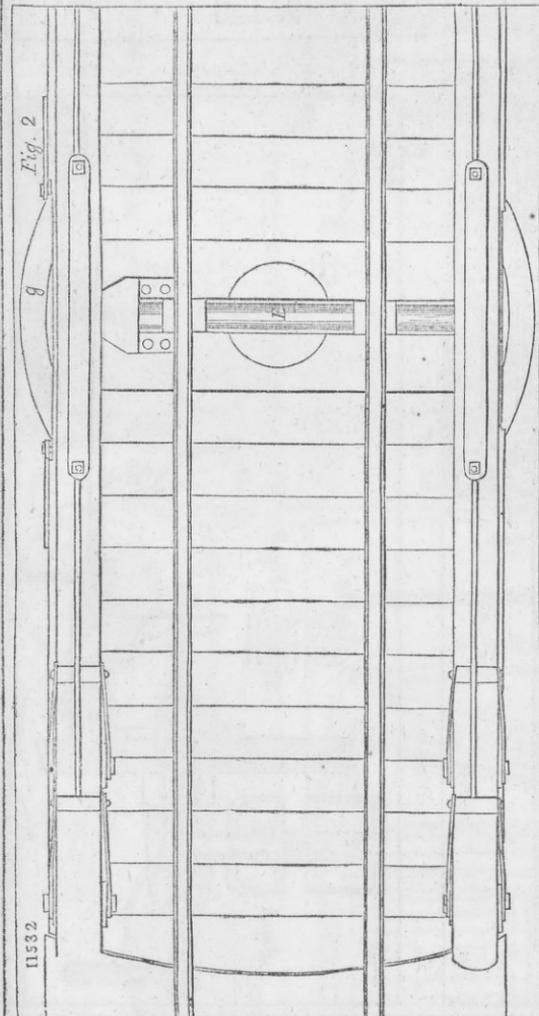
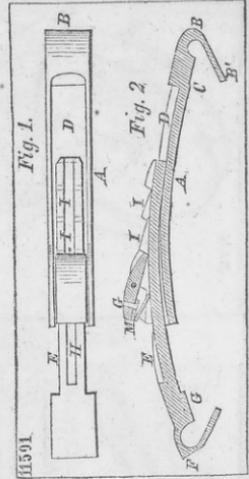
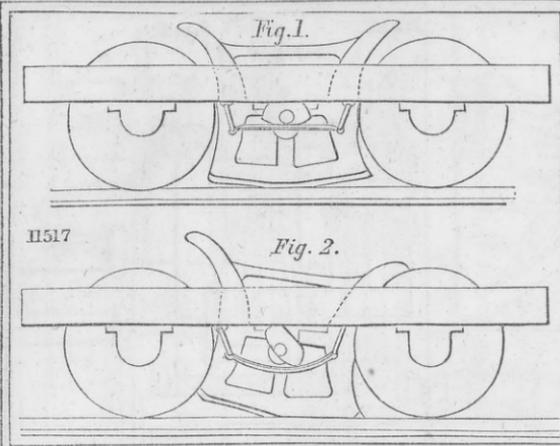


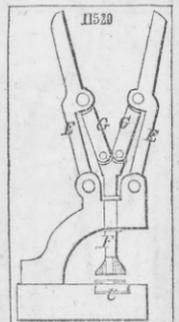
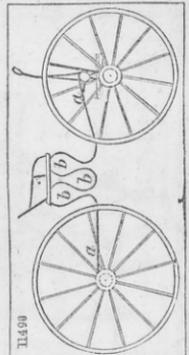
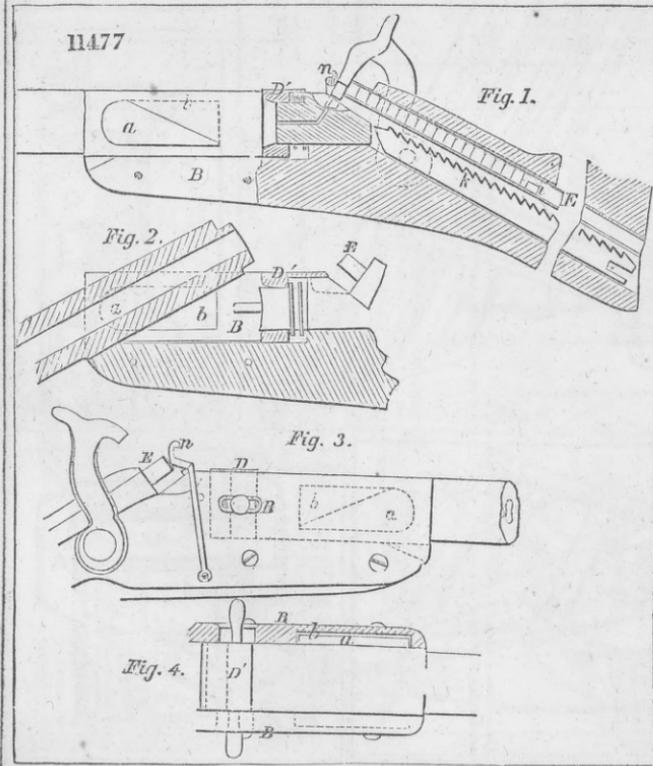
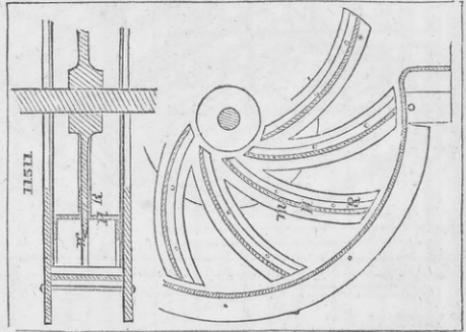
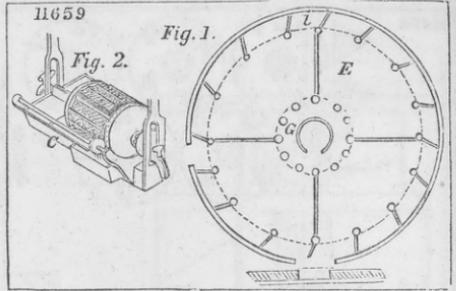
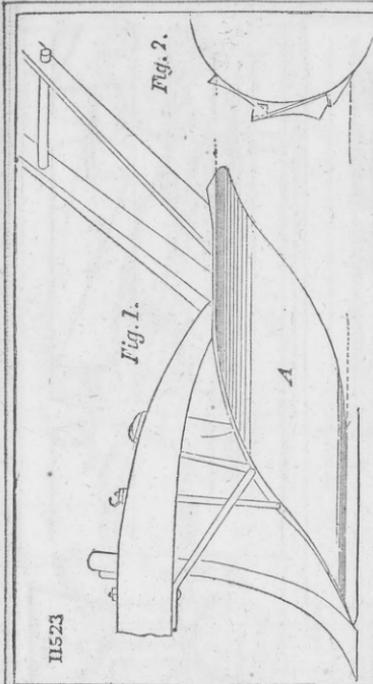












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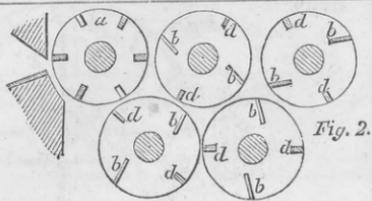


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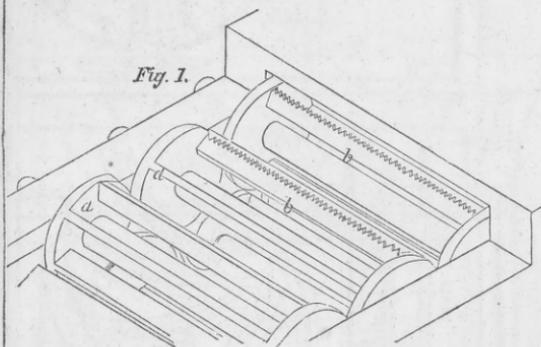
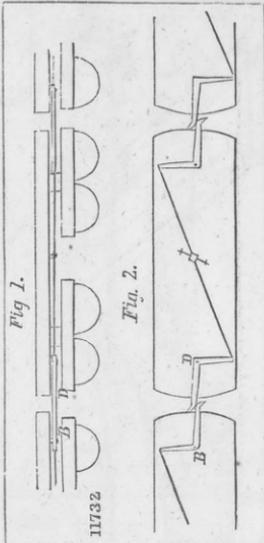
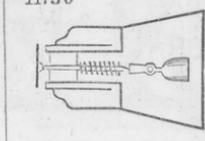


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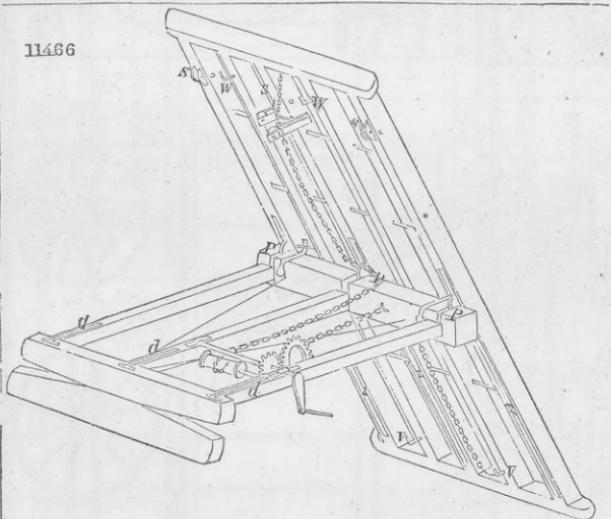


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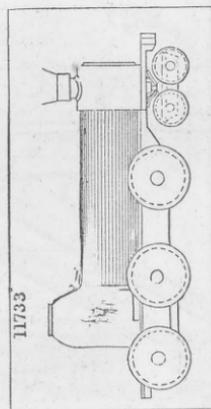
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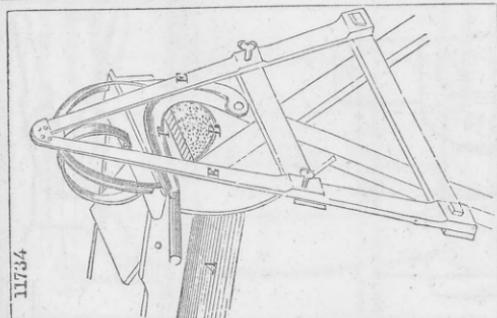
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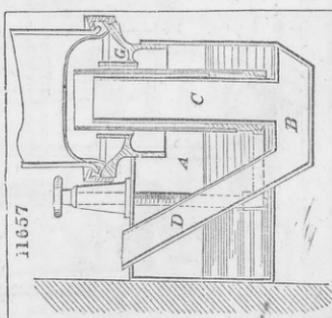
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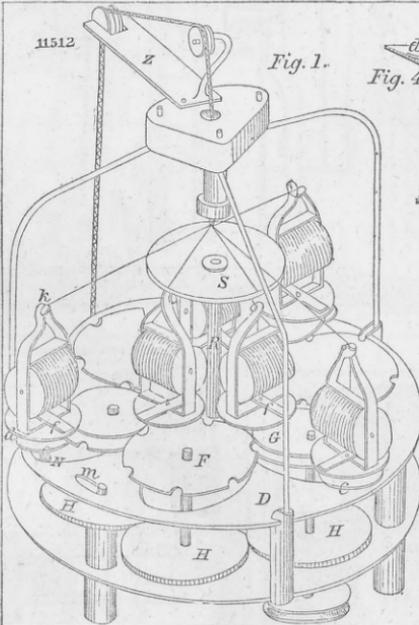
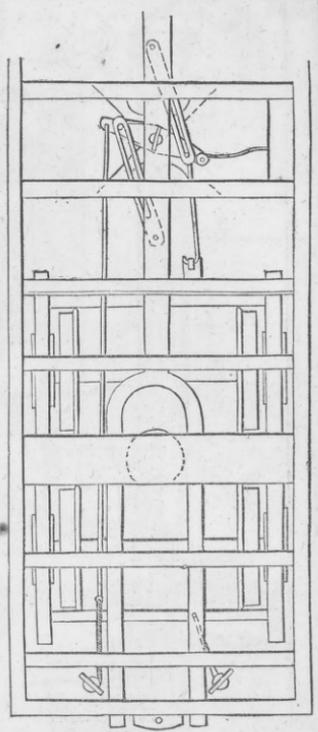
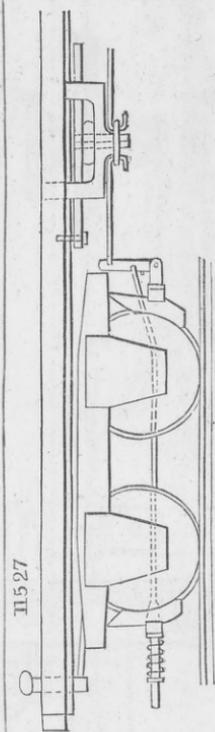
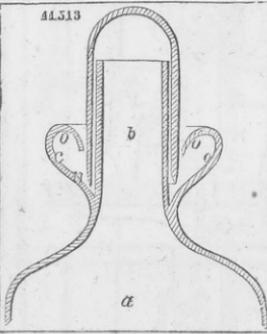
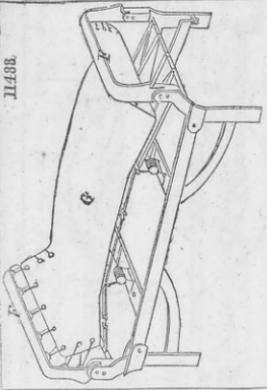


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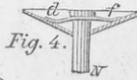


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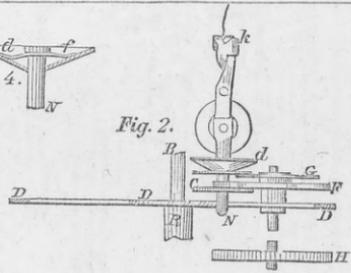
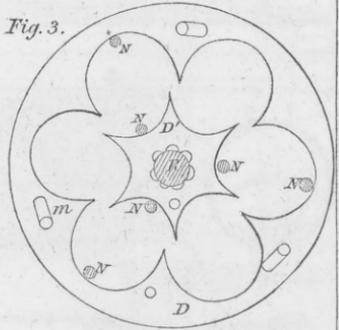
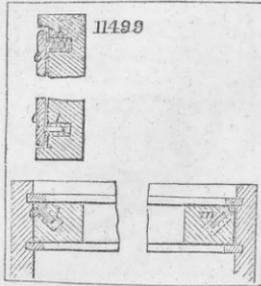
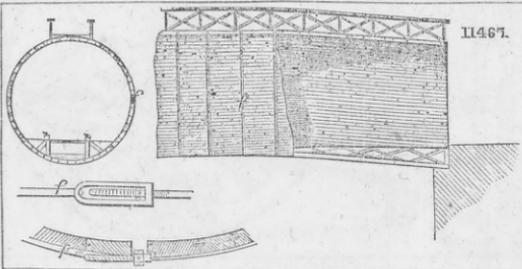
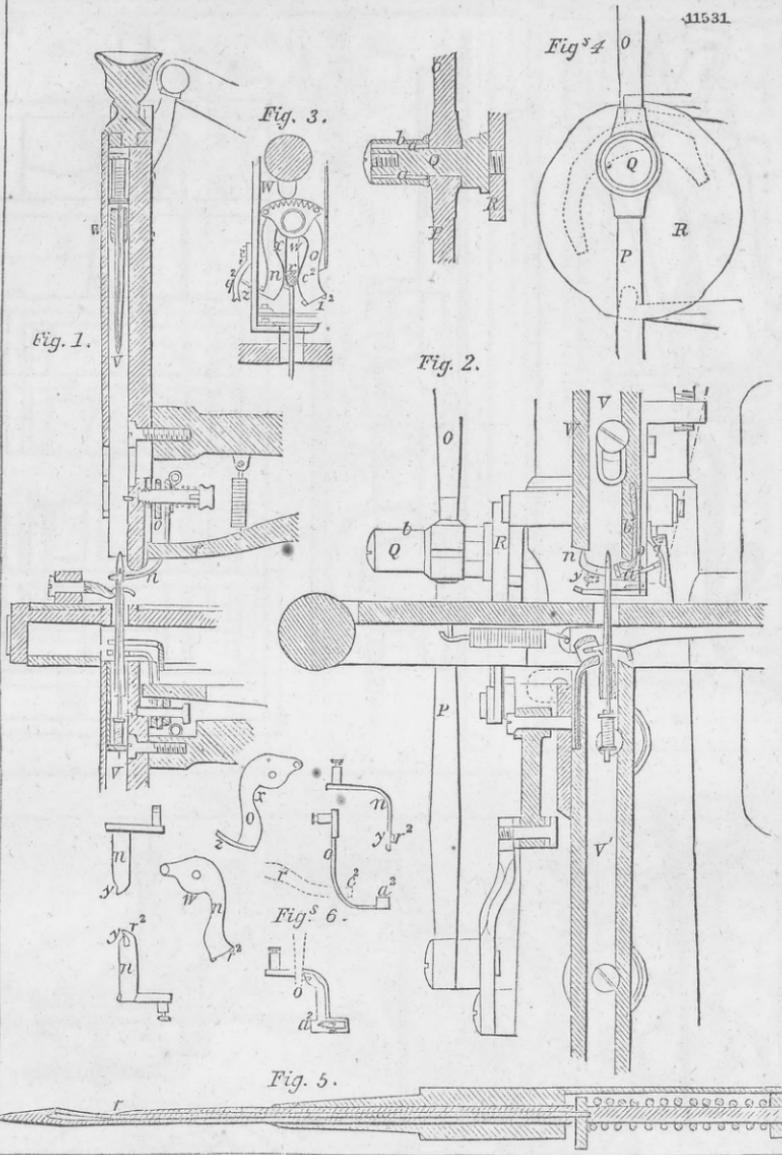


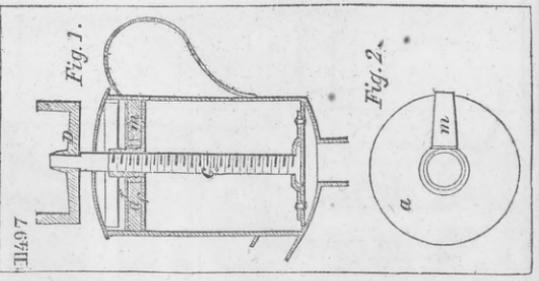
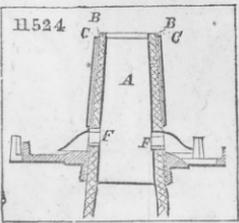
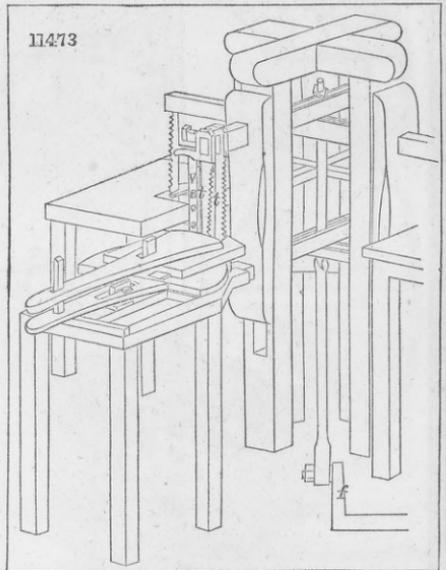
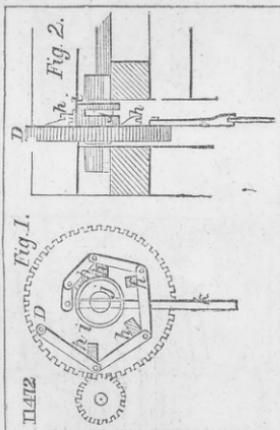
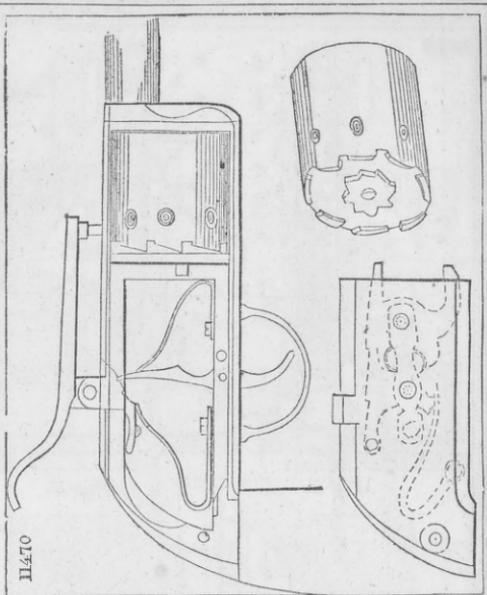
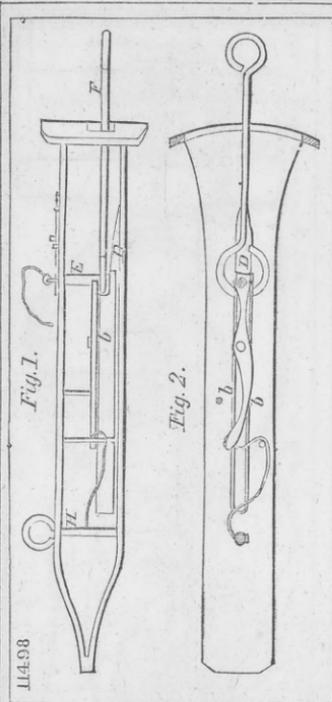
Fig. 2.

Fig. 3.



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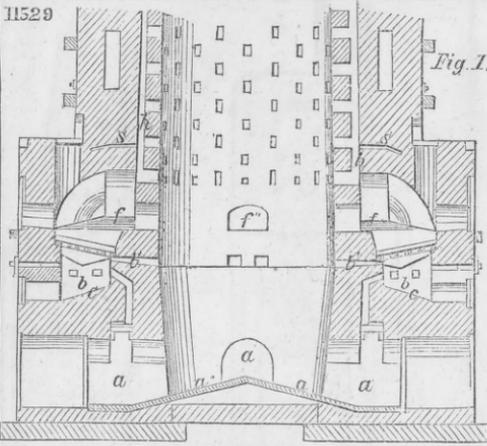


Fig. 1.

Fig. 2.

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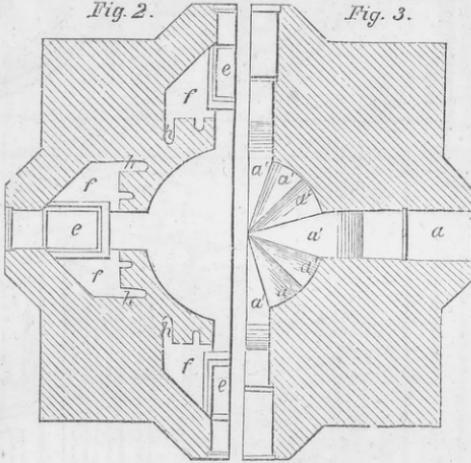


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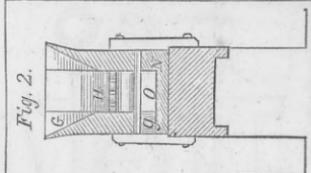
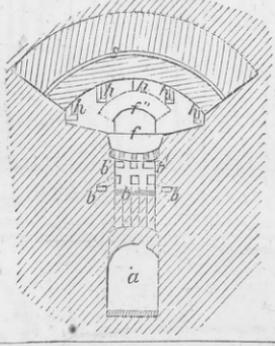


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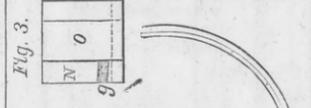


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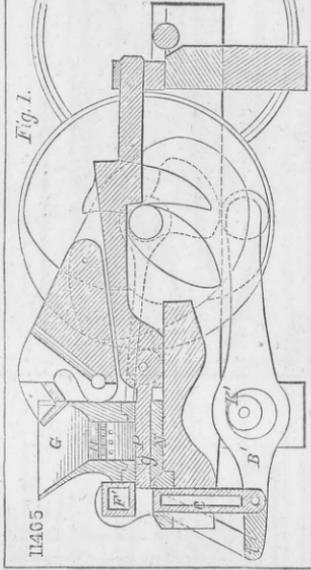
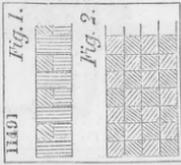
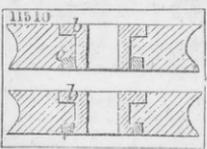
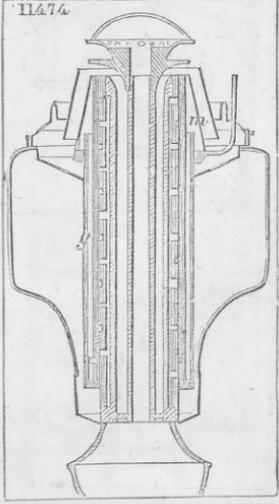
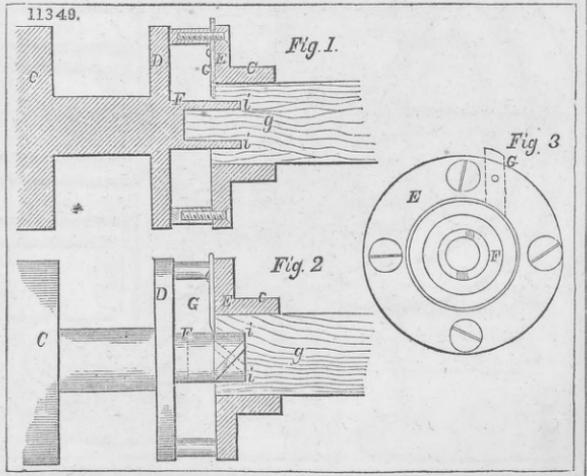
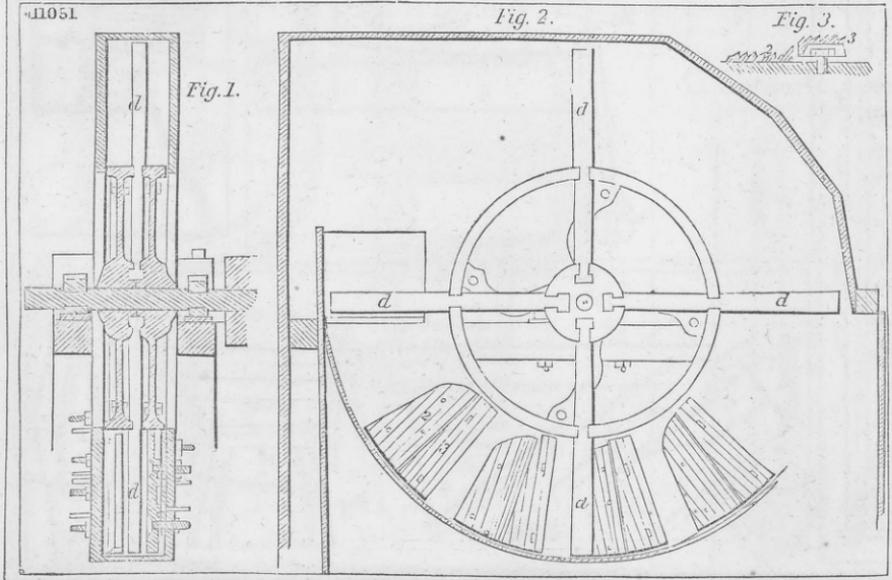
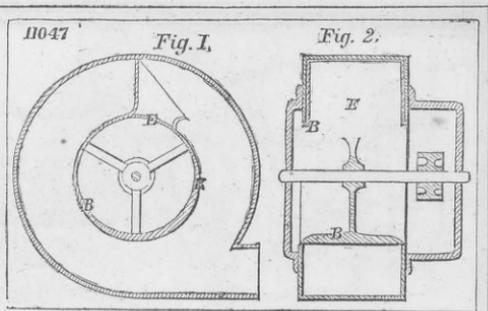
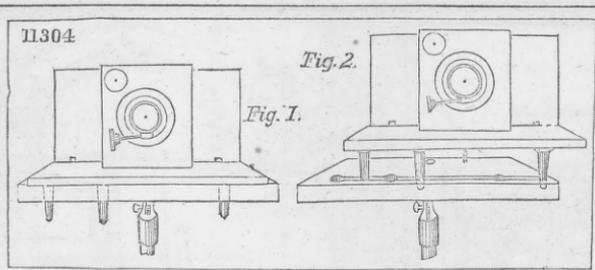
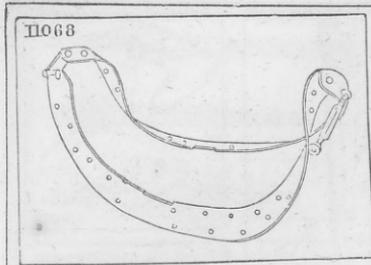


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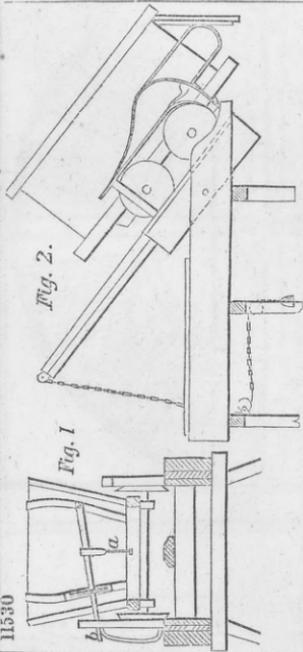
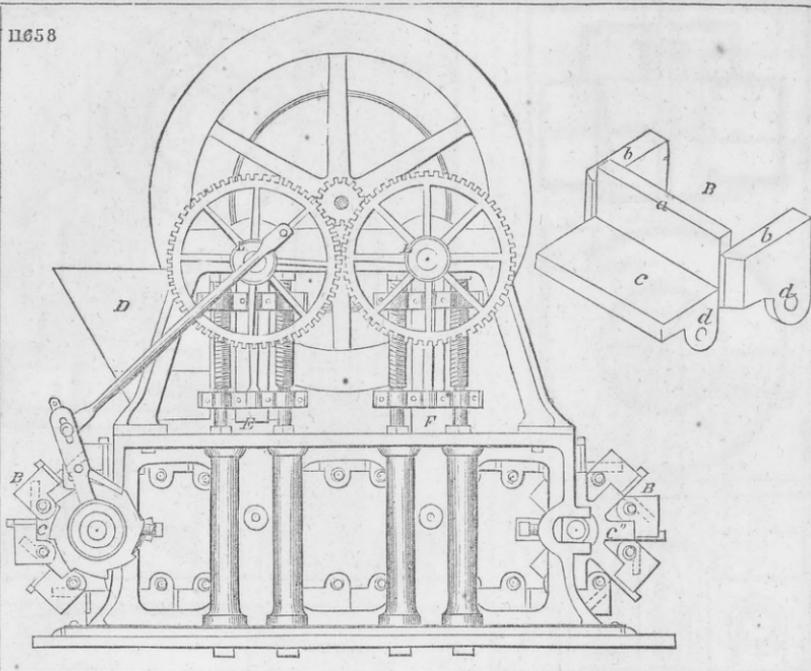
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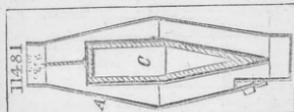




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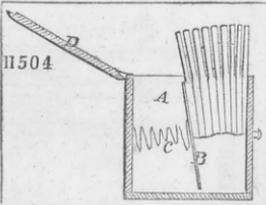
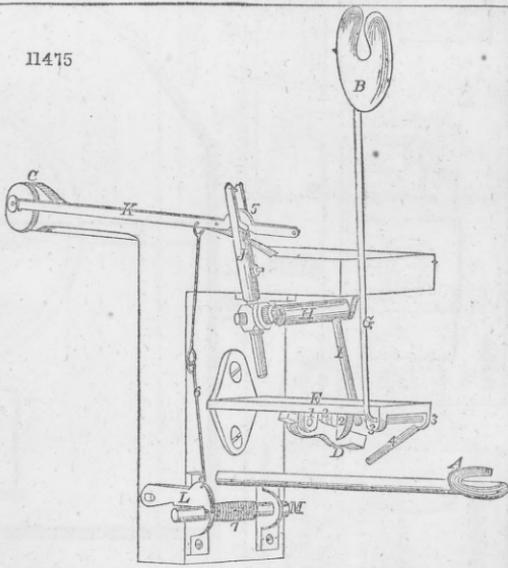


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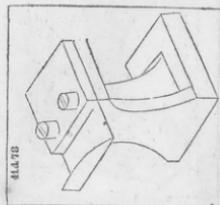


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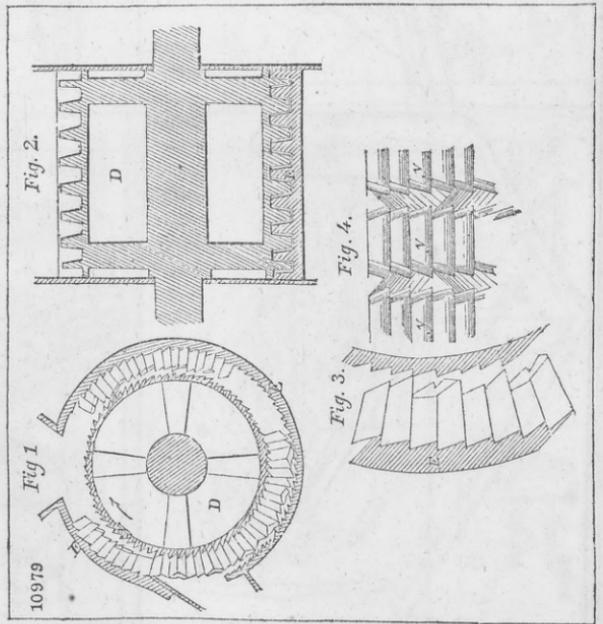
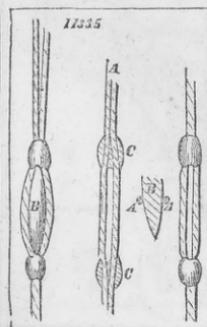
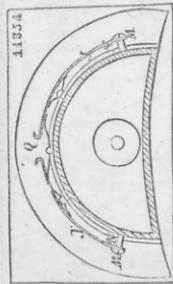
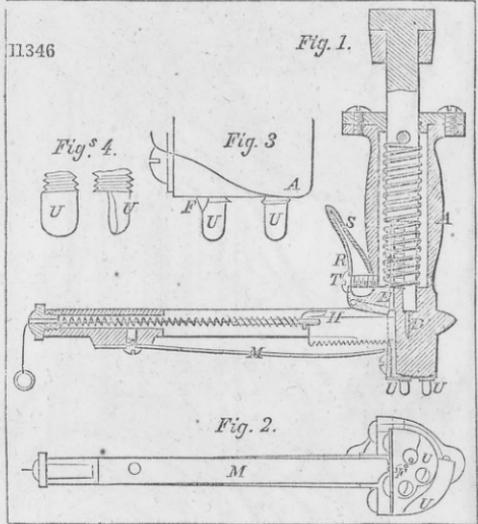
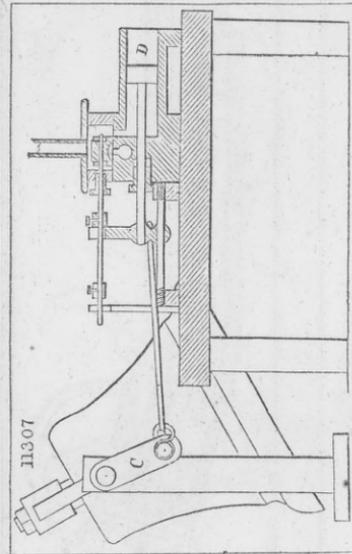
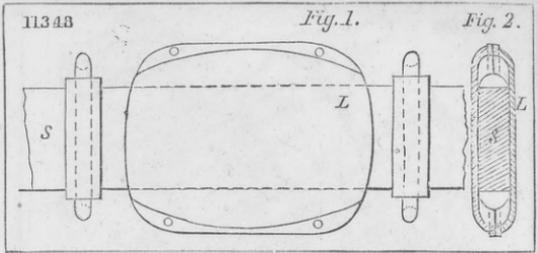
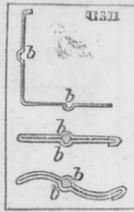
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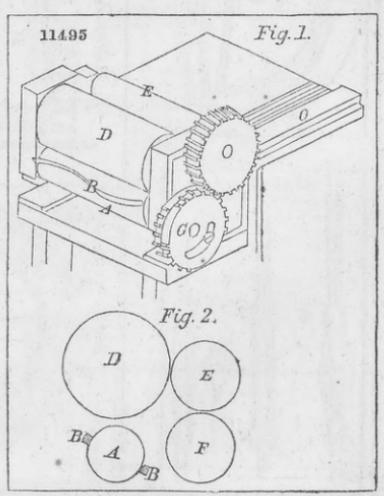
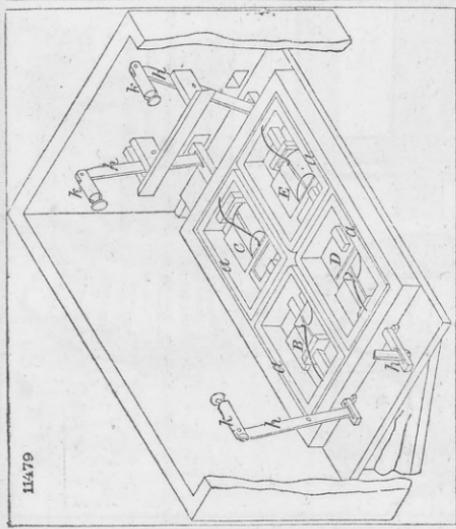
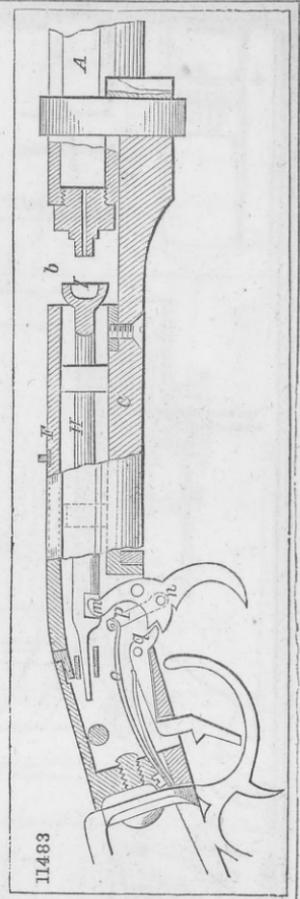
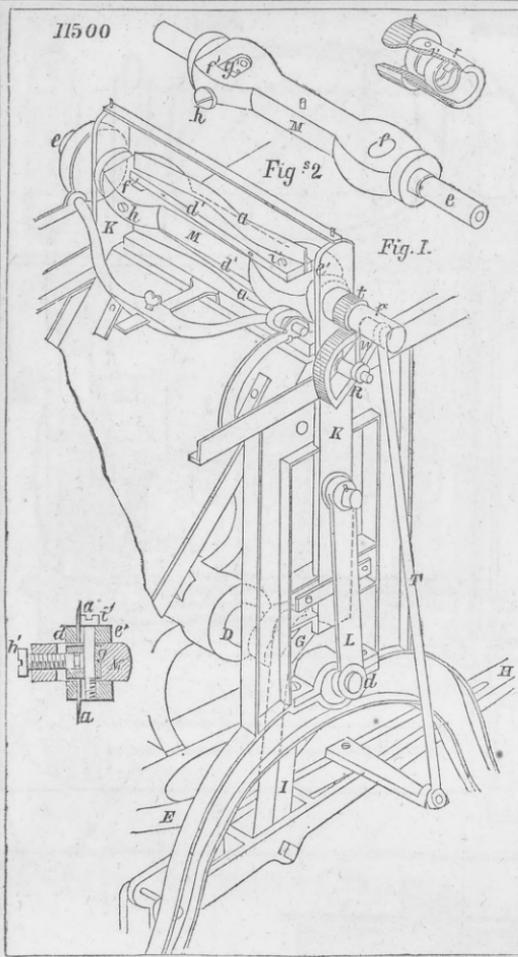


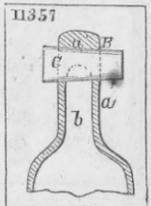
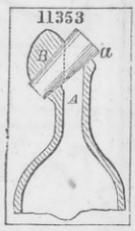
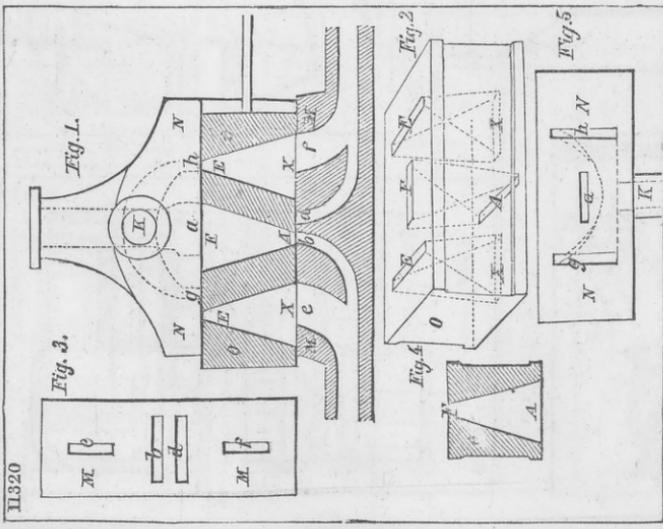
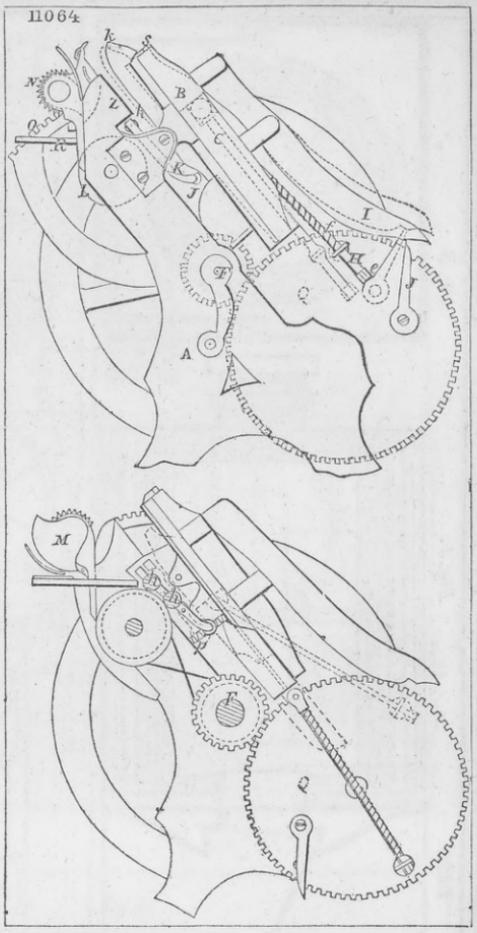
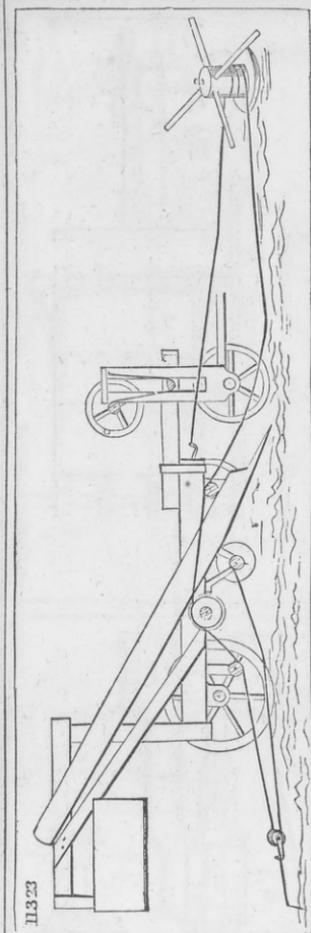
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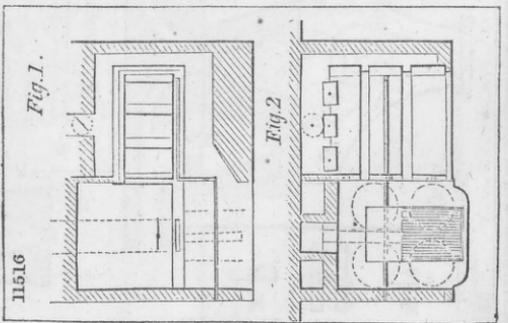
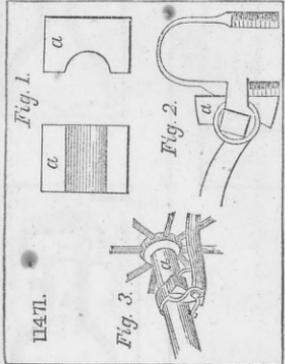
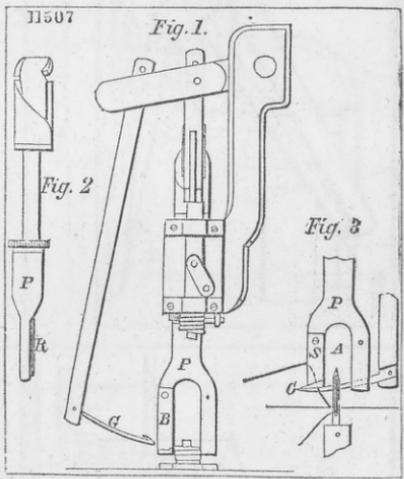
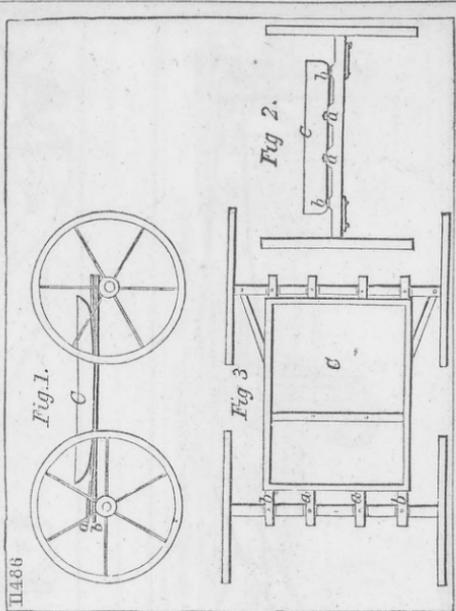
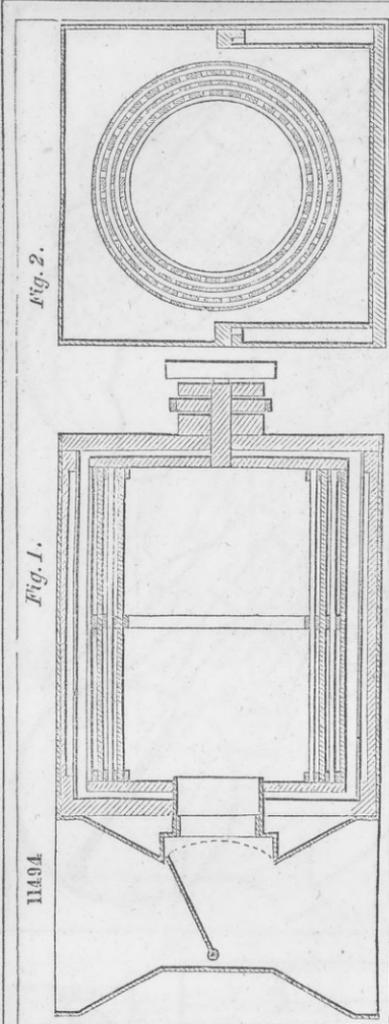


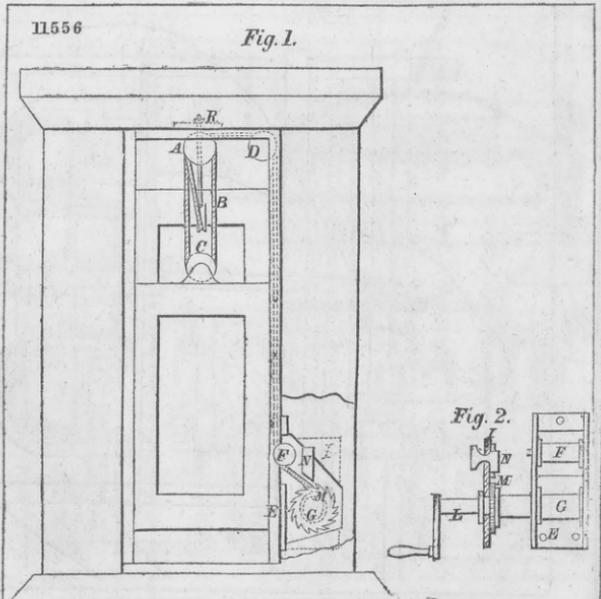
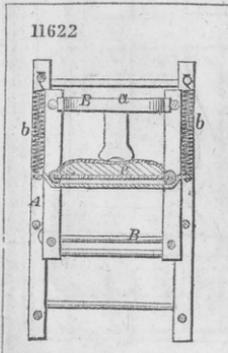
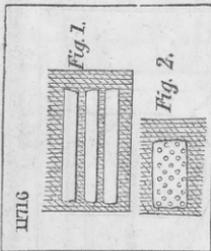
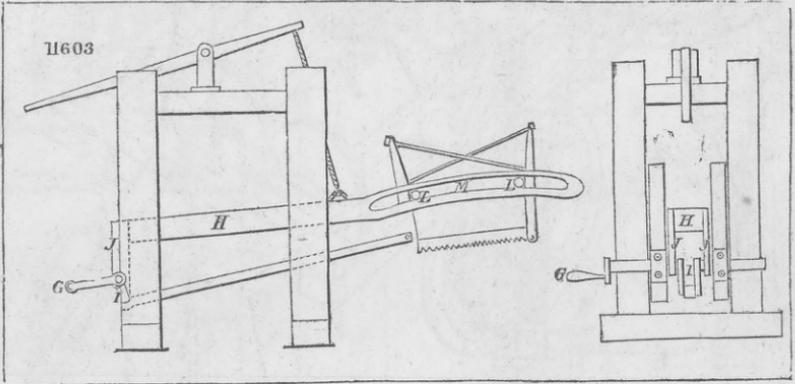
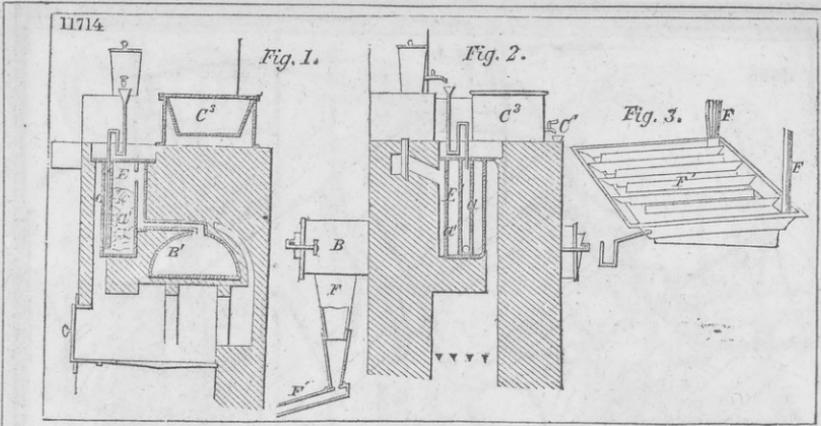
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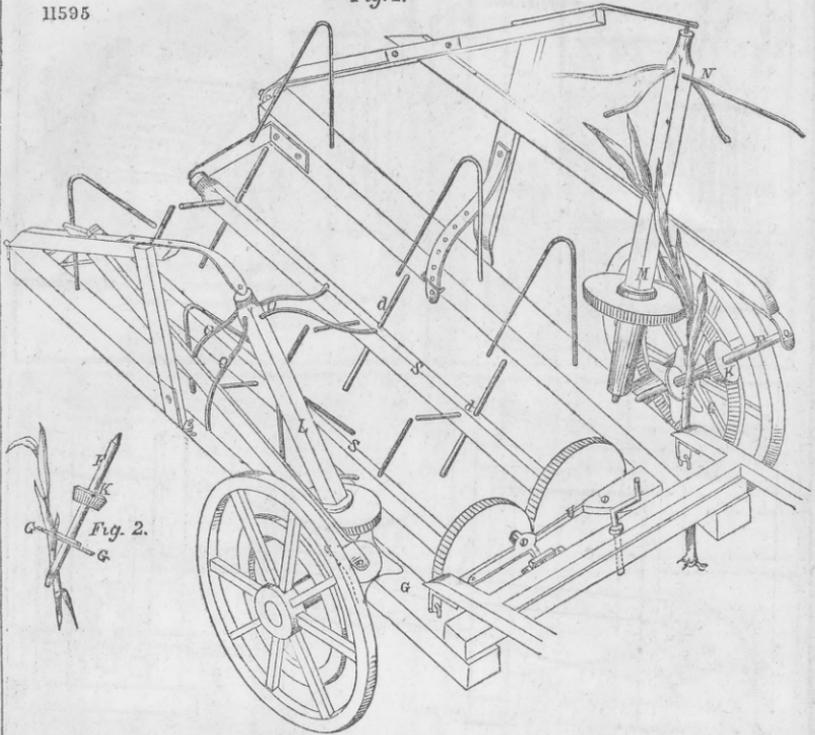






