N. E. LEMMON.

SNAP SWITCH MULTIPLE FUSE.

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1,036,657.

Patented Aug. 27, 1912.

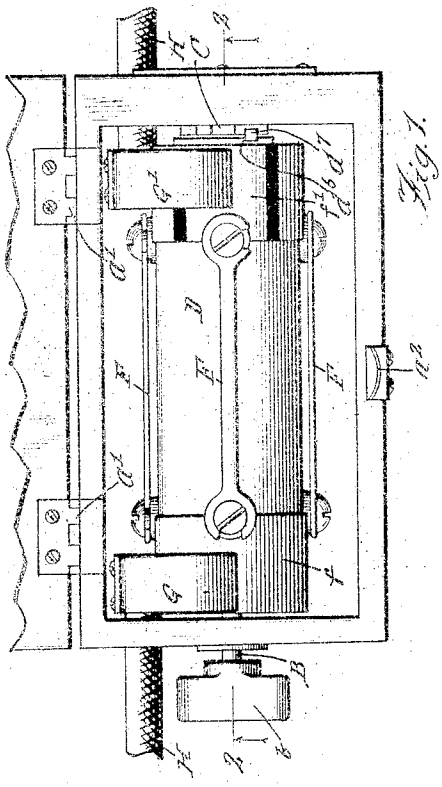

Fig. 1.

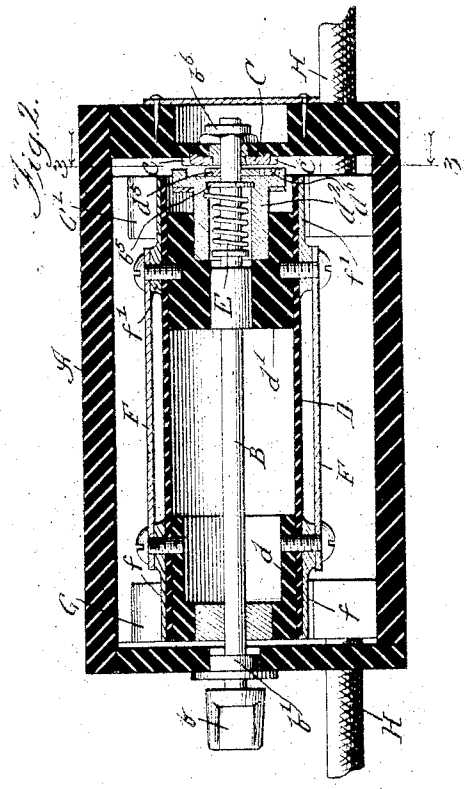

Fig. 2.

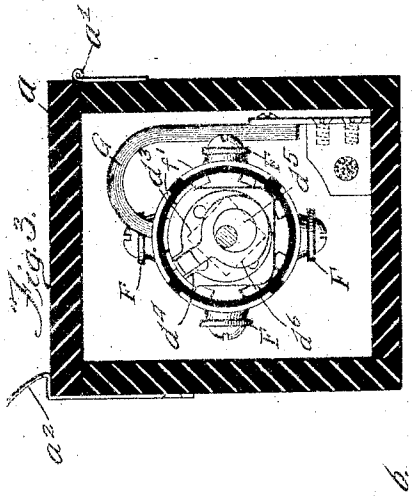

Fig. 3.

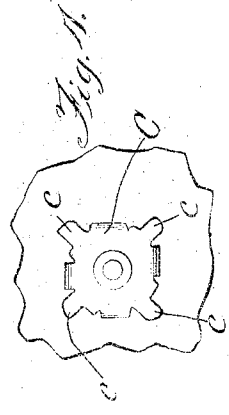

Fig. 4.

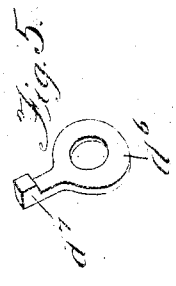

Fig. 5.

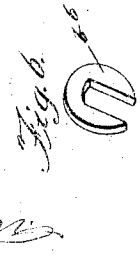

Fig. 6.

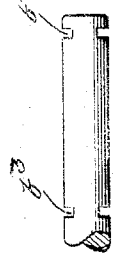

Fig. 7.

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UNITED STATES PATENT OFFICE.

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SNAP-SWITCH MULTIPLE FUSE.

