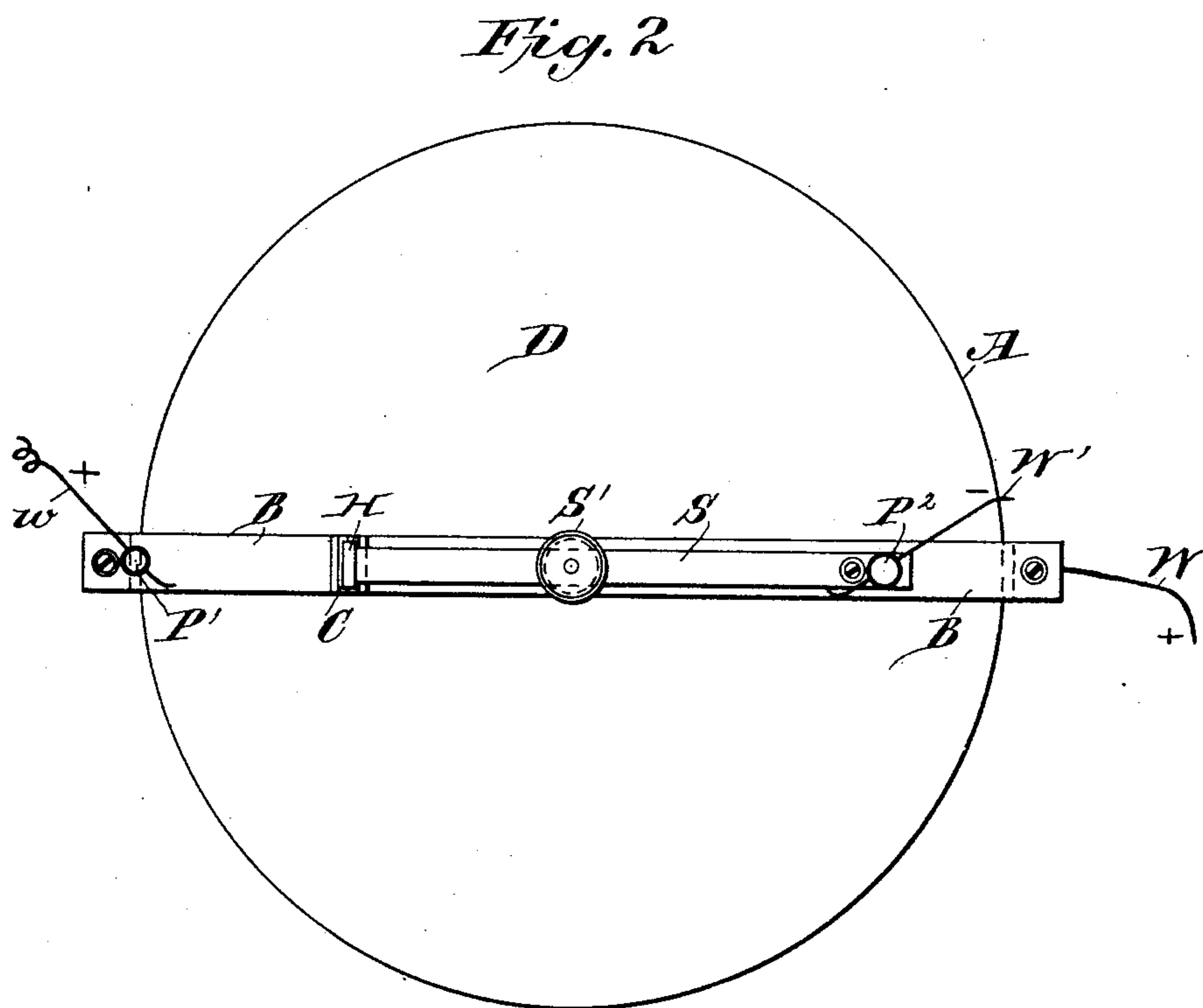
