March 3, 1931. C. W. SYMONDS 1,794,557

QUARTZ ROD FOR USE WITH ULTRA VIOLET LAMPS

Filed Jan. 12, 1929

Fig.1.

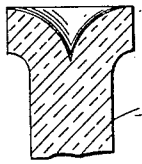


Fig.3.

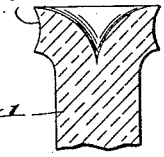


Fig.4.

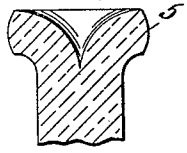


Fig.5.

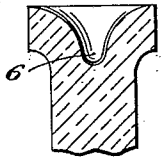


Fig.6.

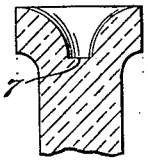


Fig.7.

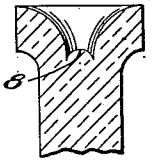


Fig.2.

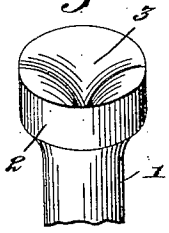


Fig.8.

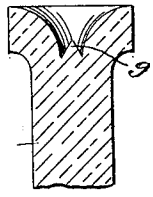


Fig.9.

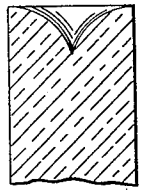


Fig.10.

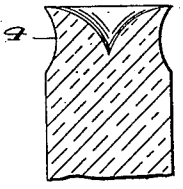


Fig.11.

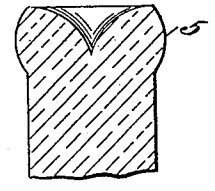


Fig.14.

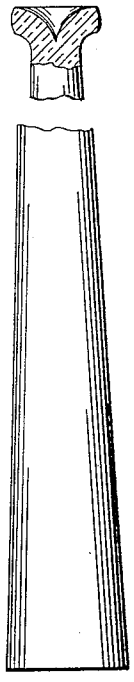


Fig.12.

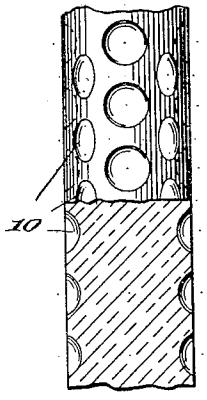


Fig.13.

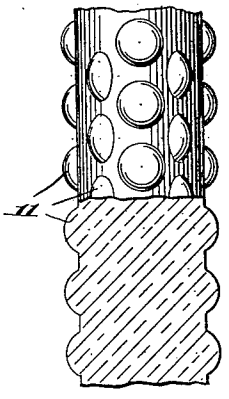


Fig.15.

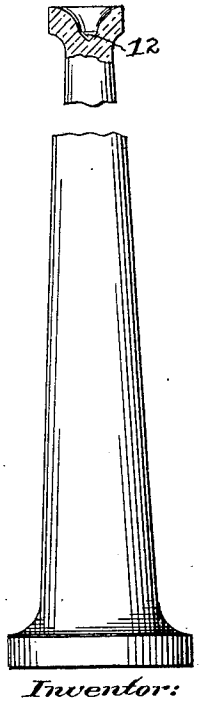
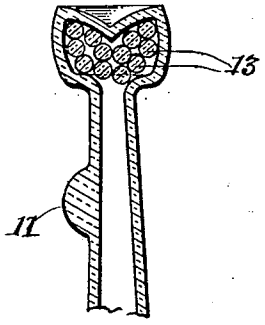


Fig.16.



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UNITED STATES PATENT OFFICE

CLEON W. SYMONDS, OF PASADENA, CALIFORNIA

QUARTZ ROD FOR USE WITH ULTRA-VIOLET LAMPS

Application filed January 12, 1929. Serial No. 332,172.

This invention relates to quartz rods for use in ultra-violet lamps and the object of the invention is to provide a quartz rod which will distribute the rays emanating therefrom evenly to all parts of the cavity to which it is applied.

Another object of the invention is to provide a quartz rod for use with an ultra-violet lamp in which the construction of the end thereof is formed to distribute rays laterally.

Another object of the invention is to provide a quartz rod for use with an ultra-violet lamp in which the lateral portions thereof are formed to distribute rays evenly through the sides.

