J. R. AYOTTE.

ROTATABLE HAND TOOL.

APPLICATION FILED NOV. 10, 1921.

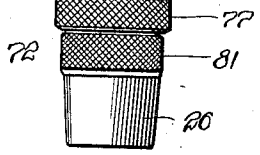
1,419,100.

Patented June 6, 1922.

2 SHEETS—SHEET 1.



Fig. 2.



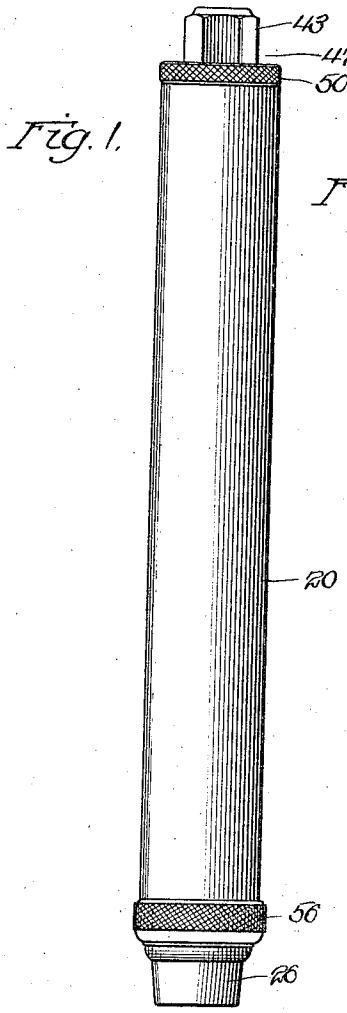


Fig. 1.

Fig. 3.

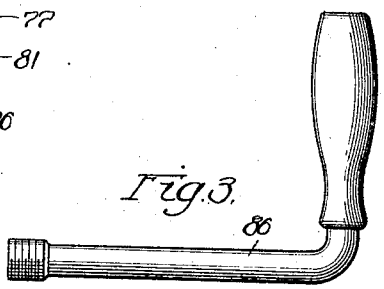


Fig. 4.

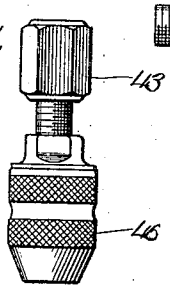


Fig. 5.

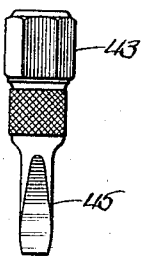


Fig. 6.

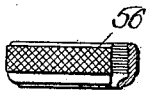


Fig. 9.

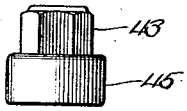


Fig. 7.

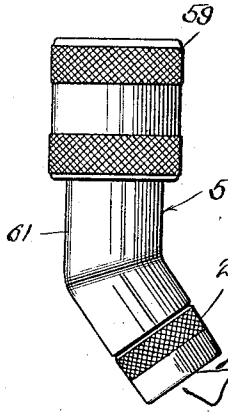
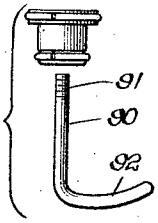


Fig. 8.



Inventor.
Joseph René Ayotte.
Jones Bain & Hinkle
Attys.

J. R. AYOTTE.

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2 SHEETS—SHEET 2.

Fig. 10.

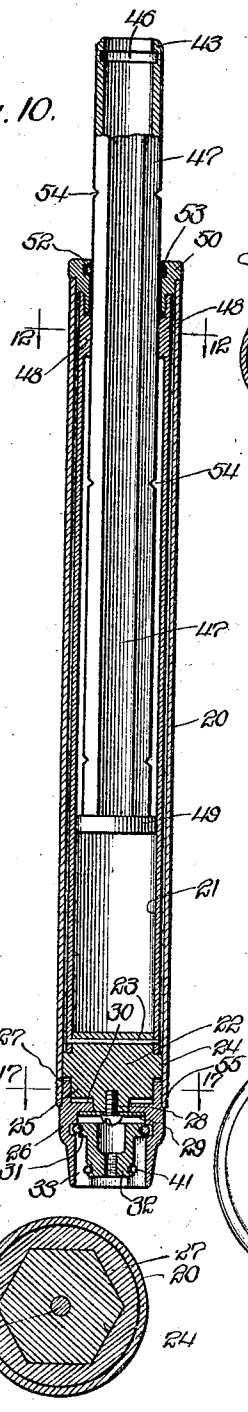


Fig. 11.

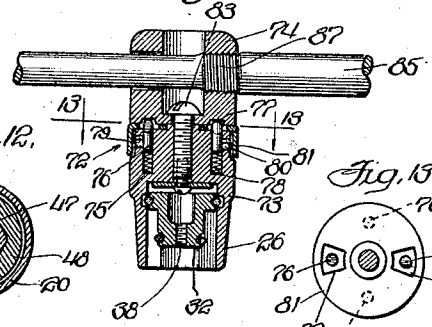


Fig. 12.

