Aug. 15, 1961 R. E. McCLELLAN 2,996,322

CABINET DOOR BOLT LOCKING DEVICE

Filed March 6, 1958 4 Sheets-Sheet 1

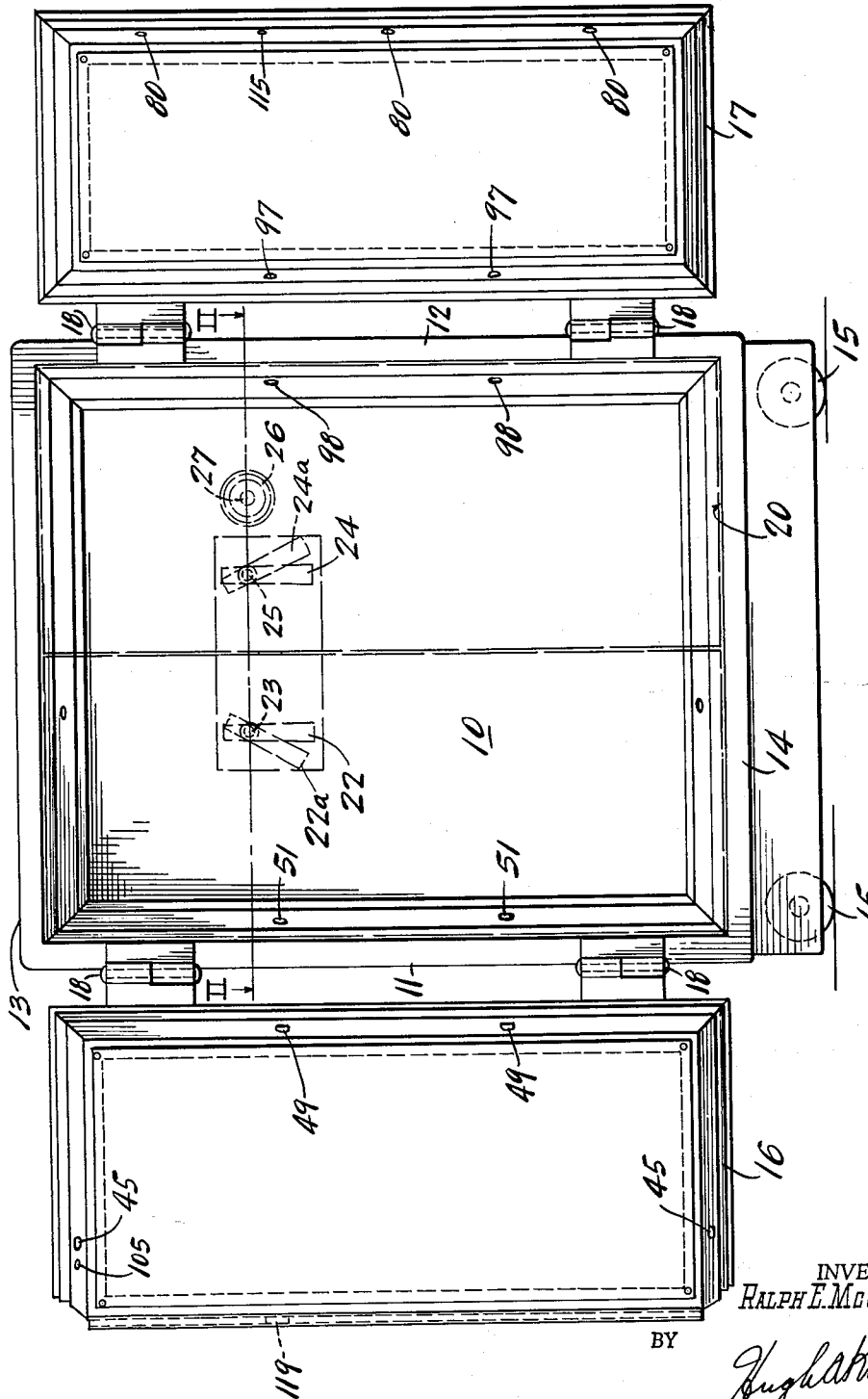


FIG-1-

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CABINET DOOR BOLT LOCKING DEVICE

