Oct. 30, 1934. H. A. DOUGLAS 1,978,935

ATTACHING MEANS

Filed Jan. 23, 1933

Fig. 1

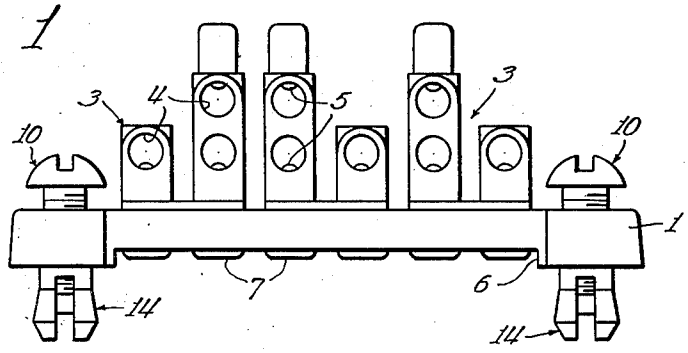


Fig. 2

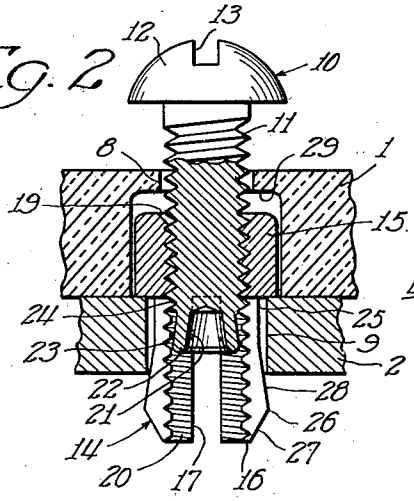


Fig. 3

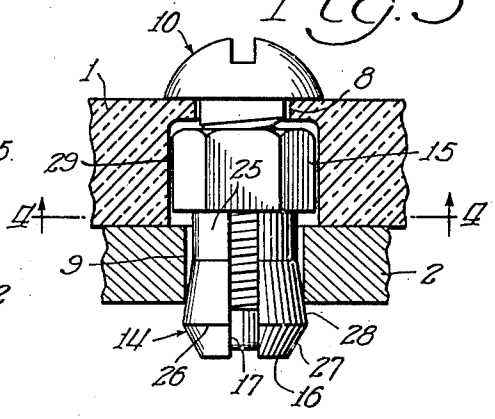


Fig. 4

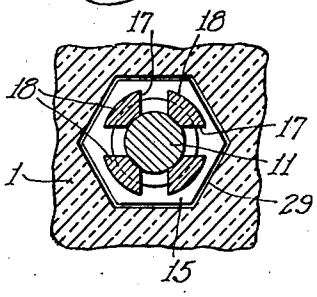
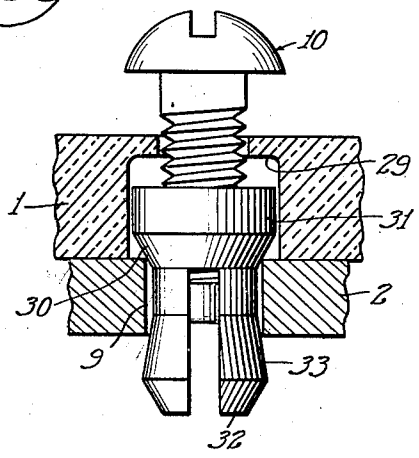


Fig. 5



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ATTACHING MEANS

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Application January 23, 1933, Serial No. 653,013

2 Claims. (Cl. 85—2)

This invention relates to attaching means more particularly for electrical insulating mountings.

The invention is of particular utility for locking a junction block to its support, and, in its more specific aspect, provides an attaching means which cannot be separated from the junction block to be lost or misplaced, while it is always ready for instant engagement with the support, and, by a novel cooperation of its parts, automatically maintains itself in operative position.

