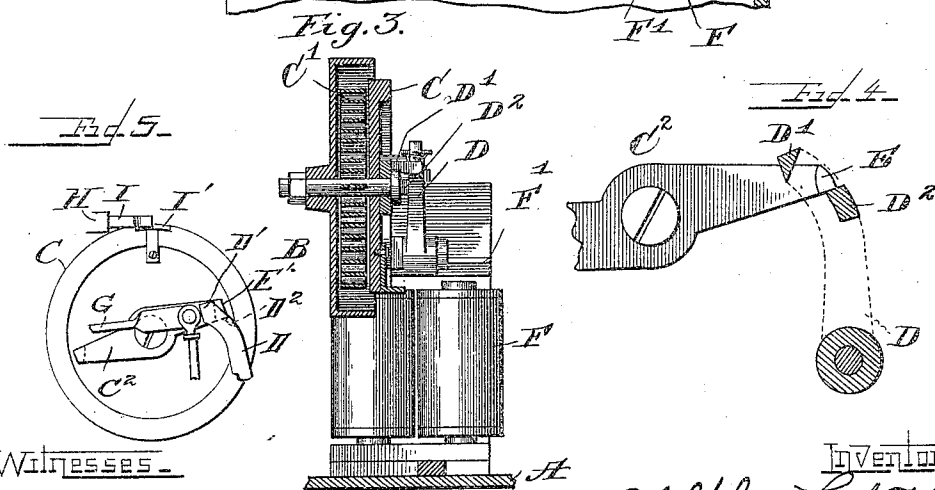
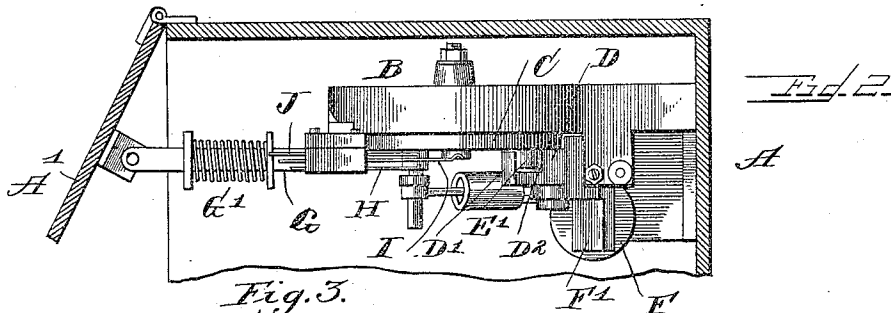
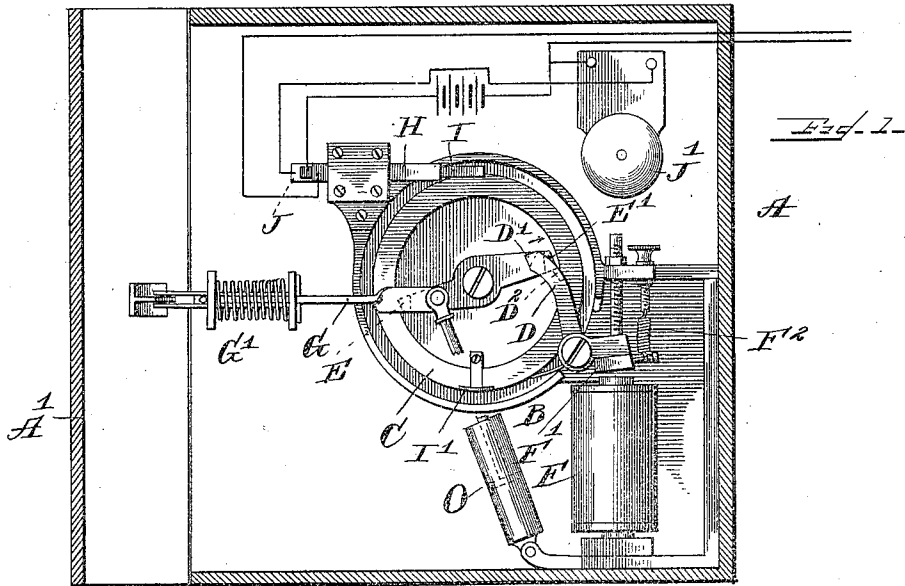


A. L. NOEL.
DOOR CONTROLLING DEVICE.
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944,494.

Patented Dec. 28, 1909.



Witnesses -

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UNITED STATES PATENT OFFICE.

ADOLPHUS L. NOEL, OF MASON CITY, IOWA.

DOOR-CONTROLLING DEVICE.

944,494.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ADOLPHUS L. NOEL, a citizen of the United States, residing at Mason City, in the county of Cerro Gordo and State of Iowa, have invented a certain new and useful Improvement in Door-Controlling Devices, of which the following is a specification.

