

May 11, 1937.

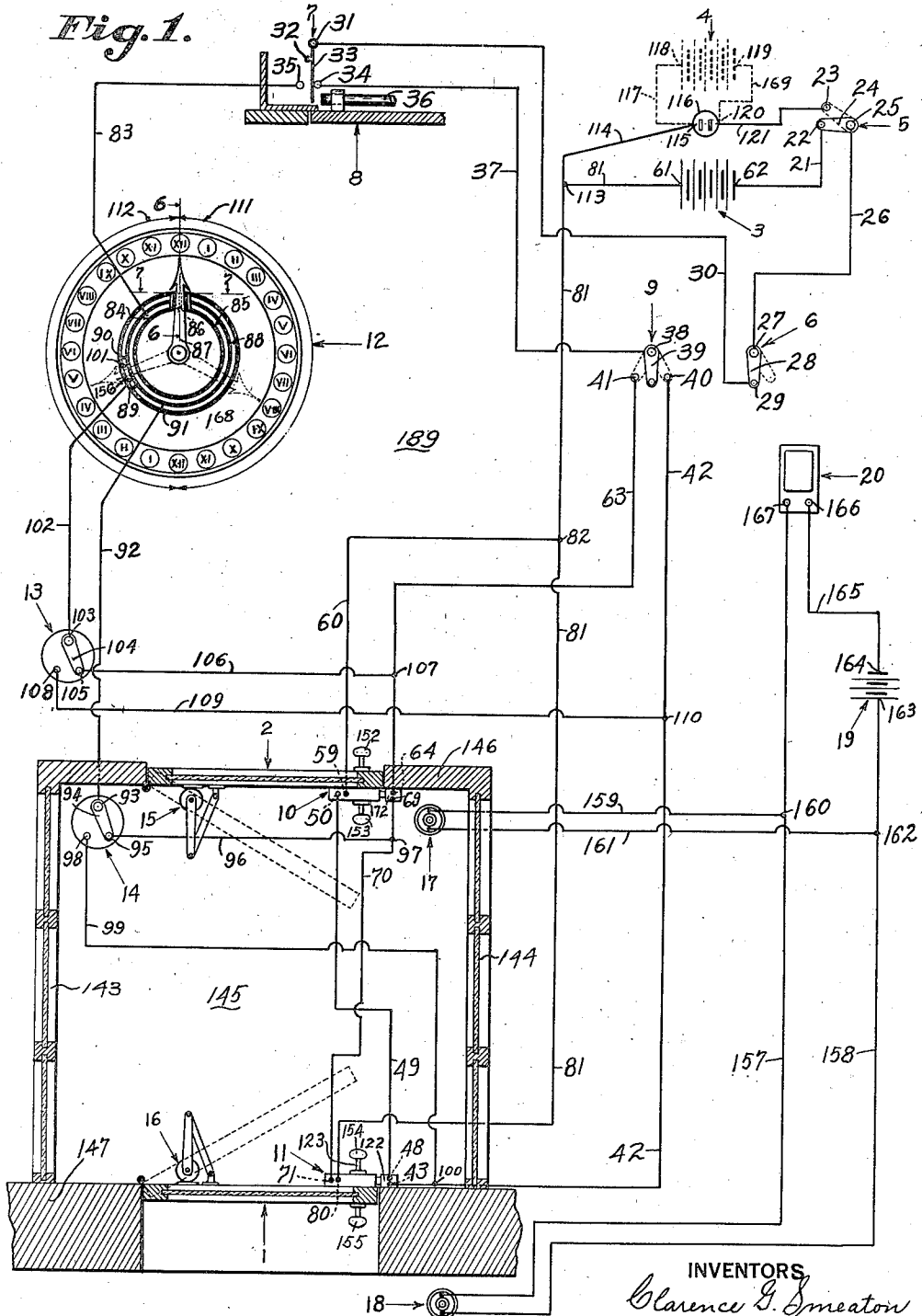
C. G. SMEATON ET AL

2,079,824

UNIT FOR BANK PROTECTION

Filed May 6, 1932

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

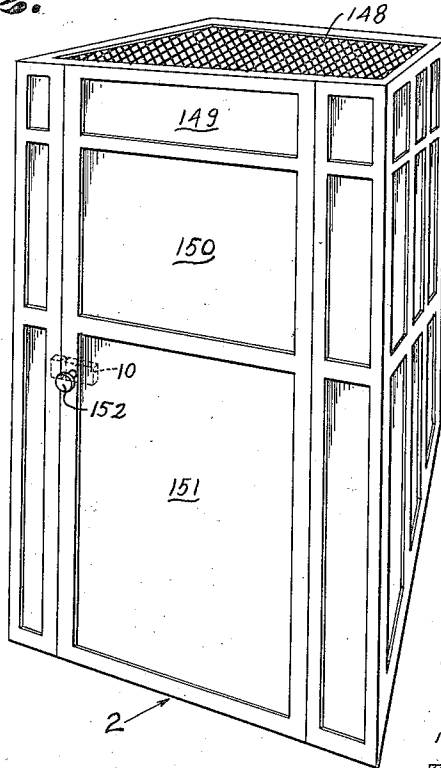


Fig. 7.

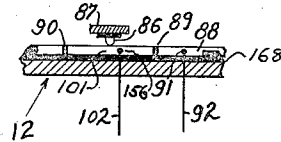


Fig. 6.

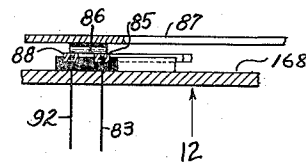


Fig. 5.

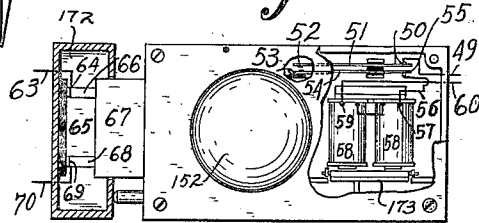


Fig. 3.

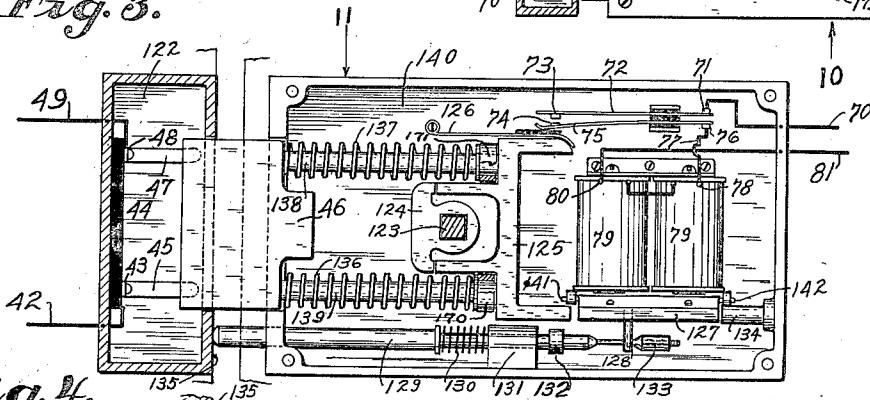
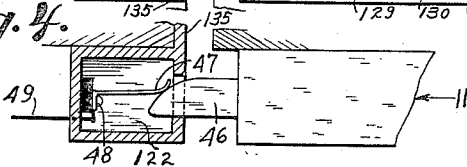


Fig. 4.



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UNITED STATES PATENT OFFICE

2,079,824

UNIT FOR BANK PROTECTION

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Application May 6, 1932, Serial No. 609,586

23 Claims. (Cl. 20—1.01)

This invention relates to an improvement in bank protection.

It is the object of the invention to control the entrance and exit from banks for the entrapment in a bullet-proof enclosure of any person or persons seeking to enter or leave the bank building and suspected or known to have unlawful intent.

