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1,903,514

WRENCH

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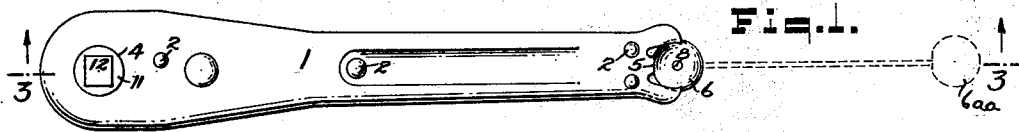


Fig. 1.

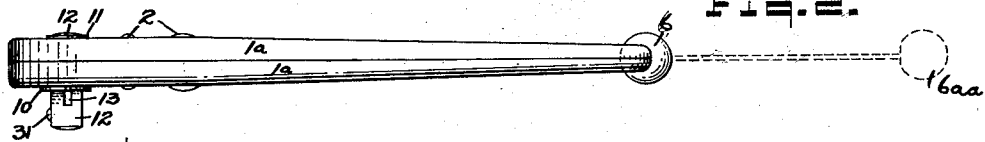


Fig. 2.

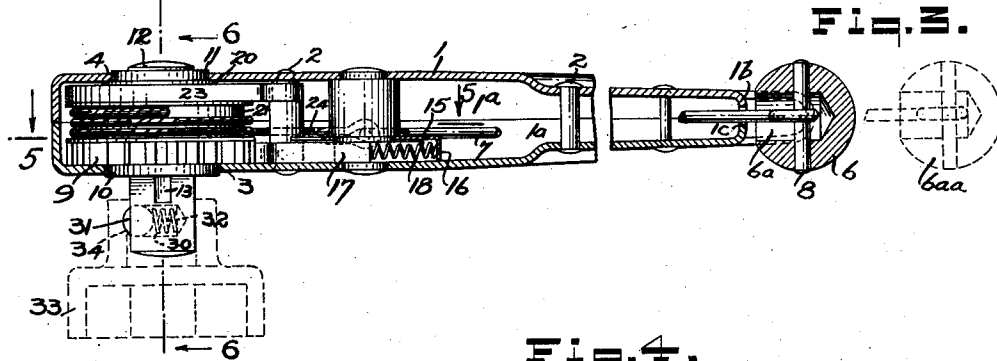


Fig. 3.

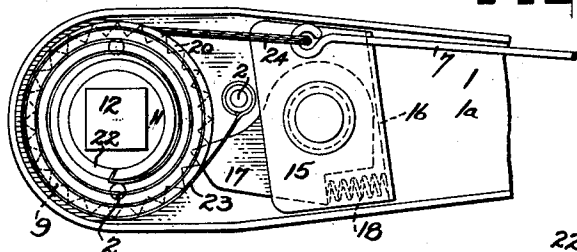


Fig. 4.

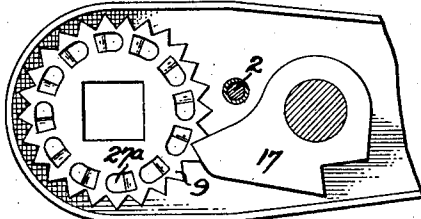


Fig. 5.

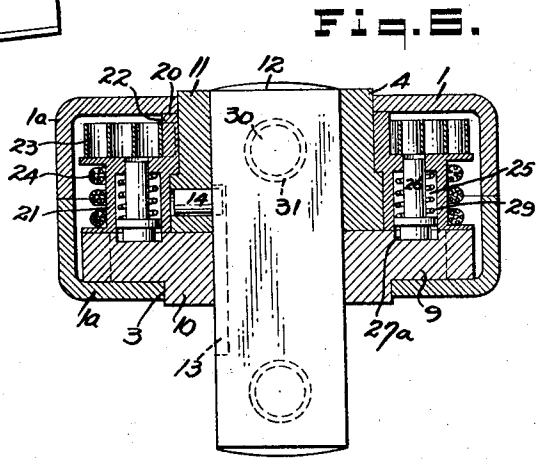


Fig. 6.

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WRENCH

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This invention relates to improvements in wrenches. It is an object of the invention to provide a relatively cheap and simple form of wrench having means for rapidly rotating a spindle therein, on which a socket is detachably mounted, without moving the wrench body, so that relatively loose nuts may be rapidly tightened—or loosened; and to so arrange the spindle rotating means that to finish tightening a nut—or to start loosening it—the wrench may be used in the ordinary manner without having to make any adjustment thereto after it has been employed for rapid rotation.

