M. E. GONSALVES.

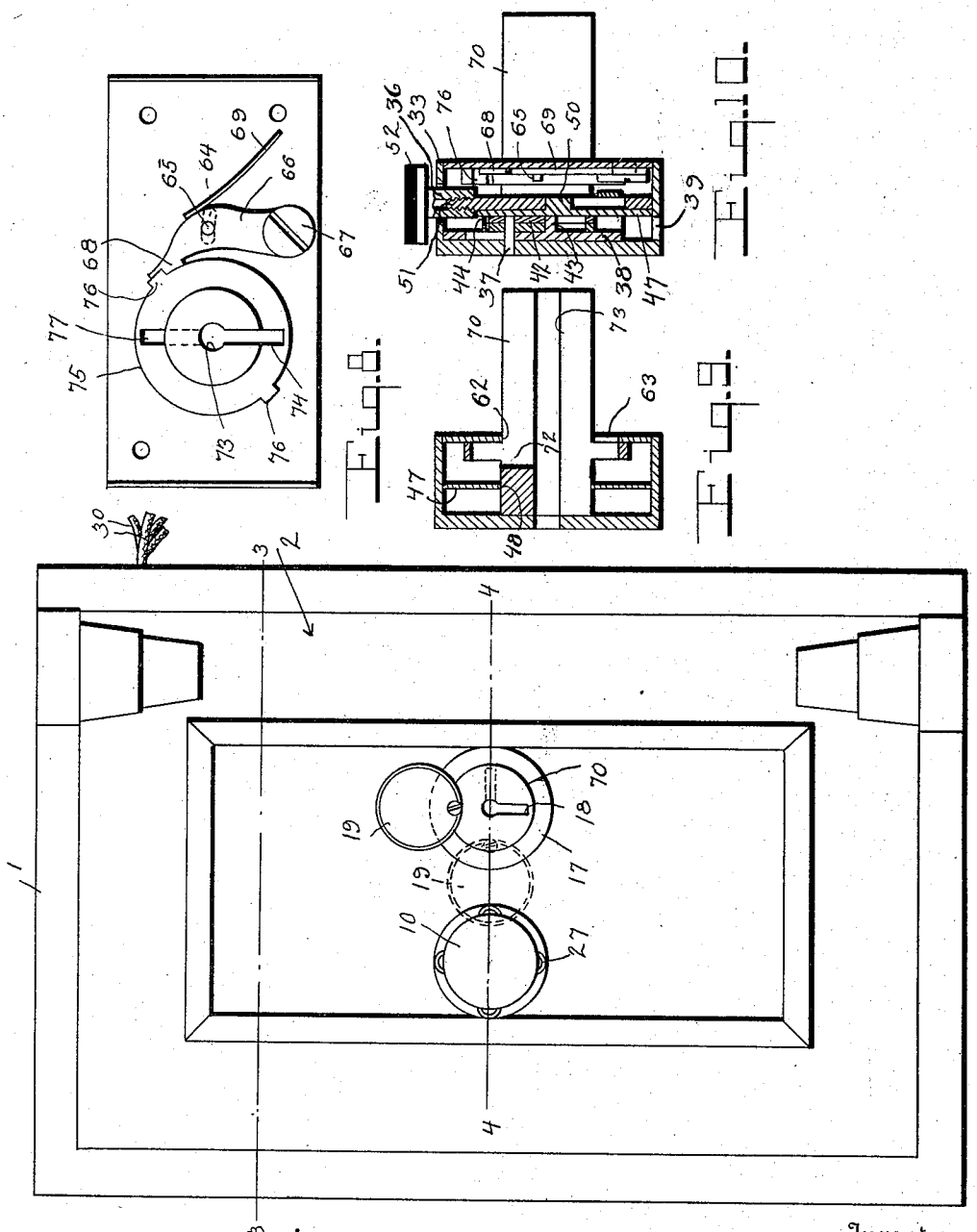
LOCK.

APPLICATION FILED MAY 31, 1916.

1,227,425.

Patented May 22, 1917.

3 SHEETS—SHEET 1.



Witnesses

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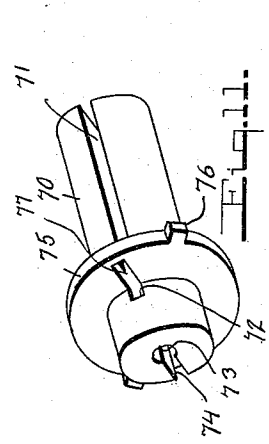


Fig. 11.

