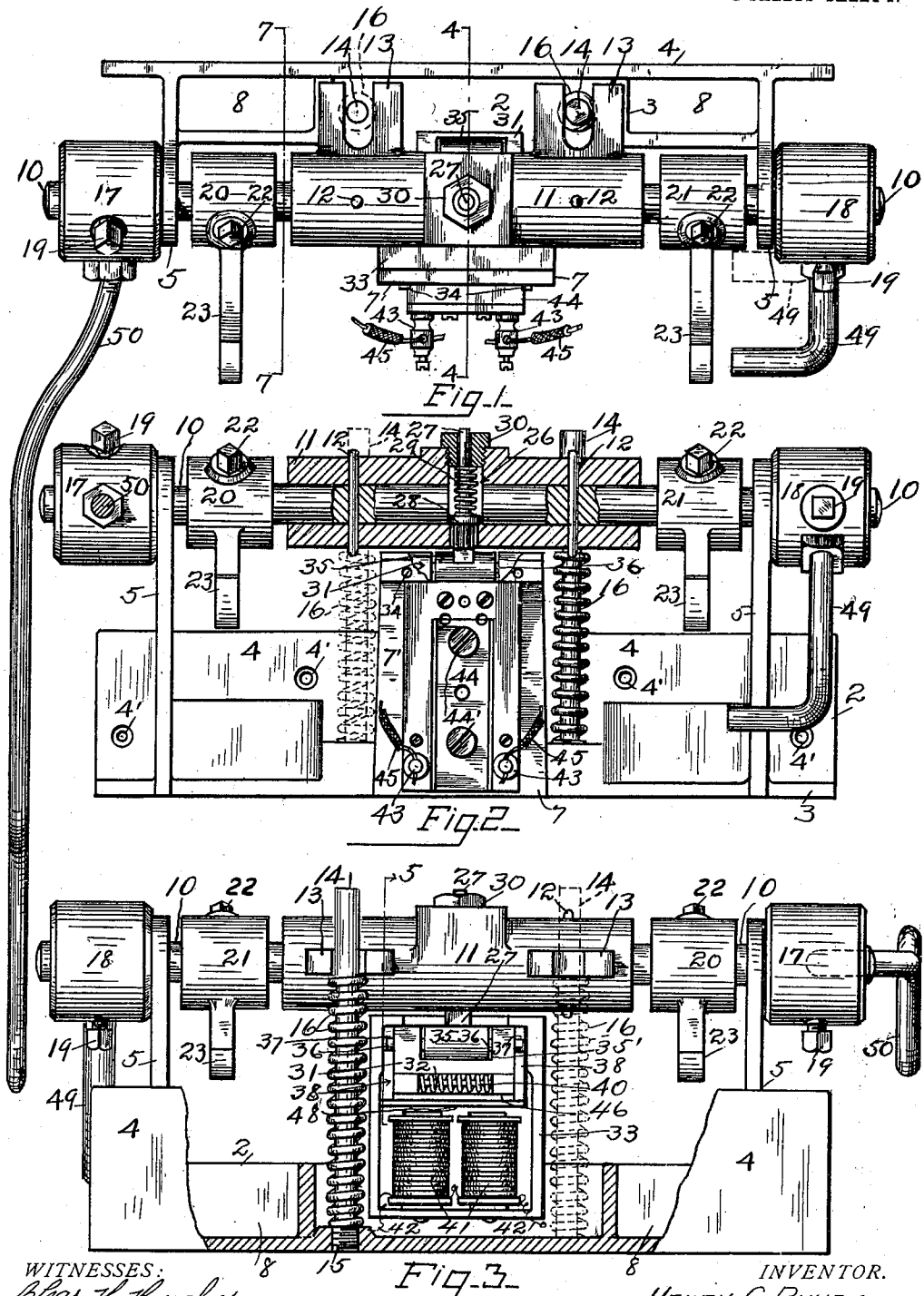


H. C. BUNDY.
DOOR RELEASING DEVICE.
APPLICATION FILED SEPT. 27, 1910.

981,913.

