

without regard to the amount involved. *Babbitt v. Clark*, 103 id. 606. The same remedy has not been given if the cause is retained. It rests with Congress to determine whether a cause shall be reviewed or not. If no power of review is given, the judgment of the court having jurisdiction to decide is final. *Ex parte Ferry Company*, 104 id. 519. It is an elementary principle that a *mandamus* cannot be used to perform the office of an appeal or a writ of error. *Ex parte Loring*, 94 id. 418.

Without determining, therefore, whether the case was properly removed or not, the writ is

Denied.

LOOM COMPANY v. HIGGINS.

1. A specification in letters-patent is sufficiently clear and descriptive, when expressed in terms intelligible to a person skilled in the art to which it relates.
2. Evidence is admissible to show the meaning of terms used in letters-patent, as well as the state of the art.
3. If an improvement of a well-known appendage to a machine is fully described in a specification, it is not necessary to show the ordinary modes of attaching the appendage to the machine: the letters-patent are to be read as if the machine and its appendage were present, or in the mind of the reader, and he a person skilled in the art.
4. *Quære*, whether the defence of insufficient description can be set up without alleging an intent to deceive the public.
5. A new combination of known devices, producing a new and useful result (as that of greatly increasing the effectiveness of a machine), is evidence of invention, and may be the subject of letters-patent.
6. William Webster's improvement in looms for weaving pile fabrics, consists of such a new combination of known devices as to give to a loom the capacity of weaving fifty yards of carpet a day, when before it could only weave forty, — *Held*, that the improvement is patentable, and that letters-patent No. 130,961, dated Aug. 27, 1872, granted to him therefor are valid.
7. Of the two original inventors, the first will be entitled to letters-patent, unless the other puts the invention into public use more than two years before the application for them.
8. An invention relating to machinery may be exhibited as well in a drawing as in a model, so as to lay the foundation of a claim to priority, if sufficiently plain to enable those skilled in the art to understand it.
9. Though the defence of prior invention ought to be set out in the answer, yet if the omission to set it out is not objected to at the proper time in the court below, it cannot be objected to here.

APPEAL from the Circuit Court of the United States for the Southern District of New York.

The facts are stated in the opinion of the court.

Mr. Edward N. Dickerson for appellant.

Mr. George Gifford and *Mr. William M. Evarts* for the appellees.

MR. JUSTICE BRADLEY delivered the opinion of the court.

The bill in this case was filed by the Webster Loom Company to obtain relief for an alleged infringement by the defendants of certain letters-patent for improvements in looms for weaving pile fabrics, &c., granted to one William Webster on the twenty-seventh day of August, 1872, and numbered 130,961, to which the plaintiff derails title. The defences set up in the answer are, 1st, a denial of infringement; 2d, a denial that Webster was the first inventor of what was patented to him, under which denial various prior letters-patent are specified as containing the invention or material parts thereof, including a patent granted to Erastus B. Bigelow in March, 1849, reissued in 1857, a patent granted to E. S. Higgins as assignee of William Weild in August, 1868, and a patent granted to E. K. Davis in February, 1869; 3d, that the invention was used by and known to E. K. Davis in the city of New York, and Thomas Crossley in New York and Bridgeport, Conn.; 4th, that the description in Webster's patent is obscure, and not sufficient to enable one acquainted with the art to which it belongs to construct or use the loom therein attempted to be described; 5th, that there is no description in the patent of the combination principally claimed and relied on. The answer also sets up an agreement between Webster and the defendants whereby they claim a right to use the alleged invention of Webster. Proofs having been taken and the cause heard, the bill was dismissed by the Circuit Court. From the decree of dismissal the company appealed.

The patent, as before stated, is for improvements in looms for weaving pile fabrics, &c., and the nature and object of the invention are set forth in the specification as follows:—

