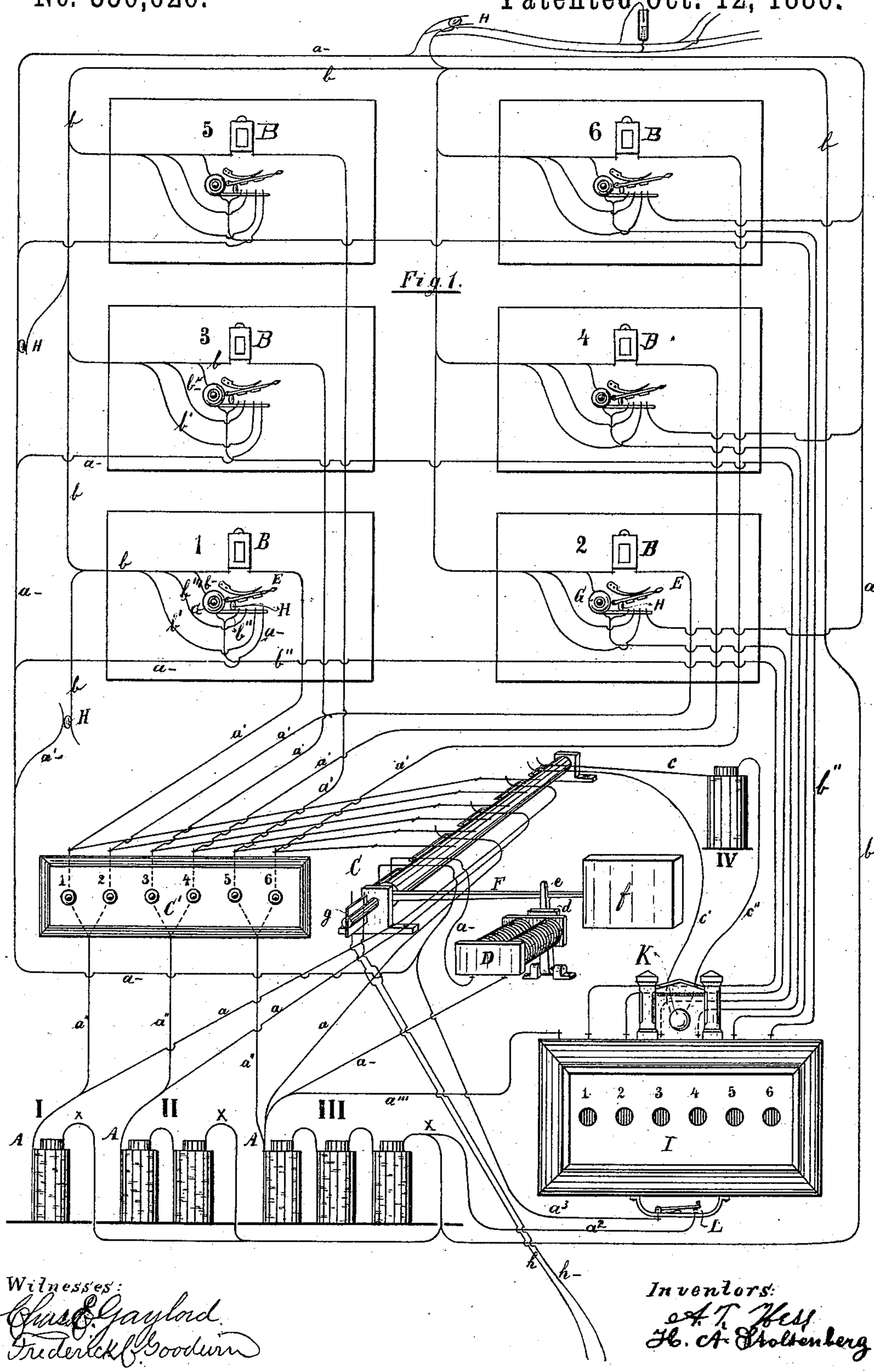
(No Model.) 4 Sheets—Sheet 1.

A. T. HESS & H. A. STOLTENBERG.

HOTEL CALL, FIRE ALARM, AND INDICATOR.

No. 350,626. Patented Oct. 12, 1886.



Witnesses:
Chas. C. Gaylord.
Frederick L. Goodwin

Inventors:
A. T. Hess
H. A. Stoltenberg.

(No Model.) 4 Sheets—Sheet 2.

