(No Model.)

C. J. VAN DEPOELE.

DEVICE FOR CONTROLLING ELECTRICAL CURRENTS.

No. 270,352. Patented Jan. 9, 1883.

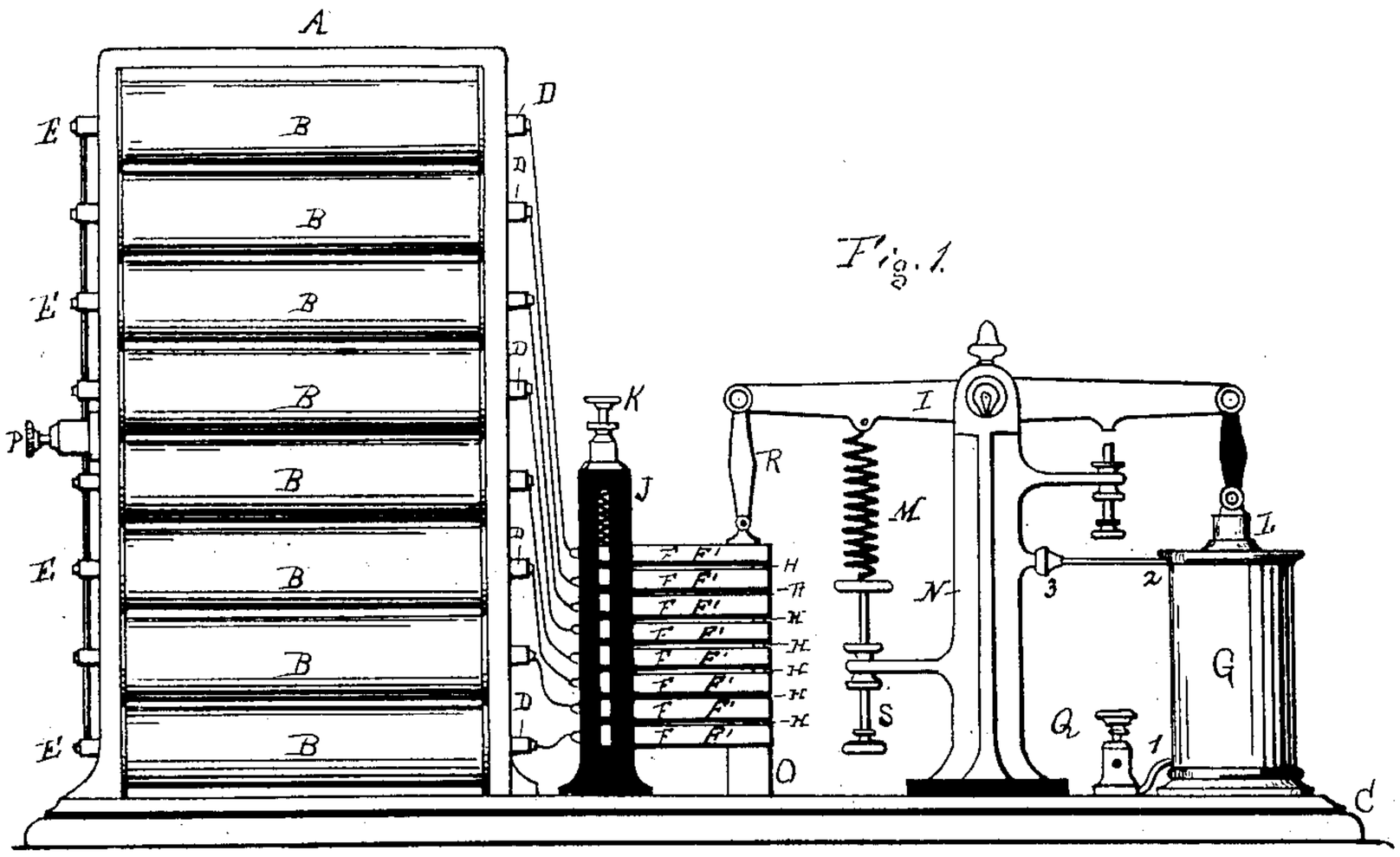


Fig. 1.

