

(No Model.)

E. A. SWEET.  
AUTOMATIC SWITCH BOARD AND SAFETY CUT-OUT FOR  
ELECTRIC CIRCUITS.

No. 448,166.

Patented Mar. 10, 1891.

Fig. 1.

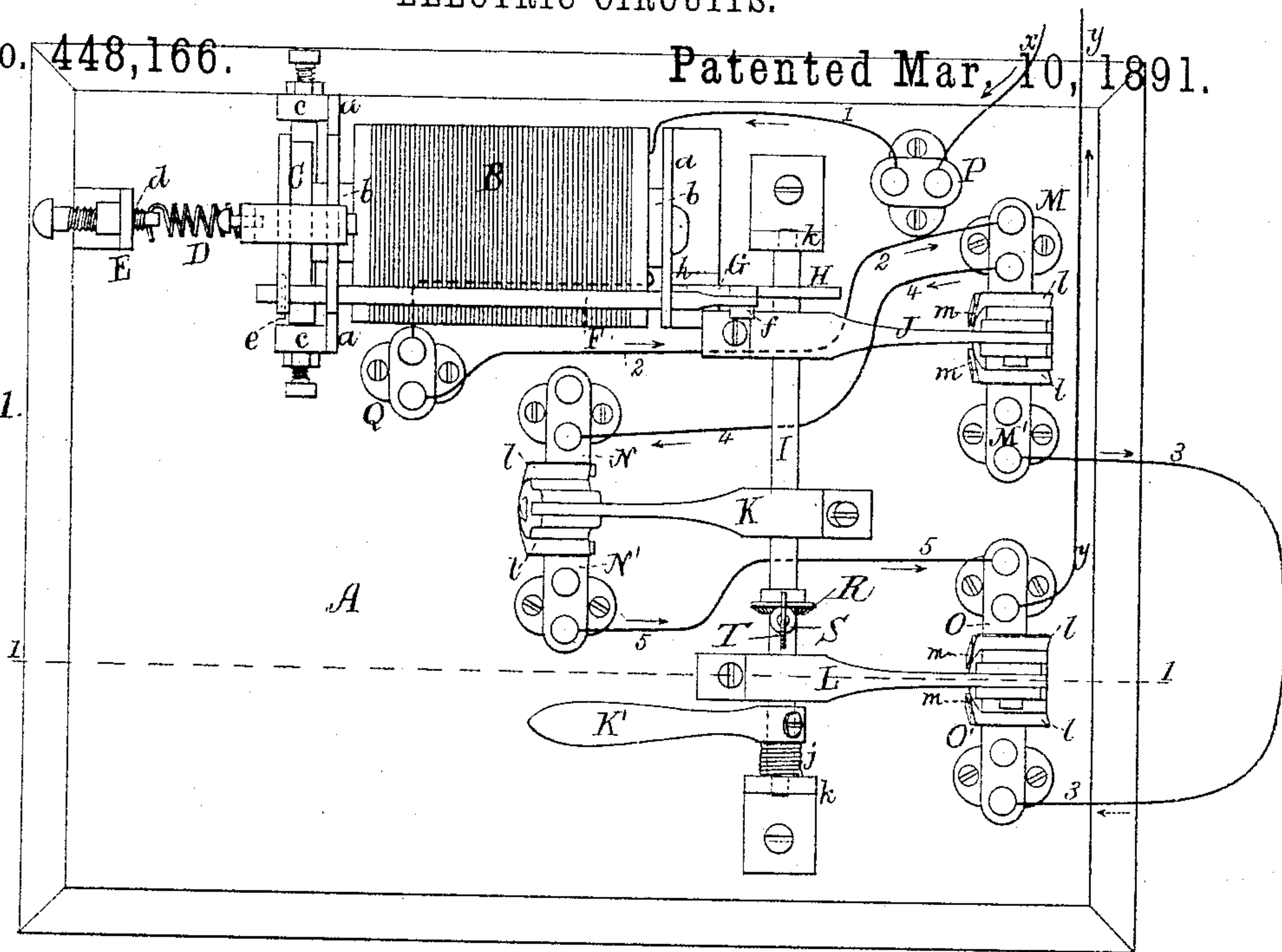


Fig. 2.

