

(No Model.)

J. H. CLARK.
ELECTRIC SWITCH.

No. 481,297.

Patented Aug. 23, 1892.

Fig: 2,

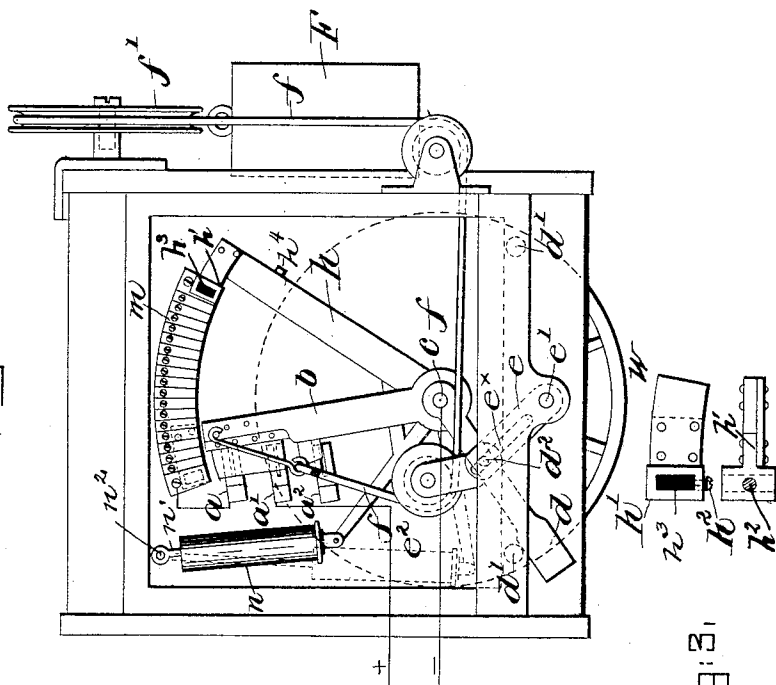
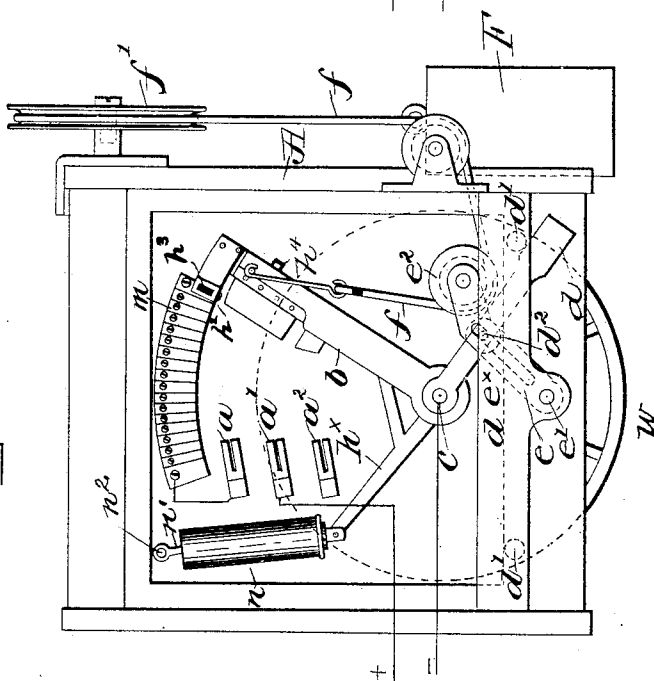


Fig: 3,

Fig: 1,



Witnesses,

Fred M. Ashworth
Louis M. Lowell

Inventor,

John H. Clark
by *Crosby & Gregory*
Attys.

UNITED STATES PATENT OFFICE.

JOHN H. CLARK, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE WHITTIER MACHINE COMPANY, OF SAME PLACE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 481,297, dated August 23, 1892.

Application filed September 29, 1891. Serial No. 407,102. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. CLARK, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Electric Switches, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction and operation of electric switches or cut-outs.

Prior to this invention it has been common to move a switch-arm by the action of a spring, which is carried from one to the other side of the center line of the switch-arm to thus act to move the arm in one or the other direction. Switches constructed on this principle frequently fail to operate properly, for the reason that a spring is capable of exerting its maximum power only when fully extended or fully compressed, and the movement is such that the spring is weakest at a time and when in a position to act to best advantage.

In accordance with this invention a weight which always exerts a constant pull is employed in place of the spring, the weight being connected with the switch-arm in suitable manner through a movable pulling-point, movement of which causes the weight to act upon the said arm from opposite sides to thereby move the arm into one or another position.

One part of this invention therefore consists of a movable switch member, a freely-suspended weight, a connection between said member and weight, and a movable pulling-point introduced into said connection intermediate said weight and movable switch member, whereby the direction of pull of the weight with relation to the member may be changed, as will be described.

Other features of this invention will be hereinafter described, and pointed out in the claims.

