

(No Model.)

2 Sheets—Sheet 1.

C. E. BUELL.

COMBINED FIRE ALARM AND FIRE EXTINGUISHER.

No. 262,887.

Patented Aug. 15, 1882.

Fig. 1

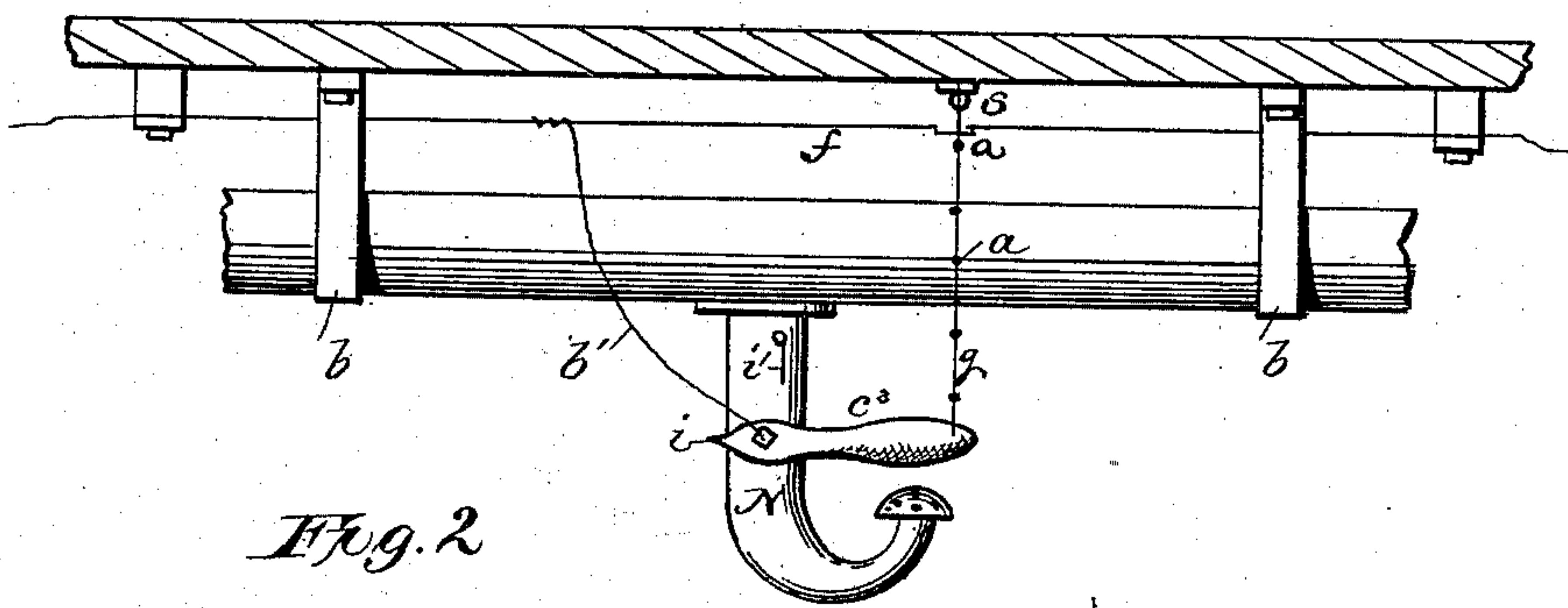


Fig. 2

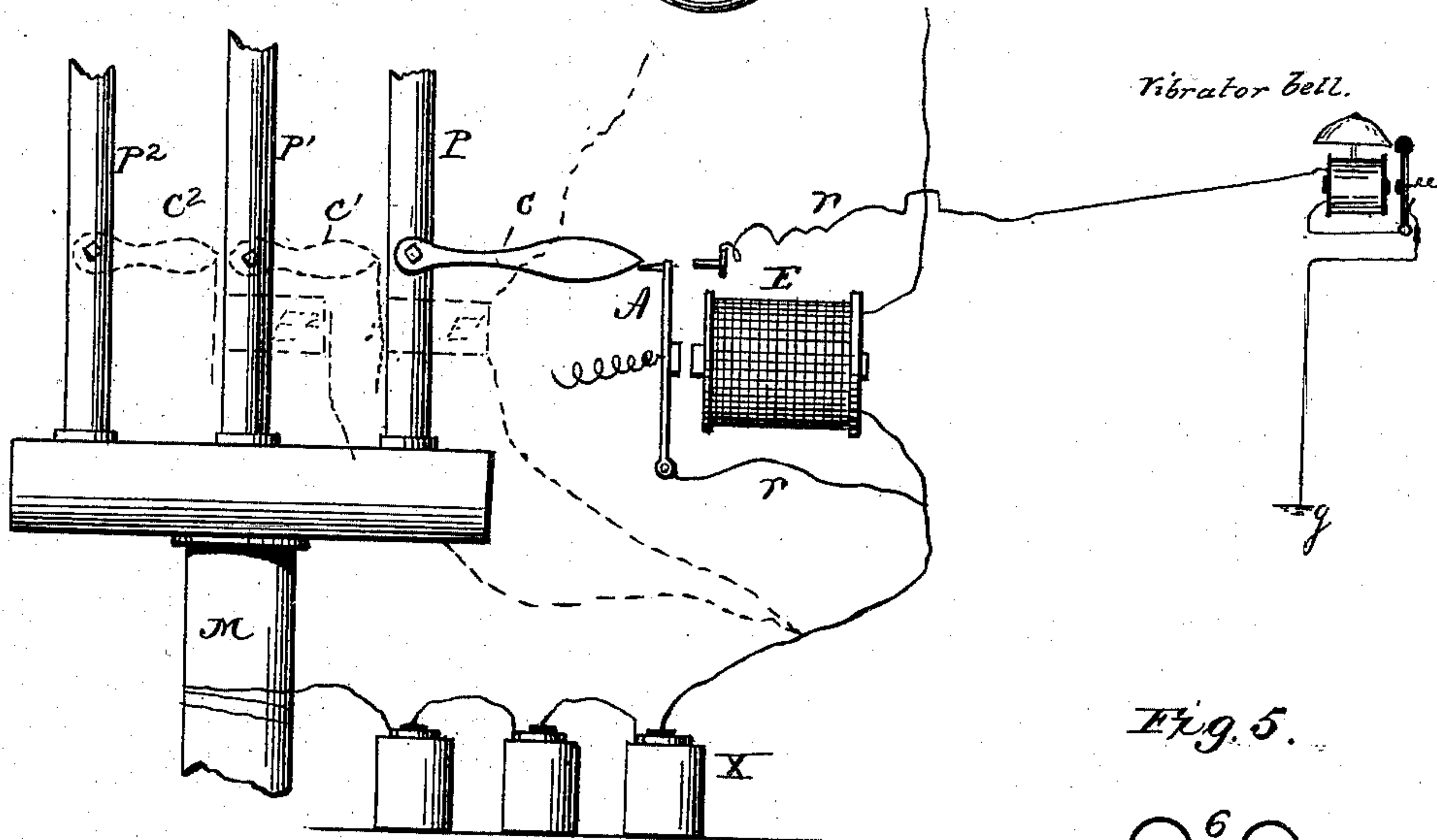


Fig. 4.

