Dec. 21, 1948. A. PETERSON ET AL 2,456,838

PIVOTED PAWL RATCHET WRENCH WITH RADIALLY-SLOTTED HEAD AND SOCKET

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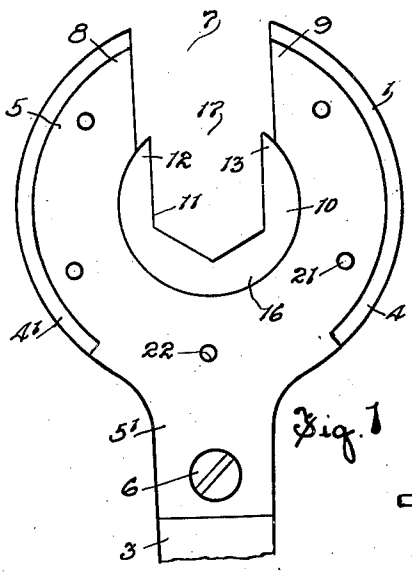


Fig. 1

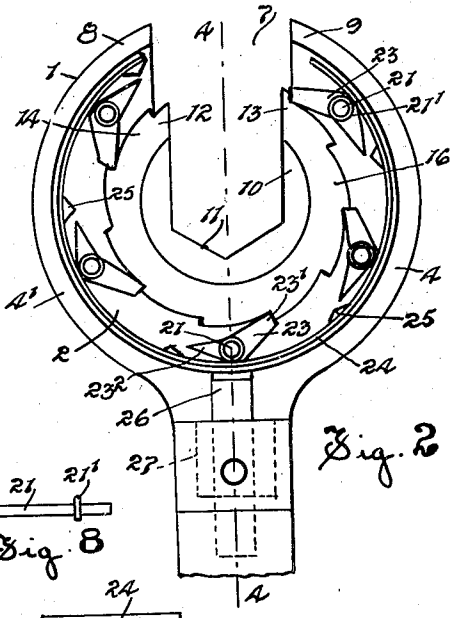


Fig. 2

Fig. 8

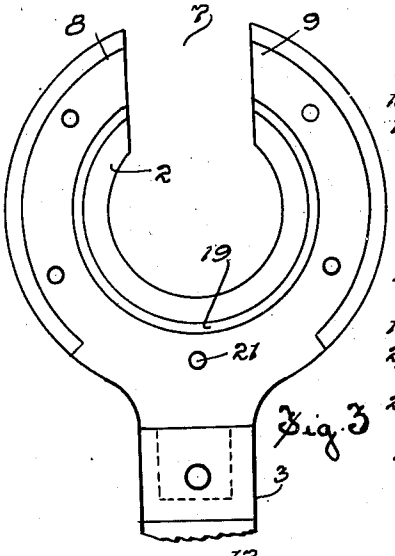


Fig. 3

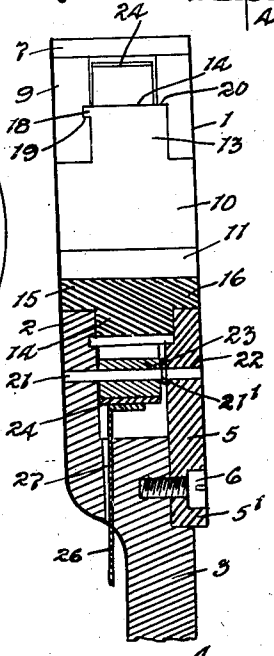


Fig. 4

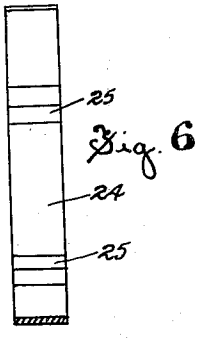


Fig. 6

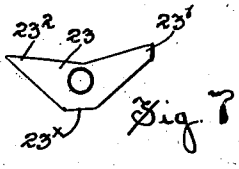


Fig. 7

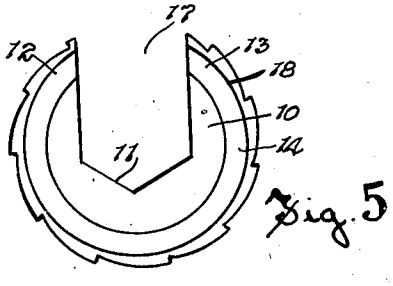


Fig. 5

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PIVOTED PAWL RATCHET WRENCH WITH RADIALLY SLOTTED HEAD AND SOCKET

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1 Claim. (Cl. 81—61)

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The invention relates to ratchet wrenches, and an object of the invention is to provide an open jawed ratchet wrench, which while functioning for the general purpose of a wrench, also allows one to use it with facility and dispatch in locations where there are obstructions limiting approach to the nut so as to render said nut accessible only from the side.

A further object is to design the wrench so that it can be manipulated and assembled at reasonable cost, and such that the various internal operating parts can be readily removed for replacement, repair or other purposes.

A further object is to provide a simple, yet effective means for releasing the dogs of the wrench from the ratchet teeth thereof, such permitting the ready and quick resetting of the segmental socket in the open jawed position.

A further object is to design the wrench such that it will take, without alteration, a range of sockets, and such that said sockets may be readily interchanged.

A still further object is to provide a single spring insertable in the wrench head without requiring fastening and engaging all dogs and to construct the dogs such that they are normally releaseably held in contact with the teeth of the segmental ratchet wheel.

