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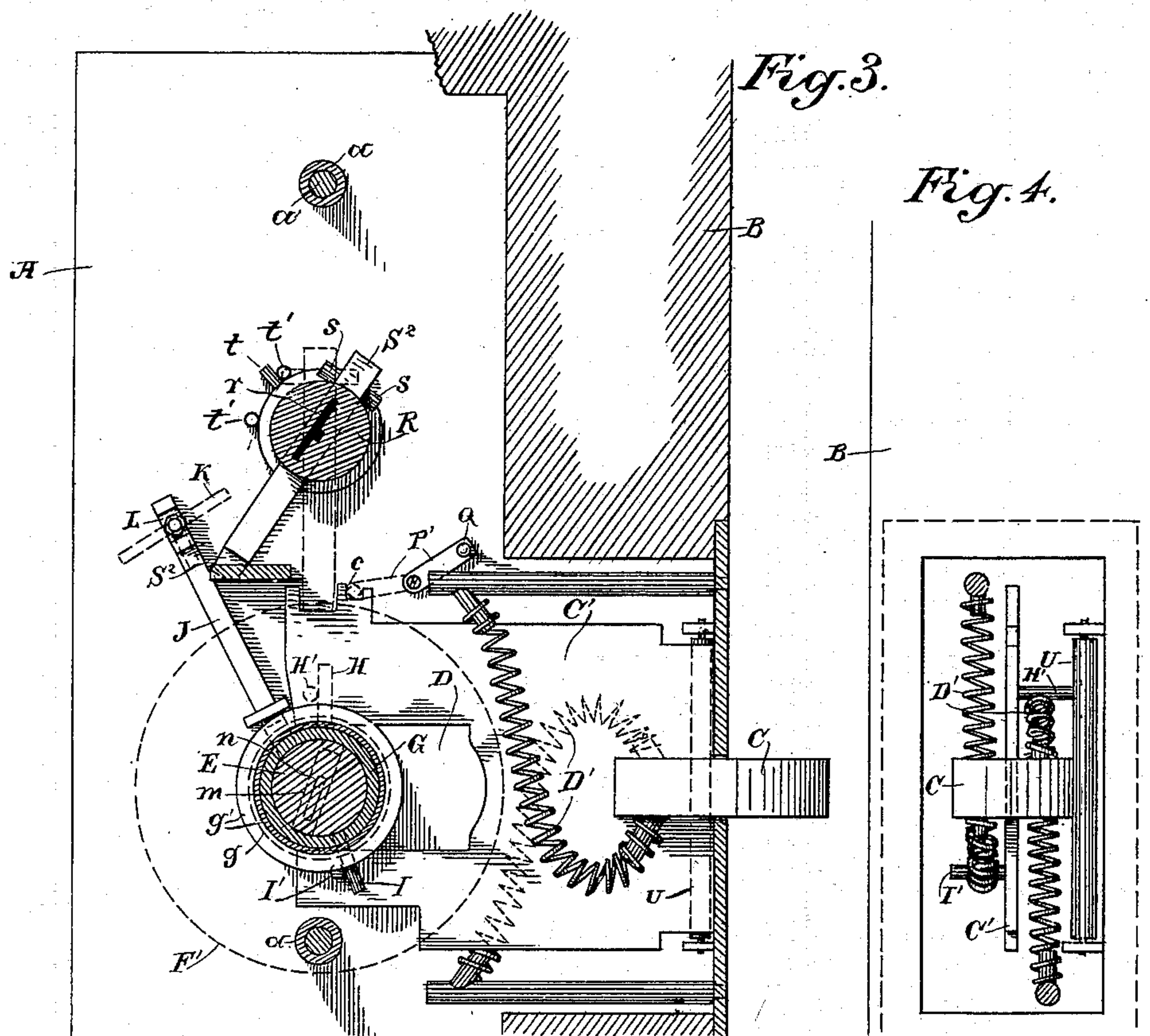
