Jan. 1, 1929.

1,697,449

F. A. ANDERSON

LIGHT THERAPY APPLIANCE

Filed April 11, 1927 4 Sheets-Sheet 1

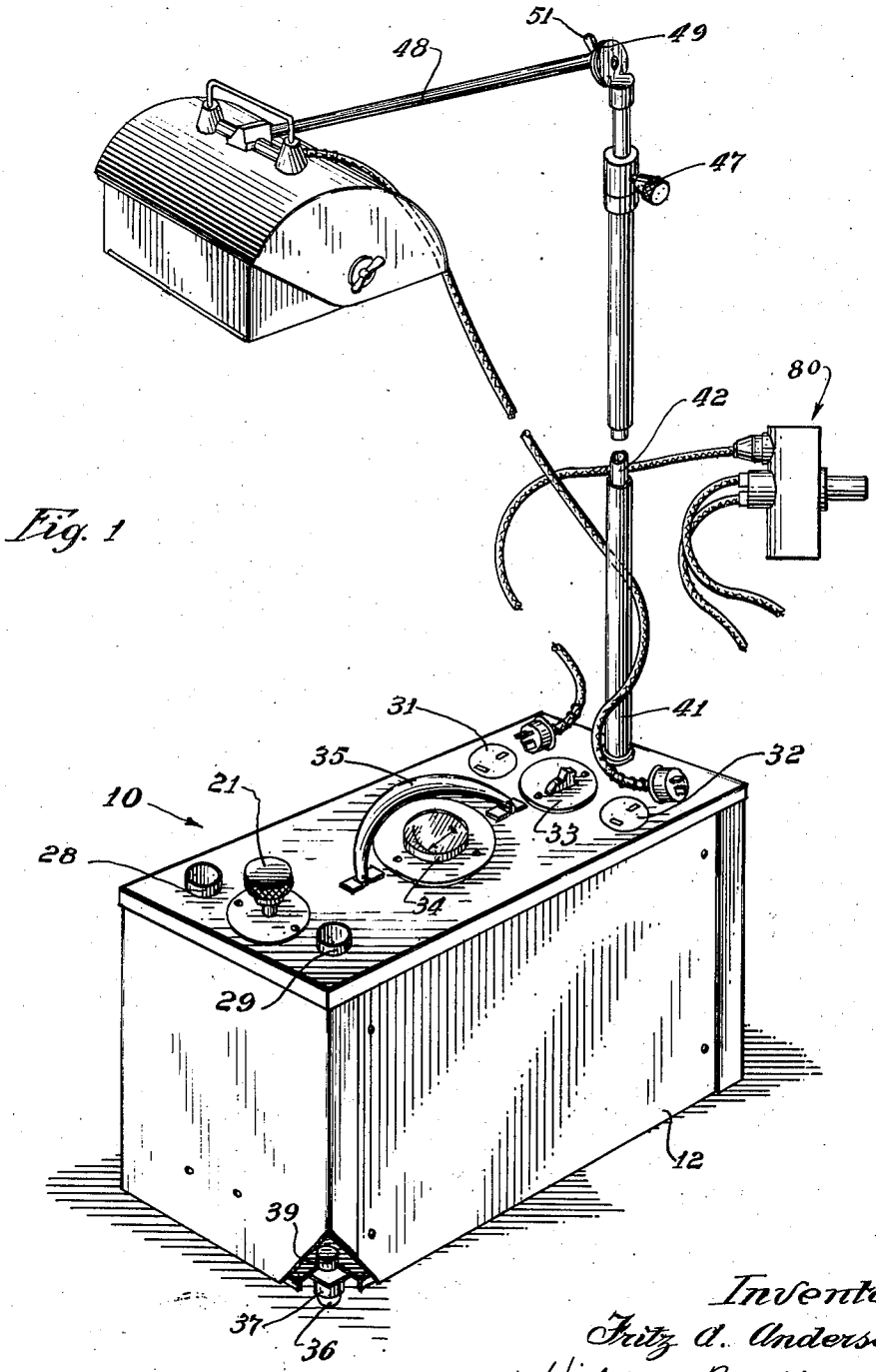