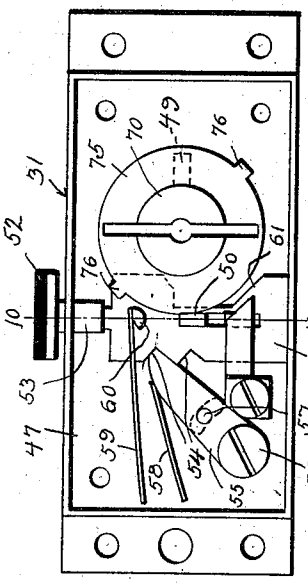


Fig. 4.

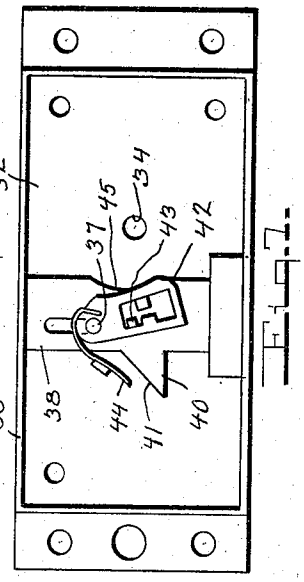


Fig. 7.

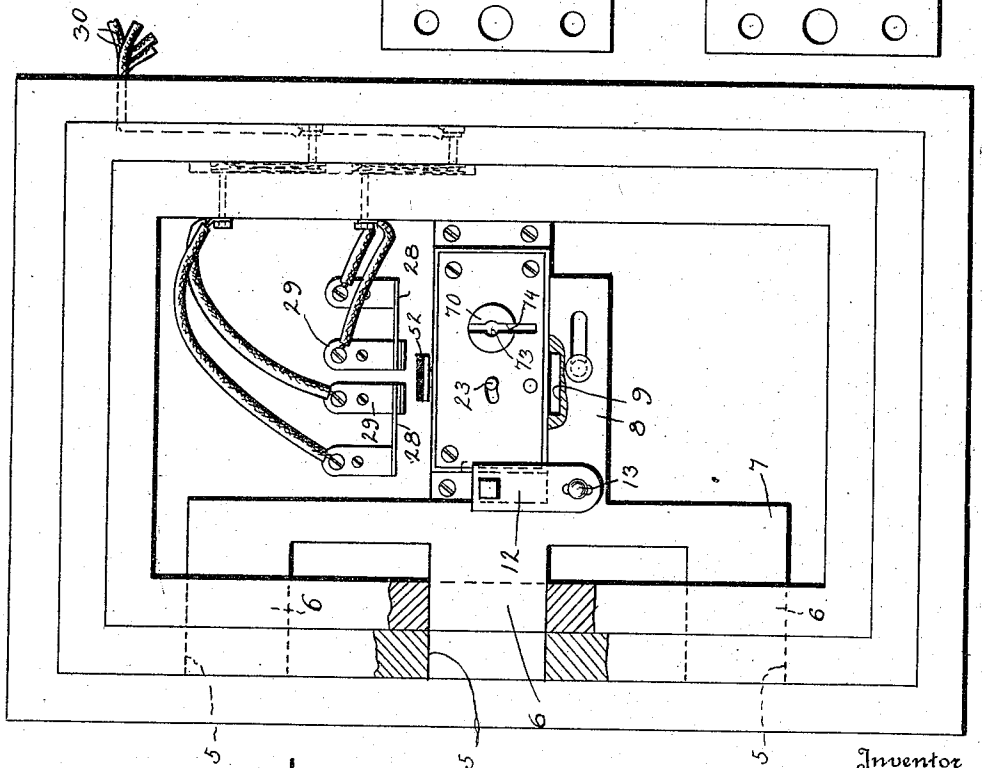


Fig. 2.

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3 SHEETS—SHEET 3.

