W. R. MICHAEL.

LOCK.

APPLICATION FILED MAR. 22, 1922.

1,429,609.

Patented Sept. 19, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

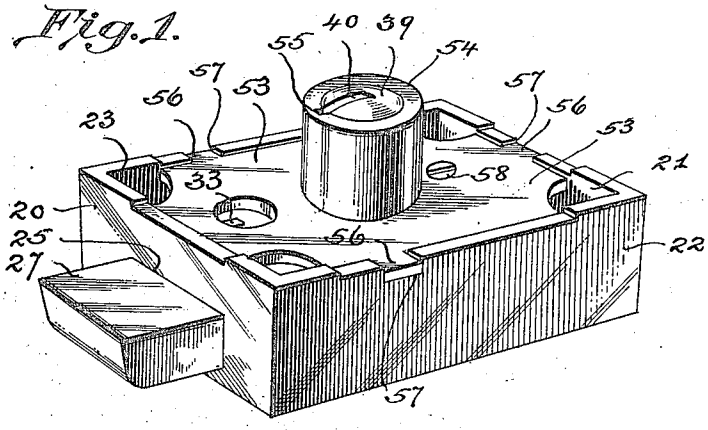
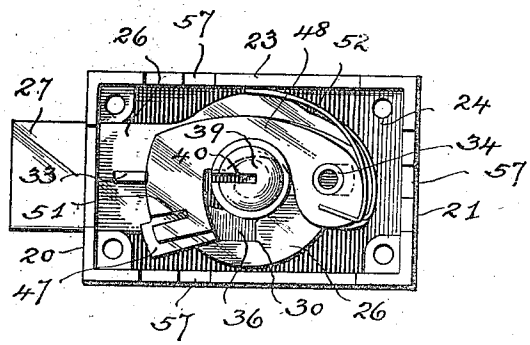


Fig. 2.



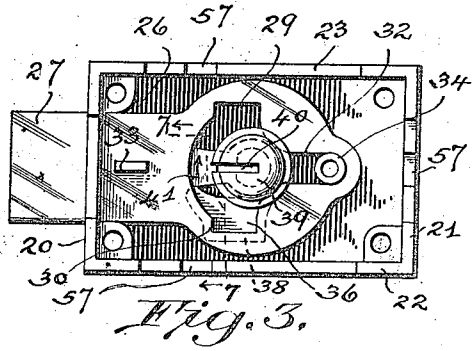


Fig. 3.

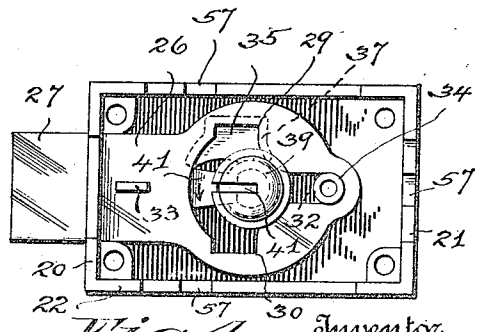


Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 5.

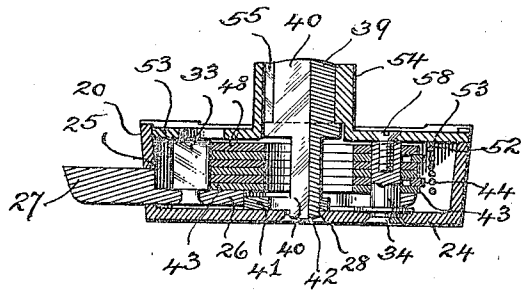


Fig. 6.

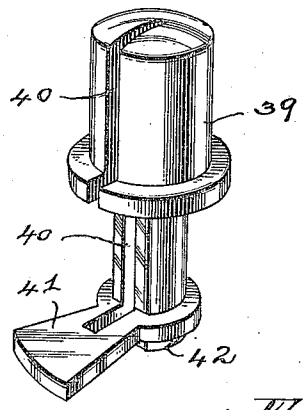


Fig. 8.

