Sept. 25, 1934. I. F. HUMMON, JR 1,974,537

ARC LAMP

Filed May 13, 1929 2 Sheets-Sheet 1

Fig. 1.

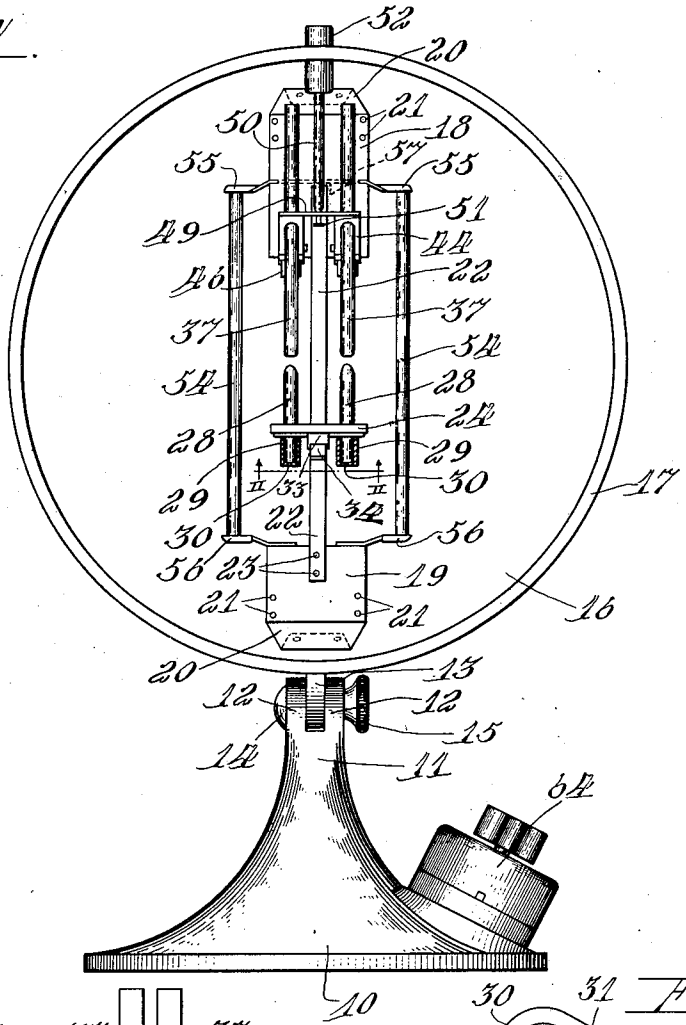

Fig. 3

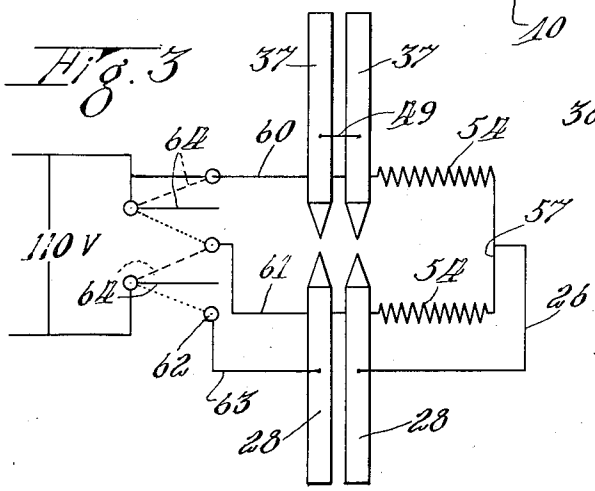

Fig. 2.

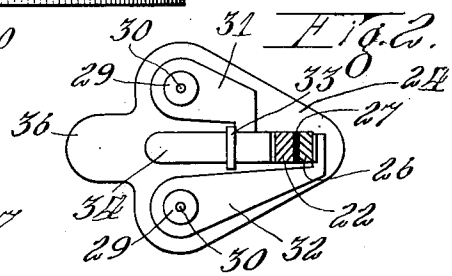

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Fig. 4.

