March 19, 1935. J. BERRYMAN 1,995,091

CATCH BOLT OF LOCKS, LATCHES, AND THE LIKE

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Fig. 1.

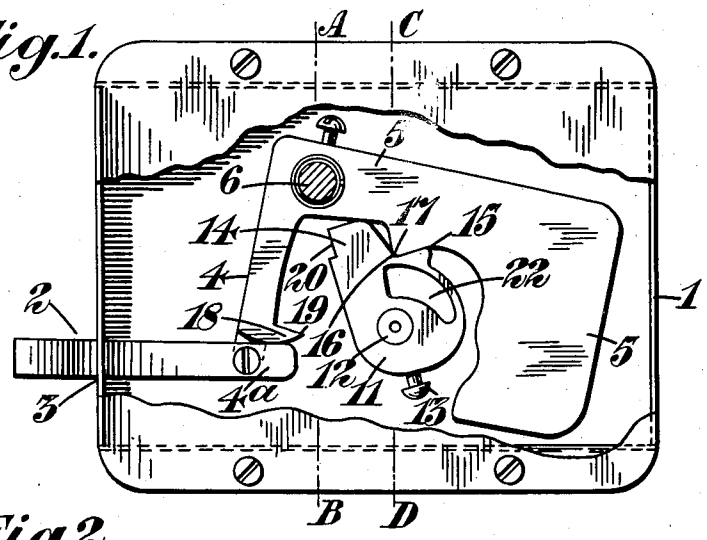

Fig. 2.

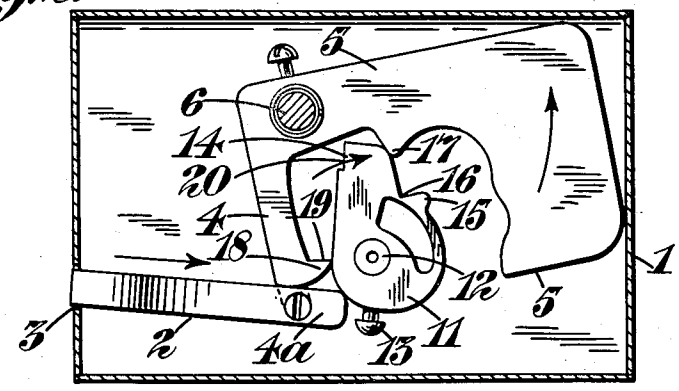

Fig. 3.

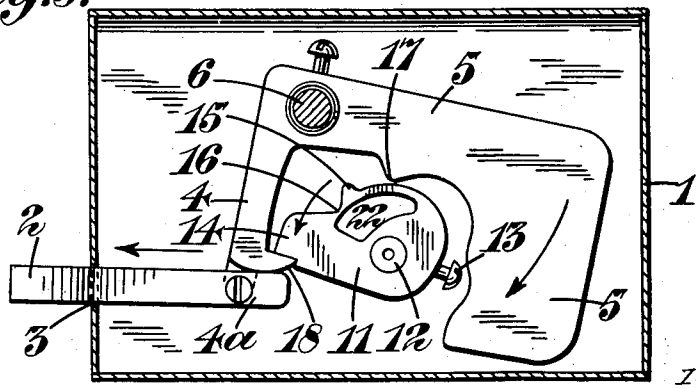

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Fig. 4.

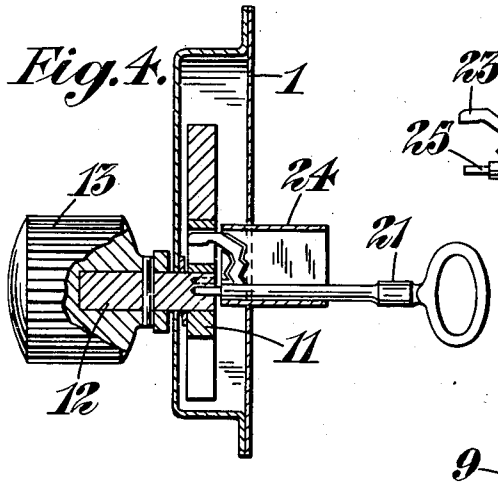


Fig. 5.

