July 24, 1962 W. DALE 3,045,499

RETAINING MEANS

Filed Nov. 27, 1961

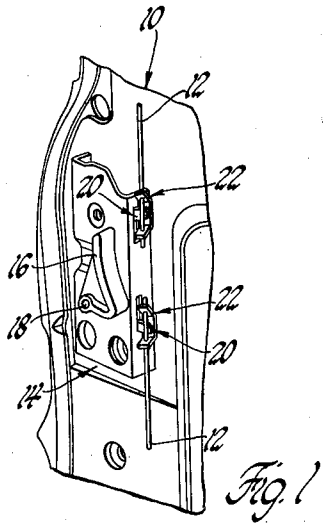


Fig. 1

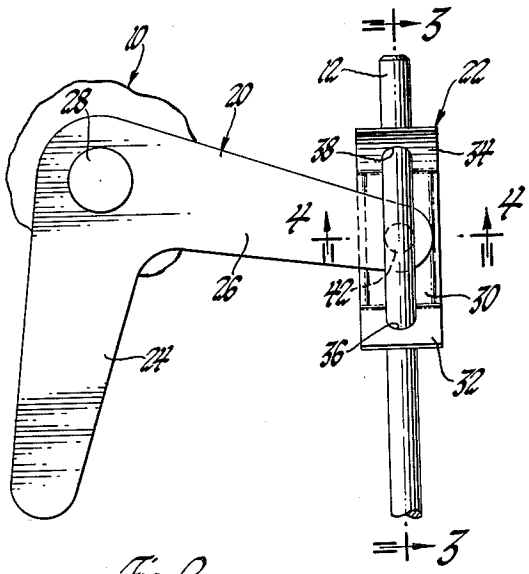


Fig. 2

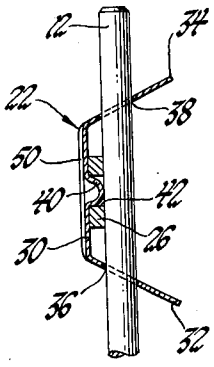


Fig. 3

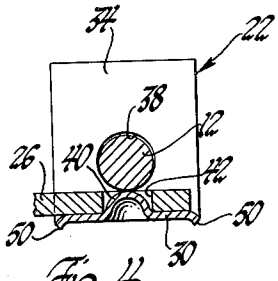


Fig. 4

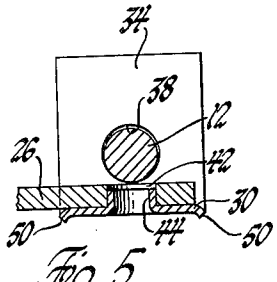


Fig. 5

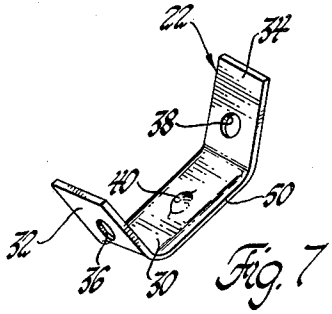


Fig. 7

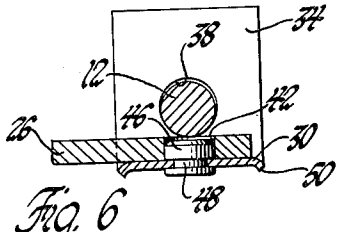


Fig. 6

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RETAINING MEANS

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This invention relates to retaining means, and more particularly to a device for securing an operating lever to an operating rod and permitting relative pivotal movement.

In the design and manufacture of many operating devices, such as vehicle door latch mechanisms, it is desirable to have an operating rod actuated by means of a suitable lever. The lever may be such as to be actuated by a handle available to the operator. A typical example is in the door latch mechanisms of panel tucks or the like in which a first door is opened by means of a conventional handle and a second adjacent door is opened by releasing latching means engaging the upper and/or lower door frame members. A handle is generally located between the two doors such that it is accessible upon opening the first door, the handle being actuated to release the latching means and permit opening of the second door. It is common to use an operating rod of some kind for actuating the latch mechanisms. Lever means are employed to actuate the operating levers, and some device or means is necessary to connect the lever means to the operating rod. In the past, such devices or means have been complicated or expensive to manufacture or assemble, or have not been positive in their retention.

The device in which this invention is embodied comprises, generally, a spring metal retainer member which secures an operating rod to a bell crank arm, or the like, and permits pivotal movement of one of the parts relative to the other. The device is provided with a body portion and angularly disposed side members which may be squeezed together to position the device with respect to the operating rod. The body of the member is provided with a dimple, or the like, which is received in a suitable aperture in the bell crank. The bell crank is thus pivotally secured between the rod and the body of the device. The device is simple in both manufacture and assembly with the other parts of the construction to provide a more economical and more efficient connecting means.

These and other advantages will become more apparent from the following description and drawing, in which:

FIGURE 1 is a perspective view of a portion of a vehicle door illustrating the latching means;

FIGURE 2 is an enlarged view of a portion of the construction of FIGURE 1 with parts broken away to illustrate the connection between the bell crank and the operating rod;

FIGURE 3 is a cross-sectional view of the operating rod and retainer of FIGURE 2 taken substantially along the line 3—3 and looking in the direction of the arrows;

FIGURE 4 is a cross-sectional view of a portion of the structure of FIGURE 2 taken substantially along the line 4—4 of FIGURE 2 and looking in the direction of the arrows;

FIGURES 5 and 6 are views similar to FIGURE 4 illustrating modifications in the retainer member; and

FIGURE 7 is a perspective view of the retainer member illustrated in FIGURES 1–4.