Filed March 6, 1958 4 Sheets-Sheet 2

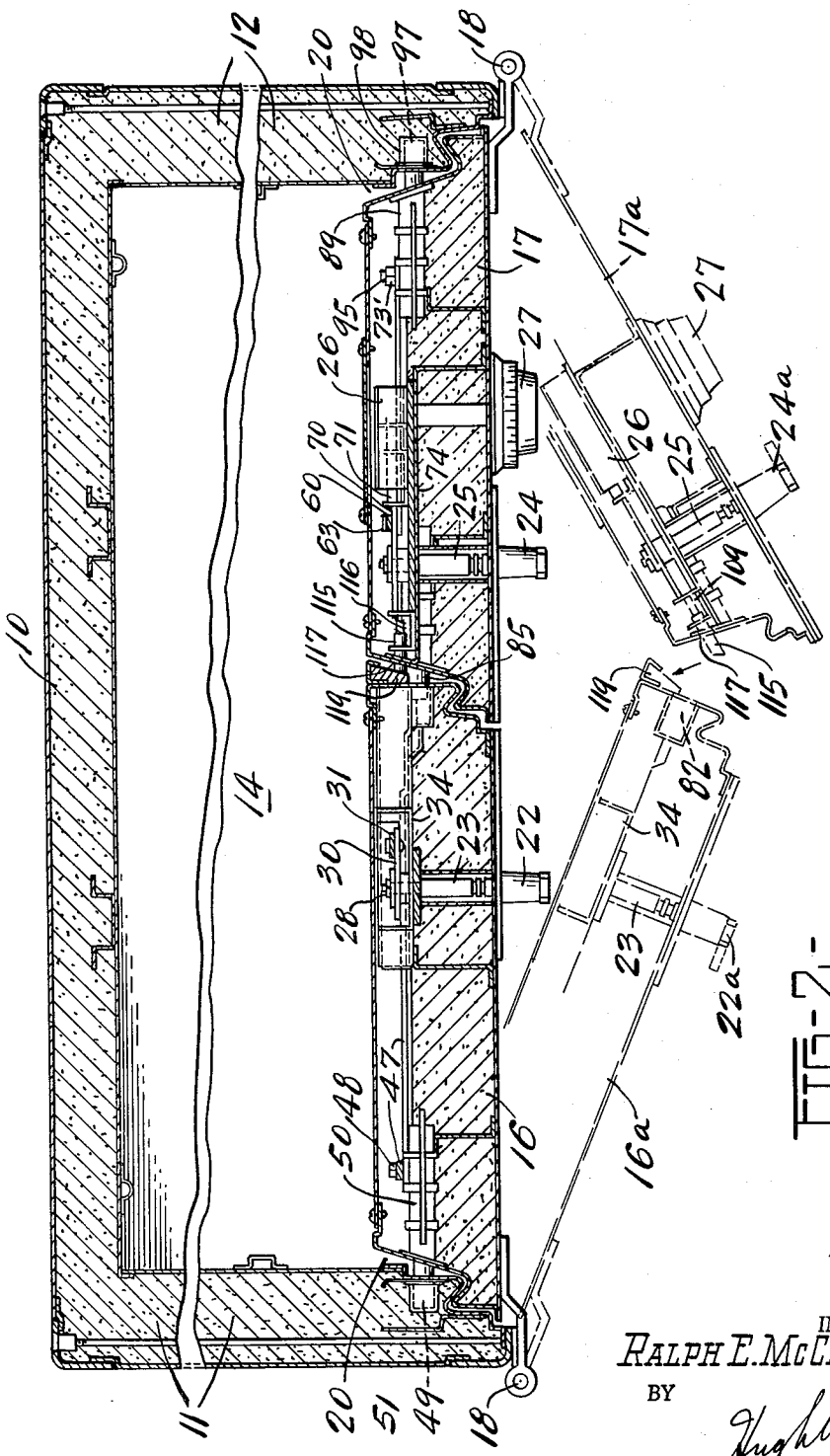


FIG-2-

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CABINET DOOR BOLT LOCKING DEVICE

