S. SEGAL.

LOCK.

APPLICATION FILED AUG. 7, 1919.

1,409,245.

Patented Mar. 14, 1922.

2 SHEETS—SHEET 1.

Fig. 1

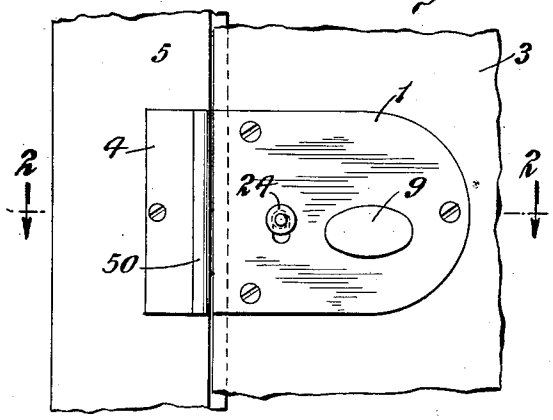


Fig. 2

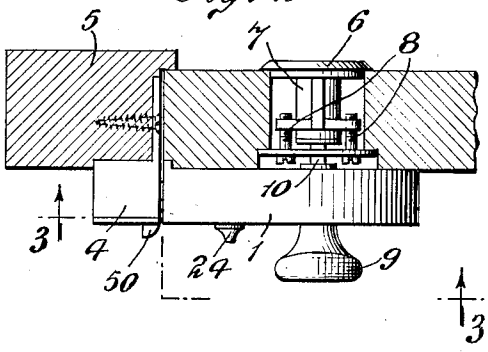
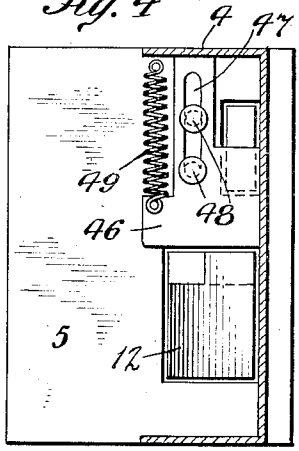


Fig. 4



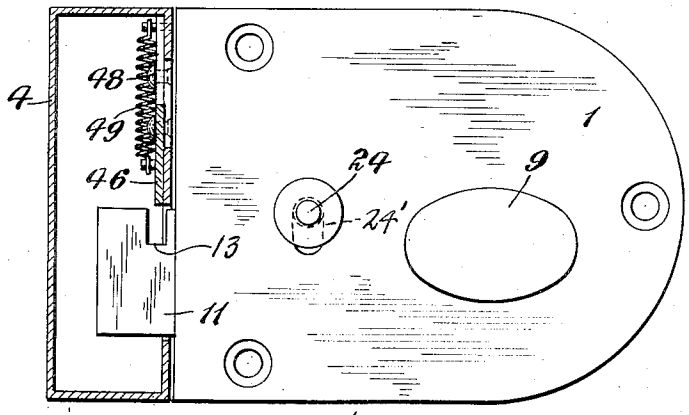
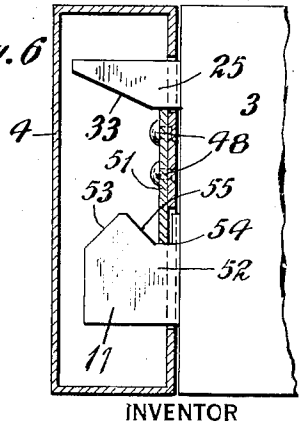


Fig. 3

Fig. 6



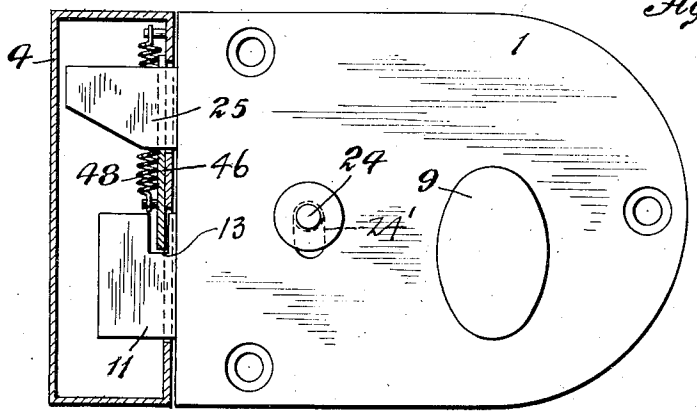


Fig. 5

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2 SHEETS—SHEET 2.

