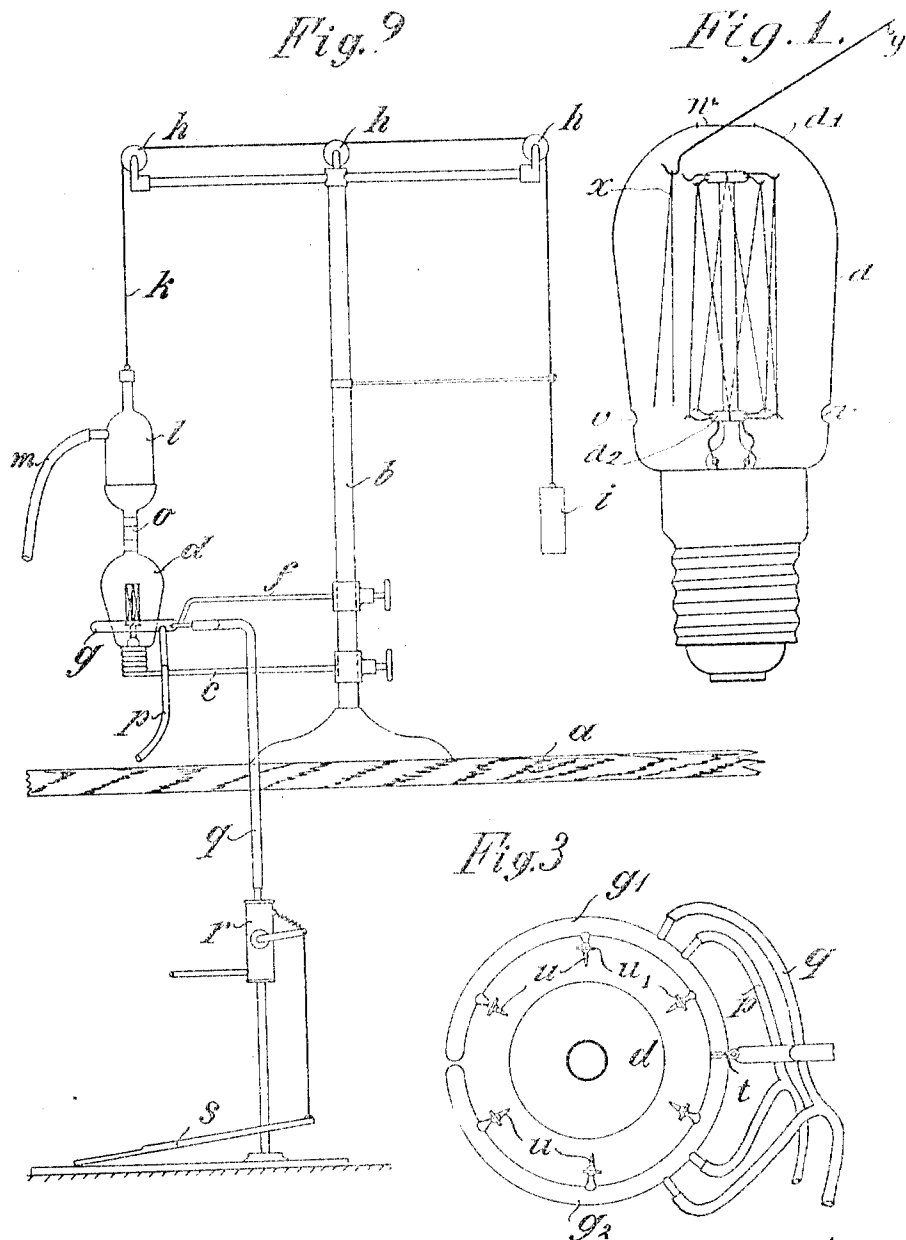


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 APPARATUS FOR REPAIRING ELECTRIC METALLIC FILAMENT LAMPS.
 APPLICATION FILED OCT. 4, 1911. RENEWED APR. 2, 1913.

1,061,583.

Patented May 13, 1913.



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APPARATUS FOR REPAIRING ELECTRIC METALLIC-FILAMENT LAMPS.

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Specification of Letters Patent.

Patented May 13, 1913.

Application filed October 4, 1911, Serial No. 652,791. Renewed April 2, 1913. Serial No. 758,489.

To all whom it may concern:

Be it known that we, OSKAR ARENDT and CURT SCHLESINGER, subjects of the German Emperor, and residing, respectively, at Berlin and Strassburg, in Alsace-Lorraine, Germany, have invented a certain new and useful Improved Apparatus for Repairing Electric Metallic-Filament Lamps, of which the following is a specification.

Our invention relates to an apparatus for repairing and regenerating metallic filament lamps having fractured filaments which are to be replaced by new ones.

According to our apparatus of repairing metallic filament lamps, according to the number and position of the fractured filaments to be renewed in each instance we make, besides the hole at the point of the glass bulb, one or more holes in the glass bulb, preferably by means of a blowpipe flame, in such manner that the old filaments can be detached and removed through the additional holes, new cement inserted, and the cementation of the new filament introduced through the end of the bulb into the same brought about by means of a blowpipe flame. The metallic filaments can be specially readily detached through these additional holes near their points of attachment, and the entire repair with the exception of introducing new filaments can be perfectly safely executed through these holes. Particularly, the important cleaning of the electrodes can be done through these holes before the new cement is applied. The cemented places themselves must be heated as highly as possible, but this high temperature of the cemented joints should not, if possible, be imparted to the filaments. It is therefore preferable to employ a blowpipe flame, which, while having a great heating action, has as small a heating surface as possible, so that the heat is as much as possible confined to the joints and the duration of the heating is as short as possible. The additional holes near the cap of the lamp which are closed after the repair is finished in no way impair the good appearance of the glass bulb. After the repair is finished a tube is fused in known manner to the hole at the point of the bulb for the purpose of evacuating the bulb and possibly regenerating the filament if it has not been destroyed.