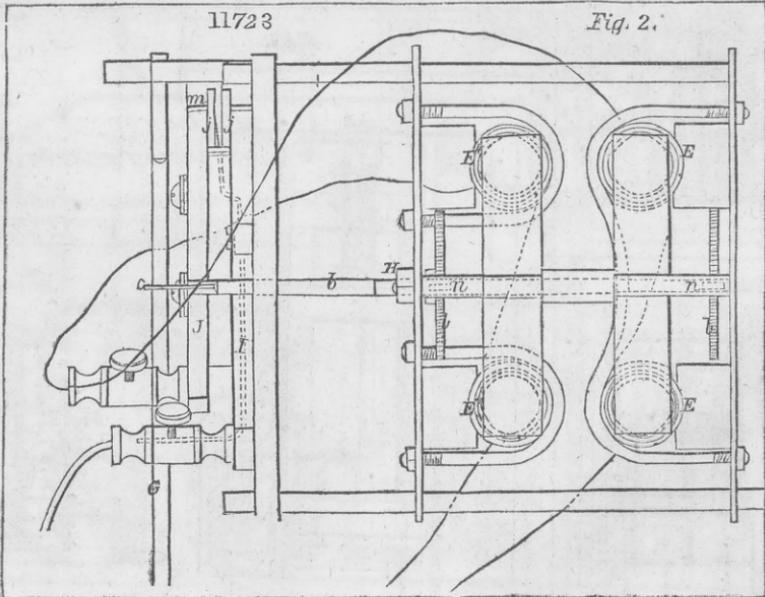
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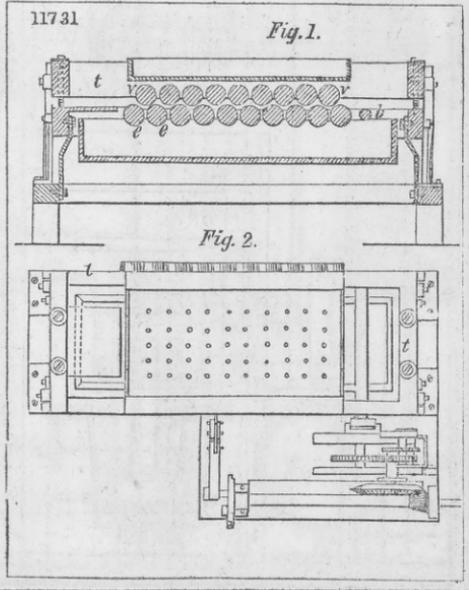
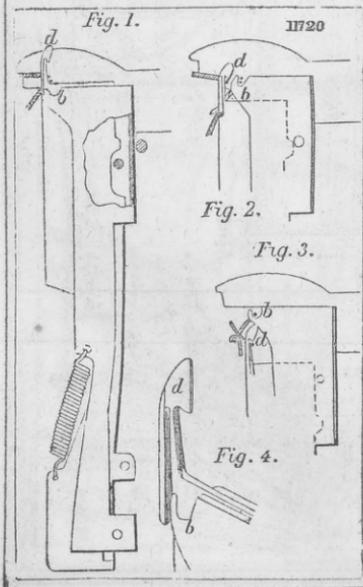
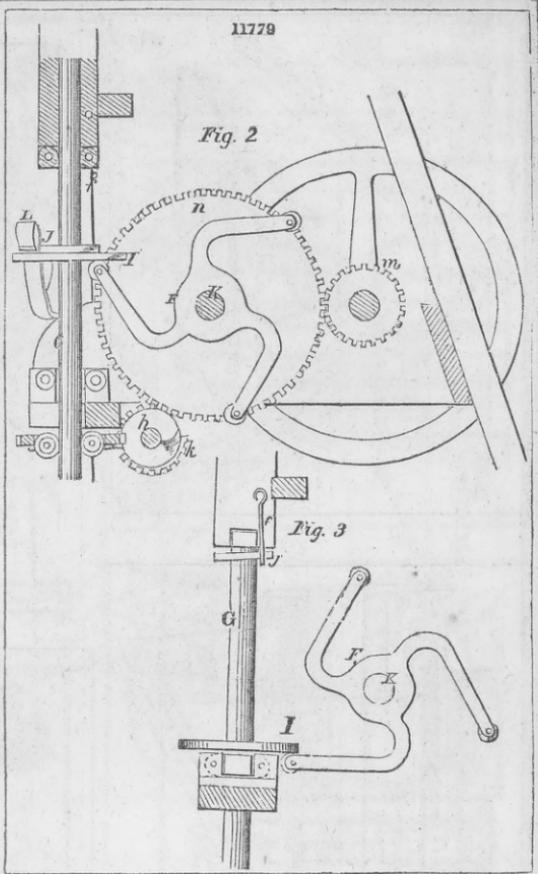
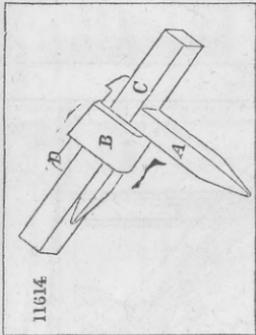
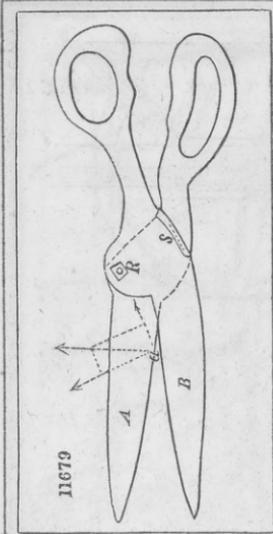
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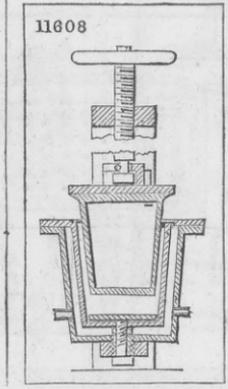
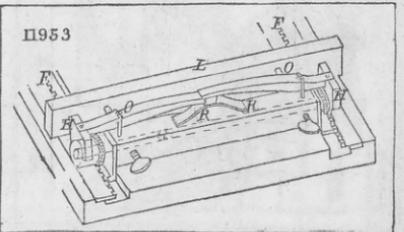
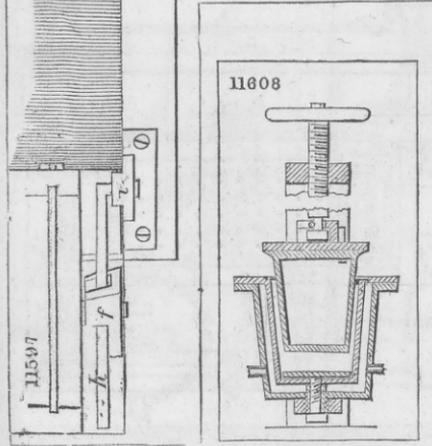
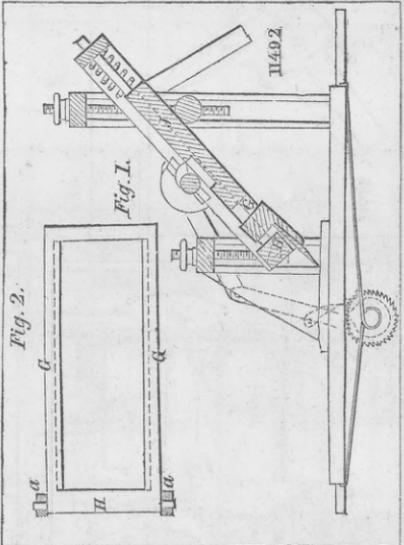
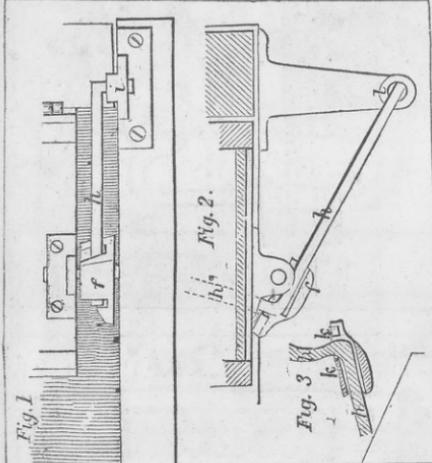
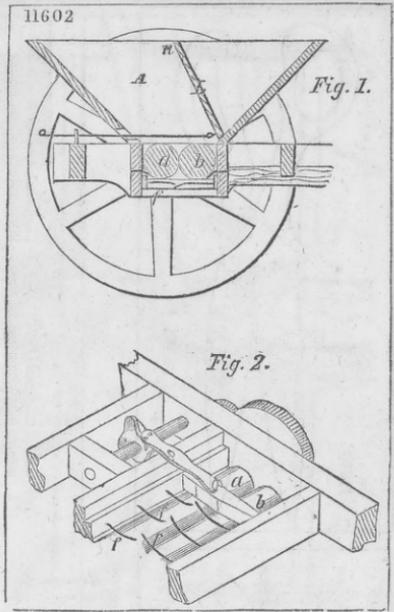
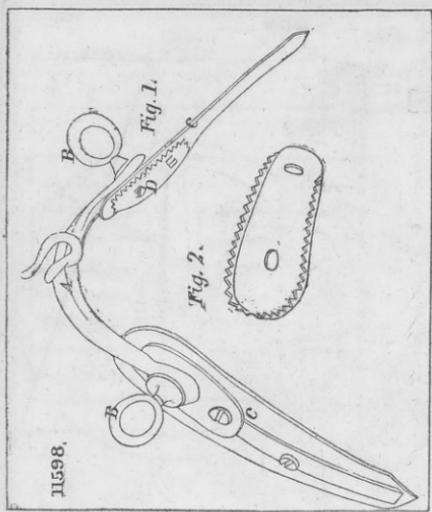


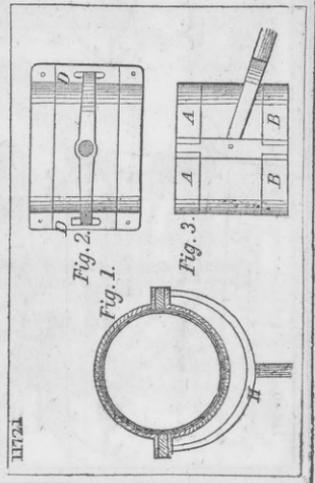
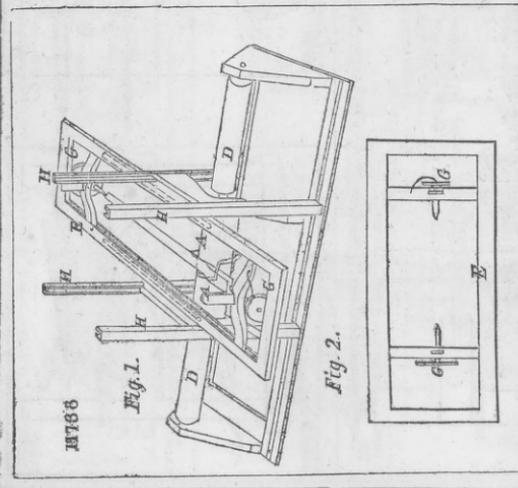
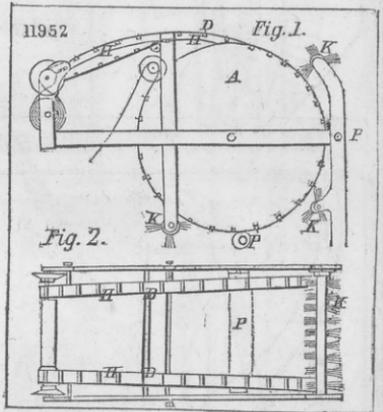
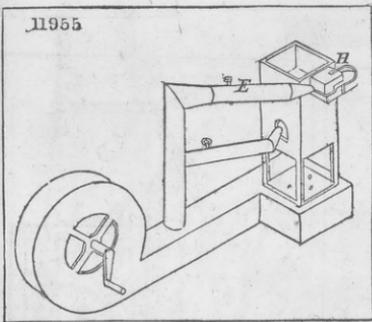
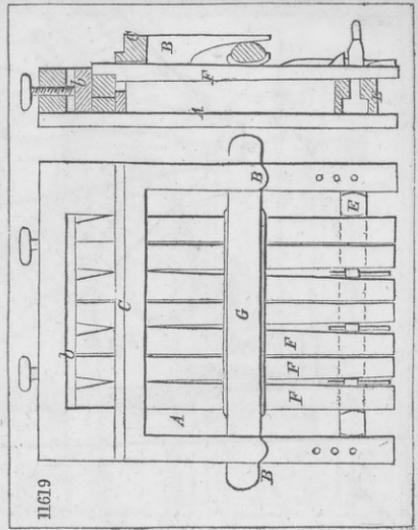
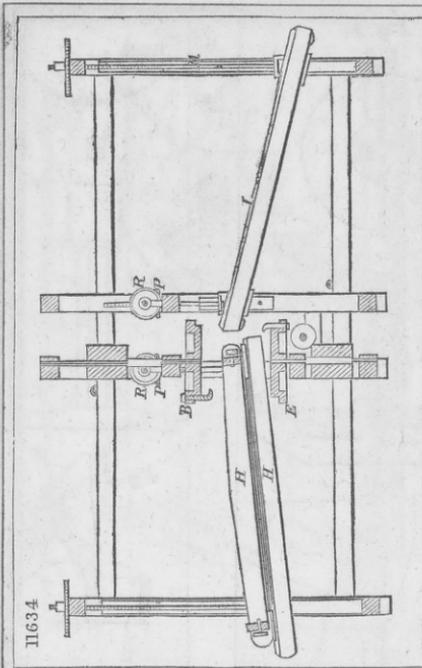
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Fig. 2.









11726.

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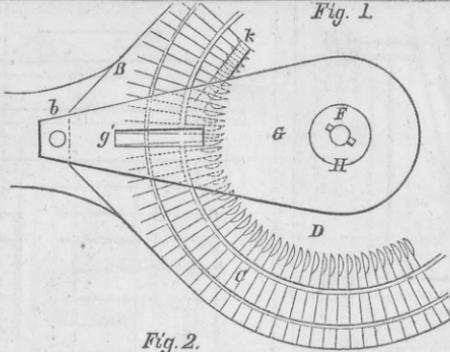


Fig. 2.

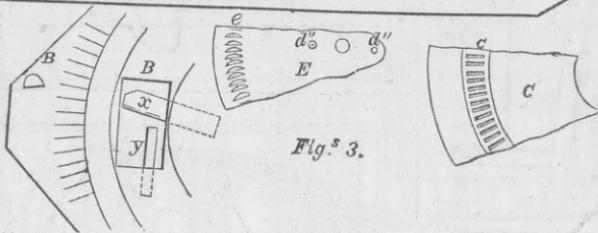
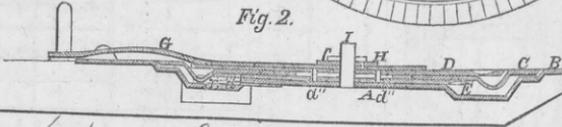


Fig. 3.

11624

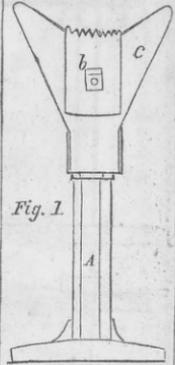


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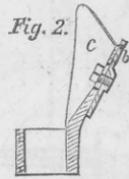


Fig. 2.

Fig. 2.

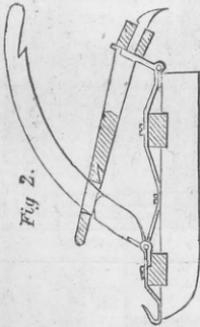
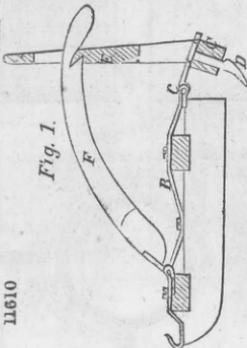


Fig. 1.



11610

Fig. 3.

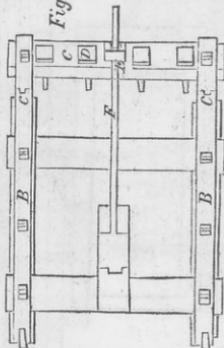


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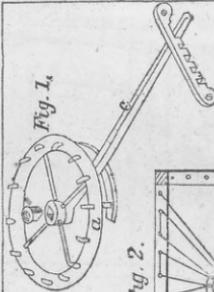
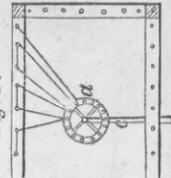
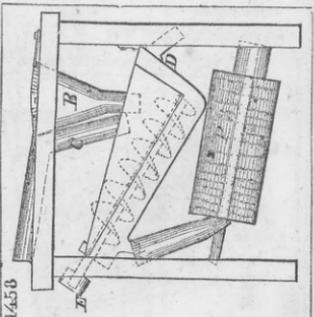


Fig. 2.



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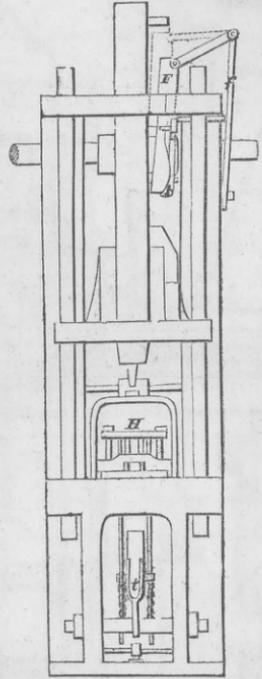
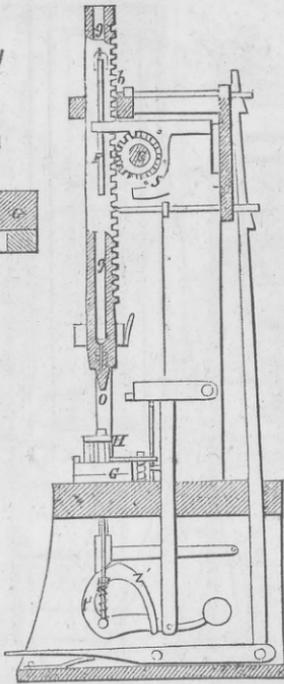
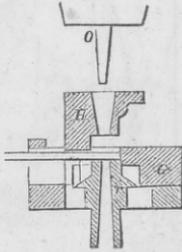


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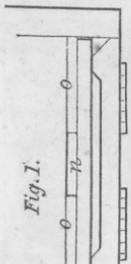


Fig. 1.

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Fig. 1.

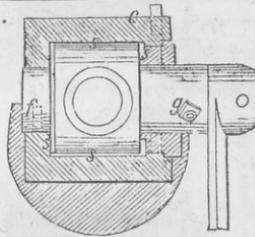
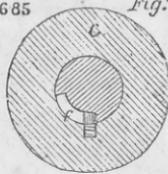


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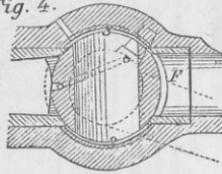
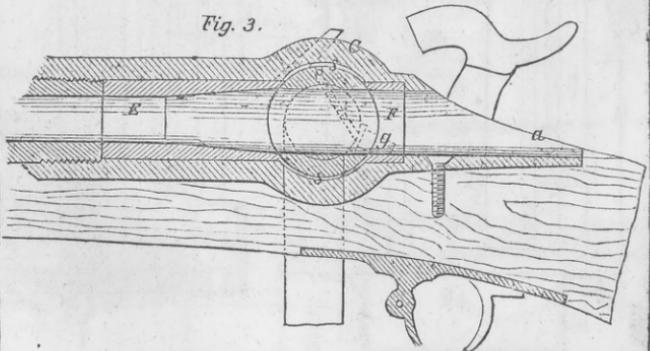
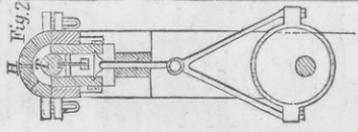
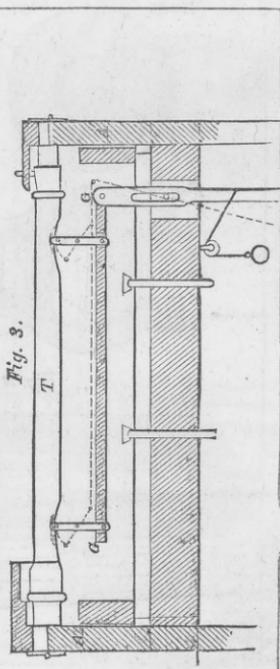
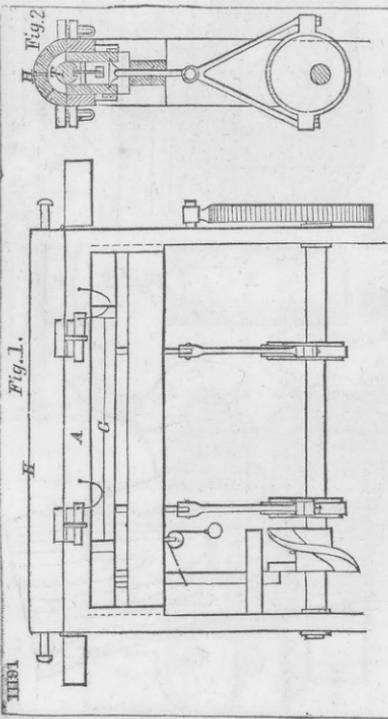
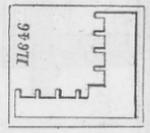
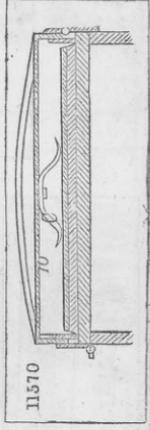
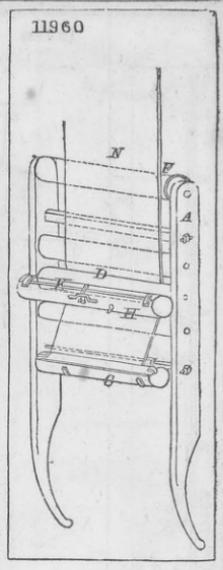
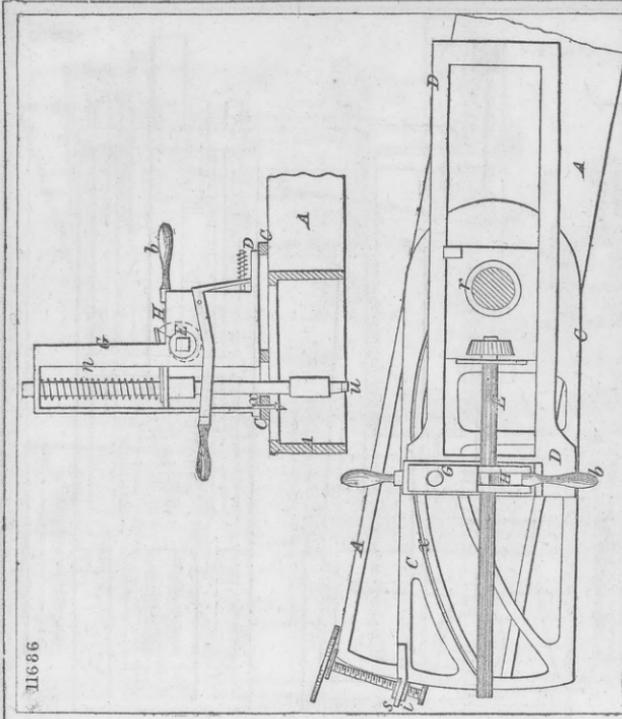
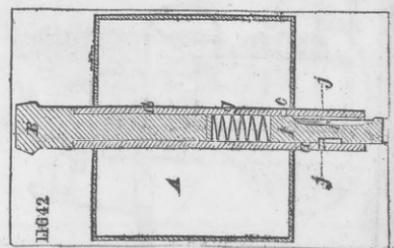
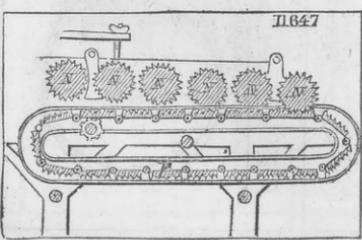
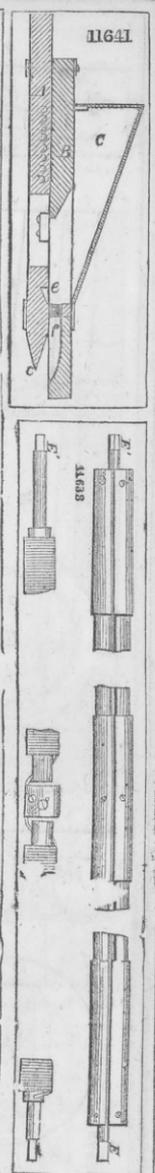
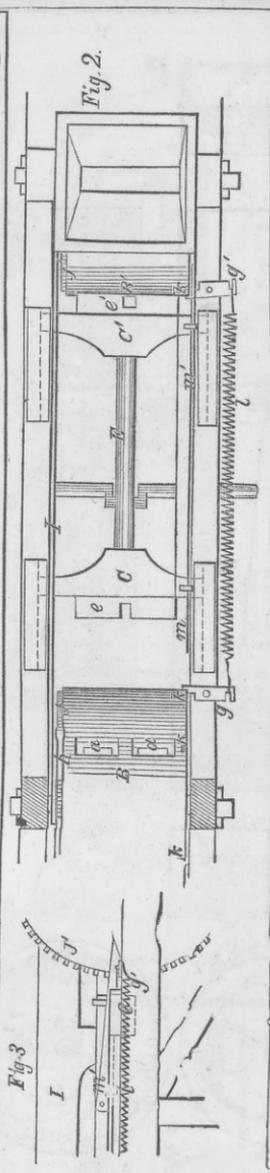
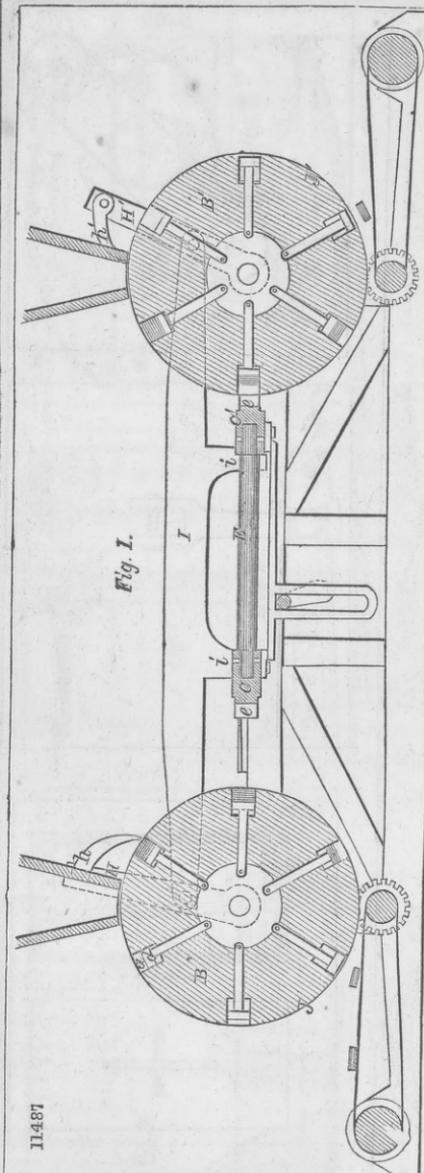


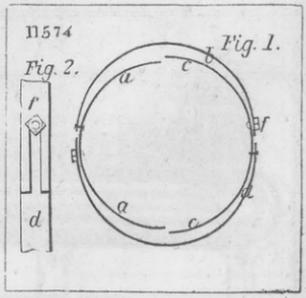
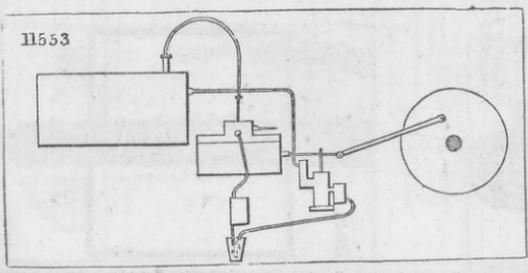
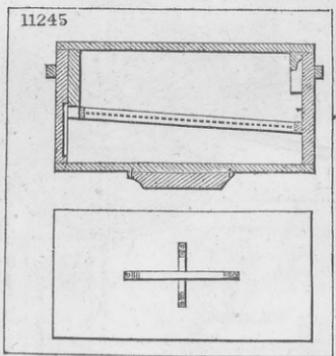
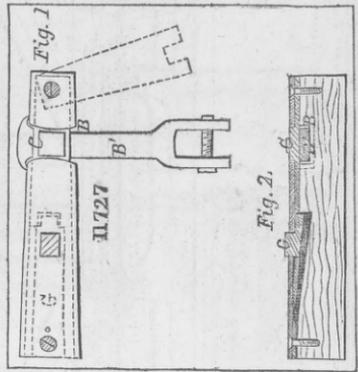
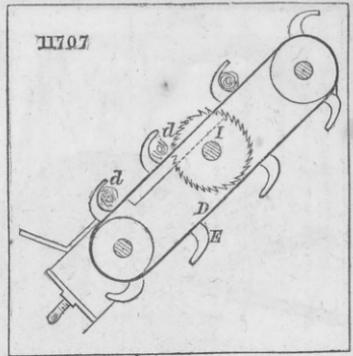
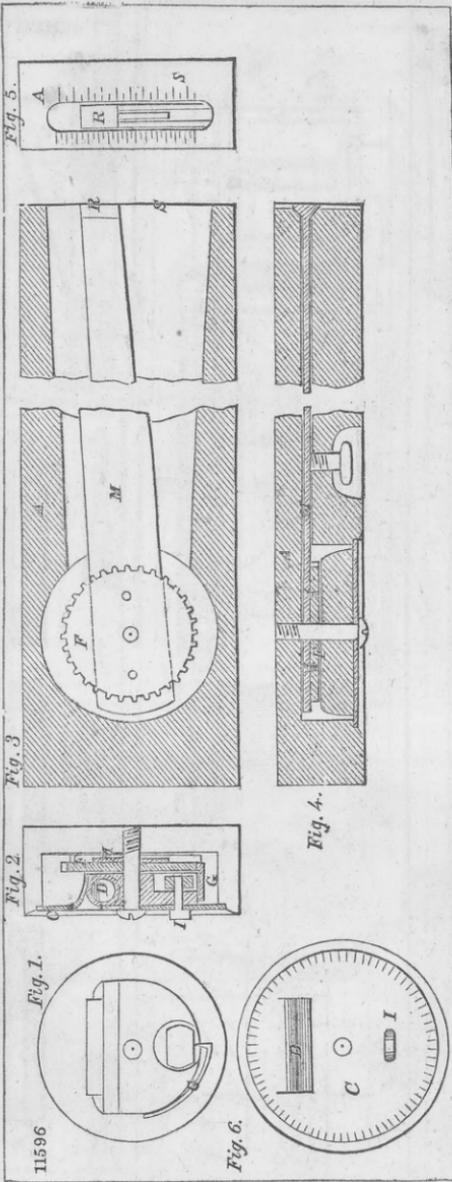
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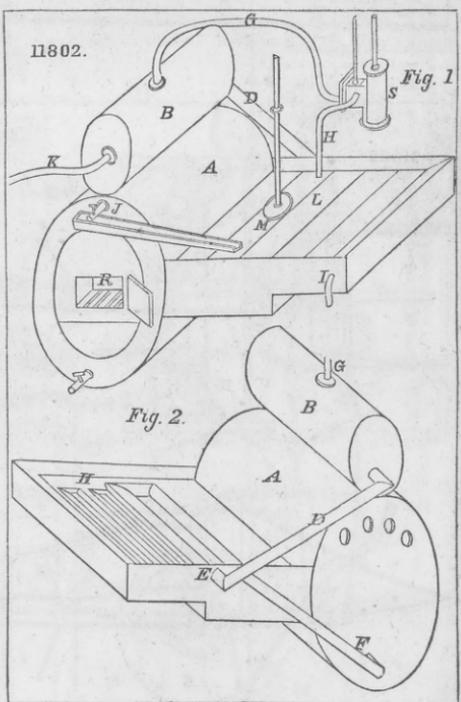
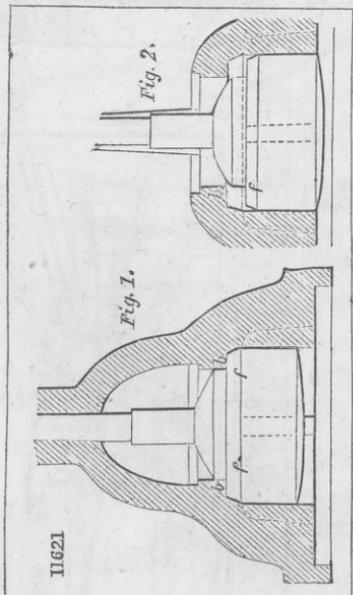
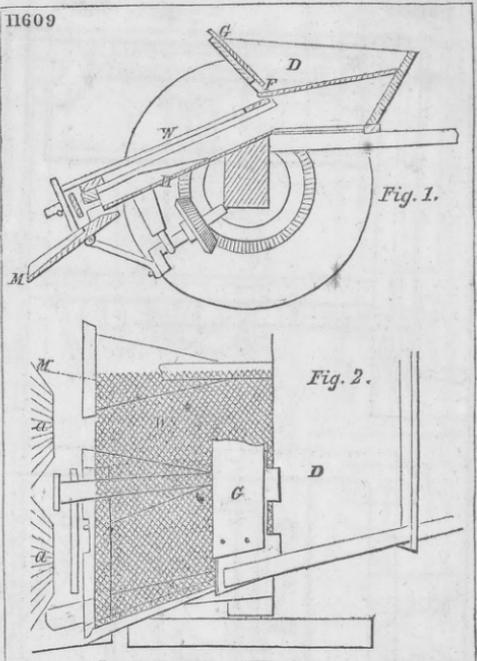
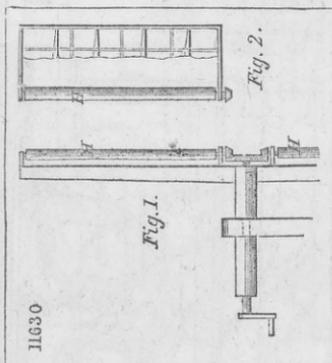
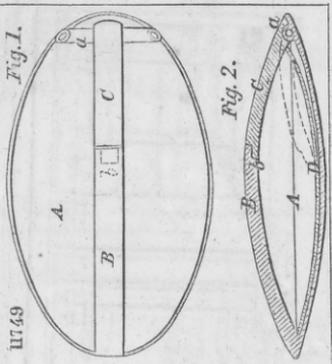
Fig. 3.











11605

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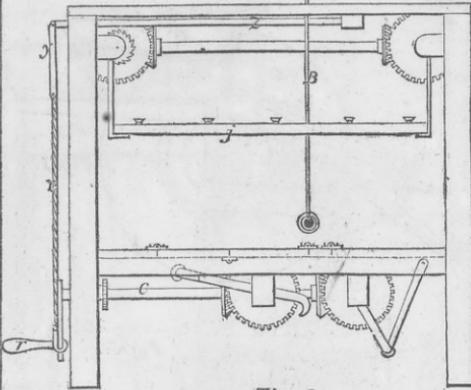


Fig. 2.

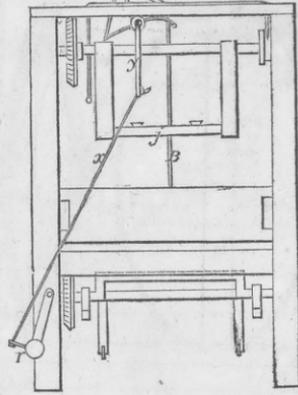
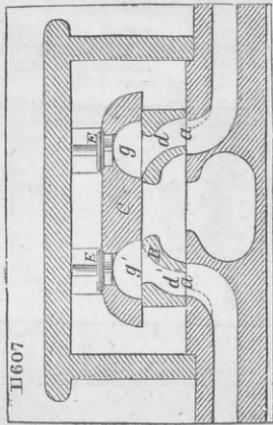
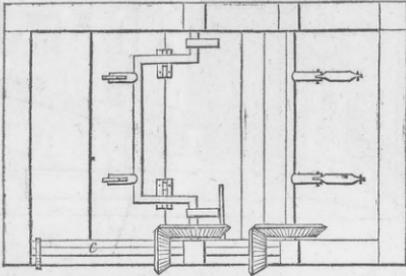


Fig. 3.



11607

11688

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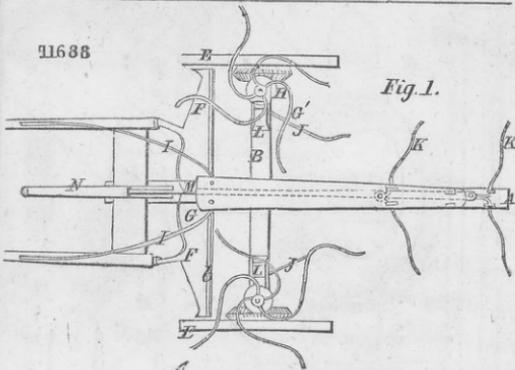
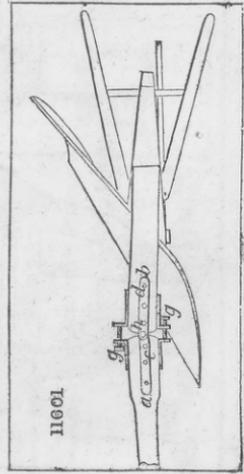
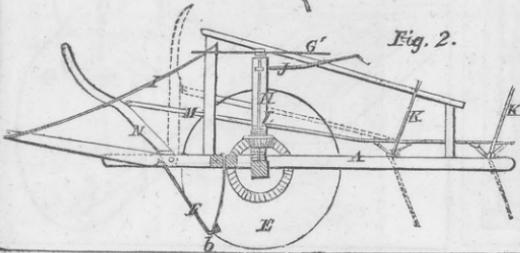
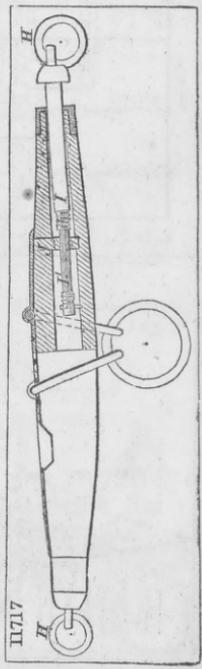
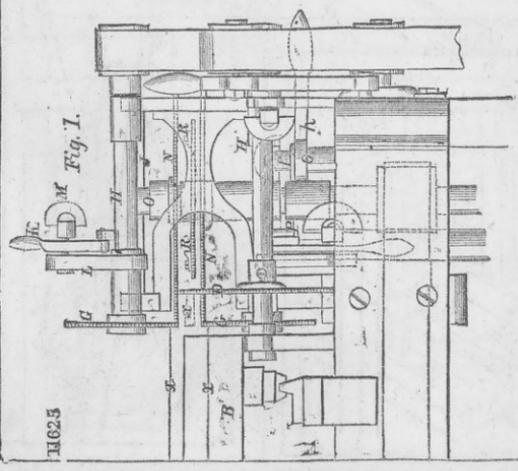
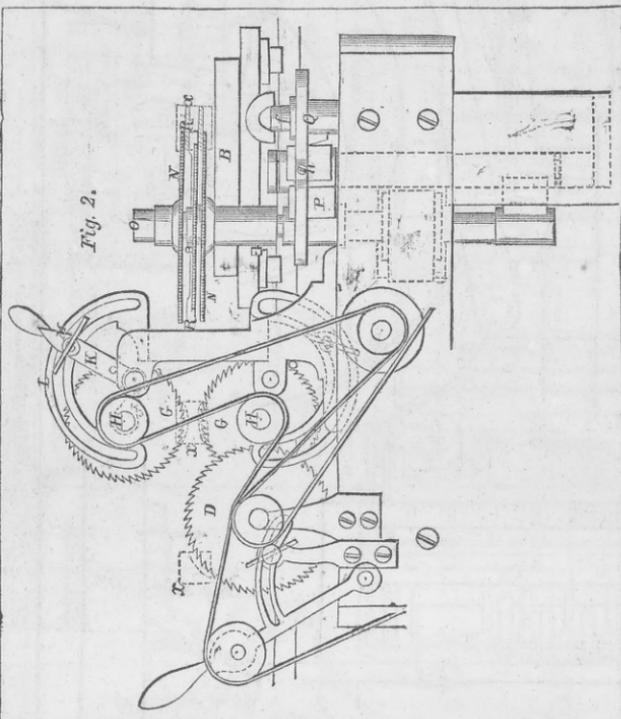
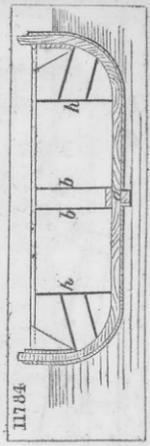
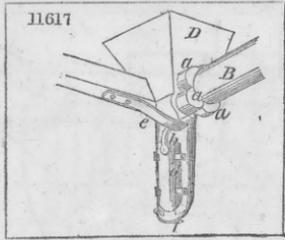
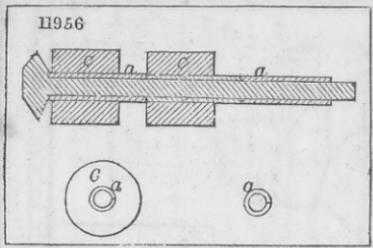


Fig. 2.



11601



11751

Fig. 1

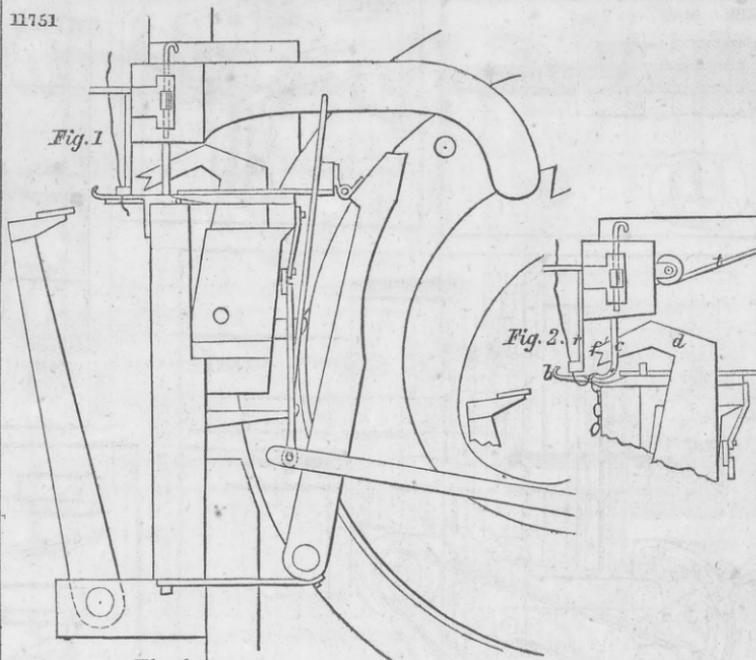


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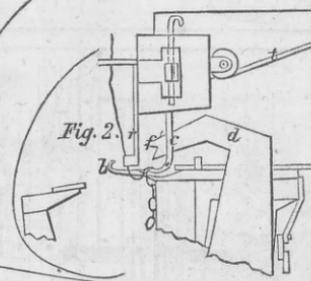


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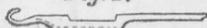


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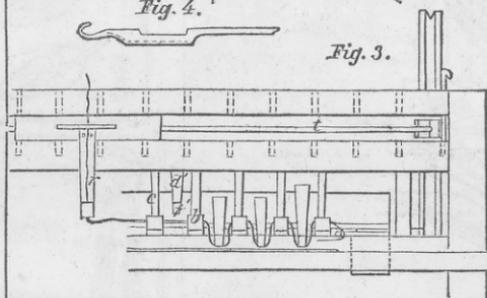
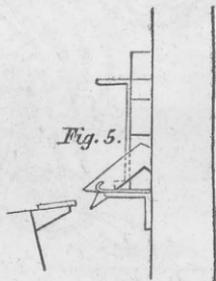


Fig. 5.



11599

Fig. 1

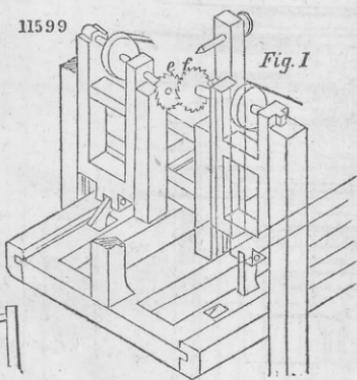
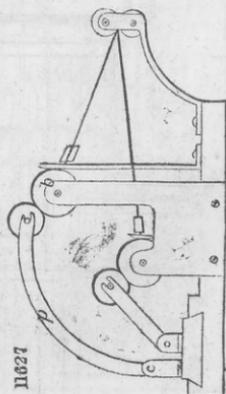
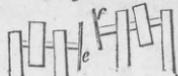
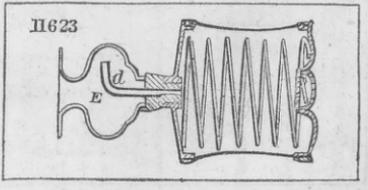
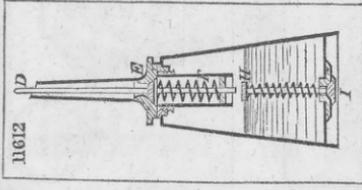
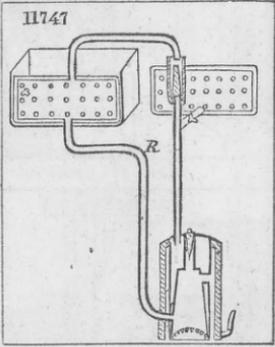
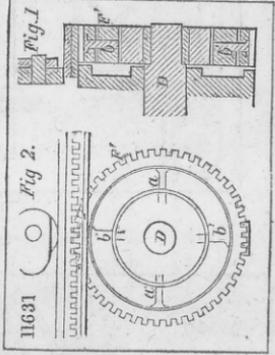
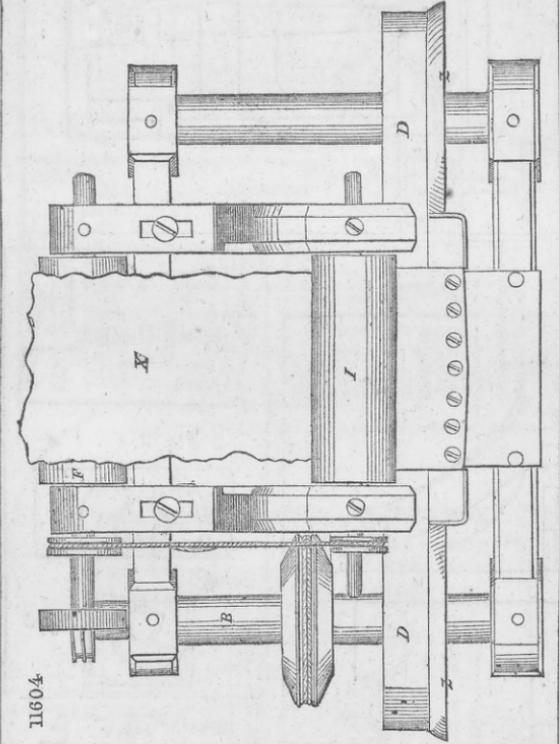
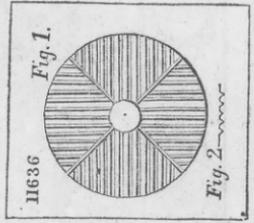
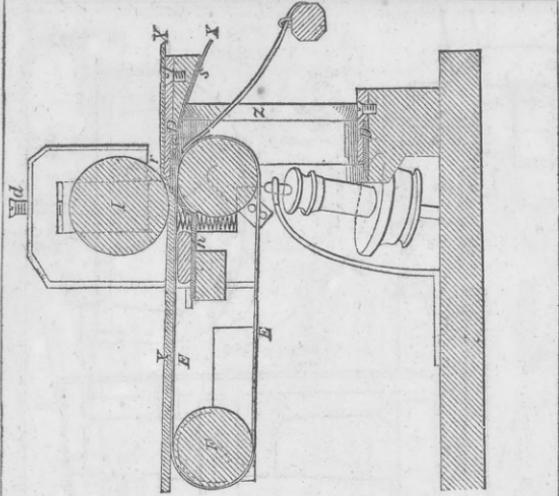
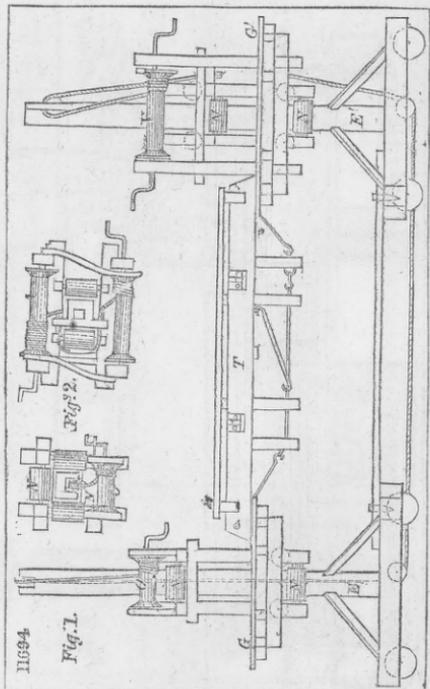
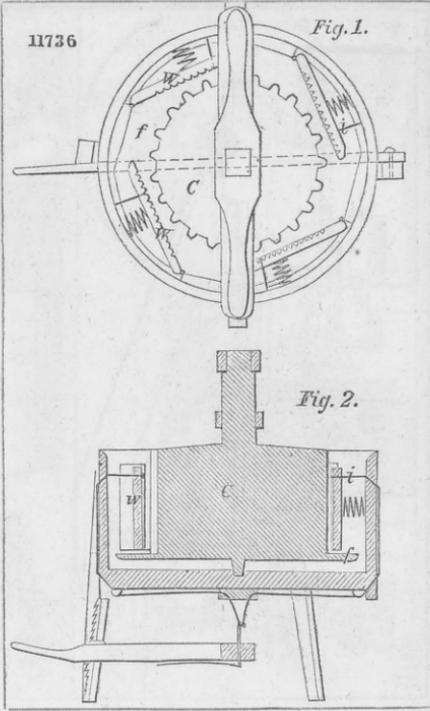
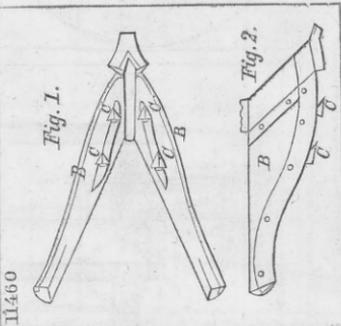
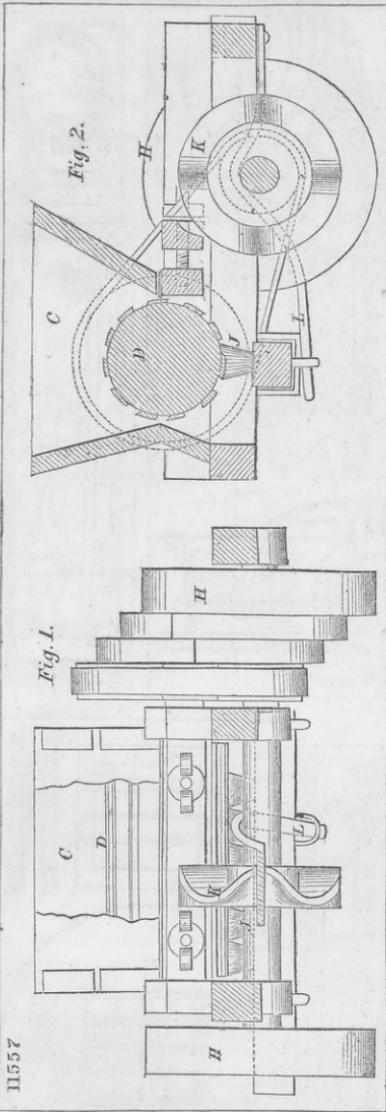


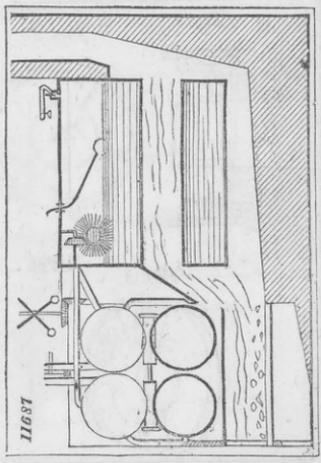
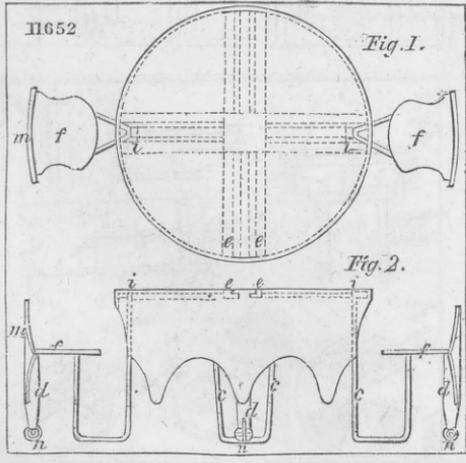
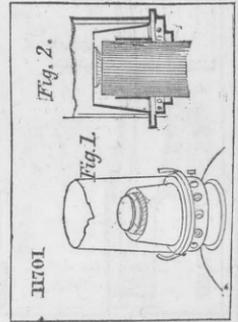
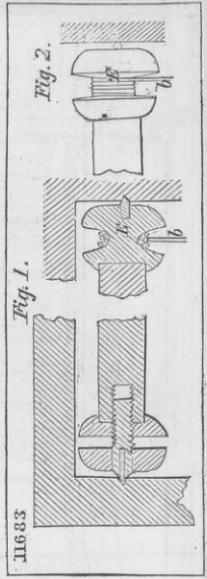
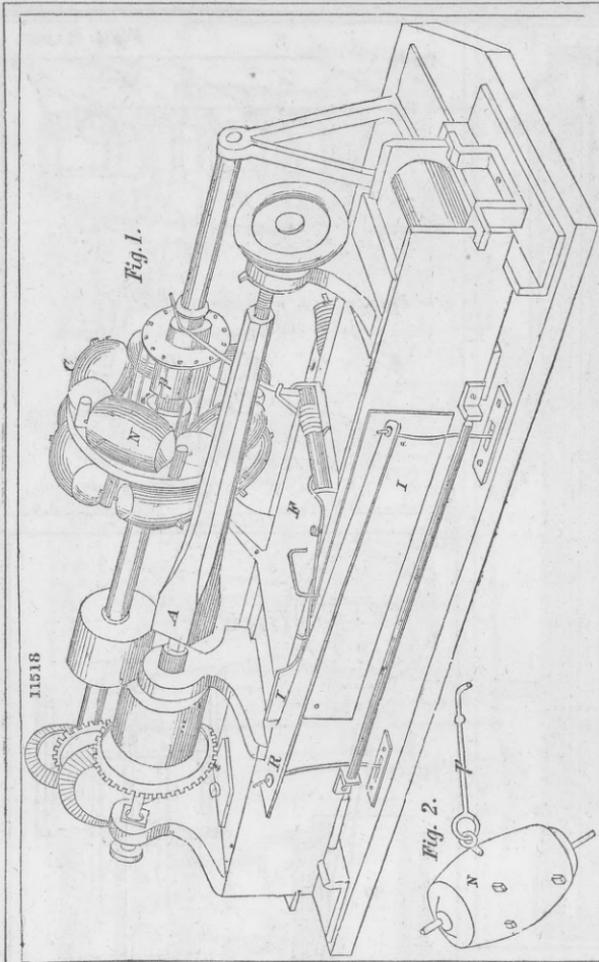
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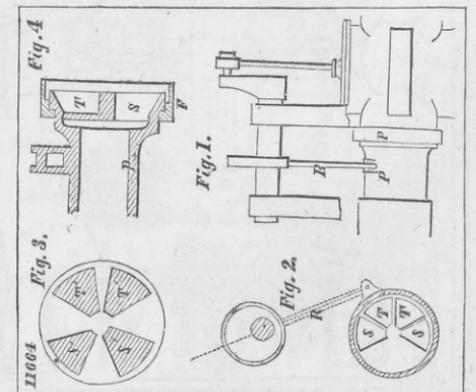
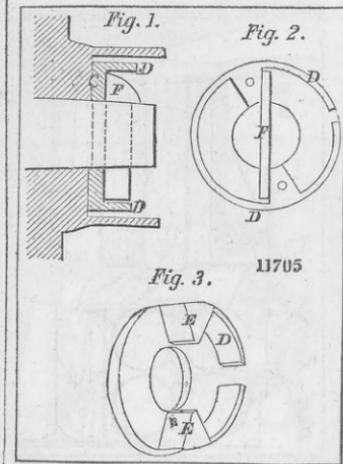
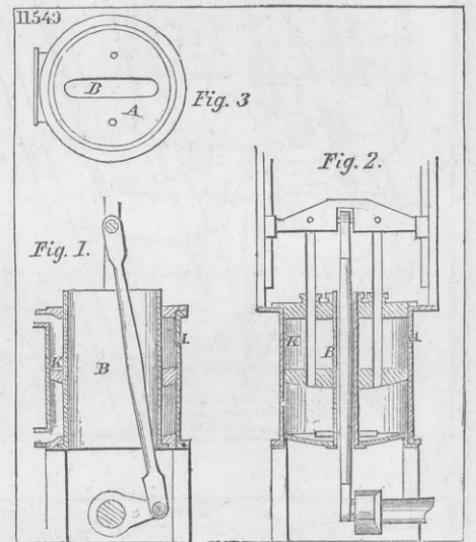
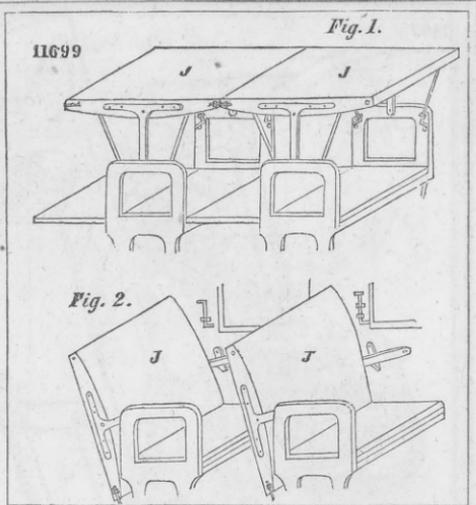
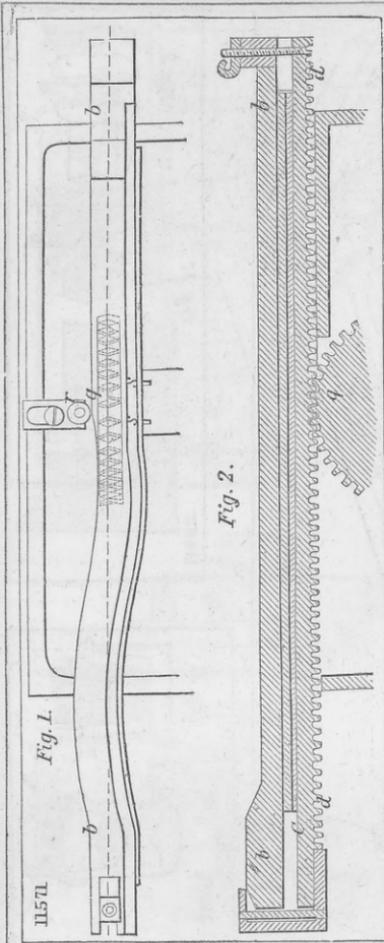


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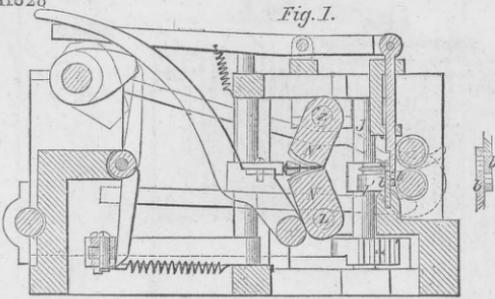


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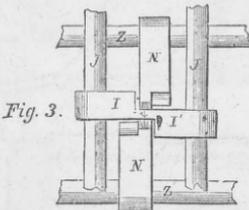
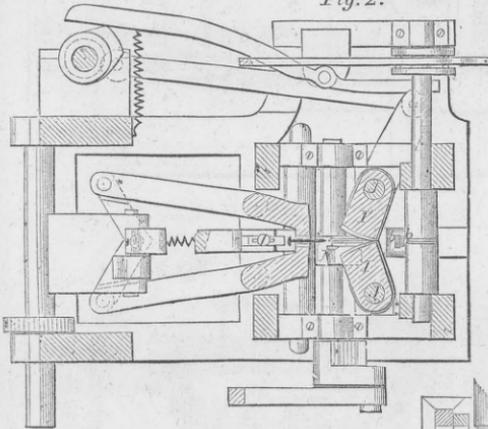
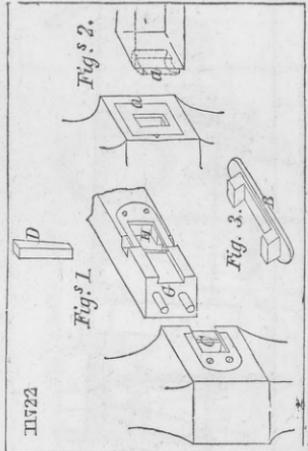
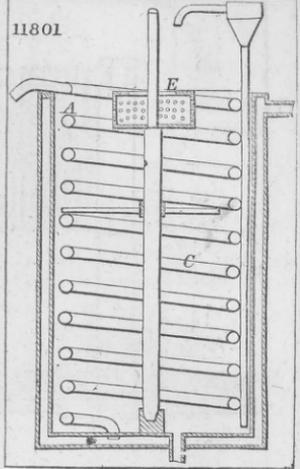


Fig. 3.

