M. J. HORN AND W. WATSON.

DOOR LATCH.

APPLICATION FILED SEPT. 3, 1918.

1,354,752.

Patented Oct. 5, 1920.

2 SHEETS—SHEET 1.

FIG. 1.

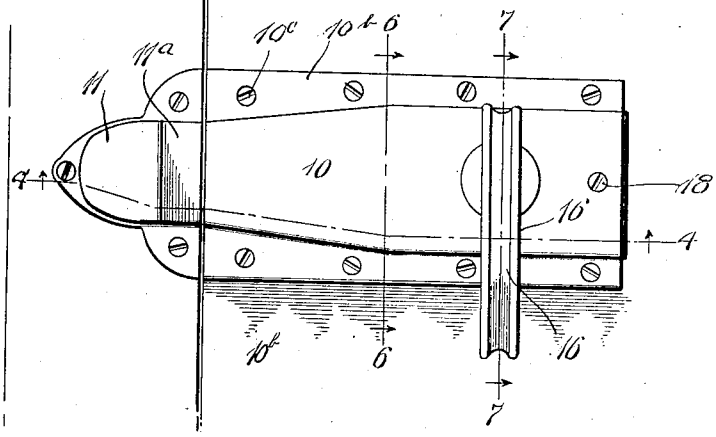


FIG. 2.

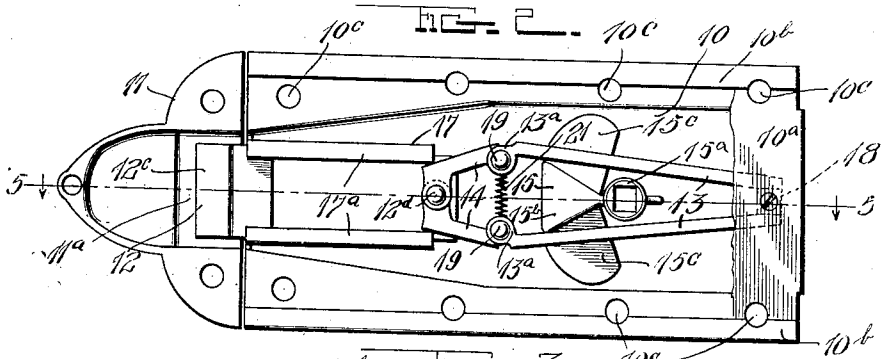
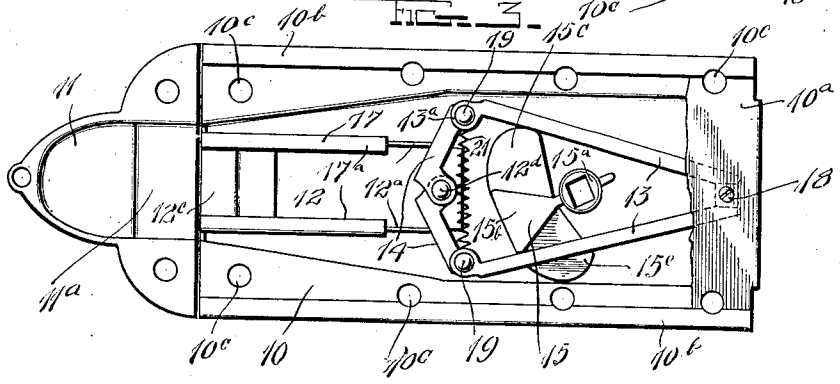


FIG. 3.



Witness.

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2 SHEETS—SHEET 2.

