F. W. TRABOLD.

ADJUSTABLE SPANNER WRENCH.

APPLICATION FILED NOV. 23, 1919.

1,402,686.

Patented Jan. 3, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

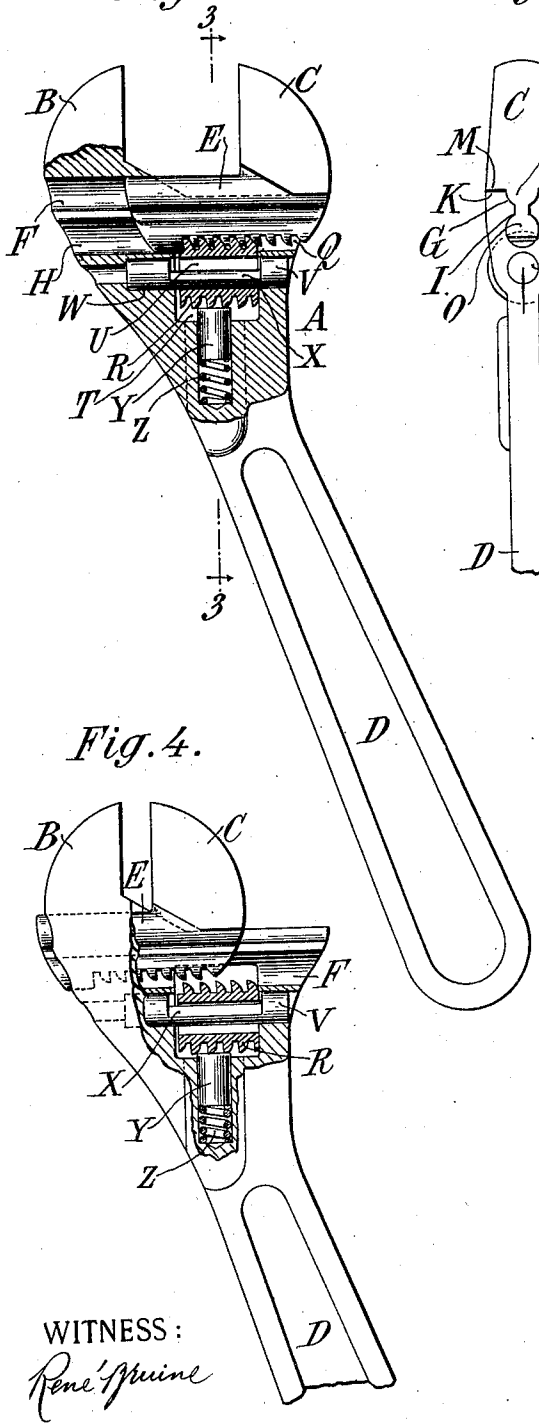


Fig. 2.

Fig. 3.

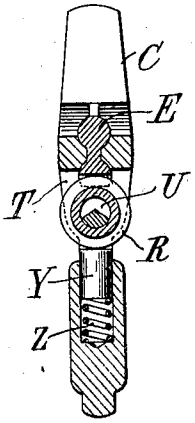


Fig. 5.



Fig. 5a.



Fig. 4.

WITNESS:

René Spuine

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2 SHEETS—SHEET 2.

Fig. 6.

