Sept. 26, 1939. T. O. RUEB 2,174,502

RATCHET WRENCH

Filed Aug. 18, 1937

Fig. 1.

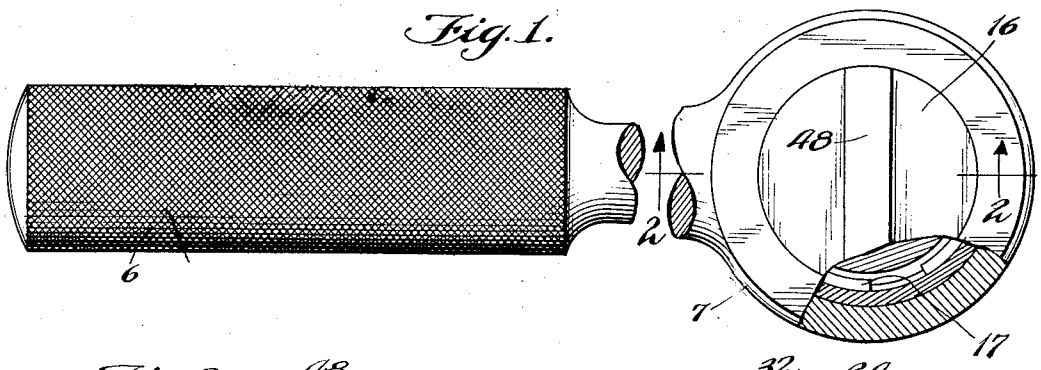


Fig. 2.

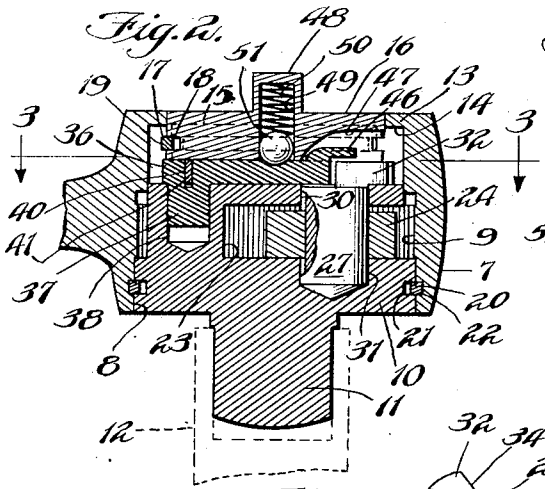


Fig. 3.

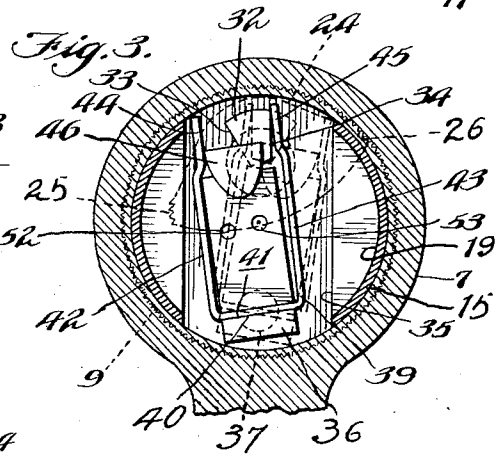


Fig. 5.

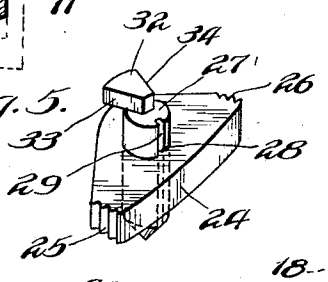


Fig. 6.

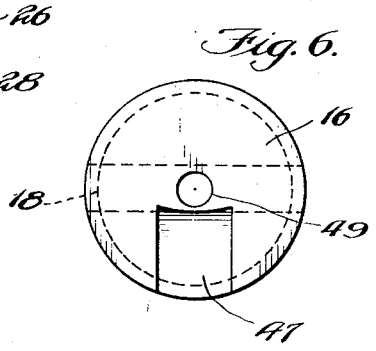
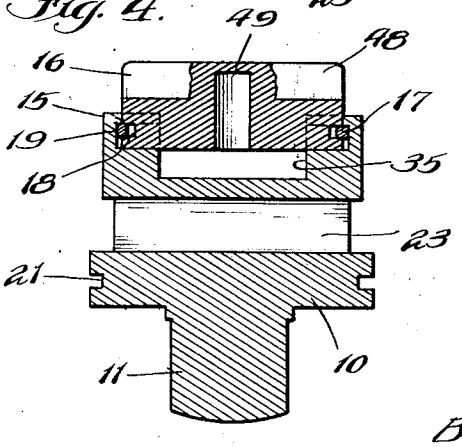


Fig. 4.



