Sept. 4, 1956 E. A. ERICSON 2,761,937

MOUNTED STOP-NUTS

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Fig. 1.

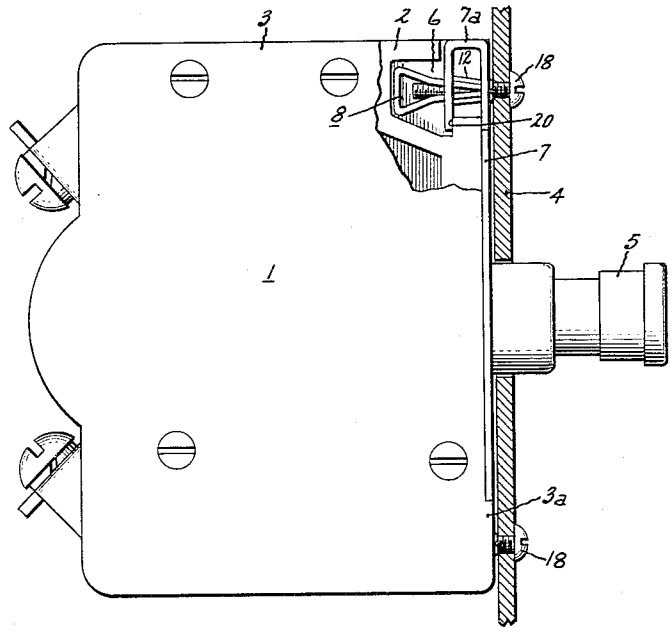


Fig. 2.

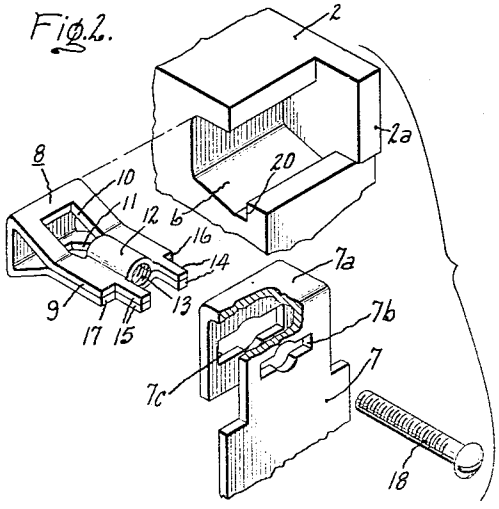


Fig. 3.

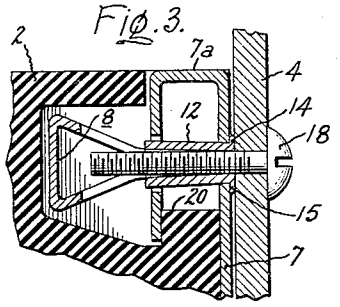
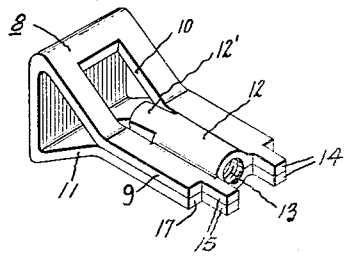


Fig. 4.



Inventor:
Eric A. Ericson,
by Claude A. Mott
His Attorney.

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MOUNTED STOP-NUTS

Eric A. Ericson, Plainville, Conn., assignor to General Electric Company, a corporation of New York

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2 Claims. (Cl. 200—168)

My invention relates to threaded bolt-receiving stop-nuts, and more particularly to a nut of such character mounted in a molded plastic body or other mass of frangible material to receive a connecting bolt.

It is frequently necessary to provide threaded bolt holes in bodies of molded plastic insulating material or other frangible material, either to provide means for bolting another member, such as a cover plate, to the body or to provide means for attaching the body itself to a support, such as a mounting panel.

Specifically, electric circuit breakers having molded plastic cases are often mounted in this manner on supporting panels. In such plastic bodies bolt-receiving means have heretofore been formed by molding threaded tubular metal inserts into the body of plastic material.

