Oct. 22, 1929. W. F. HENDERSON 1,733,012

ADJUSTABLE RATCHET WRENCH

Filed Sept. 25, 1928

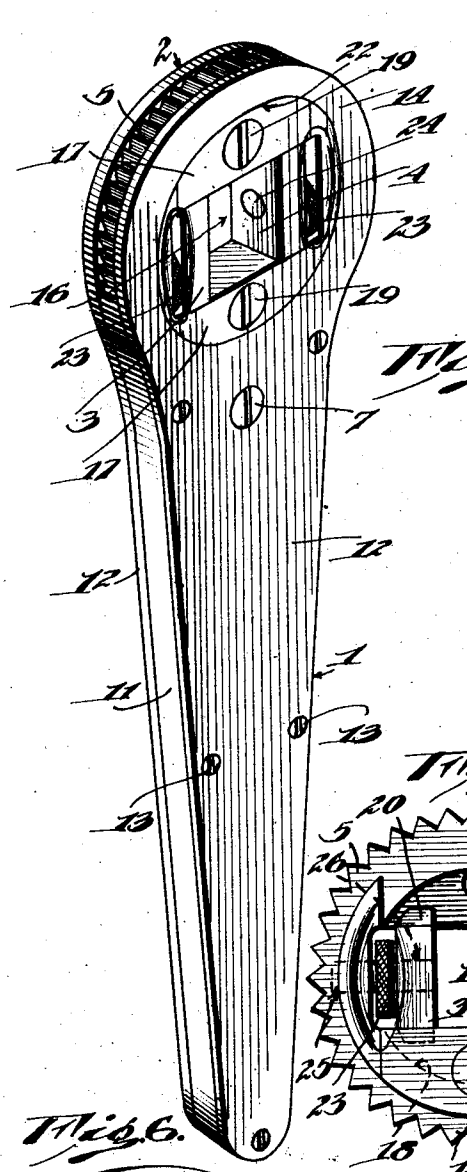


Fig. 1.

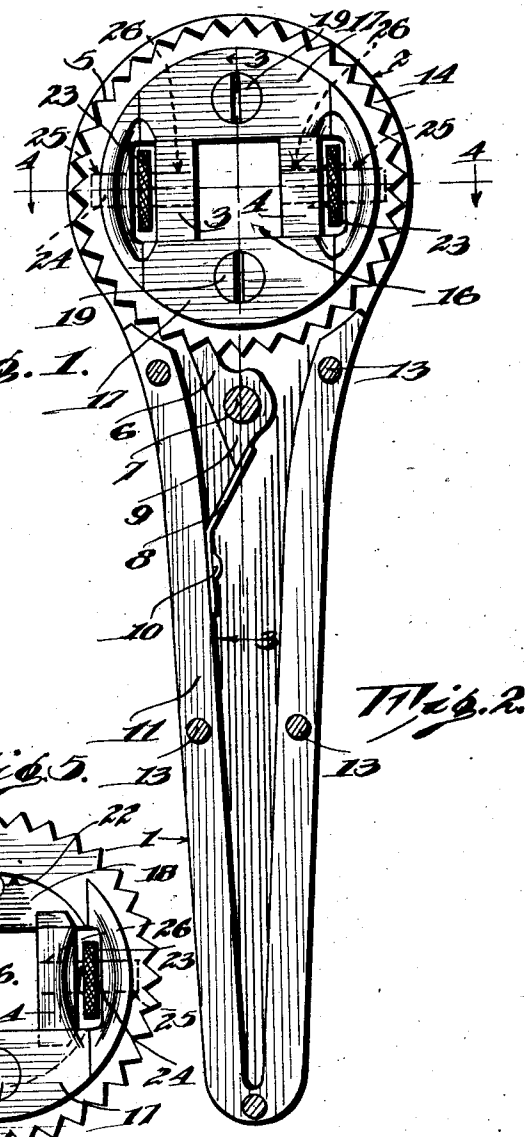


Fig. 2.



Fig. 5.

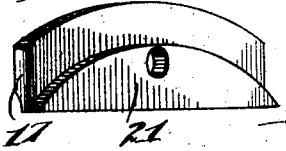


Fig. 6.



