W. WEIKEL, DEC'D.

E. E. WEIKEL, ADMINISTRATOR.

PROTECTIVE MEANS FOR SAFES.

APPLICATION FILED DEC. 14, 1910.

994,046. Patented May 30, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

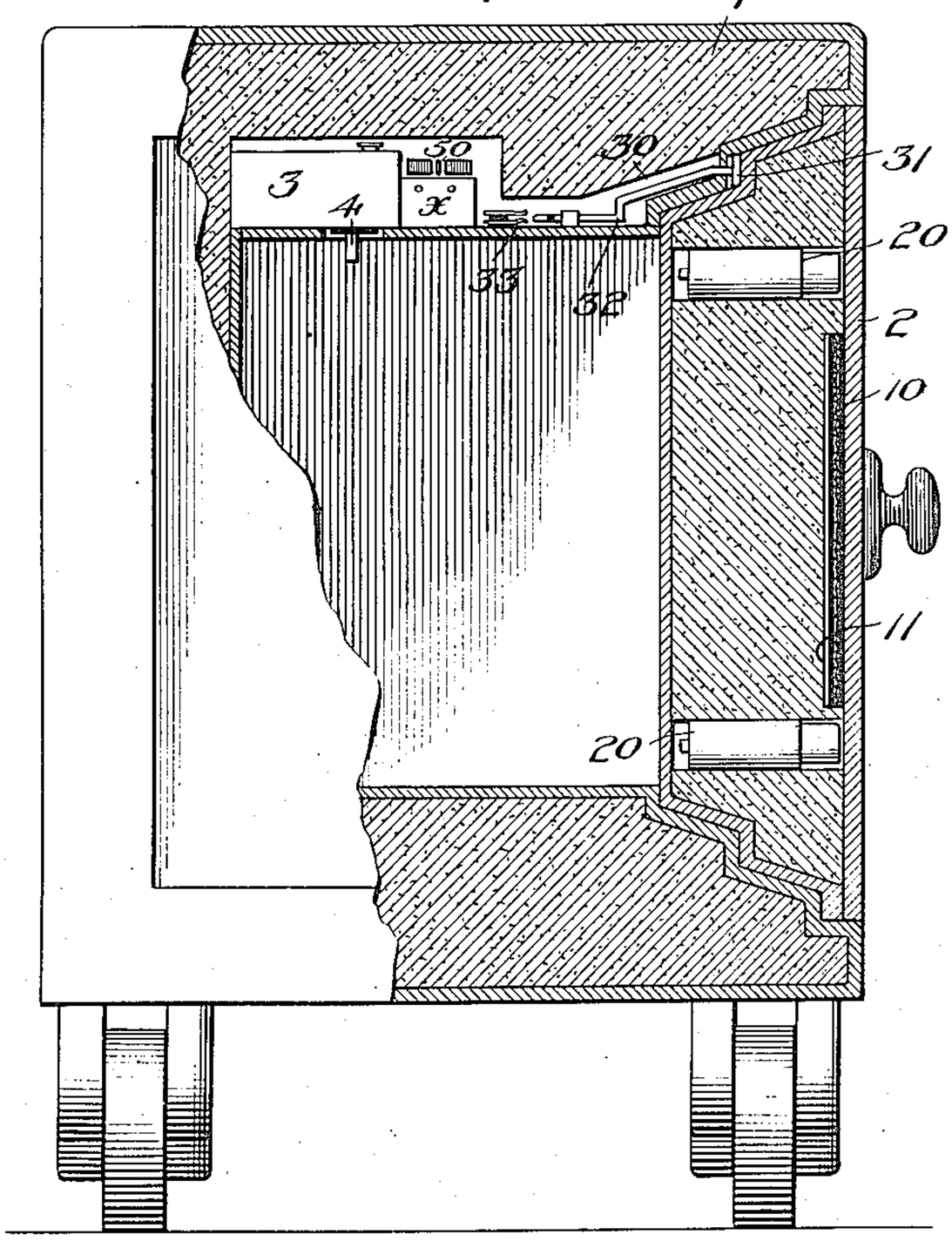


Fig. 2.

