

No. 837,254.

PATENTED NOV. 27, 1906.

M. WENGER.
WRENCH.

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Fig. 1.

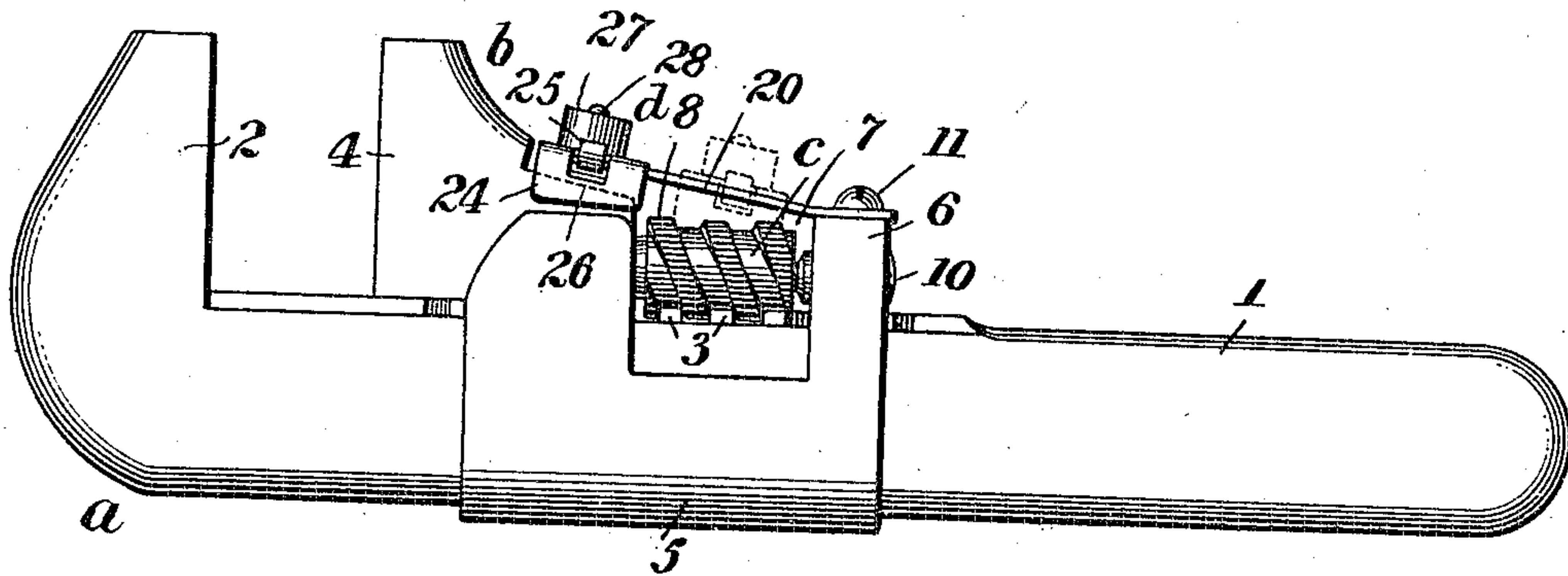


Fig. 2.

