

March 5, 1940.

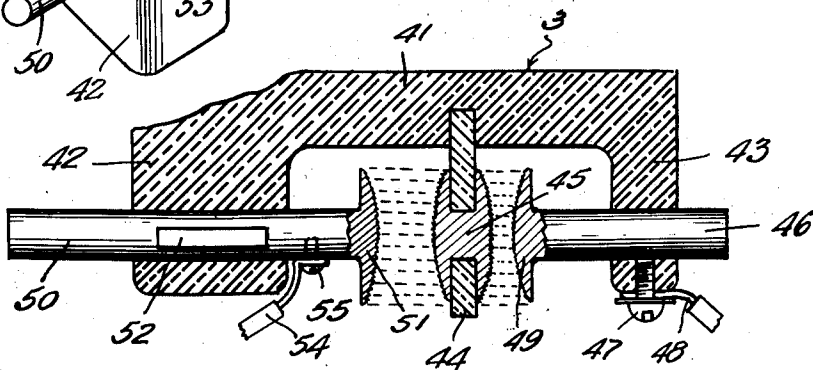
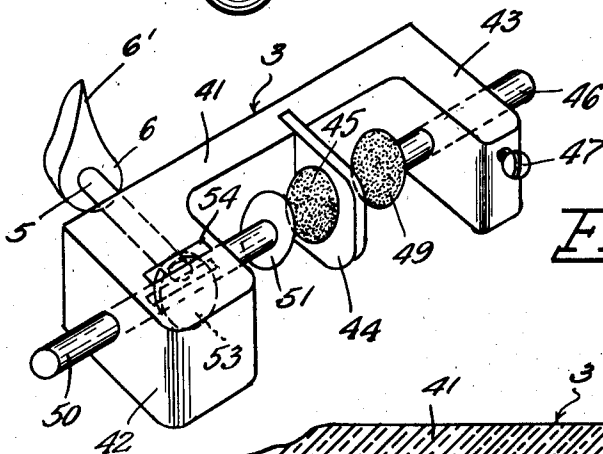
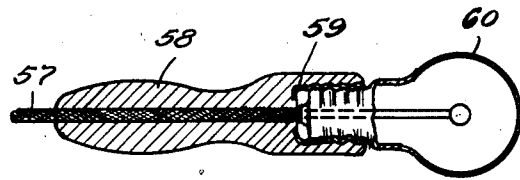
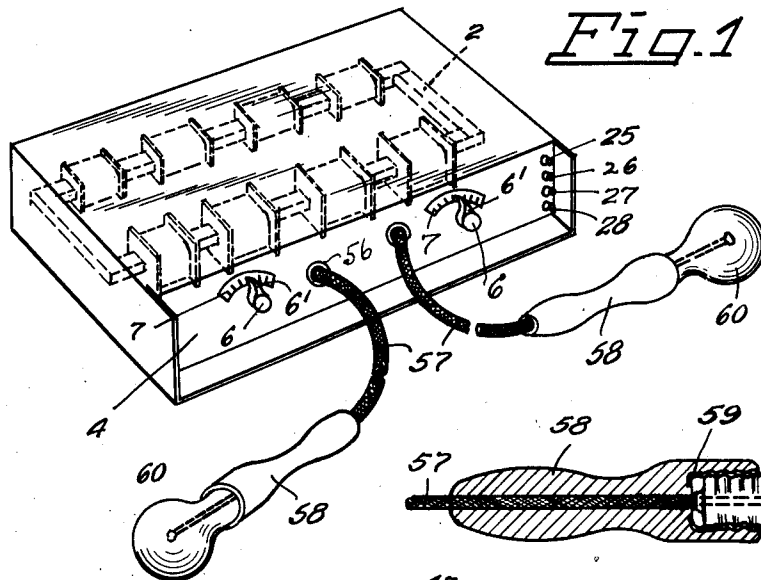
H. F. DIXON

2,192,638

ELECTRICAL THERAPEUTIC MACHINE

Filed June 30, 1936

2 Sheets-Sheet 1



INVENTOR.  
Harvey F. Dixon  
BY  
*Glenn L. Fish*  
ATTORNEY.

