H. G. VOIGHT.

LOCKING DEVICE FOR EMERGENCY EXIT DOORS.

APPLICATION FILED NOV. 4, 1912.

1,069,075.

Patented July 29, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

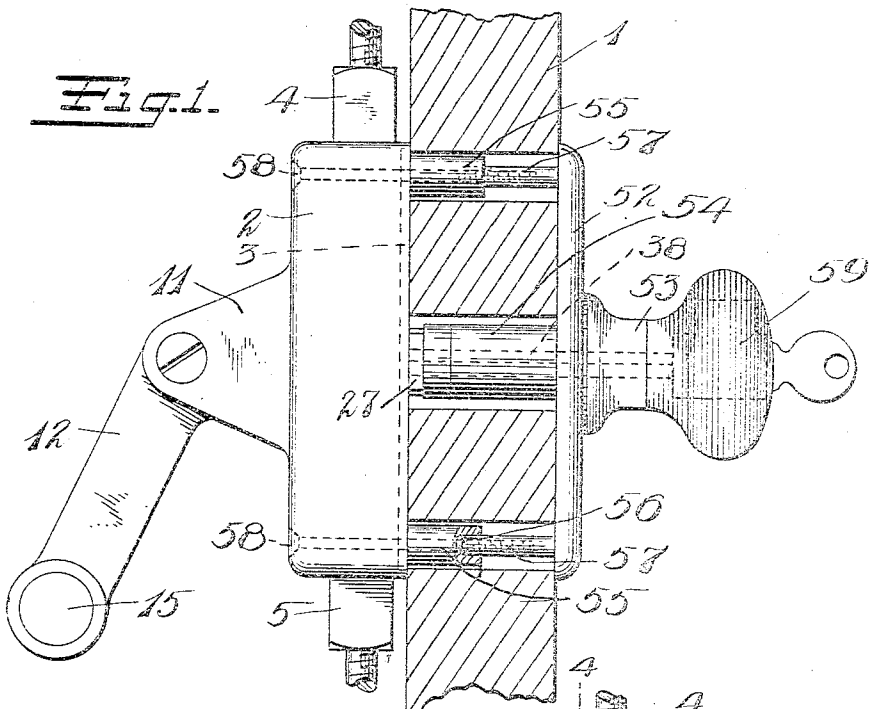
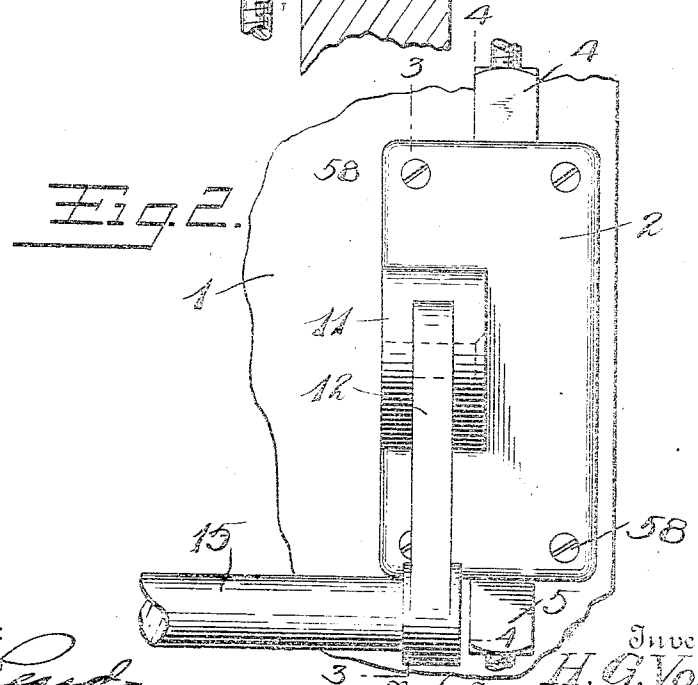


Fig. 2.