Fig. 2

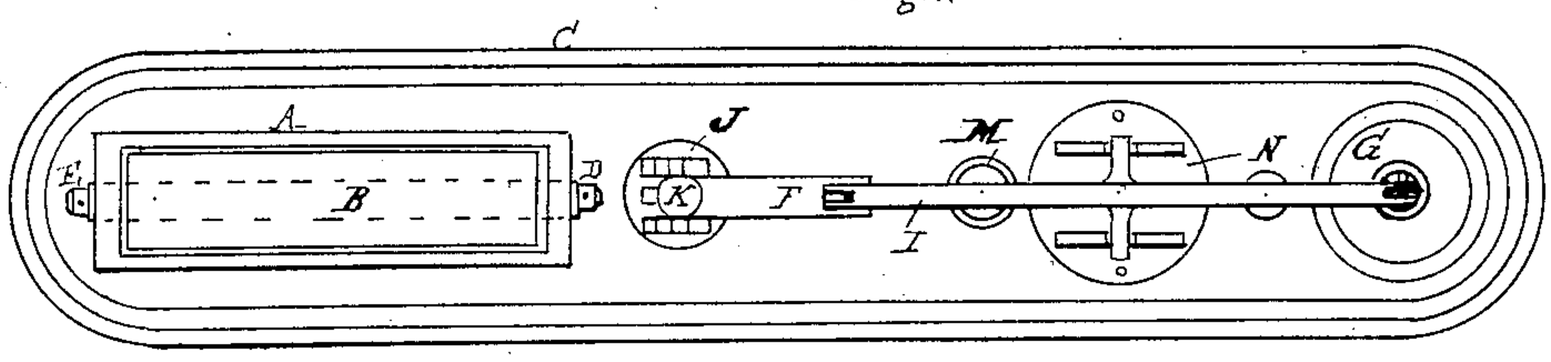
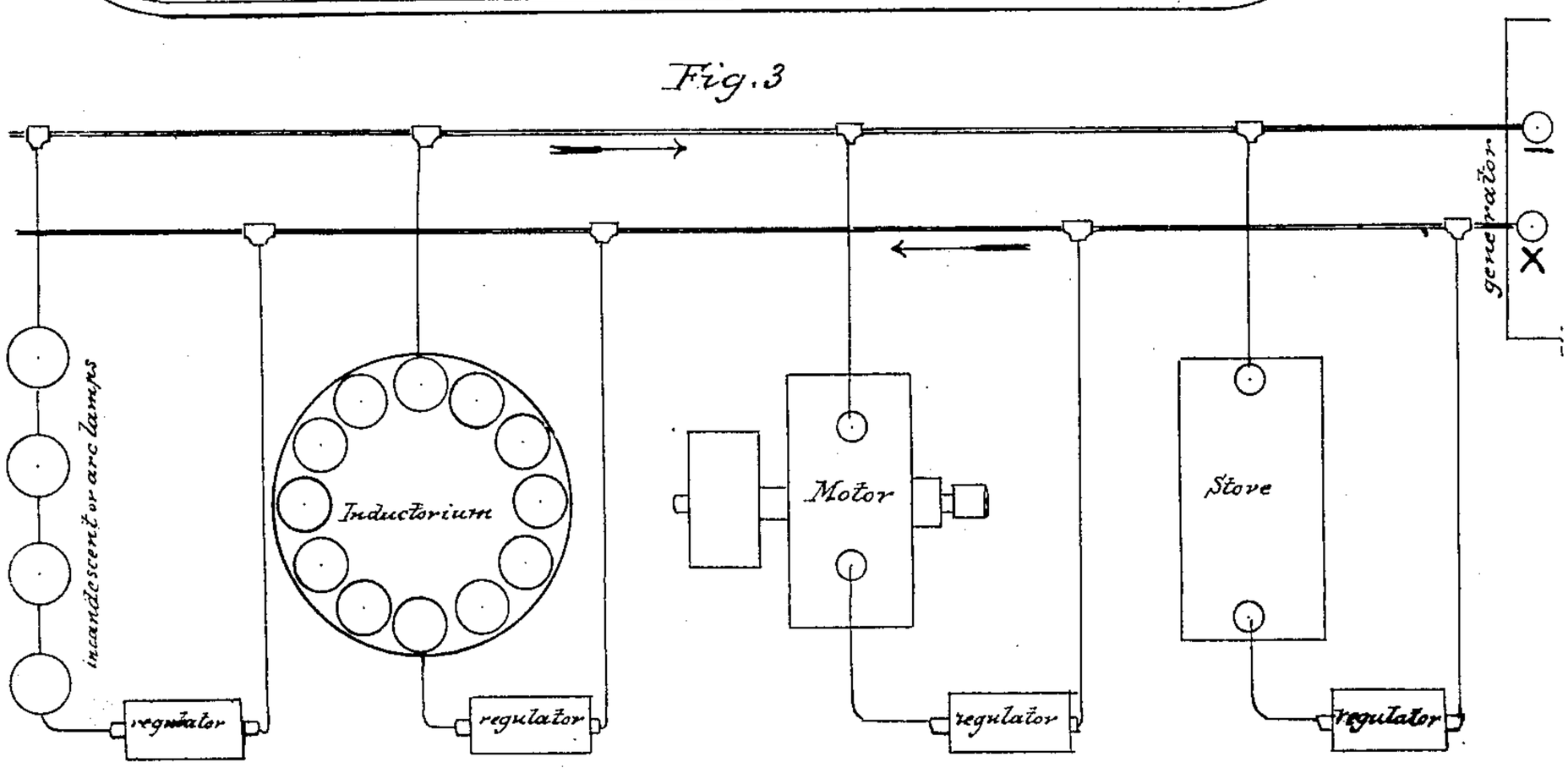


