Feb. 19, 1924. 1,483,906

W. F. MILLER

WRENCH

Filed Oct. 3, 1921

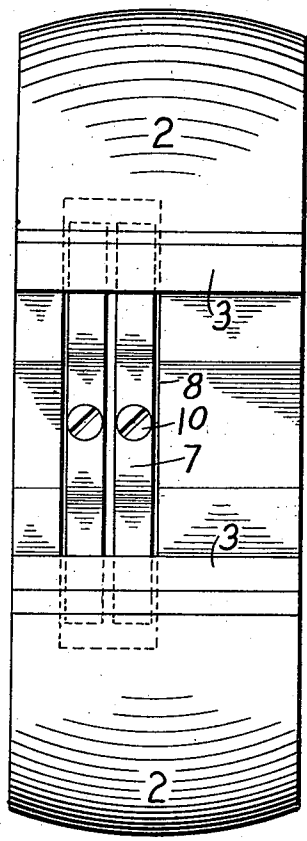



Fig. 2.

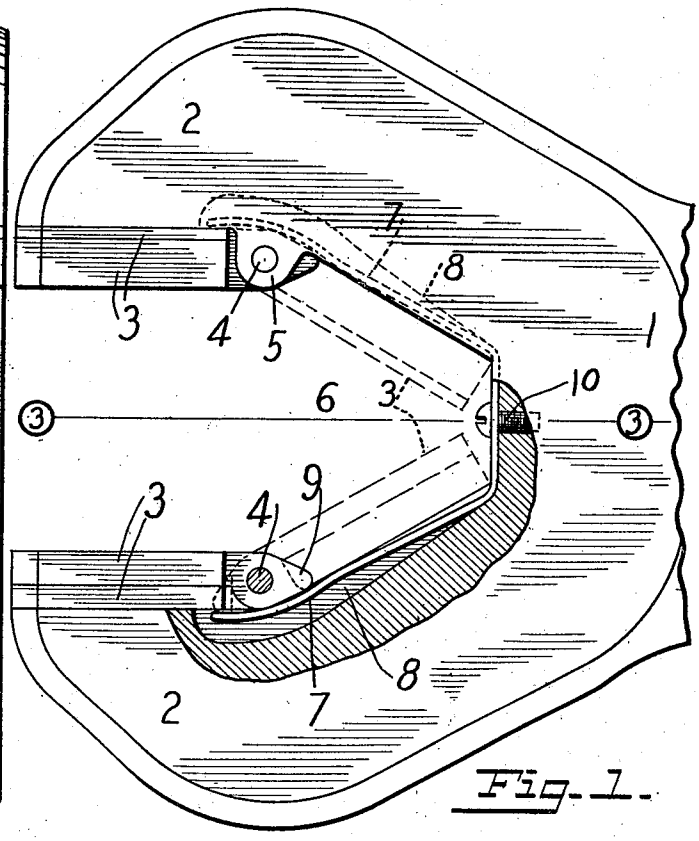



Fig. 1.

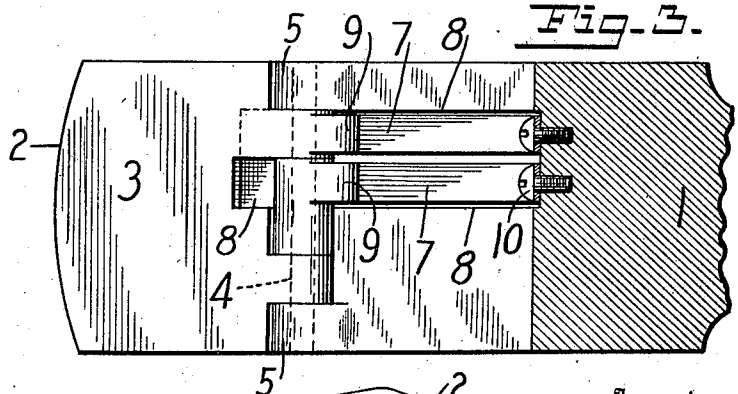



Fig. 3.

