No. 805,042. PATENTED NOV. 21, 1905.

L. A. TURNER.

SLIDING DOOR LOCK.

APPLICATION FILED NOV. 19, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

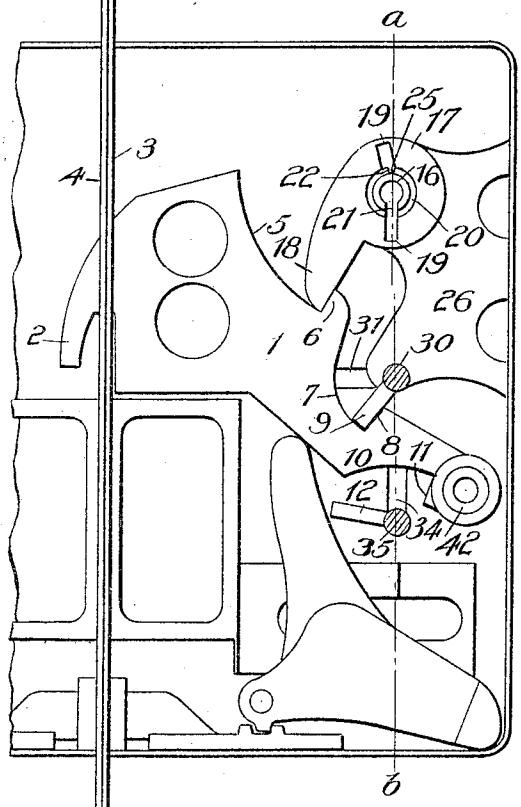



Fig. 2.

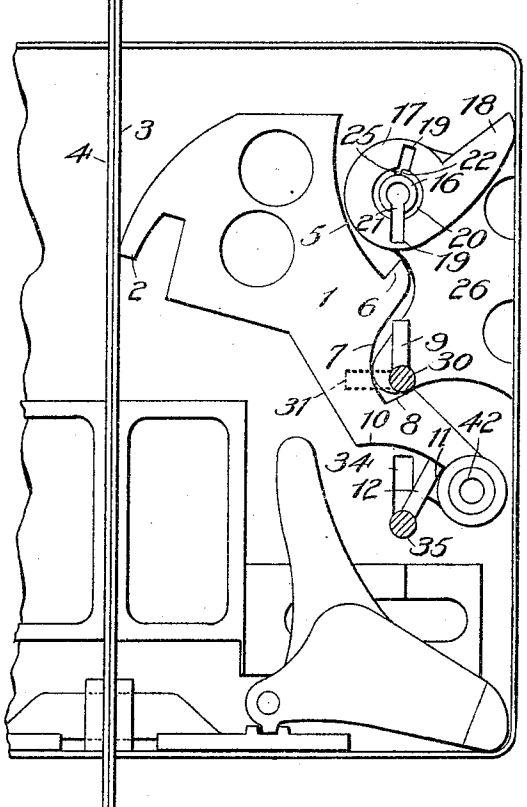



Fig. 8.

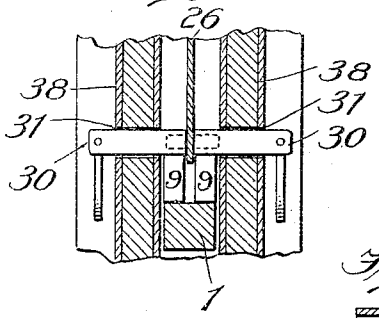



Fig. 9.

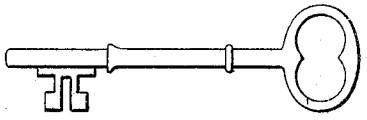
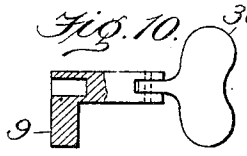


Fig. 10.




Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

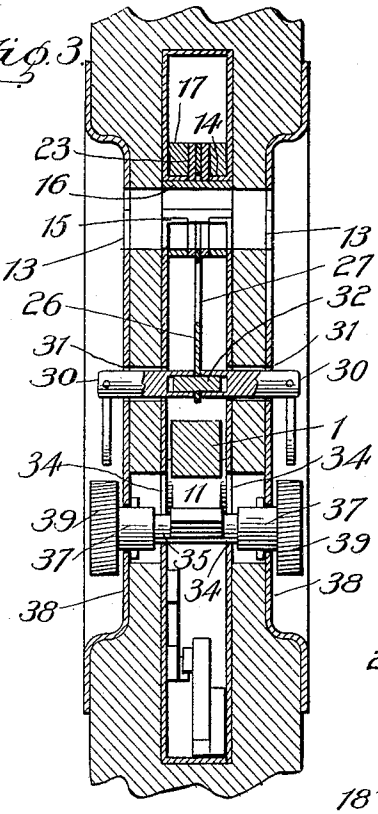



Fig. 11.

