W. A. D. EVANS.

ELECTROTHERAPEUTICAL DEVICE.

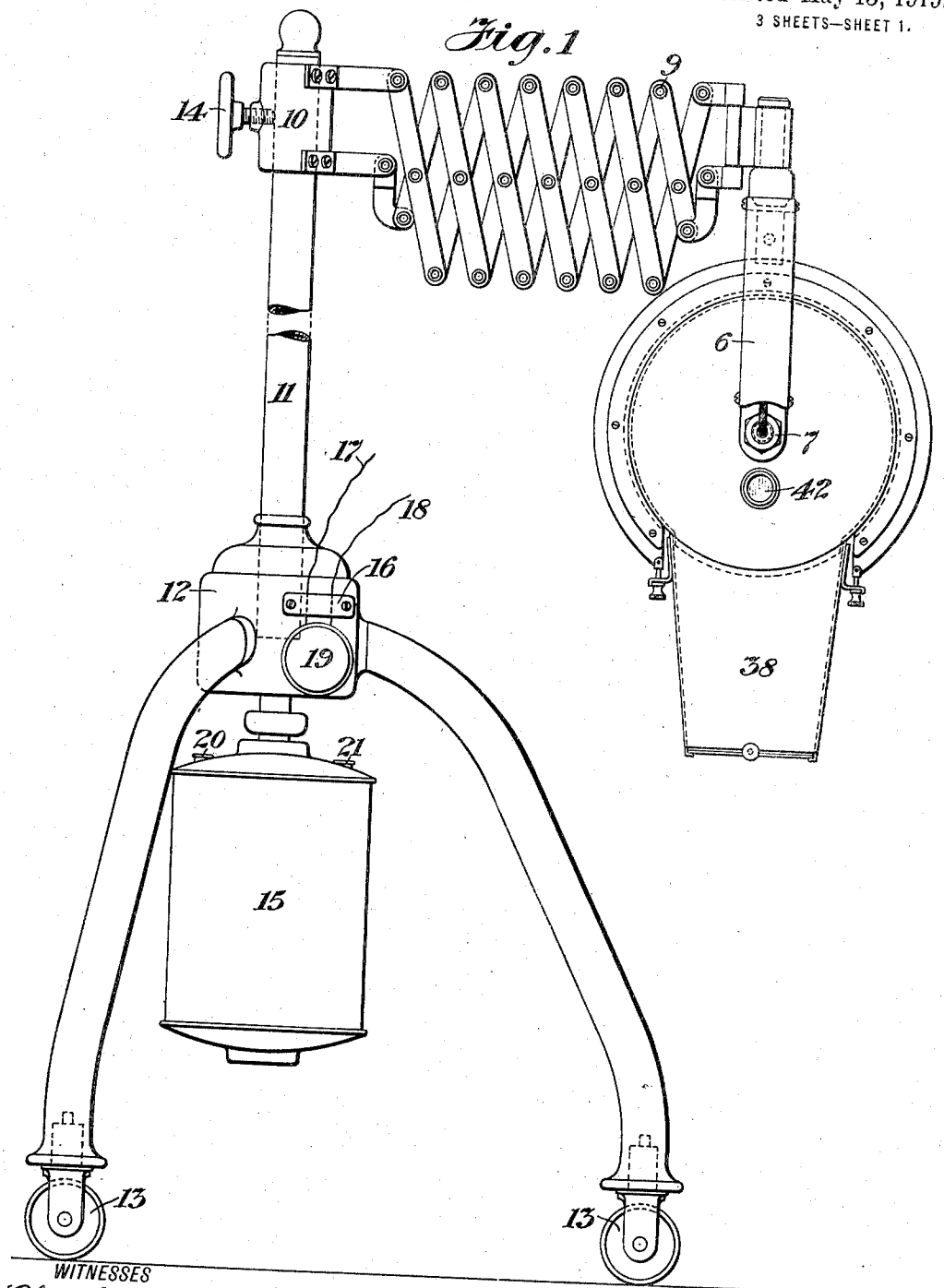
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1,303,273.

