No. 689,698. Patented Dec. 24, 1901.

L. H. WILLIAMS.

BURGLAR AND FIRE ALARM.

(Application filed Apr. 20, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 5.

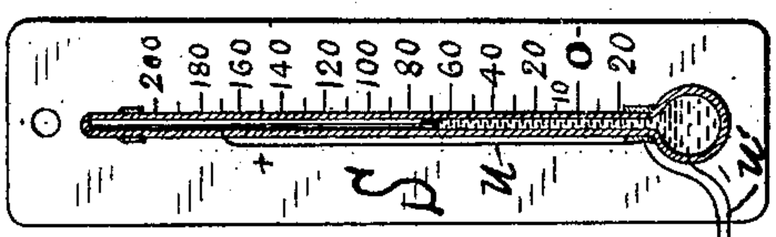

Fig. 1.

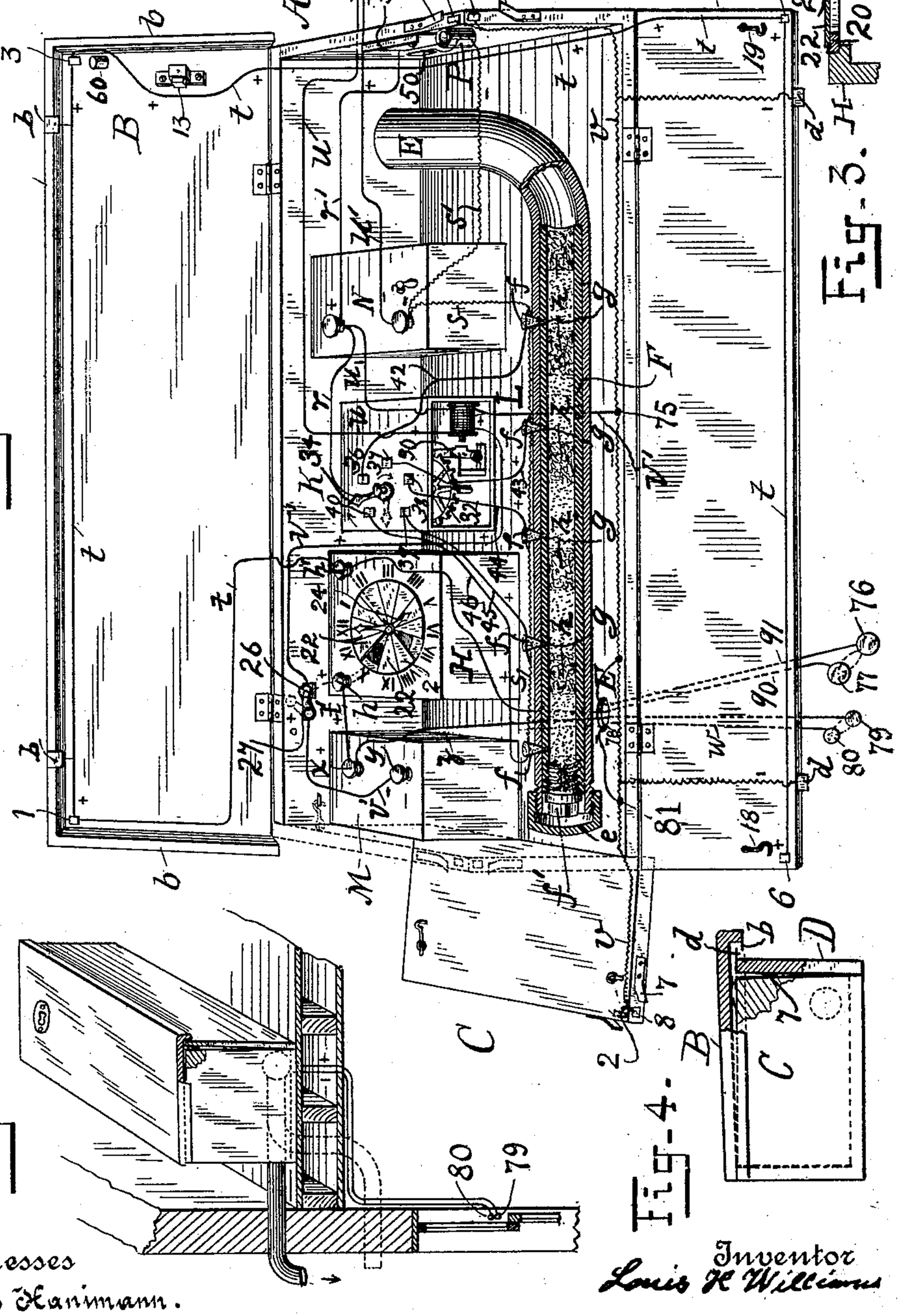

Fig. 3.

