

J. H. JOHNSON.

ELECTRIC CUT-OFF FOR EMERGENCIES.

(Application filed Apr. 25, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

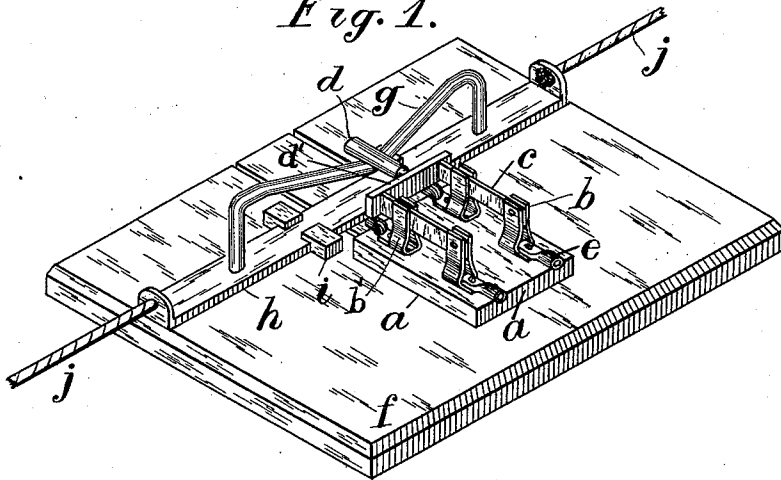


Fig. 2.

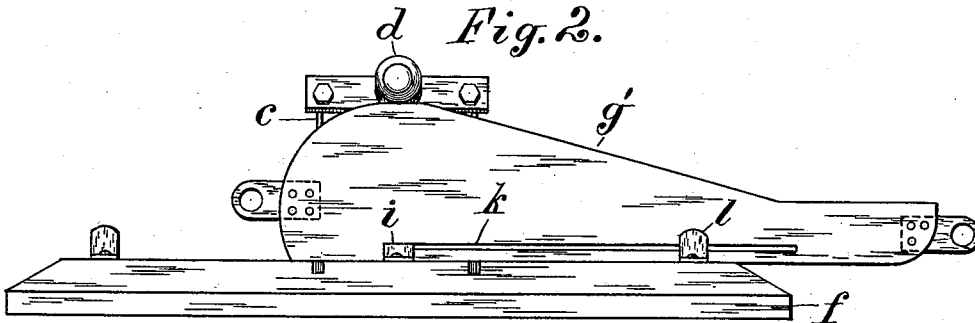
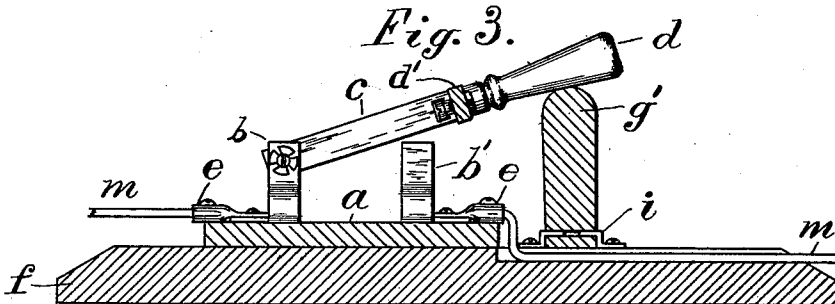


Fig. 3.



Attest:
L. L. W.
Walter F. Savage.

Inventor.
James H. Johnson, per
Thomas S. Crane, Atty.

No. 686,459.

Patented Nov. 12, 1901.

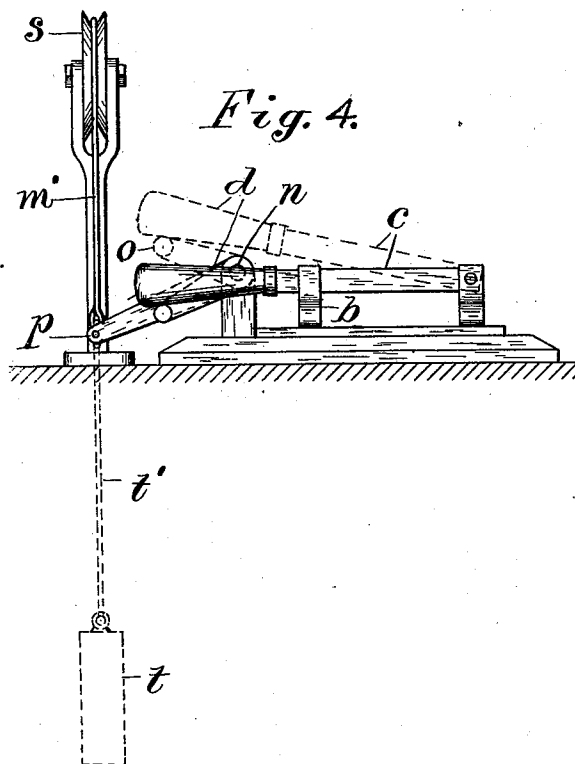
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ELECTRIC CUT-OFF FOR EMERGENCIES.

