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TOGGLE OPERATED WRENCH WITH
TOGGLE RELEASE LEVER

George W. Wells, Amesbury, Mass.

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This invention relates to improvements in wrenches.

An object is to provide a wrench which combines the advantages of a pair of pliers with the advantages of a conventional wrench of the screw adjustment type.

More particularly, an object is to provide a wrench of simple sturdy construction which embodies the advantages of the conventional wrench wherein the object gripping face of the fixed jaw and the object gripping face of the movable jaw are disposed in substantial parallelism in all gripping positions and wherein the movable jaw may be adjusted relative to the fixed jaw for size of the object to be gripped by a screw adjustment, and which also embodies the advantages of a pair of pliers wherein the movable jaw may be advanced to the closed position or withdrawn therefrom to the open position, for each stage of the screw adjustment, by the swinging movement of a handle member.

A meritorious feature is that for each position of adjustment the movable jaw is moved toward the object to be gripped or withdrawn away from said object by the swinging movement of a handle which actuates the jaw yet the jaw is held securely in gripped relationship against the object regardless of the pressure maintained on the swinging handle.

A further object is to provide a wrench of the character described with thumb depressible means whereby the handle may be quickly initially actuated to partially release the movable jaw from the object gripped by pressure of the thumb of the operator's hand which is gripping the wrench and without requiring the use of the two hands of the operator to swing the handle which actuates the movable jaw away from the cooperating handle of the wrench.

Other objects, advantages and meritorious features of this invention will more fully appear from the following description, appended claims and accompanying drawing wherein:

Figure 1 is a side elevation of a wrench embodying this invention with the jaw disposed in position to grip an object therebetween.

Figure 2 is a side elevation of the wrench shown in Figure 1 but with the movable jaw partially retracted.

Figure 3 is a side elevation of the wrench shown in Figure 1 with the movable jaw swung to the open position for the indicated position of adjustment.

Figure 4 is a plan of the wrench shown in Figure 1.

Figure 5 is a sectional view taken on the line 5-5 of Figure 4.

Figure 6 is a sectional view taken on the line 6-6 of Figure 5.

Let 10 indicate the handle element, which is

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channel shaped in cross section as shown in Figures 5 and 6 and which is provided at one end with a fixed angular jaw portion 12 secured within the channel of the handle member by rivets 14 or the like. This fixed jaw is provided with an object gripping face 16. A pair of movable jaw supporting links 20 are pivoted in parallel spaced apart relationship within the channel of the handle member 10 upon pivot pins 22 for swinging movement as hereinafter described.

Pivotally supported upon the opposite ends of the links 20 is a movable jaw member 24, which movable jaw member is also channel shaped in cross section as shown in Figure 6. This jaw member has a jaw plate 26 secured in one end thereof by a rivet 28 or in some other suitable manner. The movable jaw is coupled with the links 20 by pivot pins 30 or the like. The jaw plate 26 is provided with an object gripping face 32 which is adapted to cooperate with the object gripping face 16 of the fixed jaw to engage an object such as a nut therebetween.

A handle portion 34 is coupled with the movable jaw member 24 by a pivot pin 36. This handle portion is also channel shaped in cross section. This handle portion is also pivotally supported upon a link 38 being coupled with the upper end of such link by a pivot pin 40. The opposite end of this link 38 is pivoted to a traveling nut 42 by a pivot pin 44 for adjustment of the link to advance or withdraw the movable jaw with respect to the fixed jaw.

The nut 42 is threaded upon a screw 46 as shown in Figure 5. This screw is journaled within the end of the handle element 10 and is provided at its outer end with a knob 48. The screw is so journaled within the end of the handle element that upon rotation of the screw the nut 42 travels thereover within the channel of the handle element 10. The nut has a free sliding fit within the channel of the handle element and is held against rotation thereby while being permitted to travel therethrough over the screw. A pin or stop 50 is carried by the handle element 10 and bears against the free end of the screw to assist in supporting the screw for rotation.

A curved lever 52 is pivotally supported upon the link 38 by a pivot pin 54 as shown in the drawing. The forward end of the lever extends upwardly through a cutout in the handle 34 as shown particularly in Figure 5 and is provided at its extremity with a thumb plate 56. The lever is so curved that its opposite end is adapted to bear against the under side of the handle 34 to kick said handle member upwardly from the position shown in Figure 1 to the position shown in Figure 2 to partially release the gripping engagement of the movable jaw from the object gripped to facilitate the lifting of the

handle 34 from the depressed position 31 to the partially upraised position 34.

