

S. A. CUNNINGHAM.
THERAPEUTIC DEVICE FOR UTILIZING RADIANT ENERGY.
APPLICATION FILED NOV. 14, 1912.

1,061,225.

Patented May 6, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

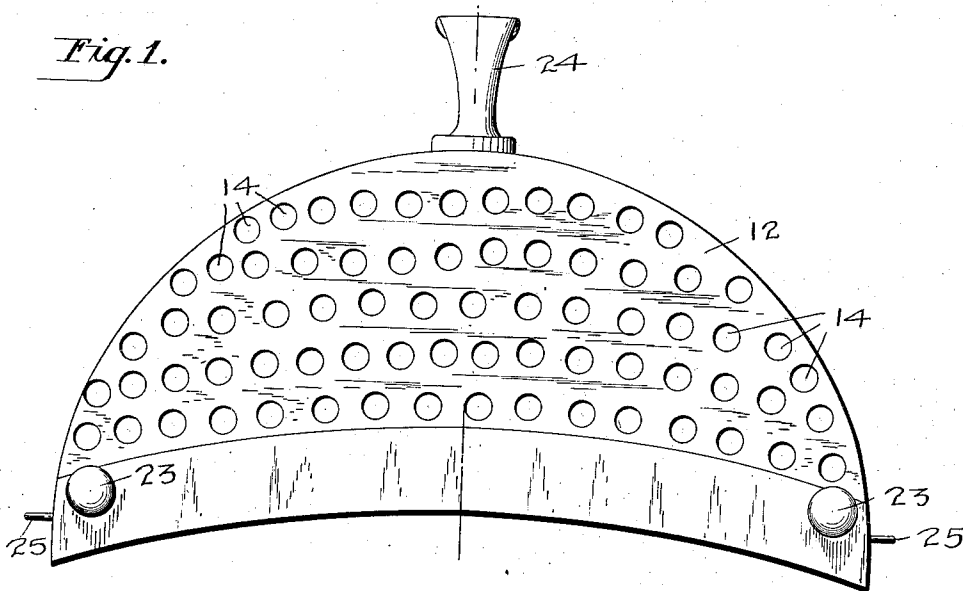
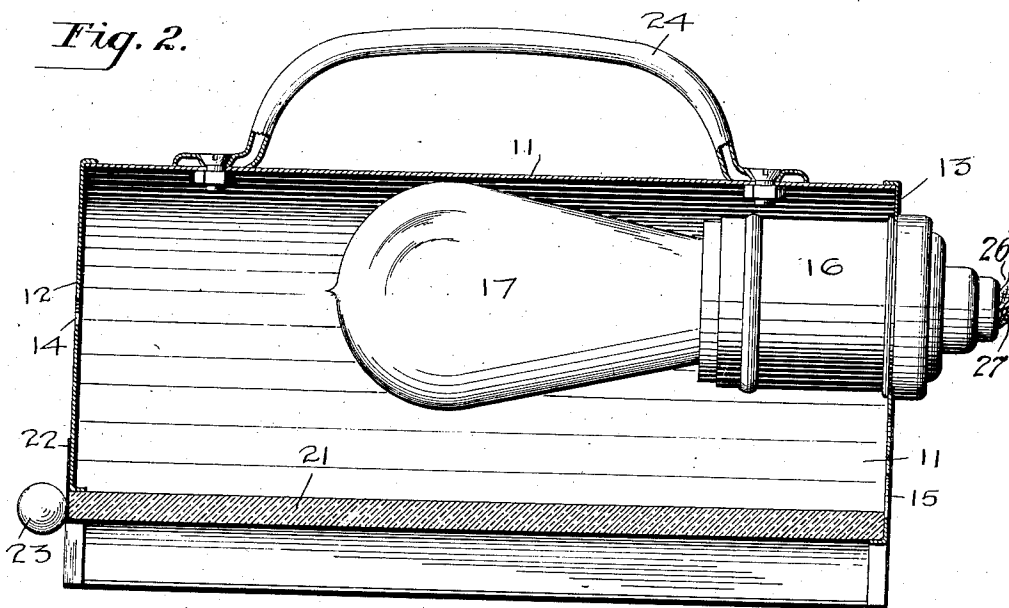


