

(No Model.)

G. W. RUSSELL, Jr. & D. B. MINOR.
CIRCUIT SWITCH.

No. 483,123.

Patented Sept. 20, 1892.

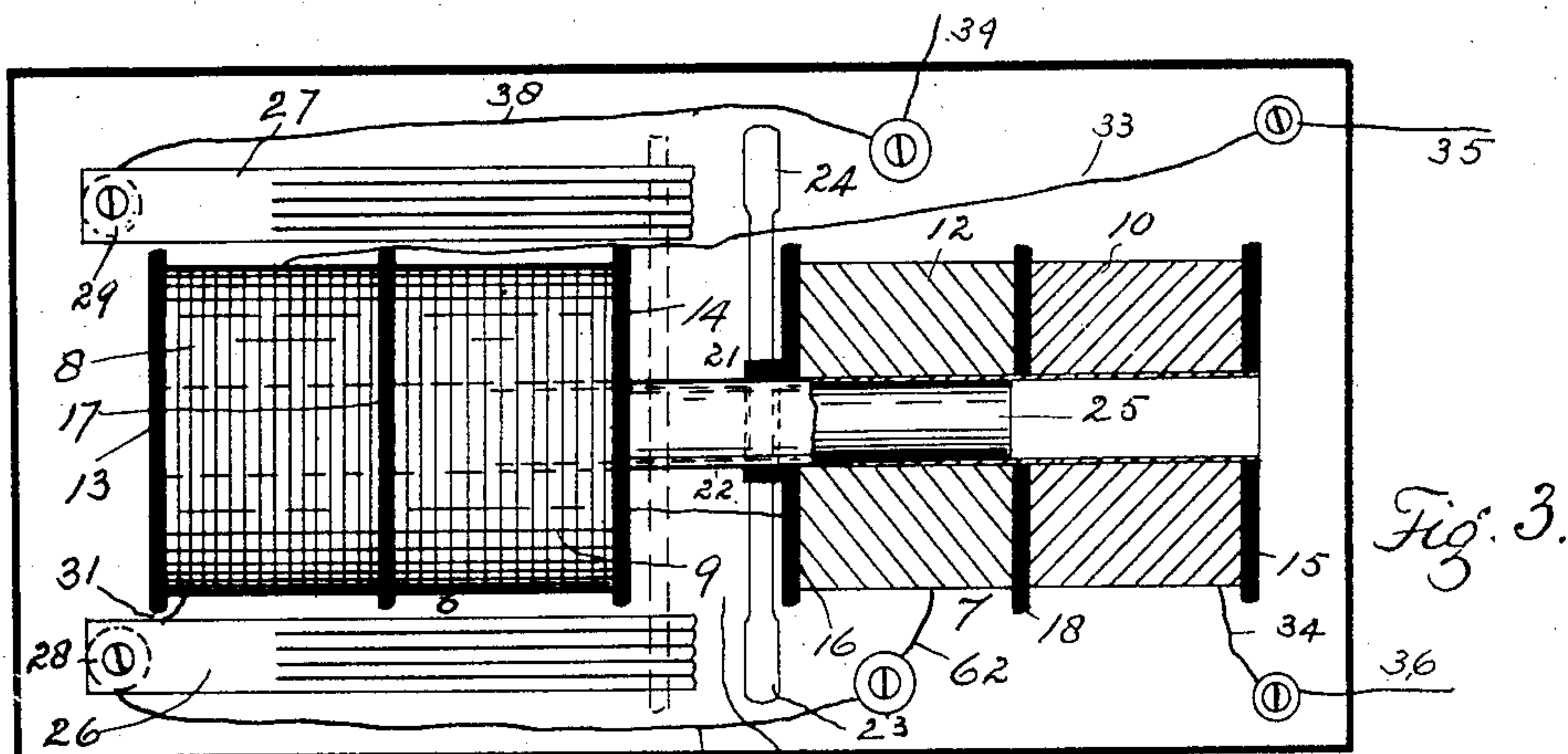


Fig. 3.

