H. A. EVERETT.

SAFETY LIMIT SWITCH.

APPLICATION FILED AUG. 27, 1910.

1,138,366. Patented May 4, 1915.

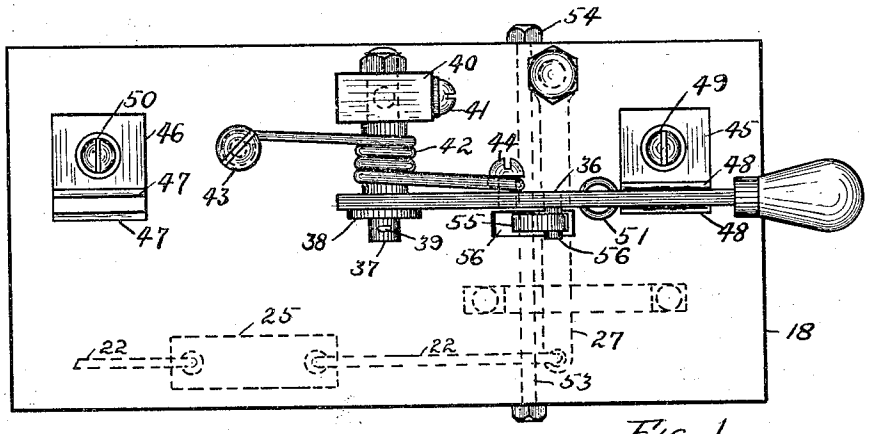


FIG. 1.

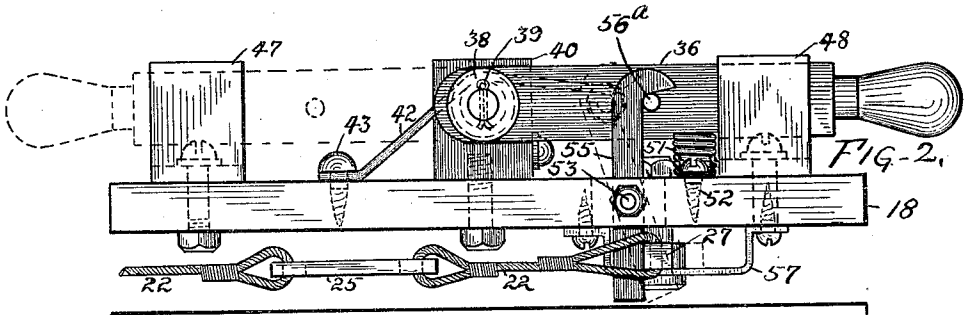


FIG. 2.

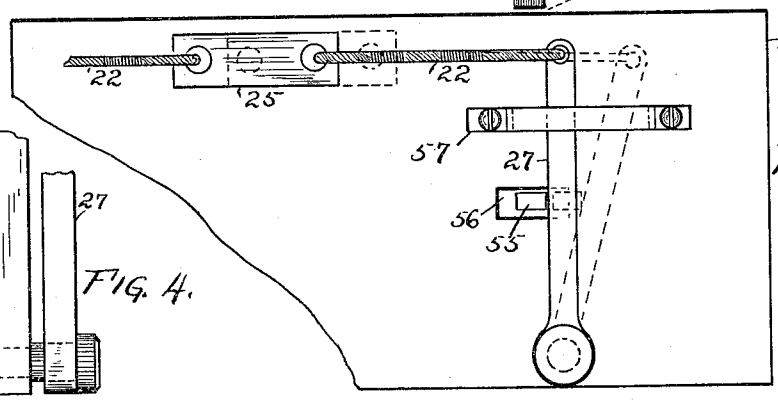


FIG. 3.

FIG. 4.

Inventor

Henry A. Everett.

By

Howard C. Cade

Attorney

Witnesses:

David Levinson

David R. Knapp.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY A. EVERETT, OF HADDON HEIGHTS, NEW JERSEY.

SAFETY LIMIT-SWITCH.

1,138,366. Specification of Letters Patent. Patented May 4, 1915.

Application filed August 27, 1910. Serial No. 579,329.

To all whom it may concern:

Be it known that I, HENRY A. EVERETT, a citizen of the United States, residing at Haddon Heights, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Safety Limit-Switches, of which the following is a specification.

My invention relates to that class of switches that are used as protective devices and my object is, to provide a means to prevent a chain block or other hoisting devices from assuming a jamming position to the structural work supporting said block, thereby preventing the breaking or rupture of the rope, protecting the motor or motors, or the wiring connected therewith and to eliminate all sources of accidental loss of life due to any of the above causes.

With this object in view, my invention consists in certain novel features of construction and arrangement of parts as will hereinafter be more fully described and pointed out in the claims, reference being had to the accompanying drawings, forming part thereof, and in which,

Figure 1 is a plan view of the switch forming the subject of the present invention. Fig. 2 is a side elevation of the construction shown in Fig. 1. Fig. 3 is a bottom view of the switch panel showing the switch tripping mechanism, and Fig. 4 shows the method of pivotally supporting the weighted arm of the switch tripping mechanism.

