

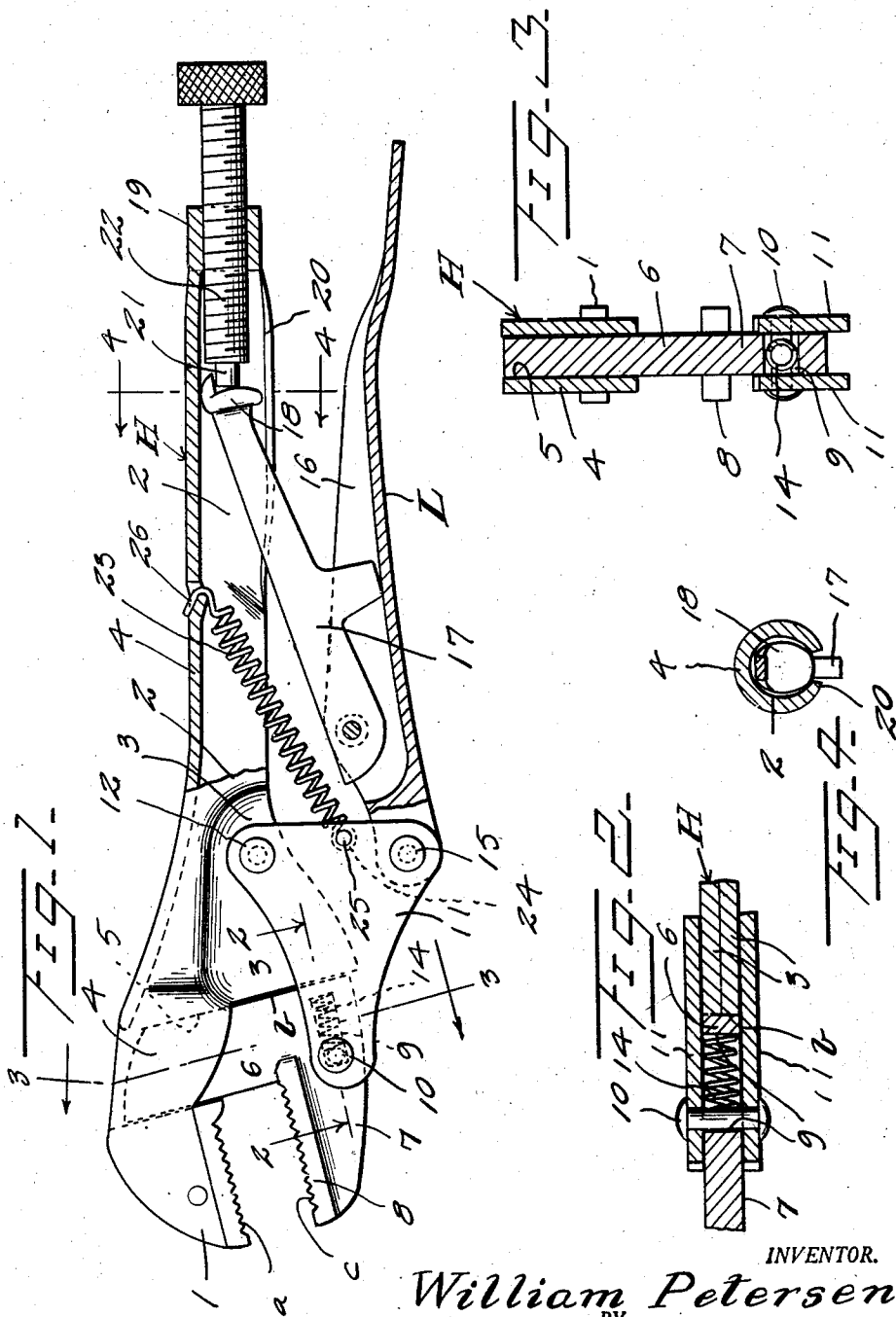
March 4, 1947.

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2,417,013

TOGGLE ACTUATED SLIDING JAW WRENCH

Filed May 21, 1945



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UNITED STATES PATENT OFFICE

2,417,013

TOGGLE ACTUATED SLIDING JAW
WRENCH

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Application May 21, 1945, Serial No. 594,970

5 Claims. (Cl. 81—88)

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This invention relates to wrenches of a type including a stub lever coacting with an operating handle in a manner to effect a fine adjustment of the jaws of the wrench with respect to the work, and it is primarily an object of the invention to provide a wrench of this kind wherein the opposed or working faces of the jaws remain in parallelism at all times throughout the range of relative adjustment of the jaws.

It is also an object of the invention to provide a wrench of a vise-grip type which can be employed in clamping objects of any thickness within the range of the wrench with full jaw contact.