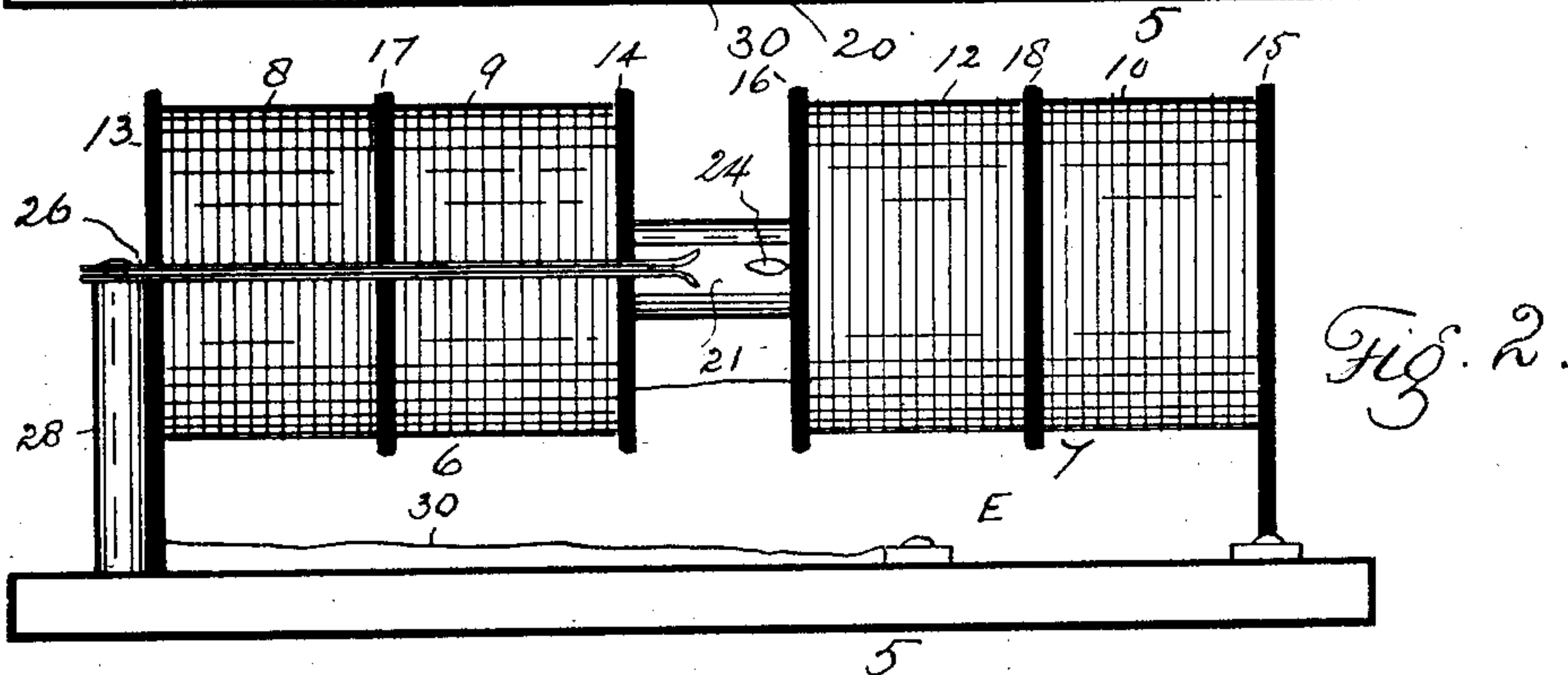


Fig. 2.

