

Nov. 19, 1940.

L. SUTHERLIN

2,222,005

MOUNTING AND FLASHING GETTER

Filed Oct. 31, 1939

Fig. 1.

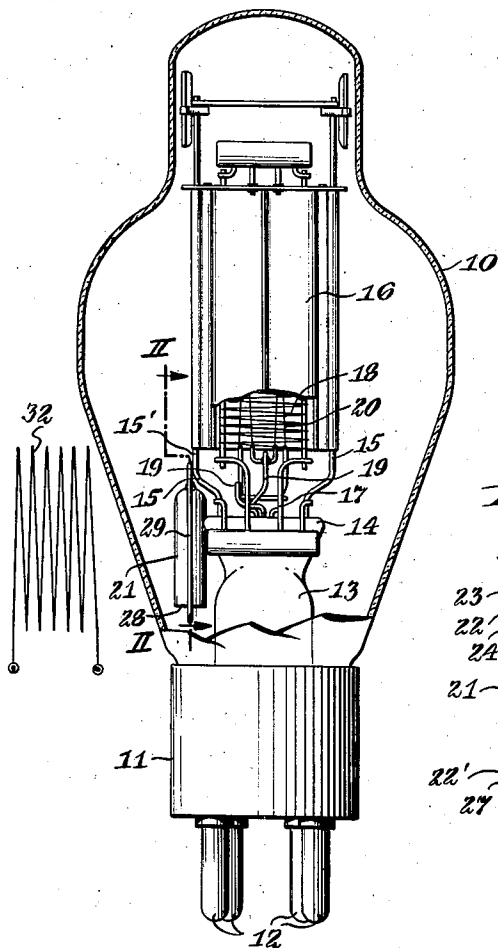


Fig. 2.

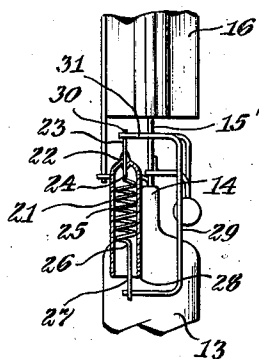


Fig. 3.

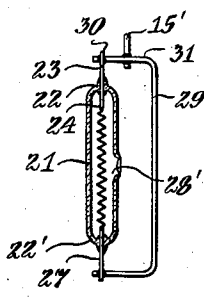


Fig. 4.

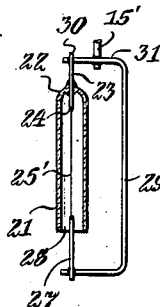


Fig. 5.

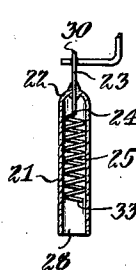


Fig. 8.

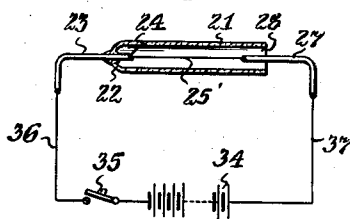


Fig. 9.

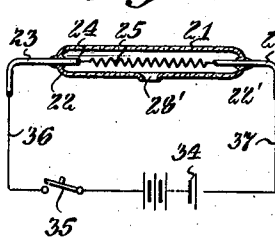
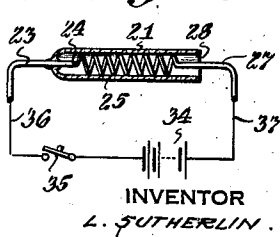


Fig. 6.



INVENTOR
L. SUTHERLIN
BY *John H. Moore*
ATTORNEY

UNITED STATES PATENT OFFICE

2,222,005

MOUNTING AND FLASHING GETTER

Lee Sutherlin, Caldwell, N. J., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application October 31, 1939, Serial No. 302,113

1 Claim. (Cl. 250—27.5)

My invention relates to an electronic discharge device and especially to a getter assembly for such a device.

5 An object of the invention is to provide a getter assembly especially adapted for the utilization of an alkaline earth getter.

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

10 Fig. 1 is a view in elevation of a discharge device disclosing a preferred embodiment of the invention.

Fig. 2 is a cross-section on lines II—II of Fig. 1.

15 Figs. 3, 4, 5, 6, 7, and 8 are modifications of the getter assembly disclosed in Figs. 1 and 2.

I have found that alkaline earth material, and especially barium, is very effective as a getter in absorbing undesirable gases inside of an electronic discharge device. The difficulty with this material is that it is a very good emitter of electrons, even at temperatures below a visible redness. When barium is utilized with the usual getter assembly construction, the barium is apt to deposit on certain electrodes which are operated more negative than one or more other electrodes in the tube. The result is an emission of electrons from this more negative electrode, and the resultant action is an undesirable discharge that disturbs the desired action of the tube.

My invention is especially designed to utilize the desired getter qualities of alkaline earth material and especially barium so that there will be no danger of the getter being deposited on the electrode structure.