A. T. HESS & H. A. STOLTENBERG.

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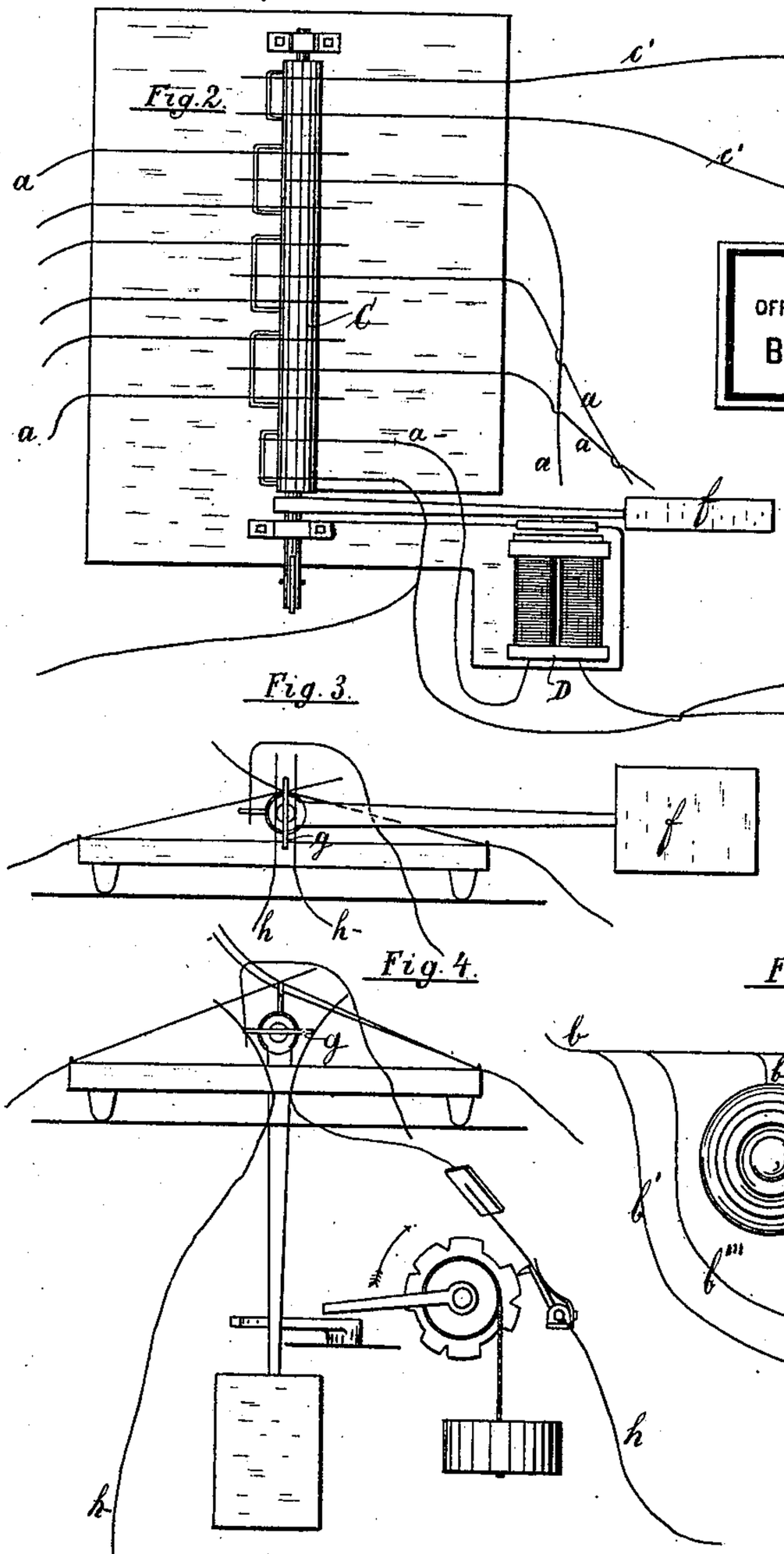


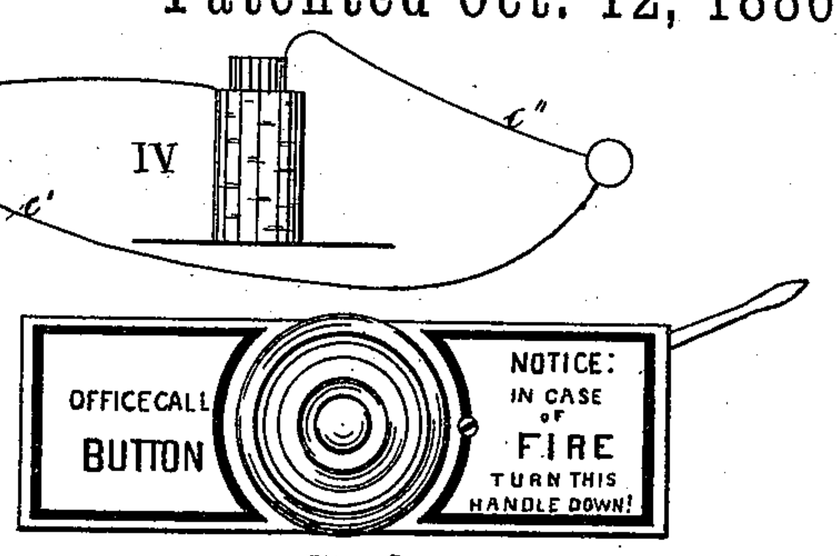
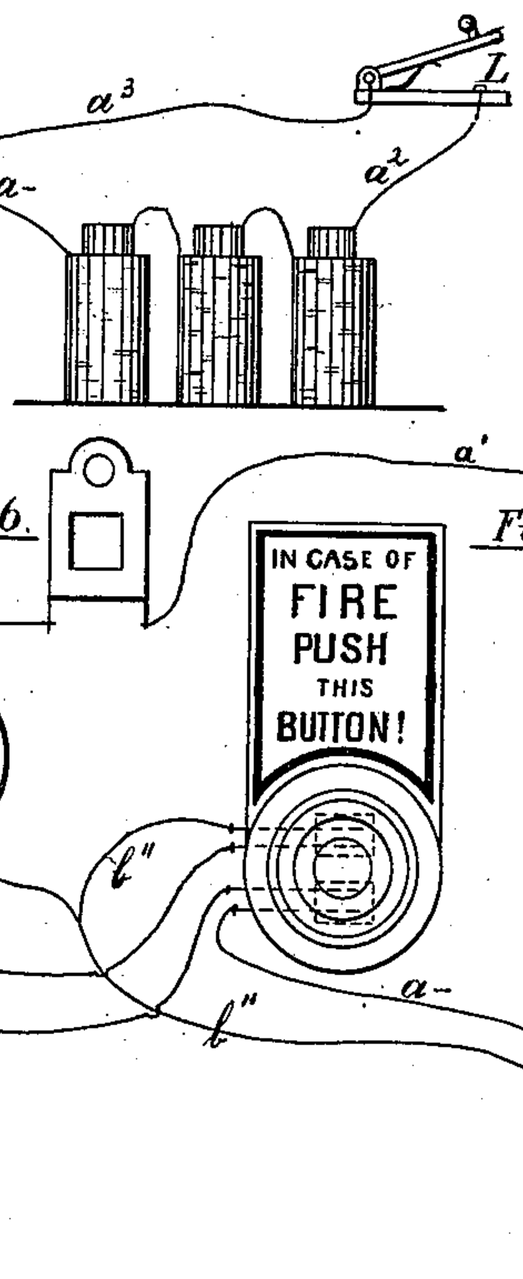


