

(No Model.)

T. C. MACE.  
LATCH.

No. 462,981.

Patented Nov. 10, 1891.

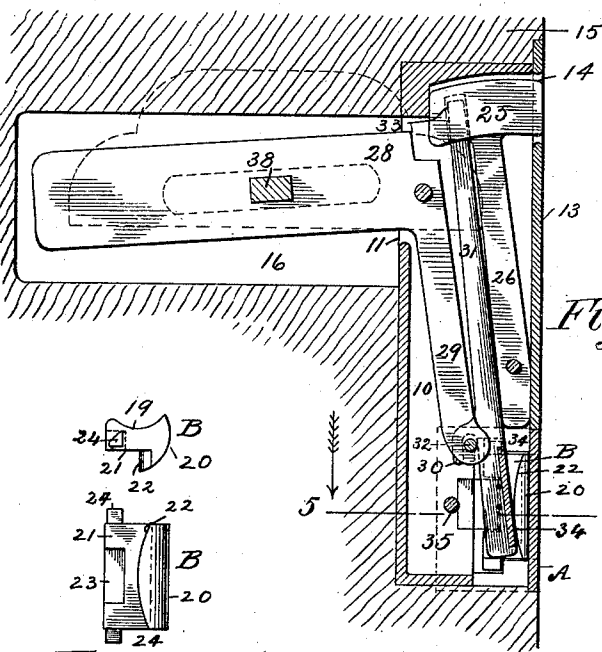


Fig. 1.

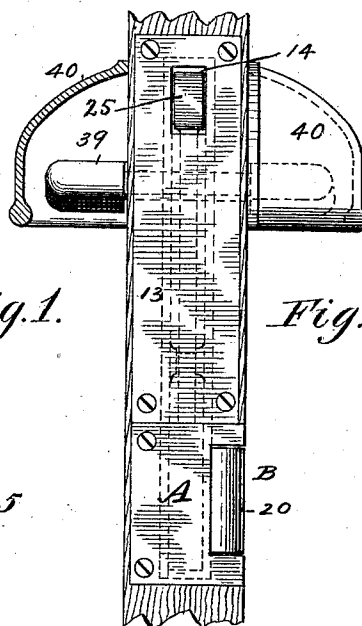


Fig. 2.

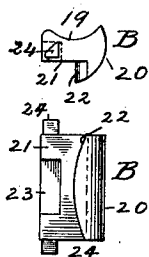


Fig. 8.

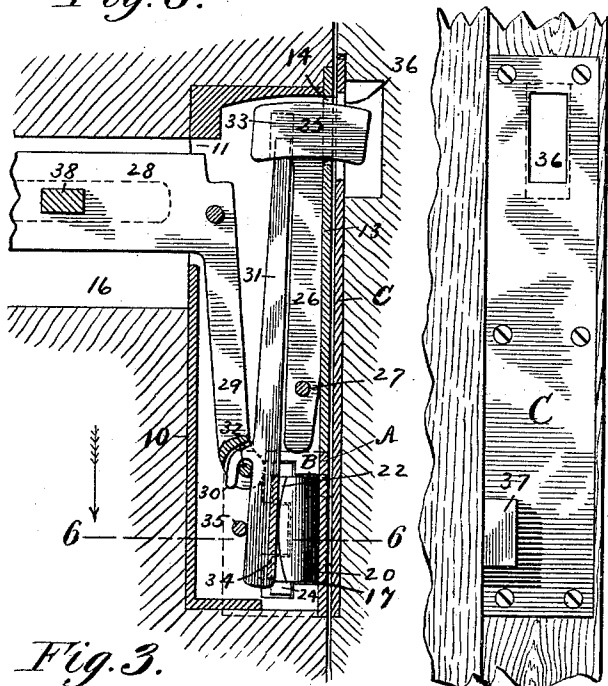


Fig. 3.

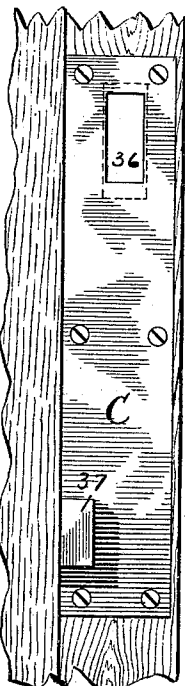


Fig. 4.

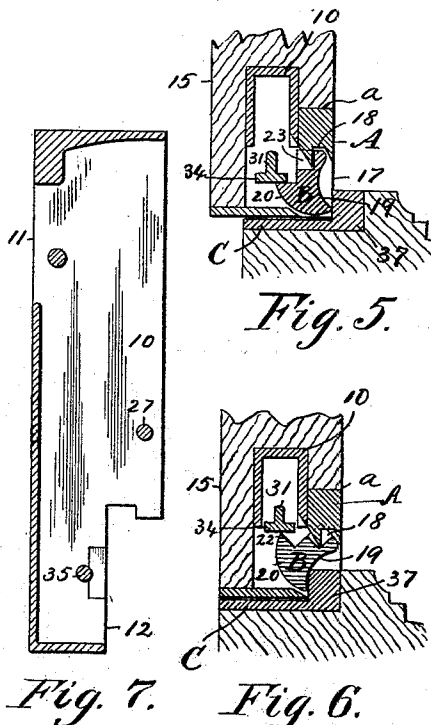


Fig. 5.

