No. 740,061. PATENTED SEPT. 29, 1903.

G. H. STOUT.

GRAVITY LOCK.

APPLICATION FILED MAY 2, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 3.

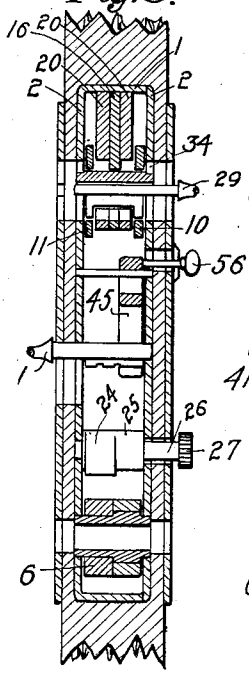


Fig. 2.

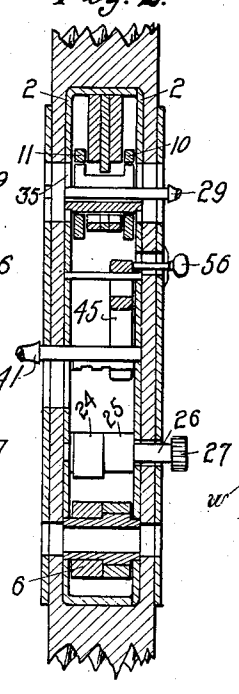


Fig. 1.

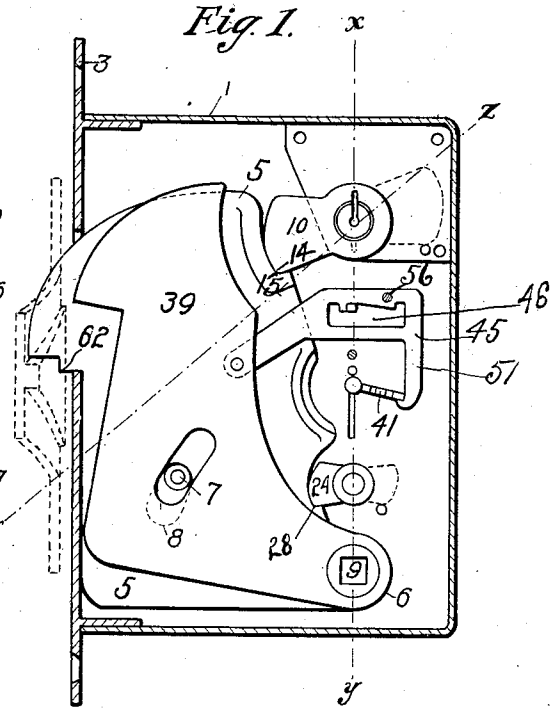


Fig. 5.

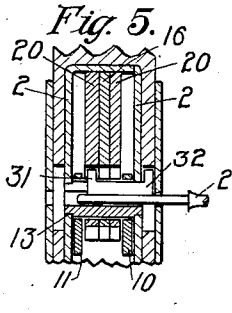


Fig. 4.

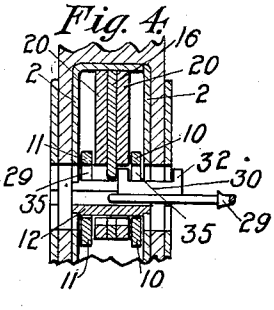


Fig. 8.

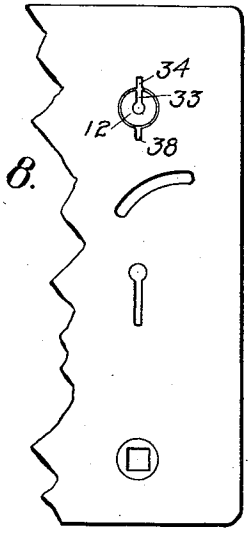


Fig. 7.

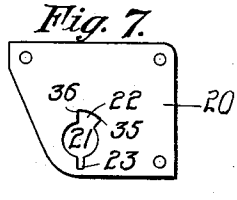


Fig. 6.

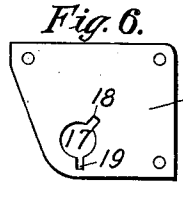
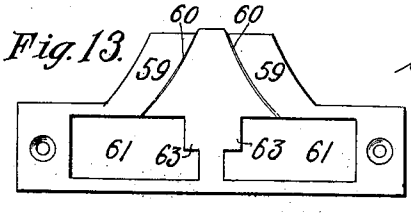


Fig. 13.



