Feb. 23, 1943. C. OLSON 2,311,685

DOOR LATCH

Filed Feb. 12, 1940 2 Sheets-Sheet 1

Fig. 1

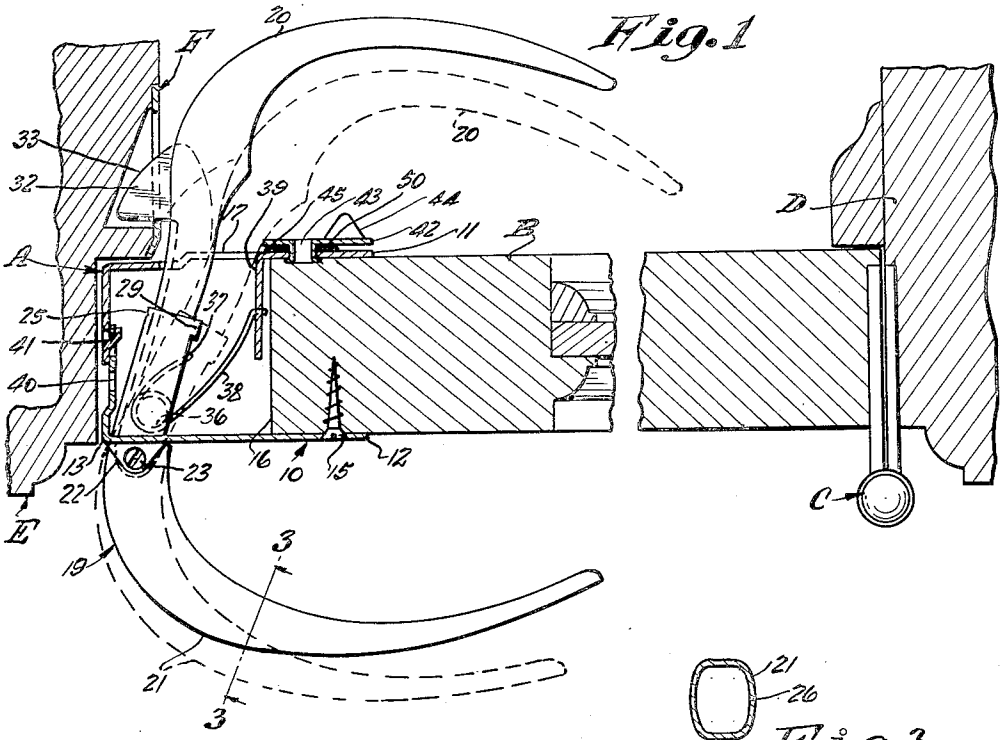


Fig. 3.

Fig. 2

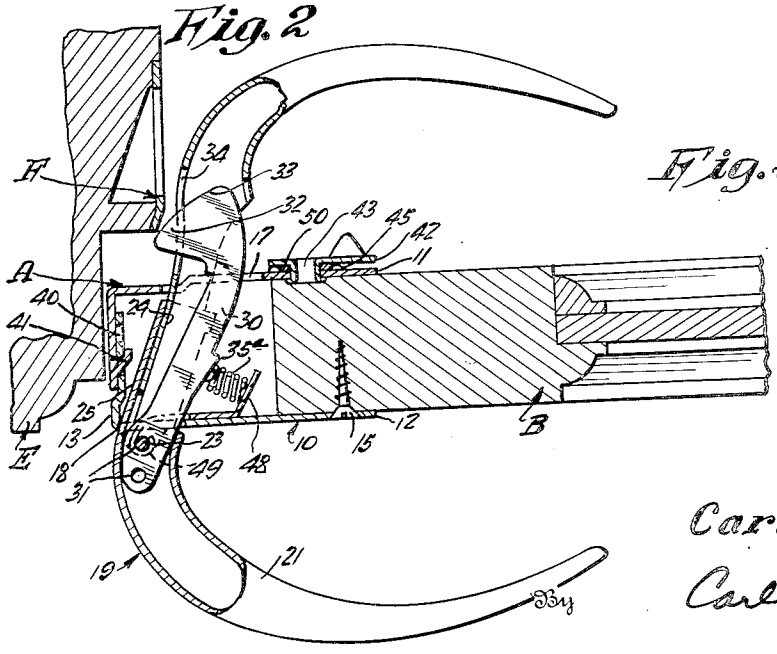
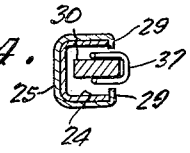


Fig. 4.



