

Sept. 29, 1931.

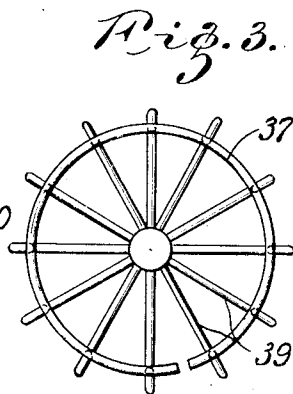
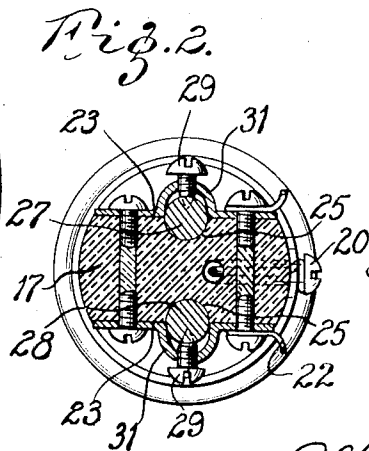
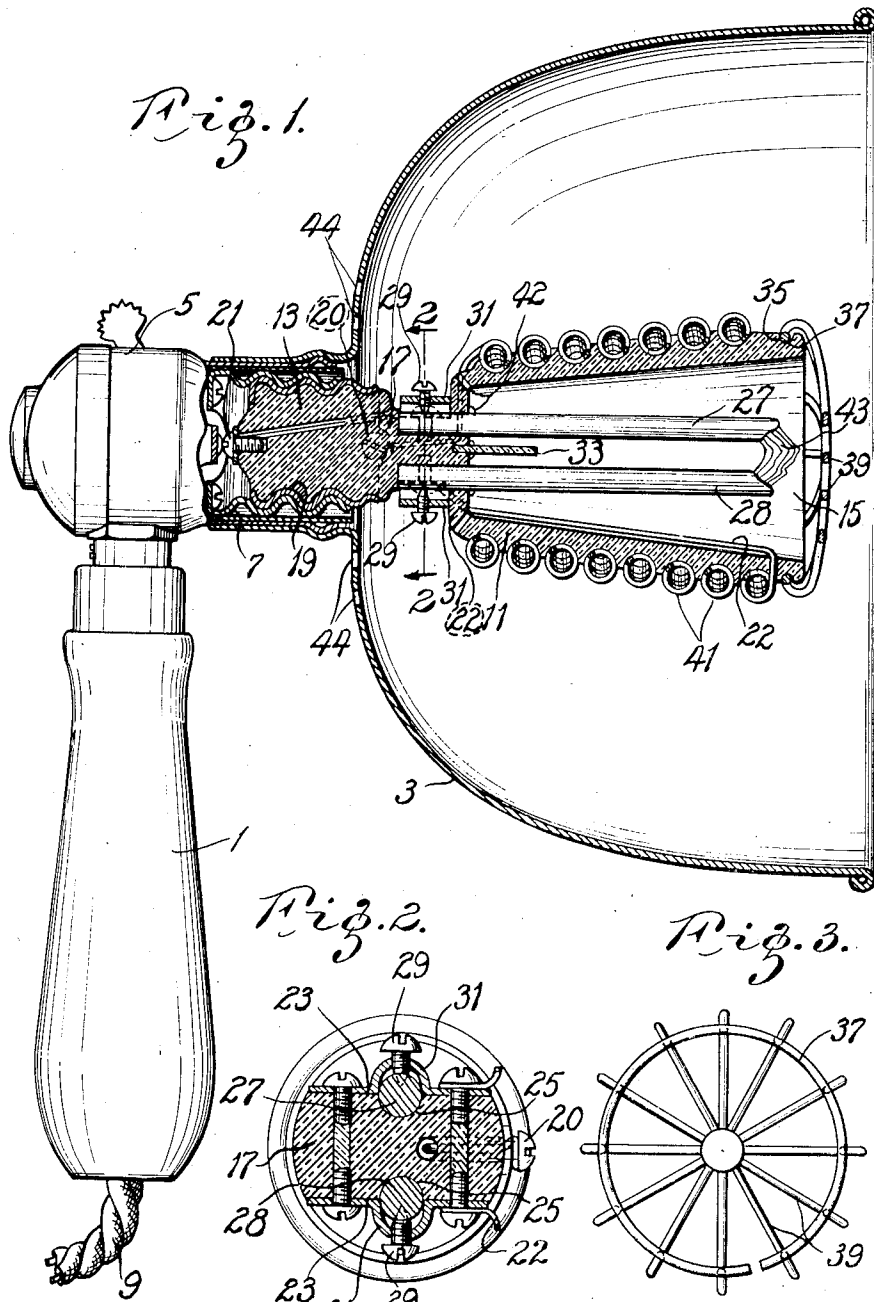
A. VISCHER, JR