Patented Jan. 17, 1911.

2 SHEETS-SHEET 1.



WITNESSES:
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Al. Neape

Fig. 3.

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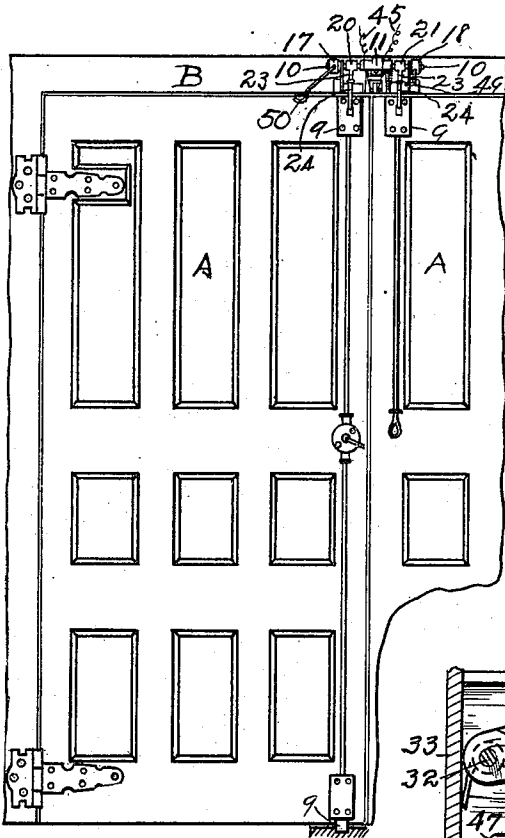


Fig. 8.

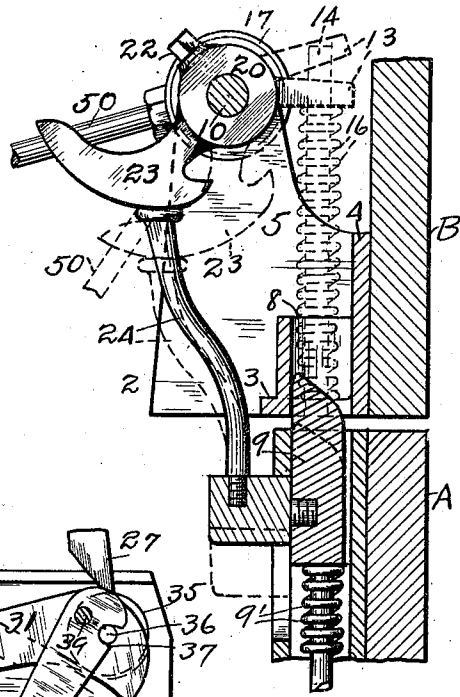


Fig. 7.

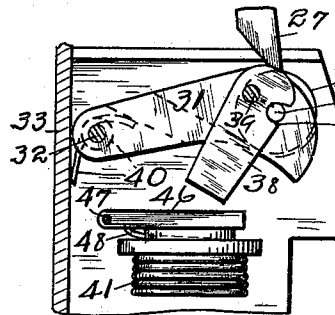


Fig. 5.

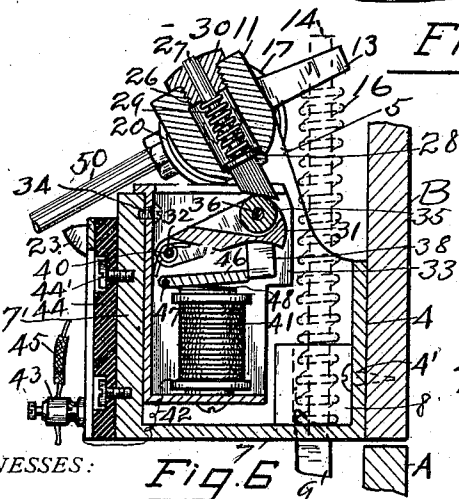


Fig. 6.

