March 5, 1929. J. S. WICK 1,704,067

WRENCH

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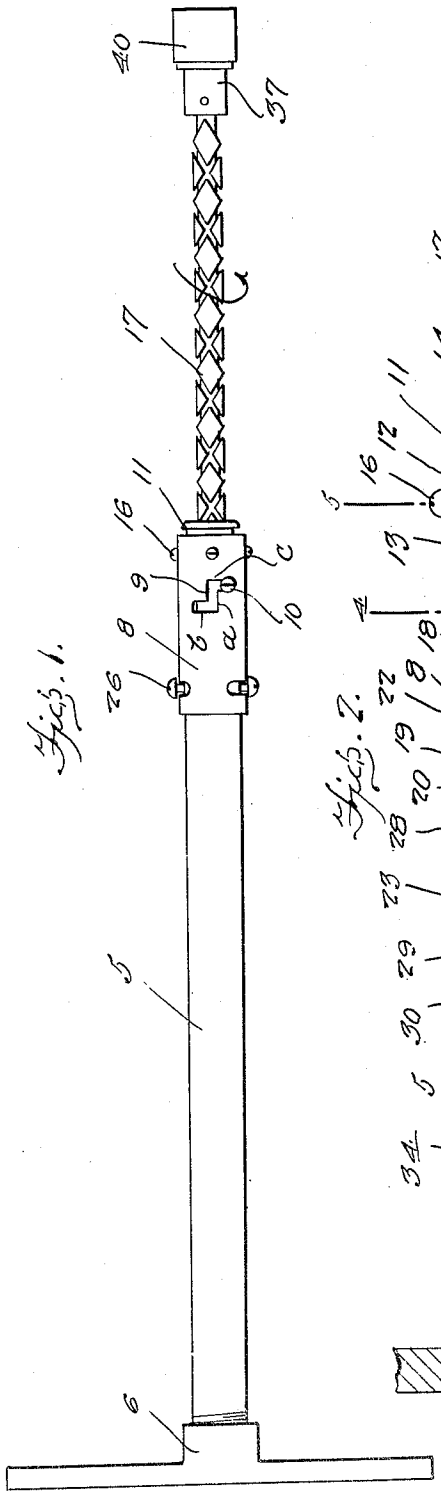


Fig. 1.

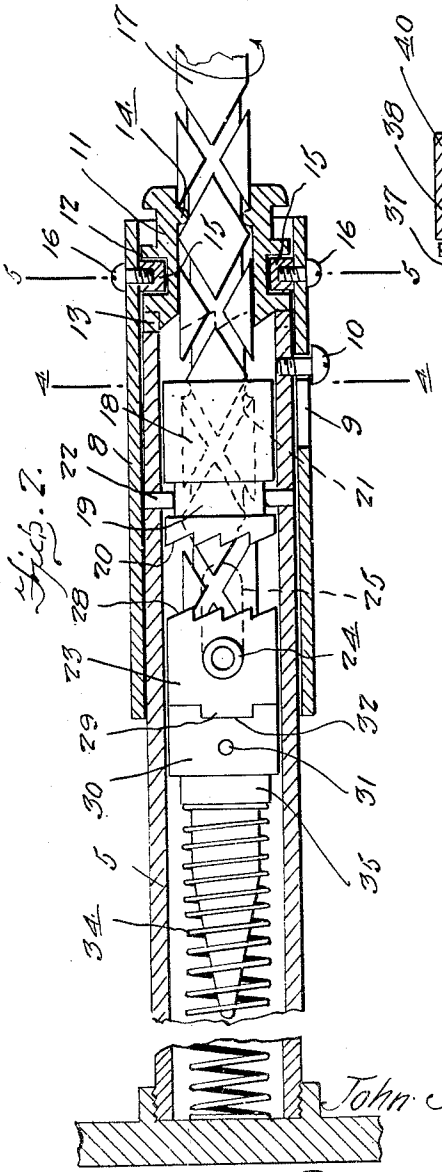


Fig. 2.

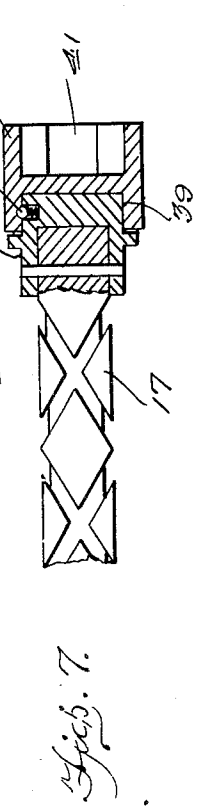


Fig. 7.