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ELECTRICAL APPARATUS

Filed April 13, 1927

2 Sheets-Sheet 1



Alfred Vischer, Jr.,
Inventor
Debor S. Haynes,
Attorney

Sept. 29, 1931.

A. VISCHER, JR

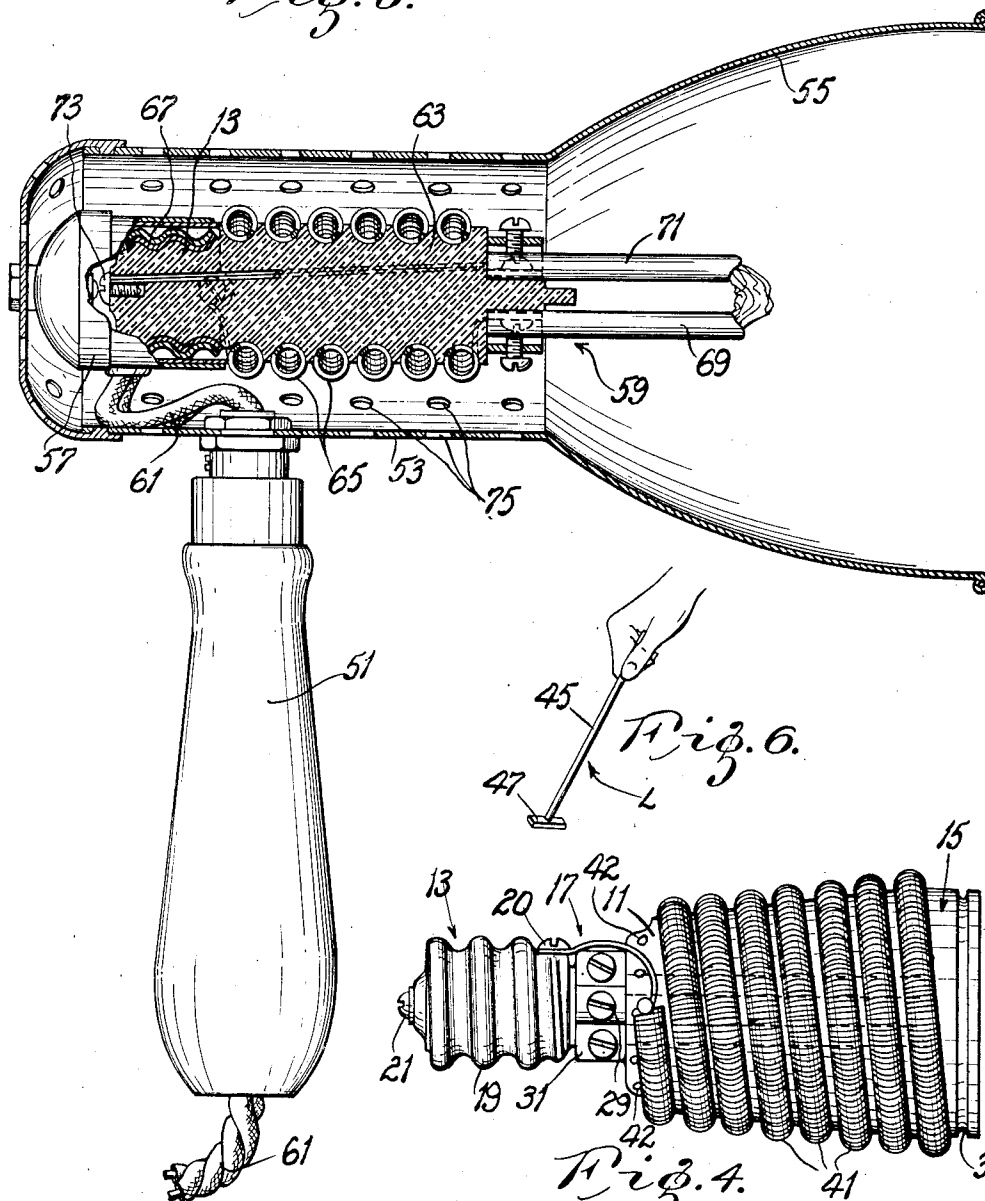
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Fig. 5.



