

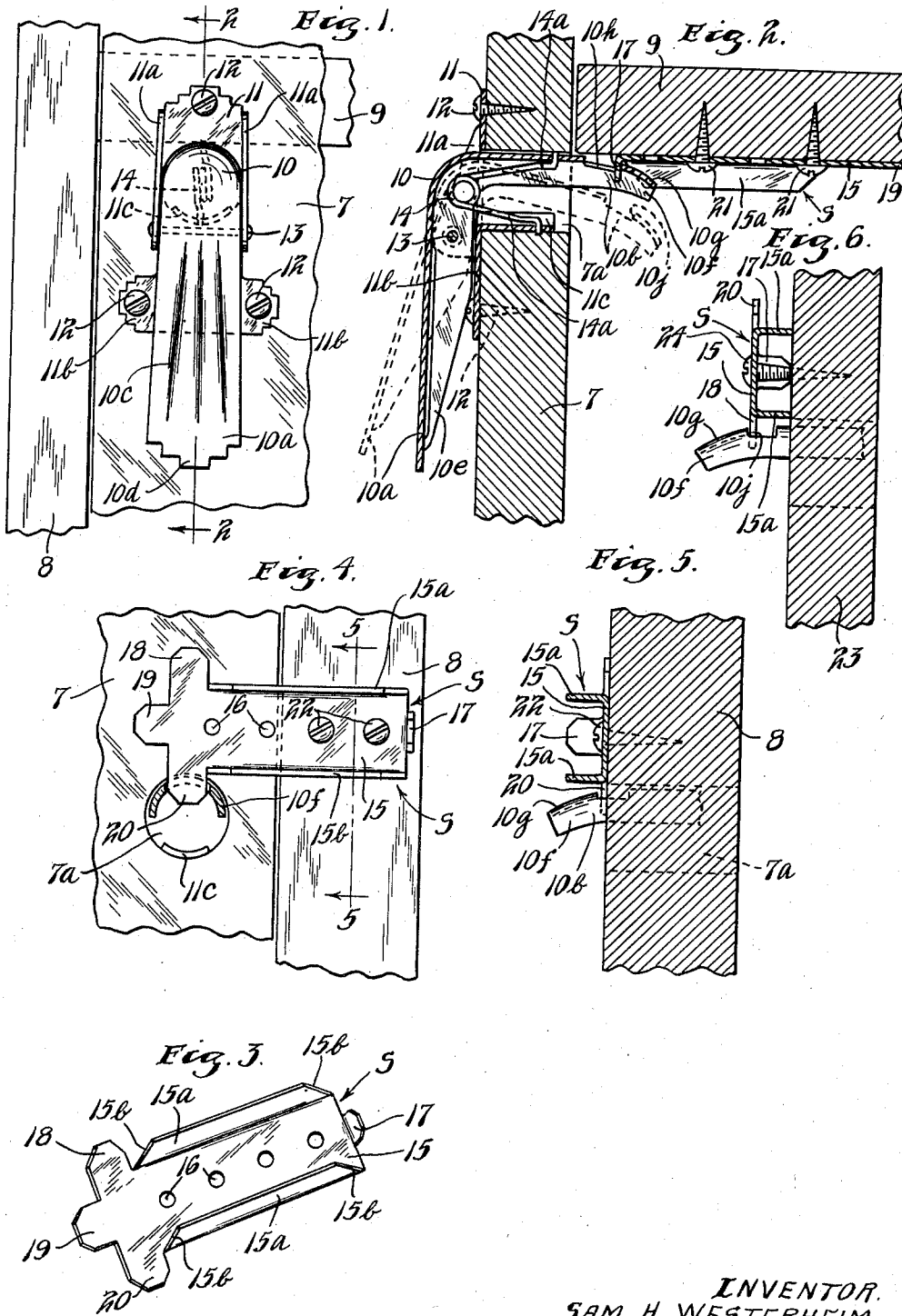
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LATCH FOR CLOSURE

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LATCH FOR CLOSURE

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1 Claim. (Cl. 292—340)

My invention relates to latches for use on doors, drawers and the like.

An object of my invention is to provide a latch having a stop element adapted to be fixedly mounted in various positions relative to the shiftable part of the latch and yet properly cooperate therewith.