Fig. 5.



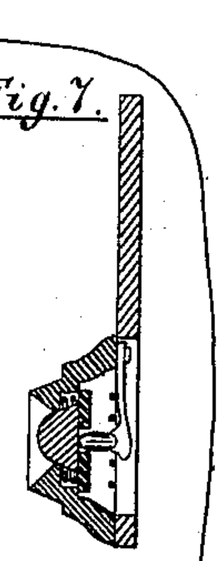


Fig. 7.

Witnesses:
Chas. E. Gaylord.,
Frederick L. Goodwin

Inventors:
A. T. Hess
H. A. Stoltenberg

(No Model.) 4 Sheets—Sheet 3.

A. T. HESS & H. A. STOLTENBERG.

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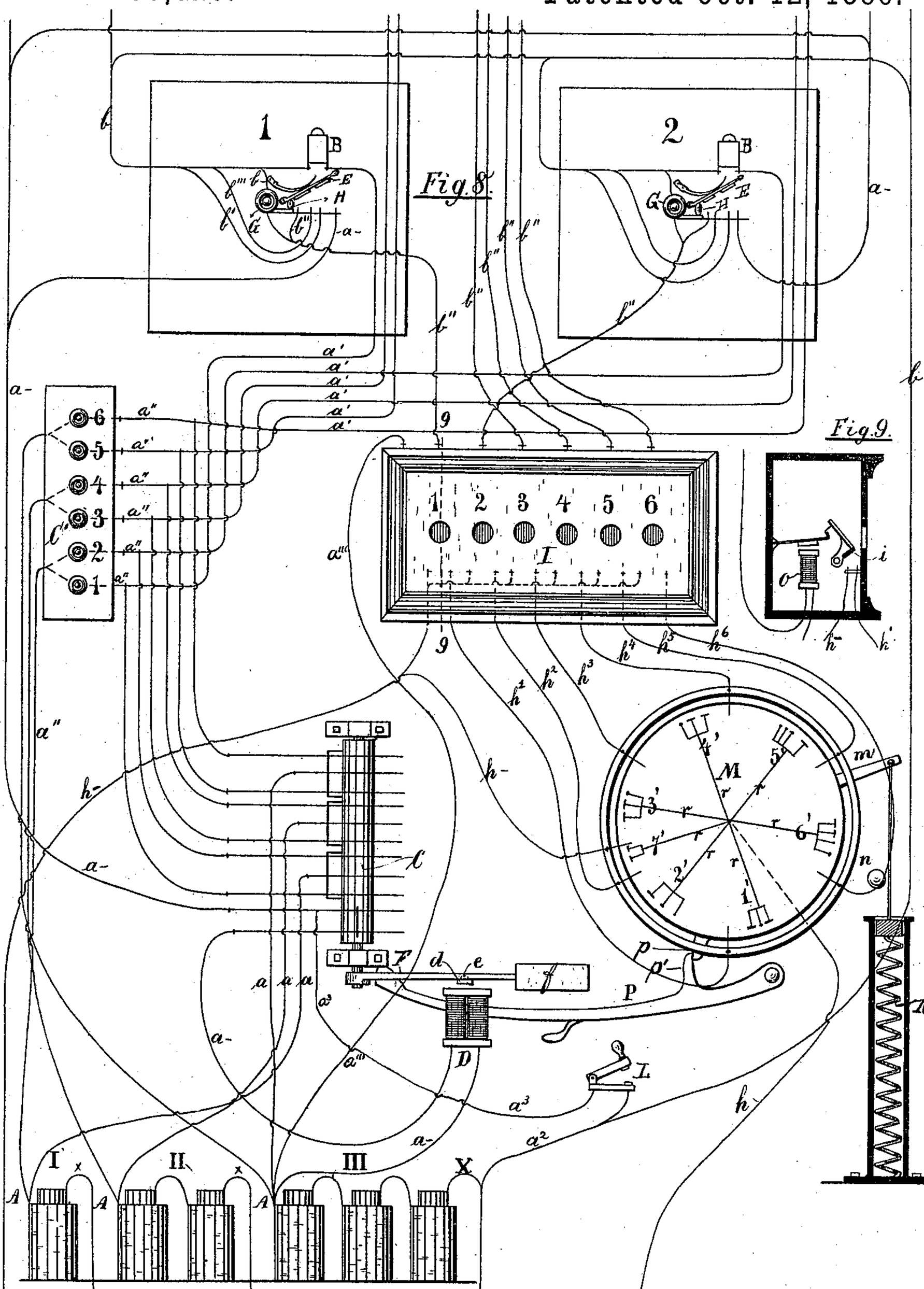


Witnesses:
Chas. E. Gaylord.,
Frederick F. Goodeen

Inventors:
A. T. Hess
H. A. Stoltenberg.