11801



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11629

Fig. 2.

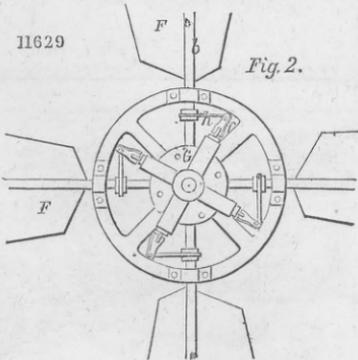
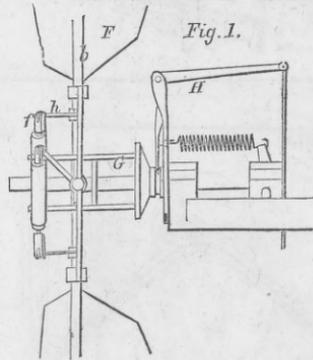


Fig. 1.



11589

Fig. 2.

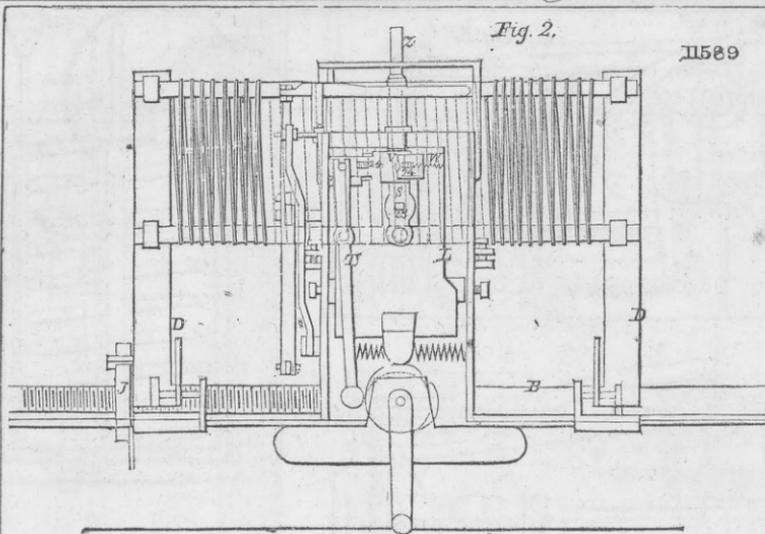


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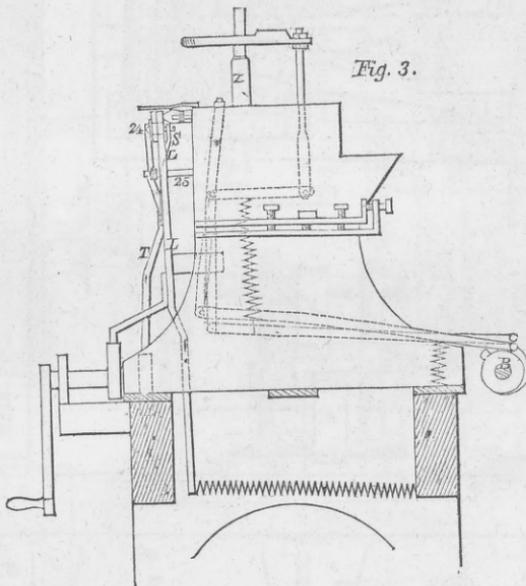
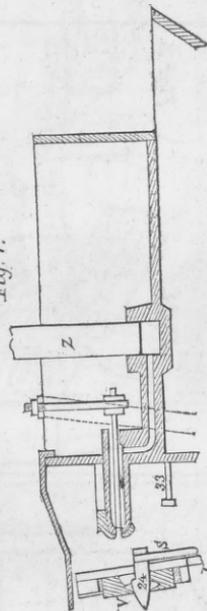
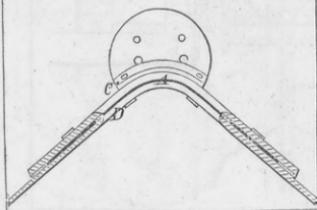


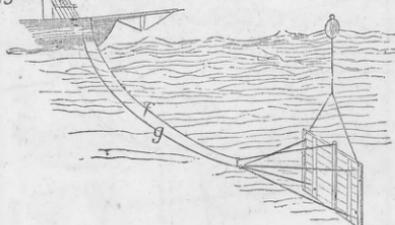
Fig. 7.



11573

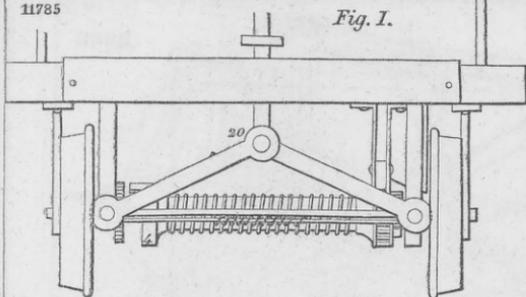


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Fig. 1.



11626

Fig. 1.

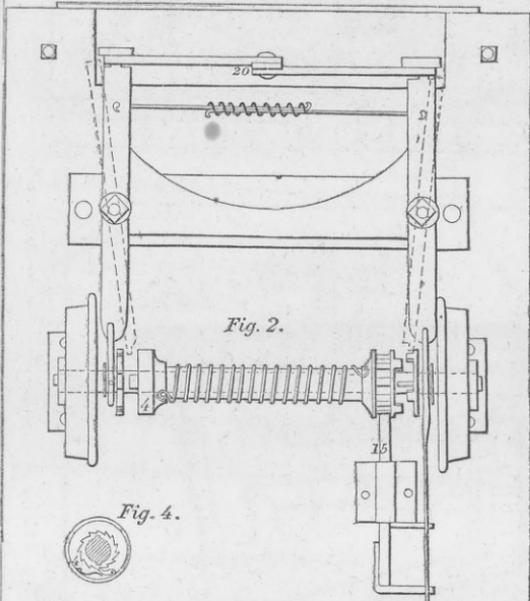
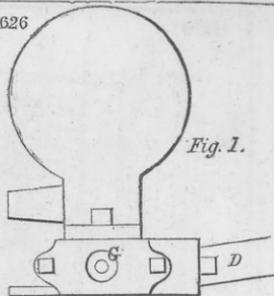


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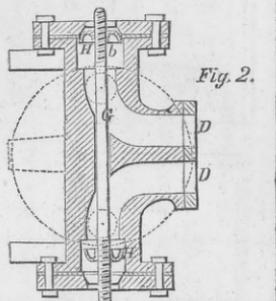
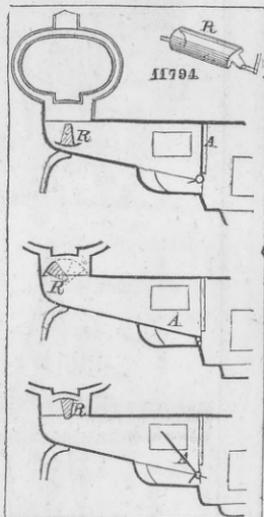
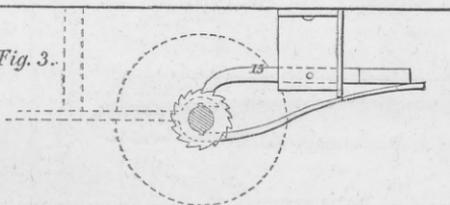


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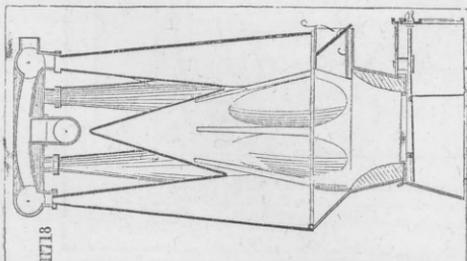
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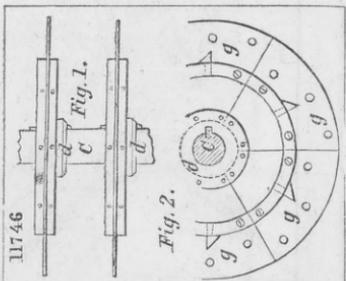
Fig. 3.



11794



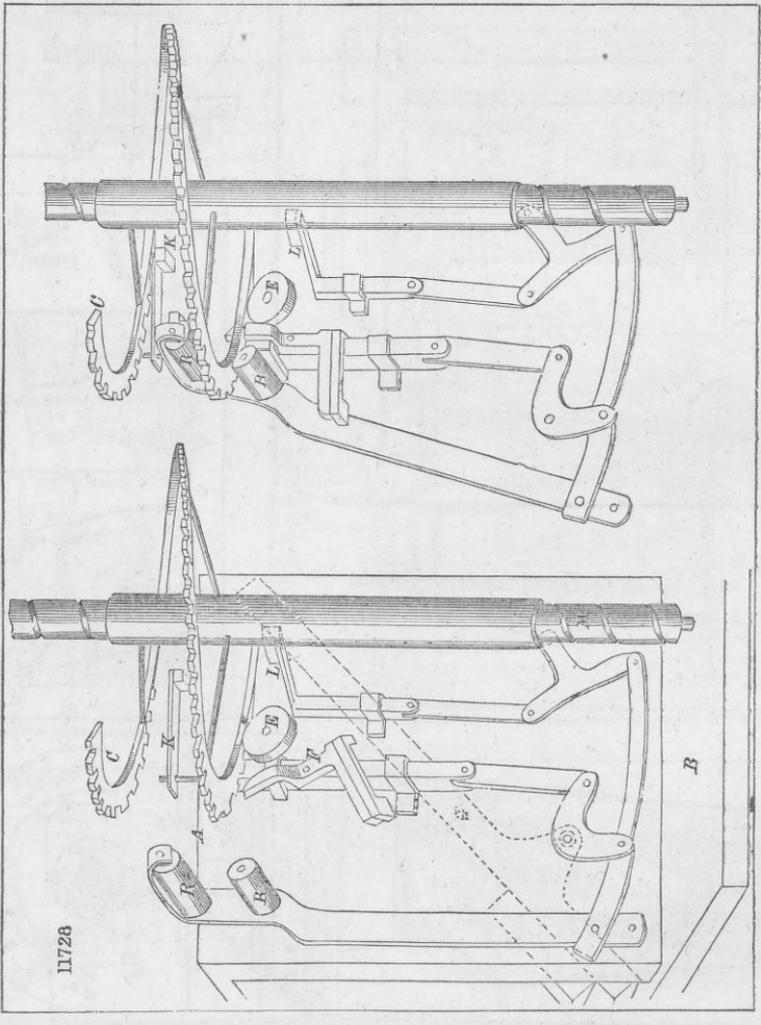
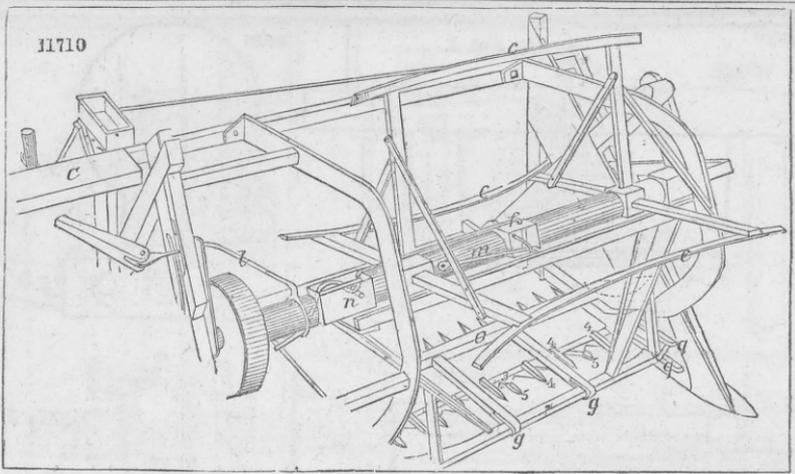
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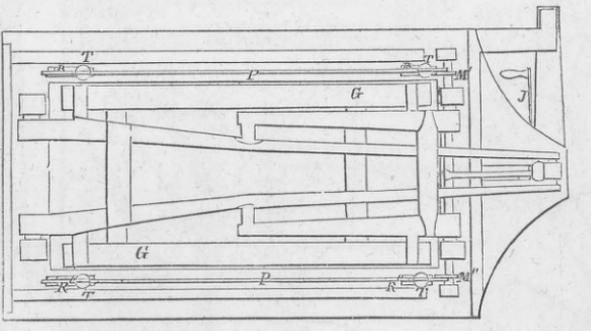
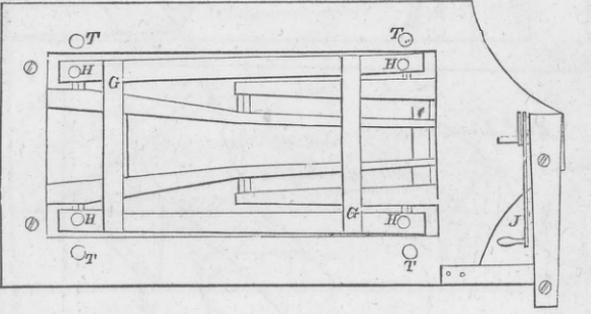
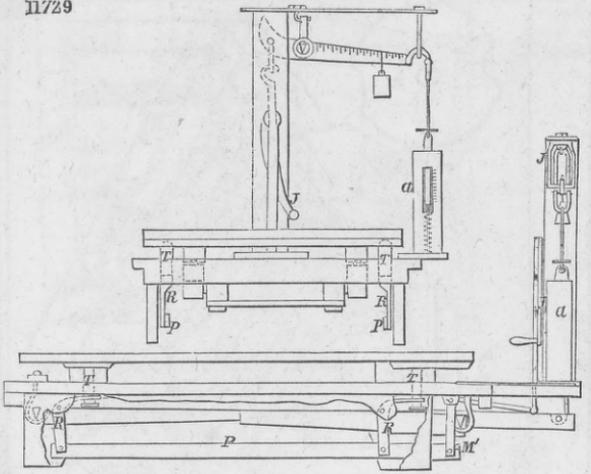
Fig. 1.

Fig. 2.

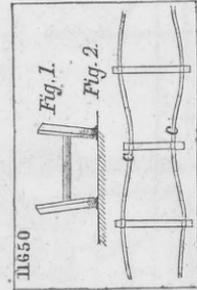
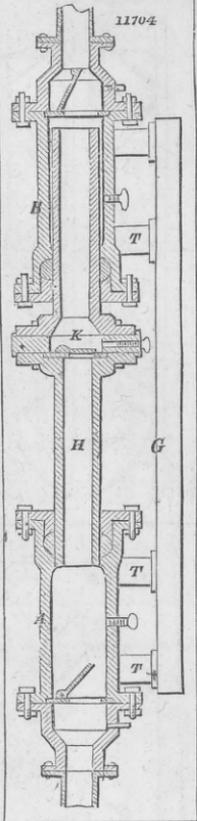


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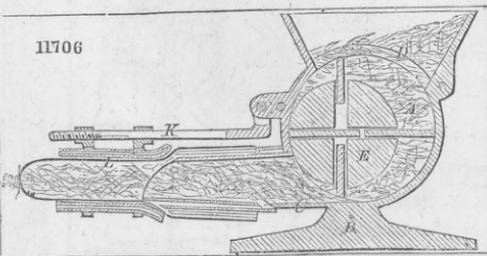
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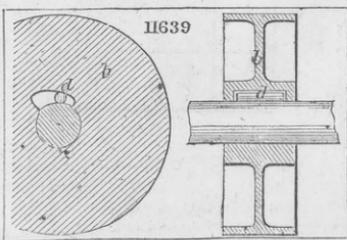
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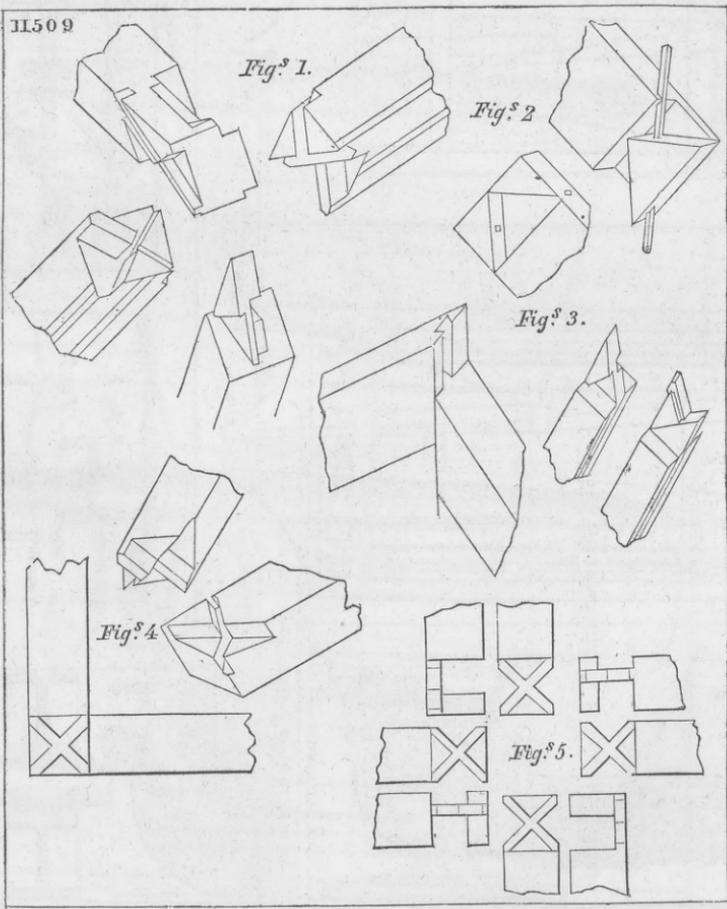
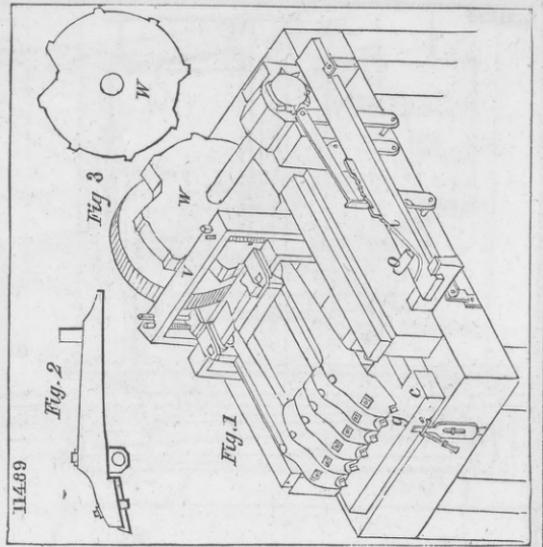
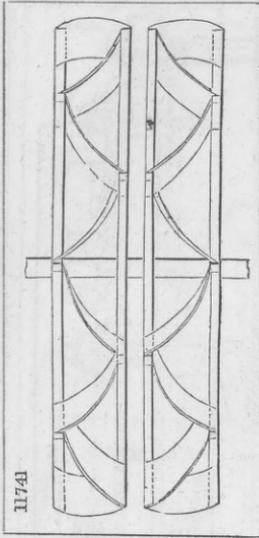


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Fig. 1.

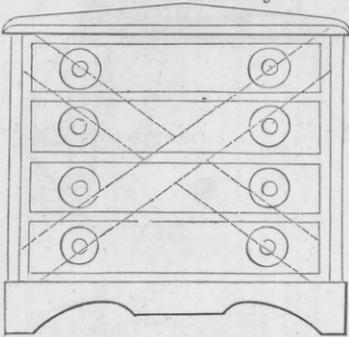


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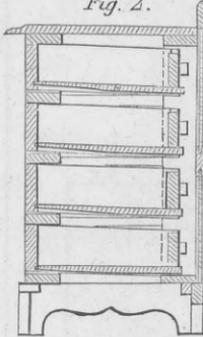


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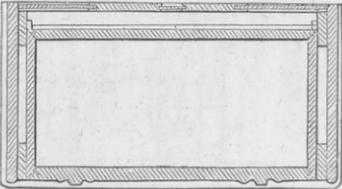


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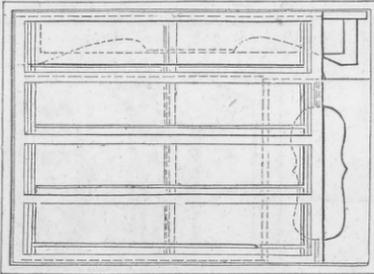


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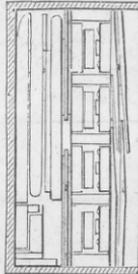
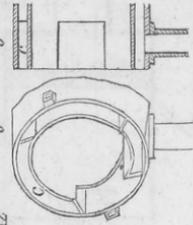
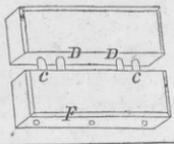


Fig. 1.
Fig. 2.



11742

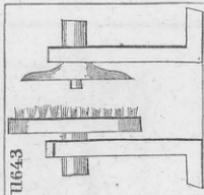
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Fig. 1.

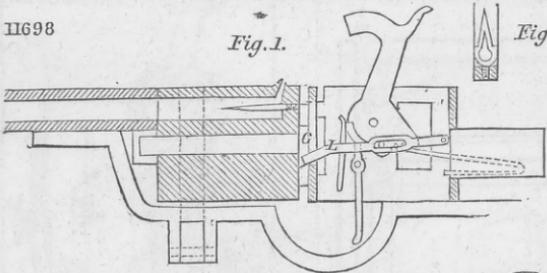


Fig. 3.

Fig. 2.

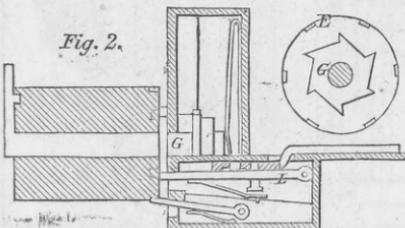
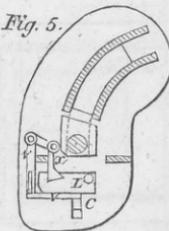
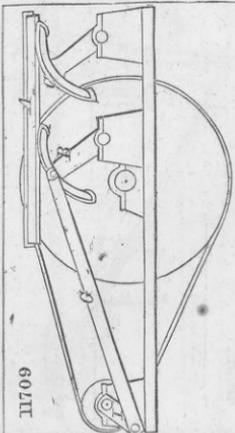
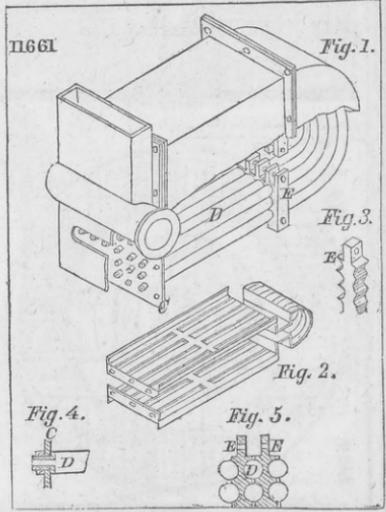
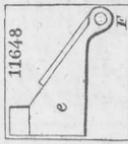
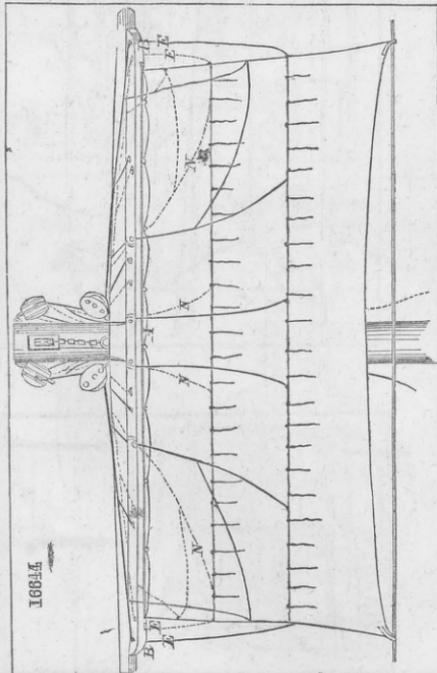
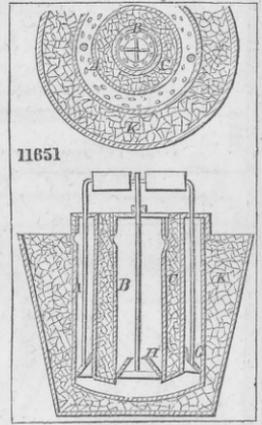
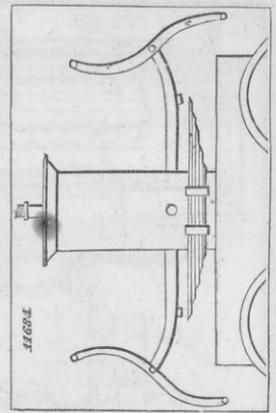
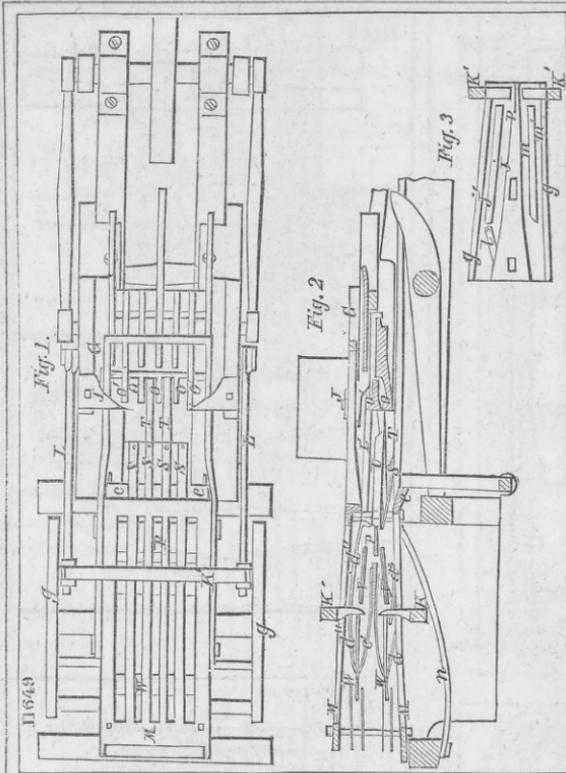


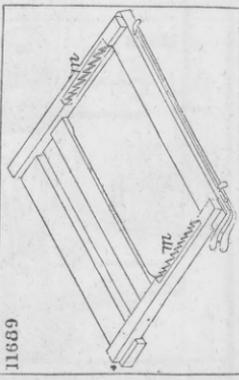
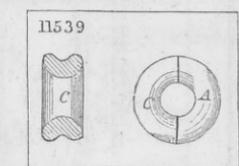
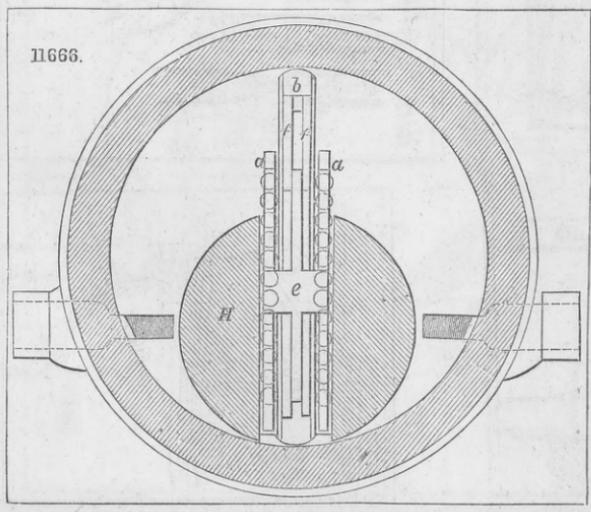
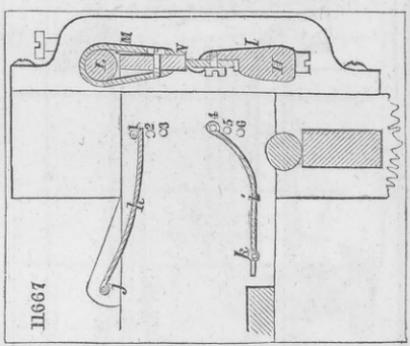
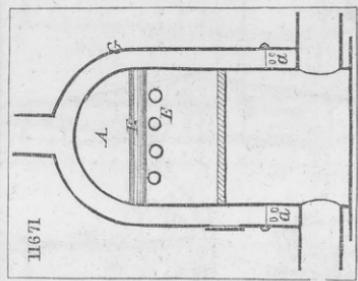
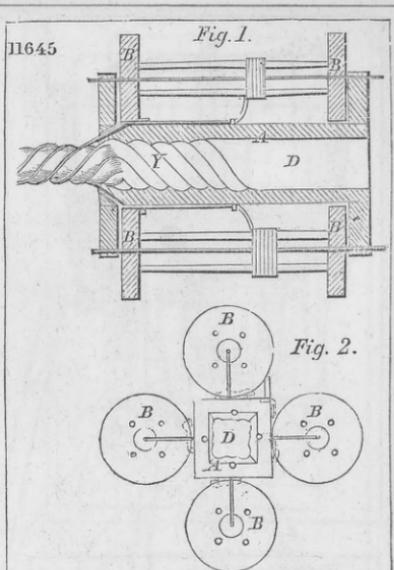
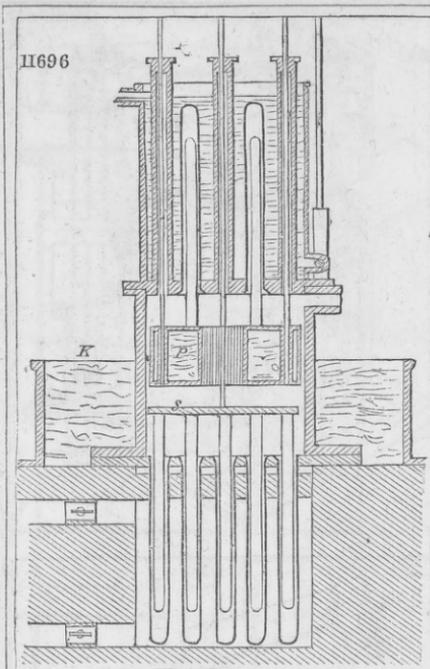
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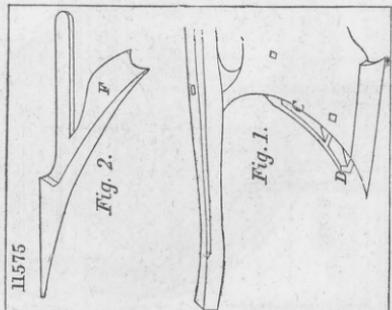
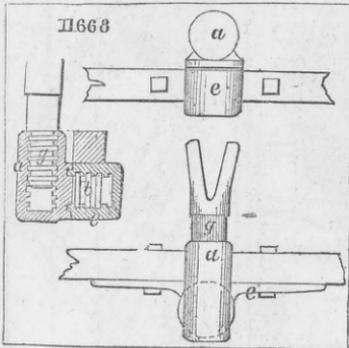
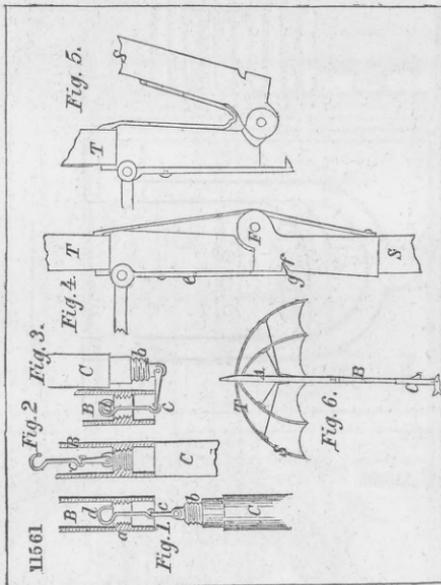
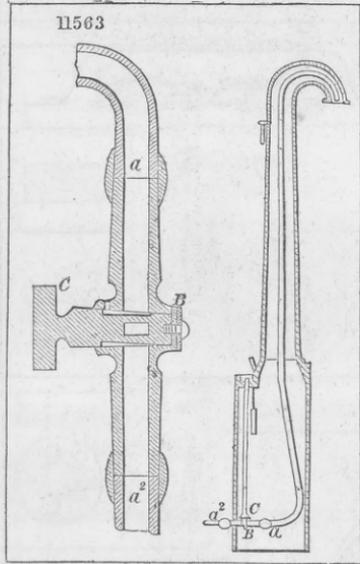
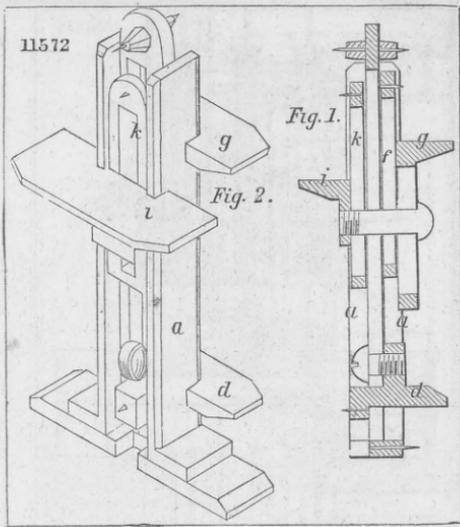
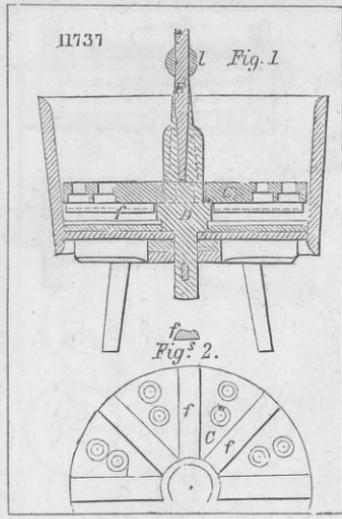


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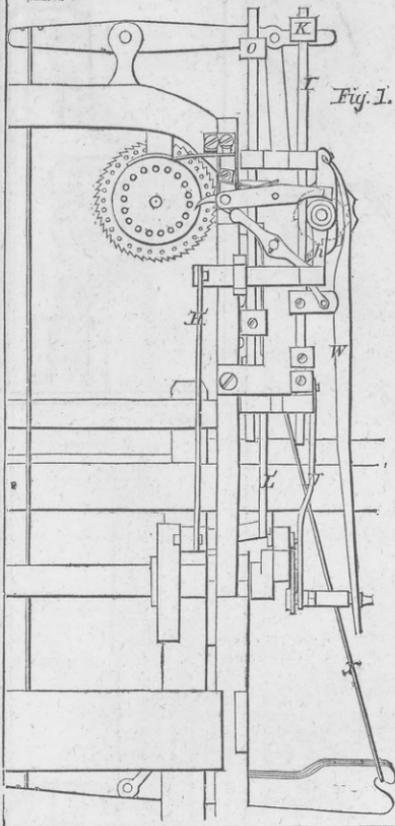
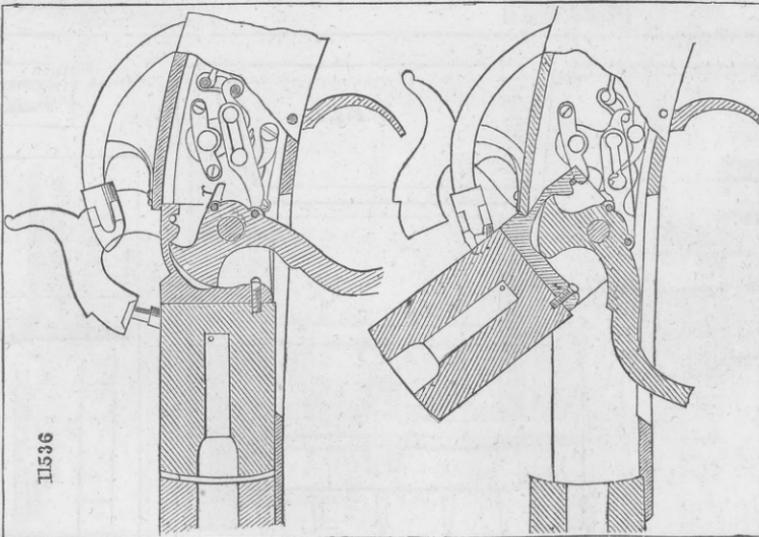
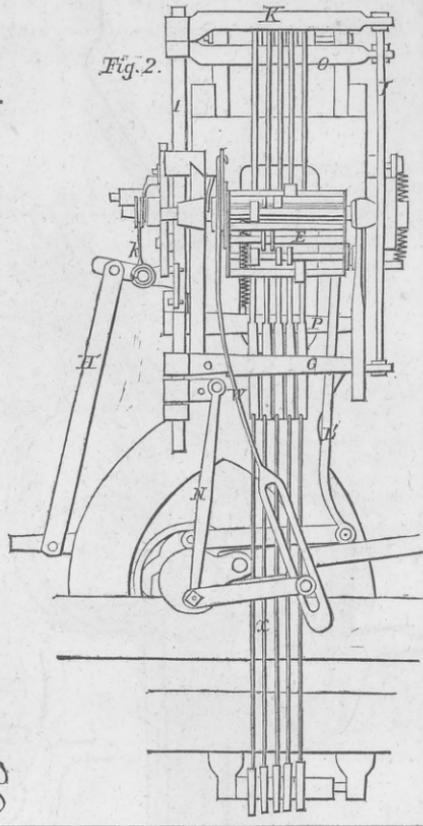
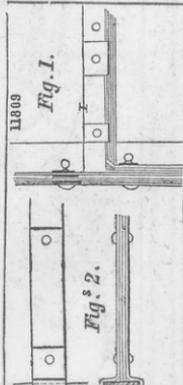
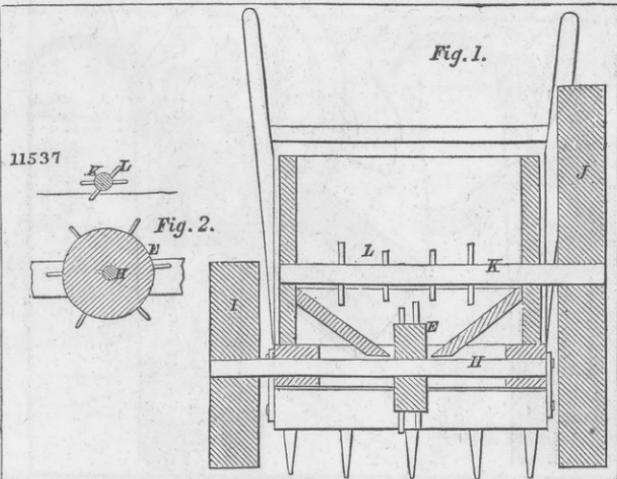
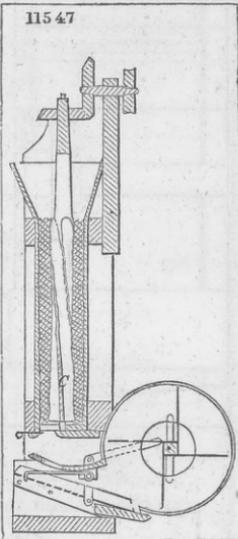
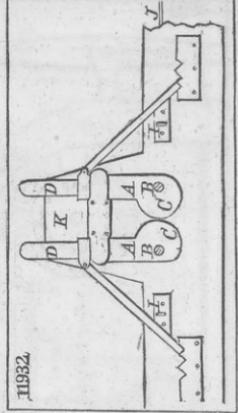
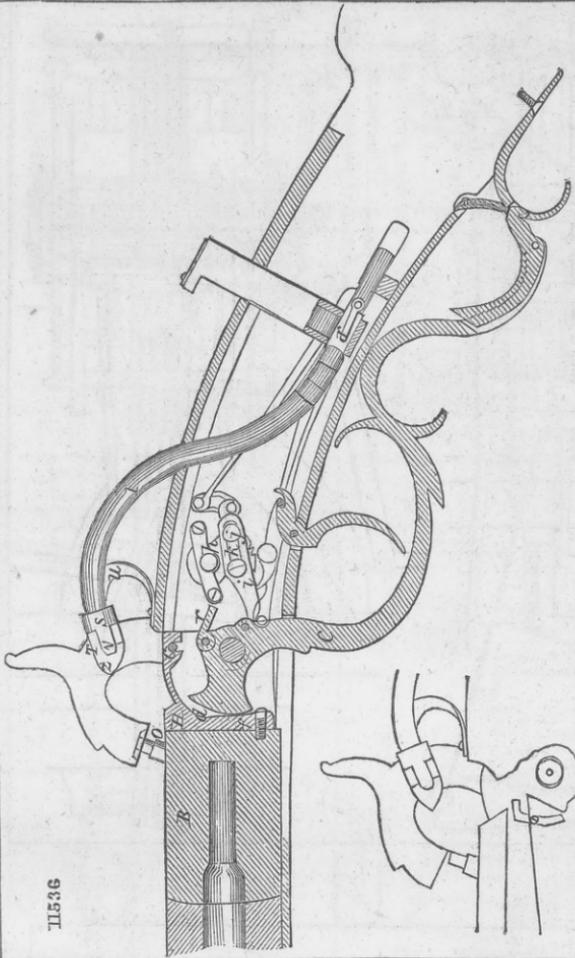


Fig. 2.





11711.

Fig. 1.

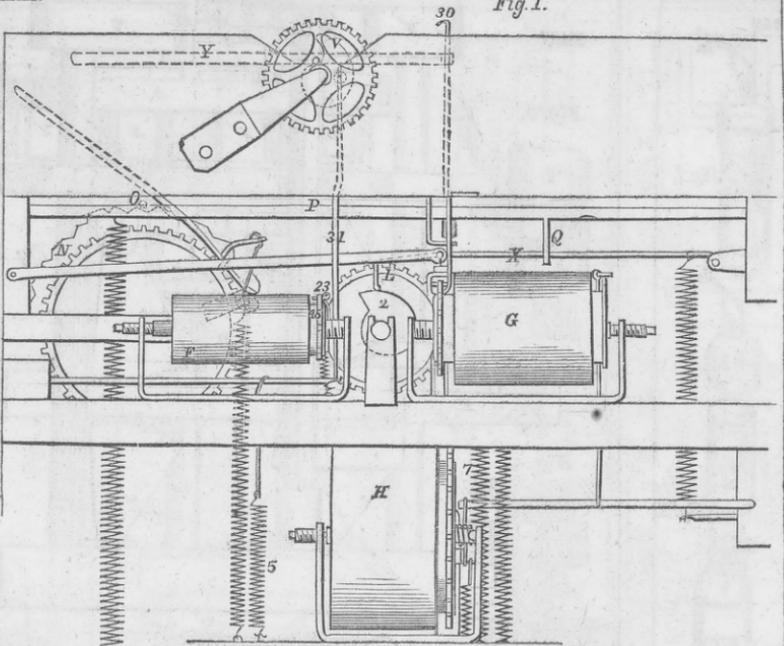


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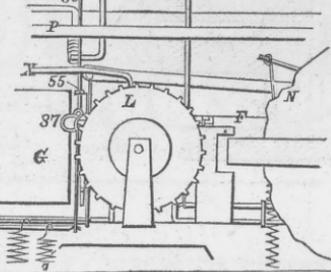


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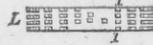
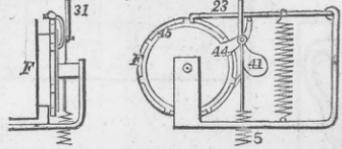


Fig. 3.



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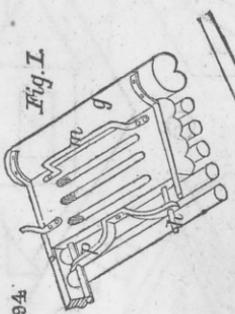


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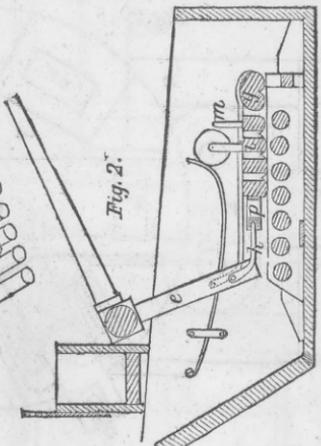
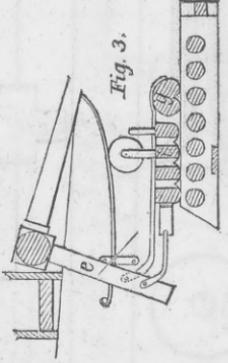


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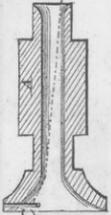
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Fig. 3.

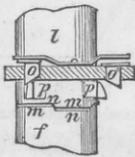


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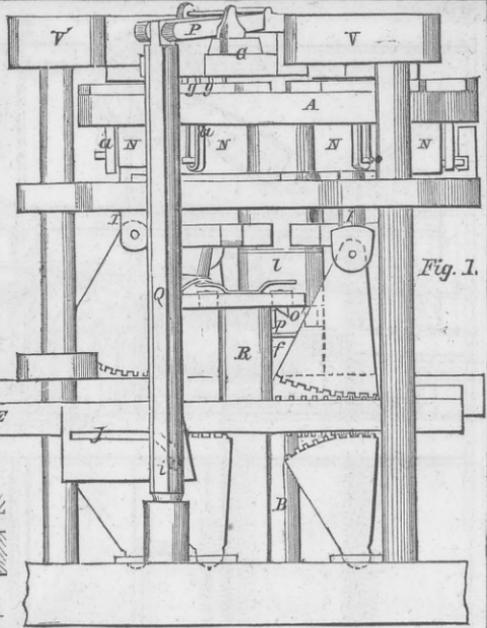
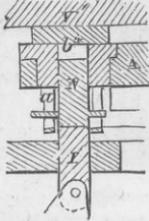
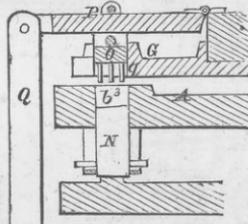
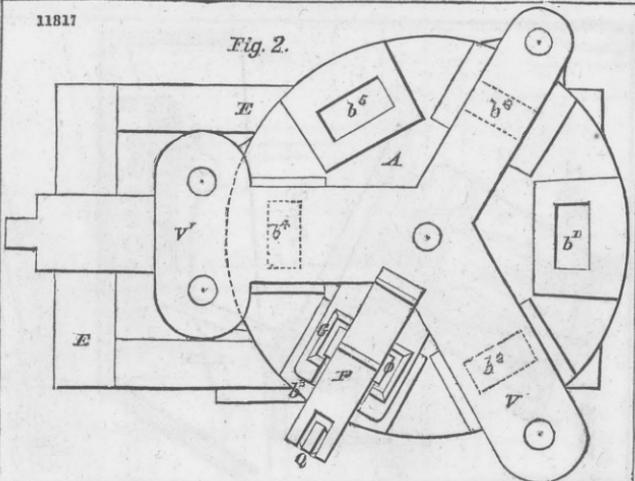


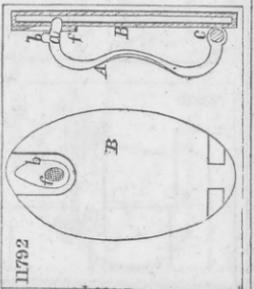
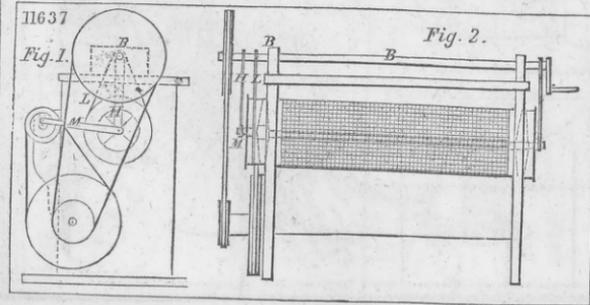
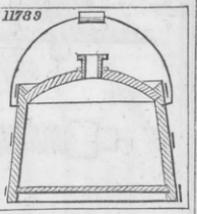
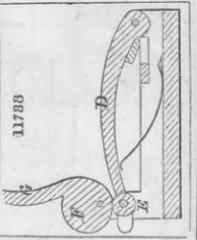
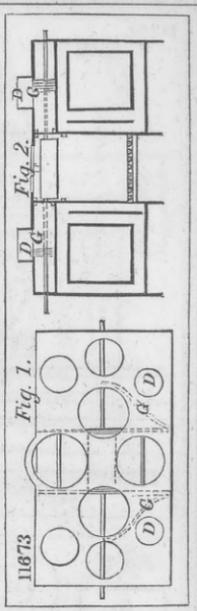
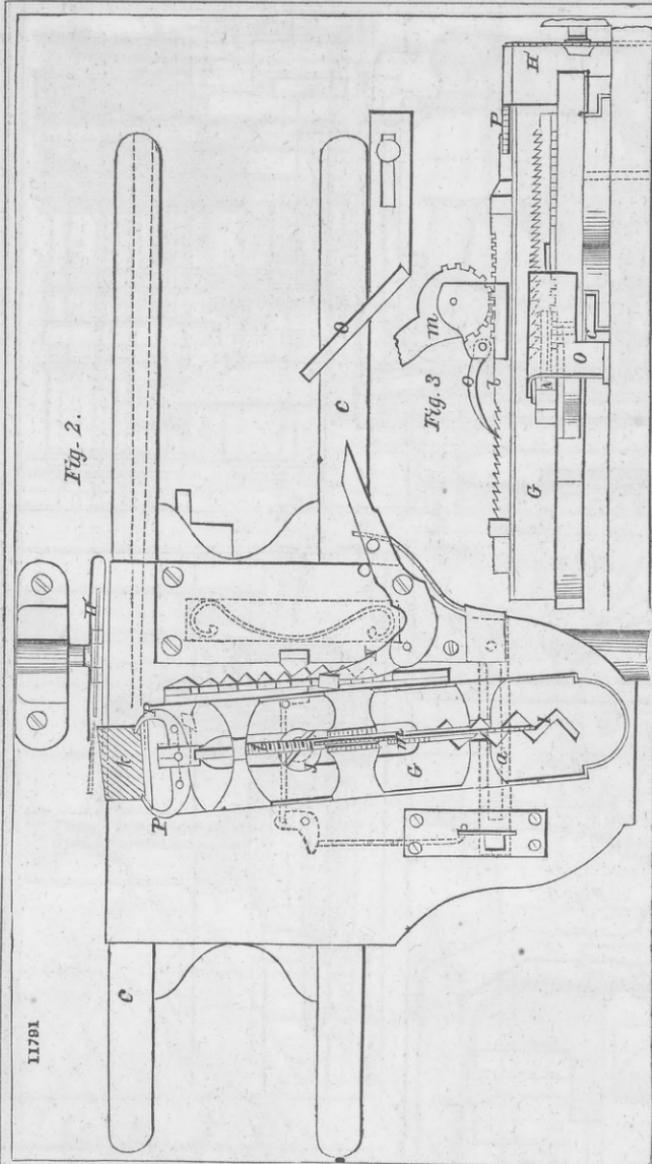
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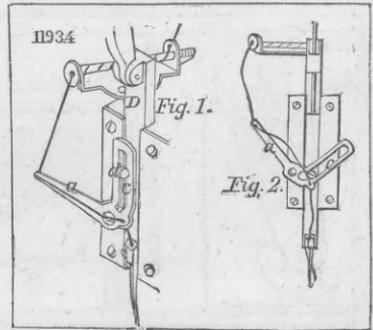
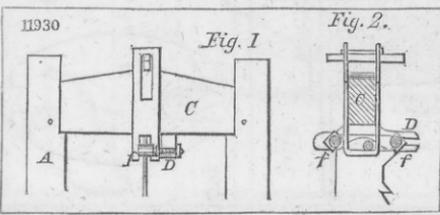
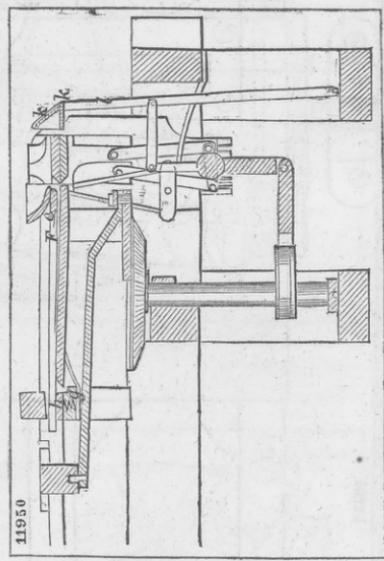
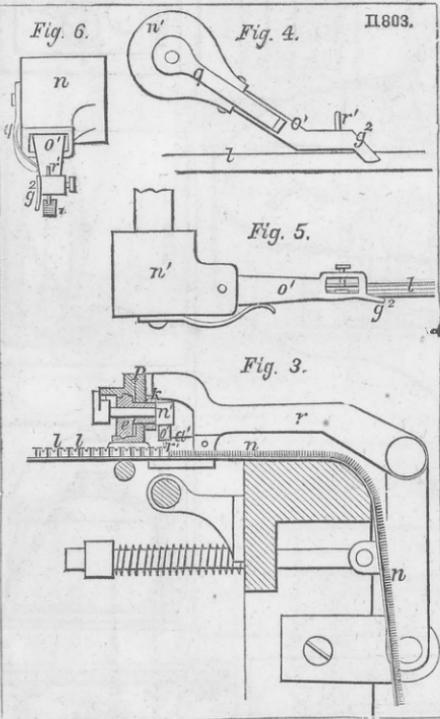
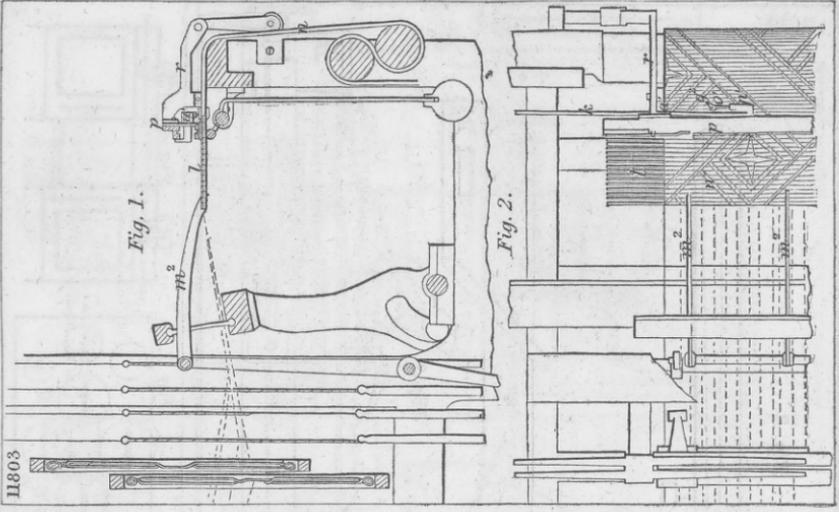


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Fig. 2.







