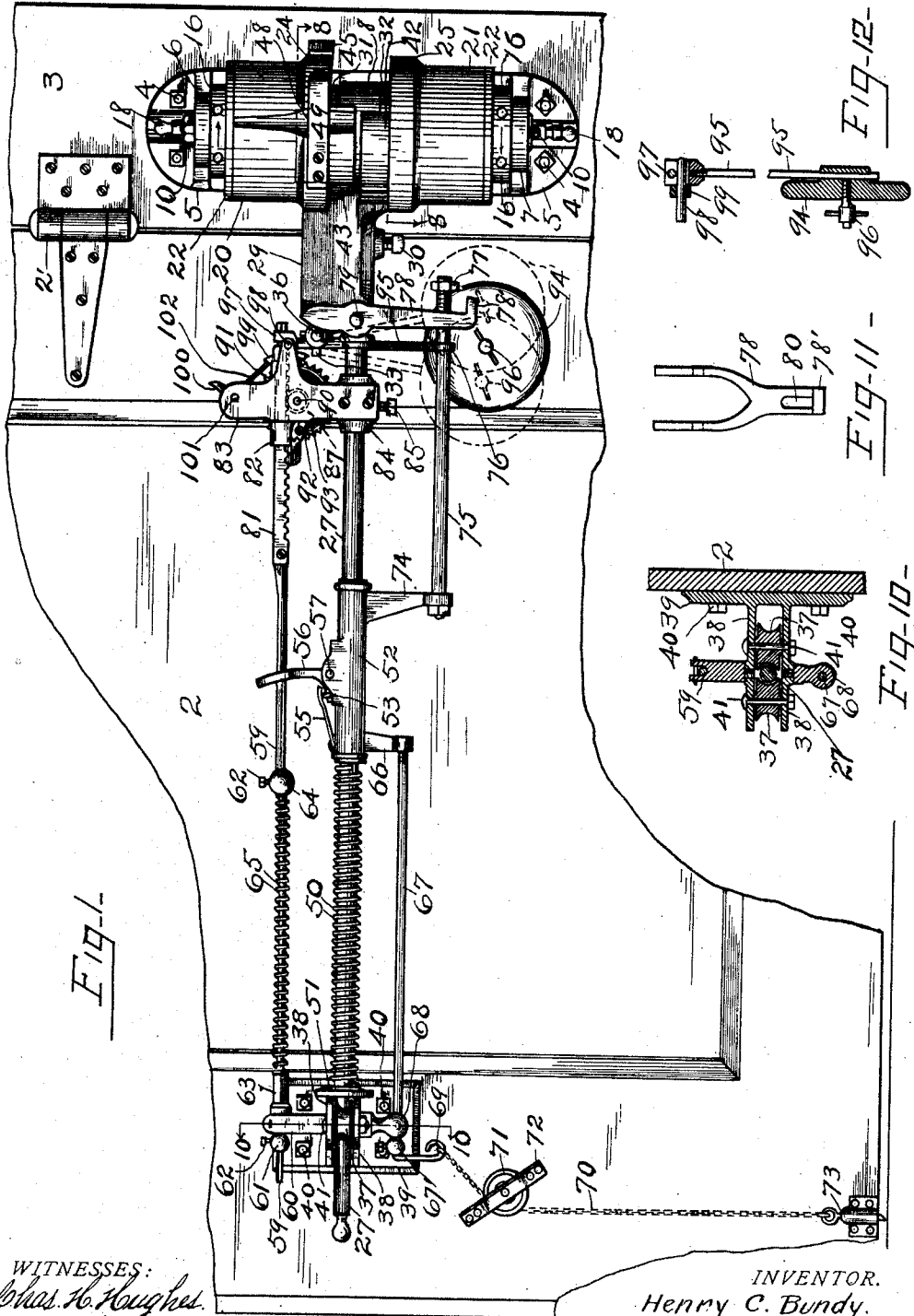


H. C. BUNDY.
DOOR OPENING AND CLOSING DEVICE.
APPLICATION FILED JULY 16, 1910.

975,507.

Patented Nov. 15, 1910.