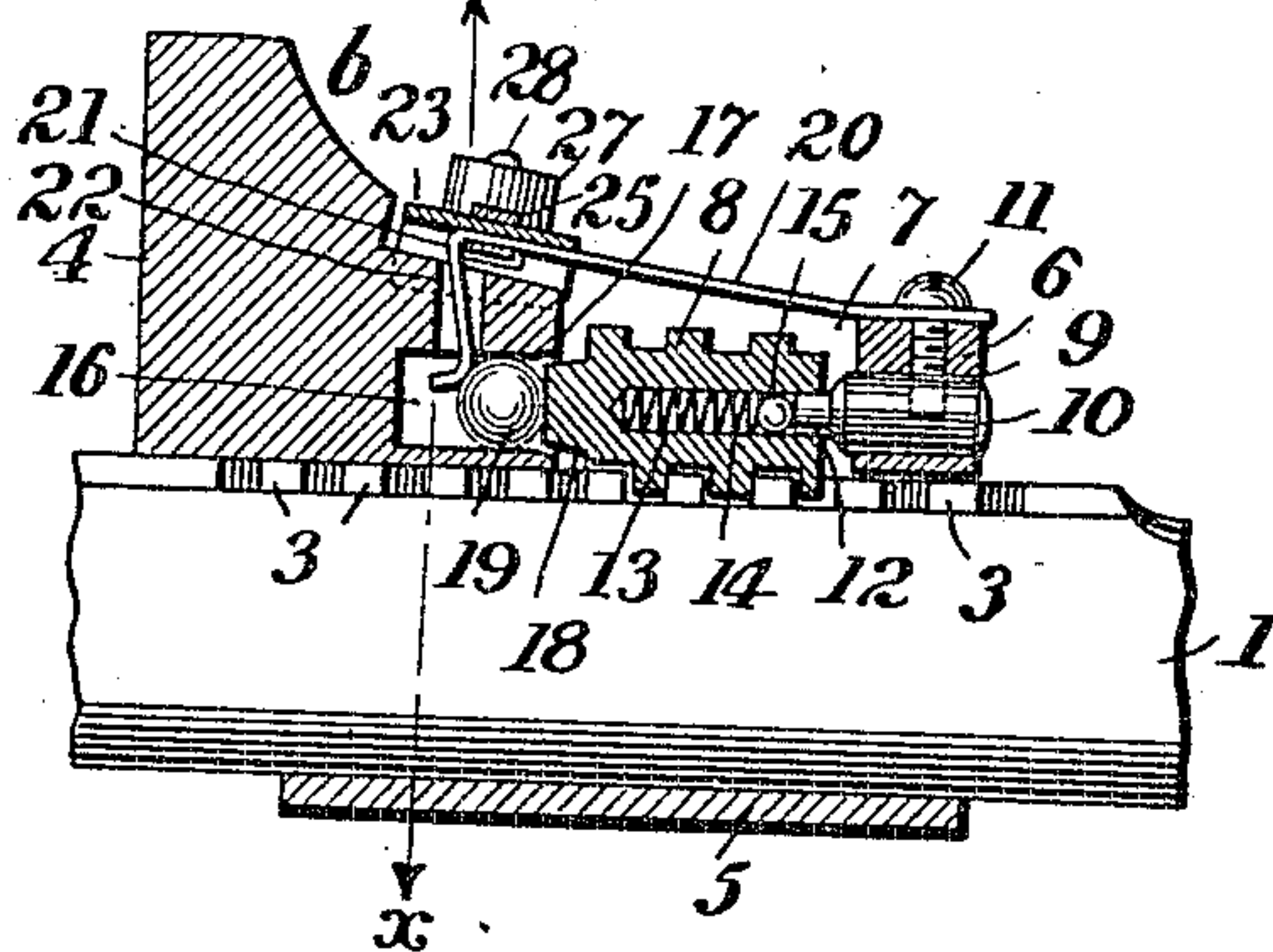


Fig. 3.

