U. S. 61, 78, said: "Why these provisions were inserted in the statute we are not informed, but we may assume, until the contrary is shown, that a state of facts in respect thereto existed which warranted the legislature in so legislating." 150 Atl. 458. This long-settled rule disposes also of the alleged discrimination created by the special exemptions applicable to certain other waters of the State.[2]

Affirmed.

POWERS-KENNEDY CONTRACTING CORPORATION ET AL. *v.* CONCRETE MIXING AND CONVEYING COMPANY.

CONCRETE MIXING AND CONVEYING COMPANY *v.* R. C. STORRIE & COMPANY.

CERTIORARI TO THE CIRCUIT COURTS OF APPEALS FOR THE SECOND AND NINTH CIRCUITS.

Nos. 3 and 4. Argued April 16, 17, 1929. Reargued October 24, 1930.—Decided December 15, 1930.

Patent No. 1,127,660, to McMichael, for improvements in methods and apparatus for transporting and treating concrete, *held* void for want of novelty and invention. P. 186. The principal features are: An upright chamber, in the top of which is an opening for introducing the material, equipped with a door to close the opening air-tight; a hopper-shaped bottom to the chamber, discharging into the delivery duct; a pipe through which compressed air enters the chamber above the mass of concrete within, to propel it into the duct; and another pipe delivering compressed air at or near the discharge or lower end of the hopper.

27 F. (2d) 668, reversed.

27 F. (2d) 838, affirmed.

---

[2] See *Close* v. *Glenwood Cemetery*, 107 U. S. 466, 475; *Powell* v. *Pennsylvania*, 127 U. S. 678, 685; *Chicago Dock Co.* v. *Fraley*, 228 U. S. 680, 686; *Rast* v. *Van Deman & Lewis Co.*, 240 U. S. 342, 357.

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

CERTIORARI, 278 U. S. 595, to review decisions in two patent-infringement suits involving the same patent. In No. 3, the District Court sustained the patent and was affirmed by the Circuit Court of Appeals for the Second Circuit. In No. 4, the patent was held void by the District Court, 23 F. (2d) 131, and the Circuit Court of Appeals for the Ninth Circuit.

Messrs. John D. Morgan and *Alan M. Johnson* for the Powers-Kennedy Contracting Corporation et al.

Messrs. Stephen J. Cox and *Lynn A. Williams,* with whom *Messrs. Clifford C. Bradbury* and *Albert G. McCaleb* were on the brief, for the Concrete Mixing & Conveying Company.

Mr. Charles E. Townsend for R. C. Storrie & Company.

MR. JUSTICE ROBERTS delivered the opinion of the Court.

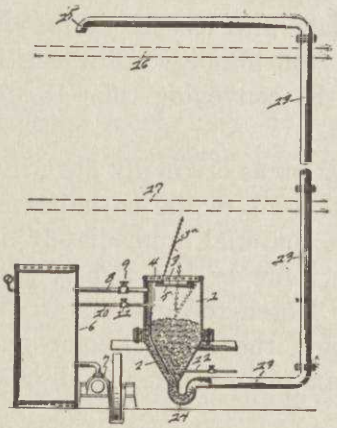
These cases involve the validity, and the alleged infringement, of letters patent No. 1,127,660, of date February 9, 1915, isued to John H. McMichael, and assigned to Concrete Mixing and Conveying Company.

The Court of Appeals of the Second Circuit, in *Concrete Mixing and Conveying Company* v. *Ulen Contracting Corporation,* 12 F. (2d) 929, held the patent valid and infringed. In No. 3 the District Court followed that decision. Its decree was affirmed by the Circuit Court of Appeals of the Second Circuit, 27 F. (2d) 668.

Meantime, in No. 4, the District Court for the Western District of Washington held the patent void for want of novelty and invention, 23 F. (2d) 131. Subsequent to the decision of the Court of Appeals of the Second Circuit, that of the Ninth Circuit affirmed the Washington District Court, 27 F. (2d) 838. In view of the conflict

thus disclosed this court granted certiorari in both cases, "the two cases to be heard as one." 278 U. S. 595.