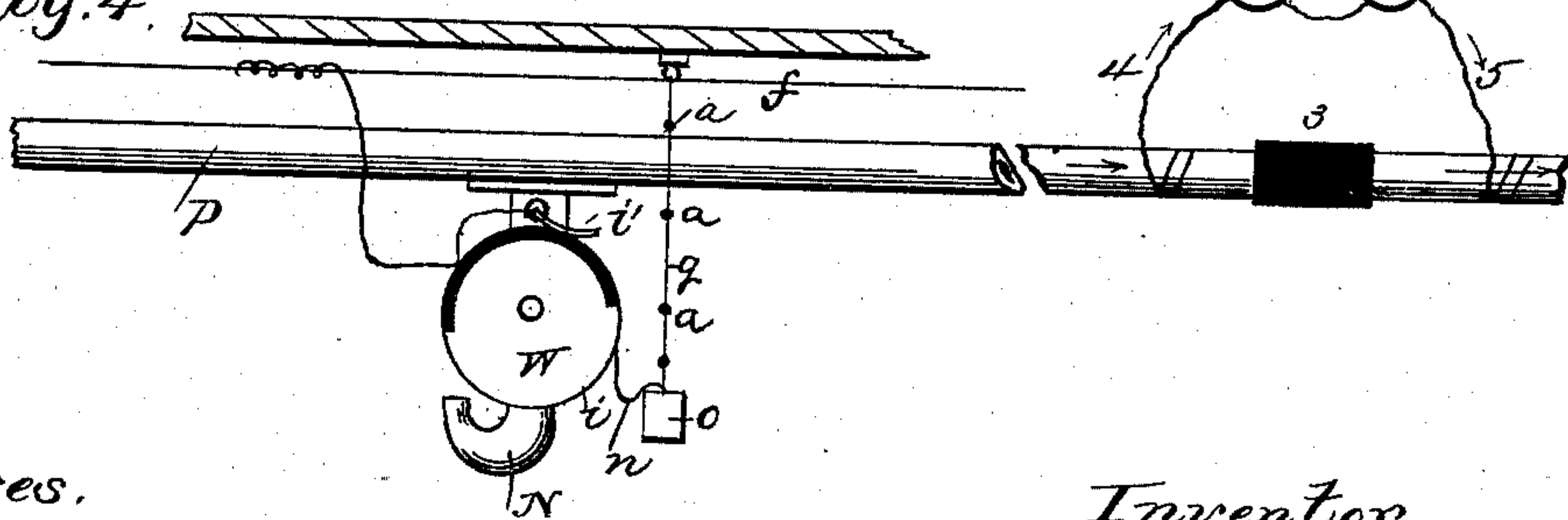
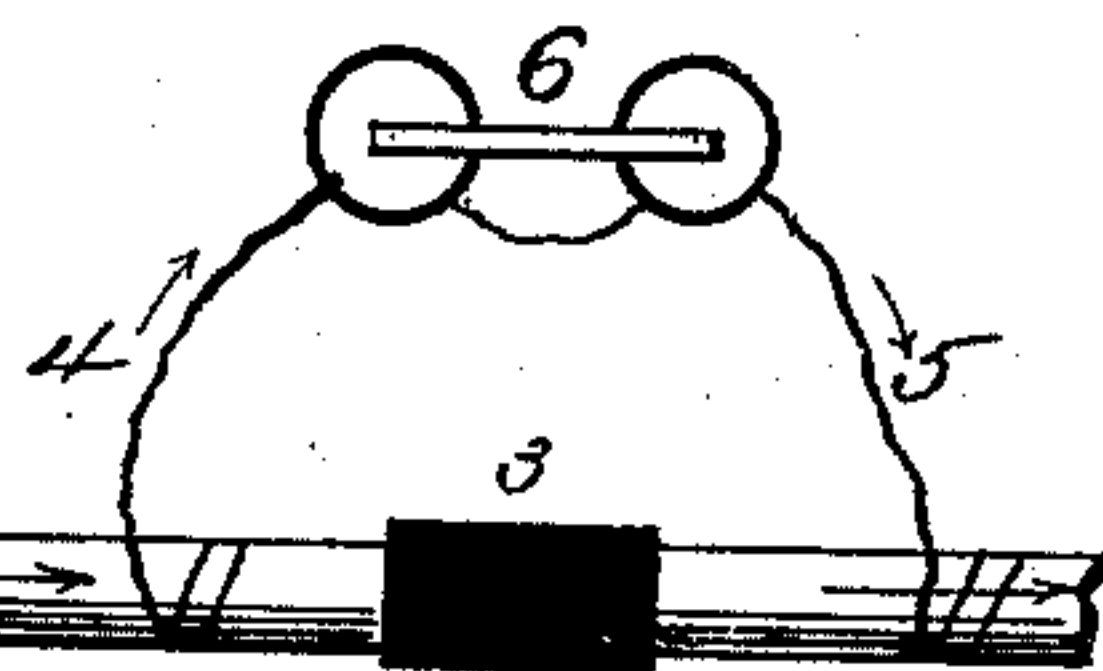


Fig. 5.



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by his attorney
Wm. H. Finckel

(No Model.)