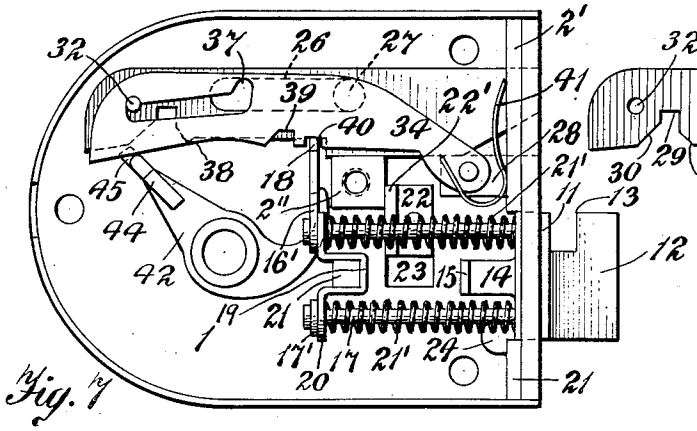


Fig. 7

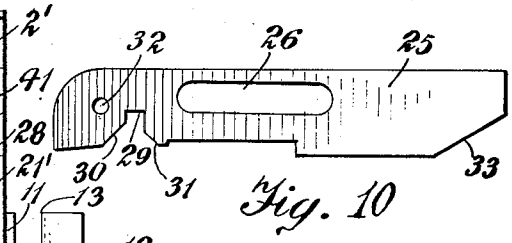


Fig. 10

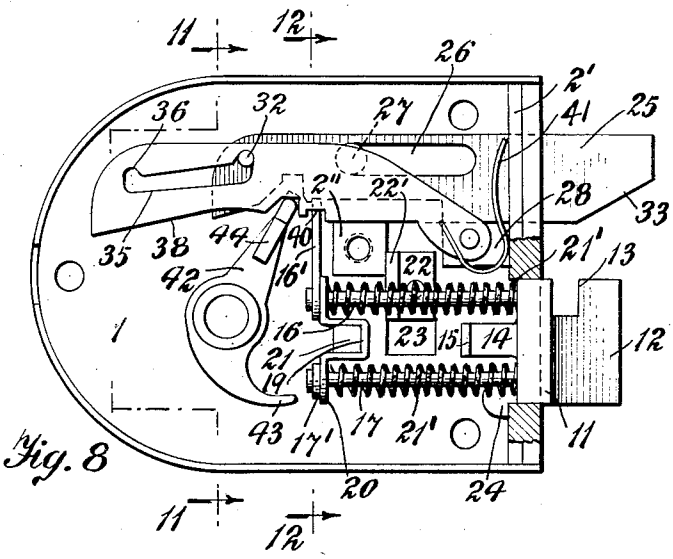


Fig. 8

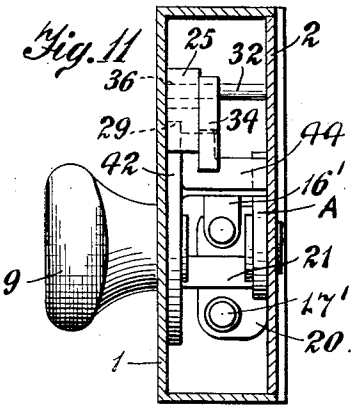


Fig. 11

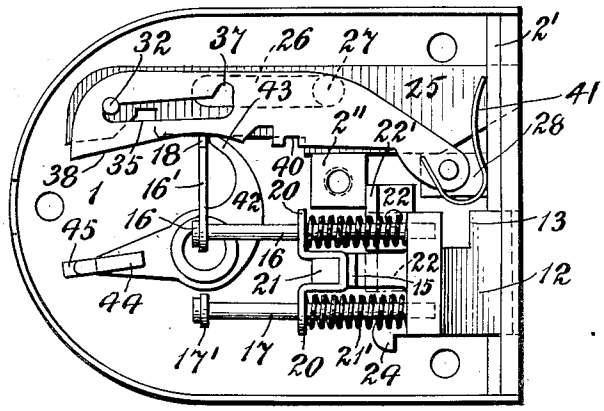


Fig. 9

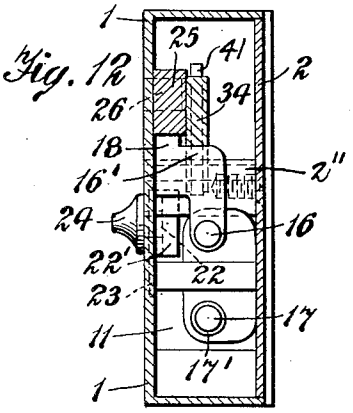


Fig. 12

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SAMUEL SEGAL, OF NEW YORK, N. Y., ASSIGNOR TO SEGAL METAL PRODUCTS COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

