No. 724,677. PATENTED APR. 7, 1903.

W. C. DICKERSON.

LOCK.

APPLICATION FILED DEC. 24, 1902.

NO MODEL

2 SHEETS—SHEET 1.

Fig. 1.

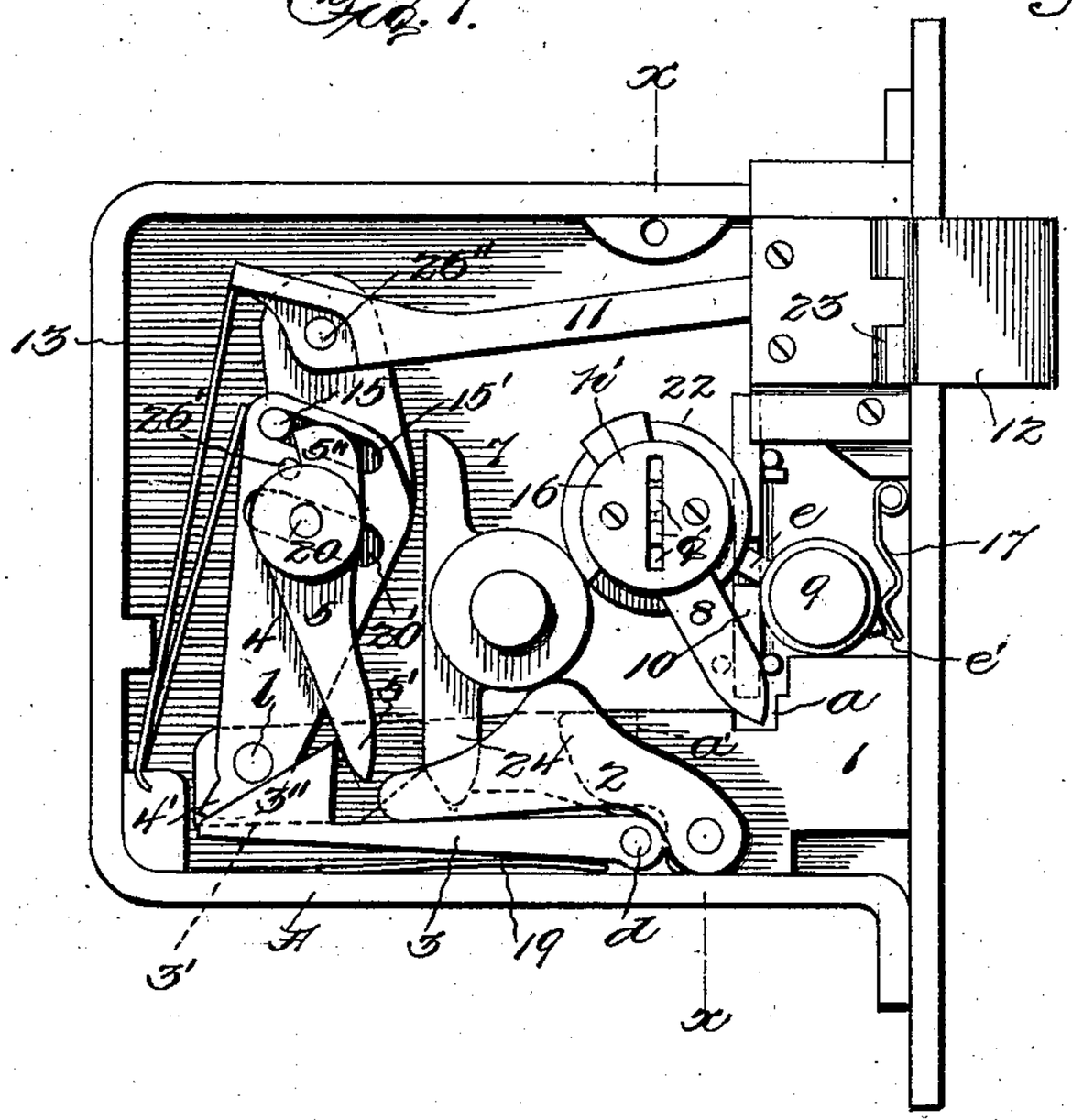


Fig. 8.