(Application filed Apr. 25, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Attest:
L. Lee
Walter F. Schuager

Inventor.
James H. Johnson, per
Thomas S. Crane, Atty.

UNITED STATES PATENT OFFICE.

JAMES H. JOHNSON, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF
TO WILLIAM R. WEEKS, OF NEW YORK, N. Y.

ELECTRIC CUT-OFF FOR EMERGENCIES.

SPECIFICATION forming part of Letters Patent No. 686,459, dated November 12, 1901.

Application filed April 25, 1901. Serial No. 57,354. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. JOHNSON, a citizen of the United States, residing at 25½ South Twelfth street, Newark, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Electric Cut-Offs for Emergencies, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to furnish an effective and practical means of cutting off the current from an electric motor, so as to instantly stop the machinery which is actuated by it.

The invention consists in the combination, with the ordinary lever-switch having a handle movable to and from its base, of mechanism inserted behind or under the handle to press the handle outward when required, but disconnected from the handle, so as to permit the independent manipulation of the same under normal conditions. A switch provided with such supplemental mechanism is particularly adapted for use with an electric elevator-car to serve as a safety device for actuation when the electric controller for any reason becomes inoperative. For such use a rope is extended from the mechanism upon the switch through the elevator-car in the hoistway to permit the actuation of the switch at any moment from the car. Such safety-switch is not in constant use like the controller of the electric elevator-motor and is not therefore liable to derangement by frequent operation. The means for pressing the switch-handle outward is in the present invention disconnected from the handle, so that when such means have once operated the switch remains open and the current cut off until the operator has personally closed the switch. This construction thus directs attention to the condition of the circuit and leads to the rectification of any disorder before the switch is again closed to restore the current normally.

Cut-out switches are now made of a nearly uniform pattern and are provided with a lever movable to and from the base upon which the contacts are secured, and such lever-switches are so satisfactory that they are used

in nearly all installations of electric apparatus.

By my invention mechanism is inserted between the support for the base and the lever-handle and arranged to throw the lever-handle outward when required to open the electric circuit, but offering no obstacle under normal conditions to the free movement of the lever by hand. Such operation of the mechanism is secured by making a movable part of the mechanism contact with the under side of the handle, so as to push it outwardly when required in emergencies. Such mechanism has no permanent connection with the handle, and thus leaves the switch-lever free to be operated by hand when required. The mechanism may be materially changed which is fitted underneath the switch-lever handle to push it outwardly, provided it is not tied to the handle and does not prevent its operation by hand under normal conditions. Two forms of such mechanism are shown in the annexed drawings, and other applications of the invention may from these illustrations be readily devised.

In the annexed drawings, Figure 1 is a perspective view of the switch-lever provided with a double wedge for throwing the handle outward when the wedge is pulled in either direction. Fig. 2 is an end elevation, and Fig. 3 a side elevation, upon a larger scale, of a switch provided with a single wedge for actuation in one direction only. Fig. 4 is a side elevation, upon a larger scale, of the switch, having a crank inserted beneath the handle to operate it instead of the wedge shown in the preceding figures.

The lever-switch referred to above and to which my invention is applicable is of that type having a flat base *a*, with two sets of forked springs projected upwardly from it and connected, respectively, with the positive and negative conductors. Knife-blades are pivoted at one end to one set of the springs and connected at the opposite end by a cross-head having a handle, and the other set of springs is arranged in a line with the knife-blades, so that when the handle and knife-blades are turned parallel with the base the knife-blades fit between the other springs to make the electric contact.

In the drawings the base of such switch is designated *a*, the hinge-springs are *b*, the contact-springs *b'*, the knife-blades or contact-bars *c* are pivoted to the springs *b*, and their opposite ends connected by an insulating cross-head *d'*, from which the handle *d* is projected. The contact-bars *c*, the cross-head, and handle form the switch-lever, and the extension of the lever parallel with the bed *f* affords the opportunity to insert between the bed and the handle any suitable handle-moving agent which may press the handle outwardly to open the circuit. In some of the figures couplings *e* are shown for the wire connections, and in Figs. 1 to 3, inclusive, the handle-moving agent is shown as a wedge *g* or *g'*, fitted to slide upon the bed underneath handle *d*. The wedge is movable transversely to the handle, so that its inclined surface presses the handle outward from its base, as shown in Figs. 2 and 3, to open the circuit. The bottom of the wedge in Fig. 1 is shown provided with a parallel bar *h*, to which clips *i* are applied to hold it and guide it upon the bed. The switch shown in Fig. 1 is provided with a double wedge, which may be actuated by a pull in either direction, and it is thus adapted for use with electric motors employed in propelling machinery which is liable to accident.

