

Dec. 1, 1942.

E. E. ANDERSON
INFRARED HEALTH LAMP

2,303,873

Filed Feb. 19, 1941

2 Sheets-Sheet 1

Fig. 1.

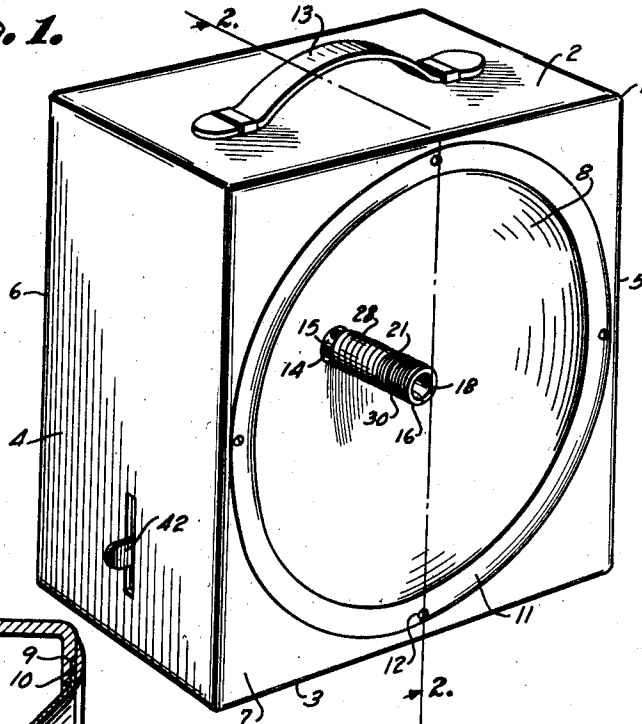


Fig. 2.

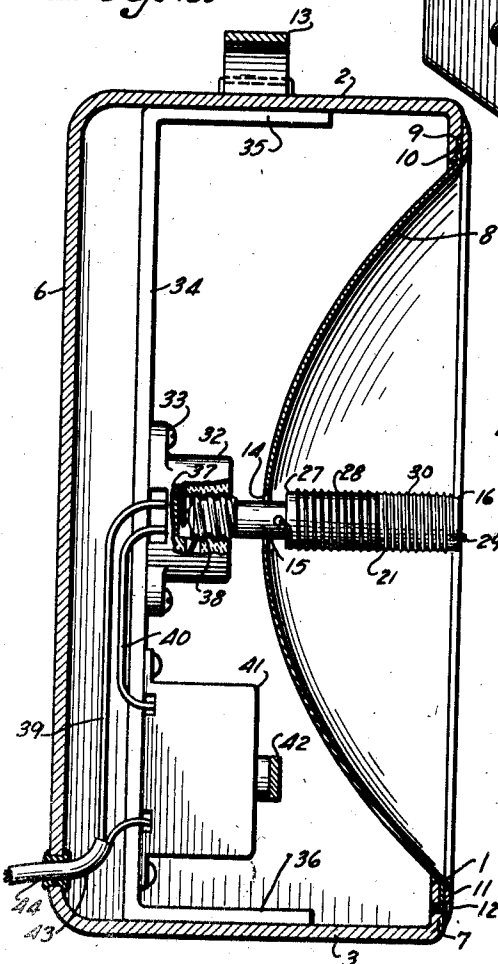
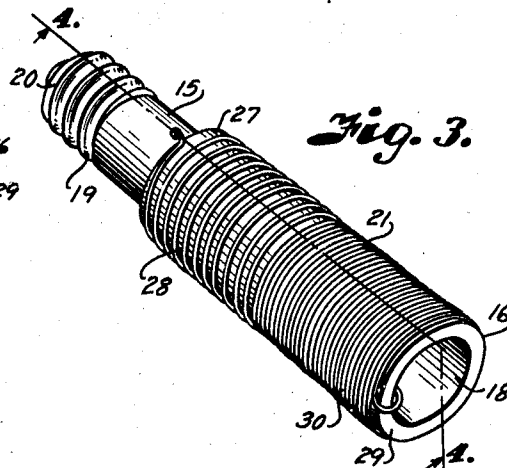


Fig. 3.



