Nov. 15, 1927.

1,649,128

N. H. ROBINSON

WRENCH

Filed April 8, 1924

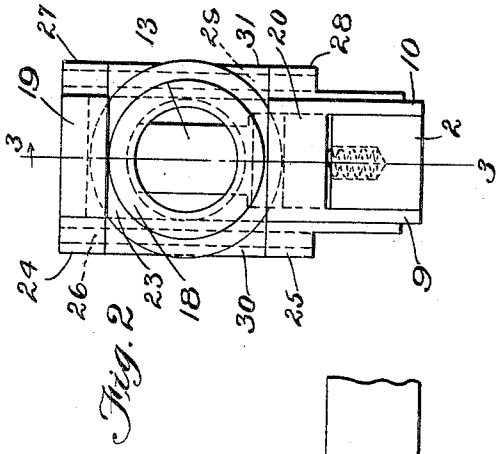

Fig. 2

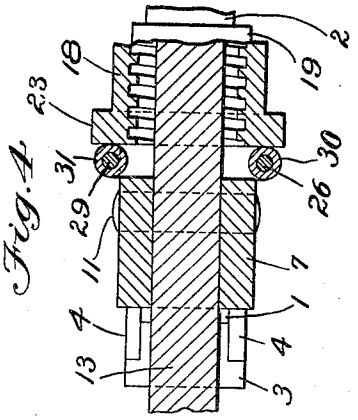

Fig. 4

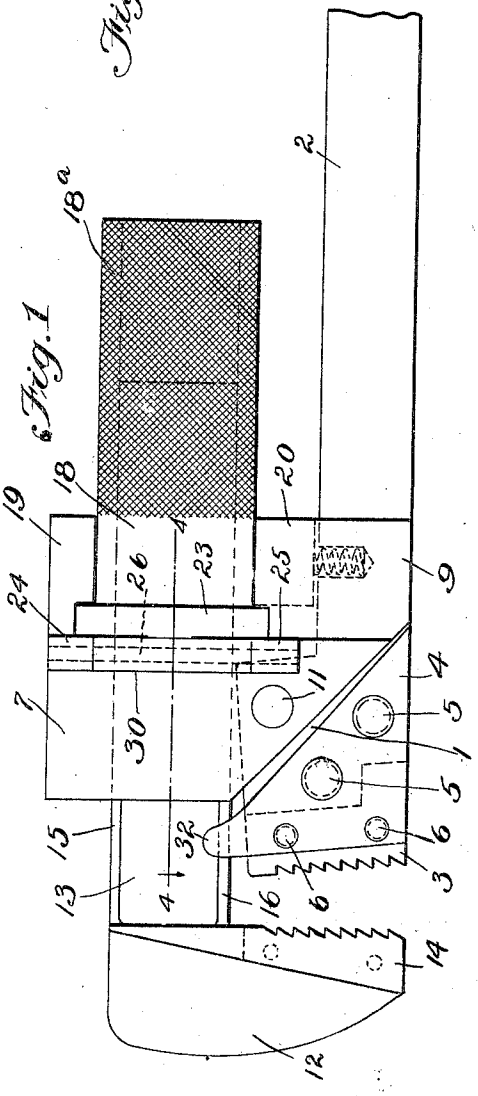

Fig. 1

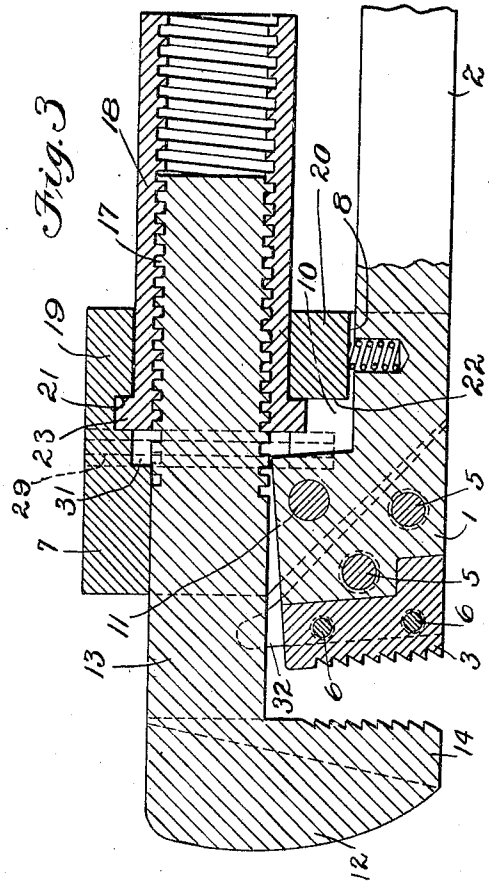

Fig. 3

Inventor
Nathan H. Robinson
by Roberts, Roberts & Cushman
Att'ys

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UNITED STATES PATENT OFFICE.

