(No Model.)

A. C. CAREY.

ELECTRIC TRIP KNIFE SWITCH.

No. 590,386. Patented Sept. 21, 1897.

Fig. 1

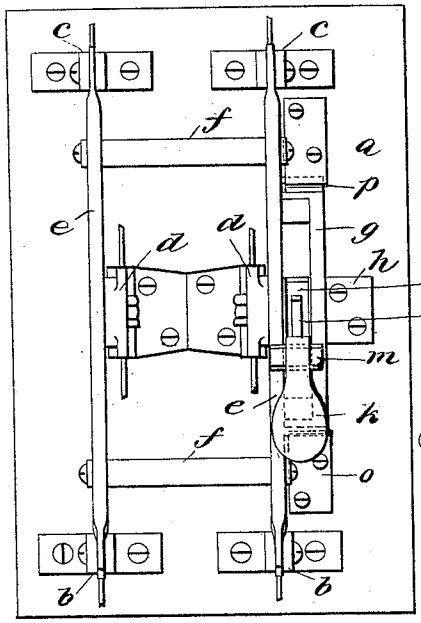


Fig. 2

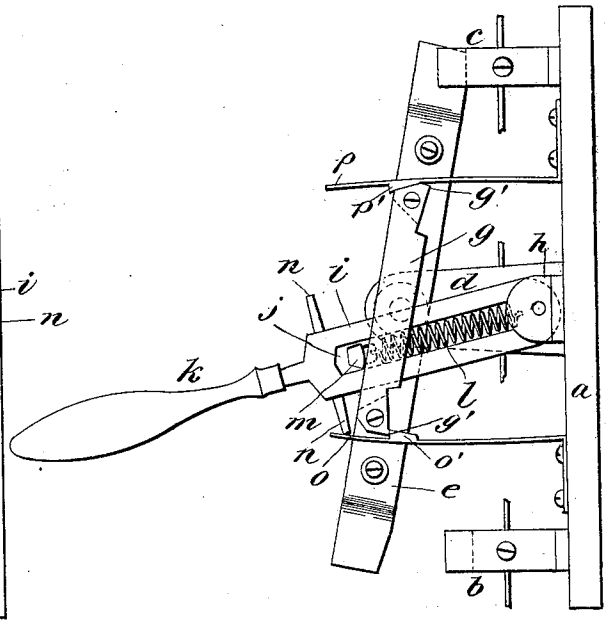


Fig. 3

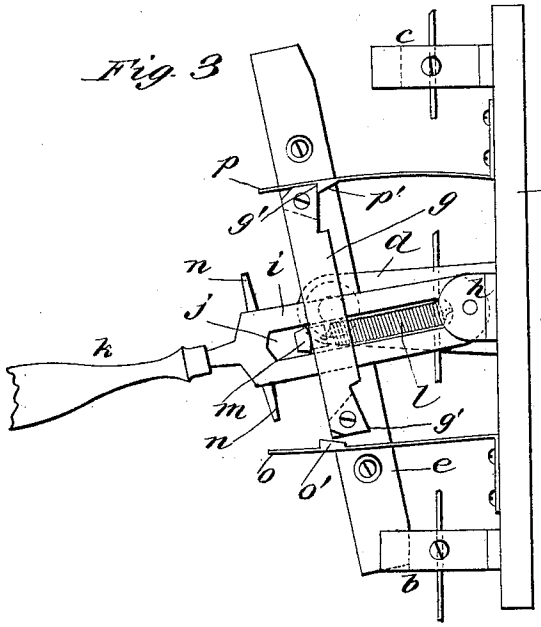
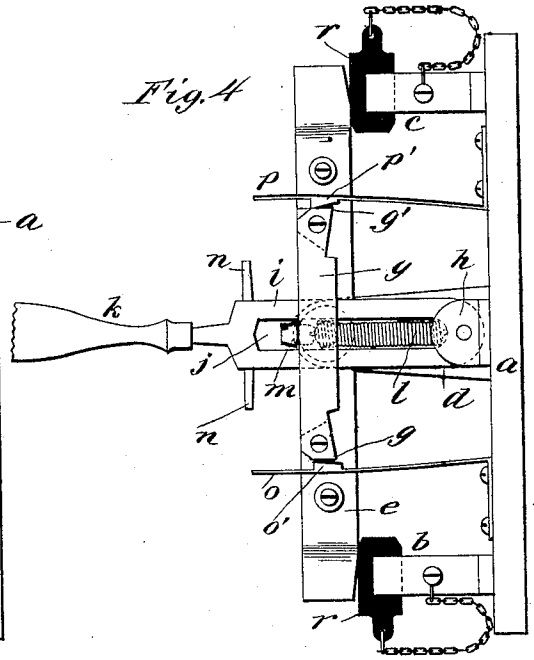


