S. P. HOVEY.

PERMUTATION LOCK.

APPLICATION FILED JULY 3, 1912.

1,103,771.

Patented July 14, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

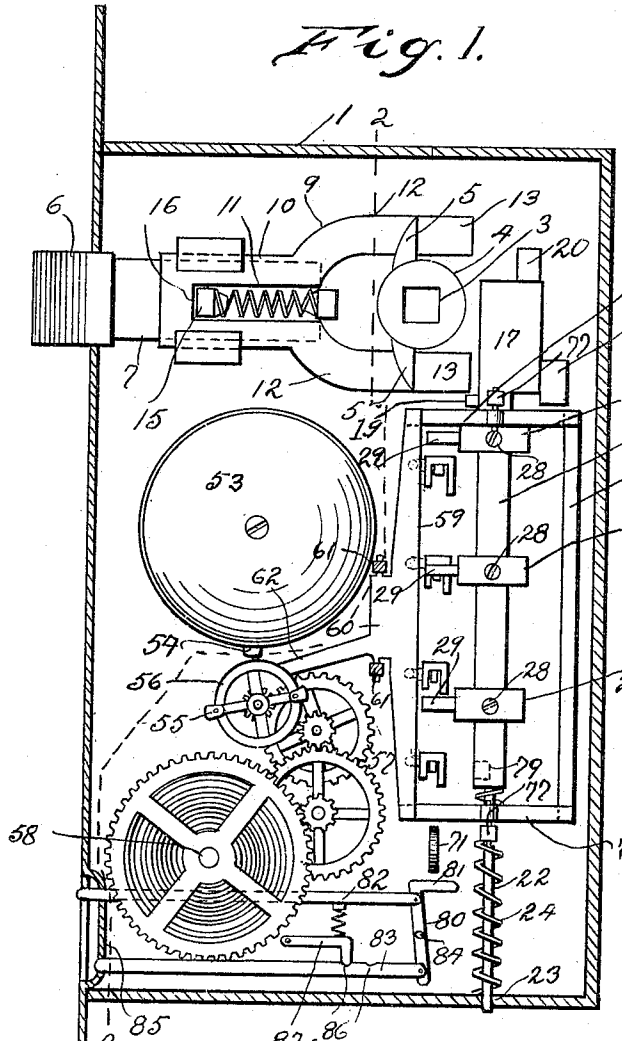
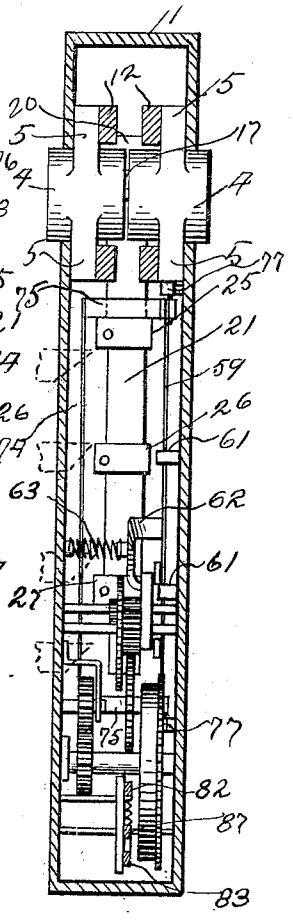


Fig. 2.



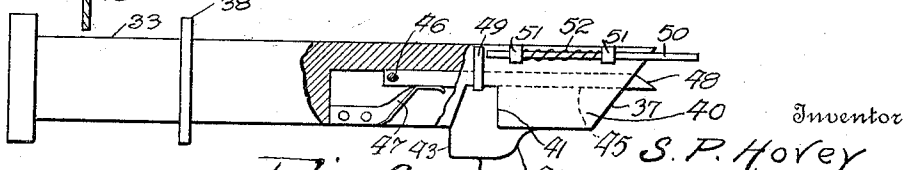


Fig. 6.

Witnesses

W. W. Turner,

A. Trudeau Jr.

Inventor

S. P. Hovey

By Chas. A. Briscoe

Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

S. P. HOVEY.

PERMUTATION LOCK.

APPLICATION FILED JULY 3, 1912.

1,103,771.

Patented July 14, 1914.

2 SHEETS—SHEET 2.

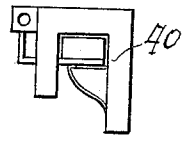


Fig. 7.

