June 27, 1944. R. T. ANDERSON ET AL 2,352,465

DOOR LATCH

Filed Feb. 26, 1941 3 Sheets-Sheet 1

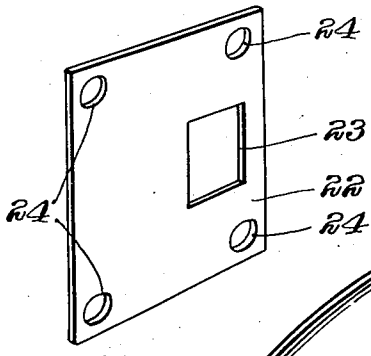


Fig. 3

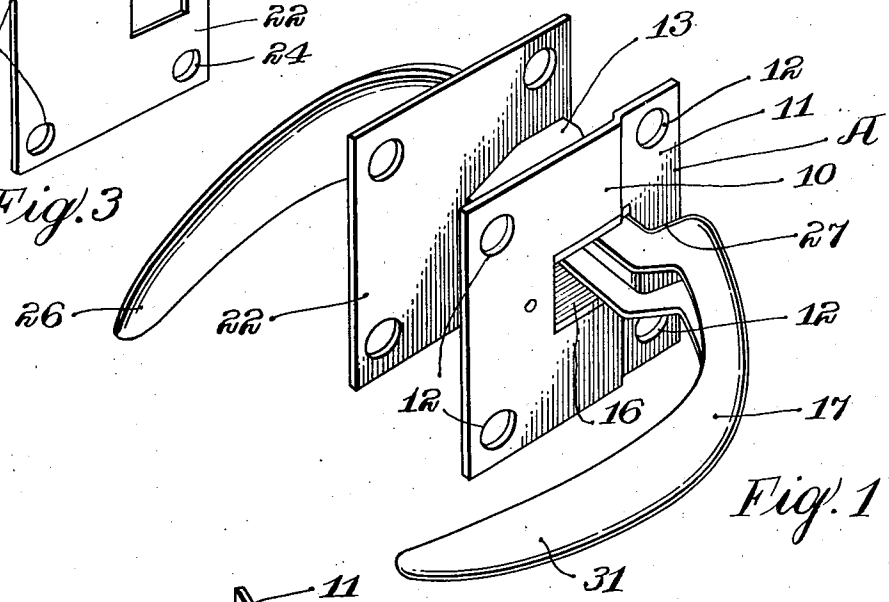


Fig. 1

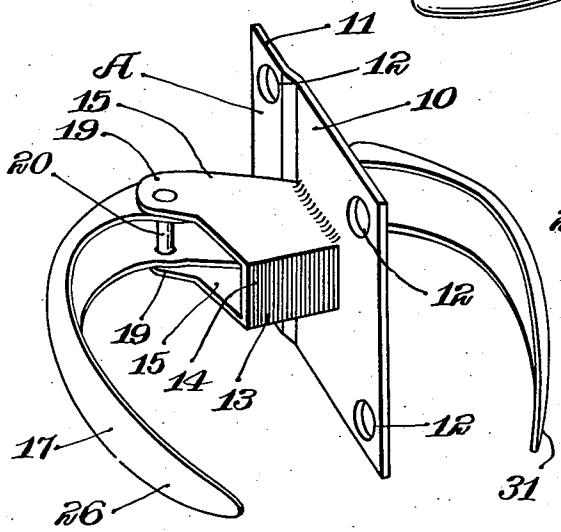


Fig. 2

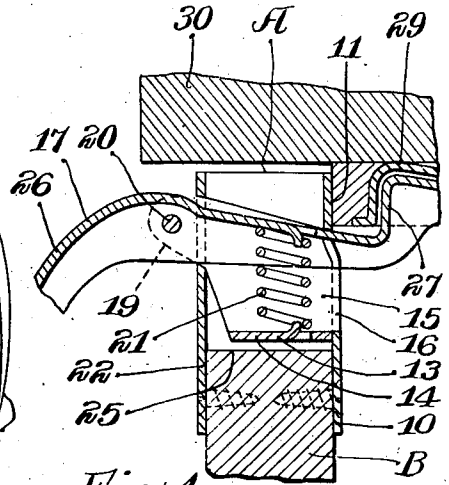


Fig. 4

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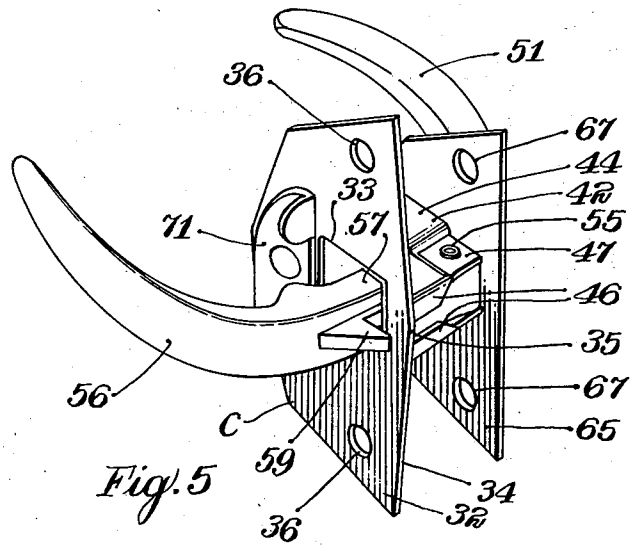