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2 Sheets-Sheet 2

Fig. 4.

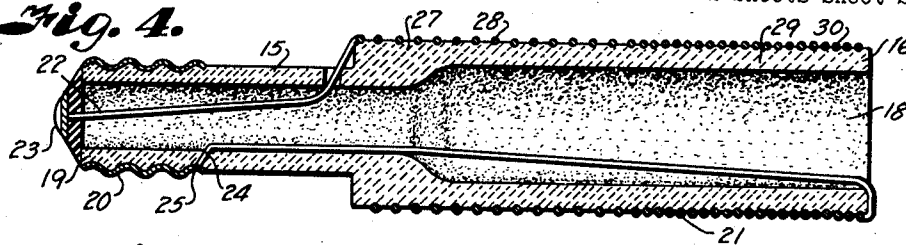


Fig. 5.

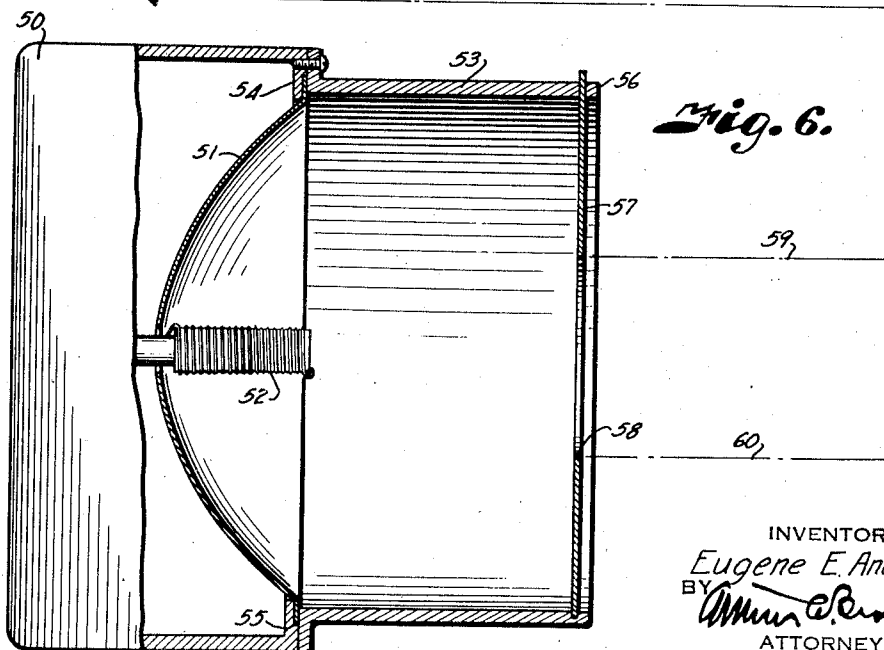
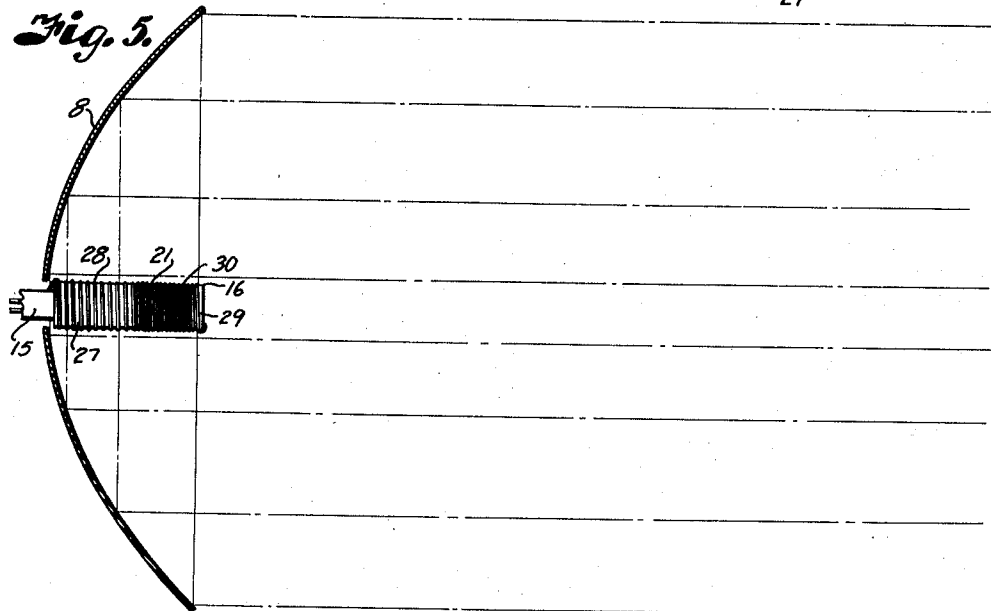