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by Johnson and Johnson

ATTORNEYS

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Fig. 10.

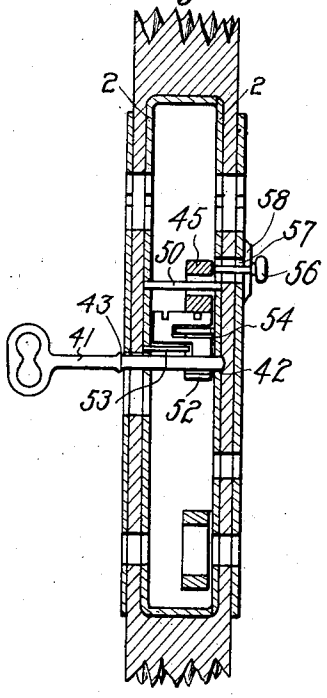


Fig. 9.

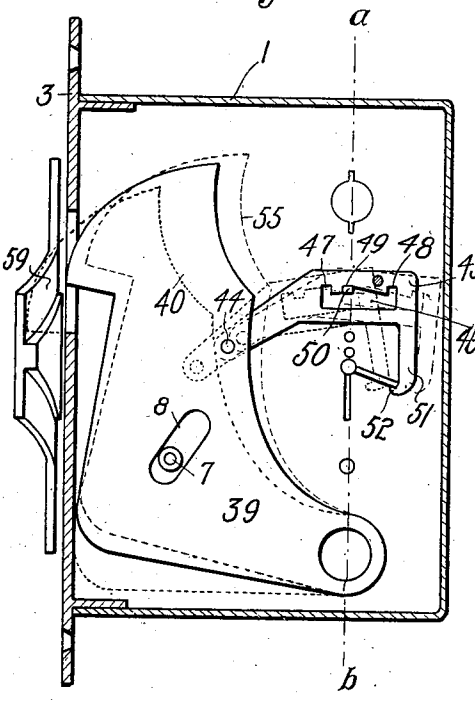


Fig. 14.

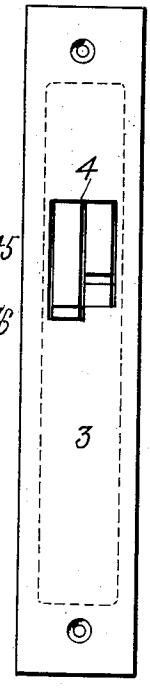


Fig. 11.

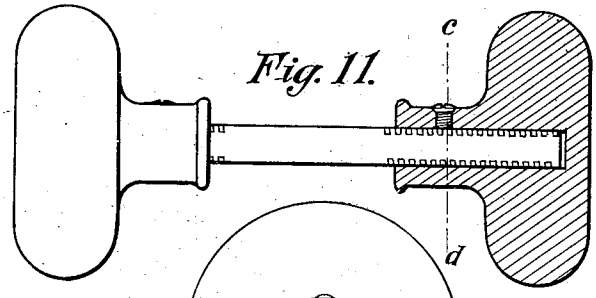
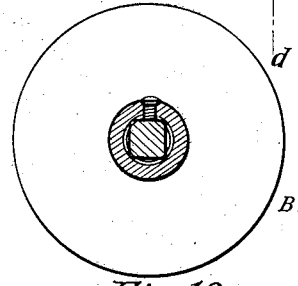


Fig. 12



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No. 740,061. Patented September 29, 1903.

UNITED STATES PATENT OFFICE.

GEORGE H. STOUT, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO LUCIUS A. TURNER, OF DENVER, COLORADO.

GRAVITY-LOCK.

SPECIFICATION forming part of Letters Patent No. 740,061, dated September 29, 1903.

Application filed May 2, 1903. Serial No. 155,395. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. STOUT, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Gravity-Locks, of which the following is a specification.

This invention relates to improvements in gravity-locks for use upon doors and when constructed as shown herein involves several novel features having special value in mortise-locks for front doors.

The object of this invention is to construct a lock the bolt and tumblers of which are held in locked position by gravity and to dispense with all springs or other devices liable to get out of order.