“The first part of my invention relates to the combination and arrangement of the reciprocating or driving-slide, sliding-bar, with-

drawing and inserting devices, and trough in such a manner that the trough shall be capable of oscillating between the points of withdrawal and insertion of the wire, the sliding-bar receiving a horizontal motion at the same time that the pushing-slide is being reciprocated on the trough by the driving-slide. The advantage of this part of my invention is that a shuttle-box, rigidly connected with the lay, may be used. The second part of my invention relates to the means for preventing the wire from bounding back from its position in the wire-box, and consists in a spring attached to the inner end of the wire-box, and fitting indentations or openings in the heads of the wires. The third part of my invention relates to the combination of the vibrating trough directly with the lay. The fourth part of my invention relates to a modification of the mechanism, and consists in having the oscillating-trough and reciprocating-slide pathway combined or made in one piece, and having the withdrawing and pushing devices combined or connected and reciprocated thereon by power applied directly thereto; the object of this part of my invention being to dispense with the driving-slide and stationary-slide pathway and sliding-bar. The fifth part of my invention consists in the combination, with a lay having a rigid shuttle-box, of a pivoted vibrating wire-trough, a reciprocating driving-slide, and latch, the latter being operated by the wire-box to release the wire, and the slide and latch moving on the trough, all as set forth."

The specification then proceeds to describe the mechanism of the invention by a description and reference to drawings, which exhibit a front view of the improvement, a top view, a wire-head, a sectional part and end view of the wire-box, the oscillating trough connected to the shuttle-box or lay of a loom, the same connected to the breast-beam of a loom, &c.,—all which would be incomprehensible to a person unacquainted with looms for weaving pile fabrics, but very plain to one who understood their construction and operation at the date of the patent. A person skilled in the art of constructing or using such looms in their most advanced and improved form, such as those known as the Bigelow loom and the Weild loom, and having one actually before him, or in his mind, would readily appreciate the meaning of the terms and the character of the improvement described.

In weaving pile fabrics, such for example as Brussels car-

pet, the pile or loop is formed by inserting a wire alternately with the filling between the threads of the warp, immediately under the woollen, or worsted, threads, and afterwards withdrawing it from the web of cloth. At first, these wires were inserted and withdrawn by hand, by the aid of an assistant, which made the process a very slow one, so that only a few yards could be woven in a day on a single loom. The first great improvement was introduced about 1840-50 by Erastus B. Bigelow, of Massachusetts, who invented a mechanical apparatus attached to the side of the loom which automatically inserted the wires in the shed, or opening between the warps, and withdrew them from the web. About a dozen wires were used, and after they had all been inserted, the device invented by Bigelow would vibrate forward and seize the head of the first wire, withdraw it from the web, and then vibrate back to the shed, and at the proper moment insert it; and so it would go on to operate as long as the loom was kept in motion. Its various motions were given and timed by means of cams of proper size and shape placed in connection with the principal movements of the loom itself. This attachment to pile-fabric looms became generally known as the wire movement; and by its aid twenty-five yards a day could be woven on a single loom without the aid of any assistant. It is seldom that such a complete revolution in one of the useful arts is made at a single jump. Improvements, however, have been made on Bigelow's invention. Amongst others, one William Weild, of Manchester, England, in or about the year 1855 effected a decided improvement, which, after being perfected by succeeding improvements, enabled him to weave thirty or forty yards a day on a single loom. The means by which this was accomplished was the placing of a horizontal trough, or grooved bar, called a wire-trough, or wire-bar, for the wire to rest on when drawn out of the web and thrust into the shed. In Bigelow's loom the wire simply rested on a fork placed close to the loom; and when it was fully drawn out by the clamp, or dog's head, which seized it for that purpose, being slender and flexible, it would sag in the middle, and, if driven rapidly into the shed, the forward end would spring upward and get entangled in the upper warp threads. This rendered a slow movement necessary,

which impeded the rapidity of the work. By giving it a trough, or grooved bar, to lie in, and keeping it straight, as was done by Weild, a quicker motion could be given to it, and a much larger amount of work could be done in the same time. The only difficulty in the way of operating with the trough as arranged by Weild was, that a certain part of the apparatus, called a pusher, which was a cross-bar or yoke, extending across and connecting the breast-beam and the wire-bar, and which was employed to push the wire into the shed, extended so far back towards the lathe, or lay, which carries the reed and shuttle-box, as to come in contact with it and interfere with its motion. Weild obviated this difficulty by sawing off (so to speak) the outer end of the lay containing the shuttle-box, which being thus detached from the rest of the lay could be separately kept back whilst the reed was driving up the filling, and was thus prevented from striking the wire-trough and pusher. But, of course, this detached portion of the lay required additional cam work, and complicated the machinery. There was also another matter that interfered with the perfect efficiency of Weild's loom. The pusher, after the wire was drawn out by a hook attached, did not seize the head of the wire, but simply pushed it forward into the shed. If this was done with too rapid a motion, the impetus given to the wire would throw it forward too far in case the loom had to be suddenly stopped on account of a broken thread or other cause. This made it necessary to work the loom more slowly than the other operations required.

