A. LEISTLER.

AUTOMATICALLY LOCKING LOCK FOR DOORS AND THE LIKE.

APPLICATION FILED JAN. 31, 1910.

970,628.

Patented Sept. 20, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

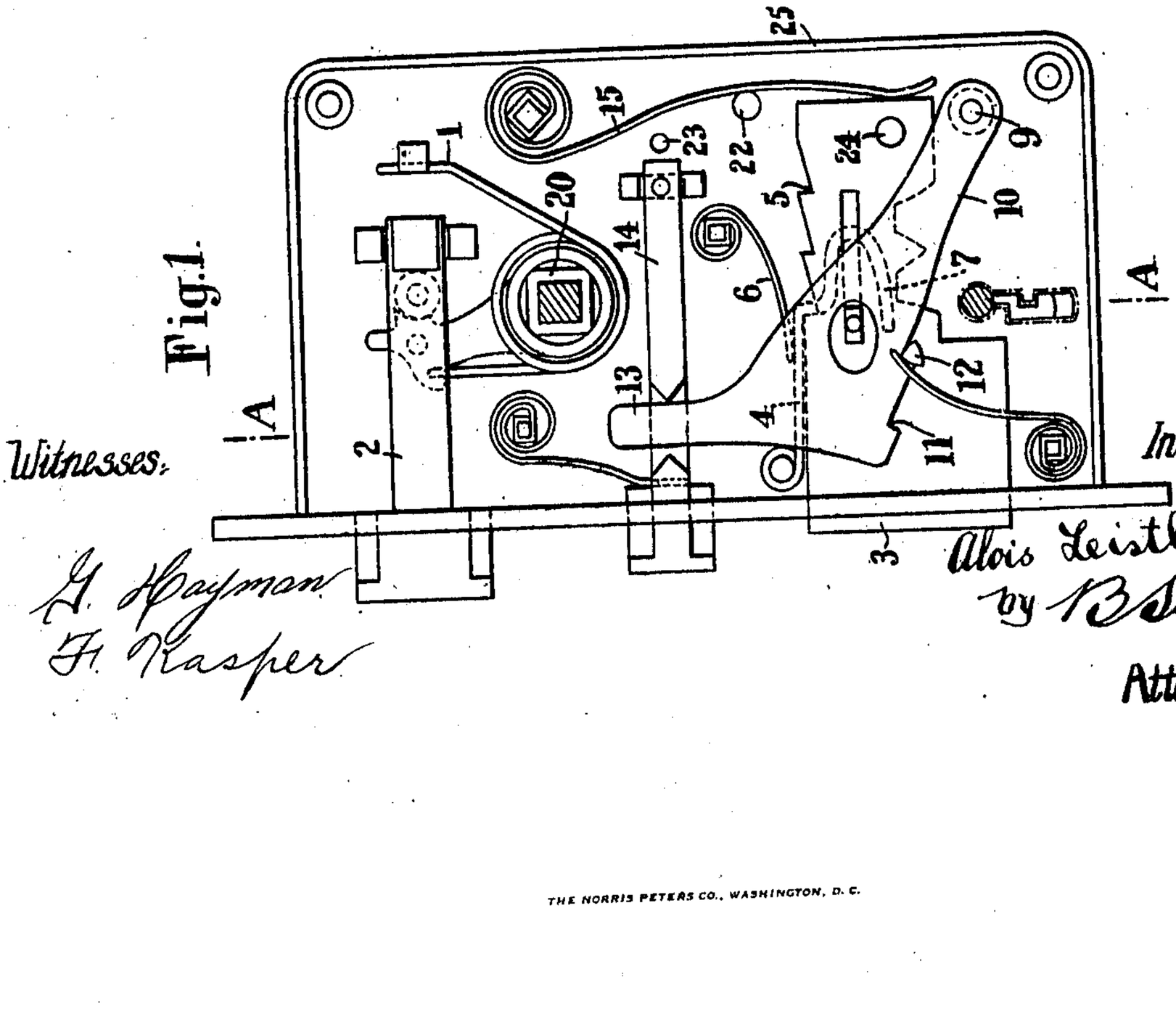


Fig. 2.