Inventor

Carl Olson

Carlson & Hayle

Attorneys

Feb. 23, 1943. C. OLSON 2,311,685

DOOR LATCH

Filed Feb. 12, 1940 2 Sheets-Sheet 2

Fig. 5

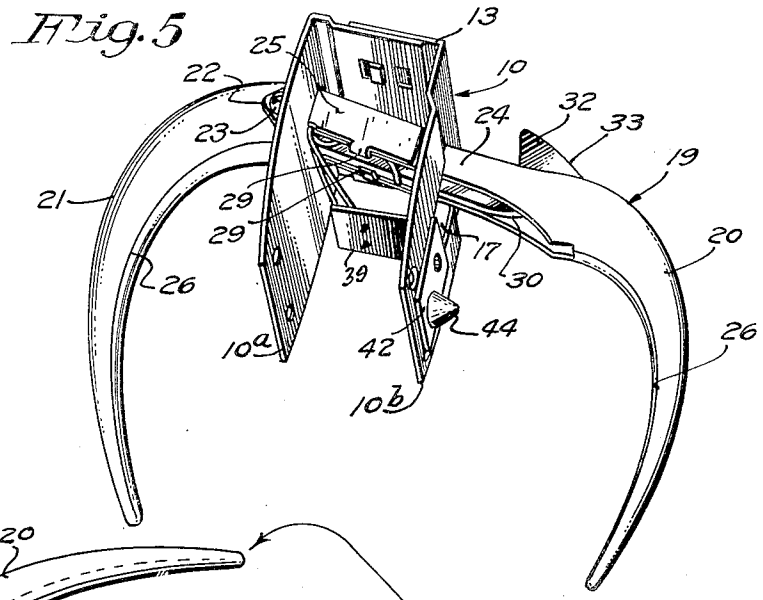
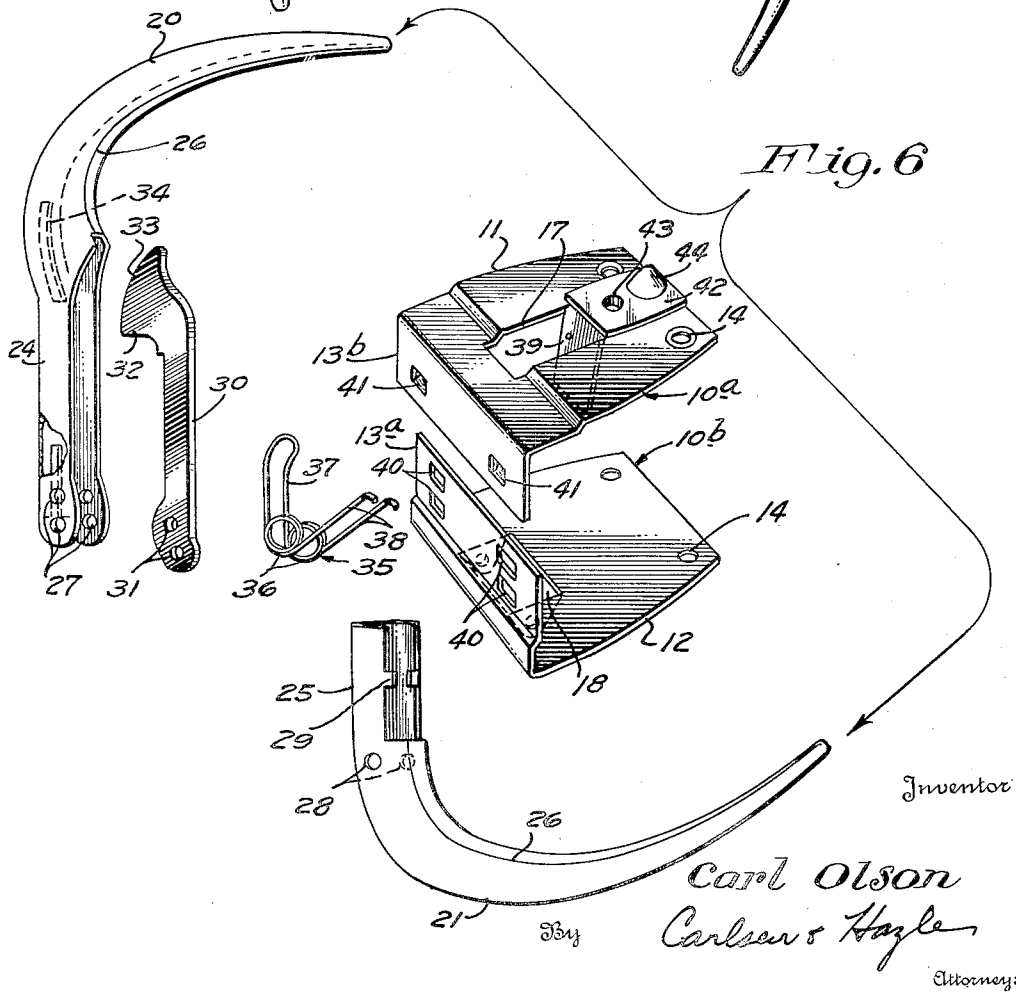