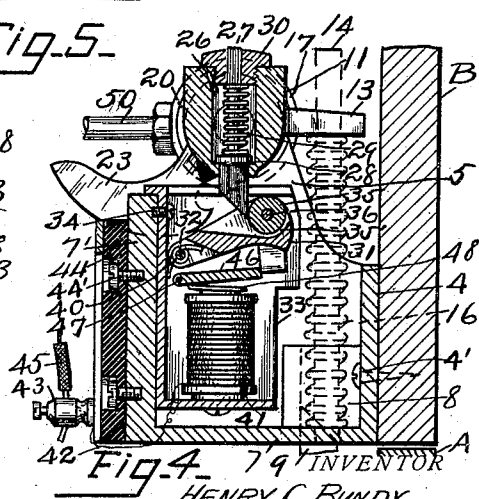


Fig. 4.

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UNITED STATES PATENT OFFICE.

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DOOR-RELEASING DEVICE.

981,913.

Specification of Letters Patent.

Patented Jan. 17, 1911.

Application filed September 27, 1910. Serial No. 584,014.

To all whom it may concern:

Be it known that I, HENRY C. BUNDY, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Door-Releasing Devices, of which the following is a specification.

This invention relates to improvements in door releasing devices, designed for use in connection with the doors of fire departments and other buildings, and the invention relates particularly to an automatic device which is capable of being controlled from points distant from the doors to which it is applied.

The object of the invention is to provide a door releasing device adapted for installation adjacent a door, or a number of doors which are arranged for operation either singly or as double doors, and which is capable of automatically disengaging or releasing the bolts or other locking devices which are employed for holding the doors in closed position, for permitting them to be swung open by other automatic devices, by hand, or by gravity.

A further object is to provide means for restraining the device from accidental or untimely operation. And a further object is to provide means for automatically restoring the working parts of the device after each operation in readiness for subsequent operation.

All of the features and parts of the invention will be understood from the detailed description which follows, and by reference to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a top plan view of the door releasing device, showing all of the principal parts in position ready for releasing a door. Fig. 2 is a front elevation of the same, with portions broken away; showing the construction and arrangement of the parts. Fig. 3 is a rear side elevation; showing the electro-magnets in relation to the tripping parts. Fig. 4 is a central cross-section, taken on line 4—4 of Fig. 1, showing the position of the tripping parts before actuation for releasing the doors. Fig. 5 is a sectional view taken on line 5—5 of Fig. 3, showing the position of the tripping parts when the releasing operation begins. Fig. 6 is a sectional view similar to Fig. 4, showing

the position of the tripping parts immediately after the device has released the bolts of the doors. Fig. 7 is a sectional view taken on line 7—7 of Fig. 1, showing in full and dotted lines the position and movement of one of the cams employed for releasing the bolts of the doors. Fig. 8 is a diagrammatic view, showing the releasing device applied to a pair of doors; also showing the lever employed for restoring or resetting the device for subsequent operation.

Similar characters of reference are assigned to corresponding parts throughout the several views.

In the drawings, 2 represents generally a bracket or base, preferably made of cast metal, having a bottom 3, and a back 4, which is perforated at 4' for receiving screws or other devices for mounting the bracket adjacent the top of a door.

5 represents integral vertically disposed lugs or arms formed near the opposite ends of the bracket, each of which is perforated (not shown) near its free end.

7 represents an L-shaped portion which projects forwardly and upwardly from the middle of the bracket, the upturned arm 7' of which is spaced from the back 4 and is arranged parallel thereto.

The present device is shown applied to double doors, as A, A, but the device may be applied to single doors with the same effect. When applied to double doors, the device should be disposed preferably upon the casing or frame B, so as to straddle the joint between the two doors, as illustrated in Fig. 8. Near each end of the bracket and adjacent the rear side 4, are provided openings or sockets 8, for receiving the upper ends of bolts 9 which are carried by the doors. Under this arrangement the bracket serves as a striker and catch for the said bolts.