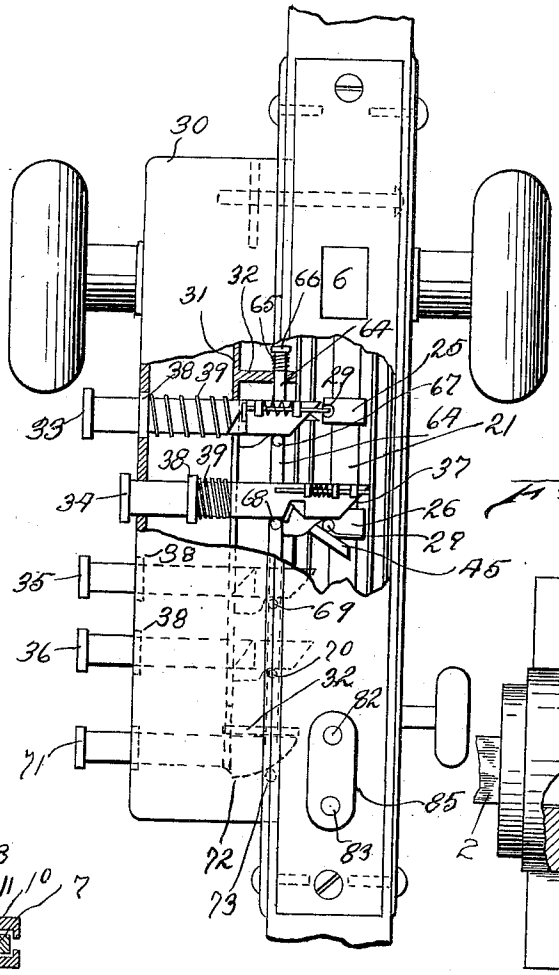


Fig. 3.

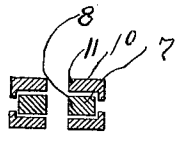


Fig. 8.

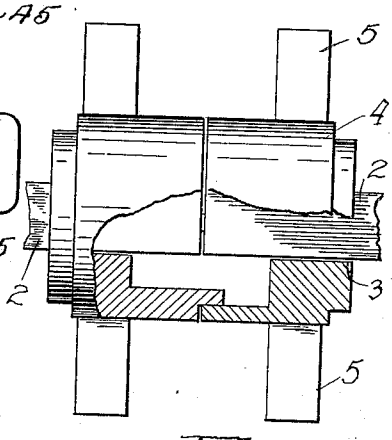


Fig. 5.

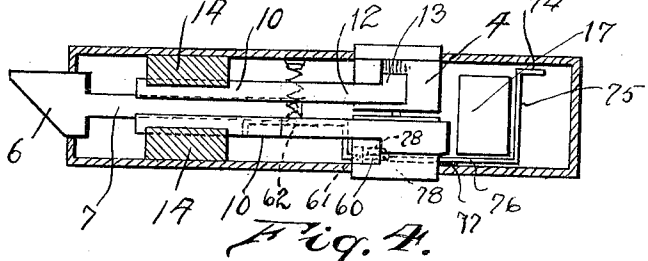


Fig. 4.

Witnesses

W. W. Turner

Inventor

S. P. Hovey.

By Chas. A. Brucoes

Attorney

THE NORRIS PETERS CO., WASHINGTON, D.

UNITED STATES PATENT OFFICE.

SELDEN P. HOVEY, OF LOS ANGELES, CALIFORNIA.

PERMUTATION-LOCK.

1,103,771. Specification of Letters Patent. Patented July 14, 1914.

Application filed July 3, 1912. Serial No. 707,519.

To all whom it may concern:

Be it known that I, SELDEN P. HOVEY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Permutation-Locks, of which the following is a specification.

The invention relates to door locks and has for its object the provision of a lock so constructed that the knob cannot be turned from the outside of the door unless a plunger carrying a suitable stop be removed from opposite the sliding bolt, and means being provided whereby a certain combination of plungers must be operated from the exterior of the door to remove said plunger and stop.

My invention will be described in detail hereinafter and illustrated in the accompanying drawings, in which,

Figure 1 is a sectional view of the lock casing showing the lock mechanism in position therein; Fig. 2, a cross section of the lock on the plane indicated by the line 2—2 of Fig. 1; Fig. 3, an end view of the lock with a permutation feature mounted thereon partly broken away to disclose the operating mechanism; Fig. 4, a horizontal sectional view of the lock mechanism; Fig. 5, a detail view of the knob spindles and sleeves; Fig. 6, a side view of one of the permutation plungers showing the same partly in section; Fig. 7, an end view of one of the permutation plungers; and Fig. 8, a cross section of the sliding bolt.