Fig. 1

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Fig. 2

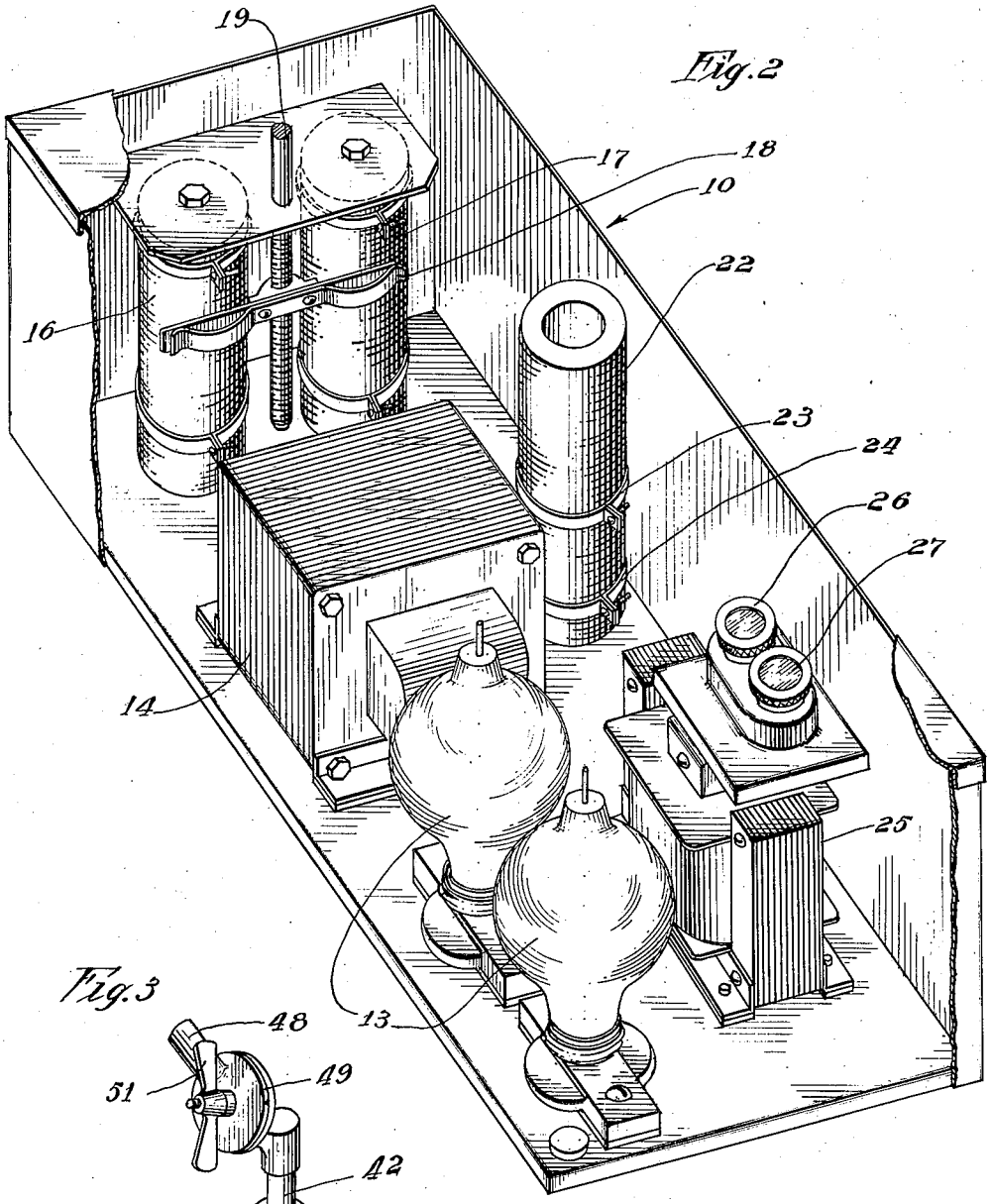


Fig. 3