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Fig. 3.

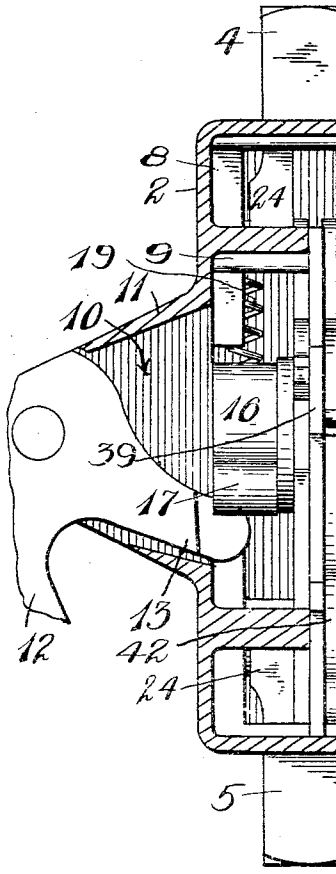


Fig. 4.

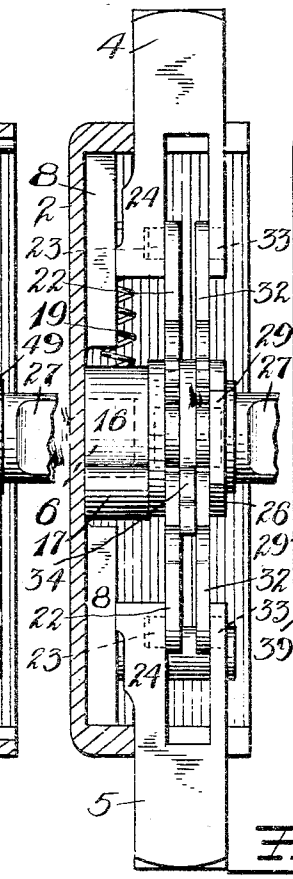


Fig. 5.

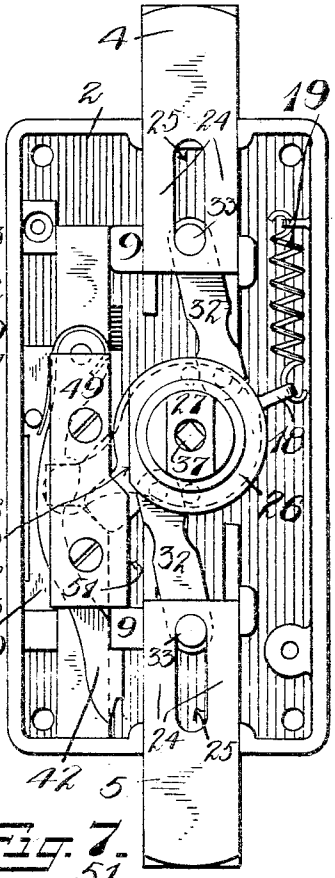


Fig. 7.

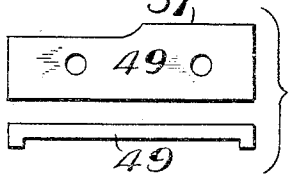


Fig. 8.

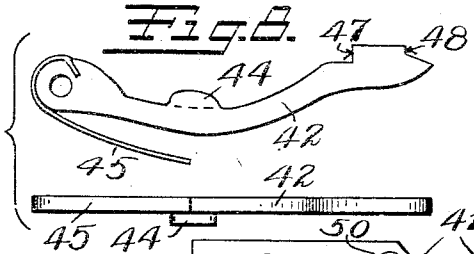
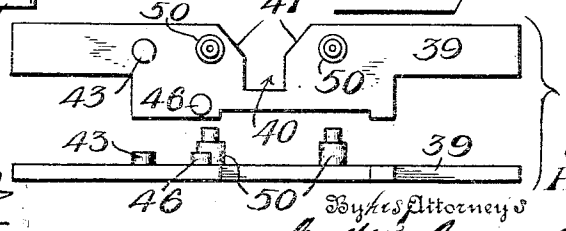


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 9.