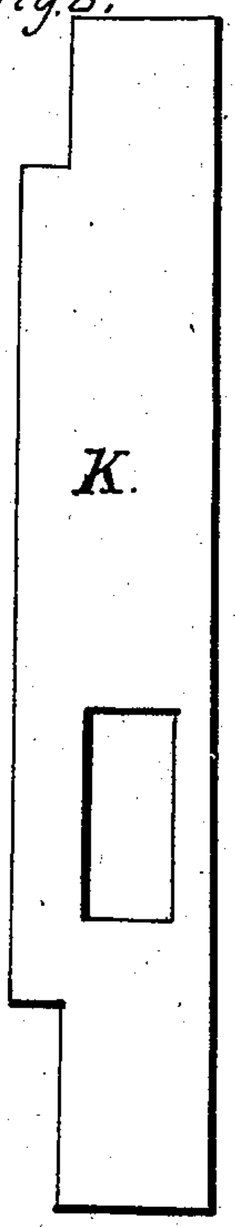
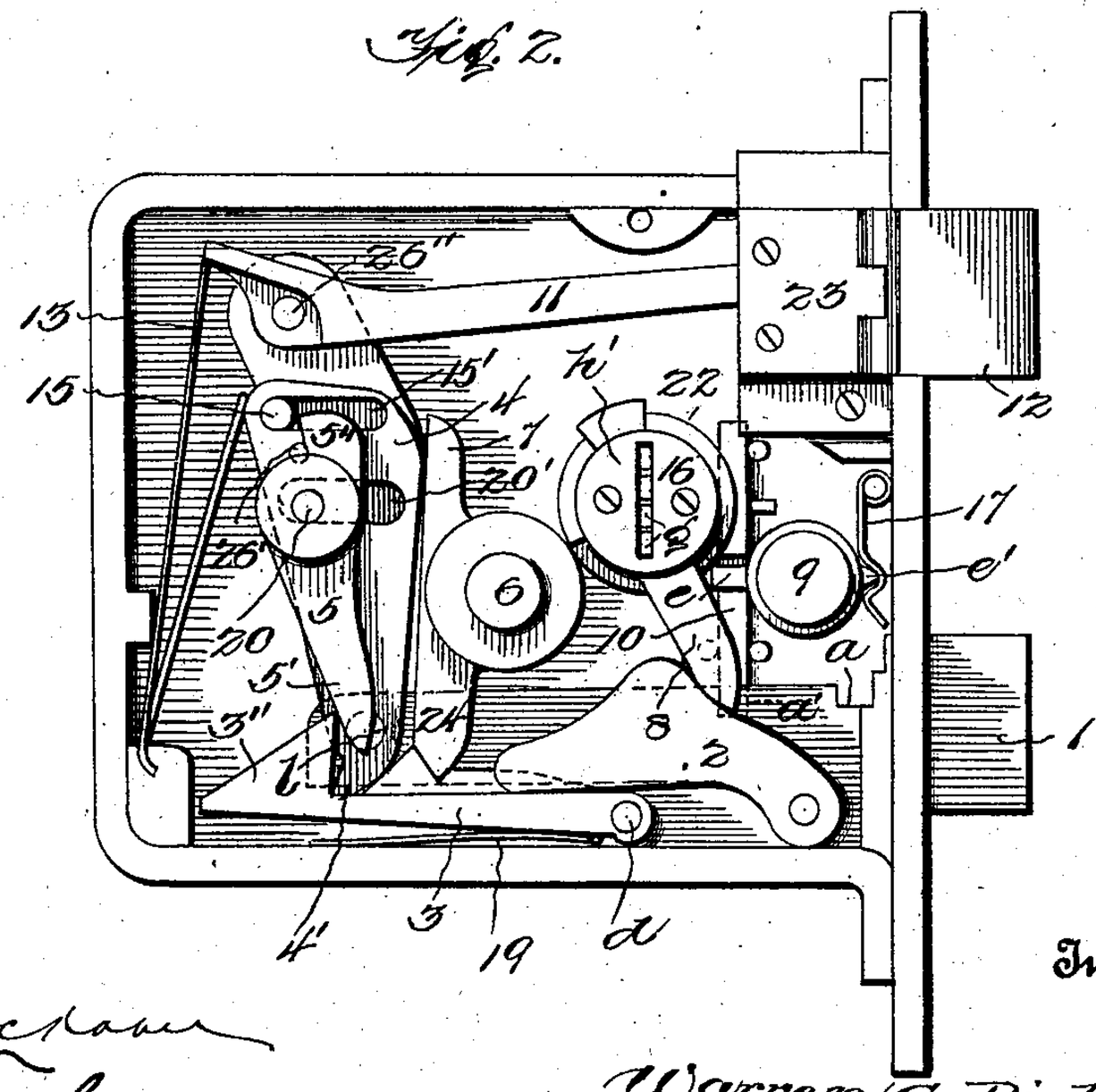


