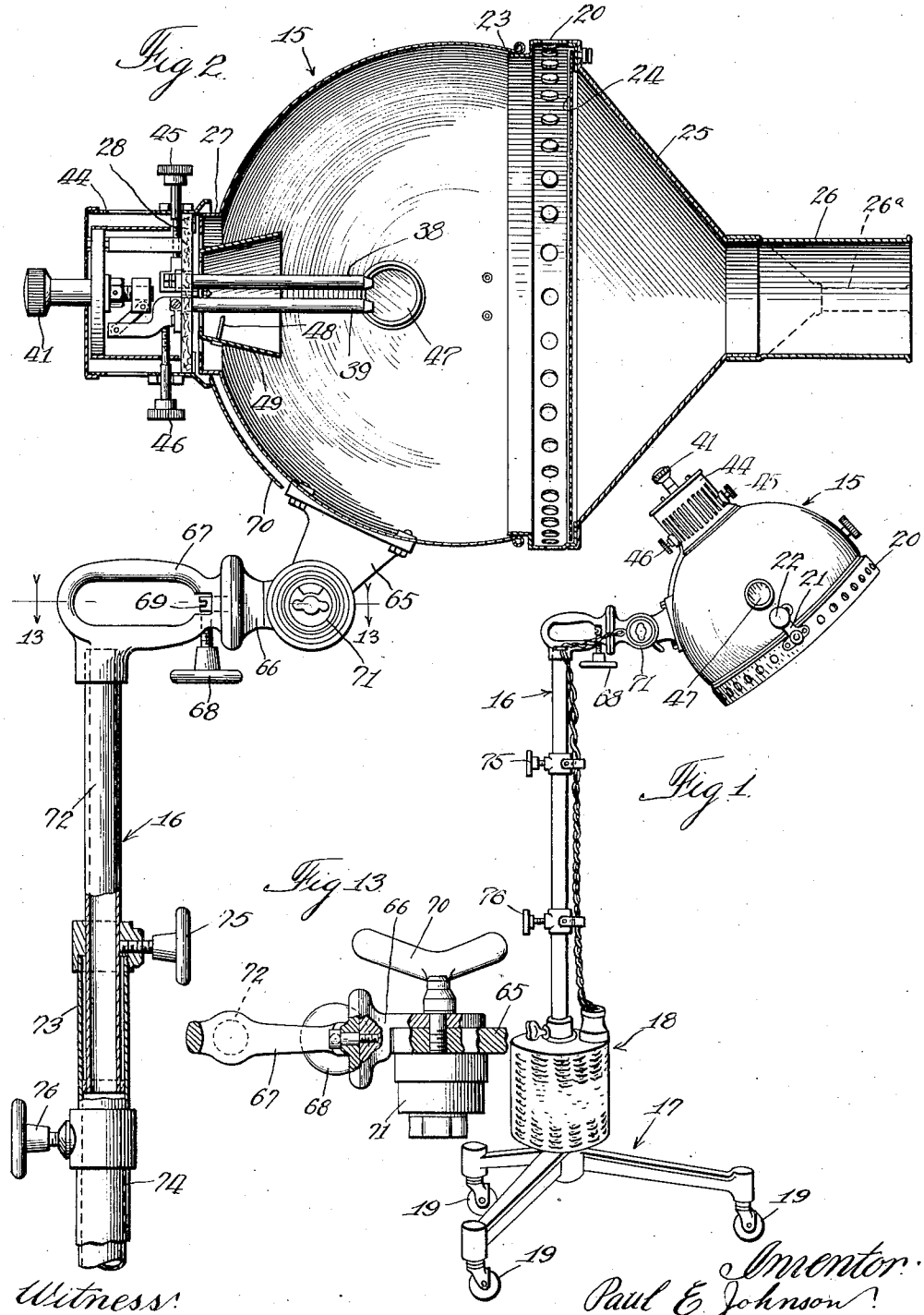
Jan. 19, 1932. P. E. JOHNSON 1,842,100

THERAPEUTIC LAMP

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Jan. 19, 1932. P. E. JOHNSON 1,842,100

THERAPEUTIC LAMP

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Fig. 3.