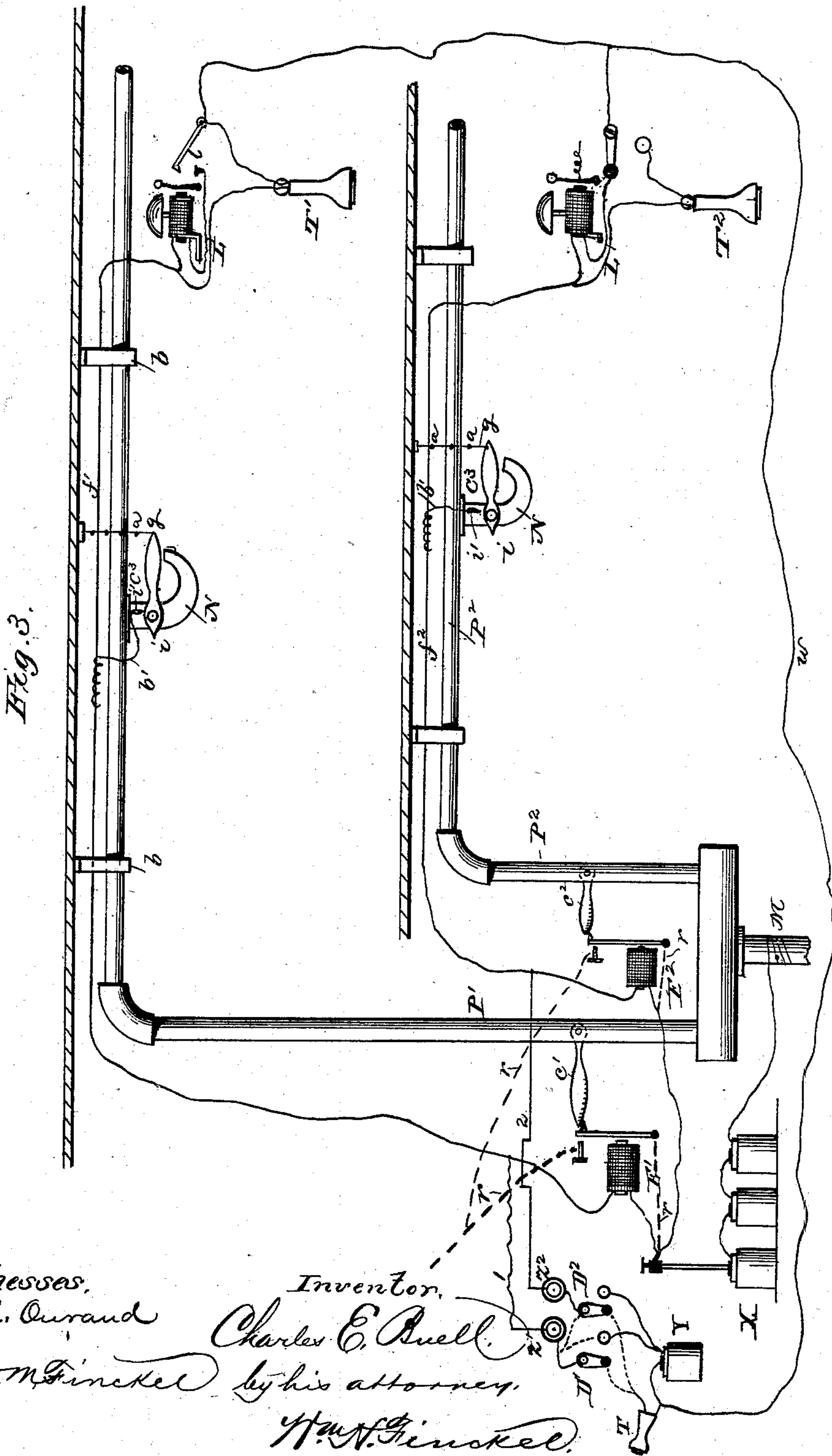
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UNITED STATES PATENT OFFICE.

CHARLES E. BUELL, OF NEW HAVEN, CONNECTICUT.

COMBINED FIRE-ALARM AND FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 262,887, dated August 15, 1882.

Application filed May 4, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BUELL, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Combined Fire-Alarm and Fire-Extinguisher; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

In the systems of combined fire-alarms and fire-extinguishers heretofore used, which employ an electric current to announce the presence of fire and to turn on the requisite water-supply, closed electric circuits have been used which require the constant replenishing of battery material, and the water was liable to be turned on by accidental breaking of the circuit or by neglect to maintain a proper care of the batteries, resulting in damage when perforated or leaky pipes are filled.