Fig. 5

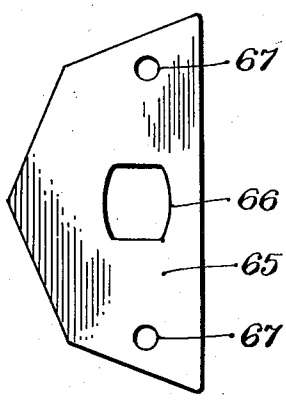


Fig. 7

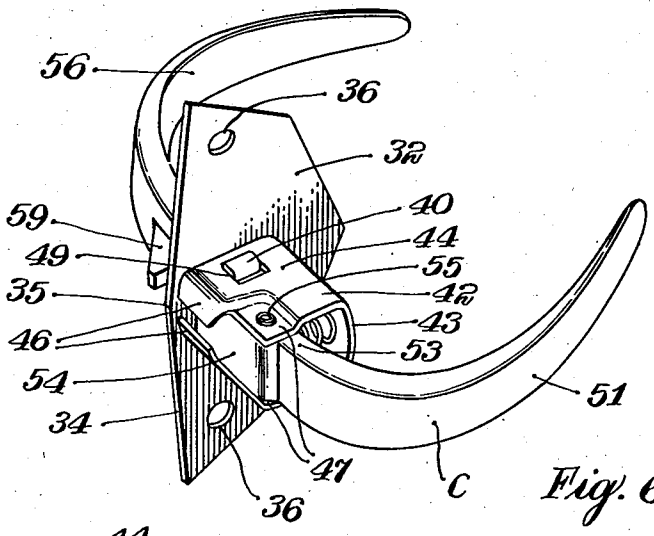


Fig. 6

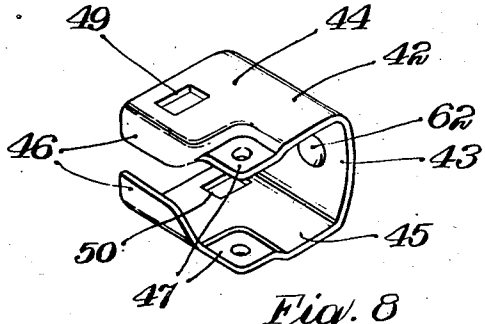


Fig. 8

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DOOR LATCH

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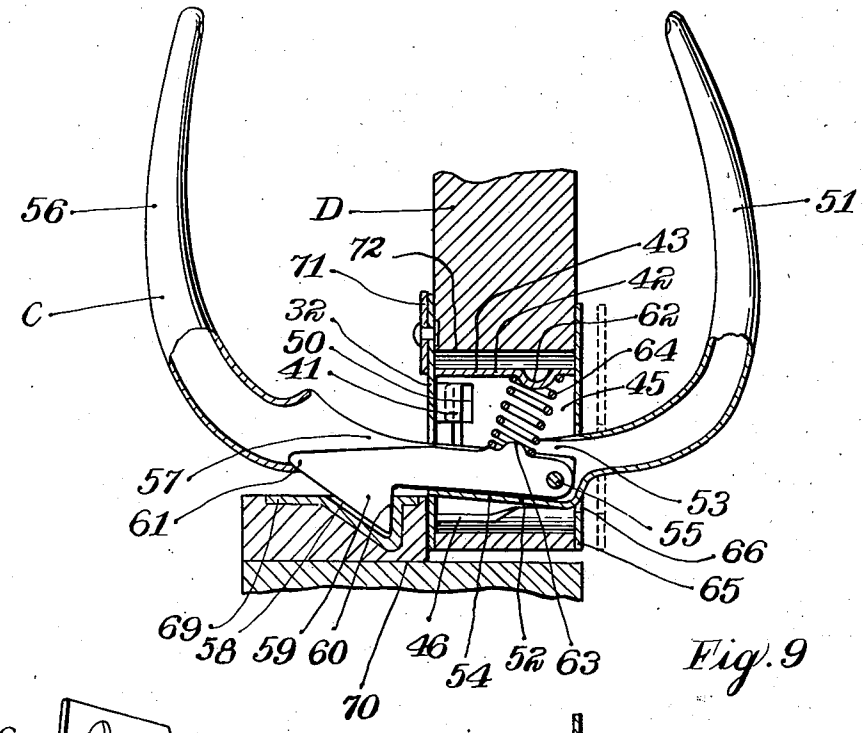


Fig. 9

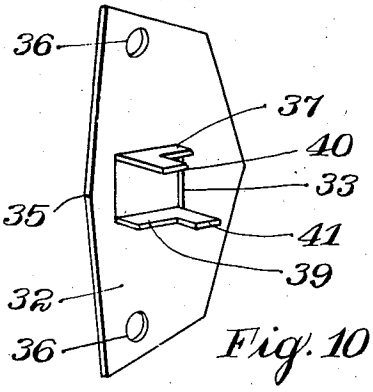


Fig. 10

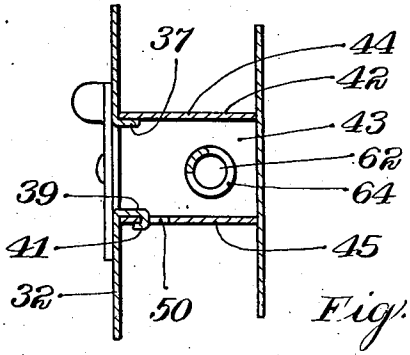


Fig. 11

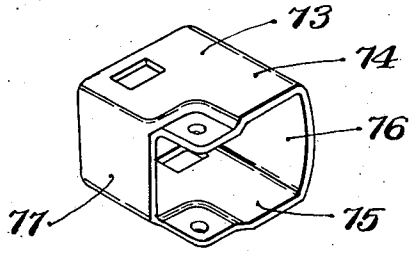


Fig. 12

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UNITED STATES PATENT OFFICE

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DOOR LATCH

Richard T. Anderson, St. Paul, and Carl Olson, Minneapolis, Minn.

Application February 26, 1941, Serial No. 380,568

3 Claims. (Cl. 292—126)

Our invention relates to an improvement in door latches, and more particularly in that type of door latch in which the door may be unlatched by a simple push or pull action.

The same general type of latch which we desire to protect has now been in general use for a period of time. In these previous types of latches, however, certain disadvantages have been found. Certain of the latches have been manufactured with a channel bracket which fits over the edge and adjacent side surfaces of the door. These latches have been extremely popular commercially, but have the disadvantage of fitting only doors of a predetermined thickness. Others of the latches have been made adjustable to fit doors of various thicknesses. Such latches are slightly more costly to manufacture. Furthermore, it has been felt in some instances that a more inexpensive construction could be made by mounting all of the latch construction on one side plate designed to overlie one side surface of the door, and to merely provide a covering plate to be applied to the opposite surface of the door. Such a construction would also have the advantage of fitting in a recess or aperture extending through the door at a point spaced from the edge thereof. Former constructions were designed to fit in a notch cut in the edge of the door.