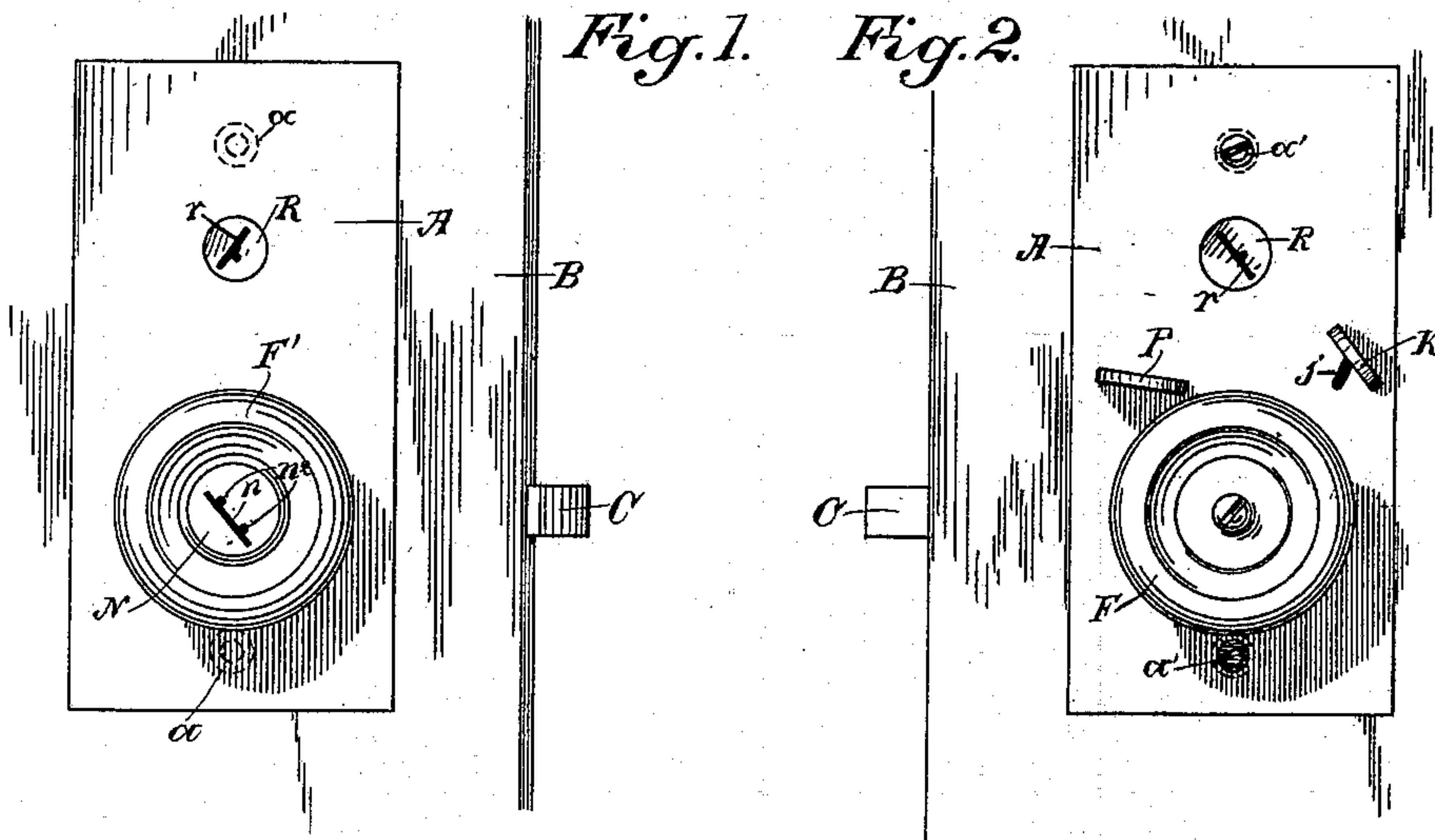
Patented Dec. 6, 1898.