Fig. 2.



Witnesses
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C. A. Fowler

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by
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NO MODEL. 2 SHEETS—SHEET 2.

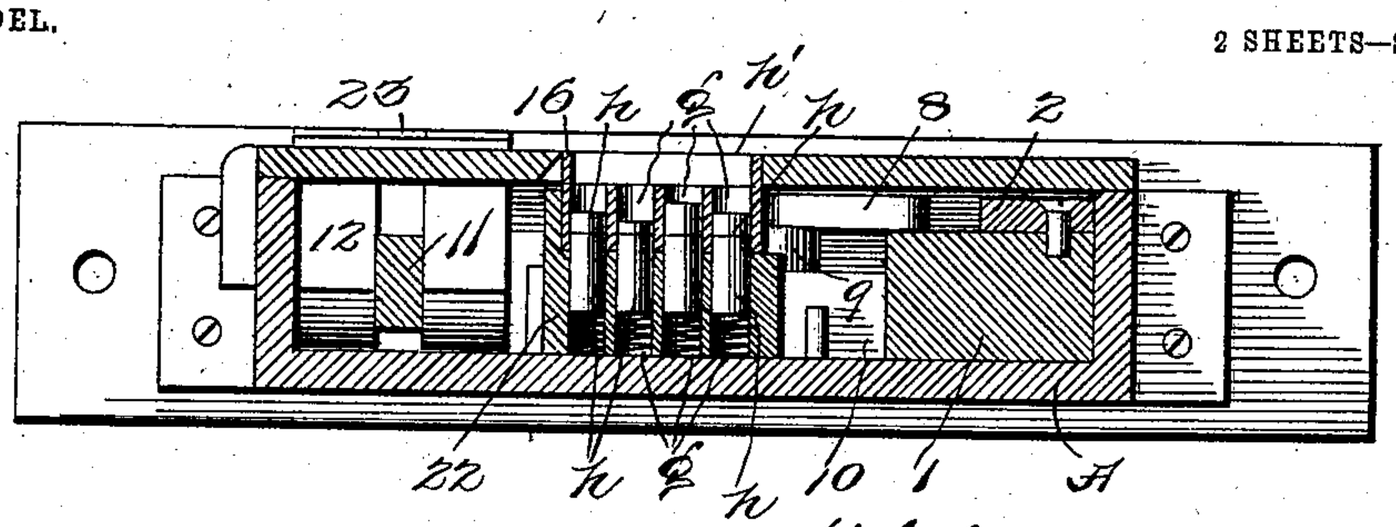


Fig. 3.

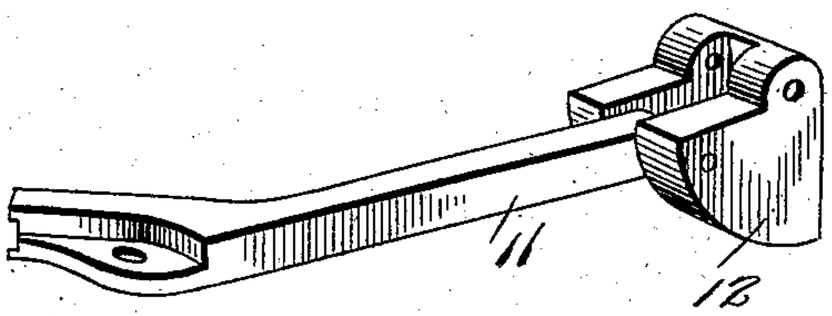


Fig. 4.