More specifically, it is proposed to provide a bullet-proof room having two doors which must be passed successively by all persons entering or leaving the bank building, the opening of either door during banking hours being absolutely dependent upon the closing of the other door and the actuation of a remote control by some person within the bank.

It is a further object of our invention to provide means controlled by the opening and closing of the bank vault to vary the operation of the doors of the entrance enclosure or trap, whereby a key-control is substituted for the above mentioned remote control in order to permit the entry and departure of authorized persons prior to and subsequently to normal banking hours providing the bank vault is closed.

In the drawings:

Figure 1 is a diagrammatic view of a protective device embodying the invention, the safety entrance trap being illustrated in horizontal cross section in its proper relation to the various electrical devices and circuits utilized in the control of the trap.

Figure 2 is a view showing in perspective a typical embodiment of the safety entrance trap per se.

Figure 3 is an enlarged detail showing partially in section and partially with the cover removed an electrically controlled lock of the type diagrammatically illustrated in Figure 1, the lock parts being shown in side elevation.

Figure 4 is a fragmentary detailed view in plan of a portion of the lock mechanism shown in Figure 3, a portion of the keeper casing being shown in horizontal section.

Figure 5 is a view on a reduced scale showing partially in side elevation and partially in section a lock mechanism corresponding to that of Figures 3 and 4 as applied on the outer door of the entrance trap.

Figure 6 is a sectional view on the line 6—6 of Figure 1 showing a detail of the time-clock switch.

Figure 7 is a sectional view of the time-clock switch taken on line 7—7 of Figure 1.

Like parts are designated by corresponding ref-

erence characters throughout the several views.

The entrance trap per se comprises a bullet-proof or bullet-resisting vestibule 145 enclosed by the front wall 147 of the bank building and by walls 143, 144 and 146 which are constructed of bullet-resisting materials. The panels 150 and 151 may be of bullet-proof glass, if desired, and the ceiling or top of the vestibule may be made of a bullet-proof mesh 148, as shown in Figure 2. The doors 1 and 2 in walls 147 and 146, respectively, are likewise constructed of bullet-resisting materials. Both doors preferably open into the interior vestibule 145 in order to make it more difficult for a person trapped therein to force the door open.

Both doors are preferably closed automatically by conventional door closers 15 and 16. The locks 10 and 11 with which the respective doors are provided include bolts 46 automatically pressed by springs 136 and 137 into locking engagement with the keeper casing 122 when the doors are closed, as shown in Figures 3 and 4. When it is desired to open the door, the bolts 46 are retracted from keepers 135 by turning the appropriate knobs 152, 153, 154 or 155, which act through the squared shaft 123 and rocker member 124 upon yoke 125 to which the appropriate bolt 46 is connected by rods 138 and 139 upon which the springs 137 and 136 are wound. The bolt cannot be withdrawn, however, unless the armature 127, pivoted at 141 and 142 is electromagnetically withdrawn from the path of the yoke by means of the magnets 79 controlled through mechanism hereinafter to be described.

The electrical control mechanism

Current from a primary source 3 or an alternative energy source 4 is supplied for the operation of the electric controls. It is important to note that current is essential to the operation of the device and if the wires are cut, as is frequently the practice of bandits, none of the doors may be operated and no person can enter or leave the bank until the circuit is reestablished. The switch 24 determines whether the current shall be taken from the primary source 3 or from the receptacle 116 into the contacts 115 and 120 of which the wires 117 and 169 of the energy source may be plugged.

The master switch 6 includes the contact lever 28 establishing connection between contacts 27 and 29 and adapted when open to interrupt current from all sources, thereby making it impossible to operate either door.

Means is provided whereby the control of the

main doors 1 and 2 of the trap or vestibule 145 is varied depending on whether the bank vault is open or closed. The door 8 represents the door of the vault and 36 is the bolt thereof. The conductor 30 leads from the master switch 6 to the vault switch 7, which has a switch lever 32 disposed in the path of bolt 36 and normally engaging contact 34. When the bolt 36 is thrown to lock the vault, the lever 32 is swung around to engage contact 35.