NATHAN H. ROBINSON, OF BRAINTREE, MASSACHUSETTS.

WRENCH.

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This invention relates to wrenches of that type having relatively movable jaws.

Wrenches of this type are often used in difficultly accessible situations, and one object of the invention is to provide a wrench so constructed that the user may, if necessary, adjust the movable jaw by means of the thumb and finger of the hand which grasps the handle.

Further objects are to provide a rotary adjusting element presenting a large area to be grasped by the hand or fingers of the user, thus permitting the manual application of great force in adjusting the movable jaw toward or from the work while at the same time providing the adjusting element and the shank of the movable jaw with screw-threaded engaging surfaces of unusual length thereby increasing the strength and durability of the parts; to provide anti-friction means to sustain the thrust of the rotary actuating element in setting up the movable jaw against the work; and to embody the several features of improvement in a construction comprising few and simple parts.

For purposes of illustration the invention is herein disclosed as embodied in a wrench of the Stillson type although the invention is not necessarily limited to wrenches of this particular type, that exemplification of the invention chosen for illustration being shown in the accompanying drawings in which:

Fig. 1 is a fragmentary side elevation of a wrench embodying the present invention;

Fig. 2 is an end elevation of the wrench taken from its right-hand end as viewed in Fig. 1;

Fig. 3 is a fragmentary longitudinal section substantially on the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary horizontal section on the line 4—4 of Fig. 1.

The numeral 1 indicates the fixed jaw of the wrench, such jaw being integral with or rigidly secured to the handle 2. Preferably the fixed jaw is provided with a hardened wear plate 3 which may conveniently be secured in position by the use of connecting plates 4 secured by rivets 5 to either side of the jaw 1, and which receive the wear plate 3 between them. The wear plate is secured to the plates 3 and 4 by rivets 6.

A supporting block 7 is mounted upon the fixed jaw 1. This supporting block is furnished with a longitudinal channel 8 at its lower side, as viewed in Figs. 1 to 3 inclusive, such channel being defined by the side walls 9 and 10 which are spaced apart a distance substantially equal to the thickness of the jaw 1 and handle 2. The fixed jaw and handle are disposed in its channel 8 between the parts 9 and 10, and the jaw is pivotally connected to the block by means of a pin 11.

The numeral 12 indicates the movable jaw provided, if desired, with a hardened wear-plate 14 and having an elongate shank 13 which may be intergral with the jaw or rigidly secured thereto.

The shank 13 is preferably of substantially rectangular transverse section, but has curved upper and lower edges 15 and 16 respectively which are screw-threaded as indicated at 17. The shank 13 is guided in a slot in the block 7, the slot being of substantially the width of the shank so as to prevent lateral movement of the latter as it slides within the block.

The threaded portions of the shank 13 engage the internally screw-threaded bore of an actuator sleeve 18. This sleeve is elongate in form, extending substantially parallel to and adjacent to the handle 2. The outer surface of this sleeve is preferably knurled as indicated at 18^a to provide a secure grip for the hand of the user.

The forward portion of the sleeve 18 is disposed between members 19 and 20 carried by or forming integral portions of the block 7. These members 19 and 20 are spaced apart vertically a distance substantially equal to the diameter of the sleeve 18 so that the latter bears firmly against the opposed faces of said members. At a point adjacent to the junction of the members 19 and 20 with the main portion of the block 7, a chamber is formed within the latter, the rear wall surfaces 21 and 22 of said chamber lying in substantially the same plane and forming an abutment for a radial flange 23 which projects from the forward end of the sleeve 18.

Upon the front side of the block 7 as viewed in Fig. 1, a pair of spaced ears or lugs 24 and 25 is provided in which the opposite ends of an pin 26 are secured see Fig. 2. Similar lugs or ears 27 and 28 project from the rear face of the block 7 and support a pin 29. Vertically elongate rollers 30 and 31 are journalled upon pins 26 and 29 and are so arranged that when the rear face of the flange 23 engages the abutment surfaces 21 and 22, its forward face is substantially in contact with the rollers, the latter forming

an anti-friction abutment which opposes the axial thrust of the sleeve 18 when the latter is turned to move the shank 13 with its jaw 12 toward the work. As indicated the rollers form substantially a line contact between the abutment 23 and block 7 thereby materially reducing friction and contributing to the ease of operation of the tool. When the jaw is moved in the opposite direction, the thrust is borne by the surfaces 21 and 22, but as the thrust of opening the jaw is relatively slight, it is usually unnecessary to provide anti-friction bearings at this point, although it is contemplated that such bearings might be provided if desired. Furthermore, under some circumstances, the sleeve 18 may extend completely through block 19 with a flange or collar at each side of the block, such flanges or collars engaging anti-friction devices if desired.