J. OHRING.  
DOOR LOCK.

(Application filed Aug. 12, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,  
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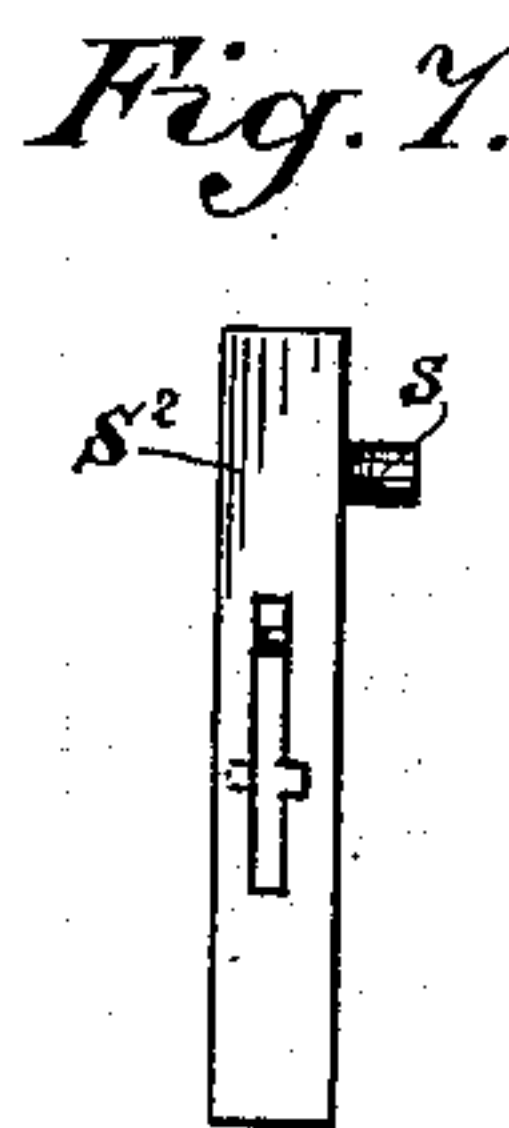