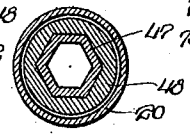


Fig. 13

Fig. 14.

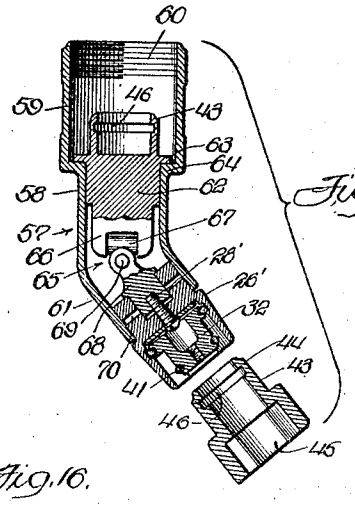


Fig. 16.

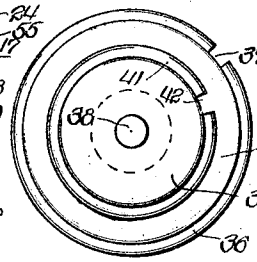


Fig. 15.

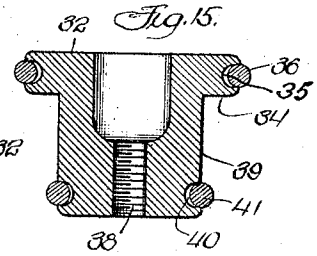


Fig. 17.

Inventor:
Joseph René Ayotte
Fowler Bain Hinkle
Attys.

UNITED STATES PATENT OFFICE.

JOSEPH RENÉ AYOTTE, OF CHICAGO, ILLINOIS, ASSIGNOR TO CODE MANUFACTURING COMPANY, A CORPORATION OF ILLINOIS.

ROTATABLE HAND TOOL.

1,419,100. Specification of Letters Patent. **Patented June 6, 1922.**

Application filed November 10, 1921. Serial No. 514,162.

To all whom it may concern:

Be it known that I, JOSEPH RENÉ AYOTTE, a subject of the King of England, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rotatable Hand Tools, of which the following is a specification.

This invention relates to improvements in rotatable hand tools.

One of the objects of the invention is to provide a universal rotatable tool to which bits, chucks, angular sockets, drills and other like instruments and appurtenances may quickly be attached and removed.

Another object is to provide an improved connector or clutch having separable members; one member of which is for attachment to or is a part of the tool and the other member secured to each of the various attachable instruments or devices to be used with the tool.

Another object is to provide a clutch member that may readily be attached to and removed from the tool and which cooperates with a clutch member carried by each of the instruments to be detachably connected thereto.

Another object is to improve clutches adaptable for uses specified,

Another object is to provide a new and improved, reversible ratchet between the tool and the handle head by which it is operated.

Another object is to provide a detachable angular or deflected end member, of the tool body, attachable to the main body of the tool by the universal clutch members and having a universal joint therein between clutch members permanently associated therewith.

Other objects and advantages of the invention will hereinafter appear.

In the drawings:—

Fig. 1 is an elevation of the main body part of the tool.

Fig. 2 is an elevation of the handle attachable to the main body part of the tool by means of the clutch members.

Fig. 3 is another form of the lever, attachable to the handle head.

Fig. 4 is an elevation of a drill chuck attached to one member of the clutch insertable in the other member at the end of the tool shown in Fig. 1.

Fig. 5 is another form of the instrument insertable in the tool.

Fig. 6 shows an elevation, partly in section, of the ferrule attachable to the lower end of the jacket of the tool as shown in place in Fig. 1.

Fig. 7 is an angular body part of the tool, attachable to the main body part and carrying proper clutch members, one at each end, for attachment to the main body part and for securing attachable instruments to the rotatable shaft within the structure shown in Fig. 1.

Fig. 8 shows an elevation of one member of the clutch insertable in the other clutch member shown in Fig. 10 and also shows the means for extracting the member when desirable.

Fig. 9 is an elevation of a socket wrench forming a part of a chuck, as shown in Figs. 1, 4 and 5.

Fig. 10 is a longitudinal section of Fig. 1 showing the inner extensible shaft partly projected.

Fig. 11 is a section of the two-part handle head shown in Fig. 2.

Fig. 12 is a transverse section taken on line 12—12 of Fig. 10.

Fig. 13 is a section taken on line 13—13 of Fig. 11.

Fig. 14 is a section of the angular detachable body member shown in elevation in Fig. 7.

Fig. 15 is an enlarged sectional view of the clutch member shown in Fig. 8.

Fig. 16 is a bottom plan view of the same.

