June 26, 1934. L. A. BITTORF 1,964,556

LATCH STRUCTURE

Filed Sept. 2, 1932

Fig. 1

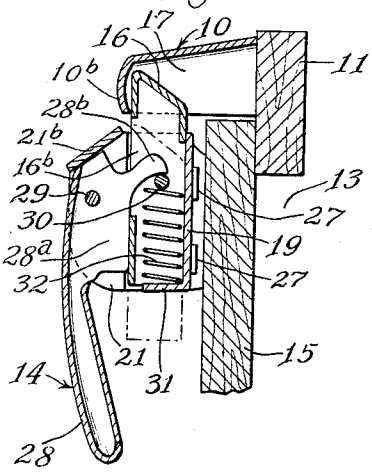


Fig. 2

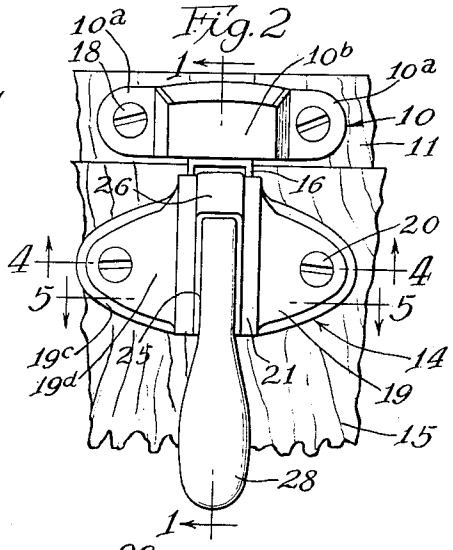
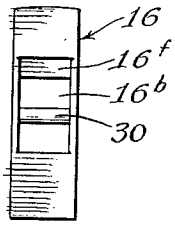


Fig. 3



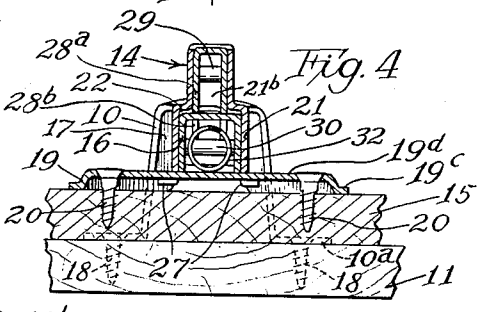
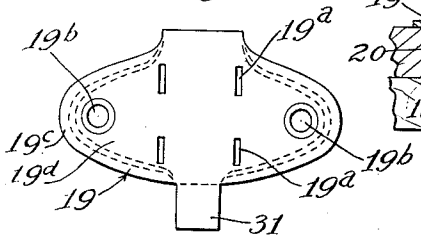


Fig. 4

Fig. 6



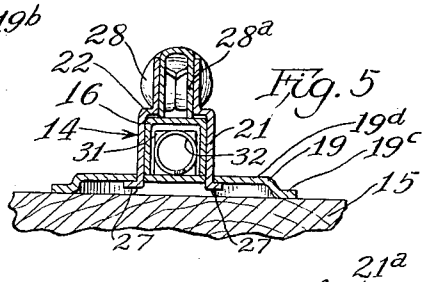


Fig. 5

Fig. 7

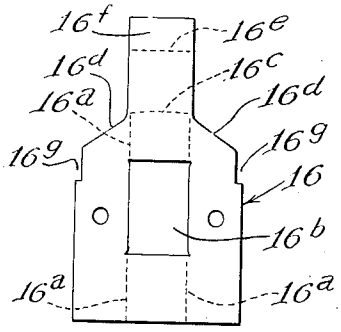
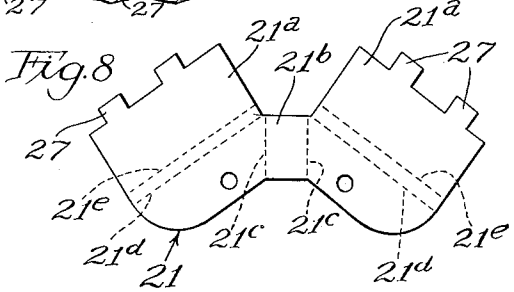


Fig. 8



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LATCH STRUCTURE

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Application September 2, 1932, Serial No. 631,440

7 Claims. (Cl. 292—173)

This invention relates to latch structure and has to do particularly (but not exclusively) with devices of this character well adapted for the doors of various kinds of cabinets and the like.

