Nov. 20, 1928. 1,692,413

W. T. LEWIS

THERAPEUTIC LAMP

Filed May 21, 1927

Fig. 1

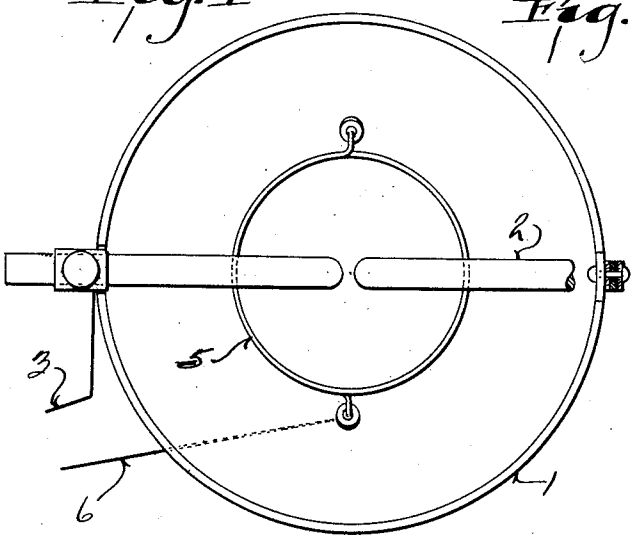


Fig. 2

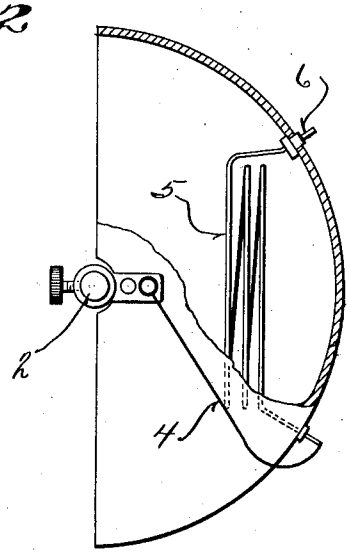


Fig. 3

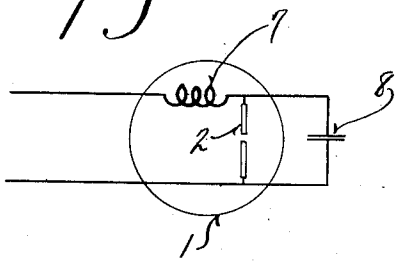


Fig. 4

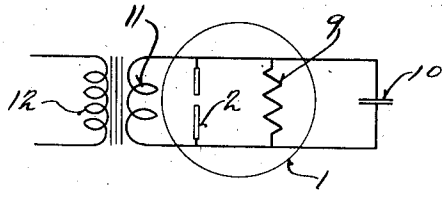


Fig. 5

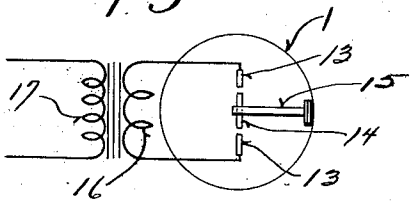
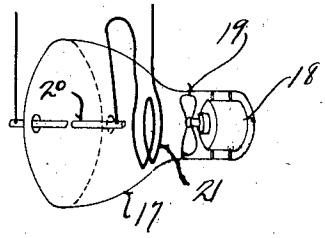


Fig. 6



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By

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UNITED STATES PATENT OFFICE.

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THERAPEUTIC LAMP.

Application filed May 21, 1927. Serial No. 193,244.

This invention relates to therapeutic lamps.

In therapeutic lamps, particularly those for giving ultra-violet light treatments, it is the usual practice to provide a rheostat which is located on the floor or at a remote point to the lamp or holder, so as to control the lamp to prevent excessive current from flowing from the line to the lamp. This rheostat necessarily wastes a large amount of energy which is wholly useless, and it is absolutely essential in these lamps to provide a resistance element as otherwise there would be times when a dead short circuit would be produced across the line.

This invention is designed to overcome the defects noted above and objects of this invention are to provide a novel form of therapeutic lamp in which the entire energy is utilized in the production of effective and active rays which are thrown directly from and reflected from the lamp upon the patient, so that all of the energy is utilized in the production of useful rays.