Assuming the bank vault door to be unlocked or open, as shown in Figure 1, current passes through switch 7 to switch 9 which is directly under the control of some responsible person such as the bank cashier. A normally centered lever 39 may be swung in either direction to make contact between the live terminal 38 and the terminals 40 and 41 to unlock either door 2 or door 1, respectively. The possibility of turning the knob to open either door, however, does not depend entirely upon the operation of switch 9. It is also made to be dependent upon the fact that the other of the two doors is locked at the time.

Thus, the wire 42 is shown in Figure 3 to lead to a terminal 43 and contact 45 within the chamber 132 of keeper 135. The current passes through bolt 46 to another contact 47 and terminal 48 within said chamber, and thence through wire 49 to the lock of door 2 (see Figure 5). The conductor 49 connects with a jack 50 having a contact prong 51 and contact 52 disposed adjacent a second contact 53 carried by contact arm 54. An insulated lever such as that shown at 126 in Fig. 3 rests upon a yoke such as that shown at 125 in Fig. 3 and upon the initial movement of the yoke to unlock the door 2 closes contacts 52 and 53 so that if the wire 49 is energized through the circuits already described, the current will pass through terminal 55 and conductor 56 to terminal 57 of the magnets 58. The return circuit is completed through terminal 59, conductor 60 and conductor 81 to the battery or source of electrical energy.

Conversely, if the teller desires to open door 1, he will move the switch lever 39 of switch 9 from its normal central position, as shown in Figure 1, to a point of engagement with contact 41. Thereupon, conductor 63 will energize the contacts within the keeper chamber 172 of the lock on door 2 (see Figure 5). If the bolt 67 of the lock on door 2 is closed, the current will pass from terminal 64 through contact 66 and bolt 67 to contact 68, terminal 69 and conductor 70. This conductor in turn leads to the magnet of door 1, as shown in Figure 3, the wire 79 being connected at 71 with a contact arm 72 carrying contact 73. The contact 74 of spring arm 75 will be lifted by lever 126 to engage contact 73 when the first movement of the knob is effected, thus transmitting current through terminal 76, conductor 77 and terminal 78 to the magnets 79 and back through terminal 89 and conductor 81 to the source of energy. It will be understood that the energization of either of the magnets 58 or 79 will attract the armature 173 or 127, respectively, thereby pivoting said armature out of the path of yoke 125 and permitting said yoke to be retracted to withdraw the bolt.

The sole purpose of providing the contacts 73 and 74 in the circuit to be engaged by the initial movement of the bolt is to economize on current consumption so that no current will be lost through the closing of the teller's switch at 9

except during the momentary actuation of the bolt by a person opening the door.

Summary of operation during banking hours

The circuit including push buttons 17, 18, battery 19, buzzer 20 and conductors 157, 158, 159, 161 and 165, and connections 160, 162, 163, 164, 166 and 167 are merely means by which any one desiring admission to the bank may attract the attention of the operator in charge of switch 9. In the normal use of the system the operator will move the contact 39 of switch 9 to engage contact 41 for the opening of door 1 or contact 40 for the opening of door 2, depending on whether the person desiring to traverse the trap is going in or out of the bank. When the switch 9 is closed, such person can open the door, giving him access to the trap providing the other door is both closed and docked.

When the person entering the trap releases his hold of the handle by means of which he has retracted the bolt on the first door, the bolt will spring out toward the position which it occupies when closed. While the door is open, however, the pin 129 will have been actuated by a spring 130 to an advanced position in which the cam 133 carried thereby will engage a finger 128 on armature 127 (or 173), as the case may be, this mechanically holding the armature out of the path of yoke 125 until the door has again closed. This permits the bolt to be retracted by the customary strike plate of the keeper in order that the door may lock automatically behind the person entering the bank. As soon as the door is locked, the pin 129 is again retracted, by contact with the strike plate, to the position shown in Figure 3, to release finger 128 and allow the armature to block the unlocking movement of the bolt.

