March 2, 1937. H. S. MIMS 2,072,463

WRENCH

Filed April 26, 1935

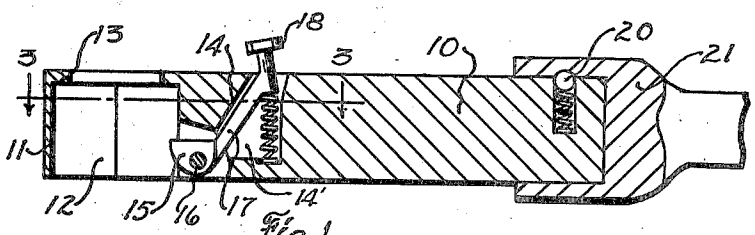


Fig. 1

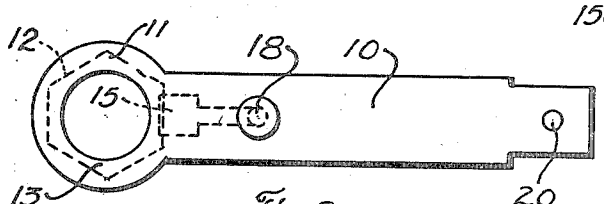


Fig. 2

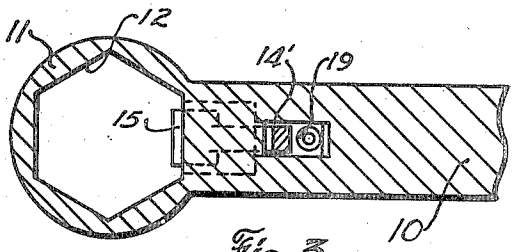


Fig. 3

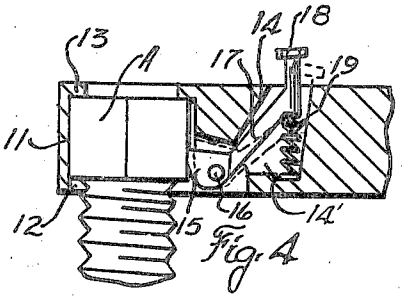


Fig. 4

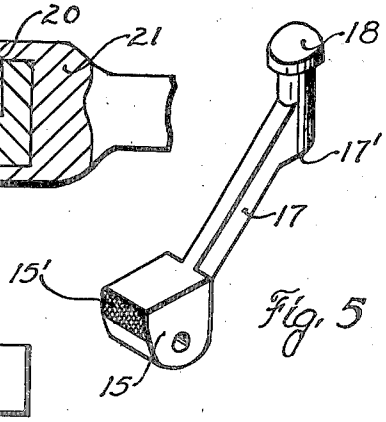


Fig. 5

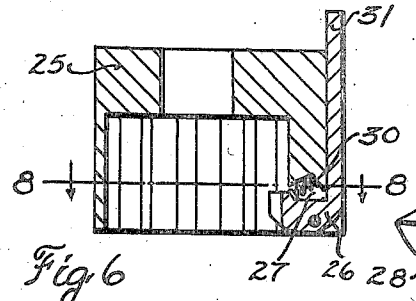


Fig. 6

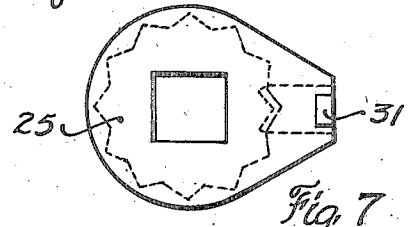


Fig. 7

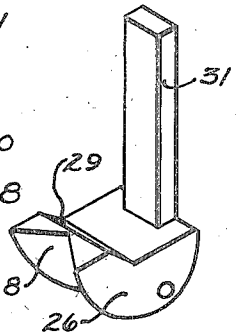


Fig 9

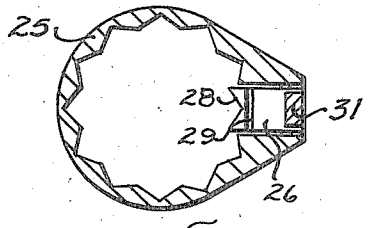


Fig. 8

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2,072,463

UNITED STATES PATENT OFFICE

2,072,463

WRENCH

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Application April 26, 1935, Serial No. 18,305

2 Claims. (Cl. 81—125)

This invention relates to new and useful improvements in wrenches.