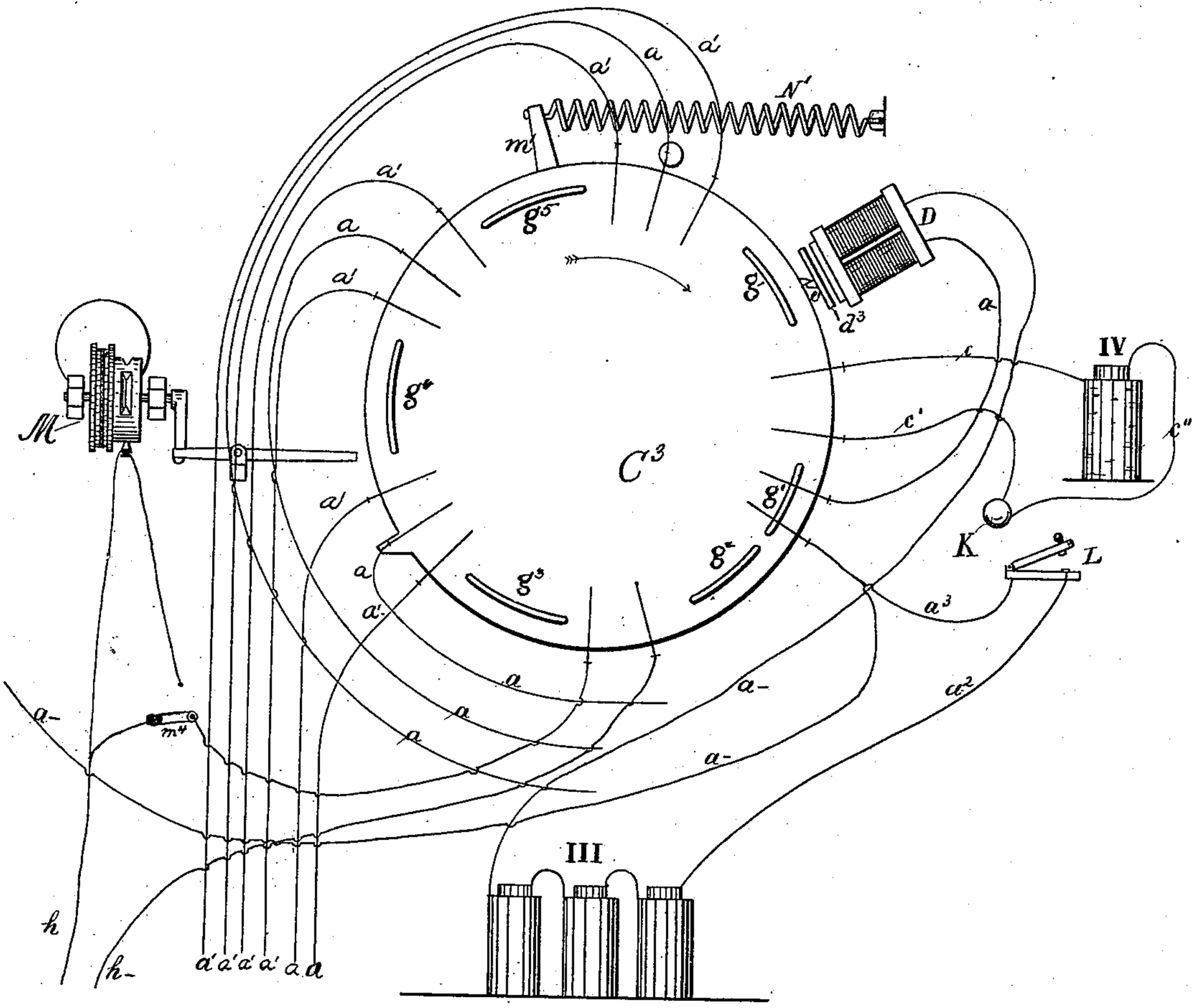
(No Model.) 4 Sheets—Sheet 4.

A. T. HESS & H. A. STOLTENBERG.

HOTEL CALL, FIRE ALARM, AND INDICATOR.

No. 350,626. Patented Oct. 12, 1886.

Fig. 10.



Witnesses:
Chas. E. Gaylord.
Frederick L. Goodwin

Inventors:
A. T. Hess
H. A. Stoltenberg

UNITED STATES PATENT OFFICE.

ALBERT T. HESS AND HANS A. STOLTENBERG, OF DES MOINES, IOWA;
SAID STOLTENBERG ASSIGNOR TO SAID HESS.

HOTEL CALL, FIRE-ALARM, AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 350,626, dated October 12, 1886.

Application filed September 5, 1882. Serial No. 105,628. (No mode'.)

To all whom it may concern:

Be it known that we, ALBERT T. HESS, a citizen of the United States, and HANS A. STOLTENBERG, an alien subject of the Emperor of Germany, residing at Des Moines, in the county of Polk and State of Iowa, have invented certain new and useful Improvements in a Hotel Call and Automatic Fire-Alarm and Indicator, of which the following is a specification.