3 SHEETS-SHEET 1.



WITNESSES:
Chas. H. Hughes
Alv. Neape

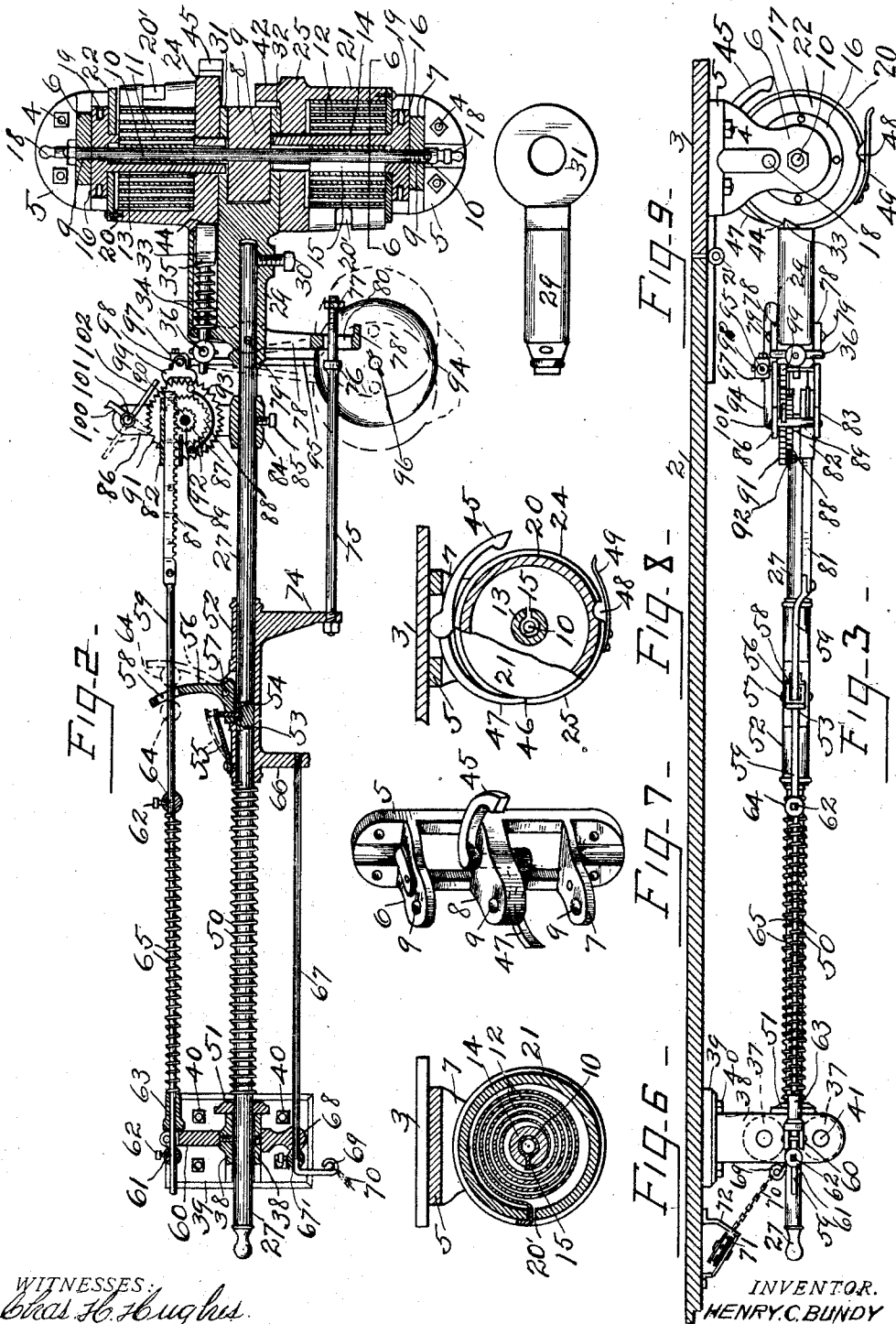
INVENTOR.
Henry C. Bundy.
BY *Harry A. Wallace*
ATTORNEY.