I accomplish the above and other objects of the invention by means of the construction illustrated in the accompanying drawings, in which

Figure 1 is a sectional elevation of the end of the quartz rod according to my invention;

Figure 2 is a perspective of the end of the rod shown in Figure 1;

Figure 3 is a sectional elevation of a modified form of quartz rod;

Figures 4 to 11 are sectional elevations of other modifications of my invention;

Figure 12 is an elevation, partly in section of a modified form of my invention showing the lateral portions of the rod formed with concave lenses;

Figure 13 is an elevation, partly in section of a further modification showing the sides of the rod formed with convex lenses; and

Figures 14 and 15 are elevations, partly broken away of further modifications of the main portion of the rod; and

Figure 16 is sectional elevation of a further modification of my invention.

On the drawings, in which like reference characters indicate like parts on all the figures thereof, 1 indicates a quartz rod embodying my invention having an enlarged end portion 2 formed with an inverted cone shaped depression 3 therein. In Figure 3 is illustrated a modified form of my invention in which the periphery of the enlarged end portion is formed with a concave surface 4, while in the modification shown in Figure 4 the periphery of the enlarged portion is formed with a convex lenticular surface 5.

In the modification shown in Figure 5, the central portion 6 of the depression is of concave formation. In Figure 6, the central portion of the cone shaped depression has a plane surface 7. In Figure 7, the central portion of the depression has a convex lenticular formation 8, while in Figure 8 the central portion of the depression has a central surface 9.

In all of the foregoing figures, the end portion of the rod is enlarged, while in Figures 9, 10 and 11, the end portion is of the same diameter as the main body portion of the rod. Figure 9 is similar in formation to Figure 1; Figure 10 is similar to Figure 3; and Figure 11 is similar to Figure 4, the end portion of the rod, however, being of the same diameter as the main body portion.

In Figures 12 and 13, the peripheries of the main body portion of the rod are shown as provided with concave and convex lenses 10, 11 respectively, so that cavities having long passages will be successfully treated by the use of these constructions.

In Figure 14, the main body portion of the rod gradually increases in diameter from the outer to the inner end, thus permitting its use with lamps of such form that the rays emerge therefrom over a large area.

In Figure 15, the main body portion of the rod is also gradually enlarged in diameter, but the sides thereof are curved, so that it may be introduced into cavities which are small and deeply situated and the entrances thereto small. In Figure 15, the depression at the end of the rod includes an inverted cone 12 which is the reverse of the formation shown in Figure 8.

In Figure 16, the rod is shown as being of hollow formation and enclosing a plurality of quartz balls 13 in the end thereof to refract the rays in various directions. It is apparent that this construction, in which the rod is hollow through a portion or all of its length, might be made in the form shown in either of Figures 14 or 15, and might be provided with lens formations in the sides thereof, or have an end formation of the type shown in any one of Figures 1 to 11 inclusive.

In quartz rods, such as have been previously employed for use with ultra-violet lamps, the rays were transmitted along the rod and emerged at the end, no provision being made for treating anything more than a substantially flat or slightly curved surface against which the end of the rod could be disposed.

By the use of my invention, which provides for distributing the rays laterally of the rod, it is possible to treat successfully many cavities and passages in the body which are of peculiar formation and which cannot be reached by the construction of quartz rod ordinarily employed.

If desired, the portion of the rod through which the rays will emerge may be polished so as to permit all of the rays emerging without loss by reflection, while the portions of the rod through which it is desired that the rays shall not pass may be left unpolished so that any rays which may strike such unpolished surface will be reflected back and properly transmitted through the rod, emerging at the specially formed end thereof.

It is obvious that in some of the constructions shown the rays will be dispersed as in the cases where the rod has concave formation, whereas in other constructions the rays will be concentrated, as in the case where the rod has a convex lens formation.

While I have described the preferred forms of my invention, I wish it to be understood that I do not desire to be limited thereby except within the scope of the appended claims.

Having thus described my invention what I claim as new, and desire to secure by Letters Patent, is:

1. A quartz rod having a depression in the end thereof, the depression being substantially cone shaped.

2. A quartz rod having a depression in the end thereof, the depression being substantially cone shaped, the sides of the rod adjacent the end having a lens formation.

3. A quartz rod having an end portion of larger diameter than the main body portion thereof, said end portion having a substantially cone shaped depression therein.

4. A quartz rod having a depression in the end thereof, the depression being substantially cone shaped, the apex of the cone being modified to form a lens.

5. A quartz rod having a depression in the end thereof, the main body portion of the rod having lenticular formations.

6. A quartz rod having an enlarged end therein with a depression forming part thereof, the main body portion increasing in diameter from said end to the opposite end.

7. A hollow quartz rod and quartz balls in the end thereof.

In testimony whereof I hereunto affix my signature.

CLEON W. SYMONDS.