The principal object of this invention is to provide an improved latch structure which may be formed of sheet metal and which is simple in construction and operation, is composed of but a few parts, is of light weight, is strong and durable, is easy to operate, is practically noiseless in operation, and is positive in its latching action.

Additional objects and advantages will become apparent as this description progresses and by reference to the drawing wherein,—

Figure 1 is a longitudinal, vertical sectional view through one form of latch structure embodying my invention;

Fig. 2 is a top plan view of the structure shown in Fig. 1;

Fig. 3 is a separated top plan view of the latch bolt shown in Fig. 1;

Fig. 4 is a section taken substantially on line 4—4 of Fig. 2;

Fig. 5 is a section taken substantially on line 5—5 of Fig. 2;

Fig. 6 is a top plan view of the blank from which the base portion shown in Figs. 1 and 2 is formed;

Fig. 7 is a plan view of the blank from which the latch bolt of Fig. 3 is formed; and

Fig. 8 is a plan view of the blank from which the latch bolt housing is formed.

Referring particularly to the drawing, the latch structure as a whole includes a keeper 10 adapted to be secured to the cabinet 11 adjacent the cabinet door opening 13, and a latch unit 14 adapted to be secured near one edge of the cabinet door 15 so that its latch bolt 16 will align with and engage the keeper 10. The keeper 10 is, preferably, formed from a single piece of sheet metal to provide a keeper socket 17 and a pair of laterally projecting lugs 10^a adapted to be secured to the cabinet by screws or other suitable fastening devices 18.

The latch unit consists of a sheet metal base 19 of oval form having spaced pairs of openings 19^a therein, the purpose of which will be described later. This base is also provided with end openings 19^b for the reception of screws or other suitable fastening devices 20 for attachment of the base to the door. The outer periphery of the base is, preferably, turned downwardly and outwardly to provide an exterior flange 19^c and a raised central portion 19^d which adds to the appearance of the structure as a whole as well as accommodating for attachment of the latch bolt housing 21 which will now be described.

The latch bolt housing is, preferably, formed of sheet metal and, in blank form, takes the shape illustrated in Fig. 8; namely, a pair of rectangularly-shaped sections 21^a are joined together at correspondingly-positioned corners by a rectangularly shaped and diagonally or obliquely disposed section 21^b. Upon folding the sections 21^a toward each other, and approximately into parallelism, about the fold lines 21^c defining the sides of the rectangular section 21^b, and by folding each of the sections 21^a first outwardly and then downwardly about their respective side fold lines 21^d and 21^e, there is provided an open-ended latch bolt housing of the shape shown in Figs. 2, 4 and 5. More particularly, the latch bolt housing is provided with a rectangularly-shaped latch bolt channel or slide way 22 normally open at both ends and an upper, narrower and top-slotted, handle swing way 25 having an inclined front portion 26. The latch bolt housing sides are each provided with legs 27 which are adapted to be passed through the base openings 19^a where they are turned over and crimped, or otherwise upset, to secure this housing firmly to the base 19.

The latch bolt 16 is a shell-like structure of general rectangular shape and is slidably received within the slide way or channel 22. It is formed from a single sheet of metal and, preferably, takes the form in blank shown in Fig. 7. Referring particularly to the blank shown in Fig. 7, by folding the same at right angles about the fold lines 16^a an open-bottom inverted U-shape body portion having an opening 16^b in its top and an open rear end is provided. Then by further folding the blank along the fold line 16^c to seat against the inclined end surfaces 16^d and by folding along the line 16^e to seat the end tongue section 16^f in the bottom cutout 16^g, a bolt of the form shown in Figs. 1, 3, and 4 is provided.

