C. E. ASHLEY.

LOCKING SOCKET.

APPLICATION FILED DEC. 26, 1919.

1,379,606.

Patented May 31, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

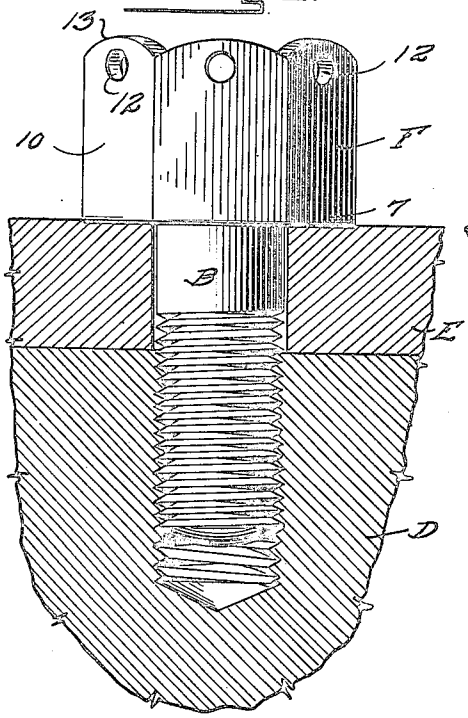


Fig. 2.

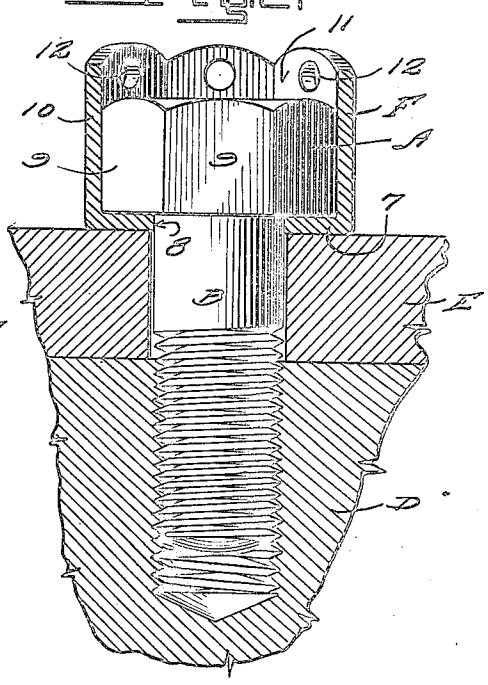
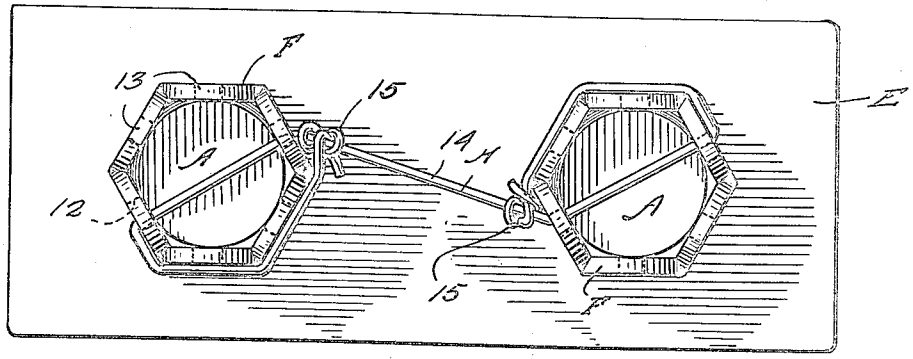


Fig. 3.



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2 SHEETS—SHEET 2.