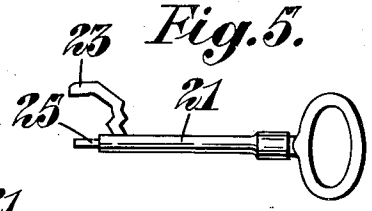


Fig. 6.

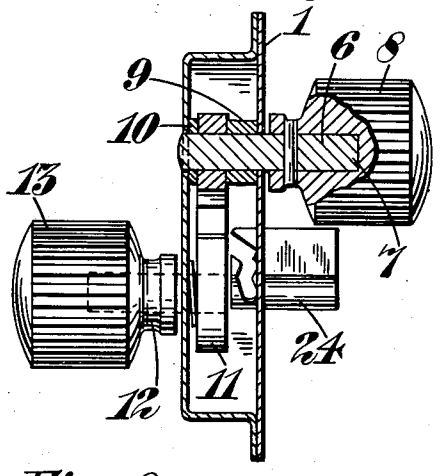


Fig. 7.

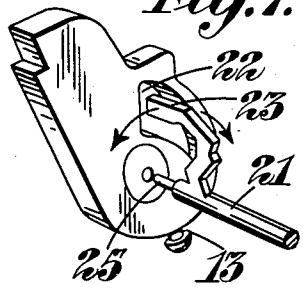
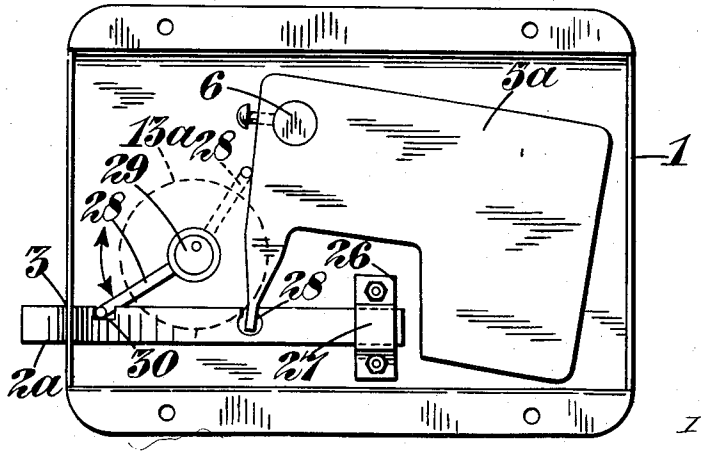


Fig. 8.



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UNITED STATES PATENT OFFICE

1,995,091

CATCH-BOLT OF LOCKS, LATCHES, AND THE LIKE

John Berryman, Gloucester, England, assignor to Charles Chester Berryman, London, England

Application May 17, 1934, Serial No. 726,164
In Great Britain January 26, 1933

9 Claims. (Cl. 70—29)

This invention refers to means for actuating the latch-bolt of locks, latches and the like.

Heretofore, as is well known, the latch-bolts of ordinary locks and latches for doors, gates and the like purposes are normally pressed outwards (ejected) and maintained in the projected position by means of a spring or springs and so that when such latch-bolt is withdrawn (retracted) against the action of such spring or springs the latter will return (eject) said latch-bolt instantly upon release of the handle or other operating means.

According to the present invention there is provided a latch having a yieldingly projected latch-bolt, a handle operable from one side of the latch to retract the latch-bolt and a separate locking device operable from the other side of the latch for locking and retracting the latch-bolt.

In its preferred form the invention comprises a latch having in combination a yieldingly-shot latch-bolt, and two independently movable handles operable from opposite sides of the door to which the latch is to be attached, each of which handles is capable of independent movement to withdraw the latch-bolt and one of which handles is a locking handle, capable of movement additional to the withdrawing movement, to lock the bolt against withdrawal by the other handle. The latch-bolt may be urged towards its locking position by a yieldingly-controlled lever and the locking handle be operatively connected to a latch-bolt controlling member, movement of which in one direction from a normal position serves to bring it into contact with the lever to withdraw the bolt and movement of which in the opposite direction from the normal position serves to bring it into a position where it stands in the path of the withdrawal movement of the lever or bolt and locks the same.

The locking handle may be carried on a spindle mounted to turn about an axis eccentric to that of the yieldingly-controlled lever and the latch-controlling member be mounted on the spindle of the locking handle. The non-locking handle may be directly mounted on the pivot-spindle of the yieldingly-controlled lever. The lever is preferably yieldingly controlled by a counterweight.