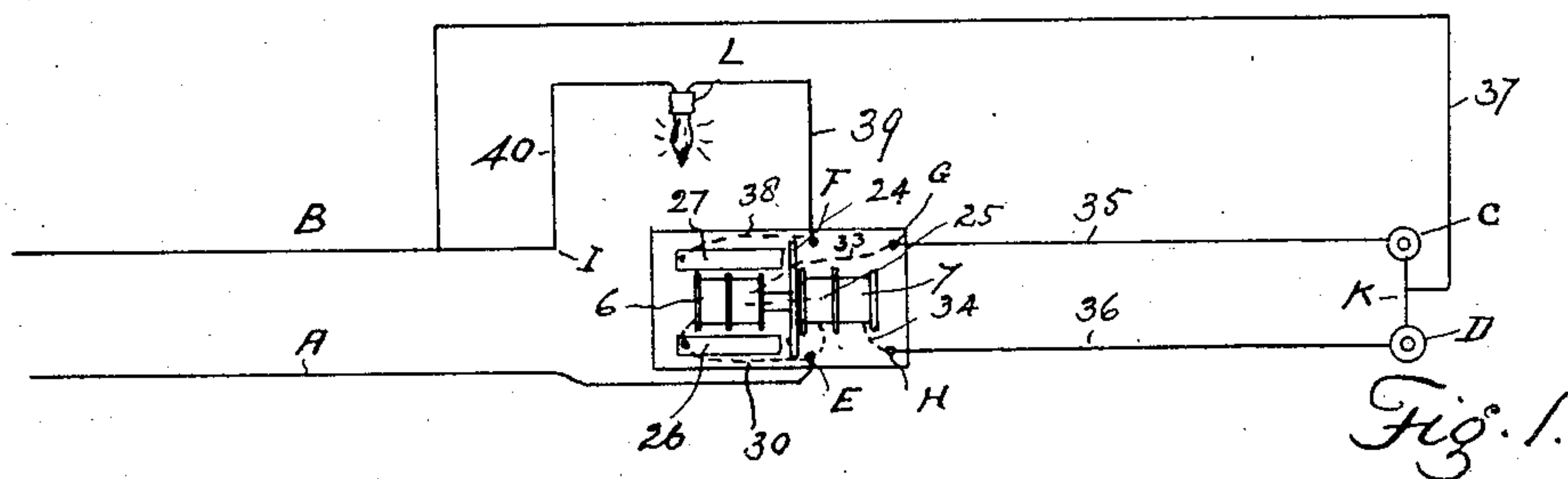


Fig. 1.

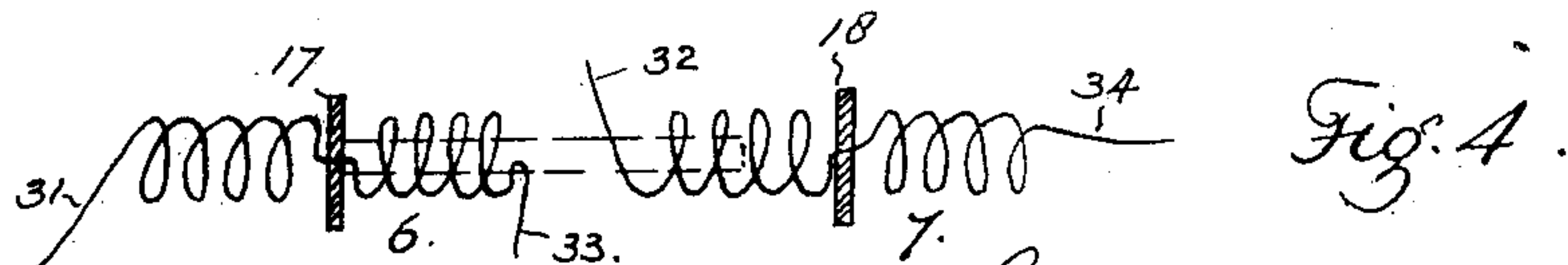


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE WM. RUSSELL, JR., AND DANIAL B. MINOR, OF DENVER, COLORADO,
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PLACE.

CIRCUIT-SWITCH.

SPECIFICATION forming part of Letters Patent No. 483,123, dated September 20, 1892.

Application filed June 1, 1892. Serial No. 435,196. (No model.)

To all whom it may concern:

Be it known that we, GEORGE WM. RUSSELL, Jr., and DANIAL B. MINOR, citizens of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Circuit-Switches; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in automatic switches for use in connection with a direct or alternating electric current, whereby the circuit may be closed or broken through the medium of push-buttons. This switch is specially designed for use in an incandescent circuit, and will therefore be considered in this specification with reference to its use in controlling lamps in a circuit of this description; but it must be understood that its availability is not limited to this use.

The object of the invention in this particular relation is to provide a means whereby all or any number of the lamps in a building may be turned on or off from any room of the building by simply pressing a button. This object we accomplish through the instrumentality of two solenoids placed end to end and connected by a brass tube, in which is located a movable soft-iron bar adapted to reciprocate in the tube as the current is alternately passed through the helices or coils of the solenoids. The reciprocating bar is provided on two opposite sides with copper projections, which extend outward between the solenoids at right angles to the bar, the brass tube being slotted and the solenoids separated to allow the bar the length of stroke required for making and breaking the circuit, which is accomplished by the copper projections, which engage and disengage copper brushes as the bar to which they are attached moves back and forth under the influence of the lines of force or magnetic attraction induced by the passage of the current through the coils.

Each solenoid is composed of two coil-sections wound in opposite directions.

We wish to observe that the terms "copper," "soft iron," and "brass" are not used in this specification in a limited or specific sense, but have a broad generic or typical meaning. For instance, when "copper" is mentioned it must be understood that any good conductor of the electric current may be employed. "Soft iron" is used as typical of magnetic or paramagnetic bodies, or those having a high coefficient of magnetic conductivity, while we employ "brass" as a general term for non-magnetic or diamagnetic bodies.