Fig. 7.

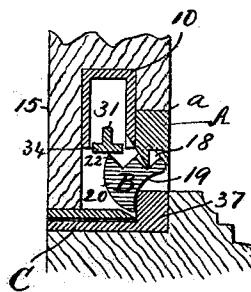


Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## LATCH.

SPECIFICATION forming part of Letters Patent No. 462,981, dated November 10, 1891.

Application filed December 10, 1890. Serial No. 374,149. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS C. MACE, of De Kalb county, in the State of Missouri, (post-office address Cameron, county of Clinton, and State of Missouri,) have invented a new and useful Improvement in Locks, of which the following is a full, clear, and exact description.

My invention relates to an improved lock, and has for its object to construct a durable and simple springless lock containing but few parts and which will operate with a minimum of friction; and a further object of the invention is to provide a gravity-bolt which, when the door is shut, will automatically shoot outward to lock the door, and wherein when the bolt is drawn backward to open the door it will remain within the lock-casing until the door is again closed.

Another object of the invention is to provide a lock in connection with which knobs or the usual form of bolt-operating mechanism may be dispensed with.

The invention consists in the novel construction and combination of these several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical section through a lock of the mortise pattern, the bolt being illustrated as thrown back in the casing, which is its normal position. Fig. 2 is a front elevation of the lock attached to a door. Fig. 3 is a central vertical section through the lock, illustrating the bolt thrown outward to the locked position. Fig. 4 is a front elevation of the striking-plate. Fig. 5 is a transverse section taken on the line 5 5 of Fig. 1. Fig. 6 is a similar section taken on the line 6 6 of Fig. 3. Fig. 7 is a central vertical section through the lock-casing, the parts of the lock being removed therefrom; and Fig. 8 is a side elevation and a plan view of the locking trip-lever adapted to act in conjunction with the striking-plate.

The lock illustrated, as heretofore mentioned, is a reversible mortise-lock; but it may

be made in the rim-pattern, if so desired. In the mortise form of lock the casing consists of two side pieces 10, connected at top, bottom, and inner side, the back or inner side having an opening 11 formed therein, for a purpose hereinafter set forth, and each one of the plates at its lower forward end is provided with a recess 12. The casing has secured to its front edge a face-plate 13, in which plate an opening 14 is produced through which the bolt passes. The face-plate 13 extends downward only to a point at or near the recessed lower end of the casing, as is best shown in Fig. 2. A suitable perpendicular opening is cut in the door 15 and a horizontal opening 16 is also produced in the door at a right angle to the front edge of the door, the said door-opening 16 being so located that it will be immediately at the rear of the opening 11 in the casing when said casing is secured in the door, as shown in Figs. 1 and 3.

At one side of the inserted casing, depending upon which way the door is to open, at the lower end of the casing, the side of the door is cut away or recessed, as shown at *a* in Figs. 5 and 6, to receive an angle-plate A, the side member whereof is of greater thickness than the front member, and the front member of the angle-plate A constitutes the lower portion of the face-plate of the lock.

The angle-plate A has a vertical opening 17 produced at the junction of its two members, extending nearly from top to bottom of the plate, and the rear perpendicular wall of the opening 17 is beveled, as shown in Figs. 5 and 6, and is provided with a perpendicular groove or channel 18.

Within the angle-plate A of the lock a trip-lever B is pivoted, the said lever being illustrated in side elevation and plan view in Fig. 8. The lever consists of a block having a concaved side 19 and a cylindrical front 20, and a vertical recess 21 is formed in the side opposite the concaved surface, the said recess being so shaped as to form upon the said side a convexed shoulder 22. In the recessed side of the block, at its inner edge, a rectangular concavity 23 is produced, in which cavity the inner wall of the angle-plate groove 18 extends, and at the top and bottom of the block a lug 24 is formed, which lugs enter cavities

in the angle-plate A. Thus by means of the lugs and the extension of the inner wall of the recess 18 of the angle-plate the trip-lever B is pivoted in the plate, and when so pivoted the cylindrical surface 20 of the block normally closes the recess or opening 17 in the corner of the angle-plate, as shown in Fig. 2.

The bolt 25 of the lock is provided with a shank 26, which shank is pivoted within the casing by a pin 27 near its lower end, as shown in Figs. 1 and 3. The bolt proper 25 is somewhat segmental in shape and is adapted to pass out and in through the opening 14 in the face-plate of the lock.