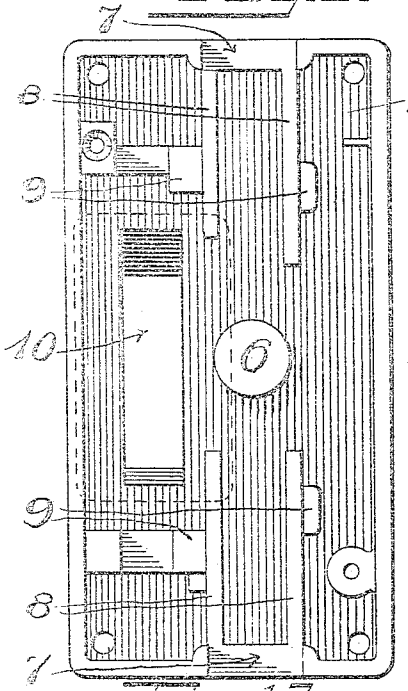


Fig. 10.

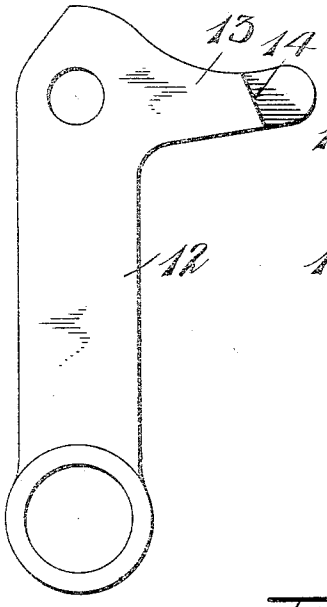


Fig. 11.

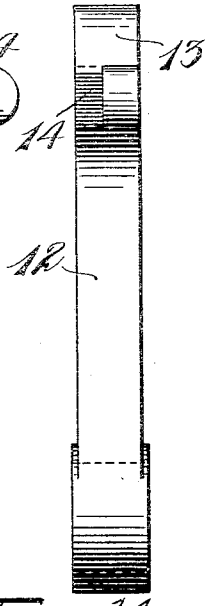


Fig. 12.

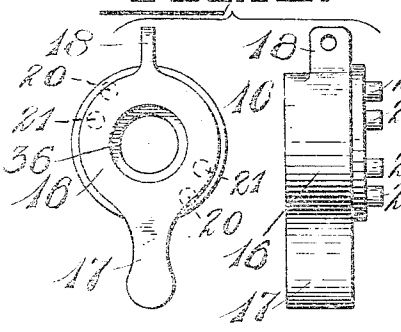


Fig. 13.

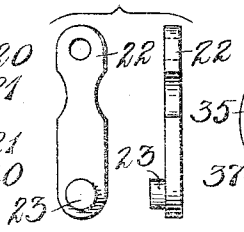


Fig. 14.

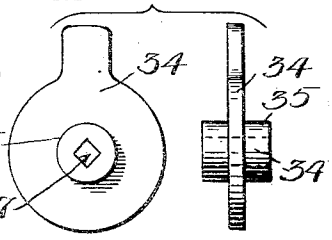
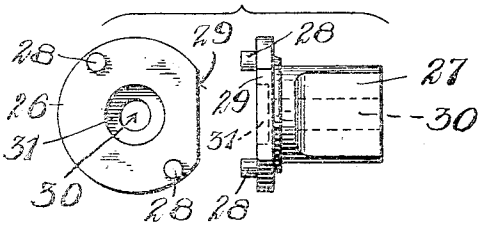


Fig. 15.



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LOCKING DEVICE FOR EMERGENCY EXIT-DOORS.