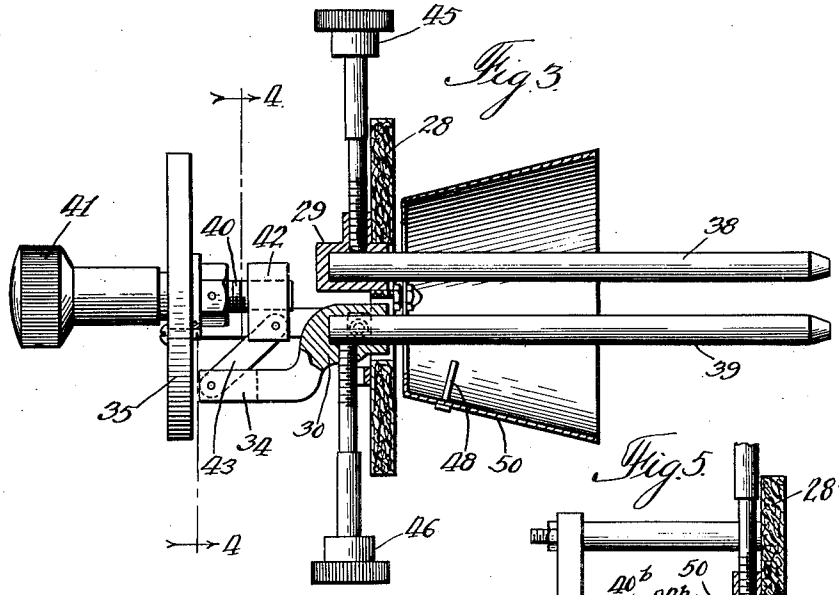


Fig. 5.

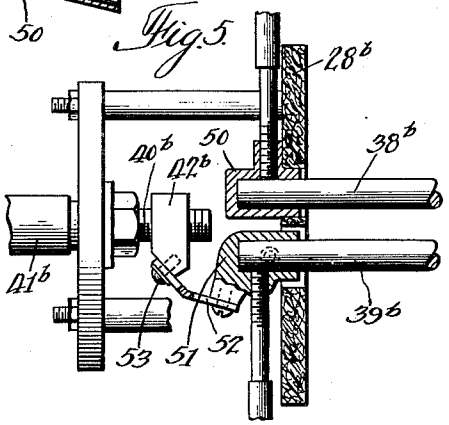


Fig. 4.

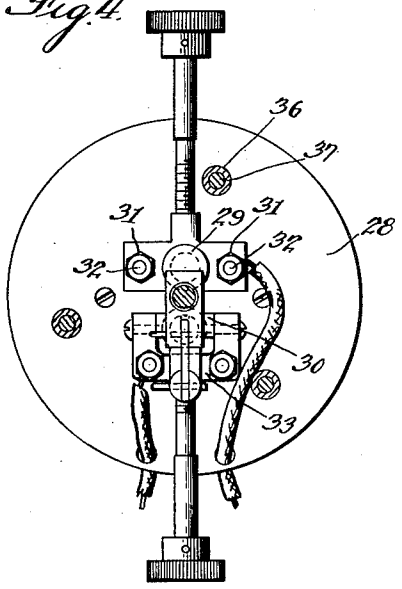
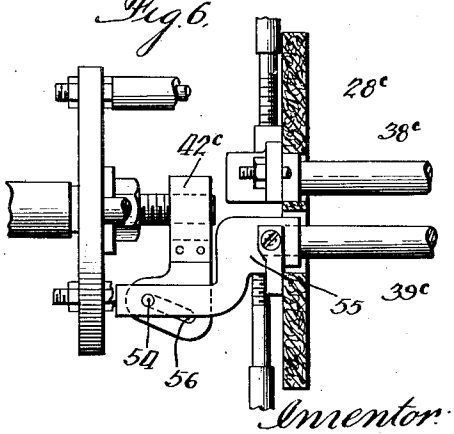


Fig. 6.