In one constructional form the latch-controlling member is provided with means to co-operate with the counterweighted lever whereby the counterweight holds the latch-controlling member in its normal position and yieldingly opposes withdrawal movement in the one direction or movement towards the locking position in the other direction.

Preferably an aperture for insertion of a key is provided on the side of the latch opposite to the locking handle and the latch-controlling member is adapted to be engaged by the key so as to be moved into or out of its locking position thereby. The key-axis may be concentric with the axis of the latch-controlling member. The invention further comprises in a latch the combination of a sliding latch-bolt, a counterweighted bell-crank lever for yieldingly advancing the latch-bolt and a rotatable handle for retracting the latch-bolt operatively connected to said bell-crank lever.

In order that the invention may be clearly understood the same will now be described more particularly, reference being taken to the accompanying drawings, in which:—

Figures 1, 2 and 3 show side elevations, in part section, of one form of the invention in different positions of the latch-bolt and its associated mechanism.

Figure 4 shows an end elevation in section of the invention taken on the line C—D of Figure 1.

Figure 5 shows the type of key used with invention of Figures 1, 2, 3 and 4.

Figure 6 shows an end elevation and part sectional view taken along the line A—B of Figure 1.

Figure 7 shows a detail of the actuating mechanism.

Figure 8 shows a side elevation of a modified form of the invention.

Referring to the embodiment of the invention shown in Figures 1–7, a casing 1, preferably of sheet metal, encloses a latch-bolt 2 and its associated mechanism. The latch-bolt 2 is supported at its outer end by, and is slidable in, an opening 3 in an end wall of the casing 1. The other end is swingably supported through the intervention of a screw 4a or any other suitable means, by an arm 4 of a counterweighted bell-crank lever 5, pivotally supported by a spindle 6. The weight comprises substantially the two arms 4, 5 of a bell-crank lever and these arms may conveniently be at right angles to each other, although no restriction need be imposed upon the angle supported between them. The pivotal point lies substantially in the angle formed between the two arms. The spindle 6 is supported at either end by the sides of the casing 1 and apertures are formed in the casing for this purpose as well as for the purpose of serving as bearings for the spindle. The spindle 6 is keyed to the counterweighted lever 5 by a screw which

passes through a portion of the weight and has its end in contact with the spindle as shown. One end 7 of the spindle 6 projects beyond the casing in order that a handle or knob 8 may be secured thereto in order to rotate the spindle 6. As can be seen from the drawings any rotation of the spindle 6 will have a tilting effect upon the weight 5 so that the arm 4 will swing about an arc and operate the latch-bolt 2 in substantially a horizontal direction. A washer 9 maintains the weight in its proper position in the casing and a washer 10 prevents frictional contact between the weight and one side of the casing. Upon rotating the spindle 6 in such direction as to withdraw the latch-bolt 2 it can be seen that upon release of the spindle from restraint, the weight 5 will fall again to its normal and lowest position (see Figures 1, 3) and will eject the latch-bolt 2.

In order that the latch-bolt 2 may be locked in its normal position, a latch-controlling member 11 (Figure 7) is provided within the cut-out portion, or between the arms 4, 5. This latch-controlling member takes the form of a cam supported upon a spindle 12 which passes through and projects on the opposite side of the casing to the spindle 6. A handle or knob 13 is keyed or otherwise secured to the spindle 12, and the spindle 12 is in turn secured to the cam 11 by means of a screw 13. The cam 11 is provided with two projections 14 and 15, the projection 14 being formed by a longer radius from the centre of the spindle 12 than the projection 15. Between 14 and 15 a hollow 16 is formed on the cam for a purpose to be shortly described. Along the inner side of the arm 5, a projection 17 is formed and at the end of the arm 4 on the inner surface a projection 18 is formed this having a flat side 19 facing the spindle 6. Assuming the latch to be in its shot or projected position (Figure 1), if the cam 11 be rotated in a clockwise direction by means of the knob 13, the projection 14 thereon will engage with the projection 17 on the weight member 5 and the weight 5 will be lifted and caused to pivot on the spindle 6 and withdraw the bolt.