25 In Fig. 1 I have disclosed an electronic discharge device of a preferred construction, although other types of tube can, of course, be utilized with my getter construction. This tube comprises a glass container 10 having a base 11 with the usual prongs 12 extending therefrom. The glass container has a reentrant portion 13 extending from the interior of the base 11 to form a press 14 through which extend a plurality of standards and supports for the electrode structure as disclosed in the preferred embodiment, standards 15 support an anode 16, standards 17 support a grid structure 18, and standards 19 form a connection and support to the cathode 20.

This electrode structure can, of course, be changed to any of the desired electrode assemblies, the most common one being the addition of further grid structure. It will be noted that one of the standards 15 for the anode is bent out

beyond the edge of the press 14 and accordingly provides a very suitable support for my getter assembly, which is disclosed in its preferred embodiment more clearly in Fig. 2.

The getter assembly comprises a hollow tube 21 which is preferably of glass, although other insulation material such as a ceramic material may be utilized. This hollow insulating tube preferably has a closed end 22 through which is sealed a conductor 23. This conductor may be of nickel or dumet, or any of the other conductive metals which will seal readily into the material selected for the tube. The size of this conductor 23 is such that it will not be heated to redness by the current utilized to flash the getter. I prefer to utilize approximately 30 or 40 mil. wire for such conductor.

The conductor 23 has an interior end 24 to which is attached a filament 25 of an alkaline earth material. This material may take various forms. One very desirable type is a barium wire surrounded by a thin sheet of nickel or iron. Another form is a combination of barium and strontium, preferably in the form of carbonates coated on a tantalum wire or ribbon. Other combinations of barium, strontium, and calcium may be utilized.

I prefer to coil the getter wire as disclosed in Fig. 2 in order to provide a considerable quantity of getter material. The getter filament is located entirely within the insulating tube. To the other end 26 of the getter filament I prefer to attach a conductor 27 that extends through the open end 28 of the insulating tube 21. A connection 29 extends from this conductor 27 to form a closed loop with the exterior end 30 of the first-mentioned conductor 23 sealed through the closed end of the insulating tube 21.

If desired, the various connecting parts 27, 29, and 23 may form an integral connection or have fewer individual pieces. The connection 29 as disclosed is of U-shaped form joining the end 30 to the conductor 27, and the upper side 31 of this U-shaped form may be conveniently welded or otherwise secured to the bulging standard 15' of the anode support. The getter may be flashed when desired by a high frequency coil 32 which is brought to the side of the tube, as disclosed in Fig. 1, to induce a high frequency in the closed loop disclosed in Fig. 2.

As previously mentioned, the connecting portions to the alkaline earth material are large enough in diameter so that the flashing heat is generated entirely in the coil of the getter material 25. It will also be noted that the tube 21

has its axis pointing directly downward, parallel with the axis of the press, and the getter vapor will pass directly downward into the bottom portion of the container supported on the base 11. 5 Because of this restricted path, there will be no danger of the getter material being deposited on the electrode structure or its supports above the press 14.

In Fig. 3 I have disclosed a modification in 10 which the tube 21 has two closed ends 22 and 22' and has a restricted opening 28' in the side thereof for flashing the getter against the walls of the container 10. This structure is not as desirable as that of Fig. 2. The filament may also 15 take the form of a straight, thin wire 25' as disclosed in Fig. 4. If considerable high frequency power is available, the filament 25 may be merely a coil of wire attached at one end to the conductor 23 passing through the tube 21, 20 and this filament may have a free end 33 located within the insulating tube. This construction, however, is not as desirable as the other modifications.

The getter construction can also be utilized with 25 direct current or low frequency by bringing out leads from both ends of the alkaline earth filament and applying a suitable current thereto. This construction as applied to the shape of material is illustrated in Figs. 6, 7, and 8 in which

a flashing current is applied to the filament by means of a source 34 controlled by a switch 35 through two leads 36 and 37 to the conductors 23 and 27 connected to the getter material. Figs. 6, 7, and 8 represent the particular insulating 5 tube and filament construction in Figs. 2, 3, and 4.

It is apparent that many modifications may be made in the arrangement of the particular construction of my getter assembly and also in the application thereof to various types of tubes. 10 Accordingly, I desire only such limitations to be imposed upon my invention as are necessitated by the spirit and scope of the following claim.

I claim:

A discharge device comprising a container hav- 15 ing a base, a press extending from said base, standards extending from said press, an electrode structure supported on said standards, an elongated tube of insulation closed at one end and open at the other end, a conductor sealed 20 through said tube of insulation, a filament of alkaline earth material within said tube connected to said conductor, and a conductive support attached to one of said standards and said conductor, said support maintaining the tube of 25 insulation lateral of said press with the open end pointing toward said base and away from said electrode structure.

LEE SUTHERLIN.