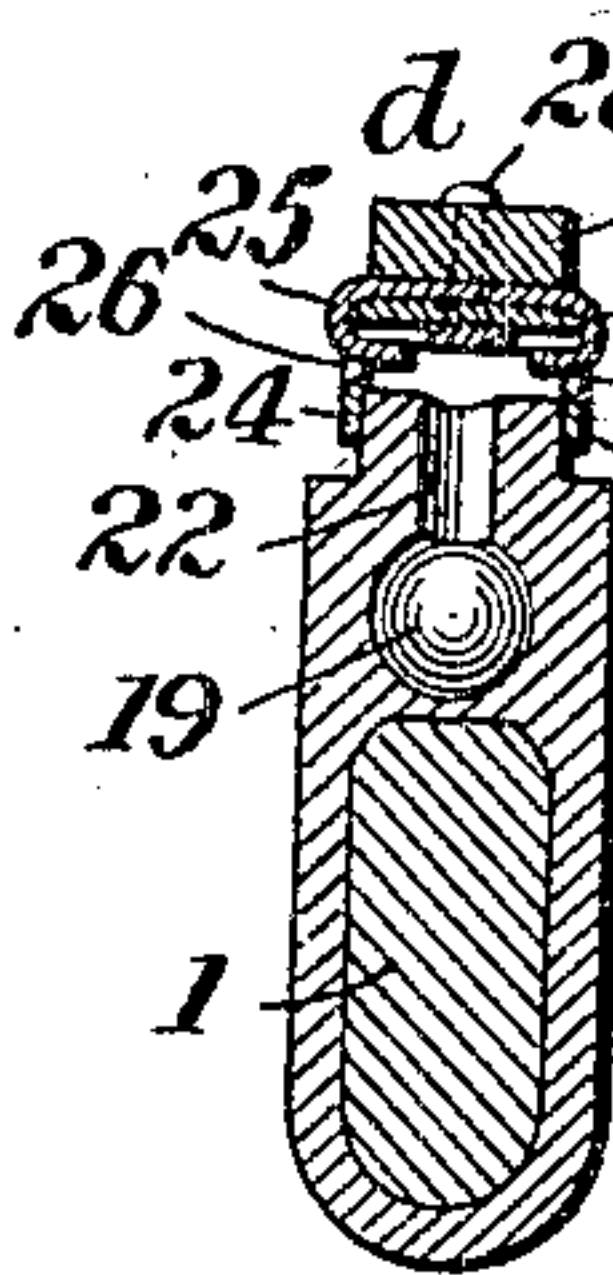


Fig. 4.

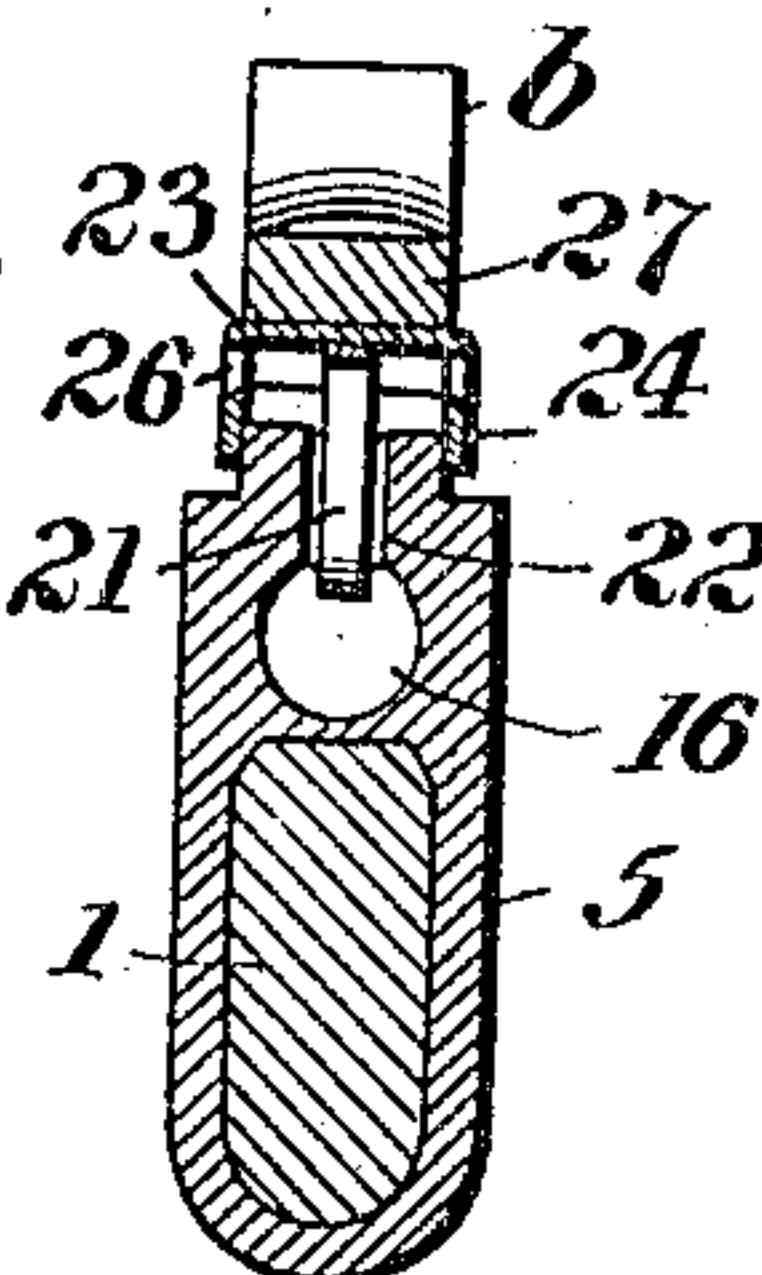


Fig. 5.