Alfred Vischer, Jr.,
Inventor,
Debor S. Haynes,
Attorney

UNITED STATES PATENT OFFICE

ALFRED VISCHER, JR., OF FLORAL PARK, NEW YORK

ELECTRICAL APPARATUS

Application filed April 13, 1927. Serial No. 183,401.

This invention relates to electrical apparatus and with regard to certain more specific features, to portable reflecting lamps for therapeutic and photographic purposes.

Among the several objects of the invention may be noted the provision of a portable lamp which throws radiant heat or infrared waves having a warming effect, in combination with ultra-violet light and like waves having a high actinic effect, whereby a new and improved therapeutic effect is attained; the provision of a device of a class described wherein the elements producing the heat waves or rays are especially adapted to cooperate mechanically, thermally and electrically with the elements producing the therapeutic waves or rays; the provision of a portable lamp adapted to be used for photographic exposure purposes; and the provision of a device of the class described which is economical and safe in operation, rugged in construction and economically fabricated. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combination of elements, features of construction, and arrangements of parts which will be exemplified in the structure hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which are illustrated two of various possible embodiments of the invention,

Fig. 1 is a longitudinal section of one form of lamp to be used for therapeutic purposes, certain parts being shown in full;

Fig. 2 is an enlarged cross section taken on line 2—2 of Fig. 1;

Fig. 3 is an inside plan view of a wire guard which may be used in connection with the form of the invention shown in Fig. 1;

Fig. 4 is a side elevation of the operating element shown in Fig. 1, otherwise defined as a heater unit;

Fig. 5 is a view similar to Fig. 1, illustrating a modified form of the invention to be used for photographic purposes; and

Fig. 6 is a perspective view of a lighter, reduced in size.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Fig. 1 there is illustrated at numeral 1 a supporting handle or grip upon which is mounted a concave and polished reflector 3 of conventional construction, including a switch 5 and an electrical screw socket 7. The socket 7 is supplied with electrical current by means of a line 9 passing through the handle 1. The elements so far described are in themselves conventional. The heating element, to be described, is new per se and the combination of said heating element and the above described elements is also new.

The lighting or heating element, per se, (used also in combination for heating purposes) comprises a body 11 composed of dielectric and heat resisting material, such as lava or what is known as lavite. The body comprises a head 13 and a cup-shaped portion 15 joined thereto at a neck 17. The head 13 is provided with a metallic cap 19 forming an electrical terminal, adapted to engage a corresponding threaded metallic line terminal of the socket 7. The head 13 also carries a separate electrical terminal 21, for engaging another separate line terminal in said socket 7. The line terminals of the socket 7 are energized or deenergized by means of the manually operable switch 5.

As illustrated in Fig. 2, the neck 17 is provided with flat portions 23, cradled at 25 to receive carbon rods or electrodes 27 and 28, said carbon rods passing through openings in the bottom of the cup 15 and extending through said cup. The relative positions of the rods 27, 28 are such that an electric arc 43 may be maintained upon applying suitable electric current with a suitable resistance in series.

The carbon rods 27, 28 are removably held in position within the cradles 25 by means of set screws 29, the latter being screwed through saddle members 31. The members 31 are held in position on the flats 23 by suitable screws, shown in Fig. 2, but are not in electrical connection.

As stated, the carbon rods 27, 28 are positioned within the cup 15. They are separated at the bottom portions thereof by means of a wall 33 of insulating material, for purposes to be described.

