Oct. 13, 1936. C. W. SYMONDS 2,056,990

ULTRAVIOLET RAY INSTRUMENT

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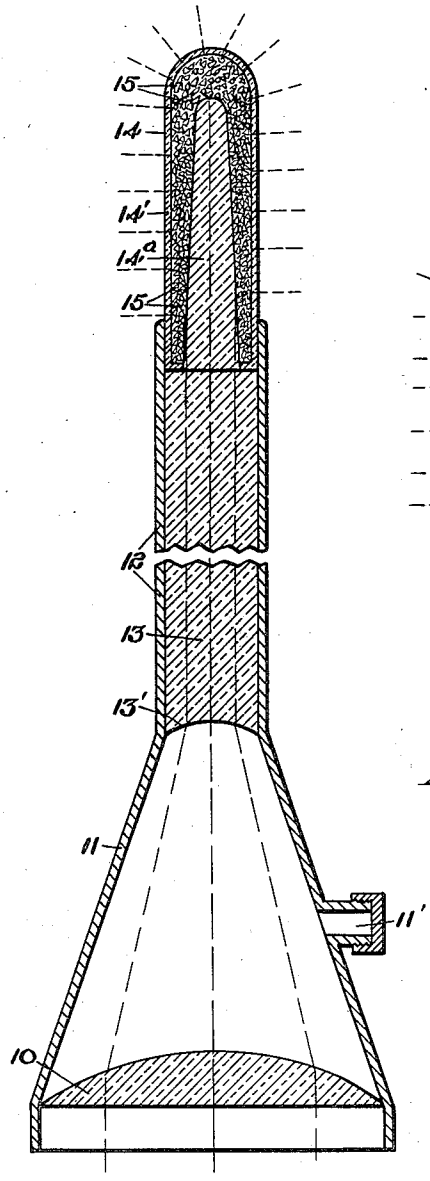

Fig. 1

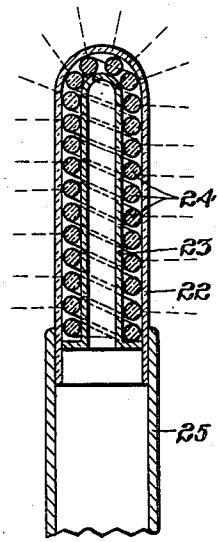

Fig. 3

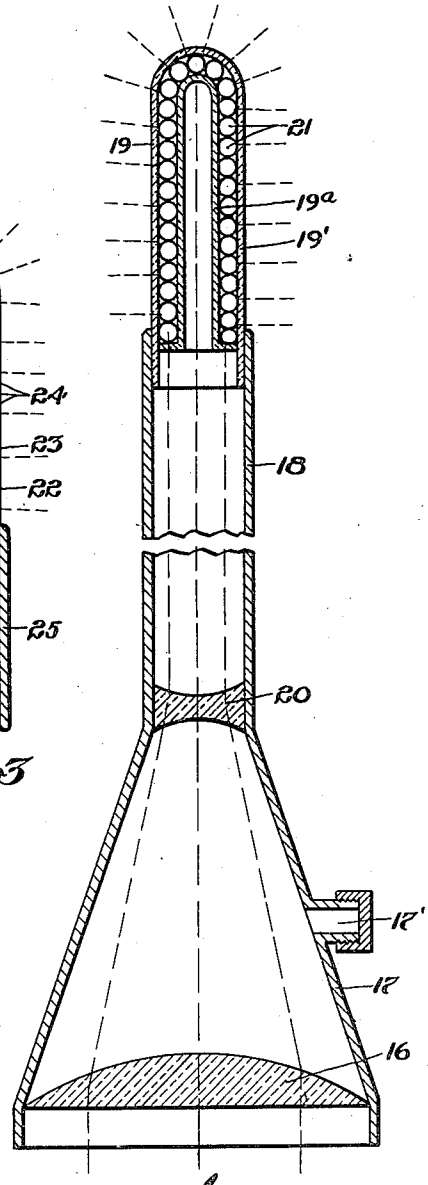

Fig. 2

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ULTRAVIOLET RAY INSTRUMENT

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Application October 13, 1934, Serial No. 748,201

3 Claims. (Cl. 128—398)

My invention relates to ultra-violet ray instruments of the type adapted to be inserted into a cavity of the human body for the purpose of subjecting such cavity to the treatment of ultra-violet rays, and is a further improvement upon the instrument shown in my United States Patent No. 1,794,557, in which I have shown various types of quartz rods for use with ultra-violet lamps, and which instrument is adapted to be inserted into cavities of the body.