It is accordingly the object of the present invention to provide a latch of the push or pull type in which all of the operating mechanism is mounted on one side plate overlying one surface of the door, and to provide a covering plate designed to overlie the opposite surface of the door which is adjustable with relation to the first side plate. This construction is designed to fit a door of any thickness within reasonable limits. The covering plate serves mainly to cover the aperture through which the latch mechanism extends. This covering plate also strengthens and reinforces the door adjacent the latch aperture.

A further object of our invention lies in the fact that with the present construction, it is not necessary to cut a notch in the edge of the door. It has been the opinion of some that in cutting a notch in the door edge, the door is considerably weakened. This may or may not be a valid objection; but to avoid any question of such a disadvantage, we now provide a latch which may be inserted through a hole spaced from the extreme edge of the door. Thus the edge of the door remains intact and unbroken.

It is a feature of our invention that the operating handle supporting mechanism may be secured to one of the supporting side plates in a simple and effective manner. This may be by welding or otherwise attaching integrally to the side plate the latch supporting mechanism. If it is desired, however, the latch supporting mechanism may be attached to the side plate by means of ears on the side plate which extend through receiving apertures in the latch supporting mechanism.

It is a further feature of our invention that the supporting side plate and the covering plate may be made in a single piece. Thus these side plates may be used to reinforce the door adjacent the cut away portion thereof. In this manner the door may be reinforced, rather than weakened, by the installation of the latch.

These and other objects and novel features of our invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of our specification:

Figure 1 is a perspective view of one form of our latch, in which all of the operating mechanism is supported by one of the side plates of the latch.

Figure 2 is a perspective view of the other side of the latch from that shown in Figure 1, with the covering plate removed.

Figure 3 is a perspective view of the covering plate.

Figure 4 is a cross-sectional view transversely through the latch shown in Figure 1, and through a door and door frame to which the latch is applied.

Figure 5 is a perspective view of another form of our latch.

Figure 6 is a perspective view of the opposite side of the latch from that illustrated in Figure 5, with the cover plate removed.

Figure 7 is a side elevation view of the cover plate used in connection with the latch of Figures 5 and 6.

Figure 8 is a perspective view of the latch mechanism housing detached from its side plate.

Figure 9 is a transverse section through the latch of Figure 5 applied to a door and door frame.

Figure 10 is a perspective view of the latch mechanism supporting side plate, with the latch mechanism housing removed therefrom.

Figure 11 is a sectional view through the latch mechanism housing, the position of the section being indicated by the line 11—11 of Figure 9.

Figure 12 is a perspective view of a modified form of latch mechanism housing construction.

The latch A illustrated in Figures 1 through 4 of the drawings comprises a side plate 10 de-

signed to overlie a side surface of a door adjacent an edge thereof. The side plate 10 is preferably provided with an offset edge portion 11 which may be recessed into the surface of the door so that the outer surface thereof lies flush with the surface of the door. Apertures 12 are provided through the plate 10 through which screws or other fastening means may be inserted for the purpose of securing the side plate to the door, indicated in the drawings by the letter B.

A channel shaped housing 13 is welded or otherwise affixed to the inner surface of the side plate 10; the base 14 and opposed top and bottom sides thereof 15 being at substantially right angles to the side plate 10. The end of the housing 13 registers with the aperture 16 in the side plate 10. A substantially horseshoe-shaped handle 17 extends through the aperture 16, and the center portion thereof is embraced by the channel housing 13. Ears 19 on the sides 15 of the housing 13 extend away from side plate 10; and a pivot 20 extends through the ears 19 and the handle 17, to pivotally connect the handle to the housing.

In order to urge the handle 17 in one rotative direction, we provide a spring 21 which is interposed between the base 14 of the housing 13 and the handle 17. Movement of the handle in the direction in which it is urged by the spring 21 is limited by the edge of the aperture 16 in the side plate 10.

