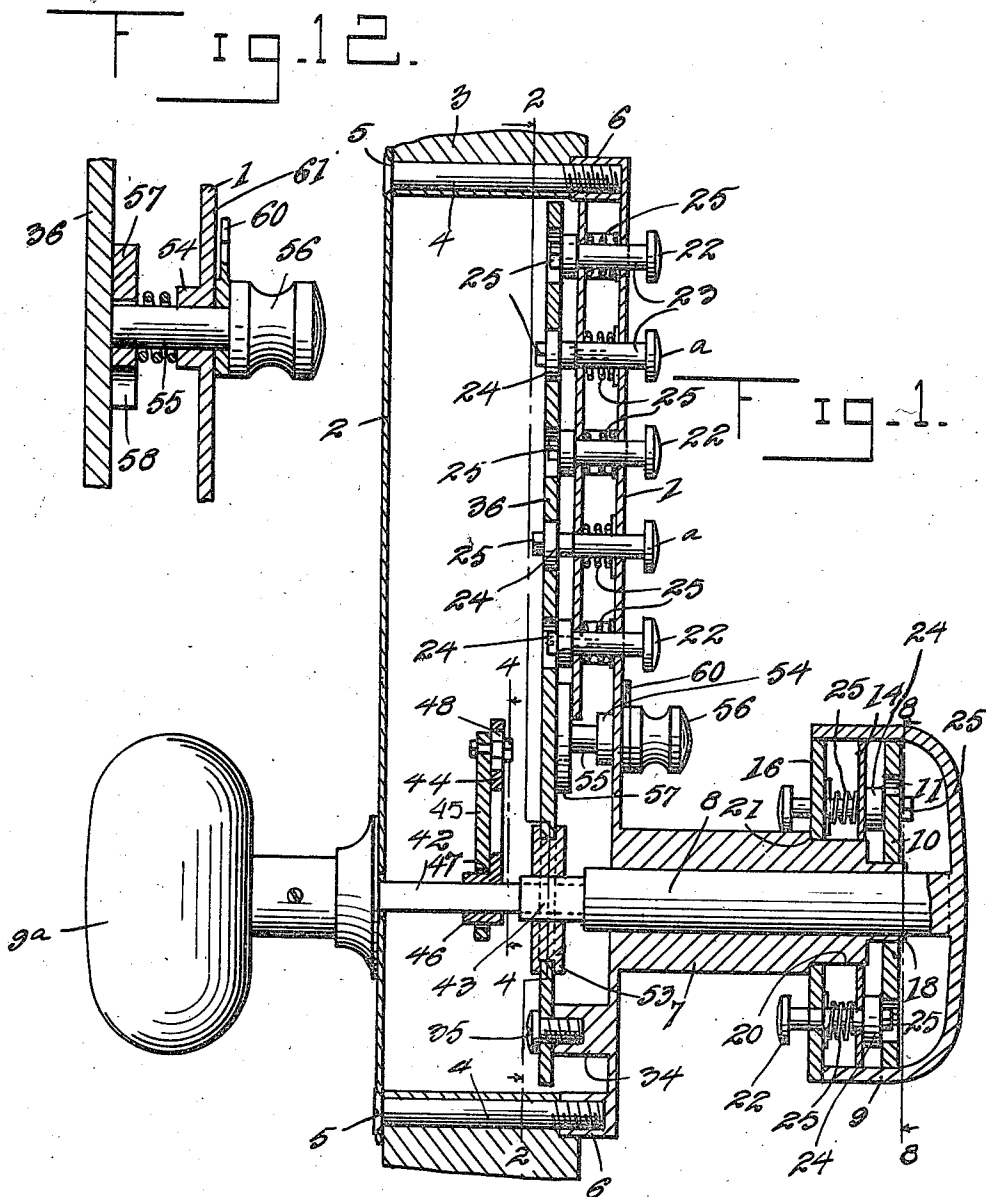


F. McCARTHY.
COMBINATION LOCK.
APPLICATION FILED OCT. 20, 1913.

1,092,733.

Patented Apr. 7, 1914.
4 SHEETS-SHEET 1.