It is only necessary for the plunger 129 to hold the armature 127 out of the path of yoke 125 until the bolt 46 strikes the latch plate. As soon as the bolt strikes the latch plate the yoke will move behind the armature 127 and the function of the pin 129 is no longer needed. Since the bolt projects beyond the pin it will strike the latch plate well in advance of the pin, and it is only after the bolt has been sufficiently retracted by the latch plate so that it can no longer be opposed by the armature 127 that the cam action of the latch plate on the pin retracts the pin.

The first door being locked behind the person passing through the trap, the operator in charge of switch 9 must swing the switch to the second position before the second door can be opened. As above noted, even though the operator switch 9 be in its second position, the second door cannot open until the first door is closed and locked.

It will be obvious that if a theft has occurred in the bank, the thief cannot escape through the vestibule 145 without the cooperation of the operator. He cannot fix the switch 9 to permit his passage through both of the doors because the system requires that switch to be moved after the opening of the first door and preliminarily to the opening of the second. If a number of criminals leave one of a band to operate the switch 9, there is no means by which he can escape unaided. Moreover, after the thief has entered the vestibule 145 and has closed the inner door 2 as a prerequisite to the opening of the outer door, there is no means by which he can escape from the vestibule except with the cooperation of the operator in charge of switch

9. The operator, at this time, is fully protected from the person within the vestibule and such person may, therefore, be held in perfect safety to await the arrival of the authorities.

Operation when the vault is closed

When the vault is closed, i. e., during hours other than banking hours, the system is controlled by a time-clock switch so that the use of a suitable key will permit the bank employees to enter the bank at the proper time and to leave the bank at the proper time. The system is so organized that even the use of the proper key will not permit any person to enter the bank except at those hours during which entry to the bank is normal and proper. Neither will the key permit any person to leave the bank except when it is proper for bank employees to be leaving.

The bolt 36 of the vault door 8, when locked, engages contact lever 32 of switch 7 with contact 35 of said switch, thereby energizing conductor 83 instead of conductor 37. This conductor leads to the commutator ring 85 of the time-clock switch 12. Contact 156 is adjustable about the hub of clock-hand 87 to be engaged by a brush 86 carried by the hand when the hand registers with said contact 156. A wire 102 leads from the adjustable contact 156 to the switch 13, which is preferably key-controlled. This switch, when unlocked by the proper key, and when connected into the circuit by means of the vault door switch 7 and the time switch 12, is shunted across switch 9. Its terminal 105 is connected by wire 106 and connection 107 to the conductor 63, its terminal 108 is connected by wire 109 and connection 110 to wire 42. Thus, this key control switch enables the doors of the vestibule to be opened in proper sequence for the release of the bank staff during the period of time in which it is proper for the staff to be leaving the bank.

At closing time after the vault is locked switch 9 is useless, and switch 13 is put in the circuit by the clock switch 12. The custodian of the keys then operates the doors by means of switch 13, leaving lever 104 engaged with contact 108 while he, or someone of the staff holds door 2 open. With the door open he then re-sets switch 13 to close the circuit to contact 105 and passes into vestibule 145, and as soon as door 2 is allowed to close, door 1 may be opened. Since door 2 remains locked, and enclosure 145 is substantially invulnerable, no objection is apparent in having door 1 remain unlocked, although a conventional night latch may be applied to door 1 if desired to operate in the ordinary manner in addition to the lock 11.

Similarly, an adjustable contact 91 in the clock-switch 12 is connected by conductor 92 with switch 14, and is arranged to be energized by the brush 86 at that hour of the day when it is proper for the staff to have to be admitted to the bank. Switch 14 is also a key-operated switch and the key may be placed in the possession of some person not ordinarily connected with the bank so as to make the presence of that person necessary to the opening of the bank. When the key is inserted in the lock switch 14 the lever 94 of that switch may be used at the proper hours, and assuming the bank vault door to be closed, to energize the respective door locks through terminal 95 and conductor 96, or through terminal 98 and conductor 99.

