March 30, 1926. 1,578,963

W. A. DUNLAP

BOLT CONSTRUCTION

Filed August 8, 1924

Fig. 1

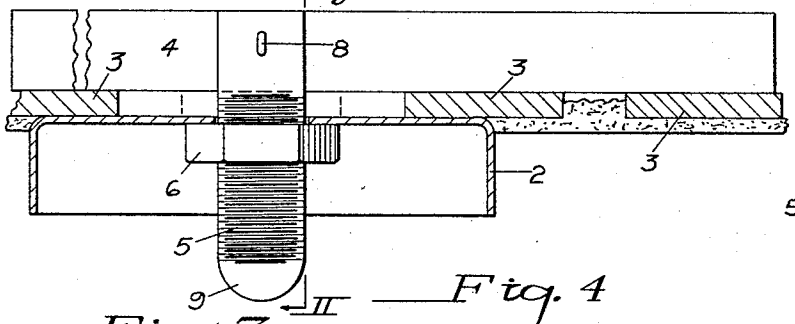


Fig. 2

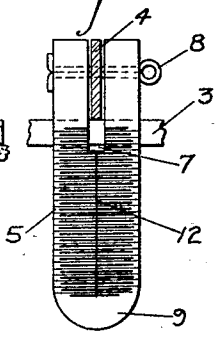


Fig. 3

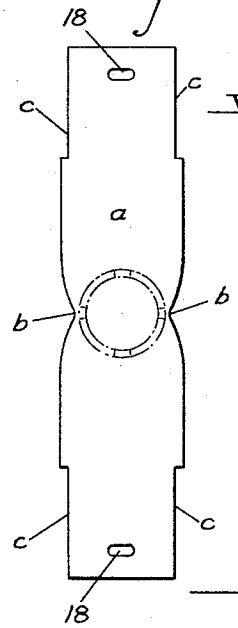


Fig. 4

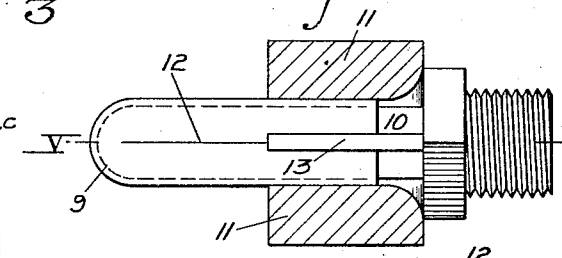


Fig. 6

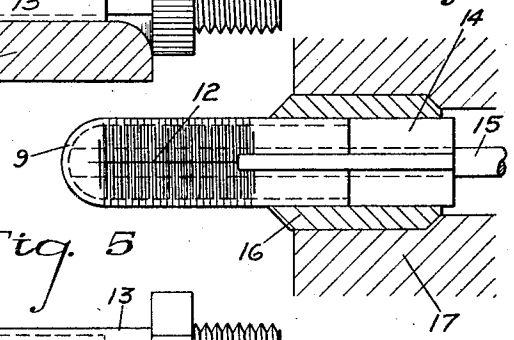


Fig. 5

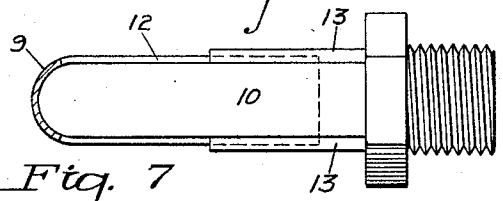


Fig. 7

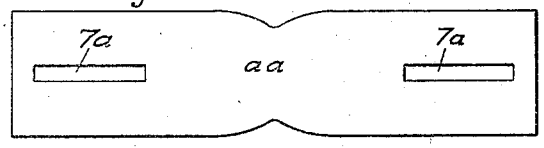


Fig. 8

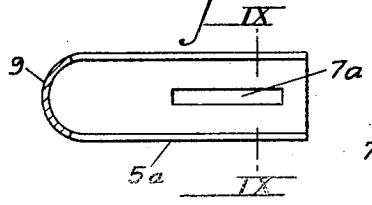
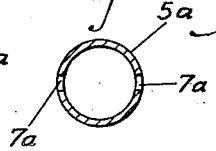


Fig. 9



William A. Dunlap
INVENTOR.

BY Clarke & Doolittle
ATTORNEYS.

Patented Mar. 30, 1926. 1,578,963

UNITED STATES PATENT OFFICE.

WILLIAM A. DUNLAP, OF PITTSBURGH, PENNSYLVANIA.

BOLT CONSTRUCTION.

Application filed August 8, 1924. Serial No. 730,953.

To all whom it may concern:

Be it known that I, WILLIAM A. DUNLAP, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Bolt Construction, of which the following is a specification.

My invention consists of an improvement in hollow bolt construction. It has for its object to provide a supporting bolt, particularly adapted to use in connection with an upper cross bar and a lower supporting element, as an outlet box or plate, etc. In the use of such boxes, which are usually mounted against the ceiling of a room for distribution of electrical circuits, the box is suspended by various means, and frequently from the usual lathing forming a portion of the ceiling.

