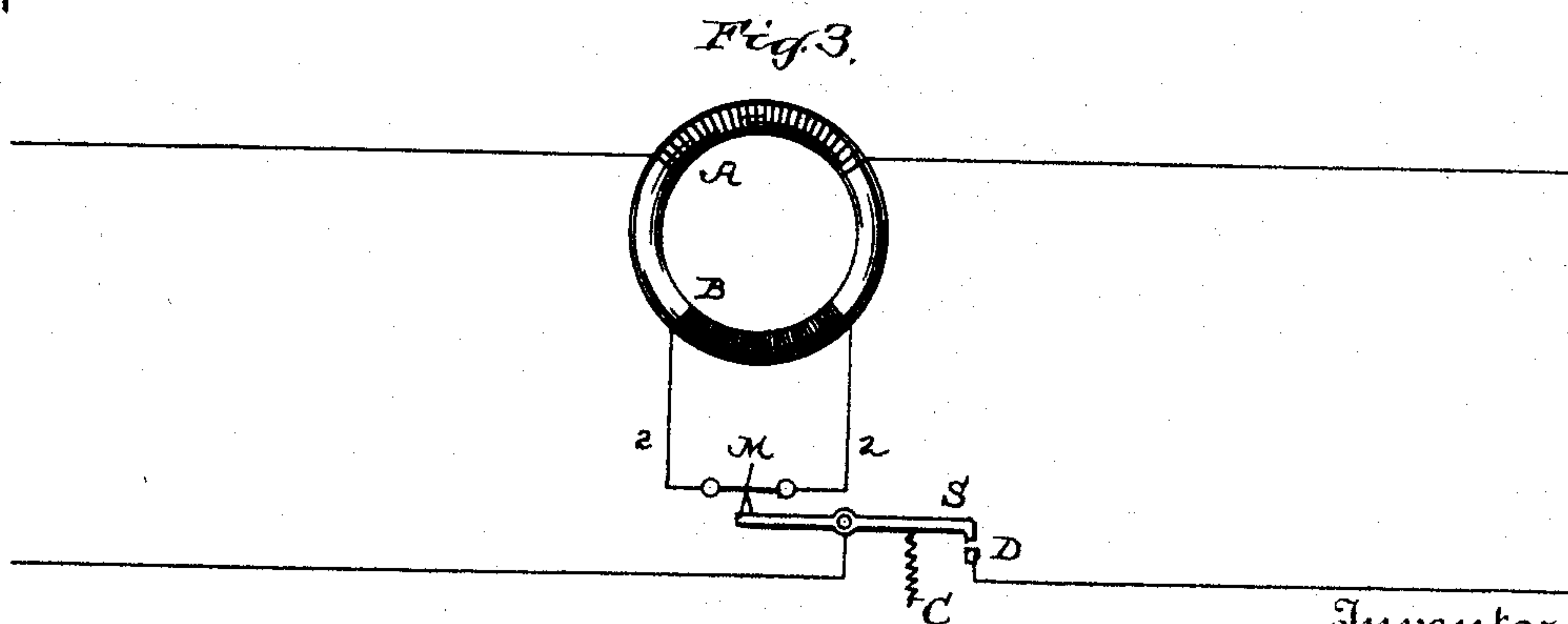
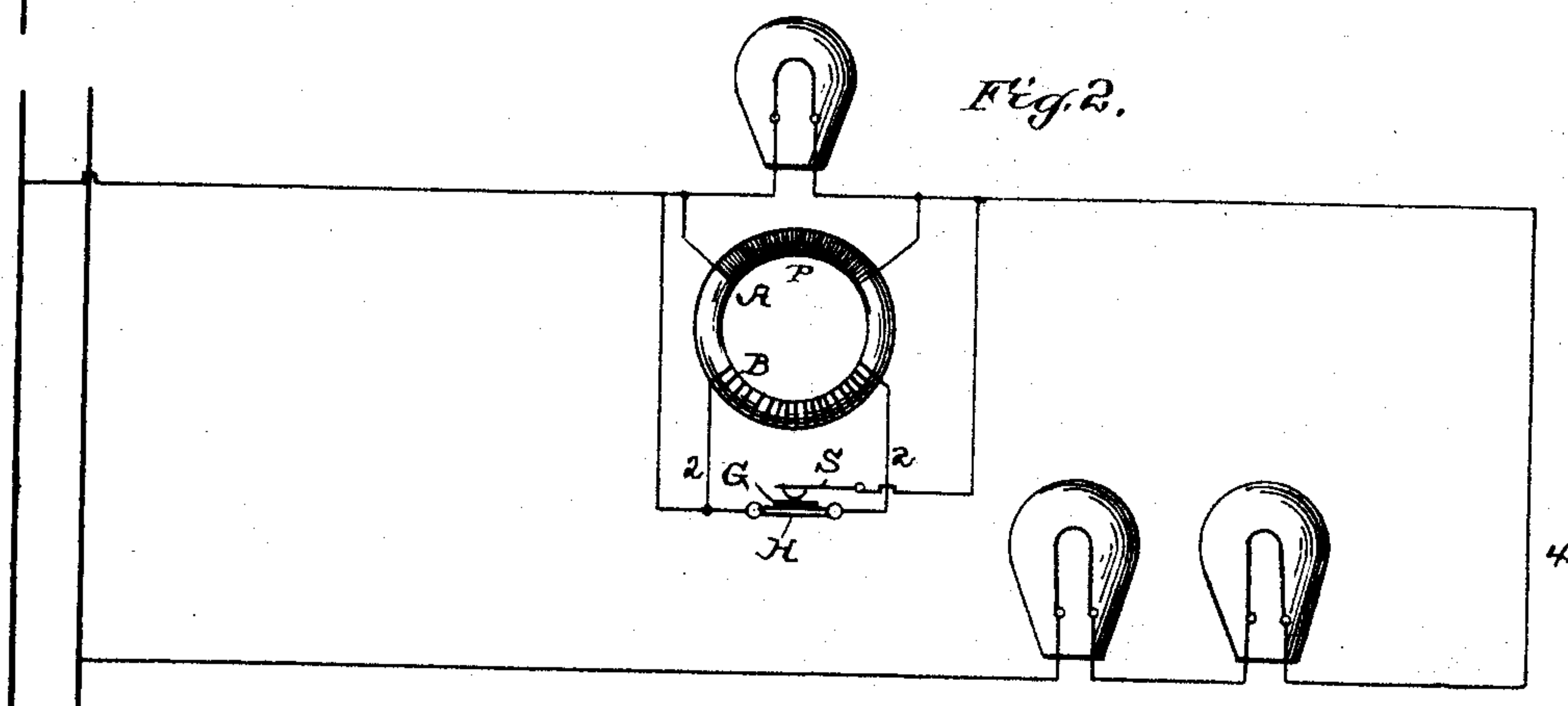