Just within the opening 11 in the back of the casing the inner end of a weight 28 is pivoted, which weight is provided with an arm 29, extending downwardly within the casing, the whole forming a weighted bell-crank lever. The arm 29 is bifurcated at its lower end and through the members of the arm a hook-extension 30 of a shifting lever 31 passes, the two being connected by a pin 32, passed through the bifurcated end of the arm, and over which pin the said hook member 30 passes. The shifting lever 31 at its upper end enters a recess 33, formed in the under face of the bolt 25, as shown in Figs. 1 and 3. The lower end of the shifting lever is carried downward to a point near the bottom of the casing, and at its lower end the front edge of the shifting lever has attached thereto or formed integral therewith a plate 34, whereby at this point the lever is somewhat T-shaped in cross-section, as shown in Figs. 5 and 6, the plate 34 being adapted to engage with the shoulder 22 upon the trip-lever B. The shifting lever 31 is fulcrumed only upon the pin 32; but its rear end is limited in its movement by a stop-pin 35, adapted to engage with its rear edge.

The striking-plate C, adapted to be fitted in the jamb of the door, is provided with the usual opening 36 to receive the bolt, and at its lower end upon its front face a lug 37 is produced. A spindle 38 is passed through the horizontal member of the weight 28, which member is located in the opening or mortise 16 of the door, and the outer ends of the spindle 38, which spindle is fast to the weight and extends beyond the sides of the door, have attached thereto buttons 39, the said buttons being concealed by hoods 40, open at the under side and attached to the sides of the door, as best shown in Fig. 2. The weight 28 normally retains the bolt in the lock-casing, as shown in Fig. 1, and when the bolt is in the casing the lower end of the shifting lever, which bears against the shoulder 22 of the trip-lever B, forces the lever to revolve sufficiently to expose its cylindrical surface at the front edge of the door and the concaved surface 19 at the side thereof. When the door is closed, the lug 37 of the striking-plate engages with the concaved surface of the trip-lever B, as shown in Fig. 5, and forces the

cylindrical face thereof within the casing, which is completely accomplished when the door is fully closed, as shown in Fig. 6, and when the trip-lever is thus manipulated the shoulder 22 thereof forces the lower end of the shifting lever 31 inward, which lever, acting upon the arm of the weight, brings the weight to almost a true horizontal position and at the same time forces the bolt 25 outward through the lock-casing into the opening 36 of the striking-plate. It is apparent that the door will remain in this locked position as long as it is closed.

In order to open the door, which may be accomplished from either side, the weight 28 is lifted by pressing upward either of the knobs or buttons 39, whereupon the stop-pin 35 acts as a fulcrum for the shifting lever 31, thus forcing the upper end of the shifting lever to move a sufficient distance to draw the bolt into the casing, whereupon the door may be opened. The moment the door is opened and the lock released from the striking-plate the weight 28 assumes its normal position, and the shifting lever forces the trip-lever B to present its cylindrical surface at the opening 17 of the angle face-plate and at the same time forces the lower end of the shank 26 outward and consequently the bolt 25 inward.

It will be observed that the lock is entirely without springs and that it is exceedingly simple, but few parts being employed; also, that the parts move with a minimum of friction and that their movements are positive.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a lock, the combination, with a pivoted bolt, of a pivoted weight, a shifting lever engaging the bolt and weight, and a trip-lever adapted to engage the shifting lever, substantially as described.

2. In a lock, the combination, with a pivoted bolt, of a pivoted and weighted bell-crank lever, a shifting lever connected with one member of the bell-crank lever and engaging the bolt, and a pivoted trip-lever engaging the lower end of the shifting lever, substantially as herein shown and described.

3. In a lock, the combination, with a pivoted bolt, a shifting lever connected with the bolt and a gravity device attached to the shifting lever, of a rocking trip-lever engaging the shifting lever, and a striking-plate provided with a lug adapted for engagement with the trip-lever, as and for the purpose specified.

4. In a lock, the combination, with a gravity-bolt and a shifting lever connected with said bolt, of a rocking trip-lever provided with a convexed shoulder engaging the shifting lever, and a striking-plate having an offset adapted for engagement with the trip-lever, as and for the purpose specified.

5. In a lock, the combination, with a pivoted bolt, of a pivoted and weighted bell-crank lever, a shifting lever fulcrumed on one

member of the bell-crank lever and engaging the bolt, and a pivoted trip-lever having a cylindrical face and normally projecting from the lock-casing, substantially as herein shown  
5 and described.

6. In a lock, the combination, with a pivoted bolt, of a weighted bell-crank lever having one of its members forked, a shifting lever engaging the bolt and provided with a  
10 hook projection extending between the forks

of the members of the bell-crank lever and engaging a pin connecting the members of the fork, and a pivoted trip-lever having a cylindrical face and normally projecting from the lock-case, substantially as herein shown 15 and described.

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Witnesses:

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