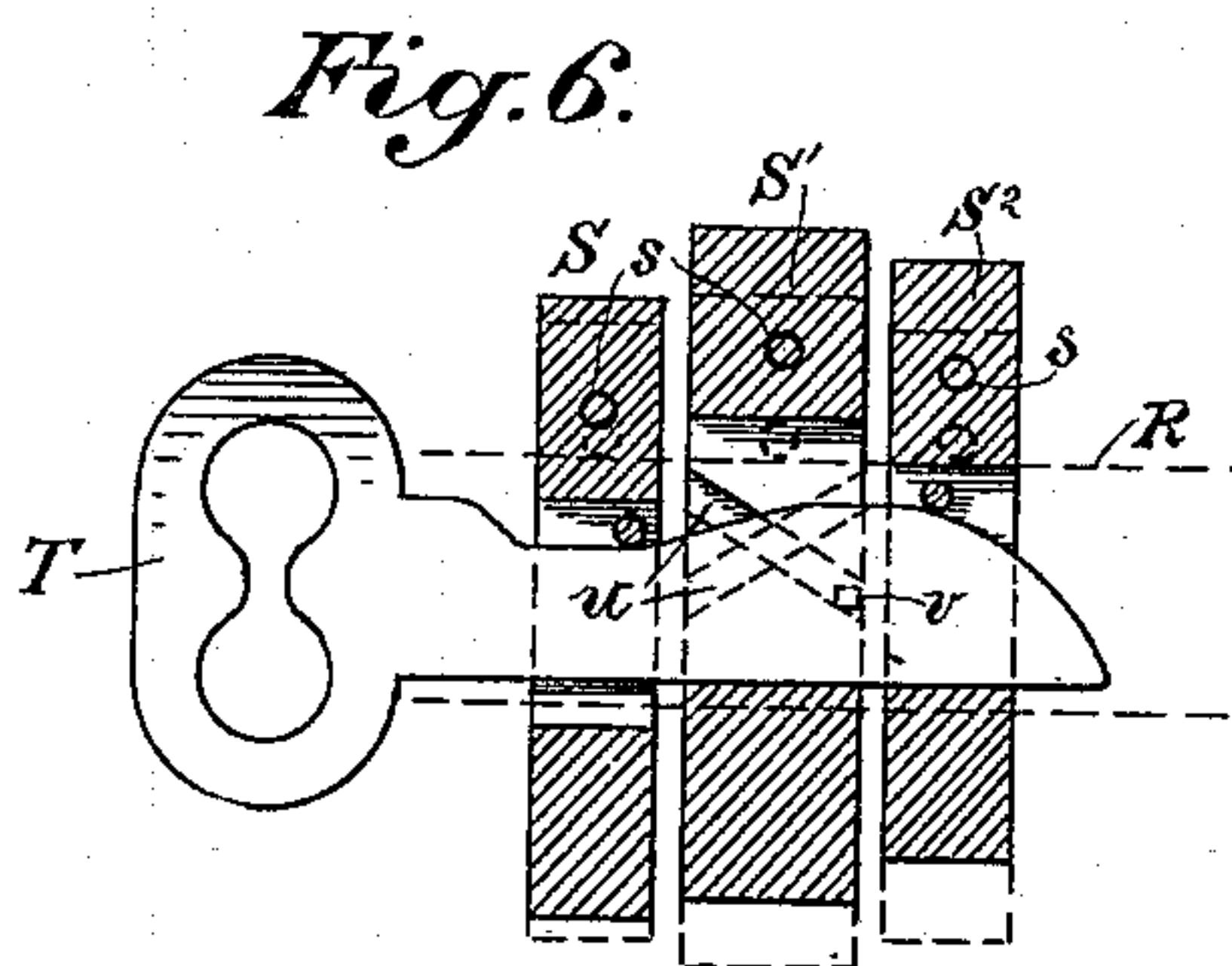
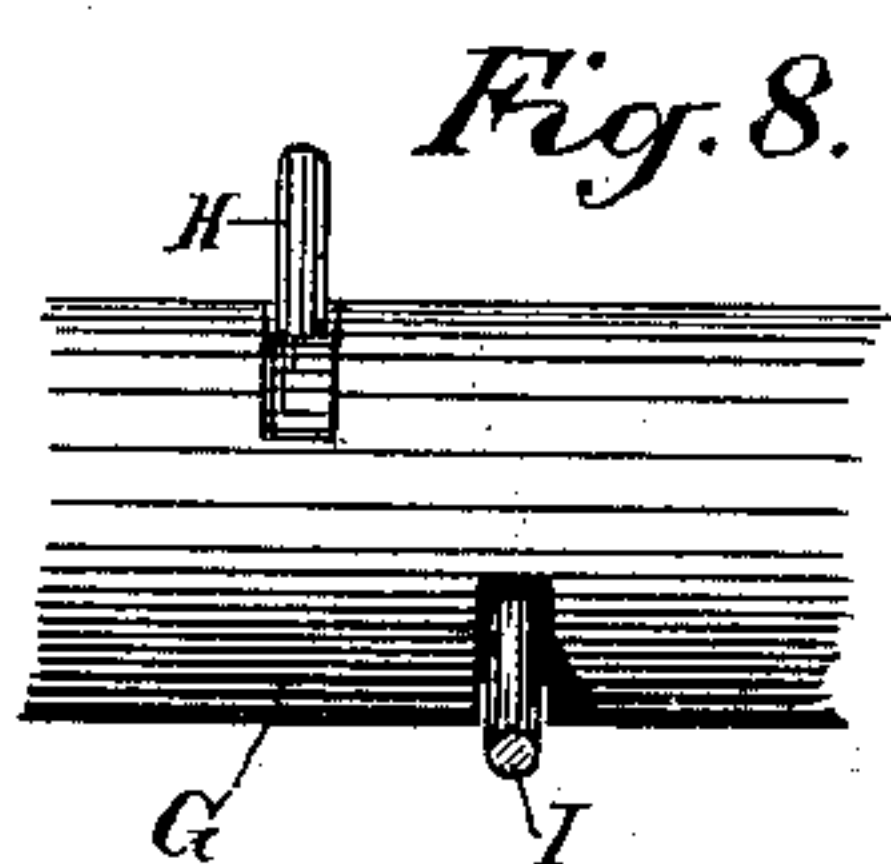
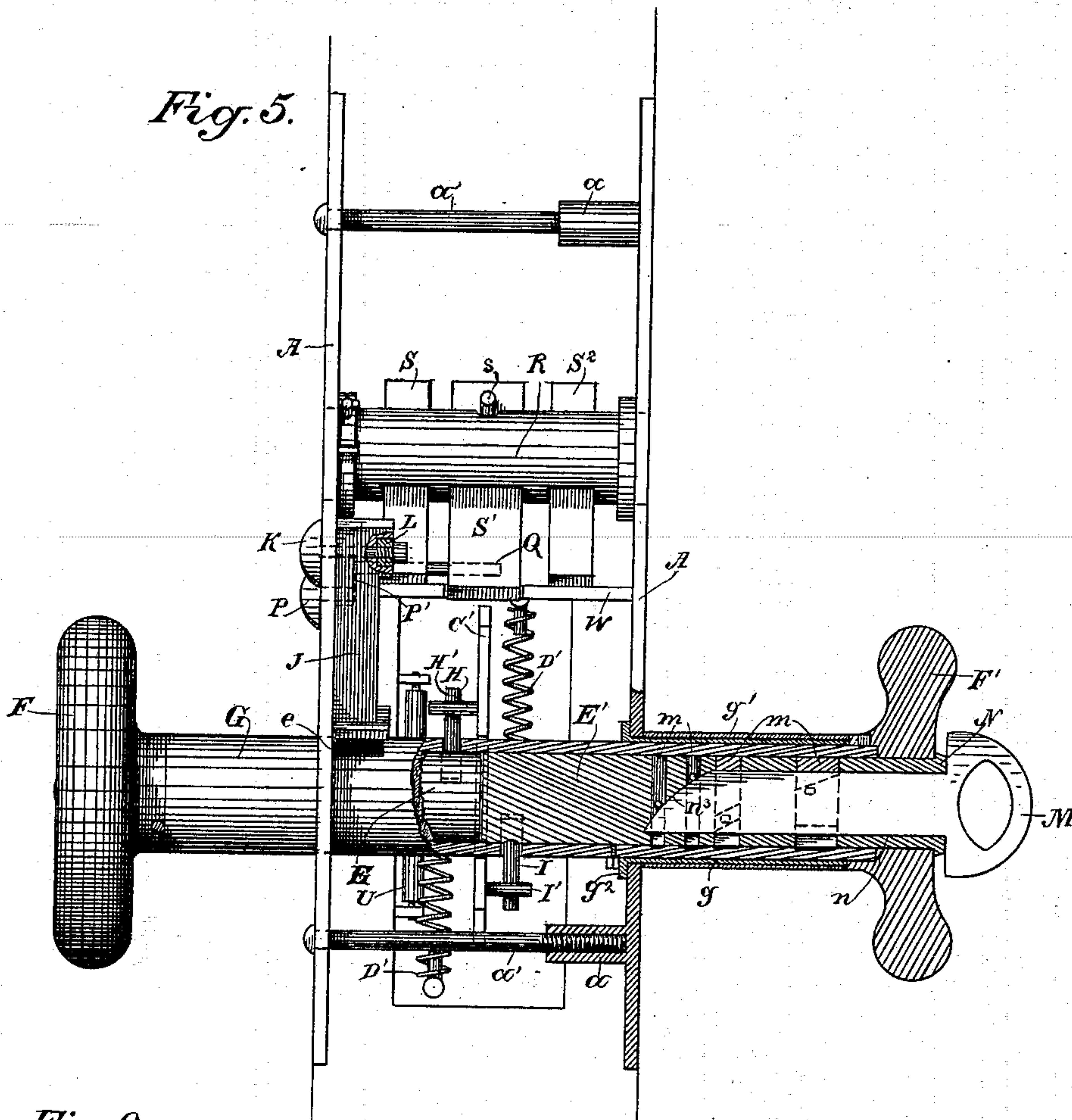
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(No Model.)

