Aug. 16, 1932. I. JEPPSSON 1,871,699

THERAPEUTIC ARC LAMP

Filed July 10, 1929 3 Sheets-Sheet 1

Fig. 1

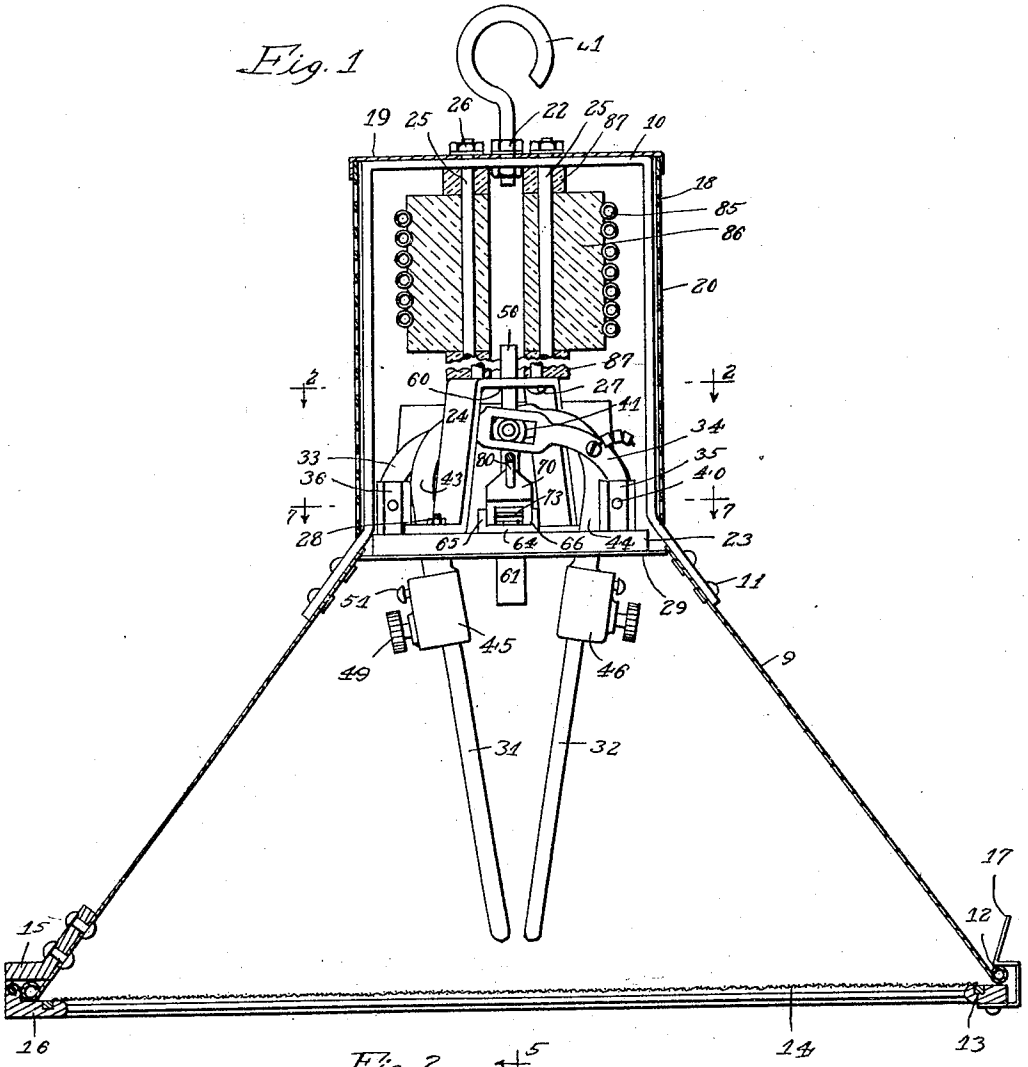
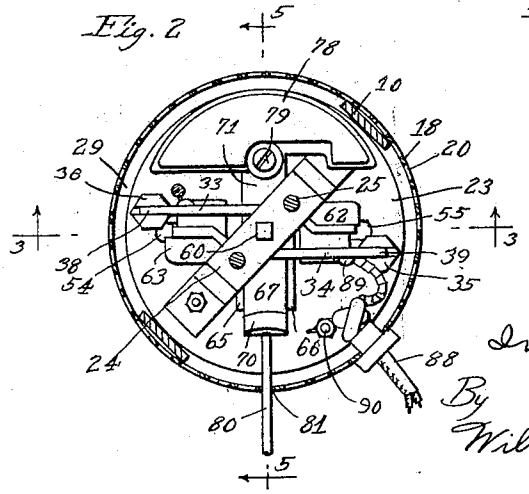