This seems to have been about the state of the art when Webster began to devote his attention to the improvements which he claims to have invented, and which it is clearly shown, whether invented by him or some one else, resulted in giving to a loom the capacity of weaving fifty yards a day. The Bigelow looms were well known and in extensive use. The Weild looms were also well known. Some improvements, not necessary to notice, had also been made on both. Webster's first conception of his invention occurred, and his original drawing was made, in the winter of 1865-66; but he did not apply for his patent until June 21, 1870; and it was not issued until Aug. 27, 1872. Prior to that time the defendants, who had a

large establishment in the city of New York, and were using Bigelow's loom under a license, had procured the control of Wield's patents in this country, and had applied Wield's improvements, with some modifications made by E. K. Davis, to a large number of their Bigelow looms. Davis was their head machinist, and in 1868 he obtained a patent for an improvement on Wield's loom, by which, instead of detaching the whole outer end of the lay, he only detached the shuttle-box and caused it to slide back on the lay so as to make room for the wire-trough. He also adopted instead of the wire-trough a pair of parallel bars between which to move the wire, the latter resting on a pin between the bars, near to the loom. The loom itself was old. Every part of it was familiar to every loom manufacturer and to every weaver. Its lathe, its treddles, its breast-beam, its shuttle-boxes, and shuttle-slide were as well known to all those concerned in the weaving of pile fabrics, as the plow or the cultivator is to the farmer. The wire motion had also become well known. Its mode of attachment to the loom; the means of giving motion to its different parts; the parts themselves; the vibrating wire-support, whether a fork or a trough, and whether pivoted to the breast-beam or to a post or to the frame or floor; the reciprocating driving-slide; the dog's head for holding, and the pusher for driving, the wires; the wire-box that kept the wires in place; the rigid lathe; the lathe whose outer end was detached; and the lathe with a detached shuttle-box, — all these things were as well known as the alphabet to all those skilled in the art of pile weaving, as it then stood. With this mass of previous knowledge and nomenclature in their minds (as we must suppose it to have been), the language, the explanations, the drawings, and the claims of Webster's patent must have been perfectly intelligible to them. When an astronomer reports that a comet is to be seen with the telescope in the constellation of Auriga, in so many degrees of declination, and so many hours and minutes of right ascension, it is all Greek to the unskilled in science; but other astronomers will instantly direct their telescopes to the very point in the heavens where the stranger has made his entrance into our system. They understand the language of their brother scientist. If a mechanical engineer invents an im-

provement on any of the appendages of a steam-engine, such as the valve-gear, the condenser, the steam-chest, the walking-beam, the parallel motion, or what not, he is not obliged, in order to make himself understood, to describe the engine, nor the particular appendage to which the improvement refers, nor its mode of connection with the principal machine. These are already familiar to others skilled in that kind of machinery. He may begin at the point where his invention begins, and describe what he has made that is new, and what it replaces of the old. That which is common and well known is as if it were written out in the patent and delineated in the drawings.

Applying these remarks to the specification before us, and recurring to the extract already made, setting forth the nature and object of the invention, it is easy to conceive that its meaning may be plain to those for whose use it is intended. They know at once what is meant by the terms, "reciprocating or driving slide," "sliding-bar," "withdrawing and inserting devices," "trough," "wire," "wire-box," "lay," &c. They also understand the movements referred to, and the objects to be attained by each device.

In like manner, if we follow the specification in its description of the invention in detail, with the references to the drawings, and the closing summary of the patentee's claims, the same method of interpretation will be applicable. And as it cannot be expected that the court will possess the requisite knowledge for this purpose, it becomes necessary that it should avail itself of the light furnished by the evidence to enable it to understand the terms used in the patent and the devices and operations described or alluded to therein. This evidence, of which the record in this case furnishes an abundance, being resorted to, we have no difficulty in comprehending the patent, or the nature of the invention therein described.

A great deal of testimony was introduced by the defendants to show that the patentee had failed to describe his invention in such full, clear, and exact terms as to enable persons skilled in the art to construct and use it. It seems to us that the attempt has failed. When the question is, whether a thing can be done or not, it is always easy to find persons ready to show how not to do it. But it stands confessed that the thing has

been done, that is to say, the contrivance which Webster claims in his patent has been applied, and very successfully so, to pile-fabric looms, and, as the appellant's counsel well remarks, no one except Webster has ever appeared to claim a patent for doing it. If the thing could not be understood without the exercise of inventive power, it is a little strange that it should have been so easily adapted to the looms on which it has been used with such striking results.

