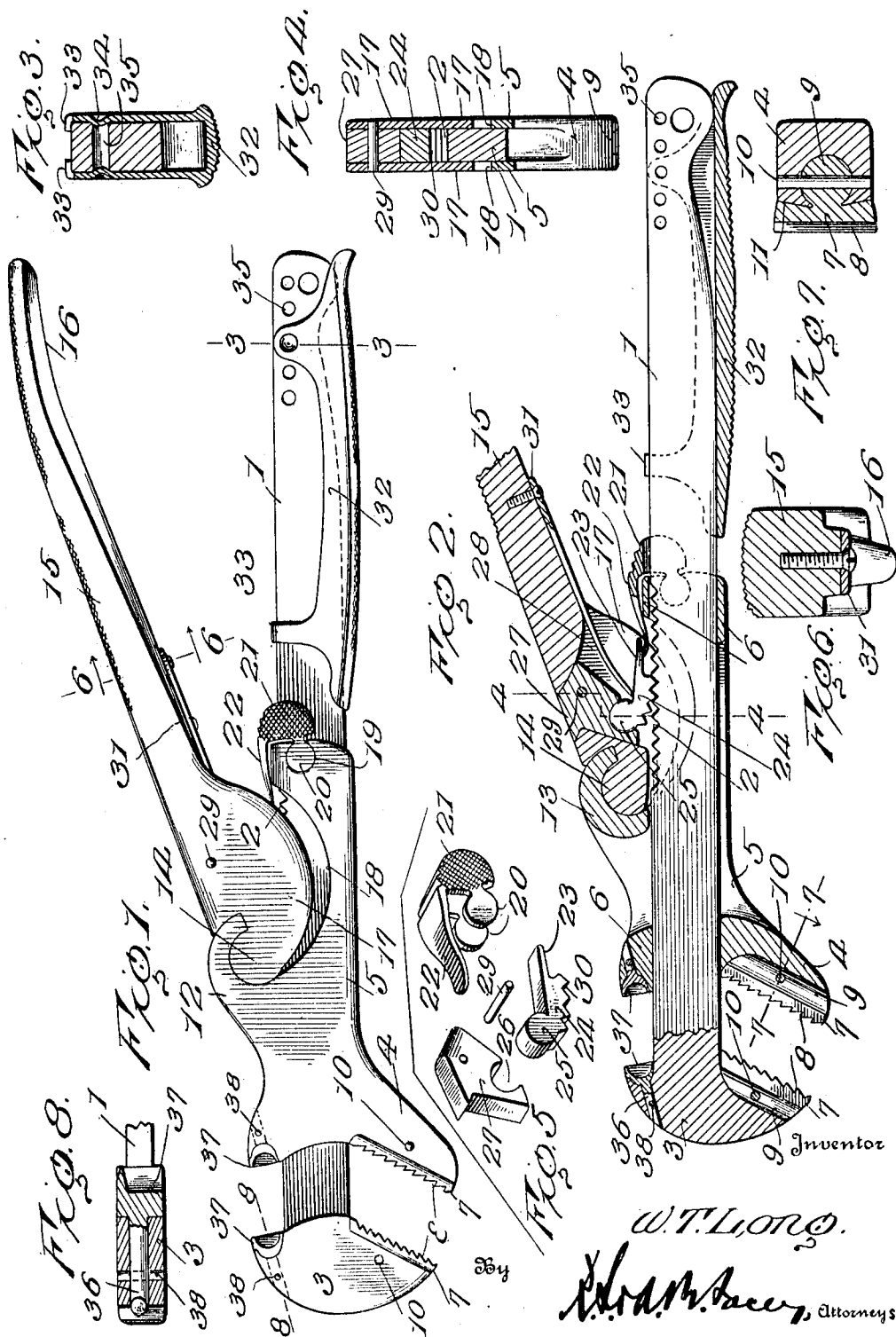


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WRENCH.
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UNITED STATES PATENT OFFICE.

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WRENCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM T. LONG, a citizen of the United States, residing at Auburn, in the county of King and State of Washington, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to improvements in wrenches of the type disclosed in Letters-Patent No. 1,181,466, granted to me May 2, 1916. The improvements will be hereinafter first fully described and then particularly pointed out in the claims.