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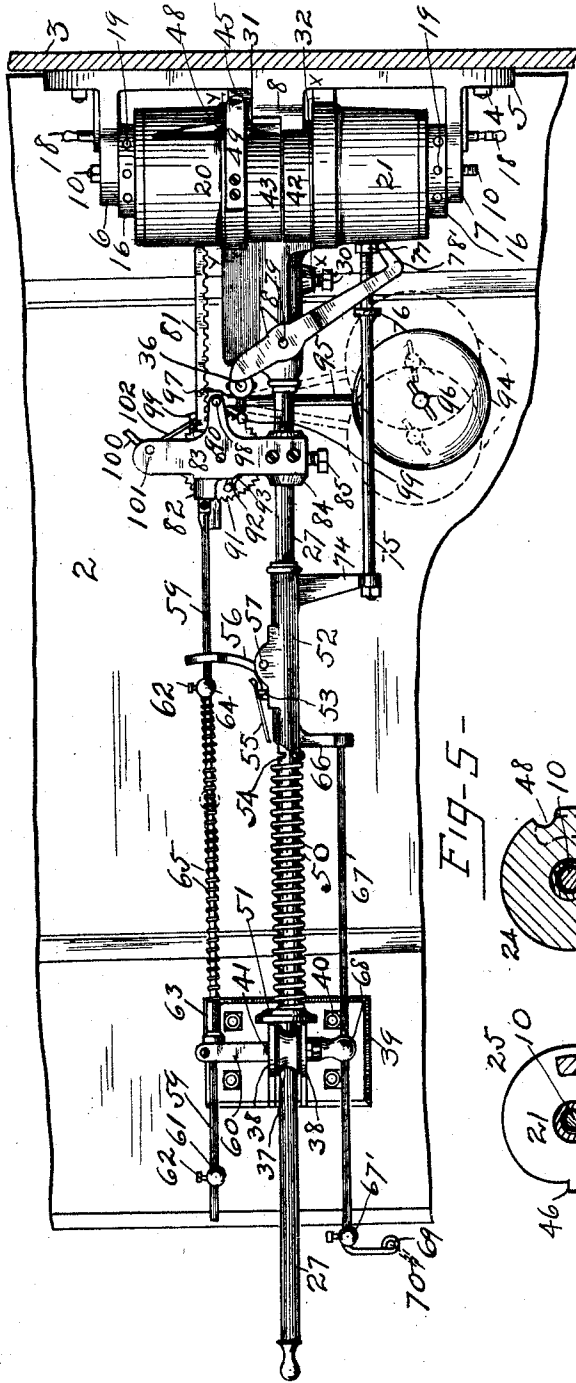
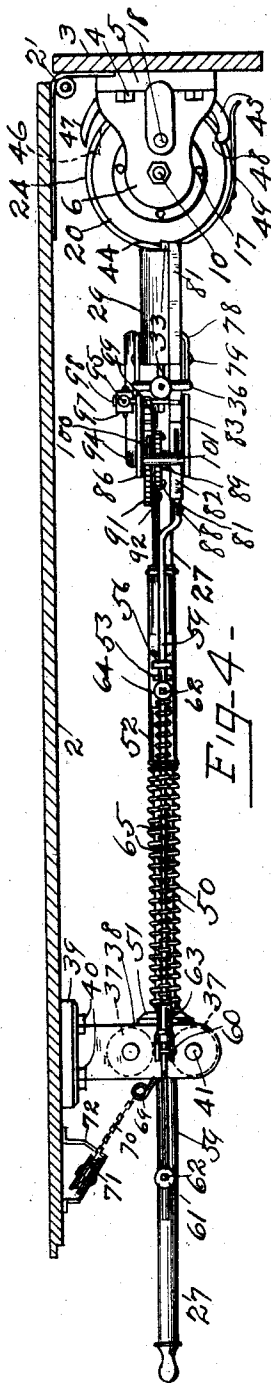
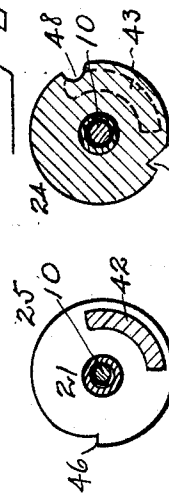


Fig-5-



UNITED STATES PATENT OFFICE.

HENRY C. BUNDY, OF WATERTOWN, NEW YORK, ASSIGNOR TO MILTON H. HART, OF AKRON, OHIO.

DOOR OPENING AND CLOSING DEVICE.

975,507.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed July 16, 1910. Serial No. 572,320.

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 Opening and Closing Devices, of which the following is a specification.

This invention relates to improvements in devices for operating doors or like parts, and is designed especially for opening and closing the doors of fire-department and other buildings.

The invention relates particularly to an improvement in the devices shown and described in my United States patent numbered 829,365, bearing date the 21st day of August 1906.

The object of the invention is to provide a mechanism which will open a door or like part instantly upon the unlatching or otherwise releasing of the door, and which will automatically close the door or part after the lapse of a predetermined time, without attention or assistance from any other source.

A further object is to provide a positive mechanical timing attachment which is carried by the main parts of the device for measuring and regulating the interval of time between the automatic opening and closing of the doors.

A further object is to provide means controlled by the main device for automatically locking and holding the doors in open position until the predetermined time has expired. And a further object is to generally improve and simplify the construction and arrangement of the whole device as compared with the former patent.

The invention consists of the features and parts set forth in the detailed description which follows, and as illustrated by the accompanying drawings which form a part of this specification, and in which—

Figure 1 is an elevation of a portion of a door and its frame, to which the opening and closing device is applied, the door being closed, and the device being set for operation. Fig. 2 is a vertical longitudinal section through the center of the device. Fig. 3 is a top plan view of the device as it appears when the door is closed. Fig. 4 is a top plan view of the device as it appears when the door is open. Fig. 5 is a front

elevation of the device in the position shown in Fig. 4, showing the position of the timing and tripping parts, at the instant the door is released and the closing operation begins. Fig. 6 is a cross-section through one of the spring casings, taken on line 6—6 of Fig. 2. Fig. 7 is a perspective view of the main bracket and the rocking pawl. Fig. 8 is a cross-section on line 8—8 of Fig. 1. Fig. 9 is a detail plan view of the forked-head of the operating lever. Fig. 10 is a sectional view of the guide-bracket, taken on line 10—10 of Fig. 1. Fig. 11 is a rear face view of the forked trigger. Fig. 12 is a sectional view of the pendulum and its connections. Fig. 13 is a cross-sectional view of the closing-spring casing, on line *x—x* of Fig. 5. Fig. 14 is a cross-sectional view of the opening-spring casing on line *y—y* of Fig. 5.

In the drawings, 2 represents the door and 3 the frame or casing therefor. The main parts of the opening and closing device are operatively supported by a bracket which is secured to the casing 3 adjacent the hinge-side of the door, by bolts or screws 4. The said bracket comprises a base 5, end lugs 6 and 7 and a central lug 8, all of said lugs projecting from the face of the base, and are perforated concentrically, as at 9, to receive a bolt 10, which pierces all of the lugs, for holding in place certain working parts of the device.

