

(No Model.)

W. B. LUCE.
ELECTRIC INDICATOR.

No. 500,404.

Patented June 27, 1893.

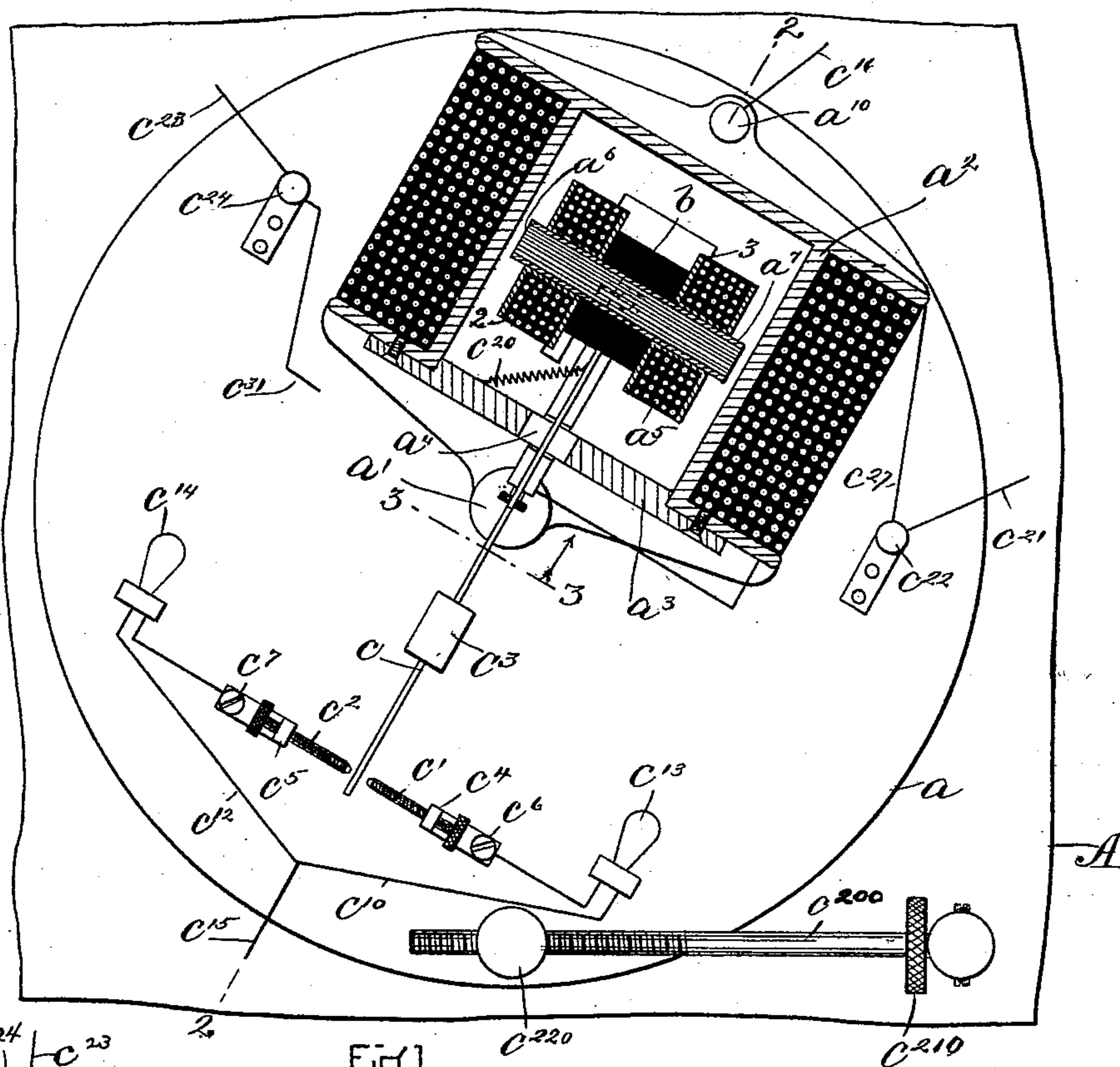


Fig. 1.