My invention relates to locks suited for use on dwelling houses, stores and the like, and has for its particular feature the provision of a secret means for operating the lock, and the lock so constructed that if the secret means is not properly operated, an alarm will be sounded to indicate that the door is being assailed by some one not familiar with the operation of the lock. While the said alarm is shown and described in the application, I make no claim whatever to the same as the lock is capable of being used without the alarm.

As shown in the drawings in which I have used similar reference characters in all the views to indicate like parts, my improved lock is inclosed in a casing indicated at 1 and constructed in the ordinary manner of lock casings.

2 indicates the knob spindles that are formed rectangular in cross section as is generally the construction of knob spindles and mounted in rectangular openings 3 in the sleeves 4, said sleeves having wings 5 extending therefrom.

6 indicates the locking bolt slidably mounted in the end of the casing 1 and having a reduced shank 7 extending rearwardly thereof and having its rearmost portion slotted as shown at 8.

9 indicates slidable members each consisting of a plate 10, having a slot 11 extending longitudinally thereof and in alinement with the slot 8 in the shank 7, and outwardly curved arms 12 with laterally extending projections 13 that are engaged by the wings 5 of the sleeves 4. Said sliding members 10 are slidably mounted in guides 14 secured to the sides of the casing 1, and as shown, inclose the shank 7 of the sliding bolt 6, said shank being provided with the laterally extending projection 15 that engages the end 16 of the slot 11 in the plate 10. The arms 12 of the members 9 on the side of the lock toward the outside of the door are longer than the arms 12 on the members 9 on the inner side of the door for the reason to be hereinafter explained.

17 indicates a block slidably mounted in the casing 1 and held in position by means of projections 18 and 19, said block being so positioned that when in its uppermost position and engaging a lug 20, said block will be in position to engage the end of the lower arm 12 of the sliding member 9 when the knob on the outer side of the door is operated and thereby prevent the bolt 6 from being operated by the knob on the outer side of said door.

21 indicates a plunger formed integral with or rigidly secured to block 17 and having a reduced lower end 22 that is slidably mounted in an opening 23 in the casing 1, 24 designating a coiled spring mounted on said reduced portion 22 and engaging the lower end of said plunger 21 and the inner side of the casing 1.

25, 26 and 27 indicate sleeves secured to the plunger 21 by means of set screws 28 or the like, it being understood that said sleeves may be adjusted as desired on said plunger 21. Each of the sleeves 25, 26 and 27 have a laterally extending pin 29 secured thereto for the purpose to be hereinafter described.

30 indicates a casing secured to the casing

1 on the outside of the door and having a vertical partition 31 therein with horizontal flanges or projections 32 extending therefrom.

33, 34, 35 and 36 indicate plungers slidably mounted in the casing 30 and partition 31 and having their inner ends beveled as shown at 37.

38 indicates a shoulder on each of the plungers 33, 34, 35 and 36, and 39 a coiled spring mounted on each of said plungers and engaging the shoulders 38 and the partition 31 to normally hold the plungers in their outermost positions. Each of the plungers is provided upon its under side adjacent its innermost end with a slot 40. One side wall of each of the slots is provided with a notch 41. The other side walls of the slots are formed with downwardly extending projections 42, positioned opposite the notches 41, and being each formed with a shoulder 43 and a beveled front edge 44.

45 indicates a pin pivotally mounted as shown at 46 in the slot 40 and held normally against the upper wall of said slot by means of a spring 47. The free terminal of the pin 45 is beveled as shown at 48 and is provided with a laterally and upwardly extending projection 49 intermediate of its ends, said projection extending through the notch 41 and upwardly parallel with the side of the plunger.

50 indicates a rod slidably mounted in bearings 51 on the side of the plunger and normally projected outwardly by means of the spring 52 mounted thereon and engaging said rod 50 and the rearmost bearing 51.

It will be apparent from this description of my invention that by properly manipulating the plungers 33, 34, 35 and 36 so that their beveled inner ends 37 engage the pins 29 on the sleeves 25, 26 and 27 secured to the plunger 21, successively, that said plunger will be moved downwardly and with it withdraw the block 17 from its position opposite the arm 12 on the sliding member 9 toward the outer side of the door.