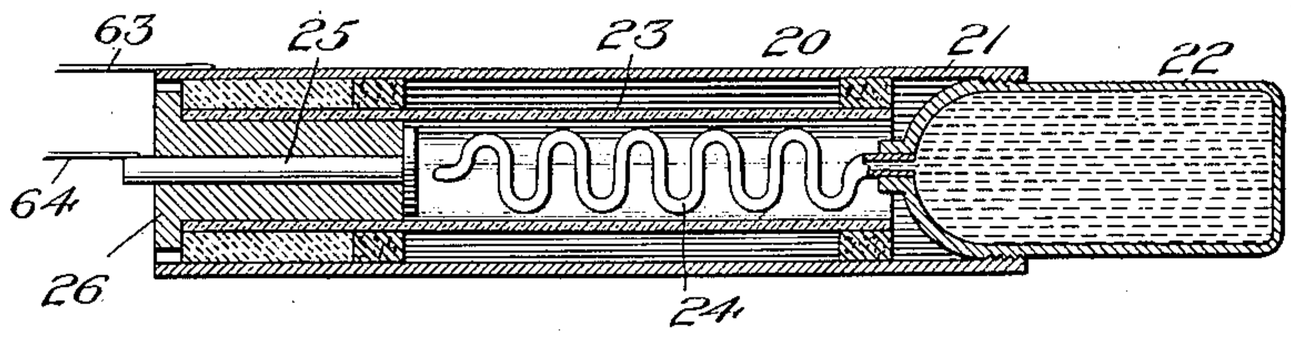


Fig. 3.

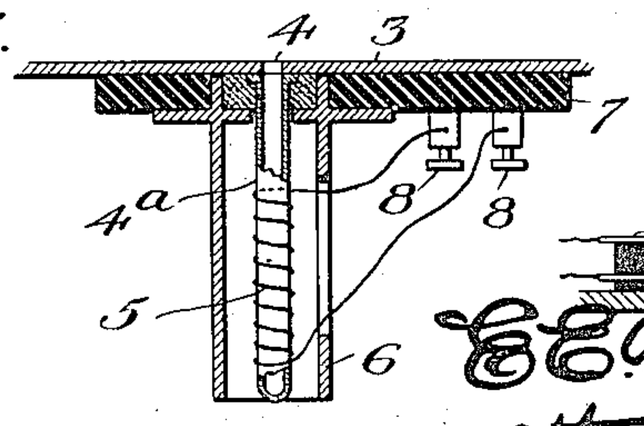
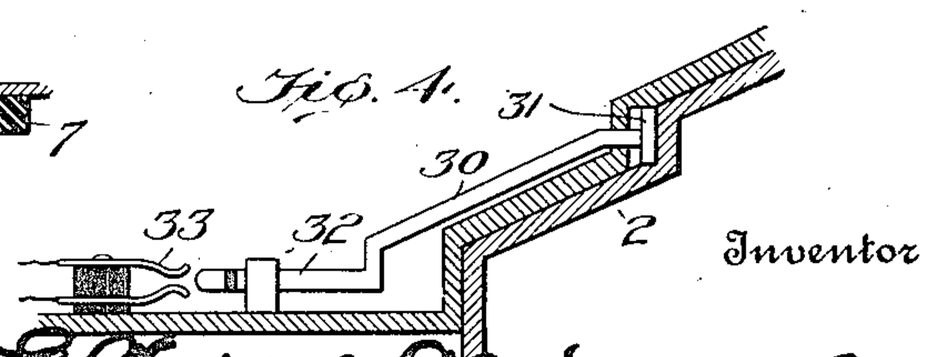


Fig. 4.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 5.