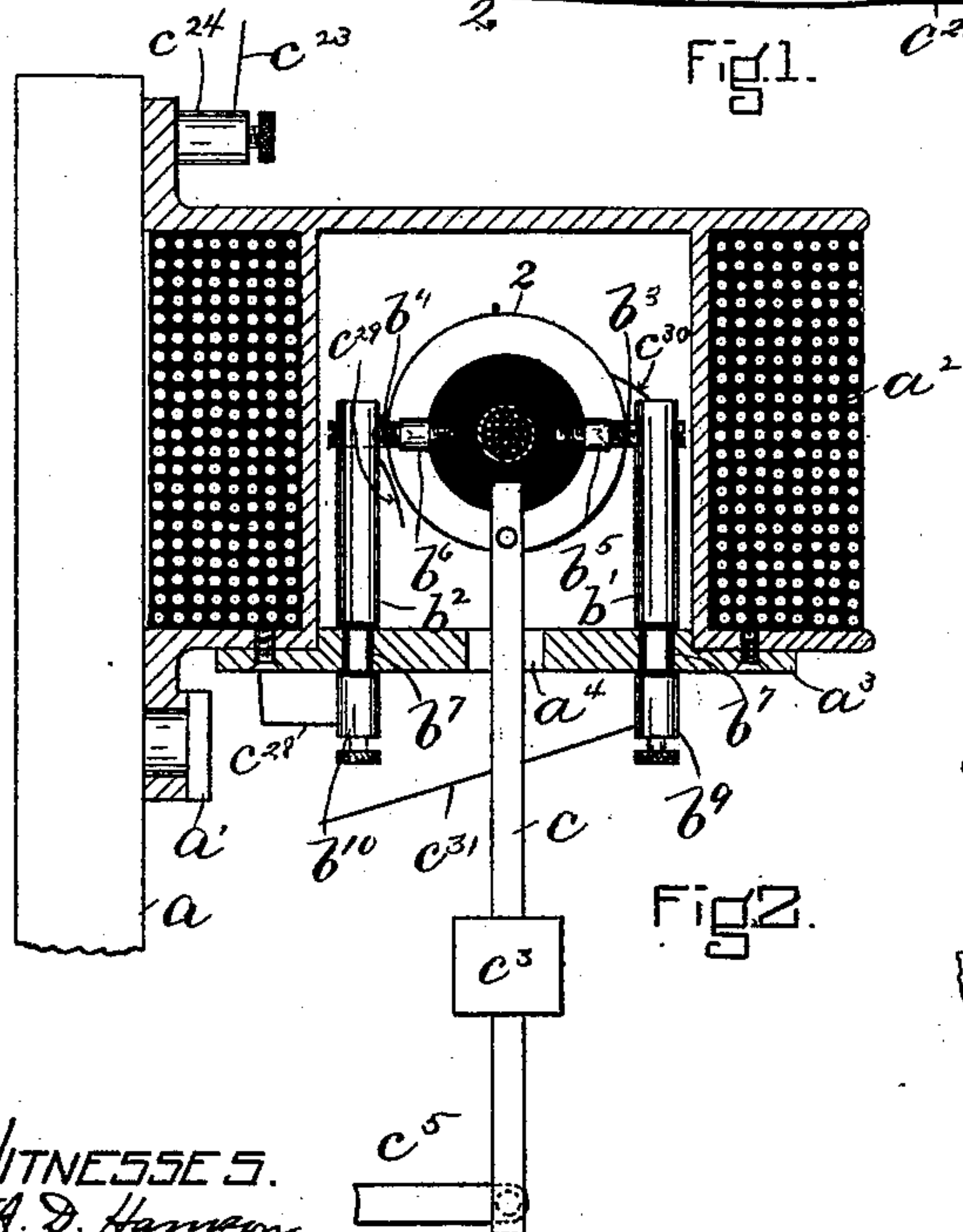


Fig. 2.

