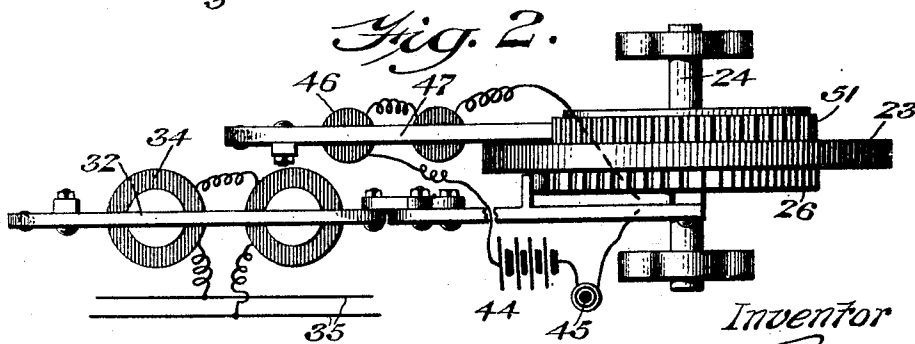
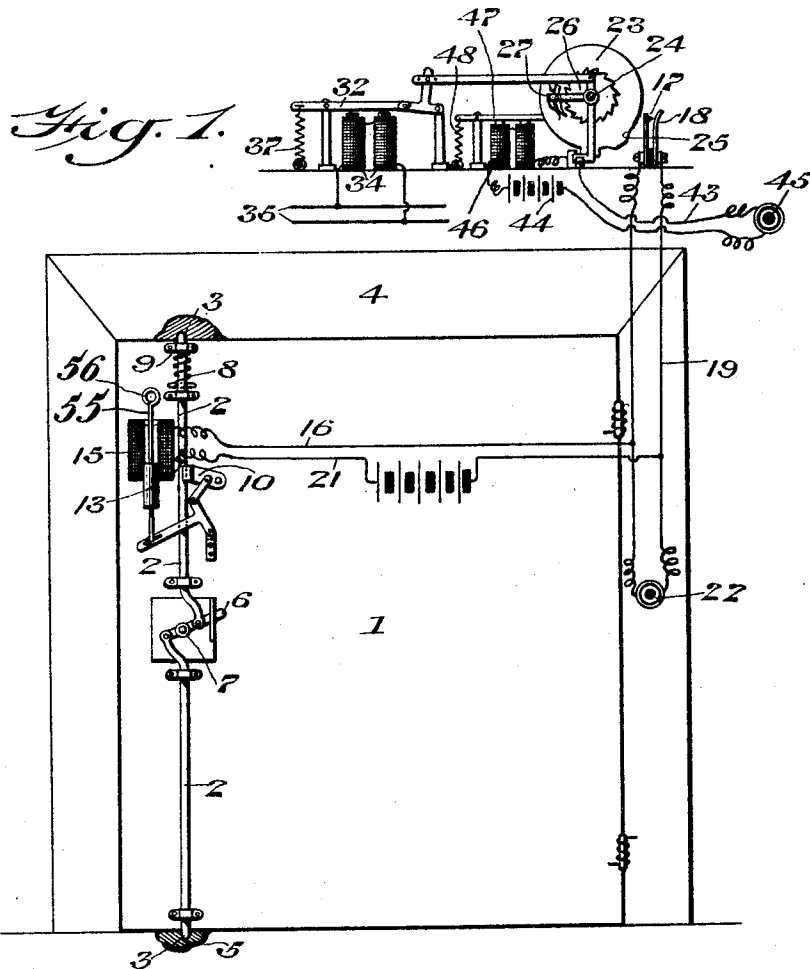


W. H. SNYDER.
ELECTRICALLY OPERATED RELEASE FOR DOORS.
APPLICATION FILED APR. 8, 1909.

938,175.

Patented Oct. 26, 1909.
2 SHEETS—SHEET 1.



