P. A. BROWN.

ELECTRICALLY OPERATED NON-INTERFERING ALARM CALL BOX.

APPLICATION FILED FEB. 1, 1909.

949,970. Patented Feb. 22, 1910.

3 SHEETS—SHEET 1.

Fig. 2.

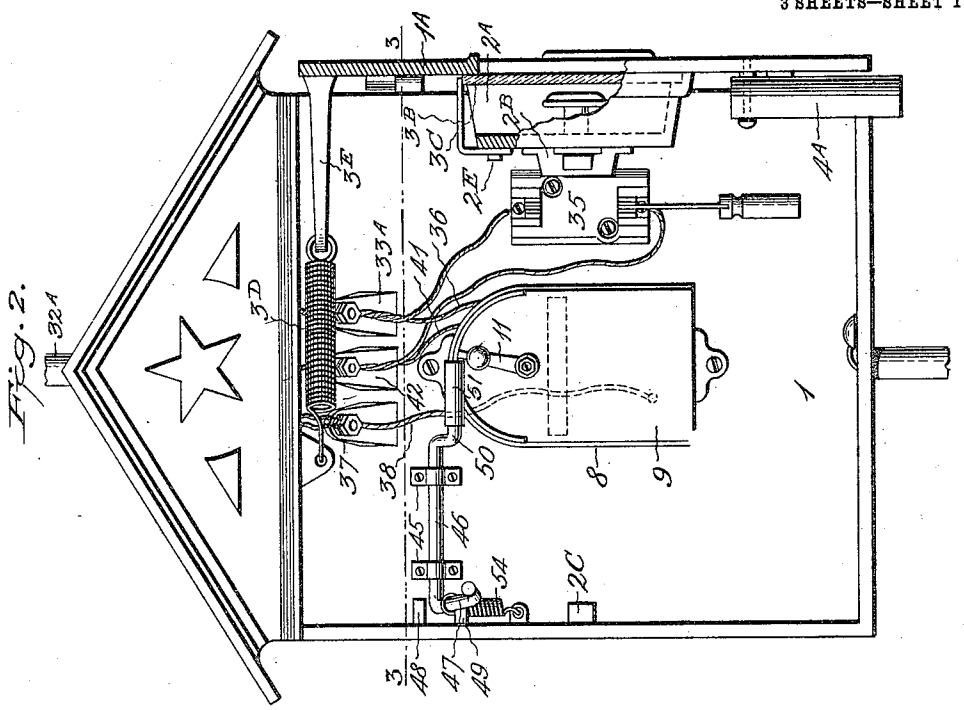
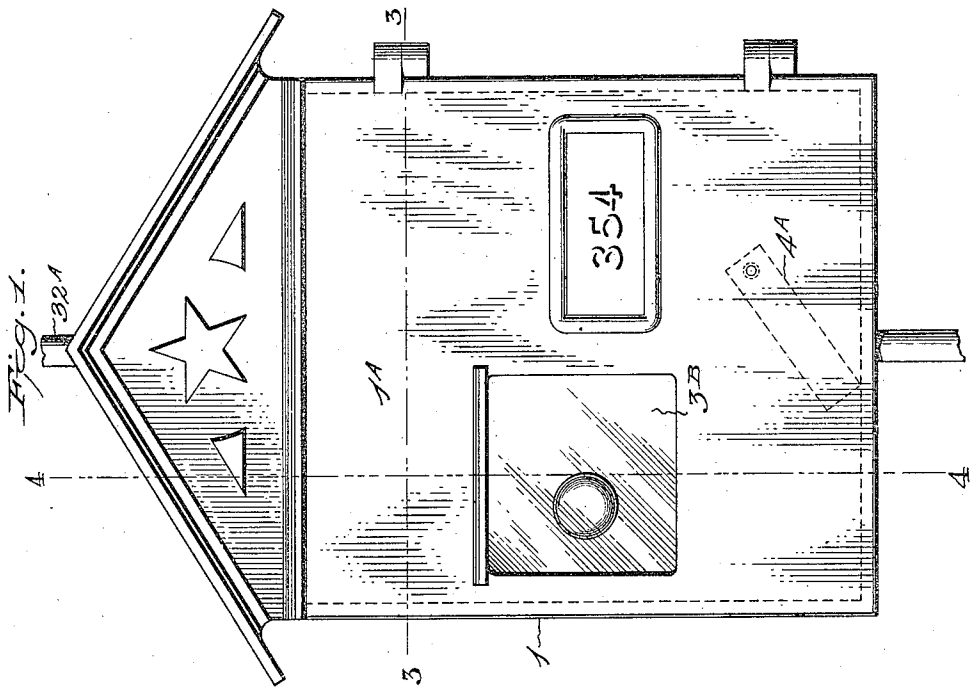


Fig. 1.