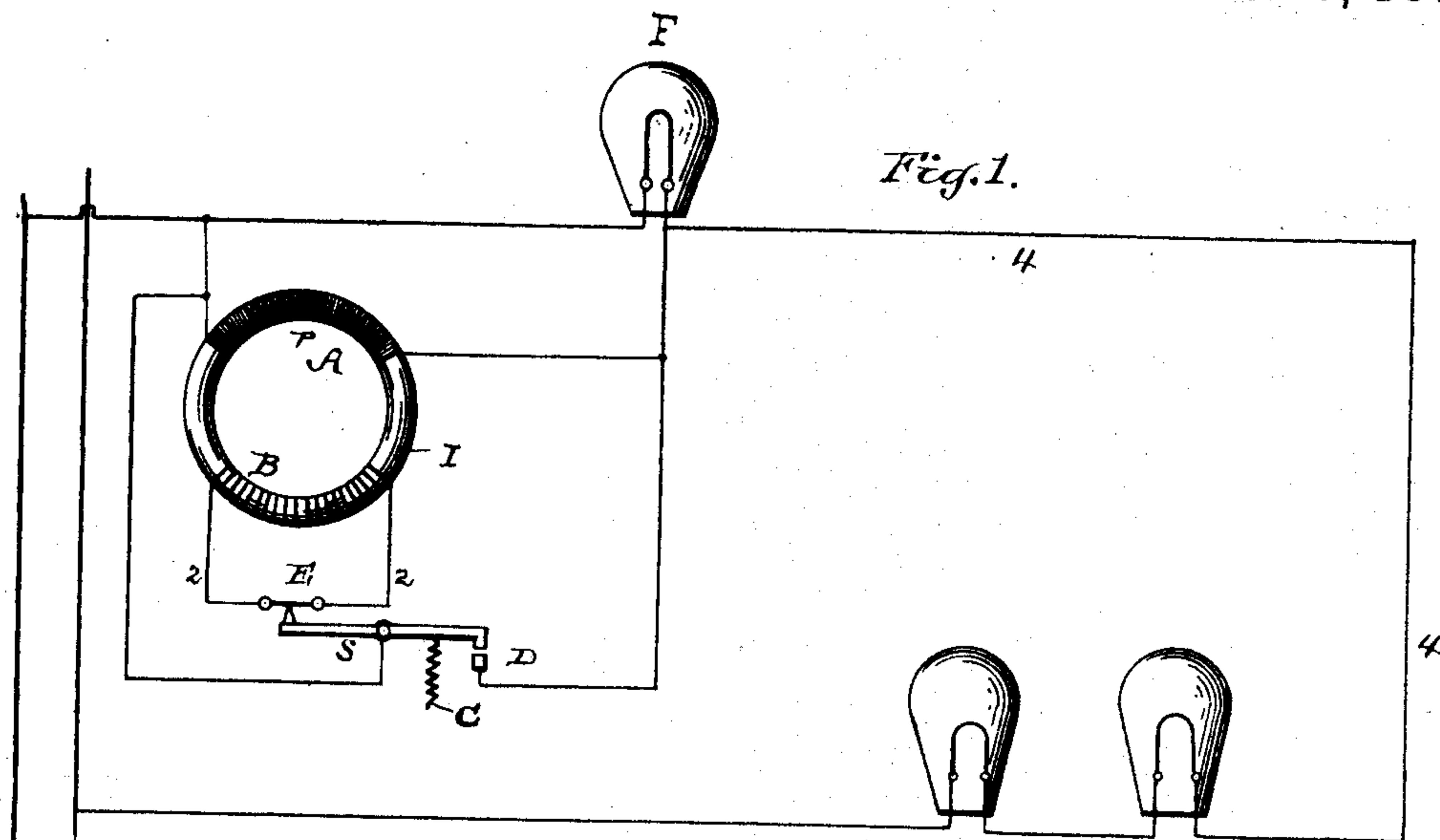


