

(No Model.)

2 Sheets—Sheet 1.

S. M. PLUSH.

ELECTRIC CIRCUIT BREAKER.

No. 282,921.

Patented Aug. 7, 1883.

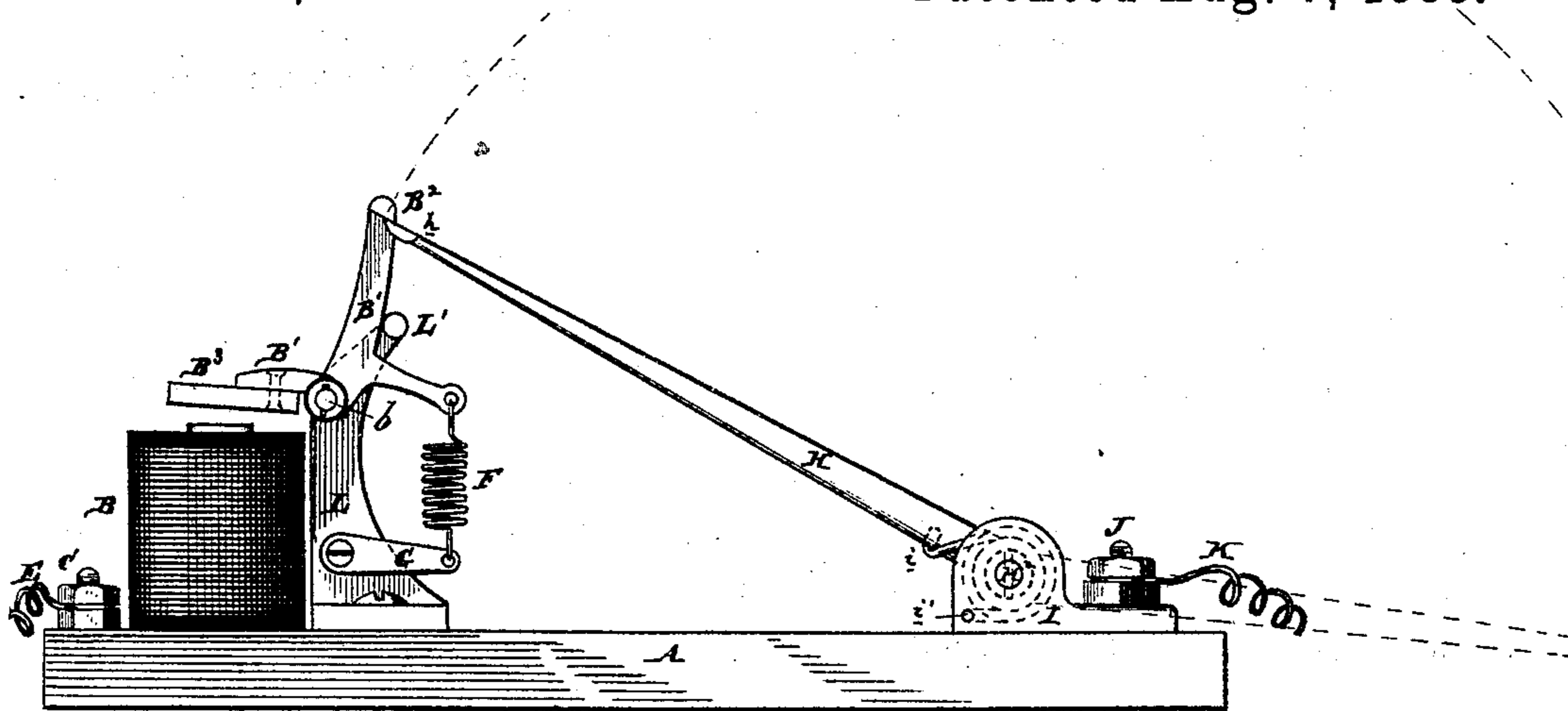


Fig. 1

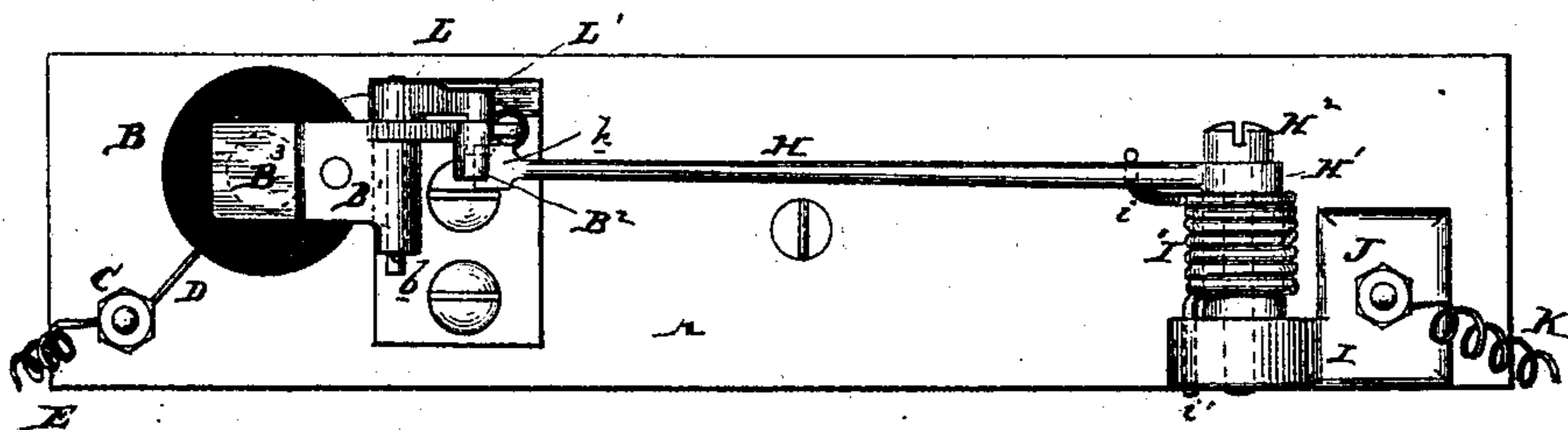


Fig. 2

Attest
Wm. McWade

Inventor
Samuel M. Plush
By his atty

[Signature]

