Oct. 2, 1962 W. L. WRIGLEY 3,056,442

RATCHET TOOL

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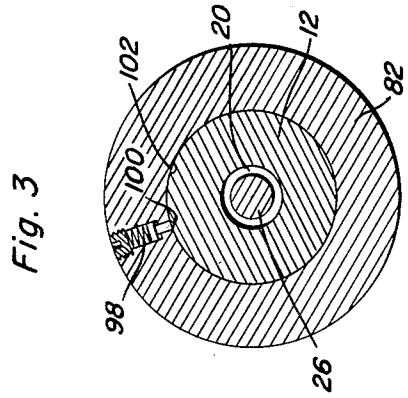


Fig. 3

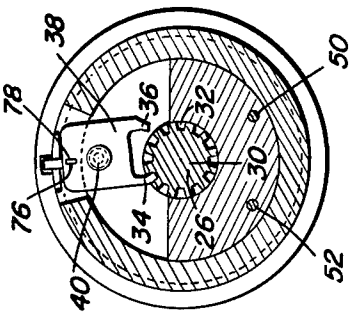


Fig. 4

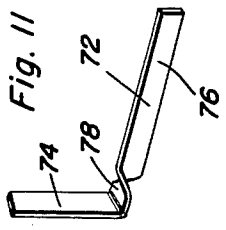


Fig. 11

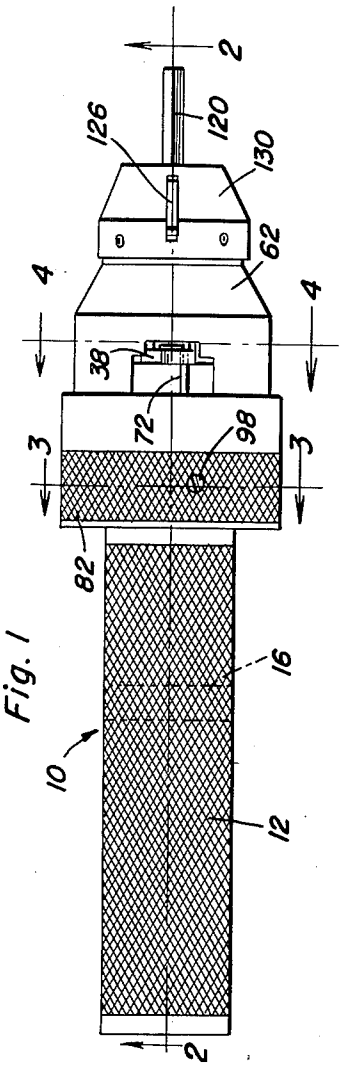


Fig. 1

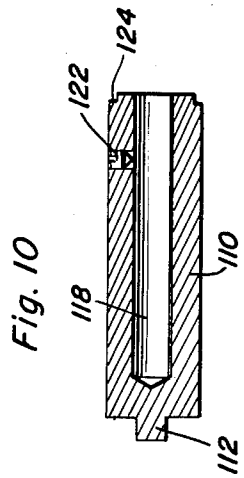


Fig. 10

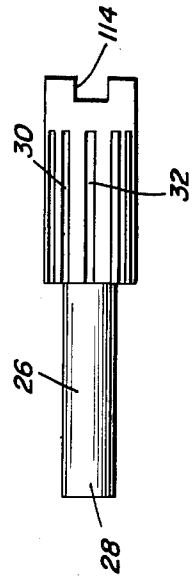


Fig. 9

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RATCHET TOOL

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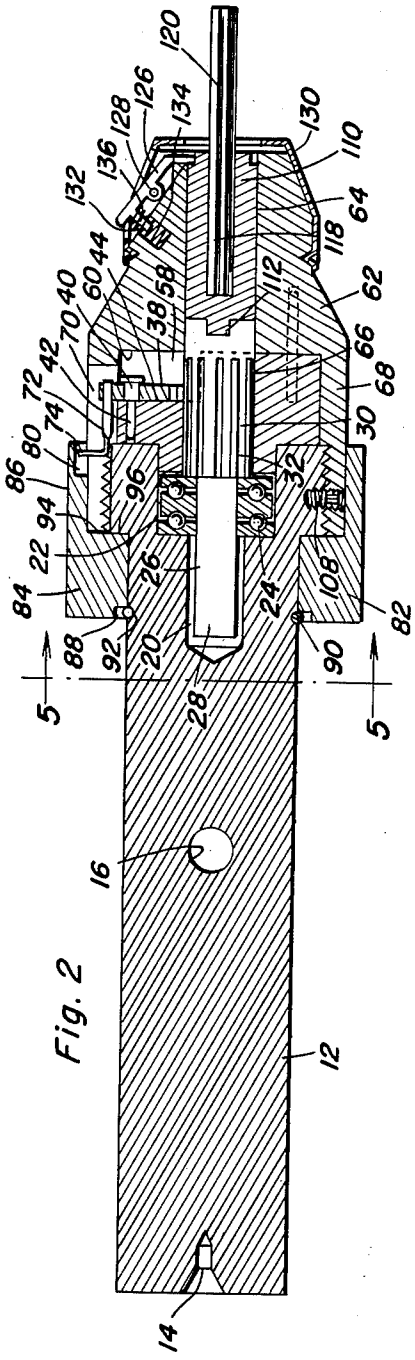


Fig. 2

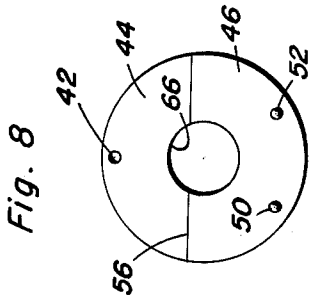


Fig. 8

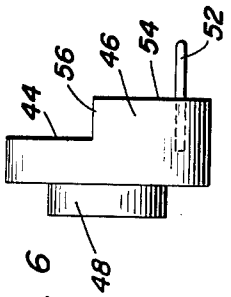


Fig. 6

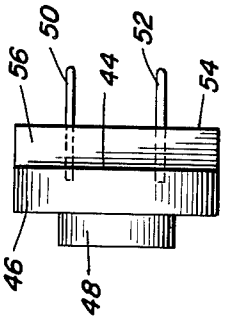


Fig. 7

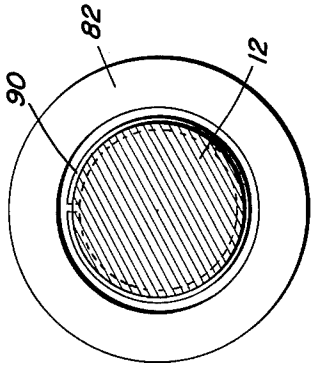


Fig. 5

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RATCHET TOOL

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3 Claims. (Cl. 145—75)

This invention relates to tools and more particularly to ratchet tools which are principally useful in operating Allen keys, screwdriver shanks, taps and other small tools.

The invention is embodied in a ratchet tool handle designed for ease of use and which is light and has considerable strength to seat and unseat screws, nuts and the like and is capable of rotating taps in many metals.

A further object of the invention is to provide a versatile tool which is very easy to change from one use to another and which is dependable and durable, accommodating many sizes of keys, taps, screwdriver shanks, etc.

One of the big disadvantages in having many hand tools such as Allen keys, screwdrivers, taps, etc. is that it requires considerable storage space and several different sizes of drivers, tap holders, etc. This tool eliminates these many awkward and long handled drivers and T-wrenches with handles that are a disadvantage to workers. A disadvantage in production tools on the market today, in the insert type of wrenches that have quick change methods, is that they are only designed for special types of tools such as sockets, slotted or Phillips bits, etc. But most are still of the solid type handles, that is, in the screwdriver class and the tap wrench class which invariably has a T-shaped handle. Most screwdrivers and wrench handles have no means for changing to different tools even though there are available tool handles which accommodate different sizes of tools of one class. Some available tools have additional liners attached on the handle to assist in steadying them while driving screws and taps. This makes it very difficult to reach into small places where, for instance, only a quarter of a turn is needed.