Witnesses
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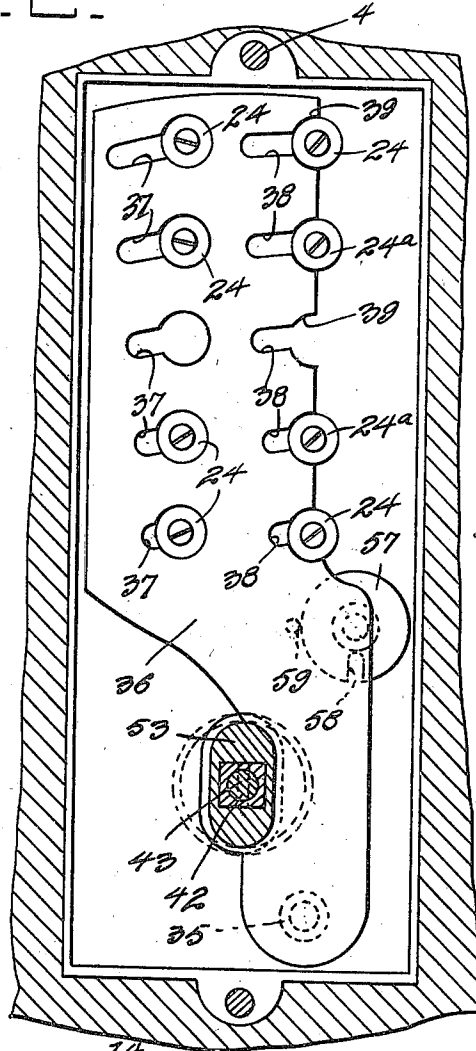
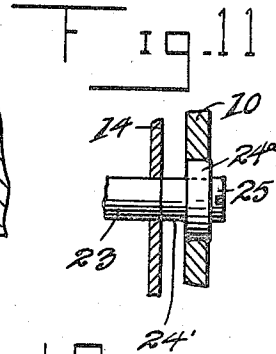
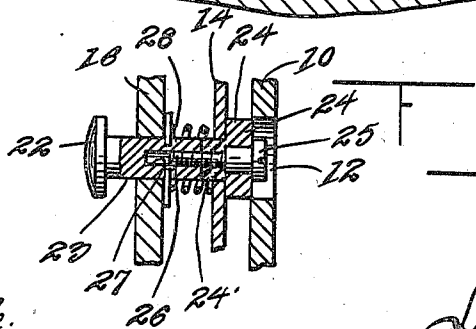
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4 SHEETS-SHEET 2.

Fig. 2.