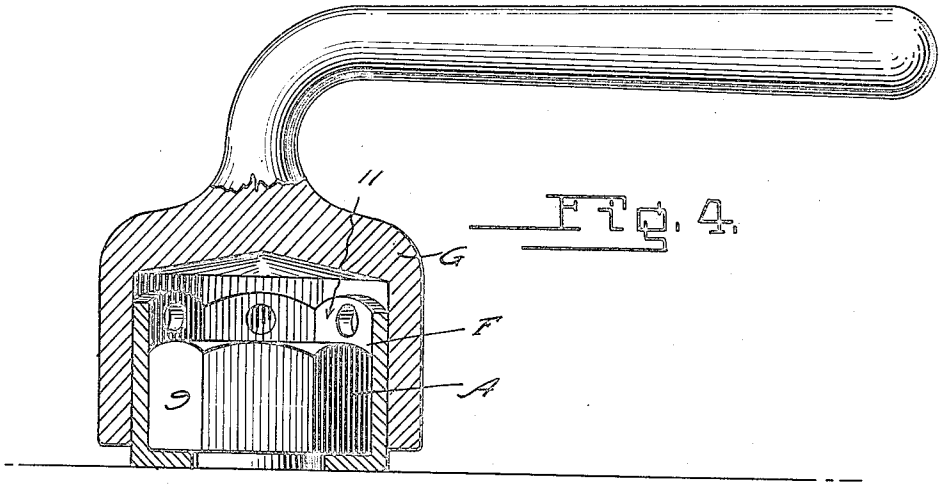


Fig. 4.

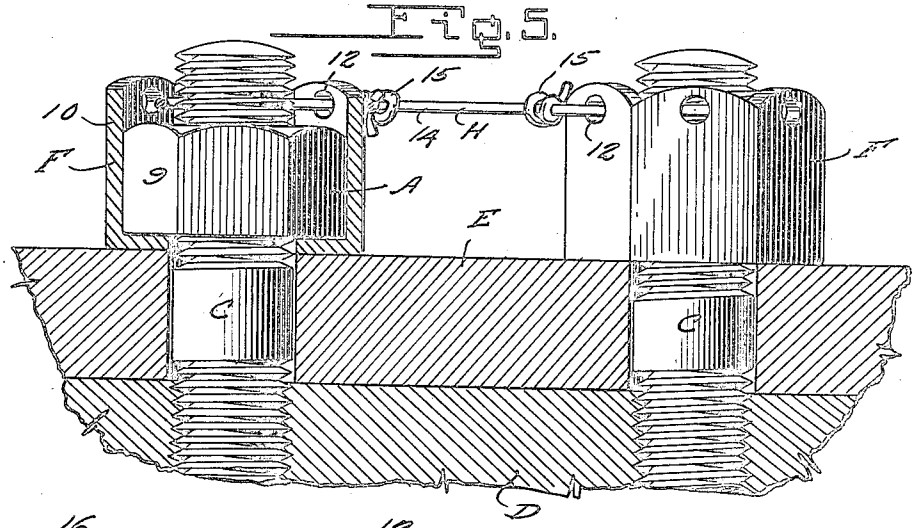


Fig. 5.

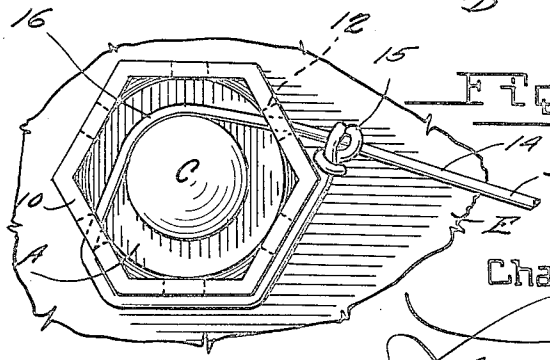


Fig. 6.

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UNITED STATES PATENT OFFICE.

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LOCKING-SOCKET.

1,379,606. Specification of Letters Patent. Patented May 31, 1921.

Application filed December 26, 1919. Serial No. 347,394.

To all whom it may concern:

Be it known that I, CHAUNCEY E. ASHLEY, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Locking-Sockets, of which the following is a specification.

My present invention relates to locking means for a plurality of bolts or nuts, and more particularly to locking sockets adapted to embrace the bolt heads or nuts and for coöperation with a wire to retain the bolts or nuts against rotation incident to vibration or other casual forces coming thereupon which might otherwise cause them to loosen.