To assist in guiding the shank 13 as the movable jaw is advanced or retracted, it is preferred to provide the plates 4 with upstanding ears 32 which lie upon opposite sides of the shank and assist in preventing lateral movement of the latter.

When the device is in use, the movable jaw may be separated from the jaw 3 by turning the sleeve 18, which is readily accomplished by the thumb and finger of the user while grasping the handle 2 with the other fingers of the same hand. The jaw 14 may be advanced to grip the work in the same manner. As the sleeve 18 is of substantial length it is possible when circumstances demand it, for the operator to grasp it with his entire hand so that he may exert the full strength of his hand in adjusting the jaw 14. This is often of decided advantage when attempting to manipulate hard or unusually smooth material where the jaws tend to slip and must be set up very firmly against the work.

The long threaded engagement of the sleeve 18 and shank 13 makes the wrench unusually strong and eliminates tendency to strip the threads when subjected to great force.

The device as thus constructed is strong and substantial, consists of but few parts, and is capable of withstanding hard usage without sustaining severe injury.

I claim:

1. A wrench comprising a fixed jaw, a handle, a support carried by the fixed jaw, said support having a guideway, a movable jaw having a shank sliding in said guideway, said shank having an externally screw-threaded portion, an elongate internally threaded actuating sleeve engaging an exteriorly threaded portion of the shank, and anti-friction means interposed between the support and the sleeve to oppose the axial thrust of the sleeve when rotated to adjust the movable jaw.

2. A wrench comprising a fixed jaw, a handle associated therewith, a support carried thereby, said support having a guideway, a movable jaw having an exteriorly screw-threaded shank sliding in said guideway, an internally threaded actuating sleeve engaging the shank, and anti-friction rollers interposed between the support and the end of the sleeve to receive the axial thrust of the sleeve when rotated to advance the movable jaw toward the fixed jaw.

3. A wrench comprising a fixed jaw, a handle associated therewith, a support carried thereby, a movable jaw having a screw-threaded shank, a rotary actuating member having threaded engagement with the shank, and rollers carried by the support, said rollers being supported on axes substantially perpendicular to the axis of the rotary actuating member and constituting an abutment for the latter.

4. A wrench comprising a fixed jaw, a handle associated therewith, a supporting block carried thereby, said block having a passage therein, a movable jaw having a shank sliding in said passage, said shank having a screw-threaded portion, a rotary actuator having screw-threaded engagement with the threaded portion of the shank, and a pair of parallel rollers, one roller being disposed at each side of the block, said rollers constituting anti-friction abutments to receive the axial thrust of the actuator when the latter is rotated to advance the movable jaw.

5. A wrench comprising a fixed jaw, a handle associated therewith, a supporting block carried thereby, said block having a guideway therein, a movable jaw having an externally screw-threaded shank sliding in said guideway, said block also having an opening, a rotary actuating sleeve turning in said opening in the block, said sleeve having a radial flange at its forward end, fixed abutment faces upon the block, one face of the flange bearing against said fixed abutment faces, and a plurality of anti-friction devices carried by the block and engaging the opposite face of the flange.

6. A wrench comprising a fixed jaw, a handle, a supporting block carried by the fixed jaw, said block having a guideway therein, a movable jaw having an externally screw-threaded shank sliding in said guideway, an elongate internally screw-threaded actuating sleeve engaging the shank of the movable jaw, the block having an opening therein, said sleeve turning in the opening in the block, a radial flange at the forward end of the sleeve, a pair of lugs projecting from each side of the block, pins having their ends secured respectively in the lugs of each pair, and rollers mounted to turn upon said pins, said rollers bearing against the forward face of the flange and

constituting an anti-friction abutment therefor.

7. A wrench comprising a fixed jaw, a rigid handle, a block pivotally secured to the fixed jaw, said block having a guideway therein, a movable jaw having an externally screw-threaded shank sliding in said guideway, an elongate internally threaded actuating sleeve engaging the threaded shank of the movable jaw, said block having a chamber therein, said sleeve having a radial flange disposed within the chamber in the block and bearing against the rear wall of said chamber, and a roller mounted at each side of the block, said rollers bearing respectively against the forward face of the flange at opposite sides of the axis of the actuating sleeve, the latter extending rearwardly from the block closely adjacent to and substantially parallel with the handle.

Signed by me at Boston, Massachusetts, this 25th day of March, 1924.

NATHAN H. ROBINSON.