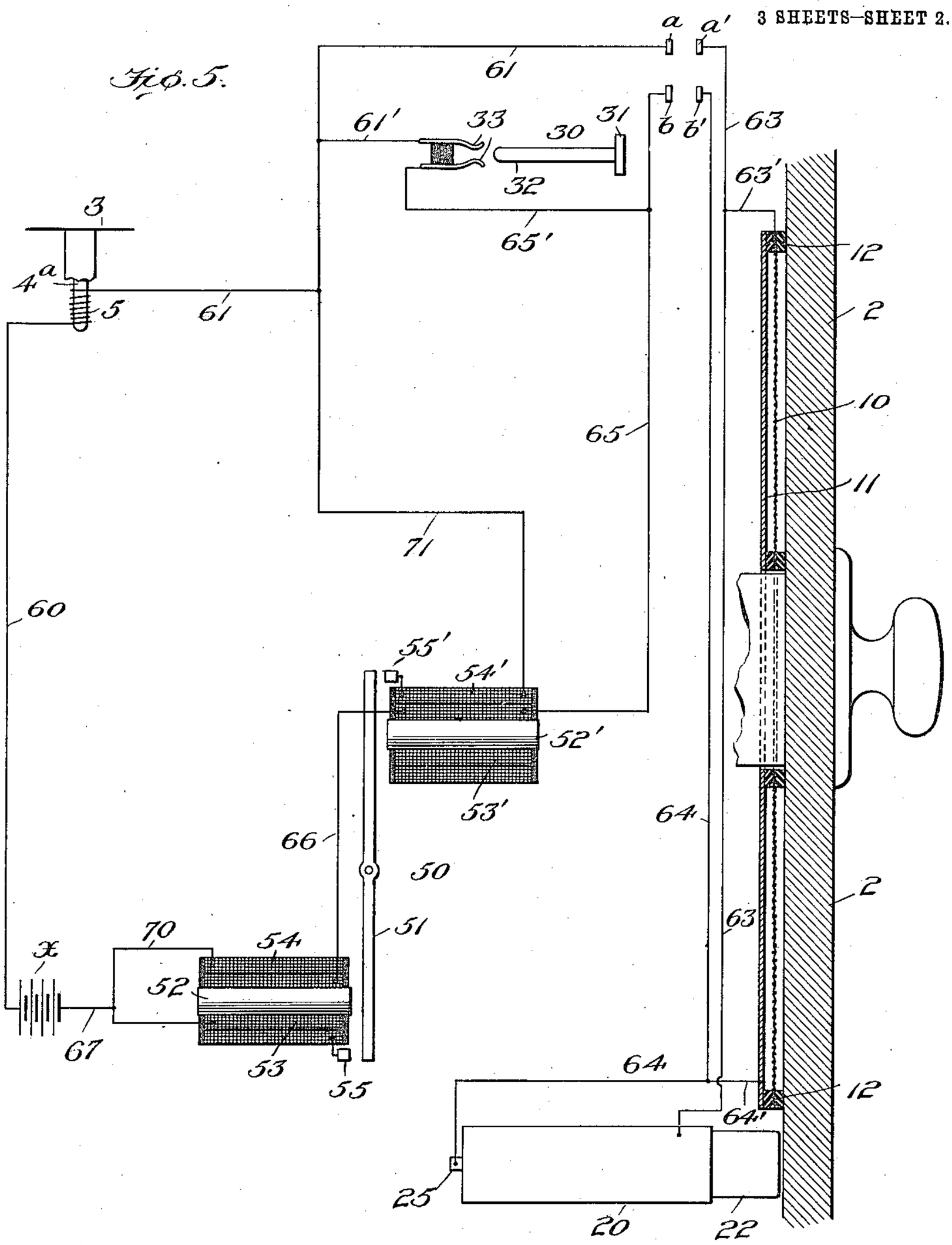
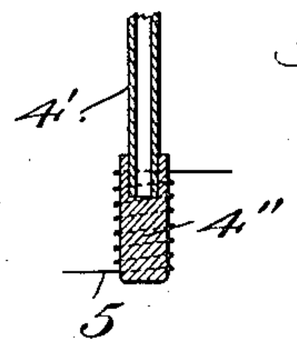


Fig. 9.



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3 SHEETS—SHEET 3.

Fig. 6.

