Oct. 11, 1932. S. WEBER 1,882,462

SPANNER WRENCH

Filed July 31, 1931

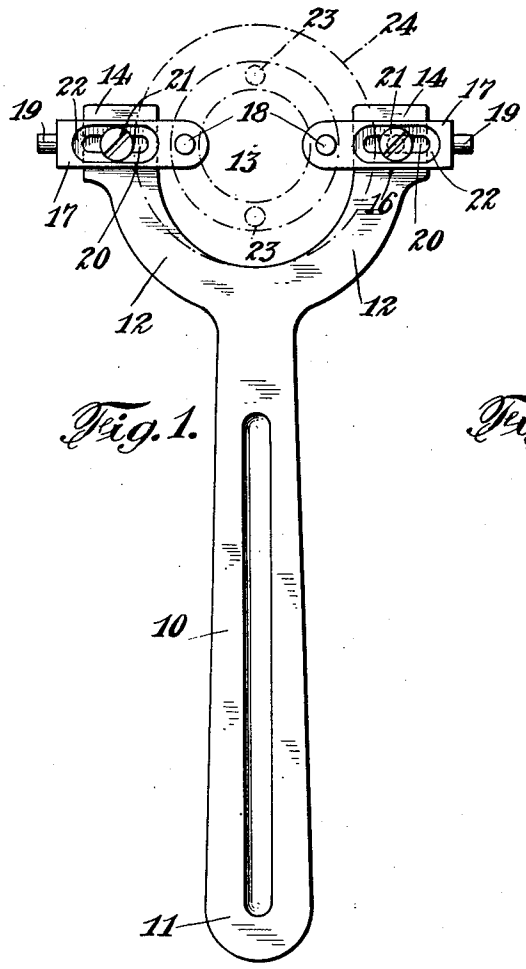


Fig. 1.

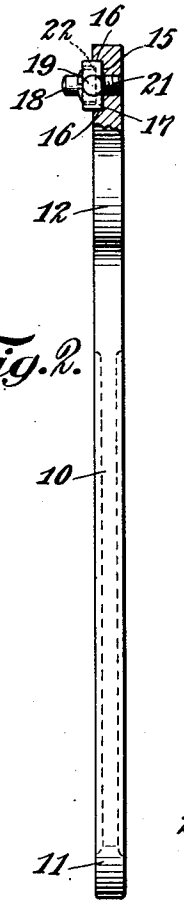


Fig. 2.

Fig. 3.

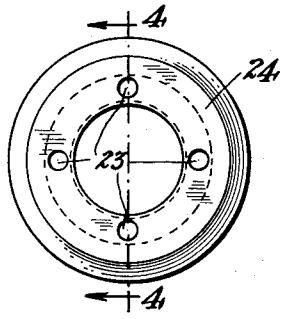


Fig. 4.

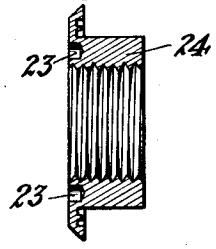


Fig. 5.

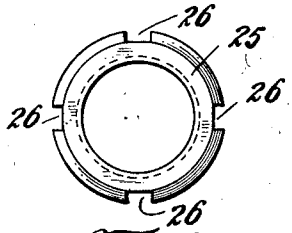


Fig. 6.

Fig. 7.

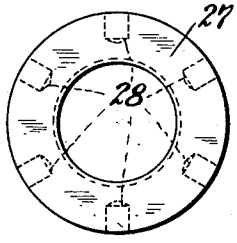
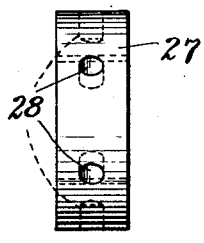
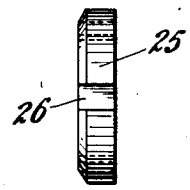


Fig. 8.





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UNITED STATES PATENT OFFICE

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SPANNER WRENCH

Application filed July 31, 1931. Serial No. 554,249.

This invention relates to wrenches and particularly to spanner wrenches by means of which various kinds of nut devices and other equipment of a similar character used on or in connection with machinery are tightened and loosened.

In view of the high speed which modern machinery attains, manufacturers are turning more and more to the use of round nuts for purposes of safety and balance. The tool of the present invention has been devised especially for use in connection with this class of nut devices, although it will be recognized that its use is not limited or confined thereto.

As is well understood, nut devices carried by machinery operating at high speed tend to tighten themselves, rendering removal difficult; and it is a common practice in endeavoring to loosen or remove nuts which have been excessively tightened, to strike the free end of the wrench with light yet relatively sharp blows. The wrenches at present in use for such purpose, being composed of either pivoted or hinge connected parts, yield with a spring-like effect under the impact of the blow so that much of the force of the blow is lost. In taking many mechanical structures apart, say for example, ball bearing motors which are to be taken apart for purposes of cleaning, rewinding or replacement of the ball bearings, an object to be attained is to remove the nuts without injury thereto and without damaging the threads or other parts. In order to remove the nut devices from such special machinery, it is often necessary to make use of a punch or the like and in so doing to bring about damage beyond repair.