Witnesses

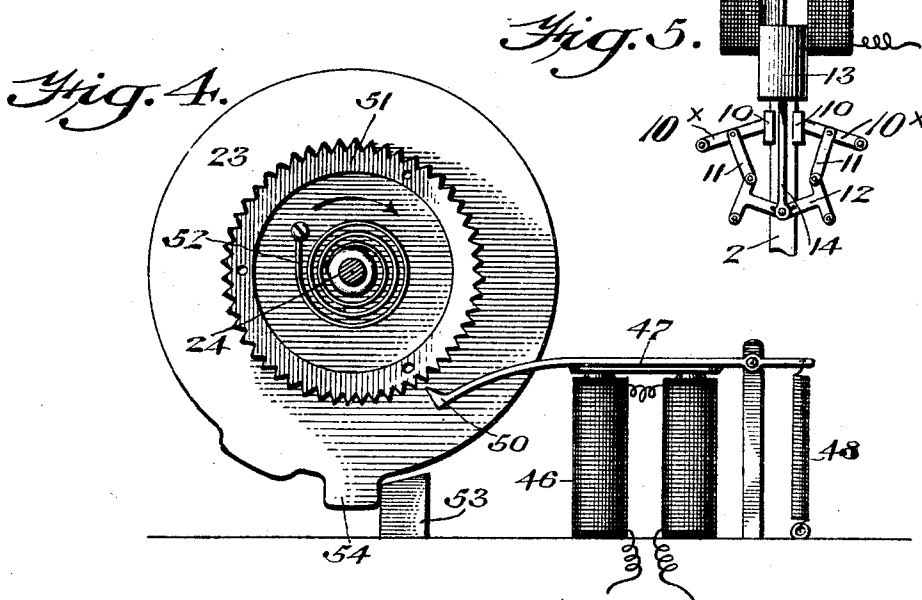
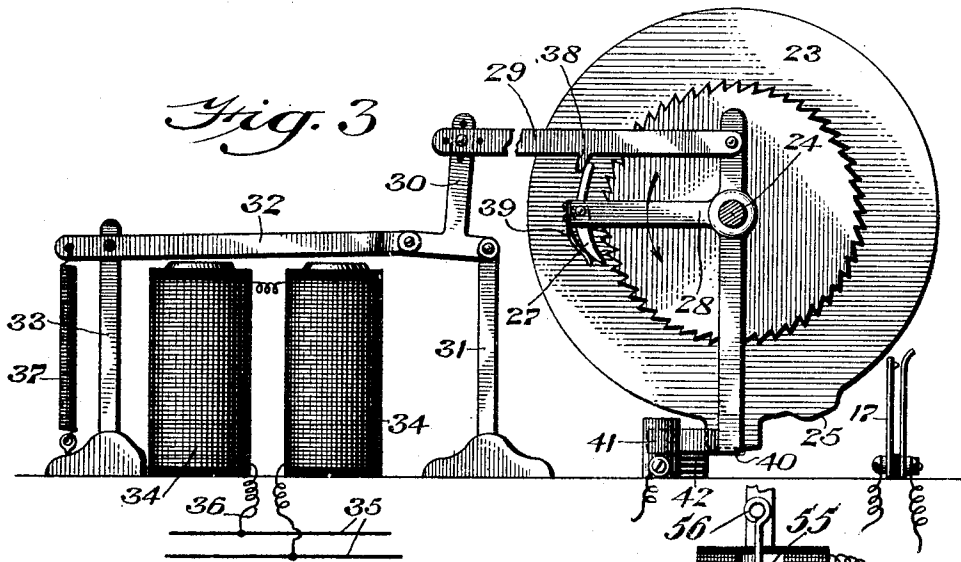
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UNITED STATES PATENT OFFICE.

WILLIAM H. SNYDER, OF ASHBOURNE, PENNSYLVANIA.

ELECTRICALLY-OPERATED RELEASE FOR DOORS.

938,175.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed April 6, 1909. Serial No. 488,254.

To all whom it may concern:

Be it known that I, WILLIAM H. SNYDER, a citizen of the United States, residing in Ashbourne, county of Montgomery, State of Pennsylvania, have invented a new and useful Electrically-Operated Release for Doors, of which the following is a specification.

This invention relates to a locking mechanism for doors and more especially to that type of locking mechanism used on stall doors of fire houses for the purpose of releasing the horses whenever an alarm is sounded. In devices of this character heretofore constructed, it has been the duty of someone in the fire house to operate by suitable means, a releasing mechanism to permit the doors to open and insure the horses coming out of the stall at the right time. Such devices have proven unsatisfactory and necessitate various combinations of levers and devices which take up a large amount of room, require endless attention and which have not operated effectively for the purpose intended.

In my present invention I have devised a complete, unitary structure operating automatically whenever a regular alarm is turned in and furthermore one which will not respond to a test call or the like and release the horses at the wrong time.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention I have shown in the accompanying drawing one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents an elevation of my invention and a diagram of the circuits in connection therewith. Fig. 2 represents a plan of the control mechanism. Fig. 3 represents an elevation of a portion of the same. Fig. 4 represents an elevation of another portion of a control mechanism. Fig. 5 represents a modified form of the locking mechanism.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates

a door, in the present instance of the type used to close the stalls used for fire horses and the same is preferably maintained in normally locked position by means of the usual bolt bar 2 adapted to engage suitable apertures 3 at the top and bottom thereof and formed in the lintel 4 and floor 5. As herein disclosed, there are two locking bars suitably connected to a lever 6, which latter is mounted on a pivot 7 attached to the door, the movement of the said locking bars being controlled by a spring 8 or the like, which normally tends to remove the bolts 2 from the locking apertures 3. In the present instance this spring 8 is coiled about one of the bars 2 and is secured at one end thereof, while the opposite end engages a stationary bearing 9 connected to the door 1.