Fig. 2



Inventor:
Ivar Jeppsson
By
Wilson + McCarthy
Attys.

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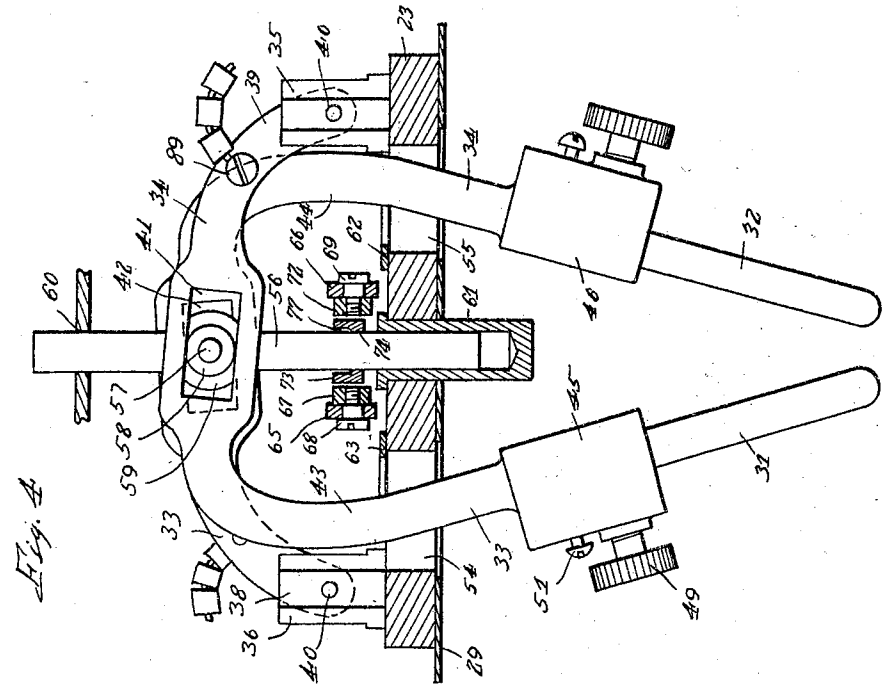