1,069,075. Specification of Letters Patent. Patented July 29, 1913.

Application filed November 4, 1912. Serial No. 729,329.

To all whom it may concern:

Be it known that I, HENRY G. VOIGHT, a citizen of the United States, residing at New Britain, Hartford county, State of Connecticut, have invented certain new and useful Improvements in Locking Devices for Emergency Exit-Doors, of which the following is a full, clear, and exact description.

This invention relates to locks, and particularly to the so-called "panic bolts" for emergency exit doors such as are commonly used on the exit doors of public buildings, theaters and other places where crowds are liable to congregate. In this type of door, there is grave danger, in the event of panic, that pressure against a door will cause the parts to so bind that the door cannot be opened even though it should swing outwardly. The purpose of the "panic bolt" is to prevent such a condition, the operating parts of the lock being so constructed that the weight of the panic-stricken crowd against the door is utilized to operate the bolt and to permit the door to freely open.

My present invention is designed to provide an improved construction of panic bolt wherein said bolt is freely operable from the interior side of the door and whereby a knob and spindle are provided for operating the bolt from the exterior side of the door, a cylinder lock mechanism being carried by the knob and spindle and being arranged to operate to dead lock the operation of said bolt from the exterior through said knob and spindle, this combination of parts being utilized to concentrate the operating mechanism so that it may be embodied in a comparatively narrow case which may be applied to doors with narrow stiles. Furthermore by my invention the operating parts are contained in two assembled units which are operatively connected by the mere interconnection of the units when applied to opposite sides of the door. These and other advantages will be apparent from the detailed specification following in connection with the accompanying drawings forming part thereof and illustrating a preferable embodiment of my invention.

In these drawings: Figure 1 is a sectional view through a door showing, in elevation, the locking parts applied thereto. Fig. 2 is a fragmentary view in elevation of the inner side of a door showing the lock case and its attached parts secured thereto. Fig. 3 is a vertical sectional view through the lock case detached, taken on the line 3—3 of Fig. 2. Fig. 4 is a similar view taken on the line 4—4 of Fig. 2. Fig. 5 is a view in rear elevation of the lock case with its rear plate removed. Fig. 6 represents in top plan and edge elevation the dead locking slide carried by the lock case. Fig. 7 represents in top plan and edge elevation the blocking plate carried by the locking slide. Fig. 8 is a detail in top plan and edge elevation of the tumbler bar carried by said locking slide. Fig. 9 is a view in elevation of the interior of the lock case with the parts removed therefrom, the back plate of said case being removed. Fig. 10 is a view in side elevation of the hinged operating lever carried by the lock case. Fig. 11 is an end view of the parts shown in Fig. 10. Fig. 12 shows in detail in front and edge elevation, the bolt operating toggle member controlled through said operating lever. Fig. 13 is a detail in front and edge elevation of one of the toggle links connected to the bolt member. Fig. 14 is a detail in front and side elevation of the cylinder lock controlled roll-back for actuating the dead locking mechanism. Fig. 15 is a detail in end and side elevation of a second bolt operating toggle member controlled through the exterior knob.

Referring to the drawings by numerals, 1 indicates a portion of a door to which a bolt is to be applied. 2 indicates a lock case provided with a back plate 3, this casing being intended for application to the interior side of the door. Extending from within this casing at opposite sides thereof are bolt members 4 and 5, being of the "Cremorne" type and arranged to project, one into the top of a door casing and the other into the sill. Any suitable form of bolt head may be employed. In the drawings I have shown only the shank or body of each bolt, since in the present case the invention does not concern the specific construction of the bolt heads.

6 designates a hub formed centrally of the case 2 on its interior, and 7 designates openings formed in opposite ends of the casing in line with the hub, the bolt members 4 and 5 extending through these openings. The inner ends of these bolt members which are contained within the case rest on pairs

of parallel ribs 8 formed in the case and are guided by pairs of spaced lugs 9 located adjacent these ribs.