The invention will be readily understood by reference to the illustrative construction shown in the accompanying drawing, in which—

Figure 1 is an elevational view of a junction block with my invention applied thereto;

Figure 2 is a longitudinal section through one of the attaching means and showing the parts in one operative position;

Figure 3 is a longitudinal section showing the parts in final operative position;

Figure 4 is a cross-section taken on the line 4—4 of Figure 3; and

Figure 5 is a section similar to Figure 2 but showing a modified construction.

Referring in detail to the figures of the drawing, the insulating junction block 1, made of molded bakelite, for example, represents an object to be mounted upon a suitable support such as the plate 2, a portion only of which is shown and which may be part of the metallic frame of an automotive vehicle. The block 1 may carry any desired number of metallic circuit connectors 3 which are adapted to receive and electrically connect electrical conductors such as insulated wires having the usual conventional bulbous shape terminals (not shown) which are received in the sockets 4 and yieldingly retained therein by spring pressed detents 5. The block 1 may have a central recess 6 therein to receive the riveted ends 7 of the connectors 3 and space these ends from the metallic support 2 to insulate them therefrom. At each end, the block 1 desirably has a hole 8 therethrough, these holes being appropriately spaced apart to register with apertures 9 through the plate 2.

Disposed in each of the holes 8 in the block 1, I have shown a screw 10 having a threaded shank 11 and having a head 12 which may have the usual kerf 13 therein for manipulation by a screw-driver. Disposed on each of the shanks 11 is a radially contractible clamping member represented by the nut 14. In this instance, the nut 14, which may be of any suitable resilient metal, such as cold rolled steel, has a body portion 15 which is of larger diameter than the aperture 9 in the plate 2, so as not to pass therethrough. The nut 14 also has a reduced portion 16 which is adapted to pass through the aperture 9 and which is radially contractible. To provide this contractibility, the portion 16 of the nut may be slotted longitudinally as at 17, desirably in two planes, as best shown in Figure 4, to provide the four spring tongues 18.

As here shown, the bore 19 of the nut 14 is threaded throughout its length including the tongues 18 to threadedly receive the shank 11 of the screw 10. After the shank 11 of the screw has been passed through the hole 8 of the block 1 and the nut 14 partially screwed on to the shank, these parts may be secured in permanent assembly to prevent their being accidentally separated. To facilitate this permanent assembly, I may cut off the tops of the threads of the nut along the spring tongues 18 as at 20 and recess the end of the screw 10 as at 21 to provide a relatively thin wall 22 at the end of the screw which may be slightly flared radially (for example, by inserting a spreading tool in the recess 21 after the nut and screw have been assembled as shown in Figure 2) to provide an annular shoulder 23 which will abut the unreduced threads 24 of the nut upon movement tending to separate the nut and screw and thus prevent separation.

In this instance at 25, where it joins the body 15 of the nut, the reduced portion 16 comprised by the tongues 18 is of slightly smaller diameter than the aperture 9 in the plate 2, but the outer end of the portion 16 is enlarged, as by thickening the tongues 18 radially to form an interrupted annular shoulder 26. In other words, the perimeter of the reduced portion 16 in a plane passing through the shoulders 26 of the tongues is of greater diameter than the aperture 9, when the tongues are in normal unflexed condition with the bore of the nut uniform throughout the entire length of the nut. From the shoulder 26, the tongues 18 are tapered inwardly toward the extremity of the nut to provide the cam surfaces 27 on the tongues. Desirably also the tongues are tapered slightly more gradually as at 28 in the opposite direction from the shoulders 26 toward the portion 25. Thus the tongues desirably have their outer surfaces tapered longitudinally in both directions from the shoulders 26.