Figure 1 of the drawings represents in front elevation an electric-switch device embodying this invention; Fig. 2, a similar view showing the fulcrum and movable member of the device in their other positions, and Fig. 3 a sectional detail to be described.

Referring to the drawings, a a' a'' represent

fixed contacts of a switch device, and b the movable member, which, as herein represented, is pivoted loosely on the actuating-shaft c , mounted in suitable bearings in the inclosing case or frame A .

The actuating-shaft c at its front end has fast on it the arm d , limited in its movement in either direction by pins or stops d' , and having a stud d'' , which works in a slot e' in the reversing-lever e , pivoted at e' and carrying at its outer end a pulley e'' .

An actuating-weight F is connected with and operates the movable member b of the device through a suitable connection, herein shown as a cord or chain f , which is passed about the sheave f' and the pulley e'' , which latter constitutes the movable pulling-point of the connection.

The shaft c may be actuated in any desired manner, it being herein represented as constituting the shipper-shaft of an elevator mechanism, it having mounted upon it a shipper-wheel W .

With the movable pulling-point e'' in the position shown in Fig. 1 the weight F acts to hold the movable member b in its rearmost or cut-out position; but if the shipper-wheel W be rotated to the right, Fig. 1, the shaft c and arm d will be thrown into their positions Fig. 2, carrying the pulling-point e'' from its position, Fig. 1, at the right of the center line of the member b to the position, Fig. 2, at the left of the center line of the said member, so that the pull of the weight F , which previously had acted to keep the member in its rearmost position, will now be exerted to throw the member over into its position, Fig. 2, to close the circuit through the contacts a a' a'' . The pull of the weight F is as great when in either of its extreme positions, Figs. 1 and 2, as it is in any intermediate position, so that full advantage is taken of the difference in the directions of the pull or leverage due to the different positions of the movable pulling-point e'' .

As herein represented, the shaft c has loosely mounted upon it a second lever or arm h , having formed upon or carried by its outer end a socket h' to receive and hold a stick of carbon h'' , held in place by a clamping-screw h''' and adapted to sweep over a series of re-

sistance-contacts m . The lever h has an auxiliary arm h^x , connected at its outer end with a dash-pot n , the piston of which is mounted on the end of the rod n' , jointed at n^2 to the frame A , the weight of the dash-pot in the present instance tending to force said dash-pot and its attached lever h into their dotted-line position, Fig. 2.

The movable member b when in its position Fig. 1 acts against a projection h^4 on the arm h to maintain the arm h also in its position Fig. 1. As soon, however, as the member b is moved to its position, Fig. 2, to close the circuit through the fixed contacts, the arm h , being no longer restrained from movement, will be moved by the weight of the dash-pot n , causing the carbon h^3 to sweep over the series of resistance-contacts m , the air or liquid contained in the dash-pot retarding the motion to make it slow, in order that the full strength of the current of the line in which the switch is included may be turned on gradually. While the member b when moved to its closed position, as described, permits the lever h to slowly follow, yet when the member b is returned to its normal or cut-out position, Fig. 1, by the shifting of the pulling-point e^2 to the other side of the center line of the member it will by the projection h^4 push the lever h before it, thus returning the said lever quickly to its normal position, together with the member b .

This invention is not limited to the particular construction herein shown and described, as the same may be varied without departing from the scope and spirit of the invention, and it is evident that the invention relating to the movement of the member b is applicable to other forms of switch or cut-out than the one herein described.

I claim—

1. The combination, with the movable member of a switch device, of a freely-suspended weight, a connection between it and said movable member, and a movable pulling-point intermediate said weight and movable switch member and through which said connection acts to operate, substantially as described.

2. The combination, with the movable member of a switch device, of a freely-suspended weight connected therewith by a flexible connection and a movable pulling-point intermediate said weight and movable switch member and about which said connection is passed, substantially as described.

3. The combination, with the movable member of a switch device, of a freely-suspended weight connected therewith by a flexible connection, a reversing-lever carrying thereon a pulling-point about which said connection is passed, and means to move said reversing-lever and the pulling-point thereon, the weight exerting a constant pull on said movable switch member, substantially as described.

4. The combination, with the movable member of a switch device, of a weight connected therewith by a flexible connection, a slotted reversing-lever carrying a pulling-point about which said connection is passed, and a pivoted operating-lever having a projection to enter the slot in said reversing-lever, to operate substantially as described.

5. The combination, with the shipper-wheel of an elevator mechanism, of a weight, a switch device, a connection between its movable member and said weight, and a pulling-point through which said connection acts and made movable by said shipper-wheel, substantially as described.

6. The combination, with the shipper-wheel of an elevator mechanism and a shaft therefor having an arm, of a reversing-lever moved by said arm, a switch device having its movable member journaled on said shaft, a weight, and a connection between said weight and movable member controlled by said reversing-arm, substantially as described.

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

JOHN H. CLARK.

Witnesses:

FREDERICK L. EMERY,
FRANCES M. NOBLE.