April 11, 1950

V. S. WARD ET AL
TOGGLE ACTUATED AND ADJUSTABLY
MOUNTED PIVOTED JAW WRENCH

2,503,783

Filed Jan. 30, 1947

2 Sheets-Sheet 1

Fig. 1.

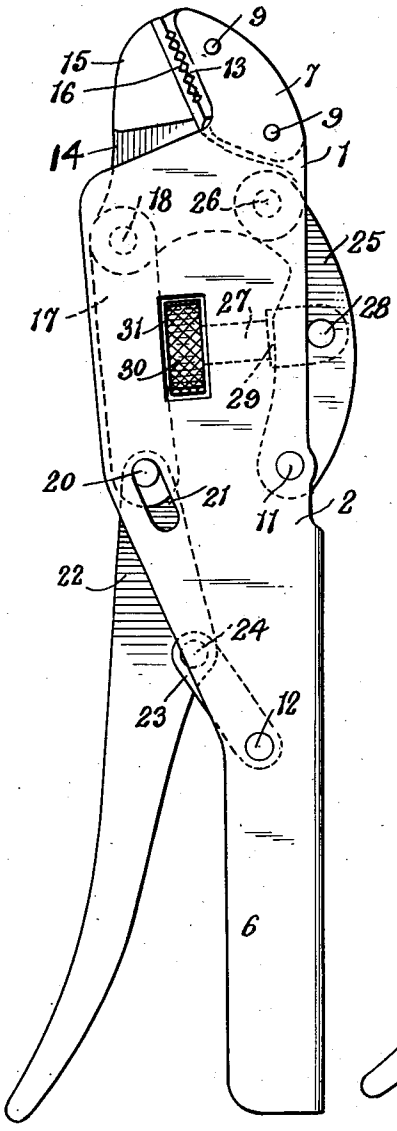


Fig. 2.

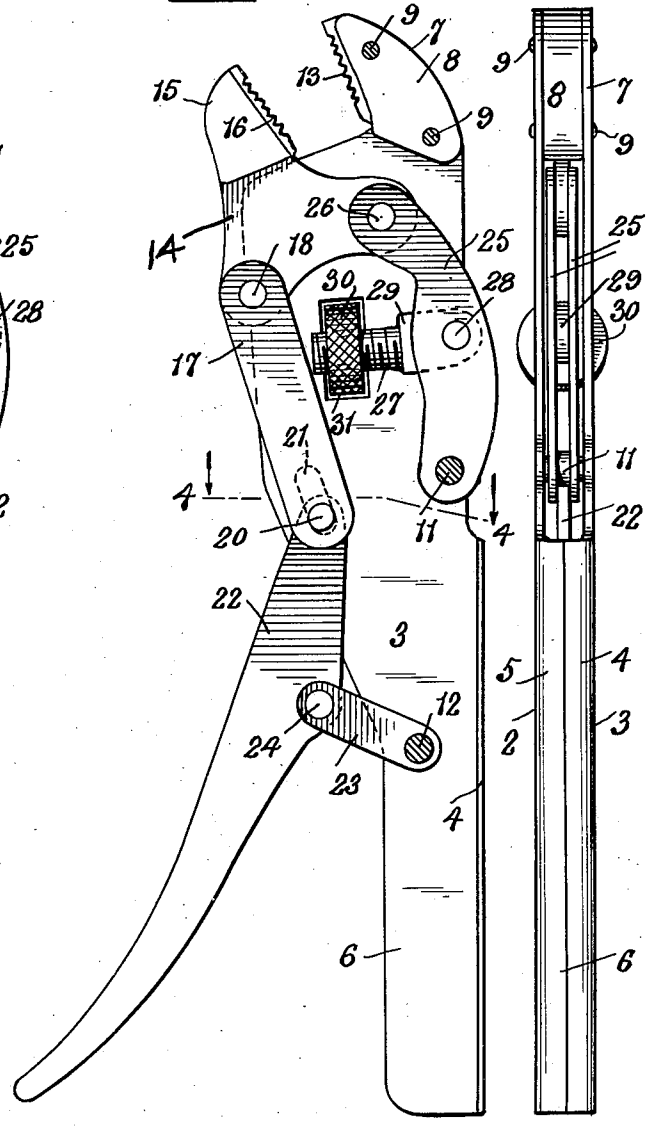
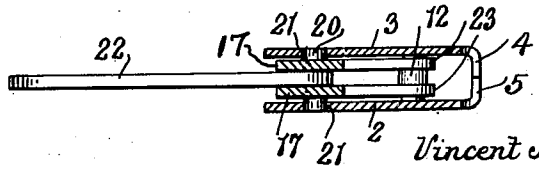


Fig. 3.