LOCK.

1,409,245. Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed August 7, 1919. Serial No. 315,795.

To all whom it may concern:

Be it known that I, SAMUEL SEGAL, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Locks, of which the following is a specification.

My present invention relates to locks and more particularly to locks of the swinging door type although in its application it is not limited thereto and it has for its object the production of an inexpensive, simple and efficient lock so designed as to make unauthorized entrance through a door extremely difficult if not impossible when the lock is in locked position.

A further object of the invention is the production of a lock having a plurality of locking elements each adapted to interlock with a keeper and which shall also contain means carried by said keeper adapted to interlock with one of said locking elements and to be held in interlocked position therewith by the other of said locking elements.

Still other and further objects of the invention will appear from the accompanying description, the invention consisting in the novel parts and combinations of parts hereinafter more particularly described and then set forth in the claims.

In the accompanying drawings forming a part of this description:

Fig. 1 is a front elevation of my improved lock as applied to the inner side of a door.

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged front elevation of the lock and its keeper showing the cover plate of the keeper removed.

Fig. 4 is a vertical cross-section on the line 4—4 of Fig. 3.

Fig. 5 is a view similar to Fig. 3 but showing the locking bolt in locked position.

Fig. 6 is a view similar to that of the keeper shown in Fig. 5 but showing a modification of the parts therein.

Fig. 7 is a front elevation of the lock casing with its cover removed and showing the locking mechanism therein in normal position.

Fig. 8 is a view similar to Fig. 7 but showing the locking bolt in locked position.

Fig. 9 is a view similar to Figs. 7 and 8 but showing both the spring latch and locking bolt in unlocked position.

Fig. 10 is a front elevation of the locking bolt.

Fig. 11 is a vertical cross-section on the line 11—11 of Fig. 8.

Fig. 12 is a vertical cross-section on the line 12—12 of Fig. 8.

Referring in detail to the several figures of the drawing:

1 indicates a metallic casing containing the locking mechanism and which is provided with a cover 2 normally resting on a ledge 2′ of the casing and on a post 2″ to which it is removably secured by a screw or other suitable means. Said casing is fastened preferably by suitable screws passing therethrough as shown, to the inner side of a swinging door 3 and adjacent the edge of the door. A keeper 4 also comprising a casing having a removable cover is fastened in any desired manner to the door frame or jamb 5.

6 indicates the face plate and 7 the barrel of a lock of the well known cylinder type, said barrel passing through the door and said face plate and barrel being held in proper position or that position shown in Fig. 2 by suitable bolts 8 as illustrated or by any other suitable means. The details of the construction of this portion of the mechanism being well known require no further description. 9 indicates a hollow knob connecting with the casing on the inside of the door and 10 is a stem connecting with the cylinder 7 (see Fig. 2) and extending through the cover 2 and adapted to actuate an arm A rotatably mounted in said cover (see Fig. 11). Said stem is adapted to be actuated to operate the lock from without the door by a key inserted in the face plate 6.

Mounted within the casing 1 is a spring latch the body 11 of which normally extends through a suitable aperture in the side wall of the casing. Said body 11 is provided with an inclined end 12 and with a slot 13 as shown and has secured thereto an inwardly extending bar 14 provided with a transverse flange 15. Secured to the body 11 of the spring latch are the inwardly and longitudinally extending rods 16, 17 provided at their inner ends with stops 16′ 17′, said stop 16′ extending upwardly and terminating in a shouldered end 18. 19 indicates a U-shaped piece having arms 20, said U-shaped piece engaging and fitting around a rectangular-shaped post 21 which