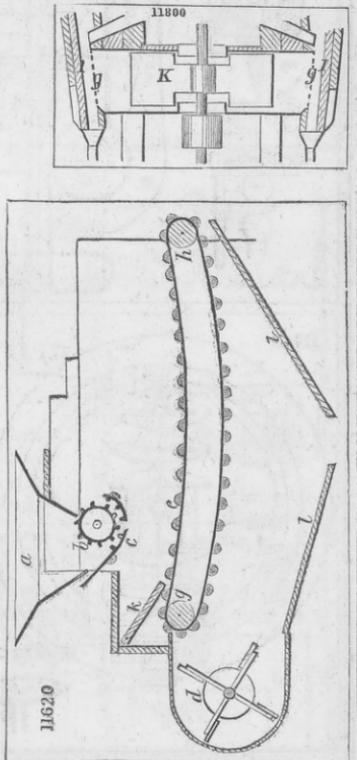
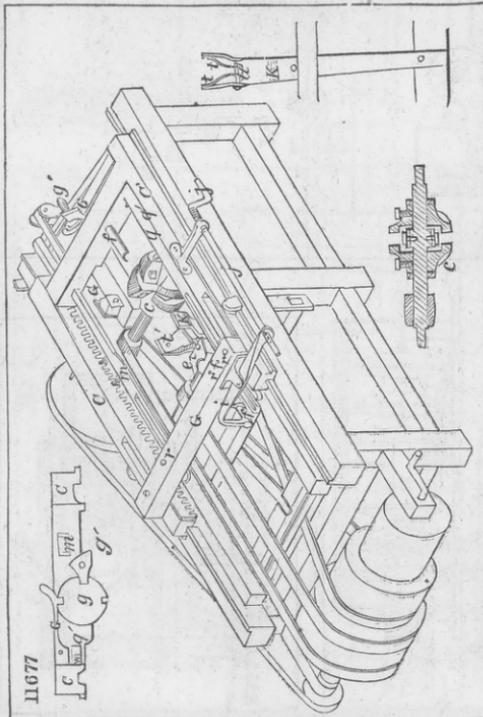
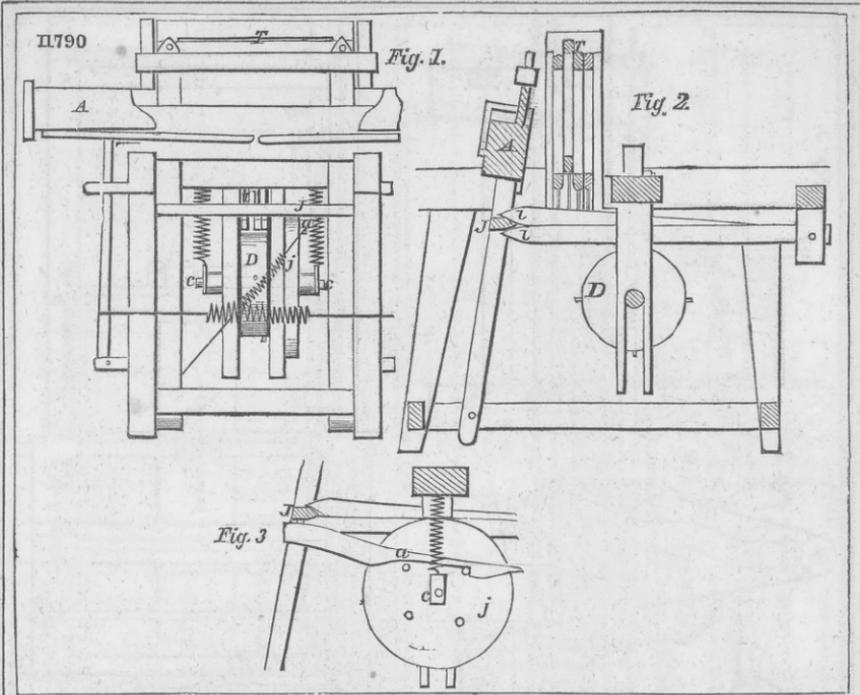


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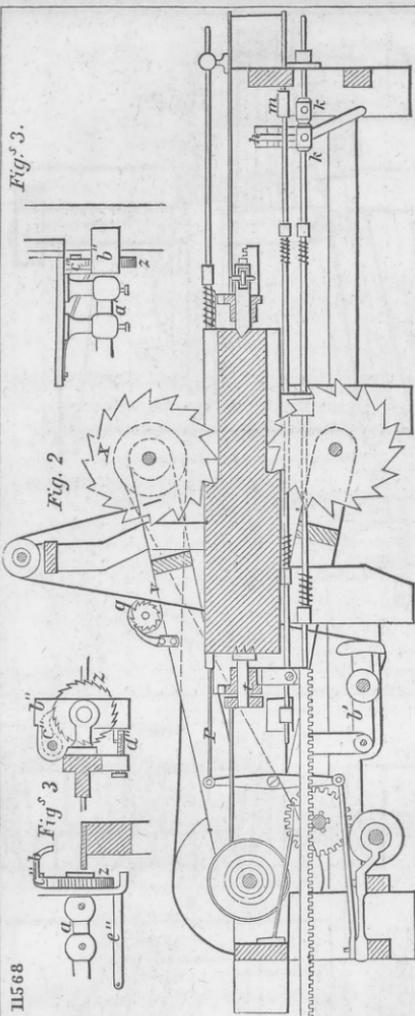


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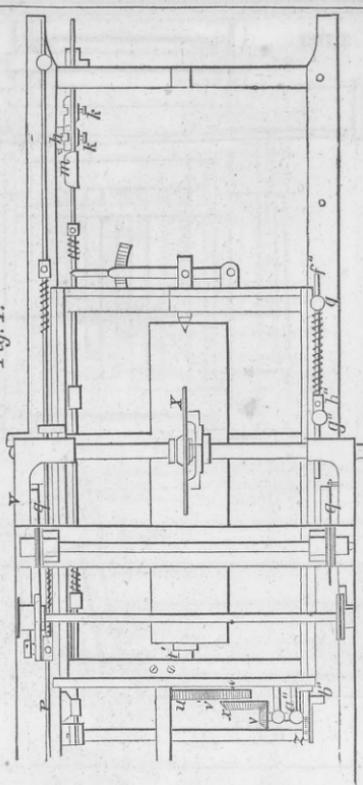
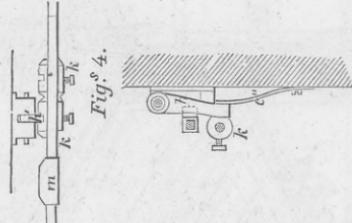


Fig. 4.



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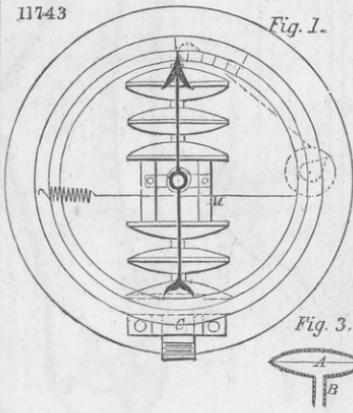


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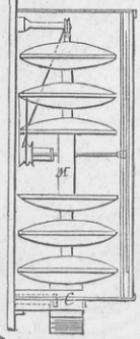
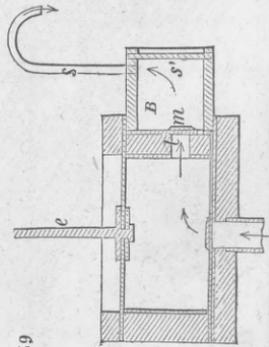


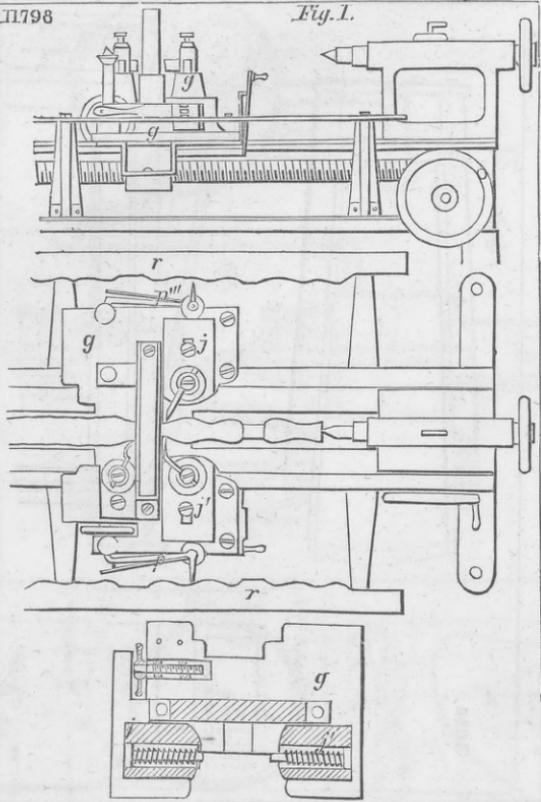
Fig. 3.



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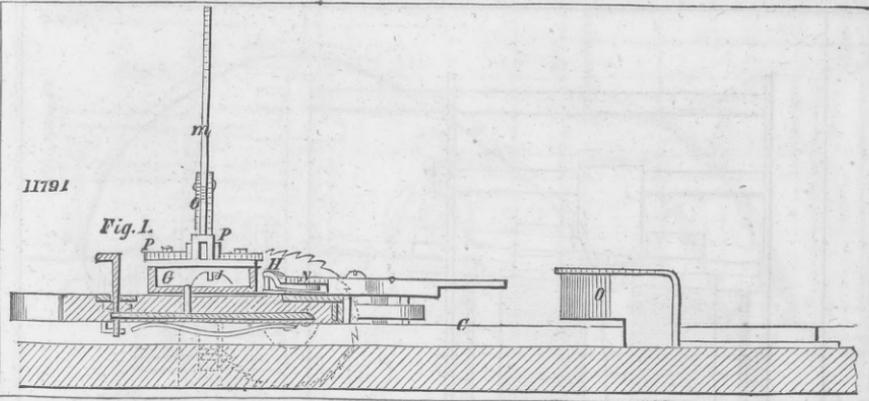
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Fig. 1.



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Fig. 1.



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Fig. 1.

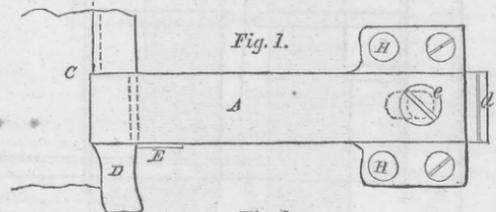


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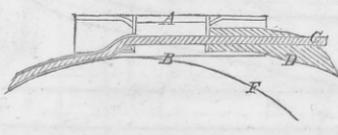
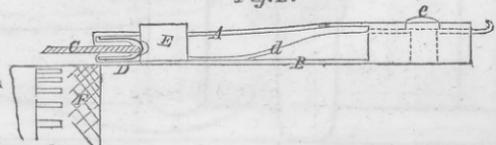
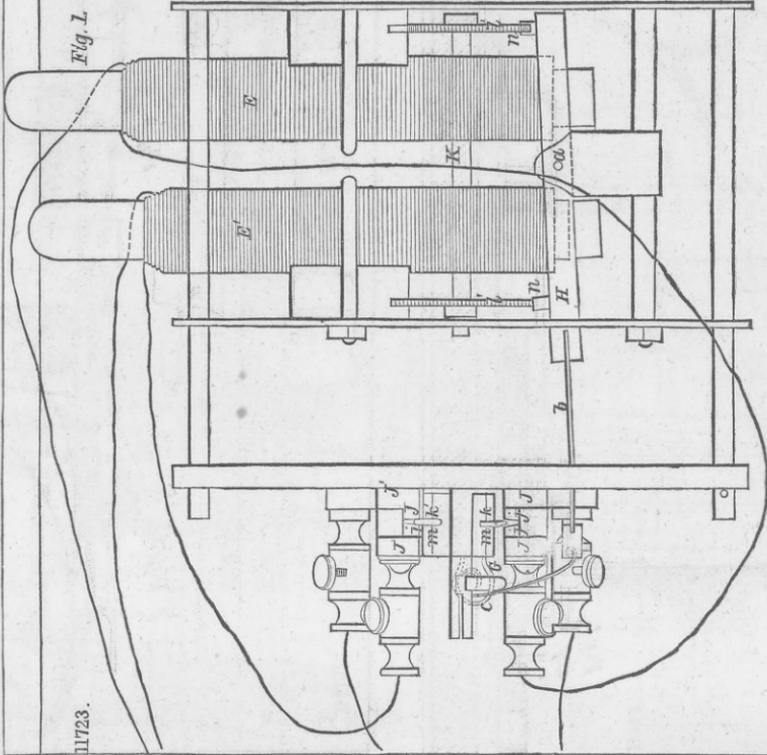


Fig. 2.





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Fig. 3.

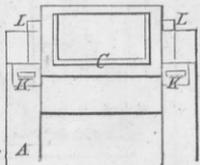


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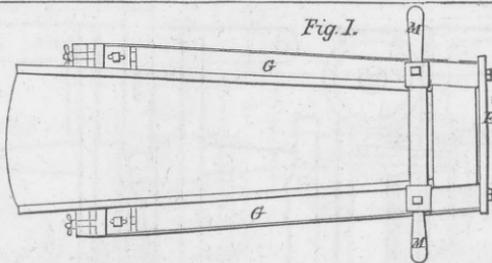
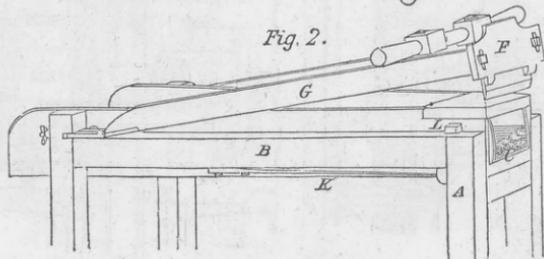
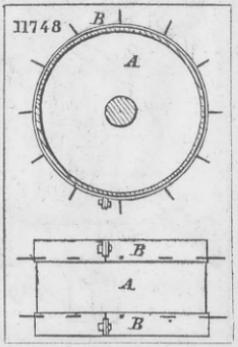
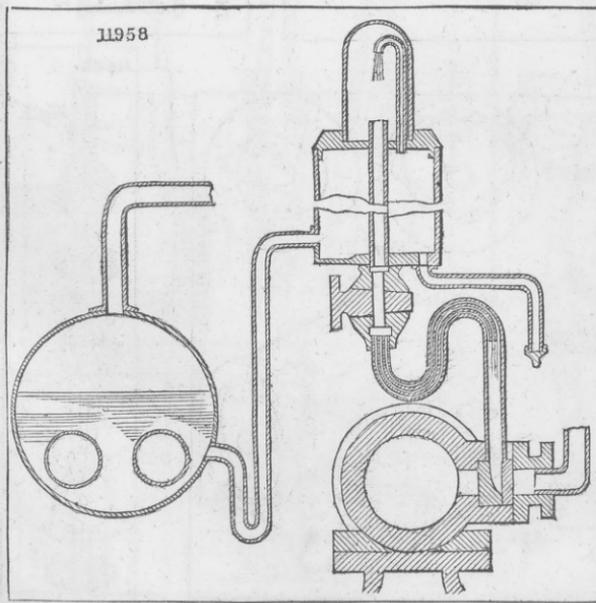
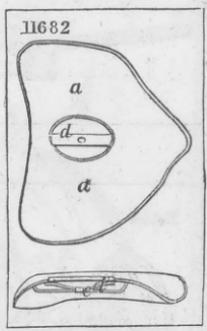
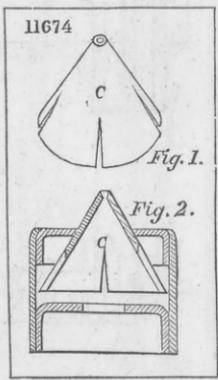
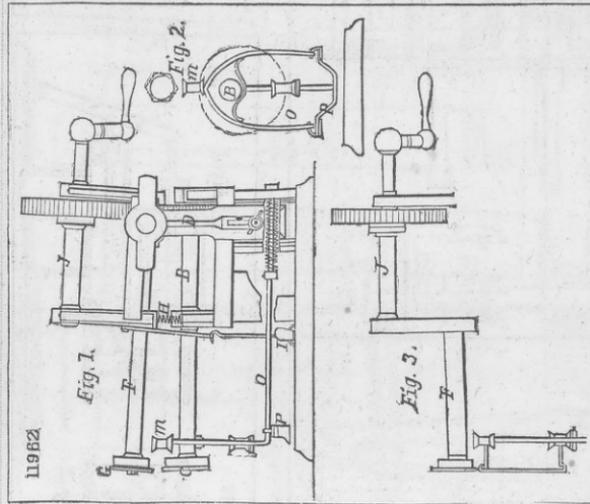
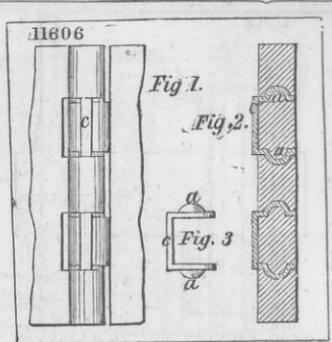
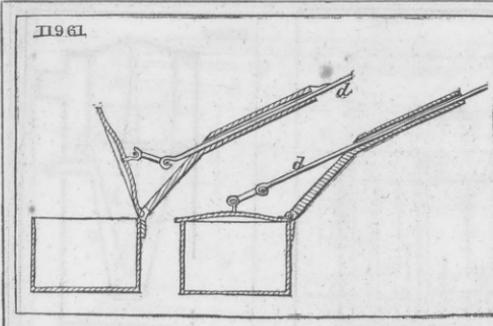
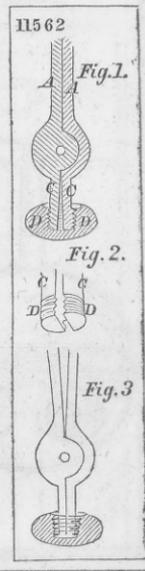
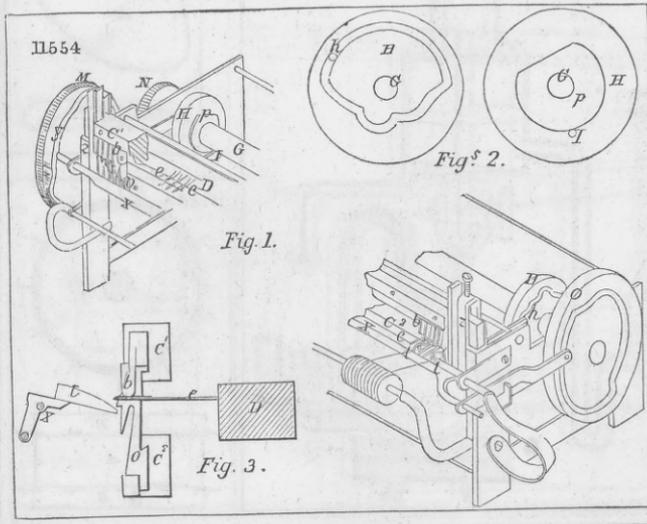
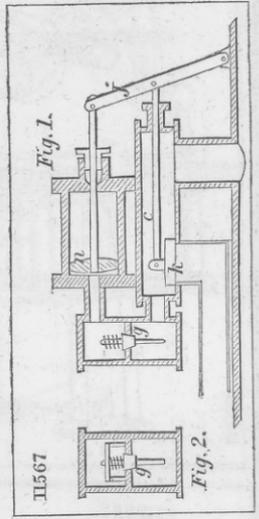
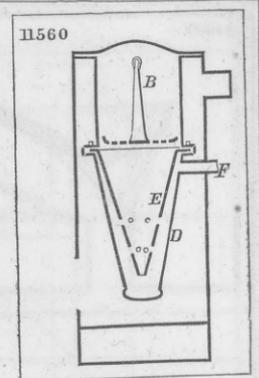
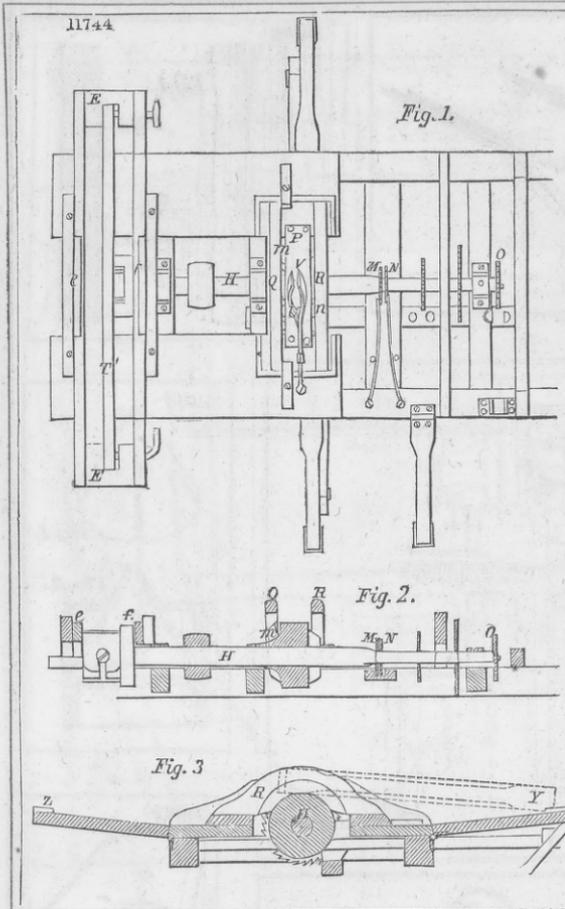
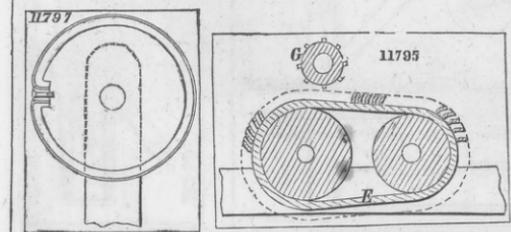
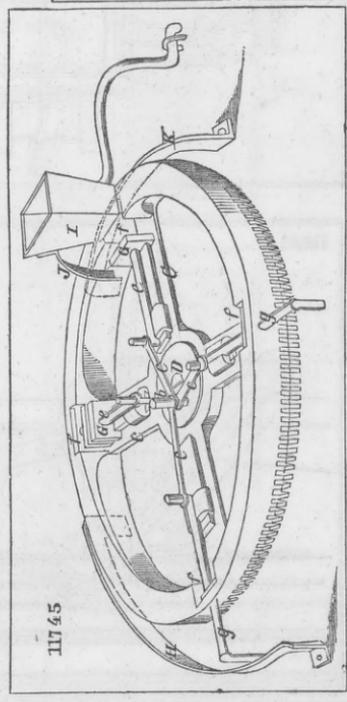
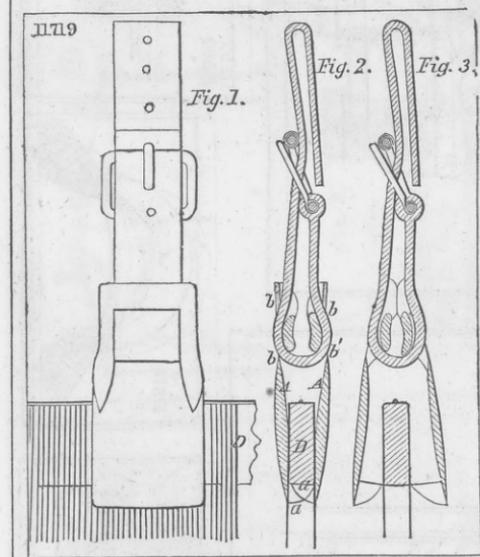
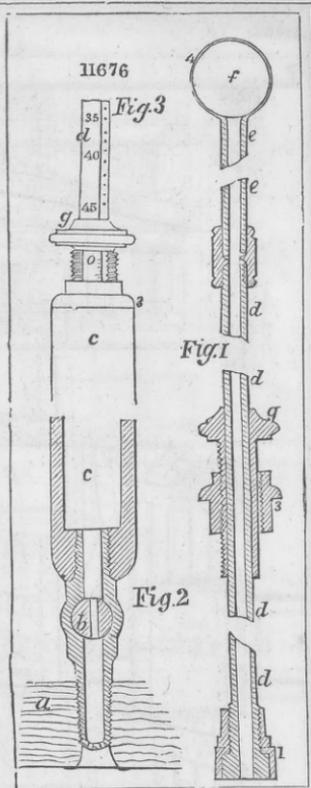
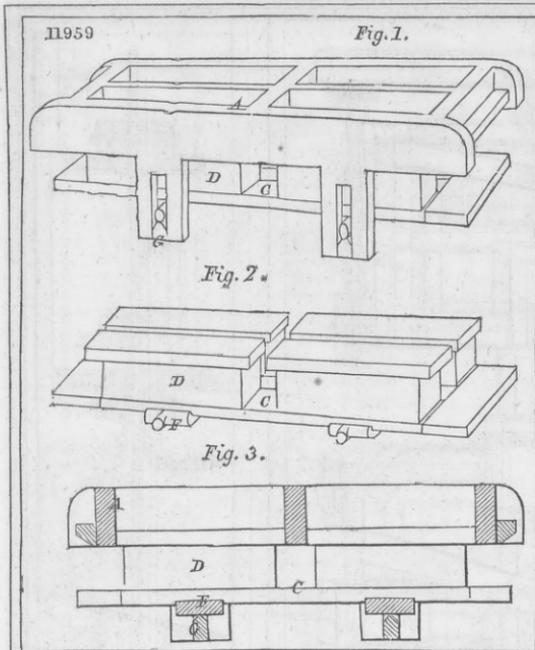


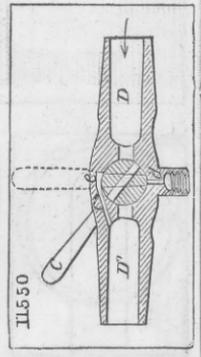
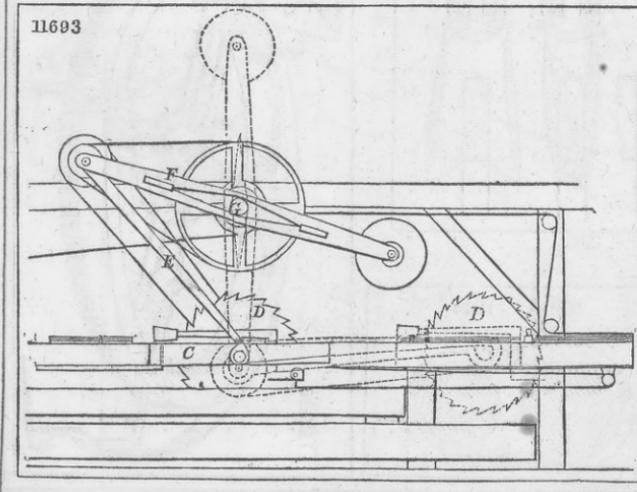
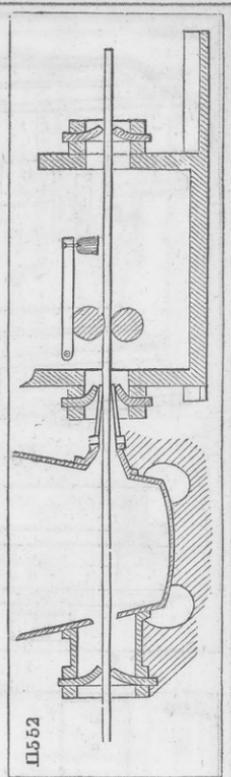
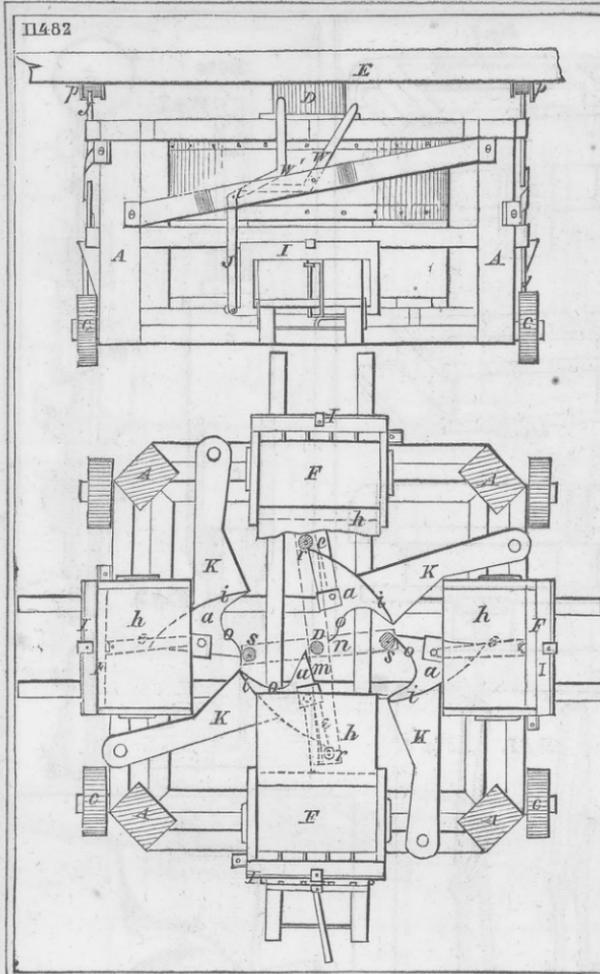
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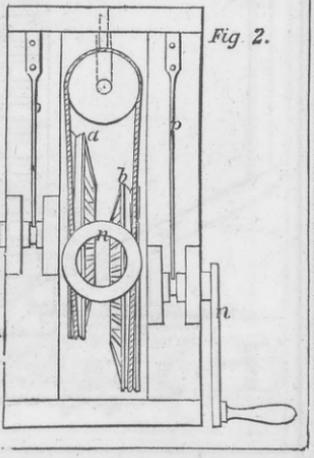
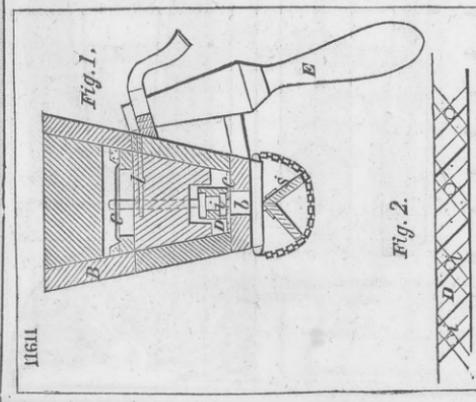
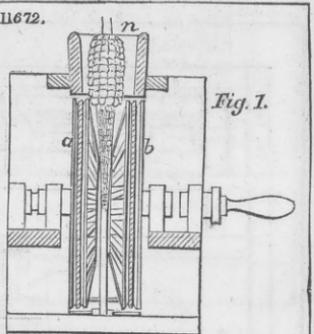
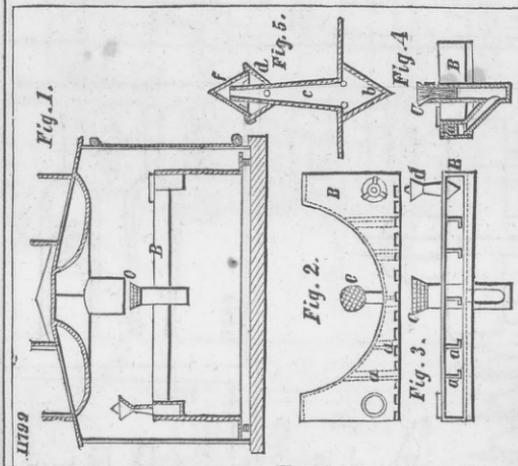
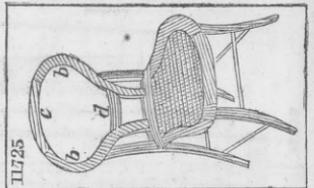
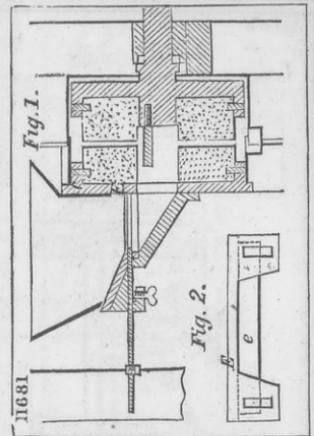
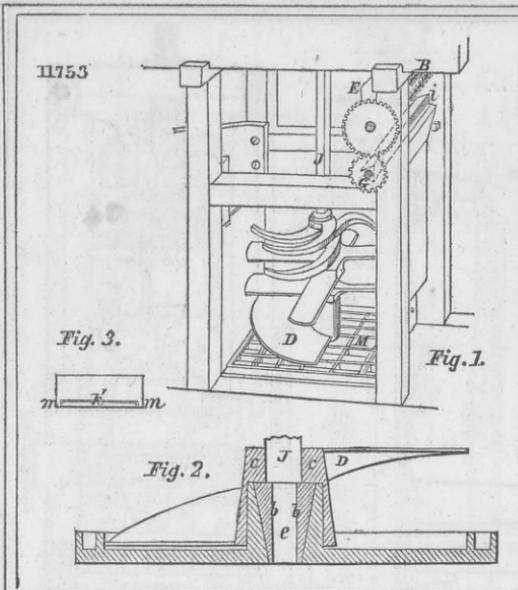


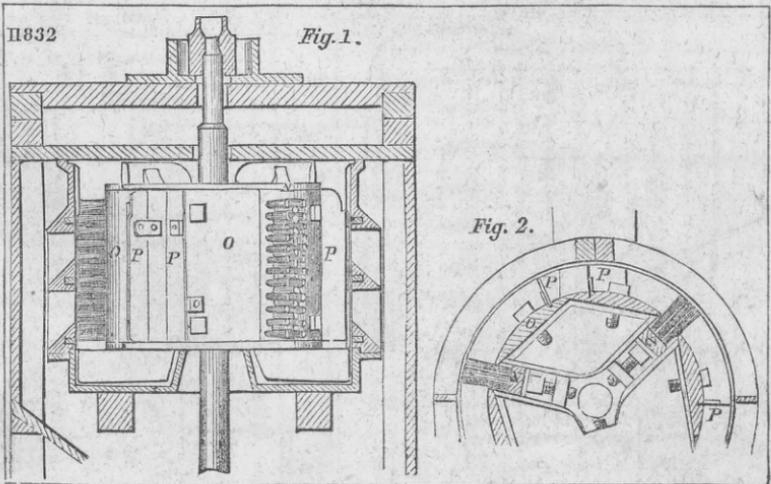
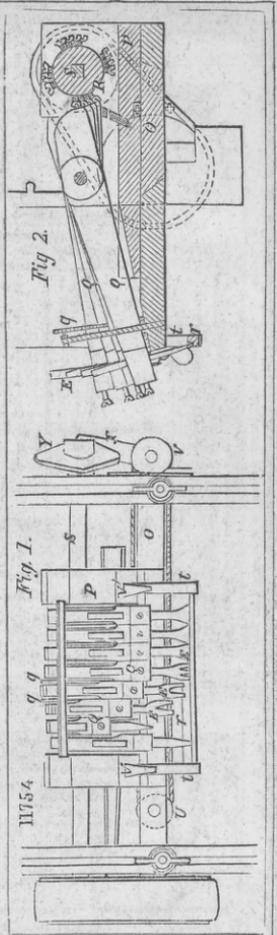
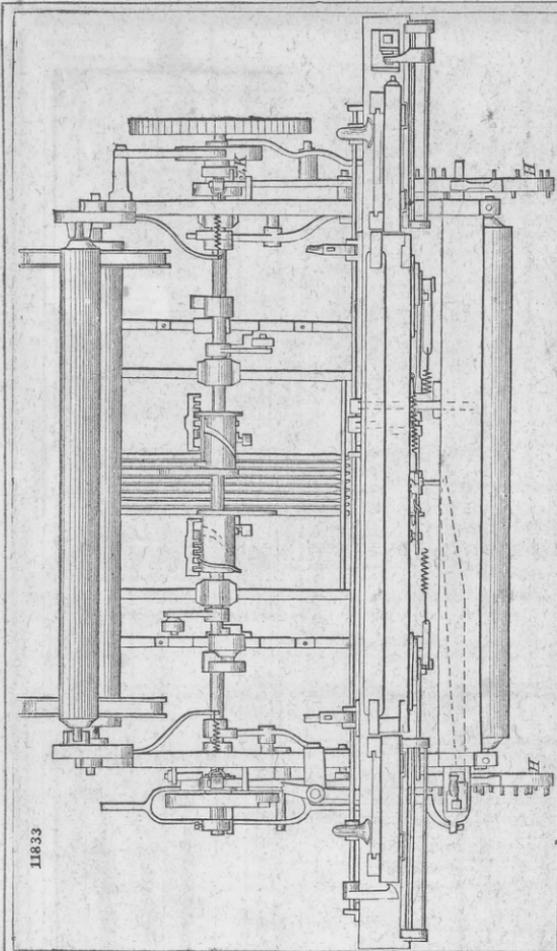


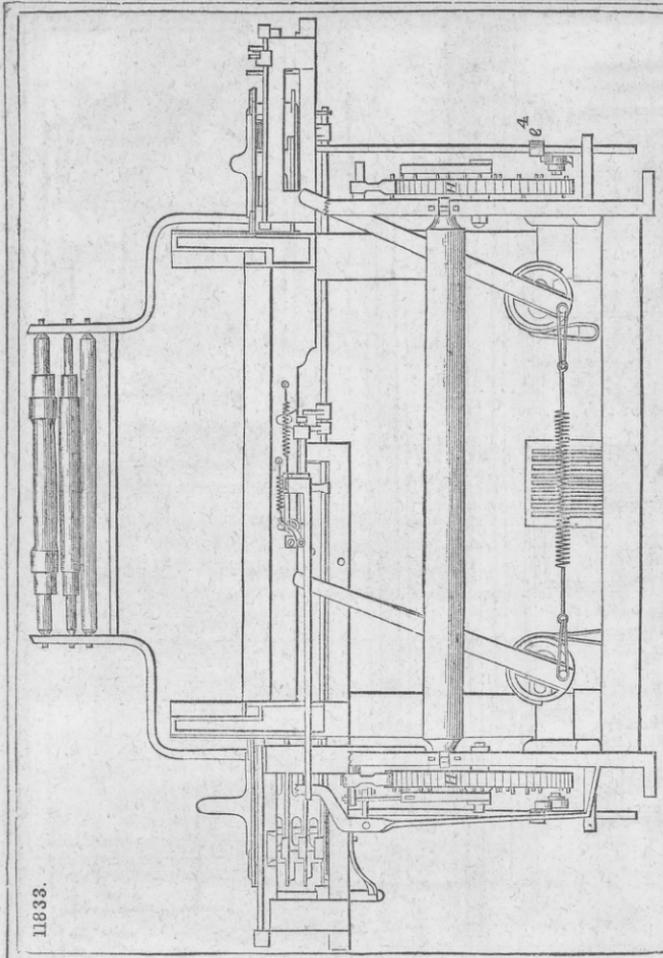




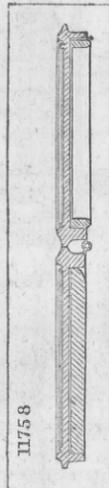
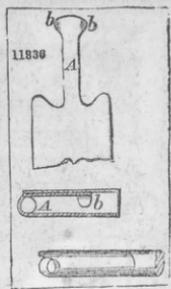




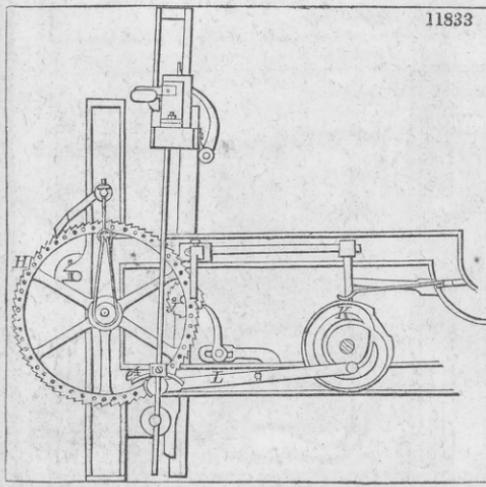




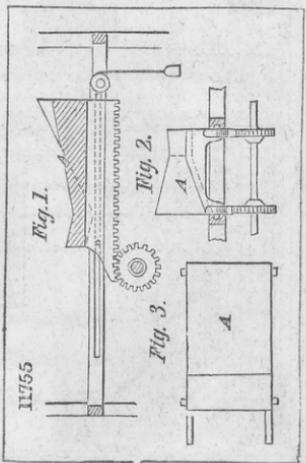
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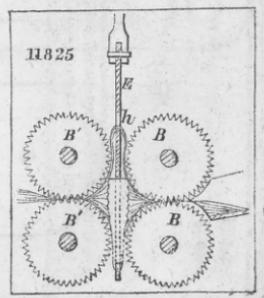
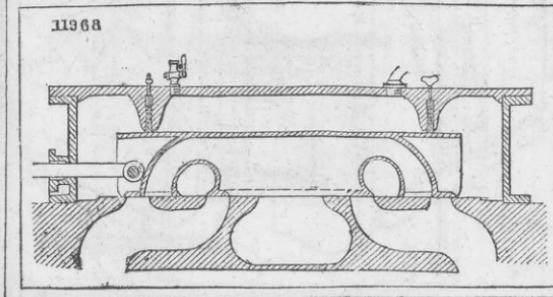
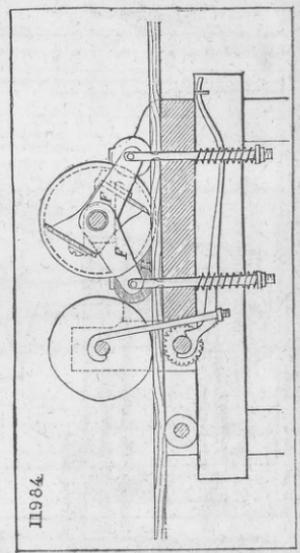
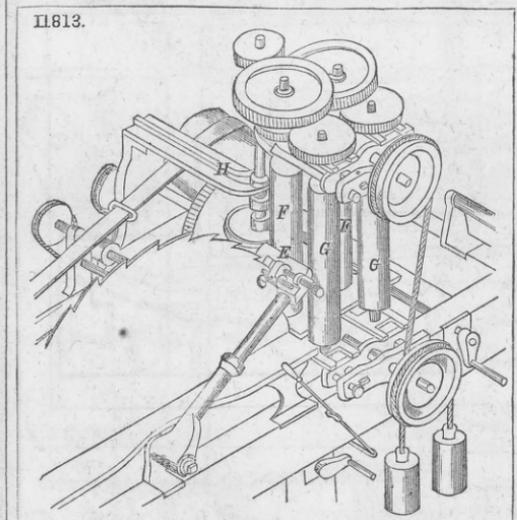
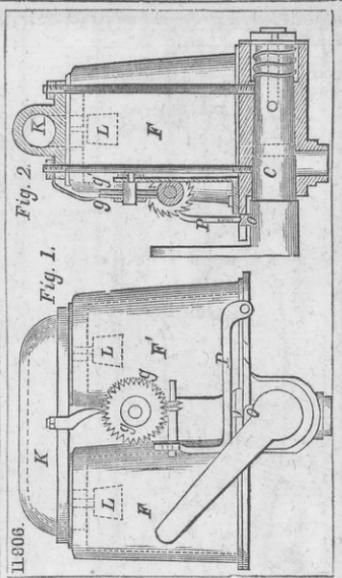
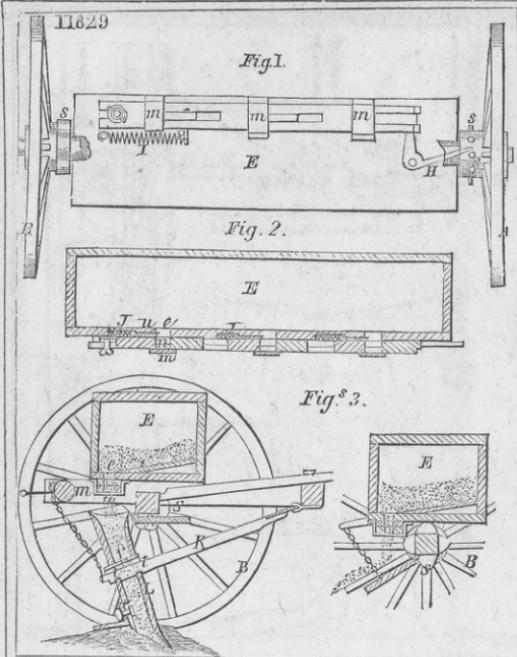


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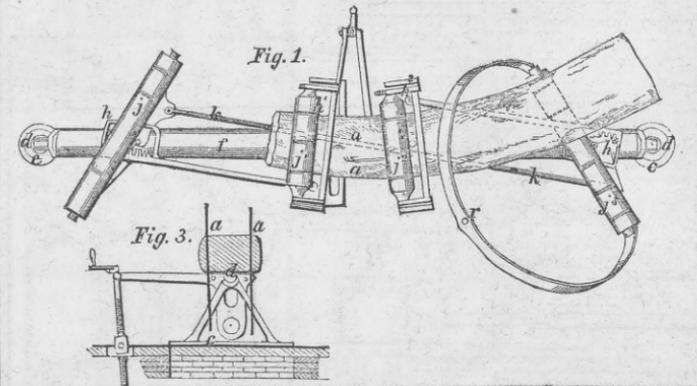
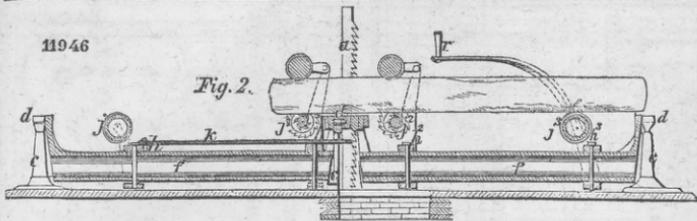
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Fig. 2.

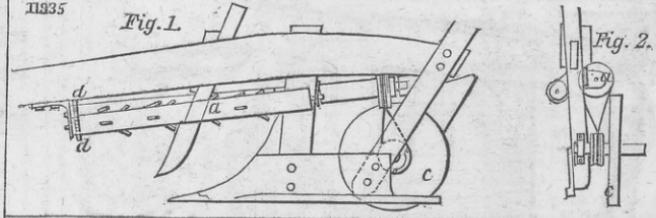
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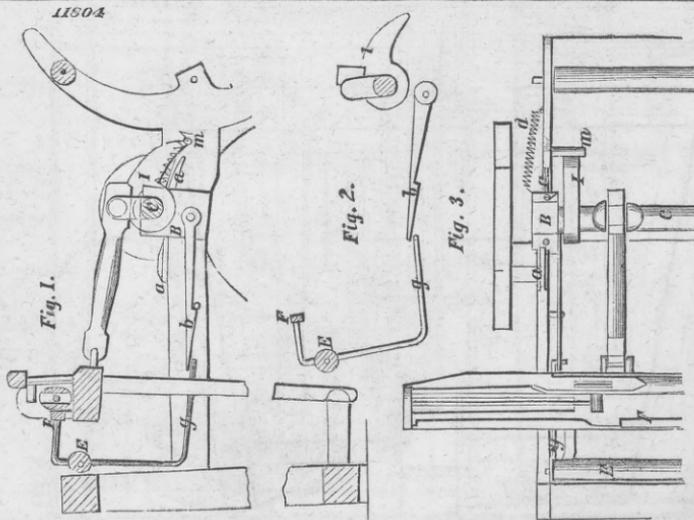
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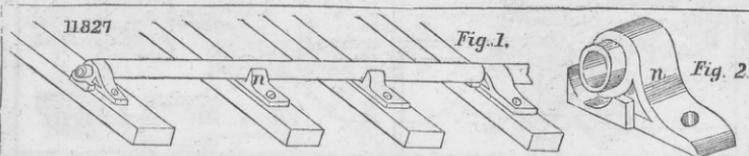
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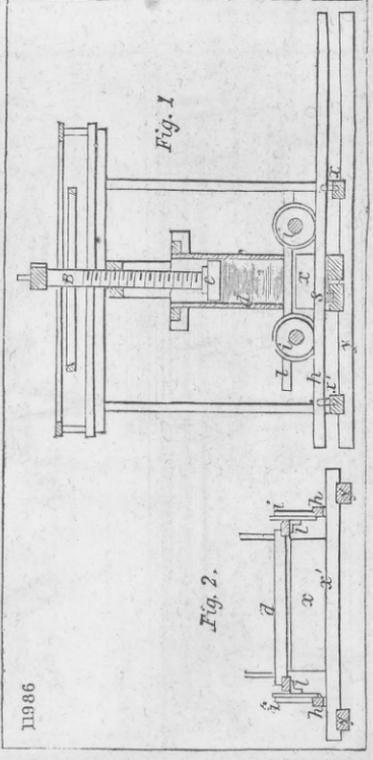
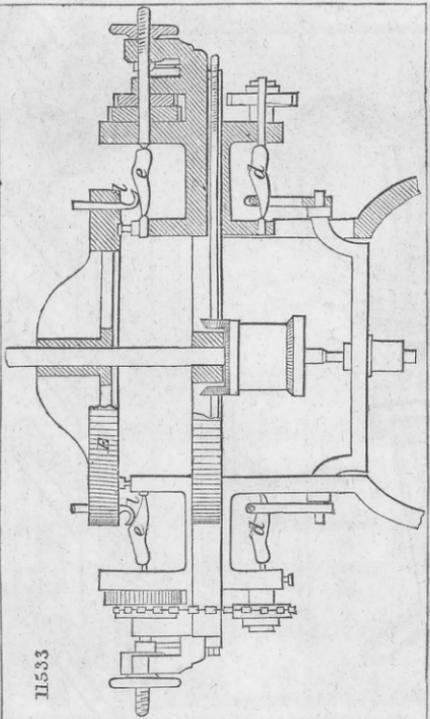
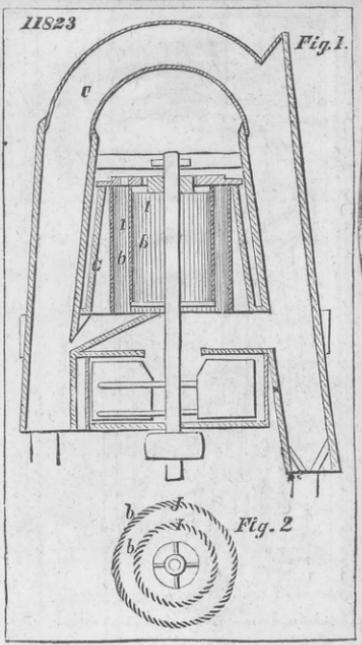
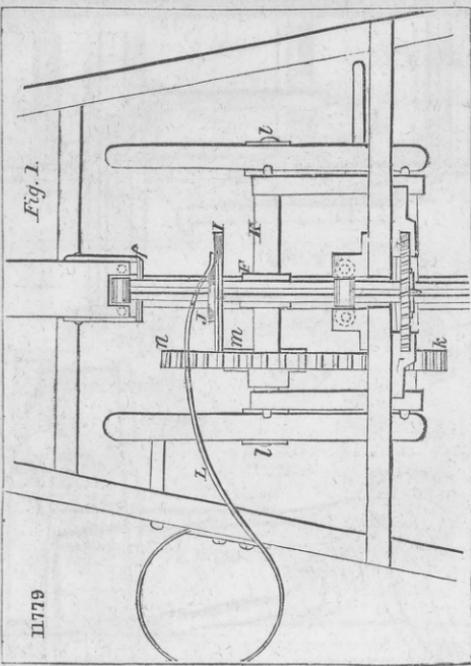


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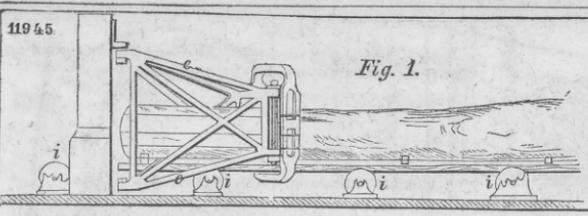
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Fig. 1.