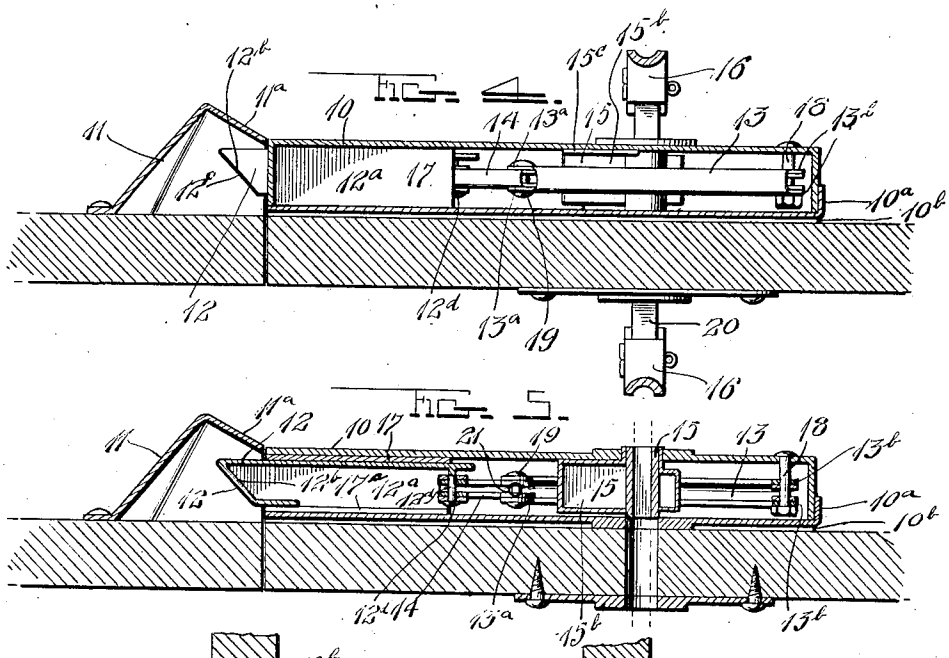


FIG. 5.

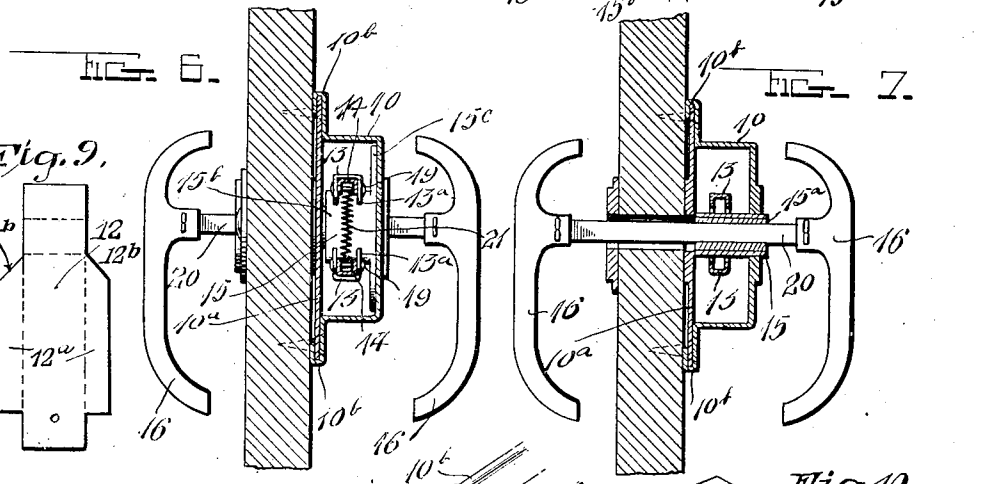


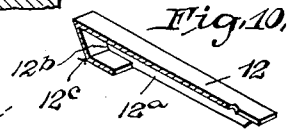
FIG. 6.

FIG. 7.

Fig. 9.

FIG. 8.

Fig. 10.



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UNITED STATES PATENT OFFICE.

MILTON J. HORN AND WARD WATSON, OF ROLAND, MANITOBA, CANADA.

DOOR-LATCH.

1,354,752. Specification of Letters Patent. Patented Oct. 5, 1920.

Application filed September 3, 1918. Serial No. 252,396.

To all whom it may concern:

Be it known that we, MILTON J. HORN and WARD WATSON, subjects of the King of Great Britain, residing at Roland, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Door-Latches; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to door latches, and it relates more particularly to an improved double acting latch actuating mechanism.

One of the objects of this invention is to provide a latch which is substantially weather-proof and dust-proof.

Another object is to provide a latch mechanism which is constructed almost entirely of stamped and pressed sheet metal parts, which provides strength and durability, not being rendered fragile by extreme cold; also providing for the comparatively cheap manufacture of the parts; and

A further object of the invention is to provide a latch mechanism constructed of few and simple parts which are easily assembled, thus minimizing the cost of manufacture.