Another object of the invention is to provide such a wrench wherein a spring is employed for turning a spool which, when so rotated as to wind up the spring, causes rapid rotation of the spindle; and to furnish means for turning the spindle and winding the spring which means is so arranged that the spring cannot be wound beyond a predetermined extent.

A further object of the invention is to provide such a wrench wherein the spindle is permitted limited axial movement so that the detachable socket may be mounted on either extremity adjacent one side of the wrench.

With these and other objects and advantages in view which will become apparent as the specification proceeds, the invention is hereinafter more fully described with the aid of the accompanying drawing, in which:

Figure 1 illustrates a plan view of the wrench, and

Figure 2 is a side elevation thereof.

Figure 3 is an enlarged section on the line 3—3 of Figure 1.

Figure 4 is an enlarged view showing a portion of the invention with one half of the hollow handle removed.

Figure 5 is an enlarged partially assembled view showing the ratchet wheel on the spindle.

Figure 6 is a further enlarged view showing a section on the line 6—6 of Figure 3.

Referring to the drawing, 1 designates a hollow wrench handle which consists of two similar portions 1a, U-shaped in section, held

together as by rivets 2. Through opposite sides of the handle aligned apertures 3 and 4 are formed, and at one extremity of the handle both portions 1a are depressed immediately of their width as shown at 5 to receive an element 6 which in the present instance is substantially spherical. The depressed handle extremity has inturned contacting portions 1b integral with its sides, through these contacting portions registering grooves 1c are formed to provide a passage for a rod 7 the outer extremity of which is looped and engages a recess 6a formed in the element 6. Through the latter and the looped rod end a pin 8 extends.

Within the hollow handle 1 a ratchet wheel 9 is provided with a hub 10 which extends through the opening 3, and resting against the inner side of the ratchet wheel is a sleeve 11 the face of which remote from the ratchet wheel extends through the opening 4. Through the ratchet wheel 9 and sleeve 11 aligned multi-sided openings are formed for the passage of a multi-sided spindle 12. In the latter immediately of its length a key slot 13 is cut and into it a pin 14 projecting inwardly from the sleeve 11 extends.

Secured transversely of one of the handle portions 1a is a plate 15 having a downturned flange 16. Pivotaly mounted beneath the plate 15 is a pawl 17, and extending from the plate flange 16 is a spring 18 which bears against one side of the pawl and tends to hold it in engagement with one of the teeth of the ratchet wheel 9. Mounted freely around the sleeve 11 is a member 20 the lower portion of which forms a spool rotatable against one face of the ratchet wheel 9, while its upper portion, which is of smaller diameter forms a barrel 22 around which a spring 23 is wound and to which one extremity of the latter is secured. The opposite extremity of the said spring is preferably secured to one of the rivets 2. It will also be noted that the upper side of the barrel 22 lies adjacent the inner side of one of the handle portions 1a. Wound around the spool 21 and having one extremity secured thereto is a cord 24 the opposite extremity of which is fastened to the rod 7.

Formed through the spool 21 parallel with its axis are apertures 25 the lower extremities of which are of enlarged diameter. Vertically movable in these apertures are stems 26 integral with dogs 27 which engage ratchet teeth formed in the adjacent face of the ratchet wheel 9. Around the stems 26 and housed in the enlarged portions of the apertures 25 are springs 29 which tend to hold the said dogs in engagement with the ratchet teeth 27.

Adjacent both extremities of the spindle 12 transverse openings 30 are formed there-through in the outer ends of which balls 31 are housed which are outwardly pressed by springs 32 arranged between them. Since the spindle 12 is axially movable either extremity may project beyond the handle 1 to receive a conventional socket indicated at 33 in which a recess 34 is provided to receive one of the spring pressed balls 31, so that the socket may be held by it against accidental disengagement.

From the foregoing it is believed that the operation of the wrench will be readily understood, briefly it is as follows: When the element 6, and with it the cord 24, is pulled to the position indicated at 6aa the member 20 is rotated in such direction that the spring 23 is wound on the barrel 22, and the dogs 27 engage the ratchet teeth 27a thereby turning the ratchet wheel 9. When the rod 7 has been pulled so that its inner extremity strikes the registering grooves 1c further outward movement of the said rod is prevented as the latter is looped at its inner end for the cord 24 to be attached thereto, and the looped rod end cannot pass through the registering grooves 1c. When the element 9 is released the spring 23 rotates the member 20 thereby rewinding the cord 24 around the spool 21 and pulling the element 6 back to its initial position. Rotation of the spool 21 in its cord rewinding direction causes the dogs 27 to slip over the teeth 27a and the ratchet wheel 9 is held stationary by the pawl 17.