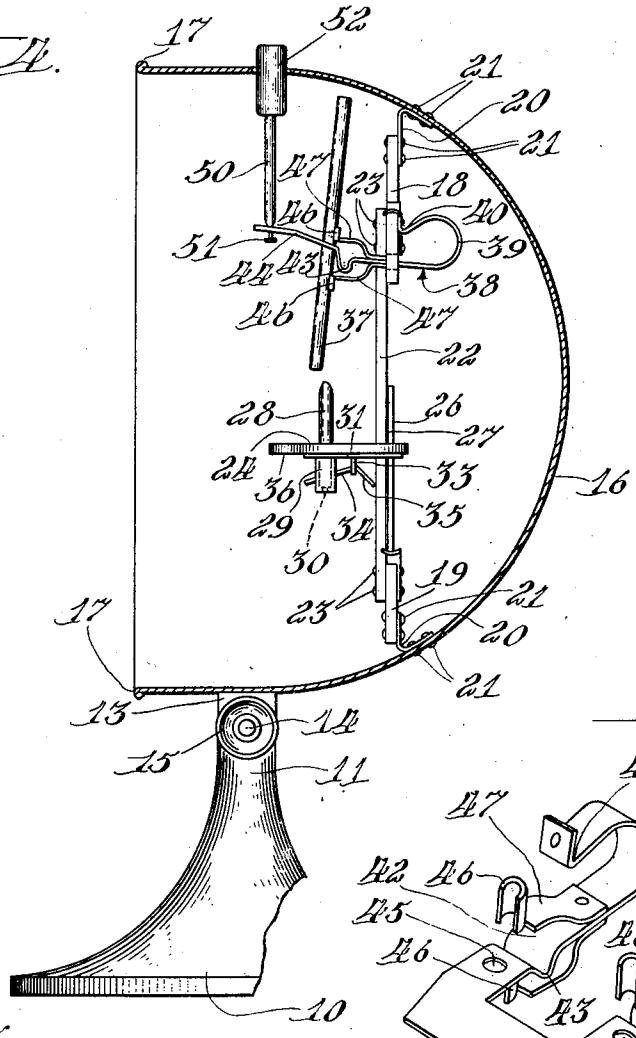


Fig. 5.

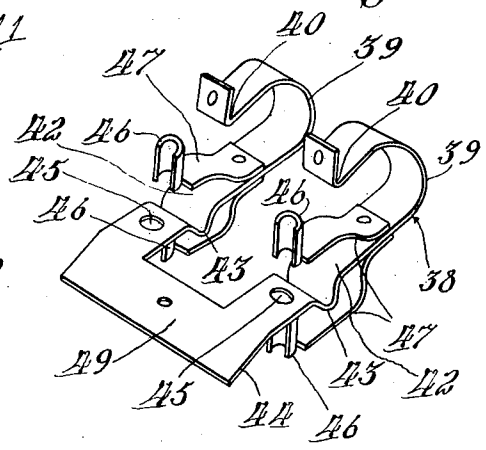
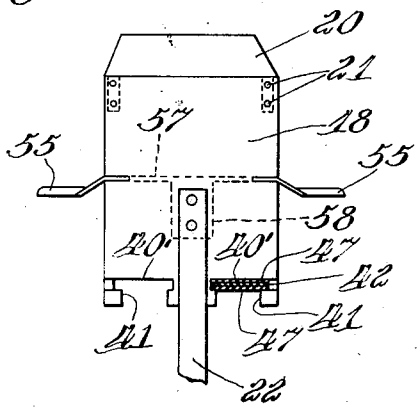


Fig. 6.



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Patented Sept. 25, 1934 1,974,537

UNITED STATES PATENT OFFICE

1,974,537

ARC LAMP

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Application May 13, 1929, Serial No. 362,581

8 Claims. (Cl. 176—119)

This invention relates to arc lamps and more particularly to ultra-violet ray generating devices, although certain features thereof may be employed with equal advantage for other purposes.

It contemplates more especially an efficient carbon ultra violet ray lamp of simple and inexpensive construction which is adapted for popular domestic employment without requiring attentive or skilled supervision.

Arc producing lamps of varied design have heretofore been proposed for unskilled use in the home, but these are of intricate construction, expensive and delicate in operation. As a result, frequent parts replacement is found necessary, and skilled adjustment required with the continued use thereof.

