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FLUSH EXTENSION LATCH

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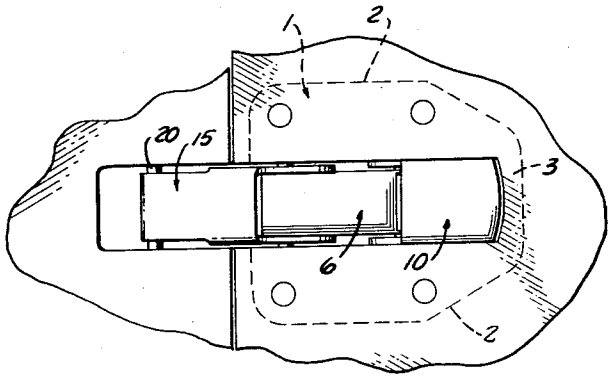


FIG. 1

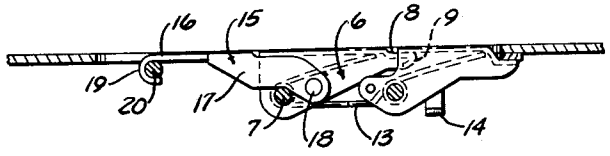


FIG. 2

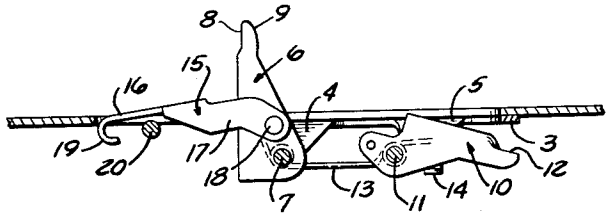


FIG. 3

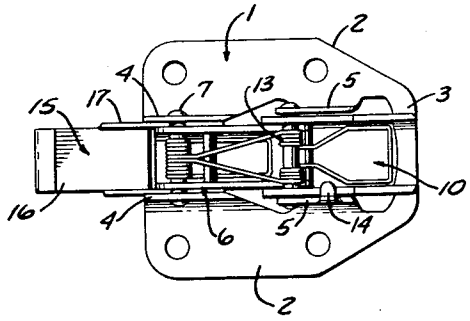


FIG. 4

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FLUSH EXTENSION LATCH

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1 Claim. (Cl. 292—113)

This invention relates to flush extension latches, and included in the objects of this invention are:

First, to provide a latch which utilizes certain features of the latches disclosed in Patent No. 2,476,268, issued July 19, 1949, to Theodore H. Beck and Leslie P. Glick and Patent No. 2,639,178, issued May 19, 1953, to John E. Hogan.

Second, to provide a latch of this type wherein the latch lever is modified to form a handle lever and a catch extension is pivotally connected therewith for engagement with a mating catch bar or pin, the catch extension being so mounted that component structures carrying the latch assembly and the catch bar or pin may be drawn toward each other as the latch assembly is caused to close.

Third, to provide a latch of this type which, when in its closed position, may be flush with the structure in which it is mounted.

With the above and other objects in view, as may appear hereinafter, reference is directed to the accompanying drawings in which:

Figure 1 is a top or plan view of the flush extension latch with the surrounding structure in which it is mounted indicated fragmentarily;

Fig. 2 is a longitudinal sectional view thereof through Fig. 1 with the latch shown in its closed position;

Fig. 3 is a similar longitudinal sectional view showing the latch in its open position;

Fig. 4 is a bottom view of the latch shown in its closed position.

The flush extension latch includes a mounting plate 1 which may be formed of sheet material. The mounting plate is divided longitudinally to form two side flanges 2 connected at one end by a web 3 so as to form a longitudinal slot extending the major length of the plate between the flanges 2. Portions of the material initially within the boundaries of the slot are bent at right angles to the side flanges 2 to form a pair of handle lever bearing lugs 4 at the end of the mounting plate 1 remote from the web 3 and a pair of keeper lever bearing lugs 5 intermediate the ends of the mounting plate.

Journaled between the bearing lugs 4 is a handle lever 6 which may be formed of sheet material and is channel-shaped in cross section. The side flanges thus formed receive a transversely extending journal pin 7, the ends of which are secured in the bearing lugs 4.

The handle lever 6 is capable of moving between a position substantially flush with the side flanges 2 and an approximately right angular position in which the extended end of the handle lever projects upwardly from the mounting plate 1. The extremity of the handle lever 6 remote from its fulcrum end is provided with an offset lip 8 in its upper surface and the extremity of the lever is bent under the offset lip and shaped to form a cam face 9.

Mounted between the bearing lugs 5 is a keeper lever 10 which may also be formed of sheet material and is channel-shaped in cross section. The side flanges thus

formed receive a journal pin 11, the ends of which are secured in the bearing lugs 5. The keeper lever or trigger lever 10 is movable between a position substantially flush with the mounting plate 1 and a downwardly inclined position. The fulcrum end of the keeper lever above the axis of the journal pin 11 is adapted to fit over and retain the offset lip 8 of the handle lever 6. The remote or extended end of the keeper lever 10 is offset, as indicated by 12, to fit over and engage the web 3.