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THERAPEUTIC LAMP

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Fig. 7.

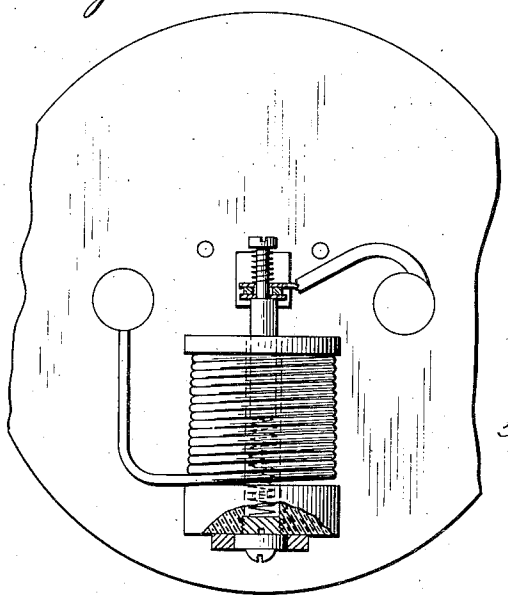


Fig. 8.

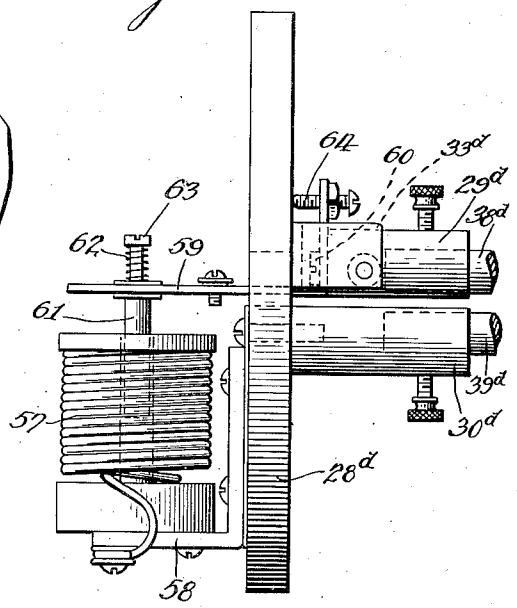


Fig. 10.

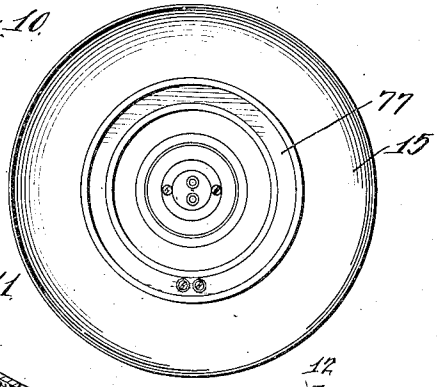


Fig. 11.

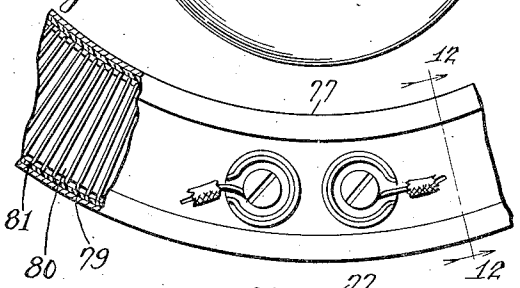


Fig. 9.

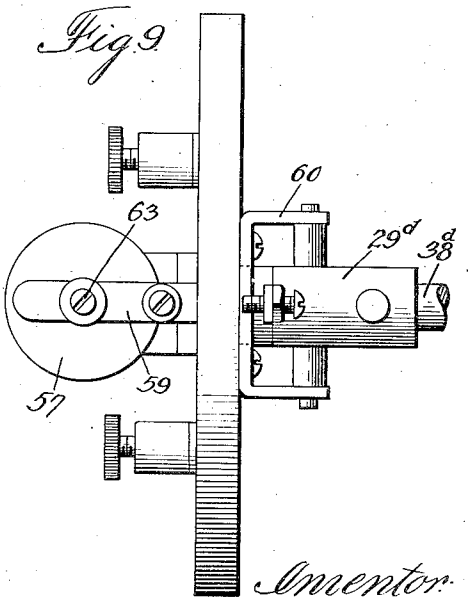
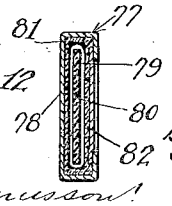


Fig. 12.



