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SWITCH OPERATING MECHANISM.

APPLICATION FILED JUNE 17, 1915.

1,330,860. Patented Feb. 17, 1920.

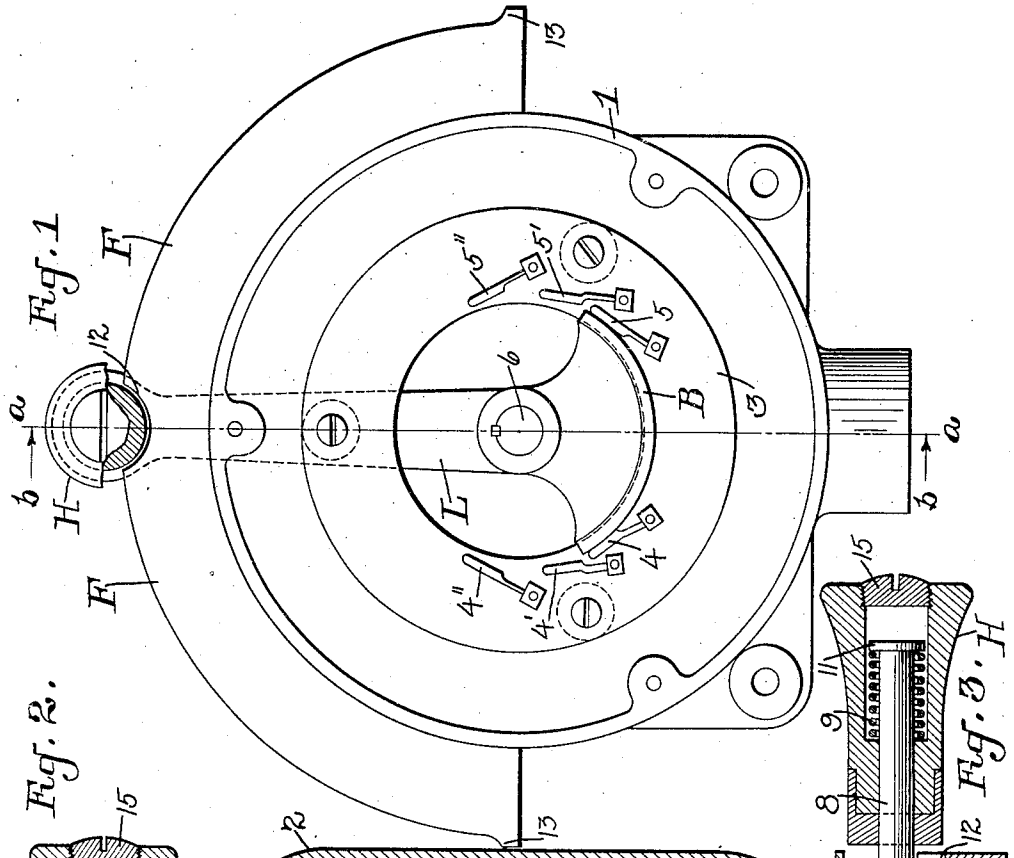


Fig. 1.

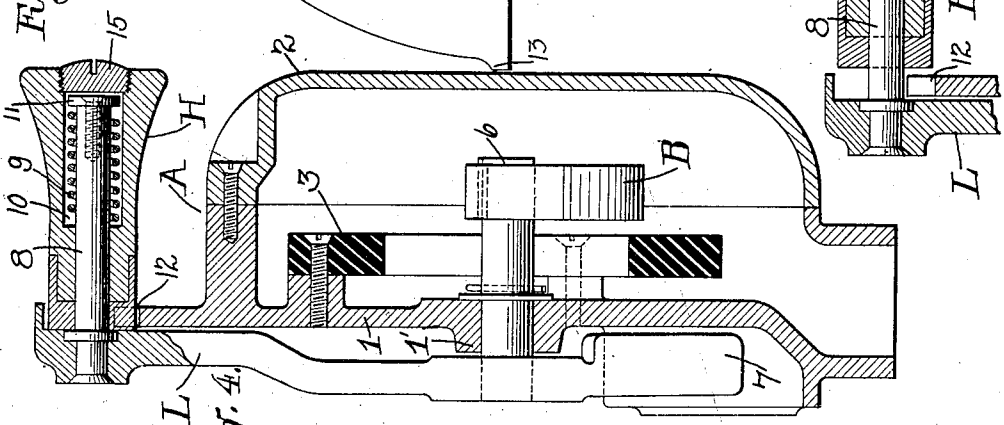


Fig. 2.