The patent is for certain new and useful improvements in methods of and apparatus for transporting and treating concrete. The accompanying drawing illustrates the apparatus.



It consists of a chamber 1, for the reception of the material, the lower portion being hopperlike in form, as indicated at 2. The cover 4 is provided with an opening 3, in which there is a door 5. A chain or rope 3a is adapted to be used in partly or entirely closing the door. Air pressure in the chamber also acts to hold this door in closed position. A pressure tank 6 holds compressed air supplied by an air compressor 7, and has a connection 8 leading the air under pressure from the tank to the chamber 1; the air inlet is preferably near the top. An air pipe 10 controlled by a valve 11 also leads into the chamber, the delivery end of this pipe being at or near the discharge or lower end of the hopper.

The apparatus includes a valve-controlled water supply pipe 12 adapted to deliver water at the lower end of

the hopper so as to make the mass more easily movable when desired and also a crook or U-shaped bend 14 in the discharge duct 13.

The operation as described in the application for patent consists in depositing material in the chamber, closing the door, turning the air from the reservoir through the pipe 8 into the upper portion of the chamber, thus insuring the immediate firm closure of the door and forcing the material in the hopper downward, it being carried along through the conveying tube 13 until it is finally discharged at 15.

In the application as originally filed, it was stated that, owing to the provision of the U-shaped bend in the conveying tube, the material, immediately after leaving the hopper, will be more or less tightly packed; and it is added that "to loosen the material at the lower end of the hopper should the same become packed, I provide the additional air pipe adapted to discharge air through the material."

It should also be remarked that in the original application the invention was described as useful improvements in apparatus for "elevating and transporting granular and plastic building material, such as sand, plaster, mortar and concrete."

The application was filed in the Patent Office on January 14, 1907. Its prosecution was most dilatory. Claims made were repeatedly disallowed, and at one time it lapsed and had to be renewed. Radical changes were made in the statement of invention, and radically new claims were made in 1911 and expanded in 1913. The applicant eliminated from the scope of his invention the transportation of granular and plastic material generally, and limited it to the transportation and treatment of concrete; and the patent as issued is so limited. While his original assertion that the compressed air admitted to

the chamber behind the mass was the propelling force was retained, statements were added and claims were made, ascribing to the air discharged by pipe 10 new action and effect, namely, that it operated to "engage submasses" or to "impinge upon successive portions" of the mass of concrete moving through the hopper and discharge duct, and to aid or assist in their movement in the duct, as well as assisting in mixing and mingling the elements of the concrete in the duct, so as to make a more perfect mixture.

The device alleged in No. 3 to infringe consists of a container, in all material respects like that of the patent, with a discharge duct. It, however, employs no upper air behind the mass in the container. It has no U-bend in the duct at the outlet of the hopper, nor does it have a pipe terminating in the hopper near the outlet. On the contrary it has a pipe which discharges compressed air into the duct at the right-angle elbow therein immediately below the outlet of the hopper, thus forcing air into and along the duct in the direction in which the material is to move.

The device alleged in No. 4 to constitute an infringement is made under the Hackley patent, No. 1,619,297, of date March 1, 1927. It consists of a cylindrical container set horizontally instead of vertically. The door for admission of the concrete is on the top of the apparatus, a funnel-shaped exit is located at one end, the bottom of said funnel being continuous with the lowest portion of the cylinder wall, and the upper portion of the funnel joining a part of the end of the cylinder. Four pipes are led into the cylinder, the first of which discharges into the funnel and the other three at various distances to the rear of the first, along the bottom of the cylinder and in the direction of the funnel. Its method of operation is that, after the cylinder is filled with concrete and

the door closed, compressed air is discharged through the pipes in order, first through the one which ends in the funnel, and successively through the others to the rearward until the last one is opened. There is no provision for admission of compressed air on top of or behind the mass, as in the McMichael apparatus. Nor is there any trap or U-bend in the delivery duct, which is continuous with the mouth of the funnel and runs in a direct line therefrom.