One object of the invention is to provide an improved wrench which may be readily applied to bolt heads or nuts of various sizes.

An important object of the invention is to provide an improved wrench having a socket adapted to fit over a bolt head, and means arranged to swing into said socket to frictionally engage the periphery of said head to hold the same in the socket, said means being so constructed that any tendency of the head to disengage from the socket will serve to increase the frictional hold of said means to positively prevent the disengagement of said head from the socket.

A further object of the invention is to provide an improved wrench having a socket for receiving a bolt head or nut, said socket having gripping means for engaging said nut or bolt head to hold the same in the socket, together with stop means for positioning said head or nut within the socket, so that the gripping means will positively engage the nut, and also to facilitate the application of the wrench to a nut or bolt head.

Still another object of the invention is to provide a wrench socket of the usual type having a pivoted gripping means which is arranged to swing into the socket to engage the bolt head or nut within the socket, said means being so constructed that a pull on the head or nut within said socket will increase the frictional hold of said means.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing, in which an example of the invention is shown and wherein:

Figure 1 is a longitudinal vertical sectional view of a wrench constructed in accordance with the invention,

Figure 2 is a plan view,

Figure 3 is a horizontal, cross-sectional view, taken on the line 3—3 of Figure 1,

Figure 4 is an enlarged vertical sectional view of the wrench socket showing a bolt head therein,

Figure 5 is an isometric view of the pivoted gripping dog,

Figure 6 is a transverse vertical sectional view of an ordinary wrench socket having a gripping dog pivoted thereon,

Figure 7 is a plan view of the same,

Figure 8 is a horizontal cross-sectional view of the same, taken on the line 8—8 of Figure 6, and

Figure 9 is an isometric of the gripping dog in this form.

In the drawing, the numeral 10 designates an elongated shank which is preferably rectangular in cross section. The shank forms the handle of the wrench and may be of any desired length or size. A wrench socket 11 is made integral with one end of the shank and this socket has its outer periphery preferably cylindrical. The inner periphery 12 of the socket is hexagonal, or other shape, to conform to the shape of the nut or bolt head to which it is to be applied. It is obvious that the socket may be made in various sizes to accommodate various size nuts and bolt heads.

The upper end of the socket is provided within an inwardly extending annular flange 13, whereby when the socket is engaged over a bolt head A, or nut, said head will not pass through the socket, thereby assuring that the head will be received in said socket (Figure 4).

For retaining a bolt head within the socket 11 and to provide a sure grip of the socket upon said head, the shank 10 is provided with a central cut-out portion or angular slot 14 which extends vertically through said shank. This slot is located adjacent the socket 11 having one end open thereto, as is clearly shown in Figures 1 and 4. A gripping dog 15 is pivoted on a transverse pin 16 at the lower end of the slot. The location of this dog is such that when its outermost end is swung downwardly, the dog is swung into the socket, while a reverse swinging of the dog moves it out of the slot (dotted lines in Figure 4). The outer face 15' of the dog is cam shaped being curved as shown, and is preferably knurled. When the socket is engaged over the bolt head A and the dog 15 swung downwardly it is obvious that the knurled cam-shaped face 15' of the dog engages the side of said head, to frictionally hold the same within the socket. Due to the cam-shaped face of the dog, any downward pull on the bolt or upward pull on the socket, will only tend to cause said dog to engage the head more securely, thereby increasing the frictional hold. Thus, all danger of the bolt head being released from the socket while the dog is in engagement therewith is eliminated.