Fig. 4



Witnesses.

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UNITED STATES PATENT OFFICE.

AUGUSTUS C. CAREY, OF LAKE PLEASANT, MASSACHUSETTS.

ELECTRIC TRIP-KNIFE SWITCH.

SPECIFICATION forming part of Letters Patent No. 590,386, dated September 21, 1897.

Application filed May 24, 1895. Renewed June 29, 1897. Serial No. 642,882. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS C. CAREY, a citizen of the United States, residing at Lake Pleasant, in the county of Franklin and State of Massachusetts, have invented a certain new and useful Improvement in Electric Trip-Knife Switches, of which the following is a full, clear, and exact description.

In some localities the fire-underwriters object to or prohibit the use of switches in electrical installations in which a spring is used to retain the parts in contact, and for the reason that should the spring become heated, as is likely, the spring loses its elasticity and capacity for retaining the contact, and short-circuiting results. In some knife-switches it is difficult to make and break the circuit quickly, and it is always desirable so to operate the circuit.

The objects of my invention are to meet the above-mentioned objection of the fire-underwriters and to provide a quick-acting knife-switch. In attaining these objects I provide stops which automatically and positively engage and hold the knife-carrier when it is tilted from one side to the other, and I provide a knife-carrier-tilting device which is independent of the carrier. These and other features of the invention will be pointed out and particularly claimed in the claims herein.

In the accompanying drawings, illustrating my invention, in the several views of which like parts are similarly designated, Figure 1 is a plan view with the parts in the same position as in Fig. 2. Fig. 2 is a side elevation of the switch with the tilting device in position to release the left-hand or lower end of the knife-carrier. Fig. 3 is a side elevation showing the tilting device in normal position after having tilted the knife-carrier, and Fig. 4 is a side elevation showing the switch cut out of the circuit.

The base *a* has mounted upon it the pairs of contact-posts *b b* and *c c* of any usual or approved construction for knife-switches. It has also the binding-posts and stands *d d*, and these stands have pivoted in them, so as to be capable of being rocked or tilted thereon, the knife-carrier, herein shown as composed of the parallel knife-bars *e e*, alined with the contact-posts *b b* and *c c* and connected to move together by the tie-pieces *f f* of insulating material. One of the knife-bars is provided with the laterally-projecting slotted portion *g*, whose ends have the distinct corners *g' g'*.

A bracket *h* is secured to the base, and this bracket has pivoted to it a lever *i*, provided with the longitudinal slot *j* and the handle *k*. A coiled tension-spring *l* is made fast to the lever in the lower end of its slot and is connected with a cross-head *m*, which is placed crosswise in the slot and plays upon the outer edges of the portion *g* and bar *e* under stress of the spring, the tendency being to draw and hold the lever at right angles to the base. The lever has the fingers *n n*, projecting substantially at right angles from its opposite edges.

o and *p* are springs made fast to the base at points in line with the ends *g' g'*, and these springs carry the lugs *o'* and *p'*, which alternately engage the ends *g' g'*, as will presently appear.