Fig. 3



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UNITED STATES PATENT OFFICE.

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DEVICE FOR CONTROLLING ELECTRICAL CURRENTS.

SPECIFICATION forming part of Letters Patent No. 270,352, dated January 9, 1883.

Application filed July 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DEPOELE, of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Devices for Controlling Electrical Currents; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in the construction and operation of devices for controlling and regulating the distribution of powerful electric currents.

The main feature of my invention consists in the peculiar mode of tapping such currents without loss, or at least with the minimum of loss, for the purpose of dividing such main current into as many smaller currents as may be desired at any point or points along the line where the main currents are flowing, so that, for instance, different currents may be obtained from such main-line current for lighting or power, or for any of the other purposes where electrical currents can be utilized.

In order that my invention may be the better understood, I will refer briefly to the *modus operandi* now in general use for dividing and regulating such currents of electricity, and which, as is well known, consists in placing a rheostat in the circuit between the poles of the source of electricity and the work to be performed, such rheostat being worked either automatically or by hand whenever it becomes necessary to alter the resistance of the circuit where said circuit is at work. The great obstacle to this method is the large amount of waste of energy which is going on continually, and which manifests itself in heat as long as the device is in operation; and in order to prevent said heat in the rheostats its wires are often strung in the open air, in order to present the largest possible cooling-surface, and sometimes such rheostats are placed under water to prevent their destruction by the heat. Thus it is clear that this heat which I propose to avoid is a cause of loss of the first production. My aim is to divide and regulate said current without the above-mentioned waste, to produce a device by which the most powerful currents can be handled with perfect safety to life and limb, and by which the use of electricity can be largely extended.

Figure 1 is an elevation of my device ready for operation. Fig. 2 is a plan of the same. Fig. 3 is a diagrammatic view, showing part of an electric main, a number of translating devices, and the location of my apparatus with respect thereto and to the energizing-current.

In the accompanying drawings, which form a part of this specification, A is a suitable frame or support for holding the coils B. This support rests upon a base, C, made of wood or other suitable material, upon which are also placed the other working parts of the system. B shows eight coils of fine wire, which will be more fully hereinafter referred to. Each of these coils has connected with it a binding-post, E, all of which are connected to a larger binding-post, P, as shown in Fig. 1. The opposite ends of these coils are also connected with other binding-posts, D, each of which is connected by means of individual wires to one of the contacts F, so that each of said contact-pieces is in connection with one of the coils B. These contacts are operated by the magnet G, as hereinafter explained. Each of these contact-pieces is separated from the other by means of an intervening layer of some non-conducting substance, F′, except at the extremities, where platinum contacts H are provided, so that on the downward motion of the beam I all the contact-pieces will be electrically connected, while during the upward motion of said beam I all or some of the contacts may be broken, as the case may be.

