

(No Model.)

W. B. TOBEY & H. W. SMITH.
CIRCUIT BREAKER.

No. 565,244.

Patented Aug. 4, 1896.

Fig. 1

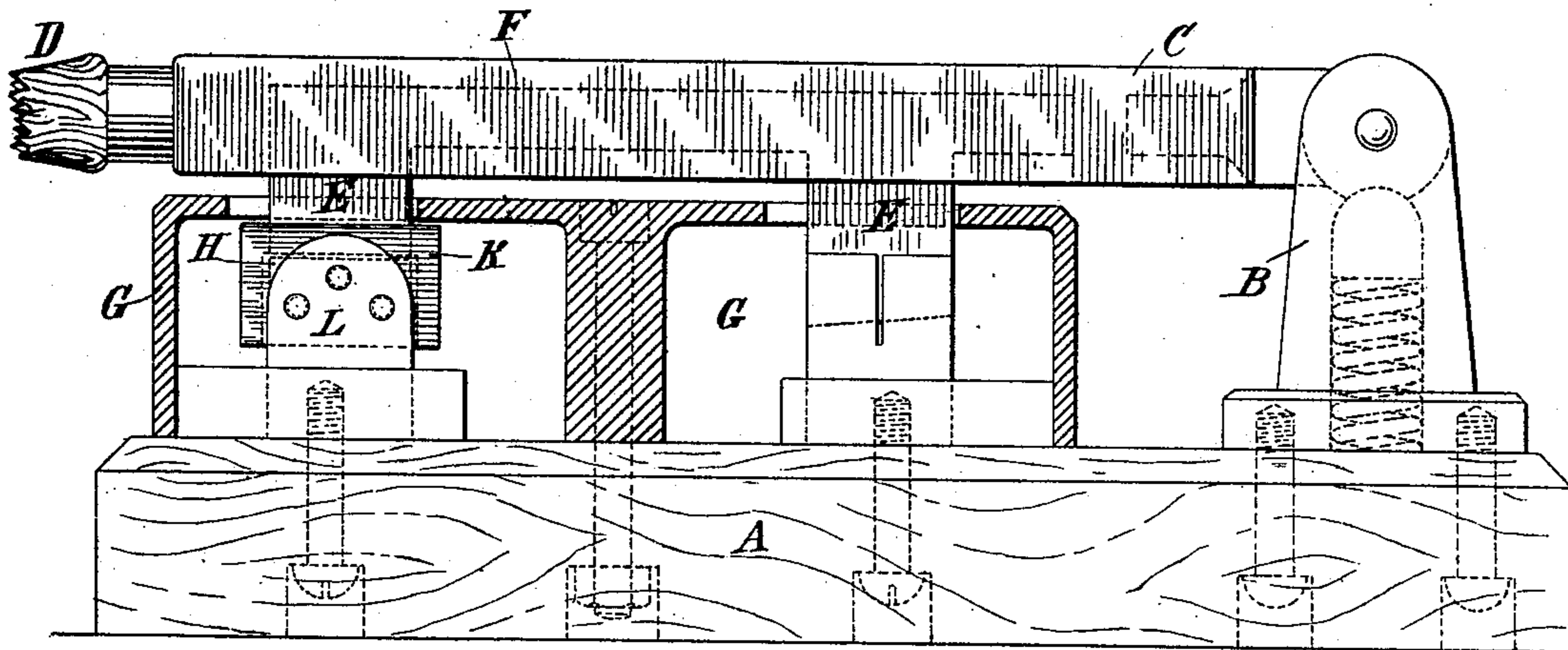


Fig. 3.