Fig. 4

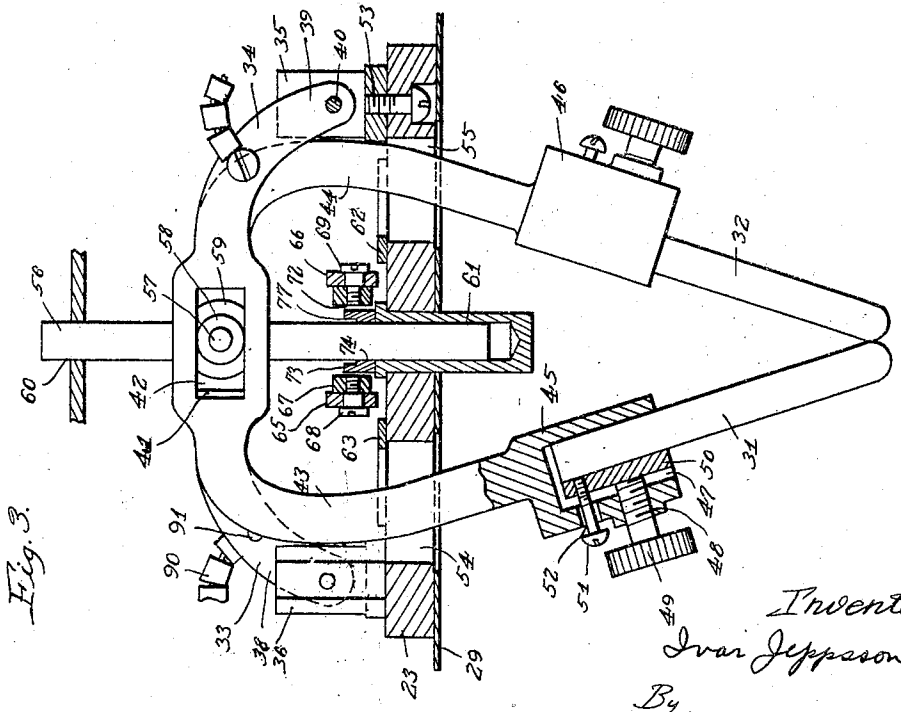


Fig. 3.

Inventor
Ivar Jeppsson
By Wilson & McCanna
Attys.

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Fig. 5

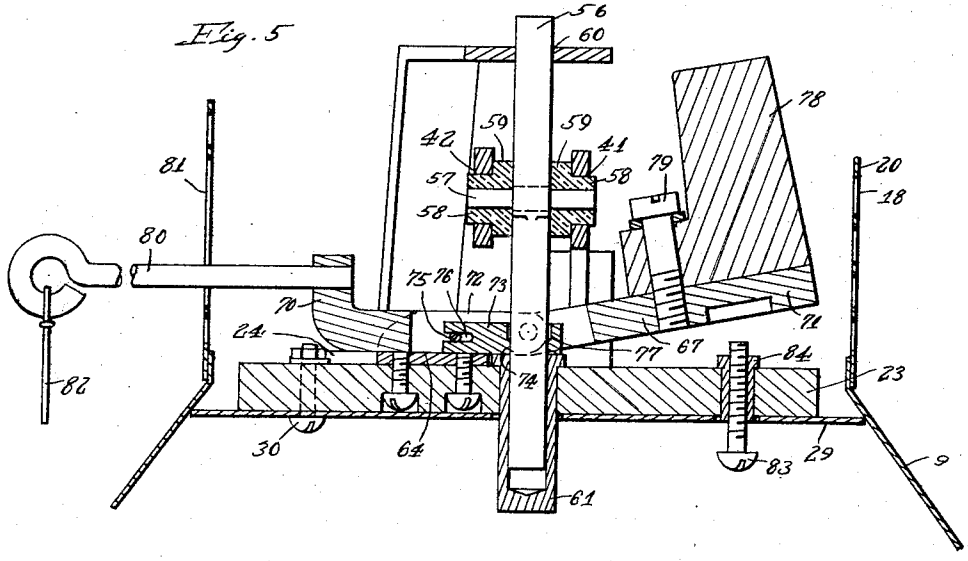


Fig. 6.