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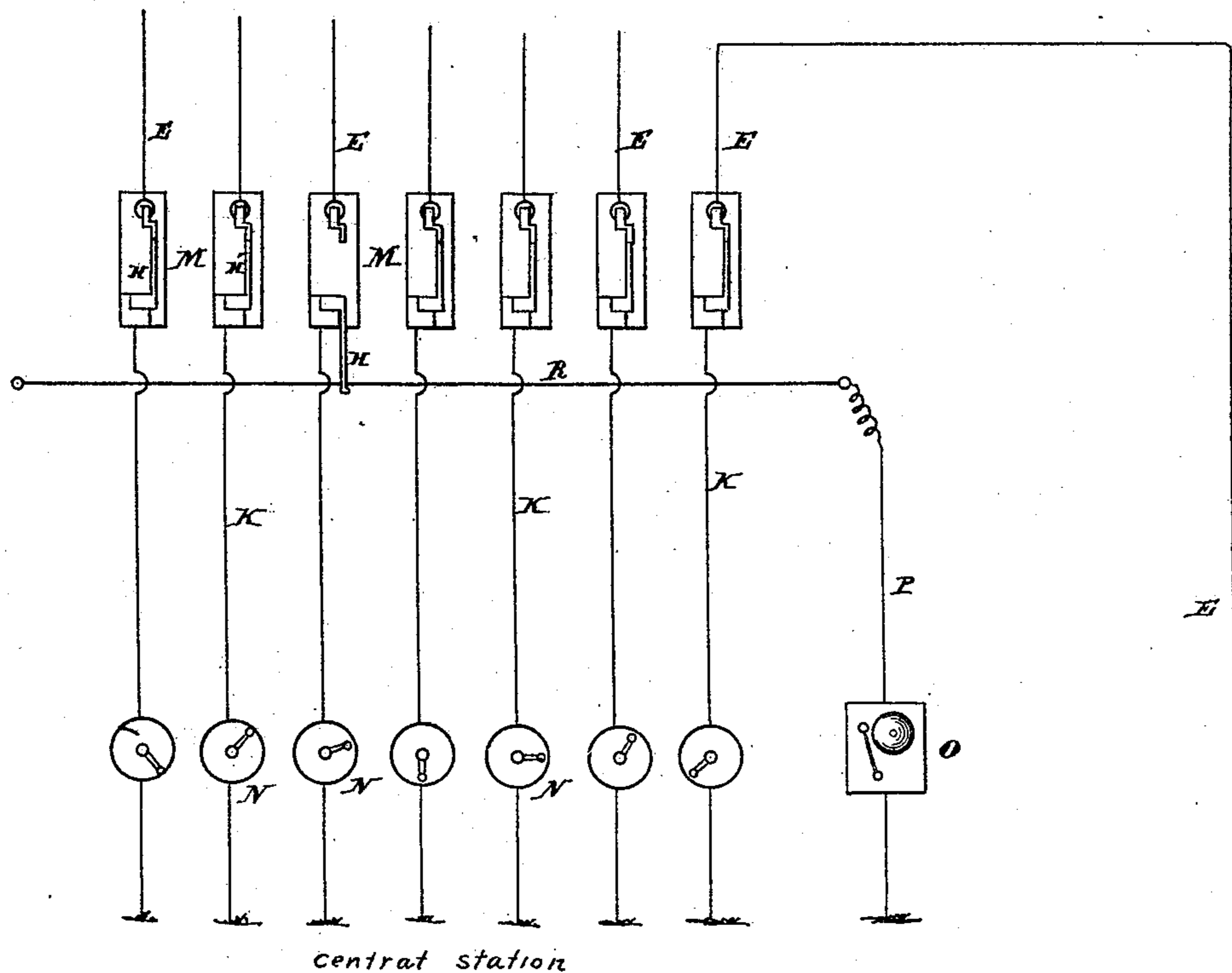
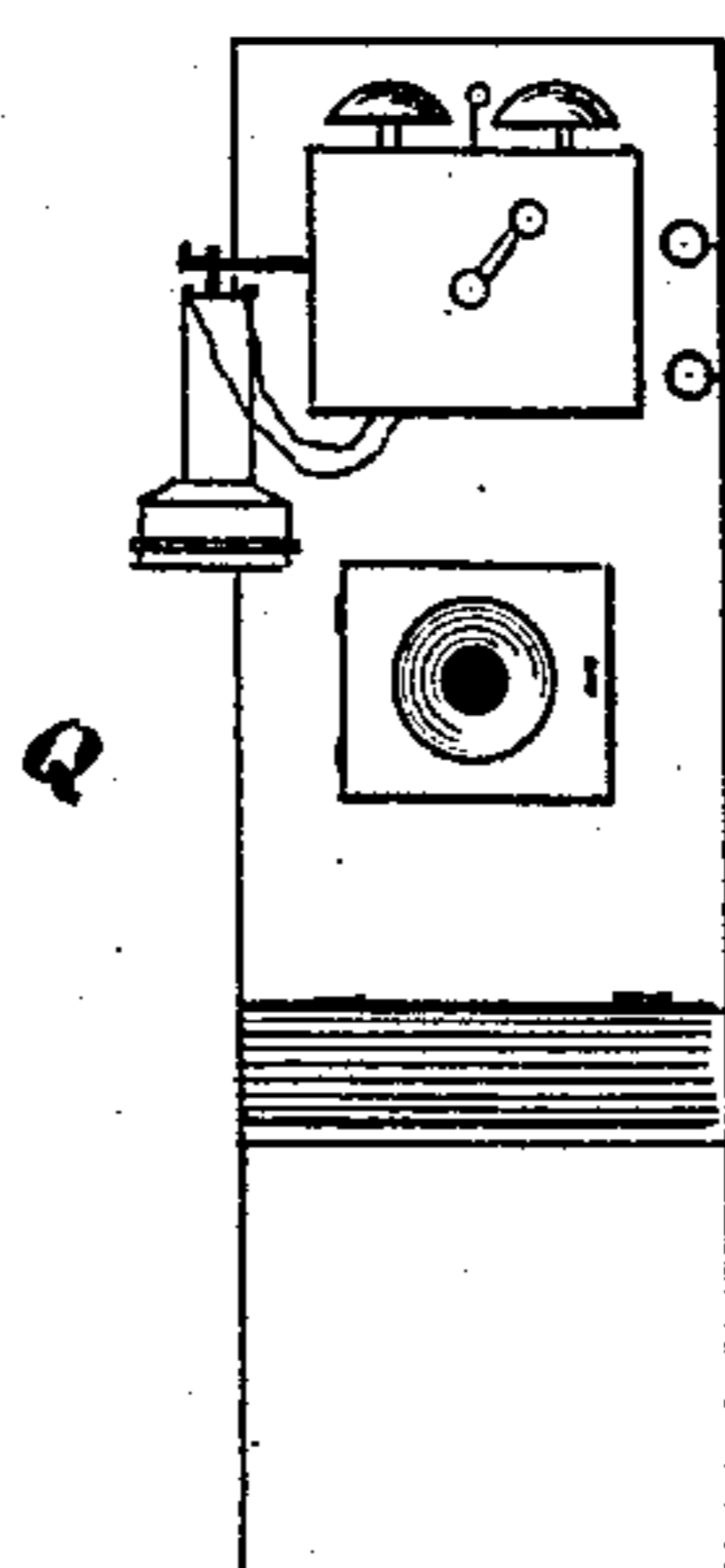