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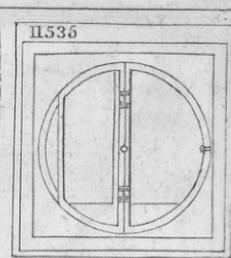
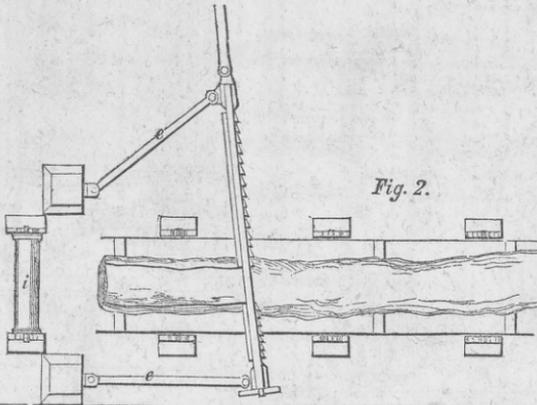
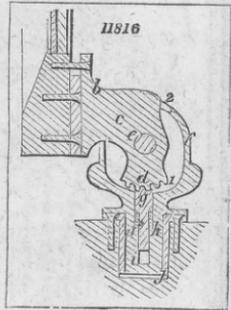


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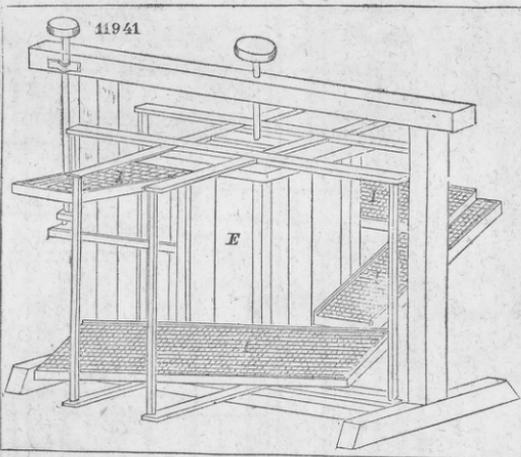


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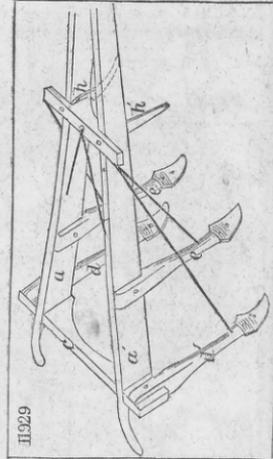


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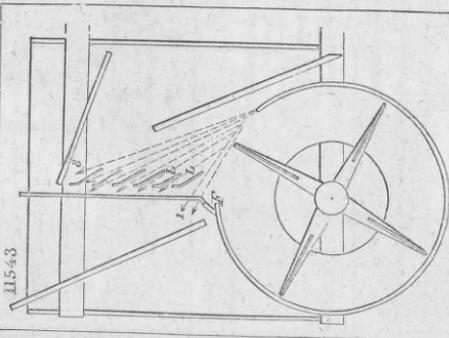
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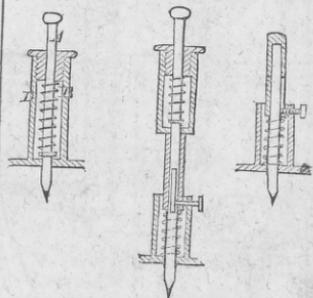
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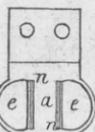
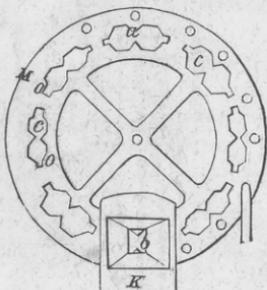
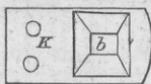
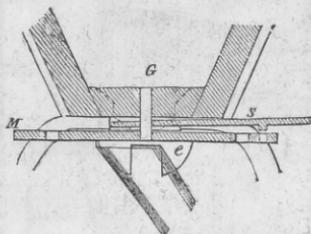
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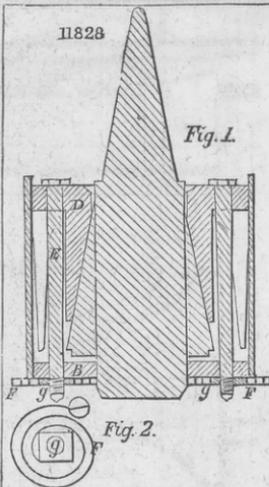
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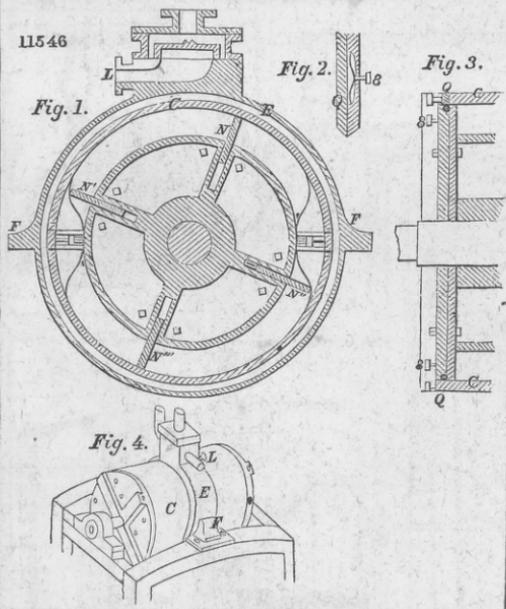
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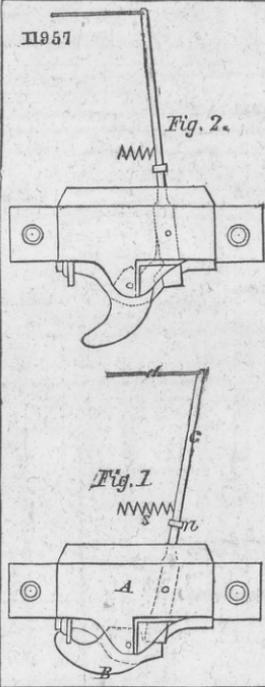
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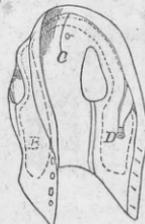
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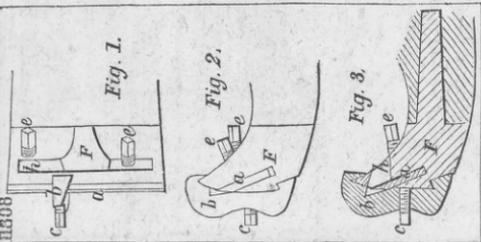


Fig. 2

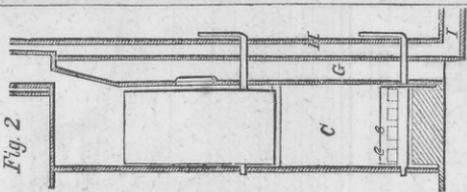
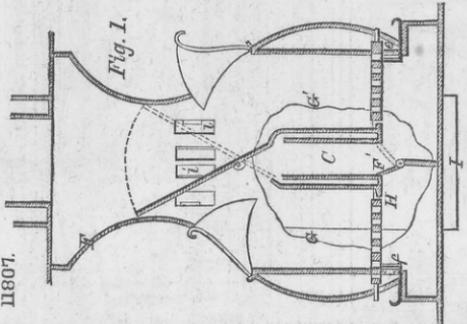
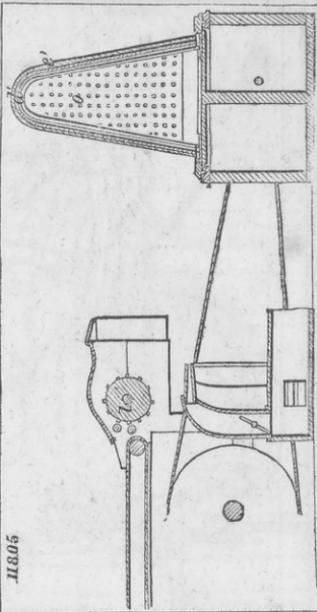


Fig. 1.



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Fig. 1.

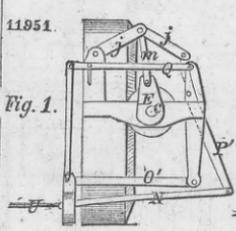
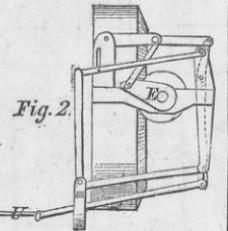
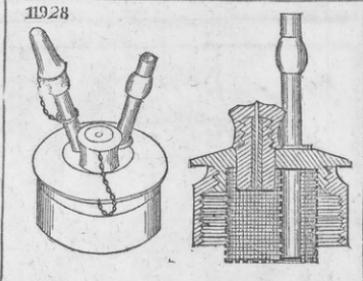


Fig. 2.



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Fig. 1.

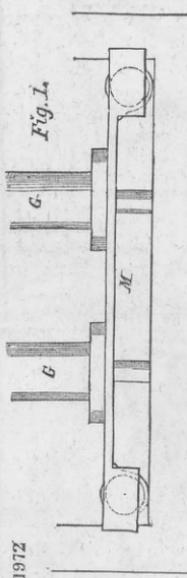
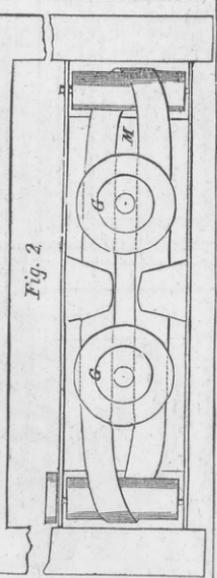
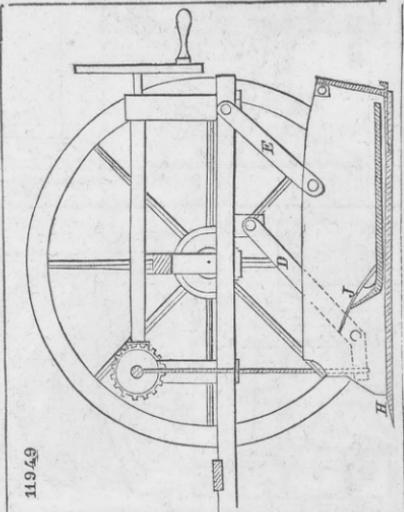
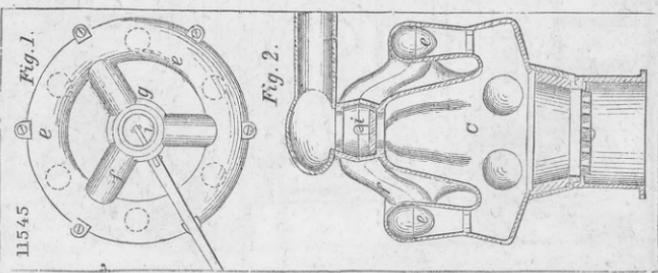
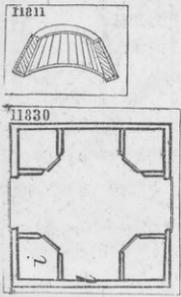
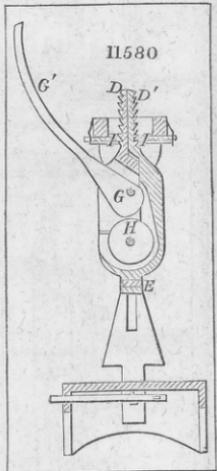
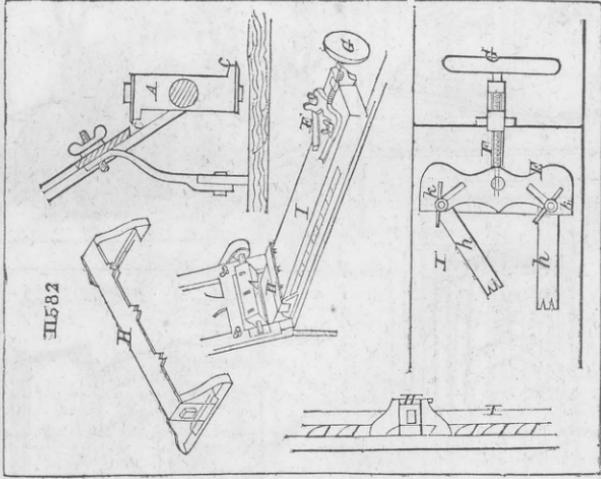
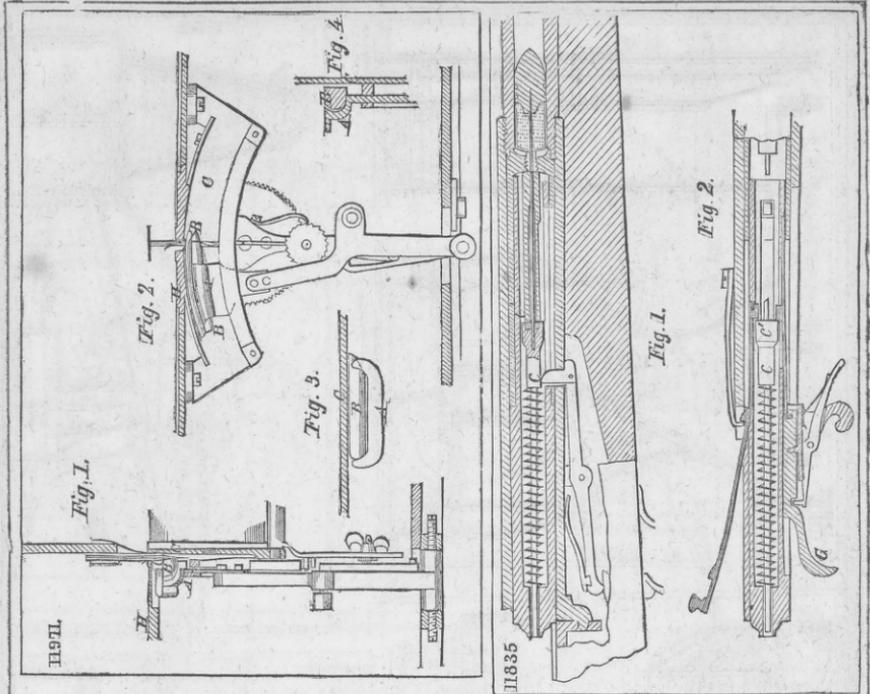


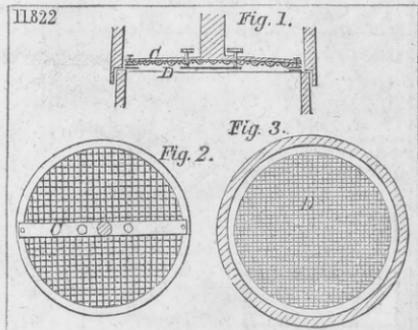
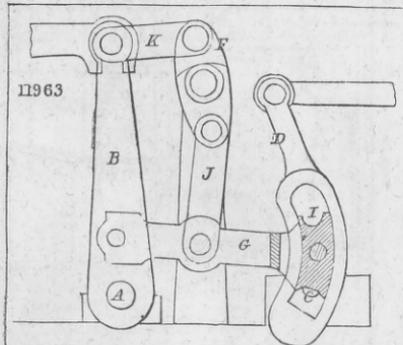
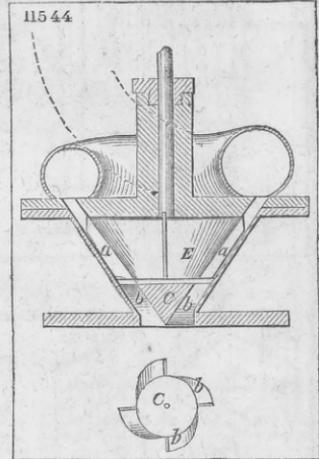
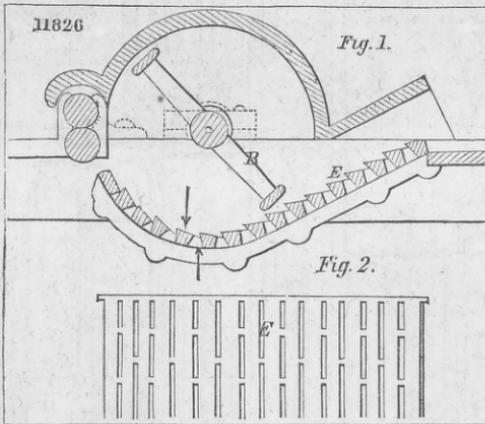
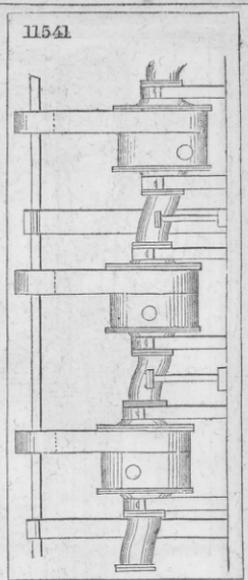
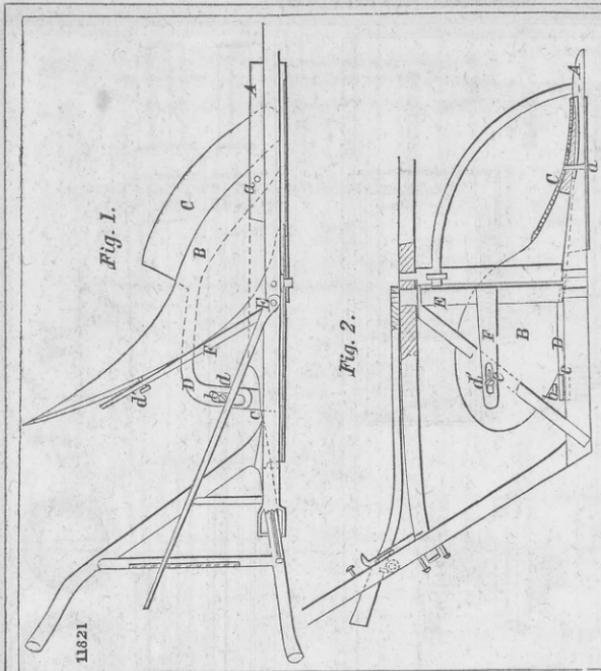
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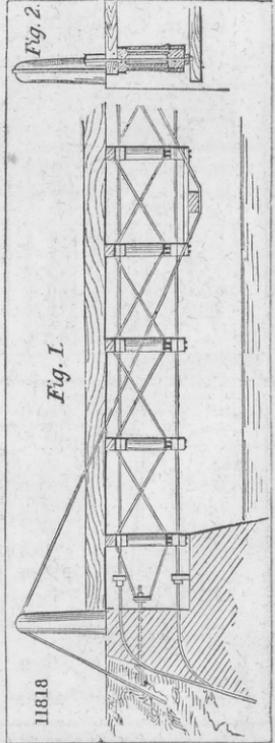
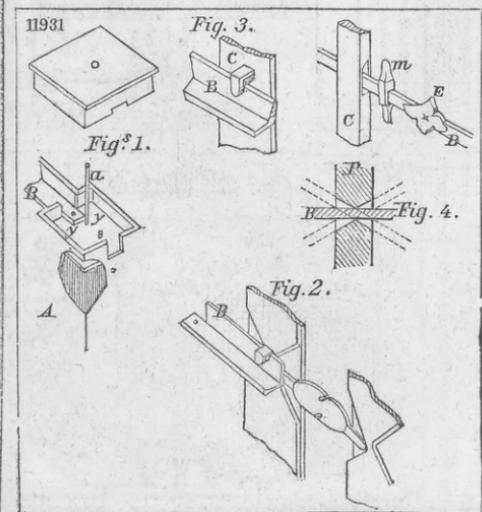
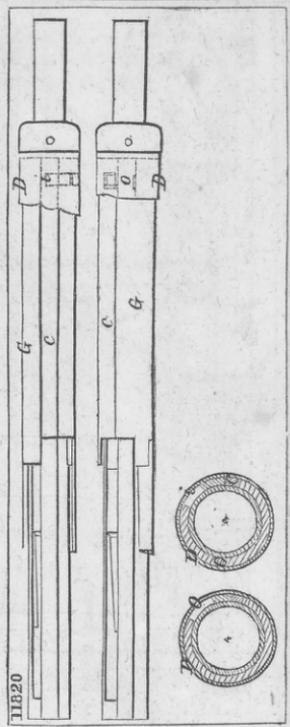
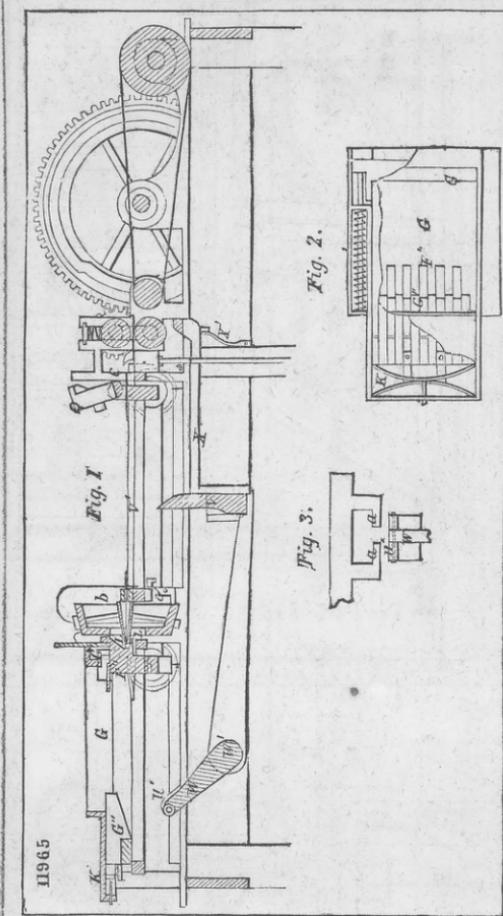


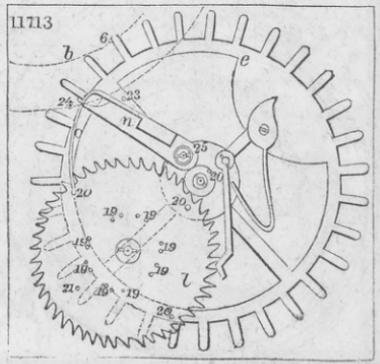
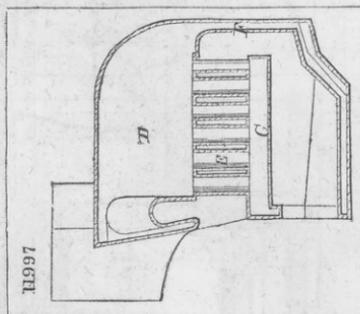
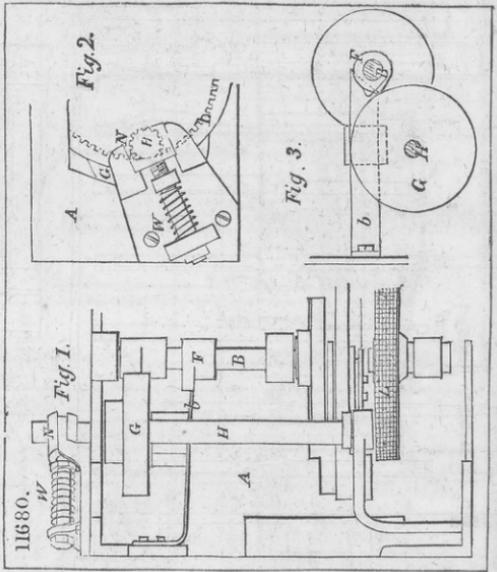
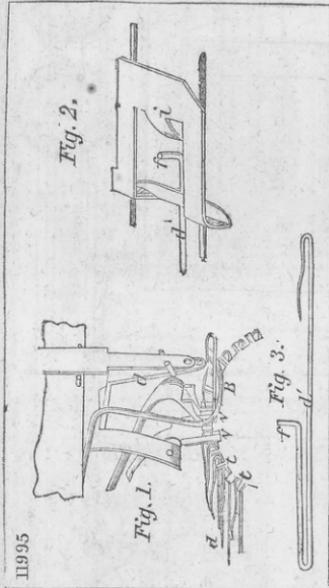
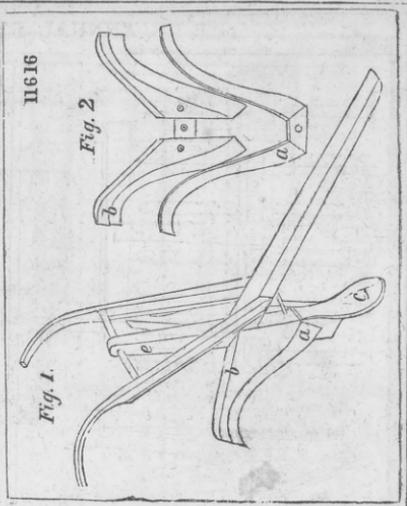
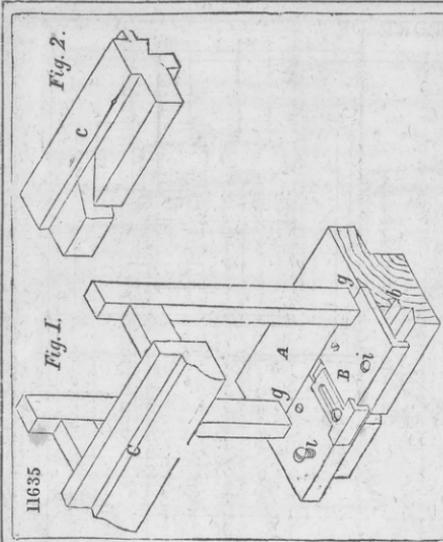
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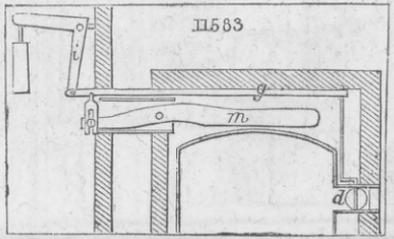
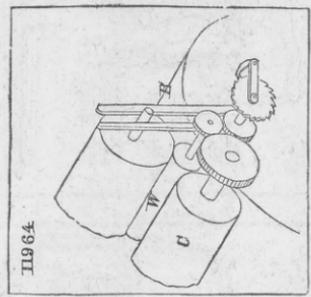
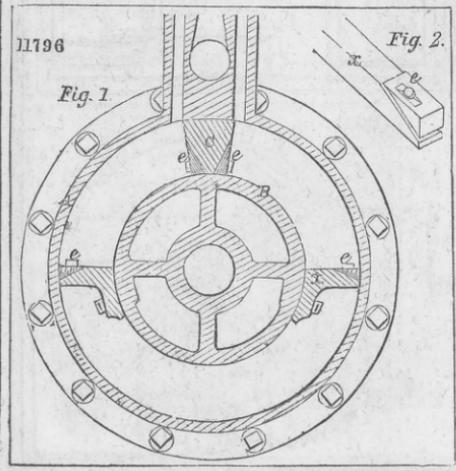
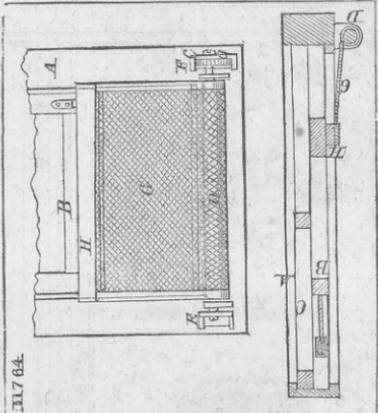
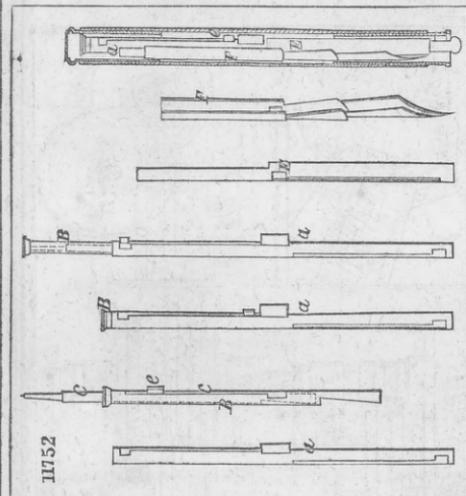
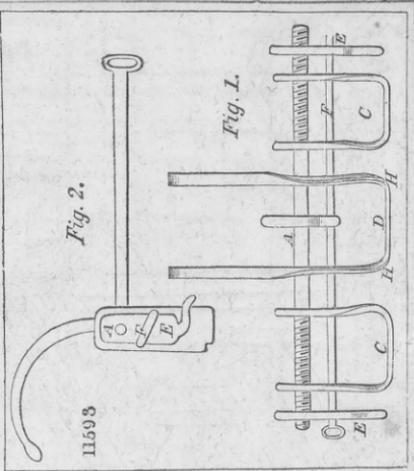
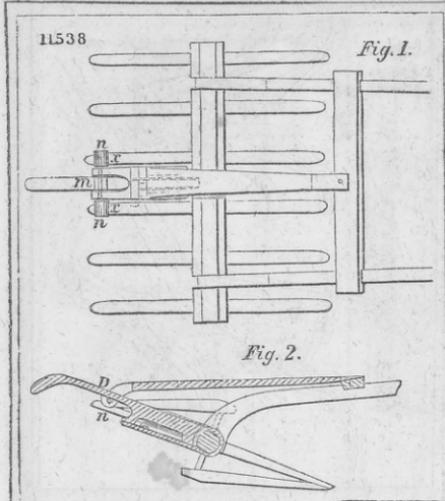












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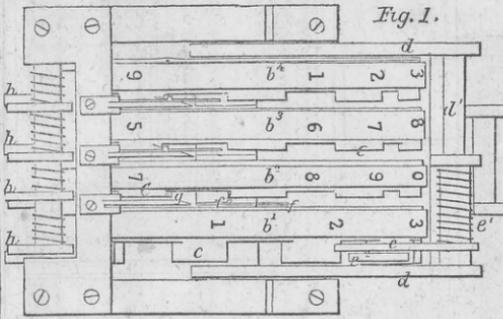


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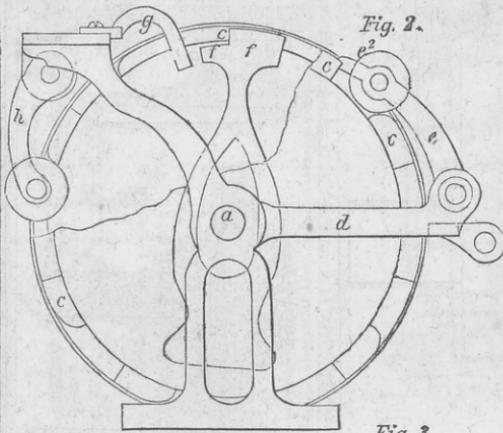


Fig. 2.

Fig. 3.

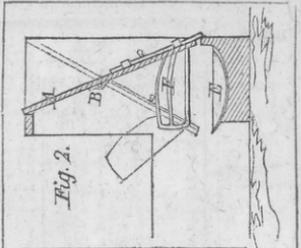
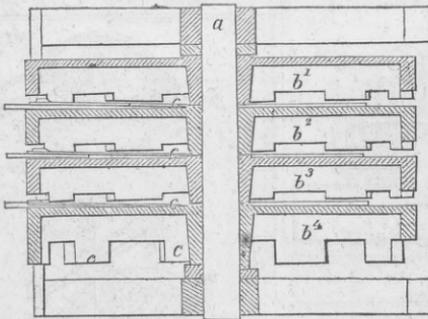


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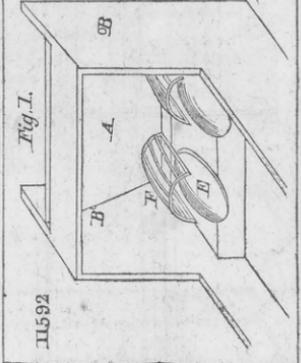


Fig. 1.

11592

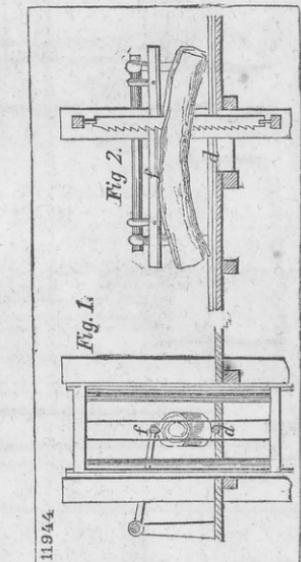
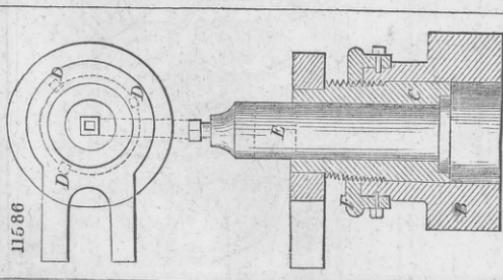


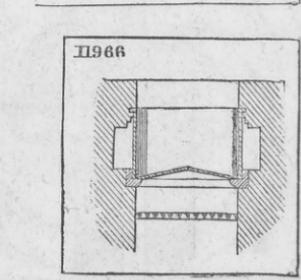
Fig. 2.

Fig. 1.

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Fig. 1.

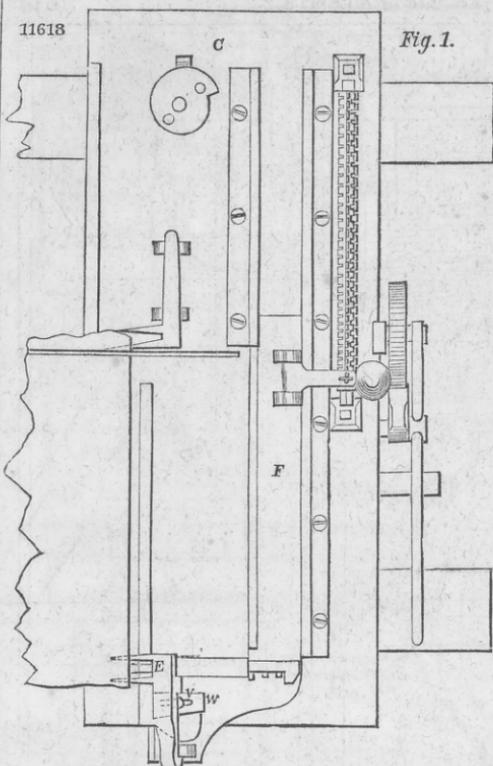
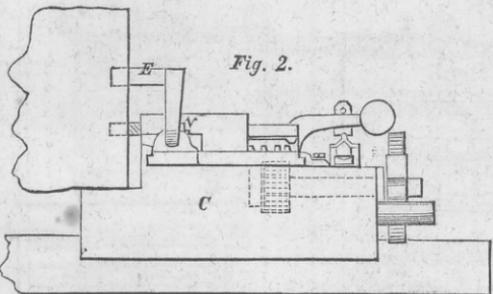
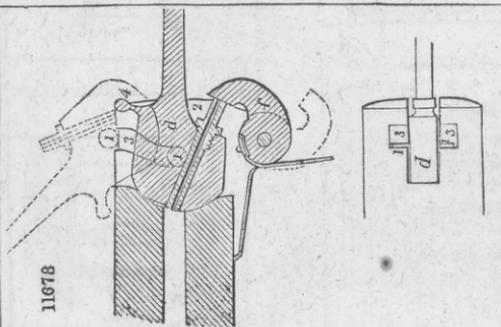


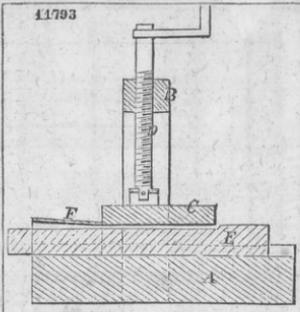
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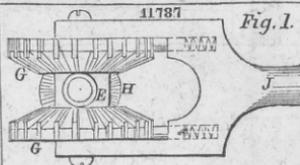


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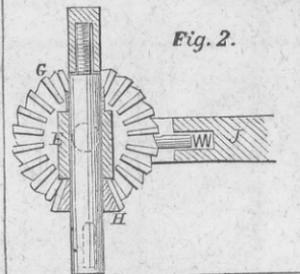
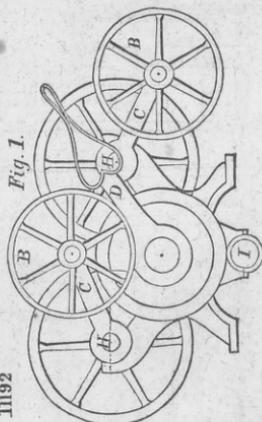


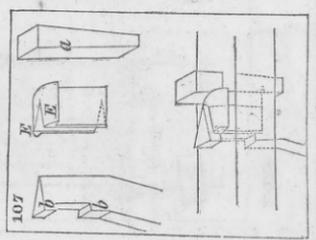
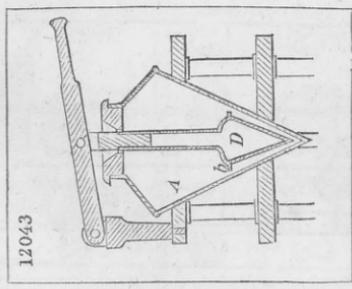
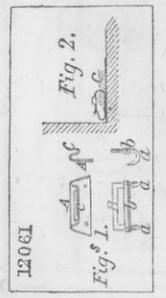
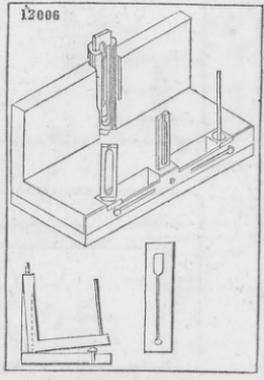
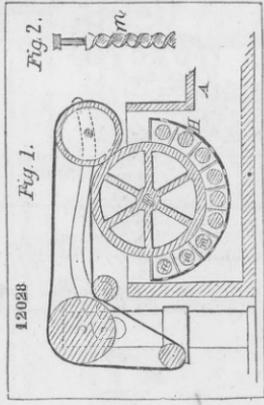
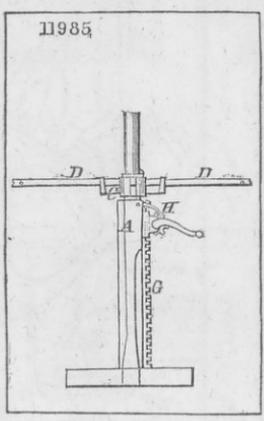
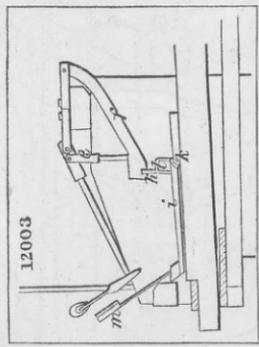
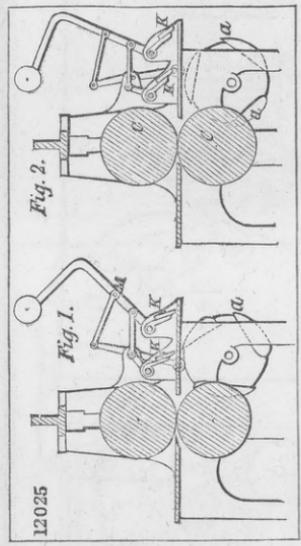
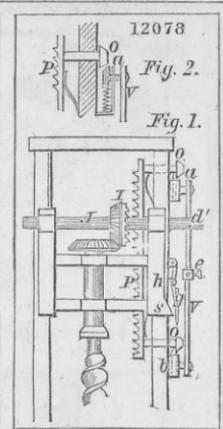
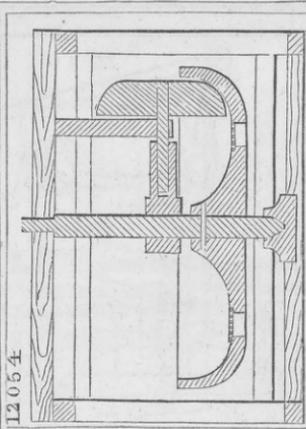
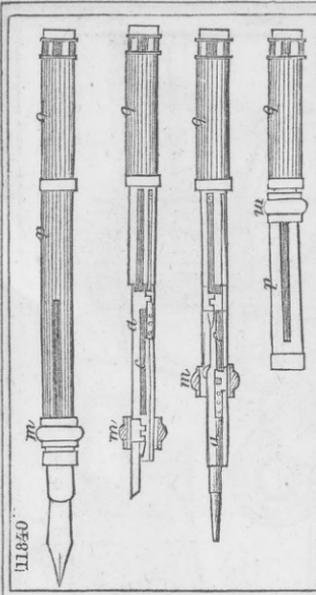
Fig. 2.



Fig. 1.

11192





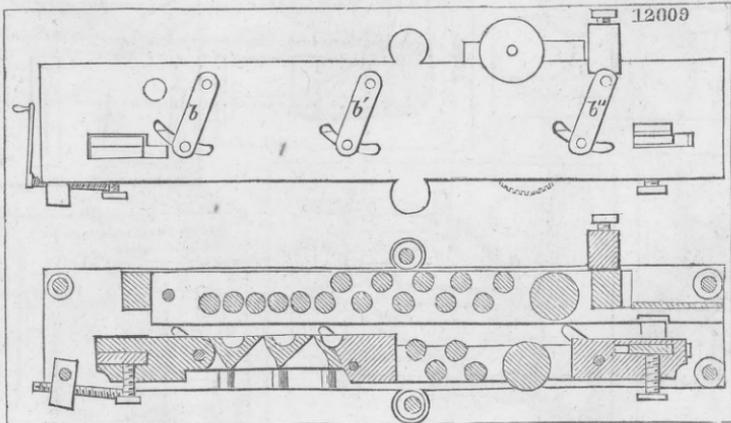
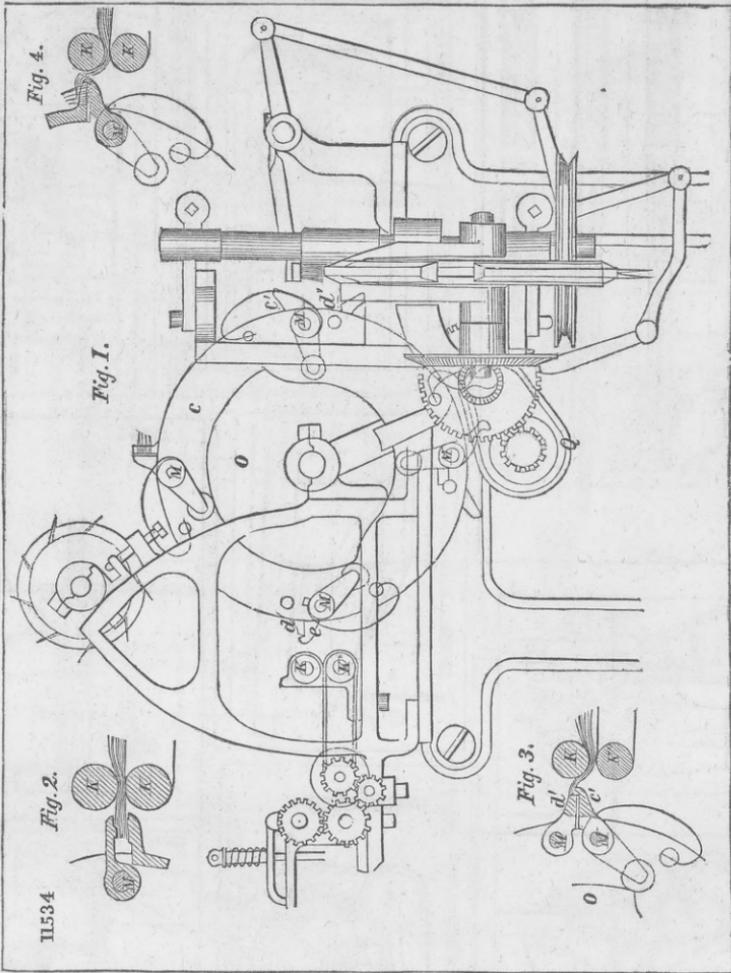


Fig. 2.



11843

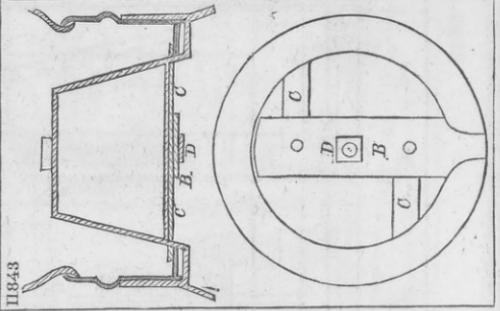
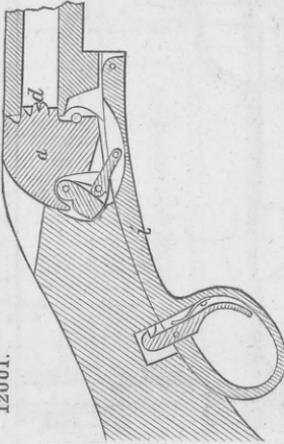
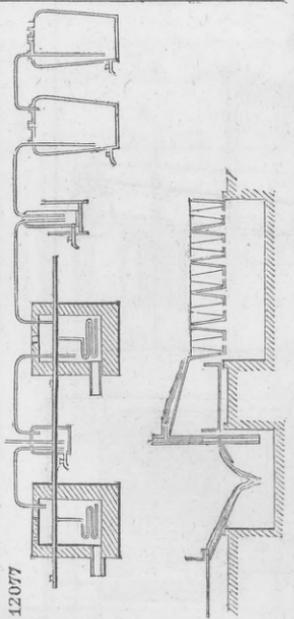
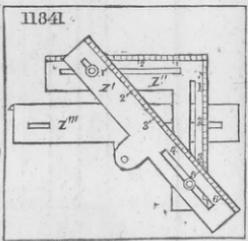
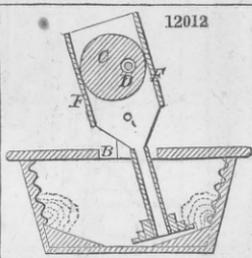
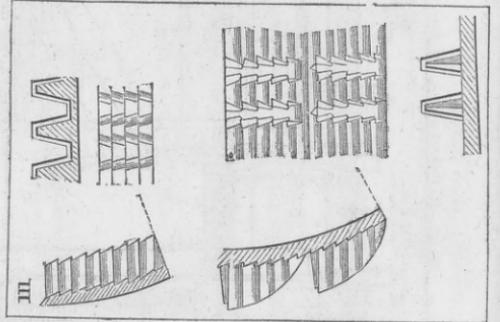


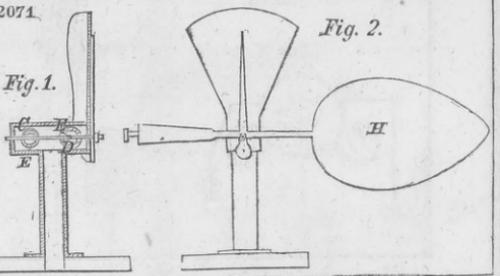
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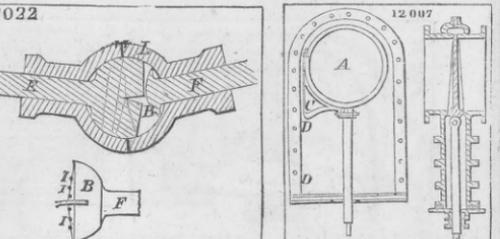
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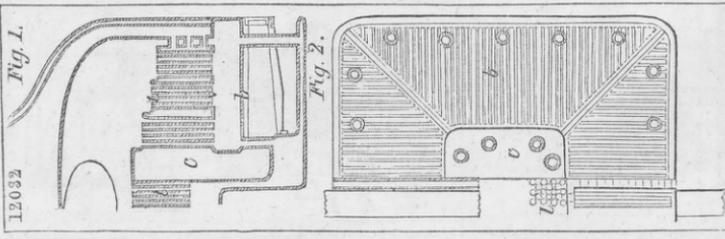
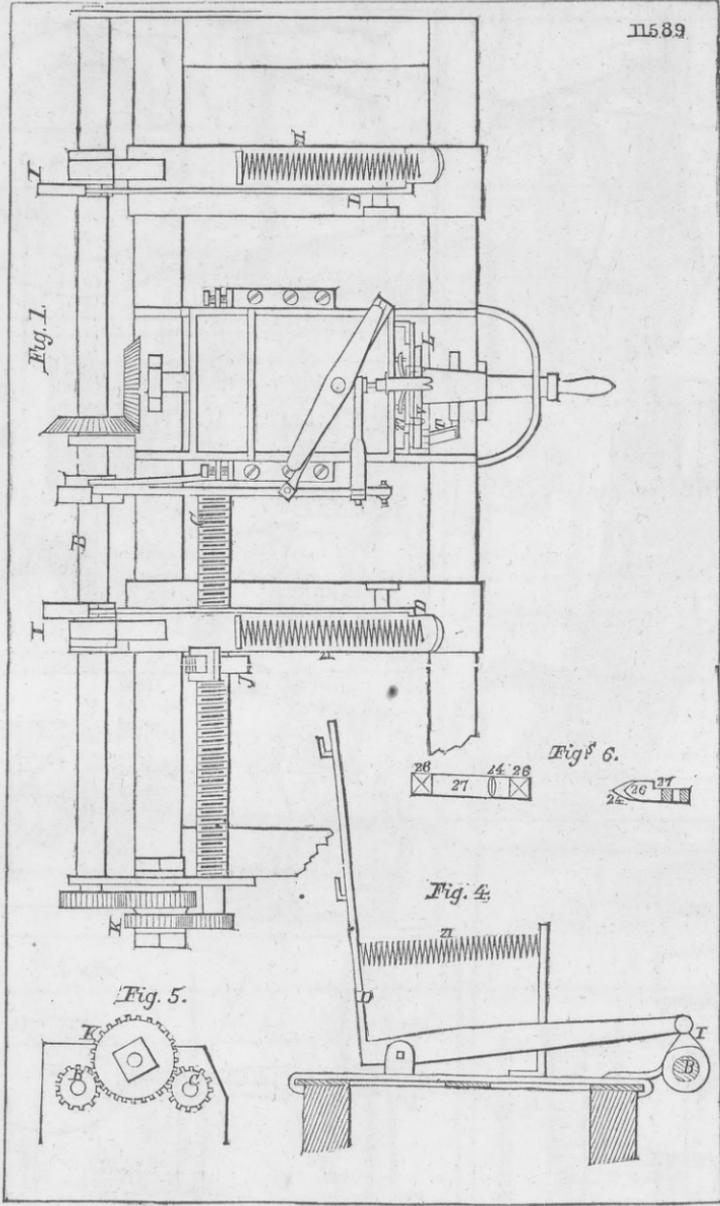
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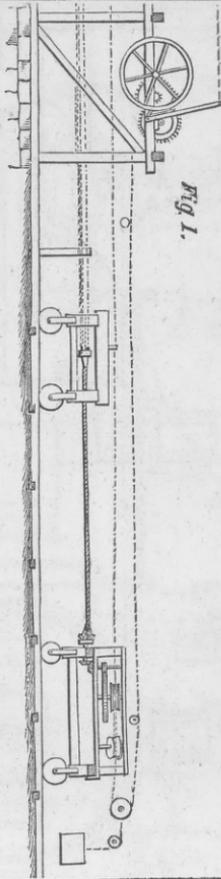
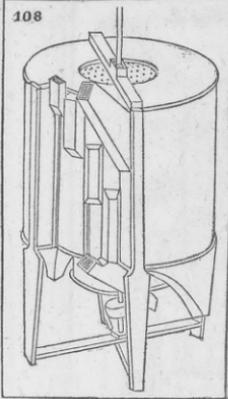


Fig. 1.

11913

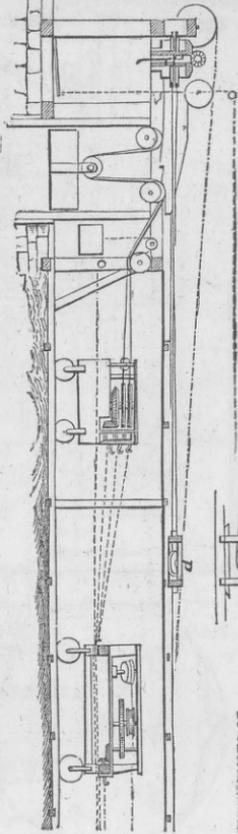


Fig. 2.

12035

Fig. 1.