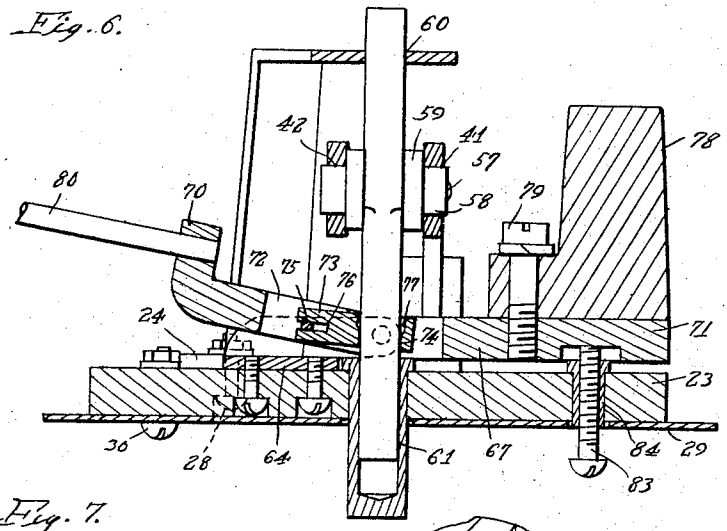
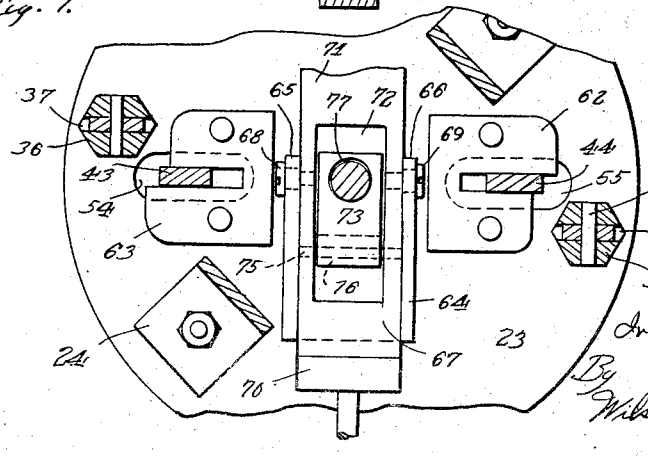


Fig. 7.



Inventor:
Ivar Jeppsson
By Wilson & McCanna
Attys.

Patented Aug. 16, 1932 1,871,699

UNITED STATES PATENT OFFICE

IVAR JEPPSSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO FLEXIBLE SHAFT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

THERAPEUTIC ARC LAMP

Application filed July 10, 1929. Serial No. 377,313.

My invention relates to arc lamps of the type adapted for use in the treatment of animals with therapeutic light rays.

It has long been known that sunlight acting directly upon the body of men and animals is an important factor in many life processes. The beneficial effects are believed to be principally due to radiant energy of certain wave lengths some of which lie beyond the visible portions of the spectrum and effort has been made to provide artificial means for producing the desired wave motions. The electric arc lamp employing suitable electrodes has been used to provide a satisfactory source of the desired energy and a number of such lamps have come onto the market. Most of these lamps are, however, too expensive to be used in treating animals. Other lamps have been cheaply constructed but involve considerable difficulty in operation and close attention. Many of the cheaper lamps are dangerous in the hands of any but an experienced operator.

I have aimed to provide a simple and convenient arc lamp wherein the electrical elements are effectively insulated and which embodies a generally improved construction.

Another object of the invention is the provision of an improved lamp which may be economically manufactured.

Another object is the provision of a lamp having improved means for adjusting the electrodes to cause them to be advanced successively to prepare the lamp for each burning period.

Another object of the invention is the provision of a gravity actuated electrode mechanism for a lamp of the character described.

A still further object of the invention is the provision of a lamp having electrodes positioned in converging relation whereby a greater burning time is obtained for each setting of the electrodes.

Another object is the provision of an easy pull connection for causing the electrodes to be adjusted for each burning period.

I have also aimed to provide a lamp requiring no resetting of the electrodes until the same require replacement.

Another object has been the provision of a lamp of longer burning time than that normally present in lamps of this character.

Figure 1 is a view showing a vertical section through the lamp;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 2 showing the electrodes in contact;

Fig. 4 is also a section on the line 3—3 of Fig. 2 showing the electrodes drawn apart to the proper arc gap;

Figs. 5 and 6 are sections on the line 5—5 of Fig. 2 showing the electrode adjusting means in positions corresponding with Figs. 3 and 4 respectively; and

Fig. 7 is a section on the line 7—7 of Fig. 1 showing a clamping finger employed in adjusting the electrodes.

The invention contemplates generally the provision of a lamp adapted to be suspended from above and having reflecting means for directing the light downward from the arcs. While the drawings show but a single arc it will be observed that any desired or suitable number of arcs may be employed.