The door releasing mechanism comprises a number of parts which will now be described: 10—10 represent two like sections of a rocking shaft arranged in line, the outer ends of which are journaled in the lugs 5. The inner ends of shafts 10 are inserted tightly in and support a sleeve or tubular part 11, which is rigidly connected to the shafts 10 by pins 12, and all operate as one part. Sleeve 11 at its rear side is provided with two integral spaced forked arms 13, for receiving studs 14, which are screwed into the bottom 3 of the bracket at

15, and 16 represents coil-springs carried by the studs 14, which exert their tension against the arms 13 for tilting or rocking the shafts 10 and sleeve 11 forwardly, for effecting the unbolting of the doors. Ordinarily but one stud 14 and spring 16 are employed, but both of these parts may be duplicated, if necessary, as indicated by the dotted lines in Figs. 1, 2 and 3.

17 and 18 represent collars mounted upon the outer ends of the shafts 10, outside of the lugs 5, for preventing endwise movement of said shafts. These collars are held rigidly in place by set-screws 19.

20 and 21 represent collars or short sleeves also rigidly mounted upon shafts 10, one being disposed between each end of sleeve 11 and the adjacent lug 5 of the bracket, and these collars are held in place by set-screws 22. Each of the collars 20 and 21 is provided with a laterally extending curved eccentric arm or cam 23, the lower rounding faces or edges of which engage vertically arranged arms or levers 24, which are carried by the bolts 9, in such manner that when the shafts 10 and sleeve 11 are rocked forwardly by the power of the springs 16, the cams 23 force the bolts 9 downwardly against their springs 9' sufficiently to disengage their free ends from the sockets 8 of the bracket, thus releasing and allowing the doors to be swung open, either by hand or by some other means. The cams 23 are adjustable on the shafts 10, and may be arranged in such manner that the releasing of both of the bolts 9 at the top of the doors will be simultaneous. Where bolts are employed at both the top and bottom of the doors, they may all be operated by the device at the same time, providing the bolts are suitably connected for such operation.

The releasing mechanism proper, which consists of the rocking shafts 10, the sleeve 11, springs 16 and the cams 23, is controlled and normally held from accidental or untimely operation by a combination electrical and mechanical tripping mechanism, parts of which are carried by the L-shaped portion 7 of the bracket, the other parts being carried by the sleeve 11. Shafts 10 and sleeve 11, when at rest, are held from being rocked by the power of the springs 16, which constantly exert their tension against the arms 13 of the sleeve, in the following manner: Sleeve 11 is perforated centrally, as at 26, between the inner ends of the shafts 10, as shown in Figs. 2, 4 and 6, and within this perforation is disposed a plunger or bolt 27, having an enlarged end which protrudes below the underside of the sleeve 11; the opposite end of which is reduced and extends upwardly through the top surface of the sleeve. The bolt 27 has a flange 28 which serves to prevent the bolt from escap-

ing from the hole 26 by gravity or otherwise. The bolt 27 is yieldingly held in its lowermost position by a coil-spring 29, which is disposed between the flange 28 and a bushing 30, which is screwed into the sleeve, and which serves as a buffer for the spring 29 and also to limit the reciprocal movement of the bolt 27.

The rocking movement of the shafts 10 and sleeve 11 in the direction for releasing the bolts 9 is permitted or prevented by a yieldable stop or part 31, which is pivoted by a rod 32 within a casing 33, which is secured to the L-shaped part 7 of the bracket, by screws 34. The stop 31 is provided at its free edge with a roller 35, which is pivoted in a cutout 35', by a pin 36, which projects slightly at each end beyond the lateral edges of the stop, where the ends of the pin 36 engage semi-circular notches 37, which are formed in the corresponding edges of a pair of triggers or catches 38, which are eccentrically and loosely mounted on the opposite inner side walls of the casing 33, by pins 39. The ends of the roller pin 36 normally engage the notches 37 of the catches 38 when the releasing parts of the device are at rest, as during the interval between the operations of the device for unbolting the doors. The stop 31 is rendered flexible, or yieldable vertically, to a slight extent, by means of a spring 40, which is mounted upon the rod 32, between the lugs of the stop. One end of this spring engages the under side of the stop for holding its free end tilted upwardly so that the roller 35 is disposed in the path of the bolt 27 of the sleeve 11; the other end of spring 40 bears against the front wall of casing 33, as shown in Figs. 4, 5 and 6. The tripping parts are preferably operated by a pair of electro-magnets 41, which may follow the usual construction, and which are mounted upon the bottom of the casing 33 beneath the stop 31. Both of the magnets are connected by wires 42 with binding posts 43, which are mounted upon an insulation 44, which is secured to the face of the L-shaped portion 7, by screws 44.