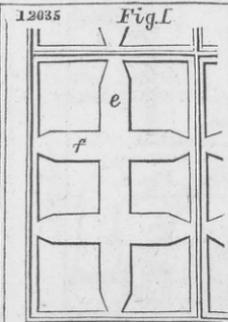
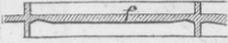
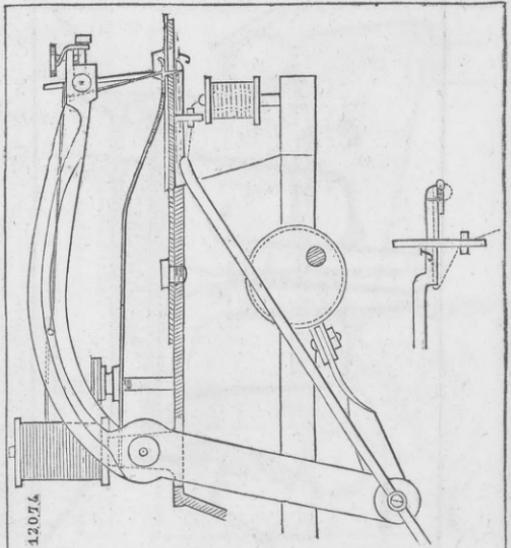
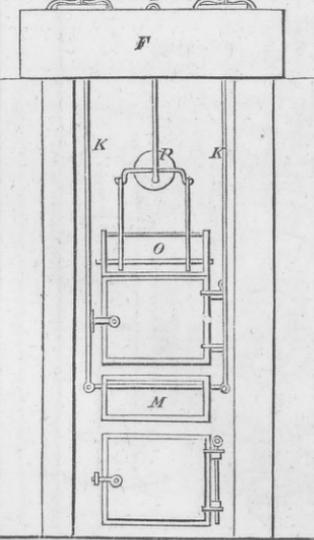


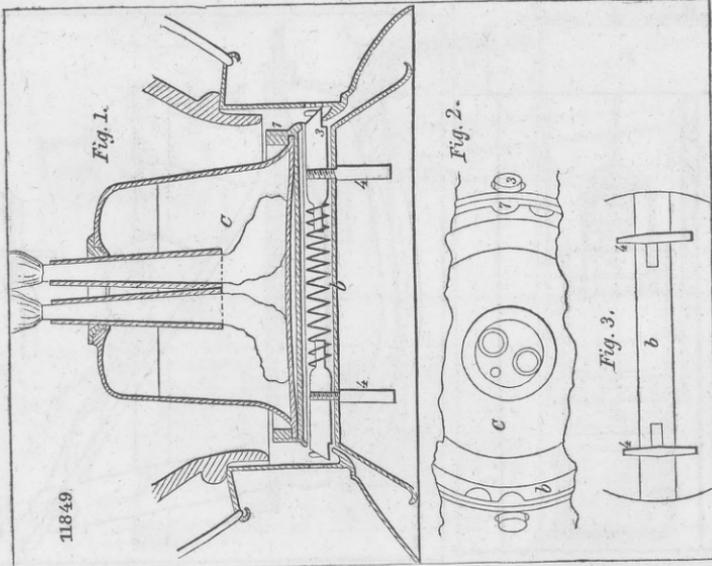
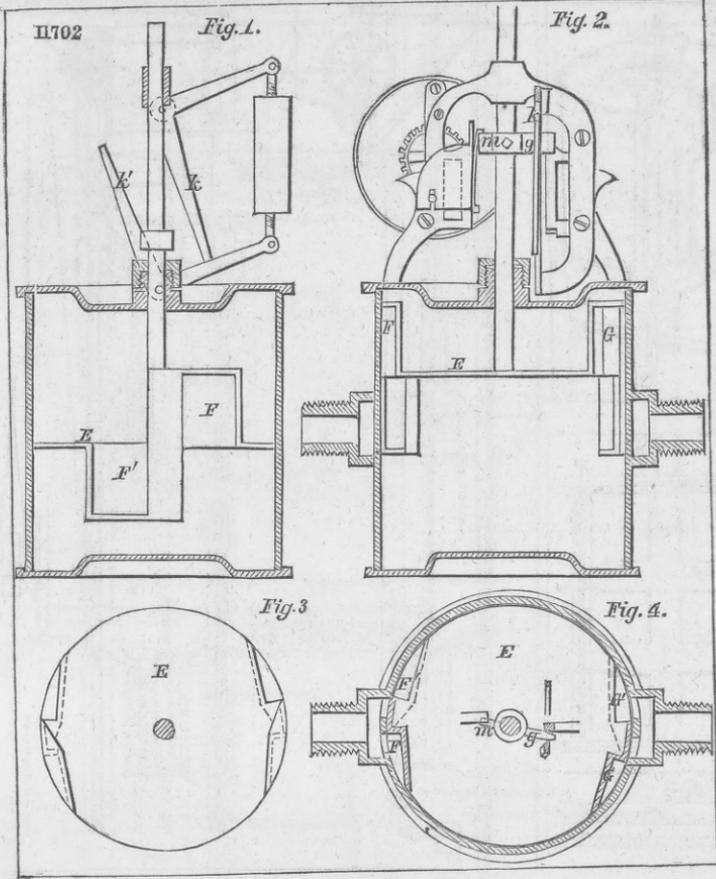
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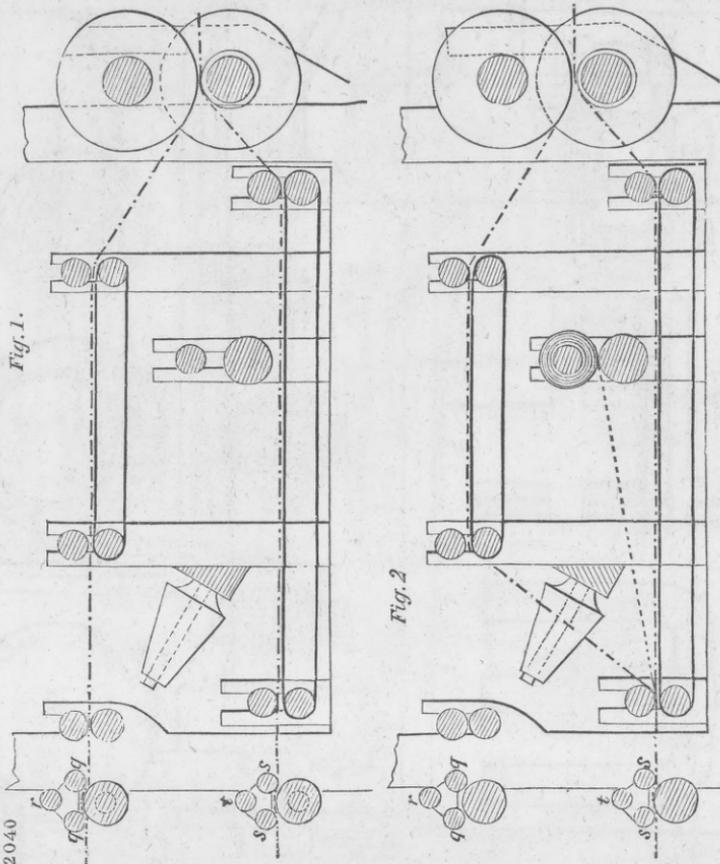


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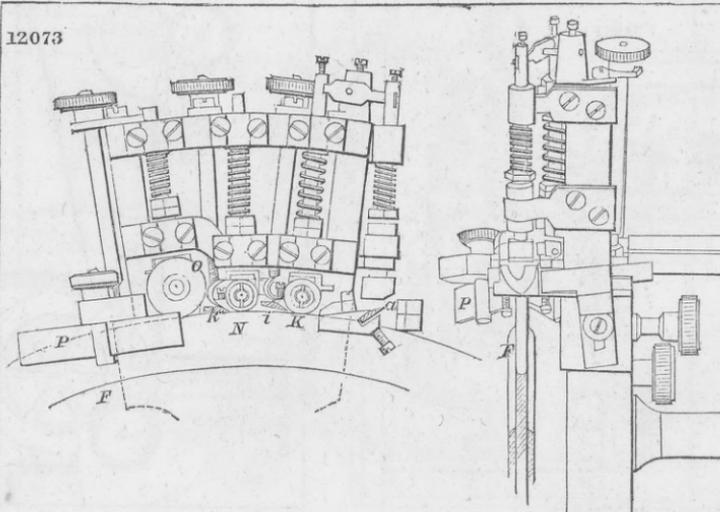


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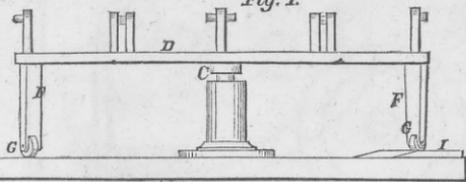
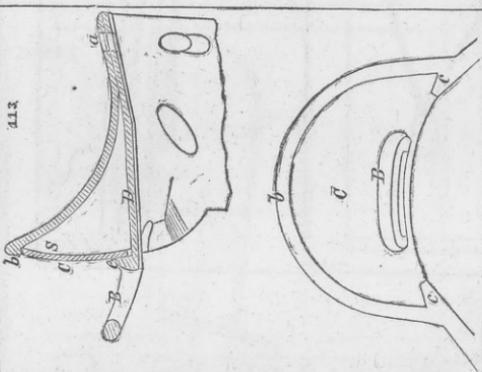
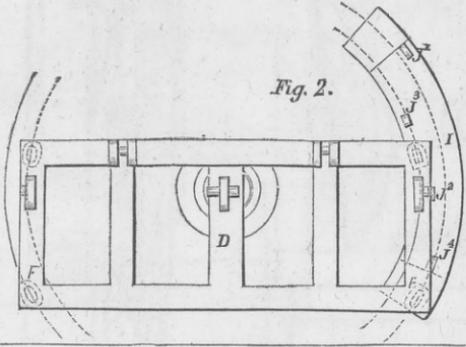
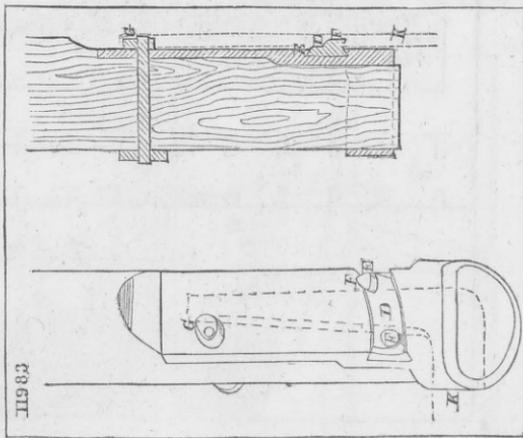
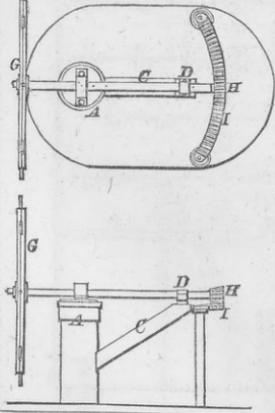


Fig. 2.



12021



12011

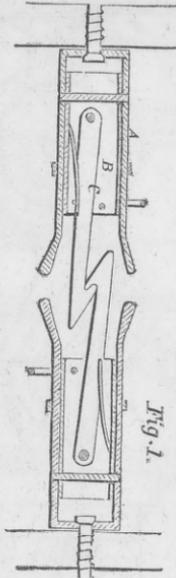


Fig. 1.

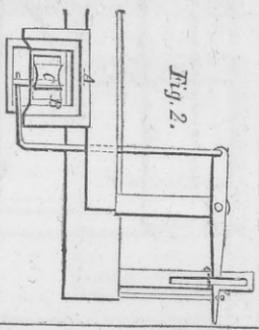
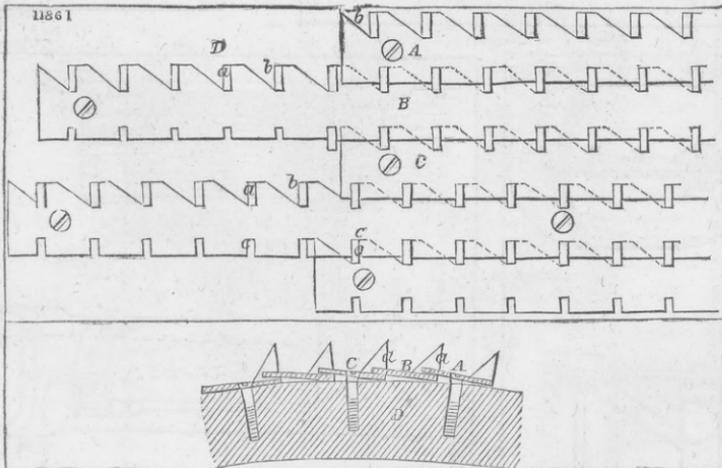
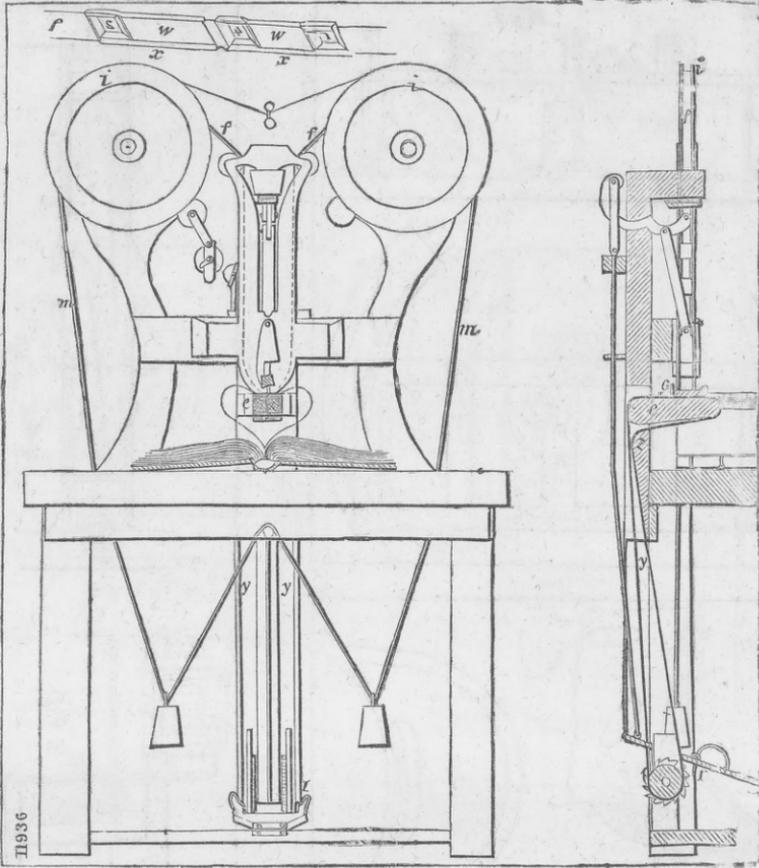
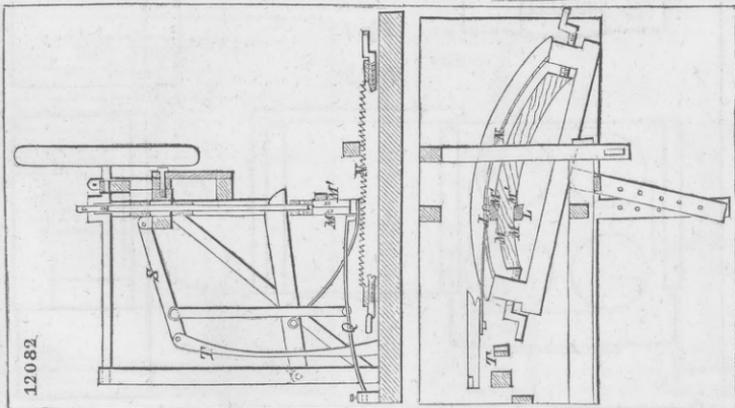
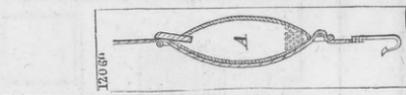
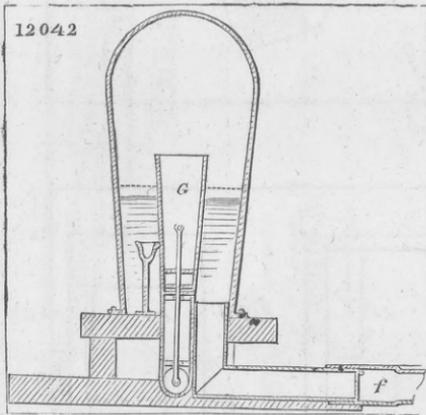
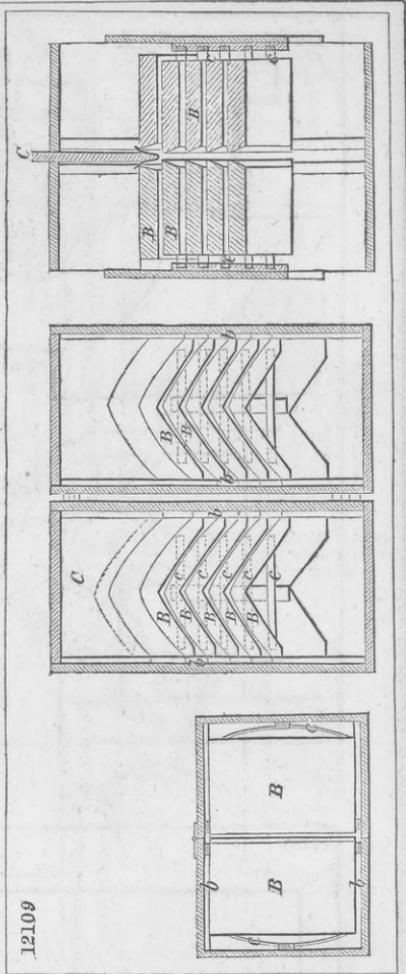
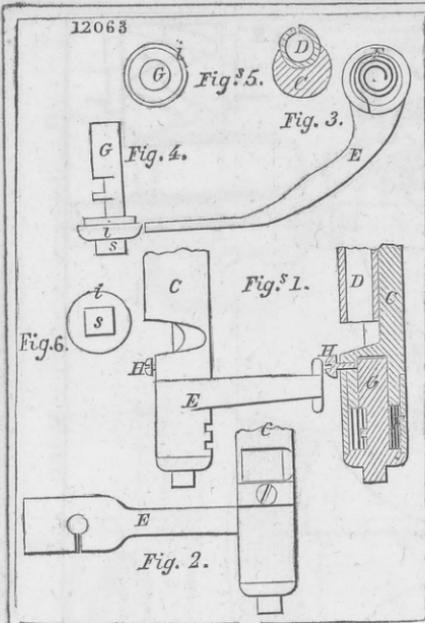


Fig. 2.





12084

Fig. 1.

Fig. 3.

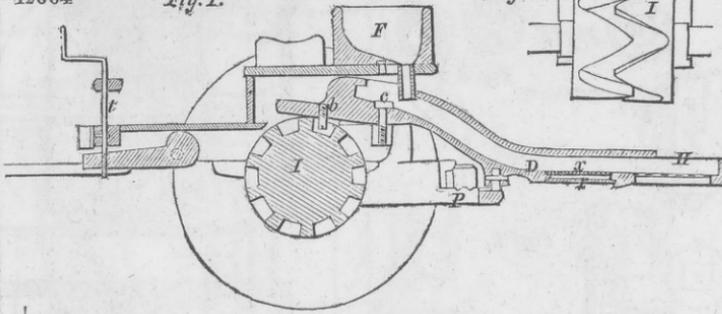
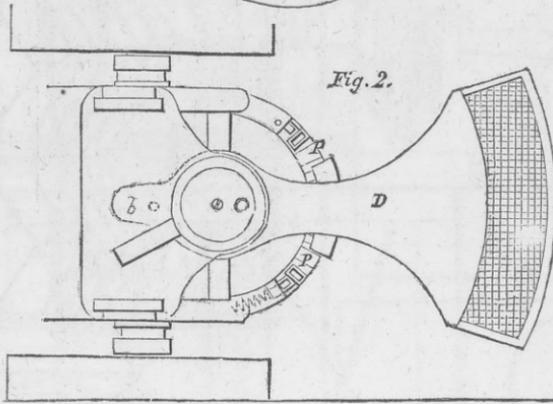


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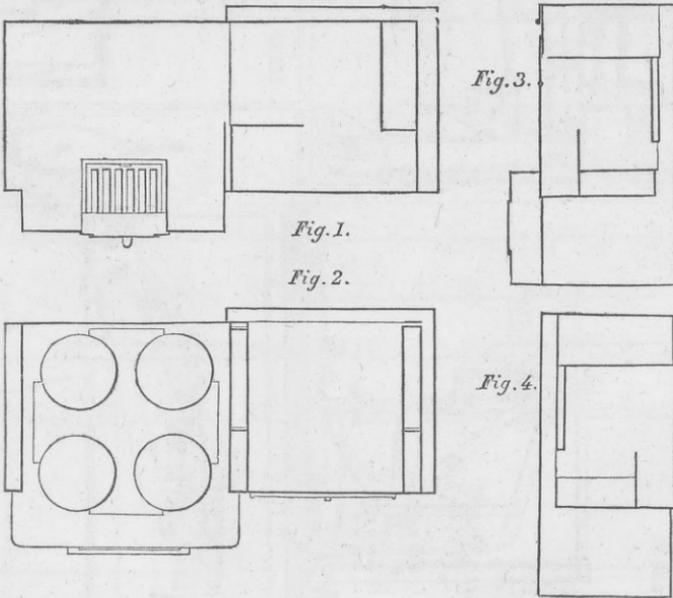
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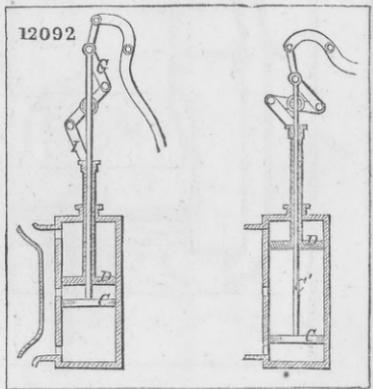
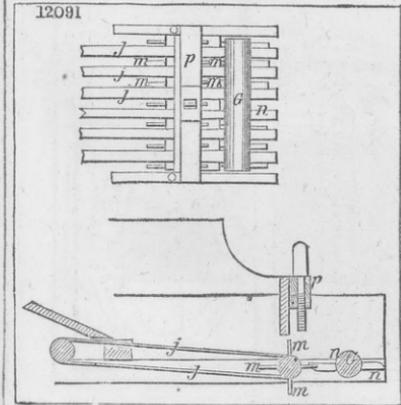
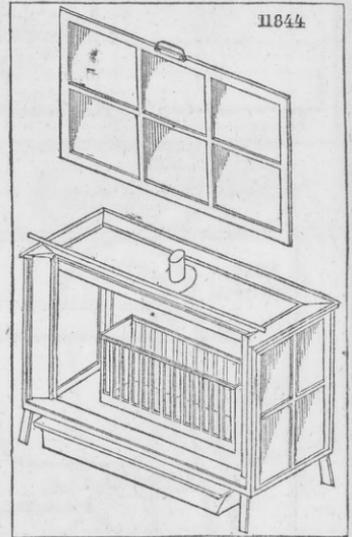
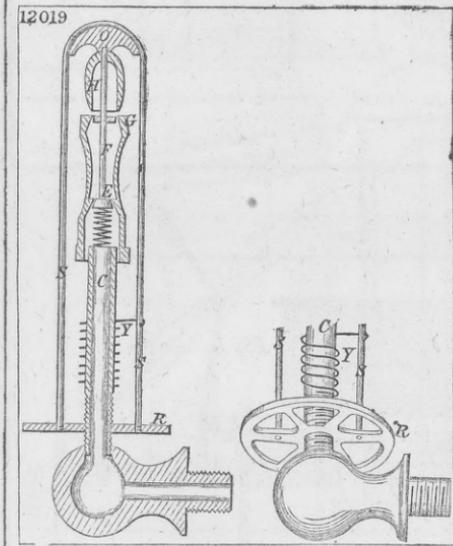
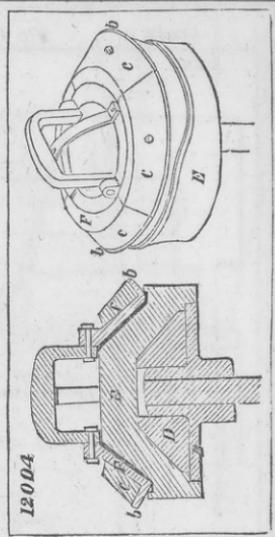
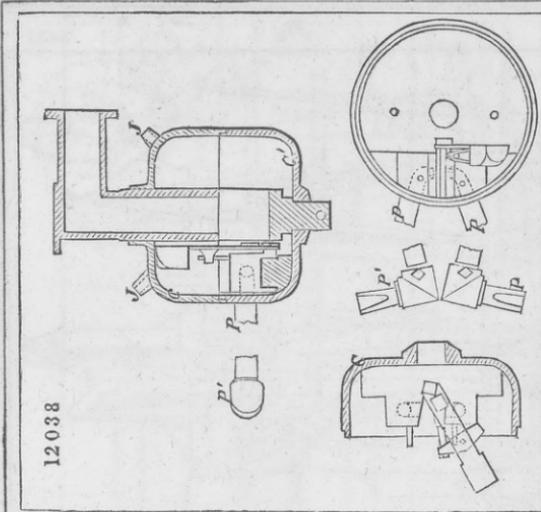
Fig. 1.

Fig. 2.

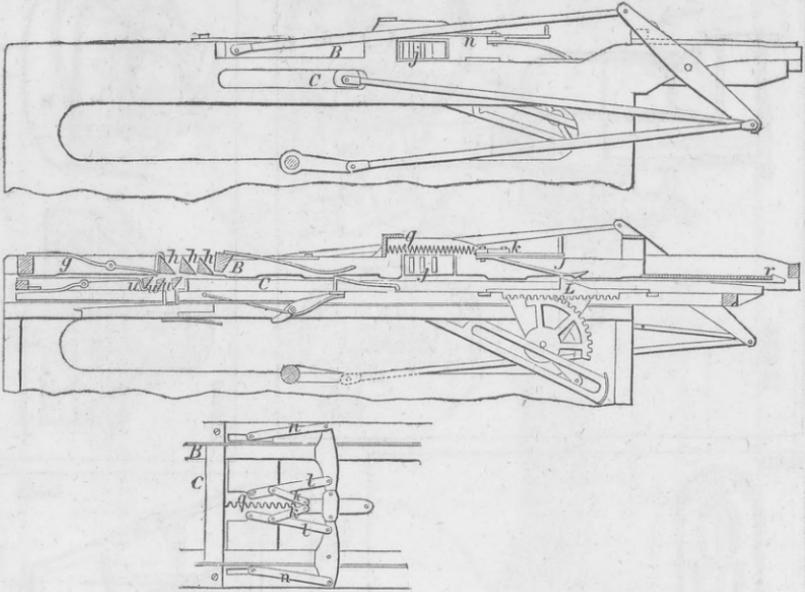
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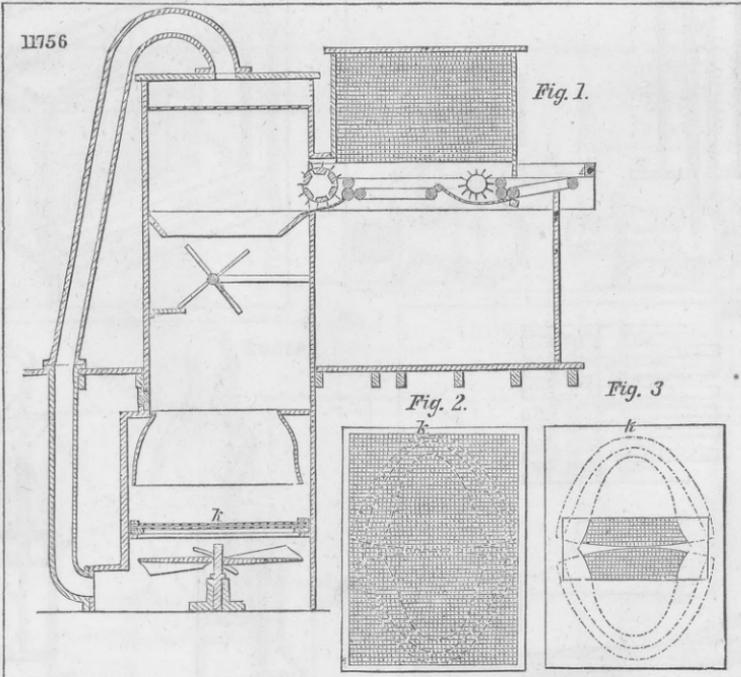




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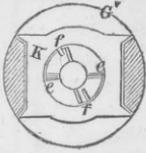


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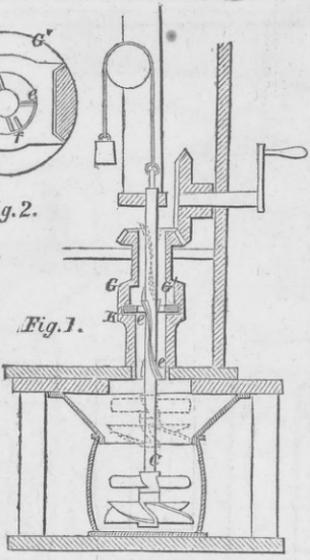
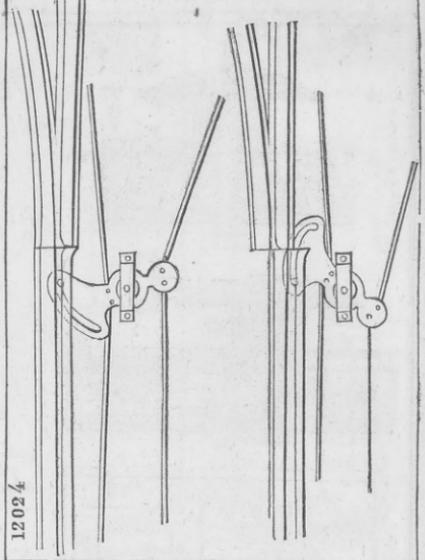
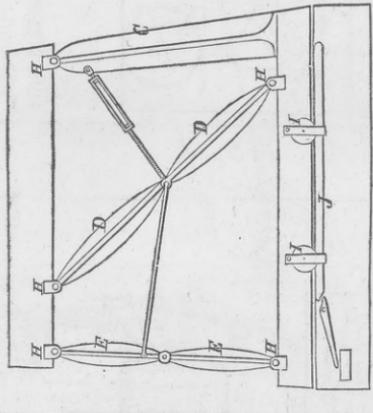


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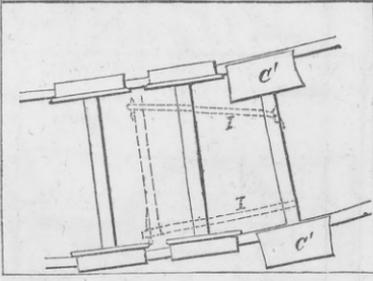
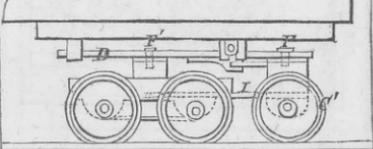


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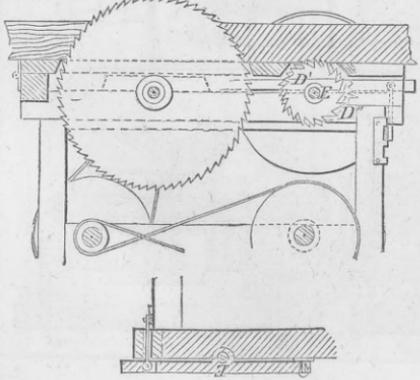
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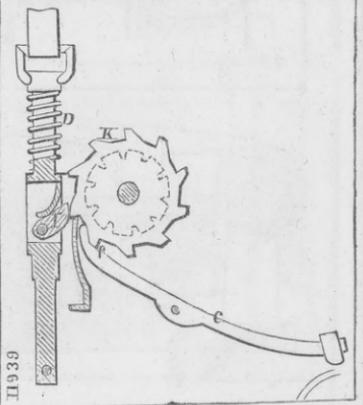
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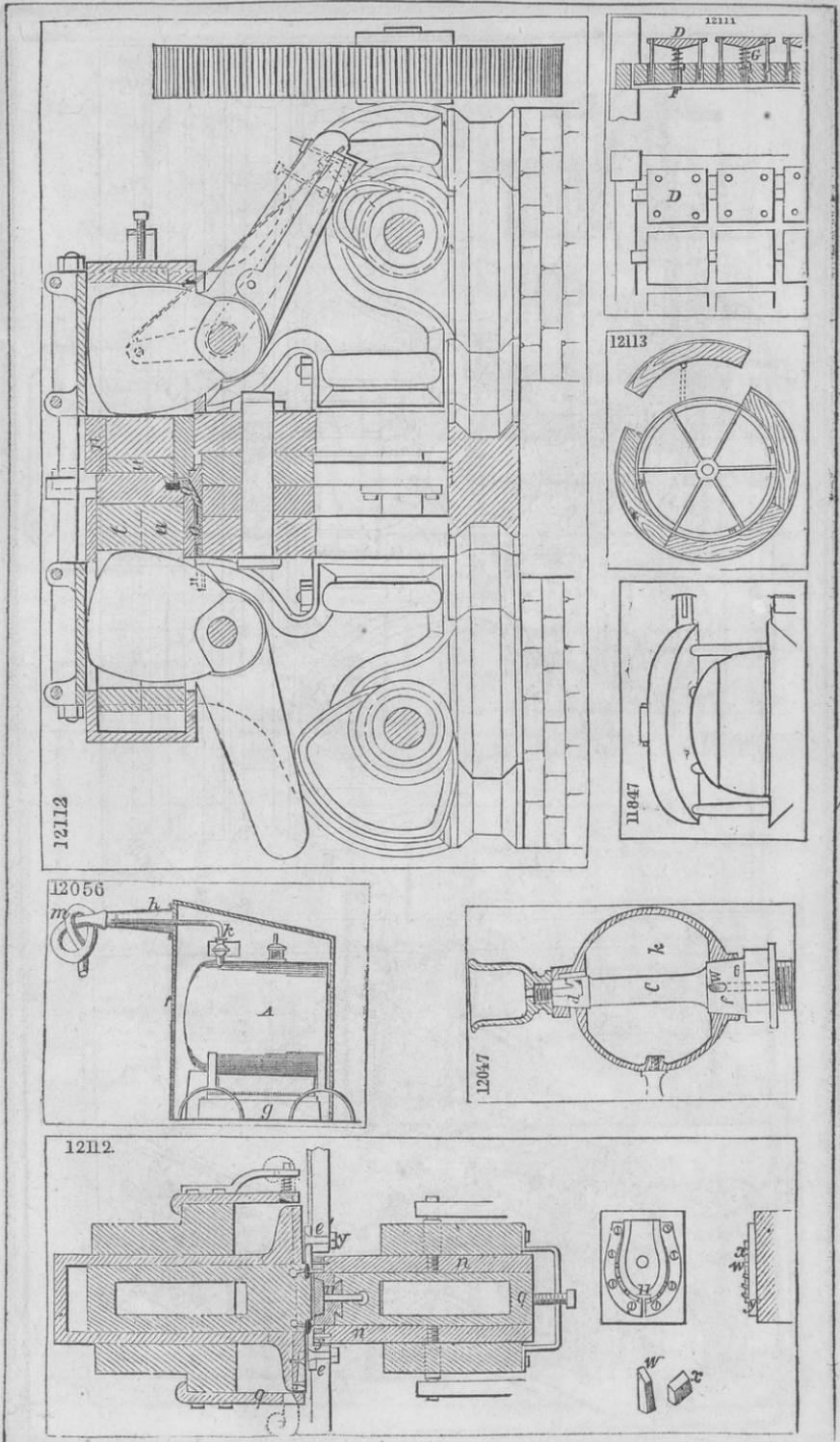


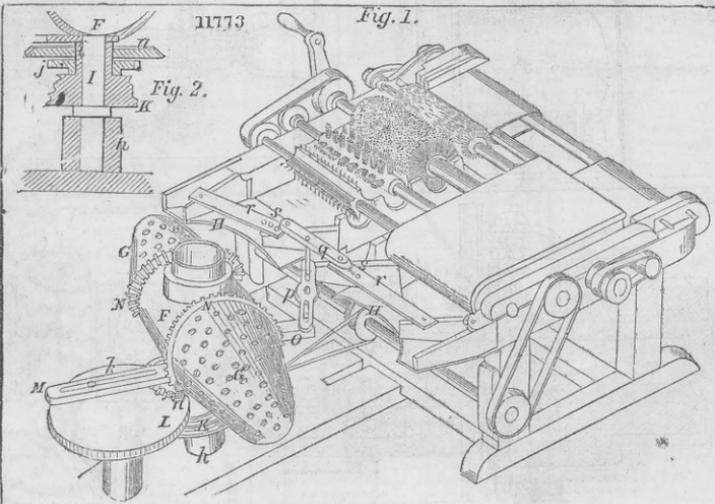
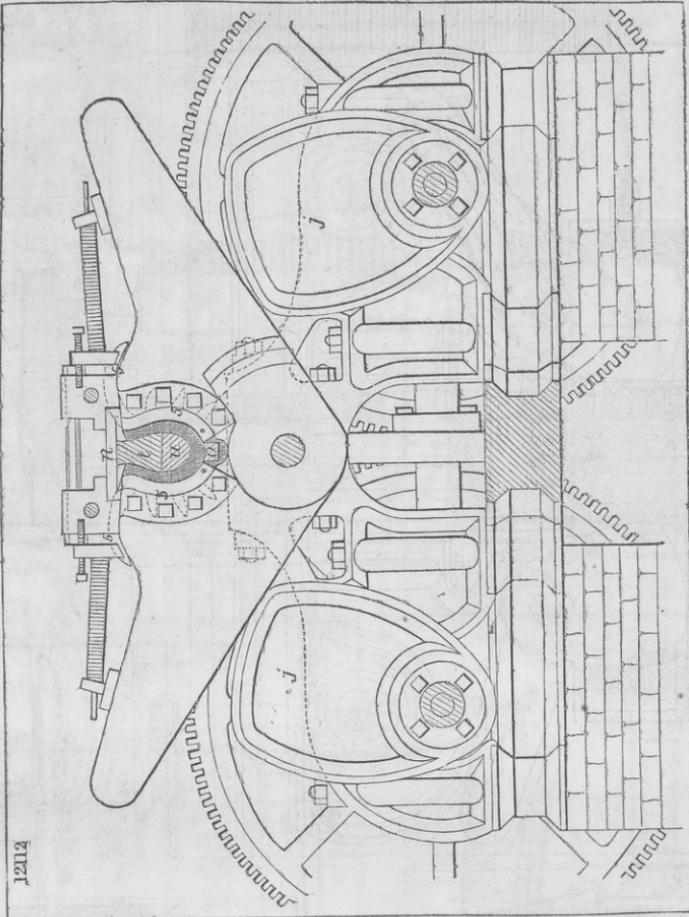
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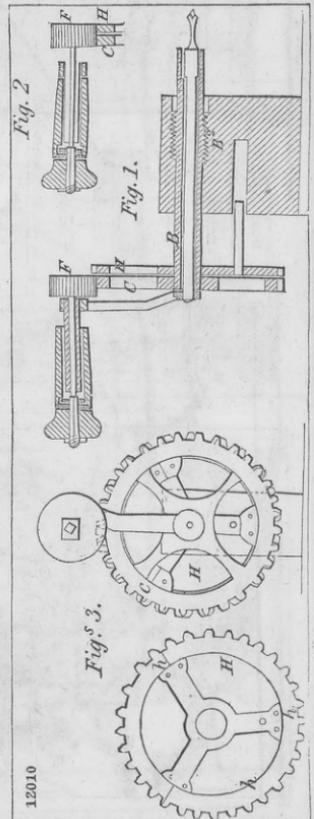
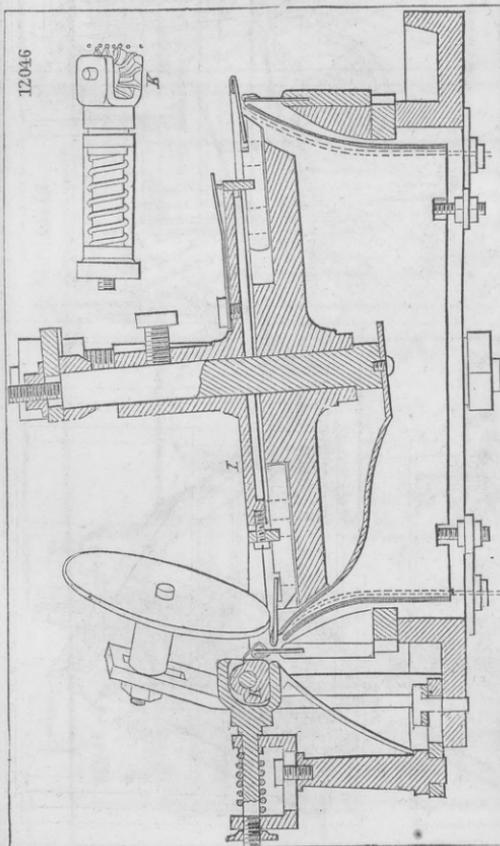
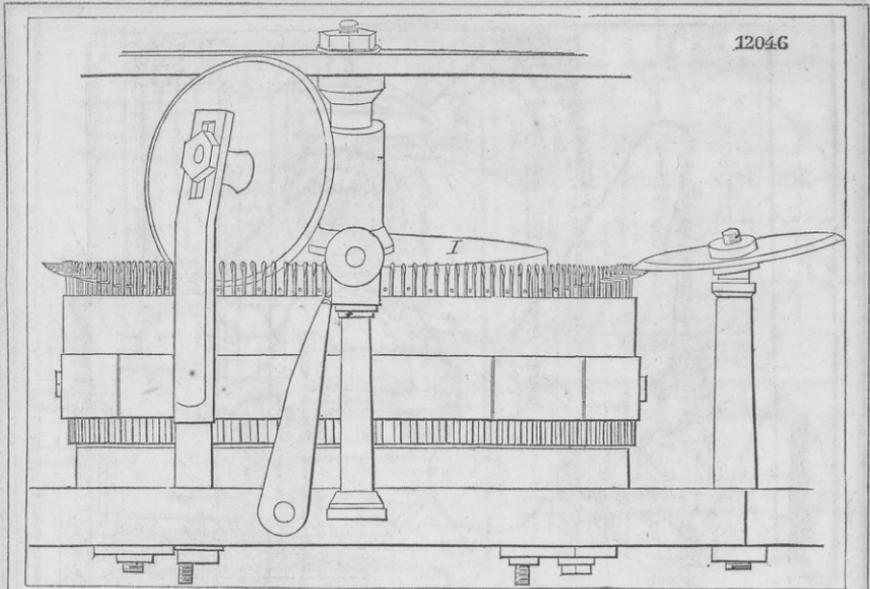


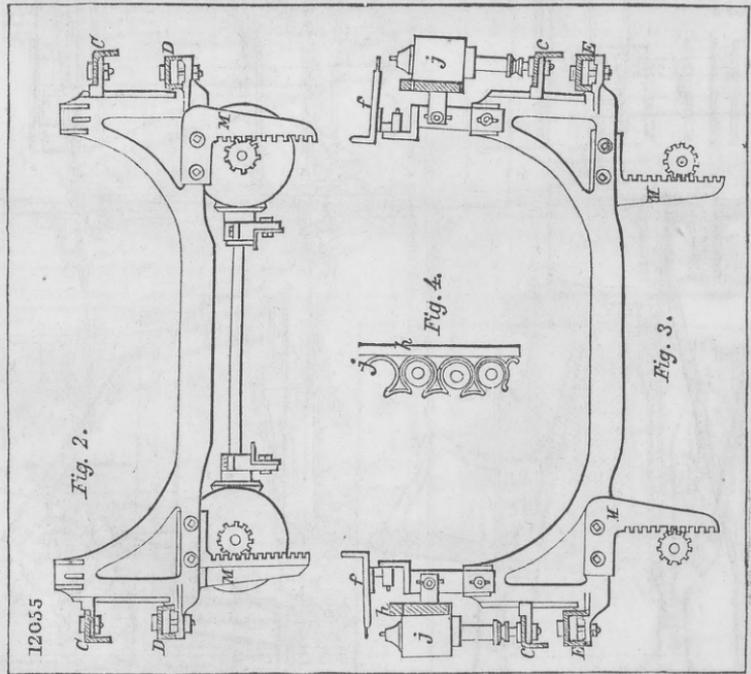
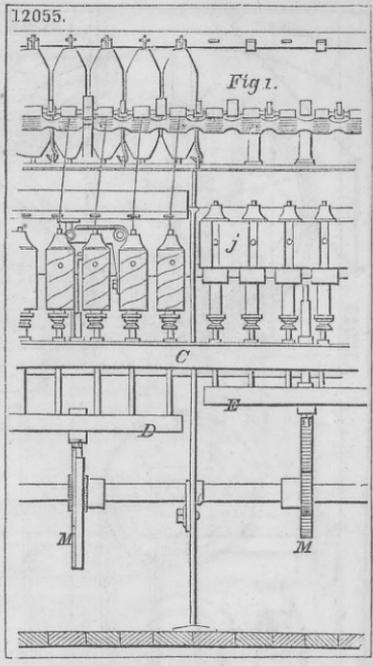
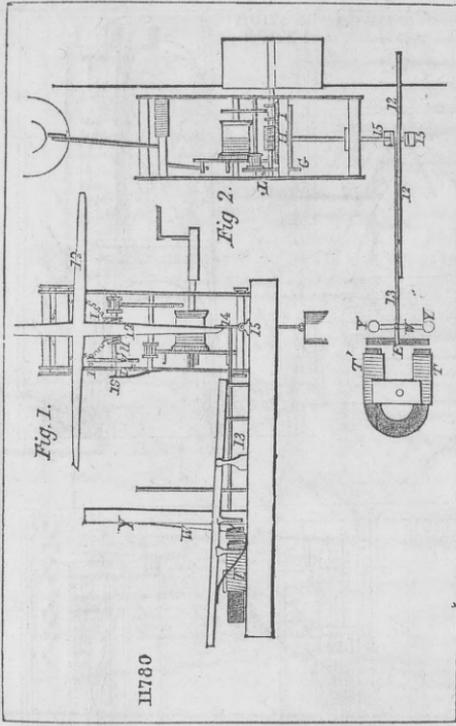
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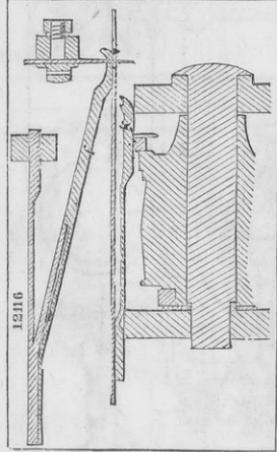
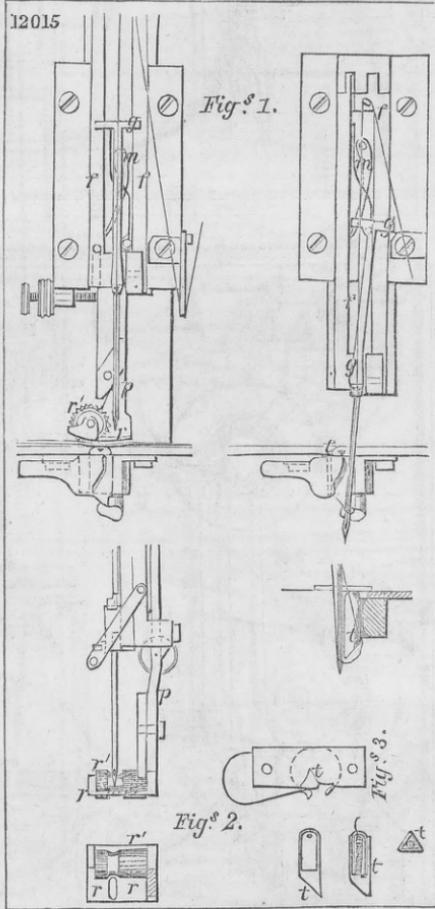
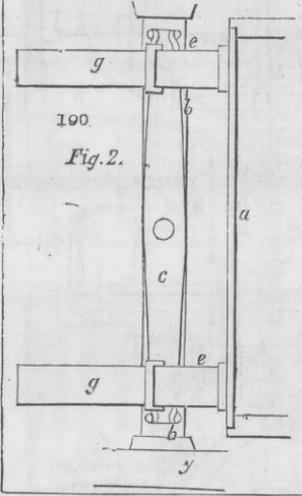
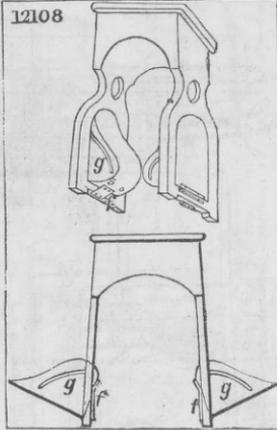
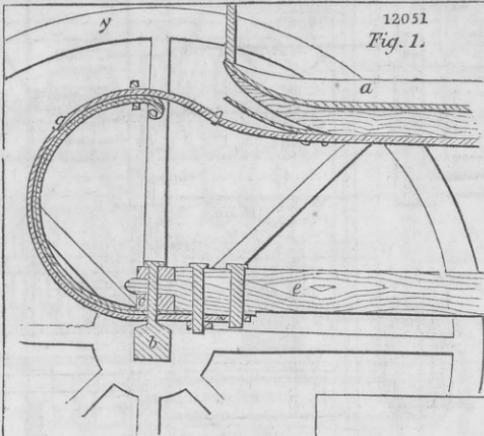




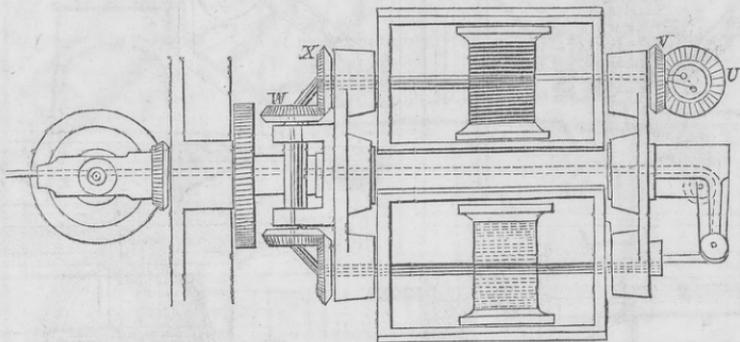
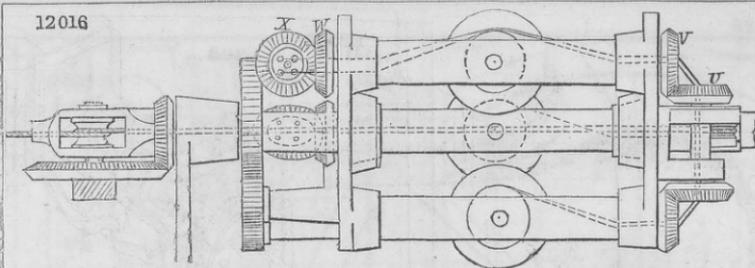




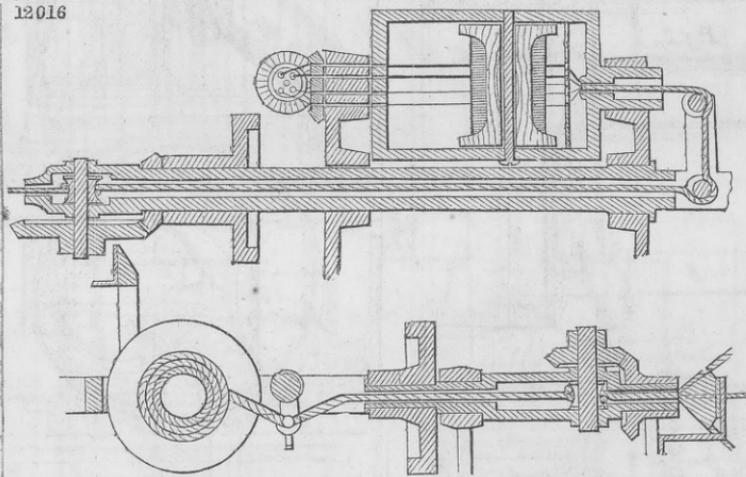




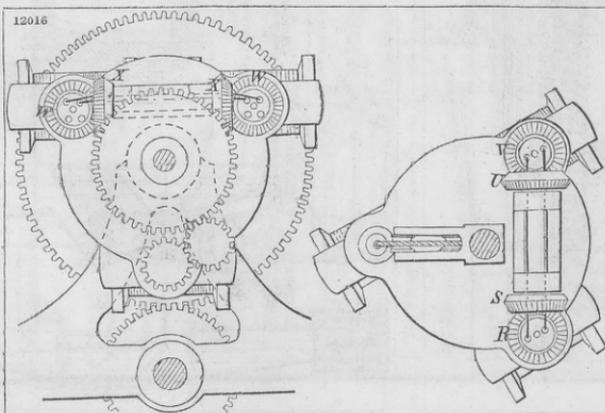
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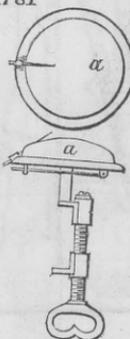
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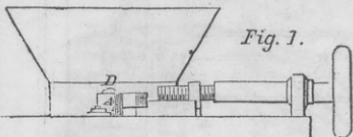
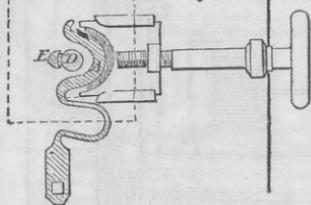
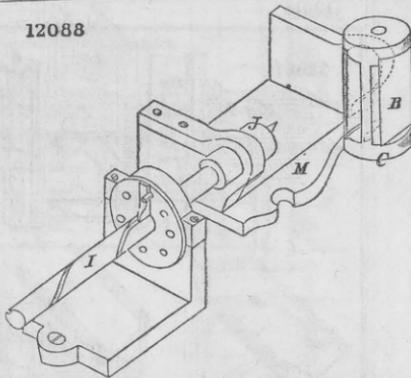


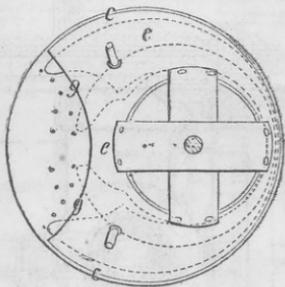
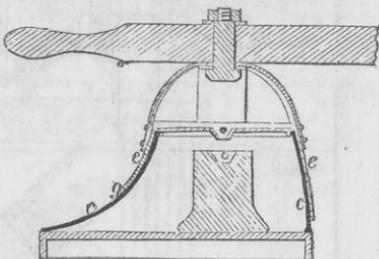
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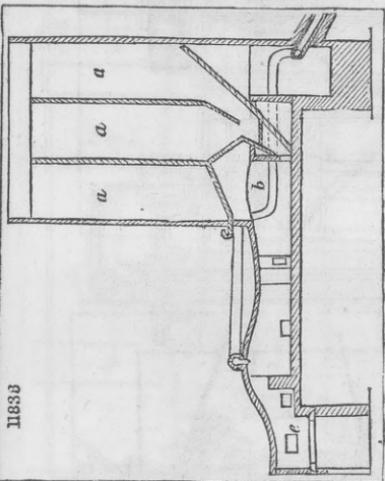
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Fig. 2.

