HARMON *ET AT. V.* STRUTHERS *ET AL.*

Circuit Court, W. D. Pennsylvania. August 18, 1890.

1. PATENTS FOR INVENTIONS—PATENTABILITY.

Letters patent No. 248, 277, granted to Frank L. Bliss, October 18, 1881, for an improvement in reversing gear for steam-engines, show an invention especially applicable to engines for drilling and operating oil-wells, consisting in the combination of an elbow lever, a lifting-bar having a slotted connection with the lever, and a stop on the engine frame for supporting the lever, whereby the lever is relieved from all jar or vibration due to the movement of the reversing link. *Held,* that the invention was one of great merit and of a primary character, and the patent should be liberally construed, and the patentee accorded the full benefit of the doctrine of equivalents.

2. SAME—INFRINGEMENT.

In the defendants' device, instead of a stop on the engine frame, the end of the horizontal arm of the elbow lever is provided with a downward projection or appendage, which engages the engine frame, and, in lieu of a slot in the lifting-bar, whereby Bliss' slotted connection is made, the upper end of the defendants' lifting-bar is reduced in diameter, and passes loosely through a hole in a swiveled eyebolt attached to the horizontal arm of the lever, and thus has free vertical play for the purpose of taking up the vibration and relieving the lever of all jar when resting on the engine frame. *Held,* that the defendants' device infringed the Bliss patent.

3. SAME—PUBLIC USE.

More than two years before his application for a patent, the inventor, Bliss, without profit to himself, and solely for the purpose of testing the efficiency of his invention by practical use in the oil-field, placed his device, then in the form of a push reverse, upon engines manufactured by his employers, who sold all those engines to a brother-in-law of one of the vendors, on exceptional terms, the substantial purpose being with a view to experimental use. *Held,* that this was not a public use or sale, within the meaning of the patent law.

4. SAME.

The push reverse embodied the combination described in and covered by the patent, but the experimental use in the oil-field proved that, as an operative reversing gear, it was not a practical success; and thereupon, after further experimenting, Bliss changed the device so as to convert it into a pull reverse of the form described in his specification and drawings. *Held* that the two-years prior public use, under the statute, did not begin to run until he had thus made his device practically efficient.

In Equity. Bill to restrain infringement of patent.

W. Bakewell & Sons, for complainants.

D. F. Patterson, for defendants.

ACHESON, J. The defendants are charged with the infringement of letters patent No. 248, 277, for an improvement in reversing gear for steam-engines, granted to Frank L. Bliss, October 18, 1881, upon an application filed March 8, 1881, the title to which letters patent became vested in the plaintiffs by assignment from the patentee, dated January 22, 1887. The specification states that the invention is especially applicable to engines employed in drilling and pumping oil-wells. These engines, the proofs show, are operated under peculiar conditions. The engine is necessarily located at a distance, usually about 70

feet, from the derrick, where the operator is required to be. In practice, an engineer is not employed, but the driller standing in the derrick handles the engine. It is very important that the engine should be at all times under his ready control, as it is often necessary that it be instantly stopped, or is motion reversed. In oil operations, such engines are moved from place to place, and they do not sit upon permanent or solid

foundations. The foundation commonly used consists of bottom mudsills with cross-timbers laid thereon and the engine block resting on and keyed to the cross-timbers. The engine is run at a high rate of speed, which causes considerable longitudinal vibration of the engine upon its unsubstantial foundation. These conditions practically preclude the employment in oil-well engines of such reversing gear as is used on locomotives, not to speak of the excessive cost of the latter, which, of itself, would forbid its use. By reason of its rigid connecting mechanism and locking device, such a reversing gear would cause a distortion of the valve. In oil practice it would be impossible to keep such reversing gear in adjustment. Hence the only reversing device for oil-well engines in practical use before Bliss' invention consisted of a cord attached to the upper end of the reversing link, and passing up, over an overhead pulley; and hence to the derrick. To reverse the engine, the driller pulled this cord, and drew the link up; but when the cord was released the link often failed to drop, and, to prevent the engine from running wild, on the happening of this event, it was the general practice to employ a man to stand at the engine, and "tramp down" the link. The evidence establishes that, before Bliss' invention, many attempts were made, but without success, to provide an efficient reversing gear for oil-well engines. Charles M. Young, a witness of experience in these matters, testifies:

"I suppose there have been more time and money spent on reverse gears for oil-engines, which seemed to be the easiest thing to make, but seemed to be the hardest thing to accomplish, of any machinery in the oil territory."

