M. HARTENHEIM.

RADIOACTIVE DEVICE.

APPLICATION FILED MAY 27, 1918.

1,317,082. Patented Sept. 23, 1919.

Fig. 1.

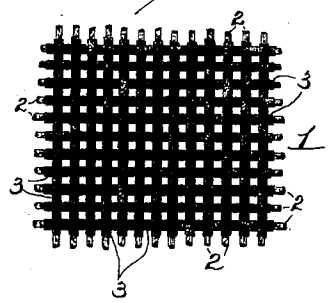

Fig. 2.

WITNESSES

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RADIOACTIVE DEVICE.

1,317,082. Specification of Letters Patent. Patented Sept. 23, 1919.

Application filed May 27, 1918. Serial No. 236,750.

To all whom it may concern:

Be it known that I, MAX HARTENHEIM, a subject of the German Empire, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Radioactive Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in radioactive devices and more particularly to such as are especially adaptable for use as separators between the electrodes of a storage battery, to provide radioactive or ionizing exciters.

It has heretofore been proposed to employ radioactive material, such as radium in electric secondary or storage battery cells to provide ionizing exciters for improving the performance of the battery and efforts have been made to distribute the radium evenly in the space between the electrodes. This has been done by using the separators between the electrodes as carriers of the radium by either coating such separators with material containing radium or by incorporating such material into the separators.

Experience has demonstrated the fact that it is a matter of much importance that the emitting of the radium rays from the carrying material shall not be obstructed or retarded. The power of penetration, especially of the alpha rays is so very small that even a few thousandths of an inch are sufficient to absorb all rays and thus make the radium inefficient. This is more pronounced when the material of the separators has comparatively high specific gravity. When the radium compound is painted onto the surface, the danger above mentioned is reduced as the varnish used is fairly permeable for alpha rays, but this is not entirely satisfactory mechanically, as the coating is liable to peel off and furthermore it is difficult to obtain a coating of uniform thickness.

The object of my invention is to overcome the difficulties and objections above outlined and to provide a structure capable of use as a separator in a storage battery, in which radioactive material shall be supported and carried thereby in a manner to insure the ready egress of the rays of such radioactive material from the supporting material, and at the same time obviate the possibility of the radioactive material peeling off.

With this and other objects in view, the invention consists in certain novel features of construction and combinations of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings; Figure 1 is a view of a separator embodying my invention, and Fig. 2 is an enlarged sectional view of one of the threads constituting the separator.

1 represents a separator made of woven threads of a material which shall not be affected by the electrolyte for a storage battery and which shall be capable of constituting a suitable carrier for radioactive material and hold the latter in a manner to permit the ready egress of radioactive rays so as to permit such rays to be projected through the electrolyte and by their ionizing power serve to reduce the internal resistance of the battery. The material which I find highly efficient for the body of the separator is glass and the radioactive material which I prefer to employ is a salt of radium. The glass is spun into threads and these threads are woven to form a sheet in the manner well known in the glass art. The glass threads carry the radioactive material, but it is important that such material shall be located on the exterior of the threads. Although the threads may be very thin, rays from radium located in the center of the threads have small chance of egress and would be screened or absorbed before they could reach the surface of the threads.

In preparing the threads of which my improved woven separator 1, is composed, a core 2 of ordinary glass is gathered from the pot of molten glass. This is then dipped into a second pot containing radium glass,—viz., molten glass in which a radium salt is intermixed,—and an outside layer 3 is formed on the core, the thickness of which layer is determined according to the requirements of the particular application. The amount of radium wanted is mixed with the glass in the second pot only and the quantity of the radium is such as will provide from one-tenth microgram to five micrograms of radium for the separator. As the covering of the core with the layer is

done while the glass is still in a good liquid condition, the layer will become integral with the core and form a solid body. It is well known in the art of glass making that by shaping or drawing glass, the original conditions and proportions of different materials or colors are absolutely maintained. If for instance, at first a cane of three and one-half inches in diameter and a layer of say one-fourth of an inch in thickness is made and then drawn out to canes of say one-half inch outside diameter, the proportion of diameter of the core to the thickness of the layer will still be three and one-half to one-fourth as originally given. These proportions are maintained throughout, so that if the canes are spun to a fine thread, this thread will consist of a core of plain glass covered with a radium-glass layer or envelop, and the same proportions between the core and layer will still prevail.

From the above, it will be apparent that the product of spun glass will have a concentrated surface of radium, and a smaller amount of radium may be used than if the glass thread would contain radium distributed throughout, and furthermore, radium contained in the core portion of the thread would be practically useless.

While I prefer to employ glass as the carrier or support for the radium, built-up composite material in which radium can be incorporated substantially as above explained, might be employed.

To obtain a distinction between the core and layer, a suitable coloring agent can be used in either the core or layer of glass, and to obtain a perfectly solid body, the same nature of glass should be used for the core and for the layer or envelop.

Having fully described my invention, what I claim as new and desire to secure by Letters-Patent, is:—

1. A radioactive separator comprising a plurality of woven vitreous threads having radioactive material incorporated therein, said radioactive material being incorporated in and confined to the vitreous outer portion only of the thread.

2. A radioactive device comprising a thread having a vitreous core and a vitreous covering containing radioactive material surrounding said core and integrally connected therewith.

3. A radioactive device comprising a plain glass body portion and a glass envelop containing radioactive material surrounding said body portion and integrally connected therewith.

4. A radioactive device comprising a sheet of woven glass threads, said threads each comprising a core of plain glass and an integral covering layer containing radioactive material.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

MAX HARTENHEIM.

Witnesses:
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F. H. ALLISON.