No. 820,271. PATENTED MAY 8, 1906.

L. A. TURNER.

GRAVITY LOCK FOR SLIDING DOORS.

APPLICATION FILED OCT. 12, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

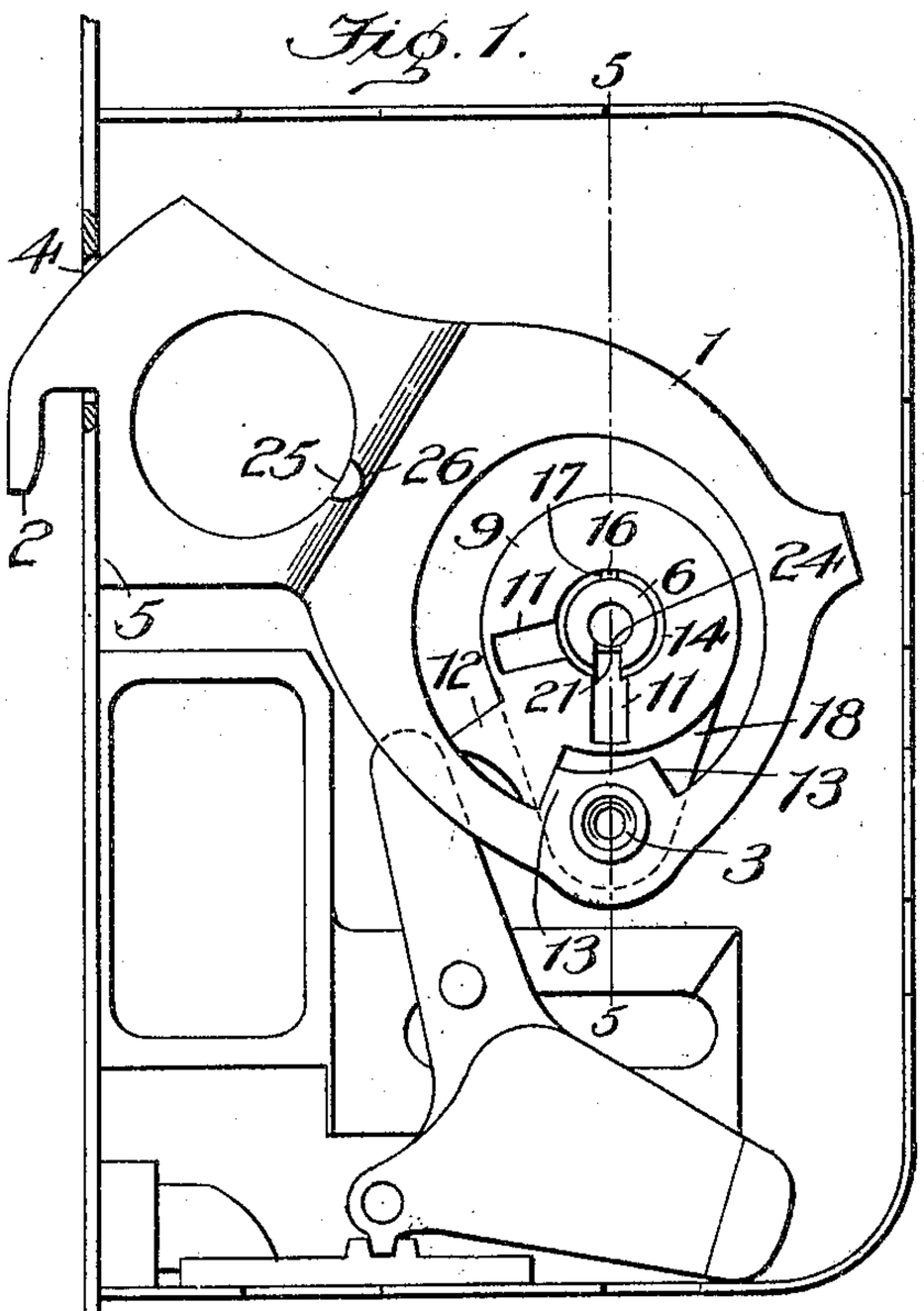


Fig. 2.