This is by no means an overstatement. The problem was not solved until Bliss perfected his reversing gear, the great merits of which are now universally recognized by oil operators. Bliss' invention permits the use of a rod, or other positively acting instrumentality, operating from the derrick to start, reverse, stop, or slow the engine, and yet obviates all the objections incident to a rigid connecting mechanism, and dispenses with all locking devices. To this tend, he employs an actuating lever, in the form of an elbow, or letter L, placed on the engine-bed. This lever and the reversing link are not rigidly, but flexibly, connected. The lever rests on a stop on the engine bed, and is joined to the link by a slotted hitting-bar, so that the continual vibration of the link is not transmitted to the lever, but is taken up as loose or idle motion by the slot. The slotted connection and stop take all jar or vibration from the lever when at rest on the stop. The reversing link is then practically disconnected from the lever. In other words, when the reversing gear is not in actual use, it is practically disconnected front the engine. The specification of the patent describes a rod, which may be composed of sections of gas-pipe coupled together, connected with the upright arm of the actuating level, and extending to any desired point, for enabling the operator to control the reversing at any required distance from the engine. "Under this arrangement," says the specification, "it will be seen that the link, D, cab be given a positive movement in either direction, whether for reversing the engine or

for throwing it out of action, by bringing the link mid way of its throw upon the swiveling block, and thus

stopping the movement of the valve." The slotted lifting-bar, above spoken of, is called in the patent a "link." The patent has a single claim, viz.:

"The elbow lever and link having a slotted connection with the link, D, in combination with the stop, or set-screw, for relieving the lever from the vibration due to the movement of said link, D, substantially as described."

Before proceeding to the question of infringement, and the defense of non-infringement, three other defenses made to this suit will be considered in their natural order.

1. It is alleged by the defendants that reversing gear, which embodied the invention claimed in the patent in suit, was in prior public use in the year 1878, on the steam-boat Shirley Belle, a small boat which plied the upper waters of the Allegheny river at or near Warren, Pa., for a few months, but which was blown up by the explosion of the boiler in the fall of that year. To sustain this defense, the defendants examined three witnesses, all of whom speak from mere memory, after the lapse of 11 years, and who differ among themselves very much in their recollection. The principal one of these witnesses is Robert Mackey, the defendants' foreman, under whose patent, granted in 1888, they manufacture the alleged infringing devices. He states that there were two engines on the Shirley Belle, and that he made two sets of reversing gear for the boat, and that one was placed on each engine; but who assisted him in the work or applied the devices to the boat he cannot tell. They were put on, he thinks, about a month or six weeks before the boat blew up. He produces a sketch, recently made from memory, for the purposes of this case, which shows a construction almost identical with what is disclosed in Bliss' patent, as illustrating the reversing gear he made for the Shirley Belle. The other two of said witnesses, however, testify positively that the boat only had one engine and one set of reversing gear, and this contradiction of itself tends to the discredit of Mackey's testimony. Fred Shirley, the defendants' second witness under this head, acted both as fireman and engineer on the boat until the day before the explosion; and, according to his recollection and description of the reversing gear, the elbow lever and lifting-bar had neither slot nor stop, and the lever vibrated. Anson H. Shirley, the defendants' other witness upon this point, describes the slot as in the lifting-bar, and not in the elbow lever, as Mackey states it was, and he neither describes, nor mentions at all, a stop. He does speak (and he alone of all the witnesses) of a little plate oil the top of the steam-chest, "to hold the lever when it was to work;" but, according to Mackey, the stop was bolted on the frame of the engine bed, and, as we have already seen, the stop is used as a rest for the lever when not at work. These three witnesses otherwise differ in matters of detail, and, upon the whole, their testimony is unsatisfactory, and inconclusive. On the side of the plaintiffs, Moses B. Shirley, who was a fireman on the Shirley Belle at the time of the explosion and for several months before, squarely contradicts Mackey, and also Anson H. Shirley, as to the construction and mode of operation of the reversing gear used on the boat; and, according to a