When a number of filaments or all the filaments of metallic filament lamps are in-

jured and have to be exchanged, according to our invention we simultaneously make a number of holes in the neighborhood of the cemented joints in a very short time by means of an oxygen blowpipe by fusing the glass, the oxygen blowpipe having a number of nozzles arranged in a circle about the lamp bulb and being divided into two parts connected by a hinge. For accelerating the operation of making the holes compressed air may be blown into the glass bulb through the hole in the end of the lamp.

In the accompanying drawing:—Figure 1 shows in elevation a metallic filament lamp during the repairing operation, Fig. 2 is an elevation diagrammatically showing apparatus for providing a number of repair holes by means of a circular set of nozzles, and Fig. 3 shows on an enlarged scale a plan of the nozzles of the oxygen-lamp employed in the apparatus according to Fig. 2.

Referring to Fig. 1, the glass bulb *d* of the metallic filament lamp to be repaired has, besides the end hole *w*, repair holes *v* made by fusing by a blowpipe near the cemented joints of the metallic filaments to be renewed. As indicated in the drawing, a new metallic filament *x* is inserted through the hole *o* by means of a hooked wire *y*, which filament is attached to its supports *d*¹, *d*² by means of jets of flame introduced through the holes *v*.

Referring to Fig. 2, on the table *a* stands a support *b* having adjustable holders *e*, *f*, of which *e* carries the glass bulb *d* of the lamp to be repaired, while the holder *f* holds the blowpipe ring *g*. An air vessel *l*, connected to a compressed air pipe *m*, is suspended on a cord *k* running over pulleys *h* and carrying a counterweight *i*. The lower open end of the air vessel *l* is connected airtight by means of a rubber tube *o* to the open end of the bulb *d*. The gas pipe leading to the ring provided with nozzles is designated *p*, and the air supply pipe *q*. The supply of air can be shut off by means of a valve *r* in known manner by a foot lever *s* under the table *a*.

As shown in Fig. 3 the two parts *g*¹ and *g*² of the ring burner are connected by a hinge *t* and provided with a number of nozzles *u* each having a cock *u*¹. All the blowpipe flames or a definite number thereof can be allowed to act on the lamp at once as required.

After the opened lamp *d* has been placed

on the holder *c*, the air vessel *l* provided with a rubber tube *o* is connected to the hole *w* in the bulb. Now if the bulb is heated at previously marked places by means of the flames of the burner, for which purpose the nozzle tubes are preferably adjustable by means of ball joints, the holes are made automatically in a very short time under the action of the compressed air in the air vessel *l*. When they have been made, by depressing the lever *o* the air valve *r* of the blowpipe tube is shut off, whereupon the flames no longer contact with the bulb. When a little skill is exercised in making the holes in the bulbs the entire operation occupies only about half a minute.

We claim:—

1. In apparatus for use in repairing electric metallic filament lamps having fractured filaments, the combination, with a support having a holder for carrying a defective lamp, of a blowpipe burner carried by the support in operative relation to a lamp carried by the holder for fusing one or more holes in the bulb of the lamp at the cap end thereof, an air vessel carried by the support for connection to the pointed end of a lamp carried by the said holder, and means for supplying gas to the burner.

2. In apparatus for use in repairing electric metallic filament lamps having fractured filaments, the combination, with a support having an adjustable holder for carrying a defective lamp, of a blowpipe burner adjustably carried by the support in operative relation to a lamp carried by the holder for fusing one or more holes in the bulb of the lamp at the cap end thereof, an air vessel adjustably carried by the support for connection to the pointed end of a lamp carried by the said holder, and means for supplying gas to the burner.

3. In apparatus for use in repairing electric metallic filament lamps having fractured filaments, the combination, with a support having a holder for carrying a defective lamp, of a blowpipe burner carried by the support in operative relation to a

lamp carried by the holder for fusing one or more holes in the bulb of the lamp at the cap end thereof, a counterpoised air vessel suspended from the support for connection to the pointed end of a lamp carried by the said holder, and means for supplying gas to the burner.

4. In apparatus for use in repairing electric metallic filament lamps having fractured filaments, the combination, with a support having a holder for carrying a defective lamp, of a circular, two-part, hinged burner having a plurality of closable nozzles carried by the support in operative relation to a lamp carried by the holder for fusing one or more holes in the bulb of the lamp at the cap end thereof, an air vessel carried by the support for connection to the pointed end of a lamp carried by the said holder, and means for supplying gas to the burner.

5. In apparatus for use in repairing electric metallic filament lamps having fractured filaments, the combination, with a support having a holder for carrying a defective lamp, of a circular, two-part, hinged burner having a plurality of closable and adjustable nozzles carried by the support in operative relation to a lamp carried by the holder for fusing one or more holes in the bulb of the lamp at the cap end thereof, an air vessel carried by the support for connection to the pointed end of a lamp carried by the said holder, and means for supplying gas and air to the burner.

In testimony whereof we affix our signatures in the presence of two witnesses.

OSKAR ARENDT.

CURT SCHLESINGER.

Witnesses as to the signature of Oskar Arendt:

WOLDEMAR HAUPT,
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Witnesses as to the signature of Curt Schlesinger:

OTTO BÜTTLER,
EDUARD PÖHLAND.