Fig. 3.

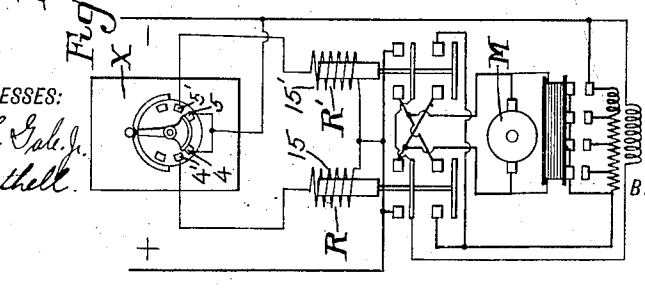


Fig. 4.

WITNESSES:

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SWITCH-OPERATING MECHANISM.

1,330,860. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed June 17, 1915. Serial No. 34,581.

To all whom it may concern:

Be it known that I, ERNEST L. GALE, Sr., a citizen of the United States, residing in Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Switch-Operating Mechanism, of which the following is a specification.

My invention relates to improvements in electric switch apparatus, and more particularly to the type commonly known as car switches, such for example, as are used in the control of electric elevators.

One of the objects of the invention is the provision of certain improved features of construction in car switch apparatus more particularly of the type having a self-centering hand lever, the most essential feature consisting in the provision of means for preventing the car lever from ever retaining an "off center" or unlocked position in case the lever should be released while in such position; this arrangement assuring the return of the lever to its center or neutral position whereupon it becomes automatically locked.

Another feature lies in the particular arrangement of certain of the co-acting parts, which are so arranged as to make it absolutely essential in order to stop the elevator car, to return the car lever substantially to its center or neutral position, whereupon the lever will become automatically locked immediately upon being released, this arrangement giving further assurance for the locking of the lever every time the car is stopped with the lever released. In the accompanying drawings, Figure 1 shows a front view of a car switch constructed in accordance with the present invention; the car switch cover being removed; Fig. 2 is a sectional view of Fig. 1, taken substantially on the line *a*—*a*, viewed in the direction of the arrows *b*—*b*, the switch cover being shown in this figure: Fig. 3 shows in section, a portion of the hand lever illustrated in Fig. 2, the parts in this instance showing the lever unlocked; Fig. 4, represents diagrammatically, the car switch and its application to a typical electric elevator controlling system.

In detail the car switch apparatus comprises the casing A, consisting of a casting, 1, which forms the back of the switch casing, and a removable cover 2, which is suitably fastened to the member 1.

Contained in the interior of the casing is a contact supporting base 3, which is of any suitable insulating material, this base supporting the usual form of contacts such as 4, 4′, 4″, 5, 5′, 5″, and being fastened to the member 1.

A contact segment B may be keyed or otherwise suitably connected to a rock shaft 6, the latter being supported in a hub portion 1′ formed in the member 1. The segment is adapted when rocked in one direction from its center or neutral position, as indicated in Fig. 1, successively to engage the contacts, 4′, 4″, and the contacts 5′, 5″, when rocked in a reverse direction. The segment when in its center or neutral position engages the contacts, 4, 5, the latter being electrically connected by a common feed wire.

A manually operable car lever L is employed which may actuate the rock shaft either directly as shown in the drawing, or indirectly through a set of gears as is well known. In the present instance however, the car lever is secured directly to the rocker arm, the car lever being self-centered by means of a weighted portion such as 7 which may form an integral part of the lever, or if desired a well known form of spring may be employed for the purpose of centering the car lever.

The lever is provided with a spring-pressed handle H, carried by a pintle 8 attached to the lever. A coil spring 9 is contained in a bore 10 in the handle, this spring being carried on the pintle 8. One end of the spring bears against a member 11 forming a collar on the pintle, and the other end thereof is seated by the bottom of the bore in the handle. A screw threaded plug 15 closes the bore in the handle.