Door 1 is in condition to be opened by merely turning knob 155 when the night latch, if used, is unlocked, switch 14 being left in the position

shown in Fig. 1, except when the bank is open. The custodian of the keys may therefore enter the vestibule 145, and, using the proper key, move switch 14 to the opposite position in which arm 94 contacts terminal 98. This cuts off the supply of current to door 1 and permits a flow of current to the latch mechanism of door 2, whereupon door 2 may be opened. The custodian may remain at this switch and operate the doors until such time as the staff is admitted, or until the vault is unlocked, after which the doors are operated by someone in charge of switch 9 as above explained.

Summary of results of system

From the foregoing description of the device and its operation, it will be apparent that the system is intended not merely to trap bandits and to protect the contents of the bank, but also to protect the bank officials and employees. Bandits have sometimes resorted to kidnapping bank officials and compelling them to open the bank. The present device is so designed that no official, even though he be possessed of the key to locks 13 and 14, could open the bank except at the proper hours for bank opening. If some person other than a bank official is in possession of the key, the bank official could not open the bank even at the prescribed time.

It is perfectly practicable to leave the switch 9 set normally to energize conductor 63 to permit the free opening of door 1. The switch 9 is preferably so located that any person within the vestibule or trap 145 is in full view of the operator of the switch. If the person desiring admission to the bank is unknown to the operator, the operator may require him to exhibit his credentials through the glass panels of the trap or vestibule before being admitted to the bank at all. If, however, an unauthorized person gets into the bank and commits some unlawful act therein, he cannot escape either by kidnapping the operator of switch 9, or by threatening violence to said operator. The operator has only to comply with the bandits request for the opening of door 2, it being necessary to close this door before door 1 can be opened. As soon, however, as door 2 is closed, the bandit is trapped and he may be held against the possibility of accidental release by opening the master switch at 6.

We claim:

1. The combination with a chamber, of a plurality of doors for said chamber, locks for said doors, and means controlling said locks effective to permit the opening of either lock only when the other lock is closed and when said means is actuated manually from a remote point, the locked status of one door and the remote manual operation being both required concurrently for the opening of either door.

2. The combination with a chamber, of doors having spring locks and arranged to control the admission to and exit from said chamber, manually operable remote control means for selectively releasing either of said locks to permit the opening of the door controlled thereby, and means connected with the lock of one of said doors for rendering the manually controlled means ineffective when said first door is unlocked for releasing the lock of the other door.

3. The combination with a chamber having spaced doors for admission and exit, of locks controlling said doors, releasable means for normally opposing the opening of said locks, electromagnetic operators for said means, circuits leading to said operators for the energization thereof to

permit the opening of said locks, said circuits including switches controlled by each lock to close the circuit to the electromagnetic operator of the other lock only when the first-mentioned lock is locked, and manually operable remote control means for alternatively energizing the respective circuits through the aforesaid switches whereby the energization of the magnetic means to permit the opening of a given lock is concurrently dependent upon the closed status of the other lock and upon the actuation of said remote control means.

4. The combination with a trap having a pair of spaced door casings provided with lock keeper members, of doors fitted to the respective casings and provided with manually operable bolts receivable into said keeper members, switch means closed by said bolts when in their respective locked positions in their respective keeper members, magnetically releasable members for opposing the withdrawal of said bolts from the respective keeper members, circuits including the switch means of one door and the magnetically releasable means of the other, and a remote switch for energizing said circuits, the release of the bolt controlled by a particular circuit being dependent upon the locked status of the bolt of the other door and the concurrent actuation of said remote switch.

5. The combination with a chamber and a vault having a door accessible solely through said chamber, of a door for said chamber and a plurality of separate means alternatively operable for controlling the opening thereof, and mechanism for rendering one of said means operable and the other inoperable in accordance with the status of said vault door as to whether it be unlocked or locked.

6. The combination with a walled enclosure having an entrance door and a vault door accessible only through said entrance door, of a plurality of separate means alternatively operable for the control of the opening of said entrance door, mechanism for rendering one of said means operable and the other inoperable in accordance with the status of the vault door as to whether it be unlocked or locked, one of the means controlling the entrance door being manually operable and the other being time controlled.

