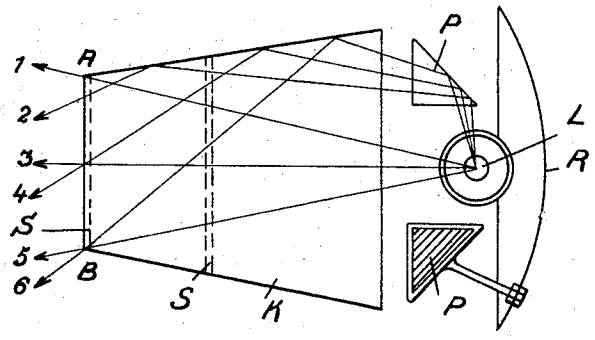
June 1, 1926. 1,586,670

F. GIRARD

QUARTZ LAMP FOR MEDICAL PURPOSES

Filed August 24, 1921

Fig. 1.



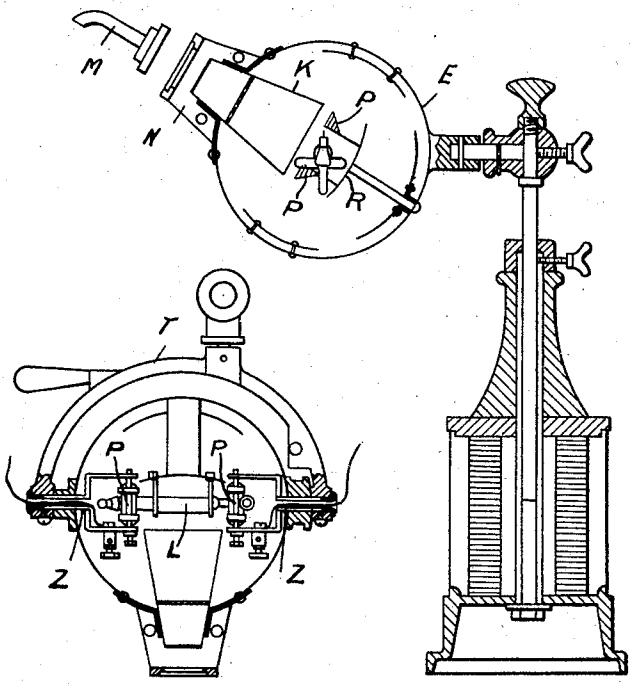


Fig. 3. Fig. 2.

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UNITED STATES PATENT OFFICE.

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QUARTZ LAMP FOR MEDICAL PURPOSES.

Application filed August 24, 1921, Serial No. 494,982, and in Germany July 24, 1916.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

My invention relates to a quartz lamp for medical irradiation and its particular object is to provide a lamp of this kind which although being devoid of the water cooling arrangement generally used is superior to water-cooled lamps.

A drawback inherent in quartz lamps consists in the fact that the ultra violet light is not intensified at all or only very little by primitive reflecting faces, and therefore does not suffice for an intense irradiation of small parts of the surface of the human body. The lamps provided with water cooling are least affected by this drawback, because they permit placing the part of the body to be irradiated close to the source of light. However, the water cooling system involves many inconveniences, amongst others, the necessity of providing means for supplying and discharging the water, frequent leakages, which cause expensive repairs, and the filtering of the rays having the shortest wave lengths by the layer of water itself and particularly by the deposits from the flowing water settling on the quartz burner and which reduce the radiation of light.

In the lamp according to the present invention these drawbacks are obviated inasmuch as the radiation of light is considerably stronger.

In the drawings affixed to this specification and forming part thereof, a lamp embodying my invention is illustrated diagrammatically by way of example. In the drawings

Fig. 1 is a diagram showing the arrangement of the lamp,

Fig. 2 is an elevation, partly in section, and

Fig. 3 a plan view.