In providing this new front-door lock the construction, purpose, and objects of pending application allowed March 16, 1903, under Serial No. 142,410, are referred to.

Referring to the accompanying drawings, Figure 1 is a side elevation of the improved front-door lock, showing in full lines the twin gravity-bolts 5 and 39. The bolt 5 is shown in its locked position and the bolt 39 is shown in a retracted position maintained by the key 41 sufficient to hold its projecting end out of contact with the keeper. The twin tumblers and the safety-latch are shown in full lines as turned in position to lock the bolt 5, the retracted positions of the bolt 5, twin tumblers, and of the safety-latch being shown in dotted lines. Fig. 2 is a sectional view taken on the line $x\,y$ of Fig. 1 and showing, essentially, the position of the twin tumblers 10 and 11 and the safety-latch 24, the positions of the twin tumblers being that attained when the key has been inserted and passed all baffles and is ready to be turned to retract both of the twin tumblers. Fig. 3 is a similar sectional view showing, essentially, the position of the twin tumblers 10 and 11 when the key has been turned to lock the tumblers and is ready to be withdrawn. Fig. 4 is a partial sectional view on the line $x\,y$ of Fig. 1, showing the key as having been pushed through the slots in the scutcheon, side plate, and baffle-plate and striking against and stopped by the central partition. Fig. 5 is a partial sectional view on the line $z\,w$, showing the key as having been pushed past the central partition and having entered the wide slot 22 in the opposite baffle-plate. Fig. 6 shows the central partition. Fig. 7 shows one of the two identical baffle-plates. Fig. 8 is a view of the rear portion of that side of the lock nearest the inside of the door and embraces the key-entrances. Fig. 9 is a side elevation showing the several positions of the gravity night-latch and its retainer or holdback. Fig. 10 is a section on the line $a\,b$ of Fig. 9, showing the key in position to lift the night-latch retainer. Fig. 11 is a view of the knobs for the bolts screwed upon either end of the squared spindle. Fig. 12 is a vertical section taken on the line $c\,d$ of Fig. 11 and showing the threading of the corners of the spindle and the threading of the interior side of the knob-socket. Fig. 13 is a plan view of the keeper. Fig. 14 is a plan view of the face-plate of the lock.

The lock-case 1 is preferably stamped from sheet metal, and one or both side plates 2 are removable. The face-plate 3 has a bolt-hole 4 near its top. The main bolt 5 is formed of a heavy plate or casting and is pivoted at its rear lower end 6 to the side plates of the casing, so that its upper end, which is diagonal to its pivot, will be projected by gravity through the bolt-hole in the face-plate 3 and into the keeper (shown in dotted lines) on the door-jamb, (and also in plan view in Fig. 13.) A stud or stop 7, projecting from one of the side plates, passes through a slot 8 in the bolt 5 (shown in dotted lines, Fig. 1) and a similar slot in bolt 39 and limits the forward and backward thrust of the bolts, so as to prevent them from injuring the more delicate parts of the lock. The bolt is retracted by a square-shanked door-knob, the spindle of which passes through the square hole 9 in the bolt 5 and may serve as the pivot of the bolt. The ends of the spindle are threaded, as shown in Fig. 11, for a distance from each end, and the flat sides of the squared socket in the knobs are also threaded, as shown in Fig. 12, so that the knobs may be screwed on both ends of the spindle and yet have a squared spindle and socket. The usual countersunk screw-bolt (seen in Fig. 11) shows the manner of fastening the knob upon the spindle to prevent its coming

off and also to insure the turning of the spindle with the knob. The threaded connection between the knobs and the spindle insures the perfect lateral fitting of the knobs in doors of different thicknesses.