2 Sheets—Sheet 2.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

JOHN OHRING, OF SAN FRANCISCO, CALIFORNIA.

## DOOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 615,571, dated December 6, 1898.

Application filed August 12, 1898. Serial No. 688,420. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN OHRING, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Door-Locks; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in locks for doors.

It consists in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a view of the outside door-plate. Fig. 2 is a similar view of the inside plate. Fig. 3 is an interior view of the lock, the outside door-plate having been removed. Fig. 4 is an end view of the bolt and connection, the bolt-plate being removed. Fig. 5 is a view from the opposite end of the lock, showing parts broken away. Fig. 6 is a section through the tumblers in the upper part of the lock. Fig. 7 is an end view of one of the end-tumblers. Fig. 8 is a section of the knob-sleeve with slots.

The object of my invention is to combine a latch and lock for doors in which a single bolt is so connected with operating mechanism that it may be used as an ordinary latch operated by turnable knobs from either the inside or the outside, or both, with a stop by which the operation through the outer knob is prevented, except by the use of a latch-key, said knob being provided with tumblers arranged to receive such a key, a means for so locking the bolt that it cannot be turned from either outside or inside, and in an independently-operated tumbler-lock acting upon the same bolt and serving as a night or permanent lock to prevent its being withdrawn by an operation of any of the previously-described mechanisms.

The casing A of the lock may be of any suitable construction adapted to fit upon the door B, and C is a bolt adapted to protrude through the edge of the door and engage with a suitable keeper in the jamb, one side of said bolt being beveled in the usual form to enable it to act as a latch and to be retracted when the bevel edge strikes the keeper, so as to allow it to close into line with the socket in the keeper, with which it engages after the door

is closed. To the rear end of this latch-bolt is connected a broad plate C', having a slot or channel made in the rear end, as shown at D, so that the plate is guided by and slidable upon the shank of the door-knob, the rear portion of the plate C' passing above and below it and the slot allowing the latch-bolt to be retracted whenever necessary.

U is a vertically-journaled roller, against the periphery of which the side of the bolt contacts or is carried by the bolt and itself rolls against a plate to reduce friction.

In order to force the bolt outward, which is its normal position, I have connected with it the two coiled springs D', one of which is fixed upon each side of the plate C', one having the lower end permanently fixed and arching over, so that the other or free end is connected with the bolt at one side of the plate, and the other, having its upper end fixed, correspondingly arches downward and then upward to connect with the bolt upon the opposite side of the plate. By thus constructing these actuating-springs I am enabled to give them a much greater length and corresponding freedom of action than if they were ordinary straight springs, and while they are sufficiently stiff to properly impel the bolt forward they are more flexible and yielding when the bolt is retracted than a straight spring would be.

The knob-shank of the door comprises an inner solid shank or spindle E, to which the inner door-knob F is secured, and an outer sleeve G, fitting loosely over the spindle E and extending through both sides of the lock-case A, having the outer knob F' fixed to its outer end, and under certain conditions the sleeve G may be locked so that the outer knob F' cannot be turned, while the inner one is left free to turn, because its shank E extends into the sleeve G and is turnable freely therein even though the sleeve itself is prevented from turning.

Concentric sleeves  $g$   $g'$  surround that part of the sleeve exterior to the lock-case, the inner one having a flange  $g^2$  on its inner end, which prevents the sleeve G from being pulled outwardly by force, while the end of the exterior sleeve  $g'$  abuts against the lock-case and prevents the parts being driven in.

The means for withdrawing the bolt or latch



by turning the inner knob when the outer one is prevented from turning consists of a pin H, projecting radially from the knob-shank E through a segmental slot made part of the way around through the sleeve G, so that the pin fixed in the shank E may project outwardly from this slot and engage with a pin H', projecting from the plate C' into the line of travel of the pin H. When the inner knob is turned, it acts, through the pin carried by the knob-shank, to retract the plate C' and with it the latch-bolt, so that the door may be opened. When the bolt has been forced out to its limit by the action of the spring, the pin H strikes against the end of the curved slot made in the sleeve G, and when the inner knob F is turned, and with it its shank, the pin advances around the slot as far as is necessary to withdraw the latch, the pin returning to its contact with the end of the slot when the knob is released. When the sleeve G is not locked, it is free to turn by turning the outer knob F', and when turned in one direction it acts against the pin H, which rests against the end of the curved slot through the sleeve, and will thus act to retract the latch-bolt in the same manner that the turning of the inner knob will retract it. Projecting downwardly through a curved slot in the lower part of the sleeve G is another pin I, which engages a pin I', projecting from the part of the plate C' which is below the knob shank or spindle. This pin is fixed in a shank E', which extends through the outer knob and through the interior of the sleeve G and which under ordinary conditions is turnable with the sleeve G, because the pin rests against the end of the slot which was made through the sleeve in the same manner as was previously described for the pin H, which is operated by the knob-shank E. This being the condition of the parts, either the inside or the outside knob may be turned in either direction, and when turned in one direction the upper pin H acts to withdraw the latch-bolt, and when turned in the other direction the lower pin I acts in the same manner. In this condition both knobs are freely turnable, and the door may be opened from either side.