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

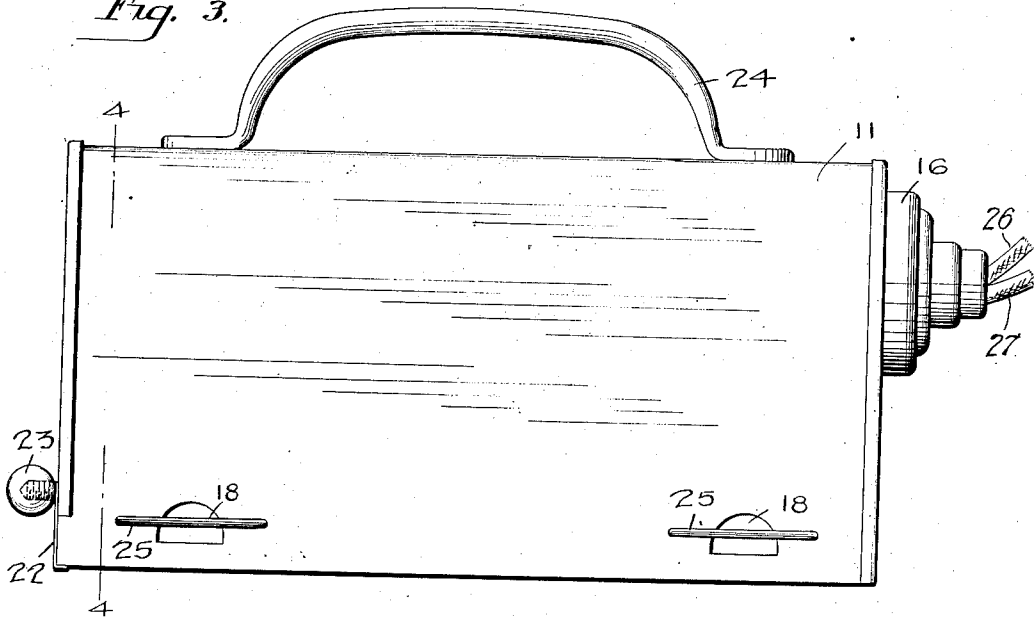
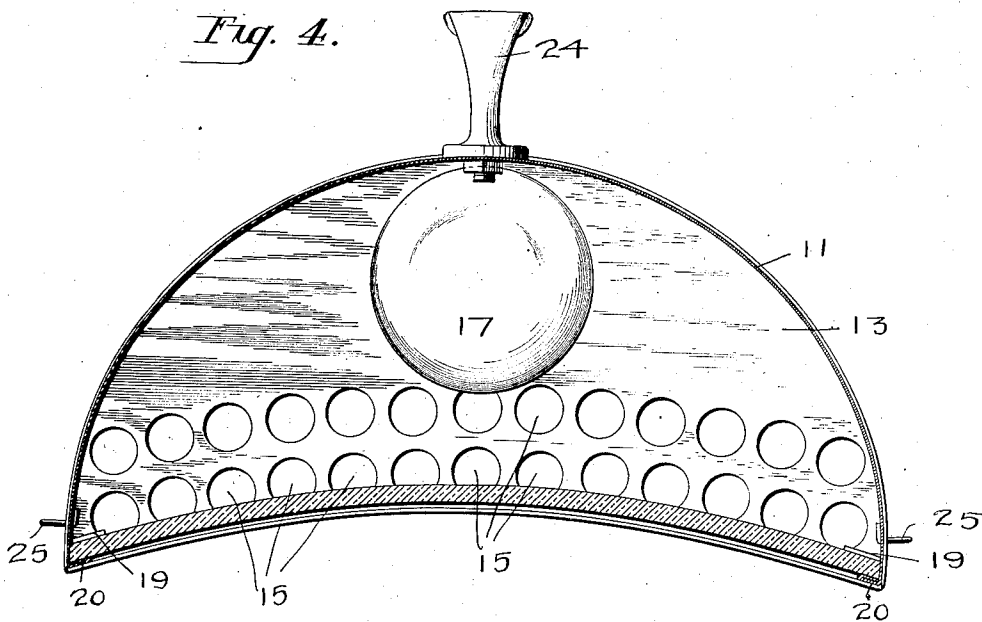


Fig. 4.



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THERAPEUTIC DEVICE FOR UTILIZING RADIANT ENERGY.

1,061,225.

Specification of Letters Patent.

Patented May 6, 1913.

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To all whom it may concern:

Be it known that I, SAMUEL A. CUNNINGHAM, a citizen of the United States, and resident of New York city, borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Therapeutic Devices for Utilizing Radiant Energy, of which the following is a specification.

For some time it has been well known that rays of light of a certain color or colors, or light from which rays of a certain color or colors have been excluded, possess well defined therapeutic properties when directed against diseased tissues of the human body, rays of certain colors even penetrating to and having a therapeutic effect upon the more deeply seated tissues underneath the skin—and this without appreciable effect upon the healthy tissues through which the rays must pass.