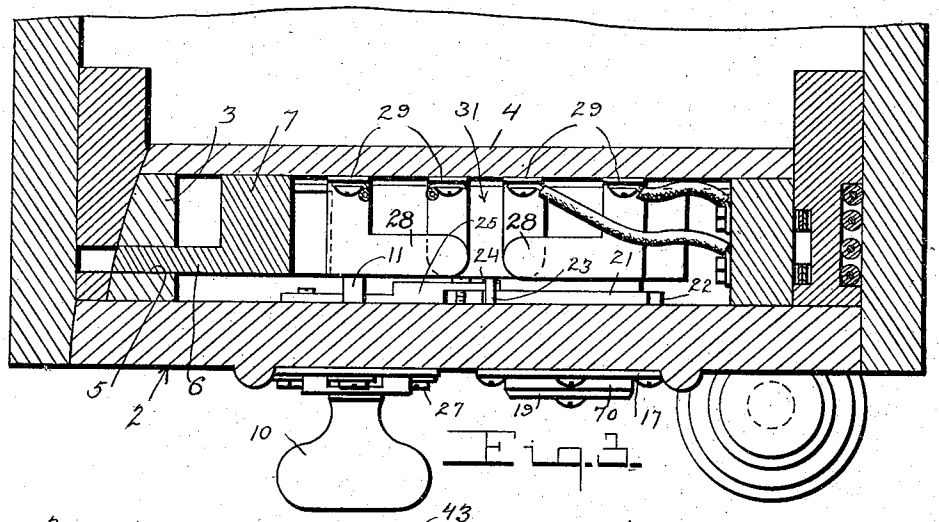


Fig. 3.

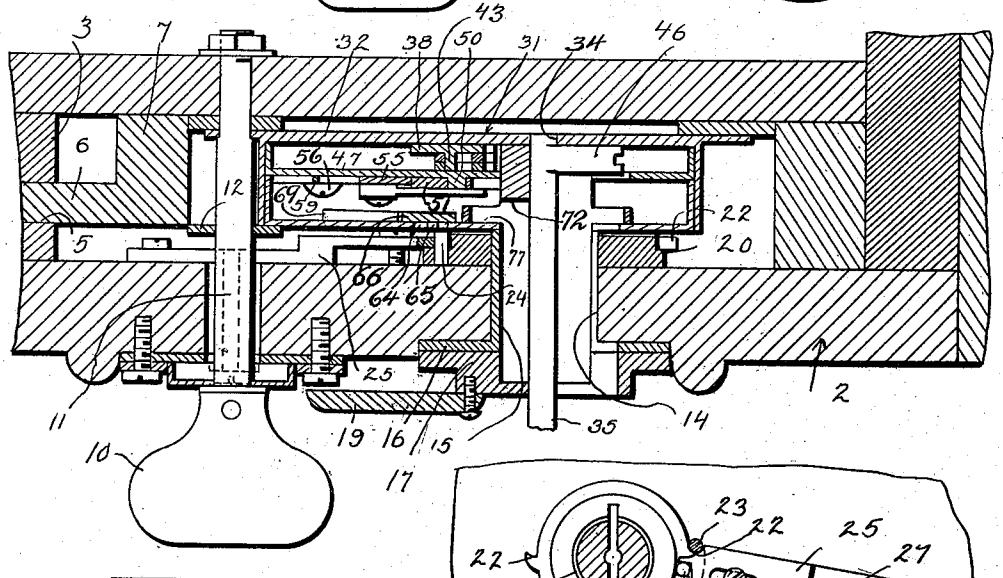


Fig. 4.

Fig. 5.

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LOCK.

1,227,425. Specification of Letters Patent. Patented May 22, 1917.

Application filed May 31, 1916. Serial No. 100,836.

To all whom it may concern:

Be it known that I, MANOEL E. GONSALVES, citizen of the British Empire, residing at New Amsterdam, in the Province of Berbice, British Guiana, have invented certain new and useful Improvements in 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 new and useful improvements in locks and the principal object of the invention is to provide a lock which will automatically close an electrical alarm circuit in order to operate a signal in case an unauthorized person endeavors to actuate the lock.

Another object of the invention is to provide a key operated lock having two separate wards or compartments one of which carries a signaling mechanism and the other the lock releasing mechanism which is arranged so that upon the releasing of the lock the signaling mechanism will be released.

A still further object of the invention is to provide a lock in which the circuit closing mechanism will be actuated upon the turning of a key in the lock and which is so arranged that upon the operating of the circuit closer the key cannot be removed unless the person operating the lock is familiar with the mechanism.