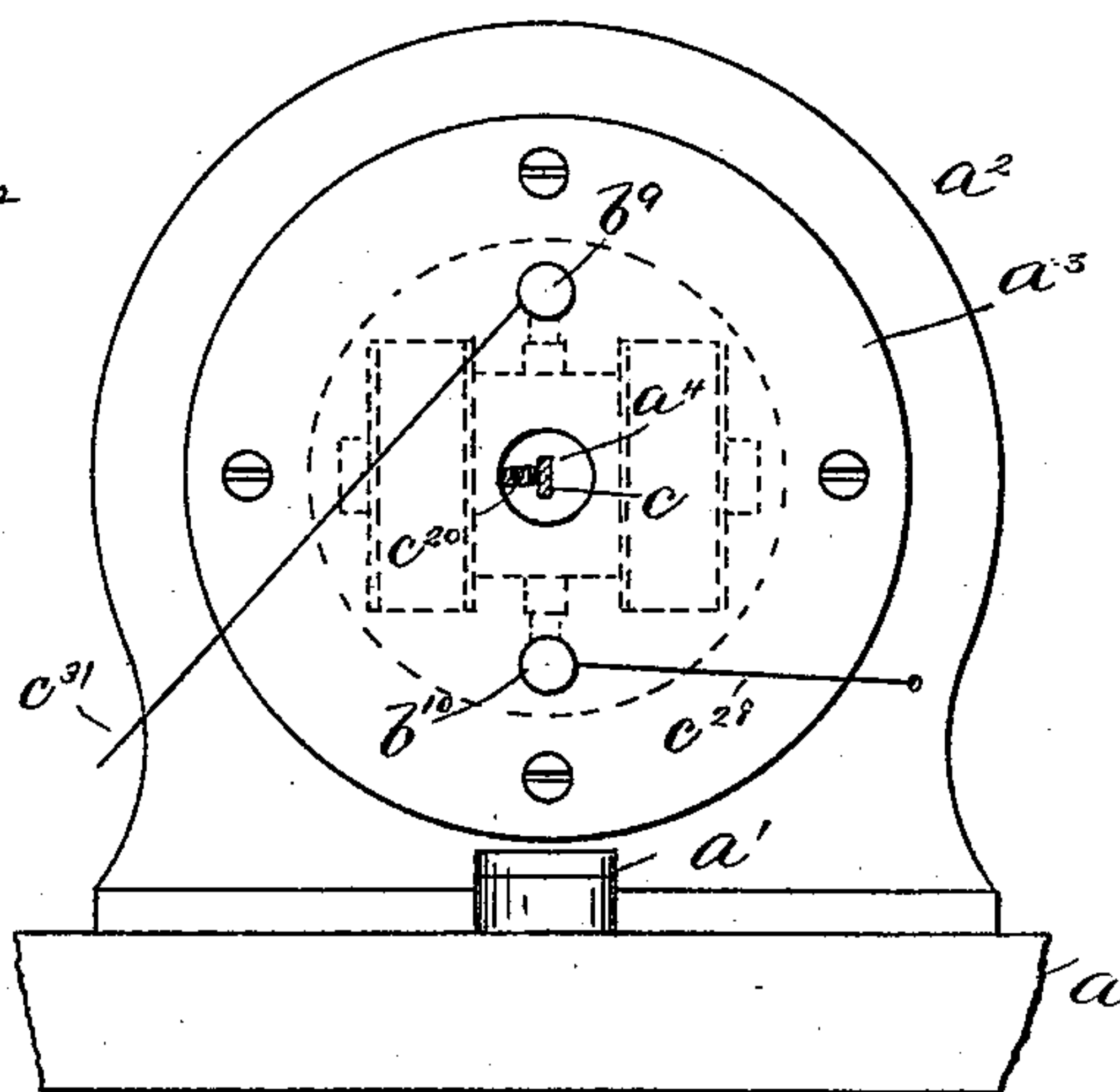


Fig. 3.

WITNESSES.
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WILLIAM B. LUCE, OF BROOKLINE, MASSACHUSETTS.

ELECTRIC INDICATOR.

SPECIFICATION forming part of Letters Patent No. 500,404, dated June 27, 1893.

Application filed January 4, 1892. Serial No. 416,977. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. LUCE, of Brookline, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Indicators, of which the following is a specification.