The bolt 16 is adapted to be actuated toward an unlatching position by a handle 28 formed preferably of sheet metal rolled and bent into the shape illustrated in Figs. 1 and 2. This handle is provided with a bifurcate end portion providing elongated, spaced and depending side sections 28^a pivotally supported in the upper, top-slotted portion 25 of the latch bolt housing by a pin 29 passing through the handle sides 28^a and the opposite sides of the bolt housing. The arms 28^a of this handle are provided with forwardly and downwardly projecting, slightly curved and spaced arms 28^b which project through the top opening 16^b in the bolt and engage the forward side of a

cross pin 30 bridging the inner central portion of the lock bolt. With the parts in position as shown in Fig. 1, it will be obvious that by raising the rear end of the handle 28 the bolt 16 is slid rearwardly a sufficient distance to disengage the same and permit opening of the door 15.

The unlatching movement of the bolt is yieldably opposed as follows: The base 19 (Fig. 6) at the rear end of the bolt housing is provided with a tongue 31 of less width and height than the bolt 16. This tongue, in the assembly of the structure, is turned upwardly at right angles to obstruct the rear end of the lock bolt housing but, at the same time, to permit the rear end of the bolt 16 to slide rearwardly thereover and therepast to substantially the dotted line position shown in Fig. 1 during the unlatching movement thereof. A spring 32 is mounted within the lock bolt with its opposite ends pressing against the upturned base tongue 31 and the bolt cross pin 30 so that movement of the bolt to its unlatching position (dotted line position shown in Fig. 1) is in opposition to the pressure exerted by such spring. The parts are so related that the spring 32 constantly urges the bolt toward and yieldingly holds it in the latching position shown in full lines in Fig. 1. It will be noted that the forward ends of the handle sides 28^a are cut away at an angle corresponding approximately to that of the housing front end section 21^b so that the front end of the handle may be readily moved downwardly. Also, the elongated sides 28^a of the handle 28 are adapted to engage the top of the bolt in latching position of the parts, thereby predetermining this position.

The structure just described is also arranged for latching action without movement of the handle 28. Specifically, by locating the handle arms 28^b forwardly of the bolt pin 30, and by extending the bolt slot or opening 16^b a considerable distance forwardly of the arms 28^b, a lost-motion connection is provided whereby the bolt may be moved rearwardly away from its handle connection and independently of handle movement. Such movement is accomplished in the closing of the door 15 by engagement of the front tapered end of the latch member with the slightly rounded top edge portion 10^b of the keeper.

I believe that the operation of my invention will be well understood from the foregoing. It will be appreciated that, while I have formed the latch and keeper structure from sheet metal, it is nevertheless quite strong and durable. The parts will operate easily, noiselessly and with a minimum of wear. The particular shapes of the several parts and the relationship of the same is conducive to the use of but few parts which may be formed inexpensively.

It is to be understood that, while I have shown only one form of my invention, and only one adaptation of the same, other changes in details and arrangements of parts may be made without departing from the spirit and scope of my invention as defined by the claims which follow.

I claim:

1. In latch structure, a base, a latch bolt housing mounted on said base, said housing having a lower, rectangularly, open-ended shaped-slide way and an upper handle-receiving section, a tongue member of less width and height than said slide way on said base and obstructing the rear end of said slide way, a shell-like, rectangularly-shaped latch bolt having its bottom and rear ends open and adapted to slide rearwardly over said tongue, said bolt also having an elongated opening in its top, a separate abutment within the interior of said bolt, a handle pivotally mounted in said upper housing section and having a part extending down through the top opening in said bolt to engage said abutment, and a spring mounted within said bolt between said abutment and said tongue.

