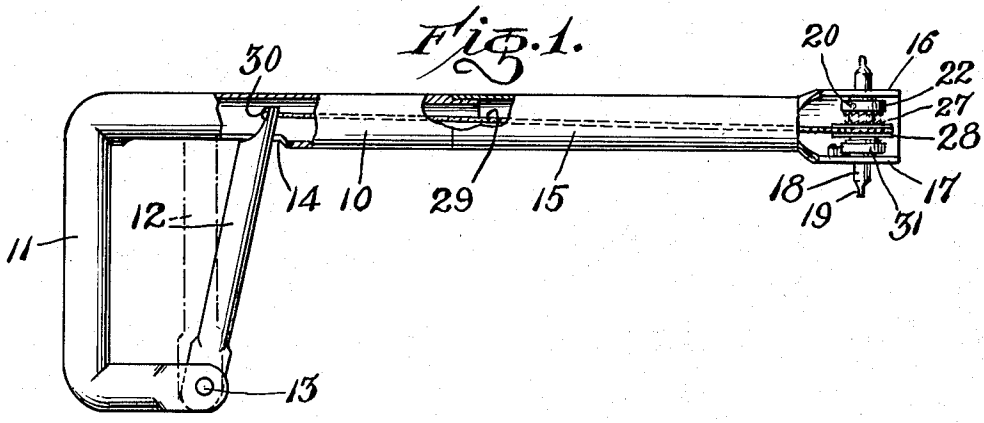
Feb. 7, 1956 L. NORWOOD 2,733,745

CABLE-DRIVEN RATCHET TOOL HAVING OFFSET PISTOL-GRIP

Filed Jan. 18, 1954

Fig. 1.



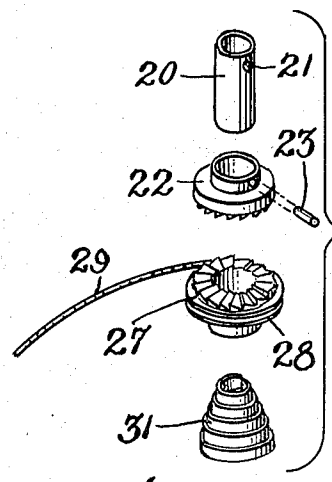


Fig. 2.

Fig. 3.

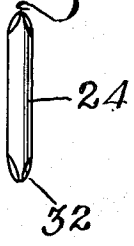


Fig. 4.

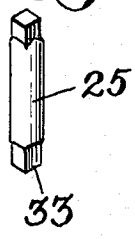
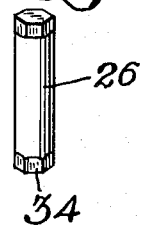


Fig. 5.



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CABLE-DRIVEN RATCHET TOOL HAVING OFFSET PISTOL-GRIP

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1 Claim. (Cl. 145—70)

This invention relates to extension offset screwdrivers.

It is an object of the present invention to provide a screwdriver adapted to permit the screwing and unscrewing of screws in places which access can be had only at right angles to the screw.

It is another object of the invention to provide an offset screw driver which does not require movement of the body of the screwdriver within the small space to effect the turning action of the screw as with prior offset screwdriver devices.

Other objects of the invention are to provide an extension offset screwdriver bearing the above objects in mind, which is of simple construction, inexpensive to manufacture, has a minimum number of parts, is easy to operate, compact, durable, effective, convenient to use and efficient in operation.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevational view of the screwdriver embodying the features of the present invention with portions of the tubing broken away to show the interior construction of the same;

Fig. 2 is a collective and perspective view of the ratchet and spring parts which are mounted in the head of the screwdriver;

Figs. 3, 4 and 5 are respectively perspective views of different types of screw engaging drive members.

Referring now to the figures, **10** represents the handle portion of the tube which has a bent part **11** serving as the hand grip and to which there is pivotally connected an operating arm **12** by a pin **13** which upon effecting a squeezing action of the hand will be moved rearwardly in the manner illustrated by the dotted lines and dash lines **12'**. The upper end of the operating arm **12** extends through a slot **14** in the underside of the handle portion or section **10**.

Fixed to the section **10** is a straight tube having its forward end split open to provide opposing sides **16** and **17** in which a screw engaging member **18** is journalled and which has a screw engaging point **19** on each end thereof. This point extends outwardly from each side **16** and **17**.

Within the space between the sides **16** and **17** and upon the engaging member or shaft **18** is a sleeve **20** having a small hole **21** and to which there is fixed a ratchet or clutch gear **22** by means of a pin **23** that also extends into the shaft **18** and against it to fix the same thereto. The screw **23** is in the form of a set screw and when released the driving shaft or member **18** can be removed from the screwdriver and replaced by any one of driving shafts or members **24**, **25** or **26**.

Journalled on the sleeve **20** is a complementary driving ratchet gear **27** having teeth adapted to oppose the teeth of the gear **22** and an external annular groove **28** in which there is connected a cable **29** that extends through the portions **15** and **10** and connected with the upper end of operating member **12** as indicated at **30**.

Upon pulling the cable **29**, the ratchet gear **27** will lock with the gear **22** to effect its rotation and thus the rotation of the drive shaft **18**. In order to hold the ratchet gear **27** in engagement with the gear **22**, there is provided a helical spring **31** that is connected to the gear **27** and also to the side face **17** so as to serve to provide axial pressure upon the gear **27** and also to provide a return spring action of the gear **27** so that it can be given another turn by a second pull upon the cable **29** if needed.

The shaft **24** has a point **32** adapted for engagement with a screw head having a cross slot. The shaft **25** has a square end **33** for fitting a screw head with a square opening. The shaft **26** has a hexagonal end **34** for fitting a hexagonal opening in a screw head.

In operation, the handle operating lever **12** is pulled, and the cable **29** in turn rotates the ratchet gear **27** on the sleeve **20** and the ratchet gear **27** engages with the gear **22** to turn the sleeve and the drive shaft **18** or any one of the other drive shafts inserted therein. The other drive shafts can be placed in the sleeve **20** by releasing the set screw **23** to release the shaft **18**.

It will now be apparent that there has been provided an offset screw driver wherein the operating head of the same can be placed in a space without the head end being worked or moved in the space in order to effect a screwing or unscrewinging action. Reverse action is had by turning the screw driver over to use the other end of the shaft. One end of the shaft is used for screwing and the other end of the shaft is used for unscrewing.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claim.

What is claimed is:

An extension offset screw driver comprising a substantially U-shaped handle having a hollow sleeve at one end an operating member pivoted upon the other end of said handle, said sleeve having an elongated opening therethrough receiving the free end of said operating member therewithin, an extension portion connected to said hollow sleeve, the central portion of said handle and said operating member being adapted to be drawn together within the hand of the user, said sleeve extension having its ends split open to provide spaced sides, a sleeve extending between the spaced sides, a shaft extending through the sleeve and adapted to be journalled in the sides of the sleeve extension, a ratchet gear secured to the sleeve and to the shaft, a complementary ratchet gear journalled upon the sleeve and having a groove therein, a cable connected to said groove and operable therein to effect rotation of the complementary ratchet gear, a helical spring connected to the complementary ratchet gear and to one side of the sleeve extension, said cable extending through said extension and being connected to the operating member at the free end thereof extending into the slot and said hollow sleeve, said ratchet gear and complementary ratchet gear having complementary teeth on the adjacent faces thereof, and set screw means for releasably retaining said drive shaft in said sleeve.

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