45 represents wires connecting with the binding posts 43, and which may also connect with any suitable electric switch or similar appliance (not shown) which may be located at any desired distance from the releasing device, by means of which the tripping parts of the device may be set in motion for permitting the operation of the releasing mechanism.

Above the magnets 41 is disposed an armature 46, having generally the same functions as the armatures of other magnets, which is pivoted within the casing 33 by a pin 47, which is applied to one edge of the armature, leaving the opposite edge of the armature free to move toward or away from the poles of the magnets upon the making

and breaking of the electric circuit. The armature 46 is normally held spaced from the poles of the magnets by a spring 48. The arrangement of the stop 31 and the armature 46 is such that, when the device is at rest, awaiting operation for releasing the doors (see Figs. 3 and 4) these two parts are held by the springs 40 and 48 substantially parallel to each other, and with their free edges slightly elevated. When the armature is in the latter position, its free edge is disposed directly in front of and engages the free lower ends of the catches 38, and prevents the catches from swinging forwardly on their pivots 39, for allowing the downward tilting or movement of the stop 31 and roller 35.

When the device is at rest, as just described, the bolt 27 carried by sleeve 11 is held by its spring 29 in its protruding position (see Fig. 4), at which time the enlarged lower end of the bolt is in positive engagement with the front side of the roller 35, which prevents the accidental rocking of the shafts 10 and the sleeve 11. As long as the armature 46 is in engagement with the lower ends of the triggers 38, the stop 31 will be held rigidly in its highest position, and roller 35 acts as a stop for preventing the springs 16 from rocking the shafts 10 and sleeve 11. When, however, the operator operates a switch (not shown) connected to the wires 45, for closing the electric circuit and energizing the magnets 41, the armature 46 is drawn down upon the poles of the magnets and away free from contact with the triggers 38 (see Fig. 5). Then the free lower ends of triggers 38, owing to the location of their pivots 39, and their connection with roller pin 36, tilt or swing forwardly under the power of springs 16 exerted through the connection of the bolt 27 with the roller 35, and the free edge of the stop and its roller move downwardly against the tension of spring 40 sufficiently to allow the bolt 27 to become shifted from the position shown in Fig. 4 to that shown in Fig. 6, which permits the forward rocking of the shafts 10, sleeve 11 and the cams 23 and the releasing of the bolts 9 of the doors.

Fig. 4 illustrates the relative positions of the sleeve 11, bolt 27, stop 31, and also the armature 46 and the catches 38, when they are at rest, or in readiness to be tripped by the energizing of the magnets 41.

Fig. 5 illustrates the positions and arrangement of the bolt 27, stop 31 and catches 38, at the instant when the armature 46 is drawn down upon the poles of the magnets. These last named parts only remain in the latter position for an instant, or during the interval while the circuit is closed, and immediately upon the breaking or opening of the circuit, they restore themselves, by the power of springs 40 and 48, to the position

shown in Fig. 6, which is the same as shown in Fig. 4, with the exception of the altered position of the bolt 27 and the sleeve 11.