Fig. 6.

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2,303,873

INFRARED HEALTH LAMP

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Application February 19, 1941, Serial No. 379,624

8 Claims. (Cl. 219—34)

This invention relates to lamps and more particularly to a lamp for emitting radiant energy, such as heat, and especially the heat producing vibrations commonly known as infra-red rays.

An illustrative use to which lamps embodying my invention may be put is the transmission of infra-red rays to, and for the relief of, adversely affected areas in human beings, such as localized congestions.

The principal objects of the present invention are, generally, to provide a convenient, economical and efficient health lamp.

Other objects of the invention are to eliminate haphazard and ineffective applications of infra-red rays for therapeutic purposes and to provide a scientifically arranged, accurate and effective lamp for such purposes; to provide a uniform pattern of infra-red heat rays suitable for application for therapeutic purposes; to so arrange a heating element in cooperative relation to a reflector that such uniform pattern may be readily effected; to provide for the projection of infra-red rays selectively substantially throughout the spectral range thereof; to provide a control for the heating element whereby maximum heat is emitted from an element without burning out the same; to provide for adjustably controlling the heat or number and characteristics of infra-red rays emitted from the lamp; to provide for controlling the size and type of pattern of infra-red rays emitted from the lamp; to substantially eliminate heat losses normally caused by reflector conduction and to thus make the lamp easier and more comfortable for an operator to handle; and to provide improved elements and arrangements thereof in a lamp of this character.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a health lamp embodying features of my invention.

Fig. 2 is a vertical transverse section through the health lamp substantially on the line 2—2, Fig. 1.

Fig. 3 is a detail perspective view of a heating element that forms a part of the present invention.

Fig. 4 is a detail vertical longitudinal central section through the heating element substantially on the line 4—4, Fig. 3.

Fig. 5 is a diagrammatic view of the reflector and heating element showing the emission of a uniform pattern of infra-red rays from the lamp.

Fig. 6 is a detail vertical cross section through the reflector of a modified form of the present invention, part of the housing being broken away and showing an arrangement for controlling the beam or pattern of infra-red rays emitted from the lamp.

Referring more in detail to the drawings:

1 designates a health lamp embodying the present invention, which generally includes a case having top, bottom, side and rear walls 2, 3, 4—5 and 6, respectively. A front wall 7 for the housing is provided with an opening for insertion of a preferably parabolic reflector 8, the periphery 9 of which is preferably mounted in an annular groove 10 in the front wall 7 circumscribing the opening in the front wall. A molding 11 is preferably mounted on the front wall of the housing as by fastening devices 12 in engagement with the periphery 9 of the reflector for holding the reflector within the housing. A suitable handling device 13 is provided on one of the walls of the housing such as the top wall 2 thereof.

