June 4, 1935. J. W. BACON ET AL 2,003,527

THERAPEUTIC DEVICE

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Fig. 1

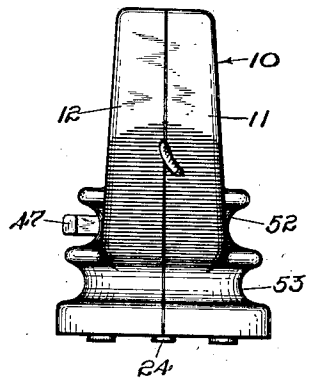
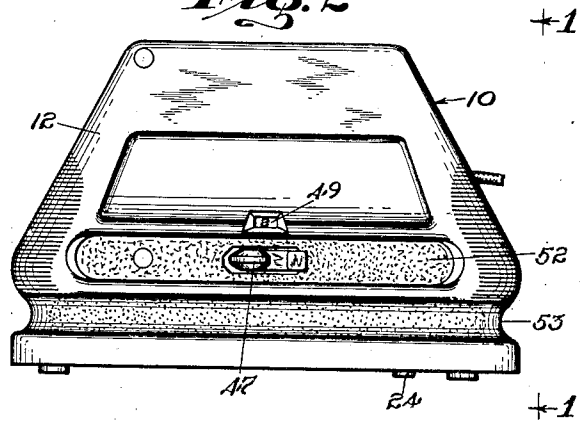