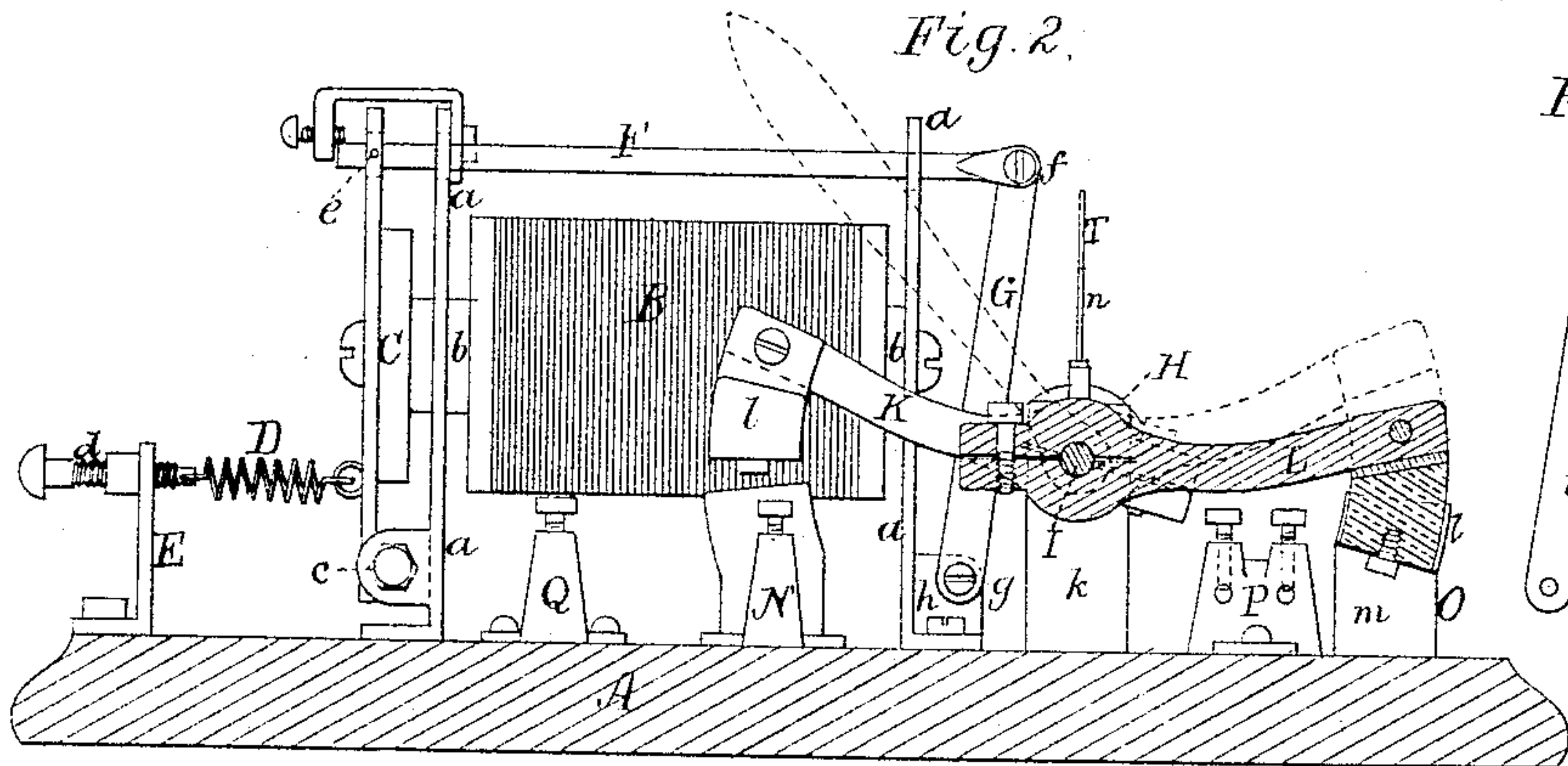


Fig. 4.