Fig. 4.

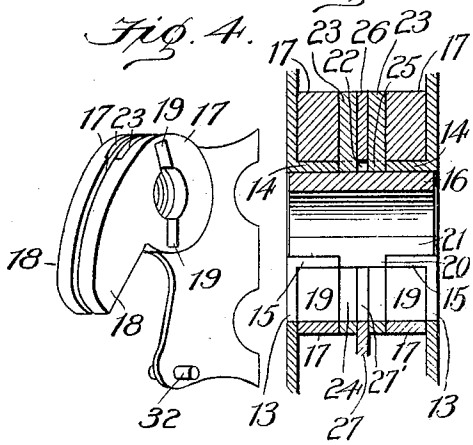



Fig. 5.

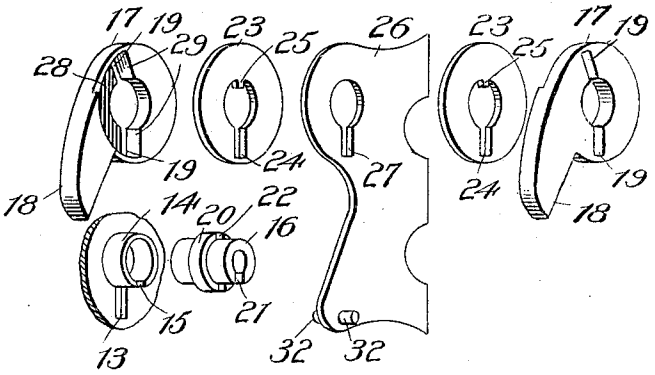



Fig. 6.

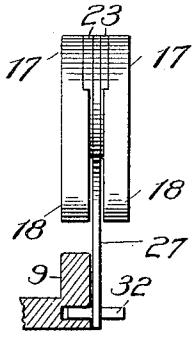
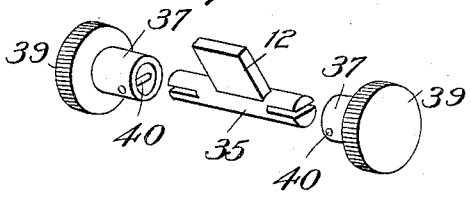



Fig. 7.




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# UNITED STATES PATENT OFFICE.

LUCIUS A. TURNER, OF DENVER, COLORADO.

## SLIDING-DOOR LOCK.

No. 805,042. Specification of Letters Patent. Patented Nov. 21, 1905.

Application filed November 19, 1904. Serial No. 233,486.

*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 gravity-locks for sliding doors, and my improvements therein reside in a novel construction of the gravity-bolt, in the novel construction of tumblers and wards, whereby and resulting from such novel construction of bolt and the locking tumblers and wards the bolt is held securely locked or is locked by a secondary key engaging the shank of the bolt, and whereby a third key acting on the shank of the bolt serves to hold the bolt in its unlocked position and may be used as a night-key, the construction of the parts allowing the keys to be used from either side of the door, and in the claims appended hereto and in connection with the accompanying drawings I will point out the parts and combinations of parts which constitute my invention.

Referring to the drawings, Figure 1 shows the lock mechanism in the position the parts occupy when the bolt is locked. Fig. 2 is a like view showing the gravity-bolt supported in its unlocked position by the direct action of a third key. Fig. 3 is a vertical section taken on the line *a b* of Fig. 1, showing the tumblers for the main key for locking and unlocking the bolt, a pair of independent keys for securing the bolt in its locked position, and a pair of independent keys for holding the bolt out of its locked position. Fig. 4 shows in perspective the tumblers and wards in their assembled relation when locking the bolt. Fig. 5 shows in perspective the tumblers and wards separated. Fig. 6 is an edge view of the same. Fig. 7 shows the key-tang and its head for acting on the bolt to hold it out of locking position. Fig. 8 shows the pair of keys for locking the bolt and their relation to the bolt and the keyhole 31. Fig. 9 shows the tumbler-actuating key. Fig. 10 shows one of the keys 9 for locking the bolt. Fig. 11 shows an enlarged section of the tumblers and wards and their relation to the key-barrel or stud.

The gravity-bolt 1 is adapted to have the function of a latch, and for this purpose its locking end is formed with a hook 2, and the shank of the bolt stands obliquely in the case and is pivoted at its shank end, so that its upper end will constantly tend to fall to project its hook outside of face-plate 3 at the meeting edges of the doors to engage and be locked with the face-plate 4 of the meeting door. At its upper end the inner edge of the bolt opposite its hook has a concave formation 5, which terminates in a shoulder 6 at the lower end of the concave, and it is with this shoulder the tumblers engage to lock the bolt. From this shoulder the shank has a second concave formation 7 on its inner edge which terminates in a shoulder 8 at the lower end of said concave, and it is with this shoulder a key 9 is caused to engage and form a supplemental lock for the bolt. On its other or under side the shank of the bolt has a third concave formation 10, which terminates in a shoulder 11 at the pivoted end of the shank, and with this shoulder a key-tang 12 is caused to engage to lift the bolt and to hold it out of locking position, as in Fig. 2. This supplemental locking of the bolt and of supporting the bolt out of locking position by the direct action of keys upon the bolt I will more particularly describe presently.