From extensive experiments, it has been found that the therapeutic effect from ultra-violet light is very much enhanced by the presence of the infra-red and red rays as the infra-red rays produce a marked hyperæmia or drawing of the blood to the surface. Thus, more blood is exposed to the beneficial action of the ultra violet rays when strong infra-red rays accompany the ultra-violet rays. In addition to this, that the effect from the ultra-violet light is enhanced when the surface of the body, upon which it falls, is warmed.

This invention takes advantages of the discovery noted above and has for its further object the production of ultra-violet and infra-red rays in a therapeutic lamp so constructed that both of these groups of rays are projected upon the patient and the therapeutic effect of the ultra-violet rays is thus markedly increased.

Further objects are to provide a very simple and practical type of therapeutic lamp embodying the features noted above which may be as freely used by physicians and others as the lamps heretofore known.

Further objects are to provide a novel form of therapeutic lamp having the characteristics noted above, in which means are provided for rapidly drawing the air through the lamp to thus prevent the accumulation of powdered carbon or other sediment on the walls of the reflector, and also to draw all sparks or heated minute particles away from the lamp so that they cannot fall upon the patient.

The reflectors for lamps having both the heat generating means and the electric arc are subjected to intense heat and are in contact with the air, and it is therefore a further object of this invention to provide a reflecting coating which will not be injured by any of the effects noted above and which is extremely hard and will last a great length of time.

Embodiments of the invention are shown in the accompanying drawings in which:

Figure 1 is a face view of one form of lamp with parts broken away;

Figure 2 is a side elevation partly in section of the structure shown in Figure 1;

Figure 3 is a diagrammatic view showing a further form of the invention;

Figure 4 is a diagrammatic view showing a still further form of the invention;

Figure 5 is a diagrammatic view showing the use of series arcs cooperating and replacing the control resistance;

Figure 6 is a diagrammatic view of a further modified form in which a small electric fan is incorporated in the lamp for causing a rapid current of air to flow through the lamp to draw all dislodged particles therefrom.

Referring to Figures 1 and 2, it will be seen that the lamp comprises a reflector 1 which carries a pair of carbons or other electrodes 2 between which the arc is formed. These carbons may be carried in any suitable manner and one form only of a holder for adjustably carrying the carbons has been shown. It is within the province of this invention to use any type of holder desired, whether manual or automatic. As the particular form plays no part in this invention it has not been developed in detail. One of the carbons is connected by means of a conductor 3 to one of the mains and the other carbon is connected by means of a conductor 4 to one end of a resistance element or heater 5. This heater element may be formed of any suitable high resistance material and may be mounted in any desired manner, by winding it upon a suitable

refractory form, or else by suspending it within the reflector. The other end of the resistance element or heater is connected by means of the conductor 6 with the other main.

In Figure 3, substantially the same idea is developed. However, in this form, the heater element is coiled and acts somewhat in the nature of an inductance, as indicated by the reference character 7. It is mounted within the reflector 1 as well as the carbons 2. It is to be noted that the inductance 7 has some resistance which acts as a check to the current flow to the lamp and also the fact that an inductance prevents sudden surges of current from the line to the lamp. It thus serves in the double capacity of a heater and a control device.

It has been found that a large current flow through the arc produces a very much hotter arc and also causes the carbons to burn into pointed tips. However, this increased consumption is not necessary in the production of an intensely hot arc as has been found by experiments with this lamp. As shown in Figure 3, a condenser 8 is bridged across the arc or otherwise connected in the circuit. This condenser changes the characteristics of the arc, although it does not greatly increase the current consumption of the lamp. It has been found that with an electrostatic condenser, approximately sixty microfarads, for example, that an intensely hot arc is produced without any great increase in current consumption. The presence of the condenser, it is believed, superimposes a high frequency alternating current upon the direct or alternating current supplied the arc. At all events, the practical and net results of this construction is that a very much hotter arc is produced without any great increase in current consumption.

In the form of the invention shown in Figure 4, a noninductive resistance element 9 is mounted within the reflector together with the carbons 2, and a condenser 10 is bridged across the arc. The lamp is supplied by the secondary 11 of a transformer whose primary 12 is supplied from the city mains.

In the form shown in Figure 5, the reflector carries two series arcs which are formed by outer carbons 13 and an intermediate or central carbon 14 held by a suitably insulated bracket 15. This lamp may be supplied in any suitable manner as, for example, from the step-down secondary 16 of a transformer, the primary 17 being connected with the city mains.