In order to facilitate the operation the engaging surfaces of projections 14 and 17 are made sloping so that they will readily tend to slide past each other when pressure is applied, thus facilitating the operation of the latch-bolt. The bolt after its complete withdrawal is shown in Figure 2. Upon releasing the knob 13 the parts will fall back to the position shown in Figure 1, the projection 17 of the weight 5 falling within the hollow 16 and holding the cam in the normal position shown. If now the knob 13 be rotated in an anti-clockwise direction so as to force the projection 17 out of the hollow 16 (which movement is at first yieldingly opposed by the counterweight) it will finally reach the position shown in Figure 3 in which a surface of the projection 14 comes into contact with the flat side 19 of the projection 18 on the arm 4 (Figure 3) and thus lock the bolt against withdrawal. If desired a recess 20 may be formed on projection 14 to receive projection 18. Figure 3 shows the locked position of the cam and latch-bolt and if the knob 8, which is arranged to be on that side of the lock or casing which is on the exterior side of the room, cupboard, or whatever it is desired to have locked, be now turned it will be impossible to unlock or withdraw the latch-bolt 2, since the latter in tending to move inwardly will merely make the projection 18 engage with greater pressure upon the projection 14 or the recess 20. The point of engagement between these movable parts lies along or slightly past the dead-centre line of the cam 11 and its spindle 12 so that no amount of pressure upon the latch-bolt or the weight mechanism will unlock the latch-bolt.

Thus no one operating the knob 8 can withdraw the latch. On the exterior side of the lock, i. e. on the same side as the knob 8, provision is made for a key 21, the axis of which is the same as the axis of cam 11. On the cam member 11 provision is made for engaging with the key so that the cam may be actuated and the latch-bolt operated. In Figures 1, 2, 3 and 7 a hollowed out portion 22 is shown for the reception of the tip of the key 23. It can be readily seen that wards could be provided within the space 22 or on the surface of the cam so that only a key having a particular design can operate the lock. Further a guide member 24 can be fitted or formed on the same side of the casing as it is desired to use the key and this may also be formed in such manner that it fits very closely around the end portion of the key so that only a particular key can be used. The key is shown as having an extended portion 25 for engaging with an aperture formed in the end of the spindle 12.

With this arrangement, a door can be locked from the inside without a key and it will be impossible to open it again except from the inside, save by a person possessing the key. Again the door can be locked from the outside with the key, and the key removed so that the door cannot be opened again from the outside except by the key.

In an embodiment of the invention shown in Figure 8 a latch-bolt 2*a* is slidably supported at both ends, at the outer end in an opening 3 in the casing as before and at its inner end in a guide 26 having a central offset portion 27 adapted to receive the inner end of the latch-bolt. The strap 26 may be secured in any well known manner to the casing or may be formed as a part of the casing. Engagement is made with a pivotally mounted weight 5*a* as before, the latch-bolt however, not being supported at its inner end by the arm 4*a* of the weight. A recess 28 is formed on the upper surface of the latch-bolt for the purpose of receiving the projecting end of the arm 4*a*. Preferably the opening width of the recess 28 is made smaller than the intermediate portion as shown so that plenty of room for the tip of the swinging arm 4*a* will be provided without there being any lost motion between the arm and the latch-bolt. As before the spindle 6 will be actuated by a knob on the outside of the door or lid to which the latch is applied so that the latch-bolt can be withdrawn and when the knob is released the weight 5*a* will be free to shoot the bolt again to its normal position.

In this case the cam 11 has been replaced as a latch-controlling member by a swinging lever 28 actuated by a spindle 29 projecting through the exterior side wall of the casing at one end and to the interior of the casing at its other end. A knob 13*a* may conveniently be secured to the spindle 29 so that the same may be actuated from the inside of the door. When the knob 13*a* is rotated in such direction as to bring the lever 28 into the dotted position shown in Figure 8, the weight 5*a* can be raised and the latch-bolt withdrawn. When the knob is released the weight falls back as before moving the bolt with it. Upon rotating knob 13*a* in the opposite direction, i. e. so as to bring the lever 28 into the full line posi-

tion of Figure 8, the end of the lever is arranged to fall into a recess 30 cut or otherwise formed in the upper surface of the latch-bolt. If now pressure be exerted upon the knob on spindle 6 on the outside of the door, it will be impossible to unlock the same, since the recess 30 engages with the lever 28 at a point beyond the latter's dead-centre. In this case the door can only be unlocked by actuation of knob 13*a* on the inside of the door or by a key arranged as before on the outside of the door and arranged to engage directly with the end of the spindle 29 by any well known means (not shown).