A cover plate 22 is provided with an aperture 23 through which the handle 17 extends. This cover plate 22 is designed to lie parallel to the side plate 10, and to overlie the opposite side of the door to that covered by the side plate 10. Screw holes 24 permit the insertion of screws or other fastening means to hold the cover plate in place.

It will be noted that, within reasonable limits, the cover plate 22 may be moved closer to, or farther from, the side plate 10. For a thin door, it may be moved toward the side plate 10 until it abuts the channel housing 13. For a thicker door, it may be spaced away from the side plate 10 until the ears 19 are entirely between the plates 10 and 22. Thus, the construction is adjustable to fit doors of various thicknesses.

The latch A is shown inserted in a notch 25 cut into the edge of the door B. It is obvious, however, that a hole may be drilled through the door slightly spaced from the edge thereof, and the end 26 of the handle 17 threaded therethrough, until the housing 13 is entirely within the body of the door B.

The handle 17 is provided with a shoulder 27 designed to engage in a keeper or catch plate 29 in the door jamb or frame 30. As best seen in Figure 4 of the drawings, the spring 21 urges the handle 17 into the catch plate 29; and the shoulder 27 may be removed from the keeper by pulling upon the end 26 of the handle 17, or by pushing upon the end 31 of the handle 17.

In Figures 5 through 11 of the drawings we disclose a slightly different form of our invention. The latch C includes a side plate 32 of any suitable configuration having an aperture 33 therein. The forward edge 34 of the plate 32 is preferably shaped as illustrated in the drawings, with a central forwardly projecting peak 35 opposite the center of the aperture 33. Screw apertures 36 are provided through which fastening screws may be inserted to secure the plate to the door D.

With special reference to Figures 10 and 11 of the drawings, it will be seen that an inwardly extending flange 37 extends along the upper edge of the aperture 33; and a flange 39 extends inwardly from the lower edge of this aperture. Ears 40 and 41 respectively project inwardly from the flanges 37 and 39 for securing the side plate 32 to the latch mechanism housing in a manner which will now be more clearly described.

The latch mechanism housing 42 is best illustrated in Figure 8 of the drawings. The housing 42 comprises a substantially tubular member having a rear side 43, a top side 44, a bottom side 45, and opposed flanges 46 forming a front side. Bearing portions 47 are offset from the top and bottom sides 44 and 45. An aperture 49 is provided in the top side 44 to receive the ear 40; and a similar ear 41 is accommodated by the aperture 50 in the bottom side 45. The housing 42 embraces the flanges 37 and 39, and is held in position thereby. The ear 40 extends upwardly through its corresponding aperture 49, and the end thereof is bent back parallel to the flange 37 to lock the housing 42 to the side plate 32. Similarly, the ear 41 extends downwardly through its corresponding aperture 50, and is bent back parallel to the flange 39 for a similar purpose.

A hollow tubular handle 51, curved as illustrated in the drawings, is provided with a channel shaped end 52. The channel shaped end 52 includes a channel base on the forward edge of the handle, and substantially parallel upper and lower sides 53. The base 54 of the channel end 52 is of such dimensions to space the sides 53 properly to fit neatly between the bearing portions 47 on the housing 42. A pivot pin 55 extends through the bearing portions 47 and through the sides 53 to pivotally connect the handle 51 to the housing 42.

A second hollow tubular handle 56, curved as illustrated in the drawings, terminates in a pair of parallel top and bottom arms 57. These arms are spaced apart a proper distance to fit neatly between the upper and lower sides 53 of the channel end 52 of the handle 51. The pivot pin 55 extends through these arms 57 to pivotally connect the handle 56 to the housing 42.

A latch bolt 59 is provided between the arms 57; and the pivot pin 55 extends through one end of this latch bolt. A shoulder 60 is provided on this latch bolt 59; and a cam surface is provided, indicated by the numeral 58, adjacent this shoulder 60. The free end 61 of this latch bolt 59 extends within the tubular portion of the handle 56, so that pivotal movement of the handle 56 toward the door D will act to pivot the latch bolt 59 in unison therewith.