Wrapped around the journal pins 7 and 11 and bearing against the levers 6 and 10 is a spring 13, which is arranged to urge the handle lever to its right angular position shown in Fig. 3 and to urge the trigger lever or keeper lever 10 toward the web 3, as shown in Fig. 2. The construction and arrangement of the spring 13 is more fully described in the previously mentioned Patent No. 2,639,178. To prevent excessive movement of the keeper lever 10, one of the lugs 5 may be extended and bent to form a stop 14.

Hinged to the handle lever 6 is an extension lever 15. The extension lever 15 includes a strap portion 16 having at one end a pair of right-angularly disposed arms 17, which arms are adapted to straddle the sides of the handle lever 6 and are pivotally connected thereto intermediate the ends of the handle lever by a journal pin 18.

The extension lever 15 is movable between a position in which the strap 16 is substantially flush with the handle lever 6 and a position at right angles thereto. The extremity of the extension lever 15 is curved to form a hook 19 capable of engaging a mating bar or pin 20 located in a structure, companion to the structure in which the latch is mounted.

It will be noted, with reference to Figs. 2 and 3, that the journal pin 18 for the catch or extension lever 15 is carried by the flanges of the handle lever 6 adjacent the journal 7 thereof, being so located that, when the parts assume the position shown in Fig. 2, the axis of the journal pin 18 lies slightly above a plane passing through the axes of the journal pins 7 and 11, or toward the mounting plate side thereof. It will also be noted that, in this position, the flanges or arms 17 of the catch lever 15 engage the ends of the journal pin 7, thereby limiting the downward or inward swing of the catch lever 15, and assuring that the latch parts 10, 6 and 15 remain flush with the surface of the structure in which they are mounted whether the two structures are latched together as shown in Fig. 2 with the hook 19 engaging pin 20, or whether the latch parts are moved into their projected position while the two structures to be latched are separated.

Operation of the flush extension latch is as follows:

When the keeper lever or trigger lever 10 is disengaged from the handle lever 6, the handle lever tends to occupy a position at right angles to the mounting plate 1. In such position of the handle lever, the extension lever 15 may project forwardly from the mounting plate for engagement with the mating bar or pin 20. As the handle lever 6 is moved from the position shown in Fig. 3 to the position shown in Fig. 2, the hook end 19 of the extension lever 15 is drawn toward the mounting plate 1 so as to draw the pin or bar 20 and corresponding structure toward the structure in which the latch is mounted. In moving the handle lever 6 towards the closed position shown in Fig. 2, the cam face 9 displaces the keeper lever 10 to allow the offset lips 8 to pass under the corresponding end of the keeper lever so as to be retained thereby.

Any tendency of the handle lever 6 to rotate by reason of tension applied to the extension lever 15 is resisted by the keeper lever 10. However, the axes of the pin or bar 20, journal pin 7, and journal pin 18 may be sufficiently close to a coplanar position that the turning moment on the handle lever is negligible. In order to release the

latch, it is merely necessary to press downward on the trigger or keeper lever **10**, permitting the handle lever **6** to move to the position shown in Fig. 3.

The mounting plate **1** is preferably secured to the underside of the panel, or other structure, in which it is mounted, in which a slot is cut in such panel to accommodate the handle lever **6** and keeper lever **10**. Inasmuch as it is desirable that the surfaces of the levers be as nearly flush with the panel or other surrounding structure as possible, the surfaces of the levers may be offset upwardly from the surface of the mounting flanges **2** to accommodate for the thickness of the material in which the latch is mounted.

While a particular embodiment of this invention has been shown and described, it is not intended to limit the same to the exact details of the construction set forth, and it embraces such changes, modifications, and equivalents of the parts and their formation and arrangement as come within the purview of the appended claim.

What is claimed is:

A flush extension latch, comprising: a mounting plate including coplanar side flanges defining therebetween a longitudinal slot, an end web bordering one end of said slot, and journal lugs bordering the sides of said slot; a retainer lever, handle lever, and catch lever, each formed of sheet material and channel-shaped in cross section to form a cross web and parallel flanges, the cross webs of said levers adapted to be disposed in coplanar tandem relation within and filling said slot; said retainer lever having an offset end adapted to fit under said end web; said handle lever having an offset end adapted to fit under the adjacent end of said retainer lever; journal means pivotally mounting said handle lever and retainer lever between said journal lugs for movement between said coplanar relation and angular positions wherein said handle lever projects outwardly from said mounting plate and said retainer lever is depressed below said end web; spring means urging said handle lever toward its outwardly projecting position and for urging said retainer lever toward its coplanar position; the flanges of said catch lever arranged to straddle said handle lever and pivotally connected thereto by other journal means, carried by said handle lever, pivotally mounting said catch lever, said other journal means being adjacent the journal means for the handle lever and being located relative thereto in such position that, when the catch lever, handle lever, and retainer lever are in their retracted positions, the axis of said catch lever journal means lies toward the mounting plate side of a plane passing through the axes of the handle lever and retainer lever journal means, and the flanges of the catch lever engage the handle lever journal means to limit the movement of said catch lever; the cross web of said catch lever projecting beyond the end of said mounting plate remote from said end web thereof and curved at its extremity to form a hook element, said catch lever being movable between an extended position when said handle lever is in its outwardly projecting position and a retracted position when said handle lever and catch lever are coplanar.

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