The wrench may be employed in the conventional manner to finish tightening a nut or to start loosening it. If the nut is to be turned in the direction in which it was being rotated by pulling the element 6 the pawl 17 will hold the ratchet wheel 9, and through it the spindle 12, stationary. When the nut is to be turned in the opposite direction the socket 33 is removed and the spindle 12 is moved axially so that it projects through the opposite side of the handle 1; the socket is then placed on the opposite spindle extremity. The purpose of making the spindle 12 axially slidable is to reduce its length and to eliminate the necessity of having a spindle portion projecting from the handle on the side of the latter on which the socket 33 is not mounted.

While in the foregoing the preferred embodiment of the invention has been described and shown, it is understood that the construction is susceptible to such alterations and modifications as fall within the scope of the appended claims.

What we claim is:

1. A wrench consisting of a hollow apertured handle, a spindle extending there-through, a ratchet wheel on said spindle and rotatable therewith, a member rotatable around said spindle, said ratchet wheel and member being within the hollow handle, a spring actuated pawl engaging said ratchet wheel, a cord wound around said member and attached thereto, an element arranged exteriorly of said handle to which said cord is connected so that when the element is pulled the member is rotated, spring means for turning said member and rewinding said cord therearound, and means carried by said member and cooperating with the ratchet wheel for rotating the latter as the cord is unwound, said means permitting rotation of the member independently of the ratchet wheel when said cord is being rewound.

2. A wrench consisting of a hollow apertured handle, a spindle extending there-through, a ratchet wheel on said spindle and rotatable therewith, a member rotatable around said spindle, said ratchet wheel and member being within the hollow handle, said spindle being axially movable through said ratchet wheel and member, a spring actuated pawl engaging said ratchet wheel, a cord wound around said member and attached thereto, an element arranged exteriorly of said handle to which said cord is connected so that when the element is pulled the member is rotated, means limiting the distance the element may be pulled from said handle, spring means for turning said member and rewinding said cord therearound, until said element is brought back into contact with said handle, and means carried by said member and cooperating with said ratchet wheel for rotating the latter as the cord is unwound, said means permitting independent rotation of the member relative to the ratchet wheel when said cord is being rewound.

3. A wrench consisting of a hollow handle, a spindle extending therethrough, a ratchet wheel rotatable with said spindle, a member rotatable around said spindle, a spring actuated pawl engaging said ratchet wheel, a spring wound around said member for rotating it around said spindle, one extremity of said spring being anchored in said hollow handle, a cord wound around said member having one extremity so secured thereto that when the cord is pulled the spring is wound on said member, said ratchet wheel having teeth arranged circularly on one of its faces, said member being apertured, spring pressed dogs in said apertures to engage the circularly

arranged teeth and rotate the ratchet wheel with said member when it is turned in one direction only.

4. A wrench consisting of a hollow apertured handle, a spindle extending there-
5 through, a ratchet wheel on said spindle and rotatable therewith, a member rotatable around said spindle, said ratchet wheel and member being within the hollow handle, a
10 spring actuated pawl engaging said ratchet wheel, a cord wound around said member and attached thereto, means arranged exteriorly of said handle for pulling the cord and turning the member, spring means for turning
15 the member in the opposite direction and rewinding said cord, said member having openings formed therein substantially parallel with its axis, spring pressed dogs in said openings, said ratchet wheel having ratchet
20 teeth formed circularly on its face adjacent said member with which said dogs cooperate so that when the member is turned by the unwinding of the cord the ratchet wheel is also rotated, and when the member is turned
25 by the spring and the cord rewound the ratchet wheel remains stationary.

5. A wrench consisting of a hollow handle having aligned apertures through opposite sides, said handle having also an opening
30 formed therethrough, a spindle extending through said apertures, a ratchet wheel rotatable with said spindle and mounted thereon, a member rotatable on said spindle, a spring actuated pawl engaging said ratchet
35 wheel, a spring wound around said member and having one extremity secured thereto, the opposite extremity of the spring being held relative to said handle, a cord wound around said member and having one ex-
40 tremity secured thereto, a rod connected to the opposite extremity of said cord, said rod extending through the handle opening, an element on said cord exteriorly of said handle, said element when pulled from said
45 handle unwinding said cord and winding said spring, and means carried by said member and coacting with said ratchet wheel for turning the latter only as the cord is unwound, said spring, when the element is re-
50 leased, rewinding the cord and returning the element to said handle while the ratchet wheel remains stationary.

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