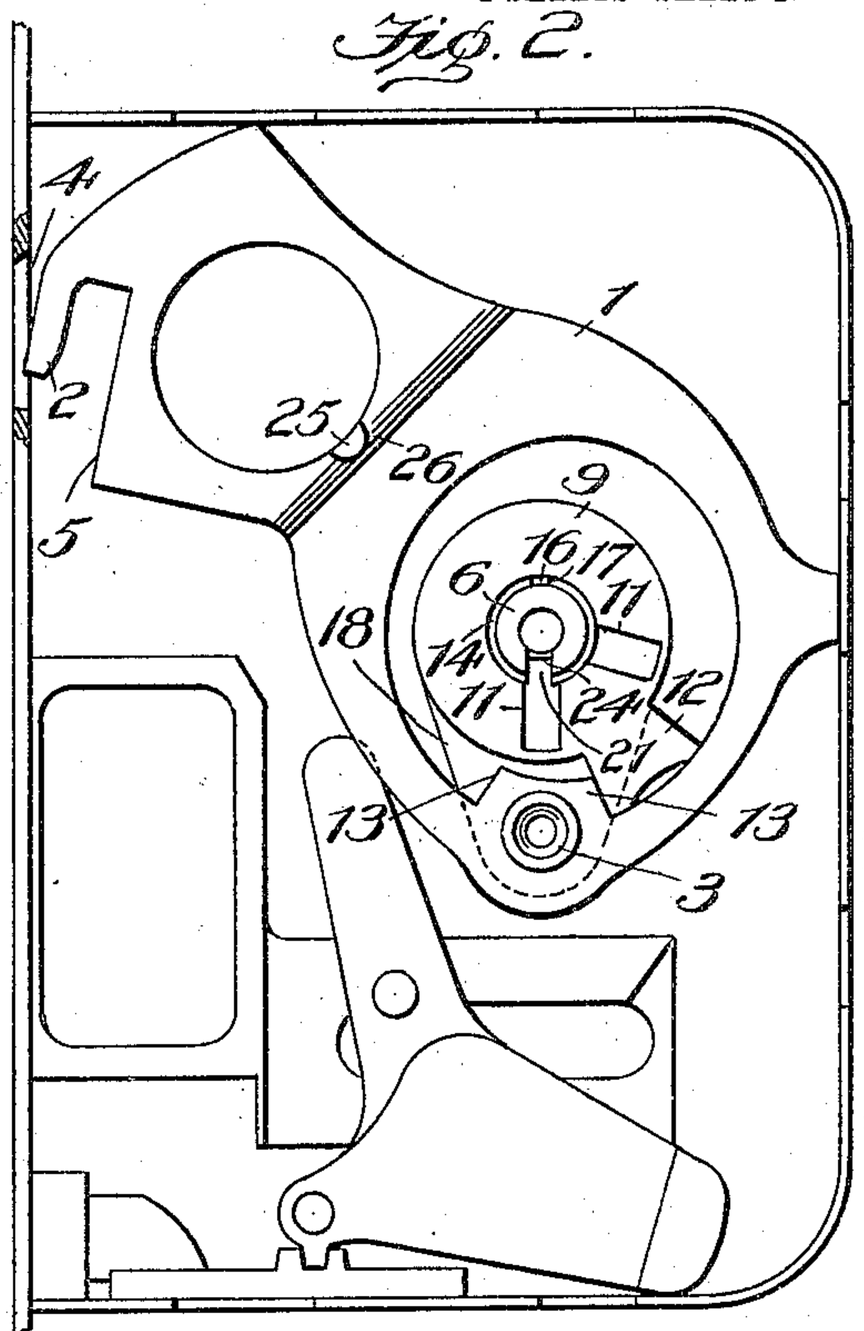


Fig. 3.