Fig. 2.

Fig. 4.

Witnesses
Charles Hanimann.
Henry V. Brown

Inventor
Louis H. Williams

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Fig. 6.

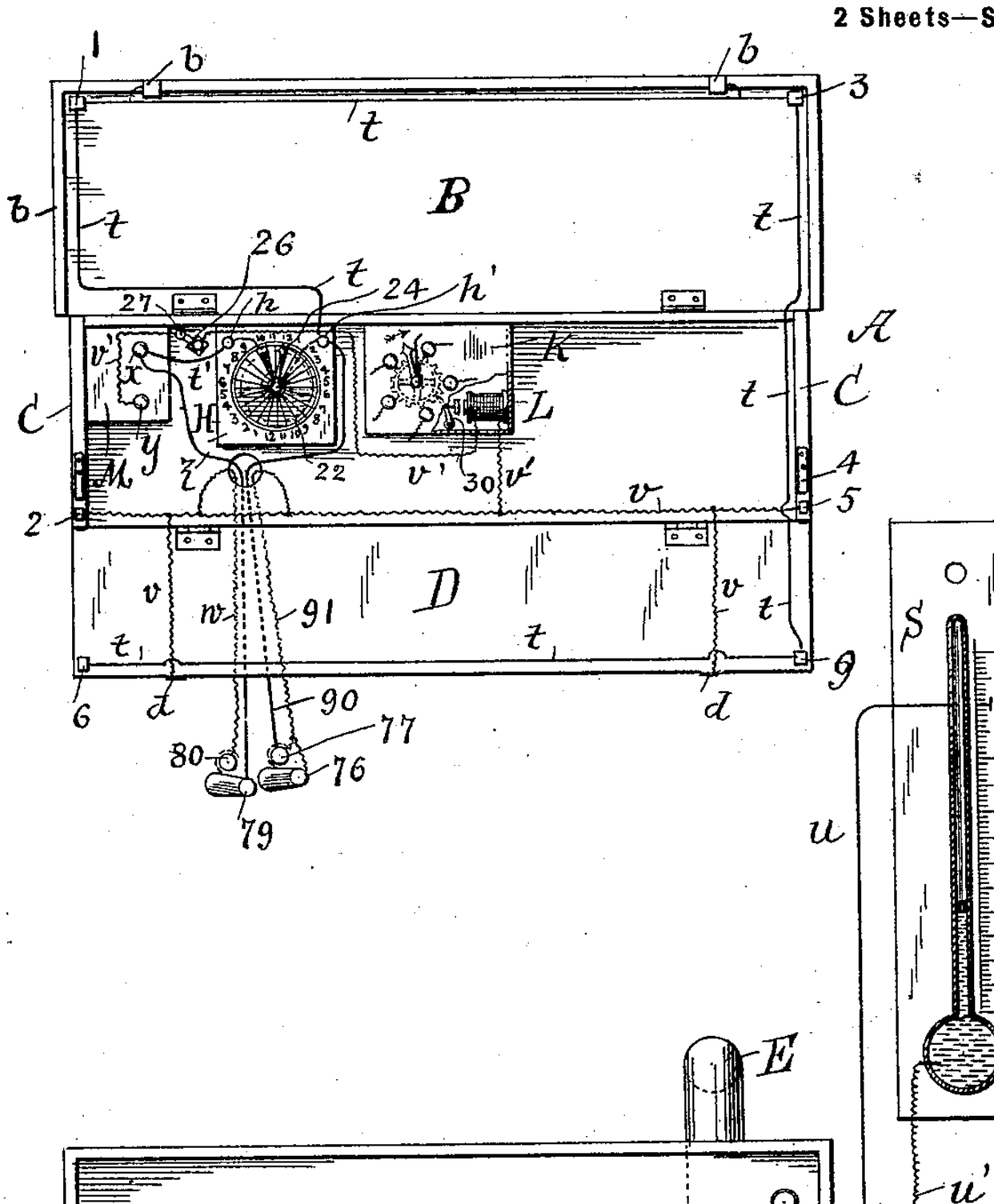

Fig. 7.