sketch made by him, neither a slotted connection or stop, nor yet an elbow lever, was used, and he is corroborated by another witness. In *Cantrell* v. *Wallick,* 117 U. S. 689, 695, 6 Sup. Ct. Rep. 970, it is laid down that the defendant, in a suit for the infringement of a patent for an invention, who sets up prior use and want of novelty as a defense, not only has the burden of proof upon him to establish the facts set up, but every reasonable doubt is to be resolved against him. Applying to the case this standard of proof, I have no hesitation in overruling this defense.

2. It is contended by the defendants that, in view of the prior state of the art, there was nothing patentable in the combination described and claimed in Bliss' patent; but, under the proofs, this proposition is altogether inadmissible. The several elements in themselves may have been old, but the combination was absolutely new, and productive of novel and highly beneficial results. Each of the elements is essential to the efficiency of the device, and the new and useful results are due to their co-operation. So far from the combination being an obvious one for attaining the proposed results, it is shown that numerous unsuccessful experiments had been made, covering a long period of time, to produce a reversing gear having the advantages which Bliss' device possesses. His invention, indeed, met a long-felt want in the oil trade, and the utility and great importance of his device are not to be gainsaid.

3. Again, the defendants allege and set up as a defense that the patented device was in public use and on sale for more than two years prior to the application for the patent. I find the material facts bearing on this defense to be as follows: The firm of Harmon, Gibbs & Co., composed of C. G. Harmon, George H. Gibbs, and Lewis L. Bliss, was formed in the spring of 1877. Frank L. Bliss was an employe of the firm. The primary purpose for which the firm was formed was to build an engine for oil-wells with a reversing gear actuated by steam, the invention of George H. Gibbs. This reversing device consisted of a miniature cylinder placed oil top of the main steam-chest, the piston of which was connected with an elbow lever having a connection with the reversing link, and was designed to operate it by direct steam-power. It is not necessary more particularly to describe this device. It is enough to say that it did hot embody Bliss' invention. It is most clearly established, by the correspondence of the firm and otherwise, that the first engine of any kind which Harmon, Gibbs & Co. ever built was not completed until the month of December, 1877; and that engine was equipped with the steam reversing gear just mentioned. Therefore, when H. H. Argue, the defendants' witness, states that in the month of October, 1877, an engine built by Harmon, Gibbs & Co., and equipped with the push reverse, (of which particular mention will soon be made,) was used in drilling an oil-well at Derrick City, on the Carter lease, he is undoubtedly mistaken. The first engine built by that firm, and which, as already stated, was equipped with Gibbs' steam reverse,

was bought by his brother-in-law, J. J. Carter; and in February, 1878, it was put in the field at an oil-well on Carter's lease, at Derrick City, to test its efficiency. As tried in

the shop, the steam reversing gear gave a great show of success, but, when put to practical work, it proved to be a failure. Frank L. Bliss was sent to the well to overcome the difficulties, and this he attempted. He put on a heavy brass link and a rope, and afterwards attached a spring pole to the bottom of the link to pull it down. These expedients failing, and after making other experiments, he devised, in the month of March, 1878, a reversing gear, designated a "push reverse." The first one was "a crude affair," and, it would seem, was made for the engine at Carter's well, upon which Bliss had been experimenting, to take the place of the steam reverse. In this push reverse, an elbow lever was pivoted to the steam-chest of the engine, and attached with a slotted connection to the lifting-bar of the reversing link; and there was a stop to arrest its downward motion located on the valve-stem box, and the link was raised by pushing a rod which extended from the engine to the derrick. During the spring and summer of 1878, Harmon, Gibbs & Co. built and sold several oil-engines, upon each of which this push reverse was placed. Frank L. Bliss was then without means to thoroughly test the device himself, and he testifies, and I have no doubt truly, that he put the device on those engines in order that it might have "a good working test." He derived no profit from this use of his device, for he made no bargain with Harmon, Gibbs & Co. until after he applied for a patent, on March 8, 1881, when it was agreed that the firm should pay the cost of patenting, and, in consideration of the same, should have a shop right. The evidence, I think, fairly warrants the conclusion that all the engines having Bliss' reversing device thereon which were sold or in use during the year 1878 and the early part of 1879 were purchased by Mr. Carter, the brother-in-law of George H. Gibbs; and, if any of them went into the hands of other persons, it was through Carter, and in furtherance of his purpose "to demonstrate the quality" of the engine. Mr. Carter testifies that he told Gibbs "the only way to determine the quality of his engine was to put it on a drilling well, and let it stand or fall on its merits," etc. Carter also states that all the engines he took from Harmon, Gibbs & Co. during that time were bought for that purpose, and because of his relationship to Gibbs. He further testifies that the price he was to pay Gibbs for these engines was $350 each, "but the experiments conducted in perfecting them brought down the price he received on the first engine to $225; * * * and like reductions, though not in all cases as large as this, were made on the price of the other engines." The push reverse did not work effectively, and there was a general complaint by the users. Carter reported to Bliss that it was a failure, and that he could not handle the engine with it. The main difficulty was in the bending of the rod when pushed by the operator to raise the link. Bliss endeavored to remedy the defects in the push reverse, but failed, and he then conceived, and, after experimenting, adopted, the present form of device. He took the elbow lever off the steam-chest, and turned it around, and bolted it to the guides of the engine, so that the link might be raised by