Still another object of the invention is to provide a lock in which the escutcheon plate forms an important feature in the releasing of the lock.

A still further object of the invention is to provide a locking means for preventing the escutcheon plate from being moved which means may be readily released by one familiar with the lock.

A still further object of the invention is to provide a lock having a revolving cylinder which is arranged so that in case the same becomes reversed the lock cannot be unlocked and yet the alarm will be sounded until a person familiar with the operation of the lock releases the same.

A still further object of the invention is to provide a lock in which the alarm mechanism is released upon the unlocking of the same.

With these and other objects in view the invention consists in the novel combination and arrangement of parts as will be fully described in the following specification and accompanying drawings in which:—

Figure 1 is a front view in elevation of a safe door showing this improved lock applied thereto.

Fig. 2 is a view similar to Fig. 1 showing the front plate removed to illustrate the details of construction and showing a portion of the device in section.

Fig. 3 is a horizontal sectional view through the door taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged sectional view through the device taken on line 4—4 of Fig. 1.

Fig. 5 is a fragmentary view of the inner side of the plate forming the front of the door.

Fig. 6 is a plan view of the lock showing the cover plate removed.

Fig. 7 is a view somewhat similar to Fig. 6 showing the partition removed.

Fig. 8 is a face view of the inner side of the cover plate of the lock.

Fig. 9 is a transverse sectional view through the lock.

Fig. 10 is a view similar to Fig. 9 and taken on line 10—10 of Fig. 6, and

Fig. 11 is a detail perspective view of the cylinder.

Referring to the drawings the numeral 1 designates a safe of the ordinary construction having hinged to its front wall a door designated generally by the numeral 2. The inner side of this door is provided with the usual side and end flanges 3 having secured at their inner edges the inner plate 4. It will thus be seen that a chamber is provided on the inside of the door in which the lock and contacts are mounted. The flanges 3 of the free edge of the door are provided with spaced slots 5 through which the lock bolts 6 are slidable and these bolts are carried by the bar 7 positioned within the chamber which is formed intermediate its upper and lower ends with an arm 8 having formed in its upper side a lock bolt receiving recess 9 to receive the head of a bolt 38 as clearly shown in Fig. 2. The inward and outward movements of the bar 7 are controlled by the knob 10 which is secured to the outer end of a rectangular shaft 11 which extends through the door and has connected intermediate its ends an arm 12 which arm is pivotally and slidably con-

nected as at 13 to the arm 8 hereinbefore referred to.

Formed in the front wall of the door is a suitable opening 14 for the reception of the hollow cylinder 15 the outer end of which is provided with a flange 16 having secured thereto the escutcheon plate 17 which is provided as illustrated in Fig. 1 with the keyhole slot 18. A suitable cover plate 19 is pivotally attached to the escutcheon plate as illustrated in Fig. 4 and is adapted to cover the keyhole slot to prevent dust and the like from entering the slot and also to form a cover therefor. The inner end of the hollow cylinder 15 is formed with a flange 20 provided with the eccentric outer edge 21 having suitable stops 22 formed therearound. The stops 22 coöperate with the stop pin 23 carried by the inner face of the outer wall of the door in order to limit the rotary movement of the disk.

In order to lock the disk against rotation a suitable pin 24 is attached to the disk and a slidable bolt 25 is mounted on the inner face of the wall and provided with a notch 26 for engagement with the pin. In order to control the movements of the bolt 25 a suitable screw 27 extends through the door and is positioned with its head on the exterior so as to form a handle for moving the bolt.

Secured to the inner wall of the door are the contact fingers 28 which are positioned in the rear of the contact springs 29 and these fingers and springs form the terminals of an electrical alarm circuit and are connected as shown in Figs. 2 and 3 to suitable conductor wires 30 which may lead to any suitable signaling mechanism.