The reflector 8 is provided with a central aperture 14 for receiving the shank 15 of a heating element 16. The heating element 16 is preferably formed of a refractory or insulating material, for example, such as "lava rock," "mica" or "miconite," preferably of tubular character. A carbon resistor rod may also be employed for this purpose, if desired. Other materials may suggest themselves to those skilled in the art in view of the above, for this purpose. The body of the heating element is preferably open at one end 18 and is preferably closed at its other end 19 by a threaded electrical connection 20. The shank 15 of the heating element is preferably offset inwardly relative to the body thereof and grooved to provide threads similar to the threads illustrated on the cap 20. It has been found desirable to vary the heat emitted from the outer end of the heating element, in this instance, for example, by increasing the same, relative to the heat emitted from the inner end thereof and while various devices may be employed for this purpose, I have found the following satisfactory. A resistance wire 21, preferably of small diameter relative to resistance wires customarily employed for heating purposes, has one end 22, Fig. 4, engaged with a contact 23 of the cap 20, the other end 24 of the resistance wire being electrically engaged with a portion of the cap 20, as indicated at 25.

Particular attention is directed to the winding of the present heating element, this preferred

winding arrangement being a relatively widely spaced coil of wire on the inner portion of the heating element body, as indicated at 27 and 28, and a relatively closely wound coil on the outer portion 29 of the heating element body, as indicated at 30. The effect of this arrangement will be more fully explained in the description of the operation of the lamp, as hereinafter set forth.

The plug end 19 of the heating element is mounted in a socket 32 that, in turn, is mounted, as by fastening devices 33, on a bracket 34 having ends 35 and 36 suitably secured preferably to the inner faces of the top and bottom walls of the housing to the rear of the reflector 8. The socket 32 comprises a contact 37 engageable by the contact 23 of the plug end of the heating element and a contact 38 engageable by the contact 25 of the heating element plug. The contacts 37 and 38 connect respectively with current conductors 39 and 40, the conductor 39 leading to a suitable source of supply and the conductor 40 leading through an adjustable control, including a choke, preferably of transformer type, in a housing 41 (with which a suitable rheostat, adjustable by the lever 42, Figs. 1 and 2, may also be and preferably is associated) for reducing the voltage, amperage and wattage employed, developed and consumed as an incident to the employment of the present lamp.

A suitable energizing and deenergizing switch, not shown, may be provided, if desired, or the current conductors 39 and 40, may be enclosed in a conduit after passage of the conductor 40 through the choke 41, as indicated at 43, and extended through an opening 44 to the exterior of the lamp housing, where the conductors may be provided with a conventional connection for insertion in a conventional wall or like socket.

The operation of a health lamp constructed as described, is as follows:

Assuming the conductors 39 and 40 to be provided with current in a suitable manner, the shank or plug end of the heating element may be inserted through the aperture 14 of the reflector and applied to the socket 32 by the threads illustrated, by a plug, or by other suitable devices. Current is thus transferred by the conductor 40 through the control 41 and passes to the contact 25 of the cap 20 and thence through the end 24 of the resistance wire to the outer end 18 of the heating element. The rheostat meanwhile is manipulated by the lever 42 to allow the desired amount of current to reach the resistance wire and consequently the amount of heat, i. e., the number and type of infra-red vibrations, to be emitted from the heating element may be controlled. From the end 18 of the heating element, the current passes through the closely spaced wound portions 30 of the coil, then through the widely spaced wound portions 28 of the coil and back through the end 22 of the wire to the contacts 23 and 37 for return through the conductor 39.

Infra-red rays or vibrations are produced by the heat caused by resistance to flow of current through the resistance coils of the heating element. These rays are emitted in all directions from the heating element and impinge against the reflector which transmits them in parallel beams to an objective, as diagrammatically shown in Fig. 5. The rays emitted from the inner end of the heating element are augmented by the heat rays developed in the outer end of the heating element and thus build up more rapidly, due

to the progression in numbers thereof, than the heat at the outer confines of the reflector. A balance between extremes is thus effected by the closely wound outer coiled portions and the widely spaced wound inner portions, the result of which is that a substantially uniform amount of heat is emitted from the reflector, that is to say, an approximately equal number of rays impinge against the reflector throughout its area and are reflected or transmitted in a uniform pattern instead of a concentrated center of a pattern that tapers off at its outer edges, or vice versa.