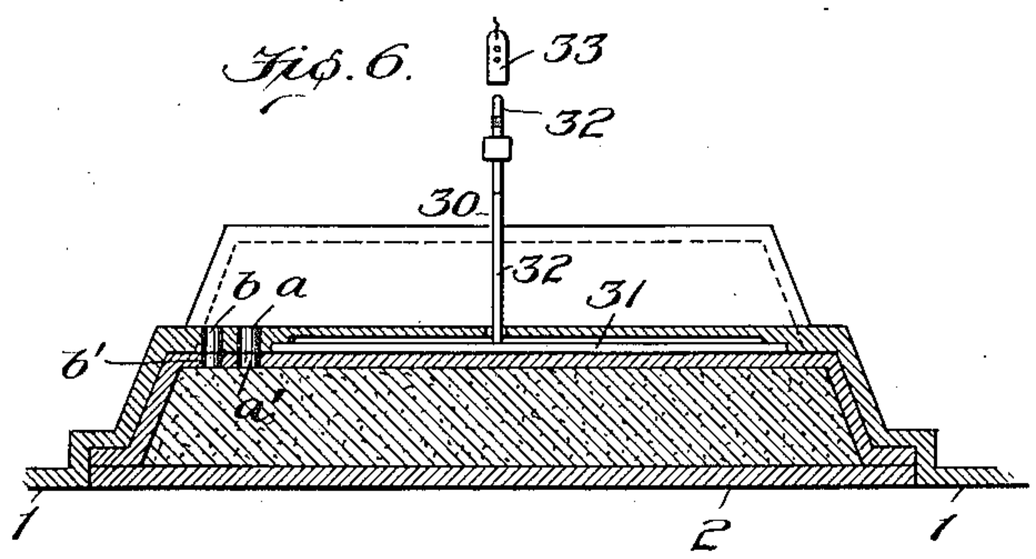


Fig. 7.