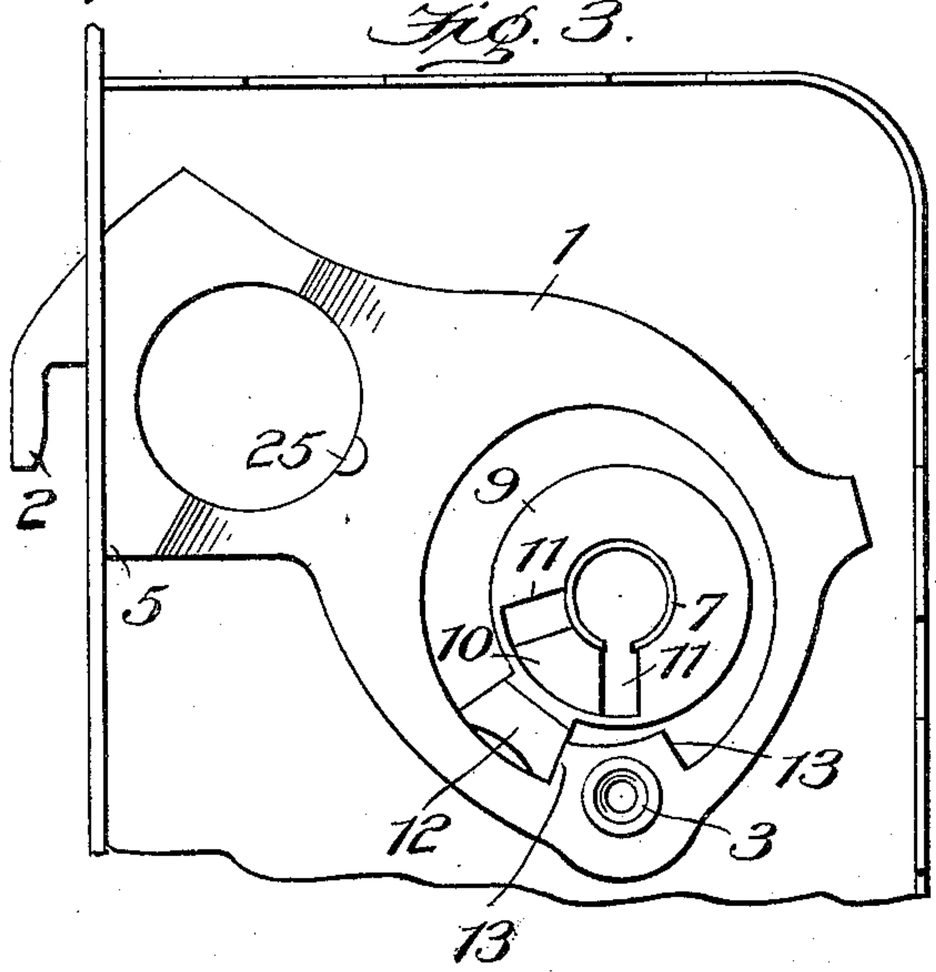
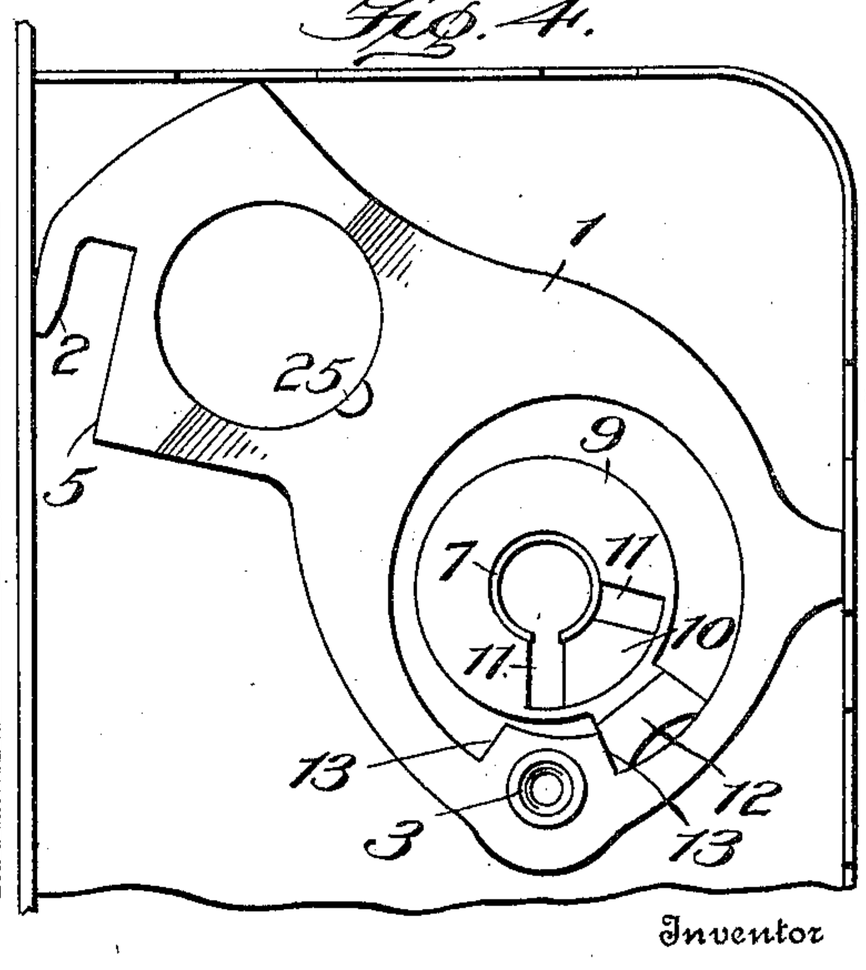