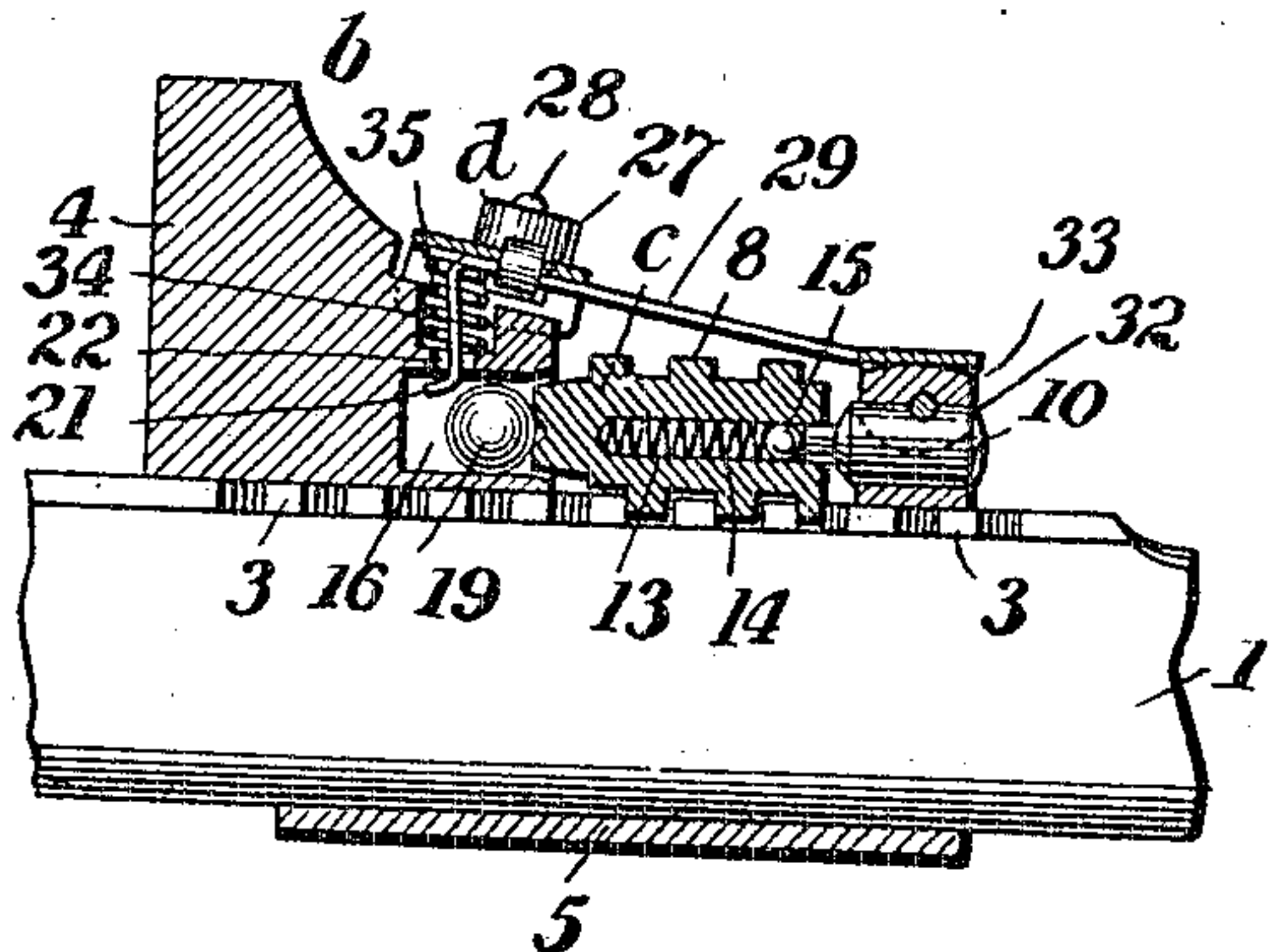


Fig. 6.

