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TILTING LATCH FACE

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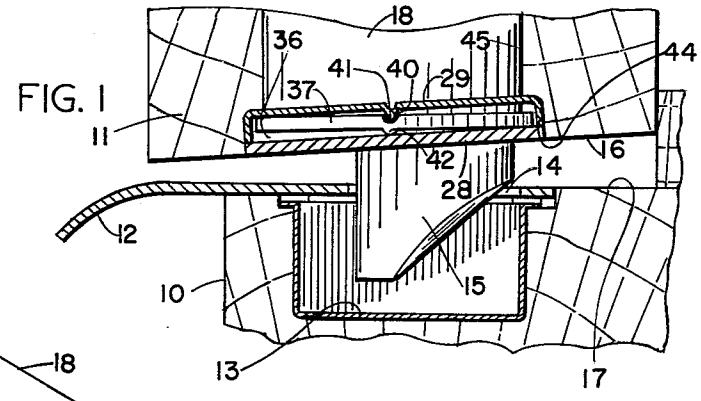


FIG. 1

FIG. 3

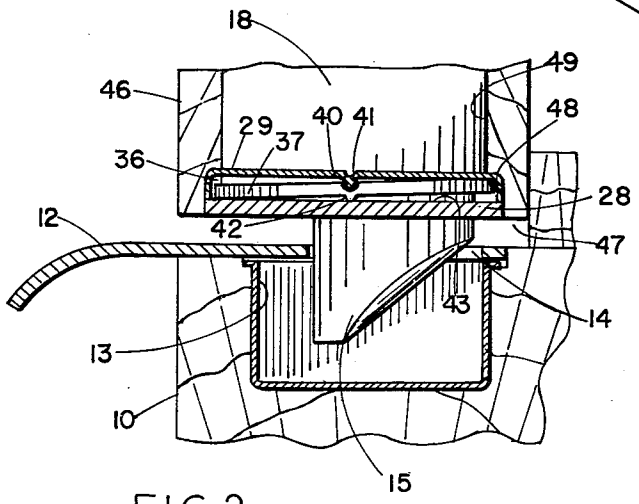


FIG. 2

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TILTING LATCH FACE

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The invention relates to door locks and has particular reference to the part identified as a latch bolt casing containing a reciprocating latch bolt to which a latch face is attached.

It is commonly understood and appreciated that when latch bolts are mounted in a door from the edge, the mounting must be dressed or finished to present a neat appearance by use of one or more plate structures inset into the edge of the door so that the plate is flush and only the latch bolt protrudes.

One common problem which is always present arises from the fact that some doors are beveled at the edge where the latch bolt is inserted. This is particularly true for relatively thick doors in that unless the edge is beveled, considerable clearance must be provided between the edge and the adjacent frame in order to permit the door to swing freely into closed position in the frame. Obviously, the thicker the door, the greater will be the need for a bevel at the edge. Consequently, the latch face plate under thicker door circumstances will need to be tilted to a considerable extent if the latch bolt is to be mounted so as to reciprocate in a position parallel to the face of the door. If an attempt should be made to tilt the axis of the latch bolt to help align the latch face plate, the mechanical connection between the latch bolt and the latch mechanism might not operate properly.

Although sundry expedients have been employed heretofore to permit the latch face plate to be tilted with respect to the axis of reciprocation of the latch bolt, prior devices have had certain objectionable characteristics in that insufficient tilt has been provided or on occasions a flimsy loose construction has been resorted to which has made the resulting installation unsatisfactory.

It is an object of the invention, therefore, to provide a new and improved tilting latch face plate which is permanently affixed to the latch bolt casing in subassembled relationship and which has an ample degree of tilt to accommodate virtually all degrees of bevel in conventional doors.

Another object of the invention is to provide a new and improved tilting latch face plate wherein the face plate structure is a composite structure in which a tilting mechanism is self-contained.

Still another object of the invention is to provide a new and improved latch face plate structure which is compact in its arrangement and simple with respect to the relationship of the tilting parts and which is of such character that installation in a proper manner is greatly facilitated.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a transverse sectional view through the tilting structure of a latch face in an installation where the latch bolt casing is mounted upon a door having a beveled edge.

Figure 2 is a view similar to Figure 1 showing the same tilting latch face construction wherein the latch bolt casing is mounted upon a door having an unbeveled edge.

Figure 3 is an exploded view showing the various parts of the latch face construction and accompanying latch bolt and casing.

In an embodiment of the invention chosen for the purpose of illustration there is shown a door frame **10** in which a door **11** is mounted in conventional fashion, the door being shown in closed position. It will be noted further that the frame is provided with a strike plate **12** and a box **13** having a bolt aperture **14** therein for reception of a reciprocating latch bolt **15**. These portions of the installation are conventional.

The door **11** is a relatively thick door and consequently is provided with a bevel on the edge **16** which faces a face **17** of the frame.

The latch bolt unit, as best seen in Figure 3, consists of a casing **18** having a cylindrical bore **19** extending therethrough for reception of the latch bolt **15**. The latch bolt is a somewhat composite structure including a tail piece **20** which extends entirely through the casing around which is positioned a coiled spring **21**. To hold the spring in proper operating position there is provided a rear spring seat or keeper **22** having a slot **23** therein by means of which it can be applied over the tail piece **20**. The keeper is adapted to rest against a bottom (not shown) in the casing **18**, thereby to provide a stop or shoulder against which the spring **10** presses.

A second spring seat or keeper **24** provided with a slot **25** fits over the opposite end of the tail piece and moreover is contained within a recess **26** in the latch bolt **15**. The keeper **24** accordingly retains the opposite end of the spring **21**.