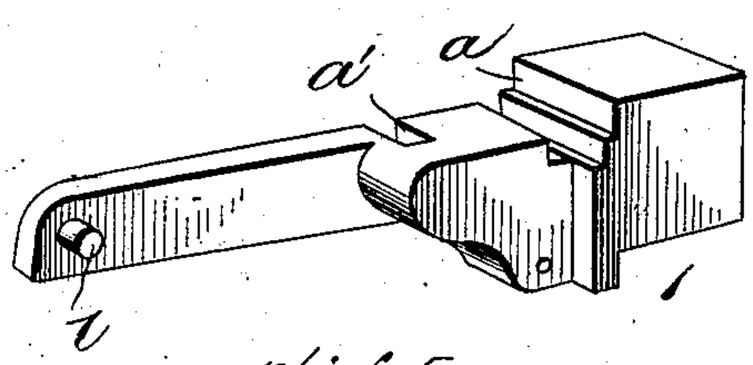


Fig. 5.

Fig. 6.

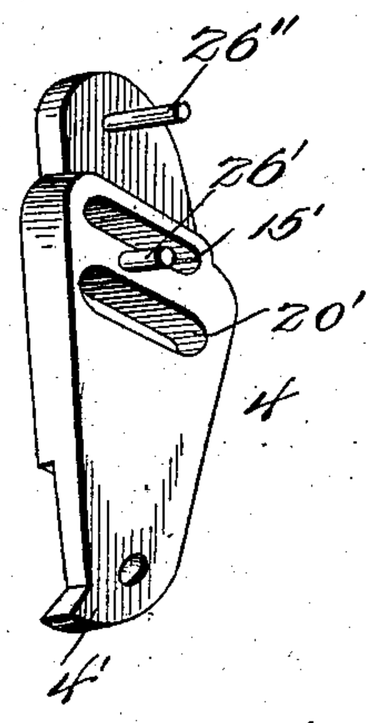
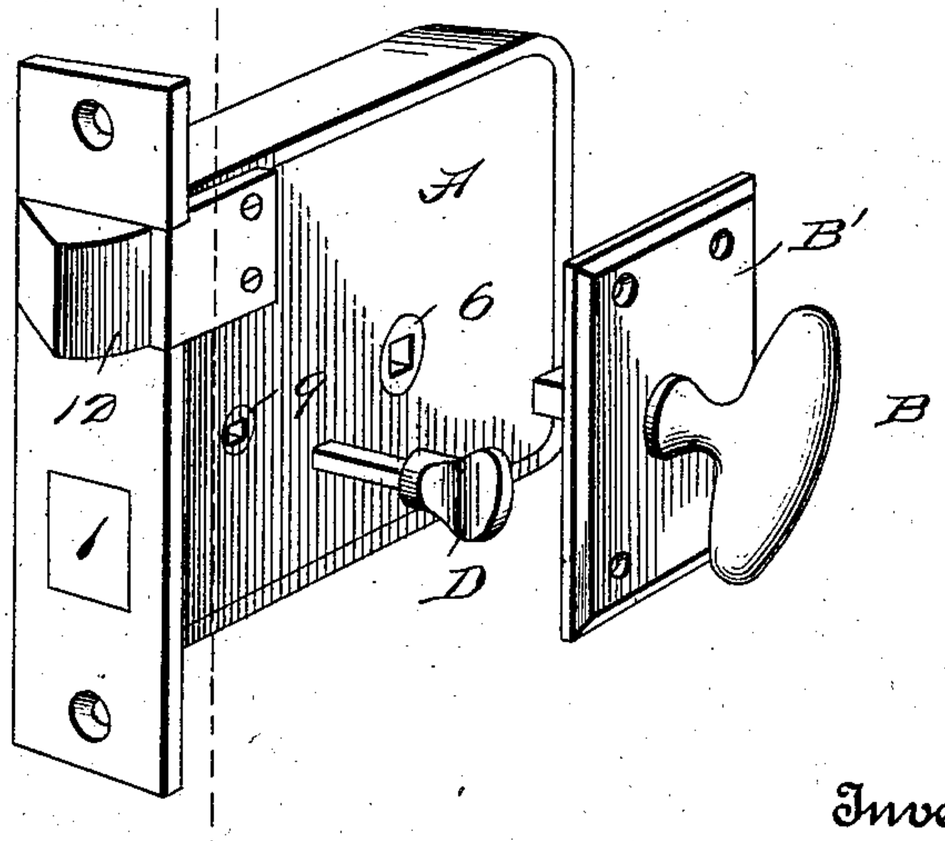


Fig. 7.