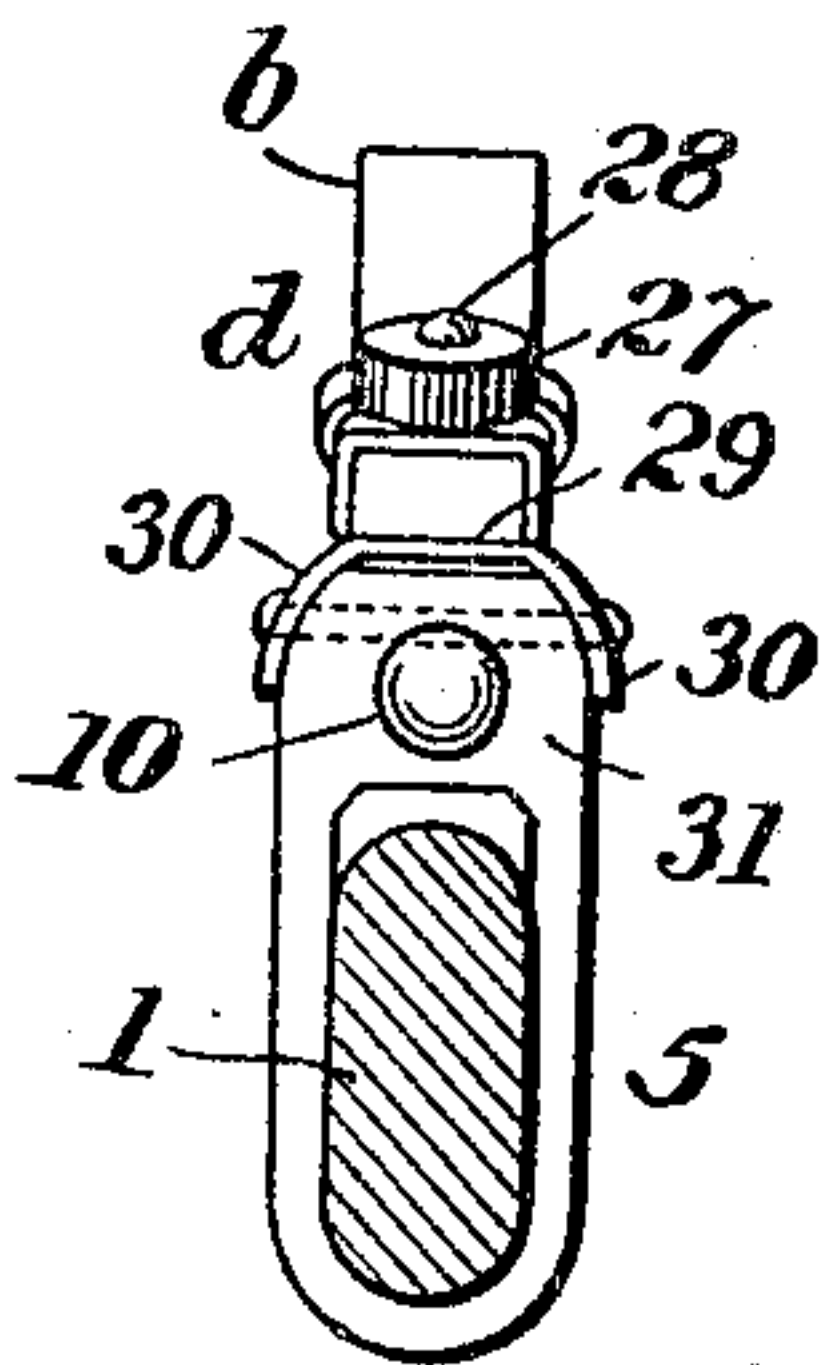
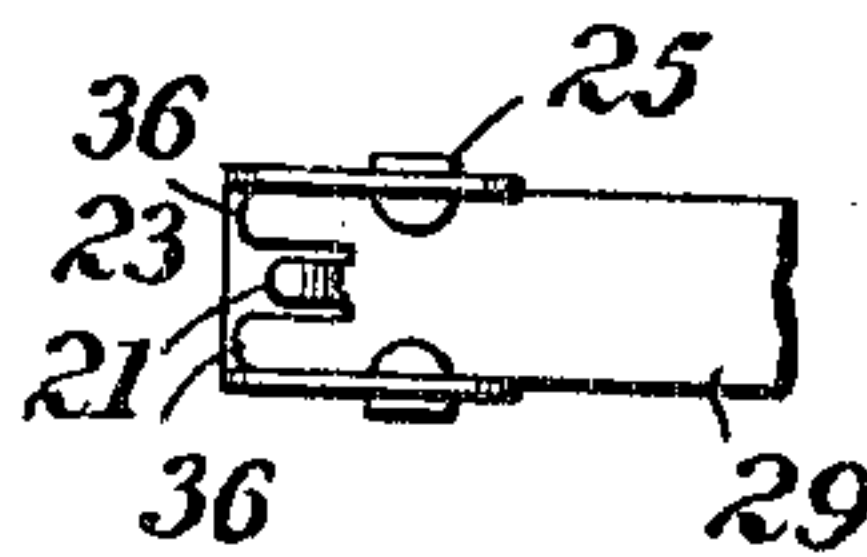