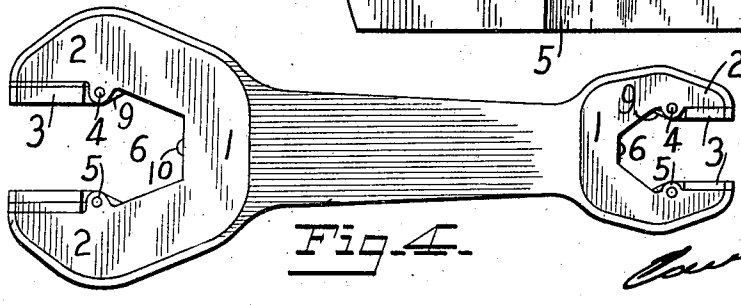



Fig. 4.

Inventor
WALTER F. MILLER.
By
Attorney

Patented Feb. 19, 1924. 1,483,906

# UNITED STATES PATENT OFFICE.

WALTER F. MILLER, OF DAYTON, OHIO.

## WRENCH.

Application filed October 3, 1921. Serial No. 504,831.

*To all whom it may concern:*

Be it known that I, WALTER F. MILLER, citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Wrenches, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a wrench and one object of the invention is to provide a wrench having fixed jaws with means enabling it to be applied to nuts or the like of different sizes.

A further object of the invention is to provide a wrench of this kind in which the movable parts will be permanently attached to the wrench and so arranged that when not in use they will not in any way interfere with manipulation of the wrench.

Other objects of the invention will appear as the device is described in detail.

In the accompanying drawings Fig. 1 is a side elevation, partly broken away, of one end of a wrench embodying my invention; Fig. 2 is a front elevation of the same; Fig. 3 is a section taken centrally of Fig. 1; and Fig. 4 is a side elevation of a double ended wrench embodying my invention.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a wrench comprising an end portion, or head 1, which is bifurcated to provide the same with jaws 2, the jaws being formed integral with the end of the wrench and being, therefore, fixed against movement. Consequently, the gripping faces of the two jaws are spaced a fixed distance apart. To enable this wrench to be applied to nuts of different sizes I provide one or more face plates, or shims, adapted for movement into and out of contact with the gripping faces of the jaws, so as to provide a narrower recess between these faces. Preferably these face plates are pivotally mounted and in the present instance I have shown two plates for each jaw, as indicated at 3. The two plates for each jaw are pivotally mounted near the inner end of the gripping face of the jaw, preferably on a common axis, but are capable of independent movement about the axis. As here shown, the face plates are journaled on pintles 4 mounted in bearing lugs 5 formed on the jaws. The space, or recess, between the gripping faces of the jaws 2 is extended inwardly beyond the ends of those faces to form a cavity, as shown at 6, into which the face plates 3 may be moved when not in use, the cavity being so shaped that either set of plates may be moved into and out of the same without interferring with the other. It will be noted, that in the present arrangement of the device I have provided four face plates, two for each jaw, and that each of these four plates is of a different thickness, thereby enabling the wrench to be accommodated to a large number of different sizes of nuts. It will be apparent that the recess has its largest size when all of the face plates are in their inoperative positions in the cavity 6 and that it has its smallest size when all of the face plates are in their operative positions in line with the gripping faces of the jaw. By moving one or more of the face plates into an inoperative position different sizes are secured, thus enabling the wrench to be accommodated to almost any nut between the two extremes in size.