It is worthy of remark, in this connection, that the defendants, in their answer, state it as a fact, that, prior to the alleged invention of Webster, looms containing lays having shuttle-boxes rigidly attached were publicly known and described in certain English patents, which they specify; and that all the other parts and elements mentioned in the fifth claim of Webster's patent (being the claim relied on) were described in another English patent of one Birkbeck; and they aver and insist, as will be more fully noticed hereafter, that the application and use of the two things together, that is, the parts described in Birkbeck's patent, with the rigid lay and shuttle-box described in the other patents, were obvious and required no invention; and that, therefore, the alleged invention of Webster was well known, and constituted a part of the known state of the art. This averment in the answer, which of course is sworn to, does not seem to tally very well with the allegation that Webster has failed to point out, in his patent, how to use and apply his invention, and that it requires further invention to use and apply it.

The appellants, indeed, have raised the question whether evidence to show that the invention is not described in the patent in such full, clear, and exact terms as to enable a person skilled in the art to construct and use it, is admissible, unless the defence is specially set up in connection with a charge that the description in the patent was made defective for the purpose of deceiving the public. The twenty-sixth section of the act of 1870, under which the patent in question was issued, declares, "that before any inventor or discoverer shall receive a patent for his invention or discovery, he shall make application therefor, in writing, to the commissioner, and shall file in the Patent Office a written description of the same, and of the

manner and process of making, constructing, compounding, and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same; and in case of a machine, he shall explain the principle thereof, and the best mode in which he has contemplated applying that principle so as to distinguish it from other inventions; and he shall particularly point out, and distinctly claim the part, improvement, or combination which he claims as his invention or discovery." Such a specification must be filed before the inventor shall receive a patent, the law says; and the appellant's counsel argues that if it is the duty of the commissioner to see that such a specification as the law requires is filed before granting a patent, not only is the patent, when issued, proof that he has done so, but his decision on the point cannot be questioned except in the manner allowed by the law; else, instead of one tribunal for deciding a matter on which conflicting testimony can always be found, we shall have as many tribunals as there are courts and juries called upon to try patent causes. On turning to the section which provides for certain defences that may be made to an action for infringement, we find it declared "that in an action for infringement the defendant may plead the general issue, and having given notice in writing to the plaintiff or his attorney, thirty days before, may prove on trial any one or more of the following special matters: First, that for the purpose of deceiving the public the description and specification filed by the patentee in the Patent Office was made to contain less than the whole truth relative to his invention or discovery, or more than is necessary to produce the desired effect;" then follows a statement of other special matters. In view of this specific defence allowed by the statute, in reference to a defective specification, it is argued that no other is admissible under that head: and reference is made to some decisions under the former statutes bearing on that subject, namely, *Whittemore v. Cutter*, 1 Gall. 429; *Lowell v. Lewis*, 1 Mason, 182; *Gray v. James*, Pet. C. Ct. 394; *Grant v. Raymond*, 6 Pet. 218; this court, in the last case, holding, contrary to the decisions of Judges Story and Washington in the other cases, that it was not necessary

to aver a fraudulent intent unless the defendant desired to avoid the patent, — a result which was provided for in the law of 1793. The court held that the plea of insufficient description was good as a defence without alleging a fraudulent intent, — but not good as a ground for avoiding the patent. The laws of 1836 and 1870 omitted the clause for annulling the patent, but still retained, in the definition of the defence allowed to be set up, the qualification of fraudulent intent. Counsel argues that, as the law now stands, the plea of insufficient description cannot be made unless made with that qualification; because the only purpose it has, under the present law, is that of a defence to the action, and it still requires the allegation of fraudulent intent to deceive the public.

There is plausibility in this argument, and if it were necessary to the decision of this case, it might give us some embarrassment. But as we are satisfied that the terms of the patent are sufficiently clear and full in the description of the invention, we make no decision on the point.