**March 5, 1940.**

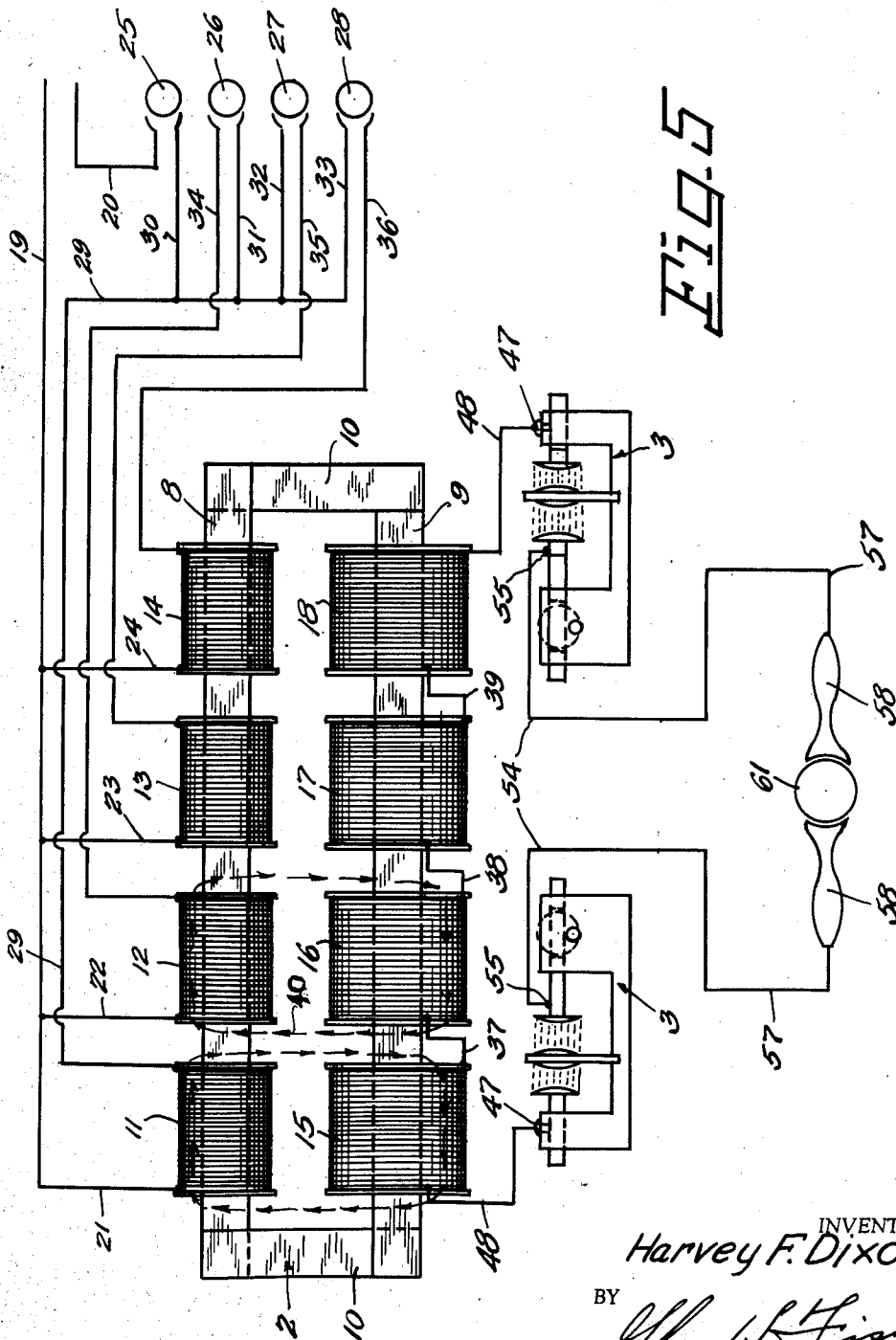
H. F. DIXON

**2,192,638**

# ELECTRICAL THERAPEUTIC MACHINE

Filed June 30, 1936

2 Sheets-Sheet 2



INVENTOR.  
Harvey F. Dixon

BY

BY *Wm. L. Fish*  
ATTORNEY.

## UNITED STATES PATENT OFFICE

2,192,638

## ELECTRICAL THERAPEUTIC MACHINE

Harvey F. Dixon, Spokane, Wash., assignor of  
one-fifth to Perry S. Dumbolton, Spokane,  
Wash.

Application June 30, 1936, Serial No. 88,255

3 Claims. (Cl. 128—413)

This invention relates to an electrical appliance known as a ray machine or electrical therapeutic machine and one object of the invention is the production of a machine which when in use causes a ray to be emitted which is a combination of high tension violet and short wave impulses and operated as a closed circuit through the body without heat or discomfort while, at the same time, causing effects which are very beneficial to the person under treatment.

It is another object of the invention to provide a machine emitting rays which are very effective as a germicide, and serve to sterilize and dislodge pus, increase red corpuscles by introduction of oxygen, and speed up circulation so that nerves are stimulated and caused to properly perform their functions and relief afforded persons suffering from high or low blood pressure. Other beneficial effects produced by the rays generated by this machine will be brought out during the course of the description.

Another object of the invention is to so construct the machine that a desired voltage may be obtained according to the needs of the patient under treatment, building up of voltage being accomplished by successively closing switches with which the machine is equipped so that a desired flow of current will be obtained.