(No Model.)

E. THOMSON.
CUT-OUT.

No. 506,383.

Patented Oct. 10, 1893.



Witnesses
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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE THOMSON-HOUSTON ELECTRIC COMPANY, OF CONNECTICUT.

CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 506,383, dated October 10, 1893.

Application filed October 27, 1888. Serial No. 289,347. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented a certain new and useful Cut-Out, of which the following is a specification.

My invention relates to an electric switch apparatus for use in connection with devices upon alternating current circuits, and consists in a novel combination of devices whereby the current flowing to the device may be cut off or shunted when the current in the same reaches a predetermined or proper strength.

My invention consists in the combination with any device upon an alternating current circuit, of an electrically controlled or operated switch governing the flow of current to the same, a transformer whose primary circuit is of high self induction and is in an uninterrupted branch around the portion of circuit containing said device, and a controlling or operating electrical circuit for the switch, connected to and supplied with current for bringing the switch into operation from the secondary of said transformer.

My invention is especially useful in connection with incandescent lamps in cases where other forms of shunting switch or cut-out are not applicable, as for instance, where the potential for working the lamps is not high enough to call into action a film cut-out; as would ordinarily be the case where the potential is only two hundred or three hundred volts and each lamp of a series runs with say twenty-five volts. It will be well understood by electricians that the switch may be electrically controlled or operated by many different forms of devices, and to carry out the principle of my invention it is only necessary to adopt some device proper for operation by alternating currents and to supply the controlling or operating electric current to such device from the secondary of the transformer.

Some of the devices which may be used for the purposes of my invention I have hereinafter described but do not wish to be understood as limiting myself to them.

In the accompanying drawings:—Figure 1, is a diagrammatic view illustrating the application of my invention to an incandescent

electric lamp. Fig. 2, illustrates a modification in the manner of controlling the operation of the electric switch. Fig. 3, illustrates a further modification in which the switch is brought into operation through the destruction of a fastening which normally holds said switch open and which is destroyed or fused by the action of the secondary current of the transformer.