Turning now to the invention claimed by Webster, and described in the patent under consideration, we find that, although it produced a great improvement in the art of weaving pile fabrics, yet, as actually exhibited in conception and accomplishment, it seems simple. The thing to be done was to combine the advantages of Bigelow's rigid lathe, divested of some of its defects, and his constant command of the wire, with Weild's trough, or wire-bar, for supporting the wire. This Webster, or, if not Webster, some other person, effected by the devices and mechanism described in the patent. Stated in brief as therein set forth, aided by the explanatory testimony before referred to, the problem was solved by substituting for Weild's pusher a latch which rides on the wire-bar, or trough, without projecting beyond it, and which receives a reciprocating motion backward and forward on the bar, either by being connected with a driving-slide moving on the breast-beam, or by being directly connected with an upright reciprocating lever. The latch, when the end of the wire-bar next to the loom oscillates or vibrates to the front of the wire-box, drops upon a wire-head into a nick or notch made therein, and withdraws the wire into the trough, and then, when the latter oscillates back to the

shed, without releasing its hold of the wire-head, drives the wire into the shed, and is then lifted out of the notch by striking the edge of the wire-box, sloped up for that purpose, and releases the wire; and then oscillates forward again to seize another wire; and so on. The lathe, in the mean time, works backward and forward without meeting any obstruction, and without any detachment or separation of its parts. Very little modification had to be made in the cams, and the whole apparatus, or wire movement, as it is called, seems more simple than it was before, either in Bigelow's or Weild's loom. This contrivance, when actually applied to the looms, worked to perfection, and enabled the weaver to drive his loom to its utmost capacity.

The patent points out and the drawings illustrate various ways of arranging the wire-bar and the reciprocating-slide which carries the latch. Thus, the outer end of the wire-bar having to be pivoted to some centre for its oscillating motion, it is shown that it may be pivoted to the outer end of the lay or shuttle-box, or to the outer end of the breast-beam, or to a vertical shaft or post, — all these devices except the first being in common use in the Bigelow or Weild looms, and being mechanical equivalents of each other. So it is shown that the pushing-slide, which carries the latch, and rides on the wire-bar like a saddle, may be operated either by being connected with a driving-slide on the extension of the breast-beam by means of a cross-bar passing through a mortise in the driving-slide, or by being directly connected with the arm or lever producing the reciprocating movement.

The patent has five claims, only the fifth of which is relied on in this case, which is as follows: —

“In combination, the lay and its rigid shuttle-box, the pivoted vibrating wire-trough, the reciprocating driving-slide, and the latch moving thereon, the latter being operated by the wire-box, the combination being and operating substantially as described.”

With the explanation of the invention already given, the meaning of this claim is quite obvious. If any explanation of it is needed, it can be readily derived from the body of the specification. The combination contains five elements: 1, the rigid lay and shuttle-box; 2, the pivoted oscillating or vibrat-

ing trough ; 3, the reciprocating-slide riding on the trough ; 4, the latch for taking and holding the wire ; 5, the operation or lifting of the latch by striking the wire-box.

Nothing further is necessary to be said in order to dispose of the defence which was strenuously urged, and to which the court below attached much importance, that the specification was insufficient in its description of the invention sought to be patented, and failed to show any means of applying it to existing looms ; and that independent invention would have to be exercised to make it a practical working apparatus as an attachment of such looms. We shall, therefore, dismiss that branch of the argument.

It is further argued, however, that, supposing the devices to be sufficiently described, they do not show any invention ; and that the combination set forth in the fifth claim is a mere aggregation of old devices, already well known ; and therefore it is not patentable. This argument would be sound if the combination claimed by Webster was an obvious one for attaining the advantages proposed, — one which would occur to any mechanic skilled in the art. But it is plain from the evidence, and from the very fact that it was not sooner adopted and used, that it did not, for years, occur in this light to even the most skilful persons. It may have been under their very eyes, they may almost be said to have stumbled over it ; but they certainly failed to see it, to estimate its value, and to bring it into notice. Who *was* the first to see it, to understand its value, to give it shape and form, to bring it into notice and urge its adoption, is a question to which we shall shortly give our attention. At this point we are constrained to say that we cannot yield our assent to the argument, that the combination of the different parts or elements for attaining the object in view was so obvious as to merit no title to invention. Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit. It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is evidence of invention. It was certainly a new and useful result to make

a loom produce fifty yards a day when it never before had produced more than forty; and we think that the combination of elements by which this was effected, even if those elements were separately known before, was invention sufficient to form the basis of a patent.

