W. L. BEATY.

RATCHET WRENCH.

APPLICATION FILED OCT. 16, 1919.

1,400,256. **Patented Dec. 13, 1921.**

3 SHEETS—SHEET 1.

Fig. 1.

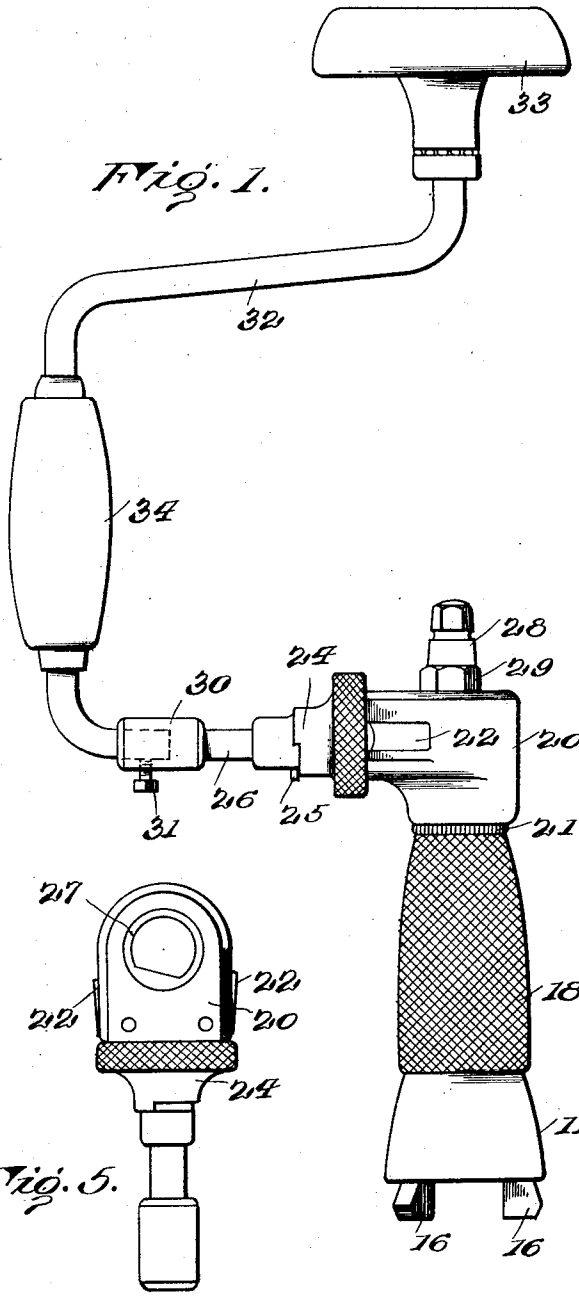


Fig. 9.

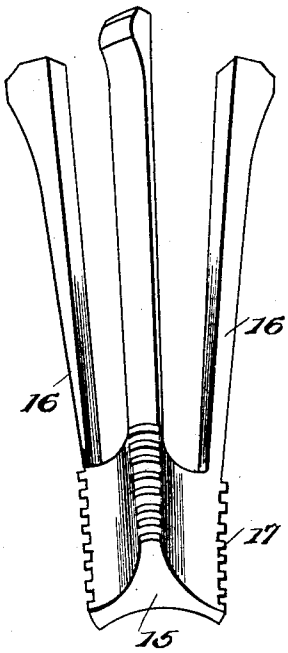


Fig. 10.

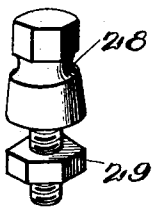


Fig. 5.

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3 SHEETS—SHEET 2.

Fig. 2.