The power for opening and closing the door is obtained from a pair of reversibly arranged spirally-wound main-springs 11 and 12, which are mounted upon arbors 13 and 14. These springs are attached to the arbors by means of slots 15, and the arbors are bored out centrally to receive the bolt 10. The outer end of each arbor is formed into an enlarged flange or head 16, and the outer faces of said flanges are provided with sockets 17 to receive pins 18, which pass through the lugs 6 and 7, the said pins being employed for maintaining the springs 11 and 12 at a certain normal tension. The main-springs 11 and 12 are inclosed respectively in cylindrical casings 20 and 21 which are arranged concentric to the arbors 13 and 14 and the rod 10. The outer end of the springs are formed into hooks for engaging slot 20' which are formed in the walls of the casings. The upper end of casing 20 and the lower end of casing 21 are open for the insertion of the springs after the latter have

been attached to the arbors, and then the said openings are closed by circular caps 22, which may be secured to the ends of the casings by any suitable means. The adjacent closed ends of the casings 20 and 21, are preferably bored out to receive the projecting ends of the arbors 13 and 14, for affording suitable bearings for these parts. When the device is assembled, the casing 20 is inserted between the lugs 6 and 8, and the casing 21 is inserted between lugs 7 and 8, of the bracket. The main spring 11 is employed for opening the door, and this spring is wound up to give it the proper tension for handling the door, by rotating the arbor 13 in the direction indicated by the arrow on a flange 16 of said arbor. The main spring 12 is employed for closing the door, and this spring is wound up by rotating the arbor 14 in the direction indicated by the arrow on flange 16 of the said arbor. The winding of the springs 11 and 12 is accomplished by means of a rod or other suitable device which is inserted in sockets or holes 19 formed in the periphery of the flanges 16. When the main-springs are both wound up, as last described, the pins 18 are driven in for holding the springs and arbors from recoiling. The pins 18 do not hinder the casings 20 and 21 from being rotated independently of the arbors 13 and 14.

The movements of the door, for opening and closing the same, are affected by a relatively long arm or lever 27, which is disposed horizontally across the face of the door. The inner end of the lever 27 is fitted with a head 29 which is bored out lengthwise to receive the lever, and these parts are then held rigidly together by means of a set screw 30. The free end of the head 29 is formed into a fork having perforated arms 31 and 32, arranged concentric to each other and also to the rod 10 and the casings 20 and 21, the perforations in the fork being large enough to receive the projecting ends of the arbors. The arms of the fork are spaced apart sufficiently to straddle the central lug 8 of the main bracket, and when the parts are assembled, the forked head becomes pivoted to the central lug. The head 29 is bored out longitudinally above and parallel to the lever 27 to provide for the insertion of a latch-bolt 33, which is normally held in position to engage the flange 24 of casing 20, by means of a spring 34, which exerts its tension against a shoulder 35 of the latch-bolt. The opposite end of the latch-bolt is provided with a cross-arm 36 for use in withdrawing the bolt, against the tension of the spring 34, from engagement with the casing 20. The opposite or free end of the door-operating-lever 27 passes between rollers 37, which are mounted between arms 38 of a guide-bracket 39, which is secured to the door by bolts or

screws 40, said rollers being held pivotally in place by pins 41. Under this arrangement the lever 27 is allowed free play reciprocally between the two rollers, when the door is opening and closing. Figs. 1 and 5 best show the extremes of the movement of the lever 27 in the guide-bracket 39. In Fig. 1, which shows the door closed, the guide-bracket appears farthest away from the main-spring casings 20 and 21, and in Fig. 5, which represents the door in open position, the guide-bracket is shown nearest the main-spring casings.

42 and 43 represent lugs formed on the adjacent heads or ends of the casings 21 and 20 respectively, for limiting the rotary movement of said casings; the lug 42 also being employed for closing the door, as will be later explained.

44 is a latch formed in flange 24 of casing 20 to receive the latch bolt 33.

45 and 47 represent oppositely arranged arms of a rocking pawl which is carried by the bracket 5, and which engage respectively a recess 48 in casing 20, and a notch 46 in casing 21, for permitting or preventing the rotary movement of the main spring casings.

When the device is at rest, as when first assembled and applied to the door, the main-spring casings 20 and 21 will be in the position indicated by full and dotted lines in Fig. 4, then the springs 11 and 12 may be wound and retained at their normal tension, by the pins 18; the door at this time should be in closed position. To set the device for automatically opening and closing the door, the door should be first unlatched and then swung by hand from the closed position shown in Figs. 1, 2 and 3, to the open position shown in Figs. 4 and 5. When the door is in the closed position a lug or projection 42 formed on the upper end of casing 21 is in engagement with the head 29 of lever 27. The opening movement of the door, by reason of the connection between head 29 and the lug 42, rotates the casing 21 to the right about a quarter turn, thereby increasing the tension of spring 12 to that extent. When the door reaches the open position shown in Figs. 4 and 5, the head 29 engages one end of a depending lug or projection 43, which is formed on the lower end of cylinder 20, the opposite end of said lug at this time engages the outer edge of the lug 8 of the main bracket which serves to stop the further opening movement of the door. When the head 29 forces the lug 43 against the lug 8, the latch bolt 33 is forced by its spring 34, into a notch 44 formed in the flange 24 of casing 20. As soon as the connection is made between the latch bolt 33 and the notch 44, the operator should close the door. The closing movement of the door, will then carry casing 20 around toward the left about a quarter of a turn to the position shown in