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UNITED STATES PATENT OFFICE.

WARREN C. DICKERSON, OF NEW YORK, N. Y.

LOCK.

SPECIFICATION forming part of Letters Patent No. 724,677, dated April 7, 1903.

Application filed December 24, 1902. Serial No. 136,432. (No model.)

To all whom it may concern:

Be it known that I, WARREN C. DICKERSON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Locks, of which the following is a specification.

My invention relates to certain new and useful improvements in that class of locks known as "combined locks and latches," and one wherein a thumb-piece is employed to hold the lock-bolt closed and to prevent movement thereof by the knob or key, and which condition remains until the position of the thumb-piece is changed to release the parts.

The invention consists of the parts and the constructions and combinations of parts substantially as I will hereinafter describe and claim.

In the accompanying drawings, in which similar letters and reference-numerals indicate like parts throughout the several views, Figure 1 represents a side view of my improved lock, showing the face-plate of the casing removed and the lock-bolt retracted. Fig. 2 is a similar view showing the lock-bolt projected. Fig. 3 is a cross-sectional view on the line $x\,x$ of Fig. 1, showing the tumblers. Fig. 4 is a detail of the latch removed. Fig. 5 is a detail of the lock-bolt removed. Fig. 6 is a detail of the lever 4 removed. Fig. 7 is an exterior view of the lock. Fig. 8 is a view of the keeper.

In carrying out my invention I construct the lock with an appropriate case A, which may be made of any suitable material and design. Within one portion—say the bottom—of this case I locate the lock-bolt 1, which is designed to operate through the usual opening in the front of the lock-case and to engage the opening in the keeper on the door-frame in the usual manner. This lock-bolt is formed with a notch or recess *a*, to be engaged by a bolt-locking member, as I will hereinafter describe. The rear or inner portion of the lock-bolt is of reduced thickness laterally and forms a rear extension and also a recess for other operating parts, said rear extension having a projecting stud or pintle *l*, which forms a fulcrum for one end of a lever 4, disposed substantially at right angles to the lock-bolt and designed to connect the latter with the bar which extends inwardly from the latch and communicates the motion of the latter to the lever, as I will presently describe.

Rising from the inner wall of the lock-case are two studs 15 and 20, and the lever 4 is provided with two elongated and preferably curved slots 15′ and 20′, in which the studs work. The lever 4 is also provided with two additional studs, one, 26′, serving as a trip for a dog 5 and the other, 26″, serving as the means for pivotally connecting the rear or inner end of the bar 11 to the lever, said stud 26′ being located between the slots 15′ and 20′ and said stud 26″ being at the outer end of the lever—*i. e.*, the end opposite to the fulcrum about which the lever 4 moves.

The latch is of the type employing a pivoted or hinged end 12, which works through an opening in the front of the lock-case, said end 12 being hinged or pivoted at the point 23 to a fixed part of the lock-case and said pivoted end 12 being also pivotally connected at one side of the pivot or hinge 23 with the front or outer end of a bar or bolt 11 extending about parallel with the lock-bolt, but in the opposite side of the case A, and having its inner or rear end pivotally mounted upon the stud 26″ of the lever 4. A spring 13 of any suitable character, herein shown as a flat spring, is designed to bear against the inner or rear end of the bar or bolt 11 and normally exerts its power to force this forward to project the striking end of the latch through the front of the lock-case, so that its extremity, which is curved or beveled in the conventional manner, will strike against the solid portion of the face of the keeper K, Fig. 8, fixed in the door-casing.