Witnesses:

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Adella M. Fowle

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3 SHEETS—SHEET 2.

Fig. 3.

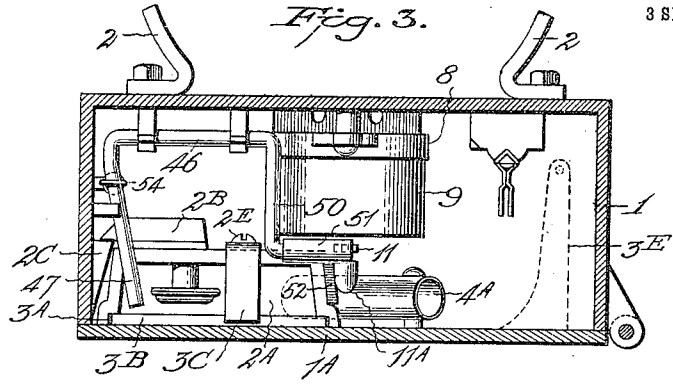


Fig. 4.

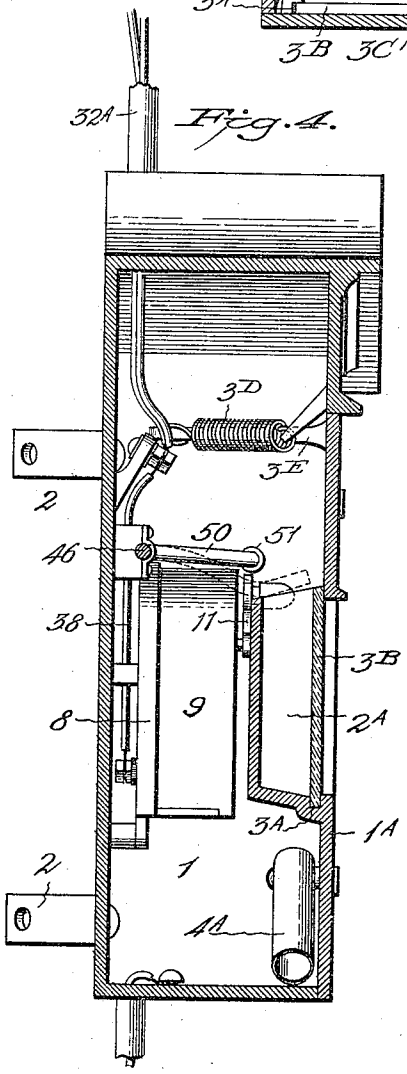
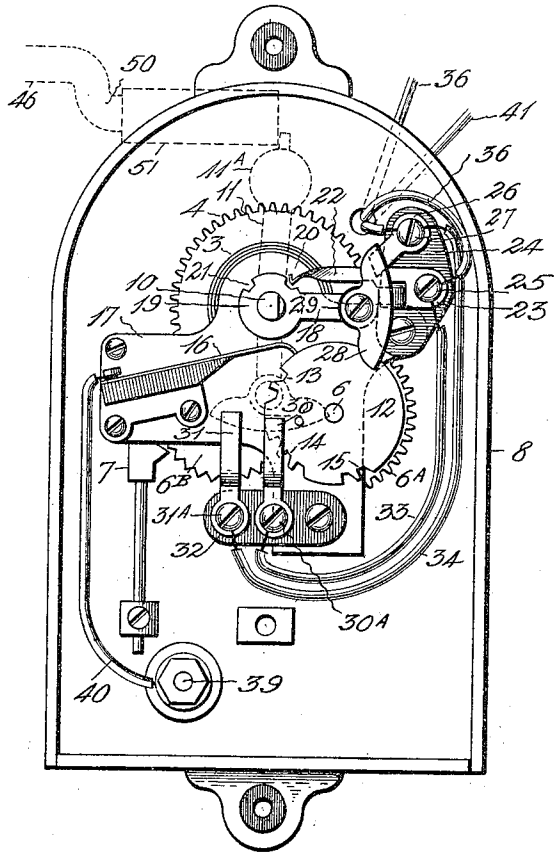


Fig. 5.



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3 SHEETS—SHEET 3.