In order to give notice that the door is being opened by someone unfamiliar with the operation of the plungers, I provide an alarm mechanism that is released by the mechanism to be now described. The alarm mechanism consists of a bell 53 having a knob or projection 54 that is adapted to be engaged by the projections 55 on the wheel 56, said wheel being operated by the train of gears designated 57 connected up with a spring motor 58, said spring motor being of the ordinary construction and not being considered necessary to be specifically described herein, as no claim is made to invention of the spring motor.

59 indicates a bar pivotally mounted by means of an offset portion 60 in ears 61 secured to the casing 1 and having an arm 62 extending from said offset portion 60 with its terminal normally engaging the wheel 56 to hold it from rotation, said arm 62 being normally held in engagement with said wheel by means of the spring 63.

It will be understood from this construction of the alarm mechanism as described, and from an inspection of the drawings, that as the rods 50 on the plungers 33, 34, 35 and 36 are so positioned that they eventually engage the bar 59 when the plungers are operated, unless the laterally and upwardly extending projection 49 on the pin 48 mounted in the plunger, is removed to prevent it from engaging the rear end of the rod, that the rod by engaging the bar 59 would depress the rod and with it move the arm 62 from engagement with the wheel 56, and the spring motor would be released to operate the gong 53. However, when the lock is properly operated so that the plungers are successively depressed in their proper order, the pins 45 will be moved downwardly to remove the projections 49 from engagement with the rear ends of the rods 50 by engaging the laterally extending pins 29 on the sleeves 25, 26, and 27. In setting the lock, it will be understood that the three sleeves 25, 26 and 27 are so positioned that by manipulation of the plungers in their proper order as predetermined by the person setting the lock, the projections 29 on one or the other of the sleeves 25, 26 and 27 will be always in a position to engage the pin 45 on the plunger 33, 34, 35 or 36 that is to be operated.

As the lock is arranged in the drawings, the plungers are to be operated in the following order: the plunger 34 first, and in Fig. 3 said plunger is shown in its innermost position and as having moved the sleeve 26 downwardly, the pin 45 being shown in its lowermost position and the pin 29 engaging the lower edge of the plunger, the plunger 33 to be the one to be next operated, and when operated will move the sleeve 25 downwardly in the same manner that the sleeve 26 has been moved downwardly by the plunger 34, then the plunger 36 will be operated, the sleeve 27 being in position at this stage of the operation to be engaged by said plunger, and after the plunger 36 has been operated the sleeve 26 will then be in position to be operated by the plunger 35, and after the plunger 35 has been operated, the plunger 21 will be moved downwardly sufficiently to have withdrawn the block 17 from opposite the lower arm 12 of the outermost sliding member 9.

In order that each plunger may be held in its innermost position after operation, I provide a rod 64 slidably mounted in the flanges 32 and held normally in a raised position by means of a spring 65 engaging the uppermost flange 32 and the head 66 on

the upper terminal of said rod. The rod 64 has pins 67, 68, 69 and 70 extending laterally therefrom and positioned to engage the lower edges of the plungers 33, 34, 35 and 36 respectively. It will be apparent that when one of the plungers, say for instance, the plunger 34, is moved inwardly, the projection 42 thereon by engaging the pin 68 will move the rod 64 downwardly until the shoulder 43 has passed from engagement with the pin 68, when the spring 65 will return the rod 64 to its original position with the pin 68 engaging said shoulder and holding the plunger 34 from withdrawal. When the next plunger is operated, the projection 42 thereon will again move the rod downwardly releasing the pin 68 from engagement with the shoulder 43 and permit the spring 39 to return the plunger 34 to its original position and when the second plunger is being operated, say plunger 33 has reached its innermost position, the pin 67 will then engage the shoulder 43 thereon and hold said plunger from returning to its original position until the next plunger is operated, and so on until the last plunger has been operated.

In order to release the last plunger from its innermost position, I provide a master plunger designated 71 and provide it with a beveled projection 72 that engages a pin 73 on the rod 64 to depress said rod and to release any one of the pins thereon from engagement with any one of the plungers.