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WRENCH

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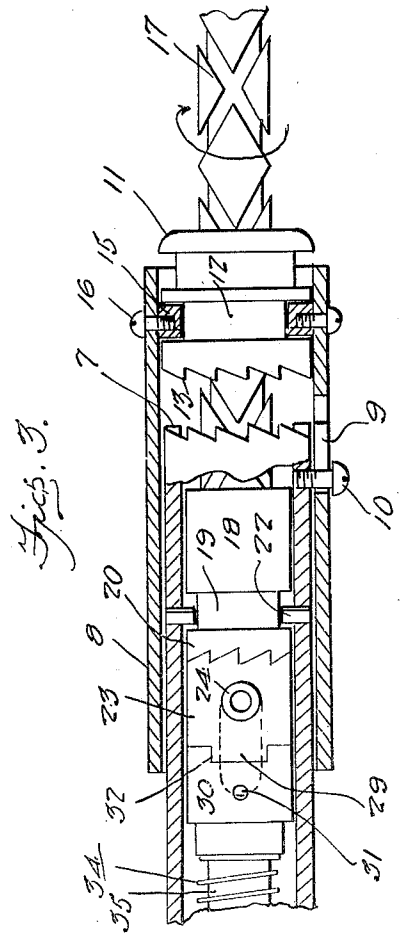


Fig. 3.

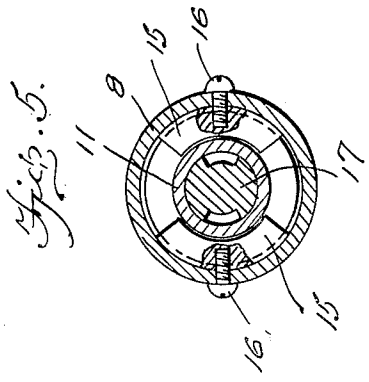


Fig. 5.

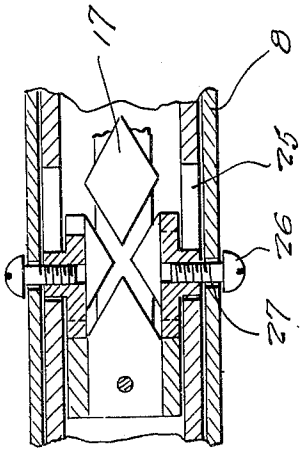


Fig. 6.

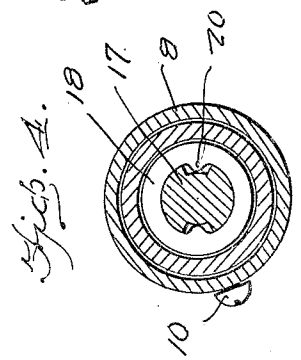


Fig. 4.

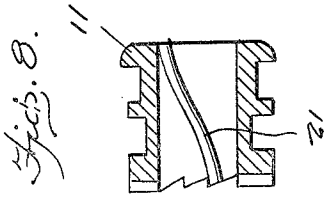


Fig. 8.

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Patented Mar. 5, 1929. 1,704,067

UNITED STATES PATENT OFFICE.

JOHN S. WICK, OF LONG BEACH, CALIFORNIA.

WRENCH.

Application filed January 23, 1928. Serial No. 248,737.

The present invention relates to wrenches and has for its prime object to provide means whereby the rotating elements may be actuated at a relatively great rate of speed with considerable ease.

A still further important object of the invention resides in the provision of a wrench of this nature having an operating mechanism which is simple in its construction, easy to adjust, and thoroughly efficient and reliable in use and operation.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is a side elevation of the wrench embodying the features of my invention,

Figure 2 is a fragmentary longitudinal section therethrough showing the same adjusted in one position,

Figure 3 is a similar view showing the same adjusted in another position,

Figures 4 and 5 are transverse sections taken substantially on the lines 4—4 and 5—5 respectively of Figure 2,

Figure 6 is a detail longitudinal section through the head on the spiral grooved shank and adjacent parts,

Figure 7 is a sectional view through the sprocket on the shank, and

Figure 8 is a sectional view through one of the driving nuts.

