

J. I. AYER.
ELECTRIC SIGNAL SWITCH.
APPLICATION FILED DEC. 27, 1909.

963,728.

Patented July 5, 1910.

Fig. 1.

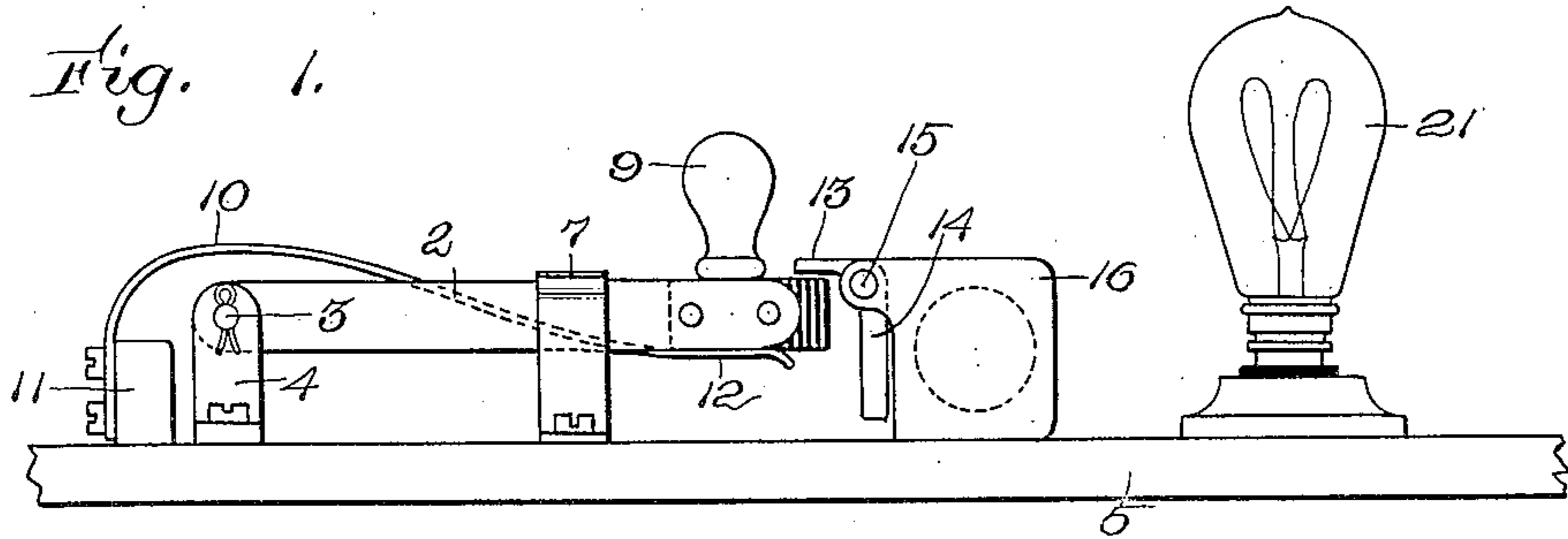


Fig. 2.