Directing attention particularly to Fig. 1 the cabinet consists of a cone shaped reflector indicated generally by 9 having a strap iron member 10 attached near its smaller end by means of rivets 11. The lower or larger end of the cone is provided with a reenforcing rim 12 which serves to reenforce the lower edge of the reflector. A circular rim 13 having a wire screen or other closure 14 acts as a door for the reflector and is attached thereto by means of hinge member 15 attached to the reflector and hinge member 16 attached to the door. A spring latch 17 acts to support the opposite side of the door and permit the same to be opened or closed at will.

A sheet metal cylinder 18 having a top member 19 and a plurality of openings 20 therein rests over the strap iron member 10 and serves to enclose the remainder of the operating mechanism. The openings 20 permit the circulation of air through the cabinet and aid in dissipating the heat formed therein.

The strap iron member 10 serves as the frame or supporting member of the assembly and has a hook 21 centrally attached thereto by means of nuts 22 to permit the lamp to be suspended therefrom. A base plate 23 of porcelain or other insulating material is positioned in the point of the reflector cone by means of a U-shaped bracket 24 supported from the strap iron member 10 by means of bolts 25 and nuts 26. The lower ends 27 of the bolts 25 are riveted to the U-shaped member 24 to permit the resistance element mounted thereabove and presently to be described to be easily removed therefrom. The U-shaped member 24 is attached to the porcelain plate through bolts 28 counter-sunk in said plate as shown in dotted lines in Fig. 6, this counter-sinking of the bolts prevents electrical contact between the U-shaped member 24 and a metal reflector plate 29 positioned across the lower side of the porcelain plate 23 and held thereon by bolts and nuts 30.

The electrodes 31 and 32 are supported in a novel manner clearly shown in Figs. 3 and 4. Electrode holders designated generally by 33 and 34 are each supported at one end in bearing members 35 and 36. These bearing members consist of hexagonal metal posts longitudinally slotted at 37 as shown in Fig. 7 to receive the flat ends 38 and 39 of the electrode holders. Pins 40 passing horizontally through the posts and the ends 38 and 39 act to pivotally support the electrode holders. Each of the holders has a substantially horizontal portion provided with rectangular openings 41 and 42 and downwardly projecting portions 43 and 44 which are equipped at their lower ends with electrode clamps 45 and 46. These electrode clamps, shown in the drawings as formed integral with the remainder of the electrode holder, each consist of an enlarged portion thereof having recesses 47 adapted to receive electrodes 31 and 32. Threaded openings 48 receive thumb screws 49 which may be adjusted to bear against the electrode to hold the same in position. However, I have also provided filler blocks 50 having screws 51 attached thereto fastened through openings 52 in the electrode clamps, the screw 51 serving to prevent the filler blocks from falling from the opening 57 when the thumb screw 49 is loosened. The filler block permits a longer bearing surface against the electrode to be had. The bearing members 35 and 36 are positioned upon the upper face of the porcelain plate 23 through inset screws 53. Openings 54 and 55 are provided in the porcelain plate to permit the passage of the electrode holders therethrough and allow for vertical and horizontal motion thereof. The electrode holders are actuated through a rod 56 having a pin 57 passing therethrough provided at each end with a roller 58 formed of a suitable insulating material to prevent the electric current carried by the electrode holders from being transmitted to the rod 56. The rollers are provided at their inner edge with flanges 59 which prevent contact between the rod 56 and the electrode holders. The outer edges of the rollers are adapted to engage the rectangular slots 41 and 42 to raise and lower the electrode holders. The rod 56 is square from the pin 57 upward and round from the pin 57 downward, the upper end of the pin being arranged to pass through a square opening 60 in the member 24, the square shape preventing the rod from rotating. The lower end of the rod is slidably supported in a sleeve 61 positioned in the porcelain plate 23. It will thus be seen that with the upward or downward movement of the rod 56 the horizontal portions of the electrode holders will be moved upward or downward whereby the eletrodes will be moved through various degrees of proximity as may be seen from Figs. 3 and 4. If desired the structure may be altered to permit one of the holders to remain stationary and allow the other to be moved toward and away from it in the manner described. While slots 37 in the bearing members serve, to a certain degree, to guide the lateral movement of the electrode holders I have provided plates 62 and 63, which are attached to the upper side of the porcelain plate 23 to more accurately guide the movement of the vertical portions 43 and 44 of the electrode holders, as will be evident from Fig. 7. These guides act to maintain the electrodes in the same vertical plane at all times.