pulling, and he straightened the lifting-bar, which had been in a bent shape, so as to get a direct pull

from the connection from the bottom of the link to the lever, and made some other modifications, and eventually completed the reversing gear in the form described in his specification and drawings. George H. Gibbs died in September, 1878. There were then a number of unfinished engines in the shop, some having the steam reverse on and some with the push reverse. These engines were turned over to Gibbs' estate, and Mr. Carter, acting in behalf of the estate, employed Bliss to finish them. Bliss explained his new ideas to Carter, and, by his directions, proceeded to change the reversing gear on those engines to the present form. There is satisfactory evidence to show that this work was done in the month of February, 1879, and that the engines were not ready to leave the shop until after the 4th of March. They were the first engines equipped with the device as patented. It is not shown that any of them were shipped, or in public use, two years before the application was filed for the patent in suit. It is true that David B. Dingman fixes June, 1878, as the time when Bliss' pull reverse was used at the well on one of Carter's leases, but he does not speak with great positiveness, and, assuredly, his recollection is at fault. In oil practice the engine is first used in drilling the well. In this work the revolutions are mainly forward, and the reversing gear is not much used. After the drilling is completed, the engine is used, with more or less frequency, and sometimes with long intervals of rest, in pumping the well or drawing the casing; and the evidence indicates that it requires considerable time, and a number of engines working in the field, to make a satisfactory test of the practical efficiency of a new reversing gear. The proofs disclose that in this regard there had been many previous failures where success seemed achieved. These facts were known to Bliss, and he testifies that they induced him to thoroughly test his device, and get it right, before applying for a patent, and that the test was not complete before late in the fall of 1879. It is urged by the defendants that the combination described in and covered by the claim of the patent in suit was embodied in the pushing reverse which Bliss devised and put on Harmon, Gibbs & Co.'s oil-engines in the year 1878. But, conceding this, was the thing patented in public use or on sale for more than two years before his application for a patent, within the meaning of the statute? I think not. In the first place, the sales by Harmon, Gibbs & Co. to Carter, in all their circumstances, were out of the ordinary course of trade, and in fairness must be regarded as made for the purpose of testing the engine. *Innis* v. *Boiler-Works,* 22 Fed, Rep. 780. All the dealings between Carter and the firm were with a view to experiment. That was the substantial purpose. Then, as respects the inventor Bliss himself, the transaction, from first to last, and in all its incidents, was purely experimental. If he could not test the efficiency of his device by putting it on his employers' engines, and sending it out into the oil-field for practical use, he could not test it at all; and, under the evidence, I am of the opinion that the test was reasonable, both as regards its extent and duration. These conclusions, I think, are in accordance with the rulings made and the principles declared by the supreme court in