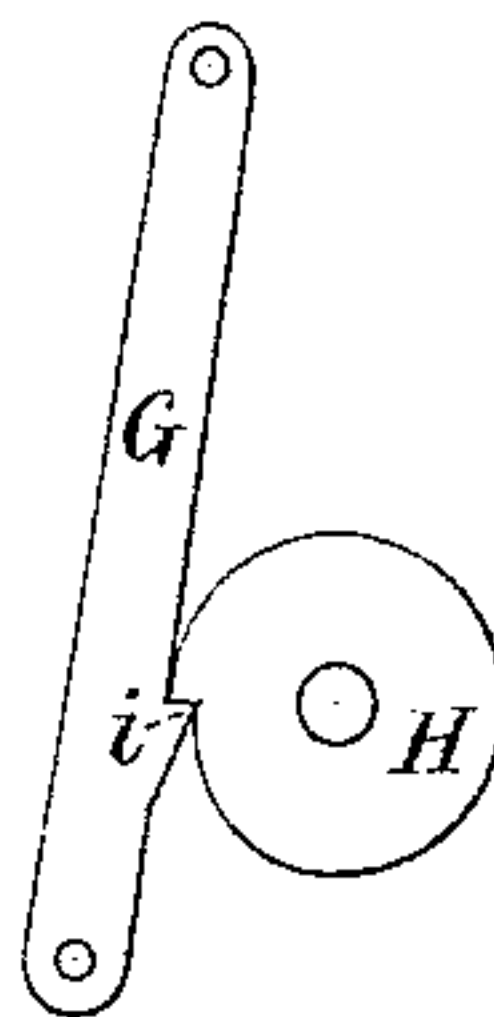
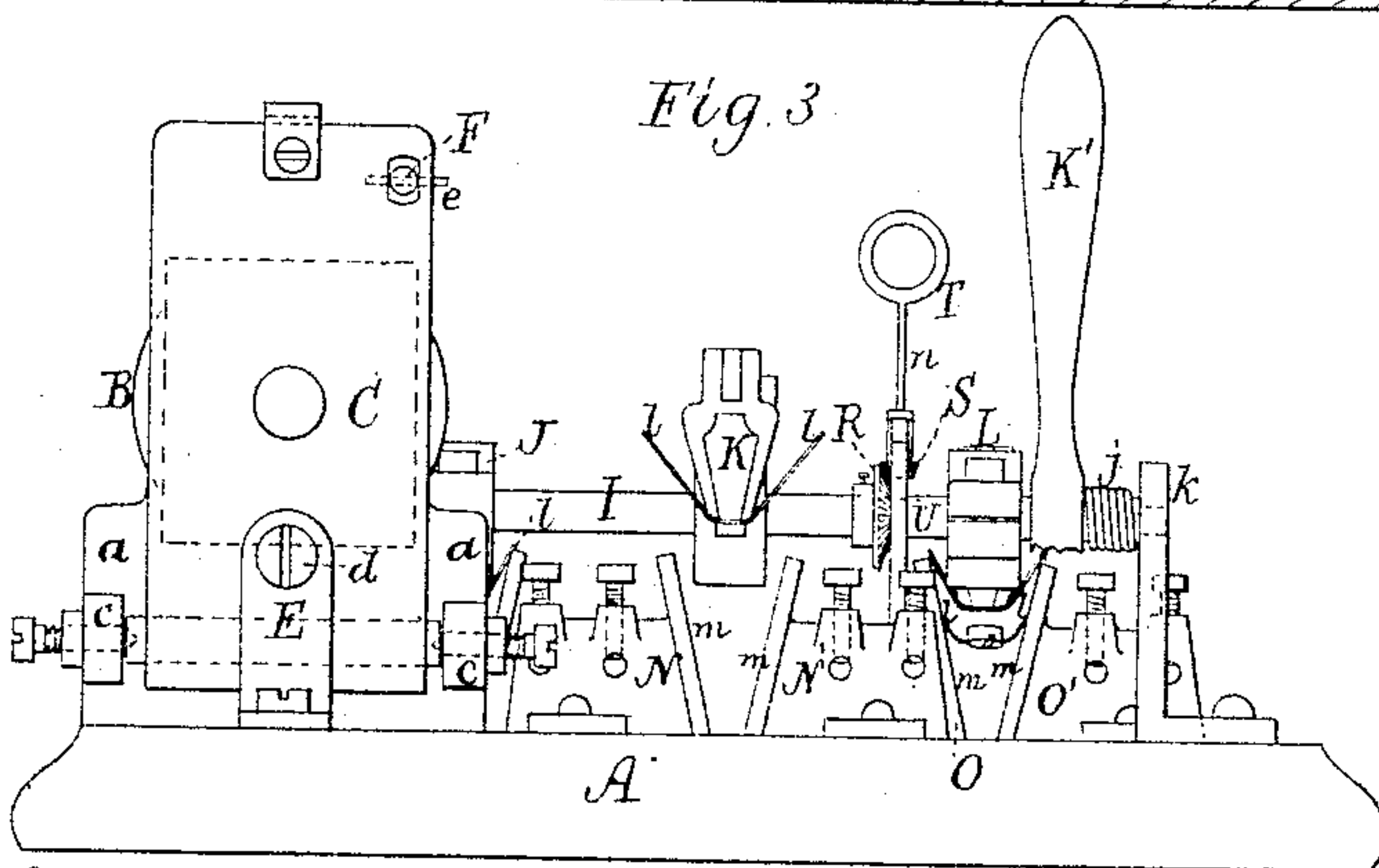