Fig. 4.



Inventors
Vincent S. Ward & Gordon K. Hurlbut
by Harry Radzinsky
attorney

April 11, 1950 V. S. WARD ET AL 2,503,783

TOGGLE ACTUATED AND ADJUSTABLY MOUNTED PIVOTED JAW WRENCH

Filed Jan. 30, 1947 2 Sheets-Sheet 2

Fig. 5.

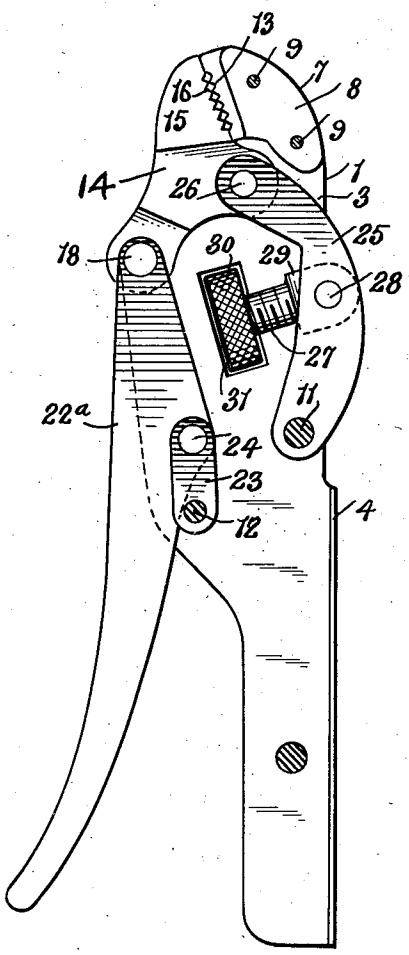
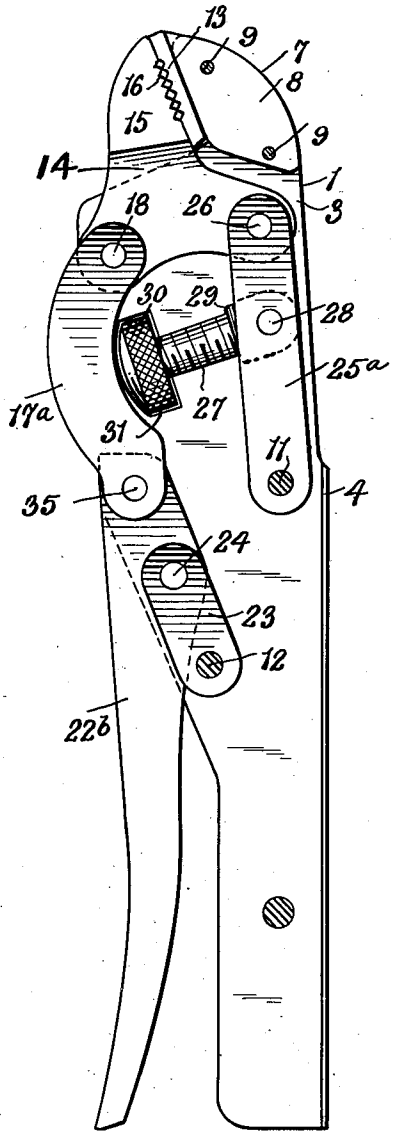


Fig. 6.