In the upper rear corner of the lock are twin tumblers 10 and 11, which turn upon a barrel-pivot 12, having bearings 13, Fig. 5, in the side plates. These tumblers are shaped so that when the bolt is shot their point 14 may enter the notch 15 in the rear edge of the bolt. This notch is preferably placed at a point slightly below the circumference of a circle centered at the pivot of the bolt and passing through the center of the tumbler bearing or pivot, so that a quick turning and twisting of the door-knob could not jar the tumblers up and back, as might happen if the notch were placed above the line of such a circle. Between these tumblers 10 and 11 is a central partition 16, Fig. 6, having a circular opening 17 for the tumbler-barrel 12. Slots 18 and 19 branch off from said circular opening for a purpose presently explained. One or more baffle-plates 20, Fig. 7, having the circular opening 21, with branch slots 22 and 23, are arranged in a similar manner, preferably between the partition and tumblers. Below the twin tumbler 10 and the rear of the bolt is the safety-latch 24, having the barrel-hub 25 and turning on a squared spindle 26, having any suitable bearing in the side plate. The spindle extends out on the inside of the door and has a knob 27 on its outer end. The safety-latch 24 when turned to the position shown by full lines in Fig. 1 falls into a notch 28 in the rear edge of the main gravity-bolt 5, which notch is preferably located on or below the circumference of a circle centered at the pivot of the bolt and which circle passes through the pivot of the safety-latch for the same reason hereinbefore explained with reference to the notch 15 and tumblers 10 and 11. Its unlatched position is shown in dotted lines in Fig. 1.

The door being locked and all the parts being shown by full lines in Fig. 1 and it being desired to unlock the same, a key 29, having a web 30, notched so as to leave two tangs or projecting ends 31 32, is pushed into the eyed slot 33 in the tumbler-bearing barrel 12 and through a slot 34, Fig. 8, in the side plate and into a slot 35 in the tumbler 10 and also into the corner 36 of the wide slot 22 in the baffle-plate 20, Fig. 7. At this position it strikes the central partition and must be turned until its tang 31 reaches the corner 37 of the wide slot 22. It is then pushed into and through the slot 18 in the central partition and into the wide slot 23 in the baffle-plate on the opposite side of the central partition; but at this position the other tang 32 on the key-web will strike the side plate, and the key must be turned back, its tang 31 passing from corner 37 to corner 36 of the wide slot 23 of the opposite baffle-plate until the tang 32 can enter the slot 34, Fig. 8. The key is then pushed home, its web-tang 31 entering the slot 35′ in the opposite tumbler 11 and its web-tang 32 entering the slot 35 in the near tumbler 10. The key is now turned around so as to lift both the tumblers 10 and 11 out of the notch 15 in the rear edge of the bolt and rests against the back of the lock-casing, as shown by the dotted lines in Fig. 1, and the key may then be withdrawn, slots 23, Fig. 7, in the two baffle-plates, slot 19, Fig. 6, in the central partition, and slot 38, Fig. 8, in the lock-casing being provided for this purpose. When the parts are in the unlocked position, slots 23, 19, and 38, just described, all coincide, and the key is pushed clear home and then turned so as to place the tumblers in the position shown in full lines in Fig. 1. To now withdraw the key after locking, the movements of the key to avoid the baffle-plates and central partition are just the reverse of the movements described in unlocking.

When this new lock is applied to the front door of a public house, its many advantages are practically and most clearly seen, as the mechanisms just above described insure such complications in the key which operates the tumblers 10 and 11 that it would take great skill to "pick" the lock to turn said tumblers without a key very carefully made for the purpose. Indeed, it is thought to be impossible. Besides this the safety-latch 24, which is capable of being unlocked only from the inside of the door, further secures the bolt 5 against even a key made to turn the tumblers 10 and 11.

In many instances the proprietor of a public house desires a lock for the front door which will afford means for its opening by certain of the tenants and yet not afford means of opening to other of the tenants and which at the same time affords means for securing the lock against all of the tenants. It is seen that the lock as above described could be opened by any tenant who possessed a key to turn the tumblers 10 and 11, and if desired to be rendered unopenable against any one of the tenants it must be done by means of the safety-latch 24; but, as stated, it may be desired that some certain of the tenants should be enabled to open the door. With this object in mind the supplemental gravity-bolt 39 is provided, as shown in Figs. 1 and 9. This gravity-bolt 39 approximates somewhat in shape the gravity-bolt 5, heretofore described. It is pivoted upon the same pivot-barrel as said bolt 5, but is not fastened to said barrel, and therefore may move independently of the bolt 5. It projects from the lock through the same opening in the face-plate of the lock and into the same opening in the keeper on the door-jamb side by side with bolt 5. Its projected or locked position, which is shown by its dotted position 40, Fig. 9, it maintains by gravity. Its unlocked position, which is shown in full lines in Figs. 9 and 1, is obtained by the turning of the key 41, Figs. 1,