Patented May 13, 1919.

3 SHEETS—SHEET 1.

Fig. 1



WITNESSES

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3 SHEETS—SHEET 2.

Fig. 2

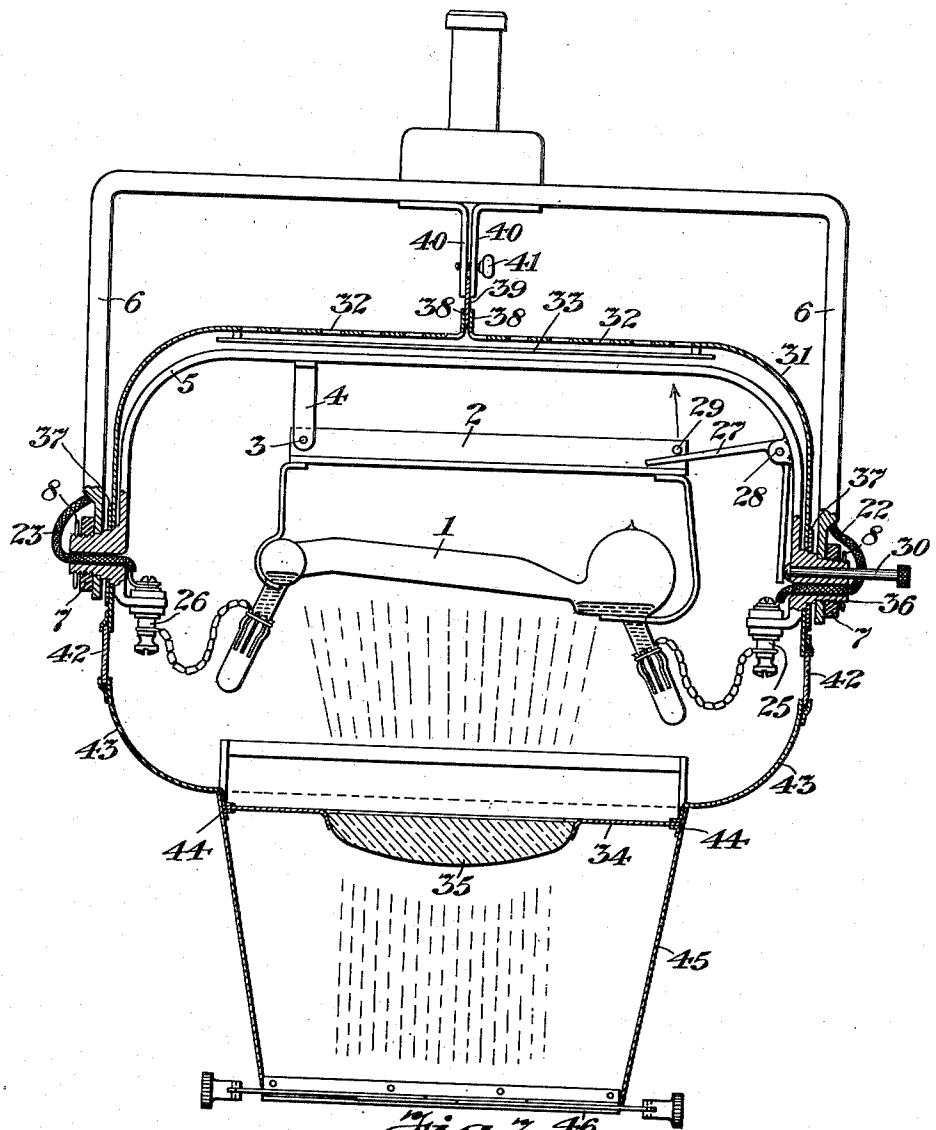
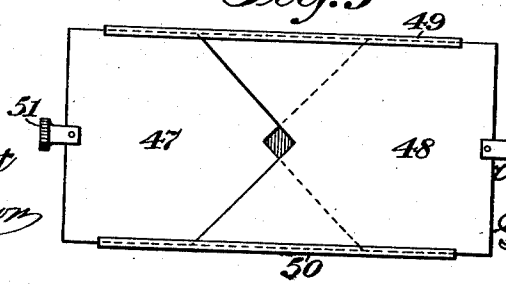