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UNITED STATES PATENT OFFICE

2,174,502

RATCHET WRENCH

Theodore O. Rueb, Chicago, Ill., assignor to The Sherman-Klove Co., Chicago, Ill., a corporation of Delaware

Application August 18, 1937, Serial No. 159,682

6 Claims. (Cl. 192—43.1)

This invention relates to ratchet wrenches of the reversible type such as set forth in my Patent No. 2,082,356 and embodies certain modifications of the wrench set forth in such patent.

The objects of this invention are to provide an improved ratchet wrench having novel and efficient reversing means which may be quickly actuated and which is not apt to be accidentally reversed.

Other objects and advantages will appear more fully from the following description taken in connection with the accompanying drawing.

In the drawing, Figure 1 is a plan view;

Figure 2 is a sectional view taken on the line 2—2 of Fig. 1;

Figure 3 is a sectional view taken approximately on the line 3—3 of Figure 2 the projection 46 on block 36 however being shown in full for convenience in illustration;

Figure 4 is a sectional detail showing the means for fastening some of the parts together;

Figure 5 is a perspective detail of the pawl and supporting pin therefor; and

Figure 6 is a bottom plan view of the top cap or disc.

The wrench has a handle 6 with a cylinder or barrel 7 which may be formed integrally therewith or attached thereto in any suitable manner. The barrel 7 has a longitudinal bore 8 and is provided with an internal annular series of teeth or corrugations 9 for engagement with the actuating pawl. The driving head or part 10 to be turned is rotatably mounted in the barrel and is provided with suitable means for connecting the same with the article to be turned, as for instance a projection 11 of the type commonly used for engagement with sockets or other similar parts as indicated at 12. The barrel or cylinder 7 has an inwardly extending flange 13 at one end which provides an inner shoulder 14 as shown in Figure 2. The head 10 is shorter than the barrel and has a recess in its inner end which is defined by a peripheral flange 15 which however extends only part way around the periphery in order to leave space for certain operating parts. A cap or disc 16 fits within the open end of the barrel and is detachably secured to the head 10 by means of a spring ring 17 which engages with a groove 18 in the disc and an oppositely disposed groove 19 in the flange 15. The flange 15 engages with the shoulder 14 to hold the turning head against movement in one direction longitudinally of the barrel. The head 10 and parts connected therewith are detachably fastened in position in the barrel by means of a removable spring ring 20 which engages with peripheral grooves 21 and 22 in the head and barrel respectively when the parts are in assembled position. The head 10 has a transverse channel or recess 23 in which is mounted a pawl 24 of approximately triangular shape with ratchet teeth or corrugations 25 and 26 at the opposite ends or apexes which coact with the teeth 9 to provide the ratchet turning movement. The pawl 24 is mounted on a pin 27 and is secured thereto in any suitable manner as by means of a spline or key 28 which fits in a keyway 29 in the pin so that these parts will turn together. The pin 27 engages with holes or bearings 30 and 31 in the head 10 and is free to turn therein to permit vibration of the pawl as shown in Figure 2. The pin 27 has a triangular shaped projection or sector 32 extending radially from its upper end as shown in Figure 5, which projection may be formed integrally with the pin or secured thereto. The projection has substantially radial converging sides 33 and 34 and serves to rotate the pin and swing the pawl to its different operating positions. The head 10 has a transverse slot 35 into which the projection 32 extends, the upper end of the pin 27 being flush with the bottom of the slot. The block or plate 36 is pivotally mounted in the slot 35, being provided at one end with a pin 37 which fits in a hole or bearing 38 in the head 10. A substantially U-shaped spring 39 is carried by the block 36 having a transverse portion 40 which fits in a slot 41 in the block and having substantially parallel side branches 42 and 43 which extend along and engage with the sides of the block. The branches 42 and 43 have inwardly extending parallel terminal portions 44 and 45 which are opposed to and engage with the respective faces 33 and 34 of the sector 32 for actuating the same.

The block or plate 36 has an upwardly and outwardly extending projection 46 which fits in or engages with a recess 47 in the lower face of the disc 16 whereby the sides of the recess will engage with the projection for swinging or vibrating the plate or bar 36 when the disc is rotated.

The disc 16 is provided on its upper surface with a transverse projection or thumb-piece 48 for turning the same. It is also provided with a central hole 49 for receiving a compression spring 50 and a ball or detent 51 which engages with relatively shallow holes or depressions 52 and 53 in the upper surface of the plate or bar 36. The recesses 52 and 53 are located on the arc of a circle the center of which is the axis of the pin 37 and are equally spaced from the median line of the bar as shown particularly in Figure 3.

When the wrench is to be used as for rotating the turning head in one direction, the disc 16 is turned by the thumb-piece 48 which causes one side of the slot 47 to press against the projection 46 and swing the plate or bar 36 in the corresponding direction. When the disc reaches its extreme position the ball or detent 51 will engage for instance with the recess 52 and will tend to hold the bar in such adjusted position. The pres-

sure or holding action of the ball is sufficient to hold the bar in such position so that the corresponding end of the spring **39**, as for instance the terminal **45**, will provide sufficient pressure against the segment **32** to hold the end of the pawl in yielding engagement with the teeth in the barrel whereby the proper ratcheting or driving movement between the barrel and the driving head is permitted.