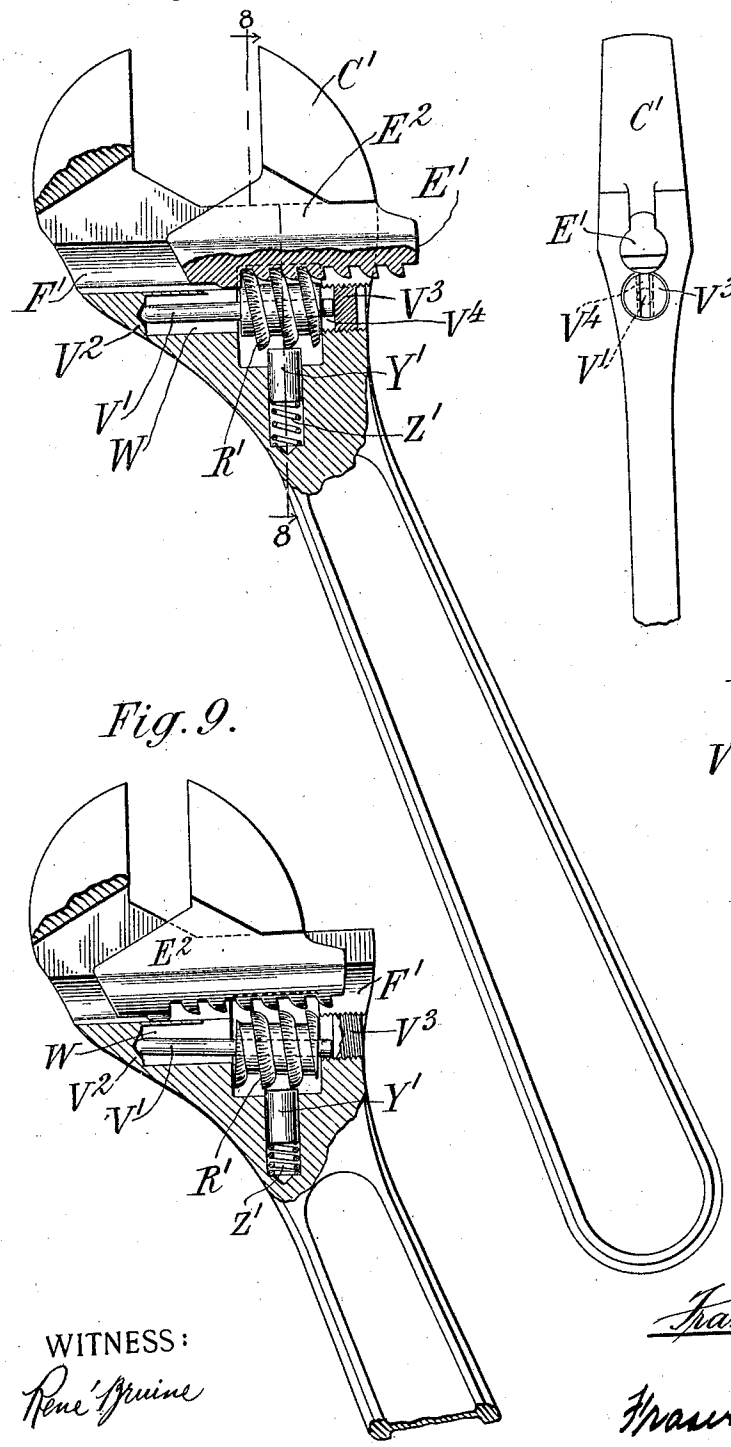


Fig. 7.

Fig. 8.

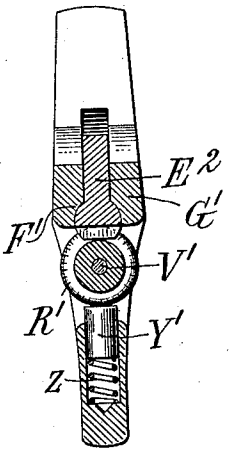


Fig. 11.

Fig. 10.



Fig. 9.

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UNITED STATES PATENT OFFICE.

FRANK W. TRABOLD, OF BROOKLYN, NEW YORK, ASSIGNOR TO J. H. WILLIAMS & CO., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

ADJUSTABLE SPANNER WRENCH.

1,402,686. Specification of Letters Patent. Patented Jan. 3, 1922.

Application filed October 23, 1919. Serial No. 332,701.

To all whom it may concern:

Be it known that I, FRANK W. TRABOLD, a citizen of the United States of America, residing in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Adjustable Spanner Wrenches, of which the following is a specification.

This invention relates to adjustable wrenches and aims to provide certain improvements therein.

It has heretofore been proposed to provide a spanner wrench, one jaw of which is fixed and the other jaw of which is movable, being actuated by an adjustable worm similar to that used in the case of monkey wrenches. The adjustments of the movable jaw, however, are slow and are found to be inconvenient in close and difficult work, as for instance, in use in restricted positions in motor cars or the like.

According to the present invention, I provide an adjustable spanner wrench in which the adjustments of the movable jaw toward the work may be as rapid as desired. Preferably, the construction is such that minor adjustments made after the jaws are in approximately right position to engage the nut, are effected by the usual thumb worm or other suitable means for taking up the slight amount of slack which remains after the approximate positions of the jaws has been attained.