1,036,657. Specification of Letters Patent. **Patented Aug. 27, 1912.**

Application filed December 23, 1910. Serial No. 599,808.

To all whom it may concern:

Be it known that I, NORMAN E. LEMMON, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Snap-Switch Multiple Fuses, of which the following is a specification.

My invention contemplates a snap switch multiple fuse. By this I mean a multiple fuse which operates on the principle of the ordinary snap switch. With this arrangement, and when one fuse blows or burns out, the switch is snapped to thereby bring another fuse into circuit. As herein disclosed, the multiple fuse consists of a rotary cylinder having the fuse strips extending longitudinally thereof, at points equidistant in the circumference of the same, and provided with a commutator at each end. The said commutators are engaged by brushes which are adapted to be connected with the circuit wires, and which serve in this way to successively include the different fuse strips in circuit. The axis of the said cylinder is coincident with the axis of the handle or rotary thumb piece of the snap switch. Ordinarily, of course, a snap switch has merely two positions, one to open the circuit and one to close the same, and the operation of the switch from one position to the other will, therefore, ordinarily either close or open the circuit. With my improved construction, however, the snap switch has a plurality of positions, but in each case it is adapted to maintain the continuity of the circuit which it controls, through the medium of a fuse strip, whereby each time it is snapped or operated, it closes the circuit instead of opening the same. The fuse strips are removable, and may be of any suitable number, whereby the device may be supplied with new strips as soon as the old ones are burned out. Obviously, however, the mere burning out of the fuse strip does not, with my improved construction, necessitate such renewal at once, as in such case all that is necessary is simply to snap the switch and thereby bring a new fuse strip into circuit. As I say, therefore, my invention contemplates broadly a snap switch multiple fuse.

To the foregoing and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings—Figure 1 is a side elevation of a snap switch multiple fuse embodying the principles of my invention, showing the door of the box or inclosure thereof open to bring into view the rotary cylinder upon which the fuse strips are mounted, and also the commutators and brushes for the ends of said cylinder, as will hereinafter more fully appear. Fig. 2 is a longitudinal section on line 2—2 in Fig. 1. Fig. 3 is a cross section on line 3—3 in Fig. 2. Fig. 4 is a detail view of a portion of the switch mechanism. Fig. 5 shows the eccentric strap or locking device for the snap switch. Figs. 6 and 7 are details of the snap switch mechanism.

As thus illustrated, the box or closure A may be of any suitable, known or approved character, and may be provided with a door or cover a mounted on hinges a', and held in place by a spring catch a^2. The switch shaft B extends centrally and longitudinally of the said box or closure, and is provided at its outer end with a handle or thumb piece b for the rotation or operation thereof. Near this handle or thumb piece the said shaft is supported in a suitable bearing b' at one end of said box or closure, and at its other end the said shaft is supported in a bearing b^2 in the other end of said box. At this end the said shaft is provided with circumferential notches b^3 and b^4 that are engaged respectively by the notched washers b^5 and b^6, such as shown in Fig. 6, whereby the shaft is held against endwise displacement. The stop plate C encircles the said shaft, at a point between the washers b^5 and b^6, and is secured to the end wall of the box in any suitable manner. The said stop plate is, in this case, provided with four equidistant stops c, which extend radially relative to the axis of said shaft.

The fuse cylinder D is preferably made of some insulating material, and is hollow, being provided at opposite ends with plugs d and d' of insulating material. These plugs are loose on the shaft B and the plug d' is provided with a metal bushing d^2, the latter having a recess d^3 on its outer face, which recess is connected with the periphery or circumference of the plug by means of a notch d^4. An eccentric cam d^5 is secured to the said shaft and disposed in the recess d^3, and an eccentric strap d^6 is mounted on said eccentric cam and provided with a catch or locking bolt d^7, which latter is adapted to engage the stops c, previously mentioned.

The spring E has one end thereof secured in any suitable manner to the shaft, and has its other end secured to the bushing d^2. It will be seen that the said locking bolt d^7 is adapted to move in the notch or opening d^4, so that it moves toward and away from the shaft, when the eccentric device is operated by the rotation thereof.

The removable fuse strips F are arranged upon the circumference of the cylinder, being four in number, as shown, and each fuse strip has one end connected to the commutator ring f, and its other end connected to one of the sections f' of the sectional commutator at the other end of the cylinder. The brushes G and G′ engage respectively the ring f and the sections f', and are connected in any suitable manner with the terminal cables or circuit conductors H, whereby the said fuse strips are successively connected in circuit by the rotation of the switch. It will be understood, of course, that the said commutators and the said brushes may be made of any suitable metal. The fuse strips can also, of course, be made of any suitable metal.