Fig. 4.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

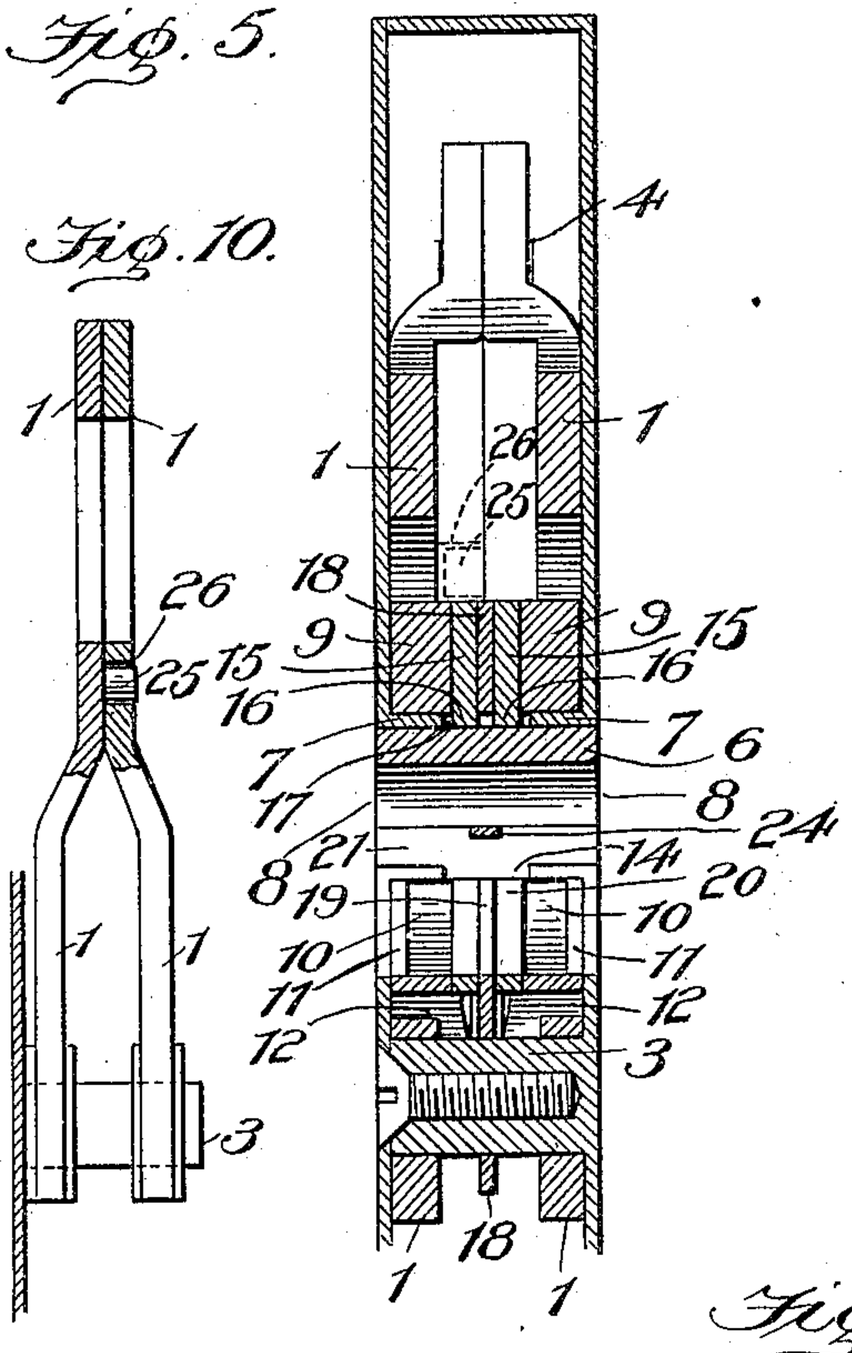


Fig. 10.

Fig. 7.

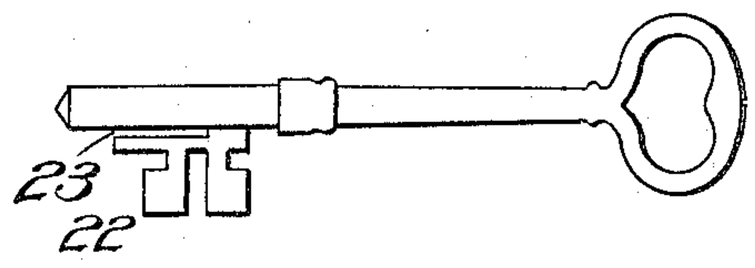


Fig. 8.