Fig. 3.



Witnesses.

W. Harmon  
D. J. Bagley.

Inventor.

Edgar A. Sweet.  
by S. N. Piper, atty.



# UNITED STATES PATENT OFFICE.

EDGAR A. SWEET, OF MILFORD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF  
TO JOSEPH L. BUXTON, OF SAME PLACE.

AUTOMATIC SWITCH-BOARD AND SAFETY CUT-OUT FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 448,166, dated March 10, 1891.

Application filed October 22, 1890. Serial No. 368,943. (No model.)

*To all whom it may concern:*

Be it known that I, EDGAR A. SWEET, a citizen of the United States, residing at Milford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Automatic Switch-Boards and Safety Cut-Outs for Electric Circuits; and I 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.

Figure 1 is a plan view, Fig. 2 a vertical section on line 1 1 of Fig. 1, and Fig. 3 an end view, of an automatic switch-board and safety cut-out of my invention. Fig. 4 is a detail view, to be hereinafter referred to.

The object of my invention is to provide a device for automatically short-circuiting any one of a number of circuits connected in series for electric lighting, so that in case of accident to either circuit of the series from any cause, whereby it is rendered inoperative, said defective circuit will be automatically cut out or disconnected from the other circuits of the series, so that they will continue in the performance of their functions the same as if nothing had happened.

The nature of my invention is defined in the claims hereinafter presented.

In the drawings, A denotes a switch-board, and *a a* standards erected thereupon, said standards supporting a bar *b* of soft iron, which sustains a hollow coil of wire B.

C represents an armature pivoted at *c c* to one of the standards *a*. A spring D is connected to the armature and to a screw *d*, screwed into an upright E, and operates to draw the armature away from the magnet when the circuit is broken.