Fig. 7



Witnesses

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WRENCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MILTON WENGER, a citizen of the United States, residing at New Holland, in the county of Lancaster and State of Pennsylvania, have invented new and useful Improvements in Wrenches, of which the following is a specification.

The present invention relates to improvements in wrenches of the kind shown in my former Patent, No. 743,360, in which a worm is journaled in one member of the wrench and engages a rack upon the shank of the other member, this worm being adapted to turn freely when the wrench-jaws are pressed toward one another and to bind against the member which supports it when pressure is applied to the jaws tending to force them apart.

In the accompanying drawings, Figure 1 is a side view of a wrench embodying my invention. Fig. 2 is a central longitudinal section through the movable member of the wrench, a portion of the shank of the fixed member being shown in side view. Fig. 3 is a section on the line $x x$ of Fig. 2 looking to the right. Fig. 4 is a similar view looking to the left. Fig. 5 is a view similar to that shown in Fig. 2, illustrating a modification of the invention. Fig. 6 is a rear end view of the movable member of the wrench illustrated in Fig. 5, the shank of the fixed member being shown in cross-section; and Fig. 7 is an inverted plan view of the forward end of the finger-piece shown in Fig. 6.

Referring to Figs. 1-4, inclusive, of the drawings, a indicates what is usually termed the "fixed" member of the wrench and which comprises the shank 1 and the jaw 2. The shank has upon one edge a rack consisting of a series of inclined teeth 3, these teeth being preferably integral with the shank. The movable member b of the wrench comprises the jaw 4 and the yoke or strap 5, which extends around the shank of the fixed member and holds the movable member in sliding engagement with the shank. The movable member has a portion at the rear of the jaw cut away, leaving a post or standard 6 projecting over the rack at the rear end of the yoke and separated from the jaw by a gap or recess 7. Within this recess is arranged the worm c , having threads 8, which engage the teeth 3 on the fixed member. The threads on the worm are knurled, as shown, so that the worm may be easily turned by hand when desired.