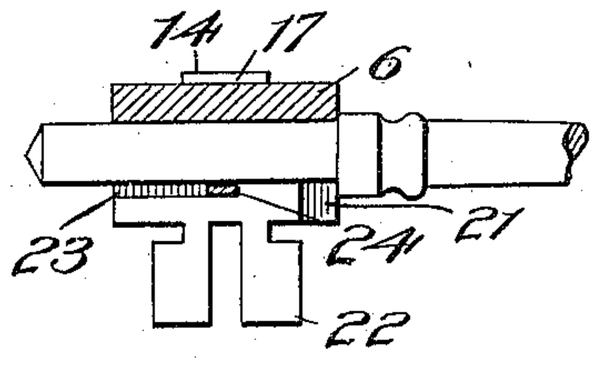


Fig. 9.

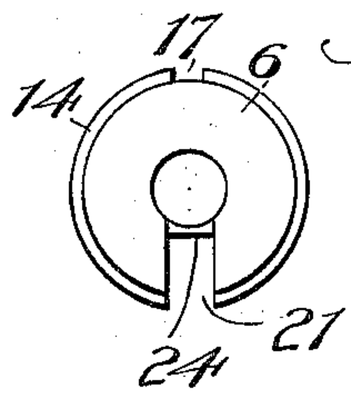
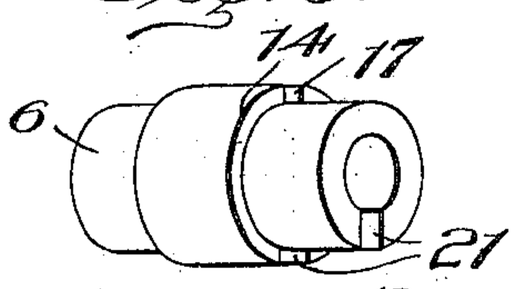
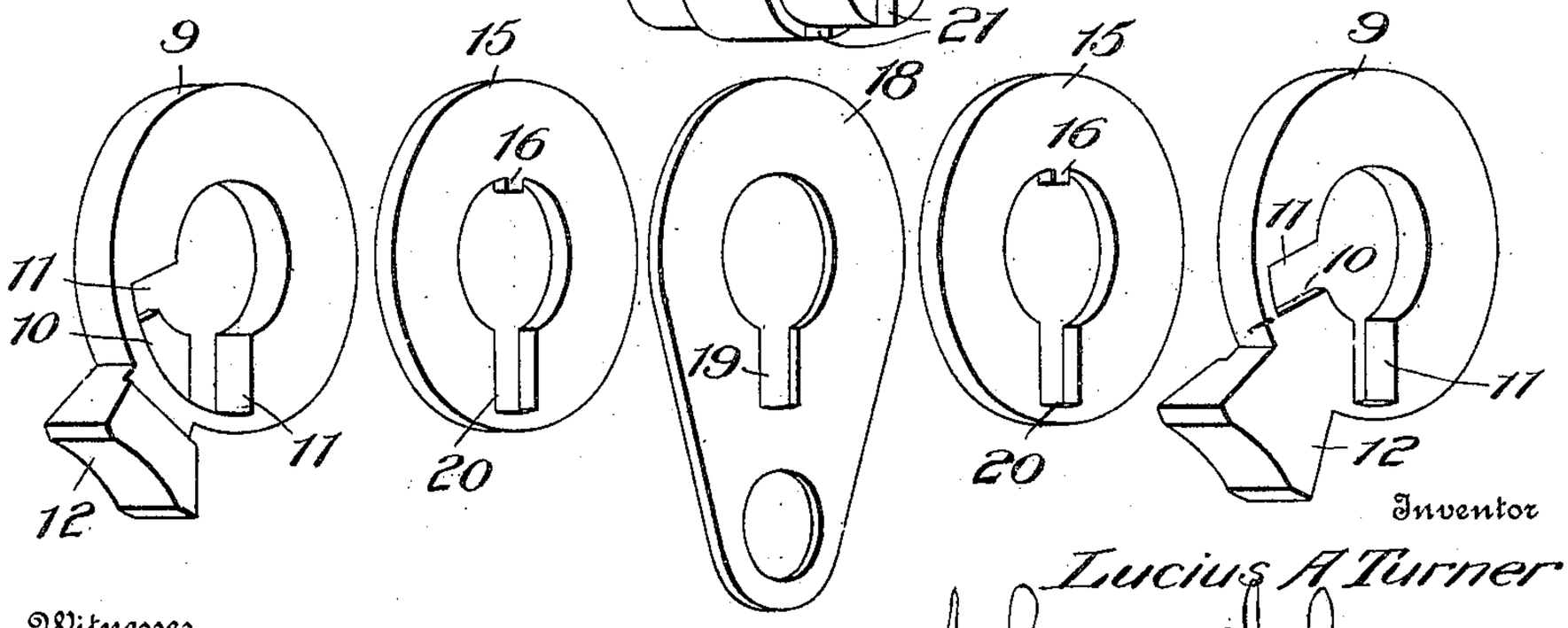