In locking bars as heretofore employed it has been customary to provide a stop means controlled by a suitable manually operated bolt to prevent the action of the spring withdrawing the locking bolts from the door prematurely or at times when it should not be operated. In the present invention I employ preferably a plurality of brake shoes 10, each suitably mounted upon a link 10* pivoted at a fixed point and connected to a lever 11 secured to an arm 12 pivoted to the door 1. These brake shoes 10 operate to frictionally engage one of the locking bars 2 and are maintained in such engagement by the weight of the armature 13 mounted upon a rod 14, which is connected to each of the arms 12. The armature 13 forms a part of a solenoid 15 suitably mounted on the door structure and adapted to be controlled by an electric means preferably in the same circuit with the ordinary fire alarm. In the present instance the circuit for the solenoid consists of the wire 16 leading to a flexible contact 17 located at a suitable point and adjacent which is a stationary contact 18 having connection by wire 19 to a battery 20, from which a wire 21 leads again to the winding of the solenoid 15.

22 designates a push button connected in parallel with the circuit just described and is adapted to close the circuit through the solenoid when it is desired for any reason to open the doors when the alarm circuit has not been energized. It will thus be apparent that if the contacts 17 and 18 are joined together a circuit will be closed which energizes the solenoid 15 and draws the armature 13 therewithin, thus releasing the

brake members 10 from gripping action on the locking bar 2, whereupon the spring 8 is immediately effective to withdraw the bolts from the recesses 3 and permit the door to swing open under the influence of suitable spring hinges or the like.

For the purpose of controlling the flexible contact 17 and operating the same to close the circuit at the proper moment, I preferably employ a disk member 23 rotatably mounted on a suitably supported shaft 24, the said disk being provided with a cam surface 25 adapted to engage the contact 17 when the disk 23 is rotated. In order to correctly produce movement of the contact making disk 23, I mount on the shaft 24 and preferably secure to the disk 23, a ratchet wheel 26, adjacent which is an operating pawl 27 for the purpose of engaging the teeth of the ratchet wheel at certain intervals and thereby producing a rotative movement of the disk 23. This pawl 27 is pivotally mounted in the present instance upon one arm of a three-armed lever 28, rotatably secured upon the shaft 24. This lever 28 is operated, as here shown, through the medium of a link 29 suitably connected to a lever 30 pivoted upon a standard 31, the said lever 30 having a pivoted connection with an armature 32 mounted upon a second standard 33. The armature 32 is adjacent to and controlled by suitable magnets 34, current for which is supplied from a main fire alarm circuit 35 by the ordinary wiring connections 36. In normal operation the magnets are deenergized and therefore the armature 32 is maintained out of contact therewith by means of a spring 37 suitably connected thereto.

38 designates a lug mounted on lever 29 and in close proximity to one end of the pawl 27, whereby the latter is maintained normally out of engagement with the ratchet 26 against the tension of a spring 39. It will thus be apparent that if the magnets 34 are energized the lever 30 will be swung downwardly and in a direction away from the disk 23, whereby the lug 38 is swung away from the pawl 27 to release the same and permit it to be forced into engagement with the teeth of the said ratchet 26. At the moment that this release takes place the lever 28 carrying the pawl is rotated slightly about the shaft 24 through the action of the lever 29, whereupon the ratchet is advanced one tooth and to bring the cam 25 a slight distance nearer the contact 17. In this connection it will be noted that some slight distance should be provided for the cam 25 to travel before striking the contact 17 as it is a frequent occurrence to test the alarm system and ordinarily before a regular alarm is turned in, the fire bell rings ten times. Therefore, I position the cam 25 so that the disk 23 will move substantially ten steps of

the ratchet wheel before closing the circuit controlled by the contacts 17 and 18. Of course it will be understood that the magnets 34 are energized only for an instant as the alarm sounds, thereby causing the pawl 27 to advance the ratchet wheel one step and the parts are then returned to their former position through the medium of the spring 37. It will further be clear that some means must necessarily be provided for returning the disk 23 to normal position with the cam out of engagement with the contact 17 and for this purpose I preferably employ a contact 40 on one arm of the lever 28 which in normal position engages preferably a pair of stationary contacts 41 and 42, which form terminals of a separate circuit 43 controlling the resetting mechanism. This circuit 43 includes a battery 44, push button 45 and magnets 46. As herein disclosed, the magnets 46 are positioned to control the movement of an armature 47 suitably pivoted adjacent thereto and held in normal position by a spring 48, while one end of the armature 47 is provided with a pawl 50 for engagement with a ratchet 51. This ratchet 51 is preferably mounted on the back of the disk 23 and in normal operation the pawl 50 engages the same to prevent return of the disk during the reciprocating movement of the lever 28.