The double wedge is shown in Fig. 1 in its central position, with the two inclines sloping upward in opposite directions from the handle *d*, so that the movement of the wedge in either direction operates to lift the handle.

The ends of the bar *h* are shown in Fig. 1 bent upwardly and perforated for the attachment of pull-ropes *j*, and such ropes may be extended in opposite directions from the switch to permit the actuation of the wedge from different stations or from all of the points where the emergency is likely to arise that requires the cutting off of the current by such switch. In Fig. 1 the switch is shown closed, and the wedge formed of metal with the bar *h* and the inclined portion *g*, formed of two parts, secured together. In Figs. 2 and 3 the switch is shown open, and the wedge *g* is shown with a single incline and of a form that may be readily made of wood and is provided with a longitudinal slot *k* near the bottom to apply the clips *i*. The slot is made of sufficient length to permit the required movement of the wedge, and cheek-pieces or guides *l* are shown to hold the wedge in the desired path. The higher end of the incline supports the handle *d* when pushed under the same and prevents the switch from being closed until the wedge has been restored again to its normal position; but when the conditions are all normal the switch may be opened and closed without any interference from the wedge, as the smaller end of the wedge fits beneath the handle *d* when the switch-lever is engaged with the spring-contacts *b'*.

In Fig. 4 a different mechanism is shown inserted between the handle *d* and the bed

to which the switch-base is attached, a rock-shaft *n* being pivoted upon the bed and provided with a crank *o*, extended beneath the handle *d*, so as to lift the handle when the rock-shaft is oscillated. An arm *p*, attached to the rock-shaft, is shown connected to a rope *m'*. The end of the rope is extended over a pulley *s* to the arm *p*, and a pull upon the rope serves to pull the arm *p* and oscillate the rock-shaft to move the switch-lever. A weight *t* is shown connected by a cord *t'* with the arm *p* to hold the rope *m'* taut and operates to hold the crank *o* normally behind the handle *d*, as shown in Fig. 6, so as not to interfere with the normal use of the switch-lever. The pulling of the rope operates to raise the weight *t* temporarily, and thus move the switch-lever to open the circuit, while the release of the pull-rope permits the weight to draw the crank again backward, leaving the switch open until it is closed by hand. The disconnection of the crank from the switch thus not only permits it to be operated freely by hand, but prevents the interposed mechanism from closing the switch, as it is constructed only to open the switch by raising the hand-lever.

My device is exceedingly cheap, simple, and effective and may be applied to the ordinary lever cut-out switch, which thus avoids the necessity of making any special switch to be used as an emergency cut-off. The handle *d* of such switches stands at a sufficient distance above the bed to fit the wedge, crank, or other handle-moving agent beneath the same, and the surface of the wedge or crank merely presses upon the under side of the handle and actuates it without any attachment thereto.

Having thus set forth the nature of the invention, what is claimed herein is—

1. The safety cut-off comprising the lever-switch having the base *a* with the double springs *b* and *b'* projected upward therefrom, the knife-blades *c* hinged to the springs *b* and fitted detachably to the springs *b'* and having the cross-head *d'* with handle *d* projecting therefrom parallel with the base when the switch is closed, a handle-moving agent inserted between the bed and the handle to press the handle outwardly from the bed to open the circuit, and a rope connected to such handle-moving agent to actuate the same in emergencies.

2. The safety cut-off comprising the lever-switch having the handle movable to and from the base at one end of the same, a bed supporting the base, a wedge with means for holding it movably upon the bed transverse to the handle, and means extended from the wedge for actuating the same in emergencies.

3. The safety cut-off comprising the lever-switch having the handle movable to and from the base at one end of the same, a bed supporting the base, and a wedge having the bar *h* at the bottom fitted movably upon the bed beneath the handle, and secured thereon by

suitable clips, with means extended from the wedge for operating it in emergencies.

4. The safety cut-off comprising the lever-switch having the round handle movable to
5 and from the base and projected beyond one end of the same, a bed supporting the base, a wedge adapted to fit upon the bed between the bed and the handle and having a rounded surface to contact with the handle, means
10 to hold the wedge movably upon the bed, and

means extended from the wedge for operating the same in emergencies.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES H. JOHNSON.

Witnesses:

THOS. S. CRANE,
L. LEE.