No. 839,017. PATENTED DEC. 18, 1906.

J. MAJOR.

DOOR LOCK.

APPLICATION FILED MAR. 6, 1905.

2 SHEETS—SHEET 1.

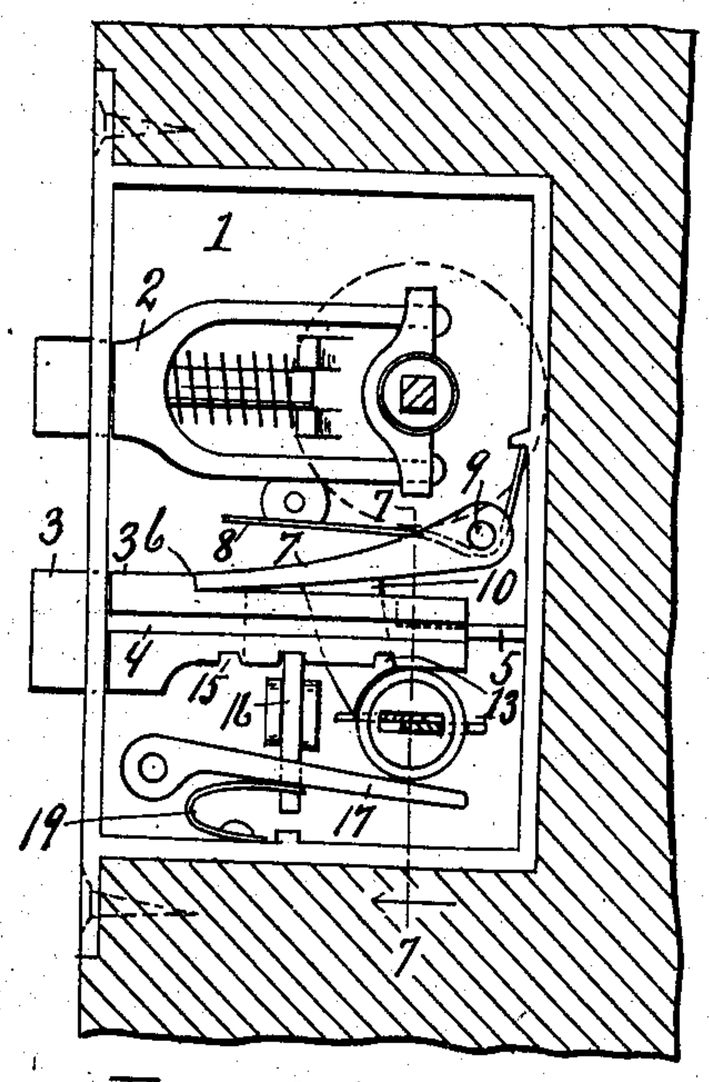

Fig. 1.