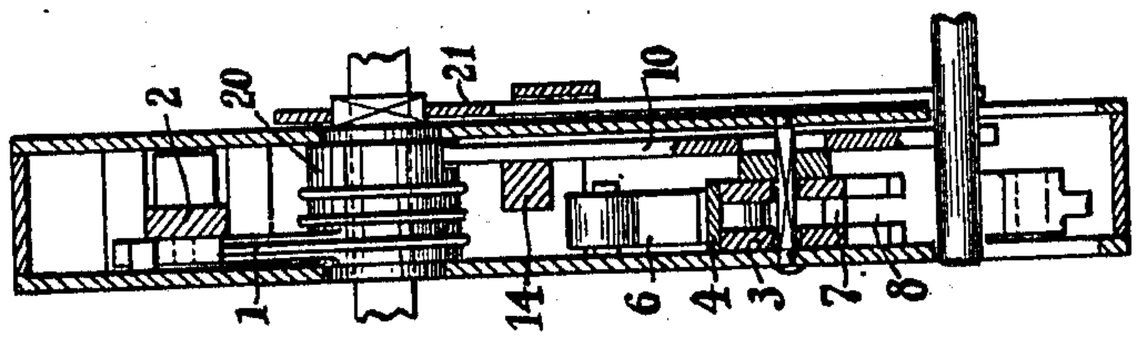


Fig. 3.

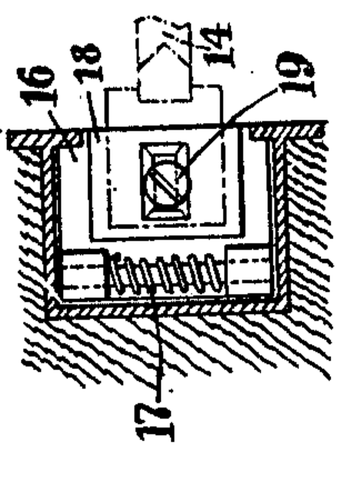
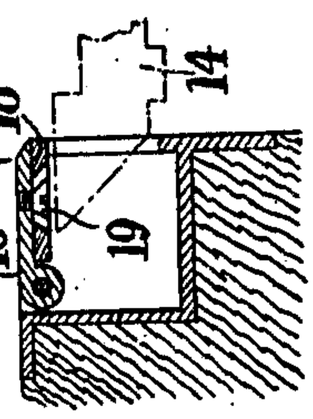


Fig. 4.



Witnesses:

G. Haymon

F. Kasper

Inventor:

Alois Leistler.

by B. Singer.

Attorney

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3 SHEETS—SHEET 2.

Fig. 6.

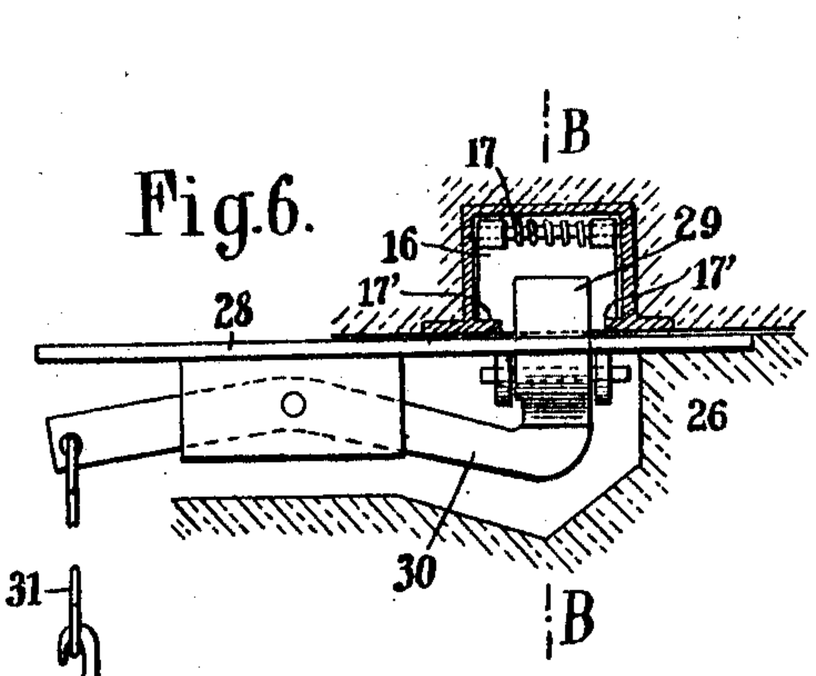
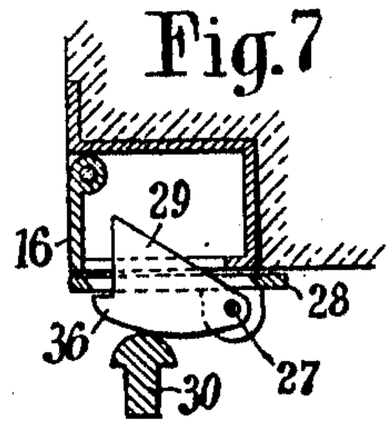