9, and 10. This key is inserted from the outside of the door and is centered or journaled in the usual manner in the lock-casing, as at 42, and the outside scutcheon at 43, Fig. 10. Reaching back from the rear edge of the bolt 39 and loosely pivoted thereto at 44 is a tumbler-plate 45, Figs. 1 and 9. This tumbler-plate 45 has a slot 46, the roof or upper interior edge of which has the recesses 47, 48, and 49, Fig. 9, and an inclined surface between the recesses 49 and 48, which extends from the roof of the recess 49 to the entrance to the recess 48. Then the bolt 39 is in its projected position, as shown by the dotted line 40 in Fig. 9, and when it is desired to withdraw the bolt to unlock the door the key 41 is turned in the direction of the arrow, Fig. 9, and bears upward against and lifts said tumbler-plate, so as to take its connection (by means of the recess 48) off the pin 50, and by further turning the key its web will bear against the depending arm 51 of the tumbler-plate and pull the same back and also the bolt back to the position shown in full lines in Figs. 9 and 1. The further turning of the key is stopped by the lip 52, projecting in its path at the lower end of the arm 51. At this position the bolt is unlocked and is maintained so by the key, which, as seen, has its web pointed downward from its pivot or eye-hole. The hold on the key may now be released and the knob turned to unlock the bolt 5, as before described. Thus far is accomplished the retraction of both bolts 5 and 39, and the door may be opened. To withdraw the key, it is turned in a reverse direction to that just described, which permits the bolt 39 to again gravitate to its projected position and permits the tumbler-plate to ride over the pin 50 until said pin comes opposite to the recess 48, at which time the gravitating tumbler-plate 45 drops, so that its recess 48 locks on the pin 50. At this position it is believed to be impossible to lift the gravity-bolt 39, which otherwise might be accomplished when the door is closed by the insertion of a thin blade between the face-plate of the lock and the keeper. This key 41, as shown, is a ward lock-key, and the variations of its wards and ward-notches may be accomplished by means of the pins 53 54, projecting inward from the side plates of the lock-casing in the path of the turning of the key-web, and also by means of grooves on the under edge of the tumbler-plate 45 and grooves on the rear edge of the bolt 5, said bolt 5 being thickened at this place to afford room for the variation of the notches, (which even in its projected position lies in the path of the turning of the key,) also by variations in the projections and notches on the outer end of the key-web. The preferred form of key is shown in the drawings; but it is obvious that any form of key may be used. This gravity-bolt 39 is analogous in its use to the common night-latch, and it is therefore seen that in the day-time it should be put out of service. This is accomplished by pulling the tumbler-plate 45, together with its attached gravity-bolt 39, back so that its notch 47 will drop down over the pin 50 to maintain the bolt 39 in its greatest retracted position. (Shown by dotted lines 55, Fig. 9.) This is accomplished by pulling on the knob-pin 56, which projects through the lock-casing and door on the inner side of the door and plays in a hole 57, made in the lock-casing of the door and scutcheon for this purpose, Fig. 10. This hole in the scutcheon-plate is covered by the slide-plate 58, which is secured upon the pin 56 after the manner of a common washer. The provision of this night-latch (gravity-bolt 39) affords the proprietor of a public house a third means of securing the door, which at times may be independent and at other times may coact with the other means hereinbefore described for securing the door. It is thus seen that this lock affords security for the door in all the instances heretofore mentioned, and it is also seen that the lock by means of the gravity-bolt 39 may be secured against opening by means of a key made to operate the tumblers 10 and 11, since to open the door from the outside a pass-key is required to operate the gravity-bolt 39 (night-latch) whenever said latch is in service.

The operation of this lock requires the provision of a keeper which will have a flared lip 59, so as to guide the bolts at their full projected positions inward and upward to meet the holes in the keeper. The flaring of the keeper-lip 59 accomplishes the inward movement of the projecting bolts, and its slide or shelf 60 accomplishes the upward lifting of the bolts, so that when the door meets the door stop or rabbet the bolts may fall instantly into the hole 61 in the keeper, and thereby lock the door; but it is seen that at some time the bolt 39 of the night-latch will be out of service, and the bolt 5 alone will have to fall into the hole 61 in the keeper, and if such keeper were made with its hole of full width at the bottom of the bolt 5 when used alone would have free play from one side of the hole to the other. This would allow the door to rattle in the eddying of the wind. To prevent this, steps are formed in the bottom of the keeper and the under side of the projecting end of the bolt 5 is stepped, so that the outer under edges of the bolts 39 and 5 would be on a level when said bolts are projected and may therefore meet and ride upon the shelf 60 in an even and smooth manner; but when the bolts fall into place in the hole of the keeper the lower step 62 of the bolt 5 will fall into the very bottom of the hole in the keeper and be prevented from lateral play by being confined between the long side of the hole in the keeper and the edge of the step 63, raised from the bottom of the keeper-hole, and thus prevent said rattling of the door. For appearance sake it is desirable that the bolt-hole in the face-plate of the lock

