

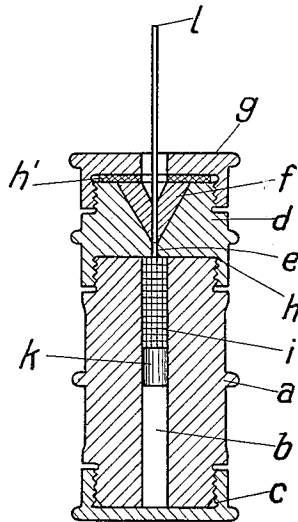
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APPARATUS FOR COLLECTING EMANATION IN RECEPTACLES

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APPARATUS FOR COLLECTING EMANATION IN RECEPTACLES

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For medicinal and scientific purposes it is required, to collect emanation from radio-active preparations—either radium or mesothorium or other radio-active substances producing such emanation—in containers and to close them up, in order to employ the contents for the purpose of radiation or injection, or to carry out physical researches for scientific purposes with such emanation. With the methods in use up to the present it was always necessary to remove the emanation from the radio-active preparations by means of pumps, and for that purpose it was required either to heat the radio-active substances with the view of obtaining the emanation, or to dissolve them or to dilute them with colloidal substances, for only in this state and under these conditions will the said preparations render a high yield, calculated upon the theoretical quantities of emanation. Therefore it was not possible to obtain in an economical way the emanation from comparatively small quantities of radio-active substances. In consequence, larger quantities of radium were collected by the several institutions, from which the emanation for example was drawn on capillary vessels. From those places the capillary vessels containing the emanation are supplied to hospitals and physicians. It has long been the desire to obtain the emanation at numerous places in a simpler manner. This task may be solved according to the present invention in a simple manner. It was found, that a good yield of emanation could be obtained from preparations of radium having a strong emanation producing power and collected in containers (capillary vessels or the like) by diffusion, if such emanation is taken up by a material having high absorptive powers for gases, as for instance active carbon or silicagel and the like, and if the volume of the radio-active preparation is as small as possible. In this respect it is necessary, in addition to having the preparation as small as possible to also avoid any dead space, which will be harmful. If treatment is carried out under these conditions, it is possible to collect without any difficulty outputs of at least 90 per cent, even up to ninety-

five per cent and more of emanation in the containers, capillary vessels and the like, charged with the absorbing materials. It is permissible to separate the absorption space from the emanating chamber by means of a diaphragm which will also permit heavy gases to penetrate easily, as for instance thin card board, blotting paper, asbestos paper and so on.

An apparatus adapted for the filling of the capillary vessels is illustrated by way of example on the accompanying drawing.

The capillary vessel 1 charged with a solid absorbing material is rendered as air-tight as possible by means of an armature consisting of the members *g*, *h*¹, *f* and *d*, and is then screwed upon the part *a*. A plate *h* adapted to permit the penetration of gas is arranged between the capillary vessel and the radio-active preparation *i*, in order to obviate losses of substances and mutual pollution of the substances used. By means of the movable plunger *k* it is possible to employ radio-active preparations of varying size and to compress these to as small a space as possible. The screw cap *c* serves for the final closure of the whole apparatus. It is advantageous to fill the portion of the channel *b* which remains free, with wax or paraffin if small radio-active preparations are employed, in order to avoid any loss of emanation.

The conical portion member or section *f*, serving for fixing the container or capillary vessel respectively, is interchangeable in order to admit of the use of capillary vessels of different shape and different size with the same apparatus. The apparatus illustrated shows only one example for the practical execution of the method in question, but it is obvious that this apparatus, of course may embody numerous combinations and forms. The radio-active preparations having strong emanating producing powers, which are distributed over colloidal substances, in general are too much diluted in order to be drawn on small containers, as for instance capillary vessels and the like, and they require too large a space. Therefore, for the purpose in question, it is necessary to reduce the volume and to choose preparations which possess com-

paratively small quantities of colloidal substances.

We claim:

1. In an apparatus of the kind described,
5 the combination of a container having a channel therein adapted to contain an emanating preparation, a capillary holder containing the material for absorbing the emanation, means carrying said capillary holder whereby
10 the latter is connected with said container in air tight communication with said channel, and a filter through which the gas may pass, located between said means and said container.

2. In an apparatus of the kind described, the combination of a container having a channel open at both ends extending axially there-
through for containing an emanating preparation, a filling in that part of said channel
20 not occupied by said preparation, a closure removably mounted upon one end of said container to seal one end of said channel, a capillary holder containing a solid material for absorbing the emanation, a second closure
25 carrying said capillary holder removably mounted on the other end of said container whereby said capillary holder is connected in air tight communication with the other end of said channel, and a filter through which
30 the gas may pass, located between said second closure and the container.

3. In an apparatus of the kind described, the combination of a container for an emanating preparation, a closure removably connected with said container, a fixing section
35 removably mounted in said closure, a capillary holder mounted in said section and containing the material for absorbing the emanation and means whereby said fixing section is secured in said closure.
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In testimony whereof we affix our signatures.

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