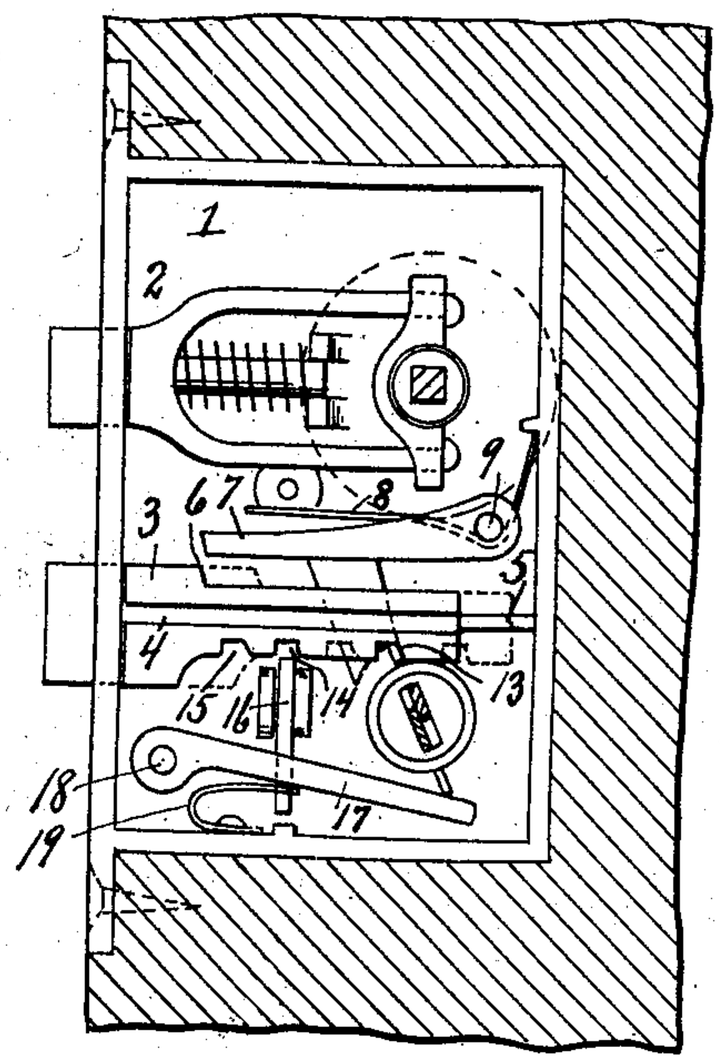

Fig. 2.

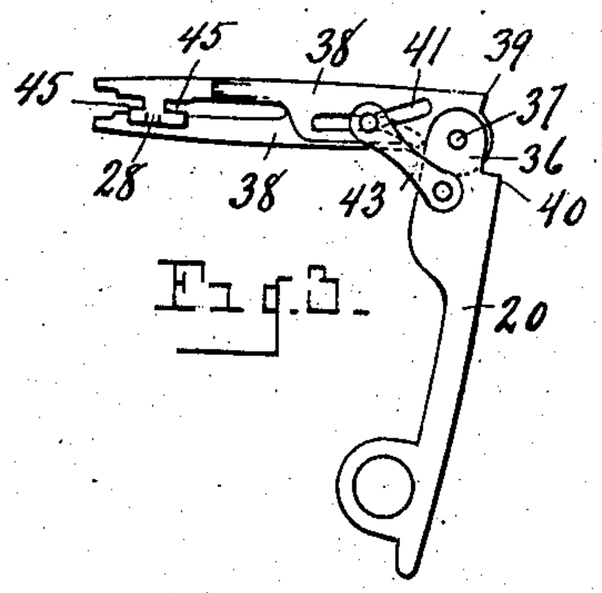

Fig. 3.

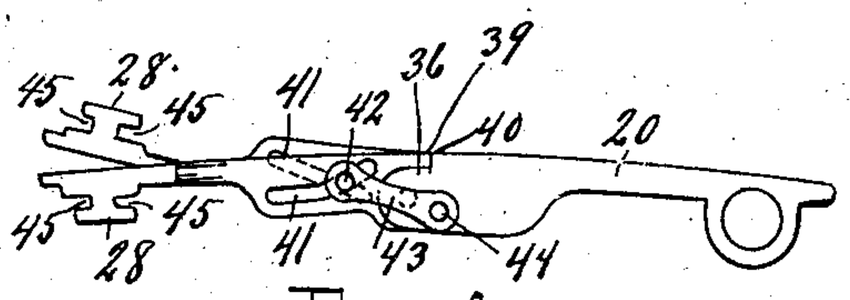

Fig. 4.

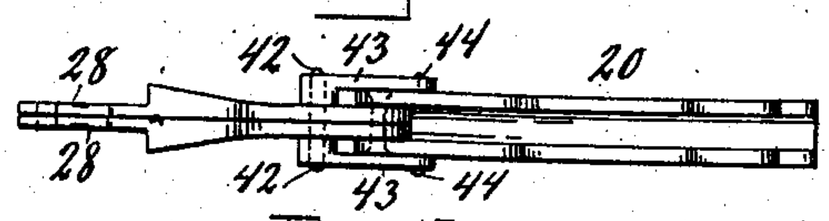

Fig. 5.