An object of this invention is to provide a combination ratchet tool handle which will ratchet in either direction and will eliminate the separate use of numerous tools. In a typical embodiment of the invention a center is provided at one end of the handle for use in a lathe or drill press so that it may be aligned. There is a hole for receiving a handle attachment, this being especially useful in tapping work. Further, additional leverage is provided for either tightening or loosening screws or nuts that are locked tight.

Another object of the invention is to provide a ratchet type handle which is slender, occupying a minimum of space, the handle having a uniquet ratchet lock arrangement and parts organization so that the handle is strong, easily used and capable of being switched over from clockwise to counter-clockwise drive with one hand while using the tool.

The tool handle is capable of accommodating numerous types of shanks, keys, etc. that are very quickly attached and detached and driven by a novel drive assembly built in the handle.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an elevational view of a tool handle constructed in accordance with the invention;

FIGURE 2 is a sectional view of an enlarged scale and taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a transverse sectional view taken on the line 3—3 of FIGURE 1;

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FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 1;

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 2;

FIGURE 6 is an elevational view of a part of the body of the tool;

FIGURE 7 is a top view of the part in FIGURE 6;

FIGURE 8 is a front view of the part in FIGURE 6;

FIGURE 9 is an elevational view of the ratchet shaft adapted to fit into the part of FIGURE 6;

FIGURE 10 is a longitudinal sectional view of the tool holder in the ratchet tool handle; and,

FIGURE 11 is a perspective view of the ratchet spring.

In the accompanying drawings there is a ratchet tool handle 10 having a knurled surface handle part 12 preferably of cylindrical cross-section, although this may be altered. There is a center 14 at one end of the handle part 12, and a transverse opening 16 intermediate the ends of the handle part 12 and through which a rod may be passed in order to obtain additional leverage in using the tool handle.

Bore 20 and counterbore 22 are in the end of handle part 12 opposite to the end which has opening 14. Double thrust bearing 24, preferably made of ball bearings and races, is located in counterbore 22. Ratchet shaft 26 has a reduced part 28 in bore 20 and an enlarged part 30 which is in part located in counterbore 22 and which protrudes beyond the inner extremity of handle part 12 and its counterbore 22. Longitudinal ratchet slots 32 are in part 30 of ratchet shaft 26 and these are engaged by the dogs 34 or 36 of ratchet pawl 38 (FIGURE 4). Shouldered rivet 40, pin or the like is attached in an opening 42 in a face 44 of part 46. The part 46 (FIGURES 3–8) constitutes a portion of the ratchet unit including pawl 38 and is made as a collar with a reduced cylindrical bearing 48 at one end seated in counterbore 22. Locating and centering pins 50 and 52 are attached to part 46 and protrude from face 54 of part 46, face 54 being parallel to face 44 but non-coplanar, there being a land 56 therebetween. Due to this shape of one surface of part 46, there is a cavity 58 between face 44 and surface 60 of nose or section 62.

The nose unit has a central passage 64 in alignment with the central passage 66 of part 46. The nose unit is made of a body which has a forward end and a cylindrical skirt 68 provided with a slot 70 in registry with cavity 58 (FIGURE 2).