the cases of *Elizabeth* v. *Pavement Co.*, 97 U. S. 126, and *Manufacturing Co.* v. *Sprague*, 123 U. S. 249, 8 Sup. Ct. Rep. 122. But then, again, the device in its original form of a push reverse was imperfect, and the invention was incomplete. As an operative reversing gear, it was not a practical success, and much less was it successful in a commercial sense. The defects were serious. The device had been condemned by those who had used it. If a remedy had not been applied, it would never have come into general use, but would have been abandoned as worthless. The changes which Bliss made may appear now to have been simple, but at the time they required reflection and experiment; and the result was a great success where there had been failure. The right principle, indeed, was in the push reverse, but Bliss had not yet discovered a satisfactory mode of applying that principle to effect the desired object. In its original form, the device lacked patentable utility, and Bliss was not ready to go into the patent-office with his application until he had made it practically efficient.

4. We are now brought to the consideration of the question of infringement. Prior to the filing of the bill, the defendants were, and they still are, engaged in manufacturing and selling engines for drilling and pumping oil-wells having an unbalanced slide-valve, with a reversing gear to be connected with and operated from the derrick by a rod. In their device the defendants employ the usual reversing link, a lifting-bar, and an elbow lever pivoted to the engine frame. Instead of a stop on the frame or bed of the engine to serve as a rest for the elbow lever when it is down, the end of the horizontal arm of the lever is provided with a downward projection or appendage, which engages the engine-bed and performs the precise function of the stop of the Bliss patent. In effect, it is the Bliss stop inverted. Then the lifting-bar and elbow lever are flexibly connected in this manner, viz.: Near the end of the horizontal arm of the lever is a swiveled eyebolt, with a vertical hole through its side, and the upper end of the lifting-bar is reduced in diameter, and passes loosely through this hole, and is provided with shoulders a little distance above and below the same, so as to permit to the lifting-bar free vertical play for the purpose of taking up the vibration, and relieving the lever of all jar when resting on the engine bed. This is practically the slotted connection of the Bliss patent. It is used for the same purpose, and with the same effect. Without enlarging upon the subject, I content myself with saying that a careful comparison of the models of the two devices, with the aid of the explanatory testimony, has brought me to the conclusion that the changes which the defendants have made are differences in form merely, and not in substance. The two devices do the same work in substantially the same way, and accomplish exactly the same results. Therefore, in the sense of the patent law, they are the same devices, notwithstanding the differences in name, form, or shape. *Machine Co.* v. *Murphy*, 97 U. S. 120, 125; *Cantrell* v. *Wallick*, *supra*.

I cannot agree with the learned counsel for the defendants that the patentee limited himself to an adjustable stop. The specification, I

think, discloses no indication of any such intent. In its lucid statement of the combination, the language touching this element is, "a rest or stop for said lever, whereby, through the slotted connection with the reversing link, all jar or vibration is removed from the actuating lever;" and the claim itself contains no such express limitation as is suggested. The set-screw mentioned is rather to be regarded as one of the forms of stops contemplated by the patentee.

As already intimated, the Bliss invention was one of unusual merit. He was not a mere improver of an old mechanism. No pre-existing reversing gear met the needs of oil-well operators. Bliss' device, and his only, did so. With reference to the particular field of industry for which it was devised and to which it is especially applicable, his reversing gear was not only altogether original, but was of immense value. It met new conditions and hew wants. He accomplished results much sought after, which no one before him had been able to achieve. He was the first to devise means whereby the driller, standing at a distant point, can give a positive movement in either direction to the reversing link, while, upon the release of the actuating lever, the reversing gear, by means of the stop, will automatically adjust itself to a disconnected position. Bliss' device first made it possible to use, in drilling and pumping oil-wells, an unbalanced slide-valve, thereby avoiding a waste of steam, and promoting economy in the consumption of fuel. The invention, then, was really one of a primary character, and the patent well deserves to be liberally dealt with, both in the matter of construction and in giving to the patentee and his assignees, in full measure, the benefit of the doctrine of equivalents. *Consolidated, etc., Valve Co.* v. *Crosby, etc., Valve Co.*, 113 U. S. 157, 5 Sup. Ct. Rep. 513; *Machine Co.* v. *Lancaster*, 129 U. S. 263, 9 Sup. Ct. Rep. 299. Let a decree be drawn in favor of the plaintiffs.