Such molded inserts are objectionably expensive, and, unless cup-shaped they provide no stop for preventing excessively long bolts from splitting or cracking the plastic if threaded too far into the insert. Nuts have also been mounted on metal plates or the like, with the plate fixed in the plastic body and the nut loosely positioned in a recess in the plastic, but these nuts also permit cracking of the plastic by bolts of excessive length. Moreover, such inserts and mounted bolts do not possess any self-locking properties. I have found particularly that, where circuit breakers assembled in plastic cases are mounted in hazardous locations, such as in locations exposed to explosive atmospheres, the danger of cracked casings is serious because of the likelihood of gas ignition by contact sparking.

Accordingly, therefore, it is a general object of my invention to provide a mounted stop-nut which is simple in construction, reliable in operation and of low cost.

It is a further object of my invention to provide a self-locking stop-nut so constructed that, when mounted loosely in a body of molded plastic or other frangible material, it protects the frangible body against cracking by bolts of excessive length.

It is a more specific object of my invention to provide a self-locking stop-nut adapted to be mounted loosely in circuit breaker casings of molded plastic insulating material to provide for attaching of the casing to mounting panels or the like, without cracking under excessive bolt pressure.

My invention itself will be more fully understood and its various objects and advantages further appreciated by referring now to the following detailed specification taken in conjunction with the accompanying drawing, in which Fig. 1 is a side elevational view, partly in section, showing an electric circuit breaker mounted upon a supporting panel by means of a stop-nut embodying my invention; Fig. 2 is a fragmentary exploded perspective view of the stop-nut and its cooperating casing parts; Fig. 3 is an enlarged detail view in sections of the panel circuit breaker and mounting nut shown at Fig. 1; and Fig. 4 is a perspective view of a modified stop-nut embodying my invention in another form.

Referring now to the drawing, I have shown a circuit

breaker **1** having a molded plastic casing **2** and a side cover **3** (one corner of which is shown broken away) mounted upon a supporting panel **4** with an actuating button **5** for the breaker protruding through the panel. The circuit breaker casing **2** is provided at each forward corner adjacent the mounting panel **4** with a nut-receiving aperture **6** (only one of which is shown) open at the side adjacent the cover plate **3** and also open at the forward end (i. e., the end adjacent the panel 4). The forward end of the circuit breaker is provided with a metal cover plate **7** having U-shaped return-bent end portions *7a* closing the apertures **6** on the forward side. While the mounting details are shown for only one corner of the breaker to simplify the illustration, it will be understood by those skilled in the art that both the upper and the lower corners forward of the breaker **1** adjacent the panel **4** are of similar construction.

The return bent end portion of the metal cover plate 7 is of reduced width and, when assembled, is held in position between a protruding shoulder *2a* on the casing 2 at one side of the aperture **6** and a cooperating shoulder *3a* (Fig. 1) on the side cover **3**. This return bent end portion of reduced width is provided with aligned keyhole apertures *7b* and *7c* in its upper and lower walls respectively, in which is fixedly mounted a self-locking stop-nut **8** which is loosely positioned within the recess **6**.

The stop-nut **8** is formed of a U-shaped band of metal having its side portions offset inwardly into flatwise engagement for an appreciable portion of their length adjacent the free ends thereof, as at **9**, Fig. 2. The lower or diverging ends of the side portions of the nut **8** are cut away or apertured at **10** and **11**. The juxtaposed side portions **9** are oppositely spread out in semi-cylindrical shape intermediate their side edges, as at **12**, and are threaded internally at **13** to form cooperating halves of a cylindrical bolt-receiving nut. The upper or free ends of the juxtaposed side portions are provided with two juxtaposed pairs of extending tabs **14** and **15** of reduced section forming shoulders **16** and **17** respectively, at the free ends of the side portions of the nut.

As shown at Figs. 1 and 3, the juxtaposed or engaging side portions **9** of the nut **8** are positioned within the aligned keyhole apertures *7b* and *7c* with the tabs **14** and **15** extending through the upper aperture *7b*. For this purpose the aperture *7b* is slightly shorter than the aperture *7c*, so that the upper wall of the mounting plate **7** seats upon the shoulders **16** and **17**. The tabs **14** and **15** are peened over the plate **7**, as shown at Fig. 3, to attach the nut **8** to the plate.