Moreover, although carbon lamps for generating ultra violet rays employ resistance units in the arcing circuit to enable the connection thereof to lighting circuits in the home with safety, yet these have heretofore been regarded as mere electrical requirements which considerably lessen the overall efficiency of arc lamps. Although it has been appreciated that such resistors develop infra red rays useful for certain therapeutic purposes, yet devices of this character have not heretofore utilized the resistors to the greatest possible advantage for health and treatment purposes. In short, practical means have not heretofore been provided to enable the resistors to serve a definite field of usefulness independent of and in conjunction with ultraviolet ray exposure.

One object of the present invention is to simplify the construction and improve the operation of devices of the character mentioned.

Another object is the provision of novel and simple means for initiating arcing between electrodes.

Still another object is the provision of a simple electrode mount for initiating arcing between electrodes and normally effect the support thereof in a predetermined spaced relation for continued activity.

A further object is to provide simple and inexpensive relatively adjustable electrode mounts in an electrical circuit for ultra violet ray generation.

A still further object is the provision of a flexible electrode mount which enables convenient initial arcing and automatically effects the spacing thereof for continued efficient ultra violet ray generation.

Still a further object is the provision of a self contained ultra violet and infra red generating ray device capable of selective or collective operation.

Other objects and advantages will appear from the following description of an illustrated embodiment of the present invention.

In the drawings:

Figure 1 is a front view in elevation of a device embodying features of the present invention.

Figure 2 is a sectional view taken substantially along the line 11—11 of Figure 1.

Figure 3 is a conventional view of the circuit employed in connection with the device disclosed in Figure 1.

Figure 4 is a side sectional view in elevation of the device disclosed in Figure 1.

Figure 5 is a perspective view of a flexible electrode mount embodying features of the present invention.

Figure 6 is an enlarged front view of the top mounting plate disclosed in Figure 1.

The structure selected for illustration comprises a base 10 which has a central elevated boss 11 preferably formed integral therewith. The boss 11 is, in this instance, provided with spaced furcations 12 adapted to receive a bracket lug 13 for effecting a rotary connection therebetween by virtue of a pin 14. The pin 14 extends through aligned bores in the furcations 12 and lug 13 to receive a knurled nut 15 in threaded engagement with the extremity thereof to afford manual adjustment of a shell or casing 16. As shown the shell 16 is, in this instance, riveted or otherwise secured to the bracket lug 13 to move in unison therewith for rotary adjustment by manipulation of the nut or knob 15.

The shell 16 is preferably, though not essentially, of semi-spherical configuration, it being stamped or otherwise shaped from highly polished metallic sheet material to serve as a reflector for the rays generated in a manner to be more fully described hereinafter. The circular diametral rim 17 of the shell or casing 16 is beaded or otherwise reinforced to define an opening to permit the generated rays to emanate therethrough from its interior which serves as an intensifying reflector. Obviously, a highly polished reflector may be resorted to independently of the shell or casing 16, thereby enabling the latter to be more cheaply constructed and finished.

In order to enable the suport of the ray generating instrumentalities, rectangular mounting plates 18 and 19 of insulating material are fixed within the casing 16 at the top and bottom thereof along a vertical median line rearwardly of the opening defined by the casing rim 17. These are supported in position by angular brackets 20 which are riveted or otherwise secured by fas-

teners 21 to the plates 18—19 and the casing 16 to constitute a fixed connection therebetween. An elongated metallic bar 22 extends between the insulator plates 18 and 19 along a vertical median line thereof for secural thereto at its extremities by means of any suitable fasteners 23, thereby rigidly sustaining the insulator plates 18 and 19 in a vertical aligned position to support ray generating instrumentalities as will hereinafter more clearly appear.

An electrode mount 24 preferably of insulating material, in this instance of substantially triangular shape, is slidably associated with the bar 22 to move therealong. To this end the mount 24 is provided with a guide slot adapted to accommodate the bar 22 which in conjunction with a metallic member 26 fixed to the rear face thereof having an insulation 27 therebetween serve as electrical contact members and guides for the mount 24. The contact members 22 and 26 extend at least for the limits of movement desired of the mount 24 to adjust the electrodes supported therein, although the mount 24 may be held stationary should this be found desirable. Any number of electrodes 28, in this instance two, may be sustained by the mount 24 which is provided with metallic cup members 29 to vertically support correspondingly shaped, in this instance cylindrical, carbon electrodes 28.