Witnesses
Charles Hanimann
Henry V. Brown.

Inventor
Louis H. Williams
By his Attorney
Walter Brown

UNITED STATES PATENT OFFICE.

LOUIS H. WILLIAMS, OF NEW YORK, N. Y.

BURGLAR AND FIRE ALARM.

SPECIFICATION forming part of Letters Patent No. 689,698, dated December 24, 1901.

Application filed April 20, 1899. Serial No. 713,724. (No model.)

To all whom it may concern:

Be it known that I, LOUIS H. WILLIAMS, a citizen of the United States, residing at the city of New York, in the county and State of New York, have invented a certain new and useful Burglar and Fire Alarm, of which the following is a specification.

This invention relates to improvements in burglar and fire alarms.

In this invention the alarm, which is preferably a gun arranged to fire a succession of charges with loud reports, is protected from interference by burglars by being placed in a chamber the key to which is in the possession of the owner of the alarm, and this chamber, which is preferably a strong box, is so arranged and provided with contacts in a circuit that any surreptitious effort to open the box will close the circuit and fire the gun. From the box extend the circuit-wires, which are carried below floors and in walls, so as to be out of reach, to the doors, windows, money-drawers, and other places that are to be secured against surreptitious opening. I also so connect the gun with thermostats that should a fire break out a thermostat will close a circuit and fire the gun. The aforesaid arrangement has great advantages over the usual system of leaving the apparatus on shelves where the burglars can get access to and disarrange it if they can once get into the house, whereas with my device the very effort to open the box to get at the apparatus gives the alarm. Combined with the alarm and also in the box or chamber aforesaid is the battery or batteries by which the current is supplied, a clock which at the proper time permits of opening the box and disconnecting the alarm, and clockwork and a switch for successively firing the charges of the gun, and preferably, but not indispensably, a chemical which will explode or fume when heated by the passage of the current, this chemical being employed to give notice of the surreptitious opening of the box in the daytime when the switch is off and the gun-circuit is broken. I also arrange the device so that it can be connected with thermostats throughout a building in such manner that should a fire break out some of the thermostats will close a circuit and fire the gun, thus giving the alarm of fire.

Referring to the drawings which accompany the specification to aid the description, Figure 1 is a perspective view of the box or chamber with the batteries, clock, clockwork-train, magnet, gun, and other parts in position and indicating the connection of the device with a thermostat. The cover of the box is shown raised, one end and the front down, and the switch in position to break the circuit through the magnet. Fig. 2 is a perspective view of the box on a smaller scale, indicating how the muzzle of the gun is carried to outside a building. Fig. 3 is a sectional detail on large scale, showing the construction of the clock-face. Fig. 4 is a sectional elevation, on the scale of Fig. 2, showing the metal clips which close the circuit when the cover of the box is raised. Fig. 5 is a sectional elevation of a thermostat on a large scale. Fig. 6 is a plan showing one of the batteries, the clock-face, clockwork-train, magnet which releases the detent of the train, and the circuits from the main entrance and other entrances of a building and around the box in which the alarm is contained. The gun and the fire-alarm, with their circuits and the other battery, are omitted for clearness, and the position of the detent is for the same reason slightly changed from that shown in Fig. 1. Fig. 7 is a plan, with the fire-alarm in elevation, of the gun, fire-alarm, and their circuits and battery, parts of the apparatus shown in Fig. 6 being omitted from this figure for the sake of clearness.

A is the box in which are the batteries M and N, preferably storage batteries and two in number, the gun E, clock H, clockwork K, magnet L, receptacle P for fuming chemicals, and circuit-wires and other parts. When the box is normally closed, as in Fig. 4, but not tampered with, plates 1 and 3 on the cover B and 6 and 9 on the front D, and all being on the insulated circuit-wire t, which is ultimately connected by insulated wire t' with pole x of battery M, are respectively adjacent to, but not in contact with, plates 2 and 5 and 8 and 11 on the ends C C, all which are on the insulated wire v, which is ultimately connected by insulated wire v', going around magnet L, with the other pole y of said battery, because the springs 2 4 7 10 keep the cover and front slightly open, as shown; but

if the box is tampered with a very slight pressure brings some of said plates together, completing the circuit and firing the gun E, as hereinafter explained; also, should the cover be lifted the spring-plates *b b* on circuit *t* will be brought into contact with the spring-plates *d d* on the front D, closing the circuit and firing the gun. When the box is closed, the hooks 18 19, being of sufficient length, allow the front to remain a little out, as mentioned.