Figs. 1, 2 and 3, and thereby increases the tension of spring 11 to the same extent that the tension of spring 12 had been increased by the opening of the door. This completes the setting of the device for subsequent automatic operation. At the instant the latch bolt 33 drops into the notch 44, the cylinders 20 and 21 are held in such position that the arm 45 of a rocking pawl or lever engages a recess 48, which is formed in the flanges 24 of cylinder 20. When the point of arm 45 enters the recess 48, a second arm 47 of the double pawl is thrown outwardly free from engagement with a notch 46 of the casing 21 by a spring 49, which normally bears against the free end of the arm 45 of the pawl. The initial closing movement of the door, owing to the engagement of the latch-bolt 33 in notch 44, turns the cylinder 20 toward the left, and throws the arm 45 of the pawl out of the recess 48, on to the face of flange 24 and this action forces the point of arm 47 of the pawl into the notch 46 of the lower cylinder 21, which prevents the accidental recoil of said cylinder, and thereby retains the additional tension which has been given to spring 12 by the opening movement of the door. The further closing movement of the door rotates the casing 20 to the position shown in Figs. 1, 2 and 3. Upon the closing of the door the latter should be locked or securely latched so as to prevent the device from opening the door until the proper time.

During the interval the door is closed, the latch bolt 33 remains in notch 44 of cylinder 20. The instant the door is unlatched, the opening spring 11 exerts its power through casing 20 and latch bolt 33 against head 29 of lever 27, and swings the door to the open position shown in Figs. 4 and 5. The opening of the door compresses a coil spring 50, which is carried by lever 27, between a washer 51 and a sleeve 52, both of which are slidable on the lever, the washer being held from displacement by the bracket 39. The sleeve 52, except while the door is closing, is held in rigid position on the lever 27 by a catch 53, which is disposed in a slotted opening in the upper side of the sleeve and engages a corresponding notch 54 in lever 27. The catch 53 is normally held in the notch 54 by a spring 55 which is carried by the sleeve 52. 56 represents a bell-crank lever pivoted in lugs on the top side of the sleeve 52 by a pin 57. One arm of lever 56 passes through an opening in catch 53, the other arm projects upwardly and has a slot 58, through which a rod 59 passes. The rod 59 is confined loosely in a slot of an upwardly projecting standard 60 of the guide-bracket 39, and is limited and partially controlled in its movement longitudinally by a ball-stop 61, which is adjustably secured to the

rod by a screw 62. On the opposite side of the slotted standard 60 is disposed a collar or washer 63, which is slidable on rod 59, and near the middle of said rod is a second stop 64 also adjustably applied and secured by a screw 62. Between the collar 63 and stop 64 is arranged a coil spring 65 which normally exerts its tension to force the rod 59 to the right, for bringing the stop 64 into engagement with the bell-crank lever 56, for releasing the catch 53, for permitting spring 50 to force the sleeve 52 to the right. The movement of rod 59 to the right by the force of spring 65 can only take place when the door is in open position as shown in Figs. 4 and 5. When the door is closed the stop 61 is in engagement with standard 60 of bracket 39 which prevents the spring from exerting its tension for moving rod 59. The sleeve 52 is provided with a downwardly projecting arm 66 to which is connected one end of a rod 67, the other end of said rod being slidably held by a lug 68 which depends from the guide-bracket 39, the said lug being perforated to receive the rod 67. A stop 67' carried by rod 67 limits its movement in lug 68. The free end of rod 67 is formed into a loop 69 to which a chain 70 is attached. The chain 70 passes over a pulley 71, which is secured to the door 2 by a clamp 72, and extends to the bottom of the door, where it connects with a latch-bolt 73, which is employed for locking and holding the door in open position when operated by the device. The sleeve 52 is also provided with a second depending arm 74 to which is secured a rod or finger 75, which extends horizontally toward the casing 21. Near the free end of rod 75 is formed a shoulder 76 and at its free end is affixed an adjusting nut 77. 78 represents a forked trigger which is pivoted by a pin 79 to the head 29, the arms of the fork passing upwardly on each side of the head. The lower portion or stem of the trigger 78 is slotted at 80 to receive the rod or finger 75, and the extreme lower end 78' of the trigger is bent at right angles to the stem to serve as a stop, as will later appear.