In the operation of the wrench it will be seen that the object gripping face of the movable jaw is at all positions of gripping adjustment disposed substantially parallel with respect to the object gripping face 16 of the fixed jaw. The movable jaw is shiftable toward or away from the fixed jaw for adjustment to engage objects of different size by rotation of the adjustment screw 46 which through nut 42, link 38, handle element 34 and its connection with the movable jaw member 24, advances or withdraws the movable jaw with respect to the fixed jaw, the movable jaw swinging with its supporting links 20.

For any given adjustment, for any given size of object to be gripped, the movable jaw is advanced into clamping engagement with the object or withdrawn therefrom by swinging movement of the handle 34 which because of its pivotal connection with the movable jaw 24 and the support of the movable jaw upon the pivoted links 20 advances or withdraws the movable jaw with respect to the fixed jaw.

In its adjustment to engage objects of different size this wrench resembles the conventional screw type of wrench. In its manipulation to clamp a movable jaw against an object or release the movable jaw therefrom this wrench resembles a pair of pliers.

It will also be seen that the pivot 36 which couples the handle portion 34 with the movable jaw 24 is offset outwardly, with respect to the handle 10, a line drawn through pivots 30 and 54, whereby pressure endwise against the object engaging face 32 of the movable jaw from the object being gripped will not tend to move the movable jaw to release the object being gripped and that this is true regardless of the pressure being maintained upon the handle element 34.

What I claim is:

1. A wrench comprising, in combination, a handle element having a fixed jaw at one end provided with an object engaging face, a movable jaw provided at one end with an object engaging face, a pair of parallel links pivotally coupling the movable jaw with the fixed jaw for relative swinging movement to advance its object engaging face toward and away from the object engaging face of the fixed jaw while maintaining the two object engaging faces substantially in parallelism, a handle portion pivoted to the opposite end of the movable jaw, linkage pivotally coupling the handle portion of the movable jaw with the handle element of the fixed jaw to swing the movable jaw to advance or withdraw its object engaging face with respect to the object engaging face of the fixed jaw upon pivotal swinging movement of said handle portion, and a curved lever rockably pivoted to said last named linkage and having one end projected outwardly through and beyond said handle portion and provided with a thumb plate at such end and having its opposite end disposed underneath said handle portion and adapted to contact and swing said handle portion outwardly upon depression of the thumb plate end of the lever.

2. A wrench comprising, in combination, a rigid jaw member provided at one end with an angularly disposed object engaging face, an adjustment block slidably supported upon the jaw member adjacent to its opposite end, screw mechanism at said opposite end of the jaw member coupled with said block to move the block toward or away from the object engaging face of the jaw

member, a movable jaw member provided at one end with an object engaging face, a handle portion pivoted to the opposite end of the movable jaw member, a pair of parallel supporting links coupling the movable jaw with the rigid jaw for relative swinging movement of the former to advance its object engaging face in parallelism toward and away from the object engaging face of the rigid jaw member, said rear handle portion pivotally coupled with the rigid jaw member by linkage pivoted at one end to said adjustment block supported upon the rigid jaw member and pivoted at the opposite end to said handle portion to swing the front jaw portion of the movable jaw member through the parallel links toward or away from the object engaging face of the fixed jaw member by raising or lowering the rear handle portion of the movable jaw member or by adjustment of said screw mechanism operating through said adjustment block, a curved lever pivoted intermediate its ends to said linkage, said lever having its forward end extending upwardly through said handle portion and provided thereabove with a thumb plate and having its rear end extending upwardly underneath and toward said handle portion, said rear end of the lever adapted to be swung upwardly against said handle portion to lift the same when the forward end of the lever is rocked downwardly about its pivot on said linkage.

3. In a wrench, a handle element having a fixed jaw at one end provided with an object engaging face, a movable jaw provided with an object engaging face disposed in an opposed relationship to said object engaging face of the fixed jaw, linkage pivotally coupling the movable jaw with the handle element for relative swinging movement of the former to advance its object engaging face toward and away from the object engaging face of the fixed jaw, a handle portion pivoted to the opposite end of the movable jaw, a link pivotally connected at one end to an intermediate part of the handle portion and having its opposite end fulcrumed on the handle element to thereby cause the handle portion to advance or retract the movable jaw relative to the fixed jaw upon swinging movement thereof, and releasing means for the handle portion comprising a lever rockably pivoted intermediate its ends to an intermediate portion of said link and arranged so that the forward end section thereof projects above said handle portion forwardly of the pivotal connection of the link thereto and the opposite rear end section thereof is engageable with the underside of the handle portion rearwardly of the pivotal connection of the link thereto, said lever adapted upon depression of its forward end section to cause the rear end section to engage and swing the handle portion in the direction to retract the movable jaw away from the fixed jaw.

GEORGE W. WELLS.

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