The object of our invention is to furnish a simple and complete system, by means of which the following results are obtained: A separate call or signal may be given from the office or any central point in the building to any room in the building; a call or signal may be given from the office to an engine-house or other outside point; a call or signal may be given from any room in the building to the office or any central point in the building; a general or simultaneous call may be given from the office to all the rooms in the building and to the engine-house or any outside point; a general or simultaneous call may be given from any room or hall in the building to the office or any central point and to all other rooms and halls in the building and to the engine-house, and when such call is given the number or location of the room or hall from which the signal or call is given is indicated in the office or other central point, and the number of the box indicating the building and the particular room or hall in the building from which the call or signal is given is indicated by suitable signals in the engine-house. In addition to these many results, we obtain an automatic general alarm or simultaneous call, from each or any room or hall in the building to the office and to the engine-house, said last-named general alarm also giving in the office or at any central point in the building the number of the room or hall, or the location of the same, from which the general alarm arises, and giving in the engine-house or any desired point or place outside of the building the number of the box designating said building and the number of the room or hall, or the location of the same in the building, from which such automatic general alarm is given. This automatic general alarm is caused by the increased temperature of the room through or by the means of thermostats, in the ordinary manner, so far as initiating the series of alarms herein described is concerned.

We have illustrated our invention by the drawings accompanying this specification and forming a part hereof, in which—

Figure 1 is a general view illustrating the system of laying the wires and making connections thereof in the building. Fig. 2 is a plan illustrating one way in which the general circuit closer required to complete the circuit between the series of batteries and all the different rooms and halls in the building may be constructed. Fig. 3 is an elevation of the same with the circuit-closer in the position shown in Fig. 1. Fig. 4 is an elevation illustrating the same turned to give a general alarm, and also illustrating in a general way the manner in which the alarm is signaled at the engine-house. Fig. 5 is a front view of the circuit-closer and general-alarm circuit-closer in the different rooms and halls of the building. Fig. 6 is a front view of the office circuit-closer and general-alarm circuit closer, detached the one from the other. Fig. 7 is a cross-section of a circuit-closer made in the form of a push-button. Fig. 8 is a general view illustrating one way in which the number of the box indicating the building and the location of the room or hall in the same may be given at the engine-house or other outside point. Fig. 9 is a cross-section of the annunciator on line 9 9 of Fig. 8. Fig. 10 illustrates a second of the many ways that may be adopted of constructing the general circuit-closer.

Like letters refer to like parts throughout the several views.

I II III IV are batteries.

A is one of the poles of the battery or batteries. X is the other pole of the battery or batteries.

Any suitable number of batteries are employed.

a a a are wires running from one pole of the battery to a point in close proximity to, either over, under, or to one side of, a general circuit-closer, C.

a' a' a' are wires running to the various rooms and halls, 1 2 3 4 5 6, in the building, and electrically connected with wires *a a a* when the general circuit-closer C is closed.

B B B are electric bells placed in the rooms and halls of the building, and electrically connected with wires *a' a' a'*.

b b b are wires electrically connected with signals B B B, and extending from said signals to the opposite poles of the battery. A complete metallic circuit, which we will term "circuit No. 1," is thus formed, when circuit-closer C is closed: from batteries I II III through wires *a a a*, general circuit-closer C, wires *a' a' a'*, bells B B B, and wires *b b b*, back again to the batteries.

a– is a wire electrically connected with one pole of battery III or with wire *a*, as preferred, and running to the electro-magnet D, through the coils of said electro-magnet, to and through general circuit-closer C, and to the circuit-closers E, placed in the various rooms and halls of the building. Wire *a*– is electrically continuous through general circuit-closer C when the same is in the position shown in Figs. 1, 2, and 3, and is disconnected or broken when general circuit-closer C is in the position shown in Fig. 4.

b' b' b' are wires running from circuit-closers E to wires *b*. When circuit-closer E is actuated, an electrical circuit is thus formed: from battery III, at A, through wire *a*–, electro-magnet D, wire *a*–, circuit-closer C, wire *a*–, circuit-closer E, wires *b'* and *b*, to the battery at X, which we will term "circuit No. 2."

d is the armature of electro-magnet D.

e is a catch, notch, or step operated by armature *d*.

F is an arm or lever secured at one end to circuit-closer C, and resting at or near the other end upon catch *e*.

f is a weight secured to the free end of lever F.

When circuit No. 2 is closed, armature *d* is brought forward by electro magnet D, and lever F is released from catch *e*. General circuit-closer C will be closed by lever F and weight *f*, or an equivalent spring, and circuit No. 1 will be closed.

The form of switch shown in Fig. 10, or any suitable key-switch or circuit-closer, may be adopted in place of the form shown in Fig. 1, as the particular mechanism employed in no way affects the manner of operation of circuits Nos. 1 and 2.