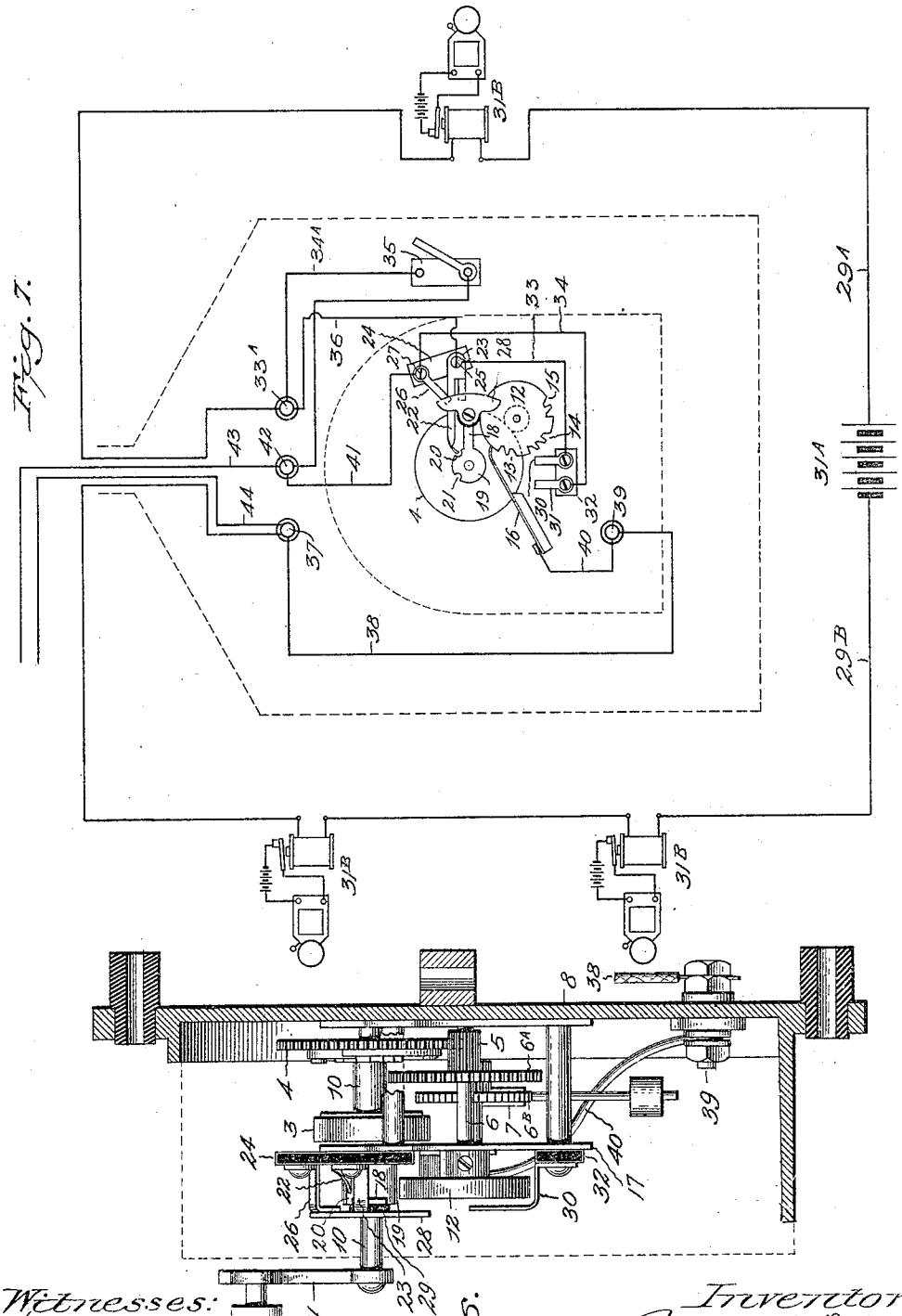

Fig. 7.

Fig. 6.

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UNITED STATES PATENT OFFICE.

PEABODY A. BROWN, OF DENVER, COLORADO.

ELECTRICALLY-OPERATED NON-INTERFERING ALARM CALL-BOX.

949,970. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed February 1, 1909. Serial No. 475,441.

To all whom it may concern:

Be it known that I, PEABODY A. BROWN, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Electrically-Operated Non-Interfering Alarm Call-Box, of which the following is a specification.

