May 27, 1952 C. J. BORKOWSKI ET AL 2,598,215

IONIZATION CHAMBER

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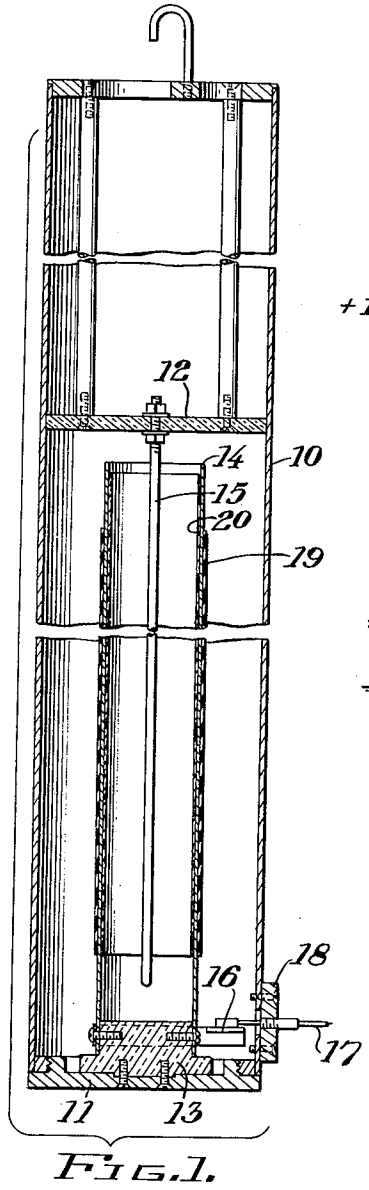


FIG. 1.

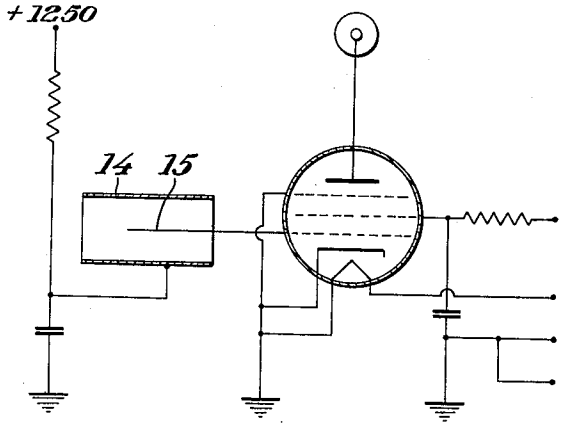


FIG. 2.

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IONIZATION CHAMBER

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2 Claims. (Cl. 313—54)

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The present invention relates to radiation measuring apparatus, and more particularly to ionization chambers for measuring alpha particle emission.

It is frequently desirable to collect dust particles or the like on a relatively large surface such as a sheet of filter paper, and then to be able to determine the radioactivity as an indication of the activity of the dust particles.

An object of the invention is the provision of an ionization chamber which will accommodate a large surface sample such as a sheet of filter paper.

Another object of the invention is to provide an alpha counting chamber having substantially fifty percent geometry.

Other objects and advantages of the invention will become apparent from the following description, when read in connection with the accompanying drawing, wherein is illustrated a preferred embodiment of the invention.

In the drawing,

Fig. 1 is a side view in section of an ionization chamber constructed in accordance with the invention; and

Fig. 2 shows diagrammatically one suitable connection to a pre-amplifier.

The ionization chamber shown to illustrate the invention comprises a right cylindrical container 10 having its lower end screw threaded to receive a removable end disc 11, and having its upper portion partitioned off by a wall 12 to form a compartment suitable for receiving a pre-amplifier tube or the like. The upper face of the disc 11 has secured thereto a shouldered block 13 of insulating material which supports, in coaxial relation in the container 10, a cylindrical tube 14 which becomes the high voltage electrode when connected as described below. A central rod-like collecting electrode 15 is supported by the partition 12 to extend along the axis of the high voltage electrode 14.

The base of the high voltage electrode 14 has secured thereto a spring contact member 16, which is adapted to make wiping contact with a high voltage lead 17 extending through the wall of the container 10 and suitably supported by an insulator 18. With this arrangement, the high voltage is not applied to the electrode 14 until it is safely in position and the high voltage is removed when the disc 11 is unscrewed for removal. In order to prevent sparking due to accidental contact between the high voltage electrode 14 and the lead 17 during insertion and removal a sleeve 19 of insulating material, such

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as rubber, is provided around the high voltage electrode 14.

By unscrewing the end disc 11, the high voltage electrode 14 may be easily removed from the interior of the container 10, and a sheet 20 of paper or foil may be curled and inserted inside the hollow electrode 14, thereby giving maximum geometry of approximately fifty percent for counting alpha emission from the paper or foil 20 when the electrode 14 is returned to the position shown in the drawing.

Anyone skilled in the art can readily devise a suitable circuit for counting the alpha emission from the sheet 20. One suitable circuit is indicated in Fig. 2.

While for the purpose of illustrating the invention a preferred embodiment thereof has been described in detail, it is to be understood that the invention is not limited thereto but is of the scope of the appended claims.

We claim:

1. An ionization chamber including a container having therein a tubular high voltage electrode, a rod collecting electrode extending along the axis of the tubular electrode, the container having a removable end wall engaging one end thereof in screw-threaded relation to facilitate ready removal of said tubular electrode, the tubular electrode being mounted thereon and removable therewith, the tubular electrode in operative position normally extending upwardly from the removable end wall to form a specimen holder for a tubular specimen contaminated with radioactivity, holding said specimen therewithin to surround said rod electrode, thereby providing improved chamber geometry.

2. An ionization chamber for counting radioactive foils, filter papers, and the like which can be formed into tubular specimens, comprising a cylindrical container threaded at one end to receive a removable end cap; means at the opposite end of said container for mounting a rod collecting electrode extending coaxially thereof; a specimen holder comprising a tubular, electrically conductive member mounted perpendicular to and electrically insulated from said end cap, and adapted to receive said specimens at its open end and to hold said specimens in tubular configuration against its inner surface, said specimens thereby being disposed concentrically about said rod when said cap is in operative position; a high voltage lead insulated from and carried by said container and extending inwardly thereof; and a spring contact conductively connected to and carried by said specimen holder, said lead

and said contact being so disposed as to make firm electrical contact when said cap is in operative assembly and to break contact when said cap is turned for disassembly.

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