52 designates a coil spring secured to the shaft 24 at one end and in connection with the disk 23 at the other, the tendency of which is to return the parts as soon as pawl 50 is released.

It will be seen that, if the push button 45 is operated to close the circuit 43, the magnets 46 will be energized and withdraw the pawl 50 from engagement with ratchet 51, whereby the spring 52 comes into operation and swings the disk 23 into engagement with a stop 53 suitably located in the path of movement of a stop lug 54 of the disk 23 indicating normal position. Of course the movement of the disk 23 under the influence of the action of the pawl 27 is a step-by-step one, during which the circuit 43 is made and broken by the movement of the arm 28, but as soon as the alarm has ceased to ring, this contact is closed and by pressing the button 45 the apparatus may be returned to normal position.

In operation, if an alarm is sounded the magnet 34 is immediately energized and as the alarm comes in as a succession of electric impulses, the armature 32 will be correspondingly operated and produce the necessary step-by-step movement of the disk 23. As soon as ten strokes of the alarm bell have been received, thus indicating that it is a regular fire call, the cam 25 has come into engagement with the contact 17 and closes the circuit controlling the solenoid 15. The action of this solenoid 15 is to draw the

armature 13 in a direction to release the brake shoes 10, whereupon the locking bolts 2 controlled by their spring devices are quickly withdrawn and the stall doors swung open to release the horses at the proper moment.

In resetting the device the push button 45 is operated, closing the circuit through the spring controlled magnets 46, whereupon their energization withdraws the pawl 50 and permits the spring 52 to return the parts to their normal position, whereupon by closing the door and manually operating the lever 6, the bolts 2 may be pushed home and since at this time the solenoid 15 is deenergized, the weight of the armature 13 holds the shoes 10 with sufficient force against the locking bolts 2 to prevent the spring 8 from releasing them.

It will now be apparent that I have devised a simple, efficient and complete device operating effectively for the purpose specified and controlling automatically the releasing of stall doors in fire houses whenever a regular alarm is turned in and thus dispensing with any manual controlling mechanism. It will further be apparent that, when testing the line or otherwise adjusting the alarm circuit, there can be no operation of the doors to release the horses prematurely unless of course there are the required number of separate and distinct successive impulses sent through the control magnets.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Attention is directed to a rod 55 connected to the armature 13 and projecting exterior of the solenoid coil 15 which preferably terminates in a loop, handle, or equivalent device 56 whereby manual resetting of the braking shoes 10 may be accomplished if desired or as occasion demands or necessitates.

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

1. In a device of the character described, a bolt, means normally tending to move said bolt to unlocked position, a retaining device opposing said means, a normally open electric circuit controlling said retaining device, an alarm circuit, and means operated by the energization of said alarm circuit for closing said open circuit.

2. In a device of the character described, a bolt, suitably mounted to lock a door, means normally tending to move said bolt to unlocked position, a retaining device opposing said means, a normally open electric circuit controlling said retaining device, an alarm circuit, a magnet in said alarm circuit, an armature for said magnet, and means operated by said armature when said magnets are energized for closing said open circuit.

3. In a device of the character described, a bolt suitably mounted to lock a door, means normally tending to move said bolt to unlocked position, a retaining device opposing said means, a normally open electric circuit controlling said retaining device, an alarm circuit, a magnet in said alarm circuit, an armature for said magnet, a step-by-step mechanism operated by said armature when said magnets are energized, and means operated by the movement of said step-by-step mechanism to close said open circuit.

4. In a device of the character described, a bolt suitably mounted to lock a door, means normally tending to move said bolt to unlocked position, a retaining device opposing said means, a normally open electric circuit controlling said retaining device, an alarm circuit, a step-by-step mechanism controlled by the energization of said alarm circuit, and means operated by said step-by-step mechanism to close said open circuit at a predetermined time.

5. In a device of the character described, a bolt suitably mounted to lock a door, means normally tending to move said bolt to unlocked position, a retaining device opposing said means, a normally open electric circuit controlling said retaining device, an alarm circuit, a step-by-step mechanism controlled by the energization of said alarm circuit, means operated by said step-by-step mechanism to close said open circuit at a predetermined time, and means to return said step-by-step mechanism to normal position.

6. In a device of the character described, a bolt suitably mounted to lock a door, means normally tending to move said bolt to unlocked position, a retaining device opposing said means, a normally open electric circuit controlling said retaining device, an alarm circuit, a step-by-step mechanism controlled by the energization of said alarm circuit, means operated by said step-by-step mechanism to close said open circuit at a predetermined time, and means electrically controlled for returning said step-by-step mechanism to normal position.

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Witnesses:

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