Among the salient objects of the present invention are: to provide an improved instrument with which a more universal discharge of such ultra-violet rays may be obtained; to provide an instrument designed and constructed so that it will converge a large number of ultra-violet rays and direct them to and through quartz elements which are so positioned that the rays will be directed outwardly through said elements radially outwardly in all directions and to all parts of the cavity into which the instrument may be inserted; to provide in an instrument of the character referred to a more practical construction and arrangement and one which will be more economically manufactured and which will, therefore, be more commercially successful for the purposes for which it is invented.

In the present invention, I have provided an instrument in which there is an inner member and an outer member, with annular space therebetween and in which the quartz elements are disposed so that the rays are directed first longitudinally through the instrument toward the end thereof and thence outwardly in all directions through the quartz elements interposed in the annular space between the inner and outer members.

In order that others may better understand my invention, I have illustrated the same on the accompanying sheet of drawing, which I will now describe.

Figure 1 is a longitudinal sectional view through an instrument embodying my invention;

Figure 2 is a similar view of a slightly modified form of my invention; and Figure 3 is a longitudinal sectional view through another form or embodiment of my invention, only the end portion of said instrument being shown.

Referring now in detail to the drawing, in Fig. 1, I have shown a quartz lens 10, of a design to cover the aperature of the source of the ultra-violet rays, not shown, but which may be of any desired type, said lens being designed to converge the ultra-violet rays within a conical shaped member 11, merging in a tubular member 12, in which is a quartz rod or bar 13, having a concaved receiving end 13' for receiving and directing the rays through the rod or bar to the end piece 14, inserted into the end of said tubular member 12, and including an outer cylindrical quartz member 14' and an inner, conical quartz member 14a, with small quartz elements 15, of irregular shape filling the space therebetween and adapted to direct or reflect the ultra-violet rays laterally or outwardly from said end piece. Said conical member 11 may be provided with an access or filling opening with closure therefor, designated 11', for the purpose of supplying said conical member with any suitable liquid or fluid which will form a good conductor for ultra-violet rays. This may be distilled water or other suitable fluid.

In Fig. 2, I have shown a similar structure including a quartz lens 16, a similar conical member 17, with closure member 17', and tubular portion 18, and end piece 19. At the juncture of the conical member 17 and the tubular member 18, is a double concaved lens of quartz, or other suitable transmitting material, said lens being designated 20. The end piece in this form of the invention is made of a uniform cylindrical outer member 19', and a smaller uniform inner member 19a, with quartz balls 21 interposed in the annular space formed therebetween for directing or deflecting the rays outwardly in all directions therefrom.

In Fig. 3, I have shown a still further embodiment of my invention in which I use an outer quartz member 22 and inner quartz member 23, with a spiral quartz rod interposed therebetween and designated 24, said end piece being inserted in a tubular member 25, similar to that portion of the construction shown in Figs. 1 and 2. It will be understood, of course, that inasmuch as the spiral rod is a unitary member, the inner member 23 can be omitted if desired for any reason.

While I have shown and described three forms or embodiments of my invention in the way of end pieces or portions, they are all for the purpose of receiving and directing outwardly in all directions as many ultra-violet rays as possible. The reason I have shown the conical members 11 and 17, and a large quartz lens for each, is to show means for gathering in a larger number of the ultra-violet rays and directing them to the end piece, no matter what type of end piece may be used, in order that the largest number of ultra-violet rays possible may be directed into the cavity to be treated.

I do not limit my invention to the details of construction and arrangement shown for explan-

atory purposes, realizing that many changes can be made therein without departing from the spirit of the invention, except as I may be limited by the hereto appended claims.

I claim:

1. In a therapeutic instrument, means for deflecting light rays which includes an outer elongated tubular member, an inner elongated member therein through both of which rays of light can pass and a series of separate quartz elements filled in between the inner member and the outer member and adapted to deflect light rays laterally from said instrument along its length.

2. In an instrument of the character referred to, in combination with a source of ultra-violet rays, means for directing them longitudinally into said instrument, an elongated end piece forming a part of said instrument and including a tubular outer member of quartz, an inner member of quartz extending lengthwise therein and of less diameter, and a quartz filler interposed between said inner member and said outer member and adapted to receive light rays from within said instrument and deflect them outwardly radially therefrom.

3. In an instrument of the character referred to, an end piece consisting of a tubular quartz member adapted to be inserted into a cavity, and a quartz light ray deflecting element within said tubular member to receive light rays from within said instrument and deflect them outwardly, said quartz light ray deflecting element being in the form of a spiral quartz rod.

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