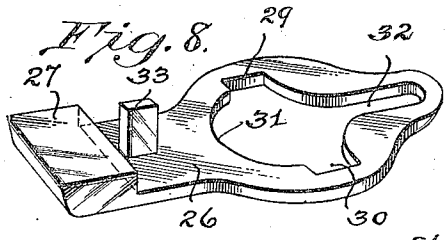
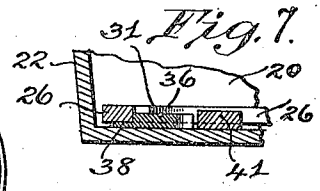


Fig. 7.



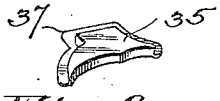


Fig. 9.

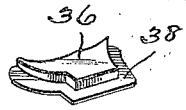


Fig. 10.

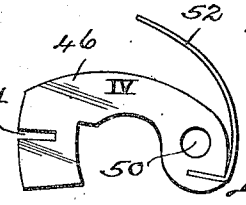


Fig. 14.

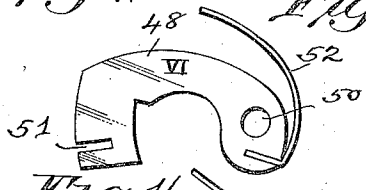


Fig. 16.

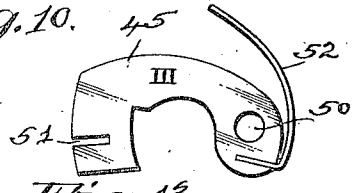


Fig. 13.

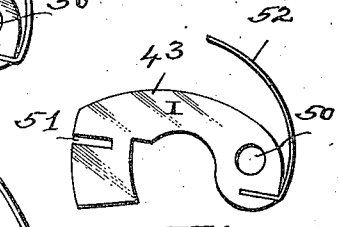


Fig. 11.

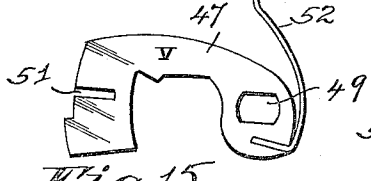


Fig. 15.

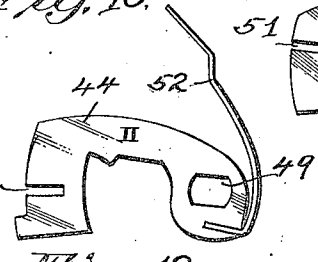


Fig. 12.

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UNITED STATES PATENT OFFICE.

WILLIS R. MICHAEL, OF YORK, PENNSYLVANIA.

LOCK.

Application filed March 22, 1922. Serial No. 545,709.

To all whom it may concern:

Be it known that WILLIS R. MICHAEL, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, has invented certain new and useful Improvements in Locks, of which the following is a specification.

This invention relates to improvements in interchangeable key locks and has particular reference to that class of locks which are usually employed in connection with safe-deposit boxes wherein one key is retained by the depositor while a guard key is retained by an attendant so that both keys will be required to operate the lock.

The present invention is directed to a construction of lock which may readily be used as either a right or a left-hand lock,—there frequently being instances in the arrangement of boxes in a vault that makes it desirable to have some doors swung from one side while others are swung from the opposite side.

By means of my invention the same lock may be used on either a right or a left-hand door and the direction of rotating the keys correspondingly changed.

The invention further consists in the novel construction, combination and arrangement of parts hereinafter set forth and particularly pointed out in appended claims.

The invention is illustrated in the accompanying drawings, wherein,—

Fig. 1. shows the detached lock in perspective.

Fig. 2. illustrates the lock in front elevation, the front cover being removed.

Fig. 3. shows the interior of the lock with all the tumblers removed but with the bolt in place and also shows the right-hand trunnion or post-stop in place in the bolt.