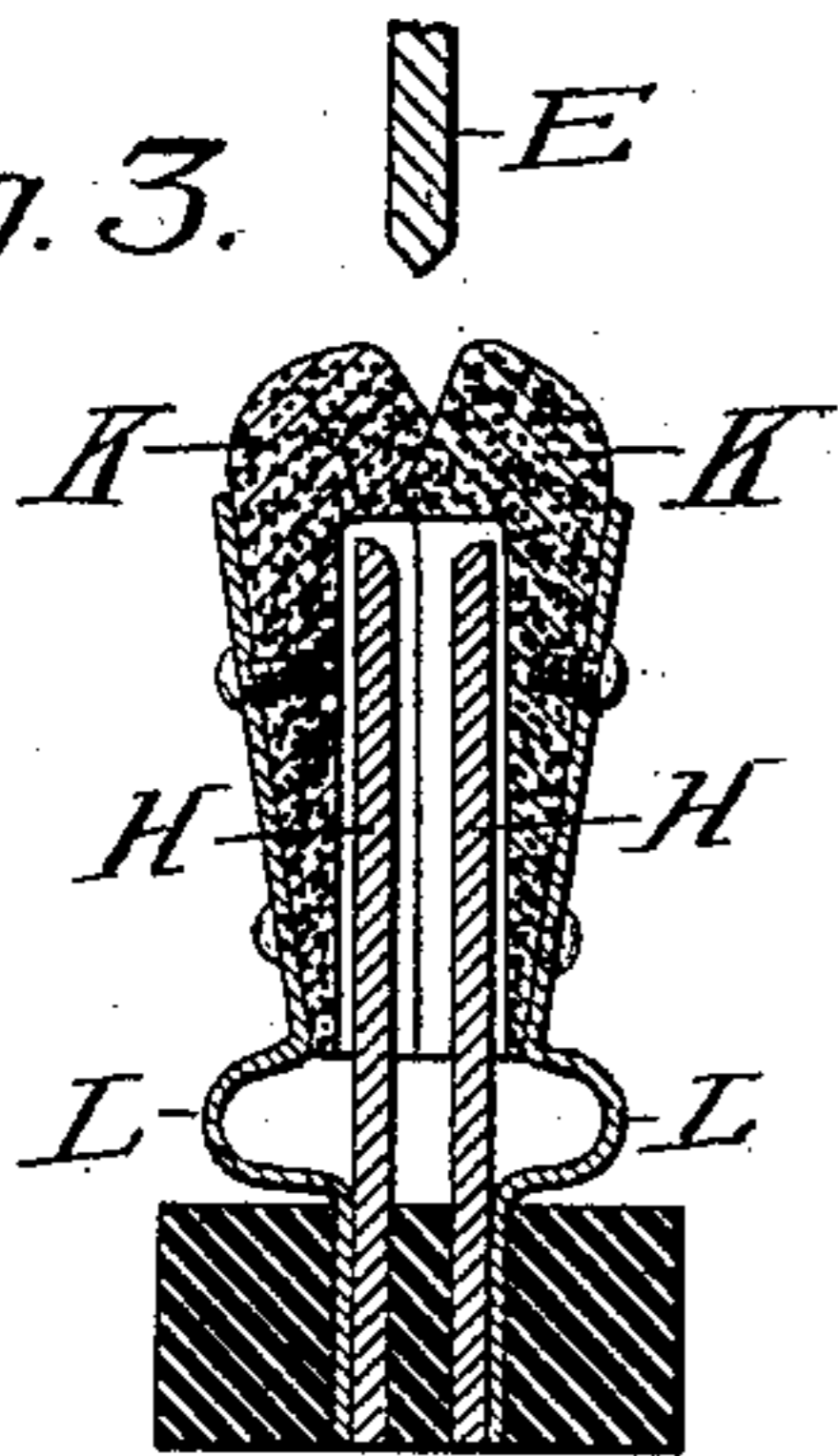
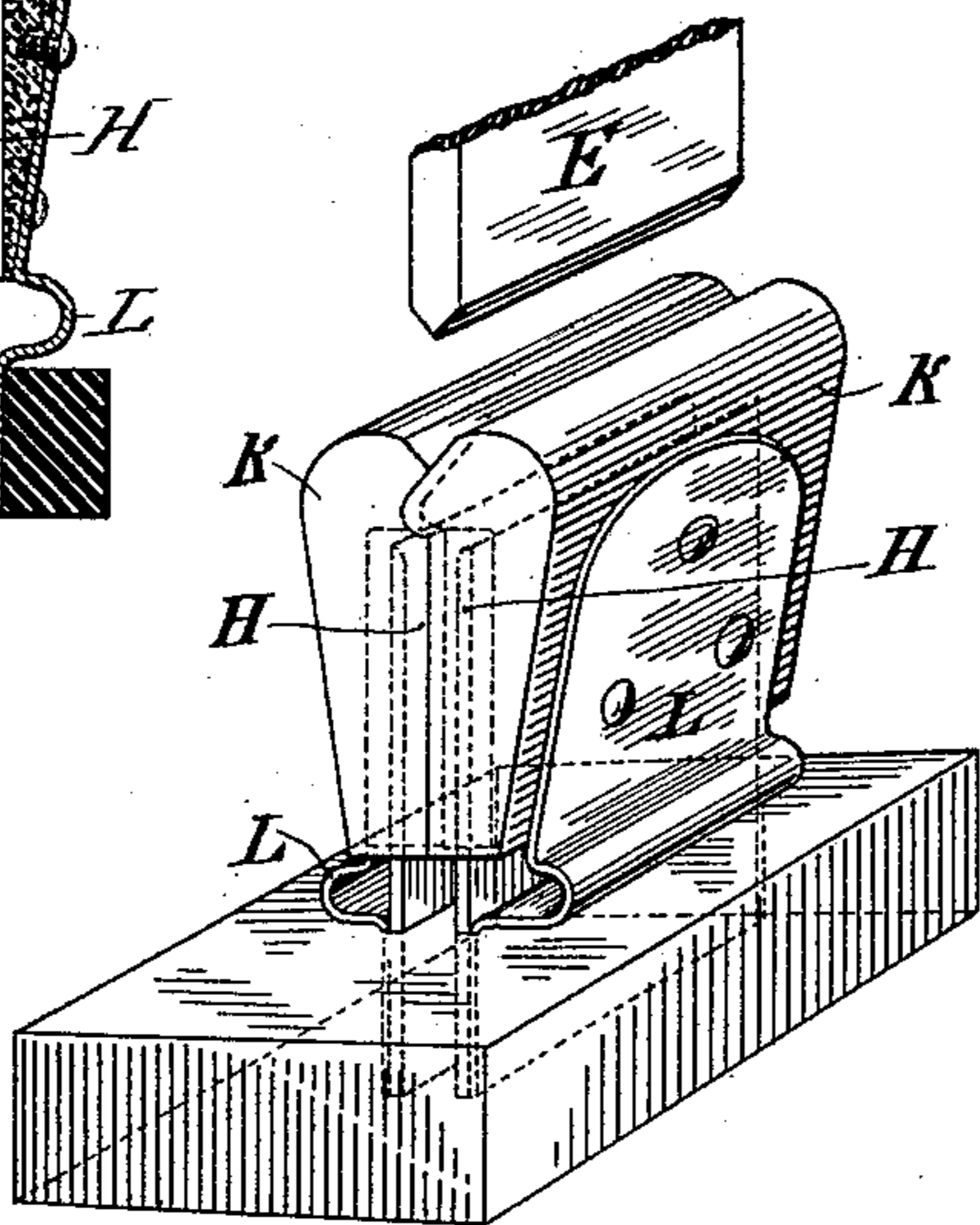


