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C. J. BORKOWSKI

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IONIZATION CHAMBER

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X 1071
X 101
X 11207
X 541
X 320

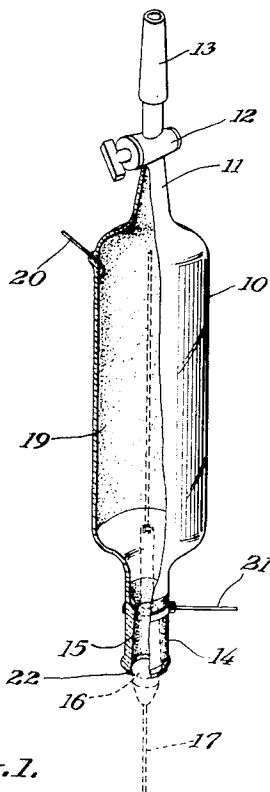
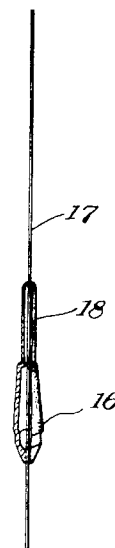


FIG. 1.

FIG. 2.



INVENTOR.
Casimer J. Borkowski.
BY
Robert H. Larimore

UNITED STATES PATENT OFFICE

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IONIZATION CHAMBER

Casimer J. Borkowski, Oak Ridge, Tenn., assignor
to the United States of America as represented
by the United States Atomic Energy Commis-
sion

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3 Claims. (Cl. 250—27.5)

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This invention relates to ionization chambers, and more particularly to such chambers adapted to measure the radioactivity of a gas. Chambers of the type to which this invention relates are commonly called Geiger-Müller counters.

An object of the invention is to provide a counter tube simple in design and easily assembled in proper relationship.

Other objects of the invention are attained by the particular arrangement and organization of parts, all of which will be evident from the following description when read in connection with the accompanying drawing in which Fig. 1 is a view in perspective of a preferred embodiment of the invention with a portion broken away and a part shown in outline, and Fig. 2 shows in perspective the part shown in outline in Fig. 1 and with a portion broken away.

As shown in the drawing, the preferred embodiment of the invention comprises a cylindrical glass envelope 10 having a constricted end 11 leading through a stop-cock 12 to a tapered fitting 13 for easy connection to suitable evacuating and gassing apparatus (not shown). The other end of the envelope 10 is provided with a neck portion 14 having an internal bore 15 tapered to receive snugly a plug member 16 formed with a corresponding taper on a portion of its exterior. The tapered glass surfaces 15 and 16 are preferably ground for reasons well understood. A small diameter rod or wire 17 is sealed in the plug 16 to extend coaxially therewith. For a purpose explained below, the plug 16 has a cylindrical sleeve portion 18 of reduced diameter extending over the wire 17.

The inner surface of the envelope 10 is provided with a coating 19 of conducting material, preferably aquadag, which is made electrically available to the exterior of the envelope 10 by a sealed-in lead 20 for the application of a high voltage. The interior and exterior of the neck portion 14 are also given a conducting coating, as shown, to which an external lead 21 is connected. In normal use, the lead 21 will be connected to ground as is well known practice.

The tapered portion of the plug 16 and the exterior of the sleeve 18 are provided with a continuous layer of conducting material, preferably aquadag, so that when the plug 16 is positioned in the neck 14 as indicated in Fig. 1 such layer is

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electrically connected to the ground lead 21. The coating on the sleeve 18 thus constitutes an accurately positioned guard ring.

It will be appreciated that the neck 14 is so oriented with respect to the envelope 10 that the electrode 17 and the guard ring on the sleeve 18 are properly positioned with respect to the electrode 19 when the plug 16 is pressed home in the neck 14. To insure a gas tight fit between the plug 16 and the neck 14 a fillet 22 of suitable wax may be applied at the juncture of the plug 16 and the head of the neck 14.

The tube above described when suitably connected to a voltage supply and sensitive circuit in any well known manner will function as a counter tube with the wire 17 comprising the collecting electrode. A gas to be "counted" may by suitable obvious arrangements be admitted into the envelope 10 through the stop-cock 12 and, after counting is completed, be evacuated therefrom.

The tube provided by this invention is simple in structure, is easy to assembly properly, and functions satisfactorily. Modifications and variations in its structure will be evident to those skilled in the art, and such modifications and variations are intended to be included in the appended claims.

I claim:

1. An ionization chamber for measuring the radioactivity of a gas within the chamber comprising a cylindrical glass envelope having a neck portion with a tapered bore, a glass plug member having an external surface correspondingly tapered and adapted to fit snugly in said bore, a conducting rod axially centered and sealed in said plug member so that it constitutes a central collecting electrode when said plug is seated in said bore, said plug having a tubular extension projecting from the smaller end of its tapered portion and surrounding said rod for a portion of its length, a layer of conducting material on the internal surface of said envelope opposed to the exposed portion of said rod, a lead-in wire to said layer, a conducting material coated on the external surface of said plug and its tubular extension, and means on said neck portion cooperating with said conducting material to provide a conducting path from said tubular extension to the exterior of said envelope whereby a guard ring is provided for the collecting electrode rod.

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2. A chamber as claimed in claim 1 in which the conducting material is graphite.

3. An ionization chamber including a glass envelope, a conducting lining within said envelope providing an outer electrode, a central collecting electrode fused in a tapered glass sleeve adapted to fit a corresponding portion of said chamber, a coating of conducting material on the exterior of said sleeve to serve as a guard ring, an unlined portion of said envelope providing electrical insulation between said outer electrode and said guard ring, and an uncoated portion of said sleeve providing electrical insulation between said central collecting electrode and said guard ring.

CASIMER J. BORKOWSKI. 15

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