7. The combination with a walled enclosure having a door affording entrance to and exit from the enclosure of a vault door accessible only through the door of said enclosure, of remote control means for regulating the opening of the first mentioned door and dependent for its operation upon the opened status of the vault door, and key-controlled means regulating the opening of the first mentioned door and subject concurrently to the control of a time clock and the closed status of the vault door.

8. The combination with a vestibule having two doors provided with locks, of means including a manual remote control and each of said locks for regulating the opening of the other, the opening of either lock being dependent on the actuation of said manual control at a time when the other of said locks is closed, said manual control including means selectively operable to determine the opening of a particular lock, a key-regulated manual control in parallel with said first-mentioned manual control and usable alternately to permit of the opening of either door when the other is locked, a vault door, and means automatically determined in accordance with the

status of the vault door as to whether the first or the second manual control may be used.

9. The combination with a vestibule having admission and exit doors provided with lock bolts normally locked, of a lockable vault door accessible through said vestibule releasable means normally barring the retraction of each said bolt, a plurality of alternately usable manual controls for releasing said means to retract one of said bolts dependent upon the locked status of the other bolt, a time clock regulating one of said means, and means whereby the locking and unlocking of said vault door will automatically determine which of said manually operable remote control means may be effective.

10. The combination with a vestibule having admission and exit doors, means including lock bolts normally locking the respective doors, electromagnetically releasable means for opposing the retraction of the respective lock bolts, switches closed in the locked positions of the respective lock bolts, a circuit including the switch of each door and the electromagnet controlling the releasable means of the other door, a plurality of differently located manually operable switches for energizing the respective circuits, and means automatically determinative as to which of such switches shall be effective upon said circuits.

11. The combination with a vestibule having admission and exit doors, means including lock bolts normally locking the respective doors, electromagnetically releasable means for opposing the retraction of the respective lock bolts, switches closed in the locked positions of the respective lock bolts, a plurality of circuits, each including the switch of one door and the electromagnet controlling the releasable means of the other door, a plurality of differently located manually operable switches for energizing the respective circuits, and means automatically determinative as to which of such manually operable switches shall be effective upon said circuits, said means including a time clock.

12. The combination with a vestibule having admission and exit doors, means including lock bolts normally locking the respective doors, electromagnetically releasable means for opposing the retraction of the respective lock bolts, switches closed in the locked positions of the respective lock bolts, a plurality of circuits, each including the switch of one door and the electromagnet controlling the releasable means of the other door, a plurality of differently located manually operable switches for energizing the respective circuits, means automatically determinative as to which of such switches shall be effective upon said circuits, said means including a time clock together with a third door, and means controlled according to locked or unlocked status of said third door as to whether one of said manually operable switches shall be effective or whether said time clock shall be effective to render effective the other of said switches.

13. The combination with an enclosure of a vestibule comprising the sole means of access to said enclosure and having serially arranged doors providing a path through said vestibule, locks for said doors, and means controlling said locks arranged to permit unlocking of either door only when the other door is locked, said means also including a remote control station and being constituted to prevent unlocking of at least one door until control is exercised from said remote control station.

14. In combination, a pair of locks having keep-

ers, bolts engageable in the keepers, a switch mechanism closed upon the engagement of the bolts in their respective keepers, electromagnetic means controlling the withdrawal of the bolts from their respective keepers, a source of current, a remote control switch having contacts individual to said mechanisms and circuit closing means connected with said source for the alternative energization of said contacts, and circuit connections between said source and said circuit closing means and between said switch contacts, said electromagnetic means and switch mechanism, said connections being operatively adapted to make it a prerequisite to the opening of each lock bolt from its keeper that the other lock bolt be engaged in its keeper and the remote control switch circuit closing means be manipulated to connect the source with the contact individual to the mechanism of the bolt so engaged.

