

No. 698,086.

Patented Apr. 22, 1902.

S. W. WARDWELL & H. H. RICKER.
WRENCH.

(Application filed Aug. 20, 1901.)

(No Model.)

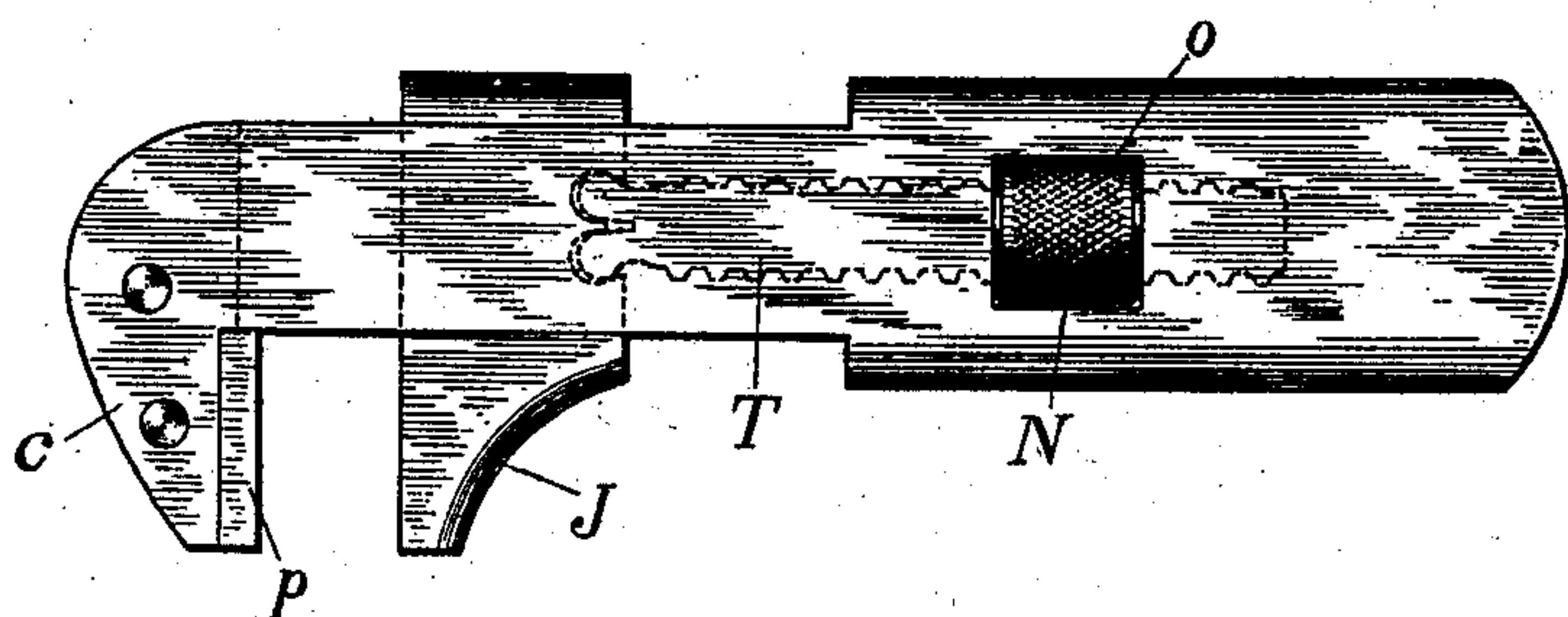


Fig. 1.

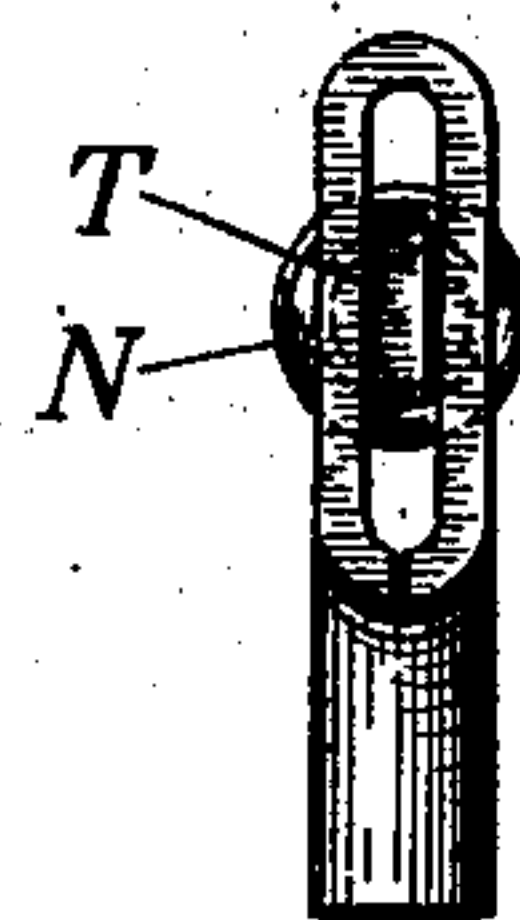


Fig. 2.

