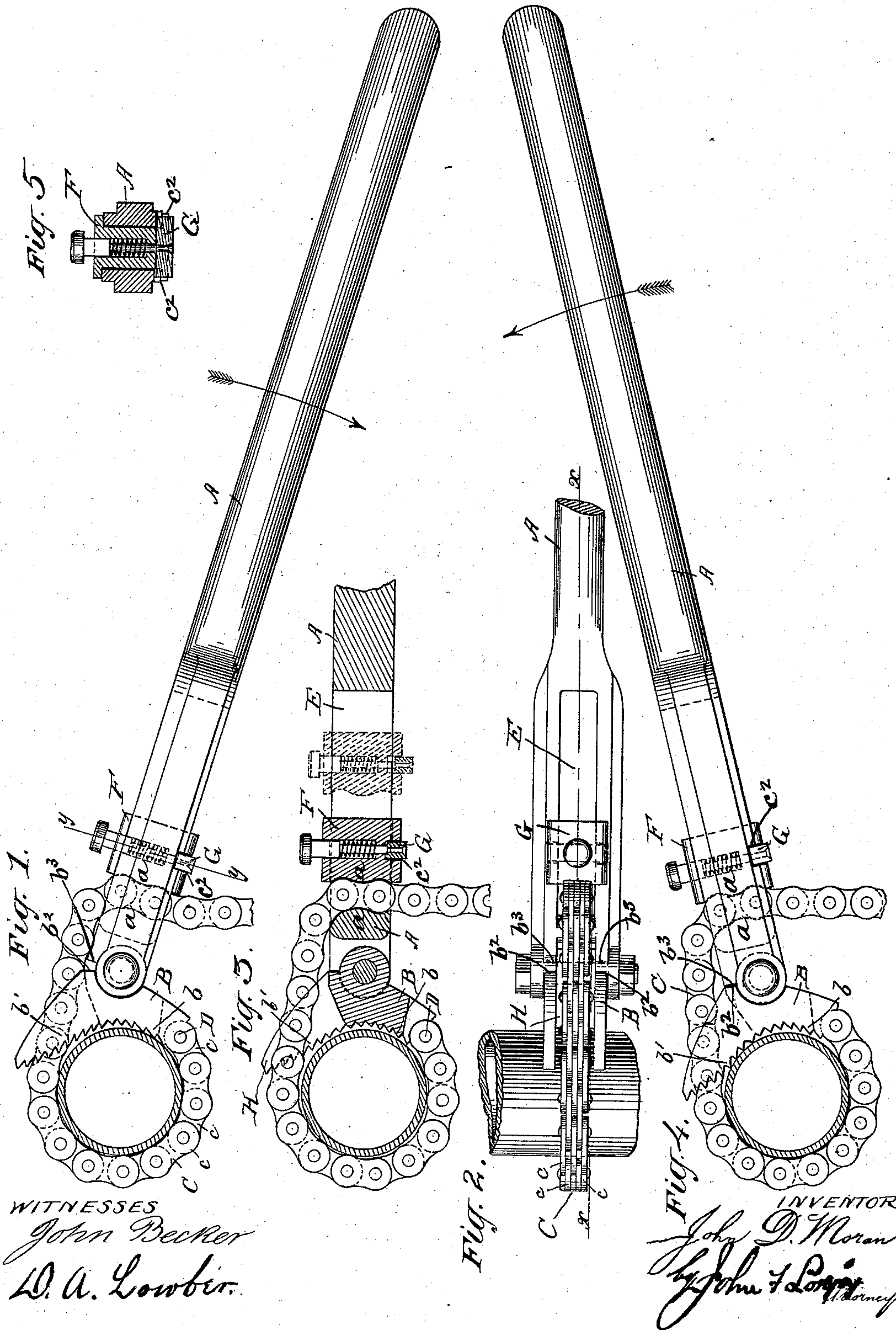


(No Model.)

J. D. MORAN.
CHAIN WRENCH.

No. 406,662.

Patented July 9, 1889.



UNITED STATES PATENT OFFICE.

JOHN D. MORAN, OF NEW YORK, N. Y.

CHAIN-WRENCH.

SPECIFICATION forming part of Letters Patent No. 406,662, dated July 9, 1889.

Application filed July 12, 1888. Serial No. 279,704. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. MORAN, a citizen of the United States, and a resident of the city, county, and State of New York, have invented a certain new and useful Improvement in Chain-Wrenches; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in pipe-wrenches, and belongs to that class known as "chain-wrenches." Heretofore in this class of wrenches it has been customary to cause a chain or other flexible portion of the wrench to surround the pipe or bar to be turned, and to so connect the ends of said chain with a bar or lever as that when said bar is moved in one direction it will cause said chain to bind upon the pipe and form a "purchase" for the lever, so that the pipe could be turned. In all previous devices, however, the several parts have been so arranged as to permit the turning of the pipe in one direction only, the reverse movement being accomplished by removing the wrench from the pipe and replacing it in a reverse position, this changing of the wrench back and forth in setting a pipe often causing annoying and expensive delay. My invention is intended to overcome this difficulty, and is so designed as that when the wrench is once set upon a pipe said pipe may be turned in either direction without removing the wrench.

The specific features of novelty will be particularly set forth in the claims concluding this specification.

In the accompanying drawings my invention is fully illustrated.

Figure 1 is a side view of my improved wrench gripped upon a pipe, the latter shown in section. Fig. 2 is a top view of the same. Fig. 3 is a section through the same on line $x x$ of Fig. 2. Fig. 4 is a side view of the wrench similar to that shown in Fig. 1, but "gripped" on the pipe in a reverse direction; and Fig. 5 is a section on line $y y$ of Fig. 1, showing the locking mechanism by which the free end of the chain is held after being adjusted around the pipe.