Other objects and advantages may become apparent to persons who read the following details of description in connection with the accompanying drawings, in which:

Figure 1 is a front elevation of a latch constructed in accordance with our invention;

Fig. 2 is an interior view of the casing; showing the working elements in the effective or latching position;

Fig. 3 is a view similar to Fig. 2, except that it shows the working parts in the ineffective or non-latching position;

Fig. 4 is a longitudinal sectional view, the section being taken substantially along line 4—4 of Fig. 1;

Fig. 5 is a sectional view taken substantially along line 5—5 of Fig. 2;

Fig. 6 is a transverse sectional view, the section being taken substantially along the line 6—6 of Fig. 1;

Fig. 7 is a transverse sectional view the section being taken substantially along the line 7—7 of Fig. 1; and—

Fig. 8 is a perspective view illustrating this improved latch in connection with a pair of complemental lock-engaging elements and a lock engaged therewith.

Fig. 9 shows a sheet metal blank of which the bolt is formed.

Fig. 10 is a central longitudinal vertical sectional perspective view of the bolt.

Referring to these drawings in detail, in which similar reference characters correspond with similar parts throughout the several views, our latch mechanism consists of a casing 10, a keeper 11, a latch bolt 12, a pair of levers 13, a pair of links 14, an actuator 15, a handle 16, and correlated elements which will be mentioned hereinafter.

Casing 10 is formed of sheet metal and is provided with a cover 10^a which is slidably engaged with flanges 10^b which extends outward and then inward to form channels in which the edges of the cover 10^a slide. The casing members 10 and 10^a are apertured at 10^c to receive screws or other means whereby the casing may be secured to a door and whereby the cover 10^a is secured on the casing.

The keeper 11 is preferably formed from a single blank of sheet metal extending laterally outward from the casing 10 to provide a cam surface or incline 11^a on which the latch-bolt 12 slides when the door is being closed.

The latch-bolt 12 is formed of a single blank of sheet metal having two opposite edges turned at right angles to its intermediate portion so as to form flanges 12^a which have inclined ends 12^b; the latch-bolt blank being also formed with a tongue which is turned back over the inclined ends 12^b and electrically welded or otherwise secured thereto so as to provide a cam surface or inclined end 12^c of the latch-bolt. The intermediate part of the latch-bolt is provided with a stud 12^d which is disposed substantially between the ends of the flanges 12^a opposite its inclined ends 12^b. The latch-bolt 12 is slidable longitudinally in and guided rectilinearly by a substantially U-shaped guide or channel element 17 which is provided with flanges 17^a which turn inwardly over the edges of the flanges 12^a so as to confine the bolt 12 within this rectilinear guide. This sheet metal guide 17 may be secured to the casing 10 by any appropriate means or may be formed integrally therewith.

The levers 13 are each formed of a blank

of sheet metal having apertured ears 13^a and 13^b, the construction of these ears being substantially the same, but their location and functions being different. The blanks are curved along an axis which extends from end to end thereof so as to substantially form a channel beam and bring the apertures of each pair of ears 13^a and 13^b into registration. The ears 13^b of one lever 13 are interlapped with those of the other lever 13, and the registering apertures therein receive a pivot or anchoring stud 18 about which the levers 13 are swung as hereafter explained.

The links 14 are each formed from a single blank of sheet metal, and each blank is formed with apertured ears at each end, and the blank is curved about an axis which extends from end to end of the blank. In other words, the links 14 are each formed as are the levers 13 except that they are not so long nor so thick after being bent into the form of a channel beam. This difference in thickness allows the apertured ears of the links to be positioned between the apertured ears 13^a of the corresponding lever 13. When thus disposed in interlapped relation with the ears 13^a, rivets or pivot elements 19 are extended through the registering apertures thereof so as to pivotally connect the respective links 14 with the levers 13. The other ends of the links 14 are interlapped with one another and their registering apertures receive the stud 12^d.

The tumbler or actuating element 15 is provided with a hub 15^a which has a prismatic aperture therethrough to receive the prismatic operating shaft 20 which carries the handles 16 at its opposite ends. Extending radially from the hub 15^a is a prismatic lug 15^b which is preferably triangular in cross section on a plane cutting the axis of the hub 15^a, and two edges or corners of the lug 15^b are normally in contact with the inner surfaces of the levers 13, so as to hold these levers in the normal position shown in Fig. 2. However, when the lug 15^b is turned into the position shown in Fig. 3, it presses one of the levers 13 radially about its pivot 18, and this movement of the lever 13 imparts such movement to the corresponding link 14 as to coöperate with the stud 12^d and guide 17 for drawing the latch-bolt 12 inward to the position shown in Fig. 3. In thus moving the latch-bolt 12 inward, the cooperation of the guide 17 consists in preventing lateral movement of the bolt 12, so that the tendency of the link 14 to pull the latch-bolt laterally is overcome.

