J. O. JOHNSON.

ADJUSTABLE SOCKET WRENCH.

APPLICATION FILED JUNE 21, 1920.

1,370,820. Patented Mar. 8, 1921.

Fig. 1

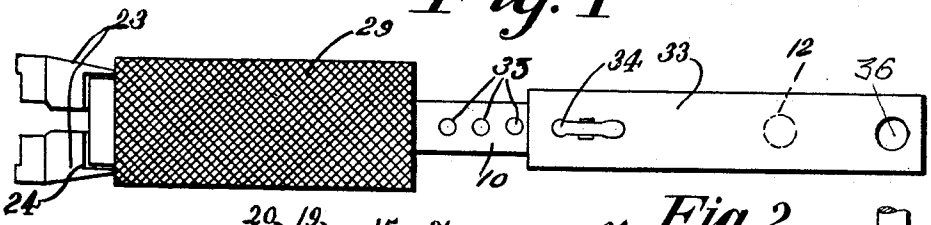


Fig. 2.

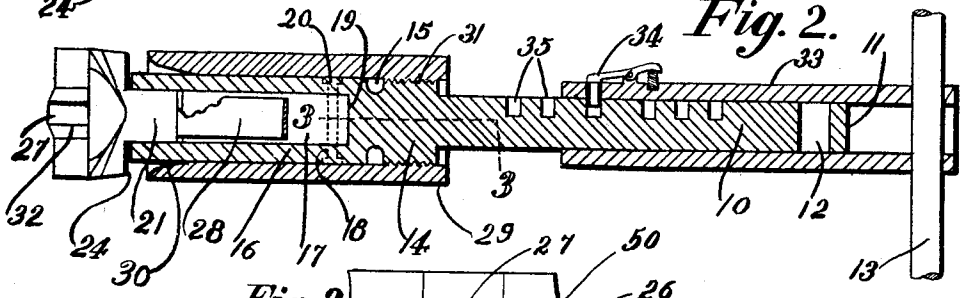


Fig. 8.

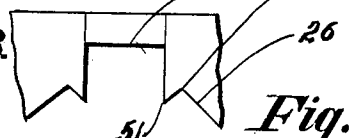


Fig. 3.

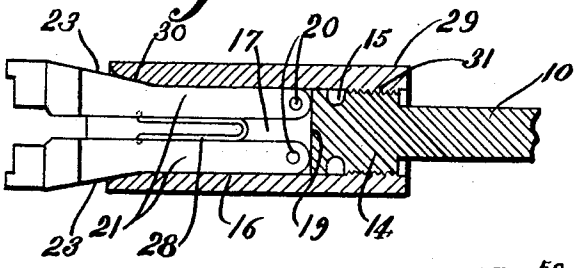


Fig. 5.

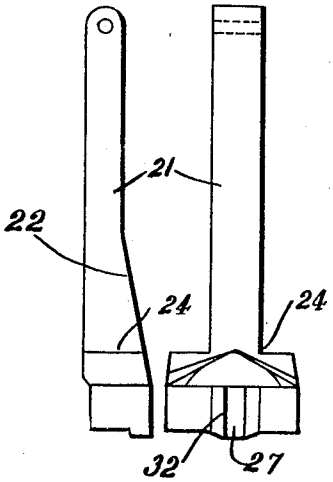


Fig. 6.

Fig. 4.

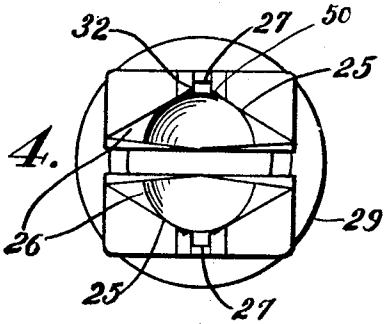
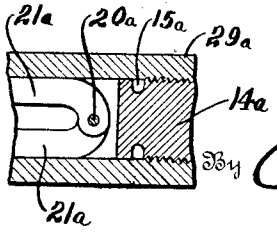


Fig. 7.



Witness

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE SOCKET-WRENCH.

1,370,820. Specification of Letters Patent. Patented Mar. 8, 1921.

Application filed June 21, 1920. Serial No. 390,475.