When it is desired to fix the latch-bolt so that it can only be opened freely from the inside, but will need a latch-key from the outside, it is done by means of a slidable bolt J, movable in guides within the lock-plate and the lower end adapted to enter a slot *e*, made in the sleeve G interior to the plate A. This bolt J is actuated by a thumb-piece K, the screw-shank of which passes through the bolt J and through a nut L, which is seated in a depression made in the bolt J, which prevents the nut from turning. By turning the thumb-piece K in one direction the nut is moved along the screw-threaded shank of the thumb-piece and clamps the bolt J against the inner face of the lock-plate wherever it may happen to lie. The shank of the thumb-piece K

passes through a slot *j*, made in the lock-plate and in line with the movement of the bolt J, so that when the thumb-piece K has been turned to loosen the bolt J the latter may be moved down until its lower end enters the slot in the sleeve G. This prevents the sleeve G from being turned by turning the outer knob; but as the bolt does not engage the inner-knob spindle E the latter is free to turn. Therefore the door can be opened from the inside by turning the inner knob F in one direction.

When it is necessary to open the door from the outside, it can only be done by the use of a key M, which is provided with suitable projections, depressions, and pins, so that it can be introduced into a slot *n* in a collar N, which is fixed to the knob-shank E', that is turnable within the sleeve G. The slot *n* and the outermost of the tumbler-rings *m* have grooves made in them in line, as shown at *n*<sup>2</sup>, Fig. 1, and the side of the key has corresponding pins which will only enter a lock in which the pins and grooves coincide. The inner end of the key is beveled, as at *n*<sup>3</sup>, Fig. 5, and this bevel engages and raises the innermost tumblers, which otherwise prevent the turning of the parts. When the key has thus been introduced and the devices upon the key are made to coincide with those of the tumblers *m* within the sleeve G, the key may be turned, turning with it the knob-shank E', and thus, through the downwardly-projecting pin I, will act, as previously described, to withdraw the latch-bolt and open the door. When it is desired to again release the sleeve G and allow the door to be freely operated from either side, the thumb-piece K is turned so that the pressure of the nut L upon the bolt J is relieved, and the bolt can then be withdrawn from its engagement with the sleeve G, because the screw-shank of the thumb-piece can freely slide in the slot in the lock-plate. When the bolt J is thus withdrawn, it is again secured by turning the thumb-piece until the nut jams the bolt and holds it in its withdrawn position. When it is desired to secure the door from the inside, it is done by the use of a second thumb-piece P, the shank of which, passing through the inner lock-plate, carries upon its inner end an arm P', and a pin Q, projecting from this arm, is made to engage with a notch *c* in the plate C', so that by turning the thumb-piece P until this engagement is made no turning of either of the knobs can move the latch-bolt. The bolt is again released by simply turning the thumb-piece P in the opposite direction.

In order to permanently lock the door independent of the knobs, I have shown a shaft R extending between the sides A of the lock-case and parallel with the knob-shank and at some distance therefrom, as shown. Slots are made transversely through this shaft, and within these slots are radially movable the tumblers S, S', and S<sup>2</sup>. Longitudinally through



the shaft R is made a flat slot  $r$ , adapted to receive a flat latch-key T, which may be introduced from either end of the shaft—that is, from either side of the door. Slots are made through the tumblers S, S', and S<sup>2</sup> coincident with the slot in the shaft, so that when the key is inserted into the shaft from either end it may pass through the slots in the tumblers S S' S<sup>2</sup>. These slidable tumblers all drop by gravitation when in their normal condition until they are arrested by pins or stops  $s$  striking the top of the shaft R. The key T is straight upon the bottom and slidable along the slot in the shaft; but the upper edge has a wavy outline, as shown, and as it is introduced it raises the first of the sliding bars S' or S<sup>2</sup>, dependent upon which side it is introduced from. The middle bar has diagonal slots made in it, as shown at  $u$ , and a pin  $v$ , projecting from one side of the key, will engage either one or the other of these slots, dependent, as before stated, upon the side of the door from which the key is introduced. When it engages this diagonal slot, it raises the central tumbler S', and, the key being pushed still farther along, the point finally engages the last of the bars S' or S<sup>2</sup> and raises that one. In passing through the tumbler nearest to the end from which the key is introduced this tumbler will be temporarily raised by the highest portion of the key to a point higher than it occupies after the key is fully inserted; but as the key passes through all of the tumblers a lower portion of the key arrives within the slot in the first one, and thus allows it to drop. These tumblers sliding freely through the shaft R and being thus raised, the shaft may then be turned by the key until the lower ends of the tumblers rest upon a shelf or support W, which keeps them out of action after the key has been withdrawn. In this condition the lock is inactive. When it is to be used, the key is inserted and the shaft turned until the lower ends of the bars S S' S<sup>2</sup> are allowed to pass off of the support W, and slipping down by gravitation the central one engages a notch in the bolt-plate C' and prevents it from being withdrawn by the turning of either of the knobs or the use of the latch-key, thus forming an independent lock which can only be opened by the key belonging to it and which differs from the key used as a latch-key. The arc of rotation of the shaft is limited by a pin  $t$ , projecting from the shaft, and two fixed pins  $t'$ , which serve as stops.