When sleeve 11 and shafts 10 and their related parts are rocked to the position shown in Fig. 6, and by dotted lines in Fig. 7, an angular stop-arm or lever 49 carried by the collar 18 comes to a bearing against the front edge of the adjacent lug 5, and thus arrests and measures the rocking or rotary movement of the door releasing parts. All of the parts mounted upon shafts 10 rotate or move with it, including the cams 23 which operate bolts 9 through their engagement with the levers 24, for releasing said bolts from the sockets 8 of the bracket for freeing the doors. Soon as the doors are free and are swung on their hinges, the first slight opening movement of one of the doors, brings its top edge beneath and into engagement with the free end of a relatively long arm or lever 50, which is carried by the collar 17, and as the door continues its opening movement, it lifts the said lever sufficiently to effect the backward rocking of shafts 10 and sleeve 11 for restoring them to their normal position shown in Figs. 1, 2, 3 and 4, ready for the next releasing operation. Lever 50 will then remain in its upper position until shaft 10 is again rocked forward. As the sleeve 11 is rocked backward by the lever 50, bolt 27 is shifted from the position shown in Fig. 6 to the position shown in Figs. 2 and 4. In passing from the rear side of roller 35 to the front side thereof, the bolt 27 yields upwardly against the tension of its spring 29 and therefore readily changes its position, in which it is assisted by the revolving of the roller. During the interval between the breaking of the circuit after the tripping parts have been operated and the restoring of the said parts to their normal positions, as described, the stop 31 is held from yielding downwardly, by the armature which has resumed its position in front of the free ends of the triggers 38, as shown in Fig. 6. Under this arrangement the restoration of the stop 31 to rigid position instantly upon the breaking of the circuit of the magnets, renders the said stop effective for holding the door releasing parts after they are restored by the initial movement of the doors, and thereby prevents a repetition of the releasing operation while the doors are ajar.

It is obvious that other means may be employed than the electrical parts herein shown for actuating the tripping parts of the device, and that some changes or modifications may be made in other parts of the device, without departing from the spirit of my invention, and I therefore do not wish to limit myself to the precise construction, arrangement and operation of the same as herein shown and described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is—

1. A door releasing device, comprising a
5 base having sockets for receiving bolts carried by a pair of doors, a rocking shaft carried by said base, a plurality of cams carried by said shaft adapted to contact with parts carried by said bolts, a tripping mechanism
10 carried by said base adapted for normally holding said shaft from being rocked in the direction for unbolting the door, means for actuating said tripping mechanism, and a spring for rocking said shaft and said cams.
2. A door releasing device, comprising a
15 base adapted for mounting adjacent a pair of doors, having sockets for receiving bolts carried by the doors, a rocking shaft pivoted in said base, a pair of cams rigidly
20 mounted on said shaft adapted to contact with parts carried by said bolts, a tripping mechanism mounted in said base adapted for holding said shaft from being rocked in one direction, means for operating said tripping
25 mechanism, a spring for rocking said shaft in the direction described, and means for rocking said shaft and said cams in the opposite direction against the tension of said spring.
3. A door releasing device, comprising a
30 rocking shaft, a pair of cams mounted upon and movable with said shaft, bolts carried by a pair of doors, the said bolts having arms arranged to frictionally engage said
35 cams, a spring arranged to exert its tension for rocking said shaft and said cams in the direction for depressing said bolts for releasing the doors, a lever carried by said shaft disposed in the path of one of the
40 doors, whereby the opening movement of the door raises said lever and rocks said shaft and said cams in the opposite direction to resting position, a stop for normally holding said cams from depressing said
45 bolts, a tripping mechanism adapted for rendering said stop yieldable, thereby to permit said spring to rock said shaft and said cams, and means for actuating said tripping mechanism.
4. In a door releasing device, the combination with a door, and a bolt for holding
50 the door in closed position, of a bracket adapted for mounting near the door and arranged to connect with said bolt, a rocking
55 shaft journaled in said bracket, said shaft arranged to operatively connect with a part carried by said bolt, a spring for rocking said shaft in the direction for releasing the said bolt from said bracket, a lever for
60 rocking said shaft in the opposite direction, a stop, for preventing the untimely operation of said shaft, and means for effecting the yielding of said stop under the power of said spring for permitting the rocking
65 of said shaft.