Fig. 7



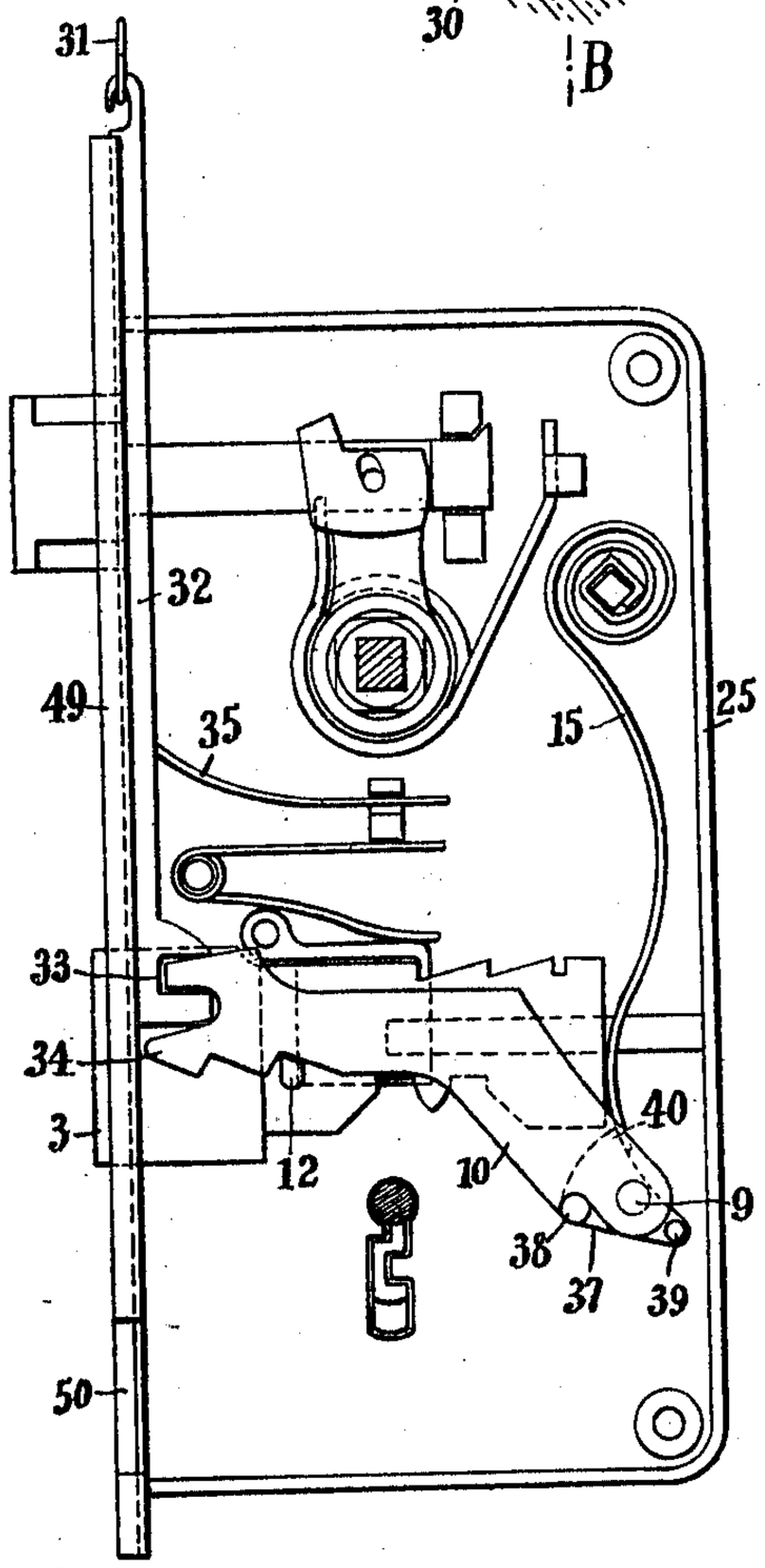