The object and purpose of the present invention are to provide a simple and practical tool by means of which successfully to cope with the difficulties referred to and others; to avoid damage and delay, and often the cost incident to a shut-down of an important piece of machinery.

One of the objects of the invention is to provide a wrench the lever handle and spanning arms of which are without pivot or hinge connections so that the full force of a sharp blow, which is delivered at the free end of the lever handle, will be transmitted to the nut device.

A further object is the provision of jaw or bar parts which are firmly seated and held in the arms against yielding under turning impulse, but which are capable of adjustment radially with respect to the axis of the nut to be operated upon.

A still further object is the provision of a tool of the character described which is furnished with instrumentalities for engaging tool-receiving openings of various kinds.

With the foregoing objects in view and others not specifically enumerated above but which will appear to one skilled in the art, the invention consists of the novel construction, combination and arrangement of parts hereinafter more specifically described, and illustrated in the accompanying drawing, wherein is shown a single example of the invention as reduced to practice.

In the drawing, wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 represents a top plan view of a spanner wrench made in accordance with the present invention, this view also showing in dash-dot lines the outline of a nut with which the wrench is in engagement;

Fig. 2 is an edge view and partial section;

Figs. 3 to 8 are details of various types of nuts with which the wrench may be employed; Figs. 3 and 4 being, respectively, plan and sectional views of one type of nut, with the sectional view of Fig. 4 taken on the line 4—4 of Fig. 3; Figs 5 and 6 being plan and edge views, respectively, of another type of nut; and Figs. 7 and 8 being plan and edge views, respectively, of still another type of nut.

The preferred form of construction, as illustrated in the accompanying drawing, comprises a solid elongated bar-like turning lever 10 which is shaped to be grasped by the hand and to serve as a handle. The end portion 11 of the lever is free and unobstructed. At its opposite end the lever is formed with a pair of integral spanner arms 12 which extend in opposite directions, spanning an intervening receiving space 13. These two in-

tegral spanner arms may be given any shape or form desired or necessary for carrying out the invention, but by preference they curve on a semi-circle as shown in order best to accommodate the wrench tool for use in connection with round nut devices.

Each of the spanner arms 12 terminates in a head 14 which may be widened in an outward direction, that is to say, in a direction opposite to the intervening receiving space 13. Cut, formed, or otherwise produced transversely in each of the heads 14 at one side thereof is a channel or recess 15, the side walls of which constitute shoulder abutments 16 in spaced opposition. A jaw or cross bar 17 is disposed in each of the channels 15, its fit therein being snug so that the shoulder abutments 16 during turning movement of the lever about an axis, will prevent any shifting or yielding movement of the jaws relatively to the arms.

The transverse channels 15 may be provided, and preferably are provided, in alignment, so that the jaws or cross bars 17 disposed therein will be in lengthwise alignment. The jaws 17 are of a length to extend well beyond the opposite edges of the head portions, and each jaw is provided at each projecting end thereof with a projection or pin suitable for entering a tool receiving aperture of a nut device. In the present instance, the projecting means carried for such purpose at the opposite ends of each of the jaws consists of pins 18 and 19; it being noted that the pins 18 project laterally from the jaws in angular relation to the long axis thereof, while the pins 19 have projection in alignment with the long axis of the jaws.

Means are provided for adjustably securing the jaws or cross bars 17 in their channels. To this end, in the present embodiment, each of the jaws 17 is provided with a lengthwise extending slot 20. Transversely through each of these slots is passed a screw element 21 which is screw-threaded into the head 15. The face of each of the jaws 17 is preferably beveled as at 22 around the slot 20 in order to provide a suitable countersink for the head of the screw. With the described arrangement, the jaws or cross bars can be readily reversed end for end in order that either the pins 18 or the pins 19 may be located within the receiving space 13 for engagement with the nut device to be turned. In addition to this, the jaws may be fixed in their channels in that precise position necessary for engaging the pins with tool receiving openings as 23 of a round nut device 24. Furthermore, by this arrangement, irrespective of the precise position in which it is necessary to fix them in their channels, the jaws are firmly held against sidewise shifting or yielding movements during the turning of the wrench about the axis of the nut with which the pins are interengaged.

In Fig. 1, the nut 24 which is illustrated in detail in Figs. 3 and 4, is shown in dash-dot outline in connection with the wrench tool, and with the jaws fitted and adjusted so that the pins 18 will enter the tool-receiving apertures 23 of the nut device. In Figs. 5 and 6, I illustrate another type of nut device 25 in which the tool-receiving apertures 26 are of the open and angular type, the same being provided in the circumference of the nut device. The pins 18 are adapted to be inserted in the open apertures 26 for manipulating this type of nut. In Figs. 7 and 8, I illustrate still another type of nut 27 in which circular apertures 28 extend into the body of the nut from the circumference thereof. In order to be applied to a nut device as 27 the jaws 17 are reversed end for end so that the pins 19 will occupy a position in the space 13 for engagement with the apertures 28.