be also stepped at its bottom, and such is illustrated in Fig. 14.

I claim—

1. In a lock of the class described, the combination with a bottomly-pivoted gravitating bolt, of two independently-movable tumblers therefor both accessible to a key from opposite sides of the lock, a central partition separating said tumblers and perforated to give access to a key from either side of the lock at the place of its division of said tumblers, and an independently-movable latch for said bolt accessible to a key from only one side of the lock, substantially as described.

2. In a lock of the class described the combination of two coaxial bottomly-pivoted independently-swinging gravitating bolts, two independently-movable tumblers for one of said bolts and a central partition separating said tumblers and perforated to give access to a key from either side of the lock at the place of its division of said tumblers, substantially as described.

3. In a lock of the class described the combination of two coaxial bottomly-pivoted independently-swinging gravitating bolts, two independently-movable tumblers for one of said bolts both accessible to a key from opposite sides of the lock and an independently-movable latch-tumbler for said same bolt accessible from only one side of the lock, a central partition separating said twin tumblers and perforated and notched to give access to the key therefor and baffle-plates upon either side of said partition perforated and notched by notches non-coinciding with the notches in the central partition to give access to the key for said tumblers substantially as described.

4. In a lock of the character described a bottomly-pivoted gravitating bolt and a gravitating tumbler-plate pivoted to and extending from the rear edge of said bolt and having notches and stops to limit the backward, forward and intermediate position of the bolt, substantially as described.

5. In a lock of the character described, a bottomly-pivoted gravitating bolt and a gravitating tumbler-plate pivoted to and extending from the rear edge of said bolt having notches and stops to limit its backward, forward and also the backward movement at an intermediate position and a key bearing against said tumbler-plate to maintain it and its attached bolt at the intermediate position, substantially as described.

6. In a gravity-lock, a bottomly-pivoted gravitating bolt and a gravitating tumbler-plate projecting rearwardly therefrom, notches in said tumbler-plate and a pin on the lock-casing in the path of the notches of said plate whereby to stop its travel forward and backward and at an intermediate position, a knob-pin on said plate projecting through the lock-casing and door on the inner side whereby to raise said tumbler-plate out of the path of said pin and move said plate and bolt backward and forward, substantially as described.

7. In a lock of the class described, a knob-bolt and tumblers therefor, a night-latch bolt and a tumbler-plate therefor a key operating said tumbler-plate, a keeper for both bolts of said lock the bottom of the hole of which is stepped to seat the knob-bolt lower than the night-latch bolt, substantially as described.

8. In a gravity-lock, the combination with a suitable casing and a bottomly-pivoted swinging gravitating bolt normally projecting through a hole in the lock-casing of a holdback device for said bolt consisting of a vertically-swinging tumbler-plate pivoted to and extending from the rear edge of said bolt having a slot in said tumbler, a pin extending from the lock-casing through said slot, notches in the roof of said slot falling over said pin to limit the backward and forward and intermediate positions of the tumbler-plate and said attached bolt, substantially as described.

9. In a lock of the class described, a bottomly-pivoted swinging gravitating bolt, a pivoted rearwardly-extending slotted tumbler-plate therefor, notches in the roof of said slot, a pin or stop on the casing entering the notches to limit the backward, forward and intermediate positions of said bolt tumbler-plate, a key having a web adapted at one position to lift the tumbler-plate notches off said pin, an arm depending from said tumbler-plate in the path of the turning of the key whereby said plate is retracted, a stop at the bottom of said depending arm to hold the key-web at a point in its turning below its center in the manner and for the purpose stated.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE H. STOUT.

Witnesses:
A. ROLAND JOHNSON,
SARA C. JOHNSON.