

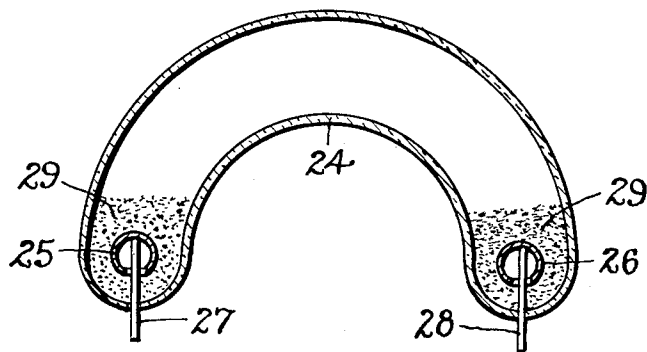
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STATIC DISCHARGE DEVICE

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STATIC DISCHARGE DEVICE

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2 Claims. (Cl. 320—1)

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This invention relates to the action of static and kinetic electricity and aims to provide a novel device for obtaining or controlling static discharges so as to be useful for various purposes, such as for enabling static charges to be broken up into numerous small charges for a prolonged discharge thereof as current of less voltage than a sudden discharge of the initial energy would produce, for enabling a current of low voltage to flow in a circuit subject to a high voltage, for replacing a resistance without producing heat like in the resistance, or for obtaining a modified form of radiant energy in place of the radiant energy produced by a sudden discharge.

Another object is the provision of a device of the character indicated which is simple in construction and which will have a long life.

In the drawing the figure is a median section of one form of the invention.

The device comprises an envelope 24 of glass or other insulating material which, as shown, is an arched tube so in the operative position of the envelope it has its end portions extending downwardly thereby providing pockets. Electrodes 25 and 26 in said pockets are supported by the respective wires or terminals 27 and 28 which are fused through the ends of the tube so the electrodes can be connected in an electric circuit. The tube is partially filled with gas carbon, lamp black or equivalent powder which conducts electric energy. This powder in each pocket receives a static charge given to the electrode therein and the powder is sufficiently fine so as to be capable of being repelled as herein-after described.

The tube or envelope should be of transparent material if all colors of the spectrum are to be radiated from within the tube but the tube can be translucent for less than all colors. Although gas carbon or lamp black will serve the purpose for a powder, a powdered metal or other conductive substance can be used, and a sufficient quantity is provided in an envelope of appropriate size in order to accomplish the results described hereinafter. The size and form of the tube and the depth of the powder above the electrodes depends on the use to which the device is put. For some purposes the tube is evacuated so the powder is active in a vacuous space between the electrodes, but for other purposes the tube contains an inactive conductive gas or any other suitable gas under any desirable pressure.

In using the device for producing radiant energy, one electrode is charged with positive electrical energy by means of a dynamo, static

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machine, electrophosphorous, or other source, while the other electrode is charged with negative electrical energy from a complementary source. The charges given to the electrodes will pass through the powder about them so as to charge the particles at the surfaces of the masses thereof. The particles at the upper surfaces are free to rise in and from the pockets and to move to the intermediate portion of the tube. This lofting of such free particles in each pocket will occur on account of their mutual repulsion and the continued charging effect from the electrode as particles are repelled. The particles at the upper surfaces of the masses are ionized, and become anions in one pocket and cations in the other pocket. These particles in being ionized tend to crowd each other with a buckling effect so as to loosen and repel some of them, as the charging is continued. The oppositely-ionized particles when lofted are attracted toward each other at the intermediate raised portion of the tube, and as they meet they neutralize their charges, electrons passing from the anions to the cations. This causes an agitation as discharges of particles occur, and useful radiant energy is thus produced, the wave length or lengths of which will depend on various factors involved. Light will be emitted if waves of the proper length are created by the agitation. The radiation is useful according to its wave lengths. When discharged particles drop down, they gravitate in opposite directions from the intermediate portion of the tube into the pockets, due to the formation of said portion of the tube. Discharged particles may be struck by charged particles as they pass each other or start to do so, which will extend the agitation toward and even into the pockets. The degree of agitation varies with the amount of charges given to the electrodes.

This device can be used in lieu of resistance elements in that the gap between the electrodes stops the passage of current excepting for such flow as is provided by the movement of the charged particles from the electrodes for contact between them as the electrons are conveyed with little or no resistance to their transfer. A number of the devices may be connected in multiple with the same result in each since high voltage energy in the circuit of the parallel devices cannot negotiate the gap in any of them without the aid of the particles of powder as they act as conveyors. A supply of high voltage can keep a number of the devices supplied with sufficient energy to keep the powders in some or

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all of them moving in the same manner for a reduced voltage. In this respect the devices are quite different from resistances connected in parallel. Instead of the electrons generating heat in having to move past particles of a resistance medium which are as obstacles, the electrons are carried by particles which move freely though slower than free electrons from the cathode to the anode. The particles are burdens for the electrons as they negotiate the gap between the electrodes but this provides a retarded discharge of lower voltage than the voltage of the initiating charge and the particles as carriers of electrons are needed in order to obtain the passage of those smaller particles of energy. The static charges given to the electrodes are broken up into numerous small charges by the particles of powder, thus making a more prolonged discharge as current of less voltage than a sudden discharge of the initial energy would produce.

What is claimed is:

1. A device of the character described comprising an envelope, two electrodes therein, and

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conductive powder in and only partially filling said envelope, said envelope being of such form that the powder in the operative position of the envelope gravitates in opposite directions to and in contact with the electrodes from a point between them, and said powder being sufficiently fine so as to be repelled from the electrodes by electrical charges received therefrom.

2. A device according to claim 1 wherein the envelope is a tube having its end portions extending downwardly and containing the electrodes and having its intermediate portion of the form set forth.

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The following references are of record in the file of this patent:

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