To all whom it may concern:

Be it known that I, JAMES OSCOE JOHNSON, a citizen of the United States, residing at Kokomo, in the county of Howard and State of Indiana, have invented a new and useful Adjustable Socket-Wrench, of which the following is a specification.

This invention relates to an improved wrench, more particularly to an adjustable socket wrench, the object thereof being to provide a novel and simple device of the above character which is particularly desirable for use in cramped and relatively inaccessible places, and which can be used equally as well with square as well as hexagonal nuts.

A further object of the invention is to provide a wrench embodying a shank having a gripping handle or cross bar for turning the same, said shank being bifurcated to receive a pair of pivoted and outwardly pressed spring jaws having means coöperating therewith for holding the same in adjustable relation and for firmly gripping or clamping the object or nut to be turned, while said jaws are formed in a novel manner to accomodate hexagonal or square nuts without slipping and at the same time, permitting the device to withstand the necessary strain without slipping or bending or requiring that the two jaw pieces be heavy and awkward so as to render it impossible for use, but on the other hand, to provide a wrench which is relatively small and light, as well as strong and durable, and which will be prevented from slipping.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that, within the scope of what is claimed, changes in the precise embodiment of the invention shown can be made without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 is a side elevation of my improved wrench; Fig. 2 is a vertical sectional view longitudinally thereof; Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2; Fig. 4 is an end view; Figs. 5 and 6 are side and face views of one of the jaws; Fig. 7 is a sectional detail showing a modification of the invention; Fig. 8 is a diagrammatic view illustrating certain details in the heads of the jaws.

Referring to the drawings in detail, in which like reference characters designate corresponding parts throughout the several views, my improved wrench is shown as comprising a shank portion 10 of any suitable and preferably polygonal cross section provided at its end portion 11 with a transverse aperture 12 for removably receiving a cross bar or handle 13 by which the shank may be turned. Intermediately the shank is provided with an enlarged threaded portion 14 forming a feed screw for adjusting the wrench as will be hereinafter described and adjacent thereto with a reduced portion 15 beyond which, the opposite end is made of a diameter corresponding to the diameter of the threaded portion as indicated at 16.

The portion 16 is provided with a longitudinal slot or bifurcation 17 providing spaced jaws or furcations, the inner faces of which are disposed in parallel relation and formed with alined spaced apertures 18 adjacent to the end wall or connecting portion 19 of the slot. Engaged in these spaced registering apertures are pivots 20 pivotally supporting a pair of jaws 21 having flat inner and side faces and rounded outer faces, the said jaws being of increased width or enlarging toward their free ends as indicated at 22 and provided therebeyond, with enlarged substantially semi-circular heads 23 which extend laterally from the flat side faces of the jaw shanks to form shoulders 24 adapted to overlie the end of the shank at the spaced portions thereof. These enlargements of the jaws are provided with relatively flat outer faces and relatively wide V-shaped recesses 25 forming end walls 26, while said V-shaped walls are formed intermediately with rectangular longitudinal recesses or slots 27 formed in relief at the corner portions of the jaws.

Mounted between the jaws and tending to normally spread them apart is an expansible V-shaped spring 28, the bight portion of which is disposed between the jaws near the pivots thereof and the arms thereof acting against the inner faces of the jaw shank outwardly, said spring being preferably of resilient spring steel in flat-strip like form. Engaged on the threaded portion or feed screw of the shank is a sleeve 29 which is externally knurled or roughened in order to

facilitate gripping and turning thereof, as well as providing an efficient handle for holding the device in applying and operating the same. This sleeve is provided with a longitudinally tapered bore 30 and a threaded portion 31 internally to engage the threaded portion of the shank so that the sleeve may be adjusted longitudinally of the shank and the jaws or jaw shanks, in order to permit expansion of the jaw heads or to contract the same for engaging an object such as a nut. The jaws may engage a square nut, or a hexagonal nut, with equal facility and by reason of the recesses or slots in the jaws, cut in relief as specified, the corner portion of a nut, especially a square nut, will fit into the recesses and the adjacent corner portions 32 will engage the side faces of the nut and prevent the corners from being mutilated or rounded off, and serve to give a more efficient grip on the nut in turning the same. Obviously, the jaws are permitted to separate by turning the sleeve to shift it longitudinally toward the cross bar, and when applied the sleeve is moved or turned in the opposite direction to clamp the jaws together on the nut, when the wrench may be turned by means of the cross bar assisted by the sleeve, which, serves as a handle in applying and holding the same in position if necessary.