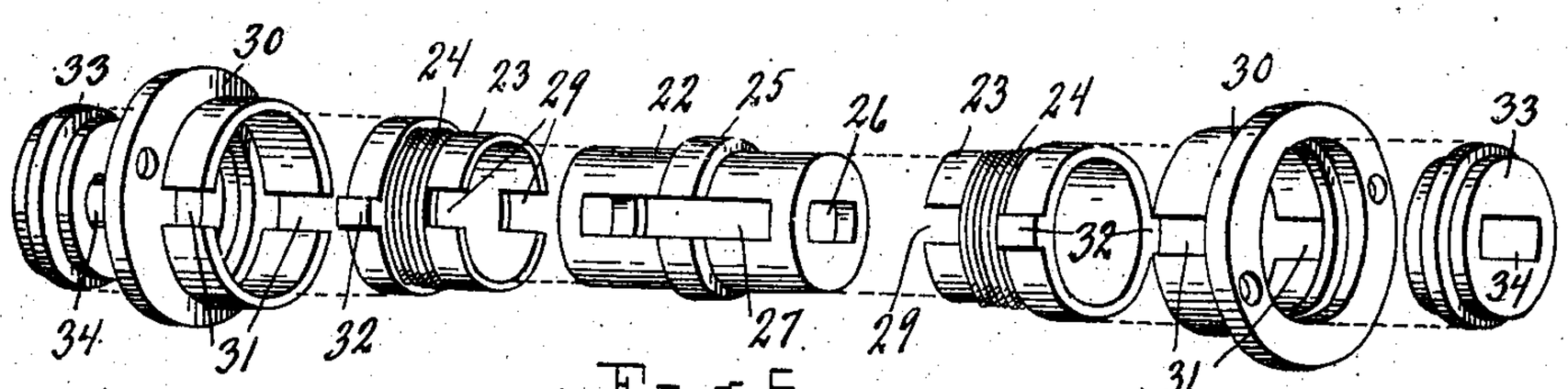

Fig. 6.

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2 SHEETS—SHEET 2.

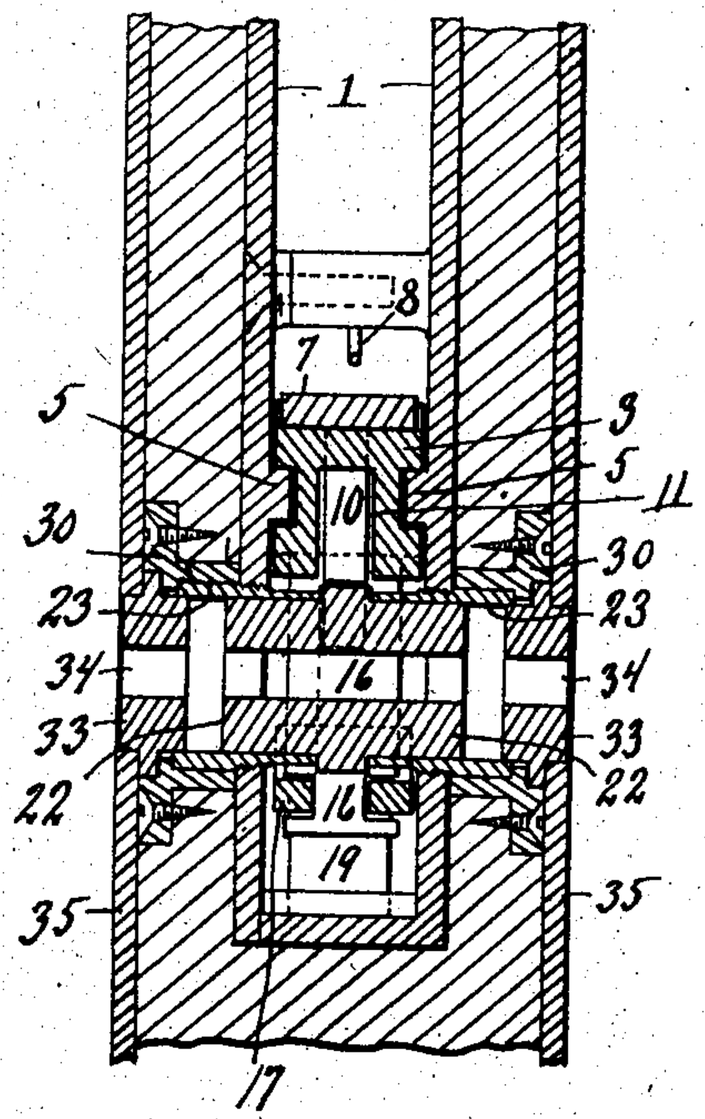

Fig. 7.