The forward end of the cup 15 flares outwardly and is provided with an external groove 35 adapted to receive therein a spring ring 37 which carries a wire guard 39. The ring 37 snaps into the groove 35, whereby a removable guard is provided. This guard may be dispensed with, if desired.

The external face of the cup 15 is helically grooved to support a helical coil of resistance wire 41. The wire 41 is composed of material adapted to attain a red heat upon the application of suitable electric current. One end of the wire 41 is connected to the threaded terminal 19 by a screw 20 and the other end 22 to one of the saddles 31 holding the carbon rod 27 in place. The other saddle which holds the other carbon rod 28 in place is electrically connected to the other terminal 21 of the head 13.

The operation of the device is as follows:

The lighting and heating unit, per se, is applied to the reflector 3 by screwing the terminal 19 into the socket 7. The switch 5 in the line 9 is then closed. Then, in order to start the device, a lighter L (Fig. 6) is used comprising a dielectric stem 45 and a short-circuiting piece 47 thereon, the latter composed of conducting and volatile carbon material. The lighter L is used by applying the conductor or short-circuiting piece 47 across the ends of the carbon rods 27, 28. This results in current flowing from the terminal 19, through the resistance coil 41, carbon rod 28, conductor 47 of the lighter L, carbon rod 27 and to the terminal 21, thereby completing the circuit.

Next, when the lighting conductor 47 is withdrawn, an electric arc 43 has been established between the ends of the carbon rods 27, 28. The resistance wire 41 provides the resistance required in the carbon-arc circuit. Otherwise the arc would not be maintained. At the same time the resistance wire 41 comes to a red heat and the heat given off is reflected in infra-red waves from the reflector 3.

After the rods 27, 28 have burned down to the bottom, the arc 43 is intersected by the dividing plate 33 and automatically cut-off. The carbons may be renewed by loosening the screws 29 and applying new carbons. If it is desired to shut the device off during ordinary operation, it is only necessary to open the switch in the line 9. This may be done with the thumb while the other fingers grasp the handle 1. The portability of the device is apparent.

The guard 39 may be sprung over the cup 15 after the heater has been lighted. It

does not materially interfere with the emanations from the arc 43.

One of the advantages of the present invention is that the resistance coil 41 provides the ordinary type of infra-red or heat waves (reflected by the reflector 3) required for warming the body or a portion thereof. This puts the part of the body under question in a more receptive condition for the penetration of the actinic or ultra-violet rays emanating from the arc 43. Hence the therapeutic value of said actinic or ultra-violet rays is enhanced. It is to be understood that the arc itself also provides some heat. The reflector throws the heat waves into the same region into which the arc rays pass.

Another feature is that the heating resistance element 41, as well as functioning as a heater, provides the necessary resistance in the arc circuit for making the arc operable; otherwise the arc would not function.

Another feature is that the arc 43 burns more steadily in this device, thereby producing more ultra-violet rays than would otherwise be possible with an ordinary arc of the same current consumption. This is because the cup 15 protects the arc against unsteady air currents, while at the same time, the limited air circulation permits of a hotter condition around the carbons, thereby aiding ionization of air at the carbon gap. Furthermore, the heating resistance around the cup also aids ionization so that a minimum current is required to produce a required spectrum.

It may be seen that the resistance 41 does three things, namely, (1) lowers the arc voltage to the proper point, say from 110 volts of the line to 45 volts across the gap; (2) aids ionization at the arc by heating and; (3) produces infra-red rays, important in therapeutics, especially in combination with ultra-violet rays. The reflector 3 reflects the infra-red heat waves, while the cup 15 throws out the ultra-violet waves.

The carbon rods to be used are of the type rich in ultra-violet emanations but it is to be understood that other rods or treated rods may be used, giving other rays. Although the position of the rods in the figures is illustrated for clearness as a vertical arrangement, yet it is to be understood that the arc operates better when the carbons are in a horizontal arrangement. This is provided for by the fact that central contact 22 of the socket 7 is resiliently formed, thereby permitting any desired angular position of the heating unit.