When the doors are opened by the automatic action of the device, it is necessary to hold the same open for a period of time sufficient to allow the fire apparatus to pass out, and then it is intended that the lever 27 after a comparatively short predetermined time effect its own release from casing 20 containing the opening spring 11, and close and lock the doors, to prevent unauthorized persons from gaining access to the building, as well as for keeping out the cold. To this end the device is equipped with a timing mechanism which is self-acting and self-winding, and which consists of the following parts: A rack 81 is formed on or con-

nected to the inner end of rod 59, and the
 said rack is disposed in a guide 82, which is
 secured to, or may be formed on, one side
 of a bracket or plate 83, which is carried by
 5 a sleeve or hub 84, which is rigidly secured
 to lever 27, by a screw or pin 85. 86 repre-
 sents a second bracket or plate which is
 mounted on the opposite side of the hub 84,
 parallel to and which coöperates with plate
 10 83 for forming a frame for the support of a
 clock-work, comprising a pinion 87, which
 engages and is driven by the rack 81 and a
 ratchet-wheel 88, which connects with the
 pinion 87 by a sleeve or hollow shaft 89.
 15 These two latter gears operate as one part on
 a shaft 90 which passes through the plates 83
 and 86. 91 represents a larger gear which is
 loosely journaled on shaft 90 and is driven
 20 in one direction by a pawl 92 which is piv-
 oted to the side of gear 91 and engages the
 teeth of ratchet-wheel 88, the said pawl be-
 ing held in operative position by a spring 93
 which is carried by gear 91. The regulation
 25 of the timing mechanism or gears is accom-
 plished by a pendulum 94, which is adjust-
 ably secured to a depending rod 95, by a set-
 screw 96, the upper end of rod 95 being
 rigidly held by a clamp 97 which is pivot-
 30 ally mounted on the rear side of plate 86,
 by a pin or shaft 98, and an escapement dog
 or part 99 which is also rigidly mounted on
 the pin 98, between plates 83 and 86, and is
 held normally in engagement with the gear
 35 91. The operation of the escapement or
 timing mechanism and related parts is as
 follows: When the door is opened by the de-
 vice, the shortening of the distance between
 the guide-bracket 39 and the main-spring
 40 casings 20 and 21 by the swing of the door
 on its hinge 2', effects the compression of the
 coil springs 50 and 65, to the extent shown
 by a comparison of Figs. 1, 2 and 3 with
 Figs. 4 and 5. The spring 65 being thus
 compressed, instantly begins to exert its ten-
 45 sion against the stop 64 thereby forcing rod
 59 to the right. The movement of rod 59
 to the right, through its rack 81, drives the
 pinion 87 and ratchet wheel 88 also to the
 right, and the latter being engaged by the
 50 pawl 92 carried by gear 91, drives said gear
 91 in the same direction. The rotation of gear
 91 under the pressure or power of spring 65
 effects the step-by-step operation of the dog
 99 and the oscillation of the pendulum 94.
 55 The dotted lines in Figs. 1 and 5, show the
 travel of the pendulum which governs the
 movement or travel of the rod 59 by even
 steps, until the stop 64 engages and trips the
 bell-crank lever 56 and lifts the catch 53 out
 60 of notch 54 in lever 27. The instant the
 catch 53 is withdrawn, sleeve 52 is forced to
 the right by spring 50 with considerable
 suddenness and forces finger 75 toward the
 casing 21. At the first movement of rod 75
 65 the shoulder 76 strikes the stem of trigger

78, swings the latter on its pivot 79, and
 effects the withdrawal of the latch-bolt 33
 from notch 44, and at the same time the rod
 67 carried by sleeve 52 pulls on chain 70, and
 lifts the latch bolt 73, for unlocking the door 70
 and permitting it to be closed. The travel
 of the sleeve 52 and finger 75 to the right is
 arrested by the stop 78' of the trigger con-
 tacting with the side of casing 21.

The releasing of the bolt 33 from notch 44 75
 of casing 20, allows the main spring 12 to
 exert its tension for closing the door. This
 is done as follows: The projection 42 of cas-
 ing 21 remains in engagement with head 29
 during the interval in which the door is 80
 held in open position, but spring 12 cannot
 close the door because bolt 33 is still held by
 the notch 44 of casing 20. While the parts
 are in the latter condition the main-springs
 11 and 12 practically balance each other 85
 while the clock-work is measuring the time
 for the final release of said parts. Soon as
 the latch bolts 33 and 73 are withdrawn,
 both of the main-springs 11 and 12 become
 active, but they exert their power in the re- 90
 verse directions. Spring 11 first moves cas-
 ing 20 a slight distance to the right until
 projection 43 strikes lug 8 of the bracket,
 which movement allows pawl 45 to drop into
 recess 48, and at the same time this action 95
 throws pawl 47 out of notch 46 of casing 21.
 The main-spring 12 then becomes free to ex-
 ert its power for rotating casing 21 to the
 left and the lug 42 being in engagement with
 head 29 of lever 27 forces the door into 100
 closed position.