An indentation 62 is provided on the rear side 43 of the housing 42; and a lug 63 is provided on the rear side of the latch bolt 59. A spring 64 is interposed between the rear side 43 of the housing 42 and the latch bolt 59, being held in place by the indentation 62 and the lug 63.

A covering plate 65 of any suitable configuration is designed to overlie the surface of the door opposite to that over which the side plate 32 extends. This covering plate 65 is provided with an aperture 66 through which the handle 51 extends; and is provided with screw holes 67 to accommodate screws or other fastening means

by which the plate 65 may be attached to the door D.

In operation, it will be seen that a pull upon the handle 51 will pivot this handle outwardly from the door D. The base 54 of the channel end 52 engages the latch bolt 59, pivoting this latch bolt in unison with the handle 51, compressing the spring 64. The latch shoulder 60 may thus be disengaged from the keeper 69 recessed in the door jamb 70. The handle 56 will pivot during this action.

A push upon the handle 56 will act to pivot the handle about the pivot pin 55. The free end 61 of the latch bolt 59, bearing against the tubular portion of the handle, will act to pivot the latch bolt 59 with the handle 56. The handle 51 need not pivot during this action.

If the door D swings shut while neither handle is pivoted out of normal, the cam surface 58 will engage the keeper 69 and pivot the latch bolt 59 independently of either handle. A pivoted lock arm 71 on the side plate 32 may be pivoted into position to block pivotal movement of the latch bolt 59.

The latch C may be attached to a door either by cutting a notch in the edge of the door, or by boring a hole 72 through the door at a point spaced from the edge thereof. In this latter case, the handle 51 may be threaded through the hole 72, and the housing 42 may be inserted entirely into the door. The side plate 32 may then be attached in place.

With the latch mechanism in place, it is only necessary to thread the covering plate 65 over the handle 51, and to attach the same to the door D in opposed relation to the side plate 32. The door D may be so thin that the side cover plate 65 abuts the end of the housing 42, or may be of considerably greater thickness without affecting the operation of the latch.

In Figure 12 of the drawings we disclose a housing 73 which may be used in place of the housing 42. The housing 73 is identical with the housing 42 with the exception that it is completely tubular, and formed from a hollow tube of material. In this housing 73, the top and bottom sides 74 and 75 are connected by a rear side 76 and a front side 77 into which the handle ends and latch project.

In accordance with the patent statutes, we have described the principles of construction and operation of our door latch; and while we have endeavored to set forth the best embodiments thereof, we desire to have it understood that these are only illustrative of means of carrying out our invention, and that obvious changes may be made within the scope of the following claims without departing from the spirit of our invention.

We claim:

1. A door latch comprising a side plate having an aperture therethrough, a housing having open ends having one end abutting said side plate, a pair of parallel flanges on said side plate adjacent said aperture engaging said housing to hold said housing in place relative to said side plate, said housing having apertures therethrough adjacent said one end, and ears on said flanges engaging through said apertures to hold said housing to said side plate, and curved handle means extending through said aperture, embraced by said housing, and pivotally connected thereto.

2. A door latch comprising a side plate having an aperture therethrough, a housing having open ends and having one open end abutting said side plate adjacent said aperture, flanges bent from the body of said side plate along the upper and lower edges of said aperture, said flanges engaging within said housing for holding said housing in place, apertures through said housing near said one end thereof, and ears on said flanges extending through said apertures in said housing to hold said housing to said side plate; curved handle means extending through said aperture in said side plate and embraced by said housing, and means pivotally connecting said handle to said housing.

3. A door latch comprising a side plate having an aperture therethrough, said aperture having opposed substantially parallel flanges bent from the body of said side plate and extending at substantially right angles thereto, ears on said flanges in offset relation, a housing having open ends one of which is secured in abutting relation to said side plate, offset apertures in said housing through which said ears are bent to hold said housing against, and in proper position with relation to, said side plate, a curved handle extending through said aperture in said side plate and embraced by said housing, pivotally secured to said housing.

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