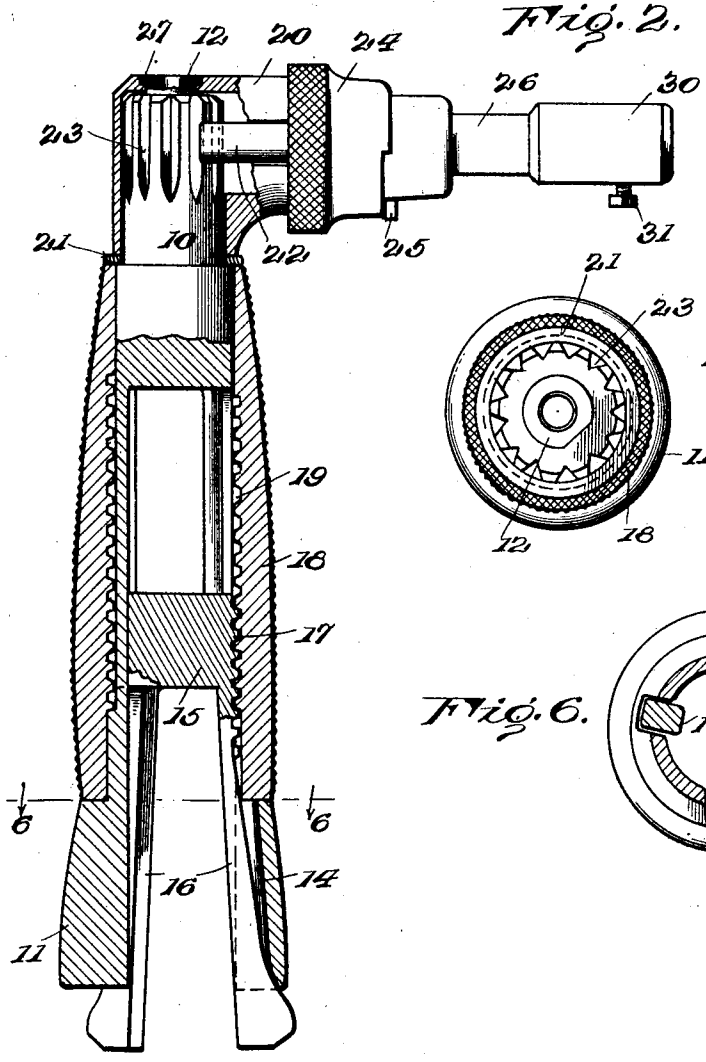


Fig. 4.

Fig. 6.

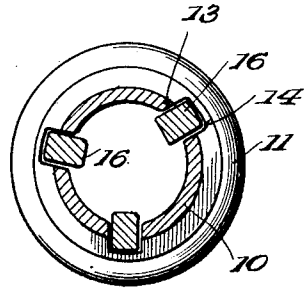
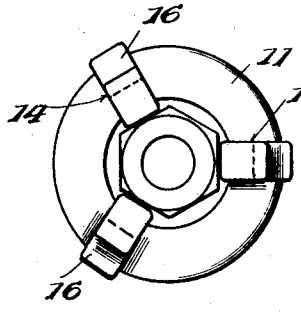


Fig. 7.



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3 SHEETS—SHEET 3.

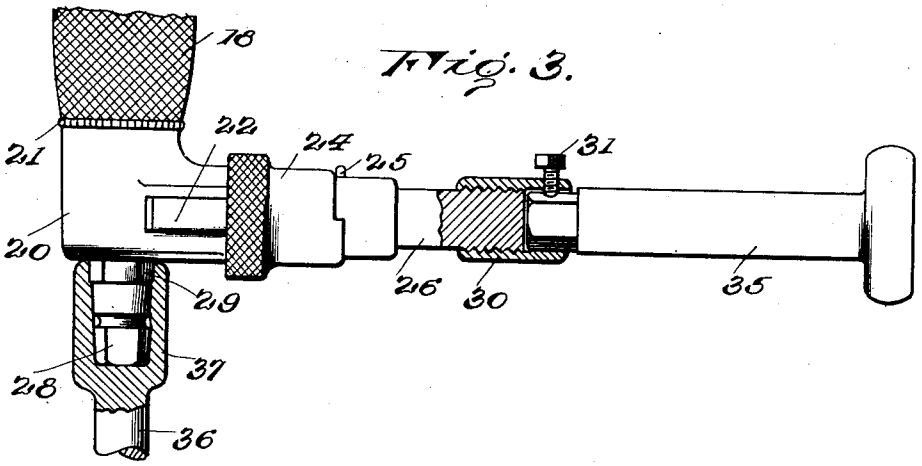


Fig. 3.

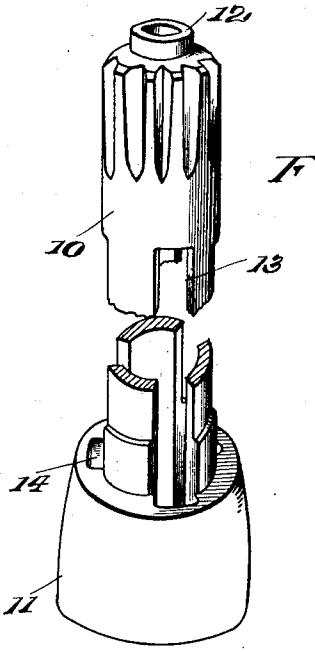
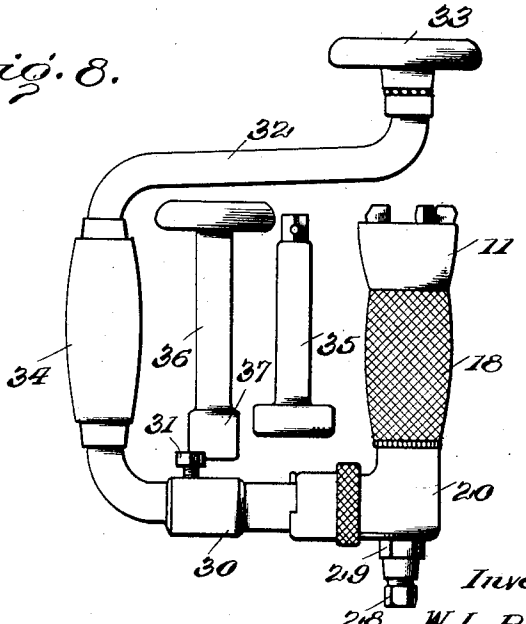