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UNITED STATES PATENT OFFICE

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THERAPEUTIC LAMP

Application filed August 19, 1927. Serial No. 213,993.

This invention relates to therapeutic lamps and has special reference to improvemts in those appliances which are productive of a sunlight equivalent for treating diseases.

More particularly, this invention relates to improvements in therapeutic lamps for producing rays of light from the arcing of carbons and for applying the rays so produced for the treatment of diseases.

Heretofore carbon arc lamps have been very large, expensive and cumbersome. Moreover, these lamps have required special transformers and wiring and have consumed an excessive amount of electric current, and as a result thereof these lamps have not come into very extensive use.

One of the objects of this invention is to provide an improved therapeutic lamp which is comparatively inexpensive to manufacture, compact and unitary in form and easy to manipulate.

Another object of this invention is to provide a therapeutic lamp having a telescoping mast and a universal connection thereon for supporting the lamp in any desired position.

A further object of this invention is to provide a therapeutic lamp having means for adding to the heat of the radiant energy normally generated therefrom.

A still further object of this invention is to provide a therapeutic lamp having improved control mechanism for operating the generating elements thereof.

Other objects and advantages will be apparent from the following description and the drawings forming a part of this specification, to which reference may now be had for a more complete understanding of the characteristic features of this invention, in which drawings:

Figure 1 is a perspective view of the therapeutic lamp as embodied in this invention;

Fig. 2 is a central sectional view of the upper portion of Fig. 1 showing the lower part thereof in elevation;

Fig. 3 is a central sectional view of one form of generating element and the operating mechanism therefor;

Fig. 4 is a rear elevational view of Fig. 3;

Fig. 5 is a view similar to Fig. 3 of another form of control mechanism for the generating elements;

Fig. 6 is a view similar to Fig. 5 of a further modification of control mechanism for the generating elements;

Fig. 7 is a rear elevational view of a still further embodiment of control mechanism for the generating elements;

Fig. 8 is a side elevational view of the structure shown in Fig. 7;

Fig. 9 is a top plan view of the structure shown in Fig. 7;

Fig. 10 is a front elevational view of the reflecting chamber of the therapeutic lamp showing a resistance element disposed therein;

Fig. 11 is a view partly in section and partly in elevation of a portion of the resistance element;

Fig. 12 is a sectional view taken on the line 12—12 of Fig. 11; and

Fig. 13 is a detail view of the adjustable connections for obtaining the adjustment of the reflecting chamber.

Referring to the drawings, and more particularly to Figs. 1 and 2 thereof, the therapeutic lamp comprises in general a reflecting chamber 15 supported by a telescoping mast 16 which in turn is mounted on a spider arm 17. A resistance element 18 is mounted on the telescoping mast, preferably at a point adjacent the lower end thereof. The spider is supported on casters 19 in order that the lamp may be readily moved about. The reflecting chamber 15 is mounted on the telescoping mast in a manner so that it may be adjusted to any desired height or position which will hereinafter be more fully explained.

The reflecting chamber 15 is curved and has an open face for receiving a perforated annular ring 20. The ring 20 is removably secured to the reflecting chamber 15 by means of an arm 21 fixed to the ring and having a transverse slot in its projecting end for engaging a screw 22. In assembling the ring 20 to the reflecting chamber 15, a reduced flange 23, preferably formed integrally with the ring, is inserted into the open face of the reflecting chamber, the diameter

of the reduced portion snugly engaging the inner diameter of the chamber. The ring is then turned to the left in order that the transverse slot of the projecting member 21 may receive the screw whereafter the screw 22 is tightened and the ring 20 is held in a fixed position.