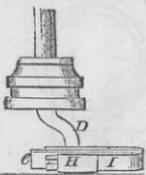


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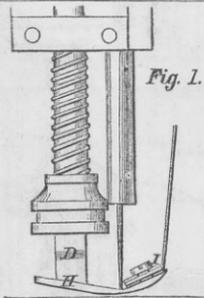
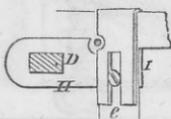


Fig. 1.

Fig. 3.



Fig. 2

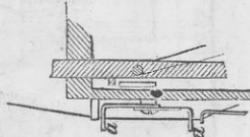
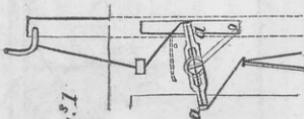
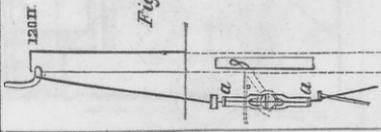


Fig. 1



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Fig. 1.

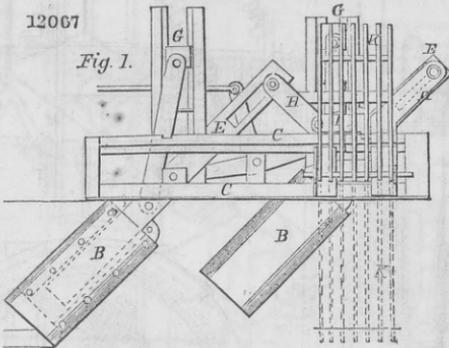


Fig. 3.



Fig. 2.

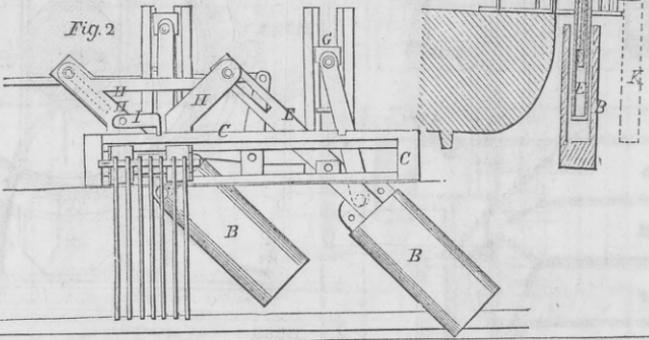


Fig. 1.

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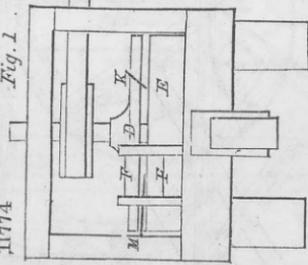


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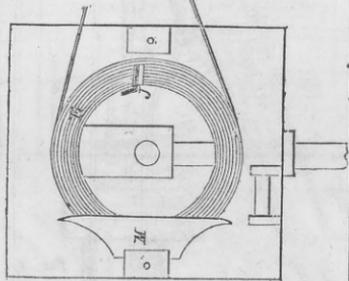


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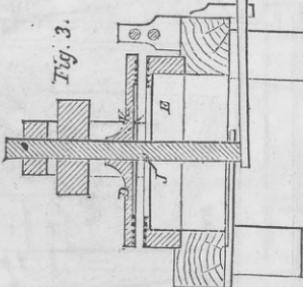
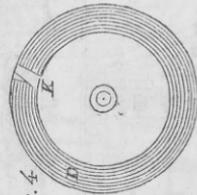
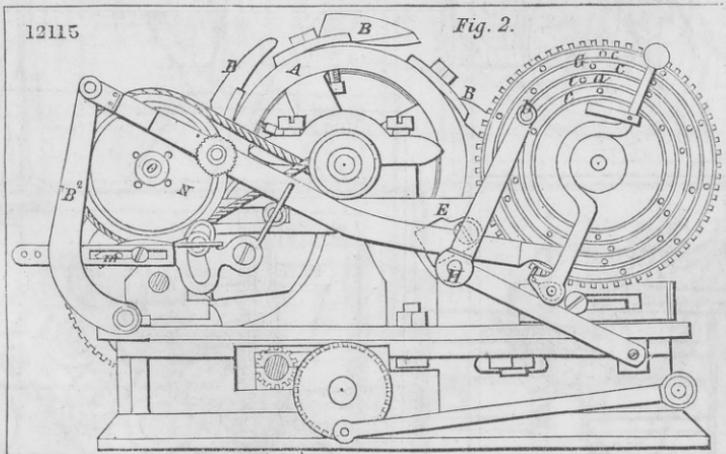
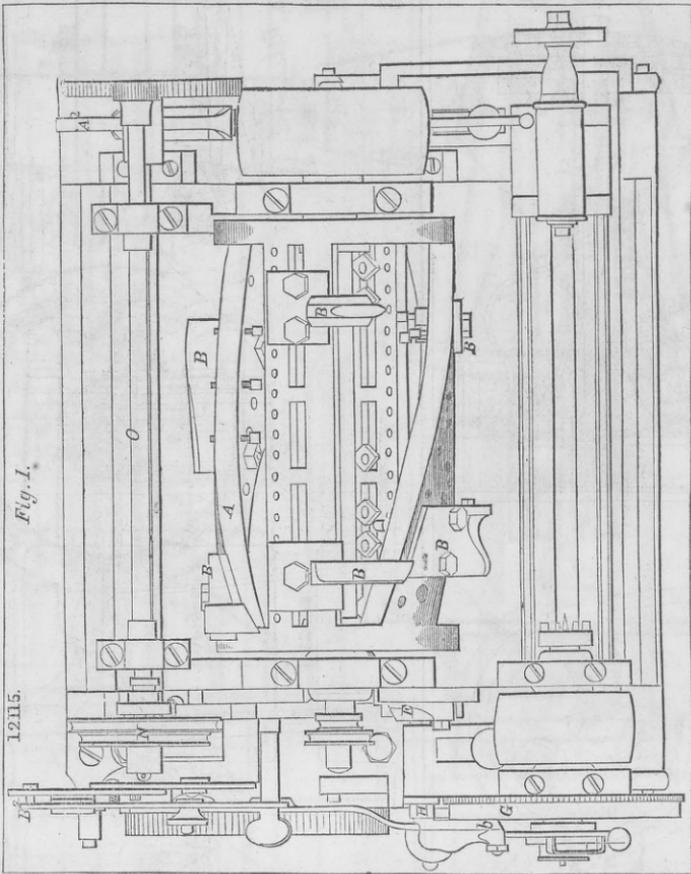
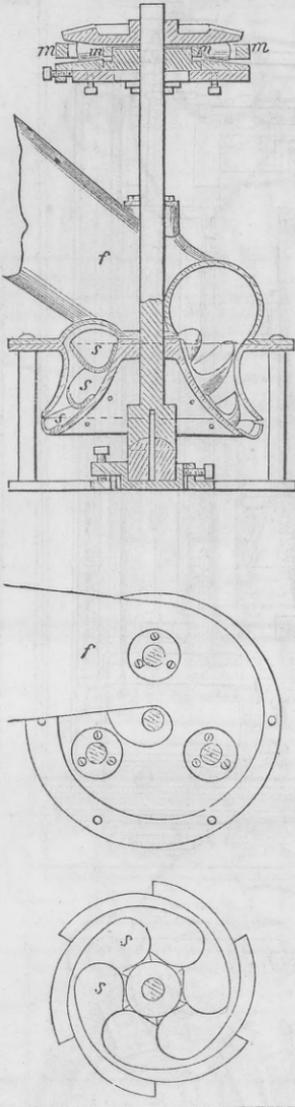


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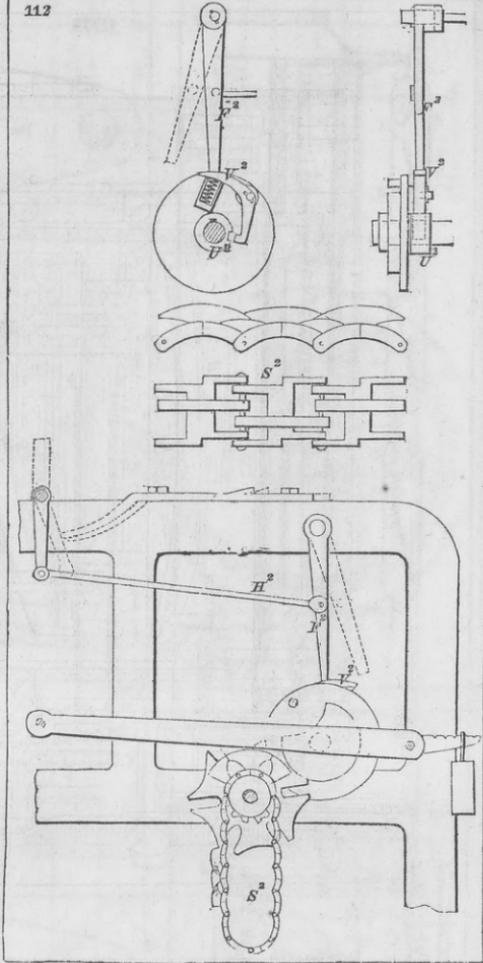




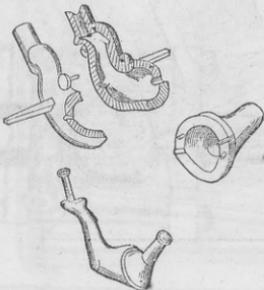
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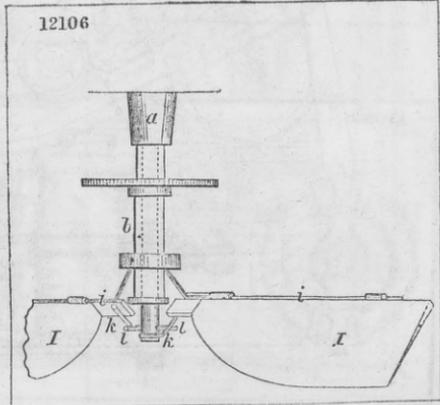
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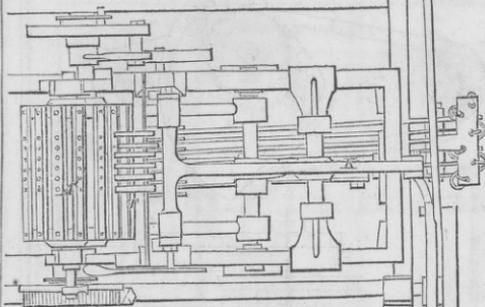


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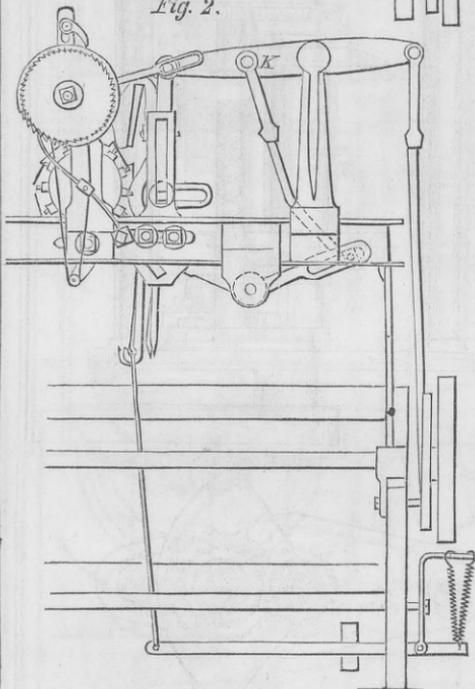
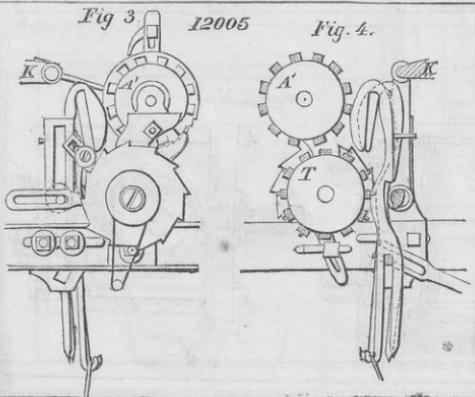


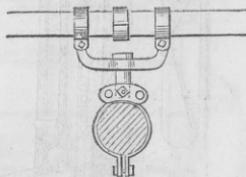
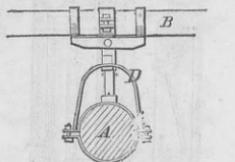
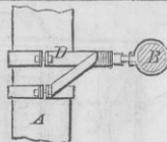
Fig. 3.

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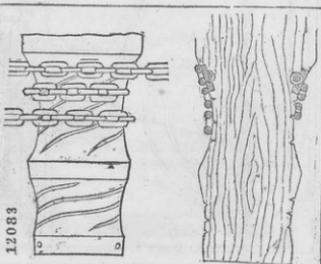
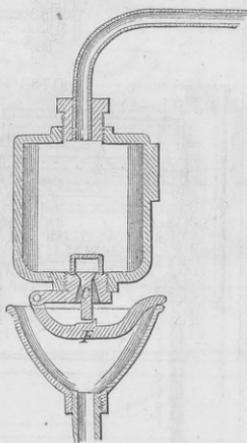
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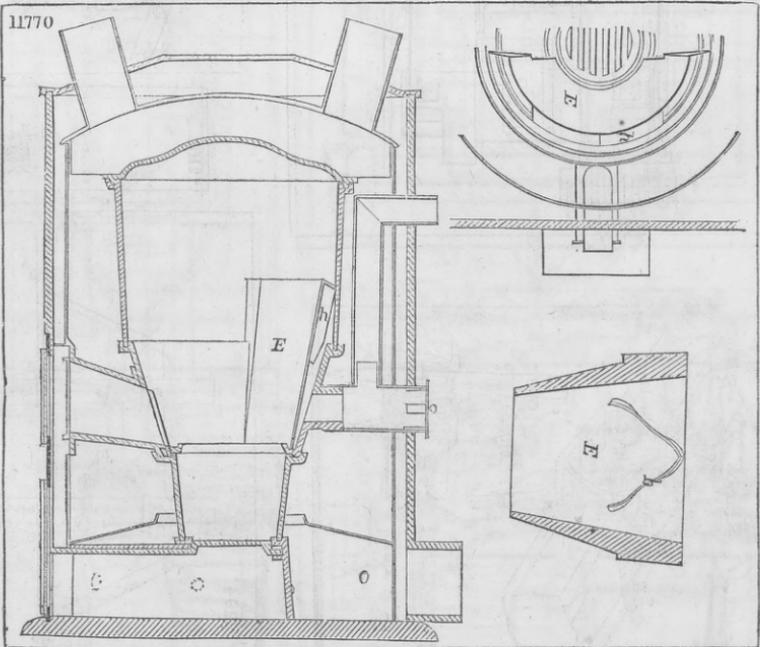
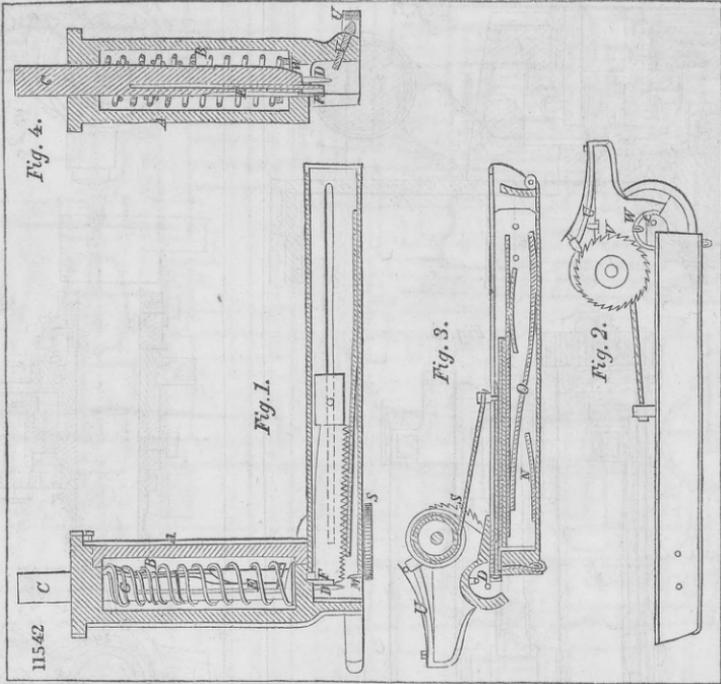
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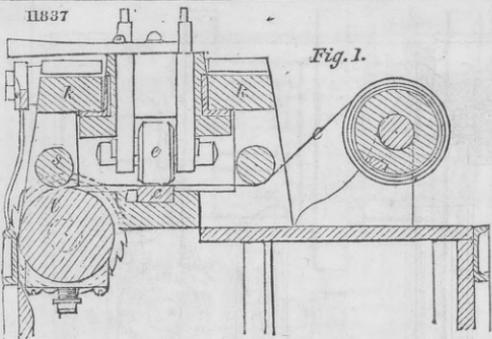
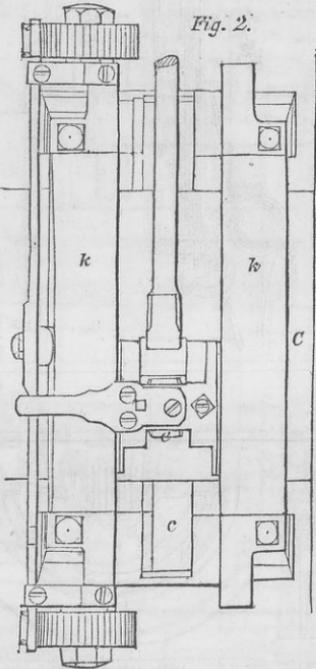
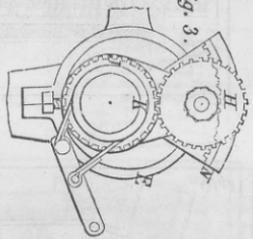
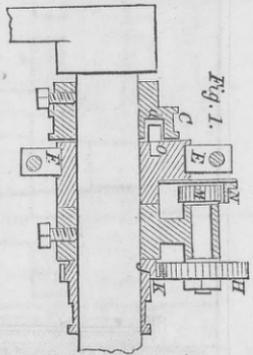
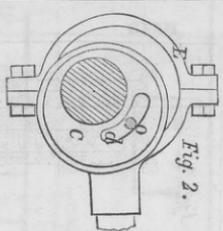


Fig. 2.



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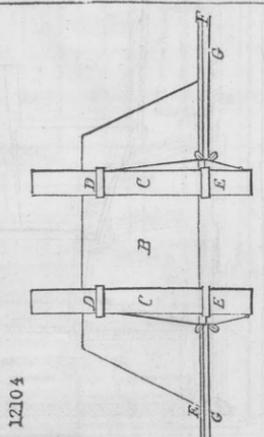


Fig. 1.

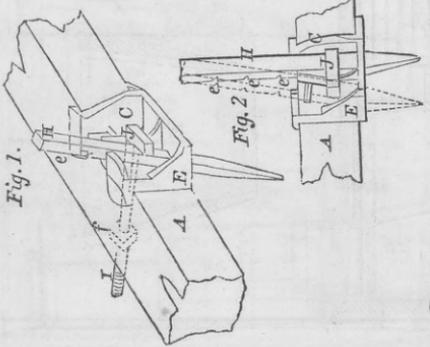
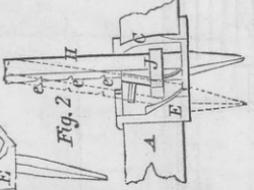
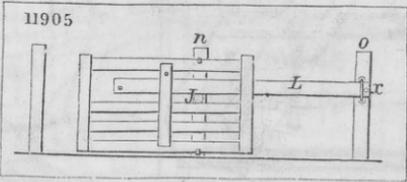
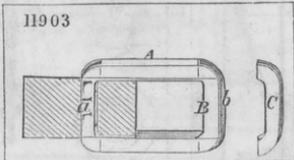
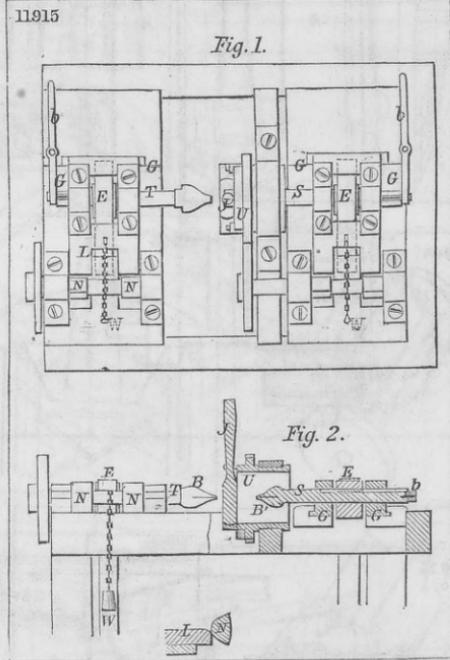
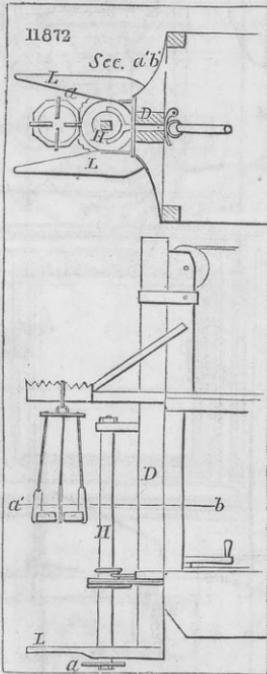
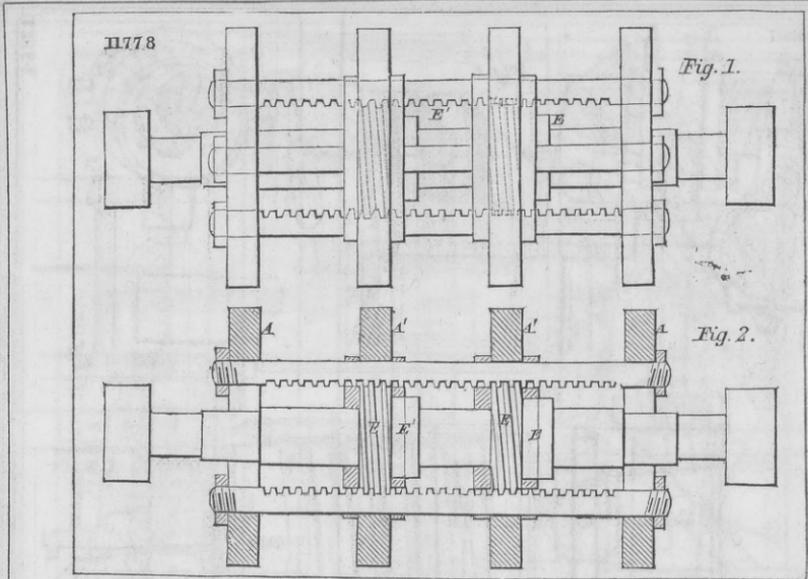
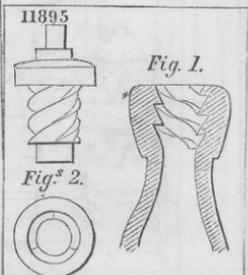
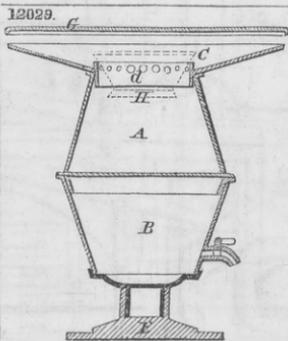
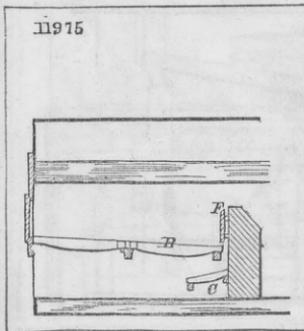
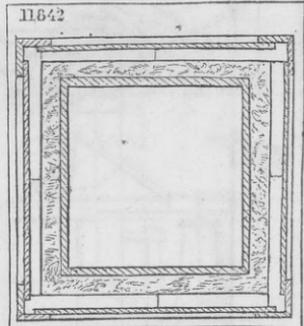
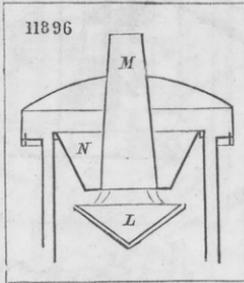
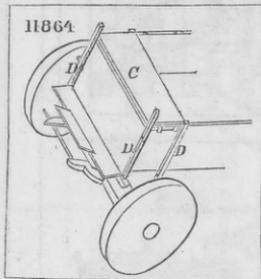
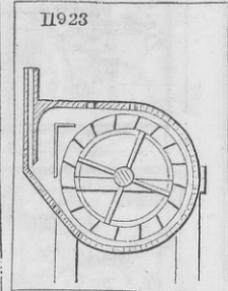
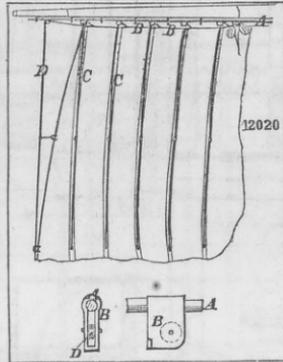
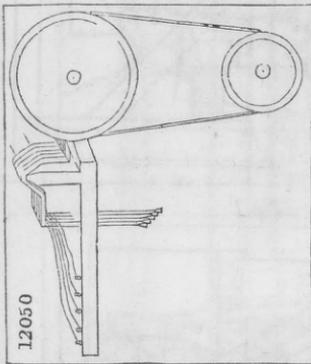
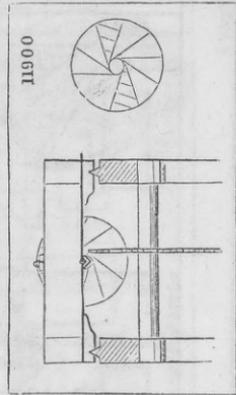
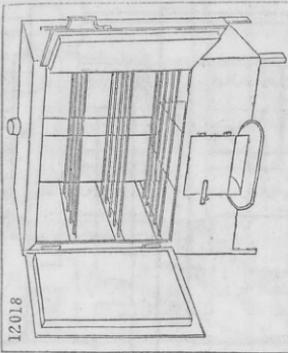
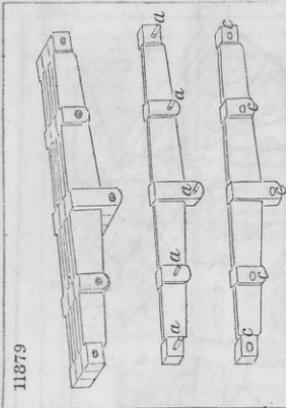


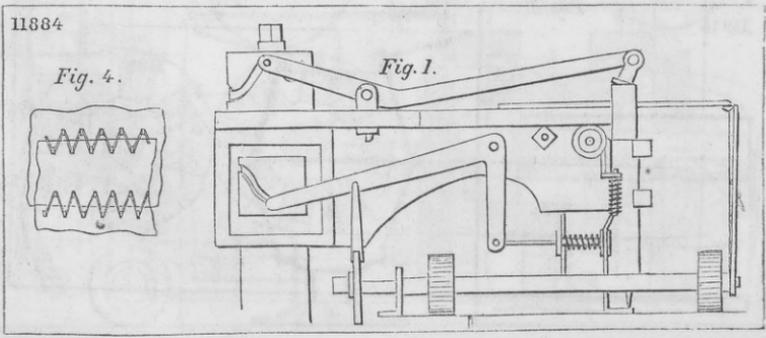
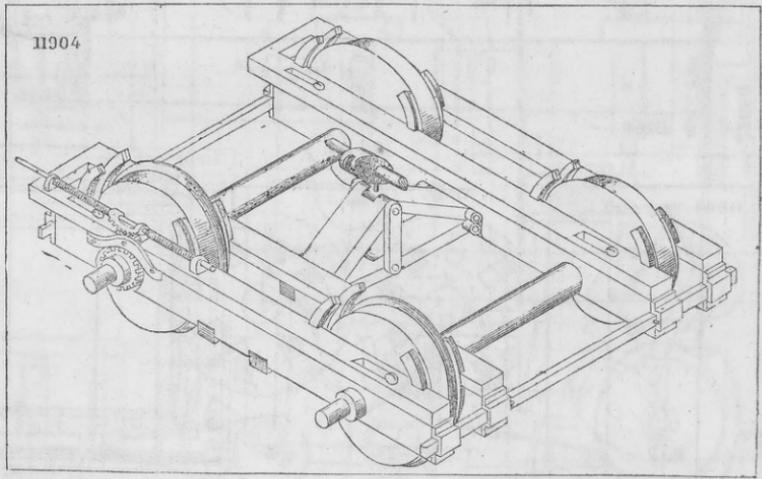
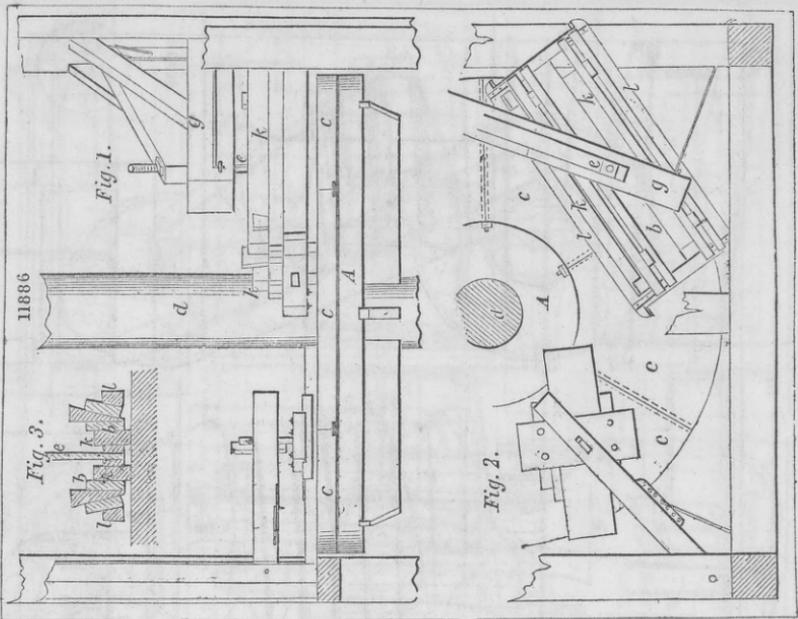
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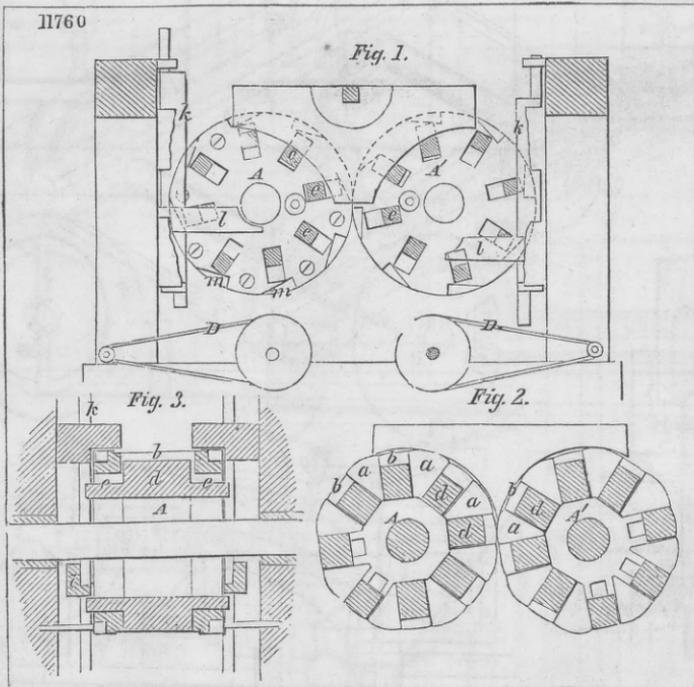
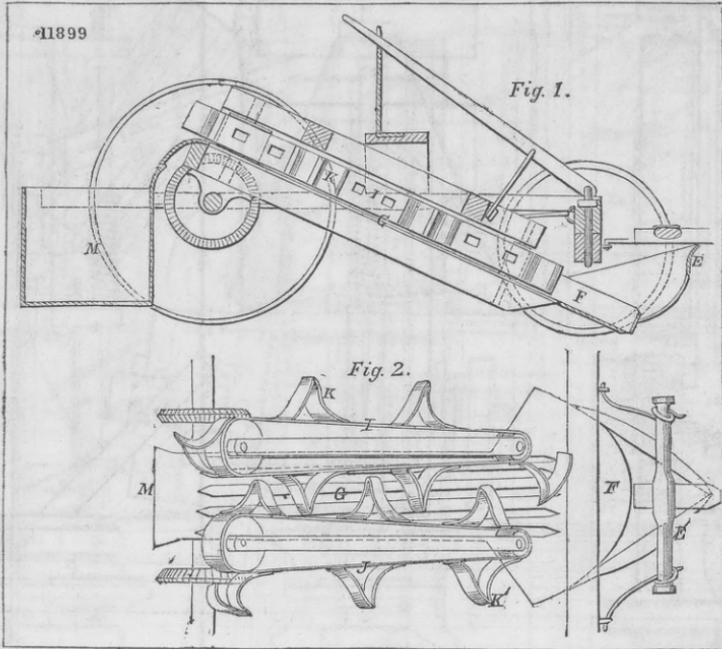


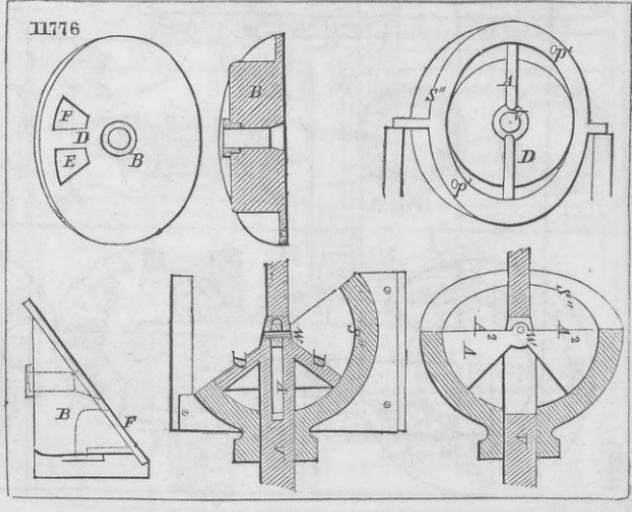
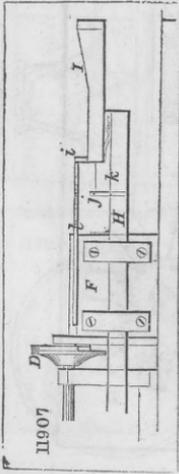
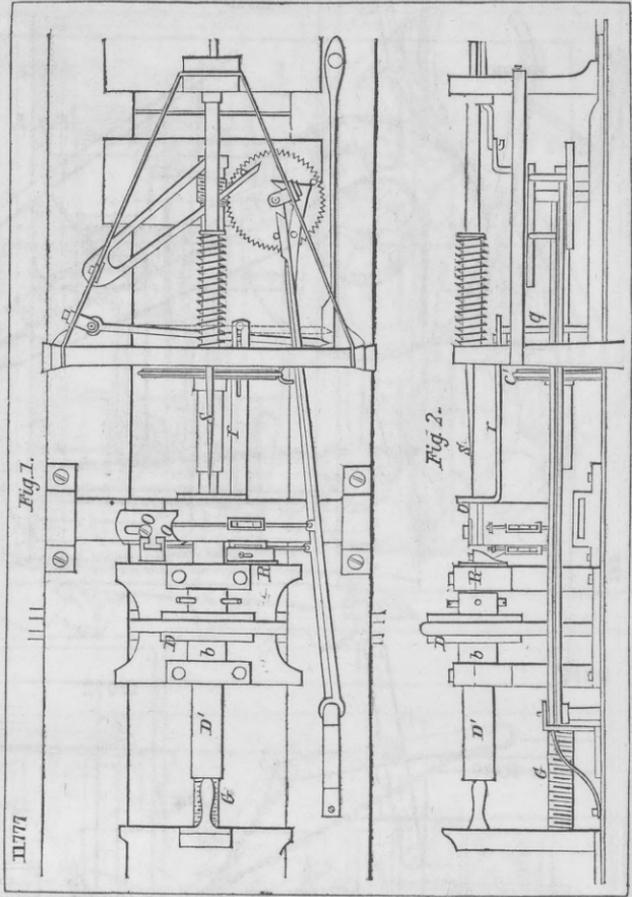
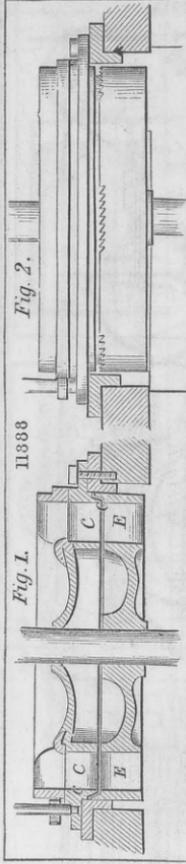
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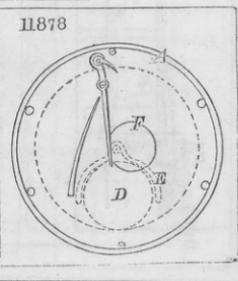
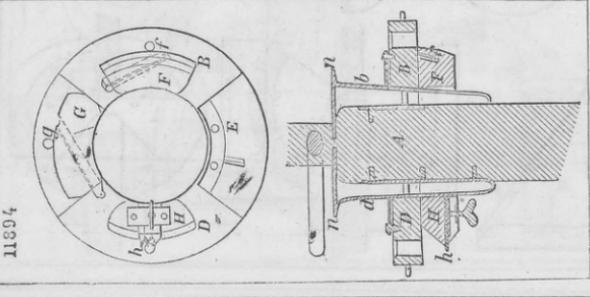
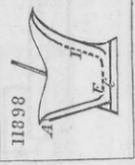
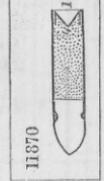
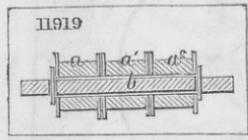
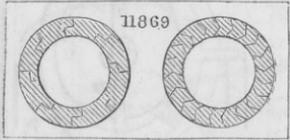
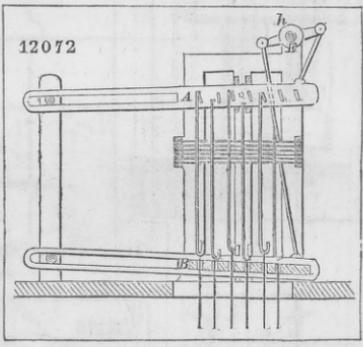
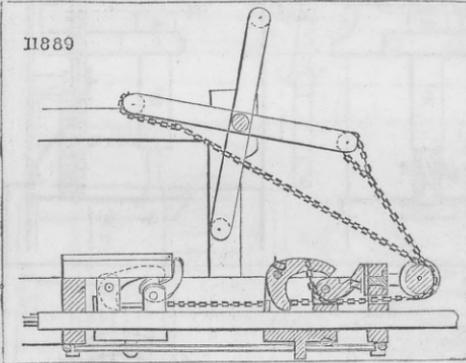
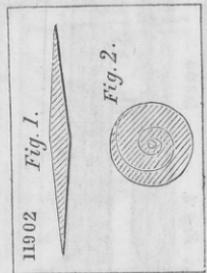
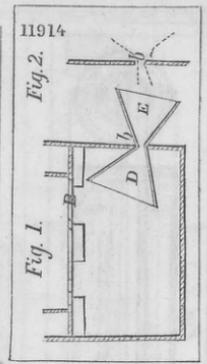
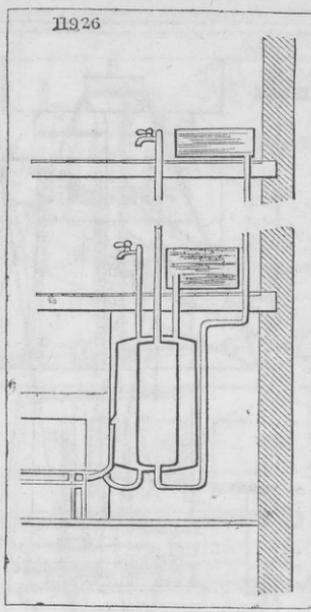
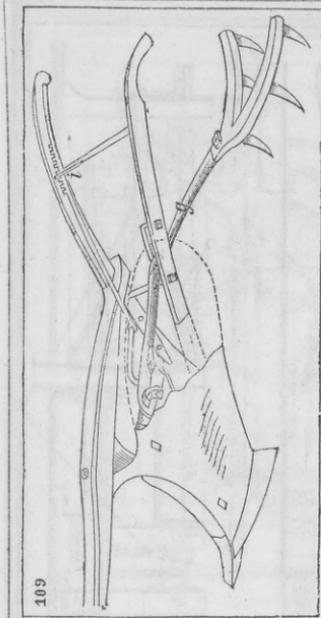


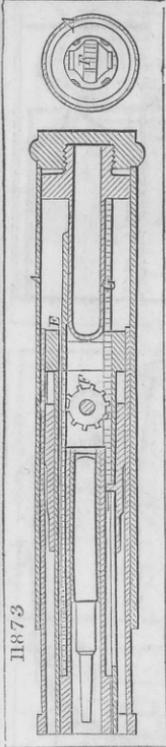












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Fig. 2.

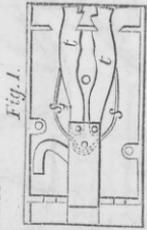
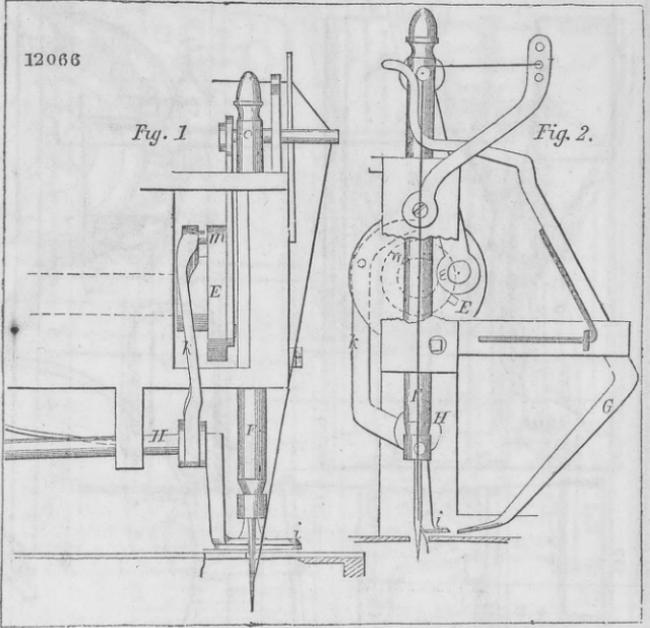


Fig. 1.

11816



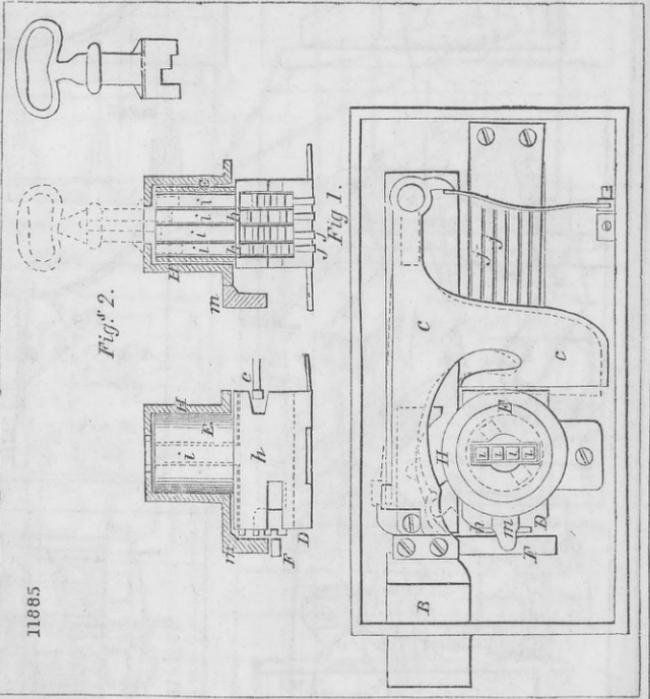
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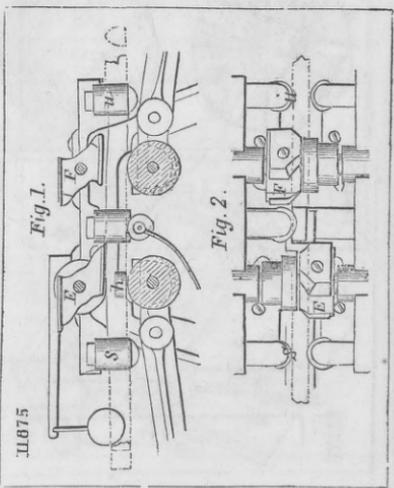
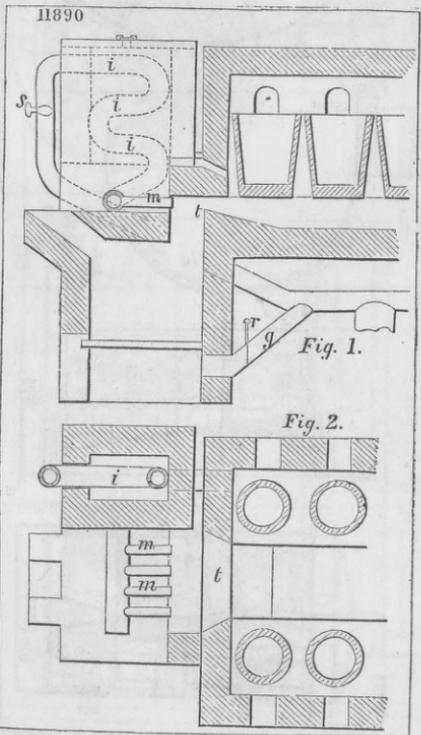
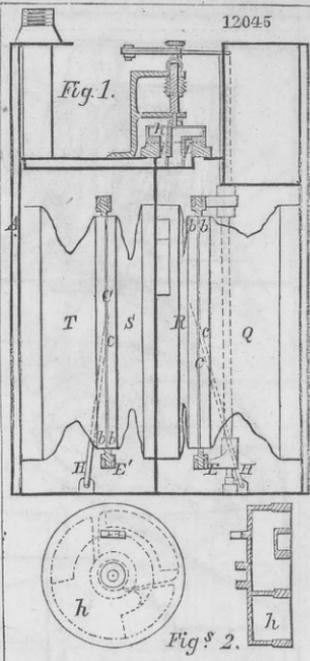
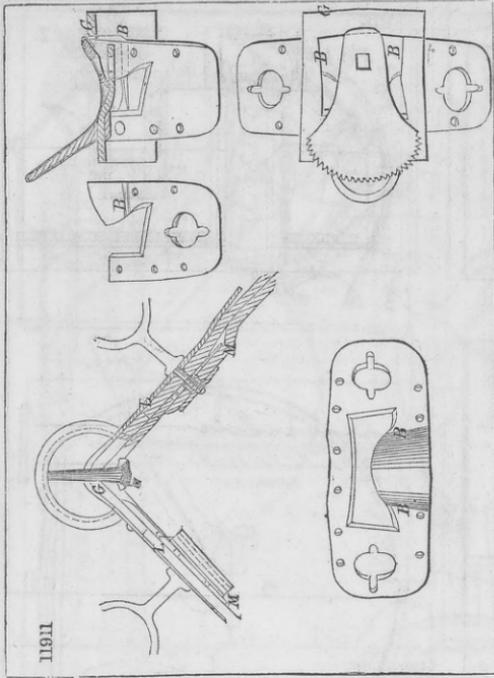
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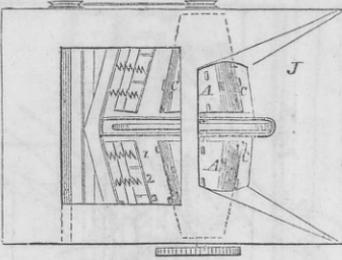
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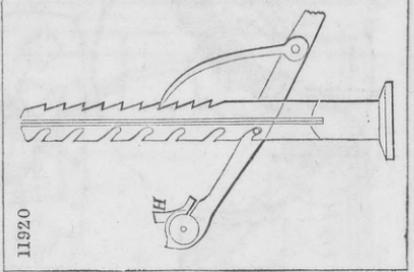
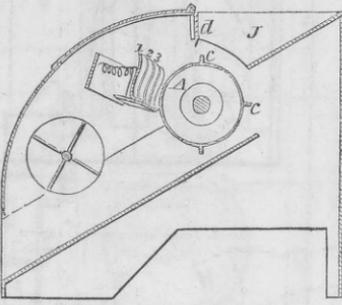
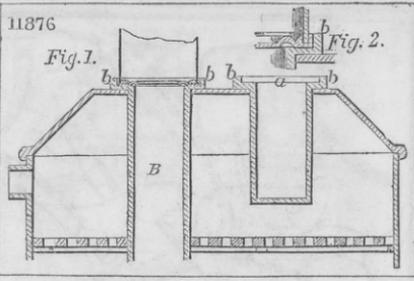
Fig. 1.



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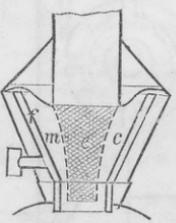


Fig. 1.

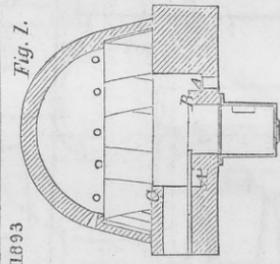
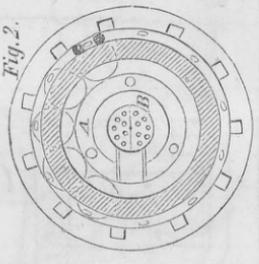
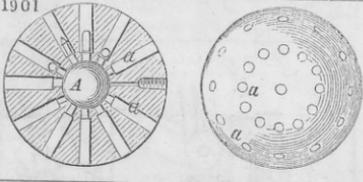


Fig. 2.



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Fig. 1.