Those portions of the device which are applied to the edge of the door comprise a face plate **28** and a back plate **29** which are secured together by conventional means (not shown) such as wood screws extending respectively through holes **30** and **31**. The face plate is provided with a latch bolt aperture **32** through which the latch bolt **15** is adapted to pass and a shoulder **33** on the tail piece limits outward motion of the latch bolt.

The back plate **29** has side walls **34** and end walls **35** which form a pocket **36** between the back plate and the face plate. On the casing **18** is a substantially annular flange **37** having flat sides **38** to enable the flange to fit between the side walls **34**, thereby to prevent the latch casing from rotating relative to the back plate **29**. Attention is further directed to the fact that the flange **37** is tilted slightly with respect to the axis of the casing **18**, the tilt being at the rate of about $\frac{1}{16}$ of an inch per inch to accomplish the result desired. The tilted relationship is more readily apparent in Figure 2. By giving the flange a $\frac{1}{16}$" tilt in the direction shown there will be possible a tilt of $\frac{1}{8}$" per inch of the face plate relative to the axis of the latch bolt when in sub-assembled position.

When the face plate and back plate are secured together, the flange **37** is contained between them. To provide fulcrums for the tilting of the plates relative to the flange and the casing **18**, the back plate **29** is provided with a projection **40** on each side in diametrically opposite positions. These projections are adapted to be received within complementary recesses **41** so as to position the flange with respect to the back plate. To further assist in this positioning and to provide a proper tilting fulcrum, the flange is provided with a projection **42** on each diametrically opposite side immediately adjacent the respective recess **41**. The projection **42** is adapted to bear against a rear face **43** of the face plate **28**.

When the device is to be assembled in the edge **16** of a door **11**, an appropriate cut-out **44** corresponding in length, breadth and depth to the combined face plate and back plate is formed at the outermost end of a hole **45**. The assembly is then pressed into position and held there by the screws previously made reference to. When the edge **16** is beveled, as illustrated in Figure 1, the face plate and back plate will be tilted to conform with the slope of the bevel, this tilt being permitted by the depth of the pocket **36**, wherein the tilting motion of the plates with respect to the flange is facilitated by the presence of the projections **40** and **42** previously described.

On those occasions where a thinner door **46** is encountered, having an edge **47** which is not beveled, the device may be mounted in much the same fashion as was described in connection with the door **11**. That is to say, a recess **48** is provided at the outer end of a hole **49** which receives the device in a manner such that the face plate **28** is flush with the edge **47**.

Inasmuch as the edge **47** is at right angles to the axis of the hole **49** and to the opposite faces of the door **46**, the face plate and back plate will still be permitted to tilt to the assembled positions illustrated in Figure 2. This degree of tilt is permitted by the depth of the pocket **36** and the employment of the projections **40** and **42** as fulcrums. It will be readily apparent, therefore, that the tilting latch face structure herein described in detail is adapted with equal facility for attachment to doors having an edge **16** which is beveled and doors having an edge **47** which is unbeveled. There is sufficient permitted tilt of the plates relative to the flange **37** to allow sufficient tilt to accommodate all expected types of installations.

Due to engagement of projections with the recesses on both sides of the flange, the flange at its center point has a substantially fixed position between the plates so that tilting takes place about the projections as a fulcrum.

It will be clear from the foregoing description that a very simple type of tilting face structure is provided which permits of a firm retention of the latch bolt casing and operating parts by the plates but which accord the plates a sufficient freedom of motion to permit automatic adjustment to the bevel of the door edge while at the same time facilitating a dependable and positive installation.

While we have herein shown and described our invention in what we have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of our invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a latch mechanism for attachment to the edge of a door a latch bolt assembly comprising a casing having a bore therethrough for reception of a reciprocatably movable latch bolt, a flange means at the outer end of said casing on diametrically opposite sides and extending at right angles to the exterior of the casing, a back-up plate member on one side of the flange means and a face plate member on the other side of said flange means, spacing means separating said plate members a distance apart in excess of the thickness of said flange means, a first projection means between said back-up plate member and said flange means and a second projection means between said flange means and said face plate member, said projection means forming engagements between said plate members and said flange means and also serving as fulcrum points which enable said flange means to rock whereby to enable said plate members to assume an angle agreeing with the beveled edge of the door.

2. In a latch mechanism for attachment to the bevel edge of a door a latch bolt assembly comprising a casing having a bore therethrough for reception of a reciprocatably movable latch bolt, a flange means at the outer end of said casing on diametrically opposite sides and extending at right angles to the exterior of the casing, a back-up plate member on one side of the flange means and a face plate member on the other side of said flange means, spacing means separating said plate members a uniform distance apart throughout the perimeter of the flange means in excess of the thickness of said flange means, projections separating diametrically opposite upper and lower sides of said flange means from said plate members whereby to provide a tilting engagement between said face members and said flange means enabling said plate members to tilt relative to the axis of said casing and lie flat on the bevel edge of the door without misalignment of the casing.

3. In a latch mechanism for attachment to the edge of a door wherein a bevel may be formed a latch bolt assembly comprising a casing having a bore therethrough for reception of a reciprocatably movable latch bolt, a substantially annular flange member at the outer end of said casing extending at right angles to the exterior of the casing, a back-up plate member on one side of the flange member and a face plate member on the other side of said annular flange member, spacing means separating said plate members a distance apart in excess of the thickness of said annular flange member, said annular flange member having a projection on diametrically opposite upper and lower sides thereof in tilting engagement with an adjacent face of one of said plate members and having a recess on the side of said annular flange member opposite each said projection, the other plate member having a projection on diametrically opposite sides in tiltable engagement with the respectively adjacent recess whereby to enable said plate members to assume an angle relative to the axis of said casing in a position flat on the edge of the door without misalignment of the casing.

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