In order that the lock may be arranged for operation after placing of the permutation feature on either side thereof, I provide a bar 74 having laterally extending arms 75 projecting from its upper and lower terminals, cross arms 76 are then formed thereon and are pivotally mounted as shown at 77 on the casing 1 the opposite ends of the cross arms 76 being adapted to engage the bar 59. It will be understood that by changing the position of the plungers 33, 34, 35 and 36 with the casing 30 containing them on the other side of the lock and transferring the pins 29 in the sleeves 25, 26 and 27 so that they extend in the opposite direction from that shown in the drawings, the lock may be arranged to be operated from the opposite side of the door to accommodate the mechanism to a door swinging in the opposite direction from that for which the mechanism is mounted as shown in the drawings, the alarm feature being operated through the bar 74, arms 75 and cross bars 76 with their terminals engaging the bar 59. This construction and arrangement will be apparent to any one skilled in the art and considered to be unnecessary to be illustrated in the drawings.

As it may be desired at times to arrange the lock so that the door may be opened from the outside as well as the inside without operating the plungers, I provide the following mechanism to this end: The plunger 21 is provided with a socket 79 adjacent to its lower terminal and pivotally mounted in the casing 1 is a lever 80 with a lateral projection 81 that is adapted to engage said socket 79. Pivotally secured to the lever 80 are the rods 82 and 83 above and below the pivot 84 of said lever, respectively, said rods extending outwardly through the end of the casing 1, said casing being provided with an inset portion 85 in which the ends of said rods 82 and 83 are slidably mounted. 86 indicates notches in the upper edge of the rod 83 and 87 a spring actuated detent that is adapted to engage one or the other of said notches to hold the mechanism in either of its two positions, that is with the upper end of the lever 80 moved inwardly to engage said socket 79 or the lower end moved inwardly when the projection 81 on the upper end of the lever is in a position not to engage said socket.

It will be clearly seen that should the operator desire to place the door in condition to be opened from the outside without the necessity of operating the plungers he may by forcing the plunger 21 downwardly, so that the recesses 79 formed therein come into alinement with the projection 81 and forcing the projection into the recess by means of pressing on the rod 82, lock the plunger 21 in its downward position which will permit the knob to be turned to either side and thereby render the lock operable from both the inside and outside. It will be obvious that upon the operator's desire to lock the door pressure may be applied against the lever 80 at its opposite end which will withdraw the extension 81 from its position in the recess and permit the spring 24 to force the plunger 21 upwardly, into the position illustrated in Fig. 1.

Having thus described my invention what I claim is:—

1. In a lock, a sliding lock bolt, sliding members engaging said lock bolt and adapted to be operated by knobs on the two sides of said lock, a sliding block normally engaging one of the sliding members and holding the same against movement, a plunger secured to said block, sleeves adjustably secured to said plunger, a projection on each of said sleeves, and means successively engaging said projections to depress said plunger and block.

2. In a lock, a sliding lock bolt, sliding members engaging said lock bolt and adapted to be operated by knobs on the two sides of said lock, a slidable block normally held in position to engage one of the sliding members and prevent said member from being operated by one of the said knobs, a plunger mounted on said block, sleeves adjustably mounted on said plunger, a lateral

projection mounted on each of said sleeves, and plungers adapted to engage said projections to depress said plunger.

3. In a lock, a sliding lock bolt, sliding members engaging said lock bolt and adapted to be operated by knobs on the two sides of said lock, a slidable block normally in position to engage one of the sliding members and prevent the sliding bolt from being operated by one of said knobs, a plunger mounted on said block, sleeves adjustably mounted on said plunger, each of said sleeves having a lateral projection, plungers slidably mounted and having beveled extremities adapted to engage said projections when successively operated to move said plunger downwardly, and means to retain said plunger in its operated position until another plunger has been moved into an operative position.

4. In a lock, a sliding bolt, a sliding member operatively engaging said sliding bolt, a block slidably mounted and normally engaging said sliding member to hold it from operation, a plunger mounted on said block, sleeves secured to said plunger, plungers slidably mounted and adapted to engage said sleeves, each of said plungers having a rod slidably mounted thereon, a pin pivotally mounted on each plunger, and a projection on said pin and normally engaging the rod aforesaid, said pin being adapted to be actuated out of engagement with said rod.

5. In a lock, a sliding bolt, a sliding member operatively engaging said sliding bolt, a block normally positioned to prevent the movement of said sliding member, a plunger mounted on said block, said plunger having a socket therein, a lever pivotally secured and having a lateral projection adapted to engage said socket, and rods pivotally secured to said lever to move said projection into and out of engagement with said socket.

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

SELDEN P. HOVEY.

Witnesses:
DENNIS B. ALDEN,
NANCY M. ALDEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."