Thus, it will be seen that the device can be applied in cramped or narrow places thus permitting the heads of the jaws to be made relatively small, thereby obviating the necessity of the same being so large and heavy as to be cumbersome and awkward to handle. The device will also be able to withstand the strain incident to the use of the device, without slipping or bending, even though not too heavy or clumsy as to render its use impracticable. Thus, the wrench may be made, as a whole, small and light and still maintain the necessary strength as well as prevent slipping for use with square as well as hexagon shaped nuts. This results from the use of the recesses or slots in the jaws at the corners of the V-shaped portions thereof, which are formed substantially by walls at right angles to each other and therefore the importance of the construction specified, will be readily apparent. Also, the harder you pull on the wrench, the stronger the jaws will take hold of the object or nut, because the edges of the walls at the slot cut into the sides or side faces of the nut instead of slipping and rounding off the corners of the nut, as practically all other wrenches do. The device obviates the necessity of using a bit stock or brace which has been found relatively impracticable, thus producing a straight body and sleeve which is an advantage over the stock wrench because the tapered sleeve cannot fit on the tapering body except at one point, and that is when the sleeve comes in contact with the same diameter as itself. Also, two jaws are employed, instead of three or more, thus simplifying the construction and making it smaller and lighter as well as sufficiently strong for use in close places.

Also, there is provided a sliding sleeve 33 on the head of the wrench, adapted to slide up or down to make the wrench shorter or longer, which ever may be desired in order to get in close places or remote places. The sleeve may be located in different points and held by a spring catch 34 engaging sockets 35 so that the catch may be inserted in the different sockets or holes in the head of the wrench, thus producing an extension device by which the wrench may be lengthened or shortened and at the same time kept in one straight construction of substantially one-piece. The sleeve 33 is provided with opposed transverse apertures 36 to receive the cross bar 13 separately or in conjunction with the aperture or opening 12.

Referring to Fig. 8 and comparing the same with Fig. 4, it will be observed that angles 50 are formed in the walls 26, these angles coöperating with the slots 27 to define relatively sharp edges 51. The edges 51 bite into the sides of a nut, before the sides of the nut come into contact with the walls 26. It is to be understood that, in Fig. 8, the detail above alluded to is greatly exaggerated, since, in practice, the edges 51 do not project more than a few thousandths of an inch beyond the walls 26. The construction, however, enhances the hold of the device on the nut or other object which is to be turned.

In the modification shown in Fig. 7 of the drawings, parts hereinbefore described are designated by numerals previously used with the suffix "a." The modification consists in mounting the jaws 21^a on a single pivot 20^a.

Having thus described the invention what I claim is:

1. In an adjustable socket wrench, a shank having a handle portion, said shank being of circular cross-section and having an intermediate threaded portion and a slot providing spaced jaw portions, jaws mounted on independent spaced pivots between said spaced jaw portions, a sleeve engaged on said threaded portion, means for expanding the jaws, said sleeve serving to contract the jaws by turning the same for longitudinal shifting movement on the shank, and enlarged heads having shoulders overhanging the ends of the spaced portions for engagement by the sleeve, said enlarged jaw portions having a semi-circular cross section substantially and provided with interior

V-shaped recesses forming end walls and the corner portions of said recesses being provided with longitudinal slots, substantially as and for the purposes specified.

2. A wrench of the class described comprising a shank having a handle, jaws pivoted in said shank for movement radially thereof, means for expanding said jaws to separate the same, means for moving said jaws into clamping relation, said jaws having interior V-shaped recesses and provided at the corners of said recesses with slots providing corner portions adapted to engage the sides of a rectangular or square nut held between the jaws, said jaws being adapted to engage the hexagonal nut independently of said corner portions and slots.

3. A wrench constructed as set forth in claim 2 and further characterized by the fact that the recesses are formed by converging surfaces wherein angles are fashioned, the angles defining sharp edges at the sides of the slots.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES OSCOE JOHNSON.

Witnesses:

OSCAR LEWELLYN,

WILLARD WHITE.