The gun consists of an outer tube E, curved, as shown, and carried out through box and wall of building and closed at the breech by the cap *e*. In a plurality of vents in said tube are primers *f f*. The inner tube F of the gun, closed by the breech-plug *f'*, has a plurality of vents *g g*, each of which registers with one of the vents in tube E, and there will be as many charges of powder or other explosive in tube F as there are vents *g*, said charges being separated by wads *h h*. In each of said primers *f* is a fine platinum wire, which is in circuit with battery N, as will be hereinafter explained.

A stationary horizontal annular metal plate 20 is connected with the binding-post *h*, and that by circuit *t'* to pole *x* of battery M. A number of metal sections 22 are laid on plate 20; but at the hours for opening and closing the box the sections are omitted, it being understood that said sections 22 can be put off and on the clock, so as to make the open intervals come at any desired hour. The hour-hand 24, the pivot of which is insulated from the plate 20 and sections 22, wipes on said sections and is connected by insulated wire *t* with plates 1 3 6 9, as aforesaid, the said wire *t* going around the cover and front, as hereinbefore mentioned.

In the normal condition of the apparatus the armature-lever 30 is pressed by a spring (not shown) into the teeth of the horizonal wheel 32 of the clockwork-train K, so as to hold said train stationary; but when a current energizes magnet L the armature, being attracted, releases wheel 32, so that hand 34, the pivot of which is connected by insulated wire *r* with one pole of battery N, is moved, passing in succession over and in contact with plates 36 37 38 39 40, which plates are respectively connected by insulated wires 42 43 44 45 46 with the platinum wire in each primer *f*, all ultimately connecting with insulated wires, which returns to the other pole of battery N.

In the receptacle P, which contains explosive or fuming chemicals, is a platinum wire, at one end connected with an insulated wire from plate 50 and at the other end with an insulated wire *s'* to a pole of battery N. The bolt of lock 13 engages under a lever 52, which is adjacent to but normally out of contact with said plate 50 and connected by insulated wire *r'* to the other pole of battery N. Thus if the cover B is raised without unlocking the lock a current going through receptacle P explodes or fumes the chemicals and gives warning to those in charge.

Bolts on doors, latches on windows, locks of cash-drawers, &c., are connected with the circuit through magnet L in any suitable manner, as by insulated wire *z* from a pole of battery M and insulated wire *w* to wire *v*, which ultimately returns to the other pole of the battery, so that, supposing the box closed and set, if a burglar opens a window, door, cash-drawer, &c., the magnet L will be energized, resulting in firing the gun.

Letting 76 77 represent the terminals of the usual burglar-alarm device at the main entrance of the building, then 77 is connected with binding-post *h'* on clock H by insulated wire 90, and 76 is connected with circuit *v* by insulated wire 91, so that it is only at the proper hour for opening or closing the building (at which hour the hand 24 is over one of the vacant intervals of the clock-face) that said main entrance can be opened without firing the gun. All other windows, doors, safes, money-drawers, &c., are connected with the apparatus in the following manner: Supposing the terminals of such window, door, safe, money-drawer, &c., to be represented by 79 80, 79 is connected by insulated wire *z* with pole *x* of battery M, and 80 is connected by insulated wire *w* with circuit V at 81. Thus all such windows, doors, safes, money-drawers, &c., are guarded at all times (except when switch 27 is opened) without regard to the clock H.

A fire-alarm may be connected with the box in the following manner: A thermometer S serving as the thermostat, an insulated wire *u* is let into the tube at a suitable height, then carried around magnet L and to one pole of battery N, while the mercury in the bulb of the thermometer is connected by insulated wire *u'* with the other pole of said battery.