Fig. 6



Inventor

Carl Olson

By Carlson & Hazle

Attorneys

Patented Feb. 23, 1943 2,311,685

UNITED STATES PATENT OFFICE

2,311,685

DOOR LATCH

Carl Olson, Minneapolis, Minn., assignor to Wright Products, Inc., Minneapolis, Minn., a corporation of Minnesota

Application February 12, 1940, Serial No. 318,545

11 Claims. (Cl. 292—126)

My invention relates generally to improvements in door latches particularly suitable for use upon screen and storm doors, but useful as well on other forms of closures.

The invention has particular reference to door latches of that type in which a curved handle is pivoted to the door with portions extended both inwardly and outwardly of the door. The latching mechanism is such that a push on the handle from the inside of the door will unlatch and swing the door outwardly, while a pull on the handle from the outside will both unlatch and open the door. The single action of either pushing or pulling upon the handle to move the door in normal manner will thus serve also to unlatch the door without other manipulation of the handle.

All door latches of this kind with which I am familiar have employed a hook or dog upon the inner handle portion to engage a keeper in the door frame, and as a result the handle has been required to oscillate when closing the door to enable the parts to lock. Furthermore, such an arrangement requires that the inner handle portion curve near the door frame, resulting in an undesirable handle form. My invention has, therefore, as its primary object the provision of a door latch in which the handle carries a movable latch member, spring mounted by the same spring that returns the handle to normal position after each operation, and which member may move independently of the handle as it meets and engages the keeper as the door is closed. In opening the door, however, this latch member moves with the handle to clear the keeper. This construction obviates the necessity of the handle swinging when closing the door and allows the handle to stand further away from the door frame in position for more convenient manipulation.

Another object is to provide a door latch in which the latching member, by virtue of the pivot position of the handle, stands at an angle which will prevent it working out of the keeper when a push or pull is exerted on the door itself.

A further object is to provide a door latch of this kind in which the handle, instead of being cast in one piece as is customary, is made in two adjustably connected sections, each of which is formed up from sheet material, thus considerably reducing the cost of manufacturing the handle.

Another and important object of my invention is to provide a door latch including as its main supporting and mounting element a bracket member which may be conveniently fastened to the door and which is adjustable to fit doors of conventional thicknesses.

A further object is to provide a door latch of this kind carrying at its inner side a safety lock member which is mounted in an extremely effective manner and which may be swung into position to engage both the handle and the latch member to prevent either or both from being manipulated from outside the door to clear the keeper.

These and other more detailed and specific objects will be disclosed in the course of the following specification, reference being had to the accompanying drawings, in which—

Fig. 1 is a cross section through a door and fragments of the adjacent door frame, showing my improved latch in place and indicating, in dotted lines, the handle movement to unlatch the door.