Filed March 6, 1958 4 Sheets-Sheet 3

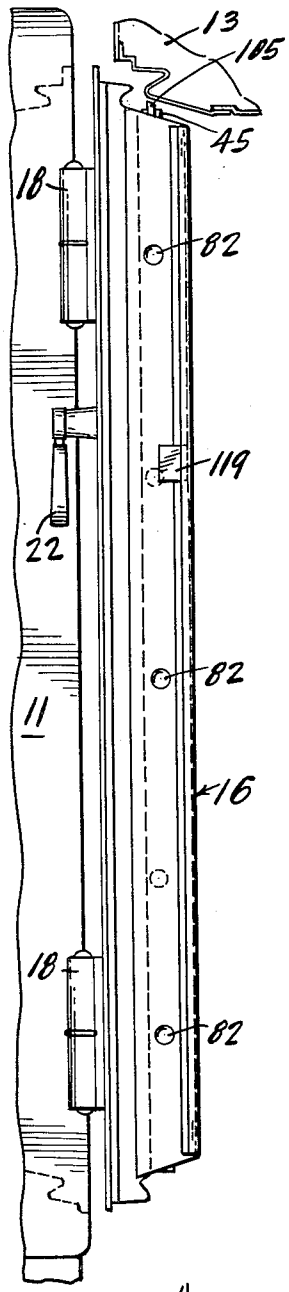


FIG-4-

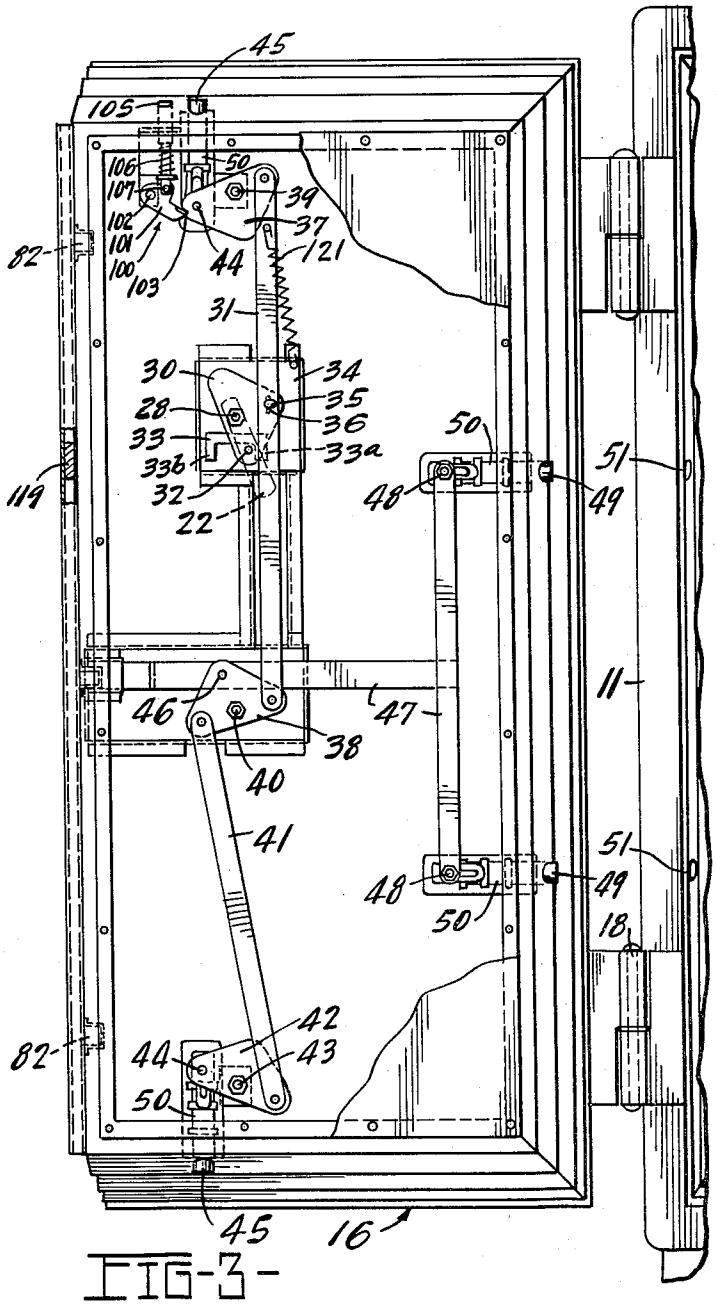


FIG-3-

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CABINET DOOR BOLT LOCKING DEVICE