Another object is to provide such a latch having an operating element movable to disengage the latch in the same direction as the direction of opening movement of a closure with which the latch is associated.

Still another object is to provide such a latch wherein movement of a shiftable portion thereof, in a direction parallel to the face of a closure with which the latch is associated, out of mutual engagement with a fixed stop element is accompanied by movement of said shiftable element rearwardly relative to the stop element.

A further object is to provide such a latch which is particularly easy to operate and which is of simple, compact, light, rugged and inexpensive construction.

These and other objects and advantages of the invention will more fully appear from the following description, made in connection with the accompanying drawing, wherein like reference characters refer to the same or similar parts throughout the views, and, in which:

Fig. 1 is a front view of an embodiment of my invention operatively associated with a broken-away portion of a door and shelf of a cabinet;

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1 as indicated by the arrows;

Fig. 3 is a perspective view of the stop member of the latch of Figs. 1 and 2;

Fig. 4 is a rear broken-away view of a relatively thick door and door frame having my stop member associated therewith in a manner somewhat different than that of Figs. 1 and 2;

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 4 as indicated by the arrows; and

Fig. 6 is a view similar to Fig. 5 except that my latch member is positioned differently to adapt it for use in association with a relatively thin door and door frame.

Referring to the drawing, and particularly to Figs. 1 and 2, an embodiment of my invention is shown in operative association with a door 7, a door frame 8 and a shelf 9. The embodiment shown includes a shiftable element comprising a bell-crank having one arm 10a disposed forwardly of and parallel to the door 7 and projecting downwardly from the junction between the arm 10a and the remaining arm of the bell-

crank. The door 7 is provided with an aperture 7a through which the remaining arm 10b of the bellcrank projects to a point a moderate distance behind the door 7. The arm 10a which is widened somewhat toward its lower end is provided with corrugations 10c and has a lower end 10d stepped as shown for the purpose of rendering the arm 10a more or less ornamental. The arm 10a is of channel shaped cross section because of the rearwardly projecting flanges 10e formed thereon.

Means is provided for swingably connecting the bellcrank 10 with the door 7 at a medially disposed point on the arm 10a so that the bellcrank 10 is swingable in the plane occupied thereby. A plate 11 having parallel vertically extending and forwardly projecting flanges 11a thereon is suitably secured to the front face of the door 7 as by means of screws 12. Apertured ears 11b are provided on the plate 11 to accommodate two of the fastening screws 12 and the upper end of the plate 11 is apertured to accommodate a third one of the screws 12. A pivot pin 13 is provided and extends through aligned apertures in the medial portions of the flanges 10e of the arm 10a and through the lower portions of the flanges 11a carried by the plate 11. The pivotal connection thus provided enables the bellcrank 10 to be rotated in the plane occupied thereby. Since the pivotal axis of the bellcrank 10 is disposed in the medial portion of the arm 10a instead of at the junction between the respective arms 10a and 10b forward movement of the arm 10a will cause the free end portion of the arm 10b to move not only downwardly but also somewhat rearwardly to provide an advantage to be explained later. The plate 11 is provided with a rearwardly bent portion 11c thereof extending along the lower limits of the aperture 7a. The aperture 7a is preferably circular in cross section and the rearwardly projecting portion 11c of the plate 11 is arcuate in cross section as shown. The plate 11 is, of course, apertured to accommodate the rearwardly projecting arm 10b of the bellcrank 10. The rearwardly projecting arm 10b is of arcuate substantially U-shaped cross section and the free end portion 10f is curved downwardly to provide a curved camming surface 10g. Just inwardly of the camming surface 10g the arm 10b is provided with an aperture 10h which is defined at the rear side thereof by a surface 10i constituting an abutment element.

A helical spring 14 is provided to yieldingly urge the bellcrank 10 in a counterclockwise di-

rection as viewed in Fig. 2. The spring 14 includes arms 14a, the outer ends of which are received in suitable apertures in the bellcrank arm 10b and the rearwardly projecting portion 11c of the plate 11.