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Fig. 4

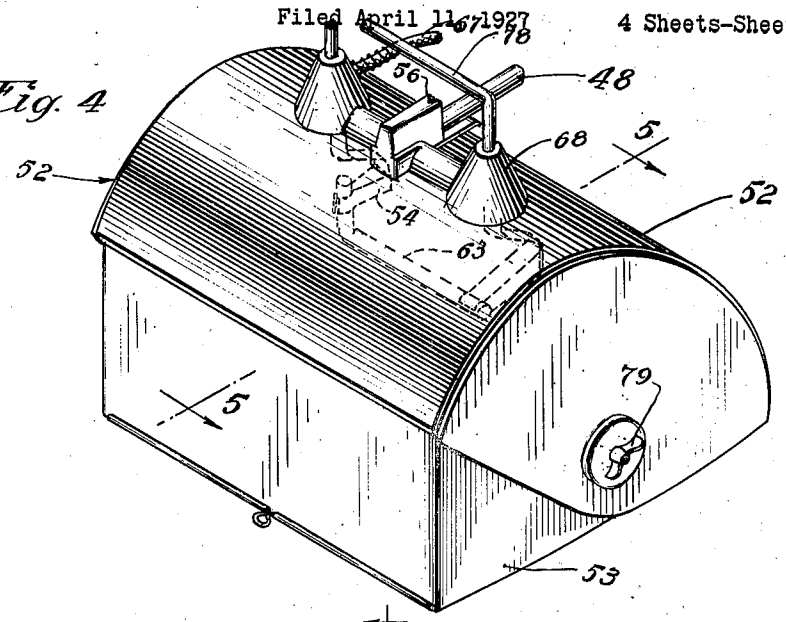
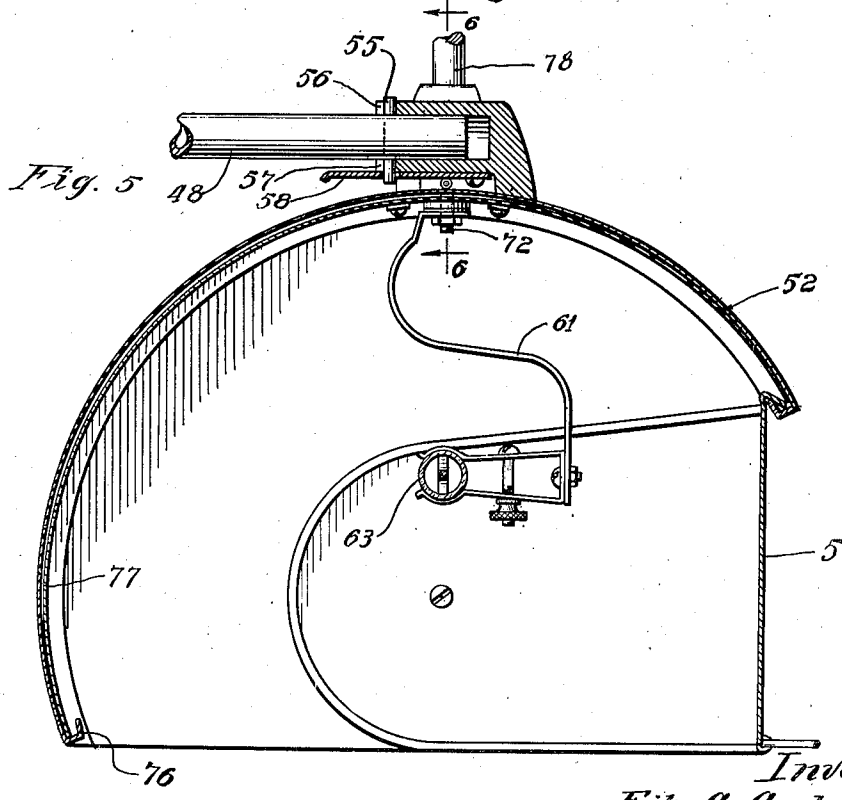