Fig. 3



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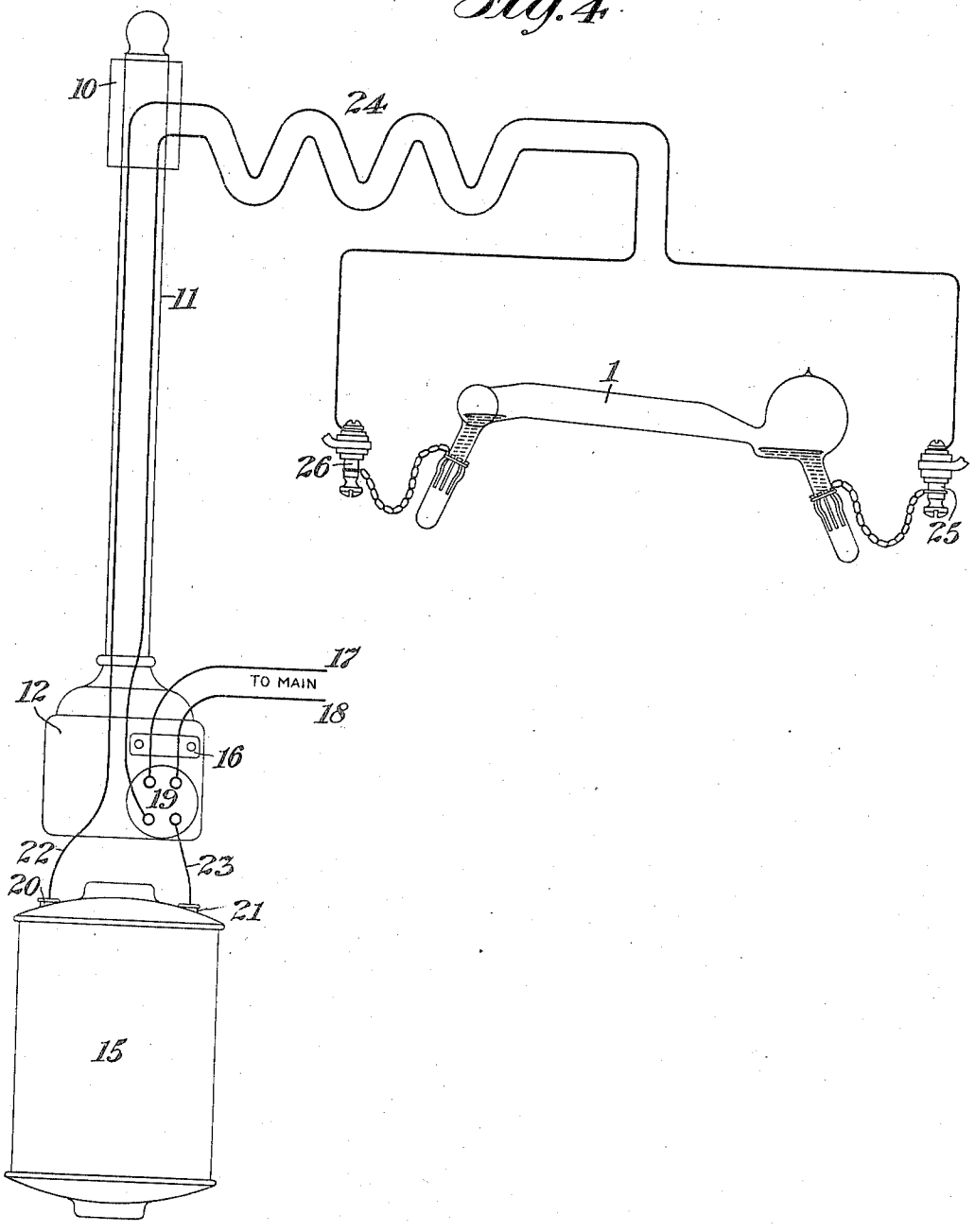
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3 SHEETS—SHEET 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTROTHERAPEUTICAL DEVICE.

