Aug. 22, 1950 L. C. MEAD 2,519,973

WRENCH TYPE PLIERS

Filed March 20, 1948

Fig. 1

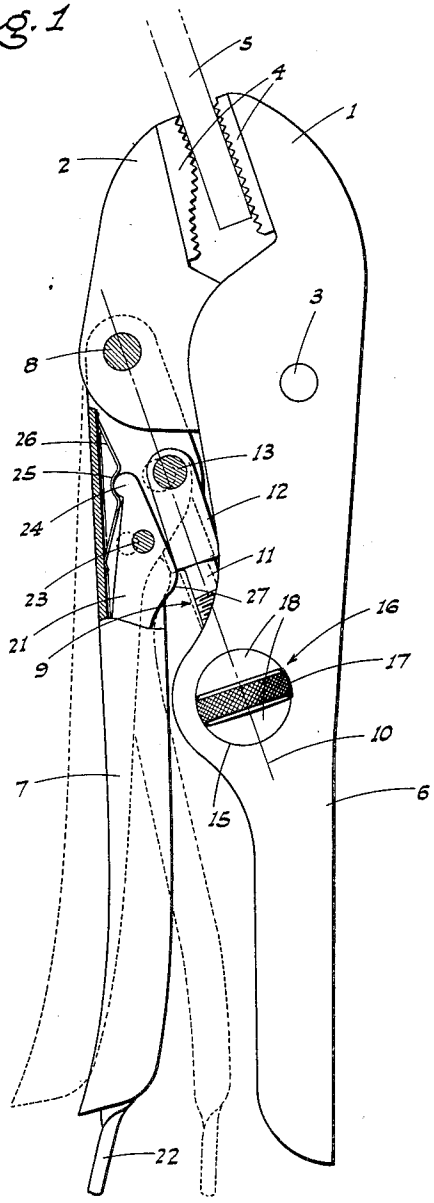


Fig. 2

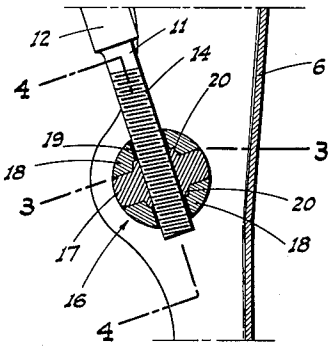


Fig. 3

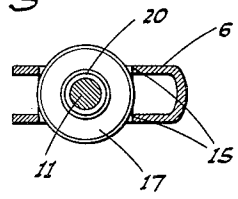
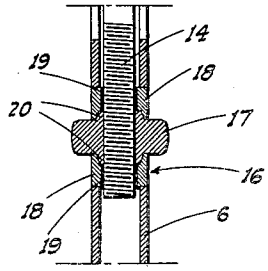


Fig. 4



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WRENCH TYPE PLIERS

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2 Claims. (Cl. 81—84)

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This invention is directed to, and it is an object to provide, improvements in that kind of a mechanical hand tool known generally as locking or wrench type pliers.

One object of the invention is to provide wrench type pliers which include a novel, handle locking unit, especially with respect to the adjusting assembly thereof.

Another object of the invention is to provide a handle locking unit, as in the preceding paragraph, in which said adjusting assembly includes a threaded shank extending into one of the channel-shaped handles of the tool, and a rotary adjustment nut on the shank working through registering openings in opposite sides of said handle for ready finger access; there being a novel locating and retaining arrangement, for the nut, working in matching relation in said openings.

A further object of the invention is to provide the tool with a novel handle releasing unit cooperating with the locking unit to open the pliers from locked position; said handle releasing unit being a modification of the design shown in copending application, Serial No. 645,761, filed February 6, 1946.

A further object of the invention is to provide improvements, in locking or wrench type pliers, which enhance the convenience and practicability of the tool, and to provide such improvements which will be exceedingly effective for the purposes for which the same are produced.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is an elevation, partly in section, of locking or wrench type pliers embodying the present invention; the handle locking unit and handle releasing unit being shown in full lines in the positions occupied by the parts thereof when the tool is in use, and shown in dotted lines in the positions occupied by the parts thereof when the tool is released from the work.

Fig. 2 is a fragmentary sectional elevation illustrating the handle locking unit, particularly the adjusting assembly thereof.

Fig. 3 is a cross section on line 3—3 of Fig. 2.

Fig. 4 is a longitudinal section on line 4—4 of Fig. 2.

Referring now more particularly to the characters of reference on the drawings, the invention is here embodied in locking or wrench type pliers of the type which include a fixed jaw 1 and a movable jaw 2; the latter being of generally bell-

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crank configuration and secured at its inner end by a transverse pivot 3 for adjustment relative to said fixed jaw 1.

Adjacent faces of the jaws 1 and 2 include teeth 4 adapted to frictionally engage the work 5 gripped in the tool. The fixed jaw 1 is formed, at the forward end, and as an integral part of, a rigid handle 6; the other relatively movable and cooperating handle 7 of the tool being of reduced length and attached, at its forward end, by a transverse pivot 8 to the movable jaw 2 intermediate its ends, i. e. generally at the elbow of the bellcrank.

The rigid handle 6, and the relatively movable handle 7 are of channel configuration, as shown, with the channels open toward each other.