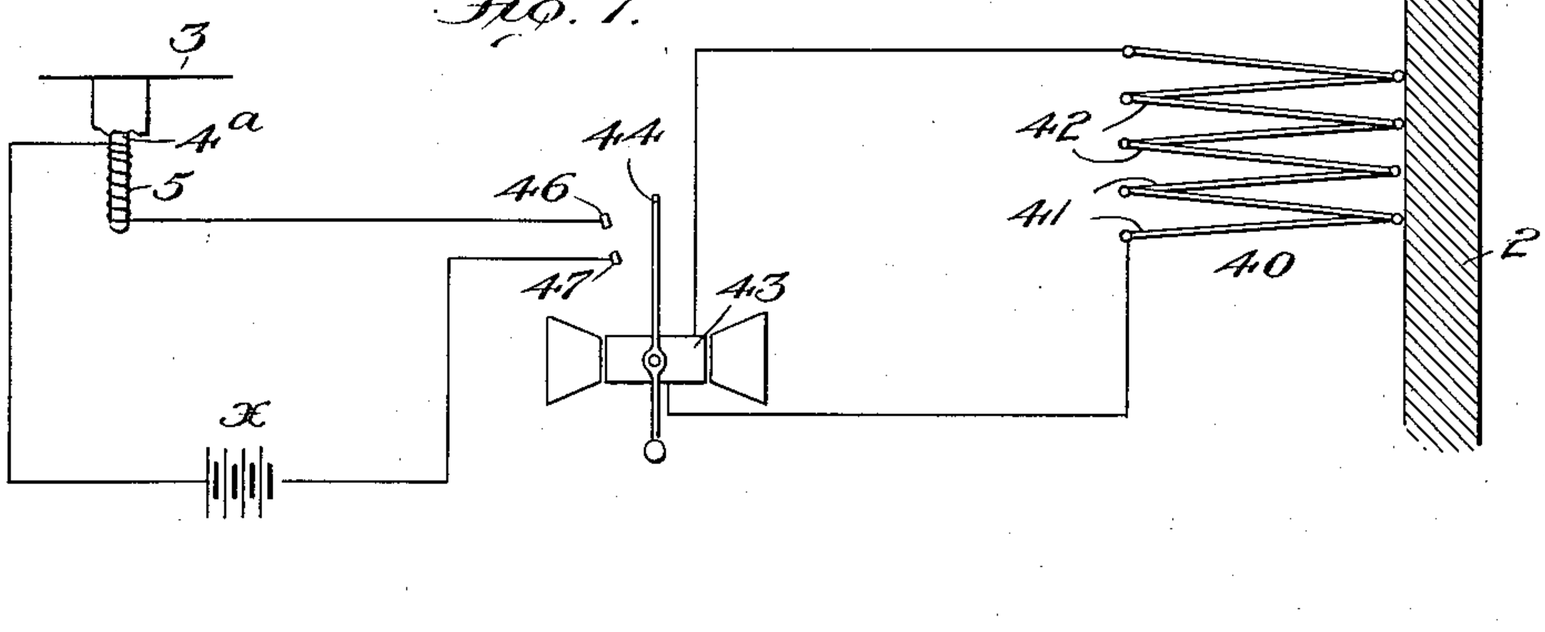
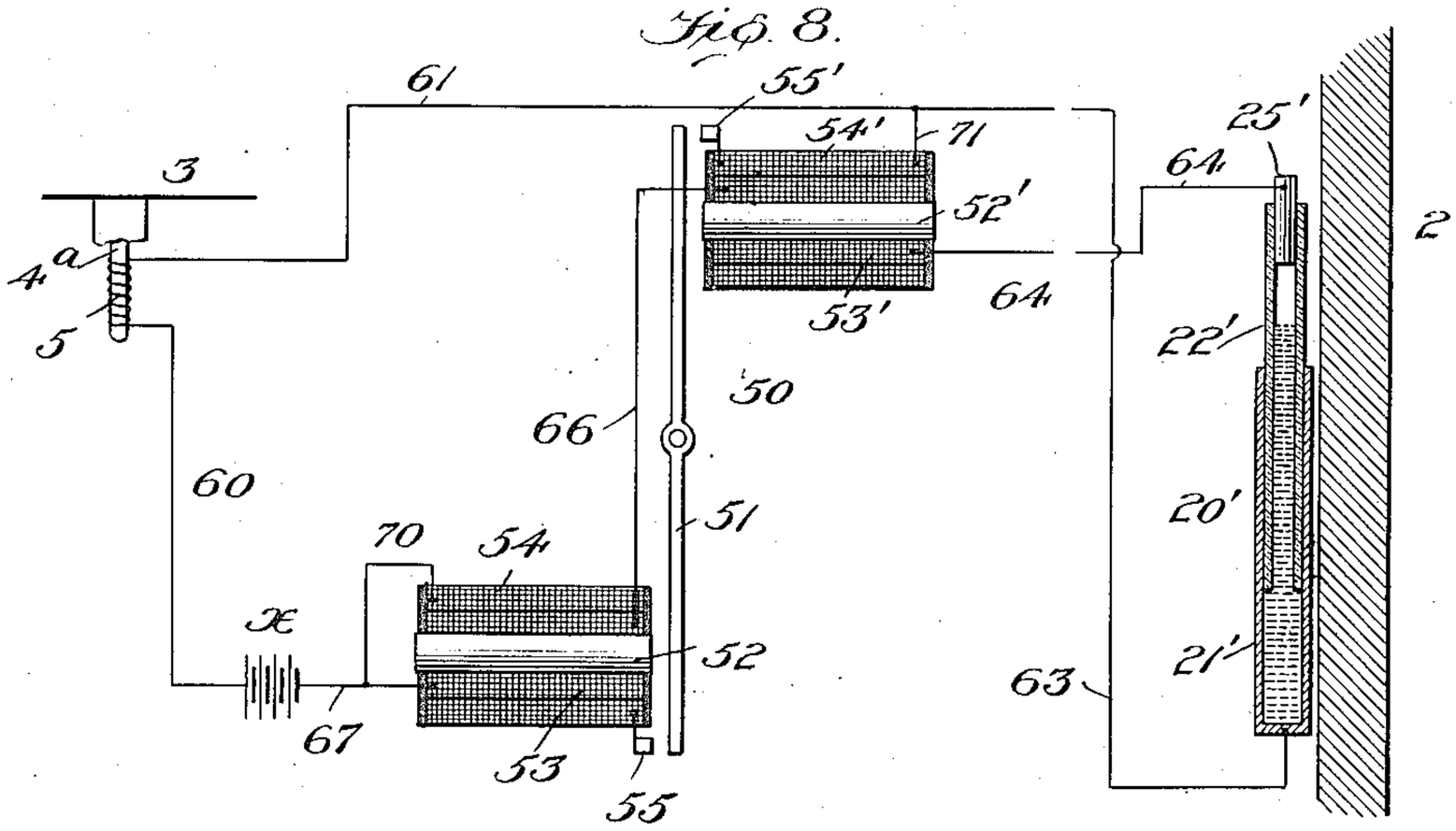