5. The combination with a pair of doors and a bolt carried by each door for holding the same in closed position, of a bracket mounted above said doors having sockets for receiving said bolts, a rocking shaft pivoted in said bracket, a pair of cams mounted
70 on said shaft and normally engaging parts carried by said bolts when the doors are closed, a spring for rocking said shaft and said cams in the direction for releasing said bolts from said bracket, a lever carried by
75 said shaft adapted for rocking said shaft and said cams in the opposite direction against the tension of said spring for restoring said parts to normal position, a stop for preventing the untimely or accidental rocking of said shaft by the power of said
80 spring, means for rendering said stop yieldable for permitting the rocking of said shaft and said cams for releasing said bolts, and means for limiting the rocking movement of said shaft and said cams.
6. The combination with a pair of doors and a bolt carried by each door for holding
90 the same in closed position, of a bracket mounted above said doors having sockets for receiving said bolts, a rocking shaft pivoted in said bracket, a pair of cams mounted on said shaft and normally engaging parts carried by said bolts when the
95 doors are closed, a spring for rocking said shaft and said cams in the direction for releasing said bolts from said bracket, a stop carried by said bracket, said stop capable of being made rigid for holding said shaft and
100 said cams from being rocked for releasing said bolts, means for rendering said stop yieldable for permitting said spring to rock said shaft and said cams, means for instantly restoring said stop to rigid condition after
105 each yielding thereof, means for rocking said shaft and said cams in the opposite direction without disturbing said stop or its related parts, thereby to permit said stop to become effective for holding said shaft and said
110 cams in readiness for a subsequent operation by the power of said spring.
7. The combination with a pair of doors and a bolt carried by each door for holding
115 the same in closed position, of a bracket mounted above said doors having sockets for receiving said bolts, a rocking shaft pivoted in said bracket, a pair of cams mounted on said shaft and normally engaging parts carried by said bolts when the
120 doors are closed, a spring for rocking said shaft and said cams in the direction for releasing said bolts from said bracket, a lever carried by said shaft adapted for rocking said shaft and said cams in the opposite
125 direction against the tension of said spring for restoring said parts to normal position, a stop carried by said bracket, said stop capable of being made rigid for holding said shaft and said cams from being rocked for
130

releasing said bolts, means for rendering said stop yieldable for permitting said spring to rock said shaft and said cams, means for instantly restoring said stop to rigid condition after each yielding thereof, means for permitting the rocking of said shaft and said cams in the opposite direction without disturbing said stop or its related parts, thereby to permit said stop to become effective for holding said shaft and said cams in readiness for a subsequent operation by the power of said spring.

8. The combination with a pair of doors and a frame, of a plurality of bolts carried by said doors, a releasing device, comprising a bracket capable of being mounted on the frame of the doors, said bracket having sockets for receiving the free ends of said bolts, a rocking shaft journaled in said bracket, a pair of cams carried by said shaft adapted to engage parts carried by said bolts when the door is in closed position, a spring carried by said bracket and exerting its tension for rocking said shaft for releasing said bolts from said sockets, means for preventing the accidental rocking of said shaft, means for limiting the rocking movement of said shaft, and means for returning said shaft to normal position after each operation thereof by said spring.

9. The combination with a pair of doors and a pair of bolts carried by the doors, of a door releasing device, comprising a bracket adapted for mounting adjacent the doors and arranged to receive the free ends of said bolts, for locking the doors in closed position, a rocking shaft journaled in said bracket, a pair of cams carried by said shaft and normally in engagement with levers carried by said bolts when the doors are closed, a spring constantly exerting its tension for rocking said shaft and said cams for releasing said bolts from said bracket, a yieldable plunger carried by said shaft, a stop normally disposed in the path of said plunger adapted for preventing the untimely rocking of said shaft, means for tripping said stop for permitting said spring to rock said shaft for releasing said doors, a pair of independent springs for restoring said tripping means, and means for restoring said shaft and said cams ready for a subsequent operation.