A stop 67' made rigid on the outer end of
 rod 67 engages the lug 68 of bracket 39
 while the door is closing and thereby pulls
 the sleeve 52 from the position shown in 105
 Figs. 4 and 5 to the position shown in Figs.
 1, 2 and 3, and permits catch 53 to engage
 notch 54 of lever 27 for holding the sleeve in
 readiness for the next releasing and closing
 of the door. 110

When the door is finally closed and locked
 by the automatic working of the device, as
 described, the device will not again operate
 for opening and closing the door until the
 attendant opens and closes the same by hand, 115
 as first explained. After each automatic
 operation of the device, the doors must be
 opened and closed for resetting the mecha-
 nism, as described.

Should it be desired, at any time after a 120
 door has been opened by the device, to delay
 or prevent the automatic releasing of the
 springs 11 and 12 and the closing of the
 door, the clock-work may be stopped by
 means of a catch or check 100, which is piv- 125
 otally mounted between plates 83 and 86, by
 a rod 101, to which is attached a handle 102.
 The arrangement and operation of this
 check or stop may best be seen by reference
 to Fig. 2, in which the dotted lines show the 130

catch 100 engaging a tooth of gear 91, while the full lines show the stop in full release.

In case the device is applied to double doors, one complete device is operatively attached to each door, and each acts independently of the other, but the timing mechanism of one of the devices is set to prolong the releasing of the main-spring a few seconds longer than the other so that the doors may close in a manner to permit one to overlap the other in the usual manner.

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

1. A door opening and closing device, comprising a pair of main-springs adapted for mounting on the frame of a door, a lever pivoted between said main-springs, and operatively connected to the door, said lever adapted to be operated in one direction by the power of one of said main-springs, and in the opposite direction by the power of the other of said main-springs, means for preventing the simultaneous operation of said main-springs, a latch-bolt carried by said lever adapted to engage a casing surrounding one of said springs for effecting the opening of the door, a lug carried by the casing of the second main-spring adapted to engage said lever for closing the door, after the said latch-bolt is released, and a spring-actuated sleeve carried by said lever adapted for releasing said latch-bolt.

2. A door opening and closing device, comprising a pair of reversely operable main-springs inclosed in separate casings supported by the frame of a door, a lever pivoted between said casings and capable of being swung in opposite directions alternately by engagement with said casings, the said lever operatively connected with the door, a clock-work for measuring the time between the operations of said lever by the said main-spring casings, a spring for actuating said clock-work, and a spring for releasing said lever from engagement with one of said casings after the first spring has spent its force.

3. A door opening and closing device, comprising a pair of reversely operable main-springs inclosed in separate casings supported by the frame of a door, a lever pivoted between said casings and capable of being swung in opposite directions alternately by engagement with said casings, the said lever operatively connected with the door, a clock-work for measuring the time between the operations of said lever by the said main-spring casings, a spring for actuating said clock-work, a spring for releasing said lever from engagement with one of said casings after the first spring has spent its force, and means for automatically locking the door in open position during the interval said clock-work is being actuated.

4. A device of the class described, comprising a pair of main-springs arranged to exert their tension in opposite directions, a cylindrical casing for inclosing each main-spring tube-like arbors disposed concentrically in said casings for supporting said springs, a bracket for supporting said casings adjacent to a door, a bolt piercing said arbors and also said bracket for pivotally mounting said casings, a rocking-pawl pivoted in said bracket, said pawl having oppositely arranged arms adapted to alternately engage a notch in one casing and a recess in the other casing for permitting or preventing the recoil of said main-springs, and a spring carried by one of said casings and normally engaging one arm of said pawl, adapted for releasing the opposite arm of said pawl from the notch of the other casing.

5. In a door opening and closing device, the combination with an opening and a closing spring, and a bracket for mounting said springs on the frame of a door, of an operating-lever pivoted at one end to said bracket and capable of being swung in opposite directions by said springs, means for positively connecting said lever with the opening spring, a guide-bracket for connecting the opposite end of said lever to the door, a sleeve carried by said lever, a catch for normally holding said sleeve stationary on the operating-lever, a spring carried by said lever and engaging said sleeve adapted for operating said sleeve upon the releasing of said catch, means for releasing said sleeve, and means coöperating with said sleeve for disconnecting said operating-lever from the opening-spring for permitting the closing-spring to close the door.

6. In a door opening and closing device, the combination with an opening and a closing spring, each adapted to be wound and operated independently, and a bracket for mounting said springs on the frame of a door, of an operating-lever pivoted at one end to said bracket and capable of being actuated in opposite directions by said springs, the said lever adapted for increasing the tension of said springs, means for positively connecting said lever with the opening spring, a guide-bracket for connecting the opposite end of said lever to the door, a sleeve carried by said lever, a catch for normally holding said sleeve stationary on the operating-lever, a spring carried by said lever and confined between said sleeve and said guide-bracket adapted for actuating said sleeve upon the releasing of said catch, and means for releasing said catch for permitting the automatic closing of the door after the lapse of a predetermined period of time.