Passing now to the description of the lock reference will be had particularly to Figs. 6 to 11 inclusive in which the lock casing is designated generally by the numeral 31 and consists of the bottom wall 32 having a side and end walls 33 formed thereon. The bottom wall 32 is formed with the opening 34 for the reception of the key pin 35. A similar opening 36 is formed in one of the side walls 33 as will be clearly seen upon reference to Fig. 10. A guide pin 37 projects into the casing from the bottom wall 32 and slidably mounted on said guide pin is the inner end of a lock bolt 38 the opposite end of which slides through an opening 39 formed in the side wall 33 opposite that provided with the opening 36. A suitable arm 40 is formed integrally with the bolt 38 and projects outwardly therefrom as illustrated in Fig. 7 and this arm is provided with the inclined face 41 for engagement with the alarm releasing pin to be more fully hereinafter described. Suitable tumblers 42 are pivoted on the pin 37 and are provided with wards for engagement with the lock pin 43 carried by the bolt. These tumblers are spring pressed in the usual manner as illustrated at 44, while the side of the lock bolt opposite that carrying the arm is provided with the recess 45, the walls of which are adapted to be engaged by the bit 46 formed adjacent the inner end of the stem 35 of the key.

The partition wall of the lock is designated by the numeral 47 and is provided with an opening 48 for the reception of the cylinder of the lock and a suitable slot 49 is formed adjacent the opening and in communication therewith and this slot is arranged so that its longitudinal axis intersects the longitudinal axis of the body of the lock. A rectangular stud 50 projects upwardly from the wall 48 and forms a guide for the sliding bolt 51 carrying at its outer end the insulated head 52 which is adapted to engage the contact springs 29 to move the same into engagement with the fingers 28 when unlocking the lock. The head 52 is provided with a stem 53 which is slidable through the opening 36 as will be seen upon reference to Fig. 10 and one edge of the bolt 51 is provided with a pair of spaced notches the walls of which form the shoulders 54 which are adapted to be engaged by the arm 55 as will be clearly seen upon reference to Fig. 6. This arm 55 is pivotally connected to the plate 47 by means of the screw 56 and is provided with the stud 57 which projects through an arcuate slot in the wall 47 for engagement with the arm 40 on the lock bolt 38. A suitable spring 58 normally tends to move the free end of the arm 55 into engagement with the shoulders 50 while a spring 59 engages against a stud 60 carried by the bolt 51 to normally tend to move said bolt inwardly and the head 52 away from the contact springs 29 hereinbefore referred to. The side of the bolt 51 opposite that formed with the shoulders 50 is provided with the recess 61 which is adapted to receive the bit 46 of the key when the lock is being manipulated. As shown in Fig. 6 it will be seen that upon movement of the key the bolt 51 will be moved outwardly so that the head 52 engages the contact springs 28 and it will be seen that the head will be held in engagement with said springs by means of the arm 55 engaging against the shoulder 50 farthest away from the head of the bolt 52.

The cover plate for the lock is best illustrated in Fig. 8 and is provided with the opening 62 which alines with the opening 48 so as to receive the cylinder of the lock. A suitable slot 63 communicates at one end with the opening 62 and extends radially therefrom in a plane at right angles to the longitudinal axis of the plate. This slot is adapted to admit the bit of the key into the lock. Formed in the plate near the opening is a suitable arcuate slot 64 for the reception of the releasing pin 65 which projects

through the plate and is adapted to be engaged at its outer end by the eccentric portion 21 of the disk 20. The inner end of the releasing pin 65 is connected to the pawl 66 one end of which is pivoted to the screw 67 while the opposite end carries the stop 68 for coöperation with the stops carried by the body or flange of the cylinder. A suitable spring 69 is attached to the plate and its free end bears against the pawl 66 so that the stop 68 will be normally held against the periphery of the flange of the cylinder as will be clearly seen upon reference to Fig. 8.

The cylinder hereinbefore referred to is best illustrated in Fig. 11 and consists of the cylindrical body 70 provided with the longitudinally extending slot 71. This slot 71 terminates short of the lower end of the cylinder to form the shoulder or wall 72 as clearly illustrated in the drawings. A longitudinal bore 73 extends axially through the cylinder 70 and a groove 74 extends from the terminal of the slot to the end of the cylinder and communicates with the bore 73 for the accommodation of the bit of the key when the same is in the lock chamber. Formed integrally with the cylinder at a point slightly above the shoulder 72 is the flange 75 provided at diametrically opposite points with the outwardly extending stops 76 which are adapted to engage the stop 68 of the pawl 66 to prevent rotation of the cylinder beyond a predetermined point. The flange is provided with the slots 77 which are arranged to aline with the slot 71 and these slots are adapted to accommodate the bit of the key when the same is in place. The shoulder 72 hereinbefore described forms a stop to limit the inward movement of the key should the cylinder become reversed and it will thus be seen that the key could not pass farther into the lock than into the contact forming chamber thereby preventing the lock from being operated unless the cylinder is in proper position.