Filed March 6, 1958 4 Sheets-Sheet 4

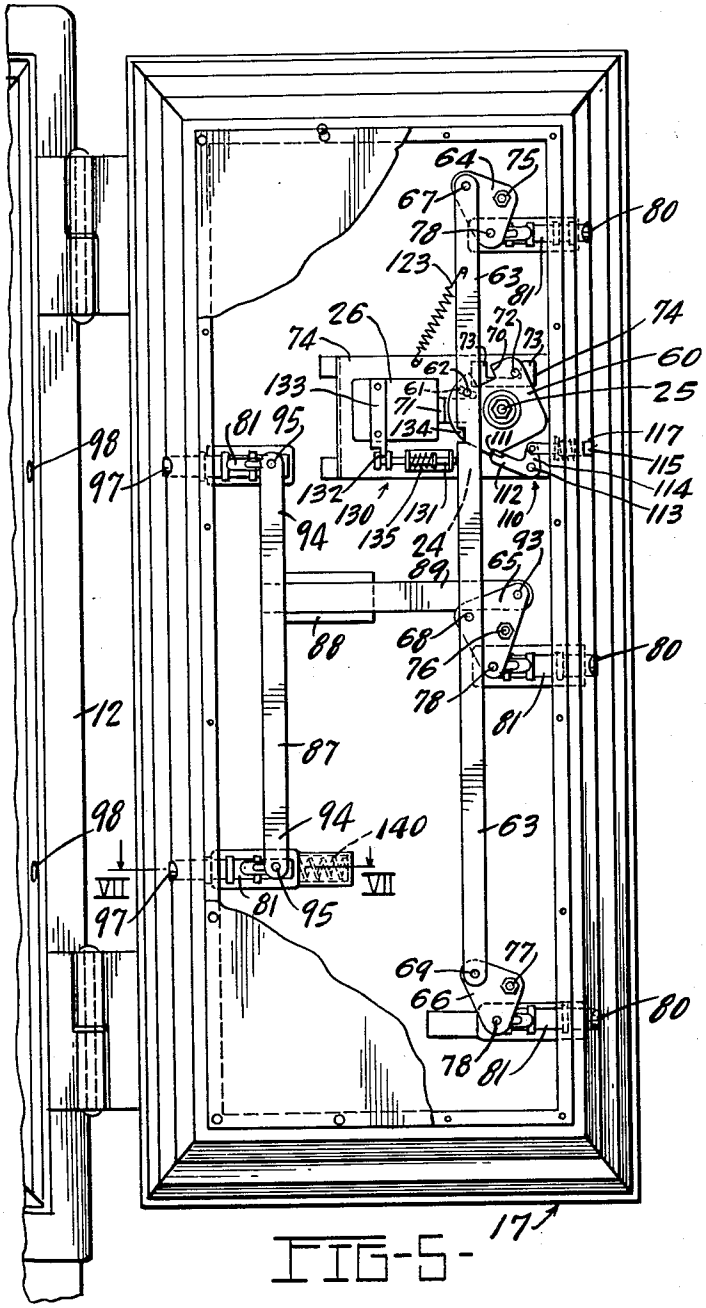


FIG-5-

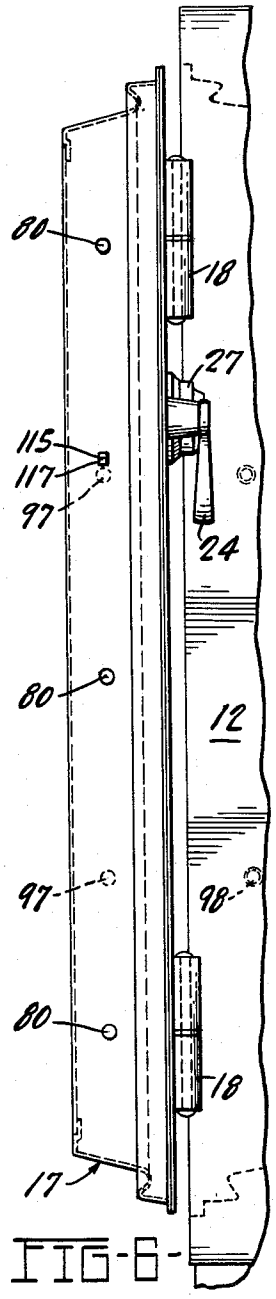


FIG-6-

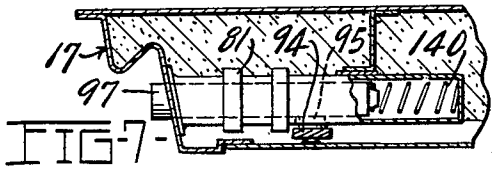


FIG-7-

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United States Patent Office 2,996,322
Patented Aug. 15, 1961

2,996,322

CABINET DOOR BOLT LOCKING DEVICE

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Filed Mar. 6, 1958, Ser. No. 719,677
14 Claims. (Cl. 292—36)

This invention relates to locking mechanisms for protective cabinets or safes. More particularly, it relates to means or devices for preventing jambing of the locking bolts and/or to prevent improper sequential closing and locking of plural doors to such a cabinet, as well as to provide safety relocking features that are operative under certain conditions.

The protective cabinets referred to herein are known more commonly as fireproof safes or vaults, and include those built with widely spaced side walls and a relatively shallow depth in order to provide for easy reach or access to the interior. The doors of such cabinets usually are dual and comprise mating and interacting half sections, each half section being supported for opening or closing movement on hinges at the opposite sides of the safe, with a common meeting line of the doors at or near the center of the front wall of the safe. Ordinarily the doors for cabinets of this type have overlapping stepped engagement with corresponding stepped formations around the door openings and these stepped formations provide at least a partial barrier against tampering and seepage of water or smoke in case of fire. This overlapping stepped construction usually is continued into the centrally meeting edges of the doors and of course necessitates the closing of one door prior to the other.

One of the difficulties arising from the construction outlined above is the fact that one of the doors may become inadvertently closed and locked and thereby interfere with proper closing and locking of the opposite door.

It is an object of this invention to produce an efficient, simple, effective and economic means for precluding the actuation of the bolting mechanism unless the door or doors are in final door bolting position.

Another object of this invention is to provide a lock means for plural doors for a safe which lock means are dependent for operation upon a predetermined sequential order for closing of the said doors.

Another object is to provide a boltwork protective device which deadlocks the boltwork in the unlocked position as a door is opened and releases it automatically as the door is closed.