Fig. 17 is an enlarged transverse section taken on line 17—17 of Fig. 10.

In all the views the same reference characters are employed to indicate similar parts.

The tool consists of the non-rotatable tubular jacket 20 which carries an inner tube 21, rotatable therein and which is secured to a lug 22 at its lower end, as by a pin 23. The lug 22 is round at 24 to provide a bearing

on the inner surface of the tubular jacket 20, but it is angular on its lower peripheral portion 25, as more clearly shown in Fig. 17, for rotatable connection with the clutch member 26. The rim 27, of the clutch member 26, is round and has bearing in the inside of the jacket 20. The clutch member 26 is secured to the lug 22 by the screw 28 and the washer 29, the latter bearing against a shoulder provided by the inner flange 30 of the clutch member 26. From this description it will be manifest that when the inner tubular shaft 21 is rotated the clutch member 26 is thereby rotated in the jacket 20. The clutch member 26 has a groove 31 to detachably secure a clutch holding nipple 32. The clutch member 26 is internally angular, as at 33, and the provision of means for rotatably connecting it to another clutch member will presently be described.

The attaching nipple 32 is provided with a flange 34 having a groove 35, and an open spring ring 36 is seated in the groove, and divided as at 37, so that it may be contracted when radially directed pressure is applied to the perimeter thereof. The nipple 32 is axially bored and threaded, as at 38, and on its smaller end 39 it is provided with another groove 40 for a similar spring ring 41, which is also divided as at 42 for the same purpose.

Another clutch member 43 is angular on its outer smaller surface 44 for non-rotatable engagement with the clutch member 26. It is provided with an internal groove 46 for engagement with the spring ring 41 on the clutch member 32, and the angular portion 43 engages the interior angular portion 33 of the clutch member 26. The nipple clutch member, 32, serves to yieldingly hold the clutch member 43 in engagement with the clutch member 26 to prevent relative axial movement. The angular portion 45 of the device 43 (Fig. 14) may be employed as a socket for rotating angular threaded nuts, or the like, or the clutch member 43 may be attached to a screw driver 45 or to a drill chuck 46 or to any other instrument or tool requiring rotation for its operation and which is capable of being hand manipulated. The clutch member 43 terminates the angular, axially movable shaft 47, which is rotatably connected with and slidably movable in the tube 21. Tube 21 is provided, near its upper end, with an internal collar 48 which is angular and conforms with the angular outer surface of the tube or shaft 47 and which is secured to the tube 21 or is an integral part thereof.

Secured to the lower end of the axially movable shaft 47 is a disc 49 which provides a bearing slidable in the tube 21 and to hold shaft 47, in cooperation with the collar 48, centrally of the tube 41. A collar 50 is rotatable about the jacket 20 and is threadedly secured to the tube 21. Near its upper edge it is provided with a groove 52 which contains a spring ring 53 that will snap into the notches 54 provided at intervals in the axially movable shaft 47. The ring 53, when in either of the notches 54, yieldingly holds the shaft 47 extended from the main body part or the jacket 20, when it is desirable to extend the effective length of the tool.

The lower end of the jacket 20 is threaded as at 55 to receive a collar 56 when the straight body part 20 only of the tool is to be used without regard to the angular or deflected body part 57.

The detachable angular member 57 to constitute a part of the body part 20, consists of the jacket 58, enlarged as at 59, and internally threaded as at 60 for engagement with the threaded portion 55 on the lower end of the jacket 20. The smaller portion is angularly deflected to render the tool more serviceable as when the object to be rotated thereby is in such location that it can not be reached when the straight body portion 20 alone is used. When the angular attachable member 57 is secured to the member 20 or to the handle 72, the clutch holding nipple 32 will enter the clutch member 43 and the spring ring 41 of the nipple 32 will snap into the groove 46 of the member 43 and hold the parts together in rotative relation.

The clutch member 43 (Fig. 14) is secured on or is a part of the upper end of a lug 62 which has a flange 63 that bears upon the shoulder 64 provided by contraction of the large member 59 at the conjunction of the smaller member 58 of the non-rotatable deflected jacket. Between the lug 62 and the connecting nipple 32 of the device 57 is a flexible joint 65, shown in this instance by the slotted end 66 of the member 62 having a link 67 pivoted therein, which is also pivoted to a rotatable member 68, as at 69, the latter being connected to the chuck member 26′ by the pin 70. The chuck member 26′ is similar in general configuration to the chuck member 26 shown in Fig. 1 and it is rotatable in the smaller tubular part 61 of the angular member 57. Now, from the foregoing description, it will be manifest that when the two part extensible shaft 47 is rotated and the angular attachment 57 is secured to the member 20, that the chuck 26′ will be rotated or driven by rotation of the shaft 47.

