F. H. WARD.

WRENCH.

APPLICATION FILED MAY 25, 1921.

1,420,795. Patented June 27, 1922.

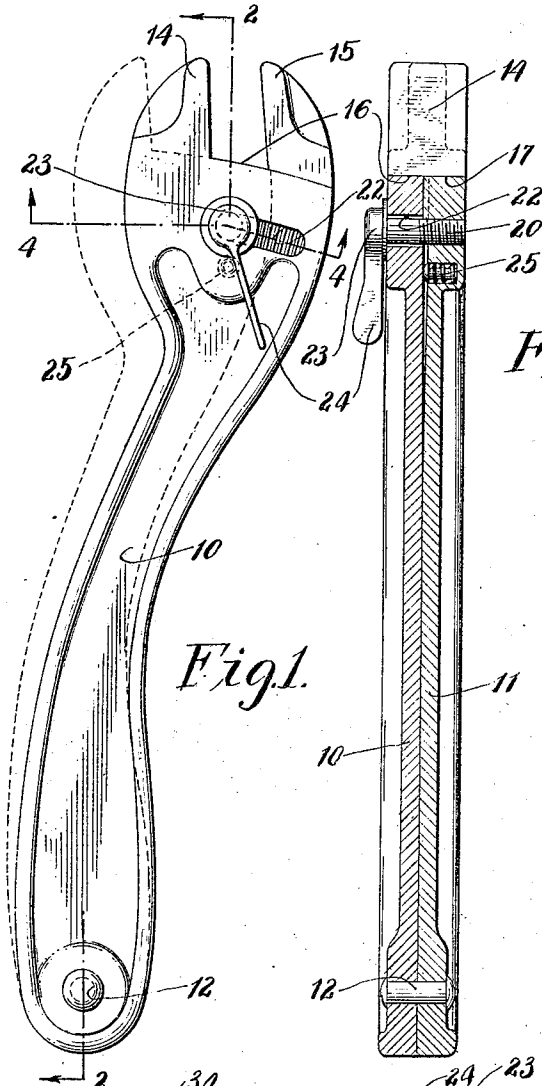


Fig. 1.

Fig. 2.

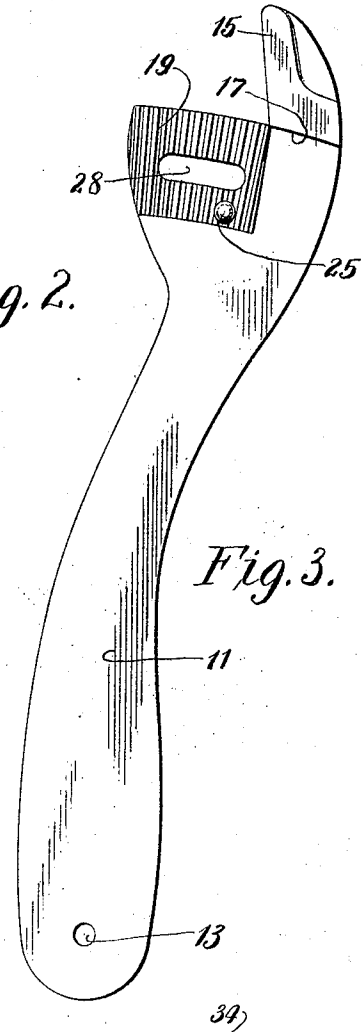


Fig. 3.

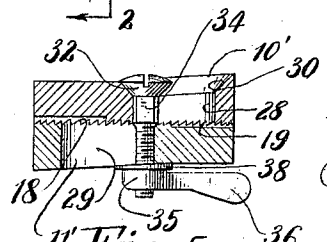


Fig. 5.

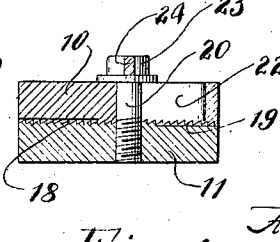


Fig. 4.

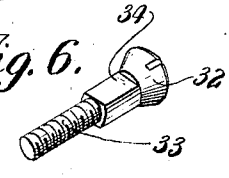


Fig. 6.

Witnesses:
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UNITED STATES PATENT OFFICE.

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WRENCH.

1,420,795. Specification of Letters Patent. Patented June 27, 1922.

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To all whom it may concern:

Be it known that I, FREDERICK H. WARD, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to improvements in wrenches particularly to adjustable types, this application being directed to an improvement over the construction disclosed in my abandoned application No. 86,274, filed March 23, 1916, and its main object is to provide a wrench having a single operating end, in which the jaws are limitedly adjustable and which possesses substantially the strength and other advantages of a solid wrench.

Another object is to provide such wrenches in forms cheap to manufacture, relatively light in weight and of pleasing appearance.

These objects are attained by the novel construction and combination of parts hereafter described and shown in the accompanying drawing, forming a material part of this disclosure, and in which:—

Figure 1 is a side view of a wrench made in accordance with the invention, the parts being shown in their closest position in full lines and in an extended position by the broken lines.

Figure 2 is a longitudinal sectional view, taken on line 2—2 of Figure 1.

Figure 3 is a side view of one of the wrench sides, showing a slight modification.

Figure 4 is a transverse sectional view, taken on line 4—4 of Figure 1.

Figure 5 is a similar sectional view showing a modification in the jaw construction and clamping means, and

Figure 6 is a perspective view of the clamp bolt.

