No. 859,064. PATENTED JULY 2, 1907.

J. A. HITCHENS.

LOCK.

APPLICATION FILED JULY 5, 1906.

2 SHEETS—SHEET 1.

Fig. 1

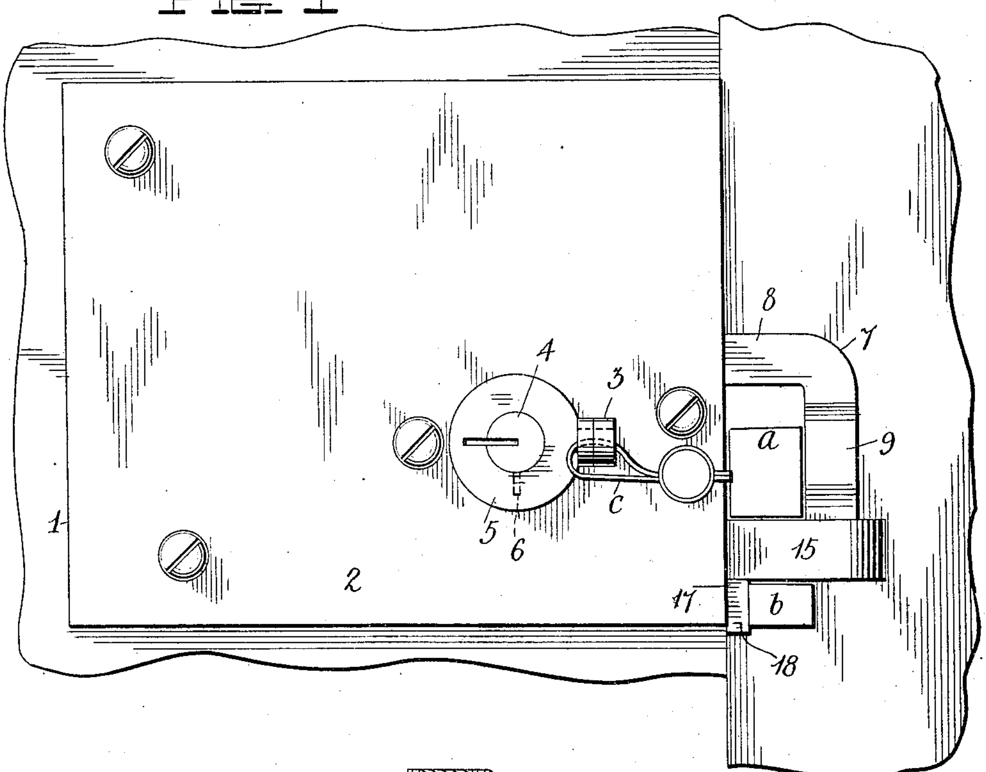
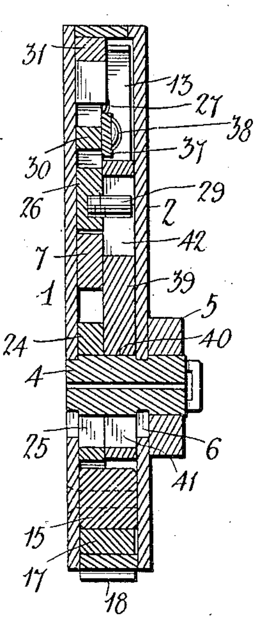


Fig. 4



Witnesses

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2 SHEETS—SHEET 2.