Fig. 5



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Fig. 6

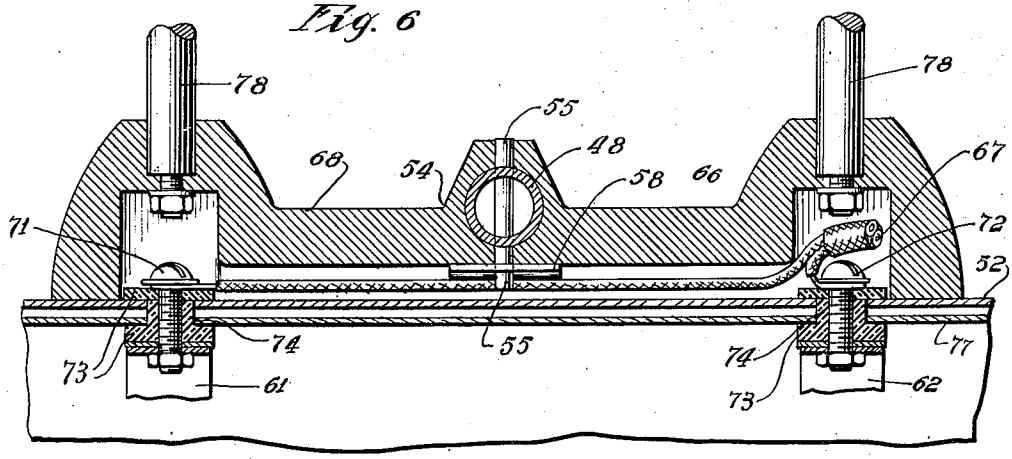


Fig. 7

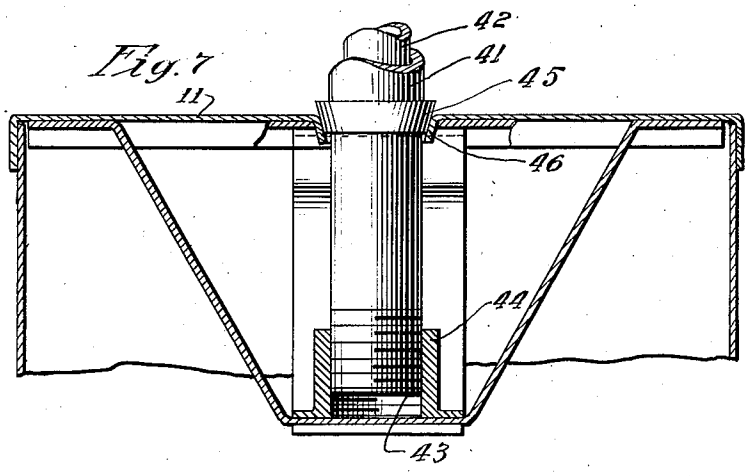
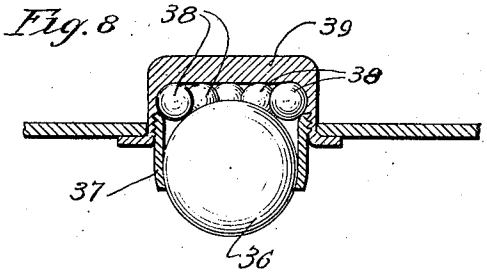


Fig. 8



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Patented Jan. 1, 1929. 1,697,449

UNITED STATES PATENT OFFICE.

FRITZ A. ANDERSON, OF MILTON, WISCONSIN, ASSIGNOR TO THE BURDICK CORPORATION, OF MILTON, WISCONSIN, A CORPORATION OF DELAWARE.

LIGHT-THERAPY APPLIANCE.

Application filed April 11, 1927. Serial No. 182,692.

My invention relates, in general, to light therapy.

It relates, more particularly, to a universal portable light therapy appliance designed to be connected to any usual commercial source of current and operate a plurality of types of light ray generators.

Ultra-violet light employed in therapeutics is usually applied in one of two ways, i. e., either generally or locally. A general application of ultra-violet light is usually accomplished by means of an "air cooled" lamp, while localized treatment is effected by means of a "water cooled" lamp. The voltages now usually employed in the two lamps are different, and it is necessary to provide a control for the current supplied to the lamps, so that the voltage may always be at the correct value.

The current supplied to the mercury arc burner or lamp tube, either air cooled or water cooled, must be direct, and accordingly alternating current must be rectified before it can be used. Heretofore the equipment has usually been furnished to be used with only one type of current supply, and such equipment cannot be employed with a different type source of current with success. Some of these outfits are mobile in that they are capable of being moved locally from place to place but, because of their weight, size and limitations as to the variety of current with which they can be used, they are not portable. In other words, it is necessary to bring the patient to the place of treatment rather than to take the treatment to the patient. As a result, many patients who would undoubtedly benefit greatly by receiving light treatments are unable to obtain the same, because they cannot be moved to a hospital or doctor's office without great inconvenience and danger. This state of affairs is especially objectionable in sparsely settled communities.