1,303,273. Specification of Letters Patent. Patented May 13, 1919.

Application filed July 25, 1914. Serial No. 853,008.

To all whom it may concern:

Be it known that I, WILLIAM A. D. EVANS, a citizen of the United States, and resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in Electrotherapeutical Devices, of which the following is a specification.

Use has been made in surgical and therapeutical work of the advantages of ultra violet radiation applied in various ways. Certain difficulties have, however, been encountered by those wishing to make such application, owing to the fact that it is difficult to bring the ultra violet rays to the place where they are most needed, without danger of the exposure of the operator to the evil effects which appertain to ultra violet radiation improperly applied. On the other hand it will be appreciated that in many instances it is impossible or dangerous to bring the subject into a position where a stationary source of radiation can be successfully applied.

So far as I know, the art does not yet disclose any means for the handy manipulation of a source of ultra violet radiation doing away with the necessity of moving the subject or of causing an exposure of the operator to unwished for effects.

My invention relates to the matter of providing such means which is illustrated in the accompanying drawings in which Figure 1 is a side elevation of my apparatus; and Fig. 2 is a sectional view of the source of ultra violet radiation and its connected parts; Fig. 3 is a view of a shutter mechanism made use of in applying the ultra violet radiation; and Fig. 4 is a diagram of the electrical circuits.

In the drawings, 1 is a source of ultra violet radiation, in this instance shown as a mercury vapor lamp having a quartz burner. The lamp 1 is mounted in a frame, 2, pivoted at 3 to a lug, 4, mounted on a curved support, 5. The curved support 5 passes at its ends through the arms of a bracket, 6, where it is held by means of nuts, 7, 7, which are kept in place by pins shown at 8, 8. The bracket 6 is connected to one end of a lazy tongs, 9, the opposite end of which is secured to an adjustable sleeve, 10, surrounding a hollow or tubular standard, 11. The standard itself, being supported by a tripod, 12, mounted on casters, 13, 13, may be moved to any desired position horizontally, thus making it possible to bring the bracket 6 and its connected parts to the position required. After the sleeve 10 has been adjusted to any given position, it may be fixed in place upon the standard by means of a screw bolt, 14. This arrangement provides for the vertical adjustment of the lazy tongs and its supported parts.

The tripod, 12, supports the usual auxiliary, 15, for the lamp parts. To the tripod is secured a cleat, 16, for holding wires, 17, 18, leading from the generator or source of current supply. These wires pass to a switch, 19, by means of which the main supply current can be connected to or disconnected from the lamp circuit.

It will be observed that binding posts, 20 and 21, stand up from the container of the auxiliary, 15, and, as seen in Fig. 4, a wire, 22, is connected to the first named binding post and a wire, 23. to the second named binding post. The wire 22 properly insulated, passes up through the interior of the tubular standard 11 and also through the coils or curves of a cable, 24, (as shown diagrammatically in Fig. 4) and thence to a binding post, 25, connected to one terminal of the lamp 1. The wire 23 passes to the switch 19 and thence through the hollow tube 11 and the cable 24 to a binding post, 26, at the other terminal of the lamp. Thus, by the operation of the switch 19 the lamp can be thrown into or out of circuit when the conditions are right. For starting the lamp I employ a bell-crank lever, 27, pivoted at 28 and extending by means of one of its arms under a pin, 29, on the frame 2. The other arm of the lever 27 projects downward into range with a push rod, 30, by means of which the lever, as a whole, may be operated to lift one end of the lamp and cause a continuous flow of mercury between the electrodes or terminals of the lamp. At this moment, if the local lamp circuit is otherwise closed, as already described, current will flow through the lamp by way of the stream of mercury and, when this stream is ruptured, the vapor between the electrodes will carry current and produce luminous effects and ultra violet radiation.