It is desirable that some means be provided for holding the face plates in the positions to which they have been moved, that is, in either their operative or inoperative positions, so as to prevent any interference with the manipulation of the wrench. Preferably the face plates are acted upon by springs which are so arranged that they will hold the face plates in either an operative or an inoperative position. This may be accomplished in various ways but in the present instance I have utilized flat springs 7 which are mounted in shallow channels 8 formed in the side walls of the cavity 6 and the free ends of these springs extend past the axes for the face plates. The hub portion of each face plate has secured thereto a projection 9 which is preferably cam shaped and is so arranged that when the face plate is in either its operative or inoperative position the projection will extend lengthwise of the spring 7 and when the face plate is in an intermediate position, substantially midway between the limits of its movements, the projection will extend transversely to the spring and will thus force the same rearwardly. After the face plate has been moved past this intermediate position the pressure of the spring on the projection will tend to complete the movement of the face plate in the direction in which it has been started and to retain the

same in that position at the end of its movement. The spring 7 may be of any suitable character but, as here shown, I have provided a separate spring for each of the four face plates and have formed the springs for the corresponding face plates on the two jaws from a single piece of metal, which is bent to a substantially U-shape and secured to the base of the cavity 6 by means of a screw 10.

The face plates are preferably of a width substantially equal to the width of the faces of the jaws and to the thickness of the end portion 1 of the wrench so that when in either their operative or inoperative positions they form merely continuations of these parts, and inasmuch as they are firmly held in position they do not in any way interfere with the manipulation of the wrench, which can be handled with the same freedom with which it could be handled if the face plates were absent. The device is very simple in its construction and enables me to provide an open ended rigid jaw wrench which may be used with nuts of a variety of sizes, without in any way distracting from the advantages which are inherent in the open ended wrench. In Fig. 4 I have shown the invention applied to a double ended wrench and in this way I secure a still greater range of sizes. It will be noted, however, that on the smaller end of the wrench I have provided a single face plate only for each jaw. In this connection, however, it will be obvious that there may be any suitable number of these face plates.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. A wrench comprising cooperating jaws having their gripping faces spaced apart a fixed distance, a face plate pivotally mounted near the inner end of the gripping face of one of said jaws, on an axis parallel with said gripping face, for movement into and out of contact with said gripping face, said wrench having a cavity arranged beyond the inner end of the gripping face and in line with the space between said jaws, to receive said face plate when it is moved to its inoperative position, and a spring arranged in said cavity and acting on said face plate to hold it in either its operative or its inoperative position.

2. A wrench comprising cooperating jaws having their gripping faces spaced apart a fixed distance, a face plate pivotally mounted near the inner end of the gripping face of each of said jaws, on axes parallel with the respective gripping faces, and movable into and out of contact with the respective gripping faces, said wrench having a cavity arranged beyond the inner ends of said gripping faces and in line with the space between said jaws to receive said face plates when they are moved into their inoperative positions and means arranged within said cavity and acting on said face plates to hold the same either in their operative positions or their inoperative positions.

3. A wrench comprising cooperating jaws having their gripping faces spaced apart a fixed distance, a face plate pivotally mounted near the inner end of the gripping face of each of said jaws, on axes parallel with the respective gripping faces, and movable into and out of contact with the respective gripping faces, said wrench having a cavity arranged beyond the inner ends of said gripping faces and in line with the space between said jaws to receive said face plates when they are moved into their inoperative positions, and a flat spring secured in said cavity and having its ends extending across the axes of said face plates, each of said face plates having a part extending beyond its axis into engagement with the adjacent portion of said spring, whereby said spring will hold said face plates in either their operative or their inoperative positions.

4. A wrench comprising cooperating jaws having their gripping faces spaced apart a fixed distance, and a pair of face plates pivotally mounted near the inner ends of the gripping faces of the respective jaws, on axes parallel with the respective gripping faces, for movement into and out of contact with the respective gripping faces, said wrench having a cavity arranged beyond the inner ends of the gripping faces of said jaws to receive said face plates, said cavity being so arranged that the face plate for either jaw may be moved into and out of the same independently of the face plate for the other jaw.

In testimony whereof, I affix my signature hereto.

WALTER F. MILLER.