If the lever be moved to one side or another, the spring *l* will be put under extra tension by the cross-head *m* riding or sliding up the inclined bar *e* and portion *g* and will tend to tilt the knife-carrier to the same side toward which the lever is moving, but since one or the other of the lugs *o'* and *p'* is always engaged with the knife-carrier such lug must be disengaged before the knife-carrier can tilt, and this disengagment is effected by bringing one or the other of the fingers *n n* into forcible contact with the upper ends of one or the other of the springs *o* and *p*.

As shown in Fig. 3, the left-hand or lower end of the knife-carrier is in contact with the posts *b* and the lever is in the position to which it is automatically returned by its spring after it has operated the spring *o* and lug *o'* to effect that position of the knife-carrier. The knife-carrier is held positively in such position by the engagement of the stop-lug *p'* with the right-hand end *g'* of the laterally-projecting portion *g* of the knife-carrier.

In Fig. 2 the parts are represented with the lever in position to engage the spring *o* to effect the position of Fig. 3, and it will be observed that in this position the spring *l* is ex-

tended so as to put sufficient strain upon the cross-head to cause the return of the lever after it is relieved of pressure upon its handle, and thereby relieve the spring of tension. By this construction and operation of lever the make and break may be effected very quickly and without danger of sparking.

It will be observed that the knife-carrier normally makes contact with the contact-posts in one or the other of its tilted positions and is locked in such position against operation by slight manipulation of the tilting device, and it is not possible to set the carrier entirely out of circuit by the tilting device, and if at any time it be desired to cut out the switch from the circuit blocks of insulating material *r* are attached to the switch at some suitable place by chains or other suitable connection and may be inserted in the slots in the posts in which the knives are next to enter and the knives be thereafter dropped upon such blocks, and then similar blocks may be inserted in the opposite posts. In this way it becomes impossible for the current to get switched on by any accident.

My invention is capable of use in connection with single, double, or triple pole switches, and a lever or tilting device may be connected with the outside or the middle knife-bar.

What I claim is—

1. In a knife-switch, the combination of the binding-posts and standards, contact-posts arranged upon opposite sides of said standards, a tilting knife-carrier comprising bars centrally pivoted to said standards and adapted to engage said contact-posts alternately, a vibrating, pivoted tilting device for said knife-carrier, having a sliding spring connection with said knife-carrier, whereby it is returned to normal after actuating the knife-carrier, and independent stops also arranged upon opposite sides of said standards and adapted to automatically engage and lock said knife-carrier in either of its tilted positions, independently of the tilting device and its sliding spring connection, substantially as described.

2. In a knife-switch, the combination with the binding-posts and standards, contact-posts arranged upon opposite sides of said standards, a tilting knife-carrier comprising bars centrally pivoted to said standards and adapted to engage said contact-posts alternately, and a spring tilting device for said knife-carrier having a sliding connection therewith, of independent stops arranged upon opposite sides of said standards and adapted to automatically engage said knife-carrier and lock it in either of its tilted positions and also adapted to be automatically released by the tilting device after its spring has been put under tension, substantially as described.

3. In a knife-switch, the combination of contact-posts and a tilting knife-carrier, with a tilting device comprising a lever having a spring connection with the knife-carrier and provided with projecting fingers, and spring-stops provided with stop-lugs which engage angles on the knife-carrier positively to support the knife-carrier in either of its tilted positions, substantially as described.

4. In a knife-switch, the combination with the binding-posts and standards, contact-posts arranged upon opposite sides of said standards, and a tilting knife-carrier comprising bars centrally pivoted to said standards and adapted to engage said contact-posts alternately, of a tilting device for said knife-carrier constructed as a lever slotted longitudinally and having a cross-head arranged in said slot and resting and adapted to slide upon the knife-carrier, and a spring fixed at one end and having its other end connected to the cross-head, whereby the tilting device is returned to normal position after operation and its spring relieved of tension, substantially as described.

In testimony whereof I have hereunto set my hand this 22d day of May, A. D. 1895.

AUGUSTUS C. CAREY.

Witnesses:

CHAS. W. NIMS,

WM. H. ALLEN.