The cup members 29 are provided with axial apertures in the bottom walls thereof to enable ready cleansing and the removal of the electrodes therefrom. Electrical conductors 31 and 32 extend between the cups 29 and the contact bars 22 and 26, respectively, to establish a slidable electrical connection therewith. The conductor 31 is however, in this instance permanently connected or secured to a looped member 33 which depends from the mount 24 to serve as a fulcrum for a pivotal lever 34. The pivotal lever 34 has an angular extension 35 which frictionally engages the contact bar 22 to sustain the mount 24 in any vertical adjusted position. Through this medium the conductor 31 establishes an electrical connection with the contact bar 22. The pivotal member 34 through its extension 35 may, however, engage any other part of the ray generating instrumentality sustaining frame to maintain the mount 24 in position when the conductor 31 is arranged in direct slidable contact with the bar 22. This affords a connection of electrodes with the energy source in any vertical position of the mount 24 which is slidable to compensate for the electrode length reduction with the continued arcing activity thereof. An extension 36 on the mount 24 enables the convenient elevation thereof while its descent may be effected by depressing the pivotal lever 34 in a clockwise direction (viewed from Figure 4) to disengage its extension 35 from the contact bar 22.

Confronting electrodes 37, in this instance two, corresponding in number with the electrodes 28, are positioned in arcing confronting range therewith. To enable momentary contact between electrodes 28 and 37 for initiating a current flow therebetween, a flexible mount 38 is provided for that purpose. The mount 38 is stamped or otherwise shaped from sheet material in the form of a strap or clip, which is provided with a comparatively large loop 39 to impart the desired flexibility and resiliency thereto. The looped extremity 40 thereof is fastened to the rear face of the plate 18 for extension through correspondingly shaped openings 40', in this instance two, provided in the plate 18 proximate to the lower edge thereof. The openings 40' communicate with the lower edge of the plate 18 through narrower openings defining throats 41 to enable the convenient insertion of the mount 38 in the openings 40' which serve as a support therefor.

The mount 38 is preferably branched to define extensions 42 which project forwardly of the insulator plate 18, there being comparatively smaller loops 43 impressed therein proximate to their slightly upwardly inclined electrode holder extremities 44. The mount extremities 44 are each provided with an aperture 45 to receive an electrode, in this instance a cylindrical carbon electrode 37, therethrough for frictional engagement in conjunction with arcuately grooved guides 46. The guides 46 are spaced for support on either side of the mount holder extremity 44 owing to curved arms 47 which are struck from or preferably adhesively associated therewith in the vicinity of the branches 42 of the flexible metallic mount 38.

As a consequence of the loop 43 and the inclination of the holder extremity 44, the electrode 37 which is disposed through the somewhat larger aperture 45, is resiliently urged against the spaced guides 46 to constitute a frictional three-point support therefor. The smaller loop 43 lends less flexibility and elasticity than the comparatively larger loop 39 so that the electrodes 37 may be moved downwardly for momentary contact with the electrodes 28 without disengagement from their holders 44. To this end the holder extensions 44, in this instance two constituting branches of the flexible strap mount 38, are interconnected by a transverse bar 49 which is in operative association with a manual actuator 50. The actuator 50 comprises a rod which is secured to the bar 49 intermediate the ends thereof by means of a threaded stud or other fastener 51 so that the rod 50 may extend upwardly through an aperture in the shell or casing 16 to receive a handle 52 preferably of insulation material. Consequently the electrodes 37 may be urged downwardly for momentary contact with the electrodes 28 by flexing the electrode mount 38 responsive to depressing the handle 52. Release of the pressure on the handle 52 will automatically cause the electrodes 37 to recede from the electrodes 28 a predetermined distance conducive to continued arcing therebetween for producing ultra violet rays.