As shown in Fig. 2, the post 6 has a bore 9 extending through it from front to rear, and a plug 10 is removably secured within this bore by a set-screw 11. This plug has at its forward end a pintle 12, which fits within an axial bore 13 in the worm c , the pintle thus serving as a bearing upon which the worm may turn and also move longitudinally. The bore 13 contains a spring 14, arranged between the pintle and the forward end of the bore, and a ball 15 is preferably arranged between the spring and the pintle to reduce the friction between said parts when the worm is rotated. A cylindrical bore or recess 16 extends into the jaw 4 from its rear end concentric with the pintle 12, and the wall of the recess at its rear end or entrance converges inwardly or forwardly, as shown at 17, to afford a tapering seat or bearing for the forward end 18 of the worm, which also is tapering or conical, as shown, and extends into the tapering end of the recess for a short distance. The worm has a limited longitudinal play relatively to its bearings, so that the conical end of the worm may engage the conical seat or be disengaged therefrom. When the jaws are moved toward one another, the threads on the worm will be pressed against the teeth on the rack and the worm will therefore compress the spring 14 and slide rearwardly relatively to its bearings. The conical end of the worm will thus be disengaged from its seat, so that the worm can rotate freely while the jaws are being pressed toward one another, the seat referred to, however, still serving as a guide or bearing for the conical end of the worm, which fits into it loosely. When the closing movement of the jaws stops, the spring 14 expands and presses the worm forward, so that the conical surfaces are again brought closely together. When pressure is applied in the opposite direction to separate the jaws, the conical seat in the movable jaw frictionally engages the conical end of the worm and binds against it, these parts forming friction clutch members, which prevent the rotation of the worm when pressure is applied to separate the jaws. In applying the wrench to an object, such as a bolt, which it is desired to turn the movable jaw can slide freely forward until it engages the object, and after the forward pressure on said member is released the worm c may be turned by hand to further adjust the member in either direction, if desired or necessary.

The construction and operation of the

parts thus far described are substantially the same as in my former patent referred to. In the present invention, however, in order to enable the operator to move the jaw 4 freely backward away from the fixed jaw 2 means are provided for holding the conical end of the worm off of its seat in the movable jaw, so that these clutch portions cannot engage and bind when the jaws are pressed or pulled apart. As shown, the recess 16 extends for some distance into the head 4 beyond the forward end of the worm, and a ball 19 of nearly the same diameter as the recess is arranged therein and adapted to bear upon the end of the worm. A finger-piece 20, consisting of a strip of spring metal, has one end secured to the post 6 by the screw 11, and the strip extends past the forward end of the worm and has an arm 21 extending through an opening 22 in the jaw into the recess 16, the free end of this arm bearing upon the forward side of the ball 19 and above the axial line of the worm, the arrangement being such that when the spring finger-piece 20 is pressed toward the worm the arm 21 will press upon the cam-surface of the ball and the latter will bear against the end of the worm, and the worm will be forced backward, thus disengaging its conical end from the seat in the jaw. While the finger-piece is depressed the member *b* may be moved freely backward and when the finger-piece is released it returns to normal position, thus relieving the pressure upon the end of the worm and permitting the conical surfaces to engage one another, as before.

The antifriction-ball 19 is preferably employed to afford a cam-surface for the arm on the finger-piece to bear against to force the worm backward; but it will be evident that this ball, in effect, is the same as an extension of the worm and the result would be the same if the worm were extended and provided with a rounded or inclined end to serve as a cam-surface.

A slide *d* is suitably supported upon the finger-piece and movable from the position shown in full lines in Fig. 1 to that shown in dotted lines. This slide, as shown, comprises a saddle consisting of a strip of metal 23, extending over the finger-piece and having right-angled flanges 24, which fit over the sides of the wrench when in the position shown in full lines, and which are adapted to engage the knurled surface of the worm when the slide is moved rearwardly, thus locking the worm against movement in either direction. The saddle is held in sliding engagement with the finger-piece by a metal strip 25, extending across the saddle and having its ends turned inwardly around the edges of the finger-piece through openings 26 in the flanges 24, the strip 25 being secured to the saddle and to a knob 27 by means of a rivet 28, passing through each.

By means of the knob the slide may be readily moved rearward to grip the worm or forward out of the way.

In the modification shown in Figs. 5, 6, and 7 the features of the wrench are the same as in the previously-described figures, except as to the details of construction and manner of mounting the finger-piece.