Fig. 2



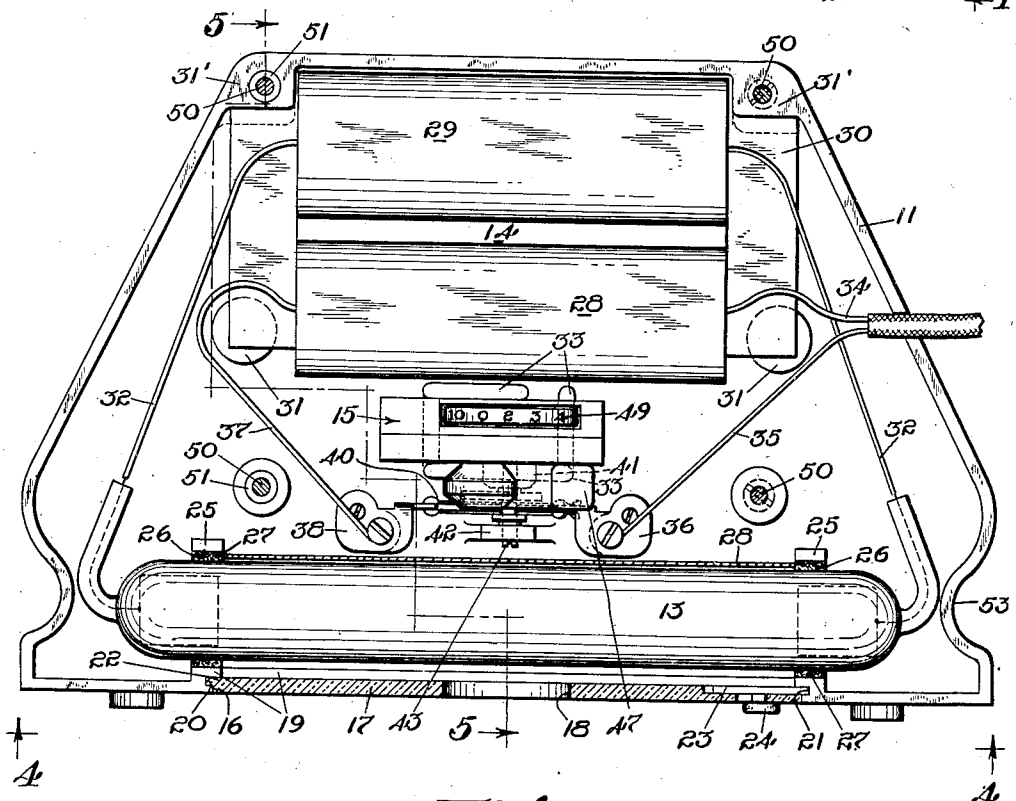


Fig. 3

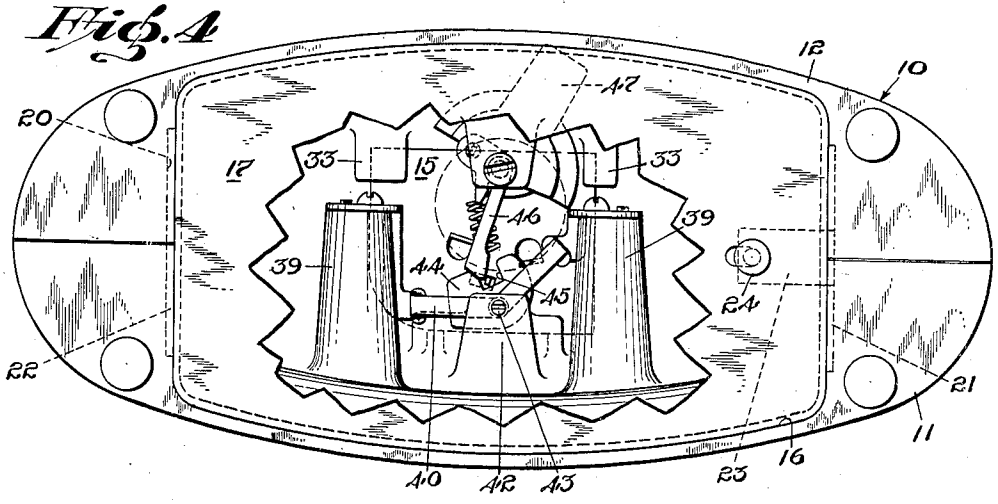
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Fig. 4



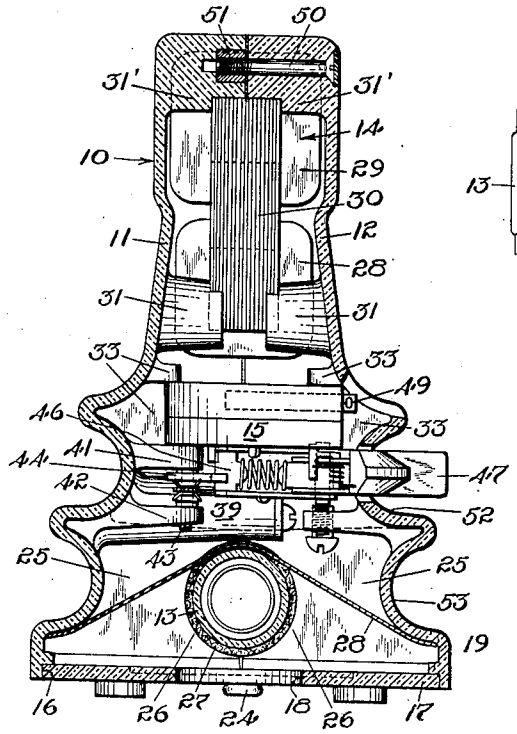


Fig. 5

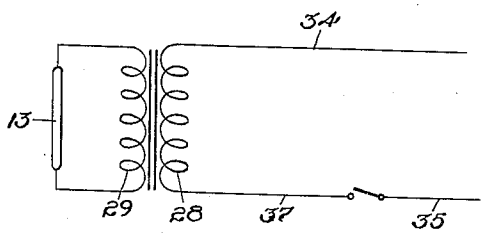


Fig. 6

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UNITED STATES PATENT OFFICE

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THERAPEUTIC DEVICE

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Application October 1, 1932, Serial No. 635,774

3 Claims. (Cl. 174—177)

This invention relates to therapeutic devices, and more particularly to devices designed for producing actinic rays, and especially ultra violet radiation, for treatment of the human body.

One means for producing such radiations is as follows: A quartz glass tube, filled with one or more inert gases, in combination with mercury, is sealed at either end as by means of electrodes and a relatively high voltage current is passed therethrough, causing an ionization of the gases therein and resulting in ultra violet radiation. In order to produce a source of sufficient intensity, long lengths of tubing have been used which are usually coiled, convoluted or otherwise bent to provide a localized light source. A high voltage and relatively low current of about forty milliamperes is used to operate such tubes and a large and heavy transformer is required to operate them. The bulkiness and impracticability of incorporating a large and heavy transformer in a therapeutic unit, to be held in the hand of the user and moved over portions of the body requiring treatment will be apparent. Accordingly, it has been a common practice to provide a separate case or cabinet in which the transformer is housed. This increases the cost appreciably and makes a cumbersome unit.

Applicant finds that the actinic value of therapeutic devices of the character referred to is proportional to the amount of current used and that the desired actinic value can be produced by using a short quartz tube of relatively large bore and passing a high current therethrough. A low voltage may be used, thus cutting down the size and weight of the transformer.

It is an object of applicants' invention to provide an exceptionally compact and light device in which both the tube or source of light and the transformer are contained, thereby providing a single compact unit which may be conveniently operated from any common electrical outlet.