Ratchet spring 72 (FIGURE 11) is made of flat stock having a flat end 74 and a flat end 76 at right angles to each other and connected by the right angular twisted portion 78 near the junction of ends 74 and 76. End 76 is located in the flat opening 79 (FIGURE 4) formed in pawl 38 on one side of the pawl pivot axis established by pin 40. The opposite side of the same axis has dogs 34 and 36. End 74 of spring 72 is disposed in a slot 80 formed in collar 82. The collar 82 is used to shift the pawl 38 for clockwise or counter-clockwise drive, and it is made of a collar body 84 having a cylindrical skirt 86. Slot 80 is formed in slot 86, and the collar body has an annular groove 88 in which retainer ring 90 is located. The retainer ring is also located in a cylindrical groove 92 formed in handle part 12 thereby permitting the knurled collar to be shifted clockwise or counter-clockwise in order to shift the pawl to the clockwise or counter-clockwise drive positions, but preventing the collar from sliding axially on handle part 12. There is a shoulder 94 between skirt 86 and body 84, and a shoulder 96 on the inner extremity of handle part 12. Shoulders 94 and 96 are in contact with each other and cooperate with retainer ring 90 to maintain the collar 82 on handle part 12 against sliding movement in a direction parallel to the

longitudinal axis of handle part **12**. It is now evident that when the collar **82** is rotated slightly in either a clockwise or counter-clockwise direction, the pawl **38** is deflected about its pivot by the drive connection established between these parts with spring **72**. A spring detent **98** (FIGURE 3) is carried by collar **82** and is engaged within depressions **100** and **102**, respectively, formed in the enlarged extremity of handle part **12** to retain the collar in the positions at which the pawl **38** is in engagement with shaft **30** for the counter-clockwise and clockwise drive directions, respectively.

After setting the pawl **38**, rotation of handle part **12** is imparted to nose unit **62** by drive screw **108** that is attached to skirt **68** and the inner extremity of handle part **12**. Centering and locking pins **50** and **52** drivingly connect part **46** with the nose unit **62** and the rotary motion is transmitted through the pawl **38** to shaft **30**. Shaft **30** is drivingly connected with the detachable tool holder **110** located in passage **64** and connected by key **112** to the extremity of shaft **30**. The key **112** is in a keyway **114** of shaft **30**. Tool holder **110** has a tool supporting bore **118** within which typical tool **120** is located and held by set-screw **112** (FIGURE 10). An annular undercut **124** at the outer extremity of tool holder **110** is used to retain the tool holder in the passage **64** but enable the tool holder to be rotated, by any suitable retaining latch such as spring latch **126**. This spring latch is mounted on a pivot **128** beneath nose covering **130** and is pressed by spring **132** to the tool holder engaging position. The spring is located in a bore **134** in the nose piece and is concentrically mounted around centering pin **136** on latch **126**.

It is evident that upon release of latch **126**, the tool holder may be slid from passage **64** very easily so that the tool **120** may be removed and replaced by a tool of a different size or of a different nature.

The forgeoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A tool holder comprising a nose section having a rear annular skirt provided with a longitudinal slot, said skirt being attached to a front end of a handle for rotation by said handle, said nose section also having a central front passage therein communicating with a cavity formed by the skirt, a collar in said cavity, means connecting said nose section to said collar for rotation of said collar by said nose section, a ratchet shaft journaled in said collar and passage, a ratchet pawl pivoted on said collar for engaging and rotating said ratchet shaft in response to rotation of said collar and being swingable on its pivot into opposite positions for rotating said shaft in opposite directions respectively, a second collar adapted for rotation on a handle and having a front skirt portion rotatable on said rear skirt of the nose section, means operatively connecting the skirt portion of the second collar to said pawl through said slot to swing said pawl in opposite directions in response to rotation of said second collar in opposite directions respectively, a tool retainer journaled in said passage in front of said ratchet shaft, and means drivingly connecting said ratchet shaft to said tool retainer for rotation by said ratchet shaft.

2. A tool holder according to claim 1, said means connecting said nose section to said first-named collar comprising pins on said first-named collar extending into bores in said nose section.

3. A tool holder according to claim 1, said first-named collar defining a cavity in one side thereof in which said ratchet pawl is pivoted for swinging clear of said nose section.

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