is mounted in the casing 1. The arms 20 of the U-shaped piece are provided with suitable perforations for receiving the ends of the rods 16, 17 so that the U-shaped piece acts as a guide and a support for the rods. 21′ indicates springs encircling the rods 16 and 17 with their ends engaging the arms 20 of the U-shaped piece and the body 11 of the spring latch and normally tending by their action to force the spring latch into extended or locked position or that position shown in Figs. 7 and 8. 22 indicates a detent having a laterally projecting flange 22′. Said detent is slidably mounted in a groove or guideway 23 with which the body of the casing is provided and is operable from within the door by a button 24 the shank of which extends through a slot 24′ in the wall of the casing and the end of which shank is fastened to said detent. When the spring latch is in retracted or unlocked position (see Fig. 9) it may be conveniently held in that position against the action of the springs 21′ by sliding the detent downwardly in its groove or guideway 23 whereby a forward movement of the latch will be prevented by engagement of the transverse flange 15 of the inwardly extending bar 14 with the laterally projecting flange 22′ of the detent. Obviously, when the detent is released from this engagement by lifting the same upwardly, the latch is immediately thrown into forward or locked position by the action of the springs 21′. The forward movement of the latch is limited by the hook or stop 24 with which the body of the latch is provided and which is adapted to engage the side wall of the casing adjacent the aperture through which the end of the latch extends (see Figs. 7 and 8).

25 indicates my improved locking bolt. Said bolt is provided with a slot 26 receiving a pin 27 which is secured to the wall of the casing and on which the locking bolt is suspended or hung. Adjacent its forward end said bolt rests on a post 28 so that a perfectly horizontal movement of the bolt is assured. Said bolt is provided with a notch 29 and inclined sides 30 and 31 adjacent said notch as well as with a pin 32 secured to the bolt. The outer end of said bolt which is adapted to extend through a suitable aperture in the side wall of the casing is provided with an inclined edge 33.

A tumbler pawl pivotally mounted on the post 28 is indicated at 34 and the flat side thereof engages the flat side of the locking bolt 25. Said tumbler pawl is provided with a slot 35 receiving the pin 32 of the locking bolt and with notches 36 and 37 forming a portion of said slot. It is also provided with a curved lower side or surface 38 adjacent its inner end, a notch 39 having an inclined inner side and a notch 40 adjacent the notch 39. A leaf spring 41 is fastened to the end of the tumbler pawl as illustrated, the other end of said spring engaging the side wall of the casing. The action of said spring 41 tends to force the inner end of the tumbler pawl downwardly, or in other words, tends to at all times cause the pin 39 of the locking bolt to engage the upper side of the slot 35 of the pawl.

42 indicates an actuator rigidly mounted on the shank of the knob 9. Said actuator is provided with a hooked end 43 adapted to engage the lower side of the stop 16′ as indicated in Fig. 9, and it is also provided with a transversely extending operating finger 44 having a shoulder 45 adjacent the end thereof. Said actuator is adapted to be operated from within the door by turning the knob 9 or from without the door by a key inserted in the face plate 6 whereby the stem 10 may be turned to force the rotatable arm A to engage the operating finger 44 of the actuator.

Referring to Figs. 3 to 5 inclusive, the casing of the keeper is provided with apertures in the side wall thereof preferably of the same size as, and in alignment with, the apertures in the side wall of the casing 1 which apertures are adapted to receive the ends of the locking bolt 25 and spring latch 11. Mounted on the side wall of the keeper casing 4 is a latch 46 comprising a plate provided with a slot 47 receiving the pins 48, which are fastened to the side wall of the casing. Said pins have headed ends to prevent displacement of the latch 46 from its mounted position and in an obvious manner. 49 indicates a spring one end of which is fastened to the latch 46 and the other end of which is fastened to the casing, the action of said spring tending to hold the latch in its extreme upper or retracted position with a portion of the latch normally covering the aperture adapted to receive the locking bolt and as indicated in Fig. 4. The edge of the casing 4 of the keeper adjacent the edge of the door is bevelled as indicated at 50.