My invention relates to the use of electric circuits for controlling the water-supply in fire-extinguisher systems, and for sounding or indicating an alarm at one or more places; and it consists in the employment of electrical circuits which are normally open, and are so arranged and equipped as to serve for communicating signals and for oral communication between different parts of a building when not being made operative for fire-alarms and fire-extinguishing purposes.

The object of my invention is to avoid the waste of electric material and liability to damage from accidental turning on of the water which are incident to the employment of closed electric circuits.

A further object of my invention is the utilization of electric circuits employed in fire-alarms and for other occasional uses for signaling and communicating by electricity without injuring their effectiveness in controlling and actuating such fire-alarms, &c.

In the accompanying drawings similar letters and figures refer to corresponding parts in each view, and Figure 1 is a side elevation of the water-discharging apparatus. Fig. 2 is a

side elevation of a series of electrically-operated valves in the main distributing-pipes; Fig. 3, a plan view of my system, and Fig. 4 a modification showing a compression instead of a gravity cock.

In Fig. 1 the pipe P is attached to the ceiling of a room by the brackets *b b*. From the pipe P a branch, N, extends downward. This branch N by preference opens toward the ceiling, and may be supplied with any of the well-known sprinkling devices. In the branch pipe N is a cock, *c*³, which is normally in a horizontal position, being held in such position by the wire *g*, which is fastened to the ceiling, as by the staple *s*, and to the weighted handle of cock *c*³. Along the ceiling is stretched a wire, *f*, which connects by one terminal with a battery, to be hereinafter described, the circuit being normally open. From the wire *f* a branch wire, *b'*, extends to an insulated contact-piece, *i*, attached to and movable with the cock *c*³. A second contact-piece, *i'*, is attached to the branch N, and it, as in Fig. 3, instead of the cock *c*³, may be connected with the wire *b'*. The wire *g*, which holds the cock *c*³ in a horizontal position and closed, is composed of several pieces of copper or other wire, soldered at *a a* with an alloy which fuses at a low temperature.

A main pipe, M, (shown in Fig. 2,) is filled with water under pressure, and may be divided into a series of branches, as P P' P², each of which is held closed by a cock, *c c' c*², which cocks are held in their closed position by the armature A of an electro-magnet, E, or by intermediate devices controlled by the electro-magnet E.

The battery X has one of the poles thereof connected to the main or pipes.

The operation of the system is as follows: An increase of temperature by the presence of fire melts a joint, *a a*, in wire *g*, releasing the cock C³, which, by its gravity, falls into a vertical position and opens the branch N. In the operation of passing from a horizontal to a vertical position the cock brings the contact-pieces *i i'* into electrical connection, closing the circuit of battery X over wire *f*, branch *b'*, and pipe P, charging the electro-magnet E, which attracts the armature A, that supports the cock *c*, releasing it, at which time the cock

by its gravity or a spring assumes a vertical position and opens the pipe P for the flow of water from the main M, which in a very short time begins to discharge itself at the branch N, extinguishing the fire which fused the joint *a*.

The closing of the circuit may be made to sound alarms at one or more places by the direct action of the electro-magnet E to strike a bell or release clock mechanism to strike a bell to close the same or another battery through a signaling device in a branch circuit, *r r*.

Several pipes may be separately controlled by one battery, as shown by the dotted lines, and other than gravity-cocks may be used to perform the operation, as described.

In Fig. 4 I have shown a compression-cock as substitute for the gravity-cock shown in the other figures. This compression-cock has a wheel, W, which is preferably set eccentrically upon the cock-stem, and has the surface-contact *i* to operate in conjunction with the contact *i'* on the branch pipe N. A cord or chain, *n*, is passed around the wheel, and has attached a weight, *o*, which is suspended from the fusible jointed wire *g*, the cord being slack, so as that the weight shall acquire momentum when the wire *g* parts, and thereby insure (by the prevention of sticking of the cock) the turning of the wheel and the operation of the cock. This wheel may or may not be eccentric. If eccentric, it will close the circuit by friction-contact, and in this case part of the surface of wheel W is preferably insulated. A spring-valve may be also substituted for these cocks—changes obvious to the mechanical electrician.

Instead of the wheel W, the well-known divided insulated wheel or commutator may be employed to close the circuit.

Fig. 3 shows a main, M, from which extend the pipes P' P², arranged and controlled as previously shown and described of the pipe P.