10 designates an elongated opening in the front of the lock case 2, arms 11 extending outwardly from the front of said case to said opening. Between these arms an operating lever arm 12 is journaled, this lever in form being substantially a bell-crank lever and being pivotally mounted to bring its arm 13 within the case. The end of this arm is preferably shouldered or reduced as at 14.

15 designates a bar carried at one end by the operating lever 12, this bar being shown as broken away, but in practice extending transversely across the inner side of a door and provided with a suitable support for its opposite end, such, for example, as a support similar to that for the lever member 12.

The bolt members 4 and 5 are of the type which is normally pressed outwardly by a spring or analogous means so that they are normally forced into the sockets in the door casing and sill. The bar 15, when pressed downwardly and inwardly, as by a crowd, operates the arm 13 of the lever member 12 to retract these bolts so that the door may be freely opened. The mechanism for effecting this operation of the bolts is as follows. Journaled on the hub 6 of the case is an oscillating toggle member 16 having an actuating arm 17 extending therefrom to a point adjacent and above the end of the arm 13 of the operating lever. An apertured lug 18 extends from the opposite side of this toggle member and a spring 19 connected thereto and to the lock case normally tends to move this toggle member to so position its actuating arm 17, as shown in Fig. 5 of the drawings. Projecting from the inner face of this toggle member 16 are pivot pins 20 and guide pins 21 adjacent thereto, these pins carrying the inner ends of toggle link members 22, the outer ends of these links being provided with pins 23 projecting transversely from said ends. The inner ends of the bolt members 4 and 5 are bifurcated forming complemental arms 24 at the inner end of each bolt. These arms 24 are each provided with an elongated slot 25 therein, the pins 23 of the toggle links 22 extending into the slots 25 in the alined arms 24 at opposite ends of the case. A second oscillating toggle member 26 is provided in alinement with the first toggle member, this second member having a hub portion 27 extending therefrom and provided with flattened sides. The inner face of this second toggle member is provided with oppositely arranged pivot pins 28, and, adjacent one edge, is flattened to form a straight edge 29, the purpose of which will be hereinafter described. A bore 30 extends centrally through the flattened hub 27 and second toggle member 26, and at its inner end is provided with an enlargement 31 forming a hub seat. Pivotally mounted at their inner ends on the pins 28 are toggle members 32 similar in construction to the link members 22, these links 32 likewise having pins 33 extending transversely from the outer ends into the slots 25 of the alined arms 24 at the inner ends of the bolt members 4 and 5, the arms 24 being, of course those to which the links 22 are not connected. The toggle members 16 and 26 and their links are spaced apart, and between these toggle members is mounted a roll-back 34 having hubs 35 projecting from either side thereof and seating in the hub seat 31 of toggle member 26 and in a hub seat 36 formed in the inner face of toggle member 16, the space between the two toggle members being sufficient to afford clearance between their faces and the faces of this roll-back so that the latter may be operated. A squared bore 37 extends centrally through the roll-back 34 and its hub members 35, this bore being designed to receive the squared end of a spindle 38 operatively connected to a cylinder lock mechanism hereinafter described, this spindle extending through and being freely rotatable within the bore 30 of toggle member 26.

I have heretofore referred to the straight edge 29 of the second toggle member 26. This straight edge is designed to coöperate with the following blocking device carried within the lock case so as to block or dead lock this toggle member from operating the bolt members 4 and 5. Mounted and suitably guided within the lock case and lying within the plane of the roll-back 34 is what I will term a dead locking slide 39 provided with a recess 40 in its edge forming abutments 41 adapted to be engaged by said roll-back. Pivotally mounted on the pin 43 carried by this slide is a tumbler 42 having a strike lug 44 projecting therefrom out within the recess 40 and carrying a spring 45 resting against a stud 46 on the slide 39 and normally tending to force this tumbler outwardly to bring its strike lug in the plane of the recess 40. The lower end of this tumbler 42 is formed with shouldered abutments 47 and 48. In the normal projected position of the tumbler, a shoulder 47 engages the under face of a stud 9 and holds the dead locking slide against movement. A blocking plate 49 is carried by the dead locking slide on the shouldered studs 50 thereon, this blocking plate lying in the plane of toggle members 26 and being spaced from the outer face of the slide and tumbler by these studs and having a straight edge extension 51. When the dead locking slide and its blocking plate are moved, this straight edge 51 is positioned to abut against the straight edge 29 formed by the flattened side of the toggle member 26 to dead lock this toggle member

