

S. W. WARDWELL, Jr.
WRENCH.

No. 573,940.

Patented Dec. 29, 1896.

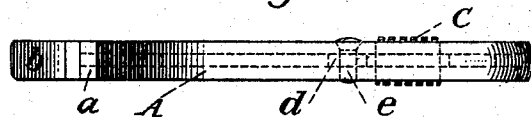
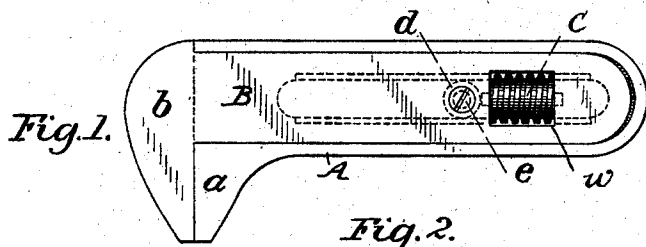


Fig. 4.

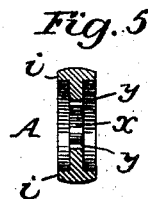
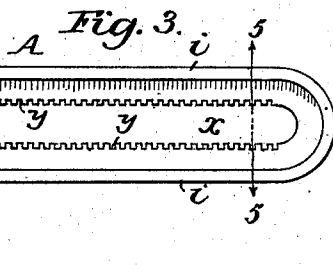


Fig. 6.

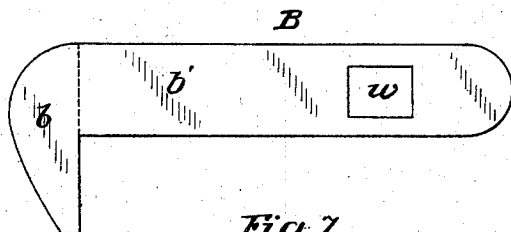
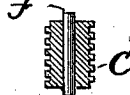


Fig. 8.



Fig. 9.



Witnesses
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 10.

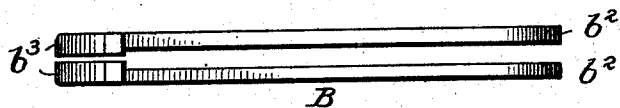


Fig. 11.

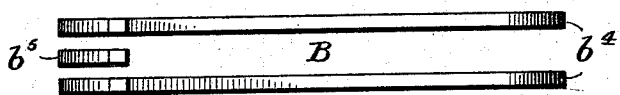


Fig. 12.

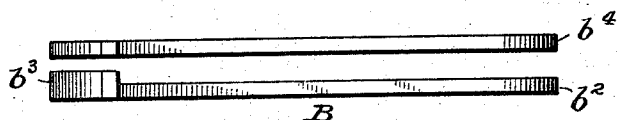
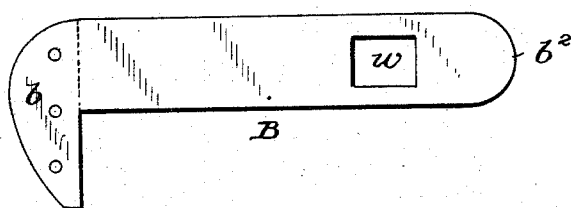


Fig. 13.



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WRENCH.

SPECIFICATION forming part of Letters Patent No. 573,940, dated December 29, 1896.

Application filed May 28, 1896. Serial No. 593,471. (No model.)

To all whom it may concern:

Be it known that I, SIMON WILLARD WARDWELL, Jr., a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

The object of my invention is a wrench so constructed as to reduce the number of parts, facilitate manufacture, and permit easy manipulation to adjust the distance between the jaws; and to this end I construct a wrench as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a wrench embodying my improvements. Fig. 2 is an edge view thereof. Fig. 3 is a face view of the handle member of the wrench. Fig. 4 is an end view of Fig. 3; Fig. 5, a section on the line 5 5, Fig. 3. Fig. 6 is a face view of the sliding member. Fig. 7 is an edge view of Fig. 6. Fig. 8 is a view of the worm. Fig. 9 is a section of the worm. Figs. 10 to 13 illustrate different ways of making the sliding member.

The wrench consists, essentially, of three main parts, to wit: what I term the "handle member" A, the sliding member B, and the worm C.