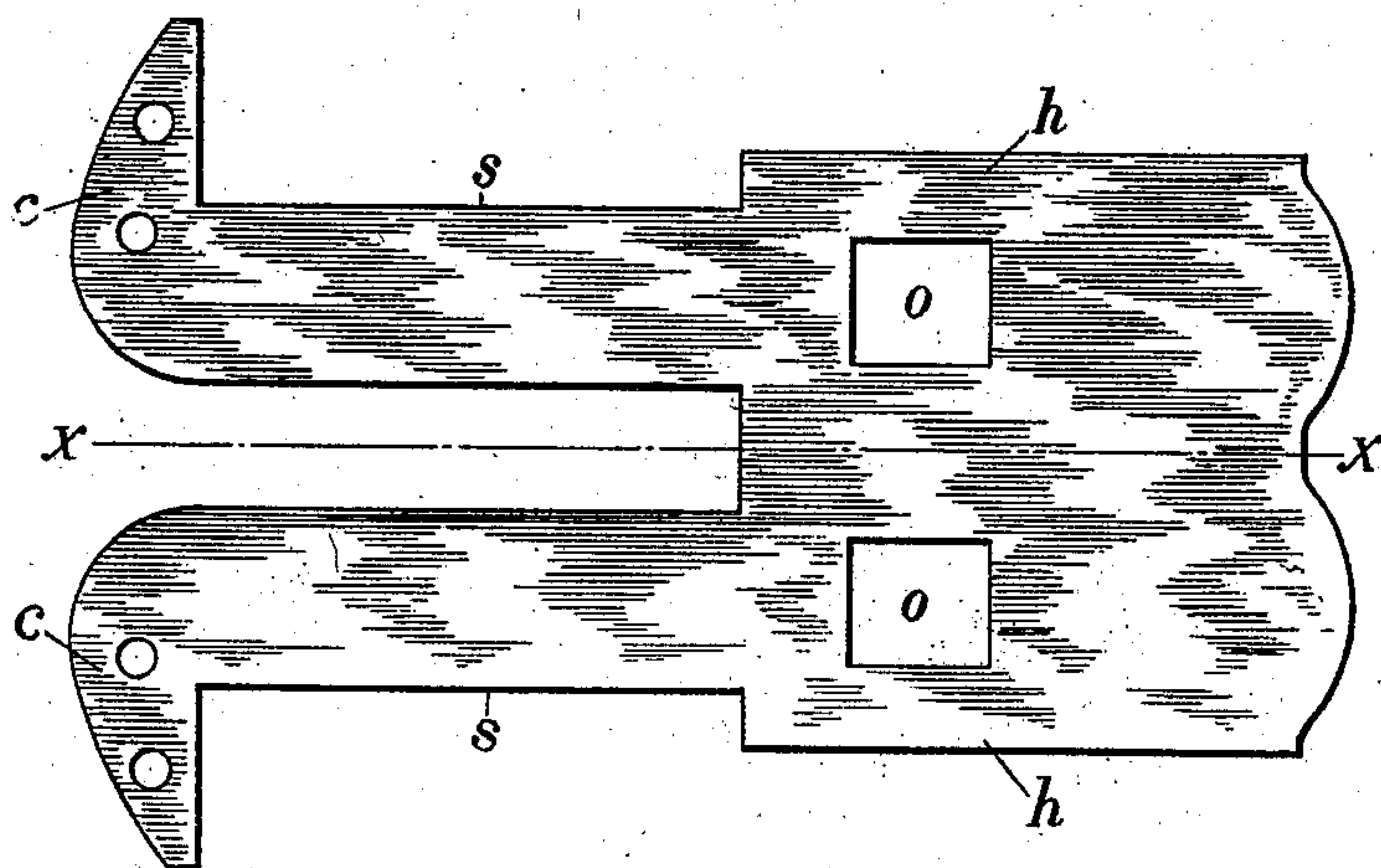


Fig. 3.