The next contention of the defendants which we shall consider is their allegation that Webster was not the first and original inventor of the thing patented, but that he was anticipated therein by E. K. Davis.

On this point, we think it very clearly made out, though we shall not go into much detail in commenting upon the evidence, that the whole substance of the invention was conceived by Webster, and exhibited by him in a drawing as early as the winter of 1865-66, long before Davis entertained any idea of it. The original of this drawing is in existence, and was produced in evidence, and is well authenticated. It exhibits the rigid lay; the wire-trough pivoted in two different positions, on a post near the extremity of the breast-beam, and to an arm projecting from the extremity of the lay; the driving or pushing slide, riding on the trough, with a projection indicating the latch, or other device for operating the wire; and even the cams to give the requisite movements. It also shows the wire-box, and the position of the end of the trough in relation thereto, the same as exhibited in the patent. In March, 1868, Webster exhibited this drawing to Davis and others, and explained it to them as representing a lay having a rigid shuttle-box, a driving-slide and latch moving upon a vibrating trough, the latch being operated by the wire-box. Davis was about that time engaged in making an improvement on the Weild loom before referred to, with a sliding shuttle-box, and parallel bars instead of a trough for the wire to slide between, and a pin for it to rest on. In July, 1868, he applied for a patent for this improvement, and obtained a patent in February, 1869. In that year Webster sent drawings to Weild, in England, to get out a patent for his invention in that country; but Weild declined to undertake it. These drawings show the entire invention in detail. In November, 1869, Webster having heard that the defendants were going to alter their Bigelow looms to Weild looms, sought an interview with them in order

to induce them to adopt his improvement. He met one of the defendants and showed his original drawing, but without result. In April, 1870, he had another interview with them, and also with Davis, at their carpet works in New York. He exhibited his original drawing and the drawings which he had prepared for England. Davis advised the defendants that Webster's plan was no improvement on the Weild loom. He was evidently anxious that they should adopt his improvement, for which he had already got a patent. Further interviews took place; but the defendants declined to adopt Webster's improvement, and adopted Davis's in part, — so much of it, at least, as the sliding shuttle-box. It is clear from the facts that up to this time Davis did not pretend to be the inventor of Webster's arrangement. But in the spring of 1870 Davis commenced to make a new loom, which he did not get into complete operation until the latter part of 1871. This is called the Sterling loom, and was made for the defendants. When completed it had in it the improvement claimed by Webster, and shown in his patent. At what time this particular form was adopted is not shown.

It is contended by the defendants that Davis had conceived the idea of using a rigid lathe with his wire-bar in the early part of 1868, and that, in the model which he prepared at that time for obtaining his patent, he exhibited the same latch devised by Webster, and operated in the same way by contact with the wire-box; and that he showed to the witness Crossley, by pinning his sliding shuttle-box fast to the lay, how it could be used with a rigid lay and shuttle-box. Then, why did he not claim the whole device when Webster exhibited it to him? Why did he advise the defendants that Webster's arrangement was no improvement on Weild's? But, if it were true that he did show these things in his model, and had he shown a trough instead of parallel bars; and if it were true that he regarded the idea as anything more than a possibility; and that he did, in fact, contemplate it as a perfected and practicable arrangement, so as to amount to invention, — the question would still remain, whether he or Webster was the first inventor. Both may have been original inventors, but only one of them could be the first. If Davis had put the invention into practical

form and operation more than two years before Webster applied for his patent, then the patent would be void by reason of prior use. But the evidence is conclusive that he never undertook to put it into practical form until he made the Sterling loom, which was only commenced in 1870. Webster's application for his patent was made in June, 1870. Though this was proved without objection, and substantially conceded, the defendants say that it does not appear what the application was, nor how much it was altered before the patent was issued. This argument cannot avail, for the application is a public record, the contents of which the defendants and all others are presumed to know; and since they had it in their power to produce it, and did not, it must be presumed that it would not have served their purpose, but corresponded with the patent. The defence of prior use for two years, therefore, is not sustained; and the question comes back to simple priority of invention. Conceding that Davis was an original inventor, the earliest point of time that he can be regarded as such was in the spring of 1868. But Webster had invented it before that time, and had made a drawing of it which, in March, 1868, he exhibited and explained to Davis. An invention relating to machinery may be exhibited either in a drawing or in a model, so as to lay the foundation of a claim to priority, if it be sufficiently plain to enable those skilled in the art to understand it. There is no doubt that Davis understood Webster's drawing; and he did not then claim that the invention belonged to himself.