It is now common practice to lock a series or a plurality of bolts against rotation after they have been adjusted or turned tight by means of a wire drawn through holes extending transversely through the heads of the bolts the wires being secured to the end bolts of the series, or to some rigid elements adjacent the end bolts. In order to accomplish this the holes must first be drilled through the bolt heads before they are positioned. It is also necessary to drill a plurality of holes transversely through each bolt head these holes opening at opposite wrench faces of the head. This is done in order that, when the bolts are adjusted in place the wire may be drawn through the particular hole of each bolt head that is alined with the holes of adjacent bolts, or those which are closest to alining so that sharp bends in the wire will be avoided. It has been found expensive to drill these holes especially in bolts having hexagonal or octagonal heads since, after one hole has been drilled, the drill used in making the next hole is very apt to break when striking the wall of the first hole at an acute angle.

One of the principal objects of my invention is therefore to provide, as an article of manufacture, a locking socket which may be used with standard bolts having polygonal heads, or standard nuts without machine work thereon and using a wire in the manner similar to that above set forth.

Another object of my invention is to provide locking sockets for association with standard bolts or nuts and which are so shaped or formed that a socket wrench which is most frequently used in rotating such bolts or nuts, may also be used without interference in turning the bolt or nut tight or otherwise adjusting it.

A further object of my invention is to provide as an article of manufacture, a locking socket which is inexpensive to manufacture and neat in appearance which requires no bending of portions in order to accomplish the locking arrangement and which may be devoid of points or rough edges which are characteristic of many bolt and nut locks heretofore patented and in use.

Other objects and advantages of the invention will appear in the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings:

Figure 1 is a view partly in elevation and partly in section showing a tap bolt equipped with a locking socket formed according to my invention, the socket being shown in elevation.

Fig. 2 is a similar view, the socket being shown in vertical section.

Fig. 3 is a plan view showing a plurality of bolts locked against rotation by use of locking sockets formed according to my invention.

Fig. 4 is a view similar to Fig. 2 showing a socket wrench in position for turning of the bolt.

Fig. 5 is a view partly in elevation and partly in section showing a plurality of nuts locked against rotation on stud bolts, sockets, according to my invention, being used in connection therewith.

Fig. 6 is a fragmentary plan view showing one of the nuts and associate stud bolt of Fig. 5 with the locking socket and wire in place.

In the drawings, where similar characters refer to similar parts throughout the several views, A designates generally a polygonal member, such as the head of a bolt B, or a nut in screw threaded engagement with a bolt, such as stud bolt C; D and E elements receiving the bolts B and C; F locking socket constructed or formed according to my invention; G a socket wrench; and H a wire associated with the socket F.

With reference more particularly to Figs. 1, 2 and 3 of the drawings, where the invention is shown as applied to tap bolts B, the bolts are there shown as provided with

hexagonal heads A. Such bolts are frequently used for the purpose of securing the head to the main body portion of a cylinder, which parts may be designated by characters E and D, respectively.

The locking socket is preferably formed of a single piece of metal to provide a base 7 which engages the under side of the bolt head A, and in the example shown is provided with a concentric perforation 8 for the reception of the stem of the bolt. Extending from this base 7 is a side wall inclosure to embrace and extend beyond the wrench faces 9 of the bolt head, this wall being designated generally by character 10. It forms a socket 11 for the reception of the bolt head. It is preferred to form this side wall inclosure integral with base 7, shaped to, engaging and extending beyond the wrench faces of a standard bolt head, or nut. Those portions of the wall 10 opposite to base 7, or in other words, those portions of the wall extending beyond the bolt head or nut are provided with transverse perforations 12 for the reception of the wires H in a manner to be subsequently set forth. It is preferred to round off the upper portion of the locking socket as indicated at 13 so as to provide no points which are likely to injure flesh.

In the production of these locking sockets, as by drawing or die stamping the side wall inclosure is made of a thickness to successfully withstand the compressive and torsional stresses coming thereupon incident to the use of a wrench used in turning the bolt into place. As clearly shown in Fig. 4 of the drawings, an ordinary socket wrench may be used without interference. The side wall inclosure may be of such a thickness that the next size socket wrench to that which would be used for turning the bolt or nut into place, may be used, when the bolt head or nut is equipped with a locking socket.

