Sept. 2, 1941. E. A. REUTER 2,254,857

ELECTRODE SUPPORT

Filed May 31, 1939

Fig. 1.

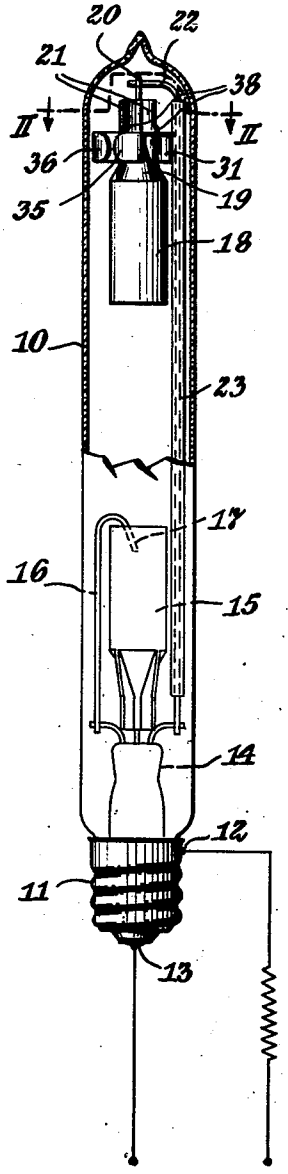


Fig. 2.

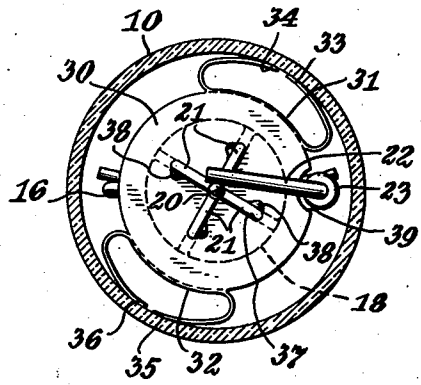


Fig. 3.

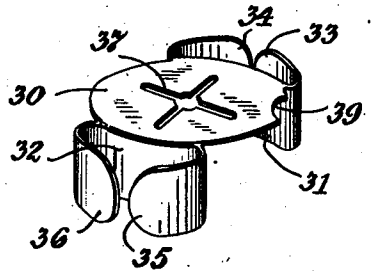
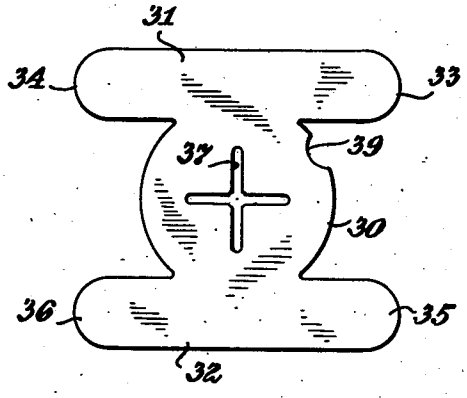


Fig. 4.



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2,254,857

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ELECTRODE SUPPORT

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Application May 31, 1939, Serial No. 276,595

3 Claims. (Cl. 176—126)

My invention relates to electrode supports and particularly to a support for the upper electrode portion of a single-ended discharge device.

An object of the invention is to provide a flexible yet sturdy conductive support for an electrode.

Another object of the invention is to provide a contact member between the glass walls and the electrode, which member is of a material that will harden on slow cooling.

Other objects and advantages of the invention will be apparent from the following description and drawing in which

Figure 1 is a view in front elevation of my invention incorporated in a specific type of discharge device.

Figure 2 is a view on lines II—II of Figure 1.

Figure 3 is a perspective view of my electrode support prior to being placed on the electrode.

Figure 4 is an outline blank of metal from which the electrode support is shaped.

The broad purpose of the invention is to provide a centralizing of the upper electrode of a discharge system supported from a single press at one end of the discharge device. It is a specific object of my invention to provide a sturdy yet conductive centralizing support between an electrode and the glass walls of the discharge device. In discharge devices, particularly those embodying a glow or a long positive column, there are apt to be charges deposited on the glass walls near the electrode. If these charges are permitted to remain upon the insulating surface, they may divert the discharge path to some extent thereto. This application constitutes an improvement on the copending application of Philip W. Blackburn, Serial No. 272,966, filed May 11, 1939, for Trigger for discharge devices.

As stated, the specific object of my invention is to provide an electrode support that will be sturdier and capable of withstanding the heat treatment of metal parts during exhaust. My invention has been illustrated in Figures 7 and 8 of the Blackburn application referred to and constitutes an improvement over the support illustrated in the other figures thereof.

In Figure 1 of this application, I have illustrated a particular type of discharge device utilized for sterilizing purposes. This tube comprises an elongated container 10 of very high ultraviolet transmitting qualities. The lower end 11 of this device is illustrated with the usual screw threaded base with its two contacts 12 and 13, but any type of electrode contact may, of course, be used.