My improved wrench may be made in any desired sizes, being applicable for small as well as large wrenches and the simplicity of the construction tends to provide a tool which will not be apt to get out of order and one which will be effective in use. It would be particularly noted that the thumb-piece on the disc is of such size that there is little possibility of the ratchet being accidentally thrown from its desired position by contact of the hand with such thumb-piece, which has heretofore been found possible with other types of wrenches.

While I have shown a preferred form of my invention it is not intended to be limited to the exact construction shown and described except as specified in the following claims, in which I claim:

1. The combination with a ratchet device having a reversible pawl, of means for reversing the position of the pawl comprising a rotatable pin on which the pawl is secured, a projection extending radially from said pin, a bar pivotally mounted adjacent to the pin, holding means carried by the bar and engaging with the sides of the projection for moving the projection and for holding the pawl in its respective engaging positions, a projection extending from the bar, a rotatable member mounted adjacent to the bar and having a recess for receiving said projection, means on said rotatable member for manually turning the same, a detent yieldingly mounted in the rotatable member and adapted to engage with recesses in the bar for holding the bar in its adjusted positions.

2. In a ratchet device of the character set forth, the combination of a driving member comprising a cylinder having inwardly extending peripheral teeth, a driven member comprising a head rotatably mounted in the cylinder, means for holding said head in the cylinder, a pin rotatably mounted in the head, a double-ended pawl carried by the pin and coacting with the teeth in the cylinder, a radial projection on said pin for turning the same, a block pivotally mounted in the head, springs on the sides of the block which engage with the projection on the pin for swinging the pin and for holding the pawl in its respective operative positions, a projection at the free end of the block, a disc rotatably mounted in the head adjacent to the block and having a recess with its sides engageable with said last named projection to swing the block when the disc is turned, means for holding said disc in engagement with the head, a thumb-piece on the head for turning the same, a hole in the disc in axial alignment with the head, a ball mounted in the hole, and a spring pressing the ball toward the block, said block having two recesses in the upper face thereof which are engaged by the ball when the block is swung by the movement of the disc to its respective operating positions to hold the block in said positions.

3. In a ratchet device of the character set forth, the combination of a driving member having a circumferential series of ratchet teeth therein, a revolvable driven member journaled in the driving member, a pawl associated with said driven member cooperating with said ratchet teeth, a pin supporting said pawl, an eccentric projection on said pin, a block pivoted at one end to the driven member, a U-shaped spring secured in said block with its free arms extending along the sides of the same and having their extremities oppositely disposed with regard to the projection for swinging the pawl to its operating positions and to hold the pawl yieldingly in such positions, and means for actuating said block comprising a disc mounted adjacent thereto, inter-engaging means between the disc and the block whereby the block may be swung by rotating the disc, and a detent on the disc engaging with the block for holding it in adjusted positions.

4. A device as per claim 3 in which the detent comprises a spring pressed ball which engages with recess in the block.

5. In a ratchet device, the combination with a driven member comprising a head having means for engagement with a nut or the like, of a pin mounted in said head, a double-ended pawl secured to said pin with its ends adapted to project outwardly at the circumference of the head, a driving member comprising a cylinder engaging with said head and having internal teeth which are engaged by the pawl, a projection on said pin extending radially therefrom, a bar pivotally mounted on the head, springs secured to the bar and having their free ends opposed to the sides of the projection, a disc rotatably mounted in the head and projecting outwardly through one end of the cylinder, inter-engaging means between the disc and bar for swinging the bar when the disc is rotated, a thumb-piece on the disc, a hole in the disc in axial alignment with the head, a ball mounted in the hole and a spring pressing the ball against the bar, said bar having recesses spaced apart and adapted to be engaged by the ball when the bar is swung to its extreme positions to hold the bar in such positions and to cause the springs to coact with the ratchet means to hold the same in operative positions.

6. In a ratchet device, the combination of a driving member having an inwardly extending flange at one end, a driven member rotatably mounted in the driving member with one end engaging with said flange, a spring ring for detachably holding the driven member in the driving member, a ratchet engaging means on the inner periphery of the driving member, a pin rotatively mounted in the driven member, a double-ended pawl on the pin for engagement with said engaging means to reverse the movement of the driven member when actuated by the driving member, a radial projection on the pin, a bar having one end pivoted to the driven member and the other end terminating adjacent to the projection, springs secured to the bar and engaging with the projection for swinging the pin, a disc rotatably mounted in the driven member, a spring ring for detachably holding the disc in the driven member, inter-engaging means between the disc and the bar for swinging the bar when the disc is rotated, and a spring-pressed detent mounted in the disc and engaging with the bar for holding the bar in its adjusted positions.

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