G. AMBORN.

SPANNER WRENCH.

APPLICATION FILED FEB. 11, 1908.

956,259.

Patented Apr. 26, 1910.

2 SHEETS—SHEET 1.

FIG. 1.

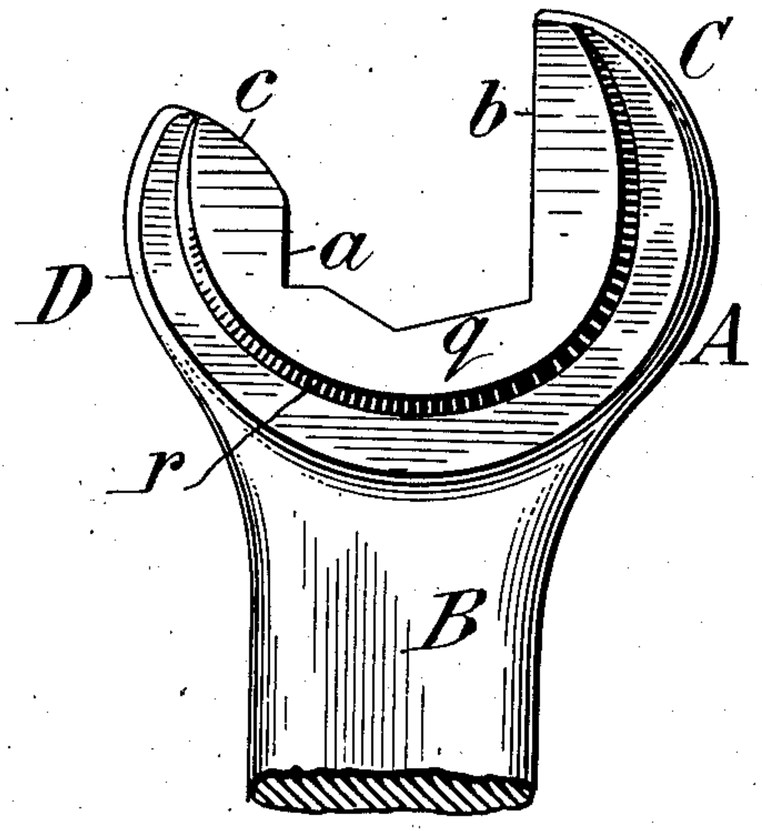


FIG. 2.

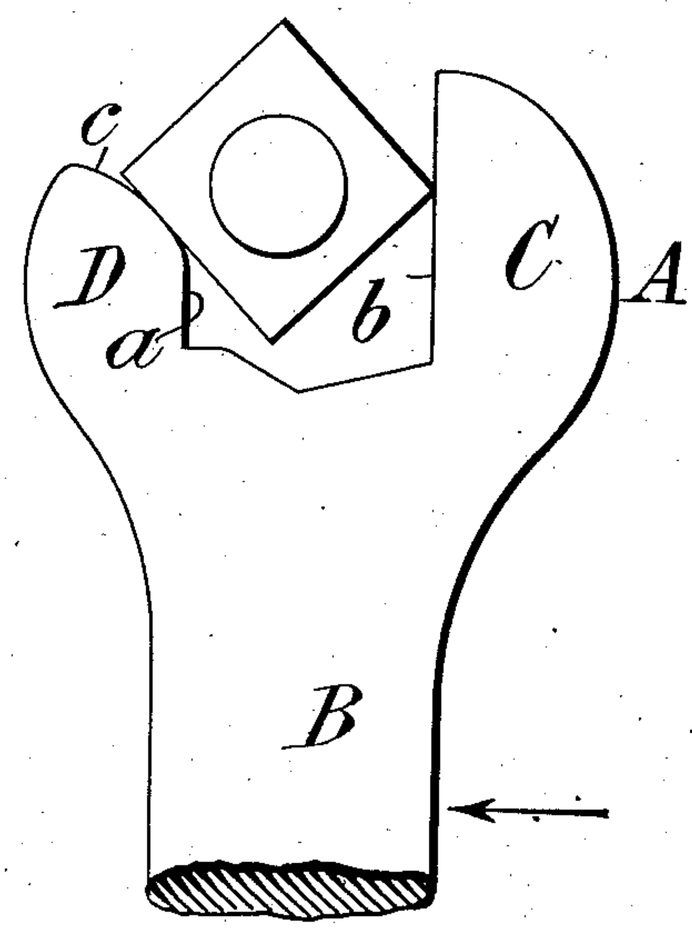


FIG. 3.