This invention has for its object to provide an electrical indicating device especially adapted to be used in power and like electric stations, to indicate the condition of a line circuit.

In accordance with my invention, the line circuit within the power or central station has included in it a solenoid, having pivotally suspended within it a core preferably made as a solenoid, having secured to it a pointer which may and preferably will be made to serve the purpose of a contact arm or circuit controller, co-operating with terminals of two independent circuits or branches of an electric circuit, each circuit including in it an indicating device, preferably an incandescent electric lamp, one lamp being constructed so as to give one colored light, as for instance a red light, and the other a green light, the circuit of one lamp being completed when the pressure or voltage on the line becomes excessive or above a normal or determined point, and the circuit of the other lamp being completed when the pressure falls below the normal. The main line solenoid is secured to a support herein shown as a disk pivotally fastened to a back which may be a wall of the station. The disk referred to may and preferably will be provided with a rotating or adjusting device, by which the said disk may be moved to place the main line solenoid at an angle or at an incline to the vertical diameter of the disk, so that the core pivotally supported within the main line solenoid may be acted upon by gravity when the pressure on the line falls below the normal or predetermined point.

My invention in an electrical indicating device, therefore, consists of the construction and combination of parts as hereinafter described and claimed.

Of the accompanying drawings, forming part of this specification, Figure 1, is a sectional view on an enlarged scale of a pressure indicating device embodying my invention. Fig. 2, is a partial section and elevation of

the indicating device shown in Fig. 1, the section being taken on the line 2—2. Fig. 3, is a section on the line 3—3, Fig. 1, looking in the direction of the arrow thereon.

The same letters and figures of reference indicate the same parts in all the figures.

In the drawings: A represents a wall of a power or like electric station, to which is fastened a disk a of slate or other insulating material. The disk a has secured to it, as by the screw a^{10} , a substantially large solenoid a^2 , provided with a removable cap a^3 having a central orifice a^4 . The solenoid a^2 has pivotally supported within it a core, preferably magnetic, and consisting of an auxiliary solenoid a^5 , which may be provided, as herein shown, with a core a^6 of fine iron wires or rods extended through a tube a^7 , the said auxiliary solenoid being composed, as shown, of spools 2 3, mounted upon the tube a^7 near its ends, and separated from each other by a space, in which is located a sleeve or body b , of rubber or like insulating material, the said sleeve being pivotally secured, as shown in Fig. 2, to upright posts b' b^2 , having secured to them pointed screws b^3 b^4 , which fit into suitable sockets in screws b^5 b^6 , inserted into the insulating sleeve b . The upright posts b' b^2 are extended loosely through suitable holes in the cap a^3 , and electrically separated therefrom by insulation b^7 (see Fig. 2), and are fastened to the cap a^3 by binding screws b^9 b^{10} . The insulating or non-conducting sleeve or body b has fastened to it in any suitable manner, one end of a pointer c , preferably made of metal to form a contact arm, which is extended through the central orifice a^4 and which may and preferably will co-operate with two circuit terminals c' c^2 , shown as screw rods, the said contact arm, as herein shown, being provided with a weight or pendulum c^3 . The screw rods or circuit terminals c' c^2 are supported, as shown, by uprights c^4 c^5 secured to the disk a as by screws c^6 c^7 . The circuit terminals c' c^2 have connected to them wires c^{10} c^{12} , herein shown as forming branches of an electric circuit, the said branch wires including in them indicating devices, shown as incandescent electric lamps c^{13} c^{14} , constructed to shed different or distinguishing lights, the lamp c^{13} , for instance, giving a green light, and the lamp c^{14} a red light, or a