against bolt operating movement. When the roll-back 34 is operated to dead lock the toggle member 26, it engages the strike lug 44 of the tumbler by moving the tumbler inwardly and moving its shoulder 47 away from stud 9. The roll-back then engages one of the abutments 41 on the slide and moves said slide up to bring its straight edge 51 against the straight edge 29 of the toggle member 26, dead locking said toggle member as aforesaid. When the slide reaches this dead locking position, the shoulder 48 of the tumbler snaps over the upper face of the stud 9 and holds the slide against reverse movement until the roll-back 34 is moved in the opposite direction to retract the tumbler and move the slide back to its first position.

Coöperating with the lock case 2 and its parts and mounted on the opposite side of the door, is an escutcheon plate 52 carrying a knob 53 and its spindle 54. The back plate 3 of the lock case 2 is provided with socket studs 55 extending therefrom, these socket studs having apertures extending therethrough and having said apertures enlarged adjacent their outer ends to form seats 56 for the ends of dowel pins 57 carried by the escutcheon plate 52, these dowel pins being formed with threaded bores.

58 designates screws inserted through the lock case 22 from the exterior side thereof and fitting through the bores in the socket members 55 and having a threaded engagement with the interior of the dowel pins 57 so that the parts of the lock can se securely held together.

The spindle 54 of the knob 53 is provided with a bore, the outer end of which is shaped to engage the flattened hub 27 of the second toggle member 26 when the escutcheon plate 53 and its attached parts are secured to the lock case in the manner heretofore described.

A cylinder lock mechanism 59 (indicated in dotted lines in Fig. 1) is carried by the knob 53 and the spindle 38 controlled thereby extends through the bore of the knob spindle and is freely rotatable therein when the key of the lock is inserted and turned, this spindle 38, as heretofore stated, extending through the bore 30 of the second toggle member 26 and having its ends squared to seat in the squared bore 30 of the roll-back to dead lock the toggle member 26 against movement, as I have heretofore explained.

It will be noted that the lock case and its attached parts forms one assembled unit and that the mere act of attaching the escutcheon plate with its knob, spindle and associated parts, to the lock case serves to automatically connect the knob and cylinder lock spindles with their operative parts in the lock case. The parts of the lock case can, therefore, be assembled and regulated in the factory and no further regulation is necessary, it being merely necessary to secure the parts to opposite sides of the door, suitable bores, of course, being provided in the door through which the knob spindle, dowel pins and the socket members of the back plate of the lock may extend.