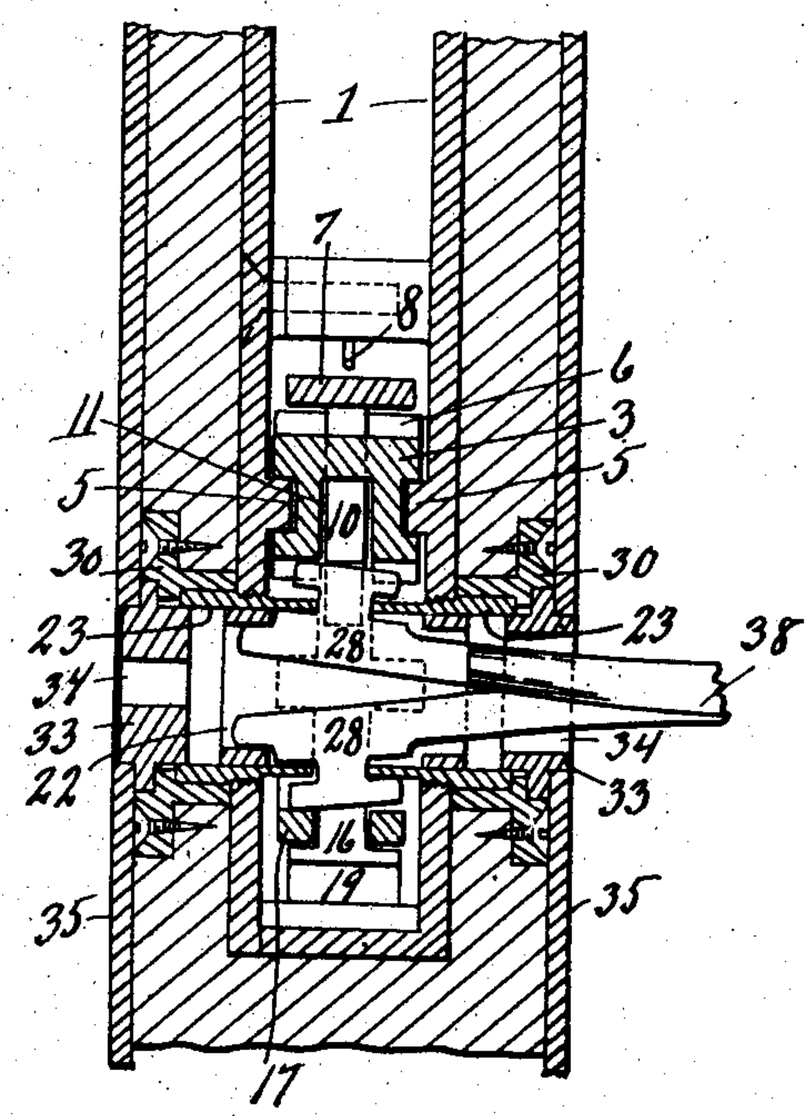

Fig. 8.

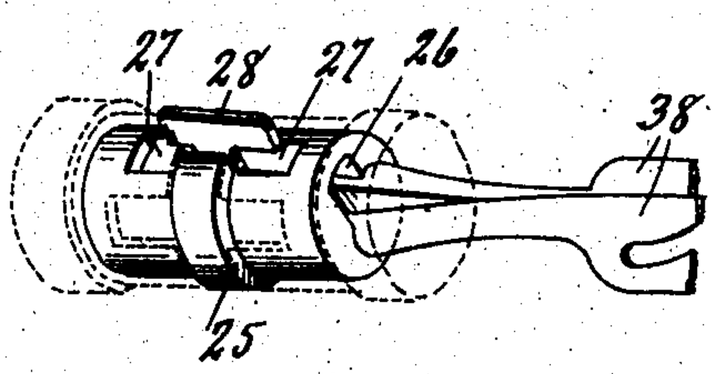

Fig. 9.

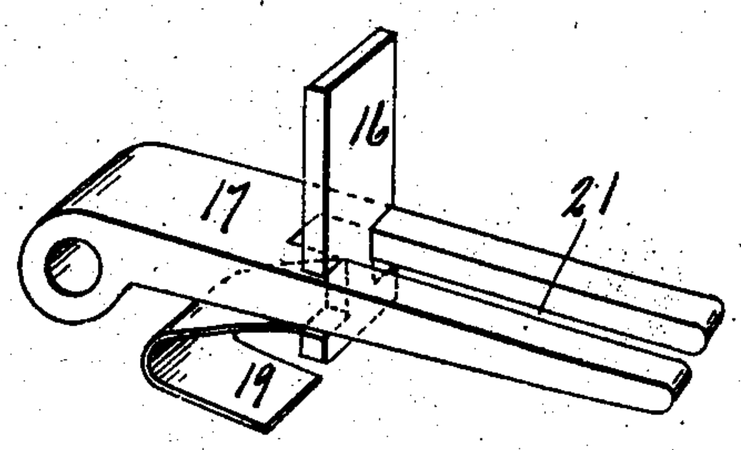

Fig. 10.