Among the objects of the present invention is the provision of a compact light therapy unit adapted to be readily transported from one location to another.

Another object is to provide a light therapy appliance adapted to use either alternating or direct current.

Another object is to provide a light therapy appliance in which the number of pieces of apparatus and the weight thereof are greatly reduced.

Another object is to provide a reflector for an air cooled lamp designed to protect the lamp from injury during transportation thereof.

Anothr object is to provide with a comparatively small reflector, a large area of diffusion of light rays.

Another object is to provide a relatively small reflector having a large available reflecting area.

Another object is to provide a light therapy appliance comprising a base, reflector and reflector supporting standard all readily detachable from each other, and furnishing a rigid support when assembled.

Another object is to provide a universal light therapy appliance readily carried suitcase fashion by a single person.

Other objects and features of the invention will become more apparent from a consideration of the detailed description taken with the accompanying drawings, in which

Fig. 1 is a perspective view partially broken away showing the current controlling unit with the telescoping standard secured thereto.

Fig. 2 is an enlarged fragmentary view of a portion of the standard.

Fig. 3 is an isometric view showing the arrangement of equipment in the current controlling unit box.

Fig. 4 is an isometric view of the reflector.

Fig. 5 is a section taken on the line 5—5 of Fig. 4.

Fig. 6 is a section taken on the line 6—6 of Fig. 5.

Fig. 7 is a sectional view showing the manner in which the standard is secured to the box, and

Fig. 8 illustrates the type of roller which is used to permit the equipment box when serving as a base for the standard and reflector to be readily shifted on the floor for purposes of adjustment.

The appliance comprises a box having the general appearance of a medium sized suitcase and containing complete electrical equipment to rectify alternating current and to control the voltage of the commercial direct current or the voltage of the rectified current to supply an air cooled lamp or a water cooled lamp with current at the most desirable voltages. A telescoping standard is adapted to be attached to the box which

houses the controlling equipment and is provided with an arm adapted to extend at right angles to the standard to support an air cooled lamp reflector or to be extended back parallel to the standard to facilitate carrying thereof. The reflector is somewhat reduced in size over the usual type of air cooled lamp reflector and is provided with an adjustable apron whereby the area of diffusion of rays may be enlarged and the quartz tube generator protected from injury during transportation. The tube is mounted on resilient supports to minimize the effect of jarring. The supports also act as electrical conductors, thereby increasing the available reflecting surface of the reflector. The reflector is adapted to be readily disengaged from its supporting arm and is provided with a small bail-like handle to permit it to be carried suit-case fashion.

The current controlling unit comprises a box or cabinet 10 having a top plate 11 on which the controlling apparatus is adapted to be secured and a readily removable side 12 affording access to the interior of the box. The equipment required to furnish a universal control for any usual commercial supply of current is housed within this box. The equipment comprises electrical valves 13 and transformer 14 which are adapted to rectify alternating current in the manner described in the co-pending application of Roland H. Maxson, Serial No. 27,673, filed May 4, 1925. Parallelly arranged resistance coils 16 and 17 are bridged by a rheostat arm 18 adapted to be moved vertically in contact with the coils by the spindle 19 turned by knob 21 on the top of the box.

A third resistance coil 22 is provided with terminal bands 23 and 24 for the purpose of making semi-permanent adjusments where unusual commercial current conditions are encountered. Such adjustment would be of utility, for instance, when the unit had been used on 110 volt current and it became necessary to move it to a location where only a straight 220 volt current was available. The added resistance which can be obtained by means of resistance coil 22 together with the adjustment obtainable by means of the adjustable rheostat arm 18 will enable the physician to successfully use the same appliance with the higher voltage.

A reactance 25 is designed to smooth out the direct current pulsations and thereby prevent extinguishment of the arc when the alternating current reverses and to assist in protecting the equipment from heavy flow of current of short duration, such as may be occasioned, for instance, when striking the arc. Fuses 26 and 27 adapted to be inserted in the alternating current and direct current circuits, furnish an added protection.

On top of the box electrical service connectors 28 and 29 for direct and alternating current, respectively, are provided. These connectors may be of the ordinary screw plug or slip terminal types. The unit is designed to supply two direct current voltages, one for a water cooled lamp delivered at outlet connector 31 and the other for an air cooled lamp delivered at outlet connector 32, whether the source is direct or alternating current.

