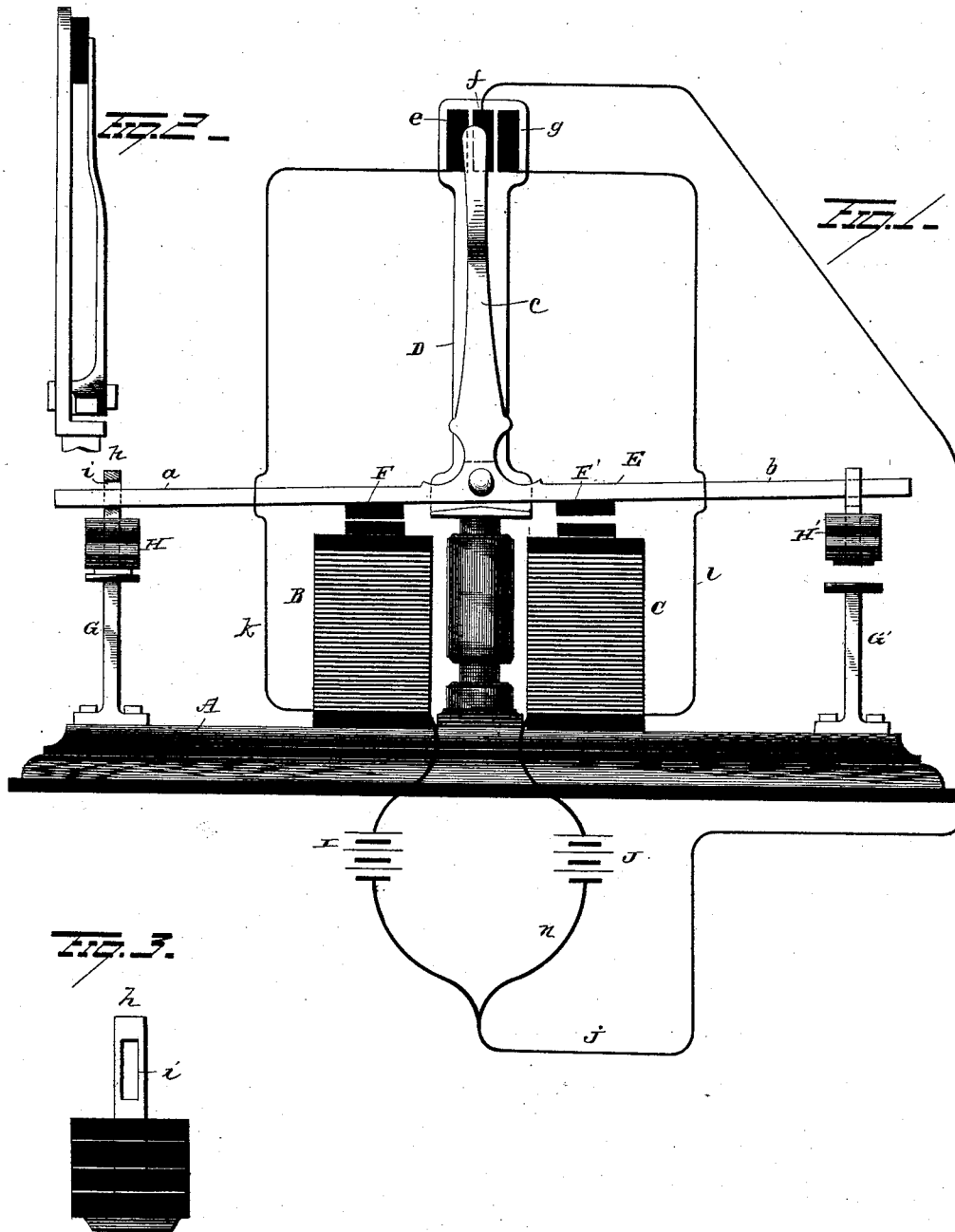


(No Model.)

F. STITZEL.
AUTOMATIC ELECTRICAL SWITCH.

No. 382,625.

Patented May 8, 1888.



Witnesses
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UNITED STATES PATENT OFFICE.

FREDERICK STITZEL, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO THE
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AUTOMATIC ELECTRICAL SWITCH.

SPECIFICATION forming part of Letters Patent No. 382,625, dated May 8, 1888.

Application filed February 25, 1888. Serial No. 265,231. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK STITZEL, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Automatic Electrical Switches; and I do hereby 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.

My invention relates to an improvement in electrical switches, and more particularly to such as are adapted to operate automatically by variations of the strength of electro-magnets.

In telegraph, electric-signal, and other systems which are operated on a normally-closed circuit the battery is liable to become weakened by constant use, and thus operate the instruments unsatisfactorily.

It is the object of my present invention to provide mechanism by which a weak battery may be cut out and a fresh battery switched into circuit automatically.

A further object is to produce an automatic switch for electric circuits, which shall be simple and cheap in construction and effective in operation.

With these objects in view my invention consists in certain novel features of construction and peculiar combination and arrangement of parts, as will be hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of my improved switch. Fig. 2 is a side view of same. Fig. 3 is a detached view of one of the counterbalance-weights.

A indicates a base, of wood or other suitable material, having two electro-magnets, B C, mounted thereon in pairs or singly, as desired, and removed a short distance from each other.

An upright, D, is fixed to the base, preferably between the magnets B C, and, extending some distance above said magnets, is advantageously widened near its upper end, as shown in Fig. 1.

Pivoted to the upright D a short distance above the magnets B C is a lever, E, having arms *a b c*, this lever being made of brass or other suitable material. The arm *c* of this

lever E is preferably made thinner than the arms *a b*, and extending from the center of the lever E at right angles thereto is adapted to bear with a yielding pressure upon metallic blocks *e f g*, secured on the face of the upright D near its top. The metallic blocks *e f g* are separated a short distance from each other and act as electrical contact-blocks, as hereinafter set forth.