The case has three keyholes, all accessible from the opposite sides of the door, and therefore they are in the opposite sides of the lock-case, the upper ones, 13, being opposite the concave formation 5 at the upper end of the bolt and standing downward. From the upper keyholes a collar 14, Figs. 5 and 11, projects within the case, and each collar is provided with a slot 15, which corresponds with the slot of the keyhole and which in both plates are in alinement. Upon these collars is mounted to rotate a key-barrel or stud 16, and on these collars and key-barrel are assembled the locking tumblers and wards, as I will now describe. On each of the collars is fitted to turn against the inner wall of the case a tumbler 17, each being formed of a disk or hub having a radial arm 18, adapted to engage its shoulder 6 when the bolt is in locked position and to maintain it in such position. The hub or disk of each tumbler has radial slots 19 19, disposed diametrically, and which when the tumblers are turned to their locked or unlocked position are caused to register with the keyholes in the case. The key-barrel or stud is formed with a circumferential shoul-

der 20, Fig. 5, by which it is confined within the collars and has a longitudinal slot 21 open at both ends, while the shoulder has a longitudinal groove 22 diametrically opposite the slot. Upon the shoulder of this key-barrel or stud are mounted a pair of wards 23 23, each ward being formed with radial slot 24, corresponding with the longitudinal slot in the key-barrel, and a tooth 25, adapted to engage the groove 22 in the key-barrel shoulder, so that these wards and the key-barrel are caused to turn together with the turning of the key. The outer walls of the fixed collars and of the key-barrel shoulder 20 are of the same diameter, so that the tumblers and the wards are fitted upon the key-barrel.

Between the wards 23 is a fixed ward 26, which has a radial slot 27, corresponding to the keyhole-slots in the case. The fixed ward therefore separates the pair of tumblers and the pair of movable wards. The inner face of the hub or disk of each tumbler has a semicircular recess or depression 28 at that part next its radial arm, so that each radial slot in said hub forms a shoulder 29 29 in said recess, and into each of these recesses the tang of the key operates to turn the tumblers. I prefer to make the thickness of the hub part of the tumblers and the projection of the collars equal and the thickness of the movable and fixed wards equal to the width of the shoulder on which they are centered. When the tumblers are in position, with their arms in engagement with the shoulder of the bolt locking it, as in Fig. 1, one of the key-slots 19 in each tumbler will register with the keyholes in the case, and when the bolt is in its unlocked position, as in Fig. 2, by turning the tumblers up and over against the inner wall of the back of the case then the other tumbler keyhole-slot 19 will register with the keyholes in the case, so that at the limit of each movement of the pair of tumblers a slot in each will register with the lock keyhole-slots. In inserting the key (shown in Fig. 9) its tang will first engage the slot of the key-barrel, and turning the barrel until its slot registers with the slot in the tumbler, the key-tang will pass through said slot and into and through the slot in the ward, which always registers with slot in the key-barrel, then turning the key to the right or to the left its tang will pass into the slot in the fixed ward. Continuing to turn and push in the key, its tang will pass into the slot in the next ward, and so on into the slot of the next tumbler, thereby engaging the key with and turning the tumblers to either lock or unlock the bolt, and rendering it very difficult to pick the lock.

For supplementing the locking function of the tumblers I provide for locking the bolt by the direct action of a key 30, inserted through a keyhole 31 in either side of the lock-case. This key has a tubular barrel and engages a stud 32, projecting from the fixed ward to hold the key in position to cause its tang to be turned in the concave 7 of the bolt in engagement with the shoulder 8 thereof, so that the tang of the key will stand in such engagement at about right angles to the shank of the bolt and prevent it from being raised when locked. For this purpose the keyhole 31 preferably stands horizontal, and the fixed ward has a guide-stud 32 on each side to engage a key from each side of the door. For holding the gravity-bolt up out of locking position keyholes 34 are made in the opposite lock-plates, within which is mounted a stem 35, having its ends projecting beyond the lock-plates and having a key-tang 12 between the lock-plates adapted to engage the concave formation 10 on the under side of the bolt-shank, so that on turning the tumbler up said key-tang will engage the bolt-shank with a lifting action until said key-tang engages the shoulder 11 at the termination of said concave standing in such engagement about at right angles to the shank of the bolt, and thereby hold the bolt in its unlocked position. The means for turning this key-tang 12 consists of tubular stems 37, mounted in the escutcheon-plate 38, and each having a nutted head 39 for turning it, the inner ends of said stems being adapted to engage the ends of the tang-stem. For this purpose a convenient construction is shown of making the ends of the stems forked and providing each of the tubular stems 37 with a transverse pin 40 for interlocking with the forked ends of the stem 35, so that the latter may be turned by the nutted head of either escutcheon-plate. This coupling also adapts it for different thicknesses of doors. As shown, only one of the doors is provided with the lock. The meeting edge of the other door is provided with a slotted keeper-plate 4, with which the hook of the bolt engages.