The apparatus operates as follows: At the hour of closing the hour-hand 24 will be over one of the open intervals in the clock-face, so that the box can be closed without completing the circuit to magnet L. Now switch 27 is placed on plate 26 and the sections 22 set so as to leave an interval at the desired hour for opening the building and box. Now the box is closed and locked. Suppose a burglar tries to open the main entrance of the building during the hours when it is closed. Then the circuit being closed at such entrance by the well-known devices therefor, the circuit will be completed as follows: from pole *x* of battery M to binding-post *h* on clock, to plate 20 and sections 22, to hour-hand 24, to binding-post *h'*, to circuit-wire 90, to burglar-alarm device at the entrance, and back by wire 91 to circuit *v*, to circuit *v'*, around magnet L to switch 26 27, and to the other pole of battery M, energizing the magnet and causing the current to successively fire charges of gun, giving a number of loud explosions to alarm inmates and neighborhood. Suppose a burglar tries

some other window or door than the said main entrance. Then the burglar device thereat, as 79 80, closes the circuit and current goes from pole x of battery M to wire z, to 79, to 80 by wire w, to circuit v, to circuit v', around magnet L, and to other pole y of battery, energizing the magnet and firing the gun, as before. Suppose a burglar, having got into the building without alarm, tries to get into the box to disarrange the device, so that he can proceed to open interior doors, drawers, &c., with impunity. Then in tampering with the box he will either press in the sides, front, and cover or will pry up the cover, in any case completing the connection between wires t and v, energizing the magnet, and firing the gun. Suppose that during the day, when switch 27 is usually open, a person wishes to get into the box to disarrange the mechanism. Then when he raises the lid the bolt of the lock will cause lever 52 to contact with plate 50, closing the circuit from battery N through receptacle P and exploding or fuming the chemicals therein, the smell of which will give the alarm. When cover B is again closed, stopper 60, which fits receptacle P, will prevent further escape of the fumes. Suppose a fire breaks out at any time. Then will the mercury in some one of the thermometers expand, so as to close the circuit between wires u and u', energizing magnet L and firing the gun. At the proper hours the main entrance and box can be opened without firing the gun, because at those hours the circuits to said main entrance and around the box will be broken, since the hour-hand 24 is then over an open interval in the clock-face; but all other doors, windows, safes, cash-drawers, &c., will remain guarded so long as switch 27 is closed.

Manifestly the invention is not limited to the particular manner of connecting and arranging the circuits herein shown and described, and other details may be modified without departing from the essential invention.

Now, having described my improvements, I claim as my invention—

1. The combination in an alarm system of two electric batteries, a clock in the circuit from one battery equipped with an apertured face electrically connected with said circuit, a hand adapted to contact with said face and connected with said circuit, a magnet in said circuit, means for closing said circuit to operate the alarm, a circuit from said other battery and a device for closing and breaking the same operatively connected with said magnet, and a gun in said last-named circuit, substantially as described.

2. In a burglar-alarm, the combination of a circuit and means for closing the same to effect the operation of the alarm, a clock provided with an apertured face adapted to be set for any desired hour and connected with one terminal of the circuit, a hand adapted to contact with said face and connected with another terminal of the circuit, a clockwork-train K adapted to make and break a circuit to the alarm, and a magnet controlling said clockwork-train and in circuit with the aforesaid clock, substantially as described.

3. In a burglar-alarm, the box A containing the alarm mechanism and provided with movable cover B, ends C C and front D, a partial circuit t on said cover and front, and another partial circuit v on said ends, normally separated and incomplete, but arranged to be brought into contact and completed when the box is tampered with, substantially as described.

4. In an electrical alarm, the combination with a circuit, and means for closing the same of a gun E having an outer tube with primers which are connected with said circuit and a separable inner tube F containing explosive charges and having vents registering with said primers, whereby the ignition of the said primers by said circuit explodes said charges, substantially as described.

5. In a burglar-alarm, the combination of a box or chamber for the alarm mechanism, a cover or door therefor, an electric circuit, a bolt 52 connected with one terminal of said circuit, a plate 50 connected with the other terminal of said circuit and positioned so as to be engaged by said bolt when the said cover or door is opened, and a receptacle for fuming or explosive chemicals connected with said circuit so as to be exploded or fumed when said cover is raised, substantially as described.

6. In an alarm system, a gun, a circuit for firing the gun, a clockwork-train controlling said circuit, a second circuit adapted to effect the operation of said clockwork-train, and a thermostat adapted to close said second circuit when the temperature rises, substantially as described.

LOUIS H. WILLIAMS.

Witnesses:
HERRON V. BROWN,
DAVID WALTER BROWN.