The operation of the lock is as follows:

Normally the lock is in the position shown in Fig. 7 with the end of the spring latch extending out of the casing 1 and the locking bolt 25 in retracted position. If the door is closed, it automatically locks for the reason that the inclined end 12 of the spring latch strikes against the beveled edge 50 of the keeper and is forced inwardly momentarily thereby and against the action of the springs 21′ until the door is completely closed, when the spring latch is projected or thrown into the aperture in the casing of the keeper by the action of the springs to lock the door. To unlock the door, a key in the face plate 6, or the knob 9, is turned in a direction such as to operate the actuator 42 in a counter-clockwise direction (see Fig. 9) whereby the hooked end of said actuator en-

gages the stop 16′ and forces the latch inwardly against the action of the springs 21′ in an obvious manner. The door may be retained in unlocked position with the spring latch retracted by means of the detent 22 as previously described.

When the door is closed and the spring latch has been automatically thrown or projected into locked position, as has just been described, additional security against an unauthorized entrance through the door may be provided by means of the locking bolt 25, that is by sliding or moving the same horizontally through the casing on the pin 27 and post 28 until its end protrudes or extends within the keeper casing. This is effected by turning the key in the face plate 6 or by turning the knob 9 in a direction such as to operate the actuator 42 in a clockwise direction. The position of the mechanism before this operation is shown in Fig. 7 and after the operation is shown in Fig. 8. When so moved or operated the end of the transversely extending operating finger 44 of the actuator 42 slides against the inclined side 30 of the notch 29 of the locking bolt, the shoulder 45 of the operating finger simultaneously engaging the curved lower side or surface 38 of the tumbler pawl 34 thereby raising said tumbler pawl on its pivot against the action of the spring 41 and releasing the pin 32 from engagement with the notch 36. Further movement of the actuator in the same direction causes the end of the operating finger 44 to engage the notch 29 of the locking bolt to move or force said locking bolt horizontally through the casing, the pin 32 thereof at the same time travelling or sliding through the slot 35 of the tumbler pawl. When the shoulder 45 of the operating finger reaches the inclined side of the notch 39 the tumbler pawl moves downwardly by the action of spring 35 thereby forcing the shoulder 45 to engage the notch 39, the pin 32 to engage the notch 37 and the shouldered end 18 of the stop 16′ to engage the notch 40. Thus when the spring latch and the locking bolt are in extended or locked position they are held in that position and against any horizontal movement by engagement of the various parts just described, as is obvious, until they are released by turning or operating the actuator in a counter-clockwise direction by means of a key from without the door or by the knob 9 within the door. When the actuator is so turned or operated, the shoulder 45 raises the tumbler pawl on its pivot thereby releasing pin 32 from engagement with notch 37 and the shouldered end 18 of the stop 16′ from engagement with notch 40. The end of the operating finger 44, by its engagement with notch 29, then forces the locking bolt inwardly and as it reaches its extreme inner position the end of the operating finger slides down the inclined side 30 of notch 29 thus forcing the pin 32 to engage the notch 36 due to the action of spring 41. Further movement of the actuator 42 in the same direction causes the hooked end 43 of the actuator to engage the stop 16′ to force the spring latch into unlocked or retracted position against the action of springs 21′ as has been previously described and as is indicated in Fig. 9.

As is manifest from the foregoing description, by my improved mechanism I have in reality provided two locking elements which, when they are both in locked or extended position are "dead," that is they cannot be moved except by an authorized person by turning the knob 9 or by means of a key from without the door. In order to make the lock still more secure I have provided additional locking means (see Figs. 3 to 5 inclusive) in the nature of the latch 46. When the locking bolt 25 is thrown forward into locking position, the spring latch of course already being in that position, the inclined edge 33 of said locking bolt engages the top of said latch 46 forcing the same downwardly into the slot 13 of the spring latch so that it interlocks therewith and it is held therein by the locking bolt when the same is in extreme extended or locked position. (See Fig. 5.) When the locking bolt is withdrawn the latch 46 automatically is released from its engagement with the spring latch by the action of the spring 49.

In the modification shown in Fig. 6 the latch 51 is mounted in the keeper casing in the same manner as the latch 46 of the preferred form but no spring is provided therefor so that it normally rests on the top pin of the pins 48 by the action of gravity. The upper side of the end of the spring latch 52 is beveled as at 53 and the outer side of the slot 54 with which the spring latch is provided is inclined as at 55. Thus when the spring latch is thrown into extended or locked position the beveled edge 53 strikes the lower end of the latch 51 forcing said latch upwardly, the end finally riding over said inclined edge and sliding down the inclined side 55 of the slot 54 and into said slot. When the locking bolt is thrown into locked position it engages the top of the latch 51 and holds the same in interlocked position in slot 54. As is obvious, when the latch bolt 52 is withdrawn, the locking bolt first having been withdrawn, the latch 51 rides up the inclined side 55 and down the beveled edge 53 until it is clear of the latch bolt.