In the operation of the lock it will be seen that the same is assembled in the manner illustrated in the drawings and assuming the lock to be in locked position it will be evident that the key is first inserted into the lock and will pass into the cylinder until it engages the wall 47 whereupon the revolving of the key will move the bolt 51 outwardly so that the head 52 engages the contact springs thereby sounding an alarm. The outward movement of the bolt 51 will cause the arm 55 to engage the shoulder 50 farthest from the head 52 thereby locking the bolt in projected position. Simultaneously with the movement of the key in a direction as to retract the bolt 38 and move the bolt 51 outwardly the flange 75 is moved into such position as to cause the stop lug 68 to engage one of the lugs 76 and prevent further rotation of the cylinder, in the releasing direction. The outward movement of the bolt 51 will also lock the key against rotation in a reverse direction as the bit of said key will engage against the edge of said bolt and thus it will be seen that the key cannot be removed and the alarm shut off until the escutcheon plate 17 is rotated. The movement of the escutchen plate 17 will cause the eccentric portion 21 of the disk 20 to engage the releasing pin 65 and it will thus be seen that the key may then be rotated until the bit alines with the slot 49 in the plate 47 at which time the key will move farther into the lock and contact with the tumblers 42 and the wall of the recess 45 thereby moving the lock bolt into unlocking position. Simultaneously with the movement of the lock bolt into unlocking position the arm 40 contacts with the pin 57 thus releasing the arm 55 and permitting the bolt 51 to move inwardly under the influence of the spring 59 and thereby move the head 52 away from engagement with the contacts 28 thus discontinuing the alarm circuit. It will thus be seen that the lock can be released and will give the alarm and should any person not familiar with the combination attempt to operate the lock the alarm will be sounded. In event however should a person familiar with the operation of the lock desire to unlock the same the key is inserted as previously described whereupon the escutcheon plate is revolved in a counter-clock-wise direction to remove the releasing pin 65 in such a direction as to release the key and allow the same to turn in a counter-clockwise direction until its bit alines with the slot 49 whereupon the key is moved farther into the lock and then turned in a clock-wise direction so as to release the bolt 38 from lock bolt 7. It will thus be seen that the lock may be released without operating the alarm mechanism. Should the cylinder become reversed and the lock be in locking position it will be seen that the lock cannot be released as the shoulder 72 formed by the end of the slot will prevent inward movement of the key into the lock releasing chamber and yet the alarm mechanism will be operated upon turning of the key.

In order to further assist in baffling an unauthorized person should he attempt to enter the safe the bolt 25 is provided and it will be seen that in order to rotate the escutcheon plate the bolt must be moved so as to disengage the stud 24.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that certain minor changes in the construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the inenvtion as claimed.

What is claimed is:—

1. A lock of the class set forth including a bolt retracting and projecting means adapted to be operated by a key and manually controlled retractable means normally preventing the key from being engaged with the first named means and also preventing the key from being withdrawn after the bolt has been retracted.

2. A lock of the class set forth including a bolt retracting and projecting means adapted to be operated by a key and manually controlled retractable means normally preventing the key from being engaged with the first named means and also preventing the key from being withdrawn after the bolt has been projected.

3. A lock of the class set forth including a bolt retracting and projecting means adapted to be operated by a key and manually controlled retractable means normally preventing the key from being engaged with the first named means and also preventing the key from being withdrawn after the bolt has been retracted or projected.

4. A lock of the class set forth including a bolt retracting and projecting means adapted to be operated by a key, manually controlled retractable means normally preventing the key from being engaged with the first named means, said manually controlled retractable means also preventing the key from being withdrawn after the bolt has been retracted or projected and independent manually controlled means for releasing the retractable means.

5. A lock of the class set forth including a bolt retracting and projecting means adapted to be operated by a key, manually controlled retractable means normally preventing the key from being engaged with the first named means, said manually controlled retractable means also preventing the key from being withdrawn after the bolt has been retracted or projected and a manually released latch for releasing said retractable means.

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

MANOEL E. GONSALVES.

Witnesses:
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BENNETT S. JONES.

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