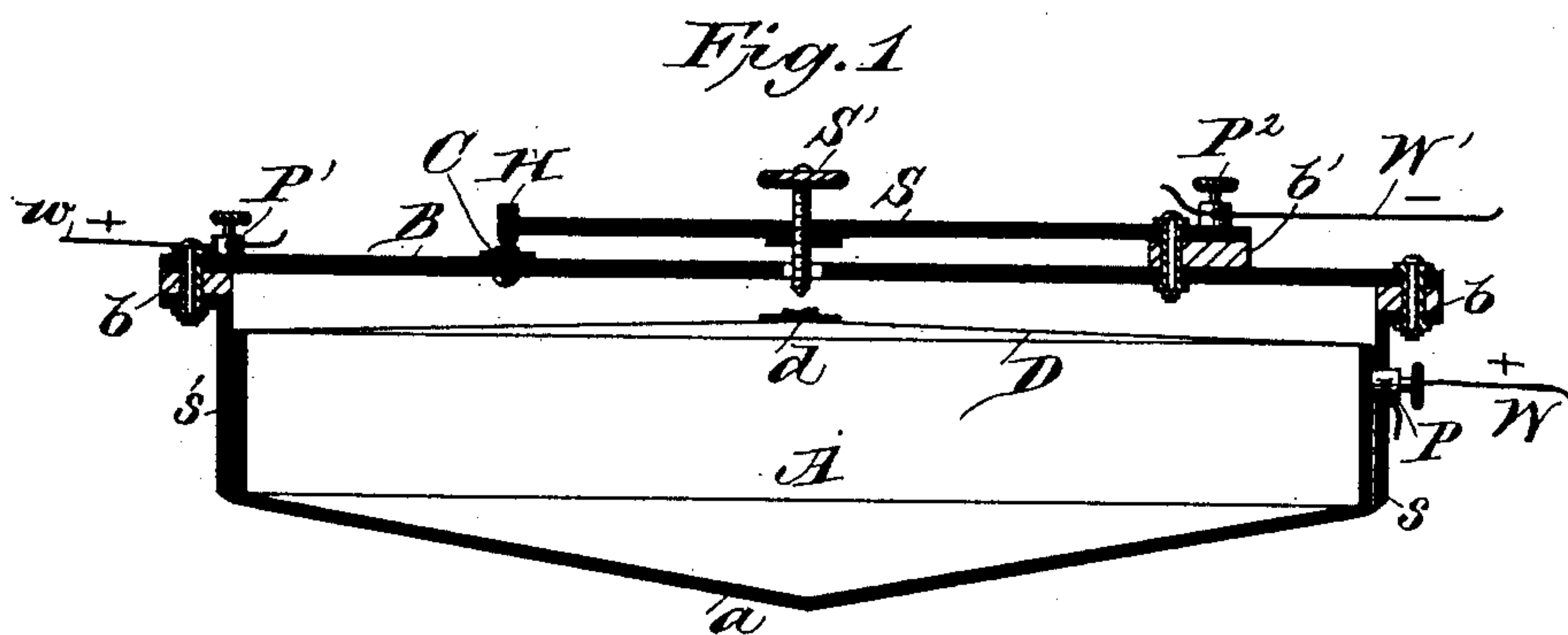