Coming now to one of the particular features of the present invention, it consists in the provision of a flange F, this flange having a recess portion 12 therein, which coincides with the center or vertical position of the car lever. This flange in its preferred construction forms an integral part of the casting 1, it being substantially semi-annular

in shape, or as a matter of fact, it may extend any desired distance corresponding to the limits of movement of the hand lever in both directions from the center or neutral position, at which limits of movement there is provided a pair of stops for the lever such as are shown at 13, these stops being engaged by the pintle 8.

The recess 12 is adapted for engagement by the handle H, the latter being urged into the recess by the action of the spring 9. In this manner it is seen that the lever is locked in its central or neutral position, through the engagement of the handle with the recess in the flange F. Now in order to release or unlock the car lever, it is necessary to pull on the handle against the action of the spring until the handle is clear of the flange F, as indicated in Fig. 3, whereupon the lever may be actuated in a desired direction.

It is to be particularly noted that the depth of the flange portion F extending either side of the recess 12 and to the stop members, is uniform, or regular, the handle upon being actuated in either direction from center position riding on the front lateral face of this flange. As has been before stated herein, the hand lever is self-centering, and should an operative release the handle when in any position off its dead center, it will be automatically returned to its center or neutral position and become automatically locked, through the engagement of the handle with the recess 12. Right here it is to be particularly pointed out that with the provision of the flange of uniform depth, it is impossible for the hand lever, whenever released by an operative, to retain an "off center" or what amounts to the same thing, an unlocked position, whereupon it may be moved accidentally, and thus cause very serious results.

The provision of such means as herein provided to prevent the hand lever when released by an operative from being left or ever retaining an "off center" or unlocked position, is considered to be of great practical value, since it eliminates accidents such as result from accidental movement of the car lever, and furthermore to say the least, it is considered a bad practice particularly in elevator service to permit of the car lever when released by an operative retaining an "off center" and consequently an unlocked position.

In the way of giving further assurance for the locking of the car lever, I establish a certain relation between the hand lever when in its dead center position, the segment B actuated thereby, and the contacts 4′, 5′, which latter in a usual form of electric elevator controlling system, control a circuit for the operating windings of the motor reversing switches. In Fig. 4 are illustrated certain of the parts of an elevator system as are necessary to illustrate the particular point in question, in which, R, R′ are the reversing switches for the electric motor M, adapted to operate the elevator car X; 15, 15′ are the operating windings for the reversing switches R, R′, respectively. Now as will be noted, the contact 4′ controls a circuit for the winding 15, and the contacts 5′ controls a circuit for the winding 15′; thus a clockwise movement of the segment B from its center position into engagement with the contact 4′ effects an operation of the car in one direction, and a counter-clockwise movement thereof from its center position into engagement with the contact 5′, effects a movement of the car in a reverse direction. Of course, centering the lever, effects a stopping of the car, since the circuits for the windings 15 or 15′ are opened, thus effecting an opening of the associated reversing switch, thereby cutting off the current supply designated + and − to the motor.

Now as to the particular relation between the parts heretofore mentioned, I purpose to position the contacts 4′ and 5′, in as close proximity as is considered practical, to the contact segment B, when in its center position as shown in Fig. 1. The result and particular benefit gained by this arrangement, lies in the fact that an operative must, in order to effect a stop of the car, that is to say, in so far as the functions of the reversing switch apparatus are concerned, return his lever almost to its dead position, this being so by reason of the close proximity of the contacts 4′ and 5′ relatively with the contact segment B. It will readily be seen that with this arrangement of parts, an operative will soon acquire a habit of returning the lever to its dead center, whereupon it becomes locked immediately upon the release of the handle.

Having thus described my invention, and without limiting myself to the precise details of construction as herein shown, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A switch operating mechanism comprising a pivoted lever, a stud secured to the lever, a handle mounted on the stud, a spring to seat the handle against the lever, and means to lock the lever against movement, comprising a stationary flange having a notch therein adapted to receive the handle, the said flange abutting the handle to retain it in unseated position during any movement of the lever corresponding to "on" position.

2. A switch operating mechanism comprising a casing, a lever pivoted to the casing, a stud movable with the lever, a spring seated operating handle mounted on the stud, and means to lock the lever against movement, comprising a stationary flange

having a notch therein adapted to receive the handle, the said flange clearing the stud but abutting the end of the handle to retain it in unseated position during any movement of the lever corresponding to "on" position.

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

ERNEST L. GALE, SR.

Witnesses:
EDWARD H. STEELE,
GEORGE D. ROSE.