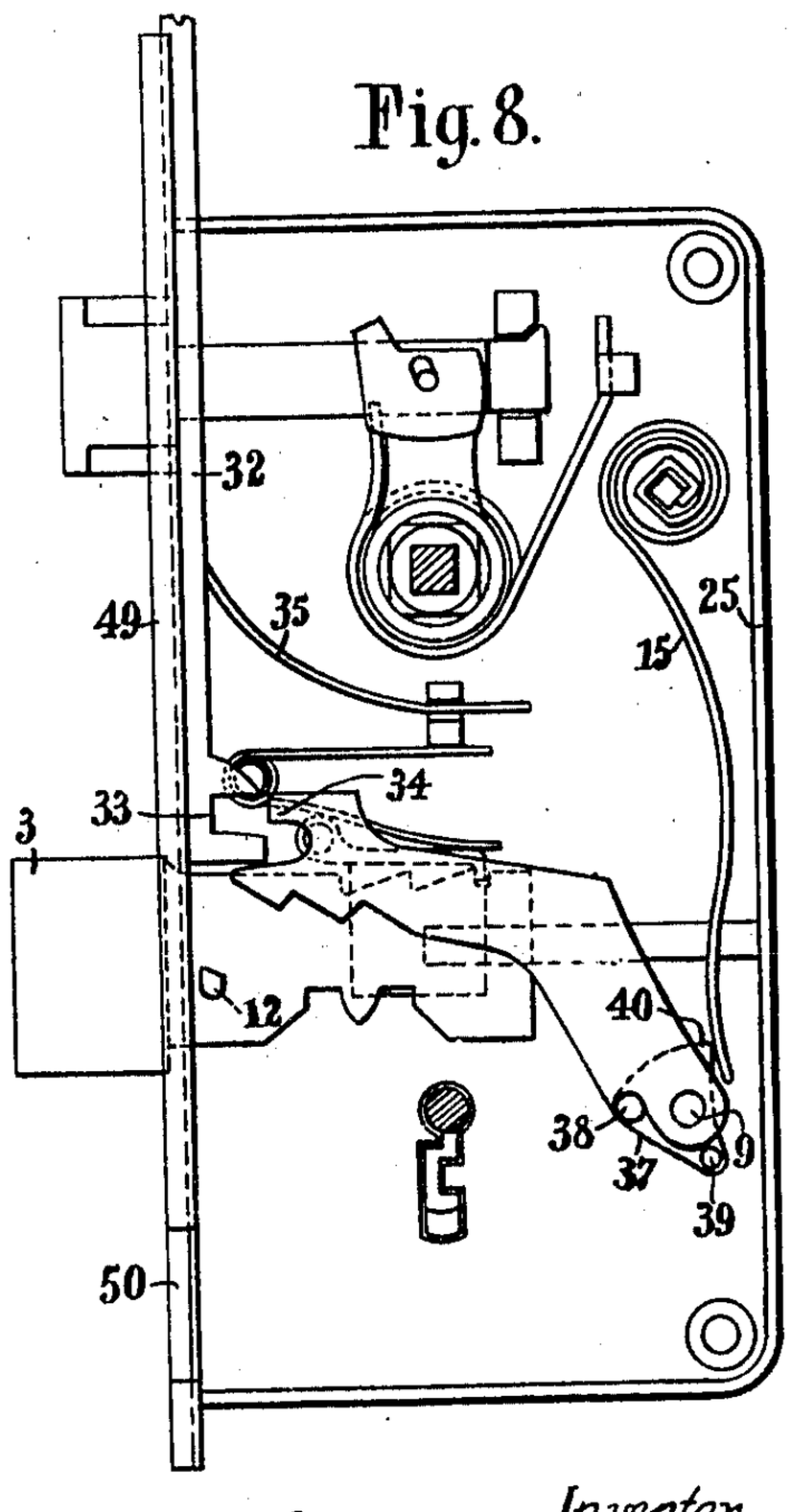


Fig. 8.