The construction illustrated in Fig. 10 is as follows: C^3 is the dial. d^3 is the armature of magnet D. *g* is a piece of metal or other conductor inserted or inlaid upon the face of dial C^3. Dial C^3, having arm or hook *m'*, actuated by spring N', is used as a circuit-closer. Dial C^3 is held in the position here shown by catch *e'* on armature d^3. *a a a* are wires running from one pole of a battery to a point in close proximity to and over dial C^3, and to one side of pieces of metal *g*, inlaid or inserted, as above described, in the face of dial C^3. *a' a' a'* (inclusive) are wires placed in the same relative position to dial C^3 and conductors *g* as wires *a a a*, and run to the various rooms and halls in the building. Wires *a a a* are electrically connected with wires *a' a' a'* by conductor *g* on dial C^3 when the dial revolves or is rotated (by spring N') sufficiently to bring conductors *g* underneath said wires. Wires *a' a' a'* are connected with bells in the various rooms and halls of the building. All the wires in Fig. 10 perform like service and are identical with wires having like letters in Fig. 1. Wires *c'*, *c'*, *a*–, *a*–, *h*, and *h*– are all placed in the same relative position with dial C^3 and conductors *g g g*, excepting that wire *a*–, by means of the conductor *g'*, is electrically continuous through dial C^3 when the dial is in the position shown in Fig. 10, and is broken when dial C^3 is in the position it assumes when catch *e'* is released. It will be seen by inspection of Fig. 10 that when catch *e'* is in any way released dial C^3 will partially rotate, actuated by spring N'.

The several circuits shown or illustrated in Fig. 10 are as follows: circuit No. 1, from one pole of the batteries (not shown in Fig. 10, but see Fig. 1) on wires *a a a*, conductor *g*, *g'*, &c., (when dial C^3 is partially rotated,) wires *a' a' a'* to the bells in the different rooms, and by return-wires back to the batteries; circuit No. 2, (closed by circuit-closer E, Fig. 1,) on wires *a*– *a*–, electro-magnet D, wire *a*–, conductor *g'* on dial C^3, wire *a*– to the circuit-closers in the various rooms of the building, and thence to the battery or ground; circuit No. 6, from one pole of battery III through circuit-closer L, wire a^3, wire *a*–, conductor *g'*, and wire *a*– to electro-magnet D, through electro-magnet D, and on wire *a*– to the other pole of battery III; circuit No. 7, from one pole of battery IV on wire *c*, conductor *g*, wire *c'*, bell K, wire *c''*, back to the battery; circuit No. 8, from one pole of a battery placed in the engine-house, or any point outside of the building, on wire *h*–, conductor g^2, wire *h*, through switch m^4, to the engine-house or other outside point, through signals there placed, and back to the battery or to the ground; circuit No. 9, from one pole of a battery placed in the engine-house or any point outside of the building on wire *h*–, conductor g^2, wire *h*, to and through the signal-dial M, when switch m^4 is operated to close circuit through said dial, thence by wire *h* to the engine-house or other outside point, through signals there placed, and back to the battery or to the ground.

h is a wire from general circuit-closer C to an engine-house or other point outside of the building, and is electrically connected with wire *h*– by conductor *g* on general circuit-closer C, when in the position shown in Fig. 4. Wire *h*– may be a grounded wire or may form a return-wire, making a complete metallic circuit to the engine-house and return. Wires *h* and *h*–, Fig. 4, are used with a suitable indicator when it is desired merely to give the location of the building or the number of the box indicating the building in the engine-house or outside point.

H is a thermostat of any desired character interposed in the rooms, halls, or any desired

place between the wires *a*– and *b*, as shown in Fig. 1; or thermostat H may be placed in circuit-closer E, as also shown in Fig. 1. Thermostat H automatically closes circuit No. 2 when the temperature of the room, hall, or building is raised to the proper degree, and the same result is produced as if circuit No. 2 were closed at will.

a''' a''' a''' are wires running from one pole of the batteries or from wires *a a a* through signal-board or circuit-closer C' to and electrically connected with wires *a' a' a'*.

What we term "circuit No. 3" is thus formed: from batteries I II III, when any one of the circuit closers on signal-board C' is actuated, through wire *a''*, circuit-closers *l*, &c., on signal-board C', wire *a''*, wire *a'*, signal B, and wire *b* to pole X of the batteries.

b– is a wire running from circuit-closer G to wire *b*.

b'' is a wire from circuit-closers E and G to an annunciator, I. Annunciator I has bell K placed thereon, when desired.

a''' is a wire from annunciator I to one of the poles of battery III.

A circuit, which we will term "circuit No. 4," is thus formed when circuit-closer G is closed: from the battery through wire *a'''*, annunciator I, wire *b''*, circuit-closer G, wire *b*–, and wire *b* to the battery.

b''' is a wire from circuit-closer F to wire *b*.

A circuit, which we will term "circuit No. 5," is formed, when circuit-closer E is closed, from the battery through wire *a'''*, annunciator I, wire *b''*, circuit closer E, wire *b'''*, and wire *b* to the battery. As the closing of circuit-closer E closes circuit No. 2 and circuit No. 5, they are at all times opened or closed simultaneously.

a^2 is a wire running from pole X of the battery to circuit-closer L.

a^3 is a wire from circuit-closer L to wire *a*–, and electrically connected with wire *a*– at any point between circuit-closer C and circuit-closers E.

What we will term "circuit No. 6," from battery III through wire a^2, circuit closer L, wire a^3, wire *a*–, electro-magnet D, and wire *a*– to the battery at A, is closed by circuit-closer L.

Circuit No. 7, closed by general circuit-closer C, from battery IV, through wires *c c'*, bell K, and wire *c''* to the battery, may or may not be added, as preferred.

h, Fig. 8, is the wire to the engine-house; but in place of leaving the building, as shown in Figs. 1 and 4, it is diverted through the annunciator I.

h– is the ground or return wire.

P is a lever or spring actuated at will, when desired, and also automatically actuated by lever F.

p p' are catches, placed, respectively, on dial M and lever P.

N is a spring, turning the dial M by lever *m* when catches *p p'* are released.