The handle member A carries the inner or fixed jaw *a*, of any suitable construction, and has on opposite sides parallel ribs *i i*, and it also has a longitudinal slot *x*, the inner edges of which are formed into teeth constituting two parallel racks *y y*. Preferably, as shown in Figs. 1 to 5, the member A is punched from a single homogeneous piece of metal with a rounded end, the rib *i* following the edge of this member along the rounded end and at opposite sides. If desired, however, this member may be otherwise formed, providing, however, it has the channels formed by the guide-ribs *i i* and jaw *a*.

The member B has a head constituting the outer or movable jaw *b*, from which extend two parallel flat stems *b' b'*, each of such a width as to fit nicely and slide freely, but without play, in the channel between the guide-ribs *i i* at one side of the member A. In the stems *b' b'* are formed coincident openings *w*, adapted to receive the worm C. This worm is put in place after the stems *b'* have been inserted sufficiently in the channels of

the member A, formed by the ribs *i i*, to bring the openings *w* opposite the slots *x*. As thus inserted the worm engages the opposite racks *y y*, and by turning the worm the member B may be carried in or out and held fixedly in position with practically no play, the hub of the worm bearing at each end against the adjacent end of each slot *w*.

The worm is suitably centered. Thus it may have a pin *f* driven into the worm, or the latter may be formed with projecting trunnions, as shown in Fig. 8.

As shown in Figs. 6 and 7, the head *b* and stems *b' b'* of the member B are formed all of one single continuous piece, which is first cut into suitable shape, then milled to separate the stems *b' b'*, and then slotted, forming the openings *w w*. While this is a preferable construction, the member B may consist of two sections *b² b²*, Fig. 10, formed each with a thickened end piece *b³*, which end pieces may be brought together and riveted, as indicated in Fig. 13, or, as shown in Fig. 11, this member B may consist of flat pieces *b⁴ b⁴*, stamped of the shape shown in Fig. 13, with a distance-piece *b⁵*, riveted between the head portions, or, as shown in Fig. 12, the member B may consist of a flat piece *b⁴* and a piece *b²*, having a thickened head portion *b³*, riveted to the corresponding portion of the part *b⁴*.

While the construction illustrated in Figs. 1 to 7 reduces the number of parts and the extent of manipulation of manufacture and is attended with other advantages, the above-described wrench, however the parts may be formed, secures a proper distribution of metal to resist the strains, large bearing-surfaces at the portions of the structure subjected to the greatest wear, is extremely simple in its construction, so that it could be manufactured at a small cost, while it presents no protuberances or projecting parts likely to injure the hand and is extremely compact and can be readily manipulated.

In order to prevent any possible spreading of the parallel stem portions *b' b'*, I prefer to connect them in some suitable manner—as, for instance, by a screw-bolt or rivet *e*, passing through an intermediate washer or distance-piece *d*. The intermediate washer or part *d* provides shoulders against which the stem portions *b'* bear, thus avoiding any tend-

ency for the wrench to bind from the bearing of the stems against the intermediate portion.

While I have shown and prefer a worm engaging the racks for moving the movable member of the wrench, any other suitable means for shifting and holding this part may be employed, and, if desired, one of the racks may be dispensed with.

When the studs or trunnions are formed on the worm, the latter is introduced into place by first spreading the stem portions b' b' apart and then bringing them together, inclosing the worm. If the latter has a separate pin f , the pin may be introduced longitudinally after the worm is in place.

Without limiting myself to the precise construction of parts shown, I claim as my invention—

1. In a wrench, the combination with a handle member provided at one edge with a jaw and having longitudinal channels upon opposite sides, of a movable member having two separated plates parallel throughout and adapted to be introduced longitudinally into and fit said side channels, and a jaw connected to the separated plates, and adjusting devices, substantially as described.

2. The combination in a wrench of the member A having a jaw a , channels on opposite sides, a slot x with edge racks, a member B

having a jaw b , two parallel stems fitting the said channels, recesses w , and a worm C engaging said racks and extending into the said recesses, substantially as set forth.

3. In a wrench the combination with the handle member formed with a jaw and with a slot having edge teeth, of a movable member formed with a jaw and with parallel separated stems adapted to fit upon opposite sides of the handle member, said stems being provided with recesses, and a worm in said recesses for engaging the teeth at the edge of the opening in the handle member, substantially as described.

4. A wrench provided with a member A, comprising both the handle and the inner jaw with side channels and with a central slot having edge teeth adapted to engage a worm or other device for shifting the movable member of the wrench, the latter with parallel stem fitting the channels and recessed to receive the worm, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON WILLARD WARDWELL, JR.

Witnesses:

EDWIN D. SMITH,
H. A. COOK.