It is important to note that the bolt is pivoted at its end upon a fixed stud 42, and that the construction of the bolt at this end provides for the use of night-keys for lifting the bolt to unlock it and avoids the use of knobs. This fixed bolt-stud serves to receive a screw to secure the removable plate to the lock-case. The lock may be used for single and double sliding doors, and in the latter each door will be provided with a hand-pull, and while I have shown such pull device it is not included in the claims of this patent, as it is made the subject of a separate and distinct application filed by me of even date herewith.

I claim—

1. In a sliding-door lock, a case, each side whereof having an inward-projecting keyhole-collar, each collar having a slot corresponding with the keyholes, a gravity-bolt pivoted at its inner end, its free end having a locking-hook on one edge and a curved shouldered recess on its opposite edge, and a tumbler mounted on each keyhole-collar and having each a pair of radial slots and adapted to

engage the free end of said bolt to secure it in its locked position, and a rotary slotted key-barrel connecting said collars.

2. In a sliding-door lock, a case each side whereof having an inward-projecting key-hole-collar, each collar having a slot corresponding with the keyholes, a gravity-bolt pivoted at its inner end, its free end having a locking-hook on one edge and a curved shouldered recess on its opposite edge, and a tumbler mounted on each keyhole-collar each tumbler having a pair of radial slots, and having a radial arm adapted to engage said bolt-shoulder to secure said bolt in its locked position, and a rotary keyhole-barrel connecting said collars.

3. In a lock for sliding doors, the lock-plates each having an inward-projecting slotted collar at the keyhole, a key-barrel or stud having a longitudinal slot and seated to rotate within said collars, a tumbler mounted upon each collar, having a radial arm and a pair of radial slots and a semicircular recess or depression forming shoulders at said slots, a ward fixed to the case and mounted on said key-barrel and having a slot registering with the slots in the lock-plates, a ward between each tumbler and the fixed ward, and having a radial slot and engaged with and rotary with said barrel-stud, and a key adapted to engage and rotate the key-barrel, the tumblers and the wards engaged with said barrel, a gravity-bolt pivoted at its inner end on a fixed stud having a locking-hook at its free end and a shoulder on its upper inner side arranged for engagement with the tumblers to lock the bolt.

4. In a lock for sliding doors, a case, a gravity-bolt pivoted at its inner end to a fixed stud, having a locking-hook at its free end and a shoulder opposite said hook, rotary tumblers for engaging said shoulder for locking the bolt, a shoulder on the under side of the shank of said bolt at its pivoted end, keyholes in the lock-plates, a tang mounted in said keyholes, and heads adapted to engage the stem of said tang whereby the latter is caused to engage the bolt-shank and lift and hold it out of locking position.

5. In a lock for sliding doors, a case, a gravity-bolt pivoted at its inner end to a fixed stud, having a hook at its free end and a shoulder opposite said hook, a second shoulder above the pivot on the inner side of the bolt, keyholes in the lock-plates at said second shoulder, a fixed plate having pins projecting from its opposite sides, and a key adapted to engage said fixed pins and said bolt-shoulder to secure the bolt in its locking position.

6. In a lock for sliding doors, a case, a gravity-bolt pivoted at its inner end to a fixed stud, having a locking-hook at its free end and a shoulder at its pivoted end both on the under side of said bolt, and a pair of shoulders on its inner side above said pivot, means engaging the shoulders on the inner side of the bolt for locking and for securing said bolt, and means for engaging the shoulder at the under side of said bolt for unlocking and holding said bolt out of locking position.

7. In a sliding-door lock, a case each side whereof having an inward-projecting key-hole-collar, each collar having a slot corresponding with the keyholes, a gravity-bolt pivoted at its inner end, its free end having a locking-hook on one edge and a curved shouldered recess on its opposite edge, a tumbler mounted on each collar and having each a pair of radial slots, each tumbler having a radial arm adapted to engage said bolt-shoulder, a rotary slotted key-barrel connecting said collars, a slotted ward having a fixed relation to and between said tumblers, and a rotary slotted ward between each tumbler and the said fixed ward.

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

LUCIUS A. TURNER.

Witnesses:
F. E. MILLER,
H. MOULTON SMITH.