In assembling the mounted nut described above, it is preferable to insert the U-shaped member **8** into the apertures *7b* and *7c* of the plate **7** before tapping the nuts. With the member **8** inserted into the plate **7** and the tabs **14** and **15** peened over, the semi-cylindrical portions **12** are tapped, and in this operation the die will spread the lower ends of the semi-cylindrical portions **12** as it approaches the end of the thread. When the die is withdrawn, the juxtaposed side portions of the nut **8** spring together into their original shape and thereby are prepared to exert a resilient clamping action upon a mounting bolt **18** later threaded therein. To facilitate this resilient clamping action, the keyhole slot *7c* is made slightly oversized for the nut.

It will now be understood by those skilled in the art that, with the nut **8** thus fixedly mounted in the plate **7**, the assembled plate with the nuts at each end is slipped sideways onto the circuit breaker casing **2** to position the nuts loosely within the apertures **6**. As shown at Figs. 1, 2 and 3 the return-bent end portions *7a* of the plate **7** slip under shoulders **20** on the casing **2** to position and hold the plate. The side cover **3** is then placed upon the circuit breaker and fixed in position to prevent removal of the plate **7**.

It will be further evident that, when the mounting bolts **18**, by which the circuit breaker is fixed to the panel **4**, are threaded into the **8**, contact between the bolt and the frangible plastic casing is prevented by the bight portion of the nut. Thus, even though an oversized bolt is threaded too far into the nut, no damage can be done to the frangible casing.

At Fig. 4 I have shown a modified form of self-locking stop-nut **8** in which the semi-cylindrical cooperating side portions **12** of the nut are provided with depending internally threaded tabs **12'** extending downwardly into the apertures **10** and **11** to provide additional clamping force to lock a cooperating bolt in position. It will be evident that these arcuate tabs **12'** (only one of which is shown) may be pinched together after tapping, thereby to increase the clamping force upon a cooperating bolt.

While I have shown only certain preferred embodiments of my invention by way of illustration, many modifications will occur to those skilled in the art, and I therefore wish to have it understood that I intend in the appended claims to cover all such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A mounted stop-nut comprising a U-shaped band of metal having its side portions offset inwardly into flatwise engaging relation for an appreciable portion of their length adjacent their free ends, and angularly diverging adjacent the bight of said U-shaped band, the said diverging portions of said sides being centrally apertured and the juxtaposed ends of said side portions being semi-cylindrical intermediate their side edges and threaded internally throughout the complete length of said engaging portions to constitute complementary halves of a bolt-receiving nut said side portions having integral locking portions adapted to be engaged and forced apart by a bolt threaded between said side portions whereby to provide a resilient locking pressure resisting loosening of said bolt, two pairs of tabs of reduced section extending from the free ends of said engaging side portions and forming shoulders at the ends of said side portions, and a mounting plate having a keyhole aperture seated upon said shoulders to hold said free ends of said side portions in fixed relative position, said tabs being peened over said plate through said aperture to secure said nut to said plate.

2. In combination, a body of frangible molded plastic material having a recess therein, a metal plate having a return bent end portion fixed to said body with said end portion closing said aperture at one side, said return bent end portion having spaced apart walls provided with aligned keyhole apertures therein, a U-shaped stop-nut loosely positioned in said recess and having its side portions offset inwardly into flatwise engagement for an appreciable portion of their length adjacent their free ends and angularly diverging adjacent the bight of said U, the engaging ends of said side portions extending through said aligned apertures and being oppositely spread apart intermediate their side edges and threaded internally throughout the complete length of said engaging portions to constitute complementary semi-cylindrical halves of a bolt-receiving nut said side portions having integral locking portions adapted to be engaged and forced apart by a bolt threaded between said side portions whereby to provide a resilient locking pressure resisting loosening of said bolt, and tabs of reduced section extending from said free ends of said side portions and peened over said mounting plate to secure said nut to said plate to hold said free ends in fixed relative position the keyhole aperture in said return-bent end portion of said plate adjacent the bight of said U-shaped stop-nut being slightly oversize with respect to the portion of said stop-nut passing therethrough whereby said side portions may move a limited amount with respect to each other to resiliently grip a bolt inserted therein.

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