My invention relates to door opening devices and has for its object to produce a new and improved construction of this description.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a view of an alarm box embodying my invention showing the door open; Fig. 2 is a plan view of the door opening device when located as shown in Fig. 1; Fig. 3 is a vertical sectional view through the shaft upon which the parts are mounted, some of the parts being omitted. Fig. 4 is a view with parts omitted showing the relative position of the two engaging devices on the holding device. Fig. 5 is a view, with parts omitted, showing the relative position of the interlocking parts when the door of the alarm box is closed.

Like letters refer to like parts throughout the several figures.

One of the objects of my present invention is to provide a device which shall act as a door opener and which shall also have other functions, and I have illustrated my device in connection with an alarm or signal box.

It is of course evident that my invention has various applications and may be used in the arts in many other ways, and I have not attempted to set forth these various ways, as they will readily occur to those versed in the art. When my invention is used, for example, in connection with alarm boxes, such as the box A shown in the drawings, and applied to the door A¹, the door opening device B is located within the box and is provided with a connection to the door.

Referring now to the particular construction shown in the drawings, this door opener comprises a movable part C which in this instance is a disk mounted upon a suitable support. The movable part C is provided with some actuating means for giving it motion. Any means for this purpose may be used and I have illustrated a coil spring C¹ having one end attached to the movable

part C and the other end to a fixed part such as the bolt or shaft upon which the part C is mounted.

Some suitable holding device is provided for holding the disk in a predetermined position against the action of the spring and this holding device is arranged so that it may be released under proper conditions, thus permitting the movable part to be moved by the spring or other associated device. There is also provided means for releasing the part C and also for limiting its movement when released.

Referring to the particular device shown in the drawings wherein one construction for this purpose is illustrated, there is associated with the movable part or disk C, a holding piece or device D, provided with the engaging parts D¹ and D² separated by a space. (See Fig. 4.) Associated with the movable part C are two projections E and E¹ suitably spaced, preferably 180 degrees apart, and adapted to cooperate with the engaging devices D¹ and D².

The projections E and E¹ may be integral with the movable part C, but I prefer to have them separable therefrom as by forming a part of the piece C² rigidly connected to the disk C. The parts are so formed that the projections E and E¹ may, under the proper conditions, pass between the engaging devices D¹ and D². Under normal conditions one of the projections associated with the disk C is in contact with the engaging device D². The holding device D is movably mounted upon a suitable pivot and is also provided with means for automatically moving it in the direction of the arrow shown in Fig. 1. The movement in this direction is so limited that after being moved the engaging device D² is out of engagement with the projection on the piece C² with which it was previously in engagement, and D¹ is then in the path of the projections upon said part C², and hence when the piece C² has rotated a half of a revolution one of the projections will strike the top of the engaging device D¹ and the mechanism will be stopped.

As herein shown, the movement of the holding device D is effected by an electromagnet F connected in a suitable circuit which extends from the box to any point desired, said holding device being connected with the armature F¹ of the magnet, there being a suitable retracting means, such as

the spring F^2 for moving the holding device D to its normal position when the magnet is deenergized. When the magnet is energized the holding device D is moved in the direction of the arrow in Fig. 1. The movable part C is connected in any suitable manner with the door to be opened. As herein shown, a connecting piece G is pivotally connected to the part C at one end and at the other end to the door A^1 . This connecting piece G is provided with some means for retarding the motion of the movable part C , such for example as a dash-pot O . As shown in the drawing, the dash-pot is pivoted at its bottom so as to be free to move as the part C rotates and its piston is connected by a suitable rod with the pivot upon which the connecting piece G is mounted. This connecting piece is preferably made adjustable, so that its end may be properly connected with the door when the device is located at varying distances from the door. This result is produced in the drawing by the spring G^1 associated with said connecting piece G . The connecting piece is made in two parts, the spring being interposed between these parts and engaging a stop device on each of said parts. The spring will thus be compressed between the stop devices when the connecting piece is elongated, thus producing an automatic adjustable connecting piece. With this device, it is not necessary to accurately place the mechanism, for the connecting piece G can be adjusted to accommodate itself to the distance between the device and the door.

Associated with the movable part C is a circuit making and breaking device. As herein shown, this circuit making and breaking device comprises three contacts, H , I and J . The contact I consists of a spring between the other two contacts and projecting beyond them. On the face of the movable part C is a projection I^1 . When the parts are in normal position this projection engages contact I and moves it into contact with contact H so as to complete the circuit between these two contacts. When the movable part C is released the projection I^1 moves away and releases contact I , which then springs back and makes contact with contact J . This circuit making and breaking device may be used for any desired purpose. For example, the contact I may be connected to a battery or source of electric supply and the contact J with a suitable alarm device or bell J^1 . The other contact H may be connected to any suitable circuit, such, for example, as a normally closed circuit passing through the box, which circuit will be opened when the contact I moves away from contact H .