My invention relates to improvements in non-interfering alarm call boxes; and the objects of my invention are: First, to provide an electrically operating alarm calling box for fire and other alarm systems. Second, to provide an automatically operating alarm mechanism releasing and non-interfering alarm call box. And third, to provide a simple, durable, and easily operated automatic bell ringing mechanism releasing and alarm calling machine, for fire, burglar, and other alarm systems. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a front view of the call box used in the present alarm ringing system. Fig. 2, is a similar view, the door being open and partly in section. Fig. 3, is a horizontal, sectional view on the line 3—3 of Figs. 1 and 2. Fig. 4, is a vertical, sectional view on the line 4—4 of Fig. 1. Fig. 5, is a front view of the mechanism by which an electric circuit through a plurality of relays is opened and closed, for the purpose of ringing an alarm. Fig. 6, is a side view of the said mechanism. And Fig. 7, is a view in diagram, showing a plurality of bell ringing relays in circuit with the improved mechanism for automatically effecting the ringing of an alarm.

Similar characters of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1, designates a call box, which is provided with the usual entrance door 1^A, which box is preferably made of a conductive metal and is provided with lugs 2, or other suitable means, by which it may be attached to posts or walls.

The door is formed with a chamber 2^A, which is open at the top and front side, and to the rear wall of this chamber an ordinary spring controlled latch 2^B is secured, which hooks under a keeper 2^C, that is positioned on the body of the box in alinement to receive it. The stem of the latch extends through the rear wall of the chamber, and is provided with a knob which lies within and is inclosed by the chamber.

A groove 3^A is formed in the end walls and bottom of the chamber, where they unite with the door, and the front wall of the chamber is left out to afford access to the chamber. A piece of glass 3^B is inserted in the groove 3^A, and incloses the knob, and this glass cover 3^B is secured within the slot by a clip 3^C, that is removably secured to the rear wall of the chamber by a screw 2^E, and extends over the upper end of the chamber and over the edge of the glass. The glass acts as a sealed cover for the knob which it incloses, and prevents access to the knob except in case an alarm is to be sent in from the call box, when the glass is broken and the knob is turned to release it from its keeper 2^C. The door of the call box is adapted to be latched when the clock mechanism is set in an operative position to ring an alarm, and I preferably arrange the call box door to fly open when it is released from its keeper 2^C, and preferably carry out this feature of my invention by means of a spring 3^D, preferably using a coiled spring, one end of which is secured to an arm 3^E, that is formed on the door, and the opposite end of which is attached to the call box in a position to throw the door open when the knob is turned to release the latch from the keeper. The inside of the door is also provided with a gravity stop 4^A, which is pivotally secured to the inside of the door, and is arranged to lie within the call box when the door of the call box is closed, but is adapted when the glass is broken and the latch knob is turned and the door flies open, to swing down between the door and the lower front portion of the box, and prevent the closing of the door accidentally or purposely without inserting the hand and purposely raising the lug, the function of the lug being to prevent the door from being closed against the mechanism before the clock mechanism has rung its alarm.

The call box 1 is provided with a spring controlled clock mechanism, which consists of the usual spindle upon which is mounted the actuating spring 3, and the main driving gear 4, which meshes with a pinion 5, on a shaft 6, having a gear wheel 6^A, which actuates an escapement wheel 6^B, controlled by an escapement lever 7; the construction and arrangement of which are well known

and do not require further description. This clock mechanism is incased in a suitable metal box 8, which is provided with a removable cover 9, and the box is arranged to be secured to the back of the call box. The main spindle 10 of the spring 3, and driving gear 4, of the clock mechanism, extends up through the cover of the box 8, and to its end I secure a crank arm 11, the end of which is provided with the usual handle portion 11^A. A make and break disk 12 is secured to the spindle 6, which connects with the gear 4 through the pinion 5, and this disk is preferably geared to make four revolutions while the driving gear 4 is making the greater part of one revolution. This make and break disk 12 is provided with a plurality of notches arranged in three groups 13, 14 and 15, and its periphery is engaged by a spring contact terminal 16, which is secured to and is insulated from a plate 17, in which is formed the upper bearings of the spindles of the gears which constitute the operating mechanism for the disk 12, and this insulated contact terminal arm enters the notches of this disk and breaks the circuit of the current for the purpose of ringing a bell a plurality of times, as will be fully described hereinafter.