A screen 24 is mounted on the outer side of the ring 20 in any suitable manner for the purpose of preventing sparks or hot particles given off from the arcing of the carbons or the generation of the radiant energy of any character, from burning a patient's body. By this means the lamp may be brought in closer proximity to the surface upon which it operates with more desirable results and no danger. However, in lieu of the wire screen it may be desirable to use quartz or colored glass, the latter being colored so as to eliminate any of the rays that may be desirable. Further, quartz, corex glass and other like refractory materials, in addition to preventing sparks or other foreign matter from burning or otherwise molesting the body of the patient permit radiation without materially decreasing or altering the energy transmitted therethrough.

In order to localize the rays so that a limited surface may be operated upon, such, for example, as the nose, throat, ears and the like, an adapter 25 is removably secured to the front of the ring 20 by any desirable means, such as a bayonet joint or the like. The adapter 25 is frusto-conical in shape and is adapted to receive various sized localizers, such as those indicated by the numerals 26 and 26*a*.

The base of the reflecting chamber 15 is flanged and apertured as at 27, the aperture being circular and having its axis coincide with the axis of the curved surface of the reflecting chamber. An annular heat resisting and insulating member 28, preferably formed of asbestos, porcelain or other refractory material, is secured to the outer side of the flanged portion 27 of the reflecting chamber 15 as by means of screws, or other suitable securing means.

Referring now more particularly to Fig. 3, a pair of carbon holders 29 and 30 are secured to the insulating plate 28, the carbon holder 29 having flanged portions 31, through which bolts 32 are extended into the plate 28. One of the bolts 32 acts as an electrical terminal for the holder 29. The holder 30 is pivotally mounted on a bracket 33, which latter is secured to the plate 28, the holder 30 having an extension 34 projecting rearwardly therefrom and bifurcated at its outer end. A plate 35, preferably of an insulating material such as that of the plate 28, is supported on collars 36 which act as spacing members and through which screw members 37 are passed, the latter extending through both of the plate members 28 and 35 and securing them in a fixed spaced relation.

The carbon holders 29 and 30 have cup shaped recesses formed therein for receiving carbon electrodes 38 and 39, respectively. It will be noted that the holder 30 is adjustable relative to the holder 29, the latter being fixed to the plate 28. By reason of the adjustable relation between the holders, the outer ends of the electrodes may be brought into an engaging relation or into a spaced relation.

In order to accomplish the aforementioned action, a screw member 40 is rotatably mounted on the plate 35 and has a handle 41 secured thereto and extending outwardly therefrom. A supporting element 42 having a threaded aperture engages the threads of the screw 40 and is held against rotation by means of an arm 43 secured thereto and extending therefrom to fixedly engage the bifurcated portion of the extension 34 as by means of a pin 34*a*. By reason of the element 42 being non-rotatable, a rotation of the handle 41 to rotate the screw 40 will move the element 42 laterally and cause the arm 43 to pivot the extension 34 on the bracket 33 to move the end of the carbon electrode 39 in closer relation with or away from the carbon electrode 38. The mechanism for controlling the movement of these electrodes is encased in a perforated drum-shaped casing 44, the latter being perforated to prevent the oxidation of the elements of the controlling mechanism which are preferably formed of brass.

In the operation of the therapeutic lamp thus far described, the carbon electrodes 38 and 39 are placed in the sockets of the carbon holders 29 and 30, respectively, whereafter the knobs 45 and 46 are gently turned to the right to tighten the electrodes in position. The ends of the electrodes 38 and 39 are actuated into a position by means of the handle 41 such that they touch each other whereafter an electrical current is fed through the carbons and the handle 41 is rotated to separate the carbons to establish the arc for generating the radiant energy.

In order that the operator may be aware of the condition of the carbons a window 47 is disposed on each side of the reflecting chamber 14. These windows are preferably formed of a colored glass for eliminating any of the rays which may be harmful to the eye.