series of lamps may be included in each branch circuit. The branch wires c^{10} c^{12} are joined to a common wire c^{15} , forming one line wire, as the negative line wire, of the circuit, the other or positive line wire c^{16} being shown in Fig. 1 as connected to the frame of the solenoid a^2 , which is electrically connected to the contact arm c , as herein shown, by a coiled spring c^{20} . The solenoid a^2 and the auxiliary solenoid or core a^5 are included in the main line circuit extended from the power station, the positive wire c^{21} of which is shown as joined to a binding post c^{22} and the negative wire c^{23} of which is joined to the binding post c^{24} . The solenoid a^2 has one end c^{27} of its coil joined to the positive binding post c^{22} , and the other end c^{28} of its coil joined to the upright b^2 , as shown in Fig. 2, and the upright b^2 has connected to it one end c^{29} of the coil of the auxiliary solenoid a^5 , the other end c^{30} of the said coil being connected to the upright b' , which is joined by wire c^{31} to the negative binding post c^{24} . The main line circuit may be traced as follows, viz: from the positive binding post c^{22} by wire c^{27} , through the coil of the solenoid a^2 , and wire c^{28} to the upright b^2 , thence by wire c^{29} , coil of the solenoid a^5 , and the wire c^{30} , to the upright b' , thence by wire c^{31} to the negative binding post c^{24} .

The disk a may be adjusted or turned to place the main line solenoid a^2 in an inclined position, as shown in Fig. 1, so that the contact arm c occupies a central position between the circuit terminals c' c^2 , when a current of normal pressure is flowing through the solenoid a^2 . The adjustment of the disk a may be accomplished, as herein shown, by means of a screw threaded rod c^{200} extended through a bearing c^{210} fast to the wall A , and also through a threaded opening in a post c^{220} on the disk a .

When the main line pressure is normal, the auxiliary solenoid is in its central position shown substantially at right angles to the longitudinal center of the solenoid a^2 , but if the pressure exceeds the normal, the auxiliary solenoid is turned on its pivotal screws b^3 b^4 and the contact arm c brought into engagement with one of the circuit terminals c' c^2 , as for instance, the circuit terminal c^2 , thereby closing the circuit of the red lamp, which circuit may be traced as follows, viz: from the positive wire c^{16} to the frame of the solenoid a^2 , thence by spring c^{20} and contact arm c to the terminal c^2 , thence by branch wire c^{12} to the negative wire c^{15} . If the main line current falls below the normal, the auxiliary solenoid is turned, as herein shown, by gravity assisted by the weight c^3 , so as to bring the arm c into engagement with the terminal c' ,

thereby completing the circuit of the green lamp c^{13} , which circuit may be traced as follows, viz: from the positive wire c^{16} to the frame of the solenoid a^2 , thence by spring c^{20} , arm c , to the terminal c' , thence by branch wire c^{10} to negative wire c^{15} . The solenoid a^2 is herein shown as secured to the disk a , so that its longitudinal central line is oblique to the vertical diameter of the disk a , and the circuit terminals c' c^2 are substantially parallel to the transverse central line of the said solenoid. By this arrangement the auxiliary solenoid a^5 is maintained substantially at right angles to the longitudinal center of the solenoid a^2 , and the arm c is kept out of contact with both terminals c' c^2 by the main line current of normal strength.

I claim—

1. In an electrical indicating device, the combination of the following instrumentalities, viz: an insulating support a , a solenoid a^2 , as described, a magnetic core pivotally supported within the solenoid a^2 and consisting of the auxiliary solenoid a^5 , composed of spools 2, 3 and intermediate insulating body b , a contact arm c secured to the body b , circuit terminals c' c^2 with which the contact arm co-operates, and incandescent lamps or other indicating device in circuit with the said terminals, substantially as described.

2. In an electrical indicating device, the combination of the following instrumentalities, viz: a main line electric circuit, a solenoid a^2 , an auxiliary solenoid composed of spools 2, 3 and intermediate insulating body v pivotally supported within the solenoid a^2 both solenoids being included in the main line circuit, a contact arm secured to the auxiliary solenoid but insulated therefrom, an auxiliary circuit provided with circuit terminals c' c^2 and incandescent lamps in said auxiliary circuit, substantially as described.

3. In an electrical indicating device, the combination of the following instrumentalities, viz:—an insulating support a , a solenoid a^2 provided with a removable cap having a central orifice; a core for said solenoid, pivotally supported within the same and acted upon by variations in electrical pressure, and a pointer or arm c secured to said core and passing through the said orifice of the cap, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of December, A. D. 1891.

WILLIAM B. LUCE.

Witnesses:

C. F. BROWN,
A. D. HARRISON.