To the main driving spindle 10, I secure one end of an arm 18, which I term the controller arm, and the end of this controller arm which is mounted on the spindle is provided with a hub portion 19, which is secured on the spindle, and this hub portion of the controller arm is provided with two notches 20 and 21. This hub is designed to be engaged by a spring contact arm 22, which forms a part of a terminal contact 23, which is secured to a fiber block 24, by a winding screw 25, and this terminal arm 22 normally stands in the notch 20 when the clock mechanism is wound and set for operation, and in the notch 21 when the clock mechanism is unwound and at the end of its operative movement. The block 24 is secured to the plate 17, as shown in Figs. 5 and 6. A second terminal contact 26 is also secured to the block 24 by a binding screw 27, and the contacts 23 and 26 are designed to be engaged by a contact arm 28, which is secured to the outer end of the arm 18, when the crank arm 11 is turned to the position shown in the drawing, the purpose of which will be fully explained hereinafter. The contact arm 28 is insulated from the arm 18, by a non-conducting medium 29. This controller arm 18 swings around through the greater part of a revolution, as the clock spring unwinds, and is designed also to engage two terminal contact strips 30 and 31, which are secured by binding screws 30^A and 31^A to a fiber block 32, which is secured to the plate 17. The contact 23 is connected with the contact 30, by an insulated wire 33, and the contacts 26 and 31 are connected by an insulated wire 34. The line wires of an alarm system adapted to be used in connection with my improved call box, are arranged as indicated in Fig. 7, which shows a diagrammatic view of the system. This system comprises the wires 29^A and 29^B, the battery 31^A, and bell ringing relays 31^B. The line wire 29^A extends from the battery 31^A and relay 31^B to the call box, which it enters through a pipe 32^A, and is secured to an insulated binding post 33^A. From this binding post a branch wire 34^A extends to one end of a switch 35, and another branch wire 36 extends to the binding screw 25 of the contact terminal 23. The line wire 29^B extends from the battery 31^A and relays 31^B to the call box, and enters through the pipe 32^A, and is connected to an insulated binding post 37. From this post 37 a branch wire 38 extends to an insulated binding post 39, formed on the bottom of the clock mechanism supporting box, from which a branch insulated wire 40 extends to the insulated terminal arm 16.

From the binding screw 27 of the terminal 26, a branch wire 41 extends to a binding post 42 in the top of the box, and from this binding post 42 a wire 43, which I term the second section of the main line wire 29^A, extends out through the pipe 32^A of the box, and leads to the next call box in the system, and is connected to its post 33^A in the same manner as the end of the main wire 29^A. A wire 44, which I term the second section of the main line wire 29^B, is also connected at one end to the binding post 37, and this wire 44 also extends out through the pipe 32^A to the next call box of the system, and is connected to its binding post 37 in the same manner, and when these two wires 43 and 44 have extended to the end of the system of call boxes, they are connected together beyond the last call box by a circuit closing joint, which completes the circuit back to the battery 31^A. By grounding all binding posts 37 and opposite end of battery from that to which wire 29^A is connected, the ground may be used in place of wire 29^B, by attaching wire 43 to binding post 37 in the farthest box from the battery. This arrangement permits the circuit from the battery 31^A through the line wires, to be closed before the call box is set into operation, and also at the end of its alarm giving movement of the arm 11, the contact arm 28 being in engagement with the contact terminals 23 and 26 when the alarm is set off, and is moved around into contact with the terminals 30 and 31 at the completion of its operative alarm giving movement. When the arm 11 is at its starting point, the circuit is closed through the battery and line wires, and the wheel 12 is thereby shunted out, owing to the end of the contact arm 22 being in the notch 20 of the hub 19, but as the hub

rotates, the arm 22 contacts with the hub and the circuit is established through the mechanism, arm 16 and circuit wires, around through the arm 22, and when the arm 11 reaches the limit of its movement, the end of the arm 22 enters the notch 21 of the hub 19, and the circuit is again closed through the line wires by contact of the arm 28 with the terminal contacts 30 and 31, while the circuit through the wheel 12 and arm 22 is broken. This arrangement cuts all of the call boxes out of the circuit, when their mechanism is either wound up or run down, and the operation of any one box cuts out all boxes beyond it, by breaking the current at contacts 23 and 26; thus in case of an alarm coming in from two boxes at the same time, the signal would be received only from the nearest box to the batteries.