Fig. 8.



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Attorney

UNITED STATES PATENT OFFICE.

WILSON WEIKEL, DECEASED, BY EARNEST E. WEIKEL, ADMINISTRATOR, OF MIDDLETOWN, OHIO.

PROTECTIVE MEANS FOR SAFES.

994,046. Specification of Letters Patent. Patented May 30, 1911.

Application filed December 14, 1910. Serial No. 597,339.

To all whom it may concern:

Be it known that I, EARNEST E. WEIKEL, a citizen of the United States, residing at Middletown, in the county of Butler and State of Ohio, duly appointed administrator of the estate of WILSON WEIKEL, deceased, late a citizen of the United States, have hereby disclosed certain new and useful Improvements in Protective Means for Safes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to protective means for safes, vaults and other compartments or receptacles, and has for its object to prevent forceful and unauthorized access to the interior thereof by means of drills, blow-pipes, arcs, explosives or the like, by causing, upon an attempt to enter the compartment by any such forcible means, the closing of an electric circuit, which will be effective to fuse the closure of a tank containing an air poisoning agent, and thereby liberate such agent in such quantites as will render the atmosphere in the vicinity of the compartment unsuitable for respiration.

The invention is illustrated in the accompanying drawings, in which,

Figure 1 is a side elevation, partly in section of a safe containing the invention. Fig. 2 is a sectional view of one form of thermostatic circuit closer. Fig. 3 is a detail showing a fusible closure for the tank. Fig. 4 is a detail of the circuit closure adapted to be operated by the firing of an explosive between the door and its jamb. Fig. 5 is a diagram of the electric system. Fig. 6 is a plan view of the circuit closure shown in Fig. 4. Fig. 7 is a diagram of a subsidiary system involving a thermopile. Fig. 8 is a diagram showing another form of thermostatic circuit closer. Fig. 9 is a detail showing a modified form of fusible closure for the tank.

In installing the system it is preferable that the entire apparatus be included within the walls of the safe or compartment to be protected, but it is to be understood that the invention is not limited to any specific locality within or without the safe, provided the primary circuit closing means are so located with respect to the walls of the protected structure as to be operated whenever forcible entry is attempted.

Referring to the drawings, as exemplifying an effective form of the invention, 1 indicates a safe provided with the usual hinged door 2. Within a recess in the safe wall is located a tank 3, containing an air poisoning agent, preferably in the form of a fluid under pressure, which, when liberated, emits noxious or poisonous gases or fumes. The tank is provided with an outlet 4 which is normally hermetrically sealed by a fusible closure.

A simple and effective form of closure, as shown in Fig. 3, includes a glass tube 4^a with a closed end, secured over the opening 4 in the tank 3, by means of a surrounding protective sleeve 6 attached to an insulating base piece 7, secured to the tank. Surrounding the tube 4^a is a coil of wire 5 connected at its ends to binding posts 8, the coil being of a character to become sufficiently hot under the influence of an electric current to fuse and melt off the end of the glass tube and thereby permit the fluid in tank 3 to escape.