If the patent in question were valid as disclosing novelty and invention, we should be bound to analyse the differences of structure and operation above indicated, to determine the question of infringement. We have concluded, however, that it does not disclose invention, and that we need not, therefore, narrowly examine the devices and their operation to ascertain whether there is infringement.

The idea of moving fluids and solids through a pipe by air pressure, or other fluid pressure, is old, and was well known at the time of the alleged invention. Both granular and plastic materials had been so moved by devices quite similar to that of the patent. These covered a wide range, from lift-pumps for sand and sulphur, to apparatus for transporting muck, spoil, grout, and concrete.

It is averred, however, that neither an apparatus nor a method such as that devised by McMichael had theretofore been applied to the transportation of concrete. If this be true, its truth must lie in the fact that McMichael either discovered an improvement in apparatus or an improvement in method over the prior art. We think that he did not do so; and we shall call attention to some of the facts which lead us to this conclusion.

The provision of a hopper-shaped bottom for the cylinder, thus causing the mass of material to converge towards the delivery duct, is specified by McMichael as an

element in his invention. It was old in the art. Warren had employed it in a sand-blast apparatus patented April 2, 1901, No. 671,303. Goldie had used it in a cementing apparatus patented August 26, 1902, No. 707,840. Canniff had shown it in a pneumatic grout-mixing and discharging apparatus patented December 10, 1907, No. 873,345. Nor is there any merit in the claim of invention in making the funnel-shaped discharge end of the cylinder connect with the delivery duct smoothly and without offsets.

The next element to be considered is the introduction of air behind the mass in order to propel it into the discharge duct. This was old in the art. Smith had provided for the employment of such compressed air in an enclosed chamber above the mass in his patent for machinery for laying concrete pavement, of January 2, 1872, No. 122,498. Duckham had employed it in an apparatus for discharging muck or spoil (English patent No. 4400, December 18, 1875). Canniff had used it in his patent above referred to, as had McIlvrid in a grout-mixing and discharging machine, patent No. 958,421, Farnham in a sand-blast apparatus patented December 22, 1903, No. 747,396, and Warren in a similar apparatus in his patent above referred to. Other devices might be cited.

Much reliance is placed upon the pipe 10, with its end or nozzle in the chamber near the outlet. In his original application McMichael described its operation somewhat as follows:

He called attention to the U-bend or trap 14 just below the outlet of the chamber. He stated that this would cause the mass to pack tightly as it was driven down by the upper air pressure, and claimed that the blast of air from the pipe 10 would tend to prevent clogging or arching at this point, thus enabling the material to move more

freely into the discharge duct. If this be a claim to novelty or invention, it is clearly anticipated by the Duckham English patent above cited. In the device covered by that patent air is admitted to an airtight chamber above the mass of muck or spoil to be moved, thus driving it, as in McMichael's, to the outlet. One or more nozzles for the delivery of similar compressed air are placed near the outlet of the chamber, so that the air from them will mingle with and stir up the mass. It is added that a nozzle may also be placed in the discharge pipe for the same purpose, and attention is called to the usefulness of larger nozzles where the material to be moved is clay or similar matter which is likely to harden and form a resistant mass near the outlet of the chamber.

In the amendment to his specifications, McMichael, while still claiming the function of pipe 10 to be to loosen material at the lower end of the hopper and to assist movement of the mass, added an additional claim, saying that it "serves the double function of preventing choking in the entrance to the delivery pipe and of supplying air under pressure in sharp jets directly to the delivery pipe itself." He says that he has found that this supplemental air pipe 10 is very effective in aiding the passage of the material into and through the conveyor pipe. He claims that this second air pipe " gives to the material the velocity which is needed to carry it to the remote point of delivery." He explains that the upper pipe supplies air which acts by pressure, and the lower pipe supplies air which acts by velocity. Again he states that the air from this pipe "may force itself into the body of the mass," and adds that it "engages with the submasses to push them along." He phrases the matter differently by claiming that this air acts upon submasses successively, and claims as a result "the thorough commingling of the ingredients" with greater rapidity. At considerable length he then elaborates upon the value of the air discharged by this pipe as a mixing agent.