In the annexed drawings:

Figure 1 is a side elevation of a wrench embodying my present improvements.

Fig. 2 is a view of the same partly in side elevation and partly in longitudinal section.

Fig. 3 is a detail section on the line 3—3 of Fig. 1.

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

Fig. 5 is a detail group perspective view of the locking and releasing devices.

Fig. 6 is a detail section on the line 6—6 of Fig. 1.

Fig. 7 is a detail section on the line 7—7 of Fig. 2.

Fig. 8 is a detail section on the line 8—8 of Fig. 1.

The shank 1 is provided with teeth 2 upon one edge and is constructed at one end with a lateral offset 3 constituting the fixed jaw. The movable jaw 4 is disposed parallel with the fixed jaw and is constructed with side plates or wings 5 which extend longitudinally of the shank and are connected at their ends by webs 6. Said webs pass across the edges of the shank and thereby hold the jaw to the shank and guide it in its movements. It will be noted that the jaws are arranged at an angle of sixty degrees to the shank and, therefore, when a hexagonal nut is being turned, the nut will be engaged on three sides so that it will be very effectually held. The jaws may be smooth-faced, of course, but are shown as equipped with facing plates or gripping members 7 which may be constructed with transverse teeth 8 so that a pipe or rod may be gripped and turned. These members 7 are removable and may be renewed from time to time while the other portions of the tool may be made of cheaper material and the cost of manufacture thereby lessened. The jaws are constructed with longitudinal

grooves or seats which receive longitudinal ribs 9 on the respective pipe-gripping members. These ribs and seats are of such cross-sectional form that movement of a gripping member away from its jaw cannot occur and accidental longitudinal movement of the member is prevented by a transverse retaining pin 10 inserted through the jaw and the rib, as shown clearly in Fig. 7. It will also be noted that the side edges of the gripping members have a dovetailed engagement 11 with the jaws so that relative movement of the parts is positively prevented and spreading of the edges avoided.

Between their ends, at that side of the shank remote from the jaws, the side plates 5 are constructed with hook-like extensions 12 connected by a transverse web 13 of an arcuate overhanging form thereby providing a seat for the convex end or fulcrum 14 of the lever 15, the free end of the lever being provided with a longitudinal reinforcing rib 16 on its inner side. Near its fulcrum, the lever is provided with the guards 17 which depend at the sides of the shank and prevent lateral movement of the lever relative to the shank. To accommodate these guards, the edges of the side plates 5 are recessed, as shown at 18, and in the ends of the side plates are circular notches or seats 19 in which are rockingly engaged and held the knobs or disks 20 on the edges of a releasing cap 21. The said cap fits over the shank and is provided with a finger 22 extending between the guards 17 and engaging under a lip 23 on the holding dog 24, the guards constituting a housing for said dog. The dog 24, at the end remote from the lip 23, is provided with a transverse circular lug adapted to rockingly engage a circular seat 26 in the edge of a fulcrum block or anchor 27 which is fitted within a recess 28 in the lever and retained therein by a transverse pin 29 as shown and as will be readily understood. The under edge of the dog 24 is provided with teeth 30 adapted to engage with the teeth 2 on the shank to hold the lever and the jaw 4 against movement, and a spring 31, secured to the lever, bears at its free end upon the upper side of the lip 23 and thereby normally holds the dog in engagement with the shank.

A slip handle 32 is fitted upon the end of the shank 1 to provide a comfortable grip for the workman and also to serve as a stop to limit the movement of the jaw 4 and the

lever along the shank. This slip handle has resilient side members which are provided at their inner ends with retaining hooks 33 adapted to engage over the shank as shown and at their outer ends with depressed nibs or protuberances 34 adapted to yieldably engage one of the sockets 35 in the shank. This arrangement permits the slip handle to be adjusted longitudinally of the shank and thereby limit the movement of the lever or handle as desired.