From this base is supported the press 14 with the near electrode 15 having adjacent thereto the trigger electrode 16 bent over the upper rim of the electrode 15 to the interior thereof at 17 to provide a reliable starting tip for the discharge. The upper electrode 18 is preferably a duplicate of the lower electrode 15 in that it comprises a hollow cylindrical body portion terminating in a closed cone-shaped end 19 bent around a rod connector 20 and having the excess folds of material formed into four fins 21 about the cone 19 and continued for a short distance about the rod 20. Of course, any number of integral fins could be selected if desired. Other types of electrodes may be used without fins but, as explained below, my support can be attached to this type of electrode without any additional securing means that might be necessary with these other types of electrodes.

The connection 22 to the connecting rod 20 extends down toward the press 14 and is preferably covered with a glass insulation 23. These features are more particularly described in the prior referred to copending application of Philip W. Blackburn.

As previously stated, my invention concerns a sturdy but resilient support for the upper electrode 18 to center it within the tube and also to provide a conductive path for the absorption by the electrode 18 of any charges deposited upon the glass walls 10. In order to accomplish this purpose I preferably utilize a blank of material, shaped as illustrated in Figure 4. This shape is, in general, of a central circular sheet portion 30 having two extended longitudinal portions 31 and 32 at opposite sides thereof. These longitudinal portions are preferably rounded at the projecting ends 33, 34, 35 and 36. While I have found two portions 31, 32 to be sufficient, more portions may be used preferably symmetrical about the central portion 30.

The central circular portion 30 is perforated in the cross or X form 37 in order to accommodate the space occupied by the integral fins 21 and central rod portion at approximately the end of the cone portion 19. The particular shape of this perforation depends on the shape of the electrode. The longitudinally extending portions 31 and 32 are bent downwardly, preferably at a right angle to the plane of 30, and then have their ends 33, 34, 35 and 36 bent outwardly reversely to the body portion of 31 and 32, to form an incomplete or interrupted arc with the opposite end, as disclosed in perspective in Figure 3. This interrupted arc of the two ends will pre-

vent overheating by induction during the heat treatment of the tube. I prefer this shape to having the ends 33, 34, 35 and 36 extending directly outward.

This member is then slipped over the electrode and forced down until it rests on the start of the cone-shaped portion 19, as illustrated in Figure 1. The integral fins 21 may be pressed out slightly on one side above the electrode support, as illustrated at 38 in Figures 1 and 2, in order to hold this support in place. A portion 39 of this device may be removed when the blank was first formed in order to accommodate the standard 23 connected to the upper electrode.

If other types of electrodes are used, the perforation in the central portion may be replaced by welding or other fastening means or may be altered or eliminated to accommodate other types.

One of the problems in connection with this device was the selection of a suitable material. The device during manufacture will be heat treated by induction at a fairly high temperature to remove absorbed gas in the metal parts and this high temperature would ordinarily tend to soften the usual metal selected for resilient support. The metal that I have selected, however, hardens by slow cooling and in consequence thereof, when the tube is cooled to the ambient temperature, the metal will have retained its original hardness.

The metal I have selected is preferably that of 63% to 70% nickel, 2 to 4% aluminum, 2% maximum of iron, 1% maximum of manganese, .25% maximum of carbon, .50% maximum of silicon, a maximum of 1% other metals except copper, which provides the remainder approximately from 23 to 35%. The preferred percentages of these metals is 66% nickel, 29% copper, 2.75% aluminum, .9% iron, .4% manganese, .15% carbon, .25% silicon, .006% sulphur. This metal will stand the high temperature of heat treatment and upon cooling to ambient temperature, will retain its initial hardness.

An examination of Figure 2 will disclose the firm resilient pressure exerted against the glass container walls by the tips 33, 34, 35 and 36 of this electrode support. The particular shape of the support will also permit the rapid handling and assembly of the device in quantity production. The close contact of the tip members will also readily absorb any charges from the glass wall 18 and prevent any disturbance of the glow between the main electrodes. The sturdy resilient support disclosed will also permit the tube to withstand the shocks and jars of shipment.

It is apparent that many modifications may be made in this preferred embodiment and preferred application without departing from the spirit and scope of the appended claims.

I claim:

1. A metallic support for an electrode comprising a sheet portion, depending portions from said sheet portion, said depending portions having free ends, said free ends outwardly extending and reversely curved, said support being comprised of 63 to 70% nickel, 2 to 4% aluminum, 23% to 35% copper and the remainder from the group of iron, manganese, carbon and silicon.

2. A metallic support for an electrode comprising a sheet portion, depending portions from said sheet portion, said depending portions having free ends, said free ends outwardly extending and reversely curved, said support being of metal that hardens on slow cooling.

3. A metallic support for an electrode comprising a sheet portion having depending portions, said portions having free ends, said free ends extending outwardly and being reversely curved.

EDMUND A. REUTER.