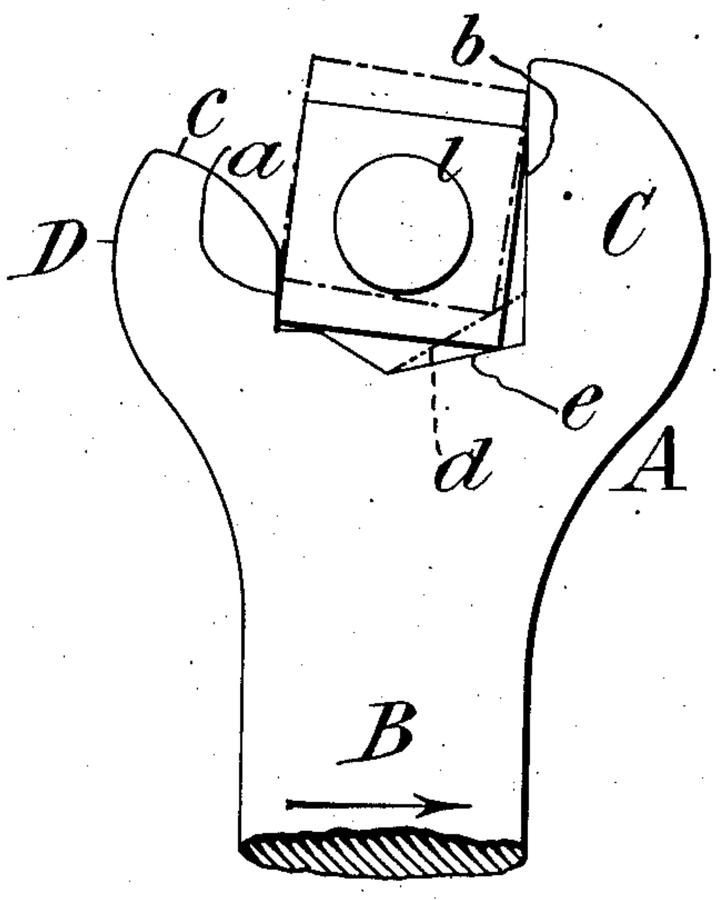
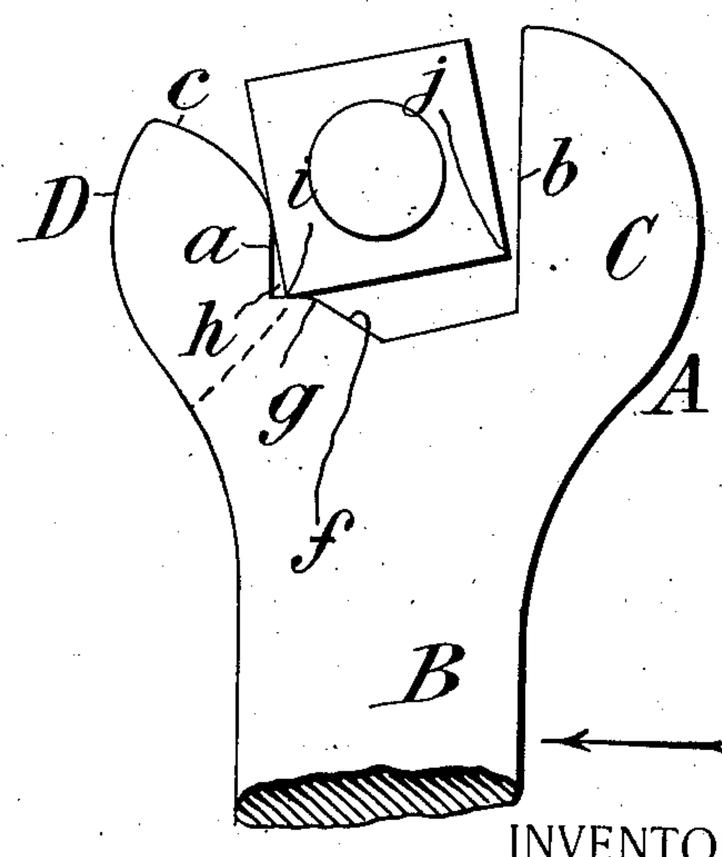


FIG. 4.