An additional object of the invention is to provide a vise-grip wrench including two relatively movable jaws having their opposed or working faces at all times parallel with each other, whereby is substantially eliminated slippage from the work should there occur any slight movement of the jaws and whereby the same pressure will be maintained on the work.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved wrench whereby certain important advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view partly in side elevation and partly in section of a wrench constructed in accordance with an embodiment of the invention, a second position of the parts being indicated by broken lines;

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 1; and

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 1.

In the embodiment of the invention as illustrated in the accompanying drawings, the main handle member H is of channel formation of desired dimensions and configuration. The forward end portion of this handle member H carries a fixed jaw 1 having its outer face substantially straight in side elevation although said face is transversely corrugated, as at a, to facilitate its gripping action.

The handle member H at a desired point inwardly of the jaw 1 has its side walls 2 laterally extended, as at 3, in a direction beyond the jaw 1 and the outer edges b of said extended portions 3

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are substantially at right angles to the face of the jaw 1. These extended portions 3 are pressed inwardly into contact one with the other.

The back or intermediate wall 4 of the handle member H between the inner end of the jaw 1 and the edges b of the extended portions 3 is open or cut out to provide a slot 5 through which freely passes the outer portion of a slide bar 6 which rides upon and along the adjacent edges b of the extended portions 3.

The inner end portion of the slide bar 6 is provided with an outwardly disposed arm 7 and carried by said arm 7 and the adjacent portion of the slide bar 6 is a jaw 8 having its outer or working face substantially flat although grooved, as at c, to facilitate its gripping action.

Disposed through the inner portion of the slide bar 6 transversely thereof, and herein disclosed as extending partially into the arm 7, is a slot 9 through which passes a pivot pin 10 carried by the outer restricted end portions of the plates 11 disposed at opposite sides of the slide bar 6 and the extended portions 3 of the handle member H. The outer or wide end portions of the plates 11 are pivoted, as at 12, to the inner parts of the extended portions 3.

Positioned within the slot 9 between the inner end thereof and the pivot pin 10 is a tension spring 14 which provides effective means for maintaining the slide bar 6 in effective engagement with the edges b and thus holds the jaw 8 against falling forward as the slide bar 6 travels inwardly to move the jaw 8 toward the fixed jaw 1 upon proper rocking movement of the plates 11.

The outer portions of the plates 11 at their bases or inner extremities are pivotally connected, as at 15, to an end portion of an elongated lever L which constitutes an operating handle. This lever L, as herein disclosed, is also of channel formation and pivotally engaged between the side walls 16 thereof at a required location is an end portion of a stub lever or fulcrum bar 17. This lever or bar 17 is of required length and extends inwardly between the side walls 2 of the handle member H at the rear portion thereof.

The end portion of the stub lever or fulcrum bar 17 extending between the side walls 2 of the handle member H is transversely enlarged, as at 18, to provide a cross-head extending beyond opposite sides thereof. The side walls 2 of the handle member H at the outer extremity of the member are pressed to provide a sleeve 19 which is internally threaded and said side walls 2 immediately adjacent to and in advance of the

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sleeve 19 for a desired distance forwardly of the handle member H are pressed inwardly, as at 20, with the outer free edges of said portions 20 spaced apart a distance less than the length of the enlargement or cross-head 18 and thus provide means to maintain the stub lever or fulcrum bar 17 in effective position at all times during the use of the wrench or, in other words, to prevent the stub lever or fulcrum bar 17 from dropping away from the handle member H. The pressed-in side portions 20 of the handle member H closely conform to the enlargement or head 18 and thus retain the cross-head or enlargement 18 in close contact with the back or intermediate wall 4.

The cross-head or enlargement 18 has direct contact with the outer extremity of a reduced pin 21 extending outwardly and axially from the inner end of a shank 22 threading through the sleeve 19. The head or enlargement 18 is maintained in contact with the pin 21 of the shank 22 under the action of a retractile spring 23. One end portion of this spring 23 is secured, as at 24, to a pin 25 carried by the inner or base portions of the plates 11 and bridging the space therebetween and at its opposite extremity, as at 26, to the intermediate wall 4 of the handle member H at a desired distance outwardly of the handle member H with respect to the plates 11.

In view of the foregoing, it is believed to be readily apparent that the present invention provides a wrench of a vise-grip type wherein the working jaws have substantially flat opposed working faces which are maintained parallel at all times within the range of movement of the jaw 1 with respect to the other jaw. This is of particular importance as by having the working faces of the jaws parallel at all times, the wrench can be used for clamping objects of any thickness within the range of the wrench with full jaw contact.

The wrench also provides a further advantage in minimizing slipping from the work as the result of any slight movement of the jaws along the work.