FIG. 2

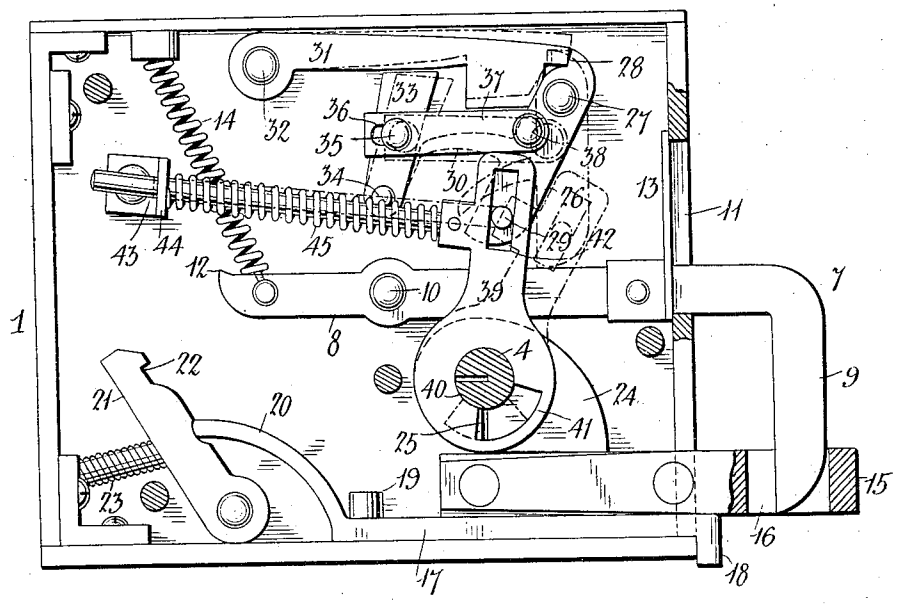
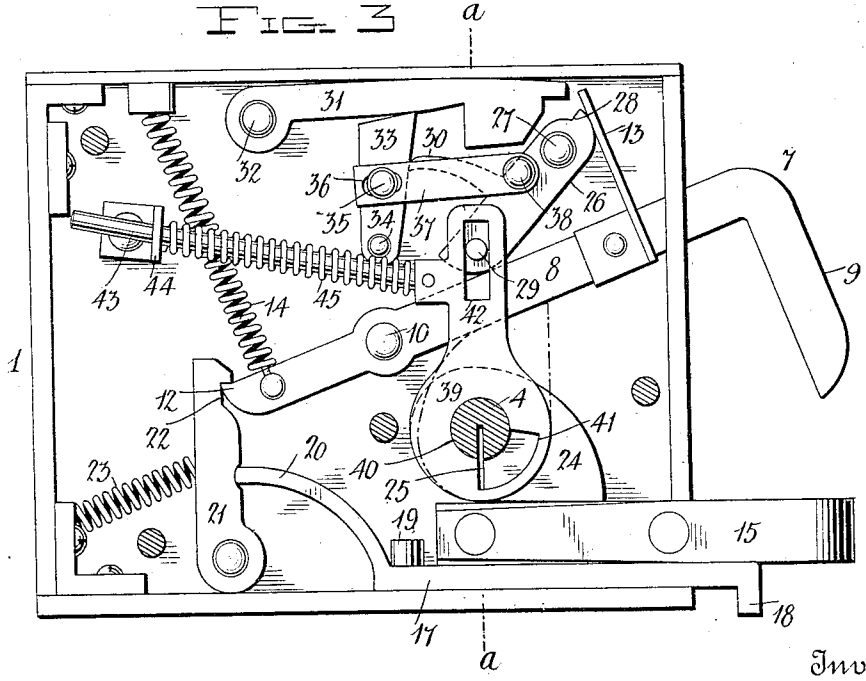


FIG. 3



Witnesses

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LOCK.

No. 859,064. Specification of Letters Patent. Patented July 2, 1907.

Application filed July 5, 1906. Serial No. 324,849.

To all whom it may concern:

Be it known that I, JOSEPH A. HITCHENS, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in 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.

My invention is an improved sliding door lock, especially adapted for use on the doors of railway freight cars, barns and other structures, and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

In the accompanying drawings,—Figure 1 is a side elevation of a sliding door lock embodying my improvements, showing the same locked; Fig. 2 is a similar view with the outer side of the lock casing removed, a part of said casing, the key guide, and the bolts which receive the removable side of the casing being shown in transverse section, the lock bolt being shown in locked position, the detent bar, key-operated arm, gravity-acting dog and releasing dog being indicated in an initial, locking position in dotted lines, and in a secondary position, to permit the movement of the bolt to unlocked position, in full lines; Fig. 3 is a similar view, showing the bolt in unlocked or open position, in full lines, and the key operated cam, in position to release the said bolt in full lines, and engaging the said bolt, in dotted lines. Fig. 4 is a transverse sectional view, taken on the plane indicated by the line *a*—*a* of Fig. 3.

The case 1 is here shown as of rectangular form and provided with a removable outer side plate 2. Said side plate has on its outer side a lug 3, which serves as a seal element. Carried by the said removable side plate and journaled for rotation is a key guide 4, which is cylindrical in form, extends through an opening in the removable side of the casing and also extends through and is journaled in an opening in the inner side of the casing. The outer end of said key guide projects beyond the outer side of the removable side of the casing and is fastened to a keeper 5, which revolves with the key guide, serves as a shield to cover the keyhole 6 and is provided at one side with a lug to aline with the lug 3. The said lug of the said revoluble keeper and of the removable side of the casing are provided with openings through which, when said lugs aline and the door is locked, as hereinafter stated, a seal wire may be passed and fastened in the usual manner. When the seal wire is thus applied, the key guide is fastened so that it cannot be turned and the keeper 5 thereof serves to cover the keyhole in the removable side of the casing. A bolt 7, which is here shown as having a long arm 8 and a short arm 9 at right angles thereto, has its long arm pivotally mounted, as at 10, in the casing and extending through and operating in a slot 11 in the front side of the casing. The arm 9 extends downwardly from the outer end of the arm 8, and the inner end of said arm 8 which extends beyond the pivot 10 is beveled on its under side and notched in its upper side to form a point 12. A wing 13 is carried by the said arm 8 to close the slot 11 when the bolt is in locked position, as shown in Fig. 2. A spring 14 is connected to the arm 8 of the bolt and serves to normally hold the bolt in locked position. A keeper-arm 15 is secured in the lower portion of the lock case near the front end and has its outer end projecting through and beyond the front side of the lock case. Said keeper-arm has a slot 16 to receive the lower pointed end of the arm 9 of the pivoted bolt.

