S. SAUBERMANN.

APPARATUS FOR IMPREGNATING WATER WITH RADIUM EMANATIONS.

APPLICATION FILED JUNE 27, 1914.

1,239,227. Patented Sept. 4, 1917.

Fig. 1

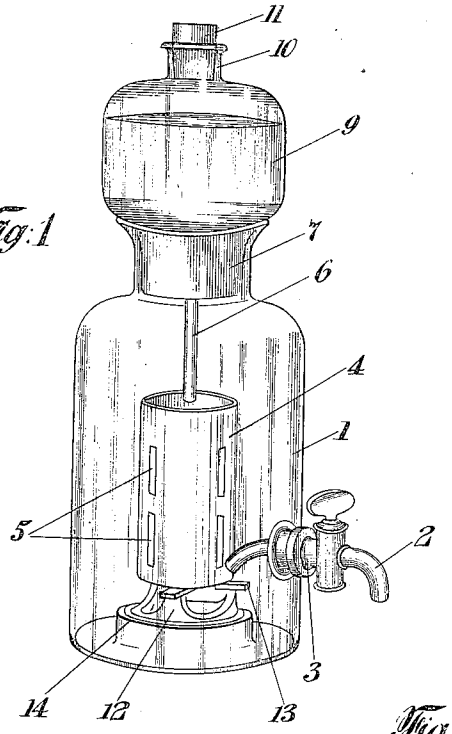


Fig. 2

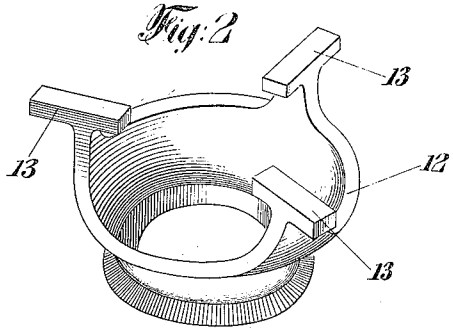


Fig. 3

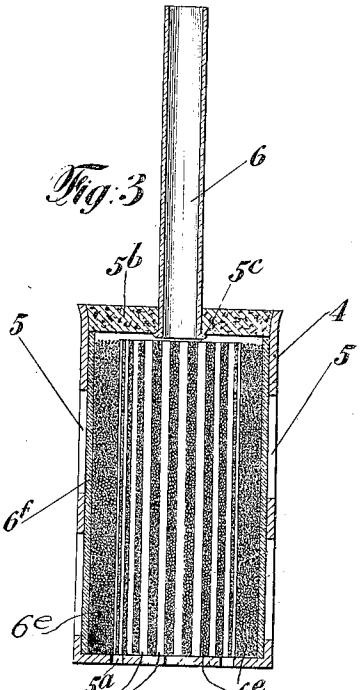


Fig. 4

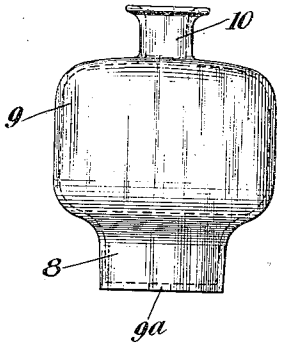


Fig. 5

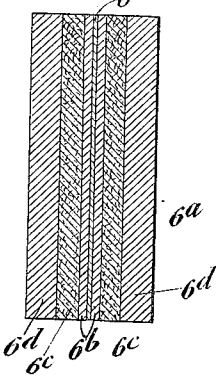


Fig. 6

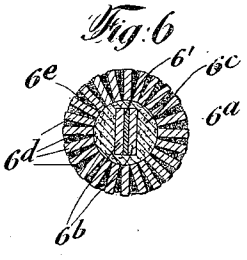
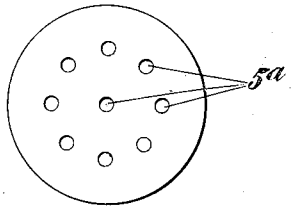


Fig. 7



Witnesses:
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UNITED STATES PATENT OFFICE.

SIEGMUND SAUBERMANN, OF CHARLOTTENBURG, GERMANY.

APPARATUS FOR IMPREGNATING WATER WITH RADIUM EMANATIONS.

1,239,227. Specification of Letters Patent. Patented Sept. 4, 1917.

Application filed June 27, 1914. Serial No. 847,638.

To all whom it may concern:

Be it known that I, SIEGMUND SAUBERMANN, doctor of med., of Charlottenburg, in the Kingdom of Prussia, and in the State of Germany, have invented a certain new and useful Improvement in Apparatus for Impregnating Water with Radium Emanations, and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates particularly to an apparatus designed for transferring radium emanations to water so that the water may acquire thereby medicinal properties giving the water therapeutic value.