A further object is to provide a wrench head having a nut receiving socket mounted rotatably therein, the socket and head having nut passages which can be brought into registration to admit the nut to the socket, and to provide coacting dogs and ratchet teeth within the head to rotate the socket upon the head being reciprocated.

A further object is to provide the pivot pins for the dogs with collars retaining the dogs against escape when the removable head plate with which the wrench is supplied, is removed.

A further object is to construct the wrench such that ample bearing surface is given the segmental socket and integral segmental ratchet wheel, in the head of the wrench.

With the above objects in view the invention consists essentially in the arrangement and construction of parts hereinafter described, reference being had to the accompanying drawing, in which

Fig. 1 is a plan view of the wrench, the handle being broken away.

Fig. 2 is a plan view of the wrench with the top plate removed.

Fig. 3 is a plan view of the head with the top plate and internal working parts removed.

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Fig. 4 is a vertical sectonal view at 4—4 Fig. 2.

Fig. 5 is a plan view of the segmental socket and ratchet teeth.

Fig. 6 is a cross sectional view through the spring.

Fig. 7 is an enlarged face view of one of the dogs.

Fig. 8 is a side view of the dog spindle, showing the collar thereon.

In the drawing like characters of reference indicate corresponding parts in the several figures.

The head 1 of the wrench comprises a segmental annular bottom plate 2 integral with the handle 3, side walls 4 and 4' integral with the bottom plate, and a removable, segmental top cover plate 5 which is received between the side walls and is detachably secured to the handle in any suitable manner, such as by a screw 6, passing through the extension shank 5' of the top plate and into the handle.

Such construction provides a jawlike head having a hollow interior and a passage 7 between the jawlike portions 8 and 9.

A segmental socket 10 is mounted in the head, that herein shown presenting four gripping faces 11 for engagement with the same number of faces of the standard hexagonal nut, entrance to the socket being between the jawlike portions 12 and 13 of the socket. The socket is provided with a segmental toothed ratchet wheel 14 and the design is such that the ends 15 and 16 of the socket, which project beyond the wheel, find bearing in the top and bottom plates.

It will be here observed that by rotating the socket the entrance passage 17 to the socket can be brought opposite the entrance passage 7 of the head, in which position the parts are shown in the drawing. This allows of the free entrance from the side of the nut into the socket.

It will be also noted that the ratchet wheel is supplied with a flange or rim 18 which is rotatably secured in a complementary channel 19 provided in the bottom plate 3, and that the top plate is countersunk at 20 (see Fig. 4) to rotatably receive the adjacent end of the socket.

To the bottom plate 2 we secure permanently a number of similar spaced, spindles or pins 21 grouped concentric to the socket and having their upper ends received within bearing holes 22 provided in the top plate. Five pins are herein shown and each pin receives rotatably a ratchet, pawl or dog 23 having the toothed end 23' thereof adapted to engage the teeth of the ratchet wheel, and all dogs are pressed normally

into contact with the ratchet teeth by a flat curved spring 24 inserted between the dogs and the side walls 4 and 4'. It will be observed that the dogs have a flat side 23^{x} contacting the spring and that they also have a tail piece 23^{2} utilized for a purpose now described.

The spring is provided on the inner side, adjacent the dogs with sloping strikers 25 which upon the spring being rotated in a counterclockwise direction, contact and trip the tail pieces simultaneously in a direction to free the dogs from the ratchet teeth. The spring can be manipulated in any suitable manner, and is herein shown as supplied with a lever 26, permanently secured thereto and extending outwardly through a suitable slot 27 provided in the head. One can shift the lever by hand when desired and so cause the dogs to engage or clear the ratchet teeth. By providing this convenient dog release arrangement one can quickly set the parts with the passages 7 and 17 continuous.

To prevent the dogs from escaping from their pivot pins we have provided collars 21' on the pins at the ends adjacent the removable cover plate.

This wrench will accommodate a range of sockets, as sockets for different sized nuts can be provided and inserted as wanted by removing the plate 5. It will also be obvious that its use is not confined to hexagonal nuts as the sockets can be modified to receive nuts with a greater or lesser number of faces.

It will be also understood that the number of ratchet teeth and dogs can be increased or diminished, provided a plurality of dogs are used and also that the head can be structurally modified without departing from the spirit of the invention.

It is also remarked that this wrench is particularly serviceable when working on pipe lines where couplings, unions and such like connections require to be connected or disconnected and

where the line permits the use of the conventional ratchet wrench.

What we claim as our invention is:

A wrench embodying a hollow head with an extending handle and having a permanent and a removable face plate, a socket rotatably mounted in the head and formed integral with a ratchet wheel, said head, wheel and socket being cross slotted to provide registrable passages for a nut to enter the socket, a plurality of spaced pivot pins permanently secured to the permanent plate and grouped concentric to the socket, a plurality of similar dogs pivotally mounted on the pins and engageable with the ratchet teeth, said dogs being provided with extending tail pieces, an arcuate spring surrounding and contacting with flat faces provided on the dogs, said flat faces and spring acting to hold the dogs normally engaged with the ratchet teeth, strikers secured to the spring and engageable with the tail pieces in the endwise shifting of the spring to simultaneously disengage the dogs, and manual means for end shifting the spring.

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ROBERT PETERSON.

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