Fig. 3



Attest
J. M. Wade
J. M. Wade

Inventor
Samuel M. Plush
By his atty.

[Signature]

UNITED STATES PATENT OFFICE.

SAMUEL M. PLUSH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO HENRY BENTLEY, OF SAME PLACE.

ELECTRIC CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 282,921, dated August 7, 1883.

Application filed March 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. PLUSH, of the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Electric Circuit-Breakers, of which the following is a specification.

My invention has reference to circuit-breakers adapted for use on telegraph and telephone lines, and is arranged to automatically break the said lines or circuits upon their becoming charged with an excessive or abnormal electric current, the said break being very large to prevent the possibility of currents of great strength—as those from dynamo-electric machines—flowing across said break and injuring the electrical instruments at the various stations.

My invention also has reference to one or more circuit-breakers combined with one or more line-circuits, and an open local circuit so arranged that if one or more of said line-circuits be broken the local circuit will be closed, and in many details of construction, as fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

In the drawings, Figure 1 is a side elevation of my improved circuit-breaker. Fig. 2 is a plan view of the same, and Fig. 3 shows the said circuit-breakers as applied to telephonic lines.

A is the base.

B is an electro-magnet one terminal of which is in circuit with line E by binding-post C and wire D, and the other terminal is in circuit with the standard L and the bell-crank B' of the armature B³, the said bell-crank being pivoted at b to standard L, and having its longer or vertical leg provided with a catch, B². The armature B³ is drawn away from the electro-magnet B by a spring, F, and its tension may be adjusted by a pivoted arm, G, made rigid with the standard L by a screw or its equivalent. Any of the well-known forms of armatures and adjusting-springs may be used, if desired, in place of those shown.

L' is a stop, and is secured to or forms part of the standard L, and is used to limit the throw of the bell-crank and its armature.