The object of my invention is to provide an apparatus in which radium emanations from various compounds and substances giving off such emanations may be introduced into a body of water or similar liquid used for drinking purposes whereby the water or the liquid may acquire and hold the radium emanations until the water may be taken into the system of a patient so as to permit the patient to take advantage of the therapeutic qualities of the liquid.

My invention comprises in general a main impregnating receptacle which is adapted to contain a body of water or other liquid adapted to be introduced into the body of a patient, said impregnating receptacle having contained within the same a porous cell containing a compound or substance adapted to give off radium emanations, said cell being supported in the center of the impregnating receptacle in any suitable manner and being provided with an upwardly directed tube which gives access of the water or other liquid to the interior of the cell, and in addition to the above a storage or supply receptacle having an outlet fitting into the top of the impregnating receptacle in order to maintain a constant and uniform quantity of water adjacent to the radium cell, so that the water may be uniformly impregnated with the emanations from the cell. At the top of the storage receptacle there is a combined filling opening and vent which is normally closed with a stopper. In addition to this, a draw-off is provided for the impregnated liquid.

While my invention is capable of embodiment in many different forms, for the purpose of illustration I have shown only one form thereof in the accompanying drawings, in which,

Figure 1 is a front elevation of an apparatus made in accordance with my invention;

Fig. 2 is a perspective view of the support for the radium cell;

Fig. 3 is a perspective view of the radium cell carried by the support;

Fig. 4 is an elevation of another detail of my invention;

Fig. 5 is a vertical section through the portion of the apparatus carrying the radio active substances;

Fig. 6 is a horizontal section through the same; and,

Fig. 7 is a bottom view of the outer container of the radium cell.

In the drawing I have shown an impregnating receptacle 1 having an outlet pipe 2 and stop cock 3. This impregnating receptacle is adapted to contain in its interior a radium cell 4 which has a number of vertical slits 5 in the side thereof, the purpose of which will be further described, and a number of holes 5^a in the bottom thereof for the discharge of water which has passed through the cells 4. At the top of the radium cell 4 there is attached a glass conduit tube 6 which provides access for the liquid entering the radium cell 4. The glass tube 6 is supported in a cork 5^b which closes the top of the radium cell and has a flange 5^c on its lower end to hold the tube in position. The radium cell 4 has on its interior a body 6^a, Figs. 4, 5 and 6, for producing radium emanations which comprises two plates 6^b of any suitable material to protect the radium containing substance and of such a character as to permit the passage of radium emanations. On one of these plates and between the two plates there is provided a layer of any suitable material 6′ adapted to give off radium emanations such for example as radium sulfate or radium carbonate or a composition containing the same. Radium sulfate or radium carbonate is practically insoluble in water. The plates 6^b may be composed of filter paper strips, porous porcelain, asbestos, or porous celluloid, the only requisite being that they be permeable to radium emanations and sufficiently solid to effectively prevent the current of water passing through the cell 4 from washing away the radium emanating material. The plates 6^b are surrounded by protective wrapping of asbestos 6^c or other permeable retaining covering and around the wrapping 6^c and extending radially there are placed a num-

ber of plates 6^d of the same material as the plate 6^b and also permeable to radium emanations. The radial plates 6^d are spaced from one another by an intermediate packing of pebbles 6^e. Inside of the cell 4 and closely fitting the inner wall of the same is a cylindrical glass tube 6^f having upon its inner and outer surface a substance adapted to give off radium emanations and preferably also a luminescent substance, such as radium sulfate or carbonate, visible through the slots 5, the purpose of which is to produce a subjective effect upon the patient. The space between the glass tube 6^f and the body 6^a is filled with pebbles 6^e or other granular inert material so as to further provide a tortuous passage for the water moving through the cell. The impregnating receptacle 1 preferably has at its top a restricted neck 7, the inner surface of which is ground in order to provide a water tight fit over a downwardly directed collar 8 carried upon the lower end of a storage receptacle 9, having a hole 9^a in its bottom into which the tube 6 fits. The storage receptacle 9 has a neck 10, which acts as a combined filling opening and vent, the hole in the neck being closed by a stopper 11, except when it is desired to draw off the impregnated liquid or to renew the supply of water or other liquid to be introduced into the apparatus.

In order to support the radium cell 4 in the approximate center of the impregnating receptacle 1, the former is supported upon an annular support 12 which has a plurality of radially directed guides 13 to position the radium cell 4 in the center of the impregnating receptacle 1. This annular support 12 is itself supported in the center of the impregnating receptacle 1 by an annular boss or guide 14 formed into the bottom of the impregnating receptacle 1.

