No. 717,201. Patented Dec. 30, 1902.

J. W. HOWELL.

CUT-OUT.

(Application filed Feb. 2, 1901.)

(No Model.)

Fig. 1.

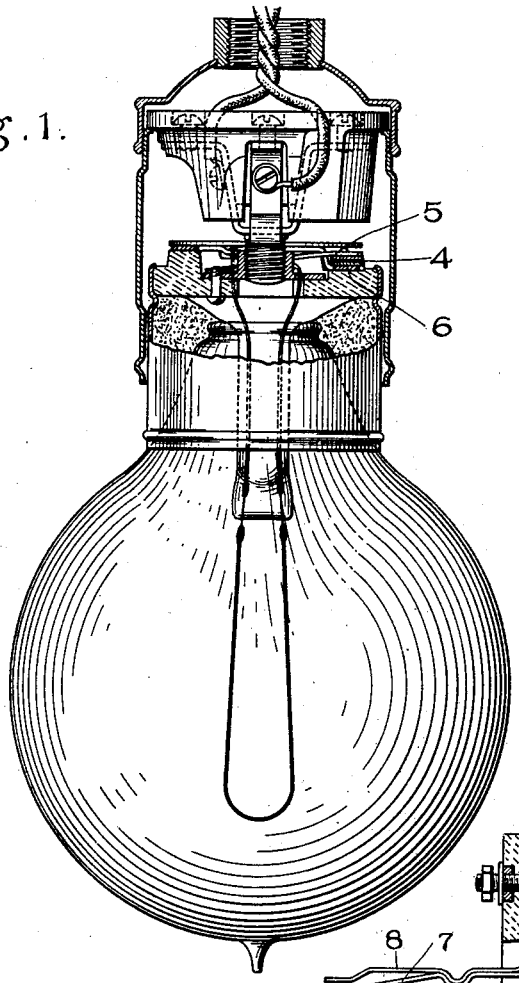


Fig. 3.

Fig. 4.

Fig. 5.

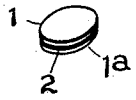


Fig. 2.

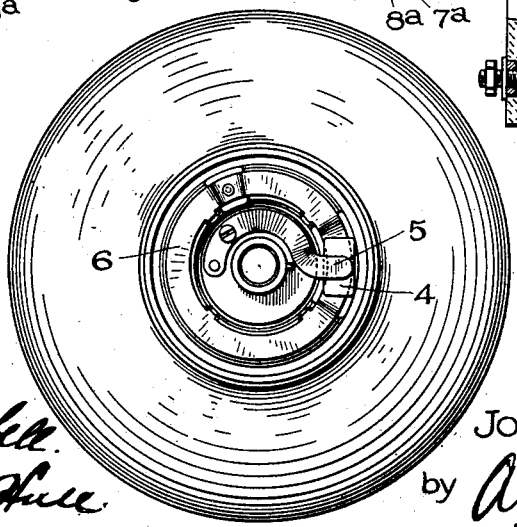
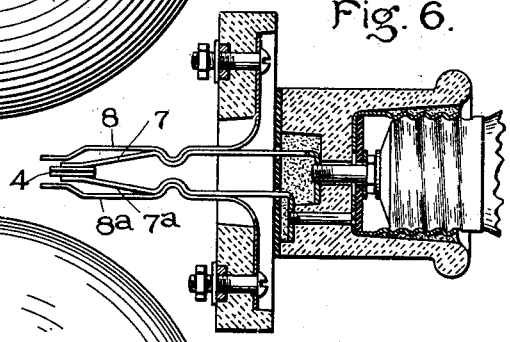


Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN W. HOWELL, OF NEWARK, NEW JERSEY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 717,201, dated December 30, 1902.

Application filed February 2, 1901. Serial No. 45,732. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HOWELL, a citizen of the United States, residing at Newark, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Cut-Outs, (Case No. 1972,) of which the following is a specification.