Fig. 6.





Witnesses

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UNITED STATES PATENT OFFICE.

LUCIUS A. TURNER, OF DENVER, COLORADO.

GRAVITY-LOCK FOR SLIDING DOORS.

No. 820,271. Specification of Letters Patent. Patented May 8, 1906.

Application filed October 12, 1905. Serial No. 282,444.

To all whom it may concern:

Be it known that I, LUCIUS A. TURNER, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Gravity-Locks for Sliding Doors; and I do hereby 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.

The invention herein relates to locks in which gravity-bolts are employed in connection with tumblers; and my present improvements are directed to a novel construction of a pair of gravity-bolts and novel construction of coacting tumblers whereby the gravity-bolts are locked when the doors are closed and when the doors are open the gravity-bolts are secured in their retracted positions all by the same key and by the same tumblers, and in the claims appended hereto and n connection with the accompanying drawings I will point out the parts and combination of parts which constitute my invention.

Referring to the drawings, Figure 1 shows the lock mechanism in the position the parts occupy when the pair of gravity-bolts are locked to lock the doors. Fig. 2 is a like view showing the pair of gravity-bolts locked in their retracted positions. Fig. 3 is a like view showing one of the gravity-bolts and its tumbler locking it in position when the doors are locked and the key-barrel removed. Fig. 4 is a like view showing the same bolt locked in its retracted position by the same tumbler when the doors are open and the key-barrel removed. Fig. 5 is a section taken on the line 5 5 of Fig. 1, showing the relation of the pair of gravity-bolts to each other, to their actuating-tumblers, and to the key-barrel. Fig. 6 shows in perspective the tumblers, spacing-plates, and ward, and the key-barrel separated and grouped. Fig. 7 shows the key, and Fig. 8 shows the key and the key-barrel, the latter being in section. Fig. 9 shows an end view of the key-barrel. Fig. 10 shows the connected bolts in section.

A pair of bolts 1 are each formed with a hook 2 at its locking end, and its shank stands obliquely down in the casing and is pivoted on a fixed stud 3, so that its hook end will constantly tend to fall and project through a slot 4 in the face-plate of the lock at the meeting edges of the doors to engage and be locked with the slotted face-plate of the meeting-door. A shoulder 5 back of the hook serves by abutting the inner wall of the face-plate to limit the fall of the hook end. Each bolt has a circular opening approximating the form of a horseshoe, with its smallest part on each side of its pivoted end, and within this opening the key-barrel 6 is centrally mounted, each end being fitted to rotate in collars 7, Fig. 5, projecting inward from the keyholes 8 of the lock-plates. Upon these collars are fitted the actuating-tumblers for the pair of bolts, and which consist of a pair of circular tumblers 9 9, each seated and fitted to rotate on its collar and having each a recess 10 on its inner side and a pair of radial slots 11 11, which open into said recess. Between the slots each tumbler has an arm 12 projecting from its circumference and adapted when said tumbler is rotated to engage one side of the edge of the smallest part of the opening in the bolt and move it into its locking position, as in Figs. 1 and 3, or to engage the opposite side of said edge and cause the bolt to be retracted, as in Figs. 2 and 4. In either position the bolt is locked by said arm abutting a shoulder 13 on the edge of the bolt-opening on each side of the pivot-stud of the bolt. For this purpose the arm and said shoulders are so formed that when abutting in either the locked or retracted position of the bolt one of the pair of the tumbler-slots will register with the keyhole-slot in the case, so that the key can be withdrawn and inserted to lock and to unlock the bolt. It will be seen that to effect this relation of the slot and keyhole in either position of the bolt the tumbler-arm flares so that it is widest at its end, and the shoulders 13 correspond to the form of said arm.