I claim:—

1. A latch having in combination a yieldingly shot latch-bolt, and two independently movable handles operable from opposite sides of the door to which the latch is to be attached, each of which handles is capable of independent movement to withdraw the latch-bolt and one of which handles is a locking handle, capable of movement additional to the withdrawing movement, to lock the bolt against withdrawal by the other handle.

2. In a latch the combination of a casing, a latch-bolt slidably mounted therein, a counterweighted lever pivoted therein and having an arm engaging said latch-bolt to eject the same under the influence of the counterweight, a withdrawing handle upon the pivot of the counterweighted lever outside the casing to one side thereof, a latch-controlling member within the casing to engage the counterweighted lever pivoted about a second axis and a withdrawing handle upon the axis of said latch-controlling member located outside the casing to the other side thereof from the first said handle.

3. In a latch the combination of a casing, a latch-bolt slidably mounted therein, a yieldingly-controlled lever pivoted therein and having an arm engaging said latch-bolt to eject the same under the influence of the yielding control, a withdrawing handle upon the pivot of the yieldingly-controlled lever outside the casing to one side thereof, a latch-controlling member within the casing to engage the yieldingly-controlled lever pivoted about a second axis and a withdrawing handle upon the axis of said latch-controlling member located outside the casing to the other side thereof from the first said handle.

4. A latch as claimed in claim 3 wherein the latch-controlling member is provided with a stop movable into the path of the counter-weighted lever or latch to lock the same and means are provided upon a counterweighted lever to cooperate with the latch-controlling member and hold the latch-controlling member yieldingly in its normal position between the locking position on the one hand and the withdrawal position on the other.

5. A latch as claimed in claim 2 wherein the casing wall is provided with an aperture for insertion of a key is provided on the side of the latch opposite to the locking handle and the latch-controlling member is adapted to be engaged by the key so as to be moved into or out of its locking position thereby.

6. A latch as claimed in claim 3 wherein the casing wall is provided with an aperture for insertion of a key is provided on the side of the latch opposite to the locking handle and the latch-controlling member is adapted to be engaged by the key so as to be moved into or out of its locking position thereby.

7. A latch as claimed in claim 3 wherein the casing wall is provided with an aperture concentric with the axis of the latch-controlling member for insertion of a key is provided on the side of the latch opposite to the locking handle and the latch-controlling member is adapted to be engaged by the key so as to be moved into or out of its locking position thereby.

8. In a latch the combination of a casing, a latch-bolt slidably mounted therein, a counterweighted lever pivoted therein and having an arm engaging said latch-bolt to eject the same under the influence of the counterweight, a withdrawing handle upon the pivot of the counterweighted lever outside the casing to one side thereof, a latch-controlling member within the casing to engage the counterweighted lever pivoted about a second axis, a withdrawing handle upon the axis of said latch-controlling member located outside the casing to the other side thereof from the first said handle, a stop associated with the latch-controlling member and adapted to be moved, when the latch-controlling member is moved in a direction opposite to that for lifting the lever and withdrawing the bolt, into a position to lie in the path of withdrawal of said lever to prevent withdrawal by the withdrawing handle.

9. In a latch the combination of a casing, a latch-bolt slidably mounted therein, a yieldingly-controlled lever pivoted therein and having an arm engaging said latch-bolt to eject the same under the influence of the yielding control, a withdrawing handle upon the pivot of the yieldingly-controlled lever outside the casing to one side thereof, a latch-controlling member within the casing to engage the yieldingly-controlled lever pivoted about a second axis, a withdrawing handle upon the axis of said latch-controlling member located outside the casing to the other side thereof from the first said handle, a stop associated with the latch-controlling member and adapted to be moved, when the latch-controlling member is moved in a direction opposite to that for lifting the lever and withdrawing the bolt, into a position to lie in the path of withdrawal of said lever to prevent withdrawal by the withdrawing handle.

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