15. The combination with an enclosure having a vestibule provided with doors arranged to obstruct admission to said enclosure except upon a passage through said doors consecutively, of normally closed locks for the respective doors, electromagnetic means controlling the opening of said locks, switch mechanism associated with each such lock and operatively organized therewith to be closed in the closed positions of the respective locks, circuit means connecting the switch mechanism of each lock in series with the electromagnetic control means of the other lock, and a remote control switch having alternatively engageable contacts connected through said circuit means with the switch mechanisms of the respective locks, whereby the passage through said doors consecutively requires as a prerequisite the manipulation of the remote control switch from one contact to the other and the closing of the lock first opened.

16. A bullet-proof compartment providing the means of entry between the front part of a bank or other institution dealing in valuables, and the back part thereof where such valuables are kept, closures in said compartment permitting entry into said compartment and therethrough, electrically operated means for unlatching and permitting an opening of either of said closures, but upon an unlatching of one of said closures preventing an unlatching of the other, and means exterior of said compartment for opening the circuit to said electrically operated means for trapping a burglar or other person in the compartment.

17. A bullet-proof compartment providing the means of entry between the front part of a bank or other institution dealing in valuables, and the back part thereof where such valuables are kept, closures in said compartment permitting entry into said compartment and therethrough, a knob on each of said closures, electrically operated latch mechanism for said closures and initiated by operation of said knob, and an electrical circuit connecting said latch mechanism in series whereby an unlatching of one closure opens the circuit to the other and prevents an opening of said other closure as long as the initially opened closure remains open.

18. A bullet-proof compartment located intermediate the front of a bank or other institution and the rear thereof where valuables are kept, and providing the only accessible means of entry therethrough and to the rear, closures for said compartment whereby access may be had from the front to the rear, latch members for normally maintaining said closures latched, and an elec-

trical circuit connecting said latch members and closures in series, and so arranged that a break or open anywhere in the circuit renders said closures inoperative and prevents entry through said compartment.

19. A bullet-proof cage for banks or other financial institutions providing the means of access to the vaults or other compartments where valuables are kept, said cage being provided with a closure leading thereto and a second closure leading therefrom to the vaults or other compartments, latching means for normally latching said closures, electrically operated mechanism for operating said latches, and a handle on each closure for making and breaking the circuit to said mechanism whereby operation of the handle causes said mechanism to unlatch the closure and permit the same to be opened, and the unlatching of said closure breaks the circuit to the other closure and prevents said other closure from being unlatched as long as the first mentioned closure is in unlatched position.

20. A bullet-proof compartment providing the means of entry between the front part of a bank or other institution dealing in valuables, and the back part thereof where such valuables are kept, closures in said compartment permitting entry into said compartment and therethrough, a handle for each of said closures, and electrically operated means adapted to unlatch and permit an opening of one of said closures when its handle is moved to open position, but upon such unlatching and opening of said closure, prevents an unlatching of the other closure.

21. A bullet-proof compartment providing the means of entry between the front part of a bank or other institution dealing in valuables, and the back part thereof where such valuables are kept, closures in said compartment permitting entry into said compartment and therethrough, a handle and a latch member for each of said closures, and electrically operated switch mechanism associated with said handles and latch members adapted to unlatch and permit an opening of one of said closures when its handle is moved to open position, but upon such unlatching and opening of said closure, prevents an unlatching of the other closure.

22. A bullet-proof compartment providing the means of entry between the front part of a bank or other institution dealing in valuables, and the back part thereof where such valuables are kept, said compartment being provided with at least two normally latched closures, and electrically operated mechanism for unlatching and permitting an opening of one of said closures and preventing an unlatching and opening of the other as long as said first mentioned closure remains open.

23. A bullet-proof compartment providing the means of entry between the front part of a bank or other institution dealing in valuables, and the back part thereof where such valuables are kept, closures in said compartment permitting entry into said compartment and therethrough, an electrical circuit connecting said closures in series whereby an opening of one of said closures breaks the circuit to the other and prevents its being opened as long as the first mentioned closure remains open, and means for opening the circuit to prevent a burglar or other person from entering the compartment or for trapping such person after he has entered the same.

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