When either handle 16 is released, its longer arm is affected by gravity, so that it assumes the position shown in Fig. 1, and this returns the tumbler 15 to its normal position. However, a spring 21 assists gravity in this respect by drawing the pivotal connections 19 toward one another into the normal position shown in Fig. 2. The spring 21 has its ends secured to the pivotal connections or pivots 19 at points between the apertured flanges 13^a and the correspond apertured flanges of the links 14, and therefore, each of these pivots 19 performs a dual function.

The tumbler 15 is provided with wings 15^c which extend between the outer wall of the casing and the pair of levers 13, and these wings serve to hold the tumbler in its bearing in the casing when the cover 10^a is removed.

Although we have specifically described this latch mechanism as being constructed mainly of sheet metal blanks or stampings, it is to be understood that our invention is not limited to such construction, nor to the exact arrangement of elements described and illustrated; but we are entitled to make changes without departing from the scope of the inventive idea disclosed in the foregoing description and following claims.

What we claim as our invention is:

1. In a door-latch, a casing provided with a rectilinear guide, a latch-bolt movable in said guide, a pair of levers pivotally connected to the casing, a pair of links pivotally connected to the latch-bolt and to the said levers respectively, and means between said levers and being operable to shift them laterally on their pivotal connections and thereby coöperate with said levers and link and guide so as to effect a rectilinear movement of the latch-bolt.

2. In a door-latch, a casing provided with a rectilinear guide, a latch-bolt movable in said guide, a pair of levers pivotally connected to the casing, a pair of links pivotally connected to the latch-bolt and to the said levers respectively, and means between said levers and being operable to selectively shift them laterally on their pivotal connections and thereby coöperate with either of said levers and its corresponding link and with said guide so as to effect a rectilinear movement of the latch-bolt.

3. In a door-latch, a casing provided with a rectilinear guide, a latch-bolt movable in said guide, a pair of levers pivotally connected to the casing, a pair of links pivotally connected to the latch-bolt and to the said levers respectively, means operable to engage either of said levers and swing it laterally on its pivotal connection with the casing, and a spring between and connected to the pivotal connections of the levers with said links, said spring being operable to yieldingly hold said levers and links in a position to hold the latch-bolt in its latching position.

4. In a door-latch, a latch-bolt formed of a single blank of sheet metal having two sides formed with beveled ends, said blank

being formed with a tongue extending beyond said beveled ends, said sides forming flanges that extend at right angles to the intermediate part of the blank, and said tongue having a part conforming to and united with the beveled end of the said sides; a stud between the other ends of said sides or flanges and secured to said intermediate part of the latch-bolt, and means pivotally connected to said stud and operable to move the latch bolt longitudinally.

5. In a door-latch, a lever formed of a blank of sheet metal having a pair of complemental apertured ears at each end and curved about an axis extending from end to end so that the apertures of each pair are in registration; a second lever having apertured ears interlapped with those at one end of the first said lever; a pivot to which the interlapped ears of the levers are anchored; a pair of links each having one end between and pivotally connected to the other pair of ears of one of said levers; a latch-bolt pivotally connected to said links, and means to selectively swing either of said levers laterally about their anchorage.

6. In a door-latch, a lever formed of a blank of sheet metal having a pair of complemental apertured ears at each end and curved about an axis extending from end to end so that the apertures of each pair are in registration; a second lever having apertured ears interlapped with those at one end of the first said lever; a pivot to which the interlapped ears of the levers are anchored; a pair of links each having one end between and pivotally connected to the other pair of ears of one of said levers; a latch-bolt formed of a single blank of sheet metal having two sides formed with beveled ends, said blank being formed with a tongue extending beyond said beveled ends, said sides forming flanges that extend at right angles to the intermediate part of the blank, and said tongue having a part conforming to and united with the beveled ends of the said sides; a stud between the other ends of said sides or flanges and secured to said intermediate part of said latch-bolt and engaged with said links; and means to selectively swing said levers laterally about their anchorage.

In testimony whereof they have hereunto set their hand.

MILTON J. HORN.
WARD WATSON.

Witnesses:
JAMES COLTART,
MARY ROSS.