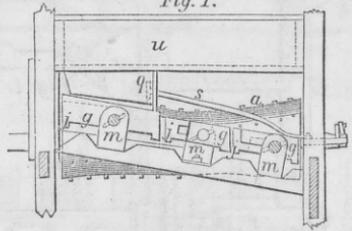
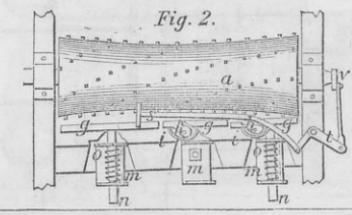
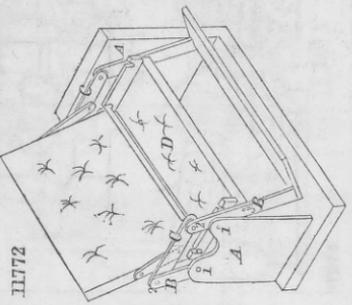
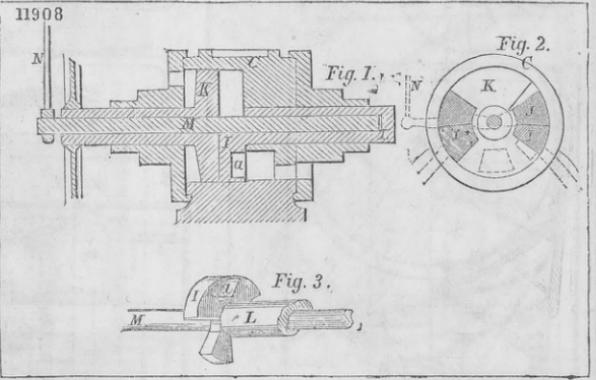
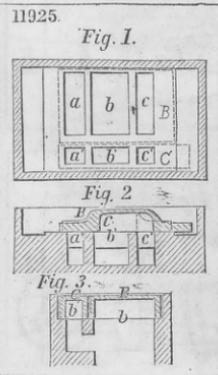
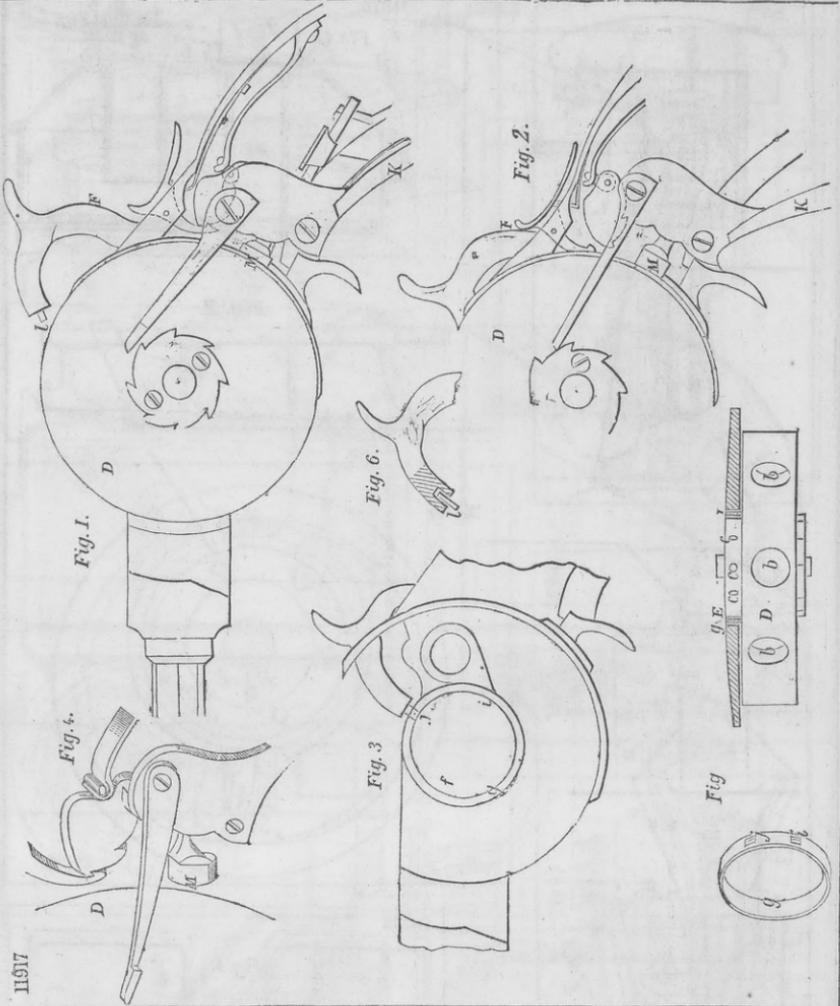


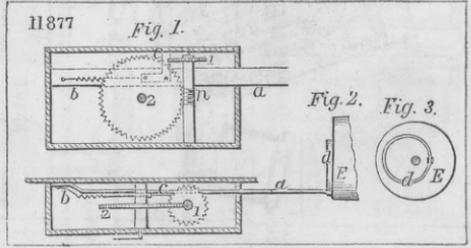
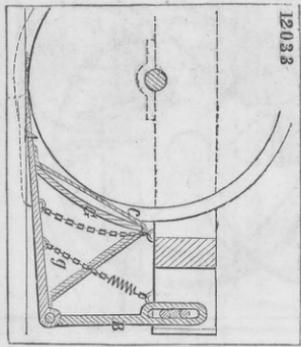
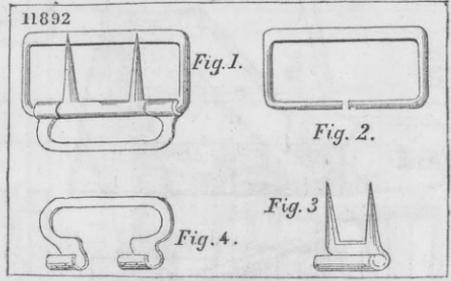
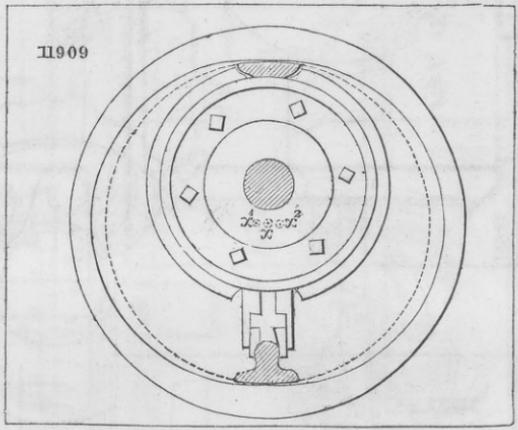
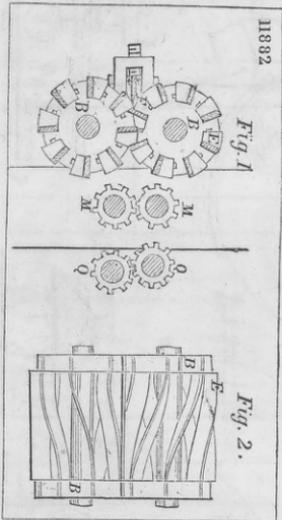
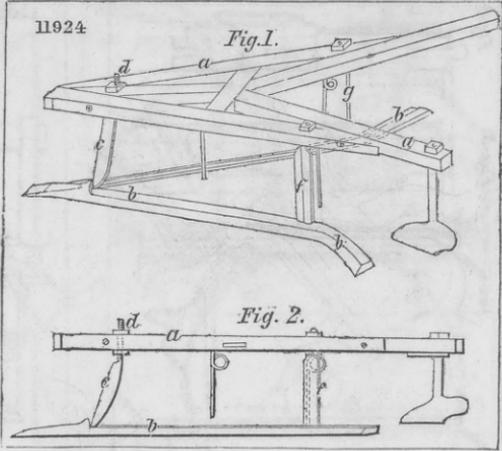
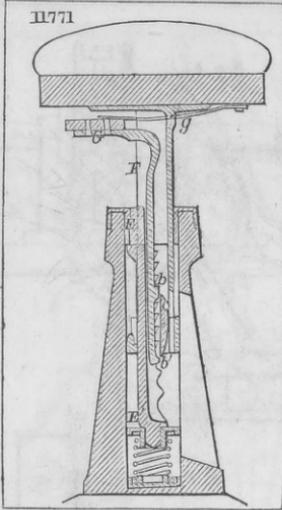
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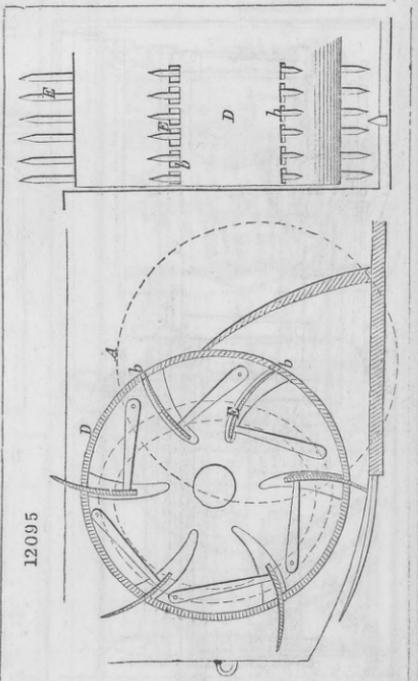
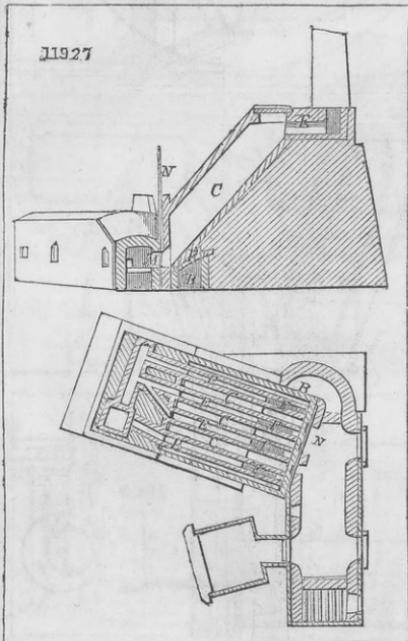
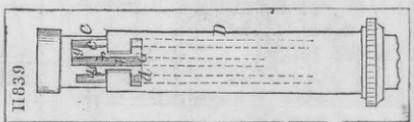
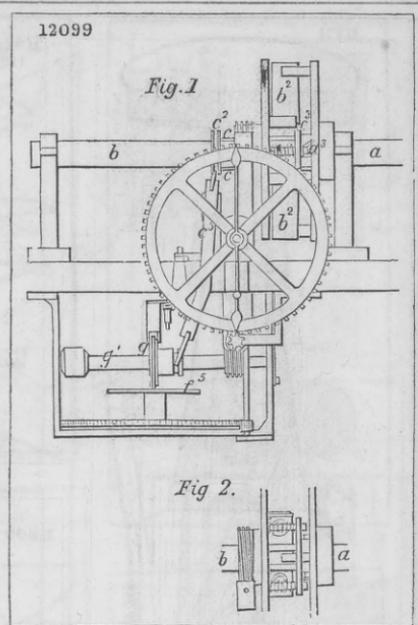
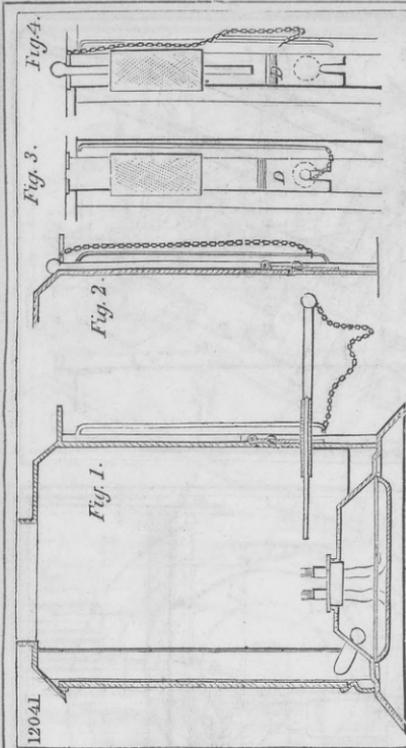


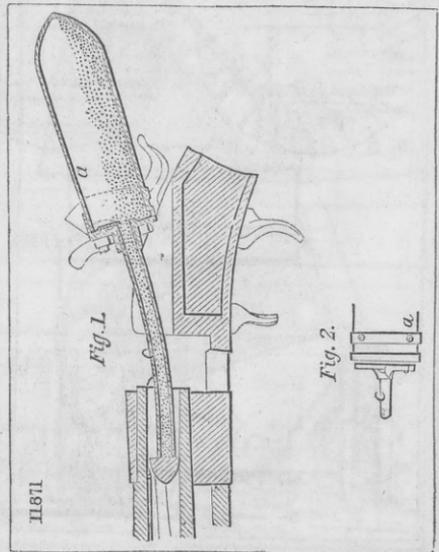
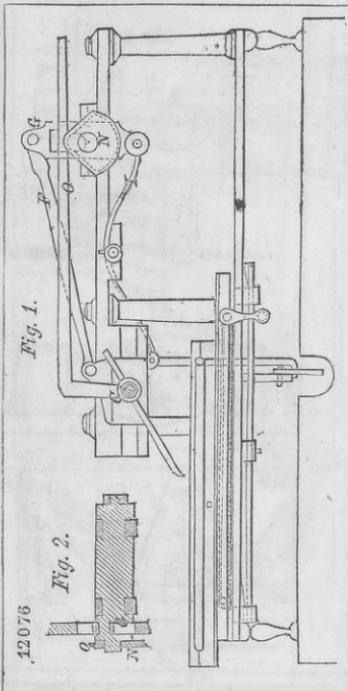
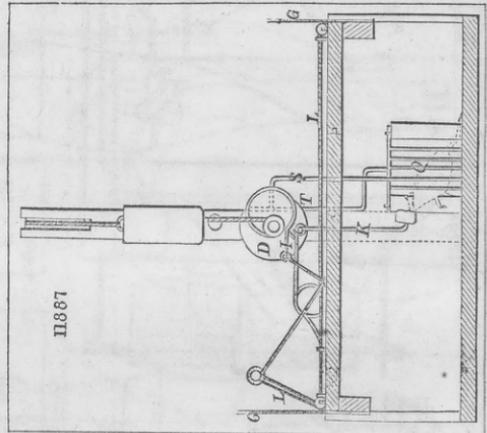
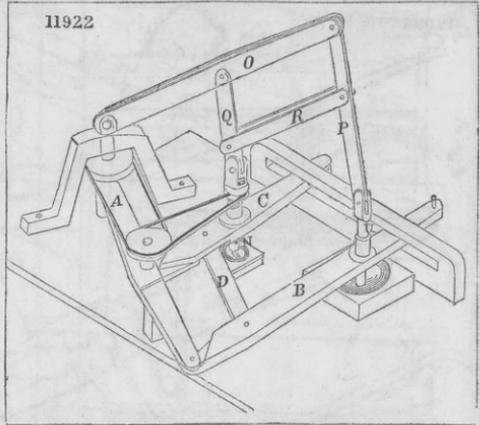
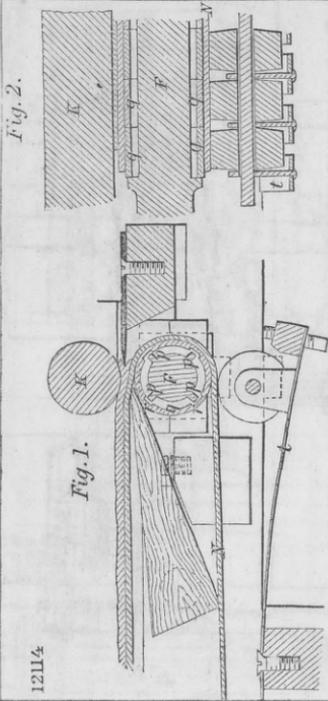
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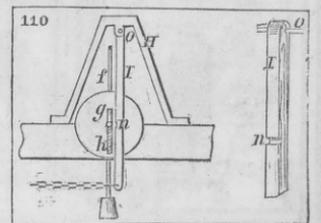
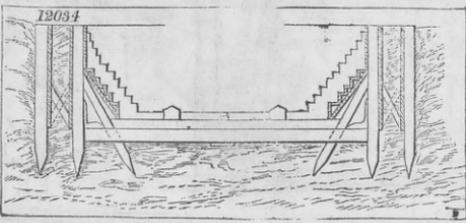
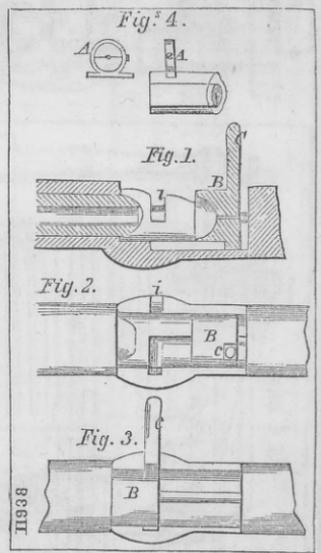
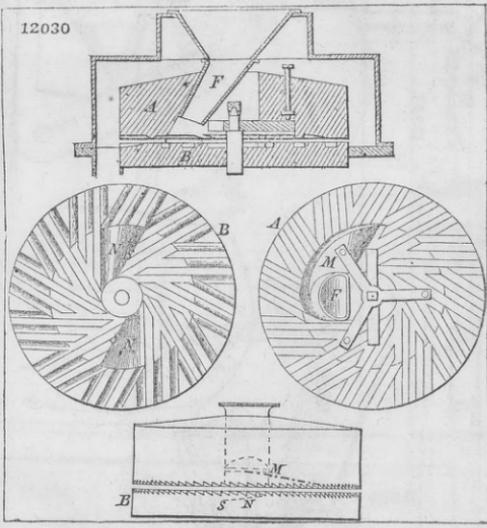
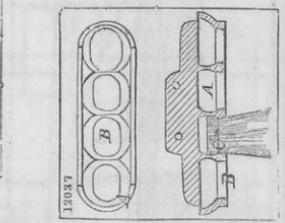
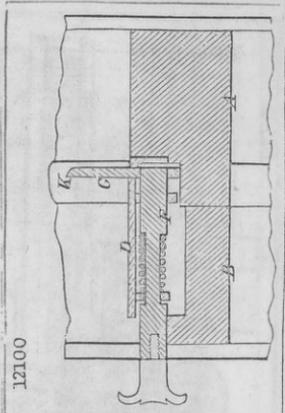
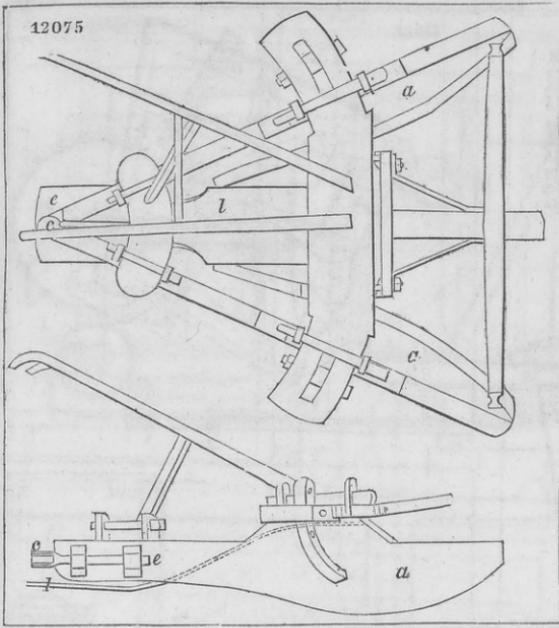












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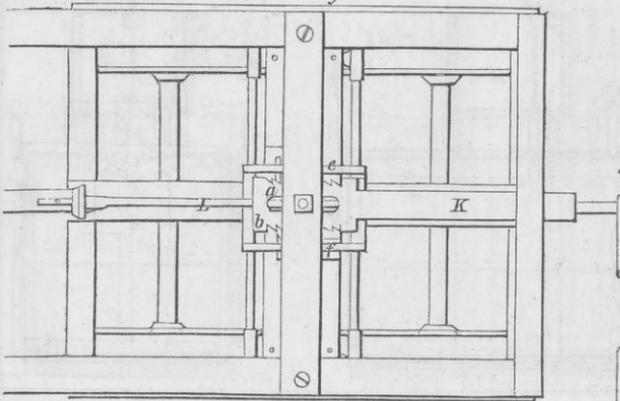


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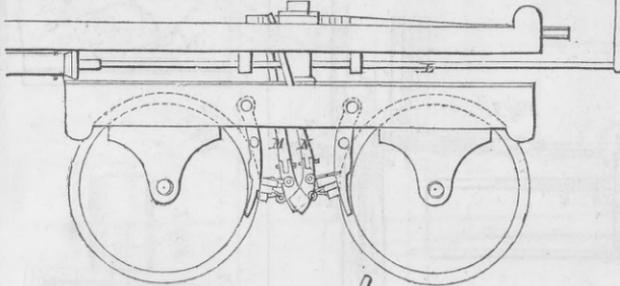


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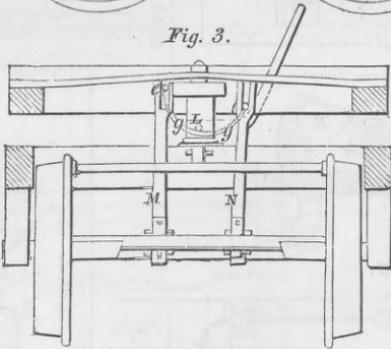


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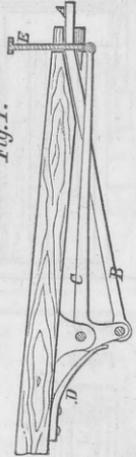
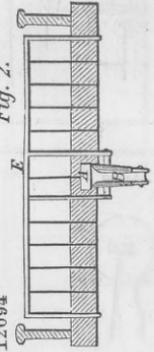
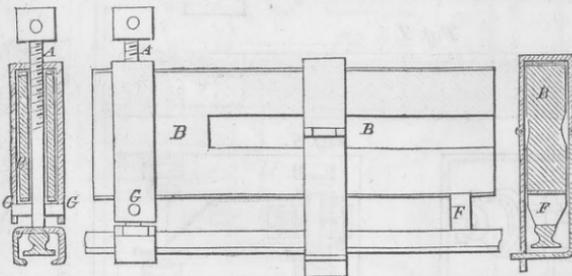


Fig. 2.

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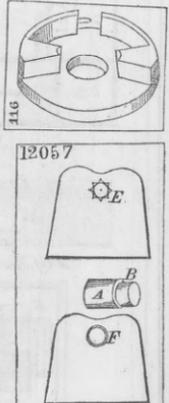


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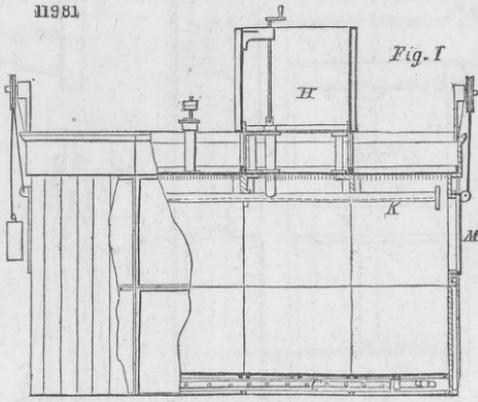
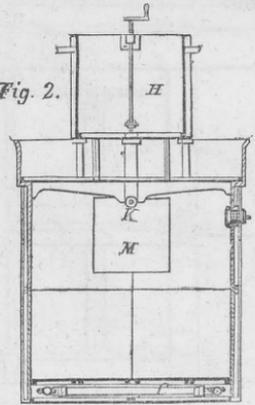


Fig. 1

Fig. 2.



11860

Fig. 2.

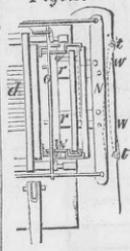


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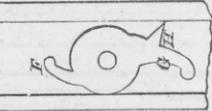
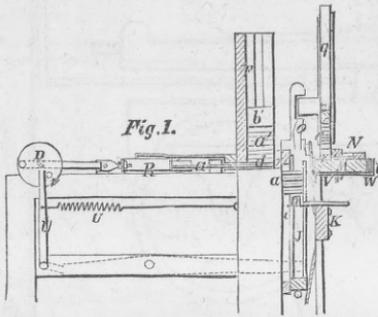


Fig. 2

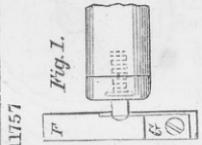


Fig. 1.

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Fig. 3.

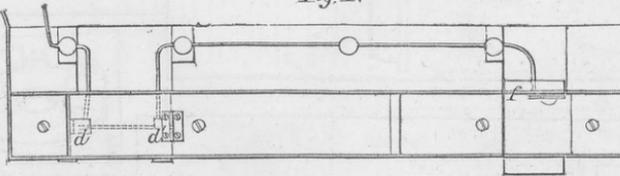
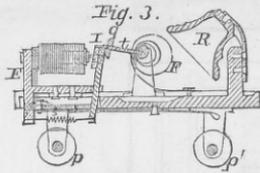


Fig. 2.



Fig. 4.

Fig. 5.

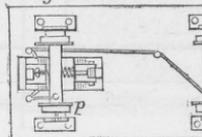
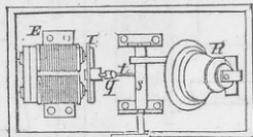


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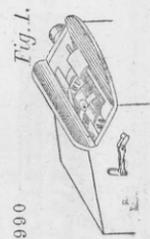
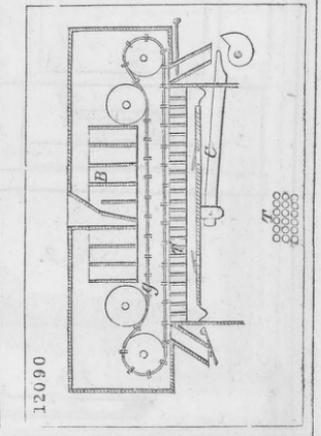
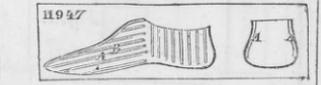
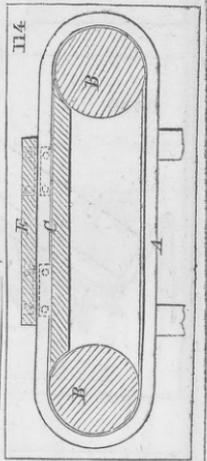
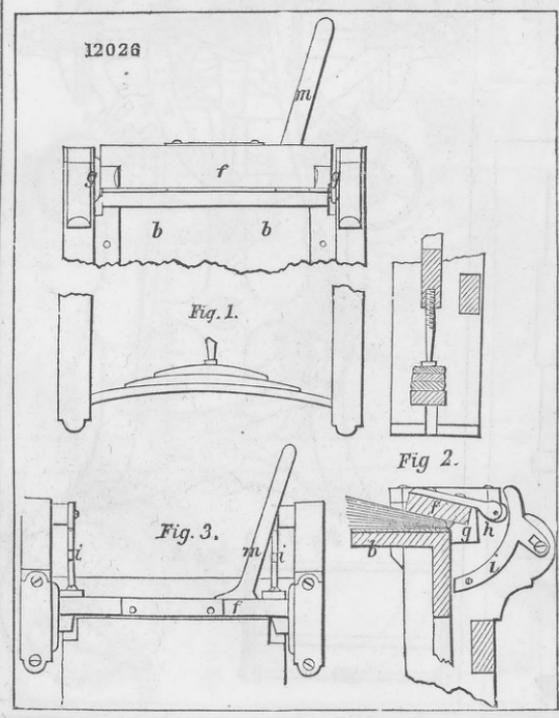
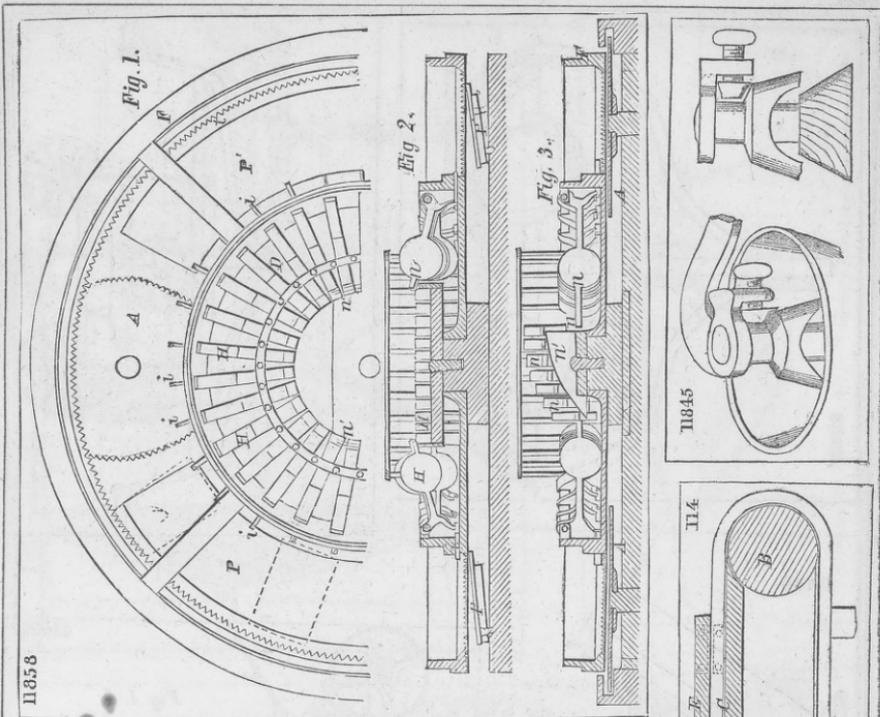
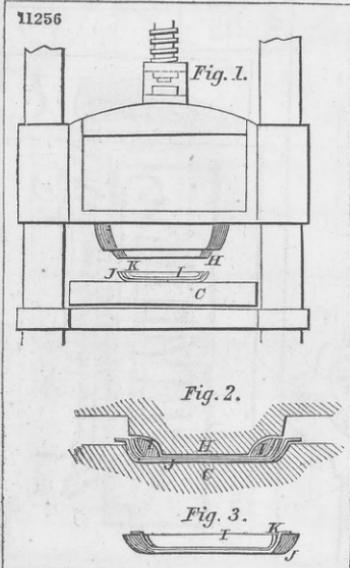
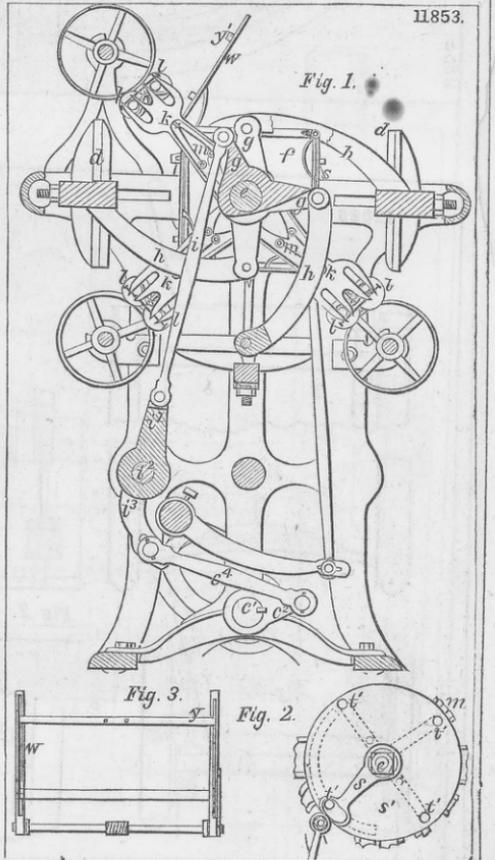
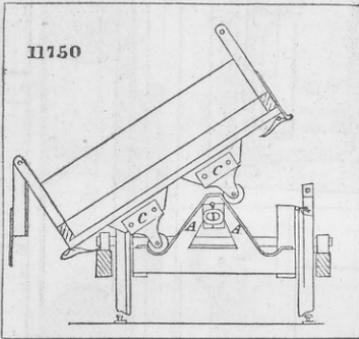
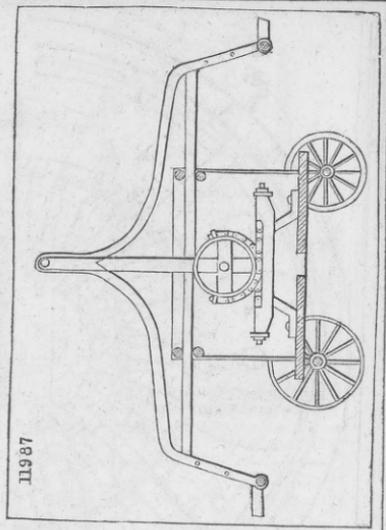
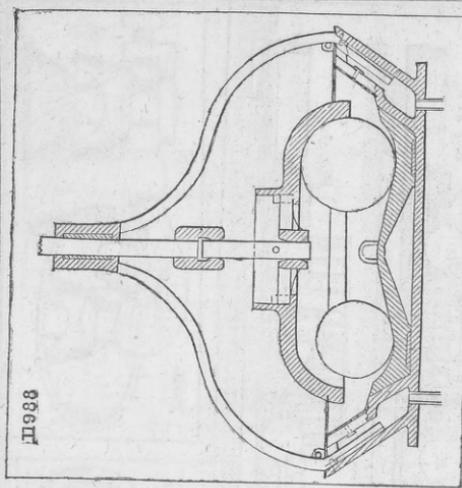
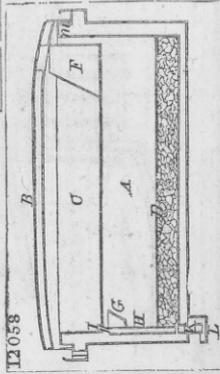
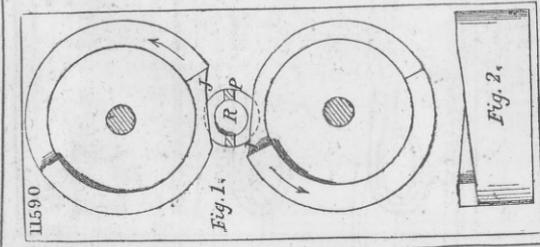
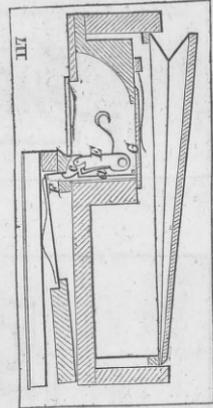
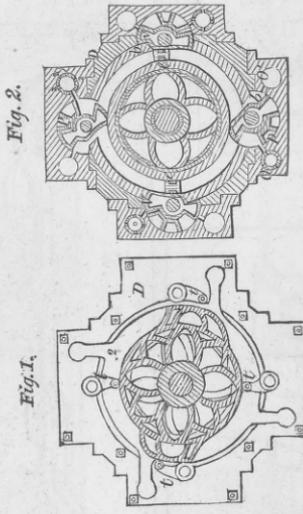
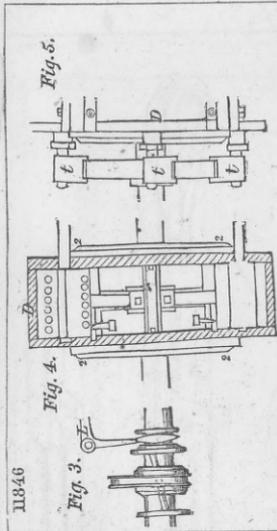
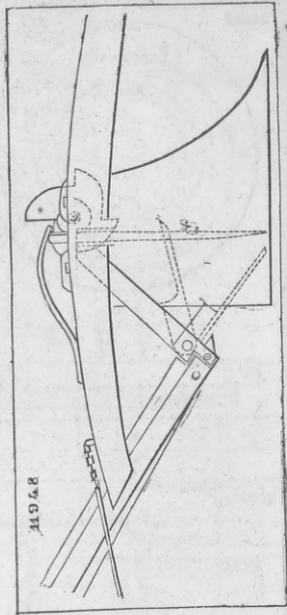
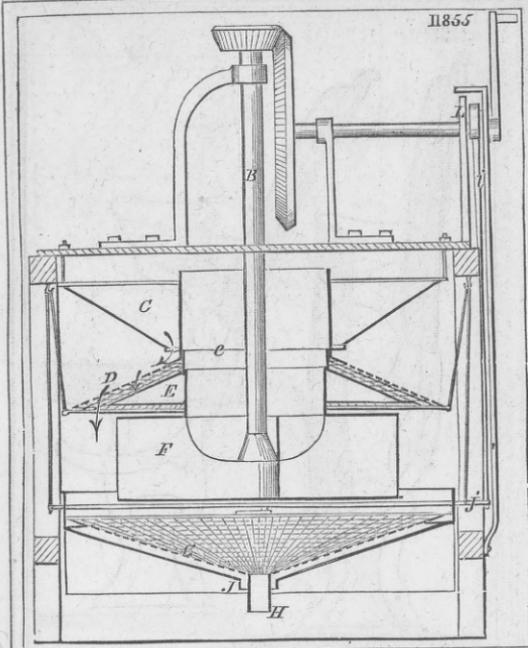


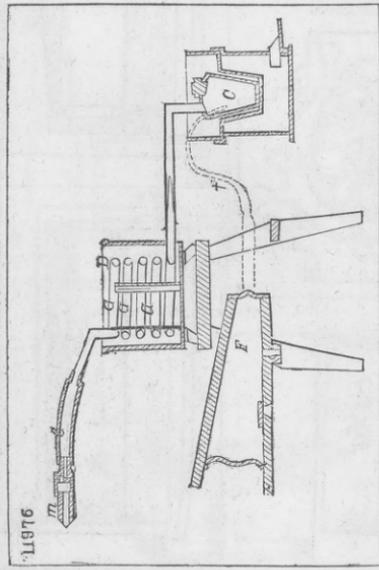
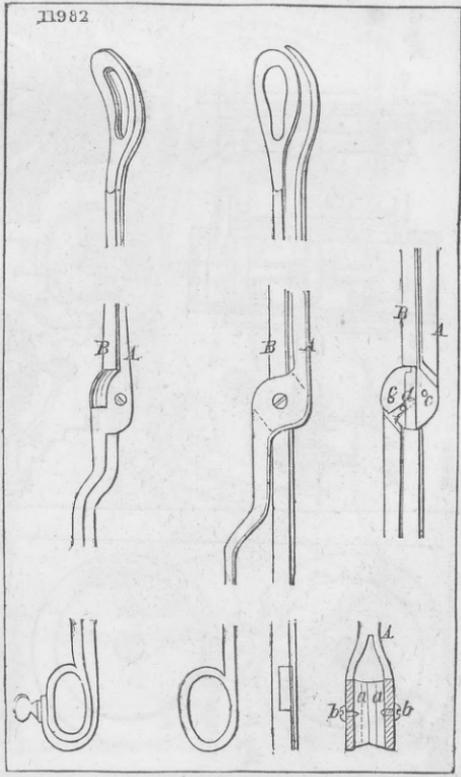
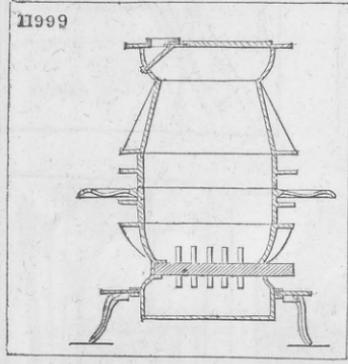
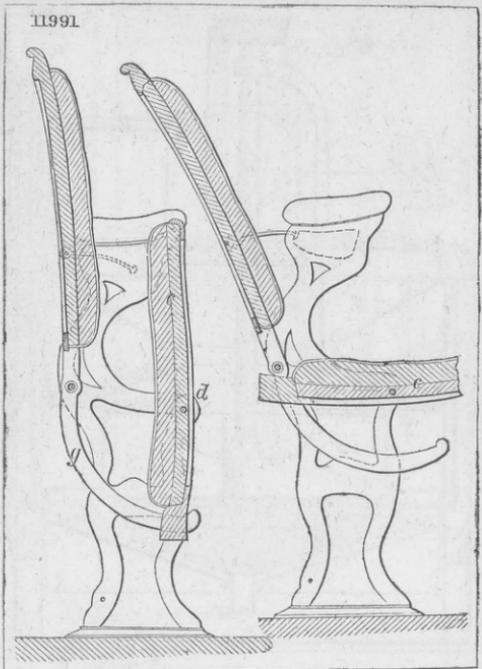
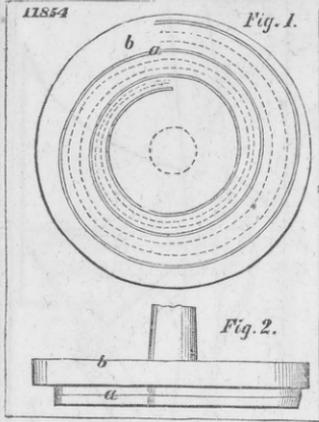
Fig. 1.

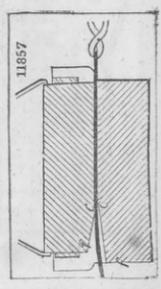
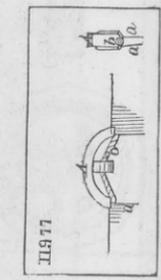
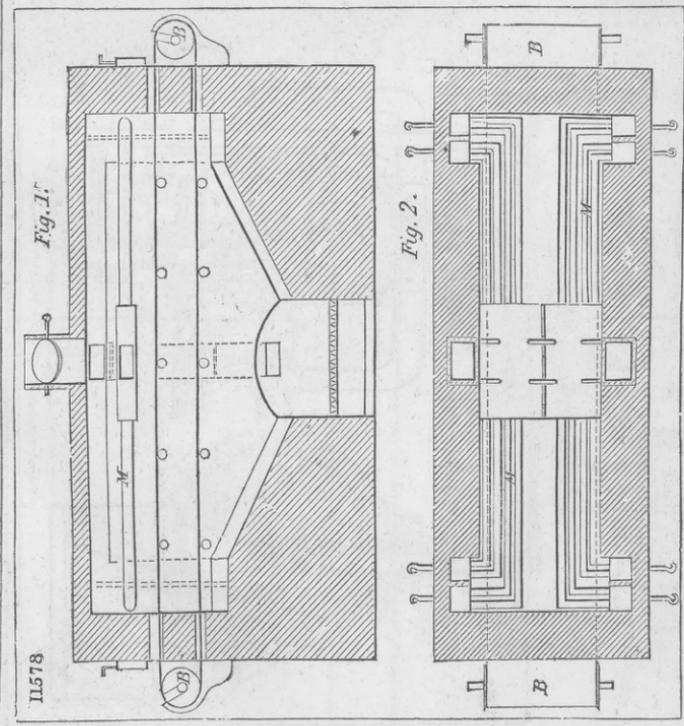
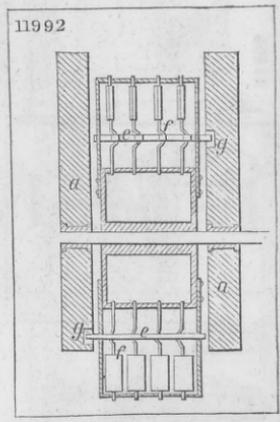
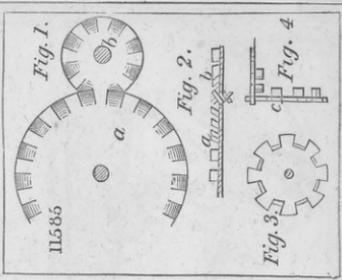
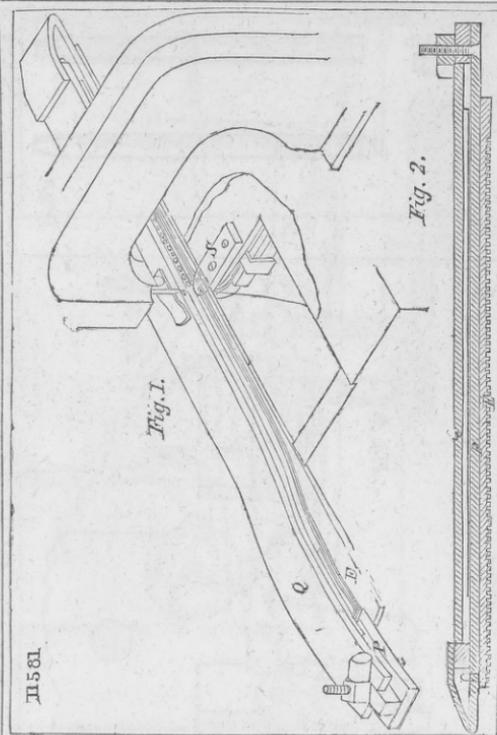
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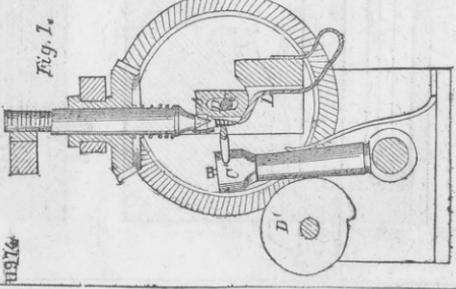
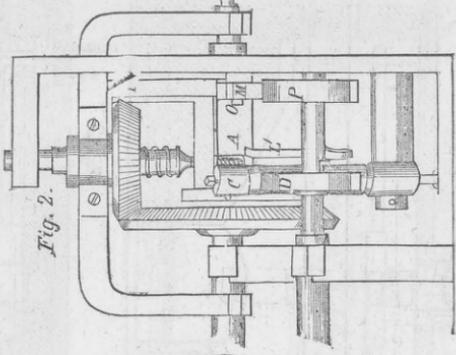
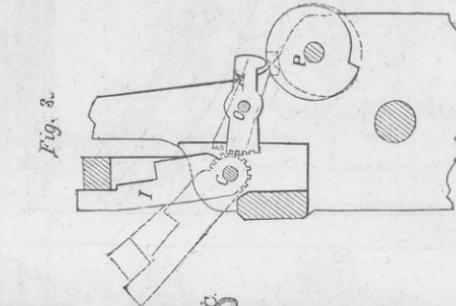
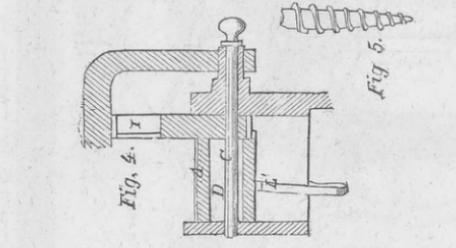
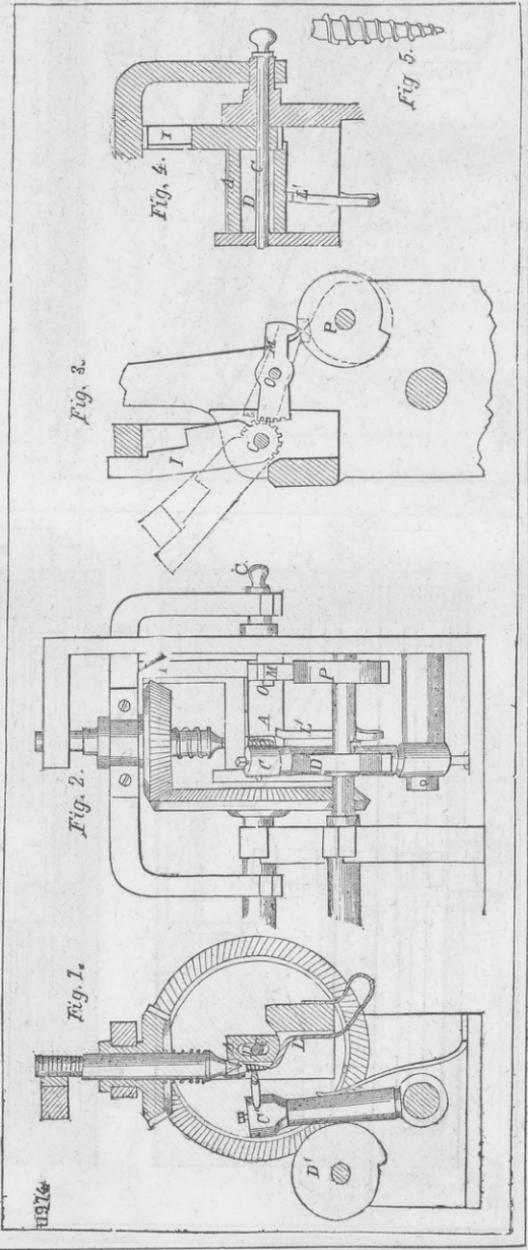
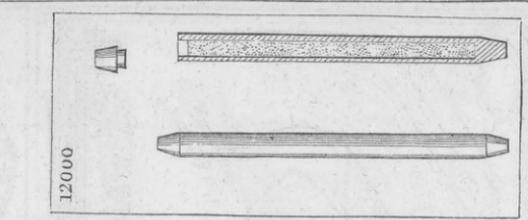
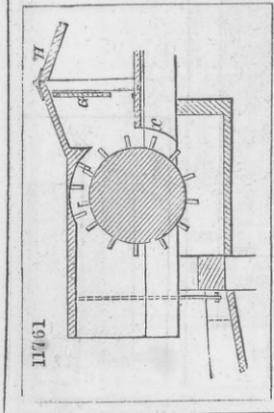
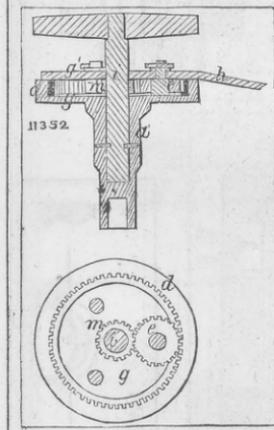
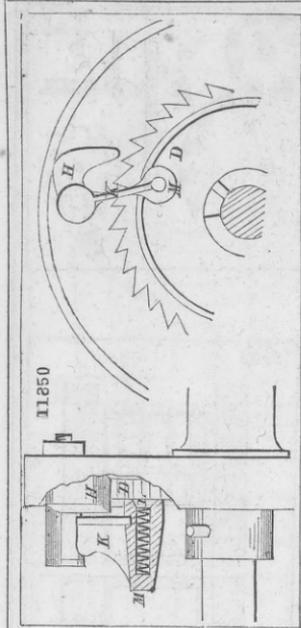


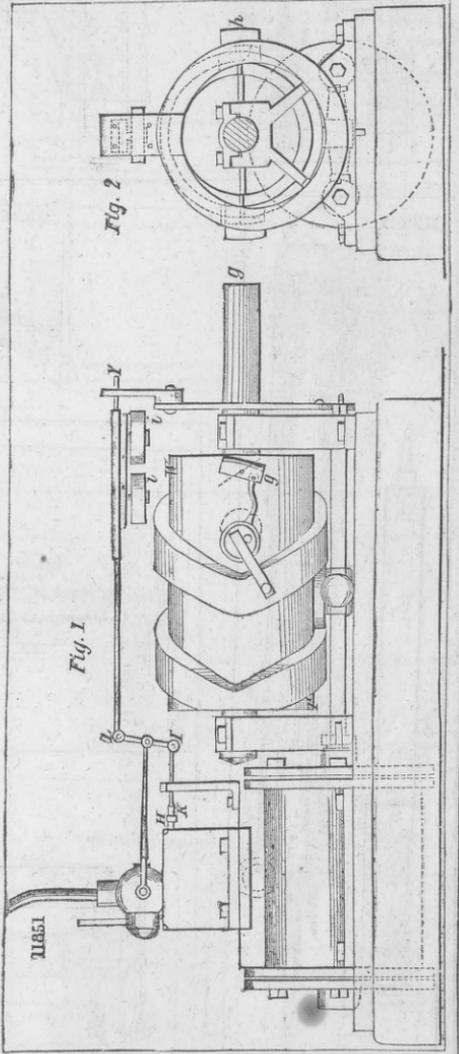
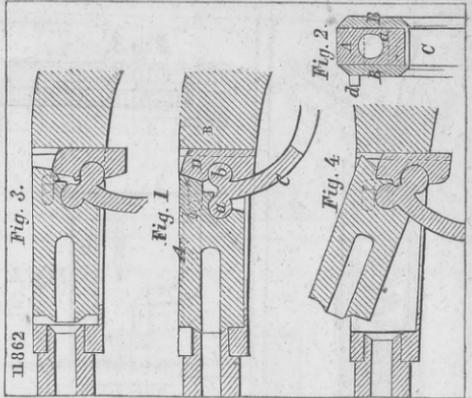
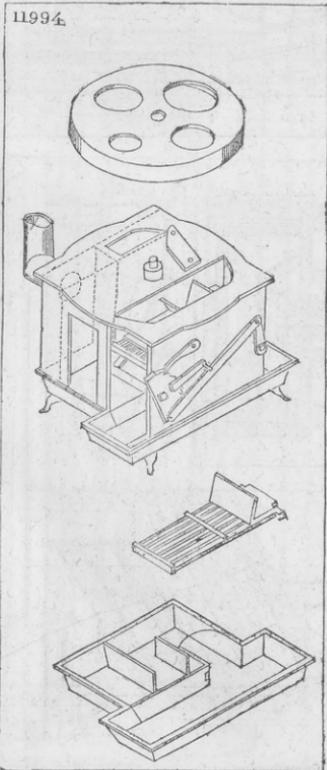
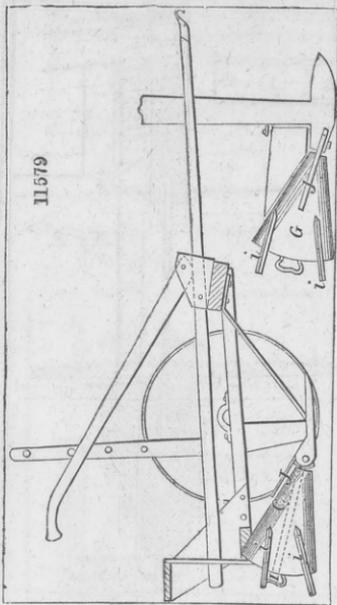


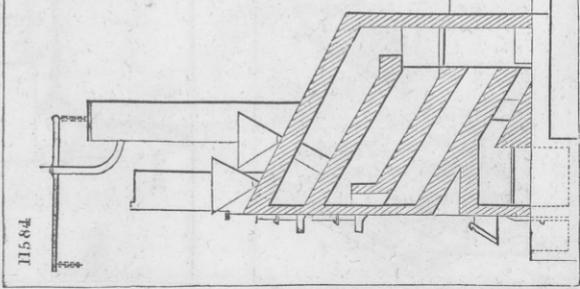
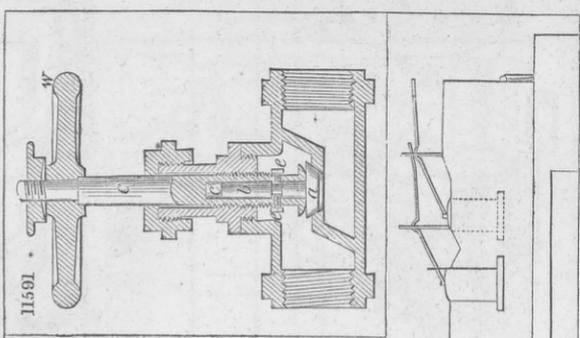
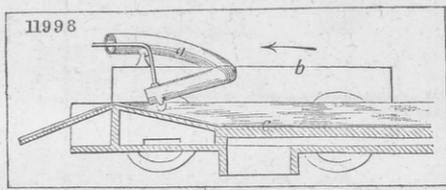
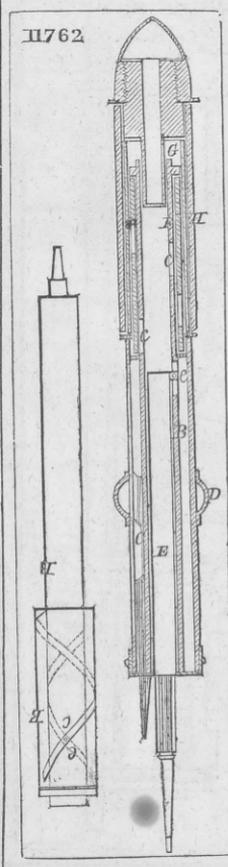
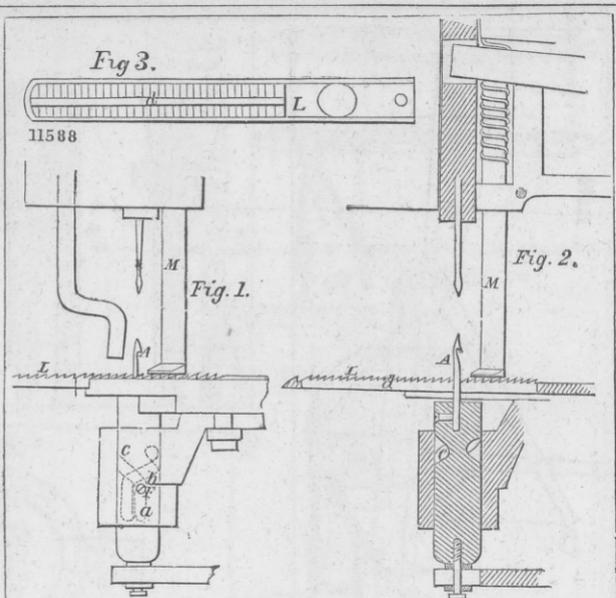












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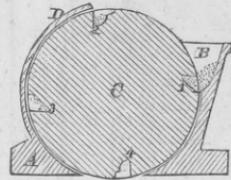
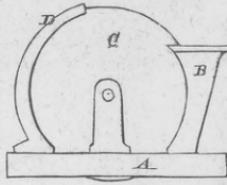
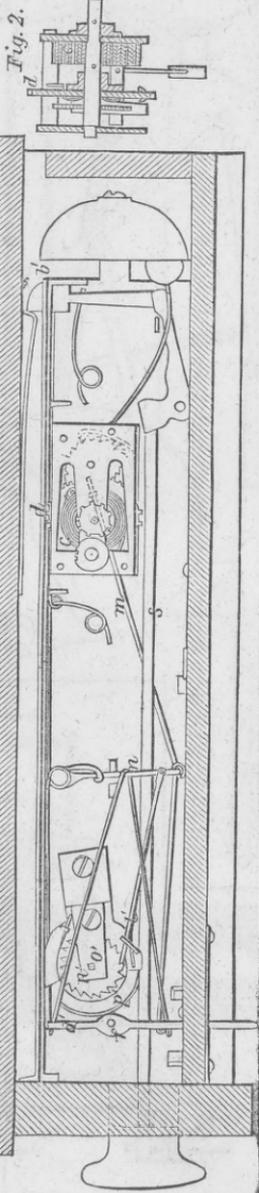
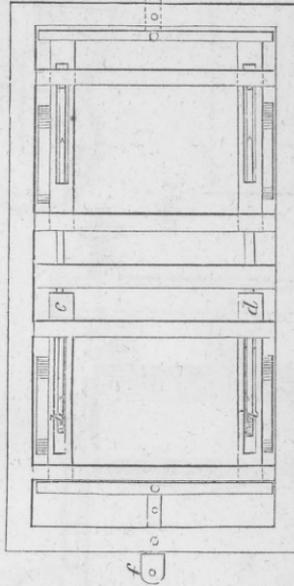


Fig. 1.



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Fig. 1.



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Fig. 2.



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