Witnesses:-

J. Hayman.

F. Kasper.

Inventor:-

Alois Leistler

by R. B. Singer.

Attorney.

A. LEISTLER.

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3 SHEETS—SHEET 3.

Fig. 9.

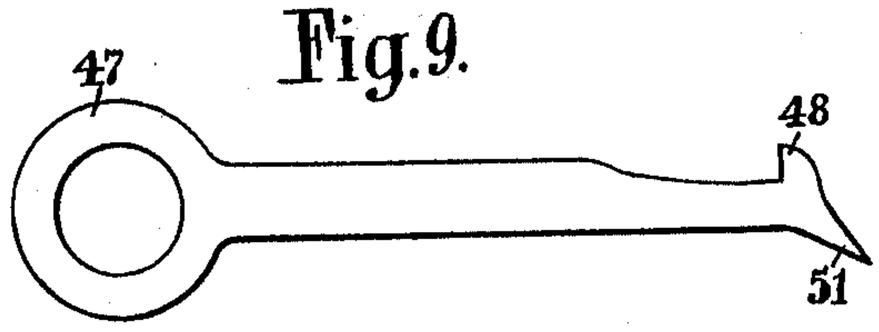
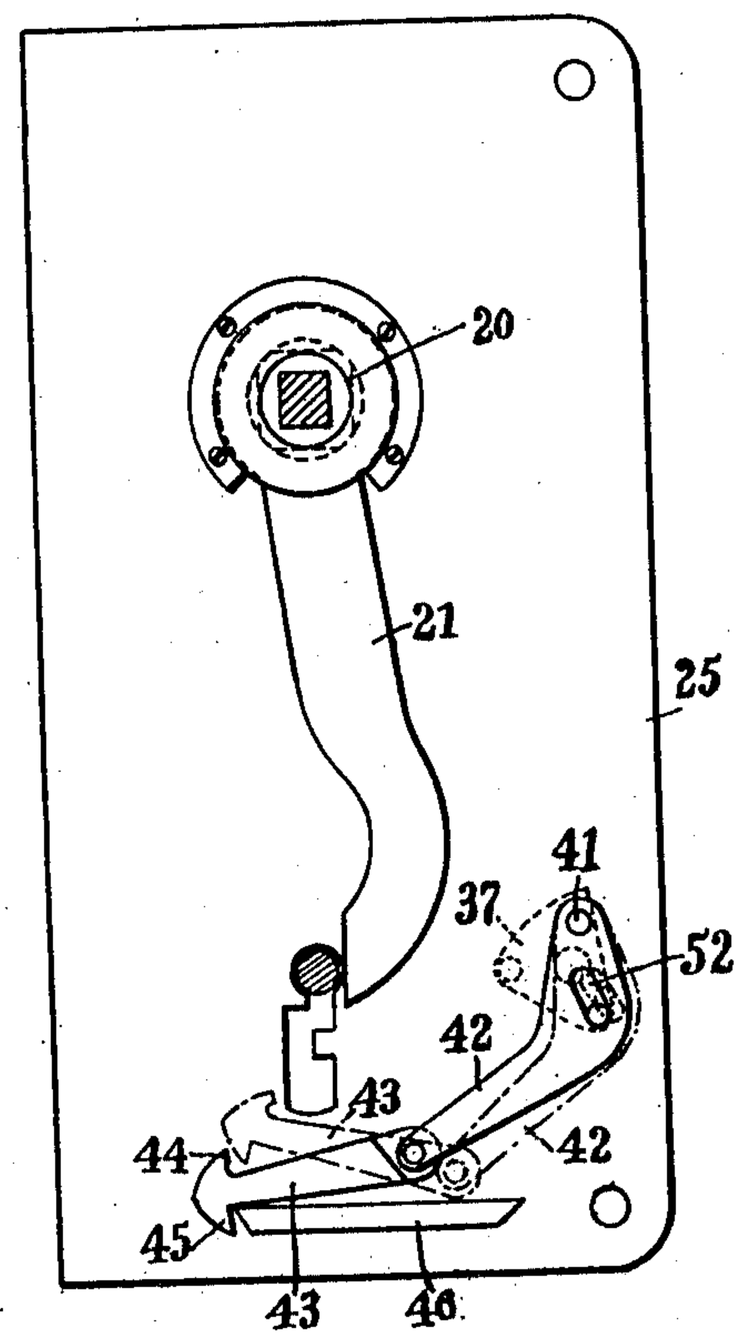


Fig. 10.