A main or line switch 33 is arranged to open both the primary alternating current line and the unmodified direct current line. A suitable indicating instrument 34 is arranged to indicate the voltage supplied to either outlet 31 or outlet 32, depending upon which one is in use. A bail-like handle 35, which may be formed as an ordinary suit-case handle, is attached to the top of the box to permit easy transportation of the entire current controlling unit.

For details of the circuit employed reference may be had to Walter Hudson's Patent No. 1,660,794 granted February 28, 1928, Serial No. 182,598, filed Apr. 11, 1927.

The box or cabinet 10 not only serves as a container to house the equipment and transport it from place to place but also acts as a base to support the reflector of the air cooled lamp when the complete appliance is in use. To permit easy manipulation of the appliance while resting on a floor, rollers are provided in lieu of casters. The rollers comprise comparatively large steel balls 36 having a circular support 37 beyond the lower dead center thereof, and engage a race of smaller balls 38 contained in a suitably designed housing 39 secured in the base of the equipment box. The rollers are 4 in number, one being provided at each corner.

The telescoping standard which is adapted to be secured to the box and support the reflector, comprises an outer tubular upright 41 and an inner tubular upright 42. The upright 41 is provided at its lower extremity with threads 43 adapted to engage an interior set of threads provided on a socket 44 supported in the box 10. A sloping flange 45 on the upright 41 is adapted to engage a circular lip 46 turned from the cover of the box to hold the upright in a rigid stationary position. A clamp at the upper part of upright 41 adapted to be operated by hand screw 47 permits the inner upright to be secured at any vertical position with respect to the outer upright.

Inner upright 42 has pivotally secured at the top thereof a reflector supporting arm 48 adapted to be held in a horizontal position at right angles to the upright or to be folded back parallel to the upright to facilitate carrying. The pivot 49 about which arm 48 swings, is adapted to be tightened by thumb nut 51 to rigidly anchor the arm in its adjusted position.

The reflector adapted to be secured to

arm 48 comprises a main reflector body 52 having a movable apron 53 pivoted at its ends to the reflector body. A latch mechanism on the top of the reflector adapted to be applied to the end of arm 48 includes a socket 54 in which the end of the arm extends, the degree of insertion being limited by the end projections of pin 55 entering recesses 56 and 57 above and below socket 54. A spring latch 58 is provided with an aperture designed to receive the lower projection of pin 55 when the reflector and arm are in assembled position, thereby preventing accidental withdrawal of the reflector from the supporting arm. In this way a rigid support for the reflector is obtained since movement about the axis of the arm 48 is arrested because pin 55 is held in recesses 56 and 57. Longitudinal movement with respect to the axis of the supporting arm is also prevented partially through engagement of the pin in the recesses and partly through the action of latch 58.

Spring supports 61 and 62 (Figs. 5 and 6) support a quartz tube 63 in such a manner as to furnish a protection therefor against jars incidental to the transporting of the appliance from one location to another. The supports are of nickeled stock so that they can aid to some slight extent in reflecting the light rays rather than obstructing them and also act as electrical contacts for the tube. The double lead comprising single leads 66 and 67 is led into the housing 68 at the top of the reflector and the single leads are connected to machine screws 71 and 72 which secure supports 61 and 62 to the reflector body. Insulation in the form of washers 73 and tubes 74 is provided to prevent each of the machine screws 71 and 72 from making contact with the metal of the reflector. By employing the resilient supports as "leads" and also by making them with a reflecting surface, the available reflecting area within the interior of the reflector body is increased, and shadow effects resulting from non-reflecting areas within the reflector are avoided.

The reflector body may be finished on its interior surface to constitute a reflector but a preferred construction is to make the reflector body of sheet steel provided with upturned edges such as shown at 76. A separate reflector 77 of highly lustrous material is supported in place within the interior of the reflector body by means of the up-turned edges or flanges 76. This permits obtaining a very light construction as the requisite strength is furnished by the reflector body and the reflecting surface, made from a softer material, is exceedingly thin since it does not have to withstand any rough useage such as would result in an appliance of this kind.