(No Model.)

A. C. IWANOWSKI.
THERMAL CIRCUIT CLOSER FOR FIRE ALARMS.

No. 400,917.

Patented Apr. 9, 1889.



Witnesses
E. M. Hallahan
A. W. Weaver.

Inventor:
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per *[Signature]*
his Att'y

UNITED STATES PATENT OFFICE.

ARMAND C. IWANOWSKI, OF MOSCOW, RUSSIA.

THERMAL CIRCUIT-CLOSER FOR FIRE-ALARMS.

SPECIFICATION forming part of Letters Patent No. 400,917, dated April 9, 1889.

Application filed February 23, 1888. Renewed March 9, 1889. Serial No. 302,746. (No model.)

To all whom it may concern:

Be it known that I, ARMAND C. IWANOWSKI, gentleman, a subject of the Emperor of Russia, and a resident of Moscow, in the Empire of Russia, have invented certain new and useful Improvements in Fire-Alarms, of which the following is a specification.

This invention relates to fire-alarms and signaling devices, and has for its object to provide a simple means whereby an abnormal increase in the temperature of a room may be indicated and such fact made known at any desired point remote from the apparatus.

The invention is based upon the expansion of atmospheric air under varying temperatures, this principle being utilized to interrupt or close an electric circuit in which is included one or more electro-magnets whose armatures control any desired species of signaling devices, such as an alarm-bell, an annunciator or indicator, or both.

The invention consists in an air-tight receptacle provided with a flexible or expansible diaphragm and contact devices, an electric circuit and suitable connections with the contact devices, and one or more electro-magnets included in the electric circuit, whereby such circuit may be interrupted or closed by the expansion of the diaphragm under the expansive action of the air confined in the receiver when the temperature of the ambient air rises above the normal, substantially as hereinafter described, and set forth in the claim.

The invention further consists in structural features and combinations of parts, substantially as hereinafter described, and set forth in the claim.

Referring to the drawings, Figure 1 is a vertical transverse section of my improved fire-alarm and signaling apparatus. Fig. 2 is a top plan view thereof.

A indicates a cylindrical vessel or casing, which I preferably provide with a conical or dome-shaped bottom, *a*, to increase the capacity of the vessel, though this is not absolutely necessary, nor is it necessary that the vessel should be of cylindrical form, as it may have any other desired form in cross-section. I prefer to give the vessel a cylindrical form for the reason that a diaphragm may be more

readily applied thereto than to a vessel that has, for instance, an angular form in cross-section, as will be readily understood. The vessel is constructed of soft iron or steel and upon it is stretched a diaphragm, D, of a sufficiently-thin material to cause it to expand, when by an increase in the temperature of the air confined in the vessel said air expands. From diametrically-opposite sides of the vessel rises a standard, *s* and *s'*, respectively, to which is secured a cross-bar, B, of metal, said cross-bar being insulated from the standards by means of blocks *b* of a suitable insulating material—such as rubber, for instance. To one side of the vessel is secured a binding-post, P, for the wire W, connected with the + pole of the battery or other source of electricity, the cross-bar B carrying also a binding-post, P', for a wire, *w*, connected to the like pole of the battery. The said bar B also carries an anvil, C, with which contacts a hammer, H, at the outer or free end of a spring, S, that is secured to the cross-bar B and insulated therefrom by means of a block, *b'*, of some suitable insulating material. The spring S carries a binding-post, P², for the wire W', that is connected to the — pole of the battery, and the said spring also carries a contact-screw, S', that projects through a perforation in the bar B over a contact, *d*, secured to the diaphragm D.

From the description of the electrical connections it will be seen that the apparatus is included in a normally-closed circuit, which circuit is interrupted upon an increase in the temperature of the air confined in the vessel A, causing the diaphragm D to expand, thereby lifting the contact-screw, and through the latter the spring S, to interrupt the contact between the anvil C and hammer H, and consequently the continuity of the electric circuit through *w* and W'. In this electric circuit may be included an electro-magnet whose armature may control an alarm mechanism. At the same time the electric circuit, through wires W and W', is closed by the contact of of the anvil C with the screw S', and in said circuit may be included an electro-magnet whose armature controls an indicator or annunciator indicating the location of the apparatus. In each of the circuits may be in-

cluded a plurality of electro-magnets whose armatures may control both an alarm mechanism and an indicator or annunciator, and these may be located upon different points in the circuit—for instance, an alarm mechanism and indicator may be located in the building in which the apparatus is used and a like set of devices may be located at an engine-house or police-station or other point more or less remote from the building to give the alarm.

Of course it will be understood that the described apparatus may be included in a normally-interrupted circuit closed by the expansion of the diaphragm D and interrupting the circuit through the wires W and W', and, if desired, the apparatus may be directly connected through the medium of a train of clock-work with a small inductor to interrupt or close a main electric circuit.

I claim—

The combination, with the receptacle A, its diaphragm D, provided with a contact, *d*, and binding-post P, of the cross-bar B, provided with an anvil, C, and binding-post P', said cross-bar being insulated from the receptacle A, the spring-actuated hammer H, and binding post P², insulated from the cross-bar and the contact-screw S', substantially as and for purposes specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 12th day of December, 1887.

ARMAND C. IWANOWSKI.

Witnesses:

N. TSCHÉKALOFF,

F. KAUPÉ.