My invention has in view to provide a bolt of cheap and simple construction and manufacture, having an upper transverse slot for connection with a supporting bar, adapted to rest upon the upper surfaces of the lathing and to extend by its lower portion through the upper wall of the outlet box, for connection therewith by a clamping nut.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a sectional view through a portion of a ceiling, showing the invention as used;

Fig. 2 is a transverse view thereof, on the line II—II of Fig. 1, the outlet box and clamping nut being omitted;

Fig. 3 is a composite view showing the blank and also an end view of the complete bolt in dotted lines, as formed therefrom;

Fig. 4 is a sectional view showing the operation of forming the blank between the forming dies;

Fig. 5 is a similar sectional view on the line V—V of Fig. 4, showing the mandrel in elevation;

Fig. 6 is a view showing the formed blank after chasing the threads thereon, as held by the clamping mechanism;

Fig. 7 is a plan view showing a modified form of blank;

Fig. 8 is a longitudinal sectional view of a bolt made therefrom;

Fig. 9 is a cross section on the line IX—IX of Fig. 8.

Referring to Figs. 1 and 2, the outlet box 2, which is usually of pressed sheet metal, is suspended upwardly against the under surface of the ceiling by means of a bolt extending through a central hole in its upper wall. For the purpose of ensuring a good bearing over several of the lathing 3 of the ceiling, I utilize a bar 4, which rests edgewise thereon, as shown, for distribution of the strains. The bolt 5 of the present invention extends downwardly through the hole of box 2 and is secured thereto by one or more ordinary nuts 6. The upper portion of the bolt 5 is slotted as at 7, for embracing connection with bar 4 by means of a cotter pin or similar device 8, extending through registering holes in the bolt and bar, as will be readily understood.

Bolt 5 is formed of a blank *a*, of sheet metal of about fourteen gauge and of a length, as shown, adapting it to be bent at its middle portion into semi-cylindrical halves, and brought together to form a cylindrical bolt unit, as shown. For the purpose of providing a rounded end 9, formed of the middle section of blank *a*, and facilitating the curvature to shape the device through suitable dies, the blank is narrowed at each side of its middle, as indicated at *b*—*b*.

In the same way, to provide clearance for slots 7, the opposite ends of the blank are narrowed inwardly toward a terminal shoulder, as indicated at *c*, sufficient metal being removed so that, when the edges of the blank are brought together in the dies, a definite open ended slot 7 at opposite locations of the upper portion of the bolt will be provided for clearance of the bar 4. The blank *a* as thus made is forced by a mandrel 10 through and between the half-round forming dies 11—11, as indicated in Fig. 4, which operation rounds the end 9 upon the similarly rounded end of the mandrel 10, and brings the opposite edges of the middle portion of the blank closely against each other, as indicated at 12.

For the purpose of definitely forming the slot 7 at the upper portion of the bolt, mandrel 10 is provided with oppositely located wings 13—13, of a width conforming to that of the resulting slot 7 and of the total clearance of the shouldered offset portions *c*—*c* of the blank. When the blank is thrust inwardly between the dies 11 of mandrel 10, in the manner just described, the blank

will be formed into shape, as shown in Figs. 4 and 5, in a single operation, leaving the end 9 of the bolt rounded and smooth, because of the integral cross section, while the edges meeting closely along the line 12 provide a smooth unobstructed periphery throughout the whole length of the bolt.

After being thus formed, the blank is then mounted upon a second mandrel 14 having a pair of wings similar to wings 13 engaging slots 7 and with a central pushing rod or bar 15 for ejecting the finally threaded and finished bolt, as indicated in Fig. 6. The blank is clamped upon mandrel 14 and fixedly held in position for chasing the threads by well known chuck-head clamping mechanism 16—17, the chasing of the threads being quickly accomplished by a turret machine, in the manner well understood in the art.

The blank *a* is also punched out as at 18 at each end, in oval form, providing for cotter pin holes when the blank is formed into a cylinder.

An alternative form of the bolt is shown in Figs. 7, 8 and 9. In such construction, the blank *a*, *a* is of the same general shape as described, except that its ends are of full width, and are provided with the closed end slots 7^a. The slots are punched out by suitable dies, leaving the punch blank, however, in the whole, severed but not removed, in the manner commonly practiced in providing the holes in the sides of the outlet box and in other similar devices. Thereafter, the blank is formed into the hollow cylindrical bolt shape in the manner already described, the slots 7^a are cleared of their waste punch plugs, and the device is then ready for threading and insertion of the supporting bar 4 through the slots.

The advantage of retaining the punched out pieces in the blank during shaping in the dies is that they act like the mandrel wings 13 in bracing the blank to retain the full desired width of the slots in the final article. The closed slot construction avoids the necessity of the cotter pin 8 and also provides for longitudinal adjustment on the bar 4, if desired.

The resulting bolt 5 or 5^a as thus made and threaded is comparatively light, and of ample strength for its intended use. It involves a comparatively limited amount of machine work, and is inexpensive to manufacture, while extremely durable and efficient when used in the manner shown. While it is particularly adapted to suspension of outlet or circuit boxes, it will be readily understood that the bolt may be also used for various other purposes; that it may be made of any desired length or diameter, and variously changed or modified by the skilled mechanic in other respects, within the scope of the following claim.

What I claim is:

A bolt of the kind described formed of a sheet metal blank bent upon itself at the middle to form an integral rounded-end cylinder with the edges of the blank in contact beyond the rounded end and provided with threads for a portion of its length and opposite clearance slots for a supporting bar at its other end.

In testimony whereof I affix my signature.

WILLIAM A. DUNLAP.