Fig. 4. illustrates the same but with the left-hand trunnion or post-stop in place in the bolt.

Fig. 5. shows a vertical longitudinal section through the lock with all the parts in place.

Fig. 6. illustrates the detached trunnion or post in perspective and on a much enlarged scale.

Fig. 7. shows a sectional detail through a portion of the casing, a portion of the bolt; the right-hand trunnion-stop and the talon on the trunnion,—the section being taken on the line 7—7 of Fig. 3, looking in the direction of the darts.

Fig. 8. shows the detached bolt in perspective.

Figs. 9 and 10 illustrate perspective details of the two detached right and left-hand stops respectively, and

Figs 11—12—13—14—15 and 16 show the several detached tumblers in side view.

Referring to the drawings the numeral 20, designates one end wall; 21 another end wall; 22 a side wall and 23 the other side wall of the lock-casing. All of these walls are formed integrally with a rear or back-wall 24.

The end wall 20, has a slot 25, therethrough so that a bolt-plate 26, when seated against the rear or back-wall 24, may have its bolt proper 27 in register with said slot.

The rear or back-wall 24 is provided with a perforation 28, as shown in Fig. 5, for a purpose to be explained.

The bolt-plate 26, as clearly shown in Fig. 8, has a slot therein of a peculiar and novel form. This slot has two oppositely disposed off-sets 29 and 30 respectively, the forward edges of which two off-sets are connected by a continuously curved front wall 31. At the rear, the slot has a narrow rearward extension-slot 32. Between the curved front wall 31 of the slot and the rear edge of the bolt-proper 27, the bolt-plate is provided with a flat-faced stud 33 which latter is located on a central longitudinal line which is midway between the two off-sets 29 and 30.

The rearward extension-slot 32 in the bolt-plate also has a longitudinally central position in the said plate so that the stud 33 and the slot-extension 32 are both in alinement, as can be seen in Figs. 3 and 4 of the drawings.

The back-wall 24 of the casing is provided with a rigid post 34, which extends through the slot-extension 32 in the bolt-plate and forms a guide for that plate as the latter is reciprocated to retract or project the bolt.

It is important to note that the axis of

this post 34 must line up with the stud 33, the perforation 28 and the center of the slot 32 for reasons that will presently be pointed out.

An important feature of my invention lies in the fact that my lock-structure is so designed that it may be utilized as either a right or left-hand lock but when set for left-hand operation it cannot be actuated as a right-hand lock until the parts are changed in the casing.

In carrying out this feature of my invention I provide what I term trunnion stops either of which may be utilized in the lock-casing at a time, but when one is used the other will be omitted.

These trunnion-stops are designated 35 and 36 respectively and are of like construction with the exception that they are formed in what may be termed as rights and lefts.

The stop 35 is shaped so as to accurately fit into the off-set 29 of the bolt-plate and has a flange 37, which engages the flat face of the bolt-body around said off-set whereby to retain the stop in place. When the stop is in place in the off-set, as shown in Fig. 4 of the drawing its rear face will seat against the back wall 24 and will slide thereagainst as it moves with the bolt-plate.

The stop 36 is shaped to accurately fit the off-set 30 in the bolt-plate and also has a retaining flange 38 to engage the rear face of the bolt-plate and retain it in place as clearly shown in Fig. 7 of the drawing.

It is to be understood that when the stop 35 is in place in the off-set 29 it will have the effect of blanking or closing off that side of the bolt-plate-slot just the same as though there had been no off-set 29 formed at that side. The same is true of off-set 30 when the stop 36 is placed therein.

The purpose and operation of these stops 35 and 36 will presently be explained.

In further carrying out my invention I employ a key-post 39 having a key-slot 40 and provided with a talon or wing 41.

The key post has an inner end 42, which seats in the perforation 28 in the back-wall 24, as shown in Fig. 5 of the drawing, which perforation forms a bearing for said post-end.