For cooperating with the above described portion of my latch structure I provide a universal stop member adapted to cooperate with the abutment element 10g of the bellcrank arm 10b. Referring to Fig. 3 my stop member S includes a preferably rectangular plate 15 carrying on the longitudinal edges thereof flanges 15a, so that the major portion of the stop member S is of channel shaped cross section. The flanges 15a may be diagonally cut away at the ends 15b thereof as shown if desired. A series of spaced apertures 16 extending longitudinally of the plate 15 are provided to accommodate screws by means of which the plate 15 may be secured to various objects. At the right-hand end of the plate 15 as viewed in Fig. 3 a projecting element 17 is formed, this element being bent to project in a direction substantially normal to the plate 15 and in the same direction from the plate 15 as the flanges 15a. The remaining end of the plate 15 is extended beyond the left-hand ends of the flanges 15a and carries on its respective end and side edges three projections 18, 19, and 20 which lie in the same plane as the plate 15. The plate 15, flanges 15a and the projections 17, 18, 19, and 20 are preferably formed integrally of suitable material such as sheet metal. The previously described bellcrank 10 and plate 11 are also preferably formed of material such as sheet metal.

In Fig. 2 my stop member S is shown attached to the lower side of the shelf 9 by means of screws 21. The position of the stop member S is such that the projection 17 is situated for cooperation with the arm 10b and abutment element 10g of the bellcrank 10. The latch is shown in the latched position. To open the door 7 the user of the device may insert a finger behind the arm 10a of the bellcrank 10 and by applying pressure move the bellcrank toward the dotted line position thereof shown in Fig. 2. In movement of the bellcrank 10 from the full line to the dotted line position the abutment element 10j moves not only downwardly to become disengaged from the projection 17 of the stop member S but also moves rearwardly to relieve frictional engagement between the abutment element 10b and the projection 17. When the bellcrank 10 has been swung to such a position that portions of the arm 10b strike portions of the door 7 defining the aperture 7a, continued forward pressure applied to the arm 10a will be utilized in opening the door 7. Thus it will be seen that a complete door opening operation may be effected by simply applying forward pressure on the bellcrank arm 10a. The pressure so applied acts not only to release the latch but also to open the door. In closing the door 7 pressure for such purpose may be applied to any portion of the door and the camming surface 10g will engage the free end of the projection 17 to cam the bellcrank 10 toward the dotted line position thereof until the

abutment element 10g has reached a position wherein it is aligned with the rear face of the projection 17. When such position has been reached the spring 14 will return the bellcrank 10 to the latched position thereof shown in Fig. 2.

Fig. 4 shows my latch applied to the door 7 and frame member 8 in a case where a shelf such as the shelf 9 is not available for securing thereto the stop member S. In this case the stop member S is secured to the door frame member 8 by means of screws 22 and is positioned so that the projection 20 is situated for cooperation with the abutment element 10g of the bellcrank 10. The door 7 and door frame 8 are shown as being relatively thick and in this case the plate 15 is attached to the door frame member 8 by means of the screws 22 with the flanges 15b projecting rearwardly from the door frame member 8. This arrangement of the stop member S places the projection 20 in the proper plane for cooperation with the abutment element 10j.

In Fig. 6 my latch is shown applied to a door frame member 23 and a door associated therewith, both of which are relatively thin. In this case the plate 15 is secured to the door frame member 23 by means of screws 24 with the flanges 15a and the projection 17 disposed on the side of the plate 15 toward the door frame member 23 so as to constitute spacing means for positioning the projection 18 in the proper plane for cooperation with the abutment element j.

While my stop member S has been illustrated and described as used in three respective positions thereof relative to the bellcrank 10, it should be apparent that the stop member S may be positioned in still other relations with the bellcrank 10.

The latching and unlatching action of my latch is the same in the arrangements shown in Figs. 4, 5, and 6 as it is in the arrangement shown in Fig. 2. While my latch has been shown in association with a door and a door frame, the latch is equally well adapted for use in connection with a drawer or with various types of closures other than doors.

It is apparent that I have invented a novel, effective easily operated closure latch of simple, compact, light, and inexpensive construction.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

In a latch, the combination with a shiftable abutment element of a keeper structure comprising, a body of channel shaped cross section including a web and a pair of flanges, a portion of said web being constructed for use as a stop to be engaged by said abutment element, said body being attachable to a surface with said web thereagainst or to a surface with the free edges of said flanges thereagainst.

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