Fig. 2 is a similar view, with handle parts in section, showing the door in act of closing and indicating the independent action of the latch member, this view also showing a modified arrangement of the latch spring.

Fig. 3 is a cross section through the handle, along the line 3—3 in Fig. 1.

Fig. 4 is a cross section through meeting ends of the handle sections, showing also a cross section through the latch member and a portion of the spring associated therewith.

Fig. 5 is a perspective view of the latch removed from the door.

Fig. 6 is a composite perspective view of the various main parts of the latch in separated form.

Referring more particularly and by reference characters to the drawings, A represents generally my improved latch mounted upon a door B hinged at C to one side D of the door frame to swing toward and away from the opposite side E of the frame. This door may of course be of any well known type or kind. A keeper F is mounted and recessed in the frame E to be engaged by the latch for holding the door closed.

The latch itself comprises a mounting member, bracket, or channel 10 of substantially U-shaped form having spaced sides 11 and 12 to fit over inner and outer faces of the door B adjacent its free edge, and a bight 13 to span said free edge, the sides having openings 14 to pass screws 15 for mounting the latch on the door. The door edge is cut out as indicated at 16, to afford working space within member 10 and the sides 11—12 are of course of such size as to wholly conceal this opening.

The sides of the member 10 have openings

17—18 to receive and clear the latch handle shown generally at 19. This handle is arcuate or substantially horseshoe shaped form and, when mounted with its central portion through the mounting member 10, provides inner and outer handle sections or levers 20 and 21. Ears 22 are struck out from the outer side 12 at upper and lower margins of the opening 18 therein and are apertured to receive a pivot pin or screw 23 which extends pivotally through the handle to mount the same for oscillating movement with respect to the door and frame.

The handle 19 is made in two sections having the curved portions constituting the aforesaid inner and outer handle levers 20 and 21 and relatively straight meeting end portions or shanks 24 and 25. These parts are formed up from sheet material and the portions 20 and 21 are rolled to a hollow shape with the seams 26 turned toward the door, while the shank portions 24 and 25 are channeled or U-shaped in cross section. In assembly the shanks 24 and 25 are telescopically related and are retained in relative engagement by openings 27 and 28 in their respective ends which, when brought into registry, receive the pivot pin 23. The shank 24, which is longer, has spaced pairs of the openings 27 so that the effective length of the medial portion of the handle may be varied by selective registry of these openings with the pin, for a purpose which will hereinafter appear. The outer shank 25 carries lugs 29 which are turned inwardly over the inner shank 24 to prevent the two sections of the handle from jackknifing about the pin 23.

A latch member 30 is mounted within the handle section or lever 20 with one end pivoted, as by either of spaced openings 31, upon the pin 23. The inner, free end of this latch member has a hook 32 adapted to engage the keeper F and has a nose or cam face 33 to slide over the outer edge of the keeper as the door closes. In this action the latch member oscillates about its pivot connection to the pin 23. The handle has an elongated slot 34 to clear this hooked end of the latch member, and the movement of the latch toward the keeper F is limited by engagement with an outer margin of this slot.

A wire spring 35 is provided and has spaced torsional coils 36 which may be fitted into the telescoped shanks 24—25 of the handle at opposite sides of the latch member 30. The bight end 37 of the spring then straddles the latch member, while the free legs 38 hook into and bear upon suitable apertured ear 39 which is punched inwardly from the bracket side 11 as the opening 17 is formed. The spring is thus so mounted that it yieldably resists the movement of the latch member 30 away from the keeper F and also resists swinging movement of the handle such as would move the latch member in this same direction.

In lieu of this torsional spring 35 I may employ an expansion coil spring 35*a* which, as shown in Fig. 2, is braced between the latch 30 and a small bracket 48. Both the latch and bracket have small bosses to retain the spring in position to resist unlocking movement of both the latch and the handle, and the bracket may be retained in place by hooking its end 49 around the pivot pin 23 as shown.