WITNESSES:

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2 SHEETS—SHEET 2.

FIG. 5.

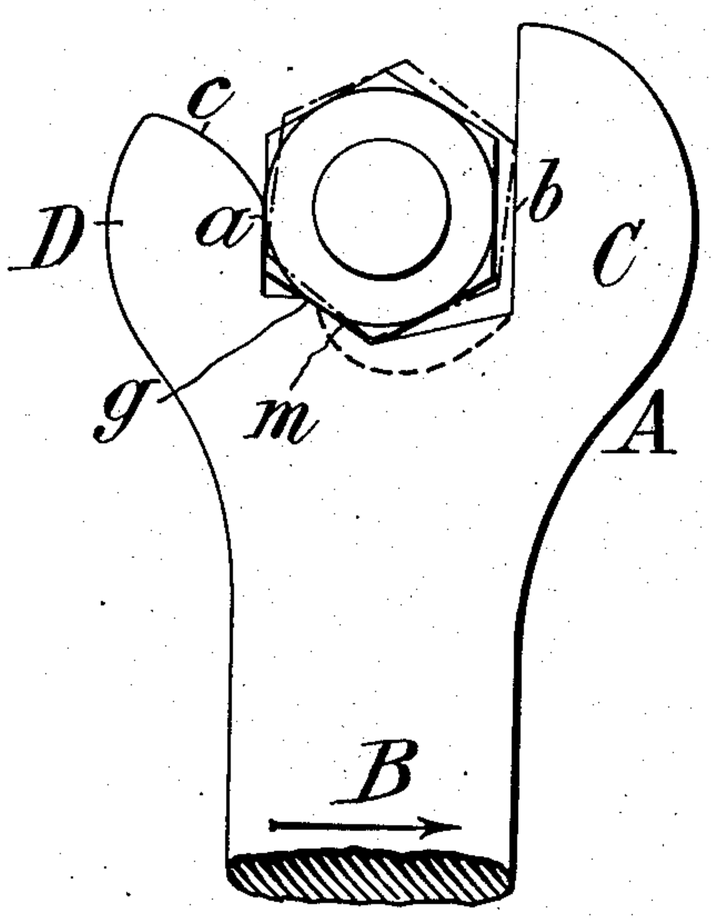


FIG. 6.