The wrench is composed of two handle elements 10 and 11, symmetrically formed with raised marginal ribs, preferably drop forged of bar steel, and fashioned into a convenient shape to be grasped by the hands in operation.

These elements have adjacent flat side surfaces and are substantially alike, except that they are formed respectively right and left. They are pivotally secured together by a rivet 12 passing through openings 13 near the end opposite the jaws 14 and 15, which are increased to a suitable thickness corresponding to that of the two handle elements taken together, the stop or offset edges 16 and 17 being machined to form a close joint with the corresponding part of the other member.

On the inner, contacting surfaces of both elements, immediately adjacent to the jaws, is formed a plurality of ratchet-like serrations 18 and 19, suited to engage with the corresponding mating surface of the other member, the teeth being disposed radially with respect to the pivot 12 as the center.

These jaws are held together by means of a clamp fastening device, as the screw 20, threaded into the member 11, and extending through a curved slot 22 formed in the other member 10, the screw being placed close to the jaw opening. The head 23 of the screw, as shown, has a hand lever 24 for convenience in turning it but obviously any other form of clamp or wedge fastening may be used.

In order that the wrench may be easily and quickly manipulated, in changing from one size to another, a spring device of some kind, as indicated at 25 is arranged to separate the side elements laterally, immediately upon the release of the clamp, thereby permitting one of the jaws to be moved with relation to the other, in the manner of opening or closing shears or the like, but obviously a flat spring could be used with equal effect to the coiled spring and plunger shown.

It is to be noticed that the angle formed between the opening of the jaws and handles is approximately fifteen degrees as being most convenient for the purpose to which such wrenches are applied.

Also that the opening between the jaws is slightly closer at their points than at the back when the jaws are closest together, but as they are separated, they become parallel.

By reason of the corrugated or serrated engaging surfaces and clamping means, the wrench is to all purposes as rigid as a solid wrench and has in addition the features of variable adjustability, thereby displacing a relatively large number of solid wrenches or an adjustable wrench of the usual unsatisfactory variety.

In the modifications shown in Figures 3, 4 and 6, both jaws are formed with inclined, wedge shaped outer surfaces 10′ and 11′ and each jaw contains arcuate slots 28 and 29 respectively. The slot 28 is bevelled inter-

nally, as at 30, receptive of the head 32 of a bolt 33 having an enlarged flattened portion 34 suited to the slot 28, while the threaded portion of the bolt passes through the slot 29 and engages with a nut 35 having a wing or lever 36 by which it may be operated. A washer 38 may be used below the nut and is preferably formed wedge shaped to compensate for the inclined surface 11'.

Thus it will be seen that the inclined surfaces act so that any pressure between the jaws tends to tighten the bolt and therefore maintain the serrations in close operative engagement.

The disclosure is to be regarded as descriptive only, and not as restrictive or limitative of the invention, of which obviously an embodiment may be constructed including many minor modifications without departing from the general scope herein indicated and denoted in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a wrench, a pair of hingedly connected handles, jaw heads formed with said handles, one of said heads gradually increasing in thickness from its median longitudinal plane to the edge opposite the jaw, means for clamping said heads to-gether, and means formed on the adjacent faces of said heads, through which said clamping means pass, whereby they are rigidly held in an adjusted position when clamped.

2. In a wrench, a pair of hingedly connected handles, jaws formed with said handles, a clamp bolt engaged with one of said handles and operable in a slot formed in the other, said slotted handle having a thickness increasing in the direction of force applied to the jaw, and means for exerting pressure between said handles contiguous to said jaws, tending to separate them laterally upon the release of said clamp bolt.

3. In a wrench, a pair of pivotally connected handles, jaw heads combined with said handles, both of said jaw heads being slotted and having a gradually increasing thickness from the center to the edge contiguous to the slots and upon the outer side of the jaw heads and means for clamping said jaws in adjustment.

4. In a wrench, a pair of hingedly connected handles, jaws combined with said handles, an oblique, outwardly inclined surface formed on one of said handles contiguous to said jaws, and means for rigidly clamping said handles together whereby said jaws are positively held in adjusted relation to each other.

5. In a wrench, a pair of hingedly connected handles, jaws formed on said handles, clamping means comprising a clamping bolt fastened into one of said handles and operative in a slot formed in the other, said slotted handle having a thickness increasing in the direction of force applied to the jaw, and means operative upon the rotation of said clamping means permitting said handles to spread laterally apart.

6. In a wrench, a pair of hingedly connected handles, jaws formed with said handles, said jaws being of gradually increasing thickness from their adjacent edges to the backs thereof, arcuate slots extending through both of said jaws, said slots being formed in register, a bolt passing through said slots, said bolt having a head engageable with one of said jaws, and a nut suited to said bolt adapted to contact with the other jaw.

7. In a wrench, a pair of hingedly connected handles, jaws formed on said handles, said handles having a thickness increasing in the direction of force applied to said jaws, and a clamping means by which said jaws may be adjustable clamped together.

8. In a wrench, a pair of hingedly connected handles, jaw heads formed with said handles, both of said jaw heads having their outer surfaces gradually inclined outwardly in the direction of force applied to the jaws, and means to clamp said jaws in functional engagement with each other.

9. In a wrench, a pair of hingedly connected handles, jaws formed with said handles, a clamp bolt engaged with one of said handles and operable in a slot formed in the other, said slotted handle having a thickness increasing in the direction of force applied to the jaw, and a cam engaging said bolt adapted to hold said jaws in adjustment.

In testimony whereof I have signed my name to this application.

FREDERICK H. WARD.