F represents a rod, it being pivoted at *e* near to the top of the armature, said rod passing through openings in the standards *a a*, and at its other end is pivoted at *f* to the upper end of an arm G, said arm being jointed at its lower end at *g* to a projection *h* from the next adjacent standard *a*. The said arm G is furnished with a projection or tooth *i*,

adapted to engage a notched or toothed wheel H, fixed to a horizontal shaft I, said shaft being adapted to be rocked in bearings in uprights *k* in one direction by a handle K', fixed thereto, and in the opposite direction by a coiled spring *j*, encompassing said shaft and attached at one end of it to the handle K' and at the other end to the next adjacent upright *k*. Secured to the said shaft I are arms J K L, the free ends of which are supplied with spring-arms *l l*, to operate as hereinafter explained, with inclined faces *m m* of the binding-posts M M' N N' O O' secured to the board A. Other binding-posts P and Q are arranged on the board, as represented.

To the shaft I is fixed a bevel-gear R, the latter engaging a pinion S, fixed to the spindle *n* of a signal T, said spindle being supported in a standard U, erected on the board and straddling said shaft.

To set the device, turn the shaft I by its handle K' and force the spring-arms *l* of the arms J and L against the inclined faces *m* of each of the binding-posts M M' and O O'. Said movement of the shaft will also carry the spring-arms *l* of the arm K out of contact with the inclined faces *m* of the binding-posts N N'. Next move the armature up to the magnet, and the arm G, moving at the same time, will engage its tooth *i* with that of the wheel H, which will maintain the parts in the position represented in the drawings so long as the circuits are intact.

*x* and *y* represent the main leading-wires from the dynamo, *x* being the positive pole and clamped to the binding-post P, and *y* the negative pole clamped to the binding-post O. The current passes from the post P by wire 1 through the coil B to the post Q, thence by wire 2 to the post M, through the arm J and post M', out on wire 3, which represents the wire of one of the circuits of the series, it being supposed that a number of like circuits are connected to the wires *x* and *y*, which light different sections of territory. The wire 3 after completing its round returns to post O', the current continuing through arm L and post O and by wire *y* to the dynamo. So long as the said circuit remains intact the course of the current, as above described, will be maintained; but the instant anything oc-



curs to break said circuit the armature will be instantly drawn away from the magnet and the toothed arm G disengaged from the wheel H, the spring *j* will turn the shaft I and throw the arm K between and against the posts N N', and at the same time will disengage the arms J and L from the posts M M' O O'. This will cut out the circuit represented by the line 3 from the switch-board, the course of the current now being through wire 1, coil B, wire 2 to post M, as before, thence from said post M through wire 4 to post N, and through arm K, post N', and wire 5 to post O, thence through wire *y* to dynamo. When the shaft I turns in its bearings, the gear R thereon will turn the signal T half a revolution, so as to expose the other side of said signal to the attendant, whereby he will know, when observed by him, that a circuit is broken and needs attention.

From the foregoing it will be seen that by my improvement the main circuit will not be broken on account of the failure of either circuit of the series; but the impaired circuit will be automatically cut out from the others in such manner that they will not be interfered with.

What I claim is—

1. An automatic switch-board and safety cut-out consisting of the electro-magnet, the armature, and toothed arm G, connected to each other, the spring D for operating the

armature, the toothed wheel, the shaft supporting said wheel, provided with arms J K L, the handle K', and spring J, the posts M M', N N, and O O', each having a bearing-face to touch the head of said arms or of spring-arms secured to said heads, and the binding-posts P and Q, all supported and arranged with relation to the switch-board essentially as set forth and represented.

2. An automatic switch-board and safety cut-out consisting of an electro-magnet, an armature, and a toothed arm connected to each other, an armature-operative spring, a toothed wheel adapted to engage said toothed arm, a shaft supporting said toothed wheel and provided with arms J K L, a bevel-gear, a handle, and a spring, the latter to turn the shaft axially, the series of binding-posts having inclined faces *m*, the spring-arms secured to the heads of the arms J K L, the standard U, the signal-spindle supported therein, the pinion fixed to said spindle, engaging the gear R, and the binding-posts P and Q, all supported and arranged with relation to the switch-board essentially as represented and explained.

In testimony whereof I affix my signature in presence of two witnesses:

EDGAR A. SWEET.

Witnesses:

LLOYD H. COOKE,  
HORACE A. BROWN.