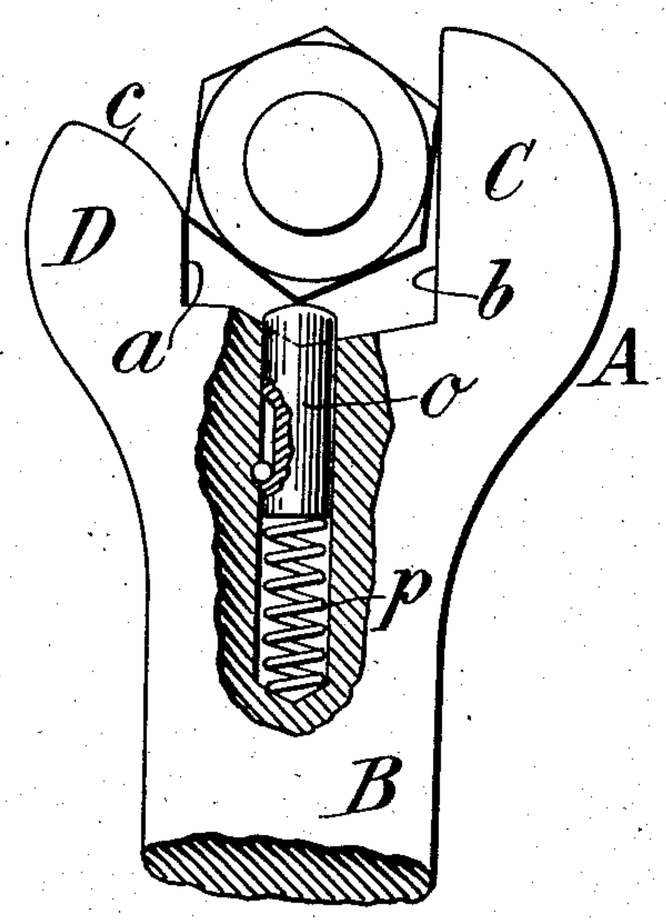
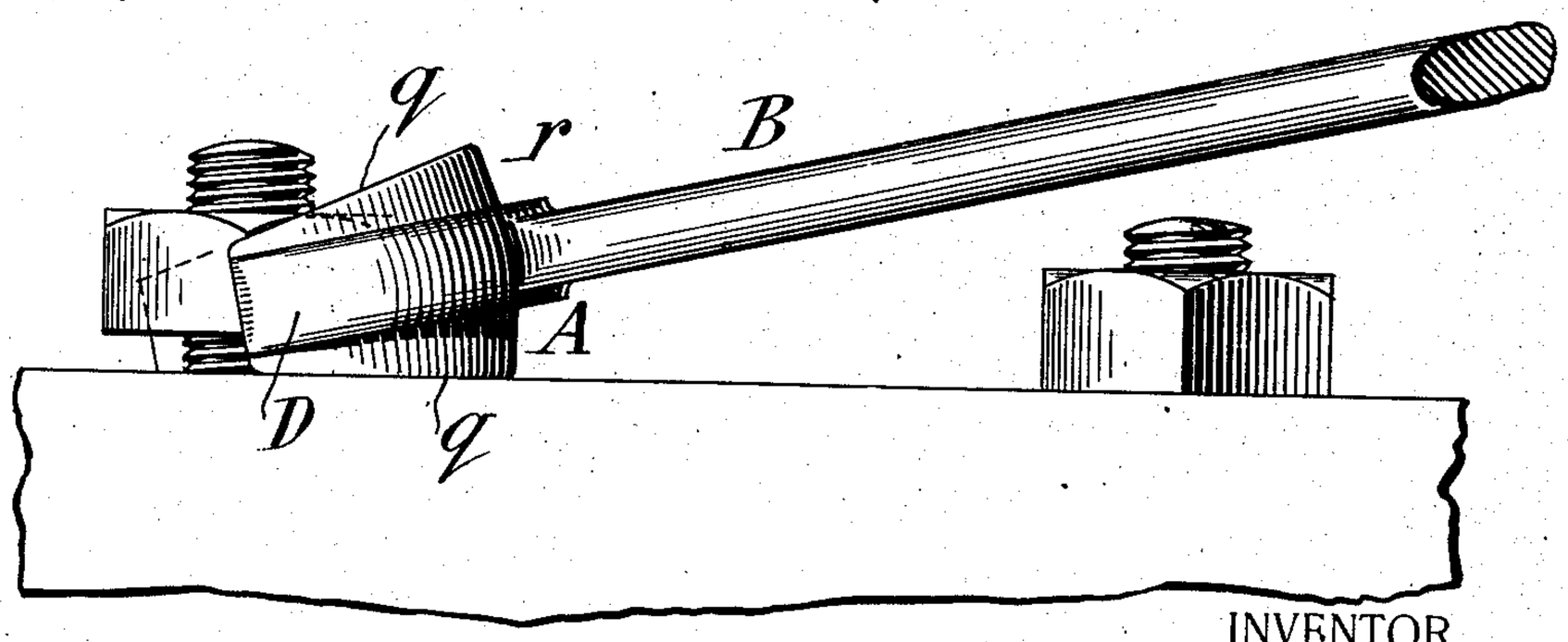


FIG. 7.



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UNITED STATES PATENT OFFICE.

GEORGE AMBORN, OF NEW YORK, N. Y., ASSIGNOR TO J. H. WILLIAMS & CO., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

SPANNER-WRENCH.

956,259. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed February 11, 1908. Serial No. 415,427.

To all whom it may concern:

Be it known that I, GEORGE AMBORN, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Spanner-Wrenches, of which the following is a specification.

This invention relates to wrenches of the spanner type and aims to provide certain improvements therein.

The invention is particularly directed to a wrench in the use of which it is not necessary to bodily remove the wrench from the nut on each reverse stroke. Several wrenches of this general type have been proposed, but each of these has been open to some objection, either that of excessive cost of manufacture or of weakness of construction.

According to my invention, I provide a wrench of this type in which the various parts are of strong and durable construction, which is capable of use either with a square nut or a hexagonal nut and which is of cheap and simple construction.