The carbon electrodes may be burned to a position adjacent a stop pin 48 secured to an inner reflecting chamber 49, which latter, in turn, is secured to the flanged portion 27 of the reflecting chamber 15. The inner reflecting chamber 49, together with the heat insulating plate 28, prevent an overheating of the control mechanism and thereby prevent any interference with the proper operation of the lamp. When electrodes have been burned to this state the reflecting chamber 15 should be adjusted so that the axis thereof is

vertical and the control mechanism is on top. The knobs 45 and 46 are untightened and the carbon electrodes are permitted to fall on the screen 24, which latter is then removed by releasing the screws 22, rotating the ring 20 a short distance and dropping off. The carbons are then replaced, as first described, and the lamp is again in readiness for operation.

By referring now to Fig. 5 of the drawings, a further form is shown for operating the generating elements. The carbon holders 50 and 51 are mounted on the heat insulating plate 28*b* in substantially the same manner as the carbon holders 29 and 30 are mounted on the plate 28, as described fully in Fig. 3, the holder 50 being fixedly mounted on the plate and the holder 51 being pivotally mounted on the plate 28. An arm 52 is secured to a projecting portion of the holder 51 and extends rearwardly therefrom and is bifurcated at its outer end. A screw 40*b* is rotatably mounted on a framework secured to the plate 28*b*, the screw having a handle 41*b* secured at its outer end to extend outside of the casing 44. A supporting element 42*b* is mounted on the screw 40 and has a screw member 53 mounted on the lower end thereof for engaging the bifurcated portion of the arm 52. The element 42*b* has a cam surface, which, when the latter is moved laterally operates the holder 51 on its pivot to bring the carbon electrode 39*b* into closer relation with or away from the electrode 38*b*, depending upon the direction of rotation of the handle 41*b*. This action is possible because of the fixed relation of the arm 52 with respect to the rotation of the screw 40*b*, the element 42*b* being held in a fixed relation by the arm 52.

Referring now to Fig. 6 of the drawings a still further embodiment is shown wherein the element 42*c* has a cam groove on the lower end thereof in place of the cam surface, as shown and described in the previous embodiment. A pin 54 secured to an extension of the pivotal carbon holder 55 rides in the cam groove 56 to operate the carbon electrode 39*c* into engagement with or away from its cooperating carbon electrode 38*c*.

By referring now more particularly to Figs. 7, 8 and 9, inclusive, a still further embodiment of a control mechanism for operating the generating elements is shown. A solenoid 57 is mounted on a bracket 58 secured to the heat insulating plate 28*d*. A pair of carbon holders 29*c* and 30*d* are mounted on the plate 28*d* in the same manner as in the previously described embodiments. However, the plate 29*d* is pivotally secured to the plate 28*d* and the holder 30*d* is fixedly mounted thereto. An arm 59 is mounted on the end of the holder 29*d* in any suitable manner, such as by means of the screws 60, and extends through the plate 28*d* and a substantial distance outwardly therefrom. A plunger 61 is secured to the arm 59 and is held in a fixed relation therewith by means of a compression spring 62, one end thereof bearing against the arm 59 and the other end thereof bearing against the head of a screw 63, the latter being secured to the plunger 61.

In the operation of this latter described control mechanism, when the solenoid 57 is energized, the plunger 61 is attracted and the arm 59 is drawn downwardly to pivot the carbon holder 29*d* on its bracket 33*d*. In this embodiment the carbon electrode 38*d* normally rests on the carbon electrode 39*d* whereby, when electrical energy is fed to the carbon electrodes and to the solenoid 57 simultaneously, the holder 29*d* moves the carbon electrode 38*d* away from the carbon electrode 39*d* and establishes an arc at the ends thereof.

The weight of the carbon holder 29*d* and the carbon electrode 38*d* is sufficient to overbalance the weight of the arm 59 and the plunger 61, and in order to limit the extent to which the solenoid may actuate the arm 59, an adjustable screw member 64 is disposed on an extension of the arm 59. The screw 65 abuts the insulating member 28*d* when the solenoid is energized, to limit the extent to which the electrodes 38*d* and 39*d* are separated.

