

April 7, 1953

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2,634,151

LATCH CASING

Filed June 1, 1950

2 SHEETS—SHEET 1

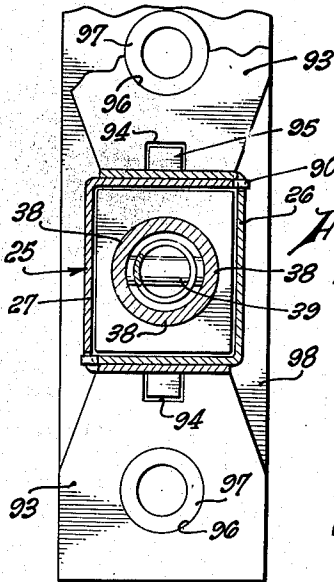


Fig. 1.

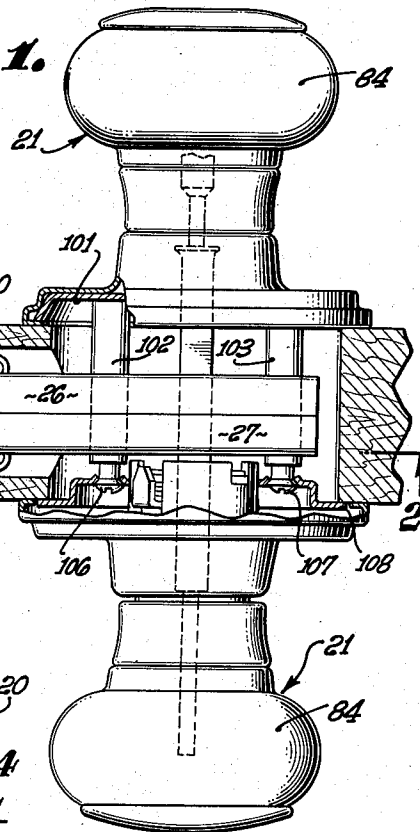


Fig. 6.

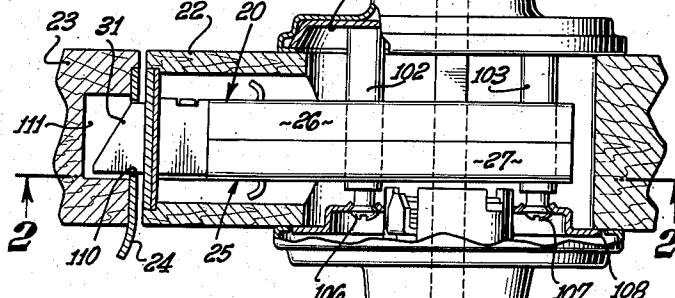


Fig. 2.

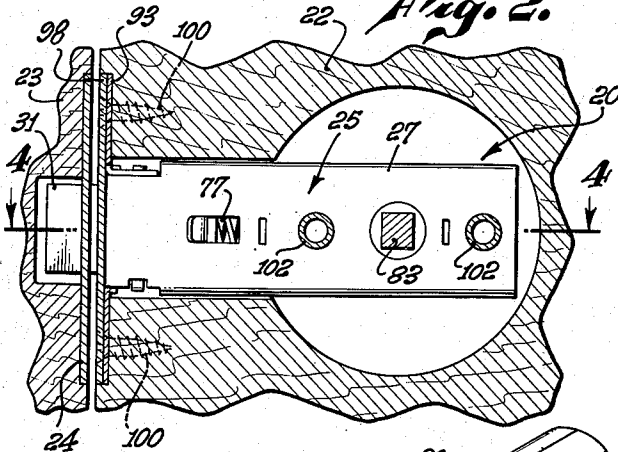


Fig. 7.