To the inside of the rear wall of the call box, I secure by straps 45, the center portion of a yoke-shaped lever 46, which I term the clock locking lever. One member 47 of this lever is adapted for a handle portion and is arranged to be grasped by an attendant having charge of the alarm system. This handle portion extends forward from the center portion along the door opening side of the call box, and is positioned between two stop lugs 48 and 49, which permit it to have a short oscillating movement, and it terminates adjacent to the door 1^A of the call box. The opposite member 50 of the yoke-shaped lever extends forward and alongside the clock mechanism box to a point above its cover, and its end is bent at right angles to extend over the cover to a point in line with its vertical center. The terminal end of the member 50 of the lever is insulated by a sleeve or cap 51, of any suitable insulated material, such as fiber, and when the crank is turned to wind the spring, the end of the crank is engaged by the insulated sleeve, and held in the position shown in Fig. 2, until the door is shut, the lever being first turned to move the sleeve out of the path of the crank, and thus allow it to pass.

A contraction spring 54 is secured to the inside of the call box at one end, and at its opposite end to the handle member 47 of the lever 46, and normally holds the handle member against the stop lug 49, and the insulated end 51 of its member 50 in the rotative path of the end of the crank lever 11 of the main spindle of the clock mechanism.

The sides of the chamber 2^A of the door converge, and the side that is nearest to the hinged edge of the door is adapted to lie adjacent to and in the path of the crank handle 11, when the door is closed, and this side is furnished with a strip of fiber or other non-conducting material 52.

The operation of my improved call alarm system is as follows: The alarm is set by turning the crank arm of the main spindle to the position shown in Fig. 2, which movement of the crank winds the spring, which is held under tension by the engagement of the end of the crank arm with the insulated end 50 of the lever 46. This movement of the crank arm brings the notch 20 of its hub to stand opposite to the terminal contact arm 22, by which the circuit connecting it through the mechanism with the arm 16 is broken, and the current passes on through the terminal 23, the contact arm 28, the terminal contact 26, and wires 41 and 43 to the next call box. The upper end of the chamber 2^A is so positioned relatively to the handle portion of the locking lever 46, that when the door is closed and latched, the said upper end contacts with the end 47 of the said lever, and moves its opposite insulated end out of engagement with the outer extremity of the crank handle 11, which then moves against the adjacent end of the chamber 2^A of the door, which lies so close to the crank handle that when it is released from the end of the lever 46 it will be almost instantly engaged by the side of the said chamber, and thus permit but a slight unwinding movement of its clock spring. When the door is latched it cannot be opened except by breaking the glass, and in order to instruct people to turn in an alarm the box is provided with the following inscription: "In case of fire break the glass and turn the knob," which is placed on the front of the box in large plain letters, which are preferably cast on the box. The instant this is done the door flies open from the contractive force of the spring 3^D, and the crank lever of the clock mechanism being released, is revolved by the unwinding of its spring. The instant the controller arm 18 commences to move, the contact terminal 22 engages its hub 19, and establishes a circuit, and at the same time breaks the line circuit at contacts 23 and 26, the current passing through the mechanism and disk 12 to the contact arm 16, and thence through the circuit wires to the terminal contact 23, and arm 22, to the hub 19, the circuit being broken only when the end of the contact arm 16 is opposite any one of the notches in the groups 13, 14, and 15 of the disk 12, and these breaks release the armature of the bell ringing relays 31^B that are operatively connected to the line circuit wires at predetermined points in a well-known manner, and an alarm is rung corresponding to the number of current breaking notches in the make and break disk of the clock mechanism, and as in the drawing I have shown two notches in a group and then three notches at a short distance from the first group, and then a group of two notches at a short distance

from the group of three notches, this disk owing to its make and break connection with the contact arm 16, will ring the number 232, and as this disk rotates four times while the controller arm is making a little less than a full revolution, this call box rings the number 232 four times. When this number of alarms has been given, the controller arm has reached and contacted with the contact terminal arms 30 and 31, and the current from the main line is shunted through the shunt wires 33 and 34 to the terminal contacts 23 and 26, and through the wires 41 and 43, 29^A, 29^B, and 44 to the next call box on the system, thus restoring the line circuit. It is then necessary for an attendant of the system to visit this call box, and upon reaching it he first closes the switch 35 to short circuit the wires 29^A and 43, thus preventing any break of the main line circuit; he then provides the door with a new glass, and winds up the clock mechanism and locks its crank lever to the lever 46. He then throws open the switch 35 and closes the door, when the call box and its clock mechanism are ready to send in another alarm the instant the glass is broken again, and the knob turned to release the latch from its keeper.