In order to adjust the position of the reflecting chamber 15, the latter is secured to a bracket 65. The bracket 65 is pivotally secured to a bracket 66, the latter having a shaft 69 extending therefrom which is rotatably journalled in a handle 67. This construction is very clearly illustrated in Fig. 13 of the drawings. The shaft of the bracket 66 is secured against rotation by means of a screw 68 extending through the handle casting to bear thereagainst. In much the same manner, the pivotal connection between the castings 65 and 66 is held against movement by means of a clamping screw 70. The main switch 71, for controlling the operation of the lamp, is mounted concentric with the pivotal axis of the bracket 65. By so mounting the electrical switch 71, the need of an excessive amount of wire is obviated and the beauty and utility of the lamp is enhanced considerably.

The handle 67 is suitably secured to the upper end of the telescoping mast 16. This mast is composed of pipes 72, 73 and 74, pipe 73 having a collar disposed on the upper end thereof for receiving a clamping screw 75, and pipe 74 having a collar on the upper end thereof for receiving a clamping screw 76. When it is desired to adjust the height of the lamp, the clamping screws 75 and 76 are loosened and the handle 67 is grasped and lifted or lowered to a desired position whereafter the clamping screws are tightened. By positioning the handle 67 on top of and in axial alignment with the telescoping mast 72, the effort required to adjust the lamp will be

minimized as the friction accompanying the binding, which ordinarily exists when the pull or lift is off-center with the axis of the mast or the direction of lift, is greatly reduced. In order that the telescoping masts be prevented from pulling apart, a metal ring is secured to the lower ends of the pipes which engages the recessed portions in the collars as shown.

The resistance element 18, which cuts down the amount of current in order to establish a good arc, makes it possible to operate the therapeutic lamp on either alternating or direct current without the use of complicated transformers. However, it may be desirable, instead of disposing the resistor 18 on the mast adjacent the spider, to utilize the heat given off therefrom by placing this resistance element in the lamp.

By referring now to Figs. 10, 11 and 12 a resistance element 77 is secured to the rear wall in the reflecting chamber 15. The resistance element is preferably formed in the shape of a ring in order to extend around the generating elements. The resistance element may preferably be made of a sheet metal 78 formed into a channel shape to receive a wire 79 wound spirally on a sheet of mica or other insulating material 80, the spirally wound wire being insulated from the channel shaped material 78 by means of a sheet of insulating material 81 enveloping the same. A strip of sheet metal corresponding to the channel shaped strip 78 is inserted into the latter and the ends of the latter are bent at right angles to hold the strip in a position such that the heating element is concealed in the casing formed by the members 78 and 82.

The resistance element 77, in addition to the normal action of transforming electric energy into heat, acts as a generator of infrared rays which has a specific therapeutic effect. Heretofore, the heat given off from the resistance unit, as mounted on the stand, has been wasted into the outside atmosphere and, in some instances, it has been disagreeable to operate the lamp due to the excess heat. It is therefore desirable that the resistance element be eliminated from the stand and positioned only in the reflecting chamber.

While several embodiments of this invention are herein shown and described, it is to be understood that various modifications thereof may be apparent to those skilled in the art without departing from the spirit and scope of this invention, and, therefore, the same is to be limited only by the showing of the prior art and the appended claims.

I claim:

1. A therapeutic device comprising a curved reflecting chamber, a pair of electrodes for generating radiant energy extending into said chamber and lying about the axis thereof, means outside of said chamber for holding said electrodes, mechanism for adjusting said electrodes, a heat insulating member on which said holding means are mounted to shield said mechanism from said radiant energy, and a perforated casing secured to said chamber for enclosing said mechanism.