When the shaft B is rotated by a right hand turn given the handle or thumb piece b, such rotation tends to wind up the spring E, one end thereof being held stationary by the engagement of the locking bolt d^7 with one of the stops c, in the manner shown. This same rotation, however, serves to operate the eccentric cam d^5, with the result that the locking bolt d^7 is moved away from the shaft, thus causing the shoulder of the said locking bolt to rise above or move outward beyond the end of the stop c with which it is engaging, thus leaving the cylinder unlocked and free to instantly rotate under the tension of the said spring. Such rotation of the cylinder serves, of course, to rotate the eccentric strap d^6 on the eccentric cam, and to thereby throw the locking bolt d^7 toward the shaft sufficiently and in time to enable it to engage the stop c, thus limiting the rotation of the cylinder to a one-quarter turn thereof. It will be seen that the different fuse strips are so positioned on the outer surface of the cylinder, that the limit of rotation of the cylinder always brings a new fuse strip into circuit with the two brushes. When a fuse strip blows or burns out, all that is necessary is simply to snap the switch, and thereby bring a new fuse strip into circuit. The operation of the shaft winds up the spring, and at the same time unlocks the cylinder from its last position, enabling the tension of the spring to cause the cylinder to rotate for a quarter of its circumference. At this point it is automatically stopped or arrested in its movement, with the result that another fuse strip is substituted for the one that was burned out. There are no open positions for the snap switch, it will be seen, as each time the switch is snapped, it closes the circuit. If it is snapped from one fuse strip to another, it will simply momentarily open the circuit, and then immediately close it. On the other hand, and when the switch is used for substituting a fresh fuse for one that is burned out, then its operation will serve merely to close a circuit which has been left open by the blowing or burning out of one of the fuse strips. In this way it will be seen that the blowing or burning out of a fuse strip does not necessitate the immediate renewal thereof, as a mere snapping of the switch will substitute another one therefor, and thus no repair work is necessary until after all the fuse strips have been used up in this manner.

What I claim as my invention is:

1. A snap switch multiple fuse comprising a rotary cylinder, a plurality of fuse strips extending longitudinally thereof, commutators for the ends of said fuse strips, mounted on said cylinder, terminal brushes engaging said commutators, a shaft extending axially of the said cylinder, means for rotating said shaft, a spring connecting the shaft with said cylinder, a device for locking the cylinder against rotation while the shaft is being initially rotated, and means on the shaft for operating the device to unlock the cylinder, to permit the spring to rotate the cylinder, adapted to cause said device to again lock the cylinder against rotation as soon as another fuse strip is brought into circuit with said brushes.

2. In a snap switch multiple fuse, a rotary cylinder, a plurality of fuse strips extending longitudinally thereof, commutators for the ends of said cylinder, electrically connected with said fuse strips, brushes for said commutators, a shaft extending through the cylinder, provided with means for rotating it, a spring connection between the shaft and cylinder, means for placing said spring under tension by rotation of said shaft, means independent of the fuse strips for normally preventing said cylinder from rotating, and means for releasing said cylinder upon said shaft being rotated to permit the same to rotate and bring the next fuse strip into operative position.

3. A snap switch multiple fuse comprising a rotary cylinder, a plurality of fuse strips extending longitudinally thereof, commutators for the ends of said fuse strips, mounted on said cylinder, terminal brushes engaging said commutators, a shaft extending axially of the said cylinder, means for rotating said shaft, a spring connecting the shaft with said cylinder, a locking plate having a plurality of locking projections, a cam mounted upon said shaft, a strip mounted upon said cam and having

a locking bolt adapted to engage said locking projections, to lock said cylinder against rotation while the shaft is being initially rotated, said cam being so positioned that the rotation of said shaft causes said cam to move the locking bolts out of engagement with said locking projections, to permit the spring to rotate the cylinder, and to permit said locking bolt to again engage the next succeeding locking projection, to again lock the cylinder against rotation.

Signed by me at Chicago, Illinois, this 17th day of December, 1910.

NORMAN E. LEMMON.

Witnesses:
J. NORBY,
S. LEWIS.