Another object is to provide a resilient means for automatically re-bolting the doors including when unauthorized tampering is attempted to forcefully unbolt the doors during attempted entry into the safe.

Still another object is to provide a boltwork protective device which automatically deadlocks the boltwork in the bolted position when the lock for controlling the boltwork is destroyed or displaced.

Generally speaking, this invention comprises a protective cabinet having a door opening, a door or doors for closing the said opening, bolting means for the door or doors, a lock for the bolting means, and control means adapted for rendering the bolting means inoperative unless the doors are closed in proper sequence. This control means may comprise an auxiliary latching means operated by the closing of the door or doors against their door jambs and/or each other in proper sequence to unlatch the bolting means for the door or doors. This latching means may engage a specific abutment provided therefor and may include resiliently urged plungers, cams, or the like which cooperate with notches or seats provided on the bolting means or bars, rock plates or levers

thereof when the bolting means is in its unbolted position and its door is also open.

This invention also may comprise means for maintaining a resilient actuating force on the bolting means which will act simultaneously and automatically to rebolt the doors including when forceful tampering is attempted to unbolt the doors, such as the fracture of a lock or of a connection in said bolting means between the bolts and their manually operated handle. It may also comprise a lock mechanism adapted to prevent movement of the bolting means to unbolt the door or doors.

The above mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be understood best by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a front elevational view of one embodiment of this invention adapted to a dual door safe and showing the doors in opened position;

FIG. 2 is an enlarged transverse sectional view of the dual door safe taken along line II—II shown in FIG. 1 showing the doors in completely closed position, some parts of the doors also being shown in phantom lines in partially closed position;

FIG. 3 is a larger side elevational view of the left-hand door of the safe shown in FIG. 1 showing in more detail the bolting, relocking and the latching mechanism of this invention included therein.

FIG. 4 is an edge elevational view of the door of FIG. 3;

FIG. 5 is a larger side elevational view of the right-hand door of the safe shown in FIG. 1 showing in more detail the bolting, relocking and the latching mechanism of this invention included therein;

FIG. 6 is an edge elevational view of the door of FIG. 5; and

FIG. 7 is an enlarged detailed sectional view along the line VII—VII of FIG. 5 showing the construction of a spring loaded relocking bolt.

(I) *Cabinet structure*

The specific embodiment of this invention shown in the drawings comprises a cabinet of a two door front open safe having a rear wall **10** (see FIG. 2), side walls **11, 12**, top wall **13** and bottom wall **14**. Wheels **15** may be provided along the bottom wall **14** to facilitate movement of the safe or cabinet. Dual doors **16, 17** may be mounted on hinges **18** to provide a closure of the open side or opening **20** of the cabinet (FIG. 1). The doors **16** and **17** and walls **10, 11, 12, 13** and **14** may be constructed of inner and outer metal panel sections, with a space between which usually is filled with a fire resistant material such as asbestos or a concrete.

The opening for the doorway usually is fabricated with a stepped or shouldered land area to create a zig-zag or lapped interfitting contact for the outer edges of the doors both in the jambs against the walls of the cabinet and against the meeting edges of the doors (see FIG. 2). In order to continue the shouldered land area cross the central and adjoining edges of the doors, the doors may be constructed with matching land areas for that purpose. This requires that one of the doors must have steps extending progressively away from the door boundary, whereas the opposite door must have similar steps extending progressively inwardly from the door boundary; thus necessitating the closing and bolting of the left hand door **16** prior to the closing and bolting of the other or right hand door **17** and then locking or securing the doors of the safe or cabinet with a lock mechanism associated with the bolt mechanism.

In cabinets of this type, the bolting mechanism may be

similar for both parts of the door and a bolt operating handle **22** and associated stem **23** may be provided for bolting the left-hand door **16** in closed position. A similar bolt operating handle **24** and associated stem **25** may be provided for bolting the other or right-hand door **17** in closed position. A combination lock **26** having a thumb knob **27** may be provided to lock the bolt works of at least one and preferably the right hand or overlapping door of the cabinet against unauthorized entry.