In addition to the uses for announcing and extinguishing fire is shown the use of signals, clocks, and telephones from a central point to various parts of the system. A return-circuit, *w*, connects with the open-circuit wires *f'* *f*², and leads to an auxiliary battery, Y. Switches D' and D² are arranged to switch the battery-wire Y to the wires *f'* and *f*², respectively; but outside of the pipe-controlling magnets E' and E² in the signal-circuits thus formed are interposed the call-keys *z'* *z*², call-bells L' and L², and telephones T T' T², with switches for cutting them in and out of circuit with the wires *f'* *f*². The switches D' D² have connections 1 and 2 for interposing the same telephone in either circuit without the battery Y.

As the operation of the system for fire-alarms and extinguishing is by an open circuit composed in part of the mains and pipes, the various pipes P can be supplied with a large number of the branches N at proper intervals apart, either of which can be used to perform the various functions, as shown in Fig. 1 and described, when made operative by an increase of temperature, as each acts independently of the others.

In place of using the pipe P for the return-circuit, any of the well-known forms of return-circuits may be employed, the form shown, however, being considered preferable.

Suitable electric connections may be made between the water and gas pipes of a building to form the auxiliary circuit, care being taken to insulate one of the pipes between the earth and the battery, (see Fig. 5,) 3 being a porcelain, rubber, or otherwise insulated union in the pipe, and 4 and 5 wires connecting an electro-magnet; 6, electric lamp or machinery, with the pipe on either side the insulation.

The inclusion of the metal pipes in an electric circuit may be variously enlarged—as, for instance, the circuit may be wholly of such pipes and used for message, alarm, telephone, lighting, or other purposes, the pipes being suitably insulated; and such pipes may be conveyers of air—as compressed air for manufacturing or railway uses—gas, or other non-conductors of electricity.

What I claim is—

1. In a fire-alarm and fire-extinguisher system, substantially such as described, the combination of a conducting pipe or pipes leading from a water-supply under pressure and provided with branches, devices for restraining the flow of water into said pipe or pipes and from the branches thereof, means for automatically opening either branch independently of the others by a rise in temperature, an electric circuit which is normally open, and an electro-magnet included therein for controlling the water-supply, the said electric circuit being automatically closed by the opening of a branch, the closing of said circuit causing the water to flow through the conducting-pipe leading to the open branch, as and for the purpose set forth.

2. The combination of the following elements: a conducting-pipe having a series of valvular branches therefrom, each provided with a valve held normally closed by a support which will rupture by an increase of temperature, an electric circuit formed in part by the conducting-pipe for controlling a water-supply, and an independent circuit formed in part by the said conducting-pipe for actuating an alarm, the whole operating substantially in the manner and for the purpose set forth.

3. In a combined fire-alarm and fire-extinguisher system, the combination, with an electric circuit which is normally open, of a conducting-pipe with valvular branches operated by gravitating devices which will automatically close said circuit, substantially as and for the purpose set forth.

4. In a combined fire-alarm and fire-extinguisher system, the combination, with an electric circuit, of a water-supply pipe included in and forming a part of the said circuit, said pipe being provided with an insulated section, and having the water normally excluded therefrom, substantially as and for the purpose set forth.

5. In a system of combined fire-alarm and fire-extinguishers, the combination, with one

water-supply, of two or more conducting pipes, each controlled independently of the other by electro-magnets, the said electro-magnets being included in and forming part of electric circuits
5 which are normally open, and which are made operative automatically by an increase of temperature, as specified.

6. The combination, with a series of conducting-pipes, of a series of electro-magnets,
10 each adapted to control a conducting-pipe, the said magnets being contained in derived circuits from the same charging-battery, substantially as described.

7. The combination, in a combined fire-alarm
15 and fire-extinguishing apparatus, of a gravitating cock adapted to open a branch-pipe, and

at the same time to automatically close an electric circuit, as and for the purpose set forth.

8. The combination, with a water-conducting pipe and an electric circuit, in a combined
20 system of fire-alarm and fire-extinguisher, substantially as described, of a supplemental electric circuit which is adapted to maintain a signaling or communicating telegraph without
25 making operative the fire-alarm and fire-extinguishing apparatus.

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

CHARLES E. BUELL.

Witnesses:

WM. H. FINCKEL,

GEO. M. FINCKEL.