A two-part handle head 72 for connection with the upper end of the device shown in Fig. 1 and the device shown in Fig. 14, consisting of the relatively rotatable members 73 and 74 is provided with a clutch member 26 having inside thereof the attaching nipple 32. Between the members 73 and 74 of the head is a ratchet device consisting of four

spring pressed axially movable pins 76. The member 73 has four axial perforations in its face located at 90 degrees from each other and each perforation contains a spring pressed pin or pawl normally elevated by springs 75 and yieldingly movable. Opposite pins 76 are tapered in opposite directions constituting a pair for cooperation with the ratchet 77 made on the lower face of the head member 74. The pins are yieldingly held in elevated position by springs 75 and are prevented from turning by laterally projecting pins 79 that are movable in slots 80. The pins or pawls 76 are tapered in such directions that the pair of pins or pawls located at 90 degrees from a pair that may at the time be inoperative, are arranged to rotate the member 73 in direction dependent upon the pair of pawls that are in operative position.

Surrounding the upper end of the member 73 is a flanged disk 81 provided with a pair of openings 82 on opposite sides of its diameter, through which the pawls or pins 76 will project when operative. When the disk 81 is rotated 90 degrees a pair of pawls 76 will pass through the disks through the perforation 82 and engage the ratchet member 77 on the rotatable head member 74, thereby rotating the member 73 in one direction, and when the disk is again rotated at 90 degrees the other pair of pawls will appear through the openings 82 and the member 73, together with the shaft 47 and the cooperating member 21, may be rotated in the opposite direction. The members 73 and 74 are rotatably held together by the screw 83, which passes through an axial perforation in the member 74 and the disk 81 into the member 73.

The member 74 of the handle head is perforated transversely for a rod or handle 85 for imparting rotation to the rotatable member with which the head 72 is connected. In Fig. 3 is shown a handle 86 that may be screwed into the threaded perforation 87 of the head member 72 by which constant rotation may be imparted to the rotatable members of the tool.

The handle head 72 may be detachably secured to the axially movable angular shaft or tube 47 by causing the clutch member 26 to engage the clutch member 43 on said shaft, whereupon the nipple 32 will hold the members in engagement. It may also be connected to the clutch member 43 of the detachable member 57 to rotate the members therein direct.

When the angular member 57 is not attached to the body portion 20 of the tool, then the threaded collar 56 may be secured to the lower end of the tool 20 to reenforce the end of the tube and as means for improving the general appearance of the device.

Fig. 8 shows a rod or pin 90 threaded at one end as at 91 and having a handle portion 92. The threaded end is to be inserted into perforation 38 of the nipple 32, so that by pulling on the handle 92 of the threaded device 90, the nipple may be removed from inside of the chuck member 26 for inspection or repairs.

While I have herein shown a single embodiment of my invention for the purpose of clear disclosure, it will be manifest to persons skilled in the art that many changes may be made in the general arrangement and configuration of the parts within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A hand rotatable tool comprising a non-rotatable straight jacket and shaft rotatable therein, constituting the main body part and having a clutch member at the inner end of the shaft in combination with an angular detachable jacket; means to detachably secure the angular jacket to the straight jacket; a clutch member at one end of the angular jacket for connection with the clutch member in one end of the straight jacket; a clutch member in the other end of the angular jacket for connection with the clutch member in the other end of the straight jacket and a flexible driving connection between the clutch members of the angular jacket whereby the shaft in the straight jacket will rotate the clutch member in the angular jacket through the flexible connecting member.

2. A hand rotatable tool comprising a non-rotatable straight jacket threaded at one end and a shaft rotatable therein constituting the main body part of the tool and a clutch member on the inner end of the shaft in combination with an angular detachable jacket; threaded means to detachably secure the angular jacket to the straight jacket; a clutch member at one end of the angular jacket for connection with the rotatable clutch member in the straight jacket; a clutch member at the other end of the angular jacket; a universal joint connected between the clutch members of the angular jacket, whereby to rotate the disengaged clutch member in the angular jacket when the shaft in the straight jacket is rotated.

3. A hand rotatable tool providing a straight non-rotatable jacket; a rotatable shaft in the jacket; a clutch member on each end of the rotatable shaft in combination with an attachment comprising a non-rotatable deflected jacket; a rotatable element therein and a clutch member on each end of the rotatable element whereby to rotatably connect said attachment to either end of said rotatable shaft.

4. A hand tool comprising a non-rotatable straight jacket having a threaded end; a shaft rotatable therein; a clutch member on

each end of the shaft; a separable attachment comprising an angular jacket, enlarged at one end for screw threaded engagement with the straight jacket; two clutch members carried by the angular jacket the same types as those on the respective ends of said shaft; a universal coupling connecting said clutch members whereby said angular attachment may be connected to either end of said shaft.

In testimony whereof I hereunto subscribed my name.

JOSEPH RENÉ AYOTTE.