Referring more particularly to the drawing, FIGURE 1 best illustrates a typical use of the construction embodying the invention. In FIGURE 1 a door structure 10, which may be a panel truck door or the like, is provided with operating rods 12 which extend from a lock device, illustrated generally by the numeral 14, upwardly and downwardly to conventional latch mechanisms, not shown, at the top and bottom of the door 10. A suitable handle 16, pivotally mounted as at 18 to the lock mechanism 14, actuates the construction. Bell cranks, illustrated generally by the numeral 20, are engaged by the handle 16 and pivot about their centers to move the operating rods 12 away from the upper and lower door frame cross members. This may release the latch mechanisms and permit opening of the door. Spring retainer members 22 are secured on the rods 12 and bell cranks 20 in a manner to be more fully hereinafter described.

The connection between the bell crank 20 and the operating rod 12 is more clearly illustrated in FIGURE 2. Bell crank 20 is provided with arms 24 and 26 and is pivotally mounted to the support 10 by means of a pivot or the like 28. At the end of one of the operating arms, as arm 26, operating rod 12 is secured by means of the spring retainer 22.

Spring retainer 22 includes a generally planar body portion 30 and side members 32 and 34 extending angularly from body portion 30. Side members 32 and 34 are provided with apertures 36 and 38 which may be slightly larger than the diameter of the operating rod 12. The axes of apertures 36 and 38 are misaligned in their free position. That is, the axes intersect centrally of the retainer member 22 and are angularly disposed relative to each other. In mounting the retainer member 22 on the operating rod 12, side members 32 and 34 may be depressed towards each other, thus tending to align apertures 36 and 38 to permit passage of the operating rod 12 therethrough. Upon release of the side members 32 and 34, they tend to return to their natural position and securely clamp the rod at the edges of the apertures 36 and 38.

Formed in the body portion 30 of the retainer 22 is a dimple or depression 40. Formed in the end of arm 26 of bell crank 20 is an aperture 42 which is of substantially the same diameter as the dimple 40. Dimple 40 is received in aperture 42 to locate the bell crank arm 26 relative to the operating rod 12. By proper spacing of the apertures 36 and 38 in the side members 32 and 34 of the retainer member 22, the bell crank arm 26 is pivotally secured on the dimple 40 and between the operating rod 12 and the body portion 30 of the retainer 32. This is illustrated in FIGURES 3 and 4.

On assembly of the connection, the arm 26 of bell crank 20 is placed in registry over the dimple 40 in the retainer member 22. Side members 32 and 34 are then deflected towards each other to bring into registry the apertures 36 and 38 to permit insertion of the operating rod 12. When the operating rod 12 is inserted in apertures 36 and 38 of side members 32 and 34 and the side member released, the operating arm 26 of the bell crank 20 will be securely retained against the operating rod 12 and will be allowed pivotal movement about the dimple 40.

FIGURES 5 and 6 illustrate modifications of the body portion 30 of the retainer 22 and particularly in the area of the pivot dimple 40 of FIGURE 3. In FIGURE 5 a cylindrical stud 44 is formed out of the body portion 30 to receive the bell crank arm 26. In FIGURE 6 a separate stud member 46 is suitably secured in the body portion 30 of the retainer member by means of a groove or the like 48 in the stud 46. Any suitable means for retaining stud 46 in the body portion 30 may be provided.

In order to provide the proper strength in the spring retainer member 22, strengthening ribs 50 may be provided along the edges of the body portion 30. This prevents buckling or deformation of the body portion 30 of the retainer member during flexure of the side members 32 and 34 and provides the proper retention of the bell crank arm 26 relative to the operating rod 12.

Thus, an operating rod connection is provided which securely retains a lever to a rod and permits pivotal movement of one part relative to the other. The device is simple to manufacture and assemble, making the connection extremely economical and efficient.

What is claimed is:

1. A device for pivotally securing a lever member having an aperture adjacent one end thereof to an operating rod member and comprising:

a body portion adapted to underlie said lever member;

means formed in said body portion adapted to engage said lever member at said aperture;

side members extending angularly outwardly from said body portion and having rod receiving apertures formed therein, said apertures being so located as to clamp said lever between said rod and said body portion when said rod is received therein, said apertures being so located as to require resilient deflection of said side members toward each other to bring said apertures into rod receiving alignment and to rigidly engage said rod upon return of said side members toward their original position.

2. The device set forth in claim 1 wherein said means in said body portion adapted to engage said lever arm includes a depression formed out of said body portion and receivable in said aperture in said lever member.

3. The device set forth in claim 1 wherein said means in said body portion adapted to engage said lever arm includes a stud member rigidly secured in said body portion and receivable in said aperture in said lever member.

4. A lever member to rod member connection comprising:

a lever member having an aperture adjacent one end thereof;

a rod member overlying said lever member at said aperture;

a spring member having a body portion and side members extending angularly therefrom;

means formed in said body portion received in said aperture in said lever member and permitting pivotal movement of said lever member relative to said body portion;

said side members having apertures therein and receiving said rod member transversely of said lever member, said apertures being located as to retain said lever member between said body portion and said rod member, said apertures being located so as to require deflection thereof towards each other to bring said apertures into rod receiving alignment to permit assembly and adjustment of said rod member relative to said lever member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,584,105	Lenz	May 11, 1926
1,815,644	Anderson	July 21, 1931

FOREIGN PATENTS

319,880	Great Britain	Oct. 3, 1929