2. A therapeutic device comprising a curved reflecting chamber, a pair of electrodes for generating radiant energy extending into said chamber and lying about the axis thereof, an insulating member secured to said chamber, holders mounted on said insulating member for carrying said electrodes, one of said holders being fixedly mounted and the other being pivotally mounted, a rotatably mounted screw member, an actuating member threadedly engaging said screw member and held against rotation therewith to obtain a lateral movement, and a link member secured to said actuating member for operating said pivotally mounted holder to adjust said electrodes.

3. A therapeutic device comprising a curved reflecting chamber, a pair of electrodes for generating radiant energy extending into said chamber and lying about the axis thereof, a heat insulating member secured to said chamber, holders mounted on said insulating member outside of said chamber for carrying said electrodes, said holders being adjustable relative to each other, a rotatably mounted screw member, an actuating member threadedly engaging said screw member and held against rotation therewith to obtain a lateral movement, said actuating member operating to cause an adjustment between said holders to adjust said electrodes.

4. A therapeutic device comprising a curved reflecting chamber, a pair of electrodes for generating radiant energy extending into said chamber and lying about the axis thereof, a heat insulating member secured to said chamber, holders mounted on said insulating member outside of said chamber for carrying said electrodes, said holders being adjustable relative to each other, a rotatably mounted screw member, an actuating member threadedly engaging said screw member and held against rotation therewith to obtain a lateral movement, said actuating member having cam means for operating to cause an adjustment between said holders to adjust said electrodes.

5. A therapeutic device comprising a reflecting chamber, a pair of electrodes for generating radiant energy disposed therein, a heat insulating member secured to said chamber, holders mounted on said insulating member outside of said chamber, said holders being adjustable relative to each other, mechanism mounted on said insulating member outside of said chamber for operating to obtain an adjustment between said holders, and a perforated casing for enclosing said

mechanism for preventing the oxidation thereof.

6. A therapeutic device comprising a reflecting chamber having radiant energy generating elements disposed therein, a telescoping mast comprising a plurality of nested pipes for adjustably supporting said reflecting chamber, a handle disposed on the upper end of one of said pipes and located substantially centrally thereof, and a mobile support for carrying said telescoping mast.

7. A therapeutic device comprising a reflecting chamber having radiant energy generating elements disposed therein, a telescoping mast comprising a plurality of nested pipes, a bracket pivotally mounted on said mast for supporting said reflecting chamber, switching means mounted on said pivotal connection for controlling said generating elements, and a mobile support for carrying said telescoping mast.

8. A therapeutic device comprising a reflecting chamber having radiant energy generating elements disposed therein, a telescoping mast, a handle secured to the upper end of said mast and located substantially centrally thereof, said handle having an extension thereon, a bracket pivotally mounted on said extension for supporting said reflecting chamber, switching means mounted on said pivotal connection, and a mobile support for carrying said telescoping mast.

9. A therapeutic device comprising a reflecting chamber, a pair of electrodes for generating radiant energy disposed therein, an insulating member secured to said chamber, holders mounted on said insulating member, said holders being adjustable relative to each other, mechanism mounted on said insulating member for operating to obtain an adjustment between said holders, a perforated casing for enclosing said mechanism for preventing the oxidation thereof, and a plurality of windows in said reflecting chamber for observing the operation of said generating elements, said windows being formed of a colored glass whereby undesirable rays may be eliminated.

10. A therapeutic device comprising a reflecting chamber having carbon electrodes disposed therein for generating radiant energy, a screen removably mounted on an open face of said reflecting chamber for preventing foreign substances given off said carbon electrodes from passing out of said chamber, and a telescoping mast for adjustably supporting said reflecting chamber, said chamber being adjustable to permit said electrodes to drop into said screen for replacement.

11. A therapeutic device comprising a reflecting chamber having radiant energy generating elements disposed therein, a telescoping mast, a handle having an extension thereon secured to the upper end of said mast and located substantially axially thereof, a bracket rotatably mounted on said extension, said chamber being pivotally mounted on said rotatably mounted bracket, and a mobile support for carrying said telescoping mast.

In witness whereof, I have hereunto subscribed my name.

PAUL E. JOHNSON.