In operation it will be readily evident that a push on the inner handle lever 20, or a pull on the outer handle lever 21, will oscillate the handle on the pivot 23 swinging the hook 32 of the latch member out of engagement with the keeper F so that a continuation of either the pushing or pulling force may open the door. The spring 35 or 35*a* of course returns the handle to normal position when released, said return movement being limited by engagement of the handle with the margin of opening 17. As the door closes the nose 33 of the latch member will cam over the keeper F until the hook 32 springs back to latching position. This movement of the latch member causes no corresponding swinging movement of the handle since the latch is freely mounted with respect to the handle and as a result there is no need, as when closing the door from the outside, to pull upon the handle while pushing to close the door. Also as will be noted, the inner handle lever 20 may stand further clear of the frame E than is the case when the handle itself engages the keeper.

Attention is directed to the fact that the pivot pin 23, about which both the handle 19 and latch member 30 oscillate, is located as far as possible toward the outer or free edge of the door spanned by the portion 13 of the latch. As a result of this condition the latch member stands normally in a "cocked-back" or oblique angle relative to the arcuate path through which the door moves so that the pull upon the latch, should it be attempted to open the door without unlatching it, will be directed against the locking face of the latch hook 32 in such manner as to cause the hook to work inward on the keeper. It is thus manifestly impossible for the latch to be worked clear of the keeper by a push or pull on the door itself, and the spring tension need not be depended upon to maintain the latching condition, as would be the case were the pivot 23 located further to the right (in Figs. 1 and 2) away from the free edge of the door. This is an important feature of my invention.

Another important feature of my invention is the adjustment of the latch to doors of various thicknesses. To accomplish this I make the mounting member 10 in two complementary sections or pieces referred to in Fig. 6 as 10*a* and 10*b*, with bight or base portions overlapping to form the bight 13 across the vertical free edge of the door. The outer portion designated at 13*a* has spaced pairs of slots 40 while the inner portion has a pair of lugs or teeth 41 punched inward. These lugs may be engaged in either pair of the slots 40 to retain the sides of the mounting member in either of two differently spaced positions. As these adjustments are made the pin 23 is inserted through the proper openings 27 and 31 in the handle and latch member in order to accommodate the bight portion of the handle to the thickness or spacing between the sides of the mounting member and maintain the proper relative position of the parts. The latch is shown as mounted on a thick door in Fig. 1 and as reduced or adjusted to a thinner door in Fig. 2 to clearly bring out this feature. The bight portion 13*a* is inset as shown to bring the lapped portions into line in their assembled relation.

A safety lock member 42 is pivotally mounted on the inner side 11 of the latch and normally stands clear of the opening 17 to permit free operation of the handle. However, when this member is rotated through one hundred eighty degrees (180°) its longer end will contact the handle and the latch member 30 thus preventing either from swinging to clear the latch from the keeper F as will be understood. The latch member is pivotally mounted by a hollow rivet 43 through the bracket side 11 and has a boss 44 formed out-

ward on its longer end as an aid in manipulating it to locking and unlocking positions. A spring washer 50 and points or detents 45 punched out from the side 11 engage the member to aid in holding it in adjusted positions and prevent it from contacting and scratching the adjacent face of the side 11.

It is understood that suitable modifications may be made in the structure as disclosed, provided such modifications come within the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. In a door latch, a latch handle pivotally mounted through the door, the said handle being formed from sheet material in inner and outer sections and curved to provide inner and outer handle levers, shank portions of substantially U-shaped cross section extended from the said handle levers and telescopically arranged, and lugs turned from one shank over edges of the other to retain the shanks in alignment.

2. A latch for a door swingably mounted in a frame, comprising a handle extending through the door for actuation at either side and pivotally mounted for movement in a horizontal plane at an inner end toward and away from the door frame, and a latch member pivotally connected to the handle for movement therewith away from the frame in unlatching the door and for movement independently of the handle in latching the door, that portion of the handle supporting the latch member being of channel formation with the latch member housed within said channel formation and with the frame-engaging portion of the latch member projecting laterally of the handle.