Another object of the invention is to provide a machine of this character wherein the circuit through a person's body is effected by application of vacuum tubes to the body, thus permitting application to particular portions of the body.

Another object of the invention is to so construct the apparatus that adjustable arc members may be adjusted towards stationary arc members and thus the length of the arcs controlled and the action of the device regulated.

Another object of the invention is to so form the apparatus that a light globe of an ordinary construction which may be either new or burned out may be used as a vacuum tube and thus reduce the cost of operating the apparatus as well as permitting easy replacement of the tubes when necessary.

A machine constructed in accordance with this invention is illustrated in the accompanying drawings, wherein

Figure 1 is a perspective view of the improved machine with elements enclosed in the housing indicated by dotted lines.

Figure 2 is a sectional view upon an enlarged scale taken longitudinally through one of the vacuum tubes and its handle.

Figure 3 is a perspective view of one of the adjustable multiple series arc devices forming part of the machine.

Figure 4 is a sectional view taken through Figure 3 longitudinally thereof.

Figure 5 is a wiring diagram.

This therapeutic machine or ray machine as it may be called has a casing 1 in which a compound transformer 2 and a pair of arc devices 3 are housed, the transformer being mounted upon the bottom of the casing and the arc devices being secured against the inner face of the front wall 4 of the housing in any desired manner so that the adjusting stems 5 of the arc devices may project outwardly through this wall and dispose the turning knobs 6 for the stems externally of the casing where they may be readily grasped and turned. These knobs are tapered, as shown at 6', to form pointers which overlie scales 7 provided upon the front wall of the casing and, therefore, proper setting of the arc devices can be easily effected.

The transformer is constructed as shown in Figures 1 and 5 and has a rectangular core-frame having side bars 8 and 9 and end bars 10, all of which are formed of laminated steel strips interlaced at corners of the frame and secured to each other in any desired manner. The side bar 8 of the core-frame carries a plurality of primary coils 11, 12, 13 and 14 which are spaced from each other to provide spaces between the coils and the side bar 9 carries secondary coils 15, 16, 17 and 18, each of which is disposed in directly opposed relation to a companion primary coil. Power is supplied by conductor wires 19 and 20 leading from a conventional inlet plug mounted through an end wall of the casing and attention is called to the fact that the wire 19 has connections 21, 22, 23 and 24 with ends of the coils 11, 12, 13 and 14, while the wire 20 leads to one side of a switch 25. This switch and other switches 26, 27 and 28 are mounted through the front wall 4 of the casing so that they may be actuated externally of the casing, and attention is called to the fact that the number of switches conforms to the number of companion primary and secondary coils. A conductor 29 leads from the second end of the coil 11 and has a connection 30 to the other side of the switch 25 and other connections 31, 32 and 33 to the switches 26, 27 and 28 at one side of each of these switches. At the other sides of the switches 26, 27 and 28 are secured conductors 34, 35 and 36 leading, respectively, from the second ends of the coils 12, 13 and 14. By so wiring the primary coils, the

switch 25 can be closed and a circuit will be established through the primary coil 11 and this coil alone energized. By leaving this switch closed and then successively closing the switches 26, 27 and 28, the coils 12, 13 and 14 may be successively energized. Therefore, the voltage may be progressively built up or reduced by closing or opening the switches 26, 27 and 28 according to the amount of voltage desired for a patient.

The secondary coils are wound with any desired number of layers of wire and are connected to each other, as shown at 37, 38 and 39. The current is induced to the secondary coils through the magnetic core frame and the coils make up a multiple transformer consisting of four primary coils and four companion secondary coils assembled in such a way as to cause magnetic lines indicated by the arrows 40 to cut off any tendency of arcing between adjacent coils. It should also be noted that the space between the adjacent coils is such that each set of companion primary and secondary coils is, to some extent, a transformer independent of the others, yet working in unison with each other and the connections being such that there will be produced multiple primary coils and series secondary coils.