Referring to the drawing in detail it will be seen that the numeral 5 denotes an elongated tube having a combined cap and handle 6 threaded at one end thereof and the other end thereof has formed on its head a series of ratchet teeth 7. A sleeve 8 is rockable and slidable on the tube 5 and is limited in its movement by a pin and slot connection. In the present exemplification of the invention, the slot 9 of the pin and slot connection is Z-shaped and is formed in the sleeve 8; this slot 9 providing a longitudinal portion *a* and lateral ends *b* and *c*. The pin of the connection is denoted by the numeral 10 and extends from the tube 5 through the slot 9. A clutch segment 11 has an annular exterior groove 12 intermediate its ends, ratchet teeth 13 at one end and inwardly extending lugs 14. Shoes 15 are anchored interiorly of the sleeve 8 by screws 16 and are disposed in the annular groove 12. The lugs 14 extend into one spiral groove of the double spiral grooved shank 17 and the teeth 13 are engageable with teeth 7 as will appear later.

A clutch segment 18 is formed with an exterior annular groove 19 intermediate its ends and at one end is provided with an annular series of ratchet teeth 20 and adjacent the other end with inwardly directed lugs 21 receivable in the other groove of the double spiral grooved shank 17. This clutch segment 18 is disposed about the shank 17 and mounted inside the tube 5 a distance from the ratchet toothed end 7 and pins 22 project inwardly from the tube 5 and terminate in the groove 19. A clutch segment 20 is disposed about the shank 17 and in the tube 5 and is provided with bosses 24 projecting outwardly therefrom into longitudinal slots 25 formed in the tube 5 and screws 26 extend through lateral slots 27 in the sleeve 8 and are engaged in the bosses 24. One end edge of the segment 23 is provided with a ratchet 28 while the other edge thereof is provided with projections 29. A head 30 is anchored as at 31 on the inner end of the shank 17 and has notches 32 for receiving the projections 29 when the shank is in its extended position as is shown in the drawings. A spring 34 of cylindrical coil type is disposed in the tube 5 and has an abutment member 35 in one end to engage the head 30 and the other end engages the cap 6. This spring urges the shank to its extended position so that when the shank is moved inwardly of the tube the spring 24 is compressed.

A cap 37 is anchored on the outer end of the shank 17 and has a spring pressed pawl 38 movable laterally thereof for engaging in a depression formed in socket 39 of the socket wrench member 40. This member 40 has a nut receiving socket 41 formed therein. Thus different sized members 40 may be furnished with the wrench so that they may be easily interchangeable with respect to the cap 37 by the quick attachable means provided through the spring pressed pawl 38.

When the sleeve 8 is adjusted to the position shown in Figure 1; that is, the pin 10 is located in the lateral end *c* and the tube 5 is pushed to telescope over the shank 17 it will be seen that the ratchet teeth 7 are engaged with ratchet teeth 13 of the clutch segment 11 so that as the clutch segment 11 is pushed over the shank 17 functions as a driving nut to rotate the shank 17 in one direction as is indicated by the arrow in Figure 2. It will be noted that teeth 20 and 28 are out of en-

gagement with one another. If the sleeve 8 is shifted by rocking and sliding the same so that the pin 10 is located in the lateral end b it will be seen that the segment 23 is moved so as to mesh its teeth 28 with the teeth 20 of the segment 18 and simultanenously the segment 11 is shifted to disengage the teeth 13 from the teeth 7. Therefore if the tube 5 is pushed to telescope the shank 7 while the parts are thus positioned as shown in Figure 3 the shank 17 will be rotated in an opposite direction from that previously described that is in a direction indicated by the arrow in Figure 3. It will be seen that the spring will return the tube 5 and during the return of the tube 5 the teeth 13 and 7 will slip over each other or the teeth 20 and 28 will slip over each other depending upon which of the teeth are in engaging position as will be quite apparent. It will also be noted that when the parts are in extended position the head 30 and segment 28 are locked together by projections 29 and notches 32 so that by rotating the tube 5 the segment may be rotated for starting a nut in either direction but as soon as the tube is moved inwardly that is over the shank 17 this connection between the segment 23 and the head 30 is disconnected because of the movement of the head 30 inwardly of the tube 5 away from the segment 23.

The lugs 14 and 21 are in the form of spiral ribs as is illustrated in Figure 8. Therefore the segments 11 and 18 form the driving nuts for the shank 17 one being threaded in one direction thereon and the other threaded in the opposite direction thereon as is well understood.