It is further apparent that because of the proximity of the coils of the resistance wire at the outer end of the heating element, the heat is increased at such outer end, the result of which is the production of more intense, short wave length infra-red vibrations, which are intermingled with longer wave length less intense infra-red vibrations emitted from the inner end of the heating element to still produce a uniform pattern, but of a plurality of wave lengths collectively. Therefore, by use of the rheostat controlled choke, a variable wave length heat generator is provided.

It is further pointed out that the aperture in the reflector is of greater size than the shank of the heating element and thus does not contact the heating element. The result of this is that the reflector does not become excessively hot through conduction of heat from the heating element and the lamp may thus be comfortably handled.

In Fig. 6 I have shown a modified form of heating element which comprises a housing 50, a preferably parabolic reflector 51 and a heating element 52 substantially similar to that described in connection with the preferred form of invention. In some instances it may be desirable to control the size or type of pattern produced by projection of the infra-red rays and/or to concentrate the same on a relatively small congested area, for example, that it is desired to treat therapeutically. To this end, I mount a preferably substantially cylindrical projector 53 on the front wall 54 of the housing in surrounding relation to the periphery 55 of the reflector. The projector 53 is preferably of a heat reflecting nature.

In the front end 56 of the projector, a shutter 57 is mounted, preferably adjustably and removably, substantially as shown, the shutter having an opening 58 through which infra-red rays 59 and 60 may be emitted in a uniform pattern similarly to the pattern of infra-red rays developed and projected by the preferred form of lamp and diagrammatically illustrated in Fig. 5 of the preferred form of invention.

The operation of a health lamp constructed in accordance with the modified form of invention just above described, is substantially similar to the preferred form of my invention.

It is apparent, therefore, that I have provided an improved health lamp that is extremely convenient in that it is easy to handle and does not burn the operator because of its lack of conduction of heat to the reflector and casing and also because of its use of a minimum amount of current for a maximum amount of work to be done; which is economical because of the relatively small resistance wires and the choke controlled flow of electricity through the heating element; and which is highly efficient because of the uniform pattern of infra-red vibrations projected

from the reflector and/or the control thereof by the reflector and projector shutter.

What I claim and desire to secure by Letters Patent is:

1. In a device of the character described, a parabolic reflector, a tubular refractory element arranged within the reflector approximately in the axis thereof, a resistance wire wound on the refractory element in relatively closely spaced convolutions at the outer end thereof and in relatively widely spaced convolutions at the inner end thereof, means for supplying a current of electricity to said wire to produce infra-red vibrations for reflection in a pattern of substantially uniformly intense cross-section from said reflector, and an adjustable control means including a choke of transformer type interposed in said current supply means for controlling the characteristics of said infra-red vibrations.

2. In a device of the character described, a parabolic reflector, a tubular refractory element arranged within the reflector approximately in the axis thereof, a resistance wire wound on the refractory element in relatively closely spaced convolutions at the outer end thereof and in relatively widely spaced convolutions at the inner end thereof, means for supplying a current of electricity to said wire to produce infra-red vibrations for reflection in a pattern of substantially uniformly intense cross-section from said reflector, an adjustable control means including a choke of transformer type interposed in said

current supply means for controlling the characteristics of said infra-red vibrations, and means for adjusting said control means.

3. A lamp of the character defined by claim 1, in which the refractory element is spaced from the reflector for maintaining the temperature of the reflector at a minimum.

4. A lamp of the character defined by claim 1, in which the convolutions of the resistance wire produce infra-red vibrations of relatively short and long length respectively.

5. A lamp of the character defined by claim 1, in which the outer end of the refractory element is approximately in the plane of the peripheral edge of the reflector.

6. A lamp of the character defined by claim 1, in which the convolutions of the resistance wire at the inner end of the refractory element are arranged adjacent the inner extremity of the reflector.

7. A lamp of the character defined by claim 1, in which the relatively widely and closed spaced convolutions of the resistance wire are respectively arranged adjacent the inner and outer extremities of the reflector.

8. A lamp of the character defined by claim 1, in which the outer periphery of the reflector is of curved cross-section, and a housing for said lamp of angular cross-section, the interior of the housing and the exterior of the reflector providing space for the control means.

EUGENE E. ANDERSON.