10. The combination with a door and its frame and a plurality of bolts for holding the door in closed position, of a releasing device capable of being mounted on the frame near the door, comprising a bracket having sockets for receiving the free ends of said bolts, a rocking shaft journaled in said bracket, a plurality of cams carried by said shaft and normally in engagement with arms carried by said bolts when the door is closed, and adapted for releasing said bolts from said sockets when said shaft is rocked

in one direction, a yieldable stop for normally holding said shaft from rocking for releasing said bolts, an arm carried by said shaft, said arm held above and free from said door when the latter is closed, said arm capable of being lowered into the path of the door by the rocking of said shaft, and adapted to be raised by the opening of the door for restoring said shaft to position ready for a subsequent action, an electro-magnet for tripping said stop, and a spring for rocking said shaft in the direction for releasing said bolts instantly upon the tripping of said stop.

11. A door releasing device comprising a bracket, a rocking shaft journaled in said bracket, a sleeve carried by said shaft, a yieldable bolt carried by said sleeve, a spring connected to said sleeve adapted to rock said sleeve and said shaft in the direction for releasing a door, a stop mounted in said bracket adapted for normally engaging said bolt for holding said shaft and said sleeve from being rocked by the power of said spring, a pair of catches pivoted in said bracket and operatively engaging the free end of said stop, an electro-magnet disposed in said bracket beneath said stop, an armature pivoted in said bracket between said stop and said magnet, one edge of said armature being free and adapted to engage the free ends of said catches for preventing the yielding of said stop, the said armature adapted to be disconnected from said catches by the closing of the circuit through said magnet, thereby to permit the yielding of said stop for allowing the said spring to rock said shaft, a spring for lifting said stop to normal position immediately after each rocking movement of said shaft, and a spring for lifting said armature for restoring its free edge against the ends of said catches, immediately upon the breaking of the circuit through said magnet.

12. In a door releasing device, the combination with a door and its frame, and a bolt for holding the door in closed position, of a rocking shaft pivotally mounted upon the frame of the door, a spring connected with and adapted to rock said shaft, a cam adjustably mounted on said shaft and arranged to contact with an arm carried by said bolt adapted to depress said bolt when said shaft is rocked by said spring, a yieldable plunger carried by said shaft, a pivoted stop arranged to engage said plunger for preventing the untimely or accidental rocking of said shaft, a pair of catches for controlling the movement of said stop, means for controlling the operation of said catches for permitting or preventing the yielding of said stop by the power of said spring exerted through said shaft and said plunger, and an arm carried by said shaft capable of be-

ing lifted by the opening movement of the door, for restoring said shaft and for shifting said plunger into positive engagement with said stop ready for a subsequent rocking of the shaft and cam.

13. In a door releasing device, the combination with a pair of doors and a door frame, and a bolt mounted on each door adjacent the frame, of a bracket mounted on the frame and arranged to overlap the contiguous edges of the doors, sockets in said bracket for receiving the free ends of the bolts for holding the doors in closed position, an upwardly extending arm carried by each bolt, a rocking shaft journaled in said bracket at right angles to said bolts, a pair of cams mounted on said shaft and positioned so as to engage the arms of the bolts when the door is closed, a sleeve carried by said shaft, having rearwardly extending arms, springs carried by said bracket and

engaging the arms of the sleeve, the said springs constantly exerting their tension for rocking said shaft and said cams in the direction for depressing said bolts for releasing said doors, a yieldable stop carried by said bracket for holding said shaft and said sleeve against being rocked by said springs, a tripping mechanism comprising a pair of catches, an armature and a pair of electromagnets adapted for permitting or preventing the yielding of said stop and the rocking of said shaft and cams, and means for resetting said shaft and said cams and for compressing said springs, without disturbing said stop or said tripping mechanism.

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

HENRY C. BUNDY.

Witnesses:

JARED E. WATKINS,
FRED A. BALDWIN.