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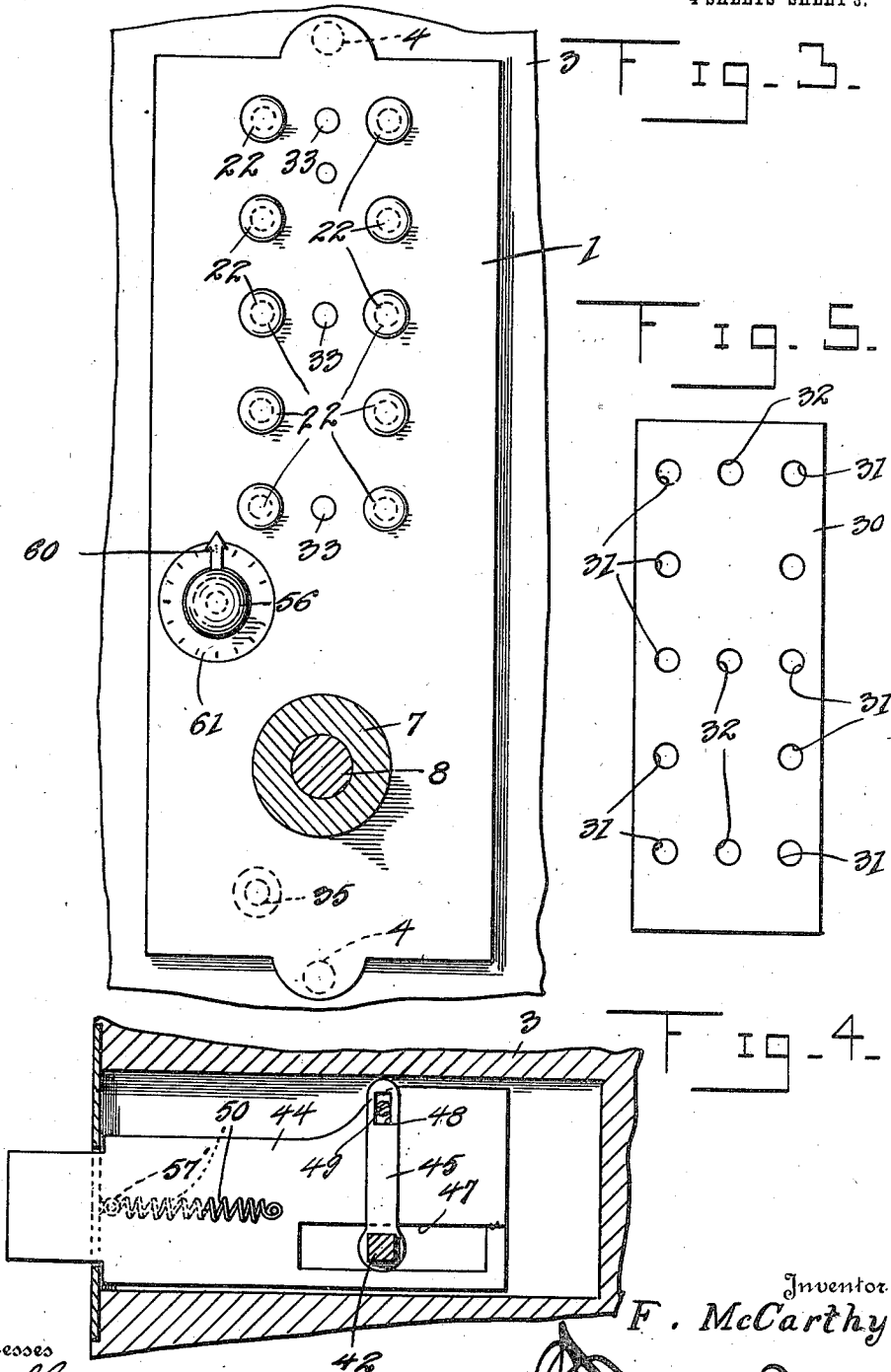
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4 SHEETS—SHEET 3.



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4 SHEETS-SHEET 4.

Fig. 6.

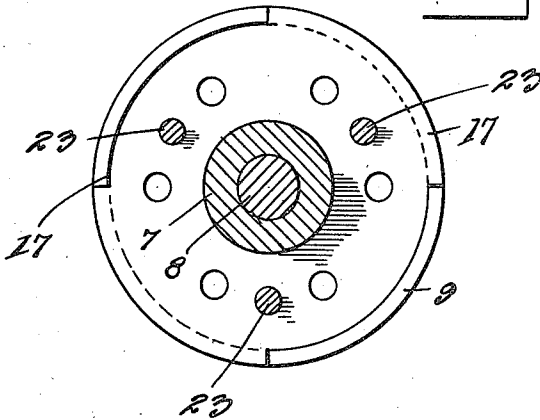


Fig. 7.

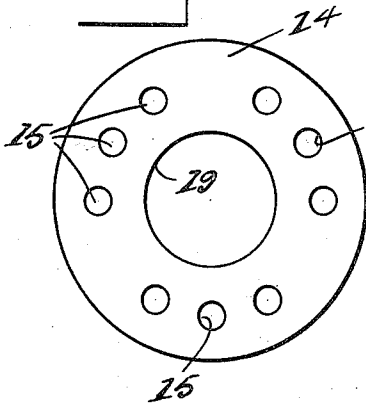


Fig. 8.

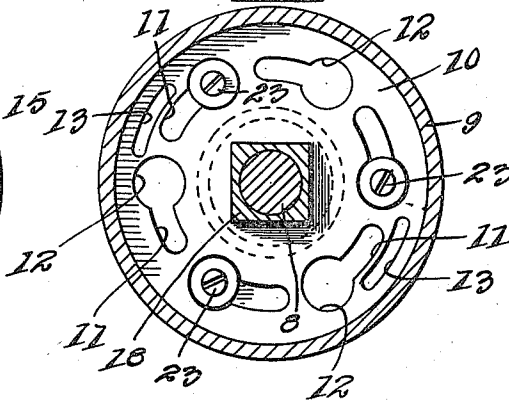
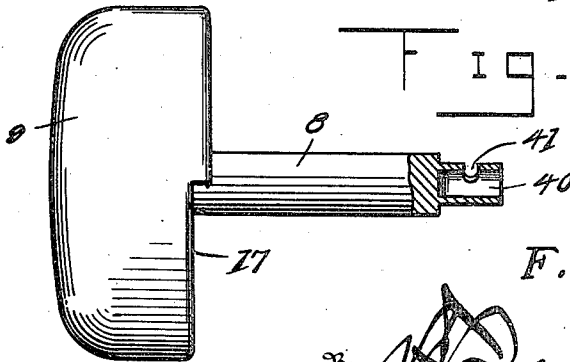


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

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COMBINATION-LOCK.