The outer plate of the case A has interiorly-screw-threaded lugs or projections  $a$ , which receive the screw-bolts  $a'$ , by which the parts are secured together and to the door from the inside, so that a smooth surface is presented on the outside and no opportunity is presented to remove or destroy the lock.

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

1. In a door-lock, a casing, a bolt movable

therein to engage or disengage with a keeper, said bolt having an actuating and guiding plate at the rear end and provided with a slot or channel, a knob-spindle disposed in the horizontal plane of the bolt and passing through and directly engaging the walls of said slot or channel, and coiled springs secured to each side of the bolt and curved into an arc of a circle, and having their opposite ends leading in reverse directions and secured at points above and below the guiding-plate.

2. In a door-lock, a bolt slidable with relation to its casing so as to engage or disengage with a keeper, and coiled springs secured to opposite sides of the bolt and curved into an arc of a circle, and having their opposite ends extended in reverse directions and secured at points above and below the guiding-plate whereby the springs act on the bolt from above and below simultaneously.

3. In a door-lock, a casing, a spring-pressed bolt slidable in and out of the casing to unlock or lock the door and having a plate extending rearwardly therefrom with a slot or channel in the rear end, a knob-spindle disposed in the horizontal plane of the bolt and passing through and directly engaging the walls of said slot or channel, said spindle comprising a sleeve to which the outer knob is fixed, said sleeve extending through both plates of the case and a spindle extending into and loosely turnable within the sleeve to which the inner knob is fixed, segmental slots made around the sleeve within the case and a pin projecting from the inner-knob spindle through one of the slots and engaging with a corresponding pin upon the bolt-plate whereby the latter may be withdrawn by turning the inner knob.

4. In a door-lock, a casing, a spring-pressed bolt slidable in and out of said casing to unlock or lock the door, a plate connected with the bolt having a slot in the rear end, a knob-spindle consisting of a sleeve passing through the casing and through the slot in the rear end of the bolt-plate having the outer knob fixed thereto, a knob-spindle extending into said sleeve from the inner side of the door with the inner knob attached to it, a spindle independently turnable in the outer end of the sleeve having a key-slot formed therein and tumblers adapted to be engaged by a key when introduced into said slot whereby the spindle may be turned within the sleeve, and a bolt slidable within the lock-case radial to the sleeve so as to engage it and prevent its being turned while the actuated spindle is turned within the sleeve and a pin projecting from said spindle through a slot in the sleeve and engaging the bolt-plate so that the bolt may be withdrawn by turning the latch-key only.

5. In a door-lock, a casing, a spring-pressed bolt slidable with relation to the casing, a slotted plate projecting rearwardly therefrom, a knob-shank consisting of a sleeve



extending through the lock having the outer knob fixed to one end and a knob-shank loosely turnable in the inner end of said sleeve having the inner knob fixed thereto, a circumferential slot made in the sleeve within the casing, a pin projecting from the inner-knob spindle through said slot and engaging a pin upon the bolt-plate so that the turning of the inner knob will retract the bolt, a radially-sliding bolt the end of which engages a slot in the sleeve whereby the sleeve and the outer knob are prevented from being turned without the use of a latch-key and a thumb-piece by which the slidable bolt is locked in engagement or disengagement.

6. In a door-lock of the character described, a slidable spring-pressed bolt having a slotted guide-plate forming an extension rearwardly therefrom, a sleeve extending transversely thereto through the casing with a knob on the outer end, a shaft having a knob fixed thereto extending into the sleeve from its inner end with a pin projecting from the shaft through a circumferential slot in the sleeve, a pin fixed to the slidable bolt-plate and engaged by the pin from the shaft, a second shaft extending into the sleeve from the outer end and means connecting it with the sleeve, a pin projecting from this shaft through a circumferential slot in the sleeve at the opposite side from the first-mentioned pin, and a second pin projecting from the slidable bolt-plate whereby the turning of either of the knobs will act through its own independent shaft to retract the bolt.

7. In a door-lock of the character described, a spring-pressed slidable bolt with a plate forming a rearward extension therefrom, a sleeve extending through the casing and through a channel formed in the rear of the bolt-plate, a shaft extending into the sleeve from the inner end and having a knob fixed thereto, a pin projecting from the shaft through a circumferential slot in the sleeve and engaging the pin upon the bolt-plate whereby the inner knob acts to retract the bolt, a similar shaft extending into the sleeve from the outer end having a pin projecting through a circumferential slot in the sleeve and engaging a pin upon the bolt-plate whereby the turning of the outer knob may also retract the bolt, a bolt slidable radially with relation to the sleeve adapted to engage a hole therein to prevent the sleeve being turned by either knob, annular tumblers fitting the shaft which enters from the outer end of the sleeve and normally locking the shaft to the sleeve, a key fitting a slot in said shaft and adapted to move said tumblers so as to disengage them and allow the shaft to be turned within the sleeve by the aid of the key, whereby the bolt may be retracted and the door opened without turning the knob.