Witnesses:-

G. Hayman.

H. Kasper.

Inventor:

Alois Leistler

by B. Singer.

Attorney:-

UNITED STATES PATENT OFFICE.

ALOIS LEISTLER, OF HOLLENSTEIN A. D. YBBS, AUSTRIA-HUNGARY.

AUTOMATICALLY-LOCKING LOCK FOR DOORS AND THE LIKE.

970,628. Specification of Letters Patent. **Patented Sept. 20, 1910.**

Application filed January 31, 1910. Serial No. 541,049.

To all whom it may concern:

Be it known that I, ALOIS LEISTLER, landowner, a subject of the Emperor of Austria-Hungary, and a resident of Hollenstein a. d. Ybbs, Lower Austria, in the Empire of Austria-Hungary, have invented Improvements Relating to Automatically-Locking Locks for Doors and the Like; 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 relates to improvements in automatically locking locks for doors and the like in which the bolt retained in the pressed back position by a locking member is released by a latch acting on the locking member when the door is closed. Locks of this kind as heretofore constructed are single-turn locks for if a lock of this kind were constructed as a double turn lock, in which the bolt is provided in the known manner with a number of notches for the engagement of the tumblers it would not act as a lock closing automatically when the door was shut; because the tumblers engaging in the bolt and which have to retain it at each turn would not permit the bolt to spring forward when the locking member was released. In order to permit of this, however, that is to say to enable self-closing locks to be constructed as double-turn locks, in accordance with the present invention the recesses in the bolt in which the tumblers engage are chamfered in such manner that the tumblers prevent the bolt from being pressed back unless the key of the lock is used, while on the other hand they oppose no obstacle to its springing forward when the locking member is released.

The invention likewise has for its object to arrange the latch serving for releasing the locking member in such a manner that it is invisible from the outside and therefore cannot be accidentally pressed into the lock. With this object the latch is not as heretofore arranged directly in the lock but on a more inaccessible part of the door preferably on its upper edge; it is connected with the locking member by appropriate connecting parts.

An embodiment of a double turn lock in accordance with the invention is illustrated by way of example in the accompanying drawing in which:

Figure 1 shows the lock with self-locking mechanism in external elevation in its operative position. Fig. 2 is a vertical section on the line A—A in Fig. 1. Figs. 3 and 4 are respectively an internal elevation and horizontal section of the part of the novel lock nab serving for the latch of the locking member and specially formed for this purpose. Fig. 5 is an external elevation of the lock with a retaining member acting upon the handle. Fig. 6 shows the lock with an auxiliary latch arranged on the upper edge of the door; this is likewise an external elevation of the device in its operative position. Fig. 7 is a vertical section on the line B—B in Fig. 6 passing through the latch and the corresponding lock nab. Fig. 8 is a view of the lock corresponding to Fig. 6 but with the self-locking device rendered inoperative. Fig. 9 represents an implement for rendering the self-locking device inoperative, and Fig. 10 is an external elevation of the lock with the means serving for rendering the self-locking device inoperative.

The lock consists in the known manner of a latch 2 acted upon by a spring 1 and operated by means of a handle and serving to close the door and of a bolt 3 adapted to be operated by means of a key for locking the door. The bolt, which is a double turn bolt, is provided with one or more tumbler hooks 4 engaging in recesses 5 in the bolt, which in accordance with the invention are chamfered rearward; these tumblers are depressed by springs 6. The ends 7 of the tumblers which are within reach of the bit of the key in its rotation pass through a slot 8 (Fig. 2) in the bolt, thereby largely increasing the security of the locking as owing to the lateral confinement of the tumblers by the two walls of the bolt it is very difficult for a false key to act on the tumblers. Beside the bolt an angle plate 10 is rotatably mounted on the pin 9; on its lower side this plate comprises two locking teeth 11 corresponding to the recess in the bolt. The locking plate rests on a locking pin 12 arranged on the bolt while the upwardly extending arm 13 of the plate acts upon a special auxiliary bolt 14. Now if the closed door is opened during the backward movement of the bolt which then takes place the locking pin 12 of the bolt comes in front of the teeth 11 in the plate 10 whereby the bolt is retained in the drawn back position by the weight of the plate itself. If the opened