Furthermore, with the present tool, when the same is used as a plier, the adjustment is always correct.

From the foregoing description it is thought to be obvious that a wrench constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

I claim:

1. A wrench comprising a handle member formed of sheet metal and bent into channel formation, a fixed jaw carried by one end portion of the handle member, the side walls of the handle member inwardly of the fixed jaw being laterally extended, said extended portions being inwardly offset for contact one with the other, said extended portions having their outer edges substantially straight, a slide bar riding on said substantially straight edges of the extended portions, an outwardly disposed jaw carried by an end portion of said slide bar, a plate having one end portion pivotally connected with the handle member and an opposite end portion operatively engaged with the slide bar whereby rocking movement of the plate will impose rectilinear movement to the slide bar, a retractile member operatively engaged with the plate and with the handle member, and means for rocking the plate.

2. A wrench comprising a handle member

formed of sheet metal and bent into channel formation, a fixed jaw carried by one end portion of the handle member, the side walls of the handle member inwardly of the fixed jaw being laterally extended, said extended portions being inwardly offset for contact one with the other, said extended portions having their outer edges substantially straight, a slide bar riding on said substantially straight edges of the extended portions, an outwardly disposed jaw carried by an end portion of said slide bar, a plate having one end portion pivotally connected with the handle member and an opposite end portion operatively engaged with the slide bar whereby rocking movement of the plate will impose rectilinear movement to the slide bar, a retractile member operatively engaged with the plate and with the handle member, an operating handle pivotally connected with the end portion of the plate pivotally engaged with the handle member for swinging movement toward or from the handle member, and a stub lever pivotally connected at one end portion to the operating handle, the opposite end portion of the stub lever having operative engagement with the handle member to provide means whereby, when the operating handle is moved toward the handle member, the plate will be rocked in a direction to move the jaw carried by the slide bar toward the fixed jaw of the handle member.

3. A wrench comprising a handle member formed of sheet metal and bent into channel formation, a fixed jaw carried by one end portion of the handle member, the side walls of the handle member inwardly of the fixed jaw being laterally extended, said extended portions being inwardly offset for contact one with the other, said extended portions having their outer edges substantially straight, a slide bar riding on said substantially straight edges of the extended portions, an outwardly disposed jaw carried by an end portion of said slide bar, the outer portion of the slide bar being provided thereacross with a slot, a plate, means for pivotally connecting an end portion of the plate with the handle member, a part carried by the opposite end portion of the plate and extending within the slot, a spring within the slot interposed between the part of the plate and the inner end of the slot for maintaining the slide bar in contact with the straight edges of the extended portions of the handle member, whereby means is provided to hold the jaw of the bar from falling forward, and means operatively engaged with the plate and with the handle member for rocking the plate for sliding the bar.

4. A wrench comprising a handle member, a fixed jaw carried by one end portion of the handle member, the handle member having a guide slot rearwardly of the fixed jaw, a slide bar carried by the handle member in said guide slot, an outstanding jaw carried by the slide bar for coaction with the fixed jaw of the handle member, the handle member having inset side faces rearwardly of said slot, a pair of substantially triangular plates in spaced parallel relation and each having a corner disposed against an inset side face, a pivot between the said corners of the triangular plates and the handle member, each triangular plate having a forwardly directed corner, a pivot between the forwardly directed corner of each plate and the slide bar for operating the bar upon rocking the plates, an operating handle pivotally engaged between the third corners of the triangular plates, a stub lever operatively engaged with the operating handle and

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with the handle member to rock the triangular plates upon movement of the operating handle toward the handle member to force the jaw of the slide bar toward the fixed jaw of the handle member, and a tension spring attached at one end to the triangular plates and interposed between the triangular plates and the handle member for rocking the rigid member in a direction to move the jaw of the slide bar away from the fixed jaw of the handle member.

5. A wrench comprising a handle member formed of sheet metal and bent into channel formation, a fixed jaw carried by one end portion of the handle member, the side walls of the handle member inwardly of the fixed jaw being laterally extended, said extended portions being inwardly offset for contact one with the other, said extended portions having their outer edges substantially straight, a slide bar riding on said substantially straight edges of the extended portions, an outwardly disposed jaw carried by an end portion of said slide bar, a plate having one end portion pivotally connected with the handle member and an opposite end portion operatively engaged with the slide bar whereby rocking movement of the plate will impose rectilinear

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movement to the slide bar, a retractile member operatively engaged with the plate and with the handle member, and means for rocking the plate, the back wall of the handle member between the fixed jaw and the substantially straight edges of the extended edges of the handle member being provided with an opening to allow free movement thereof of the end portion of the slide bar remote from the jaw carried by said slide bar.

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