The operation of the dead locking slide to dead lock the operation of the knob controlled toggle member 26 has already been explained. When the knob has not been dead locked against operation, it may be turned to oscillate its toggle member 26, thereby moving the toggle links 32 inwardly and withdrawing the bolt members 4 and 5 from their sockets. As I have before stated, the bolt members are of the type that are normally pressed outwardly by a spring or otherwise so that when projected, the pins of the toggle links of both toggle members rest at the inner ends of the slots 25. When the links 32 are moved through the knob to retract the bolt members 4 and 5, the inner ends of these bolt members move freely without disturbing the toggle member 16 and its links 22, this being permissible by reason of the fact that the slotted arms 24 of these bolts ride freely over the pins 23 of these links, the toggle members, therefore, being independently operable. When the knob is released, the springs operating the bolts 4 and 5 project said bolts and return the links and the toggle member 26 to their normal position. The bolts are operated from the interior of the door through the operating lever 12 when the bar 15 is moved inwardly. The actuating arm 17 of the toggle member 16 is normally positioned just above the inner end of the arm 13 of the operating lever. When this operating lever, therefore, is actuated to move its inner end upwardly, this end will engage the actuating arm 17 of the toggle member and oscillate it about its hub, this movement drawing the links 22 inwardly and retracting the bolts so that the door may be freely opened from the interior. When the pressure on the operating lever 12 is removed, the spring of the bolt members 4 and 5 will return the parts to their normal position through the link members 22. I prefer, however, to employ the spring 19, as this absolutely insures the proper positioning of the actuating arm 17 relative to the inner end of the operating lever 12. It will be noted that when the parts are retracted through the operating lever 12, the movement of the inner end of the bolts does not affect the toggle member 16 through its links 32, as the slotted arms 24 of these bolts which coöperate with these links, merely ride over their pins 33. The dead locking of a toggle member 26, therefore, through the dead locking slide will not interfere with the retraction of the bolts by the operating lever

12 from the interior of the door so that the bolts are always freely operable from the interior whether or no the exterior knob has been dead locked against bolt retracting operation by means of the cylinder lock mechanism carried thereby.

By using a cylinder lock in conjunction with the knob, I am enabled to arrange the operating parts substantially on the same axis and in very compact relation so that the parts may be embodied within a comparatively narrow case and may, therefore, be used with doors having narrow stiles.

While I have herein described and shown a specific embodiment of my invention, it is obvious that various structural changes may be made within the spirit of the invention and the scope of the appended claims.

What I claim, therefore, and desire to secure by Letters Patent is:

1. In a panic bolt for doors, a casing, complemental oppositely arranged bolt members therein, two spaced concentrically arranged actuating means in operative connection with said bolt members and arranged for independent operation thereof, manually controlled operating devices arranged on opposite sides of the door and each in operative connection with a bolt actuating means, one of said devices embodying a knob and spindle, means adapted to be positioned to dead lock one of said bolt actuating means, a cylinder lock mechanism carried by said knob and spindle, and means controlled therethrough and positioned between and in alinement with said spaced actuating means, whereby said dead locking means may be moved into and out of dead locking position.

2. In a panic bolt for doors, a casing, complemental oppositely arranged bolt members therein, two spaced concentrically arranged actuating means in operative connection with said bolt members and arranged for independent operation thereof, manually controlled operating devices arranged on opposite sides of the door and each in operative connection with a bolt actuating means, one of said devices embodying a knob and spindle, a movable dead locking device mounted in said casing and coöperating with the knob controlled bolt actuating means to dead lock the same, a cylinder lock mechanism carried by said knob and spindle, and means positioned between and concentric with said spaced bolt actuating means arranged to be operated through said cylinder lock to move said dead locking device into and out of dead locking position.

3. In a panic bolt for doors, a casing secured to one side of the door, complemental oppositely arranged bolt actuating members projecting therefrom, a manually operable device on the same side of said door, bolt operating mechanism within said casing in operative connection with said manually operable device, a second and independent operating mechanism within said casing, a blocking device therefor positioned within said casing and independent of said first bolt operating mechanism, a knob and spindle secured to the opposite side of the door in operative connection with said second bolt operating mechanism, a cylinder lock carried by said knob and spindle, and key operated connections between said cylinder lock and said blocking device and positioned between said bolt operating mechanisms adapted to be operated to dead lock said knob and spindle against bolt-operating actuation and without interference with the operation of said bolt through the manually controlled device on the opposite side of the door.