Examination of Fig. 1 reveals the fact that holes 42 are provided at the rear of the cup 15 as well as the series of holes 44 in the rear of the reflector 3. These holes function as ventilators without inducing a distinct draft. Hence, the gases engendered

by the arc 43 may be carried away without producing an unsteady arc flame.

In some cases, it is desirable to enclose the entire device by means of a glass cover 5 which is hinged to the beaded edge of the outside reflector 3.

It is to be understood that the resistance 41 may be wound in several ways, one of which is as shown. Another way in which 10 this resistance might be wound would be to form a double threaded groove in the body 15, so that the terminals of the resistance would both be positioned at the terminal ends of the carbons, thus eliminating the 15 return wire 22 on the inside of the cup 15.

In Fig. 5 is illustrated a modified form of the invention adapted to be used more particularly for photographic purposes, such as by amateur motion picture photographers. 20 This modification of the invention comprises a handle 51 upon which is mounted a ventilator 53 carrying therewith a reflector 55.

Within the ventilator 53 is mounted a socket 57 of the same form as said socket 7 25 adapted to receive therein a lighting element 59. The socket 57 receives current at its terminals by way of a line 61 passing through said handle 51. Current is turned on and off by way of a switch in the line 61 30 (not shown).

The lighting element 59, in this modified form, comprises a body portion 63 having a head portion 13 similar to the head portion 13 of the first-named form. The body 63 35 carries a helical recess on its external surface for receiving a resistance wire 65. The wire 65 is carried in series with the screw terminal 67 of the body 13 and carbon rods 69, 71 and also a central terminal 73. The 40 manner in which the carbon rods 69, 71 are supported is similar to that described for the first-named form and corresponding numerals apply. No cup for receiving the rods 69, 71 is used. Openings 75 in the ventilator 53 serve to circulate air about the 45 resistance wire 65.

The operation of this form is as follows:

Current is brought in over the line 61 and to the socket 57. The lighter L is used across 50 the terminals of the rods 69, 71, thereby causing an arc when the lighter is withdrawn. In this embodiment the material of the rods 69, 71 is of such a composition 55 that a white light or yellow flame covering the visible spectrum is usually desirable.

The reflector 55 throws the rays of the arc forward and these rays may be used for photographic printing and other purposes. 60 This device offers the operator handy, portable and fool proof arc that is inexpensive and gives approximately twice the illumination of nitrogen lamps.

In view of the above, it will be seen that 65 the several objects of the invention are

achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it 70 is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A heater comprising a reflector, an electric socket therein, a heating element adapted to be connected into said socket comprising a cup-shaped portion having a heating 75 resistance on the outside thereof and spaced 80 electrodes on the inside thereof, said resistance and electrodes being connected in series, means for applying current to the heating element whereby the resistance is brought to a glowing heat and whereby an 85 arc may be maintained between the electrodes, the reflector reflecting the heat from the resistance but being protected from the action of said arc and means for breaking 90 the arc after the electrodes have been reduced to a predetermined length.

2. A heater comprising a reflector, an electric socket therein, a heating element adapted to be connected into said socket comprising a cup-shaped portion having a heating 95 resistance on the outside thereof and spaced electrodes on the inside thereof, said resistance and electrodes being connected in series, means for applying current to the heating element whereby the resistance is 100 brought to a glowing heat and whereby an arc may be maintained between the electrodes, the reflector reflecting the heat from the resistance but being protected from the 105 action of said arc, means for breaking the arc after the electrodes have been reduced to a predetermined length and a guard adapted to be applied over the cup-shaped portion to enclose the arc.

3. A heater comprising a reflector, an electric socket therein, a heating element adapted to be connected into said socket comprising a cup-shaped portion having a heating 110 resistance on the outside thereof and spaced electrodes on the inside thereof, said resistance and electrodes being connected in series, means for applying current to the heating element whereby the resistance is 115 brought to a glowing heat and whereby an arc may be maintained between the electrodes, the reflector reflecting the heat from the resistance but being protected from the 120 action of said arc, the rays emanating from the arc and those from the reflector impinging at the same region. 125

In testimony whereof, I have signed my name to this specification April 5th, 1927.

ALFRED VISCHER, JR.