(II) Door bolting means

The handle **22** on the left-hand door **16** may have its stem **23** attached by means **28** (see FIG. 3) with a rock-plate **30** adapted to actuate a bolt operating bar **31** within the structure of the door **16**. A stud **32** on the rock-plate **30** may limit the movement of the rock-plate **30** between limit stops **33***a*, **33***b* of a U-shaped member **33** mounted on a bracket **34** on the door **16**. The rock-plate **30** herein may be provided with a slot **35** adapted to engage a pin **36** on the actuating bar **31** for transmitting an oscillating motion to a series of sub-rock-plates **37**, **38** pivoted on studs **39**, **40** on or inside the door **16**. The sub-rock-plate **38** shown herein is provided with a link connection **41** to another sub-rock-plate **42** pivoted for rocking motion on a stud **43**. The sub-rock-plates **37** and **42** at the top and bottom of the door **16**, respectively, may have a drive pin **44** in engagement with door locking bolts **45** adapted for longitudinal movement into and out of door bolting position. The intermediate sub-rock-plate **38** also may have a drive pin **46** in engagement with a horizontally movable T-shaped bar **47** adapted and interconnected by pins **48** to actuate bolts **49** into and out of door bolting position along the door jamb in the side wall **11** adjacent the hinges **18** for said door **16**. These bolts **45** and **49** may be guided by means of self lubricated sleeves **50** into seats **51** provided in the stepped door jamb formed along the edge of the top and bottom walls **13** and **14**, and side wall **11**, respectively.

Similarly, the door bolting handle **24** and stem **25** in the right-hand door **17** may be in fixed engagement with a rock-plate **60** (see FIG. 5) which is provided with a slot **61** for a pin **62** connecting with a vertically movable bar **63** adapted to move sub-rock-plates **64**, **65**, **66** in limited oscillating movements through pin connections **67**, **68**, **69**, respectively therewith. The rock-plate **60** also may have a notch **70** for alignment with a latch **71** of the combination lock **26**, which latch may be operated to lock the bolt works and rotation of the rock-plate **60** to prevent unbolting of the door by operation of either the handles **22** or **24**, since the door **17** overlaps the door **16** along their adjacent edges. Furthermore, the rock-plate **60** may be provided with a stop pin **72**, which may be mounted for a limited movement between opposed ears **73** on a bracket **74** for the purpose of limiting the throw of the bolts when bolting or unbolting the door. The sub-rock-plates **64**, **65**, **66**, may be pivoted on studs **75**, **76**, **77** attached to or in the door **17**, and may be connected by means of pins **78** to lock bolts **80** which may be guided in a common manner in self lubricated sleeves **81** for engagement with mating door bolting holes or seats **82** in the adjacent edge of the door **16** (see FIG. 4). The bolting mechanism for this right-hand door **17** and its vertically mounted operating bar **63** may also include a T-bar **87**, as T-bar **47** in the door **16**, which may be mounted for horizontal movement in a guide **88**. One of the extremities **89** of the T-bar **87** has a pin connection **93** with the rock-plate **65**, so as to be moved in and out of door bolting position thereby. The extremities **94** of the T-bar **87** have pin connections **95** with the bolts **97** guided in other self lubricated sleeves **81**, which bolts **97** enter seats **98** in the door jamb along the edge of the side wall **12** when the door is closed and the bolting handle **24** is turned to the full line position as shown in FIG. 2.

(III) Bolt latching device

Occasionally these bolting and locking mechanisms are subject to undesirable mishandling through the promiscuous or premature throwing of the bolts when the doors **16** and/or **17** are open, and the consequent possible damage to the doors, the door jambs, and/or the bolting mechanisms when the doors are slammed to closed position while the bolts are thus in extended position. When the doors of the cabinet are in their open position as shown in FIG. 1 or in phantom lines position **16***a* and **17***a* in FIG. 2, the bolting mechanisms may be restrained against such undesired movement, which might result from a premature operation of the bolt handles **22**, **24** to throw and unthrow the bolts unwarrantedly. This restraint may be accomplished by the provision of a bolt latching mechanism which may be incorporated in the bolting mechanism of either or both of the doors to render each particular bolting mechanism and its corresponding operating handle inoperative unless the doors are closed, and furthermore with more than one door, that they are closed in their proper sequence.

As the door **16** is swung into its final closed position, such a latching device **100** shown in FIG. 3 adjacent the sub-rock-plate **37**, is actuated. This latching device provides a positive means for restraining the bolts **45** and **49** in their unlatched position while the door **16** is open, and immediately removes this restraint when the door is closed, to then permit operation of the bolting movement. For this purpose the latching device **100** may comprise a latch arm **101** pivoted upon a pin **102** and may engage a notch **103** on the rock-plate **37**, whereby the rock-plate **37** may be held in bolt withdrawn position when the door is in open position. A latch finger or plunger **105** may project upwardly from the shell or top edge of the door **16** and be adapted to disengage the latch **101** from its notch **103** engagement with the plate **37**, when the door is closed. This occurs when the outer end of the latch finger **105** strikes or abuts the bevelled inner edge of the top wall **13** (see FIG. 4) of the cabinet to depress the finger **105** against a compression spring **106**, and pin connection **107** with the arm **101** to disengage the latch member **100** from the plate **37**, and thereby permit subsequent operation of the door bolting mechanism. Thus, only when the left-hand door **16** is in its completely closed position (FIGS. 1, 2) can the handle **22** be turned from its dotted line position **22***a* to its full line position **22**, and thereby move the bolts **45** and **49** outwardly to bolt the door. Accordingly FIG. 2 shows the left-hand door **16** of the cabinet in its partly closed position **16***a* slightly ahead of or in advance of the partly closed position **17***a* of the right-hand door **17**.

