Aug. 30, 1938. H. J. MURPHY 2,128,729

FASTENER AND FASTENER INSTALLATION

Filed May 13, 1936

Fig. 1.

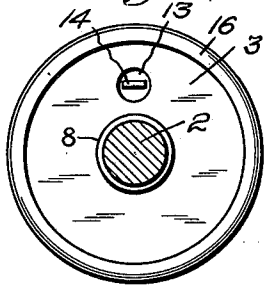


Fig. 2.

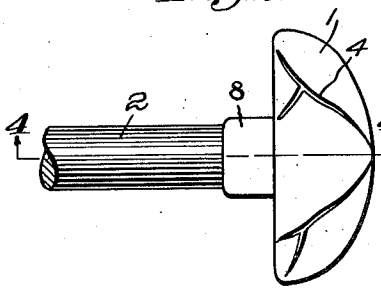


Fig. 3.

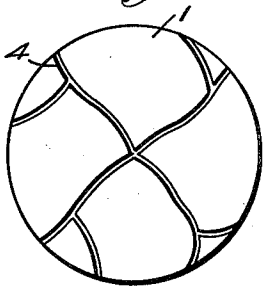


Fig. 4.

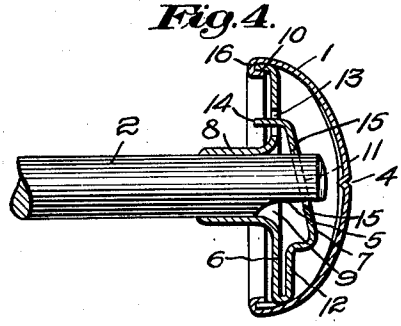


Fig. 5.

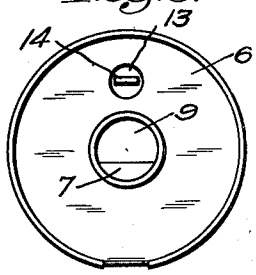


Fig. 6.

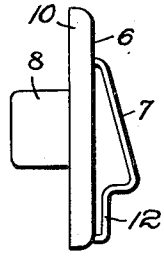


Fig. 7.

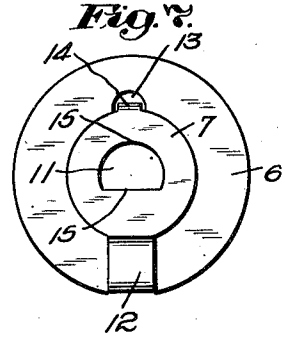
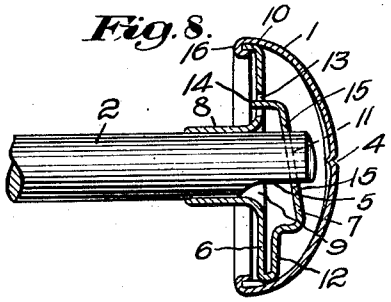


Fig. 8.



Inventor:
Howard J. Murphy,
by Walter S. Jones
Atty.

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FASTENER AND FASTENER INSTALLATION

Howard J. Murphy, Greenwood, Mass., assignor to United-Carr Fastener Corporation, Cambridge, Mass., a corporation of Massachusetts

Application May 13, 1936, Serial No. 79,507

1 Claim. (Cl. 287—53)

My invention relates to an improvement in knob fasteners and installations of the same.

An object of my invention is to provide a fastening means for securing a knob or cap or the like part to an end of a rod-like member, but it should be understood that the same fastening means may be used for securing various other articles of manufacture to a rod-like member.

Referring to the drawing, which illustrates a preferred embodiment of my invention:

Figure 1 is a bottom plan view of a cap secured to a rod member by means of my improved fastening device;

Fig. 2 is a side view of the installation shown in Figure 1;

Fig. 3 is a top plan view of the installation shown in Figure 1;

Fig. 4 is a section taken along the line 4—4 of Fig. 2 showing the parts of my installation in fastened relation;

Fig. 5 is a bottom plan view of my improved fastening means per se;

Fig. 6 is a side view of the fastening means shown in Fig. 5;

Fig. 7 is a top plan view of the fastening means shown in Fig. 5; and

Fig. 8 is a section similar to that of Fig. 4 but showing the fastening means in position enabling the cap to be separated from the rod.

Referring to the drawing, I have illustrated in Figs. 1–4 a finger operating means, such as a knob, adapted to be located on the outside surface of a radio panel or automobile instrument panel. My preferred installation, as shown, includes a cap 1 detachably secured to an end of a rod 2 by means of my improved fastening means 3. Grooves 4 are pressed into the top of the cap 1, but this formation is purely a matter of design and forms no part of my present invention. At one end of the rod 2 one side of it is beveled or cut away, as at 5, for a purpose which will be hereinafter described.