1,092,733.

Specification of Letters Patent.

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Application filed October 20, 1913. Serial No. 790,332.

To all whom it may concern:

Be it known that I, FLORENS McCARTHY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Combination-Locks; 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.

This invention relates to combination locks, and one of the principal objects of the same is to provide a lock having an outer knob containing a plurality of spring push buttons and a master button, and the lock having a series of push buttons and a master button, and independent means in the lock for rendering the lock operative or inoperative.

Another object of the invention is to provide a combination mortise lock which can be quickly operated by the person having the combination, but which could not be opened by an unauthorized person, said lock comprising a series of push buttons which are interchangeably mounted in the casing of the lock, one or more of said push buttons being constructed to serve as a master to the combination.

Another object of the invention is to provide an outer knob connected to the lock spindle and provided with a series of spring actuated push buttons, one or more of which serves as a master button to control the combination, while the inner knob is mounted to be actuated independently for opening the door from the inside.

Still another object of the invention is to provide a combination lock, in which the lock casing carries a series of spring actuated push buttons with one or more master buttons to control the combinations and an outer knob also provided with a plurality of spring actuated push buttons having one or more master buttons to control the combination and the lock combination provided with means for rendering the combination inoperative until it is set in proper position by a person understanding the combination.

These and other objects may be attained

by means of the construction illustrated in the accompanying drawings, in which,

Figure 1 is a longitudinal sectional view through the lock casing and the outer knob of a lock made in accordance with this invention, Fig. 2 is a longitudinal sectional view taken on the line 2—2 of Fig. 1, looking in the direction indicated by the arrows, Fig. 3 is a view in elevation of the lock from the outside, showing the knob spindle and mount in section, Fig. 4 is a detail sectional view taken on line 4—4 of Fig. 1, looking in the direction indicated by the arrow, Fig. 5 is a plan view of one of the supporting plates for the shanks of the push buttons, Fig. 6 is a view looking into the knob with the cover plate of the knob removed and the attaching bolts for the cover being shown in section, Fig. 7 is a plan view of the supporting plate for the push buttons in the knob, Fig. 8 is a sectional view of the outer knob taken on the line 8—8 of Fig. 1, looking in the direction indicated by the arrows, Fig. 9 is a side elevation of the outer knob with the cover plate and push buttons removed and the inner end of the knob spindle shown in section, Fig. 10 is a detail sectional view made on an enlarged scale of one of the spring actuated push buttons, Fig. 11 is a similar view of one of the locking buttons, and Fig. 12 is an enlarged detail sectional view of the knob for operating the dial hand, and for setting the lock to prevent movement of the latch from the outside.

Referring to the drawing the numeral 1 designates the outer lock plate, 2 is the inner lock plate and these two plates are connected together in a mortise in door 3 by means of lag screws 4 provided with heads 5 on the inside of the door, (Fig. 1) said bolts being threaded into the interiorly threaded bosses 6 on the inside of the plate 1, as shown more clearly in Fig. 1. The spindle mount 7 projects outwardly from the plate 1 and is bored for the knob spindle 8, the latter being connected to the outer knob casing 9.

The knob casing 9 is hollow and contains the plate or disk 10 having a series of curved slots having a contracted portion 11 and a connected enlarged portion 12, thus forming

curved slots. The plate 10 is also provided with plain curved slots 13. A supporting plate 14 is provided with perforations 15 and is supported within the knob casing 9 and spaced from the plate 10 by means of screws, not shown, the shanks of which extend through the slots 13 in plate 10 and engage plate 14. The cover plate 16 is provided with extended portions at the periphery thereof to fit within the recesses 17 in the knob casing 9 to prevent rotation of said cover plate. The plate 10 is provided with a square opening formed centrally therein, and fitted within this opening is the squared projecting end 18 of the spindle mount. The supporting plate 14 is provided with a circular central opening 19 through which the enlarged portion 20 of the spindle mount extends, and the cover plate 16 abuts against a shoulder 21 on the spindle mount 7.