Fig. 2



Witnesses:
Raphael Vetter
James H. Catlow.

Inventors:
William B. Tobey
and Herbert W. Smith
by *Duncan Page* Att'ys.

UNITED STATES PATENT OFFICE.

WILLIAM B. TOBEY AND HERBERT W. SMITH, OF PITTSFIELD, MASSACHUSETTS.

CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 565,244, dated August 4, 1896.

Application filed August 28, 1895. Serial No. 560,734. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM B. TOBEY and HERBERT W. SMITH, citizens of the United States, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Circuit-Breakers, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The invention subject of our present application is an improvement in switches or circuit-breakers more especially designed for use with circuits carrying powerful currents and constructed with the object of preventing the formation or destructive action of an arc between the terminals at the time of their separation in the operation of interrupting the circuit of which they form a part.

In principle of construction and mode of operation the improvement is not broadly novel—that is to say, the operation of the device which is effective for the prevention of an arc depends upon the principle of interposing between the terminal points at the instant of their separation a body to intercept or to receive upon itself the arc, and thus prevent the deterioration of the contact plates or portions of the switch. We have, however, devised a special form of switch for this purpose, which acts also to blow out the arc and to more effectively shut off or isolate the terminal contacts after separation. Our improvement resides and consists in the device by which we accomplish this result.