A pivotally mounted, releasable, handle locking unit, indicated generally at 9, is connected to the relatively movable handle 7 at its forward end but short of the movable jaw 2 and thence extends in a rearward and diagonal direction to connection with the rigid handle 6; all as hereinafter described in detail. The releasable, handle locking unit 9 is adjustable as to length, and its arrangement and disposition is such that when the work 5 is frictionally engaged between the jaws 1 and 2 by relative approaching motion of the handles 6 and 7, said locking unit 9 snaps inwardly beyond dead-center, then effectively but releasably holding said handles against separation. The dead-center line of the locking unit 9 is indicated at 10, and said unit comprises the following structural arrangement:

The numeral 11 indicates an adjustment bolt formed, at its forward end, with a head 12 attached by a cross pin 13 in the channel-shaped, relatively movable handle 7 near but short of the rear edge of the movable jaw 2.

The opposite end portion of the bolt 11 is formed as a threaded shank 14, which shank extends into the channel of the rigid handle 6 in intersecting relation to a pair of circular, registering side openings 15. An adjusting assembly, indicated generally at 16, is carried on the threaded shank 14 and works in said openings 15; such assembly comprising the following:

A circular adjustment nut 17 is threaded on the shank 14 and is of such diameter that it projects, for finger access, through and beyond the circular openings 15; such adjustment nut being peripherally knurled to prevent finger slippage.

Substantially semi-circular locator segments 18 are disposed on opposite sides of the circular adjustment nut 17 and are radially bored, as at 19, for the passage of the threaded shank 14

therethrough. The locator segments provide a locating and retaining arrangement for the adjustment nut 17, and such segments ride in matching peripheral engagement in the openings 15 of the rigid handle 6.

The adjustment nut 17 includes reduced diameter hubs 20 at opposite ends which bear in corresponding sockets formed in the locator segments 18.

To adjust the effective length of the locking unit 9, it is only necessary that the exposed part of the adjustment nut 17 be finger manipulated to cause either advance or retraction of the adjustment bolt 11; dependent of course upon the thickness of the work 5 to be engaged between the jaws 1 and 2.

The arrangement is such that the adjustment nut 17 can be engaged and manipulated by the fingers of the same hand which is holding the tool for engagement with the work. This greatly adds to the convenience and practicability of the tool.

When it is desired to release the tool, the relatively movable handle 7 must be swung laterally outward, with attendant breaking of the locking unit across the dead-center line 10 in the same direction. To this end there is employed a handle releasing unit which comprises a modification of the unit for this purpose shown in the aforesaid copending application, Serial No. 645,761.

In the present embodiment the handle releasing unit comprises an elongated release lever 21 normally disposed within the channel of the relatively movable handle 7 and projecting out of the rear thereof as a finger piece 22. The elongated release lever 21 terminates, at its forward end, adjacent the head 12 of the bolt 11, and slightly to the rear of the cross pin 13 the lever 21 is pivoted by a cross pin 23 in the channel of said handle 7. The cross pin 23 is adjacent but short of the forward end of the lever 21, said forward end being in the form of a laterally outwardly extended or rounded nub 24. The nub 24 bears in a corresponding seat 25 of an arched leaf spring 26 resting in the channel handle 7; the described nub and seat arrangement being all that is needed to hold said spring in place. Slightly to the rear of the cross pin 23 the lever 21 is formed with a laterally inwardly extending cam 27 which bears against the adjacent side of the head 12.

When the tool is in its locked position, as in full lines in Fig. 1, swinging of the lever 21 inwardly by the finger piece 22 causes the cam 27 to forcefully work against the head 12 accomplishing relative separation of the handle 7 and locking unit 9. With this relative separation, the handle 7 moves outwardly and said locking unit travels across the dead-center line 10 to release position of the pliers. After a pliers releasing operation, the spring 26 returns the lever 21 to its normal inoperative position within said handle 7.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. In wrench type pliers including relatively movable handles and a beyond dead-center locking unit connected diagonally between said handles; a releasing unit comprising a lever extending lengthwise of one handle along its inner side, the forward portion of the lever being adjacent the locking unit, a cross pin pivotally securing the lever to said one handle adjacent but short of the forward end of said handle, a leaf spring between said one handle and forward end of the lever urging the same toward said one handle rearwardly of the cross pin, and a laterally inwardly projecting cam on the lever adjacent but rearwardly of the cross pin, said cam bearing against the locking unit whereby to cause relative separation of the same and said one handle upon swinging of the lever laterally inwardly; said spring being arched toward the forward end of the lever, and a laterally outwardly extending nub on said end bearing against the spring, the latter having a nub receiving seat therein.

2. In wrench type pliers including relatively movable handles, the movable handle being channel-shaped and opening inwardly, and a beyond dead center locking unit connected diagonally between the handles; a releasing unit comprising a lever extending lengthwise in the channel of the movable handle, the inner end of the lever being adjacent the locking unit, a cross pin pivoting such inner end of the lever to the movable handle adjacent but short of the inner end of such handle, a projection on the lever extending inwardly beyond the pin and terminating in a nub, an arched leaf spring separate from the movable handle but slidably mounted in the channel thereof adjacent said lever projection, the arch of the spring having a depressed seat, the nub of the lever projection resting in said seat, and cam means on the lever on the side of the pin opposite the projection, such cam means being engageable with the locking unit and effective to release the same upon inward swinging of the lever.

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