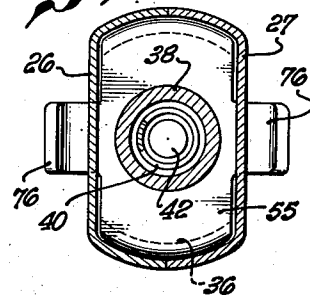
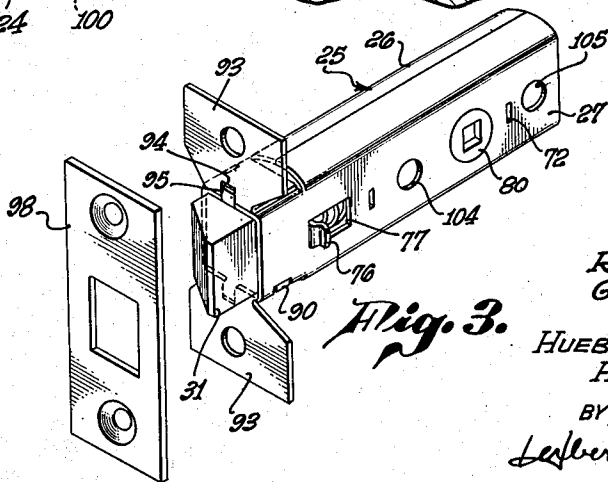


Fig. 3.

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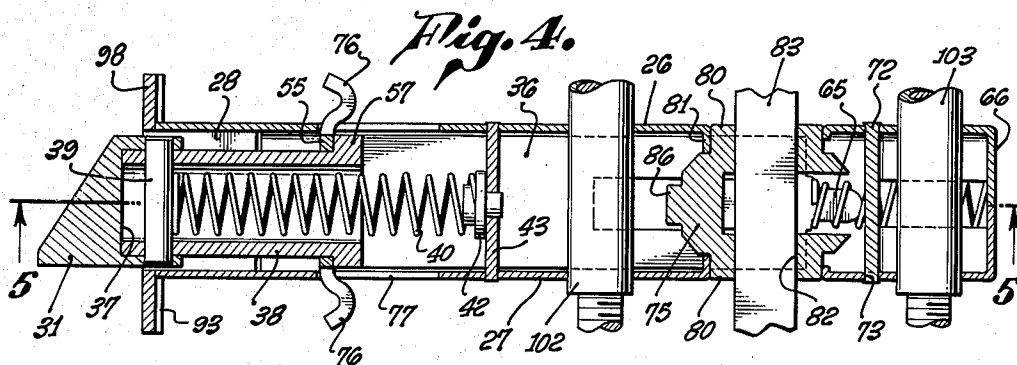
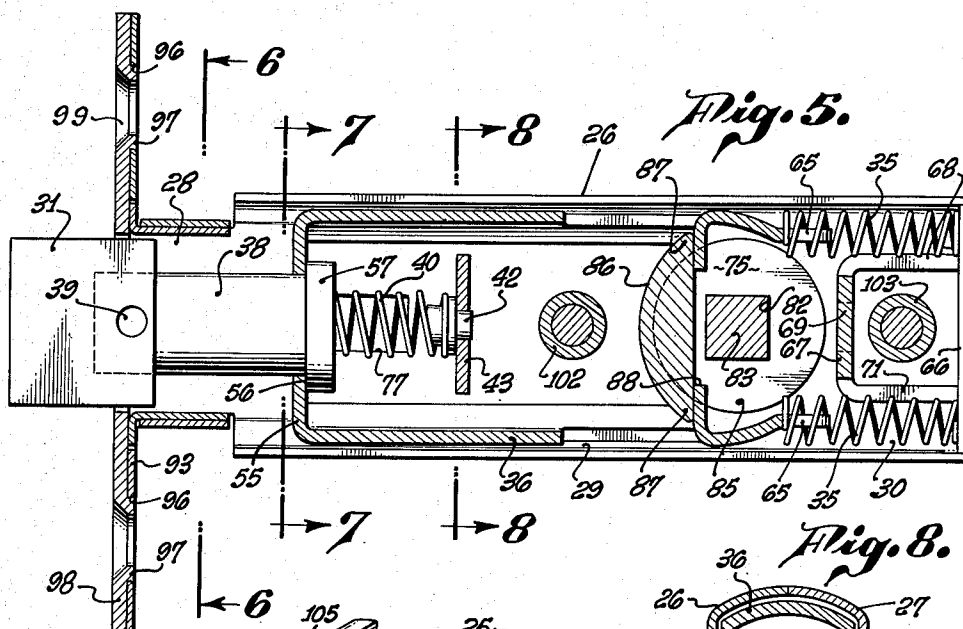
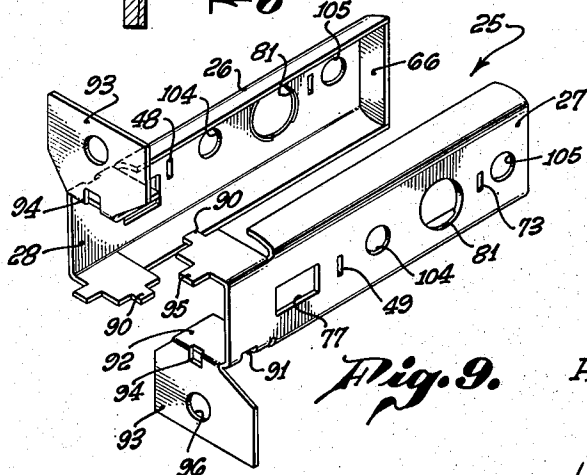
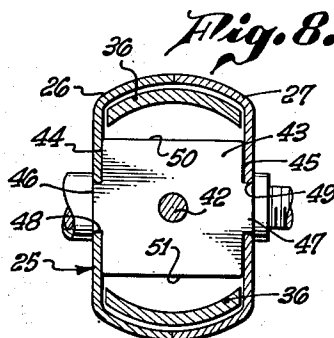
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2 SHEETS---SHEET 2