door is again closed either by acting on the handle or merely by slamming the door, the displacement of the auxiliary bolt 14 which is thereby produced lifts the locking plate 10 and disengages it from the pin 12 whereupon owing to the chamfering of the recesses the bolt springs into the locking position under the influence of a spring 15 and locks the door. In order, however, that the auxiliary bolt falling behind the lock nab when the door is closed may not impede its opening, the part 16 (Figs. 3 and 4) of the lock nab is rotatably arranged in such a manner that when the door is opened the locking part is rotated and then under the influence of the spring 17 returns to the normal position defined by stops. In order to insure correct engagement of the auxiliary bolt in the lock nab and consequently efficient operation of the self-locking device, this part of the lock nab is made in two pieces of which the piece 18 is arranged on the piece 16 by means of a slot and a screw 19 in such a manner that it may be adjusted and fixed so that by suitably adjusting the movable part the engagement of the auxiliary bolt in the lock nab may be regulated, for example if the door should shrink or drop.

In order to prevent the key from being left in the lock accidentally especially when the door is opened from the outside a plate 21 is mounted on the outside of the lock casing on the hub 20 (Fig. 5) of the handle which is made rectangular. The downwardly extending end of this plate comes in front of the opening for the shank of the key in the direction of rotation of the handle. If on opening the door the key has been left in the lock as the plate bears against the shank of the key the handle and consequently the latch are held so that the door cannot be opened until the key has been withdrawn. To enable the lock to be used like an ordinary lock the self-locking device can be rendered inoperative by retaining the spring 15 when the bolt is pressed back by means of a pin inserted through openings 22 in the lock casing 25 (Figs. 1 and 5); the auxiliary bolt 14 is likewise pressed back and retained by means of a pin passed through it and through openings 23 (Figs. 1 and 5) in the lock casing. The plate then assumes a raised position so that its teeth 11 are out of engagement with the locking tooth 12 on the bolt and the bolt can be moved backward and forward by means of the key without acting upon the locking plate. Finally the lock may also be employed as a simple latch lock by securing the drawn back bolt on the lock casing in the same way as the auxiliary bolt by means of a pin inserted through the opening 24 (Figs. 1 and 5) in the bolt and through openings in the lock casing.

Figs. 6 to 8 represent a constructional form of the lock in which the auxiliary bolt serving for releasing the lock plate is not arranged directly in the lock, but on an inaccessible part of the door. In this construction the auxiliary bolt is arranged on the upper edge of the door 26 and consists of a locking pawl 29 rotatable about a stud 27 in the cover plate 28. Under the influence of gravity this locking pawl rests on one arm of a two-armed lever 30, the other arm of which is connected with the locking plate by means of a rod 31 and a rail 32 suspended therefrom and guided in the lock casing 25. In this construction the rail and the locking plate are connected by providing the former with a tooth recess 33 in which the plate engages by means of a tooth sector 34. A spring 35 acting on the rail tends to draw the rail and the rod downward, whereby owing to the transmission of the movement by the lever on to the pawl the latter is maintained in the raised and locking position defined by the stop 36 (Fig. 7). Now if the closed door is opened, the locking plate 16 which swings outward only yields to the pressure of the pawl so that this plate returns to its normal position defined by the stops 17′ under the influence of the spring 17. When the door is shut on the other hand the pawl is forced back by the bolt nab whereby the lever 30 is rotated and the rod 31 with the rail 32 and likewise the locking plate 10 are lifted. The locking plate is thus disengaged from the locking tooth 12 and the bolt 13 springs into the locking position under the influence of the spring 15. In this constructional form of the lock a special device is provided for rendering the self-locking means inoperative; this does not necessitate the formation of a slot or the like in the door and by means of it the locking plate and the latch and the bolt spring likewise can be held in their inoperative positions. This device consists of a cam 37 comprising two eccentric studs 38, 39 and a nose 40. One stud (38) engages the locking plate 10, while the nose bears against the bolt spring 15. The second stud 39 passes through the cover plate of the lock casing 25 and engages a slot 52 (Fig. 10) in a bent arm 42 arranged on the outside of the plate and rotatable on the stud 41; another arm 43 is pivoted on the free end of the arm 42 and ends in a double hook 44, 45. When the self-locking device has not been rendered inoperative, this double hook rests on a rail 46 on the cover plate as indicated by broken lines in Fig. 10. Now if the self-locking device is to be rendered inoperative, the member or implement shown in Fig. 9 is utilized; broadly speaking this implement consists merely of a hook 48 provided with a handle 47. This implement is introduced through a slot 50 provided on the lock rim 49 with the hook 48 downward and by means

