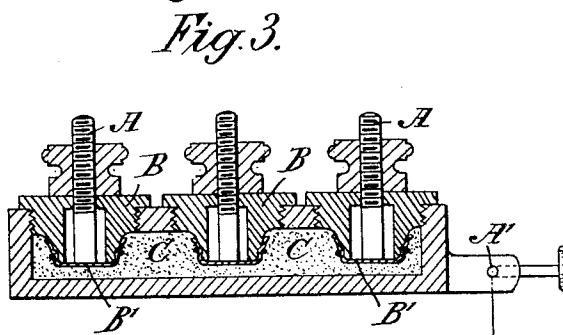
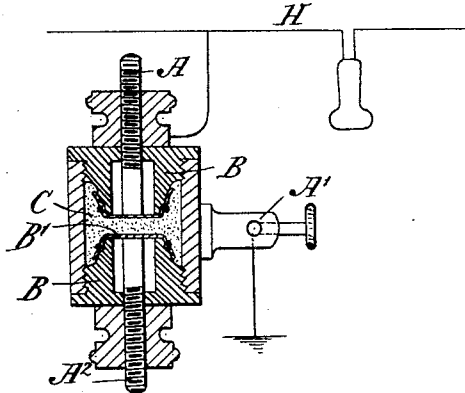
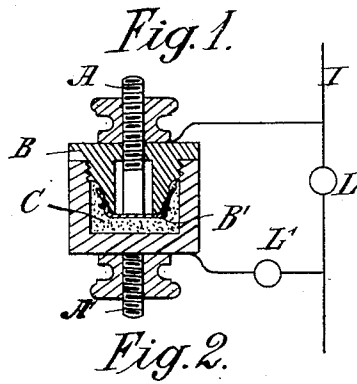


(No Model.)

E. JOKL & W. M. CHRISTIAN.
SAFETY SWITCH.

No. 570,808.

Patented Nov. 3, 1896.



Witnesses:

E. J. Griswold
S. C. Connor

Inventors:

Edmund Jokel
and
Wilhelm M. Christian
By their attorneys
Howson and Howson

UNITED STATES PATENT OFFICE.

EDMUND JOKL AND WILHELM MAXIMILIAN CHRISTIAN, OF VIENNA,
AUSTRIA-HUNGARY, ASSIGNORS OF ONE-THIRD TO GEORGE KEMP,
OF NEW YORK, N. Y.

SAFETY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 570,808, dated November 3, 1896.

Application filed August 14, 1896. Serial No. 602,774. (No model.) Patented in Austria March 27, 1896, No. 46/1,209.

To all whom it may concern.

Be it known that we, EDMUND JOKL, electrician, and WILHELM MAXIMILIAN CHRISTIAN, mechanist, subjects of the Emperor of Austria-Hungary, and residents of Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Safety-Switches, (for which we have obtained an Austrian patent, No. 46/1,209, III, March 27, 1896,) of which the following is a specification.

This invention has for its object an apparatus for throwing automatically into circuit reserve lamps or motors or resistances in place of such apparatus which have been destroyed or damaged so that the current cannot pass through them. The said apparatus may also be used as a protecting apparatus against damages by lightning or unduly strong currents.

In the accompanying drawings, Figure 1 is a sectional view of the improved apparatus as constructed for one line or apparatus to be protected or replaced by a reserve apparatus, respectively. Fig. 2 is a sectional view of the improved device as constructed for two lines or apparatus. Fig. 3 is a sectional view of the improved device as constructed for protecting three or more lines or for throwing into circuit three or more reserve apparatus in place of destroyed or damaged apparatus.

A is a pin or bolt, preferably of iron or steel, held in a plug or stopper B, preferably of insulating material, closing up tightly a casing or receptacle, preferably made of iron or steel and filled with mercury C, with which the terminal A' is in permanent contact. The inner portion of the plug or stopper B is bored out to a diameter slightly larger than that of the inner end of the bolt or pin A. The inner end of the bore in the plug or stopper is tightly closed by a piece B' of thin paper, celluloid, rubber, or other suitable insulating material tightly bound or otherwise secured to the said plug or stopper, so as to normally exclude the mercury C from the bore of the plug. The bolt or pin A is so adjusted as to bring its inner end into contact with the film or membrane B'.

The arrangement in circuit of the appa-

ratus depends on its purpose. In Fig. 1 it is designed to throw into circuit a reserve apparatus L' when the normally-used apparatus L is destroyed or so damaged that the current of the main line I, in which it is included, cannot pass through it. In this case the pin or bolt A and the terminal A' are connected with the main line I at opposite sides of the apparatus L, one of these connections including the reserve apparatus L'. Normally the current passes through the apparatus L because it cannot pass through the insulating film or membrane B' in the apparatus between the pin A and the mercury C, but if the apparatus L is destroyed or damaged the sudden interruption of the current produces an extra current or shock which finds its way through the film or membrane B' and perforates it. The mercury then enters the bore in the plug or stopper B and comes into contact with the pin or bolt A, thereby establishing a shunt to the apparatus L, in which the apparatus L' is included, and thus throwing the latter into circuit.

In Fig. 2 two stoppers or plugs B B are arranged, the one opposite the other, in one casing or receptacle, each being provided with a bolt or pin A A', insulated from the mercury C by a film or membrane B. The third terminal A' is shown to be connected to earth. This construction may serve to protect two lines, the one connected with the pin or bolt A and the other with A'.

In Fig. 2 the apparatus is shown as serving to protect the telephones or analogous apparatus in a weak-current line H against powerful currents (such as light currents or lightning) the said line H being connected with one of the pins A or A' and the terminal A' being grounded. When a powerful current enters suddenly the line H, the membrane or film B' will be perforated, as hereinbefore described, and the strong current goes to ground without causing any damage. Another line, such as II, may be connected with the other pin A or A', and this will remain serviceable even if the line H is grounded, as described.

In Fig. 3 three plugs B, with pins A and films or membranes B', are arranged in a common casing or receptacle filled with mercury

C and grounded at A'. In the latter construction the number of plugs may of course be varied at will. The operation is the same as hereinbefore set forth.

5 When the film or membrane is destroyed it is only necessary to take out the plug or stopper and to provide it with a fresh membrane or film and to again insert it into the casing or receptacle to make it serviceable.

10 We claim—

The combination of a casing or receptacle filled with mercury, one or more plugs secured to such casing and dipping into the mercury therein, conducting pins or bolts insulated
15 from the mercury and entering into such plugs the diameter of their inner ends being smaller than the diameter of the bore of the

plugs designed to receive such ends, insulating films or membranes tightly closing the ends of the bores of the plugs such films or
20 membranes being in contact with the inner ends of the pins or bolts and insulating them from the mercury in the casing or receptacle and a terminal permanently connected with
25 the mercury substantially as described and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

EDMUND JOKL.

WILHELM MAXIMILIAN CHRISTIAN.

Witnesses:

HANS LARNBER,

HARRY BELMONT.