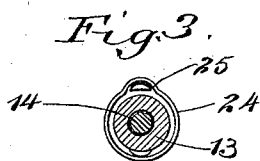
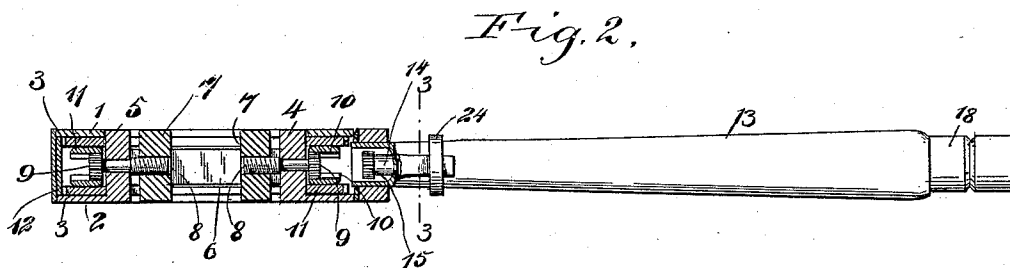
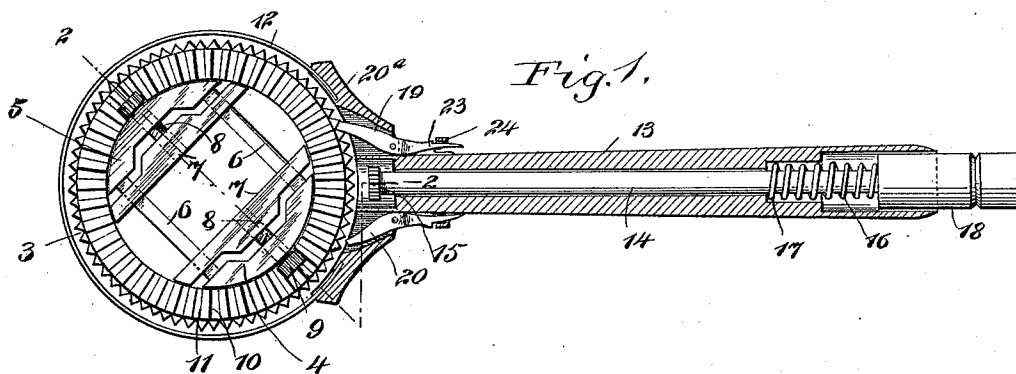


(No Model.)

E. T. WARN.  
RATCHET WRENCH.

No. 573,732.

Patented Dec. 22, 1896.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

EDWARD T. WARN, OF MAIDEN, MONTANA, ASSIGNOR OF TWO-THIRDS TO  
FRANK PICK AND CHARLES DROSCH, OF SAME PLACE.

## RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 573,732, dated December 22, 1896.

Application filed August 11, 1896. Serial No. 602,399. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD T. WARN, of Maiden, in the county of Fergus and State of Montana, have invented a new and Improved Ratchet-Wrench, of which the following is a full, clear, and exact description.

The object of this invention is to provide a ratchet-wrench so constructed that its several parts are separable one from another, thus providing for easily replacing a part that shall have become worn or broken, and, further, to provide a simple mechanism whereby the wrench may be quickly changed to operate either to the right or to the left, and which may be used conveniently in a very small space, such, for instance, as within boilers, stoves, and the like.

I will describe a ratchet-wrench embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal section of a wrench embodying my invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a section through the line 3 3 of Fig. 2, and Fig. 4 shows a pawl employed.

The wrench comprises two ring-plates 1 2, each provided on its inner side with ratchet-teeth 3. The ring-plates 1 and 2 extend somewhat beyond the circumference of the ratchet-teeth 3, for a purpose to be hereinafter described. The ratchet-teeth 3 may be formed integral with the plates 1 and 2, or they may be formed on separate ring-plates, which may be secured in the ring-plates 1 and 2 by rivets or otherwise. In either event a ring-plate and its teeth will be practically one structure.