From the description thus far given it will be manifest that when the door is closed the hinged or pivoted end 12 of the latch will strike the keeper and be turned about its hinged joint. This action gives motion to the link or bolt 11 and causes the latter to be forced rearward or inward, which movement causes the lever 4 to fulcrum about the stud 15 to compel the lower end of said lever to move in a direction opposite to the retraction of the latch and to force the lock-bolt 1

outward, so that its front end will be projected through the front of the lock-case and into the mortise in the keeper. It will thus be seen with the parts arranged as described that although the latch is withdrawn the lock-bolt has been shot forward and the door is impossible of opening, as the lever 4 is provided with a toe-piece 4′ at its lower end, which is designed to ride over the inclined surface 3′ of a lug 3″ on the free end of a dog 3 and to lock behind the square shoulder of the lug, said dog 3 being pivotally mounted upon a stud *d*, projecting from the inner wall of the lock-case, and its free end being held upward by means of a spring 19, which is depressed when the toe-piece 4′ of the lever 4 rides over the inclined surface 3′ of said dog.

To cause the disengagement of the lever 4 with the dog 3, whereby the lock-bolt will be immediately retracted into the case as the latch escapes the keeper when the door is sufficiently opened, I employ a dog 5, which lies upon the lever and is pivotally mounted upon the stud 20 and has a long toe-piece 5′ and a short heel 5″, the former of which extends to and is adapted to engage the shouldered portion of the dog 3 while the heel is engaged by the stud 26′, projecting from the movable lever 4. When the latch is retracted, as before described, the lever 4 is forced rearward against the pressure of an appropriate spring, the slots in the lever allowing the lever to move relative to the fixed studs 15 and 20. This action removes the stud 26′ from its engagement with the heel of the dog 5, which dog is now loose upon its pivot or stud 20, and consequently its toe portion is exerting no influence on the shouldered portion of the dog 3; but as soon as the latch is allowed to shoot forward, as when it escapes past the keeper, the lever is moved with it and the stud 26′ strikes the heel-piece of the dog 5 and causes this dog to pivot about the stud 20 and its toe-piece to bear down upon the dog 3 to depress the latter and allow the toe-piece of the lever 4 to ride over the shoulder of the dog 3 and permit the spring-actuated lever 4 to retract the lock-bolt simultaneously with the projecting of the latch. This coöperation of the latch and lock-bolt is important, as the lock-bolt cannot be retracted as long as the latch is withdrawn, and this only occurs when the door is opened by the use of the proper key or by the manipulation of a proper knob on the inside of the door.

Within the lock-case is also mounted a barrel 6, from which extend arms 7 24, lying ubstantially in the same plane, said barrel having a square or other socket in one end adapted to receive the like end of a knob B, secured on the inside of the door and turnably mounted in a suitable keeper or plate B′. One of the arms 7 and 24 is adapted to strike against the edge of the lever 4 when the knob is turned in either direction, thereby causing said lever to fulcrum about the stud *l* (which unites the lower end of the lever to the lock-bolt) and withdrawing the latch without at the same time affecting or shooting forward the lock-bolt.

As before described, the front portion of the lock-bolt is provided with a recess *a*. This is preferably in the upper edge, and when the lock-bolt is retracted, Fig. 1, this notch is in line with an endwise-sliding bar 10, which is actuated by a lug *e* on a barrel 9, journaled in the lock-case and having an end socket to receive the shank of a thumb-piece D, whereby the barrel may be turned about its bearings in the lock-case to cause its lug *e* to project the bar 10 into or out of engagement with the recess in the lock-bolt. By this means the lock-bolt may be held against movement and in its withdrawn position while the latch is free to be pushed in and forced out, the lever 4 turning about the stud *l*. This same locking-bar 10 is employed to hold the lock-bolt outward or shot forward by the said bar engaging a second recess *a′* in the bolt, from which locked position it can only be removed by the turning of the thumb-piece and the consequent withdrawal of the locking-bar from the recess *a′* of said bolt. The barrel 9 has also a cam-shaped lug *e′*, standing opposite to the lug *e*, and a spring 17, having a curved seat, engages the lug *e′* to frictionally hold the barrel in the position in which it is turned.