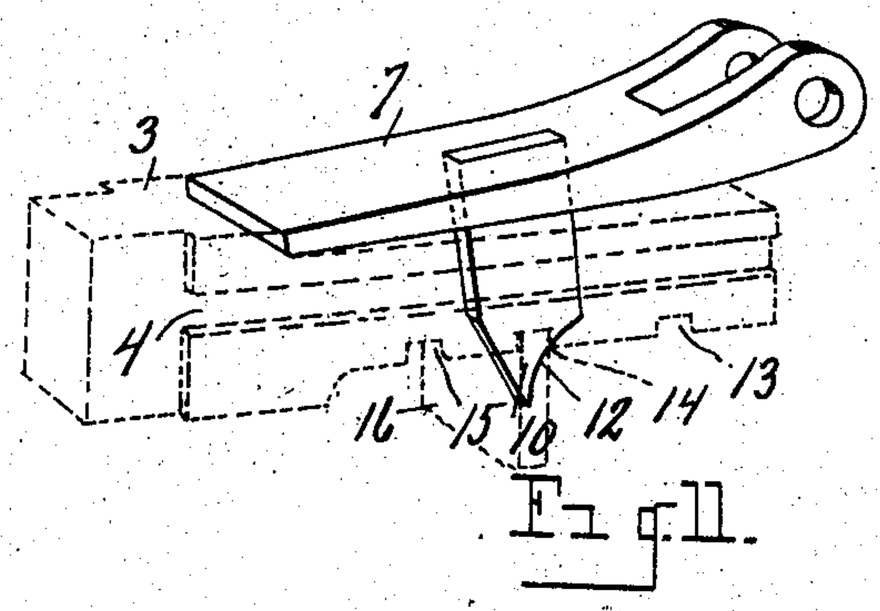

Fig. 11.

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UNITED STATES PATENT OFFICE.

JOSEPH MAJOR, OF SANDWICH, ONTARIO, CANADA.

DOOR-LOCK.

No. 839,017. Specification of Letters Patent. Patented Dec. 18, 1906.

Application filed March 6, 1905. Serial No. 248,440.

To all whom it may concern:

Be it known that I, JOSEPH MAJOR, a citizen of the Dominion of Canada, residing at Sandwich, in the county of Essex, Province of Ontario, Canada, have invented certain new and useful Improvements in Door-Locks; and I 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, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to door-locks; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to provide a lock wherein the arrangement is such as to render it practically non-pickable, and the parts are so constructed as to require a key of a peculiar character to operate the lock-bolt, the lock being comparatively simple and inexpensive and the parts of such construction as to render the lock adaptable to doors of various thicknesses.

The above object is attained by the structure illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the parts of the lock with one side of the lock-case removed, showing the position of parts when the door is locked and a portion of the door in section. Fig. 2 is a similar view showing the position of parts when actuated by the key prior to the unlocking of the door. Fig. 3 is a plan view of the key in position for insertion in the lock. Fig. 4 is a similar view of the key, showing the position thereof when inserted in the lock. Fig. 5 is an edge elevation of Fig. 4. Fig. 6 is a view in perspective, showing the cylinder of the lock, the sleeves that embrace the ends of the cylinder, the thimbles that embrace the sleeves and the escutcheons that are seated in the thimbles, said parts being disassembled. Fig. 7 is a sectional view through the parts of the lock, as on line 7 7 of Fig. 1. Fig. 8 is a similar view with the key inserted. Fig. 9 is a fragmentary view in perspective, showing the key inserted in the cylinder of the lock. Fig. 10 is a perspective view of one of the spring-actuated dogs or detents which assist in securing the lock-bolt. Fig. 11 is a similar view of the other of said dogs or detents, showing the lock-bolt by dotted lines.

The lock illustrated herein is of the type known as "mortise-locks," and the parts are assembled in a suitable case 1.

Located within the casing is the ordinary latch-bolt 2 and its operative parts, but which do not form any part of this invention and need not be more specifically mentioned.