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2,634,151

LATCH CASING

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3 Claims. (Cl. 292—337)

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This invention relates to door latches and in particular to a latch assembly in which one of the principal features of novelty is the structure of the latch case.

An object of the invention is to provide a latch case formed of mating parts which can be identical and which can be fabricated by a stamping process; the latch elements installed in one of the case parts, the mating part be brought into contact, and the parts be firmly secured together by means made integral with the case parts.

A further object of the invention is to provide in a latch combination a latch case housing the latch elements and embodying mating case parts which are joinable to complete the case and providing an interlocking throat arrangement functioning as one of the primary means for rigidly securing the case parts together and as a mounting means for attaching the latch assembly to the edge of a door.

An additional object of the invention is to provide post indexing means in a latch combination whereby aligned holes in the latch case receive index posts extending from the knob assembly mounting plate or an equivalent, to align the latch assembly longitudinally and support the same; but permitting lateral adjustment required by the thickness of the door and the lateral positioning as governed by the mounting of a co-operating face plate and mounting means associated with the throat of the latch case.

These and other objects and advantages will be made further apparent from a consideration of the following description taken in conjunction with the drawings.

In the drawings:

Figure 1 is a horizontal plan view of our latch assembly in combination with a door knob assembly, mounted in a door, the latter and a door jamb being illustrated in section.

Figure 2 is a view taken on line 2—2 of Figure 1.

Figure 3 is a perspective view of the latch assembly shown in Figures 1 and 2 with a cooperating face plate separated therefrom.

Figure 4 is an enlarged section taken on the line 4—4 of Figure 2.

Figure 5 is a section taken on the line 5—5 of Figure 4.

Figure 6 is a section taken on the line 6—6 of Figure 5.

Figure 7 is a section taken on the line 7—7 of Figure 5.

Figure 8 is a section taken on line 8—8 of Figure 5.

Figure 9 is a perspective view of the latch case

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with the two mating sections separated, and the latch mechanism removed.

Our latch assembly 20 is illustrated in association with door knob assemblies 21 mounted in a door 22 which is in proximity to a door jamb 23 on which a strike plate 24 is fixed.

The latch assembly is characterized by a case 25 embodying novel structural and functional features which will become apparent as the description proceeds.

The latch case 25 comprises mating halves 26 and 27 secured together at the throat 28 by self-contained tab and slot combinations which will be described subsequently in more detail. The two halves 26 and 27 are identical, but may be individually modified if desired.

The case embodies, in addition to the throat 28, a central housing 29, and a spring channel end 30. The throat guides a sliding latch bolt 31, the central housing confines and supports many of the latch operating parts to be described, and the spring channel end locates and houses a pair of springs 35 which normally advance a main slide member 36.

The latch bolt 31 is formed with a socket 37 which receives a tubular member 38, the latter being rigidly connected with the bolt by a transverse pin 39 which is staked in. A compression spring 40 seats within the tubular member 38, bearing at one end against the pin 39. Its other end bears against a spring seat 42 lodged against a fixed spacer 43. The spring 40 yieldably urges the bolt 31 to its advanced position.