The intensified radiation is effected by aid of two prisms arranged at a short distance from and parallel to the arc L. The prisms are made of quartz or rock crystal and have the form of rectangular isosceles triangles, the hypothenuse faces of which are not covered with a reflecting layer, as such a layer would be destroyed by the heat of the quartz burner which is about 500 degrees C. The hypothenuse faces reflect the light which is radiated by the arc in an upward and downward direction at an angle of about 60° and which otherwise is almost entirely lost, in the direction of use, as indicated by the rays 2, 4 and 6. Consequently, the entire quantity of light emitted from the surface A B, which can be utilized is considerably increased. The light is further intensified, although to a less degree, by a reflector R, while a conical metal pipe K polished on the inside collects the rays emitted by the burner, the prism and the reflector and at the same time causes particularly uniform light to traverse the surface A B. The intense radiation of light is accompanied by an intense radiation of heat, which is not desirable for therapeutic purposes. Experiments have shown, that one or two discs S of glass or quartz or rock crystal which allow ultra violet rays to pass, prevent an obnoxious radiation of heat. One of these discs is preferably made of blue uviol glass that can be used as a blue filter to prevent the emission of ultra violet rays of shortest wave length.

Figs. 2 and 3 illustrate a lamp constructed on the lines referred to above. The optical arrangement described above is mounted within a ball shaped metal casing E provided with ventilating openings and screens preventing the direct emission of light therethrough. The casing E is arranged to rotate about two perforated trunnions Z. The quartz burner is secured to these trunnions and its electrical leads are arranged within the trunnions. The prisms P, the reflector R and the conical pipe K are fixed to the metal casing, so that the concentrated bundle of light rays can be rotated with the casing about 300 degrees, its intensity being the same in any position. It is therefore possible, to irradiate not only in a horizontal direction, as with a lamp cooled by water, but also at an angular position and vertically upwards and downwards, which is of the greatest importance when irradiating cavities of the human body. For this and other purposes, special fittings such as M (Fig. 2) are required, which are placed in direct contact with the parts of the body to be treated, sometimes under pressure, as in the so called compression treatment. Besides special fittings, quartz filters may be used in this manner. When using these fittings or filters it is necessary to counteract the heating effect of the quartz burner. While this is done in the lamps hitherto used by water cooling, I achieve the same object in a far simpler manner by means of a suit-

able combination of heat insulation and ventilation or a simple air cooling. A supply or discharge of water is no longer required, there can be no leakages and no defective insulation caused thereby, the expensive quartz burner can no longer be damaged by defects in the water cooling device, which necessitate expensive and tedious repairs disturbing the work of the physician to an extraordinary extent. This is effected by making the support N for the fitting of perforated sheet metal and attaching it to the casing E by means of a thick layer of asbestos of special form. By these means, the conduction of heat from the metal casing E is reduced to a minimum and the radiation of heat from the most remote part of the conical reflector pipe K is prevented. There is left between the ventilating openings as little metal as possible, whereby the heating of the frontal portion of the support is reduced to a minimum, so that the supports remain sufficiently cool for therapeutic purposes. The trunnions Z are secured to a semi-circular arm T, which is adapted to be tilted about a horizontal pin. This pin is secured in a head which is adapted to be rotated about a vertical pin, the position of which latter pin may be altered in a stand which at the same time forms a series resistance and whose weight greatly increases the stability of the entire apparatus.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to persons skilled in the art.

I claim:

1. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp and a conical reflector in front of said lamp and said prisms.

2. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms, and means connected with said reflector for preventing the passage of heat rays.

3. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms, disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms and a pane of a material preventing the passage of heat rays arranged in said reflector.

4. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms and a casing surrounding all these parts.

5. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms and a casing surrounding all these parts, said casing being arranged to be turned about a horizontal axis.

6. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms, a casing surrounding all these parts and perforate pivot pins carrying said lamp and said casing.

7. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms, a casing surrounding all these parts, perforate pivot pins carrying said lamp and said casing and a curved arm carrying said pins and being arranged to be turned about a horizontal axis.

8. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms, a casing surrounding all these parts and a thin walled perforate support fixed to said casing and insulated therefrom against heat convection.

9. Therapeutical device comprising in combination, a mercury vapor lamp, a pair of totally reflecting prisms disposed close to and in parallel to said lamp, a conical reflector in front of said lamp and said prisms, a casing surrounding all these parts, a thin walled perforate support fixed to said casing and insulated therefrom against heat convection and a ring on said support for attaching special fittings.

In testimony whereof I affix my signature

FRITZ GIRARD.