So constructed and arranged, the block 1 may be quickly secured to the plate 2 by passing the

reduced portion 16 of the nut through the aperture 9, the screw 10 being at this time retracted in the bore of the nut as shown in Figure 2. The tapered surfaces 27 permit the extremity of the nut to be inserted in the aperture without flexing the tongues and thereafter as the nut is forced through the aperture, the tongues are flexed by the action of the tapered surfaces 27 which act as cams to radially contract the portion 16 of the nut and permit the shoulders 26 to pass beyond the aperture 9. Thereupon, by the aid of a screw-driver, the screw 10 may be advanced into the bore of the nut, as shown in Figure 3, so that the shank 11 of the screw occupies the bore of the nut in the region of the reduced portion 16 to a sufficient extent to support the tongues 18 and prevent the nut from radially contracting, so that the nut cannot be withdrawn through the aperture 9 past the shoulders 26 until the screw is again retracted. It will be understood, of course, that should the tongues 18 have been bent to take a set tending to permanently contract the end 16 of the nut, the screw by the action just described, will also expand the tongues as well as supporting them. As here shown, when the screw reaches the limit of its longitudinal movement toward the position shown in Figure 3, with the head of the screw abutting the block 1, the nut is drawn toward the head of the screw and moved transversely of the block 1 by the well-known screw action here employed and the tapered surfaces 28 are wedged into the aperture 9. Thus not only are the block 1 and plate 2 clamped together against separation, but also all play between the parts is taken up and chattering is prevented.

To hold the nut 14 from rotation with respect to the screw, while the screw is being advanced in the bore thereof, as just described, I preferably recess the block 1 as by forming a countersink 29 in the hole 8 of the block to receive the body 15 of the nut and form the recess and body of mating non-circular cross-section, for example, of hexagonal cross-section, as best shown in Figure 4; or, as shown in Figure 5, I may make the body and recess of circular cross-section and provide an annular tapered surface 30 on the body 31 where it joins the reduced portion 32 of the nut. In this modified form, when the screw 10 is advanced into the bore of the nut, the annular tapered surface 30 is wedged into the aperture 9 during the first movement of the screw, and the nut is thus frictionally held from rotating. During final movement of the screw when the tapered surface 30 tends to leave contact with the margins of the aperture 9, by movement of the nut longitudinally as already explained, the tapered surfaces 33 engage the margins of the aperture 9 at the other end of the aperture and are wedged into the aperture 9 similar to the surfaces 28, while also preventing the nut from rotating.

I advantageously form the body 15 or 31 of the nut of sufficient length axially to prevent the body of the nut from leaving the countersink 29 when the screw 10 is in its retracted position, thus assuring that the nut and screw are maintained perpendicular to the block 1 at all times and ready to be quickly and surely inserted into the aperture 9. At the same time, I provide that the countersink 29 shall be of sufficient extent axially to provide movement for the body of the screw transversely of the block 1 as the parts are clamped together, i. e., as the nut and screw move from the positions shown in Figure 2 to the positions shown in Figure 3.

Obviously, the invention is not limited to the details of construction here shown for illustration and such changes may be made as fall within the scope of the following claims without departing from the invention.

What I claim is:

1. Attaching means comprising, in combination with a support having an aperture therethrough, an object to be supported thereby having a hole therethrough registering with the aperture in the support rectangularly countersunk upon the surface adjacent the support, a nut of similar conformation and less depth than the countersunk portion of the object receivable therein having integral depending threaded resilient tongues adapted to pass through the aperture in the support tapering outwardly towards the free ends to form an enlarged portion of greater diameter than said aperture and terminated in tapering surfaces therebeyond whereby the tongues may be entered in the aperture and contracted thereby to be passed therethrough, a screw having a head adapted to abut the surface of the object opposite the countersunk portion and a shank threadedly received in the bore of the nut to mount the nut upon the object and after the tongues have been passed through the support upon further advancement to draw the nut toward its head to bring the outwardly tapered portions of the tongues into engagement with the support.

2. The structure of claim 1 wherein the extremity of the screw shank terminates in an outwardly flaring recessed portion of less diameter adapted after the body has been secured to the support to be further flared to abut the threads of the tongues to secure the screw and nut against separation.

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