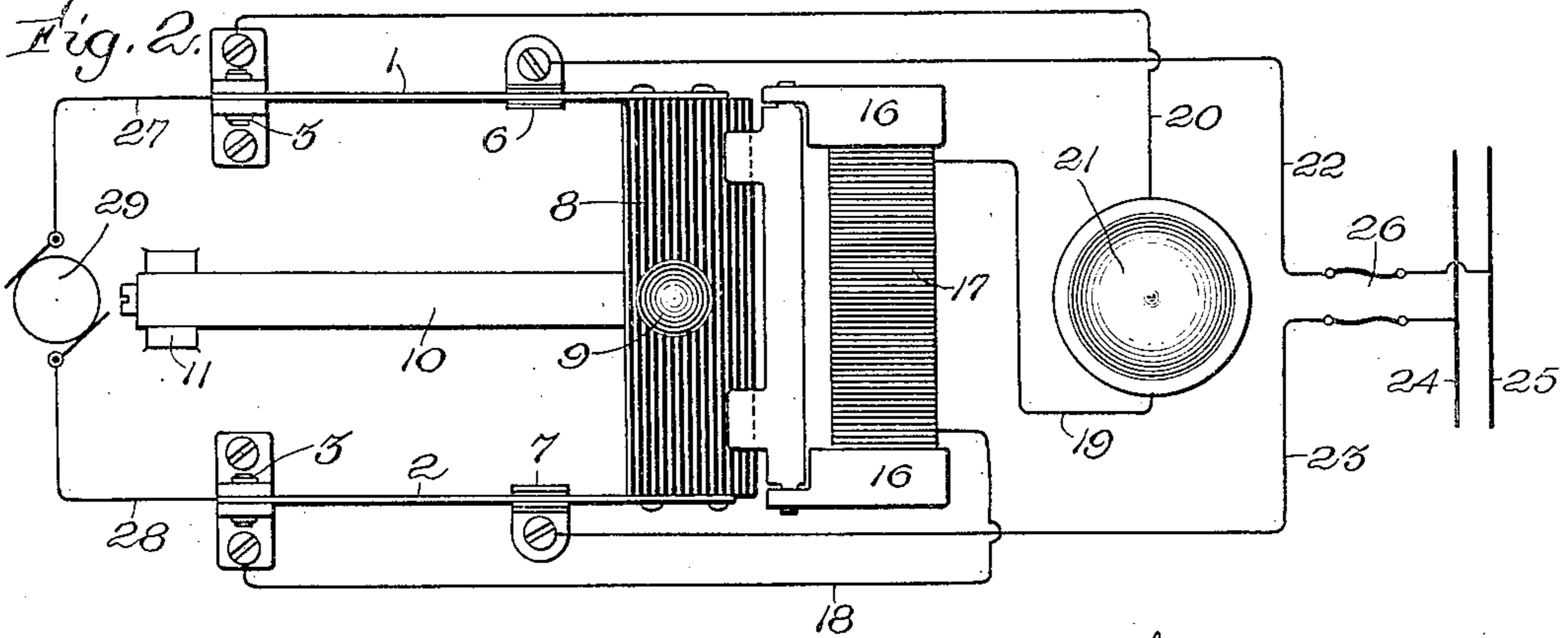


Fig. 3.