The evidence relating to loom No. 50 leads in the same direction. This was a loom of the defendants which they commenced to alter in the latter part of 1870. Davis was not employed to make the alterations on this loom. According to Webster's testimony, which must, of course, from his relation to the case, be received with caution, but which seems to be corroborated by subsequent circumstances, Davis informed Webster at the latter's house, on Christmas day, 1870, that loom 50 had been taken down to be changed to what they had seen and explained to them in the office, — referring to Webster's previous explanation of his drawings, — and that he, Davis, had told Higgins that if he took that loom down and

changed it to what they had seen Webster have, and explained in the office, it would be a Webster wire motion. In April Webster called, as he says, at the defendant's store, and saw N. D. Higgins, and they talked about this loom, and Webster claimed it as his invention, and told Higgins that he (Higgins) had seen the drawing of it at his house and mill. It is not seriously denied that this loom was made substantially on Webster's plan.

Another circumstance seems to us as having much weight in this connection. It was found that the loom No. 50, and the Sterling loom, when completed in 1871, worked with wonderful success; sometimes as many as sixty yards being woven on one loom in ten hours. If Davis was the inventor of the wire motion applied to these looms, why did he never apply for a patent for it? He was already a patentee of a different and inferior apparatus. He knew all about the method of going about to get a patent. He belonged to a profession which is generally alive to the advantages of a patent-right. On the hypothesis of his being the real inventor his conduct is inexplicable.

There is a great deal of evidence *pro* and *con* to which we have not adverted. It must suffice to say that we are satisfied, from the examination we have given to it, that Webster is entitled to the claim of being the first inventor.

The appellants' counsel has raised the question whether the defence of prior invention can be set up under the answer, which does not state it in the manner required by the statute. It denies, generally, it is true, that Webster was the original and first inventor of the improvement claimed in the patent; and specifies certain letters-patent issued in this country and in England in which it is alleged that the said invention, or material and substantial parts thereof, was described before any invention made by Webster, which is sufficient foundation for adducing such patents in evidence; but it does not give the name and residence of any person alleged to have invented the thing patented prior to Webster; it only states that it was used by and known to Davis. It is possible that this objection to the evidence would have been available if it had been taken in season. But we are not referred to anything to show that

it was taken in the court below, or before the examiner when the witnesses were examined. In *Roemer v. Simon* (95 U. S. 214, 220), we held that the failure to interpose such objection before the final hearing is a waiver of the required notice in an equity suit.

It remains to consider the question of infringement. The defendants deny that they infringe the fifth claim of the patent, which is relied on by the complainants.

At the commencement of the cause, when a preliminary injunction was applied for, the defendants put in affidavits contesting the charge of infringement, but upon a very different ground from that on which the defence is now based. Then they relied on a non-user of the last element of the combination, — the operation of the latch by contact with the wire-box; now they rely on a different construction of the third element (the reciprocating driving slide) from that given to it by the complainants. They say that they do not use that element, construed as they construe it. The position originally taken is abandoned.

Nevertheless, it will throw light on the subject to see what the defendants said on the occasion referred to. It will at least bring their present position to the test of a first judgment formed by themselves at a time when it was very much to their interest to find discrepancies between what they used, and what the patent contained. Two affidavits were put in by the defendants at that time, one made by both the defendants jointly, and one by their superintendent, Mr. Duckworth. A previous suit brought on Webster's patent against the New Brunswick Carpet Company, in which the defendants, or at least their machinist, Davis, had taken much interest, had just terminated in a decree sustaining the patent, rendered by Judge Nixon in the Circuit Court for the District of New Jersey. The defendants in their affidavit, dated June 24, 1874, say: "That at the time defendants procured the looms referred to in the affidavits on the part of complainants in this suit, and used thereon tops of wire-boxes, as cams, to disengage the latches from shoulders on the heads of the wires, they did not know or suppose that Wm. Webster, or any one else except themselves and E. K. Davis, had a patent covering any part,