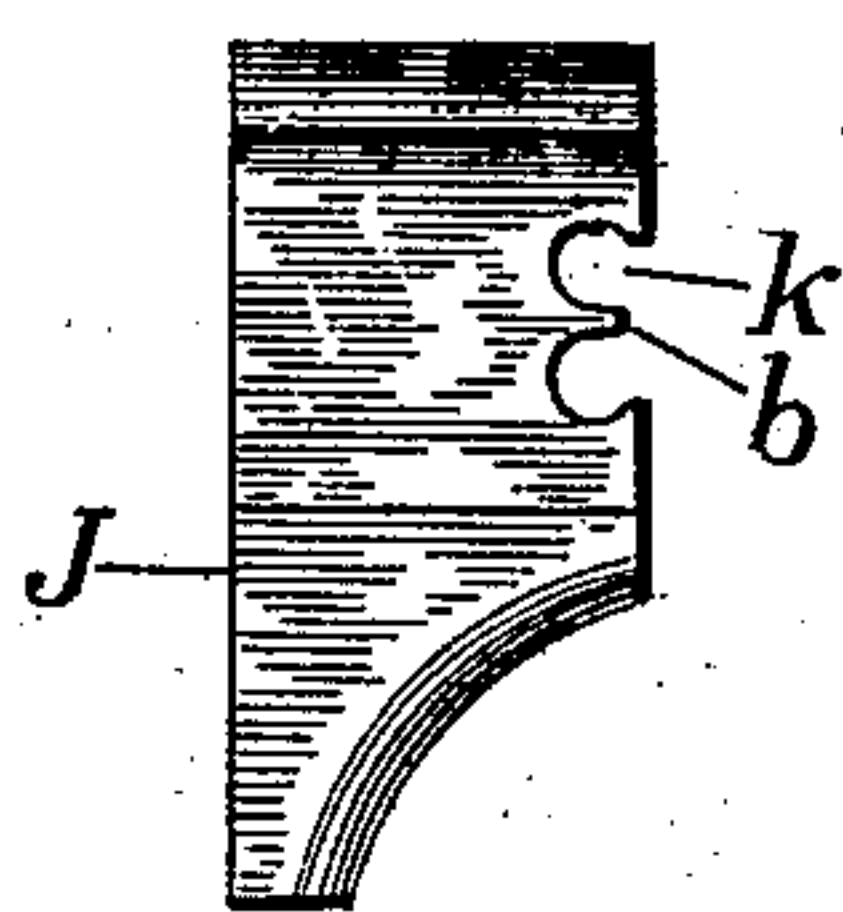


Fig. 4.

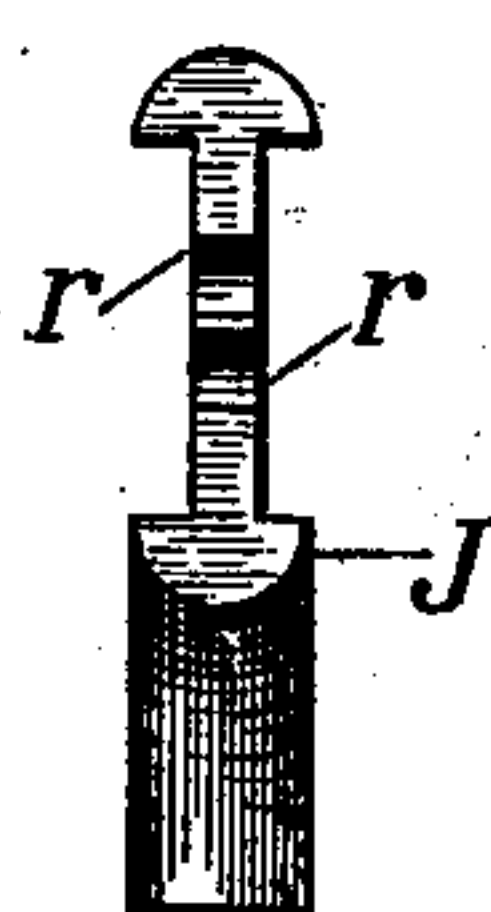


Fig. 5.