It is thought that the construction, operation and advantages of the invention will now be quite apparent to those skilled in this art without a more detailed description thereof. The present embodiment of the invention has been described in detail merely by way of example since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:

1. A tool of the class described including an elongated shank, a pair of driving nuts threaded on the shank one in one direction and the other in the other direction, an elongated tube for telescoping over the shank, one of said driving nuts being disposed in the tube and the other exteriorly thereof, one end of the tube being provided with ratchet teeth, said other driving nut having ratchet teeth for engagement with the ratchet teeth of the tube, said one driving nut having an annular groove, pins from the tube projecting in the groove, said one driving nut having ratchet teeth at one end, a clutch element in the tube about the shank and having bosses extending through longitudinal slots in the tube and provided with ratchet teeth engageable with the ratchet teeth of said one driving nut, a sleeve rockable and slidable on the tube, a pin and slot connection between the sleeve and tube, the slot thereof being approximately Z-shaped, said sleeve having lateral slots, screws in the bosses projecting through the lateral slots, and shoes extending inwardly from the sleeve into an annular groove in said other driving nut.

2. A tool of the class described including an elongated shank, a pair of driving nuts threaded on the shank one in one direction and the other in the other direction, an elongated tube for telescoping over the shank, one of said driving nuts being disposed in the tube and the other exteriorly thereof, one end of the tube being provided with ratchet teeth, said other driving nut having ratchet teeth for engagement with the ratchet teeth of the tube, said one driving nut having an annular groove, pins from the tube projecting in the groove, said one driving nut having ratchet teeth at one end, a clutch element in the tube about the shank and having bosses extending through longitudinal slots in the tube and provided with ratchet teeth engageable with the ratchet teeth of said one driving nut, a sleeve rockable and slidable on the tube, a pin and slot connection between the sleeve and tube, the slot thereof being approximately Z-shaped, said sleeve having lateral slots, screws in the bosses projecting through the lateral slots, and shoes extending inwardly from the sleeve into an annular groove in said other driving nut, said clutch segment being provided with projections on the end thereof remote from its ratchet teeth, a head on the inner end of the shank having notches to receive the projections when the shank is in its extended position.

3. A tool of the class described including an elongated shank, a pair of driving nuts threaded on the shank one in one direction and the other in the other direction, an elongated tube for telescoping over the shank, one of said driving nuts being disposed in the tube and the other exteriorly thereof, one end of the tube being provided with ratchet teeth, said other driving nut having ratchet teeth for engagement with the ratchet teeth of the tube, said one driving nut having an annular groove, pins from the tube projecting in the groove, said one driving nut having ratchet teeth at one end, a clutch element in the tube about the shank and having bosses extending through longitudinal slots in the tube and provided with ratchet teeth engageable with the ratchet teeth of said one driving nut, a

sleeve rockable and slidable on the tube, a pin and slot connection between the sleeve and tube, the slot thereof being approximately Z-shaped, said sleeve having lateral slots, screws in the bosses projecting through the lateral slots, and shoes extending inwardly from the sleeve into an annular groove in said other driving nut, said clutch segment being provided with projections on the end thereof remote from its ratchet teeth, a head on the inner end of the shank having notches to receive the projections when the shank is in its extended position, a combined cap and handle threaded on the other end of the tube, and a spring disposed in the tube between the inner end of the shank and the combined cap and handle.

4. A tool of the class described including an elongated shank, a pair of driving nuts threaded on the shank one in one direction and the other in the other direction, an elongated tube for telescoping over the shank, one of said driving nuts being disposed in the tube and the other exteriorly thereof, one end of the tube being provided with ratchet teeth, said other driving nut having ratchet teeth for engagement with the ratchet teeth of the tube, said one driving nut having an annular groove, pins from the tube projecting in the groove, said one driving nut having ratchet teeth at one end, a clutch element in the tube about the shank and having bosses extending through longitudinal slots in the tube and provided with ratchet teeth engageable with the ratchet teeth of said one driving nut, a sleeve rockable and slidable on the tube, a pin and slot connection between the sleeve and tube, the slot thereof being approximately Z-shaped, said sleeve having lateral slots, screws in the bosses projecting through the lateral slots, and shoes extending inwardly from the sleeve into an annular groove in said other driving nut, said clutch segment being provided with projections on the end thereof remote from its ratchet teeth, a head on the inner end of the shank having notches to receive the projections when the shank is in its extended position, a combined cap and handle threaded on the other end of the tube, and a spring disposed in the tube between the inner end of the shank and the combined cap and handle, an abutment member engaged in the inner end of the spring for abutting against the shank.

In testimony whereof I affix my signature.

JOHN S. WICK.