As shown in Figs. 5 and 6, the finger-piece 29 has curved flanges 30 at its rear end which fit over the sides of the post 31, these sides being correspondingly curved, and a pin 32 extends through the flanges and post and through a transverse groove in the plug 10, (see Fig. 5,) the pin serving as a pivot for the finger-piece and also as a means for securing the plug within the post or standard. The top of the post is also convexly curved from front to rear, as indicated by the numeral 33, so that the finger-piece may rock thereon. Concentric with the opening 21 is a larger opening or socket 34, within which is arranged a helical spring 35, and the tongue or arm 21 on the finger-piece extends centrally through the spring and through said openings into the recess 16. Tongues 36, Fig. 7, project forward from the end of the finger-piece at each side of the tongue 21, and these tongues rest upon the upper end of the spring. In this case it will be seen the finger-piece is spring-supported at its forward end and hinged at its rear end, while in Figs. 1-4, inclusive, the finger-piece is made of spring metal and rigidly secured at its rear end to the post. The operation is the same in both forms, as will be evident.

Having described my invention, what I claim is—

1. In a wrench a fixed member having a shank with inclined teeth, a movable member, a worm journaled in said movable member and engaging the teeth on the shank, said worm and movable member having parts adapted to interlock when the movable member is pressed backward on said shank, and means upon the movable member for holding said interlocking parts out of engagement with one another.

2. In a wrench a fixed member having a shank with inclined teeth, a movable member, a worm journaled in said movable member and engaging the teeth on the shank, said worm and movable member having parts adapted to interlock when the movable member is pressed backward on said shank, a spring normally tending to press said parts into engagement with one another, and means upon the movable member for holding said interlocking parts out of engagement with one another.

3. In a wrench a fixed member having a shank with inclined teeth, a movable member, a worm journaled in said movable member and engaging the teeth on the shank, said worm and movable member having

parts adapted to interlock when the movable member is pressed backward on said shank, and means upon the movable member for applying pressure to the forward end of the worm to disengage said parts.

4. In a wrench a fixed member having a shank with inclined teeth, a movable member, a worm journaled in said movable member and engaging the teeth on the shank, said worm and movable member having parts adapted to interlock when the movable member is pressed backward on said shank, said movable member having a recess in front of the worm, and a finger-piece extending into said recess and adapted, when operated, to press rearwardly upon the end of the worm.

5. In a wrench a fixed member having a shank with inclined teeth, a movable member, a worm journaled in said movable member and engaging the teeth on the shank, said worm and movable member having parts adapted to interlock when the movable member is pressed backward on said shank, and a spring-pressed finger-piece upon the movable member adapted, when operated, to move the worm relatively to the movable member, to disengage said parts.

6. In a wrench, a fixed member having a shank with inclined teeth, a worm having exterior threads engaging the teeth on the shank, said worm having its forward end conical or tapering, a movable member having a bearing for the rear end of the worm and having a recess with a conical seat or bearing for the forward end of said worm, a spring tending to press the worm against said conical bearing, and a finger-piece attached to the movable member and extending into said recess for the purpose set forth.

7. In a wrench, a fixed member having a

shank with inclined teeth, a worm having exterior threads engaging the teeth on the shank, said worm having its forward end conical or tapering, a movable member having a bearing for the rear end of the worm and having a recess with a conical seat or bearing for the forward end of said worm, a spring tending to press the worm against said conical bearing, a ball within said recess, and a finger-piece adapted to press said ball against the end of the worm.

8. In a wrench, a fixed member having a shank with inclined teeth, a worm engaging said teeth, said worm having a clutch-surface at its forward end, a movable member having a bearing for the rear end of the worm and a recess in front of the worm, said recess having a seat therein for the forward end of the worm, a spring normally pressing said worm toward said seat, and means for pressing said worm away from said seat comprising a spring finger-piece attached to the rear end of the movable member and having a part extending into said recess.

9. In a wrench, a fixed member having a shank with inclined teeth, a worm engaging said teeth, said worm having a clutch-surface at its forward end, a movable member having a bearing for the rear end of the worm and a recess in front of the worm, said recess having a seat therein for the forward end of the worm, a spring normally pressing said worm toward said seat, and a slide on said finger-piece having flanges adapted to engage the sides of the worm.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

MILTON WENGER

Witnesses:

FRANK SNADER,
L. Z. BRIMMER.