Located within the casing is the lock-bolt 3, having channels 4 in the opposite faces thereof, which receive the opposed guide-ribs 5 on the sides of the casing, whereby said bolt is firmly held in place and directed in its movement. Formed upon the upper face of the lock-bolt is a shoulder 6, and adapted to engage said shoulder when the lock-bolt is thrown or projected, as shown in Fig. 1, is a detent 7, which is normally held in contact with said bolt by the spring 8 and which is pivoted at 9 in the lock-case. Projecting from the under face of the detent and secured rigidly therein is a lug 10, which passes freely through the bolt 3 and lies in the channel 11, formed in the under face of the lock-bolt and extending longitudinally thereof, the end of said lug protruding through said lock-bolt and having a curved face 12. Formed transversely of the under face of the lock-bolt is the key-notch 13, adapted to be engaged by the wing of the key in actuating said bolt. Also formed in the under face of said lock-bolt is the transverse notch 15, adapted to receive the locking-dog 16, which is mounted upon the slotted arm 17, pivoted at 18 in the case and actuated by the spring 19 to hold said dog in said notch when the door is unlocked and to hold said dog in the notch 14 of the lock-bolt when said bolt is projected in the locked position. The slotted arm 17 is operated to retract the locking-dog 16 from the notches in the lock-bolt by means of the key 20 when actuating said bolt, as hereinafter explained. The slot 21 in the arm 17 extends from the locking-dog 16 to the end of said arm, the purpose of which will be hereinafter set forth.

The rotatable hollow cylinder 22 of the lock which receives the key is confined by means of the opposed sleeves 23, which are threaded at 24 to screw through the sides of the lock-case, as clearly shown in Figs. 7 and 8, the inwardly-projecting ends of said sleeves embracing the cylinder on each side of the central flange 25 thereof and confining

said cylinder so as to rotate within said sleeves. Each end of the cylinder 22 is provided with an oblong opening 26 for the insertion of the key, and in the opposite sides of said cylinder are formed the longitudinally-extending slots 27, through which the wings 28 of the key are adapted to extend when in position to actuate the lock-bolt. Formed through the opposite sides of the sleeves 23 are the notches 29, which normally register with the slots 27 in the cylinder and allow the opposite ends of the wings of the key to pass therethrough into operative position before the key is rotated in the lock. Fitting over the outer ends of the sleeves 23 are the thimbles 30, adapted to slide upon said sleeves to compensate for varying thicknesses of doors and which are locked to the sleeves by means of the notches 31 in said thimbles, which engage over the laterally-projecting lugs 32 on said sleeves, whereby the sleeves may be rotated with said thimbles and by that means screwed into the threaded openings in the sides of the lock-case or removed therefrom.

The thimbles are countersunk in the opposite faces of the door, as shown in Figs. 7 and 8, and seated within said thimbles are the rotatable escutcheons 33, each having an oblong aperture 34 therethrough for the passage of the key, said aperture fitting the stem of the key and causing the escutcheon to rotate as the key is turned. The escutcheons are confined in place by the door-plates 35, which are provided with apertures that receive the reduced outer end portions of the escutcheons and within which said escutcheons are rotatably retained, as clearly shown in Figs. 7 and 8.