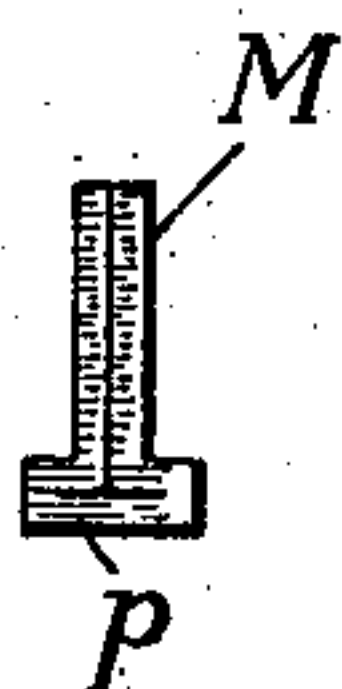


Fig. 6.

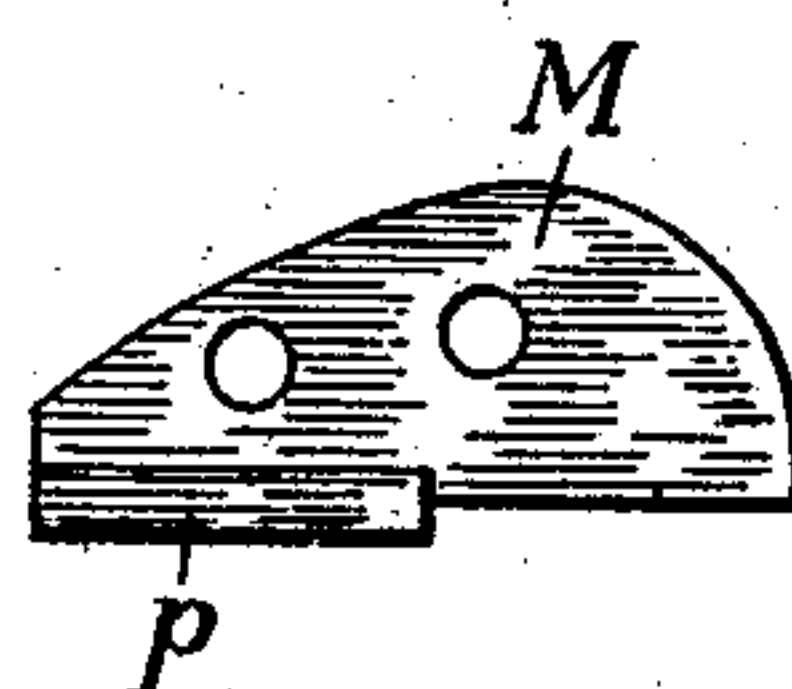


Fig. 7.

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WRENCH.

SPECIFICATION forming part of Letters Patent No. 698,086, dated April 22, 1902.

Application filed August 20, 1901. Serial No. 72,686. (No model.)

To all whom it may concern:

Be it known that we, SIMON W. WARDWELL, residing at Providence, county of Providence, State of Rhode Island, and HENRY H. RICKER, residing at Attleboro, Bristol county, State of Massachusetts, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

Our invention relates to improvements in wrenches; and its purpose is to produce an inexpensive wrench which shall be strong, efficient, and well-finished.

In the accompanying drawings, Figure 1 is a side view of the wrench. Fig. 2 is an end view of the same. Figs. 3, 4, 5, 6, and 7 show details of the structure.

The wrench illustrated is of a well-known type; and our invention comprises novel and improved structural features hereinafter disclosed.

The body of the wrench is made from a single piece or blank of sheet-steel, cut in the form indicated in Fig. 3, which comprises two side members of the wrench symmetrically posed relative to the line $x x$, on which line the blank is folded to bring the corresponding portions of the side members together to form the wrench-body. Each of the side members comprises a head portion c , a guide s for the movable jaw J , and a handle portion h . Before the blank is folded the hardened movable jaw J is placed in such position that when the blank is folded the two side portions $s s$ are thrown into the channels $r r$ in the sides of the jaw. Between the sides of the head is inserted a hardened filling-piece M , formed with a T-flange at p , which covers and protects the edges of the head sides $c c$ and forms the fixed jaw of the wrench. The filling-piece is held in position by rivets without brazing, soldering, or other similar means. The rivets are subjected to no strain, for all stress due to use of the wrench is sustained by the head sides $c c$, against the edges of which the jaw p bears. The movable jaw J is mounted to slide between the guide members $s s$, which fit the channels $r r$ in the sides of the jaw, and it is moved and adjusted in position from the nut N , mounted

in the rectangular openings $o o$ in the handle of the wrench. Engaging with the nut N and extending between the sides of the wrench is the thread-bar T , which is joined to the jaw J . In the edge of the jaw J which is opposed to the nut N is cut a recess k , narrowest at the edge of the jaw and widening in substantially dovetail form as it extends into the jaw. At the bottom of this recess and opposite its entrance is a wedge-shaped tongue or projection b , with its sharp end pointing toward the entrance of the recess.