Instead of the closure just described I may employ any other appropriate form which is capable of being fused or dissipated by the heat generated by an electric heating coil as 5, such for example, as that illustrated in Fig. 9, in which the end of outlet pipe 4′ from tank 3 is closed by a plug of fusible material 4″ surrounded by coil 5, so that, when current traverses said coil, the plug 4″ is melted and falls away, opening pipe 4′. The coil 5 is included in the circuit from an electric battery x of sufficient power to bring the coil to fusing temperature for glass, soft metals, alloys or the like, and in order to close the circuit from said battery through the coil I employ various electrical devices, which are operated when forcible entrance to the safe is sought, as by means of an explosive, drilling, burning by blow-pipe, or electric arc, etc.

As a protective means against the use of an explosive placed between the door and its jamb, I employ the circuit closing device 30, illustrated in Figs. 1, 4 and 6, said device comprising a resilient metal bar 31 mounted in the door jamb, which latter is cut away adjacent the rear face of the bar 31 to permit said bar to spring inward under

impact of an explosion in front of said bar. Connected to the bar 31 is a plunger rod 32, the inner end of which is adapted to engage two spring contacts 33, which nominally serve to interrupt the circuit from battery x through the fusing coil 5. When plunger rod 32 bridges contacts 33 the current flows from battery x by wire 60 to coil 5, thence by wires 61, 61′, contacts 33, end of rod 32, wires 65, 66 and 67 back to battery.

Inasmuch as closure of the circuit at contacts 33 may be of too short duration to allow coil 5 to become sufficiently hot to fuse the closure to outlet 4 of tank 3, it is proposed to employ means in the circuit to close a short circuit or shunt from the battery through coil 5, whenever the main circuit has been closed at 33, or by any of the other circuit closers hereinafter described. This shunt closing means 50 comprises two opposing electro-magnets having main coils 53 and 53′, respectively, in series in the main circuit, auxiliary coils 54 and 54′ and soft iron cores 52, 52′ between which moves a centrally pivoted armature 51, the ends of which are adapted to engage stationary contacts 55 and 55′ forming the inner terminals of coils 54 and 54′. The other end of coil 54 is connected to wire 67 from the battery, and the other end of coil 54′ is connected by wire 71 with wire 61 to the coil 5, so that, when magneto cores 52, 52′ attract armature 51, a shunt circuit is closed and maintained from the battery x through the coil 5 as follows, from battery by wires 67, 70, through coil 54, contact 55, armature 51, contact 55′, coil 54′, wire 71, wire 61, coil 5 thence, by wire 60, back to battery.

To protect the safe against drilling and burning with the oxygen blow-pipe, or electric arc, there are provided circuit closers in the safe walls, preferably within the structure of the door 2, which will be actuated to close the circuit from the battery through the coil 5, when an attempt is made to drill or to burn through the door.

To guard against drilling, there is mounted on the rear face of the front plate of the door and adjacent the lock and bolt work a close mesh wire screen 10 separated from a thin metal plate 11 and from the door plate by strips or frames of insulation 12. Screen 10 is connected by wires 63′ and 63 with a contact a' on the door which engages a contact a on the jamb when the door is closed, said contact a being connected with wire 61, as shown in Fig. 5. Similarly, plate 11 is connected by wires 64′, 64 with contact b' on the door, which coöperates with contact b on the jamb, said contact b being connected with wire 65 from the battery x. Should the front plate of the door be pierced by a drill, or if pierced by other means and a tool be inserted to operate the lock, the drill, or the tool will either pierce screen 10 and connect the same electrically with plate 11, or force said screen into contact with said plate, to the end that a circuit is closed from the battery through the coil 5, by way of contacts a, a', wires 63, 63′, screen 10, plate 11, wires 64′, 64 contacts b, b' and the main circuit, including the electromagnetic shunt closing device, hereinbefore explained.