The particular fastening means illustrated in Figs. 5–7 is preferably formed from a single piece of yieldable sheet metal having a base plate 6 and a yieldable spring plate 7 disposed in spaced angular relation to said base plate on one side thereof. The base portion 6, in my preferred form, is provided with a hollow bearing 8 extending substantially from the center thereof and having an opening 9 through the base plate 6. The plate 6 has a downwardly-extending rim 10 at its outer periphery. The plate 7 is perforated, as at 11, to provide an irregularly-shaped aperture, herein shown as D-shaped, to conform substantially with the cross-sectional shape of the beveled end of the rod 2. For proper operation of my fastening device, the area of the aperture 11 should be no greater than is necessary for allowing the beveled end of the rod 2 to pass therethrough during assembly of the parts of the installation, as will be hereinafter more fully described. In order to permit the rod 2 to be passed through both the bearing 8 and the spring plate 7, the aperture 11 is located in substantial alignment with the bearing opening 9 in the base plate 6. The spring plate portion 7 is joined to the base 6 by a connecting portion 12 which is integral with the base 6 and bent back along one side thereof for a predetermined distance and then outwardly away from the base 6 into junction with the spring plate 7, as most clearly shown in Figs. 4 and 6. The connecting portion 12 not only maintains the plate 7 in proper position relative to the base plate 6, but, also, as a result of its particular formation, serves to impart the proper spring action in the plate 7. The plate portion 7 is normally disposed in angular relation to the base 6 with that side to which the connecting portion 12 is joined spaced farther from the base plate 6 than that side of the plate directly opposite the connecting portion 12. The side of the plate 7 in closest proximity to the base plate 6 is provided with a releasing means to which access may be gained through an aperture 13 formed in the base plate 6. The releasing means, in my preferred form, comprises a projection 14 extending downwardly from the spring plate 7 through the aperture 13, as most clearly shown in Fig. 4.

In assembling the parts of my installation, I first secure my fastening means within the hollow of the cap 1 by crimping the peripheral free edges 16 of the cap 1 over the rim 10 of the base plate 6 (Fig. 4). The cap 1 is now ready to be attached to the rod 2 which is carried out by passing the hollow bearing 8 over the beveled end of the rod 2 and exerting axial pressure upon the cap 1 relative to the rod 2 so that the end of the rod 2 is forced through the opening 9 of the base plate 6 and the aperture 11 of the ring plate 7. Movement of the cap portion relative to the rod 2 may be limited by the predetermined formation of the beveled portion 5 which permits only a stated portion of the end of the rod 2 to pass through the aperture 11. During insertion of the free end of the rod 2 through the aperture 11, that portion of the plate 7 normally nearest to the base plate 6 is raised slightly against the spring action provided by the connecting portion 12 with the result that the relative angle between

the spring plate 7 and the base plate 6 is lessened to permit the end of the rod 2 to pass through the aperture. When pressure upon the cap 1 is released, the spring plate 7 will expand toward normal position so that the material 15—15 adjacent to opposite sides of the aperture 11 engages the rod 2 in a spring grip to secure the parts in firm assembly (Fig. 4). When the installation is complete, the bearing 8 embraces a substantial portion of the rod 2 so as to prevent rocking of the cap 1 relative to the rod. Rotation of the cap relative to the rod is prevented by the irregular shape of the aperture 11 in cooperation with the similarly-shaped end of the rod 2.

In order to separate the cap 1 from engagement with the rod 2, pressure is exerted upon the end of the projection 14 disposed beneath the plate 6 thereby raising the lower portion of the plate 7 upwardly so that at least one of the portions 15—15 of the plate 7 is moved out of spring contact with the material of the rod, as most clearly shown in Fig. 8. The cap may now be completely separated from the rod by a direct axial pull.

The separable construction of my fastening device is particularly useful when a number of the caps form finger operating means such as commonly provided on the outside of a radio panel due to the fact that the caps may be quickly removed from the rods to permit the panel, which has not been shown in this application, to be slipped over the ends of the rods thereby allowing easy access to the interior of the radio set.

I am well aware, however, that my improved fastening device may be used satisfactorily with many other installations for carrying out other objects than those specifically mentioned in this specification. Furthermore, the arrangement of the inclined gripping piece and the bearing for the rod may be different and the construction of the parts may be other than illustrated while securing the same desired results.

While I have illustrated and described a preferred form of my invention, I do not wish to be limited thereby as the scope of my invention is best defined by the following claim.

An installation of the class described comprising, in combination, an article of manufacture, a rod and a fastening means for attaching said article to said rod, said fastening means comprising a one-piece sheet metal part having an apertured portion rigidly attached to said article and a yielding portion anchored at one end only and the other end being free to yield toward and away from said apertured portion, at least a portion of said spring plate being inclined relative to said apertured portion and having an aperture through which said rod passes and is gripped by said spring plate, the inclination of said spring plate being such that the edge of the aperture therein nearest the free end is closer to the said rod-receiving apertured portion than the opposite edge for the purpose described, and means to prevent rotation of the fastening means relative to said rod.

HOWARD J. MURPHY.