Various styles and kinds of light-ray filters have been employed from time to time, for purposes such as generally outlined above, in connection with a suitable source of ordinary "white" light, such as the electric glow lamp, with or without a suitable reflector, the filter consisting of a screen of colored glass or other transparent, semi-transparent or translucent material, this screen being interposed between the source of light and the surface against which it is desired to direct the light rays. It has come to be well known that rays of light of different colors produce different therapeutic effects, and filtering screens of different colors have therefore been employed, the nature of the disorder or ailment determining the color of the screen to be employed. If, for instance, it is desired to hasten the healing of a wound, a yellow screen has been employed to filter out substantially all except the yellow rays of light which have been found to have the desired effect. Violet and ultra-violet rays are known to be effective for the purpose of destroying germs in the treatment of certain kinds of skin diseases, and under such circumstances all except the violet rays should be filtered out by the screen. It has also been found that blue rays of light are effective when it is desired to relieve pain, particularly if due to congestion, even when the seat of trouble lies well underneath the skin which is itself in a perfectly healthy condition. Similarly, a source of light and a reflector have long

been used for the purpose of generating heat for the application of the same to localized portions of the body, and for what are known as electric baths in which the body as a whole is treated. In many instances, however, the application of heat, to a degree very much in excess of the normal temperature of the body, is harmful and objectionable. Of course, where it is desired to destroy the tissue as by blistering or cauterization, the application of heat is essential, but for the treatment of local derangement of the system the seat of which is underneath the skin, which in itself may be in a perfectly healthy condition, the application of heat to too high a degree is objectionable, as stated. It is well known, however, that it is not possible to generate light without the generation of heat, and a reflector which will direct or concentrate the light rays will also direct and concentrate the heat rays. These heat rays, passing with the rays of light through the screen, naturally tend to heat the latter, and this has rendered it necessary to hold or locate the screen at some little distance from the body of the patient during treatment.

I have found that decidedly better effects are produced, particularly in the treatment of any derangements such as lumbago, neuralgia, colic, etc., by placing the filtering screen in direct contact with the skin over the seat of the trouble. When contact is not had the light ray tends to produce its effect on the skin and not in the deeper tissues. In other words, it is best to eliminate any medium through which the rays must pass from the screen to the skin of the patient. In most cases, however, due to the heating effect necessarily attendant upon the generation of light, and the concentration of the light and the heat rays due to the reflector the screen itself becomes heated to so high a degree that contact between said screen and the skin causes pain and possibly even blistering, which in many cases is decidedly disadvantageous if not fatal to the proper performance of the functions of the light rays.

The principal object of the present invention is the provision of a simple, self-contained, convenient, light and portable device for generating light, directing the rays therefrom, through the medium of a suitable reflector, over a comparatively limited area, and including a filtering screen adapted to

be brought into direct contact with the skin over the effected part of the body of the patient, the whole being so arranged as to dissipate the heat generated and therefore prevent over-heating of the screen which is adapted to be placed in contact with the skin of the patient.

Long ago, Finsen discovered that certain diseases of the skin, such as lupus (tuberculosis of the skin) could be successfully treated by directing upon the diseased tissues isolated violet rays of light, and also found that the best effects were produced by passing these rays through rock crystal lenses pressed directly against the skin of the patient. In no other device, however, so far as I have been able to determine, was the filtering screen brought into direct contact with the body of the patient, and Finsen, in order to keep his crystal cool enough to permit of such contact, employed a water-jacket. The employment of a water-jacket is objectionable, not least among the reasons for which is the fact that it obviously renders the device cumbersome and capable of use only under certain conditions, and this invention further contemplates, therefore, the provision of a device in which the rays of light may be directed through the screen, without the application of any artificial cooling means, and maintain a low enough temperature in said screen to permit of its being placed directly in contact with the skin over the effected parts.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an end view of a device embodying my invention; Fig. 2 is a central longitudinal section of the same, taken substantially on the line 2—2 of Fig. 1; Fig. 3 is a side view of Fig. 1, and Fig. 4 is a transverse section taken substantially on the line 4—4 of Fig. 3.

Referring now to the drawings in detail, numeral 11 designates a substantially semi-cylindrical or arch-shaped shell of sheet-metal having a polished inner surface and therefore providing a reflector for rays of light directed thereagainst. While I have referred to this shell as being substantially semi-cylindrical, it is obvious that it may be parabolic in lateral configuration, or have any other desired curvature which will reflect the rays directed thereagainst from a suitably located source of light in substantially parallel arrangement through the open side of this shell opposite the reflecting surface.