The thread-bar T is split at one end, which is made just wide enough to freely enter the mouth of the recess k . When the thread-bar is forced into the opening k , the wedge b enters the split in its end and spreads the latter, so it cannot be withdrawn from the jaw, but not so much as to fill the recess and cause the joint to bind. This device is entirely adequate to secure the thread-bar in place, for never in the operation of the wrench is there brought upon the joint with a tendency to separate the parts a stress sufficiently great to tear the thread-bar from the jaw.

While the wrench is in use, the tendency of the stresses to which it is subjected is to force the joint together rather than to tear it apart.

By means of the improved construction above described a more effective, better finished, and less expensive wrench can be produced.

Sheet-steel wrenches of the type indicated have been constructed with a thin filling-piece in the head, which served only for a "filling-piece," as its name signifies. It was therefore necessary that the side pieces $c c$ should be hardened to withstand the wear of use. This could be expediently and economically accomplished only by hardening the whole wrench. Were the filling-piece secured only by rivets, it would be loosened by the heating and subsequent quenching of the hardening process, and, moreover, the rivets would be inadequate to withstand the strain that would be brought to bear on them. To insure strength, it was secured by brazing, an operation which is unsatisfactory, because of the

difficulty in removing the flux from the surfaces adjoining the brazed joint, thus adding to the expense of polishing and finishing. Further, when the whole wrench was hardened it was liable to distortion and strain and required straightening, which entailed extra work and a liability to injure and mar the surface of the wrench. Both in brazing and in hardening the wrenches were subjected to additional handling, that increased their liability to dents and scratches.

The wrenches needed to be cleaned of both flux and dirt from hardening, not only to insure excellence of finish, but freedom of working as well.

With our new construction there can be no binding of the moving parts, because of distortion, for there is no operation which tends to distort the wrench, neither because of accumulated dirt or other matter, for no flux is employed, and in any event the parts can be thoroughly cleaned before assembling.

With our novel system of joining the movable jaw and thread-bar there is no possibility of binding at this point, for the shape and size both of the end of the thread-bar and of the recess in the jaw are so proportioned that the thread-bar is spread only enough to insure against its withdrawal from the jaw.

What we claim as our invention is—

1. A wrench having a body comprising head portions, a handle, and jaw-guides intermediate said head and handle, all formed from one piece of sheet metal, and a movable jaw arranged between the head and handle on said guides, substantially as described.

2. A wrench having a body comprising head portions, a handle, and jaw-guides intermediate said head and handle, all formed from one piece of sheet metal, a movable jaw arranged between the head and handle on said guides, and a hardened jaw inserted between said head portions, substantially as described.

3. The combination in a wrench with a fixed jaw, a movable jaw, and a nut for moving the jaw, of a thread-bar to connect the movable jaw and the nut having a split end, a recess of substantially dovetail form in the edge of the movable jaw, and a wedge-shaped projection of the said jaw extending into the

recess and against which the split end of the thread-bar can be driven to effect its junction with the jaw, as described.

4. The combination in a wrench having a nut, and a jaw to be moved therefrom with a recess in its edge, of a wedge-shaped projection of the jaw extending into the recess, and a thread-bar to connect the nut and the jaw having a split end adapted to be forced upon said projection to effect a junction of the jaw and thread-bar, substantially as described.

5. The combination in a wrench, of a body comprising a handle portion, sides for the head and guides for a movable jaw intermediate the handle and the head, a hardened jaw inserted between the sides of the head and secured by rivets, and a removable jaw adjustable to and from the fixed jaw.

6. The combination in a wrench with a body formed from a single piece of sheet metal comprising a handle, sides for the head, and guides for a movable jaw intermediate the handle and the head, a hardened jaw inserted between the sides of the head and secured by rivets, a jaw movable in the guides and adjustable in position by a nut mounted in the handle, and a thread-bar engaging the nut and having a split end to enter a recess in the movable jaw to engage the split end of the thread-bar, substantially as described.

7. The combination in a wrench, with a fixed jaw, a movable jaw, and a nut for moving the jaw, of a substantially dovetail-shaped recess in the edge of the jaw, a wedge-shaped projection of the jaw extending into the recess, and a thread-bar having a split end, adapted to be entered into said recess and after having been so entered to be then forced against said projection and spread to substantially fill the recess, for the purpose and in the manner substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL.
HENRY H. RICKER.

Witnesses:

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EDWIN C. SMITH.