In order to protect the safe against burning, as by means of a blow-pipe, or electric arc, certain thermostatic circuit closers are located in the door or wall structure, and these thermostatic closers are preferably arranged in parallel circuit with the screen 10 and plate 11. A preferred form of thermostatic closer is shown in Figs. 1, 2 and 5. Referring to Fig. 2 for the details, 20 indicates the closer as a whole, the same comprising a tubular metal shell 21 in one end of which is secured a metal bulb 22, to the end of which is attached a fluted or convoluted metal pipe 24, the bulb and pipe containing an expansible fluid. Within the tube 20 is a concentric glass tube 23, into which tube 24 extends and in the outer end of tube 23 there is located a contact pin 25, mounted in an insulating bushing 26. The end of tube 24 is normally separated from contact 25, but, when the fluid in 22 and 24 expands under the influence of heat, tube 24 tends to straighten out and its end engages contact 25 with the result that the main circuit from battery x through coil 5 is closed by way of wires 63 and 64 which are connected with shell 21 and contact 25 respectively, and the single closing of this circuit serves to close the permanent shunt from battery x through coil 5, as hereinbefore described.

An alternative form of thermostatic closer is shown in Fig. 8, the same comprising a metal tube 21′ carrying a telescoped glass tube 22′ both tubes being partly filled with mercury, or other fluid conductor of electricity. In the upper end of tube 22′ is a conducting plug 25′, the tube 21′ and plug 25′ being connected into the main battery circuit by wires 63 and 64 respectively, as before explained. The expansion of the mercury causes the same to engage plug 25′ and close the electric circuit.

As a further heat responsive protective means, there may be mounted in the door or walls of the safe an electric thermopile 40, as shown in Fig. 7, which consists of alternate sections of dissimilar metal, such, for example, as copper and nickel, connected together end to end and which when heated at their junctions generate an electric current. This thermic current, which is rather feeble comparatively speaking, is sufficient however to energize a delicate galvanometer, as 43, connected in circuit therewith and the movable arm 44 of this gal-

vanometer serves to bridge the open terminals 46, 47 of the circuit from battery *x* through coil 5, and, although it is not shown, it is obvious that the magnetic shunting device indicated in Figs. 5 and 8 may be applied to said circuit to convert the momentary closure of the circuit at 46, 47 into a permanent closure through the shunt, and until coil 5 becomes hot enough to melt the closure to tank 3.

It is to be noted that any or all of the various devices for closing the main circuit to fuse the tank closure may be employed and that the same may be located wherever expediency or convenience dictates.

What I claim is:

1. Protective means for safes and the like, comprising a tank containing an air poisoning agent, a fusible closure for said tank, an electric circuit for fusing said closure, and means operable upon attempted forcible entry to said safe to close said electric circuit.

2. Protective means for safes and the like, comprising a tank containing an air poisoning agent, an outlet duct from said tank, a fusible closure for said outlet, an electric circuit including a heating coil surrounding said fusible closure, and circuit closing means operable upon attempted forcible entry to said safe to close said electric circuit through said heating coil.

3. Protective means for safes and the like, comprising a tank containing an air poisoning agent, an outlet duct from said tank, a fusible closure for said outlet, an electric circuit including a heating coil surrounding said fusible closure, circuit closing means operable upon attempted forcible entry to said safe to close said electric circuit through said heating coil, and electromagnetic means in said circuit to maintain the circuit through the coil closed after a single energization thereof.

4. Protective means for safes and the like, comprising a tank containing an air poisoning agent, an outlet duct from said tank, a fusible closure for said outlet, an electric circuit including a heating coil surrounding said fusible closure, circuit closing means operable upon attempted forcible entry to said safe to close said electric circuit through said heating coil, and electromagnetic means in said circuit to close a shunt from the source of energy in said circuit through the coil after a single energization of said electromagnetic means.

5. Protective means for safes and the like, comprising a tank containing an air poisoning agent, an outlet duct from said tank, a fusible closure for said outlet, an electric circuit including a heating coil surrounding said fusible closure, thermostatic circuit closing means in the safe walls operable by heat applied to the safe to close said electric circuit through said heating coil.

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

EARNEST E. WEIKEL,
Administrator of the estate of Wilson Weikel, deceased.

Witnesses:
JAS. E. GALEESE,
W. H. TODHUNTER.