When the key-post is in place, as clearly shown in either Fig. 3 or Fig. 4, the talon or wing 41 extends laterally and has position in the bolt-plate slot.

The normal position of this talon or wing, that is, when the bolt proper 27 is shot, is such that its swinging end will confront the curved front wall 31 of the slot in the bolt-plate.

It is thus to be noted that the talon or wing 41, and the center of the key-post are in linement with the stud 33 on the bolt-plate and with the axis of the post 34.

In the present instance I provide the lock with a series of tumblers 43, 44, 45, 46, 47 and 48. Of these tumblers those designated 44 and 47 are provided at their heel-ends with slots or elongated perforations 49 while each of the other tumblers has a circular perforation 50 in its heel-end.

The particular arrangement and number of these tumblers is not material to the present invention but each has a slot, such as 51 in its free edge for the entrance of the stud 33 on the bolt-plate as is common in tumblers of this character.

The tumblers are arranged in a predetermined order in the lock-casing with their slots and perforations 49 and 50 receiving the rigid post 34. By this means the tumblers may be swung with the post as the pivot, and those having the slots 49, may also have a slight longitudinal movement.

Each tumbler has a spring finger 52, which will press against one or the other of the walls 22 or 23 of the casing, according to the direction in which the key-post 39 is to be rotated to retract the bolt-plate, and this direction is determined by the insertion of the stops 35 or 36 in the off-sets 29 or 30 of the bolt-plate. If, for example, the stop 36 is placed in the off-set 30 of the bolt-plate then the tumblers will be so located on the post 34 that the springs 52 will engage wall 23 of the casing and press the tumblers in a direction toward that side of the lock-plate where said lug 36 is inserted, as shown in Fig. 2 of the drawing. When in this position the talon or wing 41 on the key-post can only be turned to the right (as indicated by the dart in Fig. 3) to effect a retraction of the bolt-plate, because the presence of the lug 36 in the off-set 30 will close the bolt-plate slot and prevent the rotation of the talon or wing in the left-hand direction.

The reverse will be true when the lug 35 is inserted in the off-set 29 of the bolt-plate and this latter position of the lug 35 will require the tumblers to be placed on the post 34 so that the springs will seat against the casing-wall 22.

By this mere reversal of lugs 35 and 36 and reversal of the tumblers, the lock may be caused to operate by turning the key-post 39 in either a right or a left-hand direction according to which of the lugs is employed.

The lock is designed for actuation by two keys,—one of which will actuate certain tumblers, such as 44 and 47 while the other key will actuate the remaining tumblers.

This however is not novel and is present because the style of lock shown is such as to call for the use of a plurality of keys.

To retain the tumblers in position and to provide a substantial bearing for the key-post 39 I provide a cover-plate 53 which has a tubular barrel 54 projecting therefrom so

that the outer end of the key-post 39 may enter and have rotating bearing in said barrel.

This barrel has a longitudinal slot 55, along its inner side which will register with the slot 40 in the key-post only when the post is turned in position to project the bolt-plate 26. By this means the keys cannot be withdrawn without projecting the bolt.

I also provide means for ensuring the proper positioning of the cover-plate in that at intervals around the edge I provide the cover-plate with lugs 56, which are arranged to register with corresponding notches 57 on the walls 21—22 and 23 of the casing.

The cover-plate is retained in place by means of a screw 58 which passes therethrough and enters the rigid post 34, as shown in Fig. 5.

Because of the necessity for reversing the tumblers and placing a lug in one or the other of the off-sets 29 or 30 in the lock plate to obtain a right- or left-hand operation of the key-post, it is necessary that lock-lug 33; post 34 and key-post 39 all be arranged on the same center line for the tumblers must be capable of operating from either side of the key-post and the slots 51 of the tumblers brought into alinement with the lug 33 to enable the lock-plate to be retracted.