The movement of the electrodes is completely controlled by manipulation of the rod 56. Figs. 5, 6 and 7 show the means employed for operating the rod 56 in the desired manner. A bracket 64 having parallel disposed upstanding ears 65 and 66, is positioned at the center of the porcelain plate 23, one of said ears resting on either side of the rod 56. A lever 67, pivotally supported between said ears by means of trunnion bolts 68 and 69, is bent through a slight angle at the point of support to provide two arms 70 and 71. A rectangular slot 72 is formed in the center of the lever 67 at the point of its pivotal support, in a position to permit the rod 56 to pass therethrough. A clamping finger, designated generally by 73, having an opening 74 therein slightly larger than the rod 56 is positioned within the slot 72 by means of a pin 75 having its ends resting in the lever 67, and a slot 76

in the end of the finger. The opening 74 in said finger is made slightly larger near the top of the finger as at 77 to permit the finger to more readily grasp the rod 56. It will be seen that the pin 75 and slot 76 permits the finger to have a floating action and move horizontally as may be necessary when the rod 56 is grasped at the opening 74. A weight 78 is attached to the outer end of the arm 71 by means of a bolt 79. The opposite end of the lever 67 has a rod 80 attached thereto which is adapted to pass through a slot 81 in the cylinder 18 and has a cord 82 attached thereto. It will be apparent that the rod 80 may be attached to the arm 71 instead of 70 in which case the actuating movement would be upward instead of downward. The angularity of the lever 67 with respect to the rod 56 may be altered by means of an adjusting screw 83 positioned in a sleeve 84 held in the porcelain plate 23.

Resistance elements 85 shown in Fig. 1 are wound upon an insulating block 86 through which the bolts 25 pass, the bolts 25 positioning the block and, with the aid of filling material 87, holding the block in position.

In operating the device the electrodes 31 and 32 are positioned in the electrode holders and the cord 82 drawn downward. The lever 67 is thus brought into the position shown in Fig. 5, with the clamping finger 73 at right angles to the rod 56. The rod 56 is thus liberated and permitted to move freely up and down. It will be seen that at this point the force of gravity causes the supporting arms 33 and 34 to move downward bringing the lower end of the electrodes into contact, the roller 58 permitting this movement to occur freely. When the cord 82 is released the weight 78 causes the arm 71 to move downward and brings about a slight change in the angularity between finger 73 and the rod 56 thereby causing a frictional contact between the two. At the same time the arm 71 is moving upward and the finger 73 together with the rod 56, is carried upward to the position shown in Fig. 6. This movement causes the lower ends of the electrodes to become separated in an amount proportional to the movement of the arm 71, the latter distance being adjustable by rotation of the screw 83. This movement of the electrodes provides a suitable gap therebetween to facilitate the proper operation of the lamp and prevent the same from consuming an excessive amount of power. In this way also the burning time of the lamp may be adjusted, since the electrodes burn away until the distance therebetween becomes so great that the current will no longer flow.

While I have shown no diagram of the lamp wiring the electrical connections thereto will be obvious. A drop cord 88 of conventional design is attached to a suitable source of power, one of the terminals thereof being attached to one of the electrode holders by means of a screw 89. The other terminal 90 thereof is connected to the resistance element 85, the latter in turn being connected by means of an insulated wire 90 to the second electrode support at 91. The lamp is started by merely bringing the electrodes in such proximity as to cause the current to flow, and is stopped by the electrodes burning away until the distance between them becomes too great for the current to flow.