In view of the fact that these devices are domestically employed for connection to ordinary lighting circuits, resistance units or elements are ordinarily used in conjunction and in series with the ultra violet ray generating electrodes. These are particularly useful and beneficial for therapeutic purposes either in the presence of the ultra violet rays or entirely independent thereof. To this end, the resistances, in this instance two carborundum rods 54, are positioned vertically in parallel spaced relation within the focal region of the reflector shell 16. These are detachably held by clips 55 which confront similarly shaped clips 56 secured to the insulating plate mounts 18 and 19, respectively. As shown, the clips 55 are interconnected by an integral bar 57 which has a tab 58 formed thereon to enable its secural to the plate 18 with the same fasteners 23 holding the bar 22 thereto. The lower clips 56 are insulated from each other for connection to the line by wires 60 and 61 (Figure 3).

One of the lower electrodes 28 is connected to a terminal 62 by a wire conductor 63 so that a two-way switch 64 mounted, in this instance, on

the base 10 may be utilized to selectively connect the power source with the electrodes 28—37 and the ballast resistances 54 in series or merely the resistances 54 independently thereof to generate infra red rays for therapeutic purposes. Although two sets of electrodes 28—37, in this instance totalling four, are described and disclosed in the present embodiment, it is apparent that a single set of electrodes 28—37 or any number thereof may be employed depending upon the dictates of commercial practice. The clips 55 and 56 have cup-shapes or concavities at their extremities to yieldingly engage the resistor rods 54 so that they may readily be replaced without entailing any labor or inconvenience.

Various changes may be made in the embodiment of the present invention herein specifically described without departing from or sacrificing any advantages thereof as defined in the appended claims.

I claim:

1. In an ultra violet ray device, an electrode holder, said holder comprising a flexible metallic strap, spaced guides on said strap adapted to receive an electrode, and an apertured extension on said strap effective to engage an electrode in conjunction with said guides for maintaining its position relative thereto.

2. In an ultra violet ray device, an electrode holder comprising a flexible metallic strap, spaced guides on said strap for contact with an electrode, and an apertured yieldable extension projecting between said guides to receive an electrode for frictional resilient engagement in conjunction with said guides.

3. In a device of the character described, the combination with a frame, of an electrode mount slidable relative to said frame, electrical contact members on said frame along the path of the electrode mount movement, a plurality of electrode engaging means on said mount, electrical connections between said electrode engaging means and contact members, and pivotal means on said holder for frictional engagement with said frame to maintain said holder mount in adjusted position.

4. In a device of the character described, the combination with a frame, of an electrode mount slidable relative to said frame, electrical contact members on said frame along the path of the electrode mount movement, a plurality of electrode engaging means corresponding in number with said contact members on said mount, electrical connections between said electrode engaging means and contact members, means to maintain said mount in adjusted position, and a flexible electrode mount on said frame in confronting relation with said first named electrode mount.

5. In a device of the character described, the combination with a frame, of an electrode mount slidable relative to said frame, electrical contact members on said frame along the path of mount movement, a plurality of electrode engaging means corresponding in number with said contact members, said engaging means being on said mount, electrical connectors between said electrode engaging means and contact members, means to maintain said mount in adjusted position, a flexible electrode mount on said frame in confronting relation with said first named mount, and means for flexing said flexible mount for effecting momentary contact between electrodes adapted to be carried by said mounts.

6. In a device of the character described, the combination with a reflector, of spaced carbon electrodes mounted within the field of said reflector, means for impressing an electrical potential between said electrodes, resilient clips mounted in the field of said reflector, resistance units detachably sustained by said clips to serve as infra red ray generating means influenced by said reflector, and switching means for selectively connecting said resistance units in series with said electrodes.

7. In a device of the character described, the combination with a reflector, of spaced carbon electrodes mounted within the field of said reflector, means for impressing an electrical potential between said electrodes, resilient clips mounted in the field of said reflector, resistance rod units detachably sustained by said clips to serve as infra red ray generating means influenced by said reflector, and switching means for selectively connecting said resistance units in series with said electrodes.

8. In a device of the character described, the combination with a reflector, of spaced carbon electrodes mounted within the field of said reflector, means for impressing an electrical potential between said electrodes, resilient clips mounted in the field of said reflector, resistance rod units detachably sustained by said clips in parallel spaced relation to serve as infra red ray generating means influenced by said reflector, and switching means for selectively connecting said resistance units in series with said electrodes.

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