The invention consists, further, in the features, arrangements, and combinations hereinafter described and claimed, and will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a diagrammatic view of the invention, showing the circuits or paths of the current under different circumstances. Fig. 2 is a side view of the solenoids supported upon a suitable insulating plate. Fig. 3 is a top or plan view of the same partially in section. Fig. 4 illustrates the manner of winding the solenoids.

Similar reference characters indicating corresponding parts or elements of the mechanism in the several views, let the numeral 5 designate an insulating base block or plate located at any convenient point. Upon this plate as a base are mounted the solenoids 6 and 7, respectively, composed of the oppositely-wound sections 8 and 9 and 10 and 12, respectively. The solenoids are provided with end plates 13 14 and 15 16 and the intermediate disks 17 and 18, all composed of insulating material. The outer end plates 13 and 15 are secured to the base 5 in any suitable manner. Through the hollow of the solenoids passes the brass tube 19, which forms the connection therefor. The solenoids are separated by a space 20, and the portion of the tube 19 which extends through this space is slotted on two opposite sides, as shown at 21 22. Through these slots extend the copper projections 23 and 24, which form a continuous bar rigidly secured to but electrically

insulated from the soft-iron bar 25, loosely supported in tube 19 and adapted to reciprocate therein under the influence of the lines of force induced by the current passing through the coils of the solenoids. On the opposite sides of the solenoid 6 are supported double copper brushes 26 and 27, adapted to engage projections 23 and 24 when bar 25 is at its limit of movement in one direction, while parts 23 and 24 are disengaged from these brushes when the soft-iron bar is at its opposite limit of movement. Brushes 26 and 27 are supported upon metal lugs 28 and 29, secured to base 5 in any suitable manner. From the main circuit lead the wires A and B. Wire A leads to a binding-post E, secured to base 5. From post E leads a wire 30 to a metal lug 28, supporting brush 26, and therefore electrically connected with said brush, from which lead branch wires 31 and 32 to solenoids 6 and 7, respectively. From these solenoids lead the wires 33 and 34 to the binding-posts G and H, respectively, which posts are connected through the medium of wires 35 and 36 with the push-buttons C and D, respectively. These buttons are connected by a wire K, from which leads a wire 37 to wire B of the main circuit. From brush 27 leads a wire 38 to binding-post F, secured to the base 5. From post F passes a wire 39 to lamp L, from which passes a wire 40 to wire B of the main circuit.

The operation is as follows: Assuming that bar 25, with its copper projections, is in the position shown in Fig. 1, button C being pressed the current passes from wire A through brush 26 and solenoid 6 by virtue of the connection heretofore explained. As the current passes through this solenoid bar 25 is drawn into the solenoid and the copper projections make contact with both brushes 26 and 27, completing the lamp-circuit and lighting the lamp, to extinguish which it will only be necessary to press button D, when the current is passed through solenoid 7 and bar 25 drawn into the last-named solenoid, disengaging parts 23 and 24 from the brushes and breaking the lamp-circuit.

This switch is practicable for use with an

alternating current having an electro-motive force of from forty-eight to one hundred volts and with a direct current of from fifty to five hundred volts, or practically covering the entire range of variations in both currents.

Having thus described our invention, what we claim is—

1. The combination, with the main circuit, of an automatic switch interposed therein and consisting of two solenoids suitably connected, a loose bar supported therein and carrying contact projections, metallic brushes or plates connected with the circuit-wires on each side of the switch, a branch circuit in which the solenoids lie, and push-buttons located therein, whereby the current is alternately passed through the solenoids and the main circuit closed or broken, substantially as described.

2. The combination, with the main circuit, of switch mechanism interposed therein and consisting of two solenoids, each composed of two oppositely-wound coil-sections, a bar movably supported therein composed of magnetic material and carrying contact projections, suitable stationary contacts to which the circuit-wires lead on each side of the interposed switch, a branch circuit in which the solenoids lie, and push-buttons located in said last-named circuit, whereby the current is alternately passed through the solenoids, the movable bar reciprocated by the induced magnetic force, and the main circuit closed or broken, substantially as described.

3. The combination, with the main circuit, of a pair of solenoids, a reciprocating bar supported therein, a branch circuit in which the solenoids lie, and push-buttons whereby the current is alternately passed through the solenoids and the main circuit closed or broken, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE WM. RUSSELL, JR.
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Witnesses:

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