H is a pivoted arm of considerable length, and is provided with a hub, H', which is loosely

pivoted to the support I by a pin, H², and about the hub is arranged a spring, I', adapted to cause the arm H to be swung over, as indicated by dotted lines, when the end h is freed from catch B² by the armature B³ being attracted by electro-magnet upon the line E being overcharged with electricity. To insure this, one end of the spring I' is curved, as at i, to catch under the arm H, and the other end, i', is inserted in a hole in support I; but, if desired, any other form of spring may be used. By making the arm H very long and the spring I' strong the circuit is quickly broken, and the separation or break equals the length of the said arm. The electric current passes through arm H, support I, and binding-post J to wire K, which is the continuation of line E, and usually terminates in the central station or operator's office. Now, referring to Fig. 3 we see the said circuit-breaker as applied to telephone-lines at the central station. In this case the line-wires E, from the various subscribers' instruments Q, are brought together, and the circuit-breakers M are arranged in line, and the wires K pass to ground through generators N of any suitable construction. The wires K may be arranged in any of the usual methods now employed with the central-station offices. In the drawings, for simplicity, I have simply shown said wires as passing to ground, and each provided with a generator, though one generator could be used on a number of lines by suitable connections.

R is a contact-wire arranged within reach of the arms H when they swing over after being freed, as hereinbefore set forth. This wire R is in circuit with an alarm or indicator, O, of any desired construction, by wire P, which is grounded after passing through the said alarm or indicator. Now, after the circuit-breakers M are all set the local circuit R P will remain open until an excessive electrical charge is received by the line E, when the arm H of the circuit-breaker of that line is freed, when upon swinging over it is put in circuit with wire R by resting thereon, thereby completing the local circuit R P through wire K and generator N. Now, should the operator attempt to ring up the subscriber on that line the current generated by the generator N will actuate the

alarm or indicator O, and at once indicate a break in one or more of the lines.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a line-circuit and means to break said line-circuit upon the same becoming overcharged with electricity, with an open local circuit, and means actuated by the breaking of the line-circuit to complete or close said local circuit and keep it closed after the overcharge of electricity has passed.

2. A line-circuit, an open local circuit, and an alarm or indicator located in said local circuit, in combination with means to close said local circuit upon breaking of said line-circuit by an excessive charge of electricity and keep it closed until reopened by the operator.

3. A line-circuit, an open local circuit, in combination with means to close said local circuit upon breaking of said line-circuit by an excessive charge of electricity, the said means operating to keep said local circuit closed and line open after the excessive electrical charge has passed.

4. The combination of a series of line-circuits and means to break said line-circuits upon the same becoming overcharged with electricity, with an open local circuit, an alarm or indicator in said local circuit, and means actuated by the breaking of one or more of the line-circuits to complete or close said local circuit.

5. A series of line-circuits each provided with a circuit-breaker having a pivoted arm, the said arms being arranged close together, in combination with a conductor forming part of an open local circuit provided with an alarm or indicator, the said conductor being within range of said arms when the same are freed

by said circuit-breakers to complete said local circuit.

6. The combination of line-wire E, a circuit-breaker M, wire K, generator N, open partial local circuit R P, and alarm or indicator O, the whole being so arranged that when the circuit-breaker is open the generator will work the alarm, but not otherwise.

7. The combination of base A, electro-magnet B, pivoted armature B³, bell-crank lever B', provided with a catch, B², spring F, stop L', standard L, pivoted arm H, arranged to be caught by said catch B², support I, spring I', adapted to swing said arm H when freed by the catch to break the line-circuit, and binding-posts C and J, substantially as and for the purpose specified.

8. The line-circuit, in combination with a pivoted arm, H, in circuit with said line, spring I', and independent means controlled by an electro-magnet in said line and its armature to free said arm and allow it to break the line-circuit, the said armature being controlled by the strength of current in said line, substantially as and for the purpose specified.

9. The combination of base A, electro-magnet B, bell-crank B', having catch B², and armature B³, standard L, having stop L', arm G, spring F, arm H, arranged to be caught by said catch B², support I, spring I', adapted to swing said arm H when freed by the catch to break the line-circuit, and binding-posts C J, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

SAMUEL M. PLUSH.

Witnesses:

R. M. HUNTER,
R. S. CHILD, Jr.