My invention also includes other features of novelty which are hereinafter referred to.

Referring to the drawings, Figure 1 is a top or plan view of the head of my improved wrench. Figs. 2 to 4 are more or less diagrammatic views illustrating the action of the wrench in connection with a square nut. Fig. 5 is a view similar to Fig. 2 showing the action of the wrench with a hexagonal nut. Fig. 6 is a similar view illustrating an additional or supplementary means for acting upon the nut. Fig. 7 is an elevation showing the wrench in use.

Referring to the drawings let A indicate the head of the wrench and B a suitable handle preferably formed integrally with the head. The head is constructed with two arms C and D, preferably of integral construction, the arm C being longer than the arm D as shown. The two arms form a socket between them which is designed to receive the nut, the bottom of such socket approaching by preference the angular form of two contiguous facets of a hexagonal nut.

According to my invention the shorter arm D is formed with a substantially straight active face *a*, which, as shown in Fig. 3, engages the lower part of the left hand facet of a square nut when the wrench is turned in the direction of the arrow. The face *a* is also adapted to engage the left hand facet of a hexagonal nut as shown in Fig. 5. The arm C is provided with a similar straight face *b* which is adapted to engage the nut at a diagonally opposite point. The arm D is also provided with a curved face *c* extending forwardly and outwardly from the inner face *a*, such curved face being adapted to form a bearing contacting with the facet of the nut on which the wrench is adapted to rock on its reverse stroke, as illustrated in Fig. 2. Accompanying this rocking movement is a sliding movement which when the wrench is reversed carries the arm D around the corner of the nut until it engages the next adjacent facet.

The bottom of the socket of the wrench, while following in a general way the angle of two facets of a hexagonal nut is nevertheless of a peculiar formation which aids very materially in the operation of the wrench. By reference to Fig. 3 it will be seen that instead of following the dotted line *d* which extends in substantially the same direction as a facet of a hexagonal nut, I recess or deepen the socket as indicated by the full line *e*. The effect of this change is illustrated by the position of the nut shown in full lines. Its lower right hand corner is enabled to drop a considerable distance farther into the socket, so that its lower left hand corner extends much farther into the socket on the opposite side whereby practically the full length of the bearing face *a* of the short arm D is utilized. If the socket were formed as indicated by the dotted line *d* the nut would be thrown outwardly so that only the outer end of the bearing face *a* could be utilized. This would necessitate the lengthening of the face *a* in an outward direction a corresponding distance which would be a detriment. I also preferably form the adjacent face *f* of the bottom of the socket in such manner as to leave a cam surface *g*, as best illustrated in Fig. 4. This formation of the socket leaves a recess or notch *h* contiguous to the working face *a* of the arm D into which the corner of the nut can extend. At the same time, on the reverse stroke of the wrench, indicated by the arrow in Fig. 4, the corner *i* of the nut rides upwardly on the cam face *g* throwing the nut outwardly of the socket to a slight extent, thereby permitting

the corner *j* to move freely past the face *b* of the arm C without binding. It is very desirable that the face *a* be long enough to have an adequate working surface to engage the nut. Under these circumstances, however, if the cam *g* were omitted the corner of the nut *i* would sink down a proportionate distance and cause the corner *j* to bind against the face *b* of the arm C.

It will be understood that the cam and recess are important and that if these are provided the exact shape of the bottom of the socket is relatively unimportant. It may be modified, among other ways, as shown in dotted lines in Fig. 5. These features are applicable to a wrench designed for operating upon a square nut or a hexagonal nut. The operation of the various features of construction is substantially the same in the case of a hexagonal nut as that just described. As illustrated in Fig. 5 the bearing faces *b* and *a* form efficient contacts with the facets of a hexagonal nut, while the cam *g* and recessed socket act to permit the effective gripping of the nut and the easy reversal of the wrench. A very important feature of my invention is that the wrench is capable of acting upon nuts of considerably different sizes, from the full size permitted by the dimensions of the socket to those of much smaller size.

By the construction just described, I am enabled to provide a wrench which moves over the facets of the nut, whether square or hexagonal, with substantially as easy a movement as a ratchet wrench, and with little or no liability of the wrench being thrown off the nut. At the same time I gain a very important advantage that the arms are not recessed or weakened. To this advantage is added a considerable decrease in cost of construction. The entire wrench may be formed of a single forging and its socket and bearing faces easily and conveniently finished by the use of ordinary tools in one operation. There are no lateral recesses which can be finished only with difficulty. In fact the wrench herein can be made as cheaply as the ordinary spanner wrench.