or combination of parts, contained in said looms. . . . The Stirling loom, the No. 50 loom, and the three other Bigelow looms, mentioned in the affidavits on the part of the complainants, were all procured and put in operation with the tops of the wire-boxes, as cams to disengage the latches from the wire-heads, a long time prior to the issuing of the Webster patent, on which this suit is brought, and before defendants knew that said Webster had applied for said patent. The first that said defendants knew or supposed that there was anything in any of said looms covered by letters-patent granted to said Webster was during the progress of this suit against the New Brunswick Carpet Company, referred to in said affidavits; and while the testimony was being taken therein, when they heard that a claim of that kind was being made, and on further inquiry were informed that said Webster would probably sustain his right to the combination mentioned in the fifth claim of his patent, on which said suit was pending, and that the use of the top of the wire-box as a cam to disengage the latch from the shoulders of the wire-heads was one of the elements or parts of that combination. After consulting counsel on the subject, they concluded that to avoid any question of doubt on that subject they would have all their looms which contained such tops to the wire-boxes altered by having such tops entirely removed, and having other provision made for operating the wires. They accordingly had such alterations made, which were all completed by the middle of May, 1874, since which time they have not had any looms, or used any looms, employing the top of the wire-box as a cam to disengage a latch from a wire-head, or for opening a latch to disengage from a wire-head, or to support a latch away from, or out of contact with, the wire-heads in its journey from one end of the box to the other, or to permit a latch to descend and catch a wire-head in any way, or for any other purpose. That they have not since the time of said alterations used, in any loom or looms, the top of a wire-box to lift or support, or to in any way operate or participate in the operation of a latch, and that they do not expect to use any such top of a wire-box hereafter, but intend not to do so."

The fact that this mode of resisting the charge of infringe-

ment is now abandoned furnishes very fair presumptive evidence of two things: first, that the substituted device for operating the latch was a mere equivalent of the wire-box in that regard; and, secondly, that the construction of the fifth claim on which they now take their stand could not have been a very obvious one.

That construction is, that the third element in the combination of the fifth claim of Webster's patent, and which is there called "the reciprocating driving-slide," refers, not to the slide which rides upon the trough or wire-bar and carries the latch (which they do use), but to the slide which rides upon the breast-beam and communicates the reciprocating motion to the other (which they do not use). It is undoubtedly true that in the body of the specification, where the patentee is describing the joint use of these slides, he does designate the slide on the breast-beam as the reciprocating or driving slide, and that on the trough as the withdrawing and pushing slide. But it is apparent that both of these slides are, in fact, reciprocating and driving slides. The one on the trough has a reciprocating motion and drives the wire into the lay. And when, as the patent points out, the other slide is not used, — that is to say, when the slide on the trough is directly connected with the motive power, or device, which gives the reciprocating motion, — it takes the place of both. The specification states this in so many words. It says: "Fig. 4 represents a modification of the invention. The withdrawing and pushing slide B¹ in this case becomes the driving-slide." Again: "Figure 7 represents a side view of the driving-slide B¹, its pin B², to which power is applied, and the withdrawing and transfer latch C and pusher C¹, attached to the slide." These figures relate to that form of the invention in which the slide on the breast-beam is not used.

Now, if we examine the language of the claim, it seems to us that all doubt as to its meaning is removed. It reads thus: "In combination, the lay and its rigid shuttle-box, the pivoted wire-trough, *the reciprocating driving-slide, and the latch moving thereon*, the latter being operated by the wire-box," &c. Obviously the reciprocating driving-slide here referred to is that slide on which the latch moves, and that is the slide which

rides on the trough, and which is the only slide used in one modification of the invention. It can hardly be supposed that the patentee intended to make the other slide, which he showed could, at any time, be dispensed with, an indispensable element in his claim. It would have rendered the claim a practical nullity. The important thing was the slide which rides on the trough.

The argument of the defendants' counsel on this subject is very ingenious and plausible; but we are forced to the conviction that the slide intended in the combination is that which is indispensable to the operation of the apparatus. And this must have been the conviction of the defendants themselves, as well as of their counsel, when they made the affidavit before referred to.

In conclusion, our judgment is, that Webster invented the combination described in the fifth claim of the patent; that the invention is sufficiently described in the specification to meet the requirements of the law; that it was not anticipated by any prior patent or invention; that it was never in public use or on sale for more than two years before the patent was applied for; and that the defendants have infringed it.

The decree of the Circuit Court must be reversed, and the cause remanded, with instructions to enter a decree in favor of the complainants, and to take such further proceedings as law and justice may require; and it is

So ordered.

MR. JUSTICE BLATCHFORD did not sit in this case, nor take any part in deciding it.