A bail-like handle 78 is secured in the housing 68 which housing also contains as a part thereof socket 54. The apron 53 is adapted to be telescoped within the main body 52 to widen the area of diffusion of the reflected light and to be extended into a downward position as shown in Fig. 4, permitting the reflector to be placed upon the floor or on a table without danger of tilting or toppling over. The apron 53 is held in any adjusted position through the operation of thumb nut 79.

The appliance is adapted particularly for use with water cooled and air cooled "quartz" generators. It may, however, be used to supply current to other types of generators, should such use be considered desirable. A water cooled lamp 80 of any usual type may be employed which will be readily transportable since it is not of large size. The reflector makes possible the application of general ultra-violet treatment because it is sufficiently compact so that it can be transported readily from place to place without injury.

In carrying the equipment from one place to another, it is disassembled and arm 48 is extended parallel to uprights 41 and 42. The supporting standard and reflector are carried in one hand and the current controlling unit in the other.

Having thus illustrated and described one embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a portable therapeutic lamp appliance a container for a universal current controlling unit provided with a handle for carrying it in the manner of a suit-case and containing complete current modifying equipment for direct and alternating current, an upright adapted to be secured to the container, and a reflector adapted to be secured to the upright, a readily detachable electrical connection being provided between the control unit and reflector.

2. A portable therapeutic appliance comprising a box with a bail-like handle for carrying the same in suit-case fashion, said box housing a universal current control system for the purpose described, a telescoping standard adapted to be secured to the box, an extending arm pivoted to the standard and normally at right angles thereto, but adapted to be folded to a position parallel to the standard to facilitate carrying, and a reflector housing a ray generating unit adapted to be secured to the extending arm and provided with a bail-like handle permitting it to be carried suit-case fashion.

3. A reflector for a portable therapeutic lamp appliance comprising a reflector body, a resilient support adapted to hold a light ray generating element, and a hinged apron on said reflector body adapted to be opened to permit greater area of application of

rays, or to be closed so as to support one side of the reflector body when setting on a flat surface.

4. In a portable therapeutic appliance, the combination of a telescoping standard, an arm pivoted to the standard and adapted to be folded along the standard or extended at right angles thereto and having a projection on the end thereof, a fastener for securing the arm in extended position, a reflector having a bail-like handle to permit carrying thereof in suit-case fashion, and a spring latch on the reflector for engagement with the projection on the arm, the spring latch adapted to be engaged with the fingers for releasing the reflector from engagement with the supporting arm.

5. A portable therapeutic appliance comprising a box with a bail-like handle for carrying the same in suit case fashion, said box housing a current control system for a therapeutic lamp, a standard adapted to be secured to the container, an extending arm pivoted to the standard and normally at right angles thereto but adapted to be folded to a position parallel to the standard to facilitate carrying, and a reflector housing a ray generating unit adapted to be secured to the extending arm and provided with a bail-like handle permitting it to be carried in suit case fashion.

6. In a portable therapeutic appliance, a reflector comprising a reflector body, a ray generating unit therein, a bail-like handle for the body whereby the body may be carried in suit case fashion, electric terminal posts for the ray generating unit extending through the body beneath the bail, current conducting cords attached to the terminal posts, and a shield overlying the conductor cords beneath the bail to prevent accidental contact with the cords as when the reflector is carried or handled, said shield serving to support the bail on said reflector body.

7. In a portable therapeutic appliance, a reflector comprising a reflector body, means for supporting a ray generating unit within the body, electric terminal posts for the unit extending through the body, a rigid housing and connection member overlying the terminal posts on the outer wall of the body and secured to the body for connecting the body with a supporting member and for shielding wires extending to the terminal posts.

8. In a portable therapeutic lamp appliance, a container for a universal current controlling unit provided with a handle for carrying it in the manner of a suit case and containing complete current modifying equipment for direct and alternating current, an upright adapted to be secured to the container, and a reflector adapted to be secured to the upright and having a handle for carrying the reflector in suit case fashion, a readily detachable electrical connection being provided between the control unit and reflector.

9. A reflector housing for a therapeutic lamp comprising a casing, supports within the casing for carrying a lamp tube, and a supporting bracket rigidly attached to the outside of the casing and having its side adjacent the casing recessed to house portions of electrical conductors used to carry current to the lamp.

In witness whereof, I hereunto subscribe my name this 29 day of March, 1927.

FRITZ A. ANDERSON.