It will be noted that the fulcrum points or rockers 20 of the cap 21 are in advance of the main body of the cap so that a downward pressure on the said body will lift the end of the finger 22 which will thereupon hold the dog 28 out of engagement with the shank. The movable jaw and the lever may then be moved along the shank until the jaws engage the nut to be turned, whereupon the cap will be released and the spring 31 will throw the end of the dog into engagement with the shank while the lever may be rocked toward the shank. As the lever swings toward the shank, the connections of the same with the dog and the movable jaw serve as a toggle whereby the full length of the dog will be caused to engage the shank and the movable jaw will be caused to grippingly engage the nut. Reverse movement of the parts will, of course, release the nut. The members 33 form stops which by engagement with the cap 21 prevent movement of the lever and the coaxing parts over and off the end of the shank.

The rocking of the lever handle 15 causes the movable jaw to move straight along the shank and a strong pressure is exerted on the engaged article so that the tool may be used very efficiently as pliers. The lateral extension 3 is projected across the shank and in the opposed edges of the same and the side plates or wings 5, I form sockets which each receives a stem 36 on a wire-cutter jaw 37, a pin 38, inserted transversely through the stem, serving to securely fasten the jaw in place.

The lever is above the shank so that there is sufficient room for the operator's hand between the shank and the work and the lever may be easily held to the shank when the tool is in use. The lever is not hung on a pin or screw which may shear off but is fulcrumed on an integral lug which furnishes a strong wide bearing. The tool can be disassembled without requiring the removal of a large number of rivets or pins. Sufficient outward pressure is exerted upon the slip handle to release the same and slide it from the shank. The cap 21 is then held in released position and the cap, lever, and cooperating parts moved longitudinally over the shank to pass from the end of the same, after which action, a side thrust will separate the lever from the housing and the cap

from the side plates. If it be desired to remove the dog, the pin 29 may be easily driven out.

Having thus described the invention, what is claimed as new is:—

1. The combination of a shank having a fixed jaw at one end, a movable jaw mounted on the shank and having extensions projecting across the shank, a lever fulcrumed upon the said extensions at the opposite side of the shank, a dog fulcrumed upon said lever and adapted to engage the shank, means carried by the lever for normally holding the dog in engagement with the shank, and means carried by the movable jaw for releasing the dog from engagement with the shank.

2. The combination of a shank having a fixed jaw at one end, a movable jaw having a housing fitting around the shank, a lever fulcrumed upon said housing, a dog carried by the lever to engage the shank, a releasing device mounted on the housing and engaging the dog, the said device, the housing and the lever being slidable together on the shank and the shank having a plurality of sockets in its side at its free end, and a slip handle yieldably mounted on the shank to normally limit the sliding movement of the housing, the lever and the releasing device, and having a resilient side plate provided with a protuberance to engage one of the sockets in the shank.

3. The combination of a shank having a fixed jaw at one end, a movable jaw having side plates extending alongside the shank, webs connecting the side plates and extending across the shank, one of said webs being overhanging and the side plates having notches in their ends, a lever having a lug at one end rockingly engaging the overhanging web, a dog fulcrumed on the lever to engage the shank, and a releasing cap having circular projections engaging the notches in the ends of the side plates and also having a finger engaging under the end of the dog.

4. The combination of a shank having a fixed jaw at one end, a movable jaw having a housing slidably fitting around the shank, a lever fulcrumed upon the housing, a dog carried by the lever to engage the shank, a releasing device mounted on the housing and engaging the dog, the housing, the lever and the dog being slidable together on the shank, and the shank having a plurality of sockets in its side at its free end, and a slip handle mounted on the shank to limit the outward movement of the housing, the lever and the releasing device, and comprising resilient side plates provided at their inner ends with retainer hooks engaging over the shank and at their outer ends with protuberances to engage the sockets in the shank.

5. The combination of a shank having a fixed jaw at one end, a movable jaw having

extensions slidably engaging the shank, a lever fulcrumed on said extensions on the side of the shank remote from the movable jaw, a dog carried by said lever to engage
5 the shank, means on the lever for holding the dog normally in engagement with the shank, and a releasing cap rockingly mount-

ed in the ends of the extensions of the movable jaw and disposed between the lever and the shank and engaging the dog to release 10 the same from the shank.

In testimony whereof I affix my signature.

WILLIAM T. LONG. [L. S.]

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."