Having described my invention, I claim,—

1. In a lock the combination with a bolt-plate having a lug thereon, of a rotatable key-post, a series of tumblers pivotally sustained so as to swing at one side of the key-post and across the path of the bolt-lug, said tumblers being reversible from one side to the opposite side of the key-post whereby the lock may be changed from a right to a left-hand lock.

2. In a lock the combination with a bolt-plate having a lug thereon, and a slot therein, of a key-post sustained to rotate in the slot of the bolt-plate, a rigid post in alinement with the lug and the key-post and a series of tumblers pivotally attached to the rigid post said tumblers being reversible so they may be positioned at one side or the other of the key-post whereby the lock may be changed from a right to a left-hand lock.

3. In a lock the combination with a reciprocating-bolt-plate having an opening therein with a like conformation at directly opposite sides of said opening, of a rotatable key-post provided with a talon to swing in said opening between said opposite sides and a plurality of tumblers pivotally mounted so as to cross the path of the bolt-plate said tumblers being reversible from one side to the other of the key-post and its talon whereby the lock may be changed from a right to a left-hand lock.

4. In a lock the combination with a reciprocating bolt-plate having an opening therein said opening being provided at each of opposite sides with an off-set, of a rotatable key-post provided with a talon to swing in said opening between said opposite off-sets, means for closing either of said off-sets and a plurality of tumblers movable from the open off-set toward the closed off-set to lock the bolt-plate against movement.

5. In a lock the combination with a reciprocating bolt-plate having an opening therein said opening having an off-set at each of its opposite sides and also provided with an elongated slot, a rotatable key-post having a talon which swings in said opening between said off-sets, a rigid post extending through the elongated slot of the bolt-plate, means for closing either of the off-sets in said bolt-plates to prevent movement of the key-post talon past said closed off-set and a plurality of tumblers pivotally connected to said rigid post and extending around the key-post on that side where the open off-set is located.

6. In a lock the combination with a casing, of a bolt-plate slidable in the casing, a rigid post in the casing, a lug on the bolt-plate, a series of tumblers pivotally connected to the rigid post, a key-post rotatably mounted between the rigid post and the lug on the bolt-plate,—said lug, key-post and rigid post being in alinement whereby the tumblers may be mounted to swing from either of opposite sides of the key-post.

7. In a lock the combination with a bolt-plate having a lug thereon and an opening therein with an off-set at each of the opposite sides of said opening, a rotatable key-post having a talon to swing in said opening between said off-sets, a removable lug plate to close one of said off-sets and a series of tumblers movable across the lug on the bolt-plate said tumblers being reversible so they may be made to swing at either side of the key-post.

8. In a lock the combination with a casing, of a bolt-plate slidable in the casing, a rigid post in the casing, a lug on the bolt-plate, a series of tumblers pivotally connected to the rigid post, a key-post rotatably mounted between the rigid post and the lug on the bolt-plate,—said lug, key-post and rigid post being in alinement whereby the tumblers may be mounted to swing from either of opposite sides of the key-post, a cover-plate to close one side of the casing said plate having a tubular barrel to receive the key-post, and means for centering the barrel in the cover with the said rigid post, key-post and bolt-plate lug.

9. In a lock the combination with a casing having notches in its wall edges, of a bolt-plate slidable in the casing, a rigid post in the casing, a lug on the bolt-plate, a series of tumblers pivotally connected to the rigid post, a key-post rotatably mounted between

the rigid post and the lug on the bolt-plate,—said lug, key-post and rigid post being in alinement whereby the tumblers may be mounted to swing from either of opposite sides of the key-post, a cover plate to close one side of the casing said plate having a tubular barrel to receive the key-post and lugs on the cover-plate to engage the notches in the wall edges of the casing whereby to center the barrel with the rigid post, key-post and bolt-plate lug.

In testimony whereof I affix my signature.

WILLIS R. MICHAEL.