M. P. STRAEHLE.

REVERSIBLE RATCHET AND SOCKET WRENCH.

APPLICATION FILED NOV. 3, 1921.

1,412,718. Patented Apr. 11, 1922.

FIG. 1.

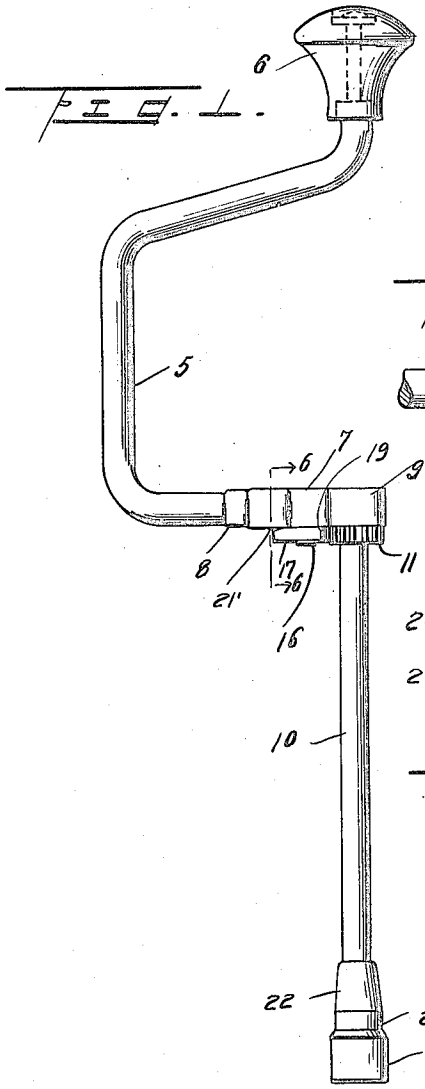


FIG. 2.

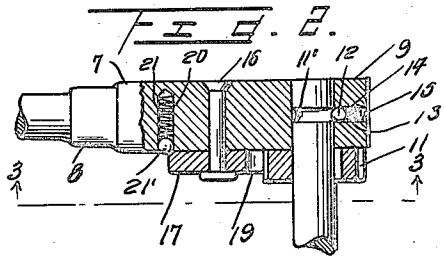


FIG. 3.

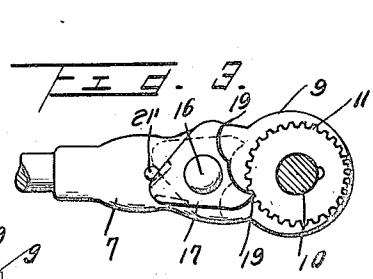
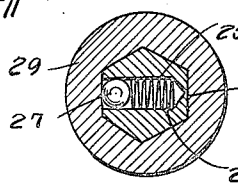


FIG. 4.



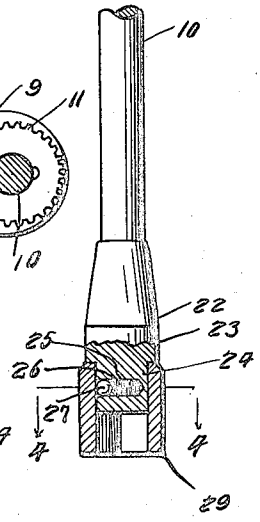


FIG. 5.

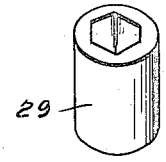
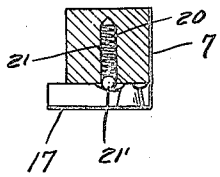


FIG. 6.



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REVERSIBLE RATCHET AND SOCKET WRENCH.

1,412,718. Specification of Letters Patent. Patented Apr. 11, 1922.

Application filed November 3, 1921. Serial No. 512,553.

To all whom it may concern:

Be it known that I, MONROE P. STRAEHLE, a citizen of the United States, residing at Pottstown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Reversible Ratchet and Socket Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to reversible ratchet and socket wrenches, its primary object being to provide a wrench wherein the component parts thereof may be readily taken apart to permit the same to be packed in a kit.

A further object of the invention is to provide a wrench which includes a plurality of sockets of different sizes which may be readily interchanged and when in operative position on the wrench will be positively held to rotate with the shaft.

Still another object of the invention resides in the provision of a ratchet mechanism which is so constructed as to eliminate undue stress of the spring thereof and which will permit the shaft to rotate in both a clockwise and a counter-clockwise direction.

Another object of the invention is to provide a reversible ratchet wrench which eliminates leaf springs and other easily distorted parts and which includes a spring urged ball that frictionally engages the ratchet to retain the same in position to permit the head to be held against rotation in either direction and which may be arranged to clear the shaft when desired, the spring being so disposed as to be subjected to a minimum wear.