One of the ring-plates, here shown as the ring-plate 2, is provided at diametrically opposite sides with transversely-extended flanges 4 5, formed integral with the ring-plate. These flanges 4 5 extend into the ring-plate 1, and this ring-plate 1 may be connected to the flanges in any desired manner. Extended between the flanges 4 and 5 are guide-bars 6, upon which the wrench-jaws 7 are mounted to move. The guide-bars 6 may have their ends removably seated in mortises

formed in the flanges 4 and 5. The jaws 7 are provided with openings through which the guide-bars 6 extend, so that said jaws may be moved toward and from each other to adapt them to the size of the work in hand. Screws 8 engage in tapped openings in the jaws 7, and the shank portions of these screws are passed through the flanges 4 and 5, as plainly indicated in the drawings. The shank portions of the screws 8, where they pass through the flanges 4 and 5, are reduced so as to form shoulders to engage the inner surfaces of the respective flanges 4 and 5, thus preventing outward longitudinal movement of the screws through said flanges, but allowing a rotary movement of the screws.

The outer end of each screw 8 is provided with a fixed pinion 9, meshing with teeth 10, formed on ring-plates 11, mounted to rotate on the inner sides of the plates 1 and 2. These ring-plates 11 will be centered and have their bearings on the flanges 4 and 5. The pinions 9 prevent inward longitudinal movement of the screws 8.

The several parts above described are mounted within a band 12 in such a manner that there may be a relative rotary movement between said band 12 and the said parts. As here shown, the band 12 engages around the periphery of the plates 1 and 2 and also has shoulder portions to engage the inner edges of the said plates, thus preventing the wrench parts from dropping out of the band. The band 12 has its ends connected to a handle 13, which is made tubular. A jaw-adjusting rod 14 extends through the handle 13 and has on its inner end a pinion 15, adapted to be moved into engagement with the teeth of the respective plates 11. This pinion 15 is held normally out of engagement with said teeth by means of a spring 16, abutting at one end against a shoulder 17, formed by an enlarged tubular portion of the handle, and at its other end against the head 18, secured to the outer end of the rod 14.

Pivoted to opposite sides of the handle 13, and adapted to engage with the ratchet-teeth 3 of each ring-plate 1 2, are pawls 19 and 20. Preferably the base portion of the handle 13 will have an enlarged portion 20<sup>a</sup>, provided with openings through which the pawls 19

and 20 extend to their engagement with the ratchet-teeth. As shown in Fig. 4, each pawl has two fingers 21 and 22, one finger being adapted to engage with the ratchet-teeth on the ring-plate 1, and the other finger being adapted to engage with the ratchet-teeth on the ring-plate 2. Springs 23, secured to the handle 13 and having their free ends engaged with the inner surfaces of the outwardly-extended portions of the pawls 19 and 20, serve to hold the pawls in yielding engagement with the ratchet-teeth.

The object in providing two pawls is to allow for operating the wrench either to the right or to the left, that is, when the wrench is operated as a right-hand wrench one of the pawls will be in engagement with the ratchet-teeth and the other pawl will be held out of engagement therewith. Of course this arrangement will be reversed when the wrench is used as a left-hand wrench.

As a means for holding one of the pawls out of its operative position I have here shown a ring 24, mounted to rotate around the handle 13 and over the outwardly-extended portions of the pawls. At one side this ring 24 has an offset 25, into which the outwardly-extended portion of a pawl may freely move when said pawl is in its operative connection with the ratchet-teeth; that is, should it be desired to operate the wrench with the pawl 19 the ring 24 will be placed with its offset 25 over the outwardly-extended portion of said pawl 19, and the opposite side of said ring engaging with the outwardly-extended portion of the pawl 20 will move the said outwardly-extended portion into close contact with the handle, and consequently secure its operative end out of engagement with the ratchet-teeth.