In the accompanying drawings, Figure 1 is a view in side elevation with parts in section of the switch in the general form in which we construct it for practical use on high-voltage circuits. Fig. 2 is a perspective view of a typical form of the arc-preventing mechanism which we have devised. Fig. 3 is a cross-section of the device of Fig. 2.

The means for preventing the formation of an arc exemplified in Fig. 2 may be applied to various forms of switch, but that shown in Fig. 1 is selected for the reason that it embodies certain other improvements in details of construction which contribute to the efficacy of the device as a whole. The said

device comprises an insulating-base A, on which is mounted a standard B, to which the switch arm or lever C, having a handle D, is pivoted. The two terminals to be bridged by the switch-arm are also mounted on the base A and connected with the circuit-wires in any ordinary and proper manner.

The arm or lever C is composed mainly of insulating material or so that no exposed metallic portion except the terminals is in electrical connection with any part of the circuit. The terminal plates E E extend downwardly from the lever, in which they are set and connected by a metallic bridge-piece F, embedded in the material of said lever.

The stationary terminals are, furthermore, inclosed in insulating-boxes G, having openings or slots in their tops, through which the blades E enter to engage with the terminals.

Fig. 2 illustrates the plan upon which these latter are constructed and which may be described as follows: H H are two metal plates (one would of course suffice, but two are preferable) in permanent connection with the circuit-wires in or under the insulating-base. These plates are inclosed by two hinged and spring-actuated or spring-supported shutters K K, which in the present case are shown as secured to the spring-plates L L, secured to the base A.

The shutters may be either of insulating or conducting material, but for high-voltage circuits are of insulating material and of somewhat greater dimensions than the contact-plates, so as, when pressed together by the action of the springs L, to completely inclose and shut in the said plates. They may also be provided, respectively, with a tongue and groove above the contact-plates, as shown at M, so that when closed a portion of one shutter bridges the line of junction of the two plates.

When the plate E is pressed down, it enters the groove formed by the beveled or rounded edges of the shutters and forces the latter apart. As it passes downward it engages with the two contact-plates and completes the circuit. When it is withdrawn, by raising the lever the shutters close together with considerable force, and so rapidly as to effectually

extinguish any arc that may tend to form between the contact-plates and the plate or blade E. Thus the plates are always preserved clean and bright and are not impaired by continued use.

When low-voltage currents are used, as in railroad systems, the shutters may be of metal or carbon and may be in electrical connection with the terminal plates. The arc which under such circumstances forms and which is apt to fuse the terminals more or less and leave small globules of molten metal on the same affects the shutters only and not the contact plates or surfaces, which latter, being tightly closed together the instant the blade E leaves them, are preserved intact and bright.

It will be understood, of course, that the shutters may be moved over a stationary blade, and that the details of construction in this and other respects may be varied without departure from the invention.

What we claim is—

1. The combination with the spring-actuated and normally-closed shutters of insulating material and the contact-plates embedded in their contiguous surfaces, of a blade or plate acting as a wedge for forcing apart the shutters when brought into engagement with the contact-plates, said shutters being adapt-

ed to close by the instantaneous reaction of the springs when the blade is withdrawn, as set forth.

2. The combination with the spring-actuated shutters having flat surfaces and intermeshing or overlapping parts held normally in contact by the springs, and contact-plates embedded in the contiguous flat surfaces, of a plate or blade acting as a wedge for forcing apart the shutters when brought into engagement with the contact-plates, as set forth.

3. The combination with the insulating-base and one or more pairs of contact-plates secured to and embedded in the surfaces of oppositely-spring-actuated and normally-closed shutters mounted on the base and inclosed in insulated boxes with openings therein, of a lever carrying one or more plates or blades adapted to enter the openings in the boxes and force apart the shutters to engage with the contact-plates carried thereby, as set forth.

In testimony whereof we have hereunto set our hands this 20th day of August, 1895.

WM. B. TOBEY.

HERBERT W. SMITH.

Witnesses:

JOHN F. KELLY,

C. C. CHESNEY.