To lock the bolts, the tumblers are turned to the left, causing their arms 12 to contact with the circular walls of the bolt-opening to move the hook end of the bolt outward, the tumblers in such movement being limited by their arms striking the shoulder 13 at one side of the pivot of the bolt. The turning of the tumblers to the right causes their arms to contact with the opposite side of the circular walls of the bolt-opening retracting the bolts, such movement of the tumblers being limited by their arms striking the opposite side of said shoulder. In these movements of the bolts the walls of the opening in each serves as a double cam against which the tumbler-arms act as they are rotated back and forth on their centering collars, locking the bolts at

the limit of each movement of the tumblers, as in Figs. 3 and 4.

The key-barrel has a mediate shoulder 14, having a width about one-third its length, and it is on this shoulder that the spacing-plates are fitted in place between the casing-collars. A circular spacing-plate 15 is fitted on the barrel-shoulder against each tumbler and has a tooth 16, which engages a groove 17 in the barrel-shoulder, so that the plates can only turn with the barrel. Between these rotating plates a fixed ward 18 is fitted on the barrel-shoulder and on the pivot-stud of the pair of bolts and has a slot 19, which registers with the keyhole-slots. Each plate has a radial slot 20, and the key-barrel has a longitudinal slot 21, which by reason of the tooth engagement of the plates with said barrel is caused to register with the slots in the plates. The tumblers and the fixed ward are designed to render it difficult to pick the lock, and this difficulty is increased by forming the bit or web 22 of the key with a slot 23 along the key-stem and providing the barrel-slot with a thin cross-bar 24, which, as the key is inserted, will be received into the web-slot to allow the key to be passed into the lock. The arms of the tumblers are of greater thickness at their ends to give large bearing on the edge of the bolt-opening.

To cause the bolts to move together as one bolt into the slots of the face-plates in locking the doors, the hooked ends are bent toward each other, so that their inner walls join, while their pivoted portions are separated to receive between them the tumblers and plates, as in Figs. 5 and 10, and it is the pivoted portions of the bolts that lie against the inner walls of the case, and thereby give a true registering movement of the hooks with the face-plate slots. When the door is locked, the tumbler-arms are in contact with the shoulders of the bolts which they actuate, and one of the keyholes in each tumbler and the keyhole in the rotary plates and ward are in alinement, and when the bolts are retracted and locked the tumbler-arms are brought in contact with the other shoulders of the bolts, said arms being turned nearly a full revolution, and the other slots of each tumbler will be brought in alinement with the slots of the rotary plates and ward. In this operation it is important to note that while the bolts are locked as a single bolt when fastening the doors or when retracted the arm of each tumbler will be engaged with the shoulder of its respective bolt and that the key-web will be at one end of the recess in each tumbler, so that in turning the key to either lock or to unlock the bolts the web of the key must first be turned the full length of the recess to engage its other end before the tumblers will be moved to throw the bolts in or out. For this purpose the shoulders of the bolts are so arranged that when the bolts are thrown to fasten the doors the arm of each tumbler will abut against the shoulder on one side of the bolt-pivot, and when the bolt is retracted the said arms will abut against the shoulder on the other side of the bolt-pivot, both bolts moving together. A stud 25 on one of the bolts enters a hole 26 in the other bolt and holds them together, so that they are thrown as a single bolt, the stud connection being made at a point near the free ends of the bolts, so that being mounted on the same pivot-stud and connected at their swing ends they are caused to be held and moved as a single bolt, with the advantage of being separately set and removable from their studs. The action of the key-web in the tumbler-recesses will, however, always cause the bolts to move together as they approach the limit of locking or retracted positions without being connected at their swing ends.

I claim—

1. In a gravity-lock, a casing each side whereof having an inward-projecting key hole-collar, the keyhole-slot opening into the wall of the collar, a pair of gravity-bolts pivoted at their inner ends, the free end of each bolt having a locking-hook, a key-barrel rotatable within said collars and having a longitudinal slot, a tumbler fitted to rotate upon each collar and having a pair of radial slots and a recess into which said slots open, each bolt having an opening and shoulders projecting therein on each side of its pivot, each tumbler having a radial arm between said slots adapted to engage the opposite edges of said bolt-opening and the said shoulders by the turning of the tumblers to project and to retract the bolts and to lock them in either position.