In the accompanying drawings, similar numerals refer to similar parts throughout the several figures of the drawings.

With particular reference to the details of construction shown in the several figures of the accompanying drawings it will be observed that the numeral 18 designates a panel or supporting base having pivotally mounted on the back thereof the lever 27 provided at its free end with an operating rope connection 22. This operating rope preferably includes an insulating connector member or block 25, while its end has attached thereto a weight (not shown) which is adapted to be engaged by the block of the ordinary type of crane hoist to operate the switch.

In Fig. 1, 36 designates the blade of a single pole double throw quick break knife switch. The blade 36 is hinged on the bolt 37 and is held in alinement on same by the spring washer 38, spiral spring 42 and the split pin 39. 40 designates the hinge post to which is secured the bolt 37 and the terminal screw 41. Encircling the bolt 37 is the spiral spring 42, one end of which is rigidly secured to the panel 18 by the screw 43 and the other end is rigidly secured to the blade by the screw 44. 45 and 46 designates switch blocks to which are rigidly secured the switch contact clips 48 and 47. The switch blocks 45 and 46 have respectively secured to them the terminal screws 49 and 50. The blade 36 engages with the contact clips 47 and 48 upon either position. Upon the reacting of the spiral spring 42, the switch blade 36 engages with the contact clips 47. 51 designates a spiral spring which is secured to the panel 18 by the screw 52 shown in Fig. 2. Upon setting the switch, the spring 51 is compressed and upon the reacting of the switch the spring 51 assists the spring 42 to open the circuit between the blade 36 and the contact clips 48.

In Figs. 1 and 2, 53 designates a bolt which passes through an aperture in the panel 18 and is rigidly secured to same by the nut 54. Pivoted on the bolt 53 is a lever 55 which acts through a slot 56^a on the panel 18. One end of the lever 55 engages with the pin 56^a rigidly secured to the switch blade 36, and the other end engages with the weighted lever 27 pivotally mounted on the back of the panel 18 and more clearly shown in Fig. 3. In said figure, 27 designates the lever pivotally mounted on the back of the panel 18, the method of pivoting being shown more clearly in Fig. 4. 57 designates a guide bracket for the lever 27 and is rigidly secured to the back of the panel 18. The end of the weighted lever 27 is secured to the weight supporting rope 22 and intermediate between the end and its pivotal center, the lever 27 engages with the lever 55.

The foregoing apparatus is suitably proportioned and mounted on an appropriate panel, all of which will be readily understood by those skilled in the art to which this invention relates. Its mode of operation will be substantially as follows: The operating weight (not shown) is supported by the rope 22 at a predetermined distance from its supporting lever 27, this distance determining the maximum upward travel of the lower chain block of the crane hoist The weight (not shown) at the end of the

rope 22 when not in engagement with chain block, is sufficiently heavy acting through its supporting rope and lever 27, to coact on the lever 55, upon the setting of the safety limit switch to hold the lever 55 in engagement with the pin 56ª on the switch blade 36. Upon the raising of the lower chain block of the ordinary crane hoist above the predetermined distance; the lever 27 is deprived of its downward force and allows the springs 51 and 42 to coact on the switch blade 36 to disengage the pin 56 from the lever arm 55 and to throw the switch blade 36 in contact with clips 47. Preferably the head of the latch or lever 55 has its engaging surface inclined to facilitate the disengagement of the lever from the pin 56ª.

From the foregoing description it will be apparent that when the weight (not shown) on the end of the rope 22 is lifted or fixed so that it ceases to exert its influence on the rope, the blade 36 will become disengaged from the lever 55 and will spring to its dotted line position. In resetting the switch it is necessary that the rope 22 again come under the influence of the actuating weight and that the blade 36 be returned by hand to its normal closed position within the switch contacts 48, and then the lever pin 56ª must be placed in engagement with the lever 55.

Having thus described the nature and object of my said invention, what I claim as new and desire to secure by Letters Patent, are:

1. A safety limit switch including a switch base having an opening, a spring pressed switch blade, a laterally projecting pin carried by the latter, a latch provided with a hook portion having an inclined pin engaging face, said latch also having a portion projecting through the opening in the switch base, a bracket on the reverse side of the base, and a lever working in said bracket having a weighted operating connection, said lever adapted to normally bear against the portion of the latch projecting through the opening in the switch base to maintain the inclined engaging face of the hook portion of the latch member normally in engagement with said pin.

2. A safety limit switch including a switch base provided with an opening, a switch blade pivoted on the base between the terminals of the switch, springs tending to throw said blade to a safety position, a pin projecting laterally from said blade, a switch blade latch member pivoted to the base in the opening therein and having a hook portion provided with an inclined face for engaging said pin, a bracket on the reverse side of the switch base, a lever pivoted to the same side of said base and at right angles to the pivot of the latch member, said lever movable in the bracket and normally bearing against the portion of the latch member that projects through the opening in the base to maintain the hook portion of said latch member in engagement with the pin, and a weighted operating connection for said lever.

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

HENRY A. EVERETT.

Witnesses:
HOWARD S. GROSE,
CHARLES G. HUVER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."