The wire *h*– is, as will be seen, at all times continuous from dial M, and the actuating of dial M through lever P alternately closes and breaks, by *r7'*, what we term "circuit No. 8."

h' h² h³ h⁴ h⁵ h⁶ are wires running from the annunciator I to the dial M.

i is a piece of metal, of suitable form and shape, attached to the shields of the annunciator I in such manner that the actuating of said shields by the electro-magnet O electrically connects wire *h*– with wires *h' h²*, &c., respectively.

1' 2' 3' 4' 5' 6' are pins or protuberances, or an electrical conductor interposed or interlaid with suitable insulating material, on dial M, which come in contact with wires *h' h²*, &c., when dial M is turned by spring N, or its equivalent, through lever *m*.

n is a stop for regulating the amount of motion of the dial.

The actuating of any one of the shields 1 2 3, &c., in the annunciator I, makes a continuous wire from dial M on wire *h' h²*, &c., metal *i*, and wire *h*– to the ground. The actuating of dial M will then alternately close and break what we term "circuit No. 9."

The movement or actuating of any one of the shields is caused by the closing of circuit No. 5, (or by the closing of circuit No. 4; but if done by closing of circuit No. 4, circuit No. 9 is not affected.) Circuit No. 5 is closed by circuit-closer E, which at the same time closes circuit No. 2; hence, when circuit No. 5 is closed the room or hall or other place in the building in which circuit-closer E is actuated or closed is shown on the annunciator, and at the same time, by the closing of circuit No. 2, circuit-closer C is actuated and circuit No. 1 is closed. As circuit No. 9 is closed as far as dial M, on dial M being actuated as arms *r1' r2'*, &c., pass by wires *h' h²*, &c., circuit No. 9 is alternately broken and closed, and the desired signal given at the engine-house. The electric current over circuit No. 9 is generated by a battery placed either in the building or in the engine-house.

A suitable register is placed in the engine-house to receive the signals sent over or through dial M.

The pins or protuberances 1' 2' 3', &c., on dial M are each connected at the center of the dial by the cross wires *r r r* with the wire leading to the engine house, as shown in Fig. 8.

In Fig. 8 is shown circuit No. 1, from batteries I II III through wires *a a a*, circuit-closer C, wires *a' a' a'*, bells B B B, and wires *b b b*, back to the batteries; circuit No. 2, from battery III at A, through wires *a*–, electro magnet D, wire *a*–, circuit closer C, wire *a*–, circuit closer E, wires *b'* and *b* to the battery at X; circuit No. 3, from batteries I II III through wire *a''*, circuit-closers 1 2 3 4 5 6 on signal-board C', wire *a''*, wire *a'*, bell B, and wire *b* to pole X of the batteries; circuit No. 4, from the battery through wire *a'''*, annunciator I, wire *b''*, circuit-closer G, wire *b*– and wire *b'* to the battery; circuit No. 5, from the battery through wire *a'''*, annunciator I, wire *b''*, circuit-closer E, wire *b'''*, and wire *b* to

the battery; circuit No. 6, from battery III through wire a^2, circuit-closer L, wire a^3, wire $a-$, electro-magnet D, and wire $a-$ to the battery at A; circuit No. 8, from a battery and signal-recording apparatus in the engine-house or other suitable outside point, on wire h, through dial M on arm 7′, on wires h and $h-$ to the ground or back to the battery; circuit No. 9, from a battery and signal-recording apparatus in the engine-house or other outside point, on wire h, through dial M on arm 7′, and arms 1′, 2′, 3′, 4′, 5′, and 6′, wires h, h', h^2, h^3, h^4, h^5, and h^6, piece of metal i in annunciator I, and wire $h-$ to the ground or back to the battery.

In Fig. 8, batteries I II III, circuit-closer C, circuit-closer C′, rooms 1 and 2, annunciator I, electro-magnet D, and the various wires, circuit-closers, and switches connecting them, are identical with the same things shown on Fig. 1, and are lettered the same, Fig. 8 being intended chiefly to illustrate dial M, with the connections more particularly pertaining thereto.

Wire a^2 may be constructed as a branch of return-wire b. Wires a'' a'' a'' may be considered and are branches from wires a a a, and connect wires a a a and a' a' a', through circuit-closers 1 2 3, &c, on board, C′ as the desired circuit-closer is actuated precisely as wires a a a and a' a' a' are connected, simultaneously, by general circuit-closer C. Wires b'' may be considered and are continuation of wire a''' after passing through the annunciator I. It will thus be seen that by short and inexpensive branches suitably constructed on circuits formed by the outgoing wires a, $a-$, and a''' and the single return-wire b we are able to secure what may be termed "nine several and distinct electrical circuits," and by the system of working these circuits singly and doubly (here set forth) we are enabled to secure the many results shown and described in this specification, the great value and utility of which are so evident as to require no explanation or illustration.