4. In a panic bolt for doors, two assembled units, one of said units comprising a casing adapted to be secured to one side of the door, complemental oppositely arranged bolt actuating members projecting therefrom, mechanism within said casing for operating said bolt members, said mechanism being operable from the casing side of the door, a second and independent bolt operating mechanism within said casing, and a blocking device within said casing operative to block the operation of said second and independent bolt operating mechanism; and the other of said units comprising a plate adapted to be secured to the opposite side of the door provided with means for connection to said casing, a knob and spindle carried by said plate, said spindle being adapted for operative connection with said second bolt operating connection upon the connection of said plate and casing, and a cylinder lock mechanism carried by said knob spindle and adapted to be likewise operatively connected to said blocking device by the connection of said plate and casing, said first bolt operating mechanism being operable from the opposite side of the door independently of said second mechanism and blocking device.

5. In a panic bolt for doors, a casing, two oppositely arranged bolt members projecting therefrom, two bolt-operating toggles within said casing, one of said toggles being operable independently of the other, a manually controlled operating device on one side of the door in operative connection with one of said operating toggles, a knob and spindle on the opposite side of the door in operative connection with the second bolt-operating toggle, a blocking device within said casing adapted to dead lock said second toggle against operation by said knob and spindle, and a cylinder lock mechanism carried by said knob and spindle provided with key-controlled means in operative connection

with said blocking device, and operative to dead lock said knob and spindle against toggle-operation without interference with the independent operation of said first bolt-operating toggle by said manually controlled device on the opposite side of the door.

6. In a panic bolt for doors, a casing secured to one side of the door, two oppositely arranged bolt members projecting therefrom, two independent toggles within said casing operatively and independently connected with said bolt members, a manually operable device connected to said casing and in operative connection with one of said bolt-operating toggles, a plate secured to the opposite side of the door and detachably connected to the casing on the side of the door opposite thereto, a knob and spindle carried by said plate with said spindle adapted to be operatively connected to said second bolt-operating toggle, and a cylinder lock mechanism carried by said knob and spindle adapted for operative connection to the blocking device in said casing and operative to dead lock said second toggle without interference with the independent operation of said first bolt operating toggle by the manually controlled device on the opposite side of the door.

7. In a panic bolt for doors, a casing, complemental oppositely arranged bolt actuating members extending therefrom, two separate manually controlled operating means for arrangement on opposite sides of a door, one of said means comprising a knob and spindle, two independent bolt retracting means within said casing in axial alinement, each operatively connected to one of said manually controlled operating means, a cylinder lock mechanism carried by said knob and spindle, a blocking device carried by said casing for said knob-operated bolt-retracting means, and operative connections between said blocking device and said lock mechanism, said connections being located between and in alinement with said bolt retracting means.

8. In a panic bolt for doors, a casing, a bolt member projecting therefrom, two spaced toggles within said casing operatively and independently connected to said bolt member and arranged in substantially parallel relation, a manually operable device on one side of the door in operative connection with one of said toggles, a knob and spindle on the opposite side of the door in operative connection with the other of said toggles, a blocking device within said casing adapted to be positioned to dead lock the operation of said second toggle, a cylinder lock mechanism carried by said knob and spindle, and means controlled thereby and positioned between said toggles and adapted to be actuated to operate said blocking device.

9. In a panic bolt for doors, a casing, a bolt member projecting therefrom, two oscillating bolt actuators within said casing and in operative and independent connection with said bolt, one of said actuators being provided with an arm projecting therefrom, a manually operable controlling lever positioned on one side of the door to engage said arm and adapted to move the same to operate said bolt, a knob and spindle positioned on the opposite side of the door and operatively connected to said second oscillating actuator and adapted to actuate the same to operate the bolt member independently of said first actuator, a dead locking means in said casing adapted to be actuated to dead lock said second actuator against operation by said knob and spindle, a cylinder lock mechanism carried by said knob and spindle, and key-controlled means connected therewith and adapted to be operated to actuate said dead locking means to dead lock said second actuator without interference with the independent operation of said bolt member through said lever and first mentioned actuator.

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