Referring to Fig. 1, I, indicates a transformer of any proper character. The form here shown consists of an endless core or ring of iron wound with two coils A, B, one of which (A,) may be regarded as the primary, and the other of which (B,) is the secondary. The primary A, carries the alternating currents which are the prime means for calling the switch into operation. The switch S, may also be of any desired character, that form here shown consisting simply of an ordinary lever provided with a spring C, which tends to close the contacts D, of the switch. The switch is normally held open by a strip E, of any conducting fusible material such for instance as is ordinarily employed in electric safety devices, such strip E, serving as a destructible or fusible fastening the destruction of which allows the switch to close the contacts at D. The fusible strip or fastening E, is in a circuit 2, which is the controlling or operating electric circuit of the switch and is connected to the secondary B, of the transformer. The current circulating on the circuit 2, and the fuse E, are so related that under normal conditions the current will be insufficient to melt the fuse, and the switch will remain open. When however the current rises to a predetermined amount through the increased strength of the alternations in the coil A, the fuse will be melted and allow the switch to operate.

In the application of the device to an incandescent lamp F, or other translating apparatus operated on a circuit 4, carrying alternating currents, the primary A, is preferably made of high resistance or of high self-inductive capacity, and is placed in a branch or shunt around the lamp or other translating device L. The coil B, is preferably made of coarse wire of few turns in order that it may supply a current of large volume for pro-

ducing quick and large heating effects in the fuse E. The switch S, is connected as shown to shunt or cut-out lamp F, when it closes contact at D. Under ordinary operations the coil A, has ordinarily enough kick or self-induction to prevent all but a small fraction of the current from passing, but upon the destruction of the lamp F, or the occurrence of an abnormally high resistance therein current will flow through the coil A, sufficiently to set up a secondary current which will melt the fuse or fastening E, and bring the switch S, into operation.

Fig. 2, illustrates another way of carrying out my invention by the employment of a modified device for electrically controlling or operating the switch. In this instance the switch is shown at S, as consisting of a spring normally tending to make contact with its contact or stop H, but held out of contact therewith normally by a fusible or destructible film indicated at G, which latter rests upon the conducting plate H, between the same and the contact of the switch spring S. When the spring makes connection with plate H, it shunts the lamp as before. The plate H, is connected with the secondary circuit of the transformer, and the controlling current in this instance, when it flows across the plate H to sufficient amount, will heat the same so as to destroy or impair the strength of the film G, thereby allowing the switch to close the circuit.

In the instances shown in Figs. 1 and 2, the secondary is of very coarse wire. It is possible however to use a very fine secondary as indicated in Fig. 3, where the controlling circuit for the switch S, contains a string M, impregnated with graphite and moistened so as to make it a partial conductor. In this instance the secondary is wound to deliver an exceedingly high potential which potential is however normally insufficient to overcome the resistance of the string M, forming the destructible fastening, but on rising to a predetermined amount will traverse the string and destroy the same allowing the switch to close.

Still other means might be employed for operating the switch S, or for controlling the operation of the same through the agency of the current delivered from the secondary of the transformer or induction coil, but inasmuch as the principle of the combination forming the subject of my invention remains the same whatever the special forms of devices used in connection with the controlling circuit for said switch, and inasmuch as the devices are capable of endless modifications

as will be well understood by electricians, I do not assume it necessary to describe any more of them.

By the term controlling, as applied to the circuit connected to the secondary, I mean a circuit which will carry the current for bringing about the operation of the electric switch whether such current be that which, by its own energy, develops the power for moving the switch or whether that energy be used to control and let off another power as of a spring or weight which shall operate the switch.

What I claim as my invention is—

1. The combination with a translating device on an alternating current circuit, of a transformer whose primary is of high self-inductive capacity and is connected to the general circuit at opposite sides of said translating device through uninterrupted connections, a secondary for said transformer constructed to supply a current of larger volume than that of the general circuit for producing quick and large heating effects, and a switch controlling the flow of current to the translating device and being controlled by heating effects due to said secondary.

2. The combination with a translating device on an alternating current circuit, of a transformer whose primary is of high self-inductive capacity and is in a constantly closed branch around said device, a secondary for said transformer formed of a few turns of large wire to supply a current of larger volume than that of the general circuit for producing quick and large heating effects, and an electric switch controlled by heating effects due to said secondary for shunting the translating device.

3. The combination of a translating device on an alternating current circuit, of a transformer whose primary is in a branch around said device and whose secondary is constructed to supply a current of large volume, a contact of an electric switch located in the secondary circuit, a connection leading from said contact to one side of the translating device, another connection leading from the opposite side of said device to the other switch contact, and a block of fusible non-conducting material located between said switch contacts.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 24th day of October, A. D. 1888.

ELIHU THOMSON.

Witnesses:

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E. M. HOLT.