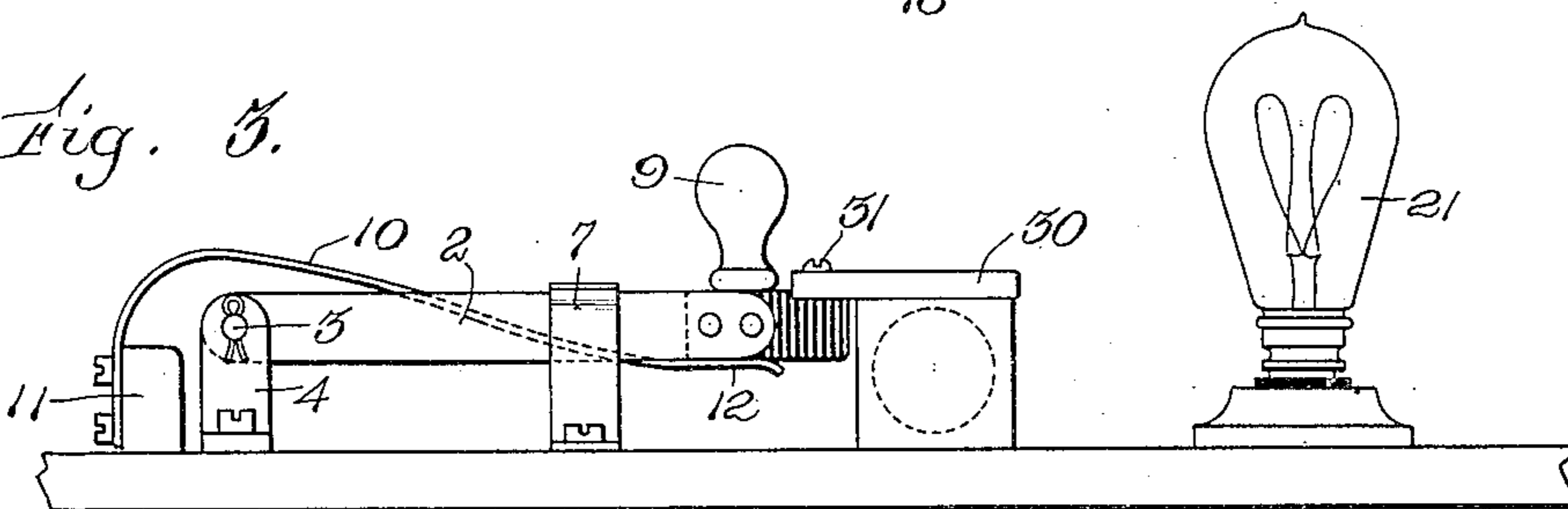
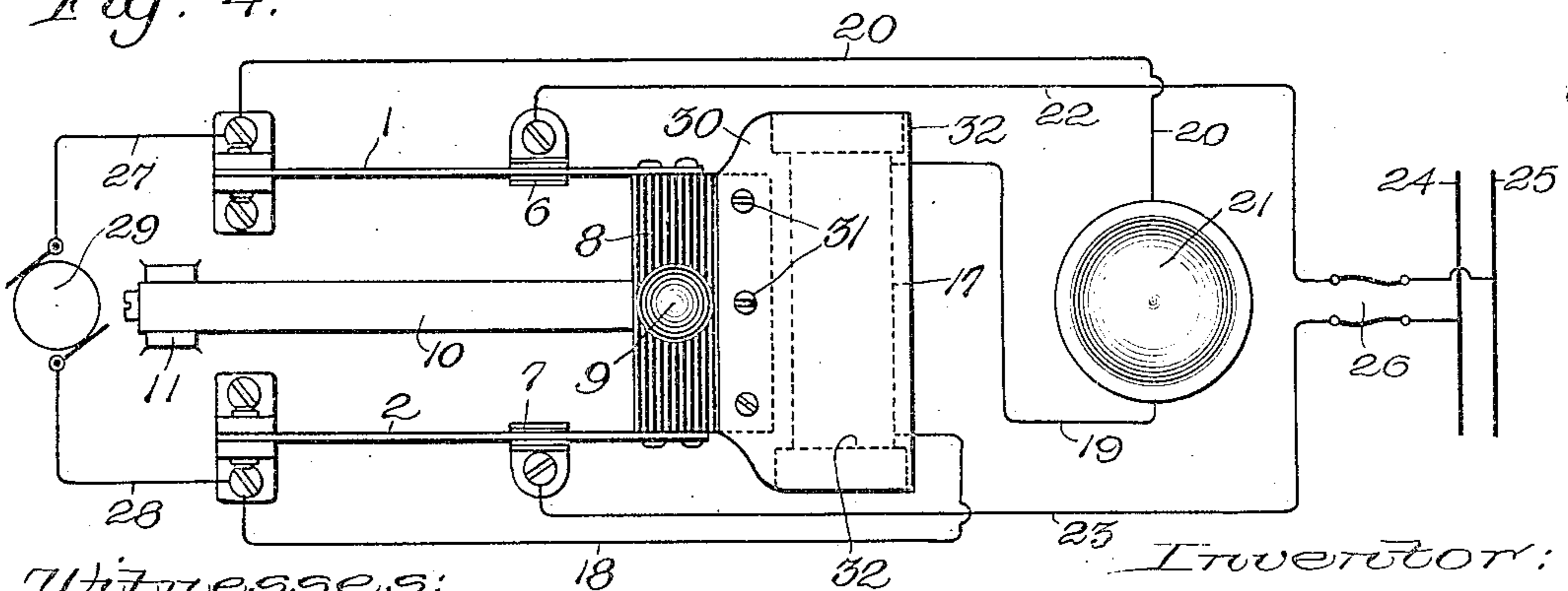


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SIGNAL-SWITCH.

963,728.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES I. AYER, a citizen of the United States, and resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Electric Signal-Switches, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

In many situations it is of vital importance to be able to know visually whether the current is on or off and whether everything, including the signal, is in proper working order, and accordingly my invention resides in providing a visual signal, preferably an ordinary electric lamp, in connection with an automatic cut-off or switch so arranged that whenever the lamp fails the current will necessarily be automatically cut off, and, vice versa, when the current is cut off, the signal lamp will so indicate.

One chief advantage of my invention is that whenever the signal becomes injured, or is otherwise defective, the current will be automatically cut off, so that wherever the automatic safety signal is required, it can be depended upon to indicate with absolute certainty whether the current is on or off.

I am aware that visual signals have been provided in connection with automatic switches, which, however, when out of order, would still leave the switch in condition to be operated in usual manner, and my invention, in its preferred embodiment, resides in providing the switch and the main circuit operated thereby, with a visual signal in a shunt controlling circuit in series with the controlling or tripping device of the switch so that unless the signal and its circuit are operative the switch cannot remain closed.

In the drawings, in which I have shown two embodiments of my invention, Figures 1 and 2 show respectively in side elevation and top plan one arrangement or construction of my apparatus; and Figs. 3 and 4 show similarly in side elevation and top plan another arrangement thereof.