The spacer 43, seen in elevation in Figure 8, has straight parallel edges 44 and 45 correctly dimensioned to space the case halves 26 and 27 of the latch case 25. Oppositely extending tabs 46 and 47 extend through slots 48 and 49 in the case halves, and are staked to assist in securing the two halves together.

The main slide member 36 is a U-shaped element, the legs of which have an arcuate cross section as seen in Figure 8 and which are supported and guided by the interior wall surface of the case. The end cross piece 55 which closes the U engages against the forward face 56 of a flange or block 57 at the inner end of the tubular member 38. Retraction of the main slide member with sufficient force to overcome the resistance of the springs 35 and 40 will draw the latch bolt inwardly.

The main slide member 36 has free reduced ends 65 engaging the compression springs 35. The opposite ends of these springs seat against the end wall 66 of the case.

A U-shaped spacer 67 at the rear of the case is

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formed with side plates 68 which are parallel to the chord of the arc defined by the curve at the top and bottom of the case as seen in Figure 8 and their free ends terminate at the rear end wall 66. Slots 71 are provided in the plates for supporting and guiding the springs 35. The diameter of the springs is greater than the width of the slots 71, and the springs are so confined by case halves 26 and 27 as to be always in slidable, guided engagement with slots 71, nested between the latch case and the walls of the slots.

The forward end piece 69 of the spacer 67 is provided with ears 72 which extend through slots 73 in the case and are staked to assist in securing the case halves together.

The main slide member has the primary function of retracting the latch bolt 31 by operation of knob mechanism or equivalent mechanism while actuated against pressure of the springs 35 and 40 either by a rotatable hub 75 or a slide bar (not shown) attached to a tab 76 in a position on the outside of the case 25 when a grip handle mechanism is used in place of a knob. The case provides slots 77 for the tabs 76 to extend through.

The hub 75 is formed with annular bosses 80 which have rotatable bearing support in bearings 81 struck from the case halves 26 and 27. A square hole 82 extends axially through the hub for reception of a square spindle 83 actuated by one of the knobs 84. The hub comprises two annular discs 85 spaced by a cam element 86. This cam has identical ends 87 engageable with cam followers 88 in the form of projections struck inwardly from the main slide member 36 and accommodated in the space between the two discs of the hub 75. Rotation of the hub will cause one of the cam ends 87 to push its companion follower 88 back, thus retracting the main slide member. When the cam 86 is in neutral position (Figure 5), the ends 87 are both in contact with the cam projections 88, and this engagement limits the forward movement of the main slide member.

In constructing the latch assembly, the operating parts are assembled in the case half 27, and the other half 26 is closed over them.

The throat 28 provides interlocking means as follows: Transverse tabs 90 project through slots 91. The throat section 92 of each case half is formed with a wing 93. At the corner angle of the throat section and wing is a slot 94 for the reception of a longitudinal tab 95 which is bent at a right angle as shown in Figure 3. The throat is reinforced by the overlapping throat sections, the parts are firmly interlocked against both transverse and longitudinal displacement, and a substantially rectangular cross section is provided to function as a bearing guide for the latch bolt 31. The wings 93 are in a common plane.

These wings have holes 96 for the reception of locating bosses 97 provided in a face plate 98 and these bosses are secured by staking (see Figure 5). The latch assembly and face plate are mounted in a door by wood screws 100 passed through holes 99 in the bosses 97.

Knob assemblies 21 which include the knobs 84 are secured on opposite sides of the door by the following means. A mounting plate 101 has extending from it hollow threaded posts 102 and 103 which extend through aligned holes 104 and 105 in the latch case. Machine screws 106 and 107 pass through a mounting plate 108 and are threaded into the posts 102 and 103. This ar-

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angement enables the latch assembly to be installed in doors of different thicknesses without any adjustments in the knob assembly or latch assembly, as the latch case can be shifted laterally parallel to the axes of the hollow mounting posts.

While the holes 104 and 105 are illustrated as mounting post index locators, eyelets, sockets, indentations or slots could be employed as equivalents.