Around the lamp 1 I place a container, 31, which is generally cylindrical in shape. At its top there are vent holes, 32, 32, for permitting heated gases to escape and below

the top is a shield, 33. At the bottom of the cylinder is a plate, 34, set across the mouth of an opening at that point and itself provided with an opening within which is secured a quartz lens, 35, for collecting and straightening for focusing the rays from the lamp 1. I provide means for permitting the rotation of the cylinder 31 and thereby shifting at will the angular position of the lens 35 and consequently the point or points at which the ultra violet radiation emerges from the cylinder. There are central openings in the cylinder 31, regarded as a whole, which openings fit around the smooth surface of the nuts or lugs, 36, suitable washers, 37, 37, being provided as is customary in such cases. Manifestly the cylinder may be rotated as already indicated and in so doing it will accomplish the purpose set forth above.

At is central portion, the top of the cylinder is formed into continuous lips, 38, 38, between which a plate or rim, 39, is held, the latter serving as a guide to prevent the twisting or displacement of the cylinder during rotation. To this end the rim 39 cooperates with a pair of plates, 40, 40, depending from the bracket 6, said plates being capable of being fixed in place by means of thumb screw or wing screw, 41. The object of the screw is to hold the cylinder firmly in place after the adjustment thereof to any desired position. By turning the screw, 41, this can be accomplished. At 42, 42 are shown observation windows, the purpose of which is obvious. The bottoms of these windows are set into spun metal casings, 43, 43, forming part of the cylinder and extending downward and being formed into flanges, 44, 44, to which a tapering metal chamber, 45, is secured. To the bottom of the chamber 45 is secured a shutter device 46 comprising the usual slides 47 and 48 and the usual guides 49 and 50. Handles, 51, 51, are provided to permit of the easy adjustment of the slides. Manifestly, by this arrangement, a greater or smaller region of applied radiation can be provided at will.

Summing up the main advantages of the apparatus herein described, from a therapeutical point of view, the first resides in providing for the easy moving of the apparatus from place to place by means of the tripod, secondly the use of the lazy tongs and the vertical adjusting devices 10 and 14 permits the localizing of the radiation at any desired point, which is further reinforced, thirdly by the fact that the cylinder containing the source of radiation is capable of rotation and, fourthly, by the adjustment, through the shutter device, of the amount of surface upon which the ultra violet radiation is focused.

It will be understood that other devices for projecting or extending the position of the lamp and its support may be substituted for the lazy tongs shown and described herein.

While, for convenience, I have selected the quartz lamp as an example of a convenient source of ultra violet radiation, yet I do not wish to limit myself to the employment of that source alone.

I claim as my invention:

1. In an electro-therapeutic apparatus, the combination of an adjustable standard, a quartz lamp mounted thereon, a container for the said lamp having an opening for the passage of ultra violet rays, a lens pervious to said rays in said opening, and means for changing the position of the opening with relation to the lamp.

2. In an electro-therapeutic apparatus, the combination of an adjustable standard, a quartz lamp mounted thereon, a container for the said lamp having an opening for the passage of ultra violet rays, a lens pervious to said rays in said opening, means for changing the position of the opening with relation to the lamp and an adjustable shutter closing off the said opening.

3. In an electro-therapeutic apparatus, the combination of a standard, a source of ultra violet radiation mounted on the same, a container for the said source having an opening for the passage of ultra violet rays, a lens pervious to said rays in said opening and means for changing the position of the opening with relation to the source.

4. In an electro-therapeutic apparatus, the combination of a standard, a source of ultra violet radiation mounted on the same, a container for the said source having an opening for the passage of ultra violet rays, a lens pervious to said rays in said opening, means for changing the position of the opening with relation to the source, and an adjustable shutter closing off the said opening.

Signed at New York in the county of New York and State of New York this 23d day of July A. D. 1914.

WILLIAM A. D. EVANS.

Witnesses:
C. H. B. WOODWARD,
GEORGE H. STOCKBRIDGE.