Between the arm 15 and the lower side of the lock case is a longitudinally-movable trip bar 17, the outer end of which projects beyond the front side of the lock case and has a downturned portion 18. A stop-pin 19 projects from the upper side of the said trip rod to engage the inner end of the arm 15 and coact therewith to limit the outward movement of said trip rod. The inner end of the trip rod 17 is curved and extended upwardly and inwardly, as shown at 20, and bears in a notch in the front side of a pivotally-mounted trigger 21 having a notch 22 to engage the inner end of the arm 8 of the pivoted bolt 7 to hold said bolt in the unlocked position thereof, shown in Fig. 3. A spring 23 normally holds the trigger in its engaging position.

On the key guide 4 is a pivotally mounted, key-operated cam 24, which has a notch 25 to receive the wing of the key so that said cam may be turned by the key and with the key guide to the position required to cause said cam which engages the under side of the arm 8 of the pivot bolt to raise said pivot bolt to unlocked or releasing position. It will be observed that the said cam 24 projects toward the front side of the lock case from the pivoted key guide upon which it is mounted, so that it is weighted at one side and by its own gravity when released by the key will turn from the pivot bolt to leave the latter free to be closed by the spring 14, when the said bolt is released by the operation of the trigger 22 and the trip rod 17.

A detent bar 26 pivoted in the lock case, as at 27, has a shoulder 28 at its upper end and extends downwardly in the lock case a sufficient distance to cause its lower end when said detent bar is in a vertical position to bear on the upper side of the bolt 7 as shown in dotted lines in Fig. 2 and thereby prevent the bolt from being turned to unlocked position by the cam 24. A stud 29 projects from the outer side of said detent bar and a curved trip arm 30 projects from the rear edge thereof. A gravity-acting dog 31 is

pivotally mounted in the upper portion of the lock case, as at 32. This dog engages the shoulder 28 of the detent bar 26 and holds said bar in its secondary position as shown in full lines in Fig. 2. The pivotally mounted bolt 7 can then be turned to open or unlocked position by the key-operated cam 24. A retaining dog 33 has its lower end pivotally mounted in the lock case, as at 34, and is provided on its outer side with a stud 35, which operates in a short slot 36 in a link 37, said link being pivotally connected to the detent bar 26 at its front end, as at 38. When the detent bar 26 is in the position shown in full lines in Fig. 2, to clear the pivot bolt and enable the latter to be turned to unlocked position, the retaining dog 33 has its upper end nearly in engagement with the dog 31, and the trip arm 30 of the detent bar is nearly in engagement with said retaining dog.

A key-operated arm 39 is pivotally mounted on the key guide 4, as at 40, and has a recess 41 to clear the wing of the key and permit the key, together with the key guide and the cam 24 to be turned independently of said arm when the lock bolt 7 is being turned to unlocked position. Said recess 41 also permits the key to be turned to a considerable extent without imparting motion to said arm. The latter is provided with a slot 42 for the reception of the stud 29 of the detent bar. A rod 43 has one end pivoted to said key-operated arm. Said rod operates in a guide 44, so that it may be moved longitudinally to enable the said key-operated arm to be turned pivotally, and on the said rod is a coiled extensile spring 45, which bears between the said guide and the said key-operated arm, and serves to normally throw the latter inwardly and to retain it in the position shown in dotted lines in Fig. 2.