This invention relates to circuit-controllers of that type commonly called "cut-outs," by which a circuit or branch normally open is closed by the rupture of a dielectric between two contact points or surfaces when the potential at the opposing surfaces reaches a determinate value. These devices are frequently made by interposing thin films of insulating substance or fabric between two contact points or surfaces, which is broken down when the potential reaches the jumping-point. The devices are commonly placed in shunt to the translating device, such as an incandescent or an arc lamp, used on a series circuit, which shunt remains open by reason of the insulating properties of the dielectric between the contact-surfaces so long as the lamp is in working order; but if the mechanism of the arc-lamp becomes deranged, preventing the arc being struck, or the filament breaks or burns out the increase of potential ruptures the film and closes the shunt-circuit, thereby preserving the series circuit in working order. A difficulty arises in the use of these paper cut-outs from the unevenness of thickness of the paper fabric. The parts have been commonly arranged so that one of the contact-plates is provided with a point or struck-up protuberance bearing on the paper, and by reason of thin spots in the paper the point at which it will puncture is uncertain, so that the cut-out may break down at a lower potential than that intended or may not break down when it should. I find by experience that by forming the cut-out of two metal plates having perfectly flat surfaces between which is placed a film of paper much more uniform results are secured. I preferably soak the paper in shellac-varnish and permit it to dry and then press it between two perfectly flat metal plates, heating it and permitting it to cool while under pressure, thereby forming a single unit of the completed device, the parts of which are not separated, and providing for the exclusion of moisture from the opposing surfaces, thereby rendering the cut-out uniform in action and responsive to a predetermined potential.

The novel features of the invention will be more specifically pointed out hereinafter and will be definitely indicated in the claims appended to this specification.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a series incandescent lamp to which my improved cut-out has been applied. Fig 2 is a top plan view of such a lamp. Figs. 3, 4, and 5 are perspective views showing the construction of my cut-out. Fig. 6 is a sectional elevation of a modified form of socket for an incandescent lamp to which the cut-out may be applied.

Referring first to the detail views, Figs. 3, 4, and 5, the complete device is shown in Figs. 3 and 5, the former a rectangular type and the latter a circular type. 1 1^a represent two plates of metal polished on one face, and 2 a sheet of tissue-paper, for which I prefer to use Japanese paper about three-fourths millimeter in thickness, soaked in an alcoholic solution of shellac and dried. This is placed between the smooth faces of the plates, heated, and put in a clamp and permitted to cool, and by this means the two plates are separated a uniform distance in all specimens of the device, the flat faces of the plates preventing them from approaching if a thin spot occurs in the paper, as is the case with types of these devices where two rounded contacts are employed. The size of the plates may vary; but I have found that pieces of metal one-fourth by one-half inch are a convenient size to employ in practice and give satisfactory results. The shellac causes perfect adhesion of the pieces and permits the device to be handled as a unit without loss of any of the parts and preserves a uniform rupture-point by preventing entrance of moisture to the contact-faces. The device may be employed with any type of translating device where it is desired to close a circuit when the dielectric breaks down.

In Figs. 1, 2, and 6 I have shown the device as applied to a series incandescent lamp, the cut-out being placed in shunt to the lamp-ter-

minals, as shown at 4, 5 being a metal tongue screwed fast to one terminal and lying over the brass ring 6, connected with the other terminal in such relation that when the cut-out is slipped under the tongue a shunt to the lamp-filament is completed, open only at the dielectric film between the plates 1 1^a of the cut-out.

The lamp shown is of a well-known form of construction and need not be described in detail.

In Fig. 6 the cut-out is shown at 4 as interposed between two flexible strips 7 7^a, connected to the terminals of the lamp-socket and adapted to be inserted between two spring-tongues 8 8^a, mounted on a fixed switchboard or base at which the circuit connections are made. With this construction the lamp and its socket may be withdrawn from the switchboard and the film cut-out inserted between the springs 7 7^a and the whole then inserted in the switchboard. So long as the lamp is acting properly the film remains intact; but if the lamp-filament should become broken or ruptured the film is broken down and cross connection made between springs 7 7^a, thereby completing the line-circuit independent of the lamp.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A cut-out for a translating device, comprising two flat metallic surfaces having interposed between them a thin film of a dielectric material, the whole being bound together so as to be handled as a unit.

2. A cut-out for a translating device, composed of plates of metal separated by an insulating-film and secured together so as to be handled as a unit.

3. A cut-out for a translating device adapted for insertion between spring-jaws, comprising two rigid pieces of metal having an intervening solid insulating-film held between similarly-shaped opposing surfaces coincident with the opposite surfaces of the film to provide a considerable area of contact.

4. A film cut-out for a translating device, comprising two rigid plates made of metal having true parallel surfaces separated by a film of shellacked insulating fabric and pressed together with uniform pressure over a wide contact-surface.

5. A film cut-out for an electric translating device, comprising two pieces of metal having true opposing surfaces separated by a shellacked film of insulating material and held in adhesive engagement by said shellacked film.

6. A cut-out for an electric translating device, comprising two flat pieces of metal having smooth opposing surfaces, and an intervening film of shellacked paper adhering to the surfaces.

In witness whereof I have hereunto set my hand this 31st day of January, 1901.

JOHN W. HOWELL.

Witnesses:
S. N. WHITEHEAD,
JOS. D. FREDERICKS.