The wrench may, if desired; be provided with a spring bolt or similar member such as *o* (Fig. 6) which is actuated by a spring *p* of sufficient strength to force the wrench slightly away from the nut so as to facilitate the reversing action. This will however not ordinarily be necessary.

Preferably the wrench is also provided on one side with an oblique face *q* which is by preference duplicated on the other side of the wrench. This face is best formed upon a flange or rib *r* as best shown in Fig. 7. One of the purposes of this construction is also illustrated in this figure. It frequently happens where a series of bolts are used that in screwing on one nut the handle will move over an adjacent bolt or nut. This restricts the use of the wrench and very often causes injury by tearing the hand of the user. In the construction of the wrench described the oblique faces *q* form bearing surfaces upon which the head of the wrench works with the handle extended in an inclined position as shown in Fig. 7. This enables the wrench to be worked freely over an adjacent bolt without danger of injury.

Although I have shown in detail one form of my invention, I do not wish to be limited thereto as various modifications may be made without departing from the invention. It is obvious that the jaws need not be integral or in fixed relative positions, and that the invention may be applied to other types of wrenches than the form shown. The term "spanner wrench" is used in the claims to cover such types.

What I claim is:—

1. A spanner wrench having a short arm adapted to engage a facet of either a square or a hexagonal nut and to exert a pulling strain thereon, and a long arm of sufficient length to engage a diametrically opposite facet of either a square or a hexagonal nut at a point past the middle of such facet in the direction of rotation, and said wrench having between such arms a socket shaped to receive a square or a hexagonal nut while said arms are engaged as set forth, and said longer arm being straight on its inner side.

2. A spanner wrench having a short arm adapted to engage a facet of either a square or a hexagonal nut and to exert a pulling strain thereon, and a long arm of sufficient length to engage a diametrically opposite facet of either a square or a hexagonal nut at a point past the middle of such facet in the direction of rotation, and said wrench having between such arms a socket shaped to receive a square or a hexagonal nut while said arms are engaged as set forth, and said longer arm being straight on its inner side and said socket having a recess at its bottom on the side of said longer arm, and a cam at its bottom on the side of said shorter arm.

3. A spanner wrench having a short arm adapted to engage a facet of either a square or a hexagonal nut and to exert a pulling strain thereon, and a long arm of sufficient length to engage a diametrically opposite facet of either a square or a hexagonal nut at a point past the middle of such facet in the direction of rotation, and said wrench having between such arms a socket shaped to receive a square or hexagonal nut while said arms are engaged as set forth, and said longer arm being straight on its inner side and said socket having a recess at its bottom on the side of said longer arm, and a cam at its bottom on the side of said shorter

arm, and said shorter arm having a curved face extending forwardly and outwardly from its inner side and adapted to rock upon the nut as the wrench is given its reverse movement.

4. In a spanner wrench, a handle and a head, said head having two arms with a socket between them to receive the nut, one of said arms being shorter than the other, and being formed with a curved face extending forwardly and outwardly from the inner side of the arm, said face being adapted to rock upon the nut as the wrench is given its reverse movement, and the longer arm being formed with a substantially straight inner face, the socket between such arms being deeper on the side of the longer arm and being provided with a cam on the opposite side.

5. A spanner wrench for square and hexagon nuts having a handle and a head, said head having two arms with a parallel sided socket between them, such socket being formed at its inner end to receive a corner of a hexagon nut, but being deeper on one side than on the other whereby to form a space between the facet of the nut and such side of the socket, and having a cam on the opposite side of such socket.

6. A spanner wrench having two arms for directly engaging a nut, a socket between such arms, and a spring-operated means for pressing the wrench away from said nut, whereby to facilitate reversal of the wrench.

7. A spanner wrench having a handle and a head rigidly fixed thereto, said head having two jaws forming a socket between them and having a flange or rib r of less width than the head, said rib extending along both said arms and around said socket, and having its greatest height at the inner end of said socket, and its smallest height on said arms.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE AMBORN.

Witnesses:
EUGENE V. MYERS,
THEODORE T. SNELL.