of this hook the upper hook 44 of the arm 43 is seized and drawn forward until the lower hook 45 comes in front of the rail 46. The rotation of the cam 37 consequent upon drawing the arm 43 forward causes the locking plate 10 to be lifted by the stud 38 and its teeth thereby disengaged from the locking tooth 12 of the bolt 3; simultaneously however, by the intermediary of the locking plate, the rods 31, 32 have been lifted and as a further result the lever 30 rotated in such a manner that the latch 29 has dropped into the inoperative position and finally the nose 40 of the cam 37 has fixed the bolt spring 15 in the inoperative position. If the self-locking device is again to be rendered operative, by means of the point 51 of the implement introduced through the slot 50 in the lock rim 49 the hook 44, 45 is pressed upward and out of the locking position, whereupon all the parts of the self-locking device return to their normal position under the influence of gravity or of spring action.

What I claim as my invention and desire to secure by Letters Patent is:

1. An automatic safety lock of the character described, comprising a spring actuated latch, a spring actuated bolt having rearwardly chamfered recesses adapted to be operated by a key, and being provided with a plurality of spring actuated tumbler hooks passing with their ends through a slot in said bolt, and engaging said rearwardly chamfered recesses of said bolt, a locking pin upon the bolt a pivoted angle plate with locking teeth at its lower end, said end resting upon the locking pin of the bolt, and an auxiliary bolt adapted to operate an upwardly extending arm of said angle plate, substantially as described and for the purpose set forth.

2. An automatic safety lock of the character described, comprising a spring actuated latch, a spring actuated bolt, having rearwardly chamfered recesses adapted to be operated by a key and being provided with a plurality of spring actuated tumbler hooks engaging the rearwardly chamfered recesses of said bolt, a locking pin upon the bolt and a pivoted angle plate with locking teeth at its lower end, said end resting upon the locking pin of the bolt, an auxiliary bolt adapted to operate an upwardly extending arm of said angle plate, and a rotatably arranged lock-nab constructed in two parts, substantially as described, and for the purpose set forth.

3. An automatic safety lock of the character described, comprising a lock-casing, a bolt, a pin protruding through an opening in said casing, a spring engaging the rear end of said bolt, retained by said pin from engagement therewith, an auxiliary bolt, and a pin upon the rear end of said casing, retaining said auxiliary bolt in its rearward position, for the purpose of permitting the lock to be used as an ordinary lock, substantially as described.

4. An automatic safety lock of the character described, comprising a latch arranged upon the upper edge of a door, a cover plate, a lock pawl pivotally connected to a stud of said plate, a two-armed lever, one arm of which being adapted to be engaged by said pawl, a rod and a rail connecting the other arm of said lever with the locking plate, a toothed recess in said plate, adapted to be engaged by a toothed sector, and a spring tending to draw said rail and rod downward, and a stop upon said pawl, substantially as described, and for the purpose set forth.

5. An automatic safety lock, of the character described, comprising a cam provided with two eccentric studs and a nose, a locking plate adapted to be engaged by one of said studs, a bolt spring against the lower end of which the nose of said cam is bearing, a bent arm having a slot, a cover plate, allowing the passage of the second stud into engagement with said slot, a second arm pivoted to the free end of said bent arm, and having a double hooked end resting upon the rail on the cover plate, and a hook provided with a handle and adapted to be introduced through a slot in the lock rim, and to engage with its downwardly directed hooked end the upper hook of said double hooked arm, substantially as described, and for the purpose set forth.

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

ALOIS LEISTLER.

Witnesses:

KARL REHRAK,

AUGUST FUGGER.