A number of perforations 12 are provided in order that the wire H may be drawn through the perforations of adjacent locking sockets, which perforations either aline, or are closest to alining, so that sharp turns in the wire will not be necessary. In this connection, reference is had to Fig. 3 of the drawing, in which it is to be assumed that the bolt B is turned clockwise in order to cause binding engagement between elements D and E. The wire H is therefore trained through the perforations 12 of each locking socket which are closest to alining, and in a manner that should there be a tendency to rotate either of the bolts in a contra clockwise direction, such will have a tendency to turn the next adjacent bolt tighter in engagement, with the member E. While I have shown the wire H as turned upon itself and twisted about that section 14 between the locking sockets, as indicated at 15, it is to be understood that the terminals of this wire may be secured to any rigid element or elements available and that a series of bolts may thus be secured against rotation, due to vibration, or casual forces coming thereupon.

In Figs. 5 and 6, the locking sockets are shown engaging polygonal nuts which are turned upon stud bolts C, which are frequently used in securing the cylinder head to cylinder block. The use of the locking socket is similar hereinbefore described, in that the bolt C extends through the perforation or aperture 8 in the base 7. The wire H is, however, trained about the circumference of the bolt C, as indicated at 16 where the bolt extends a considerable distance above the nut A.

It is to be noted that an ordinary socket wrench may also be used in turning nuts tight, or adjusting them and in which connection it is pointed out that quick assembly and dismembering of machinery is often desirable and that the locking sockets are so formed that ordinary tools, such as monkey wrenches, or socket wrenches, may be used, without interference, and the locking socket capable of remaining in good condition under the action of the wrenches in turning or loosening bolts or nuts.

I claim:

1. As an article of manufacture, a locking socket for polygonal bolt heads or nuts, formed of a single piece of metal providing a perforated base and an integral polygonal side wall of substantially uniform thickness to embrace, engage and extend beyond the wrench faces of the element, that portion of the side wall opposite to said base provided with oppositely disposed transverse apertures.

2. As an article of manufacture, a locking socket for polygonal bolt heads or nuts, formed of a single piece of metal providing a perforated base and a polygonal side wall of substantially uniform thickness to embrace, engage and extend beyond the wrench faces of the element, that portion of the side wall opposite to said base provided with oppositely disposed transverse apertures.

3. As an article of manufacture, a locking socket for polygonal bolt heads or nuts, formed of a single piece of metal providing a base and a polygonal side wall of substantially uniform thickness to embrace, engage and extend beyond the wrench faces of the element, that portion of the side wall opposite to said base provided with oppositely disposed transverse apertures.

4. As an article of manufacture, a locking device formed of a single piece of metal providing a base having a perforation to re-

ceive a shank, and a polygonal side wall of substantially uniform thickness integral with said base, said side wall providing a socket to which said perforation opens, said socket shaped to receive a standard nut or bolt head, said side wall provided with transverse apertures, one for each wrench face of the nut or bolt head.

5. In combination with a polygonal nut or bolt head, of a base having a perforation to receive the bolt shank, and a polygonal side wall of substantially uniform thickness integral with said base and shaped to, engaging and extending beyond the wrench faces of the bolt head or nut, those portions of the wall beyond the bolt head or nut provided with transverse apertures.

6. A locking device for bolts having polygonal heads comprising a cap having a base adapted to lie against the inner face of the bolt head and provided with an opening to receive the shank of the bolt, said cap being further provided with straight side walls connected together in polygonal formation and adapted to individually engage against the polygonal faces of the bolt head, said side walls having means to receive an element for preventing the turning of the cap.

7. A locking device for bolts having polygonal heads comprising a one-piece cap formed of sheet metal and bent to provide a perforated base receiving the shank of the bolt and having non-circular walls corresponding to the polygonal faces of the bolt head and adapted to lie in contact with the latter to avoid turning of the bolt, said walls projecting beyond the bolt head and beyond the bolt and being perforated to receive means for preventing the turning of the cap and consequently a turning of the bolt head and bolt.

8. In combination with a rotatable element having flat faces, of an improved locking socket adapted to prevent the rotation of said element and composed of a base having an opening therein to receive a portion of said element, flat side walls projecting substantially at right angles from said base and made to conform accurately to the flat faces on said element whereby to compel rotation of the locking socket with said element, portions of said side walls extending beyond the plane of the outer face of said element and being provided with apertures in the several walls, and means to connect together adjacent locking sockets and adapted to engage with the perforations in the walls thereof.

CHAUNCEY E. ASHLEY.