Fig. 3.

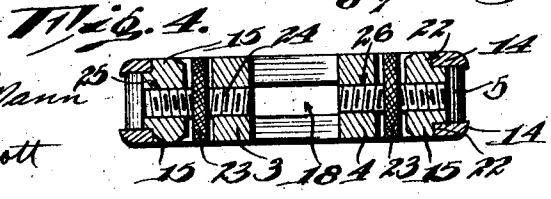


Fig. 4.

WITNESSES

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# UNITED STATES PATENT OFFICE

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## ADJUSTABLE RATCHET WRENCH

Application filed September 25, 1928. Serial No. 308,295.

This invention relates to improvements in wrenches, particularly of the adjustable ratchet type, and it consists of the constructions, combinations and arrangements herein described and claimed.

An object of the invention is to provide a ratchet wrench which is adjustable to suit a variety of objects to be turned, such as nuts, wrench sockets, square or other bars, etc. and when used in connection with wrench sockets is adaptable to all of the standard sizes of sockets so that the wrench may be regarded as a universal handle for this particular kind of implement.

Other objects and advantages appear in the following specification, reference being had to the accompanying drawing in which

Figure 1 is a perspective view of the improved wrench,

Figure 2 is an elevation of the wrench, parts being in section, one of the face plates being removed to reveal the internal workings,

Figure 3 is a vertical section taken on the line 3—3 of Figure 2,

Figure 4 is a cross section taken on the line 4—4 of Figure 2,

Figure 5 is a detail view of the wrench head, one of the retaining plates being removed,

Figure 6 is a detail perspective view of the foregoing retaining plate.

The ratchet wrench herein disclosed, has an outstanding advantageous feature among others, to the end that any object to be gripped is confined on four sides so that it is impossible for the wrench to slip off and do damage or cause an injury while in use, as not uncommonly occurs in the use of open-jaw wrenches. While strength and rugged construction are not the main attributes of the device yet these are essential factors in a wrench such as this, which is designed for a wide variety of uses.

A particular use of the wrench is that of a handle for wrench sockets. The opening in the wrench head will be of a size to admit the largest socket, and the adjustable features are such that the smallest socket will be accommodated as well. It is in this particular use that the wrench has special merit. The socket must be held firmly because it will not do to have the wrench slip off of the free end. This is a disadvantage and a dangerous feature of open-jaw wrenches. Other meritorious features are brought out in the following description.

Reference is made to the drawing. The wrench comprises several main parts, to wit, the handle 1, wrench head 2 and jaws 3 and 4. The wrench head is circular. The exposed rim is constructed in the form of ratchet teeth 5. These are successively engaged by a dog 6, concealed within the handle 1 and pivoted on a screw 7 or its equivalent, so that as the handle is rocked back and forth with a characteristic motion which the reader can readily visualize, the wrench head 2 is made to rotate.

There is no limit to the extent of rotation of the wrench head 2. It may be rotated in a complete circle or circles, or the extent of rotation may be any fractional part of a circle. A leaf spring 8 bears against the heel 9 of the dog to keep the nose of the latter in engagement with the ratchet teeth. The spring is fastened at 10 to one side of what might be called a frame 11. This frame is made in the shape of a U, and when the face plates 12 are secured to the frame by means of screws 13 or the like there is defined a chamber in which the dog and spring are concealed.

The upper ends of the face plates terminate in ring-portions 14. These are fitted around the wrench head 2 and it is between and upon these ring-portions that the wrench head is held and rotatable. The first function is achieved by providing the wrench head with outstanding circular

bosses 13. These fit and ride in the ring-portions 14 and come flush with the outsides of the face plates 12 as plainly shown in Figures 1, 3 and 4. The exposed rim of the wrench head is resultingly narrower than the total thickness of the head, and thus the ratchet teeth are well housed between the face plates.

Care is taken to make the ring-portions 14 somewhat greater in diameter than the diameter of the wrench head. This brings the ratchet teeth below the periphery of the ring-portions. Any blow directed toward the edge of the wrench head would be received by the edges of the ring-portions, and the resulting protection of the ratchet teeth from injury establishes an important contribution to the general utility of the device.