Fig. 8.

Fig. 11.



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UNITED STATES PATENT OFFICE.

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RATCHET-WRENCH.

1,400,256. Specification of Letters Patent. Patented Dec. 13, 1921.

Application filed October 16, 1919. Serial No. 331,013.

To all whom it may concern:

Be it known that I, WILBUR L. BEATY, citizen of the United States, residing at South Butte, in the county of Silver Bow and State of Montana, have invented certain new and useful Improvements in Ratchet-Wrenches, of which the following is a specification.

This invention relates to an improved ratchet wrench and has as one of its principal objects to provide a device of this character wherein a brace handle may be employed for operating the wrench while, when desired, the brace handle may be detached and a straight handle used.

The invention has as a further object to provide a wrench wherein when the straight handle is used, a stem or hand rest may be connected to the stock of the wrench for guiding and steadying the wrench.

The invention has as a further object to provide a wrench wherein the jaws thereof may be contracted into binding engagement with the work or may, as easily, be spread apart to release the work.

And a still further object of the invention is to provide a wrench which may be readily disassembled to the end that the wrench may be easily maintained in proper working condition or may be repaired.

Other and incidental objects will appear hereinafter. In the drawings:

Figure 1 is a side elevation showing a brace handle connected with my improved wrench,

Fig. 2 is a vertical sectional view on an enlarged scale taken centrally through the wrench,

Fig. 3 is a fragmentary side elevation showing the use of a straight handle in connection with the wrench, parts being broken away and illustrated in section,

Fig. 4 is a top plan view of the wrench, the ratchet head employed being removed.

Fig. 5 is a detail plan view of the ratchet head,

Fig. 6 is a transverse section taken on the line 6—6 of Fig. 2 and looking downwardly,

Fig. 7 is a bottom plan view of the wrench, the ratchet head being removed,

Fig. 8 is a detail perspective view of the wrench stock,

Fig. 9 is a detail perspective view of the jaw element of the wrench,

Fig. 10 is a detail perspective view of the headed post employed for connecting the ratchet head with the stock, and

Fig. 11 is a side elevation showing the compact manner in which the several parts of the wrench may be arranged when carrying the wrench about.

In carrying the invention into effect, I employ, as particularly illustrated in Figs. 2 and 8 of the drawings, a cylindrical wrench stock 10 provided at its lower end with an enlarged flared head 11 while an annular boss 12 rises from the upper end of the stock. The stock is hollow throughout the major portion of its length and formed through the stock at equally spaced points above the head is a plurality of longitudinally extending slots 13 communicating at their lower ends with alined channels 14 in the inner face of the head. As will be observed, the bottom walls of these channels curve outwardly toward their lower ends. Slidable longitudinally within the stock is a jaw element, illustrated in detail in Fig. 9 of the drawings. This jaw element is formed with a substantially triangular head 15 from which extends a plurality of resilient coacting jaws 16. The jaws are provided with flat inner faces while toward their outer ends the jaws are widened somewhat to provide laterally inclined outer edges, the jaws being, in fact, gradually tapered in width from their inner ends to their outer ends. The head 15 of the jaw element is insertible through the head 11 of the stock, the angular portions of the head 15 riding through the channels 14 to freely engage within the slots 13 of the stock. When the jaw element is so mounted in position, the curved outer edges of the jaws will ride against the outwardly curved lower end portions of the channels 14 of the head of the stock and it is now to be observed that the angular portions of the head 15 of the jaw element are of a length to project slightly beyond the periphery of the stock. Formed in the outer edges of these angular portions are teeth 17. Freely rotatable upon the stock is an adjusting sleeve 18 resting at its lower end upon the stock head 11 and internally provided with a