In addition to the foregoing provision is made for operating the lock by means of a key. To effect this function, I form upon the inner face of the lock-case a large stud 22, having a peripheral flange in which is rotatively mounted a disk 16, said disk and the bottom of the stud 22 being provided with a line of matching cavities *g*, in which are placed a series of tumblers *h* in the form of cylindrical pieces of various lengths. The tumblers in the stud 22 are seated upon springs in the bottom of the cavities and the tumblers in the disks abut endwise those in the stud, and when a proper key is used it acts upon the tumblers in the disk to depress those in the stud until the tops of the latter are in the plane of the upper ends of their cavities, which plane represents the base of the socket formed by the flange 22, within which the disk is rotatable, when the disk may be turned. This disk has a longitudinally-slotted cap-piece *h′*, which is exposed through an opening in the face-plate of the lock-case and the slot in which cap-plate is designed to admit the key. The disk 16 has an outwardly-projecting lug 8, which works in a cut-away segment of the flange 22 and is designed to engage the curved edge of a dog 2, pivotally secured at one end to the lock-bolt and having its opposite or free end to bear upon and depress the spring-actuated dog 3 against the influence of its spring and cause the shoulder of the dog to release the toe-piece of the lever 4, which lever will then

retract the lock-bolt. It will thus be seen that when the latch is shoved in by striking the keeper the lock-bolt is shoved out and locked and cannot be released without a proper key or the turning of the knob on the inside, and the lock-bolt may be secured so that it cannot be retracted even with the proper key and until the knob on the inside is moved to lift the locking-bar out of its engagement with the bolt, and even if the door shrinks to expose a wide crack between the edge of the door and the door-frame the lock will still be effective and cannot be opened by introducing a blade, as in the case of the night-latches now in general use. At the same time when the door is closed the lock has all the advantages of a "dead-lock," with the additional advantage of being spring-actuated.

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

1. In a lock, the combination of a latch; a member extending therefrom; a lock-bolt; a lever interposed between the inner or rear ends of said member and the lock-bolt and pivotally connected to both, said lever fulcrumed between its ends whereby the retraction of the latch shoots forward the lock-bolt; means engaging the lever to hold the lock-bolt forward; and means carried by the lever for releasing the said engaging means to allow the lock-bolt to be withdrawn simultaneously with the projection of the latch.

2. In a lock the combination of a lock-case; a lock-bolt; a lever extending transverse of the bolt and pivotally connected to the rear or inner end thereof; a latch and a bar extending therefrom and pivotally connected to the other end of said lever, said latch hinged to the lock-case and pivotally secured to the said bar at one side of said hinged point whereby the turning of the hinged end about its axis, in one direction, forces the bar inward and simultaneously rocks the lever and shoots the lock-bolt forward; means engaging the lever to hold the lock-bolt forward; means for releasing the said locking means to allow the lock-bolt to be retracted; and a spring acting against the lever to throw it and the latch forward and simultaneously withdraw the lock-bolt.

3. In a lock the combination of the lock-case; a lock-bolt; a latch; a bar extending therefrom; a spring-pressed rocking-lever connection between the bar and lock-bolt; means engaging the lever in one direction of its movement to hold it in said position, with the lock-bolt shot forward, and the latch withdrawn; and means for releasing the lever from its locked position; said latch including a beveled-faced front end hinged to the lock-case and said bar pivotally connected to said front end at one side of the hinge.

4. In a lock, the combination of a lock-case; a latch; a lock-bolt; and means connecting the latch and lock-bolt to cause one to move in a direction opposite to the other said latch hinged at one side of its longitudinal center to a stationary part of the lock-case.

5. In a lock, the combination of a lock-case; a latch; a bar extending rearwardly therefrom; a lock-bolt substantially parallel with said bar; and a spring-pressed rocking lever extending transversely between the inner ends of the bar and lock-bolt and pivotally connected to each, said latch having a beveled front face and being hinged at one side of its pivotal connection with the bar to a stationary part of the lock-case.

6. In a lock, the combination of a lock-case, having a projecting stud on its inside; a latch; a bar extending rearwardly therefrom; a lock-bolt; a rocking-lever connection between the inner ends of said bolt and bar and pivotally connected thereto; and means for holding the lock-bolt retracted within the case; said lever slotted to receive said stud to allow the lever to rock about its pivotal connection with the lock-bolt when the front of the latch strikes its keeper and is retracted within the lock-case; and means for projecting the latch when the contact with the keeper is broken.