In this last form of the invention, the two arcs in series avoid the necessity of a resistance connected in the circuit of the arc. One of the arcs, for example, may materially decrease in resistance, but nevertheless the other arc may maintain the total resistance of the circuit and thus damage can not occur.

In addition to this feature, the central carbon does not have a chance to cool off as rapidly as the outer carbons which are carried in their holders. The central carbon, therefore, becomes very hot and acts as a source for red and infra-red rays.

In the form shown in Figure 6, a different type of reflector, such as shown diagrammatically and indicated by the reference character 17, is employed. This reflector is open at its front and back and its rear reduced portion houses a small electric motor 18 provided with a fan 19 adapted to draw the air rearwardly and thus produce a rapid and strong blast of air through the lamp. This blast of air takes away all carbon dust or other material that may fall from the carbons 20 and carries it rearwardly from the lamp. Further than this, all sparks that may be produced by the lamp are drawn rearwardly and projected from the lamp and thus can not fall upon the patient. Any form of heater, such, for example, as indicated by the reference character 21, may be employed in connection with the arc in the manner described in detail for the other forms of the invention.

Although I do not intend limiting this invention to the specific mode of operation or principle which I believe is effective in producing the results discussed hereinafter, nevertheless I believe that the results produced by this apparatus or its mode of functioning are substantially as follows:

The infra-red and red rays appear to enhance the penetrating qualities of the ultra-violet rays, or at all events, materially increase their therapeutic effect.

It seems that these rays make it easier for the ultra-violet rays to get in their work and, in addition to this, the infra-red rays warm the surface of the body and make it more responsive to the effect of the ultra-violet rays. From actual experiments conducted with this lamp, it has been found that the time of exposure needed for producing the certain definite therapeutic effect may be lessened at least twenty-five percent.

When it is considered that these therapeutic lamps generate a great amount of heat and also house an electric arc, it is apparent that unusual demands are made upon the reflectors. The reflectors are plated with chromium which is extremely hard and will resist chemical change due to the action of the air or the fumes from the arc light even when in its highly heated condition. Thus, by the use of a chromium reflecting surface, absorption at such surface even after long use is materially reduced.

In the description and claims, it is intended that the expression "infra-red" be interpreted as meaning not only strictly infra-red rays, but also infra-red rays when combined with rays in the red portion of the visible spectrum. It is also to be understood that this expression

is used to cover the rays emitted by the resistance either when at visible red heat or when below this point.

It will be seen that a novel form of therapeutic lamp has been provided in which all of the energy is utilized in producing useful, curative rays which may be projected upon the patient's body and which will be effective in securing the desired results.

Further, it will be seen that the lamp is substantially fool-proof and may be handled by others than those skilled in the electrical science with the utmost safety.

It will be noted further that the lamp is very simple and embodies a new principle discovered by extensive experiments.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

It is to be distinctly understood that although the apparatus has been described as particularly designed for the treatment of human beings that obviously it may be used for the treatment of plants, animals, or other organic bodies without departing from the scope of the invention. It is, therefore, understood that the term "patient" or similar terms, are to be construed broadly as outlined immediately above.

It is to be distinctly understood that other materials than chromium may be used for coating the reflectors, although chromium is the material preferred, and except where definitely stated in the claims, the construction of the reflectors may be varied within the scope of such claims.

I claim:

1. A therapeutic lamp comprising a reflector, an arc light mounted therein, a heater mounted within said reflector and connected to said arc light, and means for producing a blast of air through said reflector from the front to the rear, whereby particles falling from said arc light are projected from the rear of said reflector and are prevented from accumulating upon said reflector.

2. A therapeutic lamp comprising a reflector having an inner surface formed of chromium, means for generating ultra violet rays, and means for generating infra-red rays, both said means being mounted within said reflector.

3. A therapeutic lamp comprising a chromium lined reflector, an arc light mounted therein, and a source of infra-red rays mounted within said reflector, whereby both infra-red and ultra-violet rays are projected from the said lamp.

4. A reflector for a lamp subjected to the action of heat and air, said reflector comprising a metal body portion provided with a reflecting surface formed of chromium.

In testimony that I claim the foregoing I have hereunto set my hand at Racine, in the county of Racine and State of Wisconsin.

WILLIAM TURNOR LEWIS.