2. Latch structure which comprises a base, a separate housing mounted on said base and having an open-ended slide way in its bottom part and a narrower handle swing way in its top part, a member on said base partially obstructing the rear end of said slide way, a shell-like latch bolt mounted in said slide way and adapted to slide past the top and sides of said base member, a handle pivoted in said handle swing way, a connection between said handle and bolt by which said bolt is moved rearwardly toward unlatching position by lifting the rear end of said handle and said bolt has movement rearwardly independent of its handle connection, a spring between said bolt and base member opposing rearward and unlatching movement of said bolt, the rear portion of said handle being adapted to seat upon the rear portion of said bolt to stop the bolt and handle in a predetermined latching position.

3. Latch structure comprising a base, a latch bolt housing having a rectangularly-shaped slide way in its lower part which is open at its ends and at its top, said housing also having a handle swing way in its top part above said slide way, a rectangularly-shaped latch bolt mounted in said slide way, said bolt being of shell-like form and having its bottom and rear end open, a tongue on said base obstructing the rear end of said slide way and of such size that the sides and top of said bolt will pass thereover and rearwardly therebeyond, said bolt also having an elongated opening in its top, a handle mounted in said swing way and having one depending part adapted to seat upon the rear top portion of said bolt in latching position and another depending and forwardly located part adapted to extend downwardly through the opening in the top of said bolt, a separate abutment in said bolt engaged by said other handle part for movement of said bolt to an unlatching position, and a spring between said tongue and said bolt abutment opposing the unlatching movement and adapted to return said handle to and hold it in its latching position.

4. Latch structure comprising a separate base member, a separate latch bolt housing secured to said base member and having a rectangular-shaped open-ended slide way therein closed at the bottom by said base member, a shell-like, rectangularly-shaped, open-bottom slide bolt mounted in said slide way, a tongue member on said base member of less width and length than said slide way and past and over which said slide bolt moves in its unlatching movement, a cross pin spanning the interior of said slide bolt, a spring confined between said pin and said tongue, and a handle member pivotally carried by said latch bolt housing and having a projection adapted to engage said pin forwardly of the latter to move said slide bolt rearwardly to an unlatching position.

5. Latch structure comprising a one-piece sheet metal base member, a one-piece sheet metal housing having an open-ended slide way therein mounted upon said base member with the latter closing the bottom of said slide way, an integral tongue member on said base member of less width and height than said slide way and adapted to be turned up into one end of said slide way,

a shell-like, one-piece, sheet metal latch bolt mounted in said slide way and having one end and its bottom open to freely slide over said tongue member and rearwardly of said housing, a single-piece sheet metal handle carried by said housing and having a projection thereon, said latch bolt having an elongated opening in its top through which said projection extends, a cross pin in said latch bolt adapted to be engaged by said handle projection, and a spring member between said pin and said tongue member opposing unlatching slide movement of said bolt under the power of said handle.

6. A latch bolt housing formed from a single blank for structure of the class described which comprises a pair of spaced and substantially parallel sections of general rectangular shape having their corresponding upper and forward corners joined together by an obliquely-disposed and rectangularly-shaped section, the upper portions of said first sections being formed inwardly and upwardly in parallel spaced relation to provide a narrow upper swing way with a separate and wider slide way therebeneath, and means along the bottom edges of said first sections for attachment of the latter to a support.

7. A latch bolt formed from a single blank for structure of the class described which comprises a shell-like body of rectangular-like shape in cross section having a flat top portion with an elongated opening therein, side portions having their forward end edges inclined downwardly and rearwardly from said top portion, a tongue extension at the end of said body adjacent said inclined side ends which is substantially the width of said body and which is turned downwardly and rearwardly against said inclined ends, said tongue being of such a length that its free end overlaps a portion of the bottom edges of said side portions, the arrangement being such that the bolt has an open bottom and an open rear end and an inclined forward or latching end.

LOUIS A. BITTORF.