In the operation of the apparatus, assuming that the apparatus is empty and that the various parts thereof are dismantled, the annular support 12 is placed in the bottom of the impregnating receptacle 1 inside of the annular boss or guide 14. The radium cell 4 is then inserted so that it rests on the projections 13 so that the radium cell 4 thereby becomes positioned in substantially the center of the impregnating receptacle 1, and thereby enabling the water to pass out freely from the holes 5^a in the bottom of the radium cell 4. The impregnating receptacle 1 is then filled with water, preferably water that is not carbonated, or any other liquid with which the radium emanations are to be impregnated until said liquid completely fills the impregnating receptacle 1. The storage receptacle 9 is then tightly fitted into the neck 7 of the impregnating receptacle 1 in such a manner that the liquid cannot escape through the joint between the impregnating receptacle and the storage receptacle. The storage receptacle 9 is now completely filled with water or other liquid which is to be subjected to the action of the emanations. The water or other liquid may now be drawn off from time to time from the outlet pipe 2 by turning the stop-cock 3 for therapeutic purposes, the stopper 11 being removed whenever it is found necessary to draw off water from the impregnating receptacle. In operating the apparatus care should be taken to maintain a sufficient quantity of the water or other liquid in the apparatus to retain the level of the same above the neck 7 of the impregnating receptacle 1 so that the emanations from the radium cell 4 will at all times affect substantially the same quantity of water or other liquid, that is to say, the quantity contained within the impregnating receptacle 1. It will thus be seen that in the operation of the apparatus all of the water must pass from the storage receptacle 9 through the radium cell 4.

By the use of this apparatus the water or other liquid is brought into contact with the radium cell in such an intimate and regular manner that the water or other liquid is impregnated with the emanations so that it, at all times, has at least the minimum required strength thereby insuring the correct strength of the dosage.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit of my invention.

I claim:

1. A radio active cell comprising a plurality of protective plate members permeable to radium emanations, a radio active substance between said plate members, and a protective wrapping permeable to water inclosing said plate members, and constituting combined retaining means and covering to prevent the escape of said radio active material from said cell.

2. A radio active cell comprising a central core body containing a radio active central member with a protective wrapping, a plurality of radially extending plates about said central body, and an exterior container inclosing said core and radial plates.

3. A radio active cell comprising a central core body containing a radio active central member with a protective wrapping, a plurality of radially extending plates of material permeable to radium emanations about said central body, an exterior container inclosing said core and radial plates, and a filling of granular material in the space between said radial plates and the wall of said container.

4. In combination, an impregnating receptacle, a radium cell within said receptacle, a supply receptacle, and a communi-

cating tube connecting the interior of said supply receptacle with the interior of said radium cell.

5. In combination, an impregnating receptacle having an opening at the top thereof, a radium cell within said receptacle, a supply receptacle mounted adjacent the top of said impregnating receptacle, and a communicating tube extending through said opening and connecting the interior of said supply receptacle with the interior of said radium cell.

6. In combination, an impregnating receptacle adapted to contain a liquid, a substantially cylindrical radium cell therein having axially extending circulation passages and discharge ports therefor, a supply receptacle mounted above said radium cell, a support member for said radium cell spacing the same from the bottom of said impregnating receptacle whereby circulation of liquid through said cell and about the same is effected, and a communicating tube connecting the interior of said supply receptacle to the interior of said radium cell, said tube and cell constituting the sole connecting passage from said supply receptacle to said impregnating receptacle.

7. In combination, an impregnating receptacle, a radium cell therein having circulation openings in the bottom thereof, and a support at the bottom of said receptacle having a plurality of arms supporting said radium cell and spacing said cell from the bottom of said receptacle whereby circulation of liquid through said openings and about said cell is effected.

8. In combination, an impregnating receptacle, a radium cell therein having an inlet opening and discharge passages in the bottom thereof, a supply receptacle communicating with said impregnating receptacle through said cell, and a support at the bottom of said receptacle having a plurality of arms supporting said radium cell and spacing the same from the bottom of said receptacle whereby circulation through said outlet openings and about said cell is permitted.

9. In combination, an impregnating receptacle, a radium cell therein, and a supply receptacle for furnishing material to be treated to said radium cell, said impregnating receptacle, radium cell and supply receptacle being connected so as to maintain a constant amount of material in said impregnating receptacle to be treated under the influence of said radium cell.

10. In combination, a supply receptacle, an impregnating receptacle, a radium cell within said impregnating receptacle comprising an outer casing having intake and discharge ports and a centrally located radium emanating unit within said casing, and communicating means connecting said supply receptacle and said radium cell whereby material to be treated enters said cell from said supply receptacle and passes over said radium emanating unit in even amounts on all sides thereof.

In testimony that I claim the foregoing I have hereunto set my hand.

SIEGMUND SAUBERMANN, Doctor of Med.

Witnesses:

Friedel Meyer,

May Schwartz.