I have described in detail a particular construction embodying my invention, but it is of course evident that the parts may be

varied in form and construction and arrangement, and that some of the parts may be omitted and others used with parts not herein shown without departing from the spirit of my invention. I therefore do not limit myself to the particular form of construction shown. This device also acts as a door closer, as well as a door opener, and can of course be used in any connection, and with any kind of a door where it is desired to automatically open and close the same or operate it from a distance.

The use and operation of my invention are as follows: When the parts are in their normal position the door to be acted upon is closed, and the projection E on the part C^2 is engaged by the engaging part D^2 on the holding device D (Fig. 4). If now the magnet F is energized by completing the circuit there-through it attracts its armature F^1 and moves the holding device D in the direction of the arrow, Fig. 1, that is, to the right. This movement of the holding device D is a limited movement, and when said device has moved sufficiently to move the engaging part D^2 from beneath the projection E the movement is stopped, and the part C^2 being released is rotated in the direction of the hands of a clock, this rotation being caused by the spring C^1 .

The release of the part C^2 by the energizing of the magnet will be clearly seen by referring to Fig. 4, wherein is shown a section through the engaging parts D^1 and D^2 just back of the holding device D , said holding device being indicated in dotted lines. When the holding device D is moved by energizing the magnet so as to release the projection E , and is held in this position, the engaging part D^1 is in the path of the projection E^1 , and when the part C^2 has made a half revolution the projection E^1 strikes D^1 and the parts are stopped. The door at this time is thrown open by means of connecting piece G , as shown in Fig. 1. If after the part E^1 strikes D^1 the magnet is deenergized, the spring F^2 moves the holding device D to the left back to its initial position, as shown in Figs. 1 and 4, and the projection E^1 slides off of D^1 and strikes D^2 . If the magnet F is deenergized before the part E^1 strikes D^1 , the holding device D is moved by the retracting spring F^2 back to its initial position, as shown in Figs. 1 and 4, thus moving the engaging part D^1 out of the path of the projection E^1 so that said projection strikes D^2 and is stopped thereby. The parts are now in position so that the energizing of the magnet F will again move the holding device D and release the projection E^1 and the part C^2 so that the parts will move another half revolution. It will be seen, therefore, that if the part C^2 is released it can move but a half revolution before being stopped, regardless of whether the holding

device D is in its initial position or its moved position, for if in its initial position the engaging part D² is in the path of movement of the projection on C², and if said holding device D is moved by the energizing of the magnet the engaging part D¹ is in said path of movement. It will further be seen that before the part C² can be released the holding device D must be moved to its initial position, for the projection thereon must slip past D¹ and strike D² before the energizing of the magnet F can cause the release.

The projections E and E¹ project laterally from the part C² so that while said projections will strike the engaging parts D¹ and D² said part C² is free to pass the engaging parts as they do not project far enough to strike C². The partial rotation of the part C² and the disk C to which it is attached moves the projection I¹ from beneath the spring contact I, and this spring contact which was held against contact H by the projection I then springs away from contact H and makes contact with contact J. Contacts H and I are connected by a circuit which may, for example, be a normally closed circuit leading from the alarm box to any desired point, and which produces some desired effect by being open. When the projection I¹ is removed from beneath contact I the movement of said contact opens this circuit, and closes the circuit through the alarm bell J, and said alarm bell is operated and will continue to operate as long as the door is open. It is, of course, evident that these circuits may be used for any desired purpose. If it is desired to close the door and bring the parts back to their normal position, it is only necessary to again energize the magnet F, provided it has become deenergized, and the holding device D has been retracted, the projection E¹ being then in engagement with engaging device D², for when this magnet is energized the holding device D is moved to the right so as to move D² from beneath E¹ and the parts are rotated another half revolution so as to be in the position shown in Fig. 5, the door thus being closed. The projection I² is now in engagement with the contact I thus changing the circuits back to their normal condition with the bell circuit open, and the normally closed circuit closed. The parts are now ready to again open the door, and sound the alarm when the magnet F is energized. The manner of energizing the magnet F will depend upon the use to which the device is put. The circuit through this magnet may, for example, be run to a device the tampering with which closes the circuit, such as the walls of a vault or the like, and in such event the magnet will be energized and the device operated. Again this magnet may be energized by a push-button at a distant point located in the circuit run-

ning to the magnet. This magnet may also be energized by the opening or closing of a door, or in fact by any means which it is desired to have operate the mechanism. In view of the numerous uses of this device I have not considered it necessary to show the circuit of the magnet F.