These specifications and the claims based upon them are particularly important in view of the theory now brought forward—that jets of air from the pipe 10 cut off so-called "slugs" or portions of the concrete and propel them individually like pistons through the delivery pipe. An examination of the specifications and claims discloses no claim to this slug or pistonlike action of the air so delivered. Any such action is quite inconsistent with the claim that the air from the pipe mingles with the mass and causes additional mixing in the delivery pipe making the latter a sort of mixing chamber. Unless the slug theory is disclosed in the patent and is a correct theory of operation it would seem that there is no invention in the use of the pipe 10.

It is conceded that in the commercial form of the patented apparatus the U-bend is entirely discarded. It cannot therefore have any useful function and cannot be the subject of invention. It is further conceded that in the commercial form, pipe 10 is not brought into the chamber and does not terminate in the hopperlike exit. On the contrary, the pipe is led into the elbow in the conduit directly below the hopper and discharges in the direction in which the material is to move. If the function of the pipe is that of a booster or velocity nozzle (as is undoubtedly, amongst other things, claimed in the patent), its use is not invention unless the application of it to concrete is novel and constitutes invention. The use of such nozzles in the conveying of material by compressed air is old in the art. Many of the patents cited and in evidence indicate this, and, apart from them, it is and must be conceded that such use was not uncommon at the time of McMichael's application.

Thomas Leake applied for a patent for an apparatus and method for mixing and transporting concrete, October 7, 1907. In this application he showed two nozzles similar to the pipe 10, discharging into the hopper of

his closed chamber. The District Court and the Circuit Court of Appeals found in No. 4 that this invention in fact antedated McMichael's and we are not prepared to say that the testimony and corroborating documents did not justify this finding. There is considerable evidence tending to show that McMichael recognized the priority of Leake, and, as a result, purchased and took an assignment of Leake's patent while his own application was pending, in order to dispose of an interference declared by the Patent Office between them. It resulted that Leake did not offer evidence or press his claim to priority and that the McMichael patent was granted in 1915 and the Leake patent in 1917, and both of them are owned by the same company.

If there be any virtue in the so-called slug theory, Leake has as clearly disclosed it as McMichael did, although neither of them make this method of operation clear in their specifications and claims.

It remains to discuss whether there is foundation for the claim that McMichael discovered new principles, namely, that concrete could be moved by compressed air, or that if it could not be satisfactorily moved by pressure of compressed air or other fluid agent, it could so be moved by a nozzle which cut off portions of the mass and drove them through the delivery duct like pistons.

Methods and apparatus for moving concrete by compressed air had been previously invented. See Smith's patent, 122,498. The court below, in No. 3, indicated that this had not been found practicable. There is no support in the record for any such finding and against it stands the presumption of operability from its patenting. In No. 4 there was uncontradicted evidence that it would work, and that Canniff's grout machine (Patent 873,345) had been successfully used for concrete. Other apparatus closely approximating that of the patent in suit had been used for transporting grout. In his specifications Mc-

Michael's only suggestion as to why they were unfit for concrete is that the pipes and parts were not of sufficient size. But obviously a mere change in proportion would involve no more than mechanical skill and would not amount to invention.

We find no adequate ground for saying that McMichael's method operated in a novel and useful manner, by reason of the alleged function of the nozzle discharging into the moving mass, cutting off therefrom slugs or pistons of concrete and driving them forward individually.

The slug theory, so-called, seems to have been advanced for the first time in the *Ulen* case; and was there credited and relied upon to sustain the patent. In No. 3 the District Court thought it probable, but the Court of Appeals held the patent valid irrespective of the correctness of the theory.