Now with the left-hand door **16** in its final closed position (see FIG. 2) the other or right-hand door **17** may be swung closed, so that a similar bolt latching mechanism **110** (see FIG. 5) may be operated to permit bolting and locking of the door **17**. This latch mechanism **110** is provided to lock the rock-plate **60** against turning movement and thus maintain the bolts **80** and **97** in unbolted position when the door **17** is not completely closed. The rock-plate **60** may be provided with a notch **111** into which an arm **112** of a bell-crank lever of the device **110** may project. A pivot **113** may be provided to permit oscillation of the bell-crank lever of the device **110** between latching and unlatching position. The other arm **114** of the bell-crank lever may be connected to a spring loaded extension plunger **115**, which spring **116** (see FIG. 2) is adapted to urge the plunger **115** outwardly through an opening **117** in the edge of the door **17**. A strike or stop **119** (see FIGS. 2, 3 and 4) may be provided on the adjacent edge of the door **16** adapted to engage the outer projecting end of the latch plunger **115** when the door **17** is being swung to closed position. Thus, the bolt work of or in the door **17** cannot be operated until the plunger **115** contacts the plate **119**

on door **16**, and insures that door **16** is fully closed before the door **17** can be closed and locked.

From the above description it will be seen that the latch mechanism **100** on the door **16**, and the latch mechanism **110** on the door **17**, act individually to prevent turning of the bolt operating handles **22**, **24** respectively, while the doors are unbolted and standing open (FIG. 1); and thus act to prevent extension of their locking bolts when the doors are open and thereby prevent damage to the doors, framing, or bolt mechanisms if the doors are suddenly closed.

Furthermore, while the right-hand door **17** can be closed first, it cannot be bolted and locked in its improper sequence; but may be swung open again to permit prior closing and bolting of the other or left-hand door **16**, because its bolt latching device **110** cannot be operated by contact with the stop **119** on the still open door **16**.

The proper order of operations for closing and bolting the doors **16** and **17** of the safe shown herein, is as follows: the door **16** is first swung to closed position thus causing the plunger **105** to strike the inwardly sloping edge of the top wall **13** of the cabinet, and thereby release the latch arm **101** from the pivoted plate **37**. When the latch arm **101** is so released and the door **16** is in closed position, the bolting mechanism for the door **16** may be operated by turning the handle **22** to its door bolting position **22**. The left-hand door **16** thus may be closed and bolted with the stop **119** thereon at rest and in its final operative position. The right-hand door **17** may now be closed, with its inner edge overlapping the adjacent edge of the door **16**, so that the latch **115** of the right-hand door **17** will be depressed by abutting against the stop **119**, thereby causing the arm **112** to be unseated from the notch **111** to free the rock-plate **60** for rotation and operation of the bolting mechanism for the door **17**. The combination lock **26** may now be set to lock the door bolting mechanism in its bolted position by extending the latch **71** forwardly into the notch **70** of the rock-plate **60** which has now become aligned with the latch **71**.

In the case of a safe or cabinet having a single door, either the mechanism **100** or **110** can be used for latching the bolting mechanism of such a door. The mechanism **110** may be readily adapted to abut against a stationary door jamb instead of against a stop **119** on the edge of another door.

(IV) Bolt relocking devices

The bolting means of a cabinet incorporating this invention may also include one or more other safety features, such as bolt relocking devices to automatically lock, throw or relock the bolting means in the event of unauthorized tampering therewith.

In the first place one or both of the bolt operating bars **31** and **63** may have tension springs **121** and **123** (FIGS. 3 and 5) respectively, connected to them, such as between them and their respective rock-plate brackets **34** and **74**, not only to normally urge or maintain the bolts **45** and **49** of door **16**, and bolts **80** and **97** of door **17** into their door bolting positions automatically bolting doors, but also to move or maintain them into said door bolting positions in the event the door handles **22** and **24**, their respective stems **23** and **25**, and/or their rock-plates **30** and **60** were broken or removed from connection with their bolt operating bars **31** and **63**.

Furthermore, a bolt relocking mechanism **130** (see FIG. 5) may be employed comprising a spring loaded plunger **131** normally held in inoperative position by a pin and groove engagement **132** with a bar **133** mounted on the lock **26** of the door **17**. When the bolting means is in door bolted position, a notch **134** in the side of the bar **63** will be brought in alignment with the plunger **131** of the relocking device **130**. When an attempt is made to tamper with the lock mechanism such as forcefully pounding away or otherwise removing the lock **26** from its normal position, the pin **132** thereon will become disengaged from the groove in the spring loaded plunger **131** and this plunger will instantly move under action of spring **135** to enter the notch **134**, and thus prevent further movement of the bar **63** and accordingly any of its associated door locking bolts **80** and **97**.