What I claim as my invention is:—

1. In a lock, a keeper, a latch adapted to interlock with said keeper and having a slot therein and a locking bolt adapted to interlock with said keeper independently of said latch and means carried by said keeper

adapted to enter the slot of said latch and to be engaged by said locking bolt.

2. In a lock, a keeper, a latch having a slot therein and a locking bolt each adapted to interlock with said keeper and a slidable plate mounted in said keeper adapted to interlock with the slot of said latch and to be engaged by said locking bolt when in interlocked position.

3. In a lock, a keeper, a latch adapted to interlock with said keeper and having a slot therein and a locking bolt having an inclined end adapted to interlock with said keeper independently of said latch and means within said keeper adapted to interlock with the slot of said latch and to be engaged by the inclined end of said locking bolt.

4. In a lock, a keeper, a latch adapted to interlock with said keeper and a locking bolt adapted to interlock with said keeper independently of said latch and means carried by said keeper adapted to interlock with said latch and to be held in interlocked engagement therewith by said locking bolt.

5. In a lock, a keeper, a latch adapted to interlock with said keeper and a locking bolt adapted to interlock with said keeper independently of said latch and means carried by said keeper adapted to interlock with said latch when said latch is in locked position and to be held in interlocked engagement therewith by said locking bolt.

6. In a lock, a keeper, a latch adapted to interlock with said keeper and a locking bolt adapted to interlock with said keeper independently of said latch and means within said keeper adapted to interlock with said latch when said latch is in locked position and to be held in interlocked engagement therewith by said locking bolt.

7. In a lock, a keeper, a latch and a locking bolt adapted to interlock with said keeper and means slidably mounted within said keeper and adapted to interlock with said latch when said latch is in locked position and to be held in interlocked engagement therewith by said locking bolt.

8. In a lock, a keeper, two independent locking elements adapted to extend within said keeper when they are in locked position and movable independently of each other and means within said keeper adapted to interlock with one of said locking elements when in locked position and to be held in interlocked engagement therewith by the other of said locking elements.

9. In a lock, a keeper, a casing for the locking mechanism, a latch and a locking bolt mounted in said casing each independently of the other and adapted to interlock with said keeper, an actuator mounted in said casing and adapted to throw said locking bolt into locked position within said keeper and to draw said latch and locking bolt into unlocked position, and means within said keeper adapted to interlock with said latch when said latch is in locked position and to be held in interlocked engagement therewith by said locking bolt.

10. In a lock, a keeper, a casing for the locking mechanism, a latch and a locking bolt mounted in said casing and adapted to interlock with said keeper, an actuator pivotally mounted in said casing adapted to throw said locking bolt into locked position within said keeper and to draw said latch and locking bolt into unlocked position and means within said keeper adapted to interlock with said latch when said latch is in locked position and to be held in interlocked engagement therewith by said locking bolt.

11. In a lock, a keeper, a casing for the locking mechanism, a latch mounted in said casing and adapted to automatically interlock with said keeper, a locking bolt mounted in said casing, a tumbler pawl pivotally mounted in said casing for holding said locking bolt in unlocked or locked position, means adapted to throw said locking bolt into locked position within said keeper and to draw said latch and locking bolt into unlocked position and means within said keeper adapted to interlock with said latch when said latch is in locked position and to be held in interlocked engagement therewith by said locking bolt.

12. In a lock, a keeper, a casing for the locking mechanism, a spring latch mounted in said casing and adapted to automatically interlock with said keeper, a locking bolt mounted in said casing, a spring pressed tumbler pawl pivotally mounted in said casing for holding said locking bolt in unlocked or locked position, an actuator pivotally mounted within the casing and adapted to throw said locking bolt into locked position within said keeper and to draw said latch and locking bolt into unlocked position within the casing and means within said keeper adapted to interlock with said latch when said latch is in locked position and to be held in interlocked engagement therewith by said locking bolt.

Signed at New York in the county of New York and State of New York, this 6th day of August, A. D. 1919.

SAMUEL SEGAL.

Witnesses:
F. G. TOWNSEND,
IRENE LEFKOWITZ.