INVENTORS

Vincent S. Ward & Gordon K. Hurlbut

BY

Harry Radzinsky

Attorney

Patented Apr. 11, 1950 2,503,783

UNITED STATES PATENT OFFICE

2,503,783

TOGGLE ACTUATED AND ADJUSTABLY MOUNTED PIVOTED JAW WRENCH

Vincent S. Ward and Gordon K. Hurlbut, Binghamton, N. Y., assignors to B. M. C. Manufacturing Corp., Binghamton, N. Y., a corporation of New York

Application January 30, 1947, Serial No. 725,390

1 Claim. (Cl. 81—84)

1

This invention relates to wrenches, and more particularly to those of the type disclosed in Patent No. 2,388,580, dated November 6, 1945, and issued to F. A. Snell.

In that patent is shown a wrench in which a movable jaw is brought to a parallel clamping relation with a fixed jaw, regardless of the spacing of the jaws, by movement of an actuating handle, and the present invention contemplates a construction by means of which similar results are obtained through a simplified and less expensive construction. The present invention relates to improvements in the type of wrench referred to, and it contemplates the provision of a simple, sturdy mechanism by means of which a movable jaw may be set at a selected distance from a fixed jaw in order to grip an object of given size, and by means of which said object may be firmly clamped between the jaws by movement of the actuating handle.

One of the objects of the present invention is to provide a structure of this character in which the number of parts employed is materially reduced; no springs are required, and the parts employed are of substantial size and strength, thus resulting in a wrench which is entirely reliable and unlikely to get out of order despite the hard use which a tool of this character is generally given.

Another object of the present invention is to provide means by which the pivots to which the movable jaw is secured, may be positioned for a maximum distance apart whereby a movable jaw of substantial size and strength may be employed, and also of means by which an adjustment of the movable jaw is secured through the use of an adjusting bolt and nut so located as to be conveniently accessible between parallel links and without causing protrusion of the end of said adjusting bolt beyond the limits of the wrench frame.

These and other objects are attained by the invention, a more particular description of which will be hereinafter set forth and more particularly pointed out in the claim appended hereto.

In the accompanying drawing, wherein an illustrative embodiment of the invention is disclosed, Fig. 1 is a side elevation of a wrench constructed in accordance with the invention, the jaws being shown in closed position; Fig. 2 is a side elevation of the wrench in a partly open position, with one of the face plates of the frame removed to show the operating parts; Fig. 3 is an edge view of the wrench as seen from the right side of Fig. 1; Fig. 4 is a sectional view on the

2

line 4—4 of Fig. 2, looking in the direction of the arrows; Fig. 5 is a side elevation of a modified construction, with one of the face plates of the frame removed, and Fig. 6 is a similar view of another modification.

Referring to Figs. 1 to 4 inclusive, the frame of the wrench is generally indicated at 1, the same including a pair of similarly-shaped, spaced-apart side members or face plates 2 and 3. For a portion of their length, the face plates 2 and 3 are each provided at their rear with an inturned flange, that provided on the face plate 2 being indicated at 5, and that on the face plate 3 being shown at 4. With this arrangement the rear of the frame 1 is closed at the back for a portion of its length, and particularly throughout the handle portion indicated at 6. At its end remote from the handle portion 6, the frame 1 is formed with the fixed jaw 7, in which an insert 8 is located, said insert consisting of one or more laminations to thus form a spacing member between the face plates 2 and 3 and being held in position by the rivets 9 or equivalent fastening elements. The spacing member 8, constituting the body of the fixed jaw, co-operates with pivot pins 11 and 12 to be described, in maintaining the face plates 2 and 3 in properly spaced relation to provide a rigid and sturdy frame of U-shape or channel shape, as clearly seen in Fig. 4. A serrated or roughened gripping face 13 may be provided on the jaw insert 8.

The movable jaw is shown at 14, the same being of substantially bell-crank form, and having the head portion 15, formed with the gripping face 16, and pivotally connected at one point between the ends of a straight pair of companion links 17, as indicated at 18. Said links 17, rigidly secured together as a unit in slightly spaced relation are, at their opposite ends, attached to a pivot pin 20 which moves up and down in the angularly disposed slots 21 in the frames or face plates 2 and 3. Located between the links 17 is an actuating handle 22, the same being pivoted at one end on the pin 20.

At 23 is shown a link which has one end pivoted at 24 to the handle 22 and its opposite end is pivoted on the pivot pin 12 extending between the face plates 2 and 3 of the frame.