When it is desired to adjust the jaws 7 toward or from each other, the adjusting-rod 14 will be forced inward to engage the pinion 15 with the teeth on the rings 11. Then by rotating said adjusting-rod the said rings will be rotated, and consequently the screws 8 will be rotated and their threaded portions will move the jaws toward or from each other. Then by releasing the adjusting-rod it is obvious that the spring 16 will move the same outward to disengage the pinion from the teeth. By this construction it will be seen that the two jaws 7 are simultaneously moved and to equal distances, and thus it will be seen that the jaws will be at all times centered.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A ratchet-wrench, comprising ring-plates having ratchet-teeth on their inner surfaces, diametrically opposite flanges extended transversely within the ring-plates and secured thereto, guide-bars supported by said flanges, jaws movable on said guide-bars, screws having rotary bearings through the flanges and having engagement with tapped holes in the jaws, each of said screws having a pinion on its outer end, rings having teeth

formed on their inner sides to engage with said pinions on the screws, a tubular handle, an adjusting-rod movable longitudinally in said handle, a pinion on the inner end of said rod, adapted for engagement with the teeth of said rings, and pawls pivotally mounted on the handle and adapted for engagement with the ratchet-teeth of the ring-plates, substantially as specified.

2. A ratchet-wrench, comprising ring-plates having ratchet-teeth on their inner surfaces, diametrically opposite flanges extended transversely within the ring-plates and secured thereto, guide-bars supported by said flanges, jaws movable on said guide-bars, screws having rotary bearings through the flanges and having engagement with tapped holes in the jaws, each of said screws having a pinion on its outer end, rings having teeth formed on their inner sides to engage with said pinions on the screws, a tubular handle, an adjusting-rod movable longitudinally in said handle, a pinion on the inner end of said rod, adapted for engagement with the teeth of said rings, pawls pivotally mounted on the handle and adapted for engagement with the ratchet-teeth of the ring-plates, and a spring for moving the adjusting-rod outward, to disengage its pinion from the teeth of the rings, substantially as specified.

3. A ratchet-wrench having two ring-plates composing a frame, two guide-bars extending across the ring-plates, and in rigid connection therewith, two jaws sliding toward and over each other and movable on the guide-bars, screws rotatably held by the ring-plates and having threaded connection with the jaws, a cog-ring, having circumferential movement between the ring-plates, a pinion fixed to each screw, the pinions respectively meshing with the cog-ring, and means for turning the cog-ring, substantially as described.

4. In a wrench, the combination of a handle, a circular band secured to the handle, two ring-plates revoluble within the band and connected to each other, two guide-bars rigidly connected with the ring-plates, two jaws sliding on the guide-bars, a screw for each jaw, the screws being revolubly supported by the ring-plates, a cog-ring circumferentially movable between the ring-plates, a pinion for each screw, the pinions meshing with the cog-rings, means for turning the cog-ring, and means for removably fixing the ring-plates to the band, substantially as described.

5. In a wrench, the combination of a handle, a rod movable through the handle, a band held by the handle, a pawl carried by the handle, a circular frame revolubly held by the band and capable of being engaged by the pawl whereby it may be turned with the band, two jaws held by the frame, revolubly mounted screws carried by the frame and respectively having connection with each jaw, a cog-ring revoluble in the frame, a pinion fixed to each screw the pinions meshing with

the cog-ring, and a pinion on the rod, said last pinion being capable of engaging the cog-ring to move the same and adjust the jaws, substantially as described.

5 6. In a wrench, the combination of a frame, a handle by which the frame is revolubly carried, means carried by the handle and engaging the frame to turn the same with the handle, a jaw movable within the frame, a  
10 revolubly-mounted screw having threaded connection with the jaw, a cog-ring revoluble within the frame, a pinion fixed to the screw and meshed with the cog-ring, and means  
15 for turning the cog-ring, substantially as described.

7. In a wrench, the combination with a handle and a band carried by the handle, of a frame revoluble within the band, a jaw removably carried by the frame, means for sliding the jaw, a pinion in connection with  
20 said means, a cog-ring revoluble within the frame and meshed with the pinion, and means for turning the cog-ring and for moving the frame with the handle, substantially as described.

EDWARD T. WARN.

Witnesses:

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BEN. V. DOUGHERTY.