The operation should be clear from the foregoing description. When the door, being open, is pushed shut, the bevelled face of the latch bolt 31 will engage the strike plate 24 and be pushed inwardly against the yielding pressure of the spring 40 until the latch bolt has cleared the edge 110 of the strike plate, whereupon the latch bolt will advance under spring pressure into the opening 111 provided in the jamb. This action is accomplished without any movement of the main slide member 36. Outward movement of the latch bolt is limited by engagement of the block 57 with the inside face of the cross piece 55 of the main slide member.

When it is desired to open the door, one of the knobs 84 is turned, which rotates the square spindle 83 and consequently the hub 75 and cam 86, as the result of which one of the end portions 87 is urged against one of the cam projections 88 which forces the main slide member 36 rearwardly against the yielding pressure of the spring 35 and incidentally against the yielding pressure of the spring 40. Rearward movement of the main slide member takes with it the tubular member 38 of the latch bolt assembly and results in withdrawing the latch bolt until it is clear of the strike plate, whereupon the door may be opened.

The end piece 55 of the U-shaped main slide member 36 substantially fills the latch case from top to bottom and along the sides, and the central portion substantially fills the case from side to side. A sliding fit in the case and the dual springs 35 oppositely disposed assure a free guided movement of the main slide member.

The whole device is compact, well balanced and smooth in operation. It is easily installed in a door of any thickness, provides indexing holes for alignment of knobs or equivalent trims, and requires no adjustments.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the 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.

For example, the latch mechanism illustrated and described may be modified in various ways either to further simplify the same or to add additional features to it, such as the dead-locking mechanism described and claimed in our copending application Serial No. 140,986, filed January 28, 1950. A slightly modified form of the latch case of the present application is shown and described in the said copending application, and the present application is therefore a continuation in part of the said copending application.

The specific form of the latch case comprising two identical halves is convenient and satisfactory from a manufacturing standpoint, but at some sacrifice of manufacturing economy may be fabricated of non-identical halves. The exact location and the number of the spacers is not

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critical, those here shown being by way of illustration and not of limitation.

The feature of an open interlocking throat providing a slide guide for the latch bolt and integral mounting means in the form of wings or equivalent, which, in cooperation with a correctly designed face plate, permits a secure mounting against the face of the door, is important, but may vary from the details shown without departing from the principles emphasized.

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

1. A latch casing comprising a pair of opposite complementary halves having an open end for a latch bolt, each half having side walls and a bottom and each half comprising an end piece on one of said walls at the open end, said end piece having a transverse tab and a longitudinal tab, a throat section on the other of said walls opposite the end piece of the opposite half, one edge of said throat section being joined to the bottom, and a wing joining the throat section at right angles thereto and to the bottom, means forming a slot at the junction of the throat section and side wall adapted to receive said transverse tab of the opposite half, and means forming a slot at the junction of the wing and throat section adapted to receive the longitudinal tab of the opposite half.

2. A latch casing comprising a pair of opposite complementary halves having an open end for a latch bolt and an apertured face plate over said open end, each half having side walls and a bottom and each half comprising an end piece on one of said walls at the open end having a transverse tab and a longitudinal tab, a throat section on the other of said walls opposite the end piece of the opposite half, one edge of said throat section being joined to the bottom, and a wing joining the throat section at right angles thereto and to the bottom, means on each half forming a slot at the junction of the throat section and side wall adapted to receive said transverse tab of the opposite half, means on each half form-

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ing a slot at the junction of the wing and throat section adapted to receive the longitudinal tab of the opposite half, and staking means respectively on the halves and plate adapted to anchor said plate to said wings.

3. A latch casing adapted to the reception of a reciprocating spindle actuated latch bolt mechanism comprising a pair of opposite complementary sheet metal halves having an open end for the latch bolt, and an apertured face plate over said open end, each half having side walls and a bottom and each half comprising a separate end piece on one of said walls at the open end having a transverse tab and a longitudinal tab, a throat section on the other of said walls opposite the end piece of the opposite half, one edge of said throat section being joined to the bottom, and a wing joining the throat section at right angles thereto and to the bottom, means on each half forming a slot at the junction of the throat section and side wall adapted to receive said transverse tab of the opposite half bent over therein, and means on each half forming a slot at the junction of the wing and throat section adapted to receive the longitudinal tab of the opposite half bent over therein, each wing having a hole therein and apertured bosses on the face plate adapted to be received in said holes for staking the halves and plate in assembled position.

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