At 25 is shown a curved link, composed of spaced companion plates secured together in spaced relation. At one end, the link 25 is pivotally attached at 26 to the movable jaw 15 and at its opposite end the link 25 is pivotally mounted on the pin 11 secured in the frame.

The adjusting means for the movable jaw in-

cludes an adjusting screw or bolt 27, which may be round or cylindrical, and said bolt or screw is flattened at one end as at 29 to extend between the companion face plates of the link 25 and be pivoted thereto on the pin 28. The threaded portion of the adjusting bolt or screw 27 is threadably engaged by an adjusting nut 30 located in apertures 31 provided in the face plates 2 and 3, said nut projecting beyond the face plates as clearly seen in Fig. 3 to enable it to be engaged by the fingers and thereby rotated to adjust the position of the movable jaw. It will be noted that the adjusting bolt or screw 27 is pivoted to the curved link 25 at substantially a central point between the pivots 11 and 26 for said link and that the threaded portion of the adjusting bolt or screw extends inwardly or toward the front of the frame, and this portion of the screw or bolt 25 is thus located within the limits of the wrench frame.

It will be seen from the structure described, that when the actuating handle 22 is moved toward the fixed handle portion 6 of the frame 1, it will cause the movable jaw 15, through the arrangement of linkage described, to swing toward the fixed jaw 7 to an extent determined by the angular position of link 25 which is controlled by the position of the adjusting screw 27. The movable jaw 15 will always assume a position of parallelism to the fixed jaw 7 when the movable jaw 15 reaches the limit of its inward swing and then, when pivot pin 24 passes the over-center position, the parts will be locked in close clamping relation with any object to be grasped between the jaws.

When releasing the object by swinging the handle 22 outwardly, or to the position shown in Fig. 2, and beyond, it will be noted that the slots 21 permit the descent of the pivot pin 20 to the lower ends of these slots and this descending movement of the pivot 20 exerts a longitudinal pull on the link 17, causing it to impart a swinging movement on the movable jaw 15, thus swinging said jaw about the pivot 26 to bring its gripping face 16 to the angular position shown in Fig. 2 and permitting the release of the object then located between the jaws.

In the construction described, it will be noted that the use of springs is avoided; that the adjustment of the movable jaw to the fixed jaw is secured by screw-thread means located between the jaw linkage, allowing an accurate and precise setting of the jaws, and that the number of parts employed, as well as the shape and nature of the same is such that a sturdy and rugged structure results.

In the embodiment of the invention shown in Fig. 5 a slightly different structure is shown, wherein a lengthy actuating handle or lever 22*a* has its upper end pivotally secured to the movable jaw 15 on the pivot pin 18, said actuating handle 22*a* thus, on its outward swing, serving to pivot the movable jaw on the pin 26 to angular or open position.

In the embodiment of the invention shown in Fig. 6, the forward or front link 17*a* is the curved link, while the rear link 25*a* is straight. The upper end of the actuating lever or handle 22*b* is pivoted at 35 to the lower end of the link 17*a*. The construction is otherwise substantially the same as that described with respect to the disclosure of Figs. 1 to 4 inclusive.

While we have shown and described several embodiments of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claim.

What we claim is:

In a tool of the character described, a frame having a fixed jaw, a movable jaw within the frame, an actuating handle coupled to the movable jaw and pivotally coupled to the frame adjacent to the forward edge portion of the frame, a link having one end pivotally attached to the movable jaw and its other end pivoted in the frame, the link being disposed toward the rear of the frame, an adjusting bolt having an end pivotally attached directly to the link at a point intermediate of the pivotal attachment of said link to the frame and to the movable jaw, said bolt projecting forwardly in and transversely of the frame in a direction toward the front edge of the frame, and an adjusting nut rotatively mounted in the frame and threadably receiving the bolt, the frame being apertured to receive said nut.

VINCENT S. WARD.
GORDON K. HURLBUT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,388,580	Snell	Nov. 6, 1945
2,398,209	Clemens	Apr. 9, 1946
2,399,454	Snell	Apr. 30, 1946
2,428,949	Ward et al.	Oct. 14, 1947
2,436,497	Snell	Feb. 24, 1948
2,464,472	Ward et al.	Mar. 15, 1949
2,478,728	Ward et al.	Aug. 9, 1949