Current from the secondary coils passes through the adjustable arc devices 3, each of which is constructed as shown in Figures 3 and 4, and referring to these figures it will be seen that each has a body or carrier 41 formed of insulation and provided with arms 42 and 43 at its ends, the arm 42 being thicker than the arm 43. A plate or intermediate arm 44 which is formed of insulating material is carried by the body intermediate the arms 42 and 43 and carries a plug 45 of conductive material which extends through an opening formed in the arm 44 and has enlarged end portions engaging opposite sides faces of the arm 44. A stationary bar or terminal 46 extends through the arm 43 where it is secured by a set screw 47 to which is secured one end of a conductor wire 48 leading from an end of the winding of an end one of the secondary coils. By securing the terminal bar 46 with a set screw, it may be adjusted to dispose its head 49 a predetermined distance from the head or enlarged end portion of the plug 45 and then firmly secured in the set position. A terminal bar 50 slidably passes through the arm 42 and at its inner end is provided with a head 51 corresponding to the head 49 of the terminal bar 46. This terminal is to be shifted to dispose its head a desired distance from the plug 45 and, in order to do so, it has been formed with a longitudinally extending slot 52 in which engages a disc 53 carried by the inner end of the adjusting stem 5 in eccentric relation thereto. The disc 53 swings about the stem 5 within the pocket or slot 52 of the arm 42 and exerts a cam action against the terminal bar at one end or the other of the slot 52 according to the direction in which the stem 5 is turned and the adjustable terminal bar will be shifted towards or away from the plug 45. Therefore, the length of the gap between the head 51 of the adjustable terminal and the confronting head of the plug 45 may be regulated and a spark of the desired length obtained. The heads 49 and 51 of the bars 46 and 50 and the heads of the plug 44 have their faces formed with needle-like points, as shown in Figure 4, so that a multiplicity of arcs will be formed and these points upon the heads may be formed in any desired manner such as by forming the heads as ringed discs, or by mounting steel wool, needles or the like in

the heads. Conductor wires 54, which are single wires, lead from the securing screws 55 carried by the bars 50 to outlet sockets 56 secured through the front wall of the casing and into these sockets are plugged single wire conductors 57 which are threaded through handles 58. These handles are formed of insulating material and at their front ends carry sockets 59 into which the vacuum tubes 60 are screwed. These tubes when specially made are provided with a single electrode centrally located in the bulbs, but in an emergency electric light bulbs may be used.

When this device is in use, a service cord leading from a wall socket is plugged into the inlet socket from which the wires 19 and 20 extend and terminal plugs of the wires 57 engaged in the outlet sockets 56. The handles 58 are grasped and the vacuum tubes 60 placed against a person's leg, as shown at 61, or any other portion of the body which it is desired to treat, and the rays generated and delivered from the electrodes of the tubes will enter the body and pass through the same from one tube to the other. These may be violet rays or other types of rays. By closing the switch 25, the machine will be set in operation and if additional voltage is desired, the switches 26, 27 and 28 may be closed to energize the coils 12, 13 and 14 and progressively increase the voltage. In order to control the length of gap between each plug 45 and the head 51 of the companion bar 50, the knob 6 of the stem 5 carrying the adjusting disc 53 for this bar is grasped and turned to turn the stem and swing the disc about the stem so that it exerts a cam action upon the bar and shifts the bar longitudinally towards or away from the plug. The length of the arc can, therefore, be accurately adjusted. I have, therefore, provided an improved electrical therapeutic machine which is of simple and compact construction and very easy to adjust and operate.

Having thus described the invention, what is claimed as new is:

1. In an electrical therapeutic machine, a transformer having a core and a plurality of sets of companion primary coils spaced from each other and secondary coils spaced from each other, the secondary coils being in series and each disposed opposite a companion primary coil, jump-gap members connected with opposite ends of the series of secondary coils and each having a stationary arc member and an adjustable arc member, means for connecting an applicator with an arc member of each jump-gap member, and means for selectively energizing the primary coils individually.

2. In an electrical therapeutic machine, a transformer having a core provided with opposed side bars, primary coils carried by one side bar and spaced from each other longitudinally thereof, secondary coils carried by the other side bar and connected in series to each other and being spaced from each other longitudinally of the side bar and disposed in opposed relation to companion primary coils, switches corresponding in number to the primary coils, a power wire connected to one end of each primary coil, a conductor leading from the second end of one primary coil and secured to one terminal of each switch, a power wire secured to the other side of one switch, and a conductor leading from the second end of each of the other primary coils and secured to the second side of a companion switch, jump-gap members each having a stationary arc member connected with one end of the series of

secondary coils and an adjustable arc member adapted to have an applicator connected therewith.

5 3. In an electrical therapeutic machine, a transformer having a plurality of longitudinally spaced primary coils and secondary coils, the primary coils being disposed opposite companion secondary coils, means for selectively energizing the primary coils, the secondary coils being in series, jump-gap members each having a body of insulation having arms spaced laterally from each other, a stationary arc member intermediate said arms, an arc member facing one side of the stationary member and having a bar extending transversely through one arm, a fastener for en-  
10 gaging the last-mentioned arc member and se-

curing the same in a set position, a conductor connecting the fastener with one end of the series of secondary coils, a shiftable arc member facing the other side of the stationary arc member and having a bar slidable through the other arm and formed with a slot, a conductor for connecting the shiftable arc member with an applicator, a stem rotatably mounted in the last-mentioned arm with one end projecting therefrom and provided with turning means, and a disc-carried by the stem eccentric thereto and engaged in a slot of the shiftable arc member for shifting the arc member towards and away from the stationary arc member when turned.  
15

HARVEY F. DIXON.