My invention is essentially new and novel, inasmuch as that during the ringing of an alarm from any one call box the other boxes on the system are entirely cut off from electric circuit, beyond the box in operation, the nearest box only giving the alarm, but the circuit is instantly restored after the alarm has been given.

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

1. In an automatic electrically operating alarm call box, a suitable box provided with a latching door, spring controlled to fly open when said latch is operated to release said door, a transparent and breakable seal over said latch adapted to protect said latch against manipulation except when said seal is broken, a combined spring and electrically operating bell ringing mechanism in said box in operative circuit relation with a relay bell ringing circuit, means for winding and setting said mechanism in an operative alarm calling position, and means connected with said door for releasing said mechanism when said seal is broken and said latch is manipulated to release said door.

2. An automatic electric operating alarm call box, comprising the following instrumentalities: a suitable box provided with a latching door spring controlled to fly open when unlatched, a breakable seal arranged to protect said door's latch against accidental manipulation, spring operated mechanism provided with an intermittent make and break mechanism of any predetermined calling number, operatively connected in the electric circuit of an electric bell ringing relay system, means for setting said spring operated mechanism and make and break mechanism in operative alarm calling position, and means connected with said door for locking said spring operated mechanism in an operative alarm calling position when said door is latched to its box, and for releasing said mechanism when said seal is broken and said latch is manipulated to release said door.

3. A non-interfering alarm call box, provided with a transparent but breakable seal, a latch inclosed by said seal, a latch keeper on said box with which said latch engages, said call box being operatively connected to an electric current carrying and relay bell ringing line circuit, a spring controlled clock mechanism in said call box provided with a rotating notched wheel adapted to rotate a predetermined number of times, means including a spring controlled lever provided with an insulated end portion for winding and setting said clock mechanism, means connected with said door for holding said clock mechanism in a wound condition and for releasing the same when said door is unlatched, and means including a spring for holding said door in an opened or non-interfering position relative to the operative movement of said clock mechanism, a spring terminal contact arm in said line circuit insulated from said clock mechanism and arranged to contact with said disk as it rotates, a controller arm connected to said clock mechanism's spring actuated movement, and arranged to make a partial revolution, a pair of terminal contacts at each of the opposite ends of said controller arm's operative movement adapted to be engaged in circuit relation by said controller arm, circuit wires extending from one set of contact terminals to the other set, a hub portion at the pivotal center of said controller arm provided with oppositely arranged notches, a spring contact connected to one set of contact terminals, and arranged to register in the oppositely arranged notches of said controller at the stationary points before and after its operative spring-controlled movement, and to engage the hub portion of said controller during its operative movement, whereby a make and break circuit is maintained between said notched disk and its terminal contact arm.

4. In a device as specified, the combination with a call box, provided with spring-operated mechanism in an electric circuit with an alarm bell, for opening and closing the circuit when the mechanism is in operation, of a crank for winding the mechanism; means for cutting the mechanism out of the circuit when the crank is at either the starting or finishing point of its movement; means for

latching the crank after the mechanism is wound; and means connected with the door for releasing the crank when the door is closed, and for immediately engaging the said crank whereby when the door is opened the crank is permitted to rotate.

5. In a device as specified, the combination with a call box, having spring operated mechanism in circuit with an alarm bell, for opening and closing said circuit at predetermined intervals, when the mechanism is in operation, of a crank for winding the mechanism; a latch for engaging the crank to hold the operating spring under tension; a projection on the door for engaging the latch and releasing the crank, when the door is shut, and for immediately engaging said crank whereby the same is released, when the door is opened; and means connected with the crank and mechanism for cutting the mechanism out of the circuit when the crank is at its starting point, and at the limit of its travel.

6. In a device as specified, the combination with a call box and a spring operated mechanism in said call box, in circuit with an alarm bell for opening and closing the said circuit at predetermined intervals, when the mechanism is in operation, of a crank for winding the operating spring of said mechanism; a spring controlled latch arm for engaging the crank to hold the spring under tension; a projection on the door for engaging the latch arm to release the crank when the door is closed, and for immediately engaging the crank whereby the same is released to set the mechanism in operation when the door is opened; terminal contacts upon the mechanism connected with a branch circuit and a contact arm connected with the crank for engaging said terminals when the crank is at the starting and finishing point of its movement, to throw the current into the branch circuit, and means for breaking the main circuit when the branch circuit is closed.