The manner of operation of our invention is as follows: When it is desired to ring the signal in the office or any central point in the building from any room and announce the room from which the ring is given to said office or central point by means of the annunciator, circuit-closer G is closed. Circuit No. 4 is thus closed, and a current of electricity passes over wire a''' from battery III through annunciator, over wires b'', through circuit-closer G, over wires $b-$ and wire b, back to the battery III. When it is desired to ring the bell in any room from the office or central point, circuit closer C′ is closed. A current of electricity then passes from one of the series of batteries I II III over wires a'', through circuit-closer C′, over wires a', through signal B, and over return-wire b, back to the battery. If it be desired to send an alarm from the office or central point to the engine-house, catches p p' are released by lever P, when spring N moves dial M, alternately breaking and closing circuit No. 9, and a current of electricity flows through wires $h-$, dial M, (over 7′r,) and over wire h to the engine-house and return, either by wire $h-$ or by the ground. If a general alarm is desired to be given from the office or central point, armature d is pressed forward by the operator, or circuit-closer L is closed. When circuit-closer L is closed, armature d is brought forward by the current of electricity on circuit No. 6, over wires a^2, circuit-closer L, wires a^3 $a-$, through electro-magnet D, and then over wire $a-$ to the battery, releasing the lever F from catch e; or, as stated before, armature d may be brought forward by the operator directly, and lever F released from catch e. General circuit-closer C is then closed by weight f and lever F, thus closing circuit No. 1. A current of electricity then flows over wires a, general circuit-closer C, wires a', signals B, and wires b, back to the battery. At the same time general circuit-closer C, by means of piece of metal g, closes wires h and $h-$, (in the form of construction shown in Fig. 1,) and a signal is sent to the engine-house or other outside point, and in the form of construction adopted and shown in Fig. 8, dial M alternately makes and breaks said circuits Nos. 8 and 9, and the signal is sent to the engine-house, giving in both cases the number of the box indicating the house or building. In the latter case, to send the signal the catch-lever P is retracted, whereupon the dial M is rotated by the spring N through the intermediancy of the arm m. If it be desired from any room in the building to send a general alarm to the office, to all the rooms in the house, and to the engine-house, it is merely necessary to close circuit-closer E, closing circuits Nos. 2 and 5. A current of electricity will then flow from battery III over wires a''', annunciator I, wire b'', through circuit-closer E, over wire b''', and over wire b to the battery, connecting armature-controlling shields 1 2 3, &c., on annunciator I, and exposing them to view, and at the same time the current of electricity will flow from battery III over wire $a-$, through electro-magnet D, over wire $a-$ through circuit-closer E, over wire b', and over wire b to the battery. By the movement of the armature d (caused by the current through the electro-magnet D) weight f on lever F closes general circuit-closer C. The closing of circuit-closer C breaks circuit No. 2 before circuit No. 1 is closed by said circuit-closer C. The electrical current generated by battery III will therefore, together with the electrical current generated by batteries I and II, pass over electrical circuit No. 1—that is, from batteries I II III, respectively, over wires a, through general circuit-closer C, over wires a', through signals B, and over wire b to the batteries. The falling of lever F automatically releases lever P and catches p p', and dial M partially rotates, and a current of electricity passes through circuit No. 8 over wires h, through dial M, (7′r,) and through wire $h-$, giving the number of the box indicating the building at

the engine-house, and after the number indicating the building has been given by circuit No. 8 the dial continuing to turn, circuit No. 9 is alternately broken and closed over wire *h*, through dial M, over any one of the wires $1'r$ $2'r$, &c., over the corresponding wire, h' h^2, &c., and piece of metal *i* on the shield, and then over wire *h*– to the engine-house, thus giving also the number of the room from which the signal is given. In case of fire in any room, hall, or other portion of the building, and the failure to promptly give an alarm, as here last described, upon the temperature in the portion of the house where the fire is arriving at a certain point the thermostat H will close circuits No. 2 and No. 5, as just described, and thus an automatic alarm will be given similar in every respect to the alarm last described.

Having thus described our invention, its construction and manner of operation, what we claim is—

1. An alarm system for buildings, consisting of a number of circuits extending from a central station or office in the building to various sub-stations or rooms therein, said circuits including each a call-bell located at the sub station, and being all normally open at the central station, a revoluble circuit-closer provided with a normally-restrained operating arm or lever, said circuit-closer being located at the central station and common to all the bell-circuits, separate circuits extending from each of the sub-stations to the central station, said latter circuits being normally open at the sub-stations and provided with circuit-closers thereat, and an electric tripping device included in the latter circuits and located at the central station for bringing into action the central-office circuit-closer, said tripping device consisting of an electro-magnet provided with an armature and catch, substantially as described.

2. An alarm system for buildings, consisting of a number of circuits extending from a central station or office in the building to various sub-stations or rooms therein, said circuits including each a call-bell located at the sub-station, and being all normally open at the central station, a revoluble circuit-closer provided with a normally-restrained operating arm or lever, said circuit-closer being located at the central office and common to all the bell-circuits, separate circuits extending from each of the sub-stations to the central station, said latter circuits being normally open at the sub-stations and provided with thermostatic circuit-closers thereat, and an electric tripping device included in the latter circuits and located at the central station for bringing into action the central-office circuit-closer, said tripping device consisting of an electro-magnet provided with an armature and catch, substantially as described.

3. An alarm system for buildings, consisting of a number of circuits extending from the various sub-stations to a central station or office, said circuits being normally open at the sub-stations and provided with circuit-closers thereat, an annunciator included in the various circuits, a main signaling-circuit extending from the central station to an engine-house and normally open at two places, a circuit-closer for one of said breaks having an electric tripping device included in the sub-station circuit, a circuit-closer for the second of breaks having a tripping device operated by the electric tripper, and branch signaling-circuits leading from the annunciator to the engine-house, said branch circuits being also normally open at two places, the various annunciator-shields closing one series of said breaks and the second main signaling circuit-closer closing the other, substantially as described.

ALBERT T. HESS.
HANS A. STOLTENBERG.

Witnesses:
FREDERICK C. GOODWIN,
E. F. RUNYAN.