When the wrench of my invention has been applied to the nut to be turned, by inserting appropriate pins in the tool-receiving openings of the nut, a blow or blows, if it be necessary to tighten a loose nut or to loosen a tight nut, may be struck by a hammer or other instrumentality against the longitudinal edge of the lever 10 at or near its free end portion 11, the blows being, of course, delivered in the direction in which it is desired to turn the nut upon its axis. Owing to the manner in which the jaws or cross bars are seated in the rigid arms and held against sidewise movement by the shoulder abutments, a wrench is provided which, for turning purposes, is rigid from the free end of the lever or handle to the aperture engaging pins. By sharply rapping or striking on the lever adjacent its free end, the nut device engaged at two opposite points by the pins, is readily turned on its axis and hence tightened or loosened as the case may be. Since the jaws are reversible and can be adjusted lengthwise with respect to the axial center line of the nut, the wrench can be used for loosening or tightening different kinds of nuts which now require individual spanner wrenches of the proper size to fit the particular unit. The spanner wrench of my invention is exceedingly simple in construction and economical in manufacture, while possessing the advantage of being sturdy and providing for the loosening and tightening of different types of nuts without injuring the nuts or the parts upon which the nuts are threaded.

Although in the present disclosure, in order to illustrate in a general way the range of practicability of my invention, I have shown and enumerated three different specific types of nut devices, it will be recognized that in practice my improved spanner wrench has a much wider range of utility and that it may be used in connection with various additional types of nut devices and instru-

mentalities not specifically illustrated or enumerated herein.

It is to be understood that in the further development of my invention, I reserve the right and privilege of resorting to all such legitimate changes and modifications in the form, construction and relative arrangement of the various parts as may be fairly incorporated in the spirit and scope of the invention as claimed.

I claim:—

1. A spanner wrench including a turning lever having a free end portion and opposite thereto a pair of rigid arms spanning a space, separate cross bars on the arms having portions projecting into the space and shaped for engaging an article to be turned, and means between the arms and bars to afford and maintain a rigid engagement therebetween, to effect thereby a rigid wrench tool which does not yield loss of turning force between its free end portions and the projecting article engaging portions.

2. A spanner wrench including a lever having a U-shaped end forming a pair of spanner arms, transverse abutments provided on the arms and forming seats, bars disposed in the seats and held by the abutments against sidewise shifting movement, said bars extending beyond the sides of the arms and shaped for engagement with an article to be turned, and means for securing the bars to the arms.

3. A spanner wrench including a lever formed at one end with a pair of spanner arms, heads on the arms defining a space and including in their construction transverse channels bounded by shoulder abutments, bars disposed in the channels and held by the shoulder abutments against sidewise shifting movement, said bars extending into said space and shaped for engaging an article to be turned, and means for securing the bars to the heads.

4. A spanner wrench including a lever having a U-shaped end forming a pair of spanner arms, transverse grooves provided on the arms and forming seats, bars disposed in the seats having pins projecting therefrom and held by the grooves against sidewise shifting movement, said bars extending beyond the sides of the arms and shaped for engagement with an article to be turned, and means for securing the bars to the arms comprising slots in one set of said parts and screws extending through the slots and engaging the other set of said parts.

5. A spanner wrench including a lever formed at one end with a pair of spanner arms in spaced opposition, forming an intervening space between the arms, there being transverse channels in the arms, bars fitted in the channels against sidewise shifting movement, pins projecting from the bars within said space and adapted to be engaged with an article to be turned, and removable connections extending between the bars and arms.

6. A spanner wrench including a lever formed at one end with a pair of spanner arms in spaced opposition, forming an intervening space between the arms, there being transverse channels in the arms in communication with said space, separate bars fitted in the channels and endwise movable therein for projecting into said space, pins fixed to the opposite ends of the bars, the pins at one end projecting at an angle to the bars while those at the opposite end project in aligned relation with the bars, the bars being reversible for locating either type of said pins in said space, and means for securing the bars to the arms in the position to which they are moved thereon.

7. In a spanner wrench, a lever having a pair of integral spaced arms forming an intervening space, there being aligned channels in the arms in communication with the space, separate bars in the aligned channels projecting into the space, pins on the bars within the space adapted for engagement at opposite points with an article to be turned about its axis, and means adapted to afford and maintain an engagement with the bars and arms for securing the former to the latter in a position of adjustment in said channels.

8. A spanner wrench including a lever, a pair of rigid spanner arms projecting from the lever to form an open receiving space intermediate the arms, and adjustable means projecting from the arms into the receiving space, having extensions thereon for engaging an article to be moved by said wrench.

9. In a spanner wrench, a lever having a pair of spaced integral arms forming a U-shaped end, said arms having transverse channels and forming aligned seats, adjustable separate bars in the channels movable toward and away from each other and transversely of the arms, and means for maintaining an engagement with the bars and arms to secure the latter in position in the channels, each arm having pins at its ends with their longitudinal axis disposed at right angles to each other.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

STANLEY WEBER.