When therefore, the cord 82 is drawn downward and the electrodes 31 and 32 permitted to drop into contact the current immediately begins to flow between the two electrodes. When the cord 82 is released the electrodes are drawn apart a suitable distance to provide the desired burning time.

While the electrodes 31 and 32 will customarily be made of carbon this need not necessarily be so, for it has been found that radiant energy of varying characteristics may be obtained by employing electrodes of other material such for example as, electrodes of zinc or silver. In like manner the screen 14 may be replaced by filters adapted to provide a resulting radiant energy of desired characteristics. No resetting of the electrodes is required. Whenever the cord 82 is drawn downward the electrodes are brought in contact. This will result, irregardless of the length of the electrodes, within the limits of the machine, from the longest electrodes usable until the electrodes have burned down to the holders 45 and 46, when replacement thereof will be required. The machine may also be made at a very low cost and yet permit of maximum operating efficiency. The exterior of the lamp is thoroughly insulated from the electrical conductors contained therein whereby maximum safety consistent with low cost results.

It will further be seen that because of a certain degree of parallelism between the electrodes resulting from the manner of supporting the same I obtain a considerably longer burning time with a single setting than would otherwise be obtainable. A large number of parts such as springs, motors, or the like usually provided for the purpose of actuating the electrodes are eliminated. By drawing down the actuating lever cord 82, the operating mechanism is released and the electrodes are brought into position by the force of gravity. Similarly when the cord 82 is released the electrodes are drawn back to their desired operating position by the action of the force of gravity upon the weight 78.

While I have thus described and illustrated a single embodiment of my invention it will be understood that they have been by way of illustration and I do not wish to limit myself other than as required by the prior art and the appended claims in which—

I claim:

1. A lamp of the character described adapted to be suspended in an overhead position, electrodes positioned with respect to each other as the sides of a V, a lever having a drop member adapted to be pulled, means actuated by said lever by pull on said drop member for permitting said electrodes to gravitate into contact, and means for automatically separating said electrodes to a given arc gap when the pull member is released.

2. In a lamp of the character described, having at least two pivotally supported electrode holders and two electrodes supported therein in converging relation in the form of a V, means for actuating said electrode holders including a vertical movable member connected to said electrode holders, a lever pivotally supported intermediate its ends and bent through an angle at its point of support to provide an inner and an outer leg, said lever being adapted to move between a clamped position with said outer leg horizontal and a released position with said inner leg horizontal, clamping means attached to said lever arranged to clamp and lift said vertically movable member when said lever moves into its clamped position and release said vertically movable member when said lever moves into its released position, means for moving said lever between positions, whereby the distance between said electrodes is varied, and means for varying the amplitude of movement of said lever between the clamped and the released position to regulate the burning time of said lamp.

3. A lamp as described in claim 2 wherein said lever is brought into its released position by manual movement of one end of said lever, and is brought into its clamped position by a weight attached to the other end of said lever.

4. In a lamp of the character described having at least two pivotally supported electrode holders and two electrodes supported therein in converging relation, a vertically movable member connected to said electrode holders having a cylindrical lower portion, means connecting said vertically movable member and said electrode holders for separating the latter with upward movement of said member and bringing them together with downward movement thereof, a lever pivotally supported intermediate its ends, slotted and bent through an angle at its point of support and arranged to move between a clamping and a releasing position, a clamping finger having a cylindrical opening pivotally and slidably supported in said slot, said cylindrical portion passing through said cylindrical opening and being frictionally engaged by the edge of said opening when out of coincidence, a weight attached to one end of said lever to move the same to its clamping position wherein said cylindrical portion and said opening are out of coincidence to grasp and lift said vertically movable member and separate said electrodes, and means for manually grasping the opposite end of said lever to move the same to a released position wherein said cylindrical portion and said cylindrical opening are coincident to release said vertical member and permit the same to fall under the force of gravity and bring said electrodes together.

In witness of the foregoing I affix my signature.

IVAR JEPPSSON.