7. In a door opening and closing device, the combination with an opening and a closing spring each adapted to be wound and

operated independently, and a bracket for mounting said springs on the frame of a door, of an operating-lever pivoted at one end to said bracket and capable of being actuated in opposite directions by said springs, the said lever adapted for increasing the tension of said springs, means for positively connecting said lever with the opening spring, a guide-bracket for connecting the opposite end of said lever to the door, a sleeve carried by said lever, a catch for normally holding said sleeve stationary on the operating-lever, a spring carried by said lever and confined between said sleeve and said guide-bracket adapted for actuating said sleeve upon the releasing of said catch, a rod supported by said lever and said guide-bracket, a coil-spring carried by said rod and disposed between said catch and said guide-bracket adapted for actuating said rod for releasing said sleeve, and a clock-work actuated by the power of said coil-spring adapted for regulating the travel of said rod.

8. In a door opening and closing device, the combination with the opening and closing springs pivotally mounted on the frame of a door, and an operating-lever pivoted to the frame and connected to the door, of a latch-bolt carried by the operating-lever adapted to coöperate with the opening spring for actuating said lever for opening the door, a second latch-bolt carried by the door and operatively connected to the operating-lever adapted to hold the door in open position, a sleeve slidably mounted on said operating-lever and normally held stationary by a catch, a coil spring mounted on the operating-lever and engaging said sleeve, said coil spring adapted to be compressed by the opening of the door for creating a tension for operating said sleeve when the catch is released, a finger carried by said sleeve and a trigger carried by said operating-lever adapted to coöperate for releasing the first latch-bolt for permitting the closing spring to close the door.

9. In a door opening and closing device, the combination with the opening and closing springs pivotally mounted on the frame of a door, and an operating-lever pivoted to the frame and connected to the door, of a latch-bolt carried by the operating-lever adapted to coöperate with the opening spring for opening the door, a second latch-bolt carried by the door and operatively connected to the operating-lever adapted to hold the door in open position, a sleeve slidably mounted on said operating-lever and normally held stationary by a locking device, a coil-spring mounted on the operating-lever and engaging said sleeve, said coil-spring adapted to be compressed by the opening of the door for creating a tension for actuating said sleeve when the latter is released, the

said sleeve adapted to be moved longitudinally on said operating-lever by said coil-spring, for automatically releasing both of said latch-bolts, for permitting the closing of the door by the power of the closing springs.

10. The combination with a door and a door frame, and a bracket mounted upon the said frame, of a pair of cylindrical casings pivotally mounted in said bracket, a pair of reversely wound springs inclosed in said casings, means carried by each casing for independently winding each of said springs, and also for maintaining said springs at a normal tension, a lever pivoted at one end in said bracket between said casings, the opposite end yieldingly connected to the door, adapted to swing the door toward or away from said bracket a measured distance when actuated by said springs, a latch-bolt carried by said lever for positively engaging one of said casings adapted for moving the door toward said bracket, a projection on the second casing adapted to engage said lever by contact for moving the door away from said bracket, a trigger pivotally connected to said lever adapted to release said latch-bolt from the first casing for permitting the spring in the second casing to close the door, and a spring actuated sleeve carried by said lever adapted for operating said trigger.

11. The combination with a door and a frame therefor, and a pair of main-springs and an operating-lever, the said main-springs mounted on the frame, the said lever pivoted to the frame and also connected to the door, of a sleeve mounted on said lever intermediate its ends, a catch carried by said sleeve for holding the sleeve stationary during certain intervals, a coil-spring carried by said lever normally exerting its tension to force said sleeve toward said main-springs, a bell-crank lever carried by said sleeve and connecting with said catch, a rod disposed above said operating-lever, said rod having one end slidably supported by a bracket carried by the door, the opposite end comprising a rack disposed in a guide supported by the operating-lever, said rod connecting to one arm of said bell-crank lever, a coil-spring carried by said rod and disposed between said bell-crank lever and said guide-bracket adapted to exert its tension for moving said rod toward said main-springs and for tilting said bell-crank lever for releasing said catch, and a timing mechanism carried by the operating lever, comprising a series of gears actuated by the rack-portion of said rod and a pendulum, adapted for measuring the interval of time between the opening and closing of the door.

12. The combination with a pair of main-springs wound in opposite directions, and inclosed in casings adapted for increasing

the normal tension of the springs, and a bracket for pivotally supporting said casings, the said bracket adapted for mounting adjacent a door, of an operating-lever pivoted at one end to said bracket between the said casings, the opposite end of said operating-lever adapted for connecting with a door, a guide-bracket mounted on the door and connecting with the operating-lever, a latch-bolt carried by said operating-lever and held normally in engagement with one of said main-spring casings, a trigger pivoted to the operating-lever adapted to move said latch-bolt away from said casing, a sleeve slidably mounted on said operating-lever between said guide-bracket and said trigger, the said sleeve having a finger connecting with said trigger, a spring carried by said operating-lever interposed between

said guide-bracket and said sleeve, adapted to be compressed by the opening movement of the door for giving it tension for moving said sleeve in the direction for actuating said trigger, a rod carried by said sleeve and engaging said guide-bracket adapted for moving said sleeve in the opposite direction by the closing movement of the door, and a catch carried by said sleeve adapted to engage a notch in said operating-lever for normally holding said sleeve from operating said trigger.

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

HENRY C. BUNDY.

Witnesses:

J. H. O'BRIEN,
FRED A. BALDWIN.