The invention also includes certain other features of improvements which will be hereinafter more fully described.

According to the drawings, which show several embodiments of the invention,

Figure 1 is a plan of the wrench showing its moving parts in section;

Fig. 2 is an elevation of the right-hand edge of the wrench;

Fig. 3 is a section on the line 3—3 in Fig. 1;

Fig. 4 is a view similar to Fig. 1 showing the parts in released condition;

Fig. 5 is a perspective view of the supporting pin of the worm;

Fig. 5ª is a similar view of a modified form of pin.

Fig. 6 is a view similar to Fig. 1, showing a modification;

Fig. 7 is an elevation of the right-hand edge of the wrench of Fig. 1;

Fig. 8 is a section on the line 8—8 in Fig. 6;

Fig. 9 is a view similar to Fig. 6, showing the parts in released position;

Figs. 10 and 11 are views showing details in perspective.

Referring first to Figs. 1 to 5, let A indicate the wrench as a whole, having a fixed jaw B, movable jaw C, and handle D. The handle D and jaw B are preferably integral, as shown.

The movable jaw C is preferably provided with a sliding portion or shank E which is adapted to move in a correspondingly-shaped bore or recess F formed in or below the base of the movable jaw B. In the construction of such wrenches it is of course necessary to obtain a maximum amount of strength and rigidity, while on the other hand it is very desirable to reduce the weight of the wrench as much as possible and to conserve material in its production. It is also desirable that the operations of manufacture shall be simplified as far as possible in order to avoid unnecessary expense in manfacturing.

In the preferred construction of wrench shown, I have illustrated a form of sliding connection between the two parts, which is very desirable to secure the advantages above mentioned. In this construction two holes or bores G and H are formed, preferably by drilling, through the base of the jaw B, one of which bores H extends completely across the wrench, and the other of which, G, due to the formation of the head of the wrench, partly emerges from the metal about half way across the head. The intervening web of metal formed by the production of the bores G and H is then cut away throughout the entire length of the bores. The shank or tongue E is correspondingly shaped and fits the slideway thus formed closely, as is indicated in Fig. 3. The right-hand portion of the head of the wrench retains two flat bearing surfaces K and L, on which slide the corresponding surfaces M and N of the jaw C. By this means a cheap and very rigid sliding connection is formed, the lower part O of the tongue of the jaw C holding the jaw against outward strains, and the bearing surfaces K, L and M adequately supporting the jaw against inward strains. The semi-circular

portion P of the jaw strengthens the connection between the jaw and its shank or tongue, so that lateral breakage is avoided.

In the construction shown, the underside of the tongue is provided with a series of ratchet teeth Q which at the same time are best formed as worm teeth having a proper pitch or curvature. These teeth are engaged by the thumb worm member R which is mounted in a recess T formed in the throat of the wrench, the parts being normally in engagement as is illustrated in Fig. 1.

According to the present invention the entire worm member R is capable of being depressed so as to release the jaw C, and the convolutions or threads of the worm member are formed as ratchet teeth of such shape and inclination that the jaw C can be pressed by hand inwardly toward the jaw B, the worm member being by this movement depressed out of engagement with the teeth. Movement in the opposite direction, however, is prevented by the formation of the teeth.

In the preferred form the worm member is provided with a bore U (best seen in Figs. 1 and 3), and it is mounted in the recess T upon a pin V the diameter of which, where it passes through the bore U, being such as to permit the downward movement of the worm member. We have found that the best construction of pin is that illustrated in Figs. 3 and 5, wherein the body of the pin is cylindrical in form, so that its ends may fit closely in the bore W provided for that purpose. Intermediately of its ends, however, it is cut away as shown at X, as by oppositely beveled cuts, to such extent that its total width at this point is less than the internal diameter of the bore U. This permits a bodily downward movement of the worm sufficient to release the teeth of the jaw C, while at the same time the worm is not free to wobble laterally to any undesirable degree.

In the preferred form of the invention the worm is held yieldingly in engagement with the teeth by a plunger Y arranged in a vertical socket and urged upwardly by a spring Z. The plunger engages the underside of the worm with sufficient force to restore the worm into engaging position, while permitting it to be forced downwardly by direct manipulation of the jaw C.