The push buttons for the knob and for the lock may be substantially identical in construction and any suitable number may be used. In the present instance however, there are six push buttons connected to the knob and ten mounted in the lock casing. In the knob casing there are three combination lock buttons which may be interchanged with the other push buttons for changing the combination and in the lock casing there are two such lock buttons which may be interchanged with any of the others to alter the combination. As shown in Fig. 10 the push buttons each comprise a head 22 provided with a shank 23 which extends through the cover plate 16 and through the perforations in the supporting plate 14 when the push buttons are pushed inwardly. Said shanks each having a collar 24 connected thereto by means of a screw 25, the shank 26 of which is threaded and connected to the interiorly threaded socket 27 in the shank 23, while a spiral spring 28 surrounds the shank 23 between the cover plate 16 and the supporting plate 14 to normally push the buttons outward. The collar 24 is provided with a hollow boss 24' which bears against the end of the shank 23. This collar 24 conforms in size to the enlarged portions 12 of the slots in the plate 10, and when one of these buttons is pushed inward it locks the knob against rotation. The knob, however, is normally locked against rotation by one of the locking buttons shown in Fig. 11. The locking buttons α are identical in construction with the other buttons, but the shank 23 of each of said locking buttons is extended through the plate 14 to normally hold the collar 24^a in the enlarged portion 12 of the slot in the plate 10, as shown in Fig. 11. For convenience in illustration and description the heads of the buttons are indicated by the numeral 22 while the heads of the master buttons are indicated by α . In Fig. 11 is

illustrated the construction of one of the shanks of a master button, and the relative position of its collar 24^a. In the lock casing the supporting plate 30 is provided with perforations 31 to receive the shanks of the push buttons and lock buttons and these perforations are arranged as shown in Fig. 5 as disposed upon opposite sides of the plate there being five on each side. The perforations 32 are utilized for the purpose of receiving the screws 33 which serve to hold the plate in proper spaced relation to the plate 1.

Projecting inwardly from the plate 1 is a stud or boss 34 and pivoted upon a screw 35 inserted in a threaded socket in the stud 34 is a locked plate 36 provided with a series of keyhole slots 37 which increase in length from the inner to the outer end of said plate, as shown more clearly in Fig. 2. While arranged at one side of said slots is a series of open slots 38 provided with enlarged and curved walls 39 extending to the edge of the plate 36.

The reduced inner end of the knob spindle 8 is provided with an annular socket 40 having a slot 41 therein. Mounted in the socket 40 is the rounded end of the inner knob spindle 42 and a pin 43, secured to said spindle 42, extends into the slot 41. The inner knob 9^a is connected to the spindle 42, and when the knob 9^a is turned, the pin 43 moves in the slot 41 to withdraw the bolt 44, without turning the outer knob spindle 8. Connected to the spindle 42 is a lever 45 provided with a boss 46 which extends through a slot 47 in the bolt 44. The lever 45 is provided with a slot 48 and a pin 49 connected to the bolt 44 extends through the slot 48 as shown in Fig. 4. A spring 50 connected at one end to the bolt 44 and the opposite end connected to an eye 57' on the guide plate 52 serves to hold the bolt projected into the keeper (not shown) upon the door frame.

Secured to the reduced and squared portion of the spindle 8 is a grooved elliptical cam 53. The groove surrounding said cam 53 is of sufficient width to permit the plate 36 to move freely therein when the knob 9^a is turned, or when the proper buttons are pressed to permit the outer knob to turn.

Extending through the plate 1 and through a boss 54 is a shank 55 formed on or connected to a knob 56, said shank carrying a disk 57 provided with a notch or recess 58, adapted to be brought into coincidence with a stud or pin 59 connected to the locked plate 36. The knob 56 carries a pointer 60 and a dial 61 on the plate 1 is utilized for setting the pointer 60, at the desired position to indicate the location of the notch 58 in the disk 57.