Another such safety device may comprise a rebolting mechanism as shown in FIG. 7 in which the individual bolts **45**, **49**, **80** and/or **97** may be preloaded with compression springs **140** arranged to bear against the inward end of the door bolt **97**, etc., and normally tend to urge the bolt outwardly into door bolting position and bolt the door automatically as soon as the latching devices **100** and/or **110** are released by the movement of their respective doors into their closed positions. The pin connection **95** with the bar **94** acts to control the position of the bolt **97** and to hold it in such a controlled position. When the door **17** is closed and bolted, the bars **94**, **87** and **63** act collectively to maintain the bolts in door bolting position, but when an attempt is made to disjoint or sever any of the bolt connections with the bars **63**, **87** and/or **94** in the bolting system in an attempt to unbolt the doors, the springs **140** at each bolt **80** or **97** will immediately act to rebolt any of these bolts which may have become disengaged from their operating bars, either through cutting or otherwise fracturing the bars, studs, or their connecting pins. These spring loaded bolts as shown in FIG. 7 can also be employed for the bolts for the door **16**.

While there is described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of the invention.

What is claimed is:

1. A latching mechanism for a closure for a cabinet having an opening closed by a pair of mating doors, comprising: a bolting mechanism for each of said doors, means for latching said bolting mechanism on at least one of said doors, and control means on said one door responsive to a pre-determined movement of said one door relative to the closed position of said other door for releasing said latching means whereby the bolting mechanism in said one door may be operated.

2. A latching mechanism according to claim 1 including a second latching means on said other door, and a second control means responsive to a pre-determined movement of said other door relative to said cabinet for releasing said second latching means whereby the bolting mechanism of said other door may be operated.

3. A latching mechanism according to claim 1 including a resilient means for normally urging said latching means to engage its corresponding bolting mechanism.

4. A latching mechanism according to claim 1 wherein said bolting mechanism comprises at least one pivoted member and one slidable member; and wherein said latching means is directly engageable with said pivoted member of said bolting mechanism; and including abutment means adjacent the opening closed by said closure engageable by said control means when said closure is closing said opening, whereby said bolting mechanism can be moved into and out of its closure bolting position only when said closure closes said opening.

5. A latching mechanism according to claim 1 in which said bolting mechanism comprises at least one cabinet engaging bolt, means to operate said bolt, and a resilient means associated with said bolt to normally urge said bolt into closure bolting position, whereby any disconnection of said bolt operating means will cause said resilient means to maintain said bolt into closure bolting position.

6. A latching mechanism according to claim 5 including means for blocking said operating means when said bolt is in its extended position.

7. A latching mechanism according to claim 5 wherein said resilient means acts directly on said bolt.

8. A latching mechanism according to claim 5 wherein said resilient means is connected to said operating means.

9. A latching mechanism according to claim 5 including a plurality of said bolts and a separate said resilient means acting directly on each of said bolts.

10. A latching mechanism for a closure for a cabinet having an opening closed by a pair of mating doors, comprising: jambs for and between said doors adapted so that the edge of one door overlaps the other door at said jamb between said doors, a bolting mechanism for each of said doors, a first means for latching said bolting mechanism in said other door, a first control means responsive to the movement of said other door into its closed position relative to its jamb for releasing said first latching means whereby the bolting mechanism of said other door may be operated, a second means for latching said bolting mechanism in said one door, a second control means responsive to the relative movement of said one door into its closed position after said other door is in its closed position relative to said jamb between said doors for releasing said second latching means whereby the bolting mechanism of said one door may be operated.

11. A latching mechanism according to claim 10 wherein said bolting mechanisms comprise at least one jamb engaging bolt in each door, and a resilient means connected to said bolting mechanism in each door normally urging said bolts into their jamb engaging positions.

12. A latching mechanism according to claim 11 including separate said resilient means acting directly on each said bolt.

13. A latching mechanism according to claim 10 including a resilient means for normally urging both said latching means to engage its corresponding bolting mechanism.

14. A latching mechanism for a protective cabinet having an opening closed by a closure, comprising: a plurality of bolts extendable between said closure and said opening when said closure closes said opening, means for operating said bolts, means for latching said bolt operating means when said closure is away from its closed position, control means responsive to a predetermined movement of said closure relative to its closed position in said opening for releasing said latching means whereby said bolt operating means may be operated, connecting means between said bolt operating means and said bolts, and separate resilient means for and acting directly on each of said bolts for normally urging said bolts into their extended positions for locking said closure in said opening automatically when said closure is moved into its closed position and said control means releases said latching means, whereby a disconnection of said connecting means at any point between said bolt operating means and any one of said bolts will maintain all of said bolts operated in their closure locking position.

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