Another object of the invention is the provision of such a device in which the transformer defines the handle by which the device is held.

Another object is to make such a device of insulating material and in sections which are cooperative to support the various elements therein.

A further object of the present invention is the provision of a device of the character referred to with a transformer in the handle portion thereof for operating a luminous tube, with further means therein, operable from the outside of said device for setting or predetermining the period said tube is to be illuminated.

Another object of the invention is the provision of such a device having an opening therein through which light may be directed for body treatments, with means for interchangeably receiving covers having openings therein, whereby localized treatments may be performed.

Our invention possesses many other advantages and has other objects which will be apparent from a consideration of one embodiment thereof, and for this purpose, we have shown one form of the invention in the accompanying drawings, forming part of the present specification.

In the drawings:

Figure 1 is an end elevation of a therapeutic device embodying our invention, and as seen from line 1—1 on Fig. 2;

Figure 2 is a front side elevation thereof, and shows the means for operating the timing device, and the opening through which the time dial may be observed;

Figure 3 shows the device with the front half removed and showing the various devices in place therein;

Figure 4 is a bottom plan view, taken as indicated by line 4—4, of Fig. 3, a portion of the cover being broken away, and the tube being removed, to show the timing device and means for supporting the same;

Figure 5 is a vertical sectional view, taken on the staggered line 5—5, Fig. 3; and

Figure 6 is a wiring diagram used in connection with the device.

Referring now more in detail to the drawings, the device shown for explanatory purposes includes a housing, generally indicated 10, of insulating material, and composed of two sections, 11 and 12, which are similar in form. Said sections are cooperative to support therebetween a luminous tube element 13, a transformer 14, for operating said tube, and an automatic timing device, generally indicated 15, for controlling the period of illumination of said tube. An opening 16 is defined in the bottom of said housing through which light from the luminous tube can be directed for general body treatments.

In the event that localized treatments are desired, as in the case of cuts, boils and the like, we provide means in the bottom of the housing for receiving a plate or cover 17, which may be provided with one or more openings 18 of any desired shape and size for restricting the passage of light. Said plate can be inserted in the opening 16, and against a rim 19 extending around the inner wall of the housing. In order to secure the plate 17 in place, recesses 20 and 21 are provided in the housing at either end thereof, as

clearly shown in Figs. 3 and 4. One end of the plate is provided with a flange 22 for engagement with the recess 20, while the other end thereof carries a slidable locking element 23, which may be moved into engagement with the recess 21, for locking the plate 17 in place. A knob 24 on the locking element 23 serves to move it into and out of engagement with the slot 21.

The housing sections 11 and 12 have inwardly extending supporting web portions, 25, 25, shown in Figs. 3 and 5, at either end thereof with semi-circular openings 26, 26, in the innermost edges thereof, whereby, when said sections are assembled, the semi-circular openings are caused to register for the purpose of holding the tube, as indicated. We prefer to provide an asbestos insert 27 around the tube within the supports. A reflector 28 is provided in the rear of said tube and between the tube supporting members, 25, 25.

The transformer 14, for operating the tube 13, is of the closed core type and consists of a primary coil 28, a secondary coil 29, and a laminated core 30. It is supported between the sections 11 and 12 of the housing by inwardly extending bosses 31, 31, and 31', 31'. Insulated wires 32, 32, connect the secondary side of the transformer with well known metal electrodes, in the tube ends, shown in light broken lines in Fig. 3. The current is passed between the electrodes through the gaseous filling in said tube to illuminate the same. Ordinary current used for house lighting purposes is sufficient for the primary circuit. In Figs. 3, 4 and 6, a switching device is shown in the primary circuit which is manually operated to close said circuit and is automatically actuated by a timing mechanism, hereinafter described, to open the circuit. In Fig. 3, we show primary leads passing through the housing. The lead 34 is connected to the primary coil of the transformer, while the lead 35 is conected to a terminal 36. A lead 37 connects the primary coil of the transformer with a terminal 38. The terminals 36 and 38 are in turn supported by posts 39, 39, Fig. 4, which project from the housing section 11. The primary circuit is made and broken by a switch angle arm 40 which is pivotally supported between the insulated lugs 41 and 42 by means of a pin 43. A member 44 of insulating material is secured to the switch arm 40, as shown in Fig. 4, and has a notch 45 therein with which the end of an arm 46 of the timing device 15 engages.