A is the handle or lever by which the leverage is acquired.

B is a shoe-plate pivoted across the end of said lever, limited in its movement in one direction by the shoulder b^2 , and having its faces $b b'$ roughened or notched, as shown, and standing in opposite directions from the middle of its length, the teeth of its heel end b being formed on a concave line, and the teeth of its free end b' being formed on a convex line, for a purpose to be presently more fully explained.

C is a flexible cord or chain, preferably made of links $c c$, as shown, secured at one end to one end of the shoe-plate B, as shown at D, and at the other end secured to the handle or lever A, preferably by passing it through an opening E made through said handle A, and securing it then by means of a locking-block F, held in position by a spring-actuated pawl G, which engages in a notch c^2 in the handle A, as shown. This locking mechanism, consisting of the block F and pawl G, I do not consider as absolutely necessary to the operation of my wrench, as any other means of securing the free end of the chain C may be used.

Referring to the shoe-plate which forms the gripping-jaw, it will be seen that its toothed face is formed partially concave and partially convex, so as to operate conjointly with the shoulder b^2 , formed on its back edge, and a corresponding shoulder b^3 , formed on the end of the lever, so that the concave toothed heel-part b of the jaw will be caused to lie up against the pipe, so as to turn it in one direction, while the convex toothed part b' acts to turn the pipe in the other direction when necessary by forcing the lever in opposite directions. In this operation the lock of the spring-latch G holds the chain to the lever in either movement thereof, for the chain is locked within the slot of the lever between corrugated surfaces $a a$, which correspond to the curved edges of the links c of the chain. Moreover, in this operation the chain is caused to pull directly from the gripping-jaw at one end and at its other end from the lever, for if both ends of the chain were connected directly to the lever the advantage and operation stated could not be obtained. The gripping-jaw is pivoted to the lever by what is known as the "rule-joint" to obtain a firm support for the jaw and to relieve the

pivot of undue strain, because the joint is formed by a solid abutment of the jaw upon the curved end of the lever, with the joint-forming web of the jaw between the slotted parts of the lever. In this construction and for effecting the advantages stated the jaw stands upon the end of the lever, so as to project about equally on opposite sides of the lever, with the coacting shoulders b^2 and b^3 on one side of said joint. To permit the free end of the chain to be drawn into the slot E of the lever, the jaw at its free end is slotted to allow the chain to pass between its ends from the pipe to the lever, as shown. Now, in turning the pipe in screwing it on the heel concave toothed part b of the jaw is forced against the pipe and causes the chain to be drawn tight and evenly around the pipe and with such force that there is no slipping or crushing of the lightest pipe, as the fulcrum of power is upon the abutments of the rule-joint, while to unscrew the same pipe the lever is moved in the opposite direction until the coacting shoulders b^2 b^3 of the rule-joint meet. The chain will then be slackened and allow the free end of the jaw to be brought in contact with the pipe and cause the chain to tighten and the jaw-teeth to bite into the pipe and hold it with a gripping force equal to that applied to screw the pipe on. In effecting this unscrewing operation the jaw is supported upon the said shoulders and allowed thereby to have a limited movement in its adjustment to screw or to unscrew the pipe.

The operation of my device is as follows: The wrench is set by placing the shoe-plate B against the pipe, leading the chain C around said pipe, so that it will closely embrace said pipe, and securing the free end to the handle or lever A, so that the chain will set snugly around the pipe. A movement of the lever A in the direction indicated by the arrow in Fig. 1 will cause the end b of the shoe-plate B to "bite" upon the pipe and the chain C to tighten, and a continued movement of the lever or handle will cause the pipe to turn. A reverse movement of the lever, as indicated by the arrow in Fig. 4, will cause the end b' of the shoe-plate B to bite into the pipe, and the end b of the shoe-plate B will be raised from the pipe by reason of the limited movement of the plate and will tighten the chain

C, and the pipe may be turned in the reverse direction.

In wrenches intended to be used on small pipes the shoe-plate B may be bifurcated or slotted on the end toward the free end of the chain, as shown at H.

What I claim is—

1. In a chain-wrench, the combination, with the lever having the end shoulder or abutment b^3 , of a gripping-jaw having its toothed face concave at b and relatively convex at b' , and having the back edge shoulder b^2 , the said jaw being pivoted to the end of the lever for co-operation of the said shoulders with the said concave and convex toothed parts, and the chain connected to one end of said gripping-jaw, whereby the wrench may be operated in either direction to screw or to unscrew the pipe without removing it therefrom.

2. In a chain-wrench, the combination of the lever having the slot E, the notch c^2 , and the end shoulder or abutment b^3 , the gripping-jaw having its toothed face concave at b and relatively convex at b' , and constructed with the back shoulder b^2 , the pivot connecting said jaw with the lever at one side of the said joint-shoulders b^2 and b^3 , the chain having one end pivoted to the heel of the jaw, and the slide F in the lever-slot, and provided with a locking-latch G, substantially as described, for the purpose specified.

3. In a chain-wrench, the combination of the lever having the slot E and the notch c^2 , a gripping-jaw pivoted to the end of said lever, and a chain connected to one end of said pivoted jaw, with means for locking said chain to the lever, consisting of the slide F, secured within said slot, and the spring-latch G, carried by said slide and operating in the said notch, the said slide and the end of the lever-slot having coincident swells a a , corresponding to the curved edges of the chain, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 5th day of June, 1888.

JOHN D. MORAN.

Witnesses:

A. HAMILTON REAVEY,
JOHN F. LOVEJOY.