Secured to the arms *a b* of the lever E, at each side of the upright D, are soft-iron armatures F F', said armatures being secured to the lever directly over the poles of the magnets B C, as shown in Fig. 1.

Short posts G G' are fixed to the base block A, directly beneath the arms *a b* of the lever, and preferably at or near the extremities of said arms, these posts being about two-thirds the height of the magnets B C. The posts G G' serve as supports for two weights, H H', preferably made in separable sections, and provided at their top with shanks *h*, having elongated slots *i*, as shown most clearly in Fig. 3.

The weights H H' are placed upon the ends of the arms *a b* of the lever E, and one permitted to rest upon its supporting-post, while the other is held suspended by the lever E, and vice versa, as the device operates, as presently explained. The posts G G' and weights H H' serve as supports for the end of the lever actuated by the magnets, and prevent the armatures on the lever from approaching too near the magnets.

The cores of the magnets should be made of small diameter and the wire composing the coils should be comparatively large, so as to offer as little resistance to the current as possible.

Two batteries, I J, will be employed, the battery I being represented in Fig. 1 of the drawings as being in use, while the battery J is held in reserve to be automatically switched into circuit when the battery I becomes weak. One pole of the battery I is connected by a wire with one end of the coil of the magnet B, the other pole of said battery being connected through the main circuit-wire *j* with the contact-block *f* on the upright D. The free end of the coil of the magnet B is now connected

by a wire, *k*, with the contact-block *e*, while the contact-block *g* is connected with one end of the coil of magnet C by means of a wire, *l*, the opposite end of the coil of said magnet being connected with a pole of the battery J. The opposite pole of the battery J is then connected with the wire *k* by means of wire *n*.

The device will be regulated to the desired strength of the current by applying or removing sections of the weights H H'.

The device being constructed and electrically connected as above set forth operates as follows: Assuming that the battery I is in operation, the parts will take the positions shown in Fig. 1. When the battery I becomes so weak that the strength of the magnet B is overcome by the weight H', the lever E will turn on its fulcrum until the weight H' reaches its seat on post G'. During this movement of the lever the arm *c* will move from its position on contact-blocks *e f* and electrically connect the blocks *f g*, thus cutting out the battery I and switching in the battery J. The magnet C now becoming magnetized attracts the armature F' and causes the arms *a b* of the lever B to first move the limit of the slots *i* in the shanks of the weights H H' and then raise the weight H on the arm *a*. The arm *c* is sufficiently wide, so that when moved over the blocks *e f g* one battery will be switched into circuit before the other is cut out. After the battery I has been thus automatically cut out, its electrodes may be taken out and cleaned by an attendant and other necessary repairs made to said battery, so that when the battery J becomes weak the battery I will be again automatically switched into circuit.

It is evident that slight changes might be made in the constructive details of my invention without departing from the spirit thereof or limiting its scope; hence I do not wish to limit myself to the exact details of construction herein set forth; but

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

1. In an electrical switch, the combination, with electro-magnets, of a pivoted lever carrying a counterbalance-weight at each side of its fulcrum, and contact-blocks with which an arm of said lever is adapted to make contact, substantially as set forth.

2. In an electrical switch, the combination, with two electro-magnets, of a pivoted lever carrying armatures to be actuated by said magnets, adjustable weights on the lever at opposite sides of its fulcrum, and contact-blocks with which an arm of said lever is adapted to make contact, substantially as set forth.

3. In an electrical switch, the combination, with two electro-magnets, of a lever pivoted between said magnets and carrying armatures,

adjustable weights carried by the lever at opposite sides of its fulcrum, and a series of contact-blocks with which an arm of the lever is adapted to make contact, substantially as and for the purpose set forth.

4. In an automatic electrical switch, the combination, with two electro-magnets and two batteries, of a lever pivoted above said electro-magnets and carrying armatures, adjustable weights carried by the lever at opposite sides of its fulcrum, contact-blocks with which an arm of the lever makes contact, and conductors connecting the contact-blocks with the batteries and coils of the magnets, substantially as set forth.

5. In a switch, the combination, with two electro-magnets and two batteries, of a pivoted lever carrying a weight at each side of its fulcrum, three contact-blocks mounted on a suitable support and electrically connected with the batteries and coils of the electro-magnets, and an arm of the lever adapted to connect the contact-blocks in pairs alternately as the device operates, substantially as set forth.

6. In an electrical switch, the combination, with two electro-magnets, of a pivoted lever above said magnets and carrying weights on opposite sides of its fulcrum, a series of contact-blocks with which an arm of the lever is adapted to make contact, and two batteries electrically connected with the contact-blocks and coils of the magnets, whereby when one battery becomes weak it will be cut out and the other battery switched into circuit automatically when the arm of the lever moves over the contact-blocks, substantially as set forth.

7. In an electrical switch, the combination, with two electro-magnets, of a lever pivoted above said magnets and carrying a weight at each side of its fulcrum, and having slotted shanks through which the arms of the lever pass, supporting-posts mounted on a base beneath the weights, and contact-blocks with which an arm of the lever is adapted to engage, substantially as set forth.

8. In an electrical switch, the combination, with two electro-magnets, of a lever having three arms pivoted above said magnets and carrying armatures, and weights on two arms of the lever at opposite sides of its fulcrum, the third arm of said lever being made thin and adapted to bear with a yielding pressure upon a series of contact-blocks, substantially as set forth.

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

FREDERICK STITZEL.

Witnesses:

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