There is an opening 16 clear through the wrench head. This opening is usually rectangular and oblong in shape. It is in this opening that the jaws 3 and 4 are made to ride back and forth. It is also in this opening that the object to be gripped is received. Looking down upon the wrench head as in Figure 5 one will see a pair of retainer plates 17. One of these is shown in position in Figure 5, the other being shown as a detail in Figure 6.

Recesses 18 are covered by the retainer plates when secured in position by heavy screws 19. One wall (the one appearing on the far side in one instance in Figure 5) is solid with the wrench head. The opposite wall (the one nearest the observer of Figure 5) is composed of the plates 17 in part. It is between the two walls that lugs 20 of the jaws 3 and 4 move and are guided. The lugs bear against the solid wall mentioned, and are held in place when the plates 17 are fastened down. For this purpose each retaining plate has a segmental enlargement 21 (Figure 6) not only to bear against the lugs but to snugly fit the rounded rim 22 of the recess 18, for which purpose the top of the enlargement is rounded as shown.

After everything is in place there will still be a space between the solid wall and the removable walls defined by the plates 17. It is in this space that the lugs move. The jaws 3 and 4 are actuated by knurled finger pieces 23 of screws 24. These screws are more in the nature of screw shafts. They protrude at approximately even distances at each side of the finger pieces. In other words, the finger pieces, are approximately in the center. The opposite ends of the screw shafts are oppositely threaded, those portions that screw into threaded holes 25 in the wrench head have right-hand threads, while those portions that screw into threaded holes 26 in the jaws have left-hand threads.

But little of the mode of operation needs to be described in detail, it being perfectly obvious that the object to be gripped will be presented in the opening 16 when the finger pieces 23 should be manipulated to close the jaws 3 and 4 thereupon. It is only in respect to the screw shafts that any detailed description of the operation should be given.

Upon turning one of the finger pieces 23 in the proper direction, the screw shaft 24 will move into the threaded hole 25 by virtue of the right-hand thread. This action pulls the jaw 3 (for example) along with the screw shaft, but at the same time the left-hand threaded end of the screw shaft 24 will be screwed into the hole 26 of the jaw, so that while the screw shaft is being screwed into the wrench head and is pulling the jaw 3 along with it, the screw shaft is also being screwed into the jaw. The result is that the jaw 3 will be moved with double speed.

It is believed clear that the formation of the lugs 20 leaves adjacent shoulders on the ends of the jaws 3 and 4. These shoulders bear up against the edges of the solid and removable walls adjacent to the opening 16. The jaws thus have firm bearings at a number of points, adequately bracing them and providing a strong wrench. Having clamped the jaws upon the object to be gripped and turned, the handle 1 is moved back and forth, whereupon the dog 6 progressively turns the wrench head.

While the construction and operation of the improved ratchet wrench is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:—

1. A wrench comprising a wrench head having circular bosses and a peripheral rim of ratchet teeth, a handle by which it is carried consisting of a pair of plane face plates with ring-portions in which said bosses have bearing, and a frame by which the face plates are spaced apart to define a chamber at which said rim is exposed.

2. A wrench comprising a wrench head having an opening, jaws guided upon the wrench head and movable in the opening, finger pieces for each jaw, and a screw shaft by which each finger piece is carried, the opposite ends of each screw shaft being oppositely threaded and screwing into the wrench head and jaws respectively, causing the jaws to advance or recede in respect to each other along the opening with an accelerated action when the screw shafts are screwed either into or out of the wrench head and jaws.

3. In a wrench, a wrench head having an opening and recesses, retainer plates which are removable from the head and define one wall of the recesses, the other wall being defined by a solid portion of the head, and jaws situated in the opening having lugs which ride in the recesses between said walls.

4. A wrench comprising a wrench head

having an opening therethrough and recesses defining solid walls adjoining the opening at one side of the head, protuberances on the other side of the head situated at opposite ends of the opening, retainer plates fitted upon the head between the protuberances having enlargements entering the recesses and defining enclosures, jaws situated in the opening having lugs riding in the recesses, said lugs defining shoulders bearing against the edges of said walls and retainer plates, and means to secure the retainer plates to the heads thus to retain the jaws.

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