The operation of the lock may be briefly described as follows:—In order to open the

door the person having the combination of the lock will press the buttons *a* on the inner side of the outer knob and also the buttons *a* in the lock member when the outer knob can be turned and the plate 36 will be swung upon its pivot 35 by the partial rotation of the cam 53 and the bolt 44 will be withdrawn from engagement with the keeper on the door frame. It will be obvious that the pressure of any other buttons than those mentioned will not permit the knob to turn the bolt 44 to be withdrawn, and in view of the fact that the buttons are interchangeable and that the lock buttons may be disposed in any of the openings the combination can be readily changed by withdrawing the bolts 4 and removing the lock from the mortise in the door. In like manner the master buttons of the outer knob may be interchanged to alter the combination. When the party desires to render the lock inoperative from the outside to any person but himself the pointer 60 is turned upon the dial 61 so that it will be rendered necessary to turn the knob 56 to its proper position on the dial so that the pin 59 will ride in the notch 58 before the combination which opens the lock will be rendered operative.

From the foregoing it will be obvious that the lock is capable of being adjusted to provide an almost endless number of combinations and that it will be practically impossible for a person to operate the lock unless he thoroughly understands the interior construction and has the combination of the dial, the knob and the lock. This operation would be absolutely impossible for an unauthorized person to operate the lock by tampering with the same owing to the length of time which would be required to accidentally stumble onto the combination.

The details of construction may be varied within wide limits and it is to be understood that I do not wish to be limited to the precise construction shown so long as the changes are fairly within the terms of the claims.

What is claimed is:—

1. In a combination lock, a lock casing, an outer knob, an inner knob, spindles connected to said knobs and extending into the casing, a sliding lock bolt connected to one of said spindle members and constantly operable by movement of the inner knob, means within the lock casing for rendering the bolt inoperative from the operation of the outer knob, and means within the outer knob for cooperation with the means in the casing for rendering the sliding bolt operable and inoperative.

2. A lock comprising a casing, an outer knob, an inner knob, spindles projecting from said knobs into said casing, means for connecting said spindles within the casing, a sliding bolt connected to one of said spin-

dles and constantly operable by turning the inner knob, a lock plate suitably mounted within the casing, said lock plate being provided with a series of curved slots, spring push buttons having shanks adapted to engage said slots, master buttons mounted in the casing for engagement with said slots, the outer knob being provided with means for cooperation with the buttons within the lock casing to control the movement of the sliding bolt.

3. A lock comprising a casing, a sliding lock bolt mounted in the casing, means for operating the sliding bolt from the inside of the lock, means within the lock for rendering the bolt operative and inoperative, an outer knob provided with means for cooperating with the controlling means in the casing, an adjusting disk provided with a notch, a shank connected to said disk, a knob for rotating said shank, a stop pin within the casing, to coact with said notch, a pointer carried by the knob, and a dial on the casing for indicating the position of the disk and notch to permit an authorized person to set the lock to render it inoperative or operative.

4. In a combination lock, a casing, an inner knob, and an outer knob connected by spindle sections with the lock casing, a lock bolt operatively connected with the spindle of the inner knob, a lock plate within the lock casing, said lock plate being provided with a series of curved keyhole slots and with a series of curved open slots, spring actuated push buttons mounted in the casing, and provided with collars adapted to engage the larger portions of the keyhole slots, master buttons provided with collars which normally engage the larger portion of said slots, an outer knob, and means within said outer knob for rendering the mechanism within the casing operable or inoperable.

5. In a lock, the combination of a casing, an inner knob, an outer knob, spindles connected to said knobs and extending into the casing, a sliding lock bolt connected to one of said spindles and operative by the inner knob, a lock plate pivoted in the casing and provided with a series of keyhole slots, a series of spring controlled push buttons mounted in said casing and adapted to engage the walls of the slots in said lock plate, a master button mounted in said locked casing and provided with a collar which normally engages the enlarged portion of a keyhole slot, an outer knob, and means within said knob for controlling the locking and unlocking mechanism within the lock casing.

6. In a combination lock, a sliding bolt, a plurality of spring push buttons, and a plurality of master buttons for controlling the locking and unlocking movement of said

sliding bolt, a knob connected to the outer
side of the lock, said knob containing means
to control the locking and unlocking move-
ment of said bolt, and independent means
5 in the lock for rendering the lock operative
or inoperative.

In testimony whereof I affix my signa-
ture in presence of two witnesses.

FLORENS McCARTHY.

Witnesses:

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GEORGE SMITH.