J is a carrier or support to the contact-pieces F, made of non-conducting material, such as wood or vulcanized fiber.

K is a set-screw, intended to hold such contact-pieces F in position, a coil-spring being interposed between the set-screw and the contact-pieces, so as to allow such pieces to follow the upward motion of the beam when the contact-pieces are separated, while the contrary occurs in the downward motion of the beam. The beam I, pivotally supported at its center, oscillates, being acted upon by the core L, which has a vertical play within the magnet G, and is counteracted at the other end by means of the spring M.

N is the standard which supports the oscillating beam I.

O is the support for the contact-pieces F.

Q is the negative binding-post, while P is the positive binding-post.

Having thus described the different parts of my device, I will now explain the operation of the same, so that it will be readily understood by electricians.

As it is well known electric currents always follow the line of the least resistance, therefore the main point is to provide such coils or passages for the electric fluid that when the two terminals of said channels are brought into direct contact with the two conductors leading from the source of electricity, the channels for the current which it is intended to divert will be so proportioned that no perceptible heat will be produced in them, while a certain amount of available current will be flowing, capable of performing a certain amount of work, only so much of the current being subtracted from the passing current as such channels will allow to pass without becoming heated and increasing their own resistance. For instance, if to perform a certain amount of work will require the currents supplied through eight or ten such channels, the amount of current required can, by this invention, be easily diverted by putting more or fewer of said channels in contact with the main conductor and allowing the current to flow through one or all of the said channels at once, according as the minimum or maximum is desired. Each channel or coil B may be composed of one or several conductors or passages, the ends of all of which are secured to the same binding-posts. In order to form a device which will allow large amounts of currents to be diverted or subtracted from a powerful source without loss by heating, all there is necessary is to add a greater number of coils or channels, as I will now explain. Part of the current from a powerful source enters at the binding-post Q, Fig, 1, and passes by means of suitable connections, 1, to the magnet G, and comes out of said magnet at 2, and is carried by a proper conductor to binding-post 3, which forms part of the standard N, which standard is in electrical connection with the beam I, first by its central pivot, and, second, through spring M. The current now passes from the beam I through the link R, which is electrically connected to the upper contact F of the series W. When no current is flowing all these contact-pieces are pressed together at H by means of the spring M. Thus it will be seen and understood that the moment the current is established the magnet G becomes active, and would at once separate all the contacts D were it not for the spring M, said spring being regulated by means of a screw, S, with relation to the amount of current it is intended to use.

It will be readily understood that the condition of tension on the main line is apt to be altered at any moment by the throwing in or out of some work—as, for instance, where a number of incandescent lamps or some other work is cut out, and that such change of condition will not materially affect the current passing through the regulator, the said regulator only operating to subtract the quantity of current that can readily pass through its coils without waste or injury, and thereby to prevent the passage of more than the predetermined amount of current, the tension-spring on one side of the walking-beam and the attraction of the solenoid on the other operating as a check on each other, according to the strength of the general current on the main line. I do not desire to limit myself in the construction of these channels or passages to wire, as the same can be made of carbon, liquid, or any other electric conducting substance.

What I claim as my invention is—

1. The coils B, permanently connected at their outer ends to one of the branch conductors of a multiple-arc circuit, and a corresponding series of superposed insulated contact-pieces F, each connected to the inner end of one of said coils, and provided with contact-points H, and the support J, provided with adjustable downward-acting spring and suitable set-screw, in combination with the lever I, provided with link R, electrically connected to the upper one of said contact-pieces, the solenoid G, permanently connected to the other conductor of the branch, the core L, and suitable wire connecting said solenoid and lever, and adapted to elevate or depress said core and lever to separate or connect the contact-pieces F, and thereby regulate the branch current passing through the device in response to the fluctuations of the main current, substantially as set forth.

2. In combination with the wires of the external circuit, the coils B, contact-pieces F, and support J, the solenoid G, standard N, lever I, core L, and suitable connecting-wires, all located in and forming part of a branch of a main circuit, an adjustable stop, a regulating tension-spring connected to the stop and the said lever I, and suitable adjusting-screw, substantially as shown and described.

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