8. In a door-lock of the character described, a spring-pressed locking-bolt slidable with relation thereto having a rearwardly-extending and slotted plate, a sleeve extending through

the casing and the slot in said plate, pins projecting from the plate above and below said slot, shafts extending into the sleeve from opposite ends, the inner one having a knob fixed to it, a pin projecting through a slot in the sleeve and engaging one of the pins upon the bolt-plate, a knob fixed to the outer end of the sleeve and a shaft extending into the sleeve from the outer end with a pin projecting from it through a second slot in the sleeve adapted to engage the second pin of the bolt-plate whereby the bolt may be normally retracted by turning either of the knobs, a bolt slidable within guides in the casing radial to the sleeve, a slot in the sleeve and a means for moving the bolt so as to engage said slot whereby the sleeve is prevented from being turned by the outer knob while the bolt may be retracted by turning the inner knob and shaft.

9. In a door-lock of the character described, a spring-pressed slidable bolt with its slotted plate, a sleeve extending through the slotted plate having a knob fixed to its outer end, a shaft extending into the outer end of the sleeve having a key-slot made therein, annular tumblers by which it is normally locked to the sleeve, a key by which said tumblers are disengaged to allow the shaft to be turned independent of the sleeve by the use of the key, and means connecting the inner end of the shaft with the locking-bolt whereby the latter may be withdrawn by the turning of said shaft, a second shaft extending into the sleeve from the inner end and having the inner knob fixed to it, means connecting said inner shaft with the bolt-plate whereby the bolt may be retracted by turning the inner knob, a device by which the sleeve is locked so that it cannot be turned whereby the bolt may be retracted by turning the inner knob and its shaft, or by turning the outer shaft by aid of the key.

10. In a door-lock of the character described, a spring-pressed slidable bolt with slotted plate, a sleeve extending through the lock and the slot in the plate having a knob fixed to its outer end, a slotted key-controlled shaft turnable within the outer end of the sleeve with connections through a slot in the sleeve whereby the bolt may be retracted, a shaft carrying the inner knob and likewise turnable within the sleeve with connections through a slot whereby it will independently act to retract the bolt and a supplemental key-controlled shaft having sliding tumblers movable in slots made transversely through the shaft and a notch made in the bolt-plate adapted to be engaged by one of said tumblers to prevent any movement of the bolt.

11. In a lock of the character described, a spring-pressed slidable bolt with rearwardly-extending slotted plate, a sleeve with knobs and turnable shafts and connections whereby the bolt may be retracted by the turning of the sleeve or shafts, a supplemental key-controlled shaft journaled above the bolt-plate



having bars or tumblers slidable through slots in the shaft, a support upon which said tumblers normally rest when the lock is in condition for ordinary use, a key by which the tumblers are raised and the shaft turned to bring them into vertical line, a notch formed in the bolt-plate in line beneath the central tumbler so as to be engaged thereby when the key is withdrawn to allow the tumblers to drop, whereby the locking-bolt is fixed and prevented from any movement.

12. In a lock of the character described, the slidable bolt means for retracting it through a transverse sleeve and knob-shafts and a supplemental turnable shaft slotted transversely, tumblers slidable through said slots, a support by which the tumblers are normally supported when out of use, a key by which said tumblers are disengaged from the support and the shaft turned, a slot in the locking-bolt plate adapted to be engaged by one of said tumblers when the key is withdrawn, a stop-bar against which said tumbler contacts to prevent the locking-bolt and plate from moving rearwardly, and a pin projecting radially from the tumbler-shaft with fixed stops between which it is movable to limit the rotation of said shaft.

13. In a door-lock of the character described, a spring-pressed slidable locking-bolt with the rearwardly-extending slotted plate, a sleeve extending transversely through the casing and the slot in the plate, with interior independently-turnable shafts extending into the sleeve from opposite ends, a knob fixed to the inner shaft and connections whereby

the turning of the knob and shaft will retract the bolt, a knob fixed to the outer end of the sleeve, an independent turnable shaft extending into the sleeve from the outer end with tumblers whereby it is normally connected and turnable with the sleeve, and a key entering a slot in the shaft and disengaging the tumblers so that the shaft may be turned independently of the sleeve and knob, and connections through which the turning of the shaft retracts the locking-bolt independent of the movements of the inner knob and its shaft.

14. In a lock of the character described, a spring-pressed slidable bolt, knob-shafts, a sleeve within which said shafts are turnable and connections through slots in the sleeve between said shafts and the locking-bolt whereby the latter may be withdrawn, a supplemental sleeve surrounding that portion of the knob-sleeve which is exterior to the lock and having a flange upon the inner end engaging the lock-plate to prevent the sleeve being pulled out, a second sleeve concentric and exterior thereto, the inner end abutting against the lock-plate and the outer end abutting against a shoulder of the outer knob to prevent the latter and its connected parts from being driven inwardly by force.

In witness whereof I have hereunto set my hand.

JOHN OHRING.

Witnesses:

S. H. NOURSE,  
JESSIE C. BRODIE.