It being desirable, as stated, to dissipate the heat rays to a large extent by ventilating the interior of this shell or reflector 11, it might seem at first glance to be desirable to leave the ends thereof open. This, how-

ever, would give rise to other objections. In the first place means must be provided for mounting an electric lamp and this shell must have at least one end portion for the support of the lamp in order that there may be no break in the reflecting surface of the shell. Furthermore, the device is often used at such locations on the body and so disposed that the rays of light would be directed through the open end to the eyes of the patient. As treatments are often of some considerable duration, it will be apparent that this steady glare would be annoying and inconvenient even if there were no more harmful results. I therefore provide this arch-shaped reflector 11 with end portions 12 and 13, the end portion 12 being provided throughout its entire extent with the perforations 14 14, and the end portion 13 being provided with the perforations 15 15 in the lower part thereof in view of the provision of a socket 16 for an electric lamp 17 as hereinafter described. At each side edge of the shell 11, and preferably located near the ends of said shell, I punch apertures 18 which not only have the function, like the apertures 14 and 15, of contributing to the ventilation of the interior of the shell, but also provide interior lips or lugs 19 which cooperate with the flanges 20 at the side edges of the shell to firmly yet removably support the glass screen 21. This screen 21 preferably consists in an integral piece or pane of glass of a color to filter out rays of light of certain color or of all colors except that of the screen itself. This screen 21 is curved, substantially as shown, the curvature being such as would be complementary to the average curvature of that portion of the human body to which it would naturally be most frequently applied. As hereinbefore suggested, one of the most important features of my invention is the provision of a device in which this light filtering screen may be brought into direct contact with the skin over the affected part or parts, and this screen is therefore curved in order that a larger area of the surface of the body may be brought in contact therewith than would be possible with a flat or straight screen. This screen is made removable through the employment of a plate 22 at one end of the shell, this plate being secured to the shell by means of screws 23 having heads of such size and configuration as to be readily grasped by the fingers, and it will be apparent that when these screws are removed the plate 22 may be taken off and the screen 21 removed by sliding the same along its supports.

I prefer to provide the device with a suitable handle 24 for the purpose of facilitating the application and also handling of the same, and I have also shown strap retainers 25, preferably four in number and

located as shown, through which straps may be run for the purpose of binding the device securely to the body of the patient over the affected part or parts.

5 The lamp 17 and its socket 16 are of the usual well-known pattern, the latter being securely fastened to the end member 13 of the shell, the feed wires 26 and 27 leading to any desired source of electric energy. This
10 lamp will preferably have a bulb of glass of the same color as that employed for the screen 21. This problem of utilizing light rays with the elimination so far as possible of the application of the heat rays, also
15 cause the adoption of the arch-shaped reflector, the usual dome or cup shape of reflector, such as used in search lights and head lights concentrating and intensifying both the light and the heat rays to too great
20 a degree, and it being manifestly impossible to ventilate reflectments of the last-mentioned type without breaking the reflecting surface and even then not so satisfactorily as is possible with a reflector such as shown
25 and described herein.

It will be apparent that I have provided a therapeutic device for utilizing radiant energy which is simple, self-contained, light in weight and portable, comprising a source of
30 artificial light, a reflector adapted to dissipate the heat rays and concentrate the light rays upon a localized area of greater or less extent, and a light-filtering screen which is adapted to be brought into direct contact
35 with a substantial area of the curved surface of the human body irrespective of the degree of curvature.

I claim as new and desire to secure by Letters Patent:

40 1. In a device of the character specified, the combination of a ventilated reflector; a transparent screen supported by said reflector and adapted for contact with the surface to be treated; and a source of light surrounded by a colored medium through
45 which the light-rays pass.

2. In a device of the character specified, the combination of an arch-shaped member having a reflecting surface upon its inner
50 face; apertured end walls secured to said

member; a transparent screen supported at the outer edge of the arch-shaped member and adapted for contact with the surface to be treated; and a source of light surrounded by a colored medium through which the
55 light-rays pass.

3. in a device of the character specified, the combination of an arch-shaped metallic member having a reflecting surface upon its inner face, the lower edges of said member
60 being turned inwardly; apertured end walls secured to said member, the apertures being sufficient in number to permit free passage of air through the device to keep it thoroughly ventilated and cooled; an electric
65 light supported by one of said end walls and lying adjacent to the reflecting surface aforesaid; lugs extending inwardly from the side walls of the arch-shaped member adjacent the inturned lower edges of said
70 member and thereby forming a guide-way; and a transparent screen mounted in said guide-way.

4. In a device of the character specified, the combination of an arch-shaped member
75 having a reflecting surface upon its inner face, the lower edges of said member being inturned; lugs extending inwardly from each side of said arch-shaped member, having a spaced relation with reference to the
80 inturned edges, and forming guide-ways; apertured end walls secured to said arch-shaped member, the apertures being sufficient in number to permit free passage of air through the device to keep it thoroughly
85 ventilated and cooled; an electric light supported by one of said end walls and standing in close proximity to the arch-shaped member; a transparent screen supported by the guide-ways aforesaid; and means for
90 holding said screen in place in said guide-ways.

In testimony of the foregoing, I have hereunto set my hand in the presence of two witnesses.

SAMUEL A. CUNNINGHAM.

Witnesses:

P. FRANK SONNEK,
AARON GINSBURG.