Automatic timing devices are well known and it will therefore not be necessary to describe in detail the type here shown, other than to make its position clear in the novel combination set forth by applicants. Its purpose primarily is to automatically operate the switch at a predetermined time to break the luminous tube circuit and discontinue the emanation of ultra violet radiation therefrom. The timing device 15 is supported within the housing 10 by ribs as 33, 33, on the housing sections 11 and 12. Said switch arm 40, notched member 44, and arm 46 are standard parts of the timing mechanism shown, said arm 46 being connected with and operated by the lever 47, which is manipulated for the purpose of winding and setting said timing mechanism by the projecting lever or member 47, in a well known manner. It is understood that the timing mechanism can be set to run any set time period, and as may be desired, and indicated on the time dial, designated 49.

The two sections 11 and 12 of the housing may be secured together in any desired manner, but we have shown through bolts, as 50, 50, screwed into inserts, as 51, as will be clear from Fig. 5.

It will thus be seen that we have provided a most compact, unitary device with the transformer embodied therein and forming a convenient handle or gripping shape for the housing. We have also so formed the housing sections that there is provided the grooves or depressions, as at 52 and 53, making it very convenient to hold the device in the hand for manipulation over the body, even though used by a person upon himself or herself.

While we have described in detail one practical embodiment of the invention, we are aware that many changes can be made in the details of construction and arrangement without departing from the spirit thereof, and we do not limit the invention to the showing used for explanation, except as we may be limited by the hereto appended claims.

We claim:

1. In a unitary self-contained therapeutic device adapted to be handled bodily and moved over the body to be treated, in combination, a housing consisting of two cooperating shell members and having an open side with finger gripping grooves formed in its outer face at opposite sides for the convenient handling thereof, a transformer supported within said housing so that the primary and secondary coils thereof are disposed one above the other, said housing being formed closely around said transformer coils for defining the handle of the device, an ultra violet light emitting tube supported horizontally beneath said transformer and adjacent the open side of said housing for emitting light therefrom, said tube being operatively connected with the high voltage circuit of said transformer, means connecting the low voltage circuit of said transformer to a source of electricity, and a time switch mechanism supported within said housing and connected in the low voltage circuit of the transformer for controlling current thereto, said mechanism comprising a time indicator and an operating lever for setting said mechanism for a predetermined period, said housing having an opening therein through which the time indicator is discernible and a further opening through which the operating lever extends whereby to permit its convenient manipulation from the outside of the housing.

2. In a unitary self-contained therapeutic device adapted to be handled bodily and moved over the body to be treated, in combination, a housing consisting of two symmetrical shells having longitudinally disposed finger gripping grooves formed in their outer faces at opposite sides whereby to provide convenient holding means, said housing being open at its bottom, a detachable cover for said open side of the housing with an aperture formed therein, a transformer supported between said shells so that the coils thereof are vertically disposed one above the other, said shells being formed closely around said coils for defining a vertically disposed handle on said device, an ultra violet light emitting tube supported horizontally beneath said transformer by cooperating portions of the housing shells and adjacent the open bottom of said housing for emitting light therefrom, said tube being operatively connected with the high voltage circuit of said transformer, means connecting the low voltage circuit of the transformer to a source of electricity, and a time controlling mechanism supported within said housing and connected in

the low voltage circuit of the transformer for controlling current thereto, said mechanism comprising a time indicator and an operating lever for setting said mechanism for a predetermined period, said housing having an opening therein through which the time indicator is discernible and a further opening through which the operating lever extends whereby to permit its convenient manipulation from the outside of the housing.

3. A therapeutic device in the form of a unitary, self-contained article adapted to be handled bodily and moved over the body to be treated and consisting of a housing formed of two cooperating shell members, said housing being open at its bottom and having formed in its opposite sides, finger gripping grooves for the convenient handling thereof, a transformer supported within said housing by cooperating portions of the shells so that the primary and secondary coils thereof are disposed one above the other, said housing being formed closely around said transformer coils for defining the handle of the device, an ultra violet light emitting tube supported horizontally beneath said transformer by cooperating portions of the housing shells and adjacent the open bottom of said housing for emitting light therefrom, said tube being operatively connected with the high voltage circuit of said transformer, means connecting the low voltage circuit of the transformer to a source of electricity and a time controlling mechanism supported within the housing and connected in the low voltage circuit of the transformer for controlling current thereto, said mechanism having associated therewith, an operating lever which protrudes from the housing for convenient manipulation by the operator whereby to set said timing mechanism for a predetermined period, said mechanisms all being operatively connected within said housing as a unitary device so that said device can be maneuvered over the body in much the same manner as an electric iron is used.

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