The character of this lock is such as to require a key of peculiar construction, such as illustrated in the drawings in this case. Said key comprises a channeled handle 20, at one end of which are the opposed ears 36, between which are pivoted, at 37, the stems 38 of the duplex wings 28, said stems having a shoulder 39, which engages a corresponding shoulder 40 on the handle when the key is straightened after insertion in the lock, whereby the joint between the stems and handle is stiffened. In order to cause the wings of the key to spread in opposite directions after insertion in the lock, the stems 38 are provided with the slots 41, which curve in opposite directions and through which passes a pin 42, carried by the lower ends of the links 43, whose upper ends are pivoted at 44 to the handle, the pin 42 traveling in said slots as the key is opened and closed. When the key is closed or partially closed, as shown in Fig. 3, the wings thereof lie together in opposed relation, enabling the key to be inserted through the escutcheon and into the cylinder 22, when upon straightening the handle of the key the pin 42, riding in the slots 41 as the links 43 draw into alinement with the handle, will cause the stems to separate, so as to throw the wings of the key apart, as shown in Fig. 4. This movement of the wings will cause them to pass outwardly through the slots 27 in the opposite sides of the cylinder and through the notches 29 in the sleeves 23, as illustrated in Figs. 1 and 9. With the wings of the key in the position above described a rotation of the key will cause one of the wings to engage the end of the lug 10 of the detent 7 and move said detent from engagement with the shoulder 6 of the lock-bolt, in which position the parts are held as the wing of the key moves in contact with the curved face 12 of said lug into engagement with the notch 13 of said bolt. A further rotation of the key will then cause the wing to engage said notch and slide the bolt rearwardly, as in unlocking the door. At the same time the opposite wing of the key will engage the slotted arm 17 and force said arm outwardly, as shown in Fig. 2, thereby retracting the locking-dog 16 from the notch 14 in the under side of said bolt and permitting it to move freely. As the key is further rotated to the right the wing of the key engaging the arm 17 will pass therefrom, permitting the spring 19 to return said arm and throw the dog 16 into the notch 15 in the under side of the lock-bolt, thereby securing said bolt in its unlocked position, the detent 7 resting at its free end upon the upper face of the lock. It will be noted that the upper and lower edges of the wings of the keys are notched, as shown at 45, and that as the key is rotated after it is inserted and expanded the opposed or inner ends of the sleeves 23 lie in said notches, while the expanded ends of the key-stems lie within the cylinder 22, as clearly shown in Fig. 8, whereby the key is perfectly centered and held properly in position while being rotated to manipulate the lock. It will also be noted that the key cannot be expanded until it is turned so as to cause the wings thereof to register with the notches 29 in the inner ends of the sleeves, which are so positioned as to cause the wings to stand transversely of the lock when they are projected therethrough. With the parts in their normal or unlocked position the lock-bolt may be thrown by turning the key to the left after it has been inserted into the lock and the wings expanded, which movement of the key will cause one wing to swing the pivoted arm 17 and retract the dog 16 from the notch of the lock-bolt and cause the other wing to engage in the notch 13 in the under face of the lock-bolt and carry said bolt outwardly to the locked position shown in Fig. 2, when as the wings of the key pass from engagement with the arm 17 and the lug 10 of the detent 7 the free end of said detent will drop into engagement with the shoulder 6 of the lock and the dog 16 will en-

ter the notch 14 in the under side of the lock-bolt, whereby said bolt is firmly held and can only be moved to unlock the door after the detent 7 has been raised to free the shoulder 6 and the arm 17 moved to retract the dog 16 from the notch 14.

To remove the key from the lock, it is turned so as to cause the wings to register with the notches 29 in the sleeves when the handle thereof is bent at right angles to the stems, as shown in Fig. 3, thereby causing the wings to collapse or close so as to withdraw them from within the cylinder and enabling their removal through the opening 26 in the end thereof and through the opening 34 in the escutcheon.

It will now be understood that this lock can only be manipulated by means of a key of the peculiar construction shown and that said lock cannot be picked by the insertion of a wire or other instrument, owing to the fact that the only entrance into the lock through the escutcheon is by way of the slots 27 in the cylinder 22, which as said cylinder rotates is partially cut off by the embracing walls of the ends of the sleeves, leaving only a small central opening through the walls of the cylinder that will scarcely permit of the introduction of a wire or other tool, and as said central opening in the sleeve is in direct alinement with the channel 11 in the face of the lock-bolt and the slot 21 in the arm 17 neither of said parts could be actuated by the end of a wire passed through said central opening, as said wire would only enter said channel or slot, and as the lug 10 is quite pointed at its end it does not afford any opportunity of raising the detent by the use of any instrument, except a properly-constructed key, as herein shown.

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

1. In a lock and key, the combination of the lock-bolt, a spring-actuated detent engaging said bolt, a lug upon said detent extending into the path of the key, a spring-actuated arm carrying a locking-dog also engaging said lock-bolt, a slotted cylinder disposed between said lug and the spring-actuated arm and a key member adapted to enter said cylinder having wings which extend through the slots therein and simultaneously engage said arm and the lug of the detent to release the lock-bolt, one wing member being also adapted to engage said bolt to actuate it.

2. In a lock and key, the combination of the lock-bolt, a detent engaging said lock-bolt, the locking-dog also engaging the lock-bolt, a spring-actuated arm to which said dog is attached, said detent having a lug projecting therefrom, a key member having a divided stem, oppositely-disposed wings fixed to the divided portions of the key-stem adapted to simultaneously engage said lug and arm to release the detent and dog from the lock-bolt, one of said key members being adapted to engage said bolt to actuate it.