In No. 4 the District Court found it incorrect and untenable. This coincides with our own view. The top pressure behind the mass and that coming through the pipe 10 is the same. There is no mechanism to produce sharp spurts or jets of air out of the end of pipe 10. That air, as the patent specifications in certain paragraphs suggest, mingles with the mass of concrete as it comes down through the hopper. It does not cut off masses and drive them forward like pistons, but acts merely by velocity. The evidence is persuasive that the concrete issues from the end of the discharge pipe in a stream or solid flow and not in surges of lumps. It is proved that it freely passes ninety-degree bends in the pipe. In short, there is neither theoretical nor practical demonstration of any such phenomenon as the owner of the patent asserts.

And, even if the mode of operation is as claimed, it is to be remembered that Leake in his application of October 7, 1907, uses the same words to describe the operation of his nozzles as we find McMichael subsequently in-

serted in his specifications and claims. When this application came into interference with McMichael's, he, of course, became familiar with Leake's claims. It is significant that he then amended his claims, almost in the very words of Leake. This of itself destroys the patent. *Railway Co.* v. *Sayles,* 97 U. S. 554; *General Electric Co.* v. *Sangamo Electric Co.,* 174 Fed. 246; *Lopulco Systems, Inc.* v. *Bonnot Co.,* 24 F. (2d) 510.

For these reasons we find that the patent is invalid. It consists of a combination of elements all of which were old in the art. Its application to the transportation of concrete did not involve invention. Neither the combination of old elements or devices accomplishing no more than an aggregate of old results (*Hailes* v. *Van Wormer,* 20 Wall. 353; *Office Specialty Mfg. Co.* v. *Fenton Metallic Mfg. Co.,* 174 U. S. 492; *Grinnell Washing Machine Co.* v. *E. E. Johnson Co.,* 247 U. S. 426) nor the use of an old apparatus or appliance for a new purpose (*Roberts* v. *Ryer,* 91 U. S. 150) is invention.

When, in addition, we find that similar combinations had been used for the transportation of granular material, muck and spoil and grout, and that combinations lacking one or another of the old elements of McMichael's had been used to transport concrete, what was said in *Concrete Appliances Co.* v. *Gomery,* 269 U. S. 177, 179, applies with equal force to these cases:

"The several elements in the petitioners' claims which we have enumerated embrace familiar devices long in common use, separately or in smaller groups, both in this and in kindred mechanical arts. It is not argued that there is any novelty in such units or groups; and the only serious question presented is whether, in combination in the apparatus described, they constitute an invention."

This court called attention to the fact that the principle of conveying and distributing a mobile substance by

gravity had been exemplified in various methods for centuries, and that long prior to the patent there in suit the principle had been applied to various substances such as grain, coal, crushed stone, sand, and iron ore, and said [p. 184]:

"The observations of common experience in the mechanical arts would lead one to expect that once the feasibility of using 'wet' concrete in building operations was established, the mechanical skill of those familiar with engineering and building problems would seek to make use of known methods and appliances for the convenient handling of this new building material."

Here it appears that the use of compressed air for conveyance of granular and plastic materials had long been known and practised; so that the cited case is clear authority against invention in the instant cases.

The decree in No. 3 is reversed and the cause remanded with instructions to dismiss the bill of complaint. The decree in No. 4 is affirmed.

No. 3, reversed.
No. 4, affirmed.

BROAD RIVER POWER COMPANY ET AL. *v.* SOUTH CAROLINA EX REL. DANIEL, ATTORNEY GENERAL.

CERTIORARI TO THE SUPREME COURT OF SOUTH CAROLINA.

No. 528 (1929 Term). Argued on Rehearing, December 3, 4, 1930.—Decided December 15, 1930.

Upon rehearing of this cause, the Court, though divided upon the reasons, adheres to the view that the writ of certiorari should be dismissed for want of jurisdiction. See 281 U. S. 537.

Mr. George M. LePine, with whom *Messrs. C. Edward Paxson, W. C. McLain* and *Wm. Marshall Bullitt* were on the supplemental brief, for petitioners.