I claim:

1. A door controlling device comprising a rotatable part, a stop device for said rotatable part, a two-part connection between the rotatable part and the door to be controlled, a spring interposed between said two-part connection whereby it may be lengthened.
2. A door controlling device comprising a box, a door therefor, a movable part adapted to be connected with the door to be controlled, a motor device associated with said movable part, a holding device for the movable part, said parts and motor device contained within the box, means for automatically releasing the movable part comprising an electric circuit, a circuit making and breaking device, and an electromagnetic device.
3. A door controlling device comprising a movable part adapted to be connected with the door, a motor device associated therewith, two projecting parts associated with the movable part, and a holding device comprising a movable piece adapted to engage one or the other of said projections in each of the positions of said holding device, a box in which said controlling mechanism is contained, the door when closed protecting said mechanism.
4. A door controlling device comprising a movable part, an actuating device therefor, a holding device for holding such movable part in a predetermined position, an electromagnet for retracting such holding device, said holding device acted upon directly by said electromagnet, a retracting device for returning the holding device when the magnet is deenergized, and means associated with the holding device operating when the holding device is retracted for engaging the movable part after it has been allowed a limited movement.
5. A door controlling device comprising a movable part adapted to be connected with a door, an actuating device therefor, a holding device provided with two engaging parts fixed in position with relation to each other, a projection on the movable part adapted to engage one of said engaging parts, and means for moving the holding device so that said projection will pass between the two engaging parts so as to be released.
6. A door-controlling device comprising a movable part adapted to be connected with the door, an actuating device therefor, a movable holding device adapted to engage the movable part at two different points,

said holding device provided with two separated engaging devices, one adapted to normally hold the movable part and the other to limit its movement when the first engaging device is released.

7. A door controlling device comprising a movable part adapted to be connected with the door, an actuating device therefor, a holding device adapted to engage the movable part at two different points, said holding device provided with two separated engaging devices, one adapted to normally hold the movable part and the other to limit its movement when the holding part is released, and a circuit making and breaking device controlled by said movable part.

8. A door controlling device comprising a movable part adapted to be connected with the door, an actuating device therefor, a combined holding and limiting device comprising an engaging piece adapted when in one position with the door closed to hold the movable part in a fixed position and when in another position to arrest it after a limited movement.

9. A door controlling device comprising a movable part adapted to be connected with the door, an actuating device therefor, a movable holding device associated therewith and provided with two engaging devices, one adapted to hold the movable part against movement, the other adapted, when the first part is moved to release the movable part, to stop the movable part after it has been set in motion.

10. A door controlling device comprising a movable part adapted to be connected with the door, an actuating device therefor, a movable holding device associated therewith and provided with two engaging devices, one adapted to hold the movable part against movement, the other adapted, when the first part is moved to release the movable part, to stop the movable part after it has been set in motion, and means for controlling the position of said holding device.

11. A door controlling device comprising a movable part adapted to be connected with the door, an actuating device therefor, a movable holding device associated therewith and provided with two engaging devices, one adapted to hold the movable part against movement, the other adapted when the first part is moved to release the movable part to stop the movable part after it has been set in motion, and an electromagnet associated

with said holding device and adapted to control its position.

12. A door controlling device comprising a rotating disk, a connecting piece attached thereto and adapted to be connected to the door, an actuating spring for said disk, two projecting parts connected with said disk, a holding device associated with the disk and provided with two engaging devices, one adapted to engage either of the projections on the disk when the parts are in their normal position and the other adapted to engage said projections when the holding device is in its released position so as to stop the movement of the disk.

13. A door controlling device comprising a rotating disk, a connecting piece attached thereto and adapted to be connected to the door, an actuating spring for said disk, two projecting parts connected with said disk, a holding device associated with the disk and provided with two engaging devices, one adapted to engage either of the projections on the disk when the parts are in their normal position and the other adapted to engage said projections when the holding device is in its released position, and an electromagnet adapted to be controlled from a distant point for moving the holding device to its released position.

14. A door controlling device comprising a movable part, adapted to be connected with the door, a controlling device having two engaging devices fixed with relation to each other and adapted to engage said movable part, the engaging face of one of said engaging devices being in advance of the engaging face of the other.

15. A door controlling device comprising a rotatable part adapted to be rotated a part of a revolution at a time in the same direction, a connection therefrom to the door to be controlled, an actuating device for the rotatable part, two separated projections associated with said rotatable part, a holding device for said rotatable part and adapted to release the same under predetermined conditions, said holding device when in its releasing position adapted to engage said projections so as to limit the rotation of the rotatable part to a partial revolution each time it is released.

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Witnesses:

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