3. Latch mechanism for a door swingably mounted in a frame, comprising a pivoted latch handle extending through the door for manipulation from either side thereof and for movement at its inner portion toward and away from the frame in a horizontal plane, a latch member pivotally mounted on the handle and having a hook adapted to engage a keeper on the frame, the said latch member being movable with the handle to clear the keeper and being movable independently of the handle to return to latching engagement with the keeper, that portion of the handle supporting the latch member being of channel formation with the latch member housed within said channel formation and with the frame-engaging portion of the latch member projecting laterally of the handle.

4. Latch mechanism for a door swingably mounted in a frame, comprising a latch handle extending entirely through the door for movement at one end portion about a vertical pivot toward and away from the frame, a latch member pivotally mounted on the handle for independent movement about the pivot axis of said handle, and having a hook adapted to engage a keeper on the frame, the said latch member being movable with the handle to clear the keeper and being movable independently of the handle to return to latching engagement with the keeper, that portion of the handle supporting the latch member being of channel formation with the latch member housed within said channel formation and with the frame-engaging portion of the latch member projecting laterally of the handle.

5. Latch mechanism for a door swingably mounted in a frame, comprising a latch handle extending through the door and pivoted for movement at its inner portion toward and away from the frame about a vertical axis, a latch member pivotally mounted on the handle for movement about the pivot axis of said handle, and having a hook adapted for latching engagement with the frame, the said latch member being movable with the handle to clear the keeper and being movable independently of the handle to return to latching engagement with the keeper, and a spring arranged for yieldably resisting movement of both the handle and latch member, that portion of the handle supporting the latch member being of channel formation with the latch member housed within said channel formation and with the frame-engaging portion of the latch member projecting laterally of the handle.

6. A latch for a door swingably mounted in a frame, comprising a handle operable from either side of the door and pivotally mounted in the door for horizontal movement at an inner end toward and away from the door frame, and a latch member pivotally connected to the handle for movement therewith away from the frame in unlatching the door and for movement independently of the handle in latching the door, and a safety lock on the inside of the door movable to engage both the handle and latch member to prevent either from moving away from the frame, that portion of the handle supporting the latch member being of channel formation with the latch member housed within said channel formation and with the frame-engaging portion of the latch member projecting laterally of the handle.

7. A latch mechanism for a door swingably mounted in a frame, comprising a generally U-shaped latch handle pivotally supported through the door for movement at one point toward and away from the frame and in a plane perpendicular to the adjacent edge of the door, a latch member pivotally mounted on the handle for movement about the pivot axis of the handle and extending substantially parallel with the base portion of the handle for latching engagement with the frame, that portion of the handle supporting the latch member being of channel formation with the latch member housed within said channel formation and with the frame-engaging portion of the latch member projecting laterally of the handle.

8. A latch mechanism for a door swingably mounted in a frame, comprising a handle pivotally supported through the door and having a recessed inner end portion movable about the pivot toward and away from the frame, and a latch member pivotally connected to the handle for movement about the pivot axis of the handle, the said latch member being disposed within the recessed portion of the handle and movable toward and away from latching engagement with the frame.

9. A latch mechanism for a door swingably mounted in a frame, comprising a handle extending through the door and pivotally supported in the door and having an inner end portion movable about the pivot toward and away from the frame, the said inner end portion of the handle having a recess extending lengthwise thereof and having an opening in the side adjacent the frame, and a latch member movably mounted in the recess and having a hook portion extending through the said opening for latching engagement with the frame.

10. A latch mechanism for a door swingably mounted in a frame, comprising a pivoted handle extending through the door for manipulation at either side thereof and having an inner end portion movable about the pivot toward and away from the frame, the said inner end portion of the

handle having a recess extending lengthwise and having an opening in the side adjacent the frame, a latch member mounted in the said recess and having a hook portion extending through the said opening for latching engagement with the frame, and the said latch member being pivotally supported for independent swinging movement about the pivot axis of the handle.

11. A door fastening means comprising a supporting frame, a handle pivotally supported thereby, said handle being formed with an opening outside said frame, a latch bolt projecting along said handle with its outer end extending laterally through the opening in the handle, and spring means holding said latch bolt in lengthwise engagement with the handle with its end projecting through the opening in the handle, the handle through this engagement with latch bolt constituting a stop limiting the movement of the latch bolt through the handle.

CARL OLSON.