screw thread 19 coacting with the teeth 17 of the jaw element. The webs of the stock 10 between the slots 13 are, at their lower end portions, thickened somewhat to merge into the head 11 and the lower end portion of the sleeve 18 is counter-bored for snugly receiving these thickened portions of said webs. As will now be clear in view of the preceding description, by rotating the sleeve 18 in one direction, the jaw element may be retracted within the stock when the curved outer edges of the jaws 16 will coact with the bottom walls of the channels 14 for contracting the jaws. Accordingly, the jaws may be readily adjusted into binding engagement with the work. On the other hand, by rotating the screw 18 in the opposite direction, the jaw element may be projected from the stock when the jaws will, due to their resiliency, spread apart for releasing the work. Rotation of the jaw element within the stock when the sleeve 18 is rotated will, of course, be prevented by the engagement of the angular portions of the head 15 of said element within the slots 13 of the stock while the jaws 16 will coact with the side walls of the channels 14 for preventing twisting of the jaws and undue strain thereon.

Removably fitted upon the upper end portion of the wrench stock 10 is a ratchet head 20 rotatably receiving the boss 12 through the upper side thereof and preferably interposed between the head and the sleeve 18 is a suitable washer 21. The ratchet mechanism of the head may be of any approved character and in the drawings I have shown this mechanism as including companion pawls 22 located at opposite sides of the head and selectively movable to coact with ratchet teeth 23 upon the upper end portion of the wrench stock while an actuating collar 24 is rotatable upon the head and coacts with the inner end portions of the pawls. A stop pin 25 is provided for limiting the collar in its movement in opposite directions and extending from the head is a shank 26. All of this structure is of conventional design and will accordingly not be further described in detail. However, as will be clear, by selectively moving the pawls 22 into engagement with the ratchet teeth 23, the wrench stock may be readily rotated in either direction. Countersunk in the upper side of the ratchet head 20 and fixed to the boss 12 are superposed washers 27 and freely received through said boss to be threaded into the upper end portion of the wrench stock is a headed post 28 detachably connecting the ratchet head with the stock. The post carries a nut 29 seating against the uppermost of the washers 27 and clamped between said washer and the head of the post.

In ordinary practice, the shank 26 of the ratchet head 20 is somewhat longer than as illustrated but in order to adapt the ratchet head to the present invention said shank is cut off and is equipped at its outer end with a sleeve 30 which carries a set bolt 31. A brace handle 32 is provided. This handle is equipped at its outer end with the usual swiveled breast plate 33 while upon the crank of the handle is mounted a hand grip 34. At its inner end the handle is formed to removably fit within the outer end of the sleeve 30 to be firmly secured therein by the set bolt 31. Thus, the brace handle will be operatively connected with the ratchet head so that this handle may be readily employed for rotating said head and, as will be readily understood in view of the preceding description, accordingly turning the wrench. However, it may not always prove practicable to employ the brace handle 32 and I accordingly provide a straight handle 35 for the wrench. As best illustrated in Fig. 3, this straight handle may also be removably engaged at its inner end within the outer end of the sleeve 30 to be held by the set bolt 31 so that the straight handle may then be manipulated for turning the wrench. For directing and steadying the wrench when the straight handle is used, I provide a hand rest or stem 36. At its upper end this stem is formed with an appropriate head, while, at its lower end, the stem is provided with a socket 37 adapted to removably engage over the head of the post 28 to coact with the nut 29. The stem will thus be operatively connected with the wrench stock and accordingly may be held by one hand of the operator for directing the wrench while the other hand is employed for manipulating the ratchet by means of the handle 35. It will accordingly be seen that I provide a highly effective type of ratchet wrench and it is to be noted in this connection, as particularly shown in Fig. 11, that the several parts of the wrench may, when desired, be arranged in a very compact manner so that the device may be easily carried in a tool chest or tool bag.

Having thus described the invention, what is claimed as new is:

A wrench comprising a smooth bored stock having longitudinal slots in its walls and provided at one end with an enlarged open-ended head and a reduced shank at its opposite end, a boss projecting from the extremity of said reduced shank, a star shaped head slidably mounted in the stock and having extended threaded portions projecting through the slots in the stock, three resilient jaws integral with and extending from said head through the open-ended enlarged head of the stock with flat inner surfaces and having their outer surfaces bearing against said stock head, an interiorly threaded sleeve

rotatably mounted on the stock and engaging the threaded projections of the slidably mounted head, said sleeve bearing at one end against the said enlarged head of the stock, a working head fitted rotatably on the reduced shank of the stock and arranged to hold the sleeve against the enlarged head of the stock and prevent endwise movement of the sleeve, means for operating said working head, and means engaging said boss to retain the working head on the reduced end of the stock.

In testimony whereof I affix my signature.

WILBUR L. BEATY. [L. S.]