The lock will when in use, be secured on and carried by a sliding door. The side of the car, barn or other structure against which the door closes will in practice be provided with a suitable keeper, such as indicated at *a*, or of any other suitable form for engagement by the bolt 7 and will also be provided with a stop such as indicated at *b*, or of any other suitable form to engage the end 18 of the trip rod 17. When the lock is in a locked position, as in Figs. 1 and 2, the keeper 5 will be secured by the seal wire such as indicated at *c* in Fig. 1 and the trip rod 17 will be held in its rearward position by the stop *b*, so that the trigger 21 will be moved rearwardly against the tension of its spring to clear the inner end of the pivoted bolt 7. The detent bar 26 will be in a vertical position and with its lower end bearing on the arm 8 of the bolt 7 as shown in dotted lines in Fig. 2. Before the lock can be operated to unlock the door, the seal must be broken and the seal wire removed. The key is then inserted in the slot in the key guide and in the keeper guide far enough to cause its wing to come in contact with the outer side of the removable side of the lock casing, and is then turned to cause the key guide to turn far enough to enable the key to register with the key hole, when the key must be pushed in far enough to cause its wing to enter the recess 41 of the arm 39. The key must then be turned to cause its wing to engage the shoulder forming the front end of said recess and turn the upper end of the arm 29 rearwardly, against the tension of its spring 45. Said arm, by reason of the engagement of its slot 42 by the stud 29 will turn the detent bar 26 to an inclined position so that its lower end will move upwardly from the pivoted bolt 7, and the dog 31 will become engaged with the shoulder 28 of said detent bar and lock the same in such position as shown in full lines in Fig. 2. The key must then be reversely turned to cause its wing to move to the shoulder forming the rear end of the recess 41, where it will register with the notch or slot in the cam 24. The key will then be pushed farther into the guide 4 and into the notch or slot of the cam, and turned in the direction required to cause said cam to raise the pivoted bolt 7 and release the arm 9 thereof from the keeper *a*. As the bolt 7 nears the completion of such movement it engages the lower end of the detent bar 26 and turns said detent bar far enough to cause the trip arm 30 thereof to engage and move the retaining dog 33, and cause said retaining dog to engage the lower side of and act as a cam to raise and retain the gravity acting dog 31 out of engagement with the shoulder 28 of the detent bar 26, as shown in Fig. 3. As the lock bolt thus causes the detent bar to move and become cleared by the dog, said lock bolt also moves to such position as to enable the spring-pressed trigger to engage the inner end of its arm 8, and such trigger so engages such arm and holds the locking bolt in released or unlocked position. As the spring pressed trigger thus engages the locking bolt it moves the trip bar 17 forwardly to the position shown in Fig. 3, it being assumed that as the lock was operated to release its bolt from the detent *a*, the door was moved to open position, or partly open position, to clear the trip bar 17 from the stop *b*. The trigger serves to hold the bolt in released position while the door is open. When the door is closed, the trip bar 17 strikes the stop *b*, trips the trigger from the locking bolt and the latter descends to locking position. The spring 45 then moves the detent bar 26 to its upright position under the elevated end of the gravity acting dog 31. It will be noted that the slot 36 of the link 37 is of such length that the retaining dog 31 will not be moved to inoperative position until the upper end of said detent bar 26 has come in contact with the elevated end of the gravity acting dog 31. The complete locked position of the key operated arm, detent bar, gravity acting dog and retaining dog is indicated in dotted lines in Fig. 2.

It will be understood from the foregoing that in order to operate the lock the key must be manipulated in a peculiar way, which will tend to prevent its use by an unauthorized person.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, as defined by the appended claims.

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

1. A lock having its case provided with a fixed seal element and a keyhole, and a movable seal element also having a keyhole to register with that of the lock case, substantially as described.

2. A lock having its case provided with a fixed keyhole, a revoluble key guide having a keeper to cover the fixed keyhole, said keeper being revoluble with the key guide

and provided with a keyhole to be moved into and out of register with that of the fixed keyhole, said case and said revoluble keeper each having a seal element, substantially as described.

3. In a lock, in combination with a casing, a pivoted locking bolt, a spring to move said bolt to locking position, a trigger to secure said bolt in unlocking position, a pivoted detent bar to secure said bolt in locking position, a key-operated arm, connected to said detent, to move the latter and cause the same to release the locking bolt, a dog to secure the detent bar when the latter is in the position required to release the locking bolt, means to move the bolt to unlocking position, means actuated by the locking bolt when the latter is being moved to unlocking position to disengage the dog from the detent bar to release the latter, and means to disengage the trigger from the locking bolt and hence cause the latter to be moved to locking position by its spring.

4. In a lock, in combination with a casing, a pivoted locking bolt, a spring to move said bolt to locking position, a trigger to secure said bolt in unlocking position, a pivoted detent bar to secure said bolt in locking position, a key-operated arm, connected to said detent, to move the latter and cause the same to release the locking bolt, a dog to secure the detent bar when the latter is in the position required to release the locking bolt, a retaining dog, operated by the detent bar to retain the first-mentioned dog above the detent bar when the said detent bar is returned to locking position, means to move such locking bolt to unlocking position, and means to disengage the trigger from the locking bolt and hence cause the latter to be moved to locking position by the spring.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH A. HITCHENS.

Witnesses:

BENJAMIN BALLENGER,

J. C. RIEKETT.