7. In a lock, the combination of a lock-case; a lock-bolt having a recess or notch; a slidable locking-bar operating at right angles to the bolt and adapted to be moved into engagement with said recess or notch to hold the bolt against movement; means for operating the sliding locking-bar from the inner side of the door; a latch in said case; a bar extending rearwardly from the latch; and a slotted rocking lever extending between, and pivotally connected with, the inner ends of the lock-bolt and bar and yieldable rearwardly to allow the latch to be forced into the case when its front end strikes the keeper.

8. In a lock, the combination of a lock-case; a lock-bolt having a recess or notch in its edge; a slidable locking-bar arranged in line with said recess or notch when the bolt is retracted; a barrel journaled in the lock-case and having a lug to engage the locking-bar for moving the latter into and out of engagement with the lock-bolt, said barrel having a socketed end; a thumb-piece on the door having a shank to fit said socketed end of the barrel whereby the locking-bar is operated to set the bolt from the inner side of the door; a latch mounted in the case and pressed inward by contact with the keeper; a rearward extension of the latch; and a spring-pressed rocking lever extending transversely between the inner ends of the latch extension and the lock-bolt and yieldable rearwardly about its pivotal connection with the lock-bolt to allow the latch to be depressed.

9. In a lock of the character described, the combination with a case and a lock-bolt and

its actuating-lever, of a latch; and a rearward extension of the latch connected at its rear to said lever, said latch having a pivoted front end hinged at one side of the pivot to a fixed part of the lock-case.

10. In a lock of the character described, the combination with a lock-case; a latch; a bar extending rearward therefrom; a lock-bolt; a spring-pressed rocking lever extending between the inner ends of said bolt and bar and pivotally connected to both, said lever having a toe-piece; a pivoted dog in the path of the toe-piece and depressed thereby in one direction of movement of the lever, and adapted to lock behind the toe-piece; and a dog independently pivoted on the lever and actuated by the return movement thereof to trip the first-named dog from its engagement with the toe-piece of the lever.

11. In a lock of the character described, the combination of a lock-case; a latch; a bar extending rearward therefrom; a lock-bolt; a spring-pressed rocking lever extending between the inner ends of said bolt and latch and pivotally connected to said ends, said lever having a projecting stud and a toe-piece; a pivoted dog in the path of said toe-piece, having an inclined surface over which the toe-piece rides to depress the dog said dog having, also, a shoulder behind which the toe-piece of the lever locks; and a dog independently pivoted on the lever, having a heel-piece to be engaged by the stud on the lever to rock the last-named dog in a direction opposite to the movement of the lever, said last-named dog having, also, a toe-piece to bear upon the first-named dog to release the toe-piece of the lever from its locked engagement with the shoulder of the first-named dog.

12. In a lock, the combination of a lock-case having a stud; a lock-bolt; a latch; a member extending rearward from the latch; a spring-pressed lever pivotally connected at one end to the rear end thereof and provided with a slot to embrace the said stud, said lever pivotally connected at its opposite end to the lock-bolt; a barrel journaled in the lock-case and having oppositely-extending arms adapted to engage the lever to rock it about its fulcrum-point, said barrel having a socket in one end; and an operating-knob on the door having a shank to fit said socket.

13. In a lock, the combination of a lock-case; a latch; a bar extending from the rear thereof; a lock-bolt; a lever connecting the bolt and bar and provided with a toe-piece; a spring-pressed pivoted dog to engage said toe-piece; a stud projecting from the lock-case and spring-supported tumblers mounted therein; a key-operated disk rotatively mounted in the stud and provided with tumblers matching with the first-named tumblers, said disk having a projecting lug; and a dog pivotally mounted at one end and having its opposite end to be depressed by the lug on the disk to break the connection between the toe-piece of the said lever and the first-named dog.

14. In a lock the combination with the lock-case; the latch and lock bolt and operative connections; and a locking-dog; of a stud on the lock-case provided with cavities and a peripheral flange; spring-supported, endwise-movable tumblers in said cavities; a disk rotatively mounted in said flange and endwise-moving tumblers in said disk in line with the first-named tumblers; an arm projecting from the disk; and a pivoted member over which the arm rides to depress said member into contact with the locking-dog, substantially as herein described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WARREN C. DICKERSON.

Witnesses:
GEORGE P. CROSIER,
HUGO H. AVOLIN.