In most adjustable wrenches, particular of the spanner type, when the wrench is laid or dropped upon the ground or floor, the worm tends to rotate slightly, thus throwing the wrench out of adjustment. This rotation may be occasioned by the shock or by direct contact with the supporting surface, and is detrimental because of the repeated adjustments necessary in order to closely fit the nut. The construction just described performs the important function of holding the worm against such rotations, so that the adjustment, once secured, is maintained even though the wrench may be dropped or laid down temporarily.

In the operation of using the wrench provided by the present invention, the wrench may be opened fully and placed on the nut, then by pressing upon the end of the jaw C with the thumb the jaw will be slid with relation to the stationary jaw B. This adjustment may be fine or coarse, depending upon the number and shape of the teeth of the jaw and the threads of the worm. For heavy work, however, it is desirable to make these fairly coarse, so that a sufficiently close adjustment of the jaws on the nut cannot be always attained by moving the jaw directly. It is only necessary, however, to give the worm a slight twist in order to set up the jaws tightly around the work. Once adjusted for a given nut or bolt, the wrench maintains its adjustment, so that repeated manipulations are not required.

In the construction of Figs. 6 to 9 I have shown the modified form differing from the construction of Figs. 1 to 5 chiefly in details.

The worm R′ is in this construction mounted upon a pin V′ which passes through a hole in the worm R′ of such diameter that the pin fits it closely, so that the pin and worm move together as the worm is depressed to disengage the teeth of the jaw C′. Preferably, instead of the pin V′ moving bodily, it tilts about its inner end V^2. What is in effect a hinge joint between this end of the pin and the end of the bore W′, is secured by utilizing the conical end of the bore, such as is usually made by the conventional bit or drill. The end of the pin enters this conical depression and pivots from it, as shown in Fig. 9. The opposite end of the pin is free to move up and down within the bore W′, the pin being held against movement out of the bore by any suitable form of plug, such as V^3. The latter, as best shown in dotted lines in Fig. 7, is best provided with a slot V^4 arranged vertically so that the end of the pin may move up and down without substantial lateral play. This keeps the worm in alignment within its recess. A plunger Y′ is provided for keeping the worm in engaging position. This plunger is normally held upwardly by means of a spring Z′.

While I have shown and described several forms of the invention, it will be understood that I do not wish to be limited thereto, since various changes may be made therein without departing from the spirit of the invention.

What is claimed is:—

1. A wrench comprising a stationary jaw having a cut-out portion and a socket communicating therewith, a movable jaw, a pin mounted in the cut-out portion and having each end enlarged to form an intermediate

reduced portion, a worm carried by the pin between the enlarged ends, and a spring-pressed plunger mounted in the socket and having its outer end flat and engaging the worm to normally hold the worm in engagement with the movable jaw, said plunger allowing displacement of the worm longitudinally and transversely with respect to the length of the wrench.

2. A wrench comprising a stationary jaw having a cut-out portion, a movable jaw, a pin mounted in the cut-out portion and having each end enlarged to form an intermediate reduced portion, a worm carried by the pin between the enlarged ends, and a spring pressed plunger having a flat outer end adapted to engage the outer edges of the threads of the worm to normally hold the worm in engagement with the movable jaw, said plunger allowing displacement of the worm longitudinally and transversely with respect to the length of the wrench.

3. A wrench comprising a stationary jaw having a cut-out portion, a movable jaw, a worm mounted in the cut-out portion, and a spring pressed plunger, said plunger having a flat outer end adapted to engage the outer periphery of the threads of the worm for normally holding the worm in engagement with the movable jaw but allowing displacement therefrom longitudinally and transversely with respect to the wrench.

4. A wrench comprising a stationary jaw having two rounded longitudinally extending openings therethrough, the space between the openings being cut away to form communication between the openings, and a movable jaw, said movable jaw having a tongue shaped to be received in the longitudinal openings and cutaway portion, the upper and lower edges of the tongue being rounded and of greater thickness than the intermediate portion which is straight, and the tongue being connected to the jaw at the upper thickened edge, the rounded portions forming bearings for the movable jaw.

In witness whereof, I have hereunto signed my name.

FRANK W. TRABOLD.