3. In a lock and key, the combination of the reciprocatory lock-bolt, a detent engaging said bolt upon one side, a locking-dog engaging said bolt upon the other side, a rotary cylinder adapted to receive a key member, said cylinder having slotted openings in its opposite walls, movable parts connected with the detent and locking-dog lying adjacent to said cylinder, a key member having extensible wings adapted to project through the slots in said cylinder and engage said movable parts to release the lock-bolt, one of the wings of said key member adapted to engage the lock-bolt to actuate it.

4. In a lock and key, the combination of the lock-bolt, a plurality of movable parts engaging said bolt to lock it against movement, a rotary cylinder adapted to receive the key, said cylinder having slotted openings in the opposite walls thereof, and a reduced opening in the end through which the key may be passed, said movable parts lying adjacent to said cylinder, a key member adapted to be contracted for entrance into said cylinder and expanded to cause its wings to pass through the slotted openings in the walls thereof, said wings being adapted to simultaneously engage the movable locking parts to release the lock-bolt, and one of said wings being adapted to engage said bolt to actuate it.

5. In a lock and key, the combination of the lock-bolt, movable locking members engaging said bolt to hold it against movement, a rotary cylinder adapted to receive the key, said cylinder standing adjacent to said movable locking members, and having slotted openings in the opposite walls thereof and a relatively small opening through its end, fixed sleeves embracing the ends of said cylinder having notches which register with the slotted openings in the walls thereof when the cylinder is in its normal position, a key member adapted to be contracted for insertion through the end of said cylinder, and having expansible wings adapted to project through the slots in said cylinder and through the notches in said sleeves, said wings having notches which receive the ends of the sleeves when the key is turned and the cylinder is caused to rotate within said sleeves, the protruding wings of the key being adapted to engage the movable locking parts to free the lock-bolt, and one of said wings being adapted to engage the lock-bolt to actuate it.

6. In a lock and key, the combination of the rotatable cylinder adapted to receive a key member, said cylinder having a relatively small opening through the end thereof, and slotted openings through its opposite walls, a lock-bolt, a detent to engage said bolt having a lug passing through the bolt

and standing adjacent said cylinder, a spring-actuated arm also lying adjacent said cylinder, a locking-dog on said arm adapted to engage the lock-bolt, a key member adapted to be inserted in the cylinder and expanded to cause its wings to project through the slots therein, said wings being adapted to engage the spring-actuated arm and the lug of the detent to release the lock-bolt, one of said wings being adapted to engage said bolt to actuate it.

7. In a lock and key, the combination of the lock-bolt, movable members for normally locking said bolt against movement, a rotary cylinder located adjacent said movable locking members, the lock-bolt having an opening therethrough through which one of the movable members passes, and having a channel in alinement with said movable member, the other movable locking member being slotted, notched sleeves embracing the ends of the rotary cylinder and closing the major portion of the slotted openings when the cylinder is turned to carry the openings out of alinement with the notches of the sleeves, forming through the opposed walls of the cylinder small central openings only, a key member having expansible wings, said member being adapted to be inserted in the cylinder and expanded to cause the wings to project through the slotted openings of the cylinder when registering with the notches of the sleeves, said wings having a reduced portion adapted to lie in the reduced central portion of the slotted openings when the cylinder is turned, said wings being adapted to engage the movable locking members to release the lock-bolt and to engage and actuate said bolt, the channel in the lock-bolt and the slot in one of the movable locking members registering with the reduced central opening in the walls of the cylinder when said cylinder is turned in the operation of actuating the lock-bolt.

8. In a lock and key, the combination of the lock-bolt, movable members adapted to normally lock said bolt against movement, a rotary cylinder adjacent said movable locking members adapted to receive a key, said cylinder having opposed openings in its sides to permit the wings of the key to pass therethrough and engage the movable locking members, and also to engage the lock-bolt, sleeves screwed into the lock-plates and engaging the ends of the rotary cylinder, thimbles set into the sides of the door and slidably engaging said sleeves, rotatable escutcheons adapted to turn with the cylinder seated in said thimbles and the lock-plates confining said escutcheons in place.

9. In a lock and key, the combination of a lock-bolt, movable members engaging the lock-bolt to hold it in the locked position, a key member having contractible and expansible wings, the movable members engaging the lock-bolt and standing in the path of said wings when expanded, and actuated by said wings to release the lock-bolt upon the turning of the key.

In testimony whereof I sign this specification in the presence of two witnesses.

JOSEPH MAJOR.

Witnesses:
I. G. HOWLETT,
O. B. BAENZIGER.