Still another object of the invention is to provide a wrench having the above characteristics, which is simple in construction, consists of few parts, and may be manufactured and sold at a minimum cost.

With the above and other objects and advantages in mind, the invention consists in the novel combination of elements, construction and arrangement, operations and specific features all of which is hereinafter to be enlarged upon and explicitly defined in the subjoined claim, a practical embodiment of the invention being illustrated in the accompanying drawing, wherein:

Figure 1 is an elevation of a wrench constructed in accordance with and embodying the invention,

Figure 2 is a fragmentary view partly in section,

Figure 3 is a section taken on the line 3—3 of Figure 1, looking in the direction of the arrows, illustrating the pawl in a reverse position from that shown in Figure 1,

Figure 4 is a sectional detail taken on the line 4—4 of Figure 1, showing the parts on a larger scale,

Figure 5 is a detail view in perspective of one of the interchangeable sockets, and

Figure 6 is a sectional detail on the line 6—6 of Figure 1.

In reducing the invention to practice there is provided a crank 5 provided with a handle 6 upon its upper end. Extending laterally from one end of a casing 7 is a socket 8 fixed thereto in any desirable manner. This casing 7 increases in width towards its outer end and is formed with a bearing 9, the upper and lower faces of this casing being flat. Rotatable in the bearing 9 is a shaft 10 having a ratchet wheel 11 fixed to rotate therewith. The upper end of the shaft 10 is formed with an annular groove 11′ in which is engaged a locking ball 12 accommodated in a transverse recess 13 in the bearing and which is urged into engagement with the shaft by a coil spring 14 accommodated in this recess. A plug 15 is engaged in the recess 14 at its outer end to retain the spring and ball therein.

Extending transversely through the casing at a point between the bearing 9 and the socket 8 is a pivot pin 16 and movable about this pivot pin 16 and disposed upon one face of the casing is a pawl 17 which is substantially triangular in shape and is formed with teeth 19 at its widest end. In order to retain the pawl 17 in a position with either one of its teeth 19 in engagement with the ratchet wheel 11 or clear thereof, there is provided a recess 20 which opens upon that face of the casing upon which the pawl 17 is arranged and accommodated in this recess is an expansible coil spring 21 and a ball 21′, the latter being pressed outwardly by the spring 21 and acting as a detent to hold the pawl 17 in neutral position or with either of its teeth 19 in engagement with the teeth of the ratchet wheel 11. The lower end of the shaft 10 is provided with a socket or sleeve 22 which is formed with the sleeve 23 formed

with an extension 24 which is hexagonal in cross section and is provided with a recess 25 that opens upon one of the sides of the extension. An expansible coil spring 26 is seated in this recess and engaged with the coil spring is a locking ball 27 which is normally projected against the interior wall of the removable nut engaging jaw or socket 29. It will be seen that this locking ball will retain the nut engaging socket 29 on the hexagonal extension to rotate therewith and that when desired this socket may be disengaged from the extension. In the manufacture of my improved wrench it is intended to provide a number of these sockets each one of a different size to accommodate the different size nuts.

The structure illustrated and described is a practical embodiment of the invention but I wish to emphasize that I do not limit myself to the precise structure set forth and that the same may be modified and further that my limits of modification are only governed by what is claimed.

What I claim is:

A wrench comprising an operating member in the form of a crank shaft having one end angularly extended, a knob mounted on said angularly extended end of the crank shaft, a casing mounted on the remaining end of the crank shaft, a tool socket carrying shaft rotatably mounted in the outer end of said casing, a tool accommodating socket mounted on one end of said second mentioned shaft, a sleeve between said socket and said second mentioned shaft, said sleeve having a reduced free end, said socket being frictionally retained on said free reduced end of the sleeve, a pawl pivot pin extended vertically through said casing inwardly of said second mentioned shaft and depending from said casing, a reversible pawl mounted on the depending portion of said pivot member, a downwardly extended recess in said casing inwardly of the pawl pivot pin and opening upon the lower face of said member, a spherical member projecting from the lower end of said recess for engagement with either side face of the pawl to lock the latter in either of its operative positions, a ratchet wheel carried by said second mentioned shaft and adapted to be engaged by said pawl to cause rotation of the second mentioned shaft with the first mentioned shaft, and means to resiliently retain the pawl engaging spherical member in operative position.

In testimony whereof I affix my signature in presence of two witnesses.

MONROE P. STRAEHLE.

Witnesses:

ROBERT H. NAGLE,

H. W. FEATHER.