7. In a device as specified, the combination with a call box, of spring operated mechanism in said box including a rotatable disk having notches at predetermined intervals; a crank for winding said mechanism, having a notched hub; a terminal contact in engagement with the notched disk, a terminal contact adapted to engage the crank hub, and wires connecting said terminals in circuit with a relay, a notch of the crank hub being opposite said latter contact, at the starting point and another at the finishing point of its rotation, whereby the circuit is broken; a contact arm on the crank and insulated therefrom; terminal contacts in the path of said arm connected with a branch circuit, said arm being adapted to engage a pair of said contacts at its starting point and another pair at its finishing point whereby the current is turned into the branch circuit; means for locking the crank after the mechanism is wound; and means for releasing the crank when the door of the call box is opened to set the mechanism in motion.

8. In a device as specified, the combination with a call box, of spring-operated mechanism in said box including a rotatable disk having notches at predetermined intervals; a crank for winding said mechanism, having a notched hub; a terminal contact in engagement with the notched disk; a terminal contact adapted to engage the crank hub when the mechanism is in operation, and to lie in one of the notches of said hub when the crank is at either the starting or finishing point of its movement; wires connecting said terminals in circuit with a bell ringing relay; a contact arm on said crank and insulated therefrom; a terminal at the starting and another at the finishing point of the movement of said arm, which are connected with a branch circuit, one of said terminals forming part of the contact which engages the crank hub, said terminals being engaged by said arm at opposite points of its travel whereby the current is thrown into the branch circuit; a latch for engaging the crank when the mechanism is wound and a projection on the door of the call box for moving the latch to disengage the crank, when the door is closed, and for immediately engaging said crank, whereby, when the door is opened, the crank is released and the mechanism set in motion.

9. In a device as specified, the combination with a call box, of spring-operated mechanism therein, including a rotatable disk having notches at predetermined intervals; a crank for winding said mechanism, having a hub with a pair of notches; a terminal contact in engagement with the notched disk; a terminal contact in engagement with the notched hub and wires connecting said terminals in circuit with a bell sounding relay, said circuit being broken when the crank is at its starting and finishing point by the registering of the hub contact with one of its notches; and also during the operation of the mechanism, by the registering of the disk terminal with the notches in said disk, whereby the circuit is broken, and an alarm sounded by the relay; means connected with the crank for throwing the current into a branch circuit, when the mechanism is either wound or unwound; a latch for engaging the crank when the mechanism is wound; and means connected with the door by which when it is closed the said latch is disengaged from the crank and immediately engaged by the said means, whereby the crank is released and the mechanism set in motion when the door is opened.

10. In a device as specified, the combina-

tion with a call box; spring-operated mechanism in said call box in circuit with a bell sounding relay, and including means for breaking the circuit when the mechanism is not in operation, and also for breaking the circuit at predetermined intervals, when the mechanism is in operation, and a crank for winding said mechanism, of a spring-operated latch arm to engage said crank and hold the spring under tension; a projection on the door of said box for disengaging said latch from the crank when the door is shut, and for immediately engaging said crank whereby, when the door is opened, the crank is released, and the mechanism set in motion; and means for throwing the current into a branch circuit when the mechanism is not operating.

11. In a device as specified, the combination with a call box; spring-operated mechanism in said call box in circuit with a bell-sounding relay, and including means for breaking the circuit when the mechanism is not in operation, and also for breaking the circuit at predetermined intervals when the mechanism is in operation, and a crank for winding said mechanism, of a spring controlled latch arm to engage the crank and hold the spring under tension; a hinged door on said box; a casing projecting from the rear side of the door and adapted to engage said latch arm when the door is shut, and move it out of the path of the crank, which is immediately caught by the adjacent side of said casing and released thereby, when the door is opened; a latch on the rear of the casing to engage a catch on the end of the box and hold the door closed, said latch having a knob which lies within the casing; a glass plate over the front of the casing, and means for throwing the current into a branch circuit when the mechanism is not in operation.

12. In a device as specified, the combination with a call box; spring-operated make and break mechanism in said box in circuit with a bell sounding relay; means for breaking the circuit when the mechanism is not operating; means for throwing the current into a branch circuit at such times, and a crank for winding the mechanism; of a spring controlled latch for holding the crank against the action of the operating spring before the box door is closed; and a projection on the door for pushing the latch arm out of the path of the crank, when the door is closed, and for immediately thereafter engaging said crank, whereby when the door is opened the crank is released and the mechanism set in motion.

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

PEABODY A. BROWN.

Witnesses:

G. SARGENT ELLIOTT,

ADELLA M. FOWLE.