The switch proper may be of any usual or preferred kind, being herein shown as a knife switch whose blades 1, 2 are pivoted at 3 in uprights 4 on a base or switch board

5 to cooperate with usual stationary spring contacts 6, 7, said blades 1, 2 being connected by an insulating cross bar 8 operated by a handle 9. A spring 10 secured to a stationary block 11 at one end and bearing at its free end 12 beneath the bar 8 tends to open the switch, the latter being held closed by the overhanging arm or portion 13 of an armature 14 pivoted at 15 to the pole blocks 16 of an electromagnet whose winding 17 is in series with a shunt circuit 18, 19, 20 whose terminals connect in any suitable manner in shunt with the main circuit, a signal lamp 21 being herein shown interposed in series in said shunt circuit between the portions 19 and 20 thereof. The main circuit 22, 23 is herein shown as tapped from any suitable source of energy, as feed wires 24, 25, a fuse block being interposed at 26. The main circuit wires 22, 23 lead to the stationary terminals 6 and 7 in usual manner, the current being thence conveyed through the blades 1, 2 in usual manner to conductors 27, 28 to any translating device, as a motor 29 with which the safety signal switch is used. In Figs. 3 and 4 I have shown the same wiring and general construction of switch, but instead of the pivoted trip or controlling device, I have shown an armature 30 rigidly secured at 31 to the cross bar 8 of the switch to cooperate with the pole pieces 32 of the electromagnet.

In use, if everything is in proper working order, the translating device will be supplied with current by closing the switch in obvious manner, and the signal lamp 21 will continue lighted as long as current is flowing to the translating device in the main circuit. If for any reason the switch is opened, the signal lamp will go out, thereby visually indicating that the current is cut off. If the signal lamp should break or become injured, or if anything should happen to the signal circuit which would prevent the lamp from properly performing its office of signaling, the switch would thereby be rendered inoperative, or in other words the main circuit would be broken so that the translating device could not receive current. It is the main purpose and advantage of my invention to secure this result, and herein resides the invention, viz. the rendering of the current supply to the translating device inoperative whenever the visual signal becomes inoperative, so that

under no circumstances can a heedless operator leave the current supply on without also leaving the visual signal on and actually giving notice that the current is on.

5 The shunt circuit permits the visual signal to be in the form of an ordinary incandescent bulb, consuming very little current, and the fact that said signal is in series with the automatic tripping mechanism of the

10 switch, insures that the latter is rendered inoperative whenever the signal is rendered inoperative. If the lamp gets broken or its filament burns out, the switch cannot be left in circuit-closing position, or, if already

15 closed, it will open upon the occurrence of such an accident. I provide the signal device in a circuit so related to the switch that if said circuit is interrupted and hence the signal device rendered inoperative, the

20 switch will necessarily be opened. In other words, my invention resides in means for invariably signaling visually whenever the switch is in operative position to supply current to a translating device, and in in-

25 variably opening the switch and rendering it inoperative whenever anything happens to render the visual signal inoperative. My invention provides means whereby, as long as current is passing to the translating de-

30 vice, that fact must necessarily be visually indicated by the lamp. The signal may be placed near to or at any desired distance from the switch proper. In common with automatic switches in general, the switch

35 opens whenever the main current supply to the switch fails, and it will be understood that my invention does not reside in this feature and is not limited thereto, but is limited to the visual signal in series with the

40 switch controlling device whereby, if the

lamp fails, the current is cut off or cannot flow.

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

1. An apparatus of the kind described, comprising a main circuit, a circuit breaker therefor, a visual signal and its circuit responsive to the main circuit for visually indicating when the main current is on, and means controlled by said visual signal and its circuit for opening said circuit breaker when the current is interrupted in the signal circuit.

2. The combination with a translating device and its supply circuit, of a visual signal for indicating when current is being supplied to said translating device, and an automatic cut-out operating automatically to cut off the current supply from said translating device whenever said signal fails.

3. In an apparatus of the kind described, a main circuit, a switch having a blade in each side of said circuit, means normally tending to open said switch, a signal lamp, a shunt circuit around said switch in series with said lamp, an electromagnet in series with said shunt circuit, and an armature pivotally mounted on said electromagnet and provided with means for holding said switch closed when the armature is attracted by the magnet and permitting the switch to open when released by the magnet.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JAS. I. AYER.

Witnesses:

DORA A. PROCTOR,
HORACE B. GALE.