2. In a gravity-lock, a casing each side whereof having an inward-projecting keyhole-collar the keyhole-slot opening into the wall of the collar, a pair of gravity-bolts pivoted at their inner ends, the free end of each bolt having a locking-hook, a key-barrel rotatable within said collars and having a longitudinal slot, a tumbler fitted to rotate upon each collar and having a pair of radial slots and a recess into which said slots open, each bolt having an opening and shoulders projecting therein on each side of its pivot, each tumbler having a radial arm between said slots adapted to engage the opposite edges of said bolt-opening and the said shoulders by turning the tumblers to project and to retract the bolts and to lock them in either position, means for supporting and separating the pivoted ends of the bolts, the hooked ends of said bolts having their walls joining whereby they are projected as a single bolt in their locking function.

3. In a gravity-lock, a casing each side whereof having an inward-projecting keyhole-collar the keyhole-slot opening into the wall of

the collar, a pair of gravity-bolts pivoted at their inner ends, the free end of each having a locking-hook, a key-barrel having a longitudinal slot and fitted to rotate within said collars, a tumbler fitted to rotate upon each collar and having a pair of radial slots, a recess into which said slots open and a radial arm between said slots, a fixed ward mounted on said barrel between said tumblers and having radial slots, the slots of the fixed ward corresponding with the keyhole-slots and the said bolts having each an opening formed for engagement of its opposite sides with each tumbler-arm as it is rotated to cause each bolt to be projected to lock the door and to be retracted, each bolt having a pair of shoulders projecting within said opening on each side of the pivots of said bolts adapted for engagement by the radial arms to lock the bolts either in their projected or in their retracted positions.

4. A lock, comprising a casing having keyholes, a pair of gravity-bolts each pivotally mounted on the same fixed stud, in contact with the inner wall of each lock-plate, each bolt formed with a locking-hook end, their hook ends in contact side by side, each bolt having an opening near its pivoted end, a key-barrel mounted within said opening in registering relation with the keyholes, a pair of tumblers each mounted on a collar of the casings and each adapted to engage the edges of the bolt-opening to lock and to unlock the bolts in their projected and in their retracted positions, and a fixed ward upon said barrel between the tumblers the latter and the ward having slots corresponding with the keyholes.

5. In a gravity-lock, a casing having registering keyholes, a pair of gravity-bolts mounted on the same fixed stud at their inner ends, the swing end of each having a locking-hook, each bolt having an opening at its pivoted end, a rotatable key-barrel mounted to register with the keyholes in the lock-plates, a pair of tumblers each having a radial arm and a recess, a ward on said barrel between the tumblers, the ward and the tumblers having registering keyhole-slots, a shoulder on each bolt to limit the rotation of said arms at the limit of the outward and inward movements of the bolts, and a key adapted to engage said bolts, tumblers, and ward to actuate the bolts.

6. In a gravity-lock, a casing having registering keyholes, a pair of gravity-bolts mounted on the same fixed stud at their inner ends, the swing end of each having a locking-hook, each bolt having an opening at its pivoted end, a rotatable key-barrel mounted to register with the keyholes in the lock-plates, a pair of tumblers each having a radial arm and a recess, a ward on said barrel between the tumblers, the key-barrel, the ward and the tumblers having registering keyhole-slots, a shoulder on each bolt to limit the rotation of said arms at the limit of the outward and inward movements of the bolts, means for connecting the swing ends of the bolts to cause them to be projected and retracted as a single bolt, and a key adapted to engage the bolts, the tumblers and ward to actuate the bolts.

7. In a gravity-bolt, a casing having registering keyholes, a pair of gravity-bolts mounted on the same fixed stud at their inner ends the swing end of each having a locking-hook, each bolt having an opening at its pivoted end, a rotatable key-barrel mounted to register with the keyholes in the lock-plates, a pair of tumblers each having a radial arm and a recess, a ward on said barrel between the tumblers, the key-barrel, the ward and the tumblers having registering keyhole-slots, a shoulder on each bolt to limit the rotation of said arms at the limit of the outward and inward movements of the bolts, means for connecting the swing ends of the bolts consisting of a stud on one member entering a hole in the other member to cause them to be projected and retracted as a single bolt, and a key adapted to engage the bolts, the tumblers and ward to actuate the bolts.

8. In a gravity-lock, a casing, a pair of gravity-bolts mounted therein on the same fixed stud and their swing ends terminating in hooks, means for connecting their swing ends for unitary movement, means for actuating the bolts, means for locking them both in their projected and in their retracted positions, and a key adapted to actuate the bolt-actuating means and to actuate the bolt-locking means, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LUCIUS A. TURNER.

Witnesses:
FRANK MCDONOUGH,
F. R. LAVELLE.