For quickly engaging and disengaging the dog from the bolt head A, said dog is provided with an upwardly extending and rearwardly inclined operating bar 17. This bar extends upwardly

through the slot 14' and is bent upon itself near its upper end, as clearly shown in Figure 5. The extreme upper portion of the bar is provided with a thumb piece 18 to facilitate depression of said bar. The bar is formed with a shoulder 17' at the bend therein and when the bar and dog are disposed in position within the slot 14, (Figures 1 and 4) a coiled spring 19 is located within the slot beneath said shoulder and exerts its pressure to constantly force the bar 17 upwardly.

It will be seen by observing Figure 4, that normally the bar is held in a raised position (full lines) by said spring. Due to the location of the pivot pin 16, the dog is extending within the socket at this time. By depressing the bar 17, the dog is retracted and the socket may be readily positioned over the bolt head A, or nut. The annular flange 13 at the upper end of the socket prevents the head from passing completely through the socket, and assures a portion of the periphery of the head being exposed to the dog when the latter is swung inwardly. By releasing the bar 17, the tension of the spring 19 immediately swings the face 15' of the dog into engagement with the bolt head. The knurled face frictionally engages said bolt head to prevent displacement of said head from the socket. Any tendency of the head to move from the socket only serves to lighten the grip of said dog on the head because of the cam-shaped face 15' of the dog. The outer end of the shank is provided with a depressible ball 20 whereby a grooved extension handle 21 may, if desired, be attached to said shank.

In Figures 6 to 9, the gripping dog is shown applied to the usual wrench socket 25. In this form, the inner periphery of the socket is serrated and the dog 26 is pivoted in a radial slot 27 formed in the wall of the socket. The outer face of the dog is provided with a notch 28 to conform to the serrations of the socket. A shoulder 29 is located at the outer end of said dog on the top thereof and a coiled spring 30 is confined within the slot and bears against this shoulder to hold the dog outwardly within the slot. The opposite end of the dog is provided with a vertical operating rod 31 which extends above the top of the socket. As clearly shown in Figure 6, with the face of the dog extending within the socket, the rod is lying contiguous to the socket. By swinging the rod, the dog is retracted and the socket may be readily engaged over a bolt head, or nut. The outer face of the dog 26 is also curved so that a wedging or tightening action is attained upon any tendency of the bolt head to disengage from the socket.

What I claim and desire to secure by Letters Patent is:

1. A wrench comprising, a handle shank having a socket open at one side to interfittingly receive a bolt head or nut, the socket being internally shouldered at its opposite side to retain the received bolt head or nut, said handle shank having an opening communicable with the socket at one transverse side thereof, a spring-pressed lever type of retaining dog having a rounded eccentric cam portion pivotally mounted in said opening, said dog normally urged by its spring element to move the cam portion projectedly into said socket, said cam portion rotatably moving recedingly against the yieldable counter pressing force of the spring element by the insertion of a bolt head or nut into said socket and engaging the adjacent face of the inserted bolt head or nut to hold the bolt head or nut from withdrawal, and a lever extension on said dog for rotating the cam portion in the direction to effectively retract it from said socket to release the inserted bolt head or nut.

2. A wrench comprising, a handle shank having a counterpart polygonal walled socket open at one side of the handle shank to receive a bolt head or nut but being internally shouldered adjacent the opposite side of the handle shank to retain the bolt head or nut, the handle shank having an opening extending therethrough adjacent one side wall of said socket and communicating with the socket through said side wall and contiguous the bolt head or nut receiving opening of said socket, a retaining dog having a rounded eccentrically pivoted bolt head or nut engaging cam portion located in the portion of said opening of the handle shank that communicates directly with the bolt head or nut receiving socket, said dog having an angularly disposed lever extension from its said cam portion, the free end of said lever extension being projected in said opening in the region of the end of said opening for manipulation, and a spring element normally pressing said dog to move it in the direction to turn the cam portion of the dog to enter said socket to a position for engagement and retention of an inserted bolt head or nut, said cam portion moving rotatably to recede from the socket against the yieldable counter pressing force of the spring element by the bolt head or nut entering the socket.

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