

Dec. 29, 1936.

W. G. PREDDY

2,065,735

ALTERNATING CURRENT LAMP

Filed March 31, 1933

3 Sheets-Sheet 1

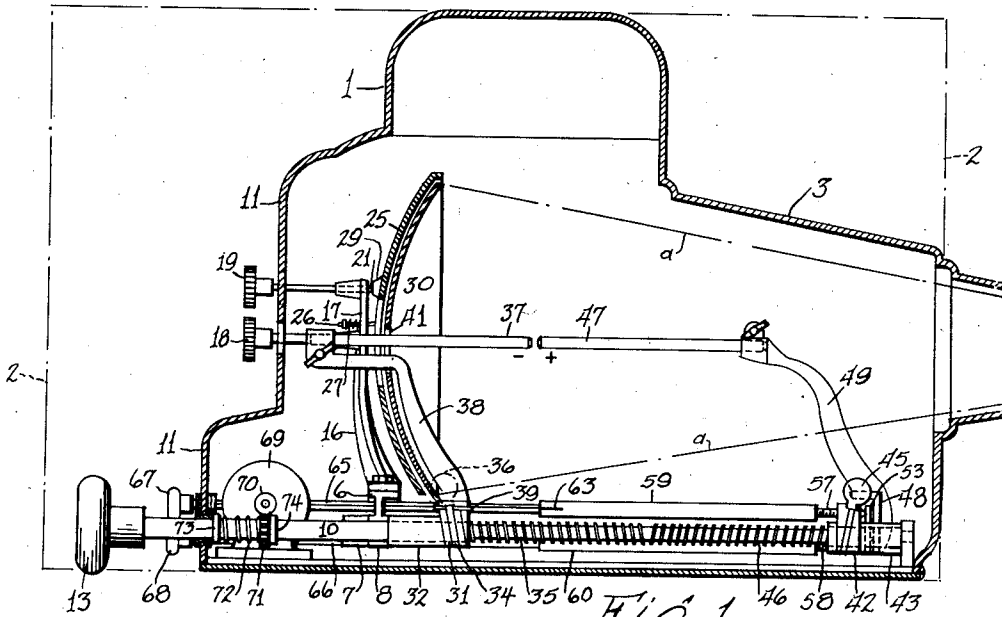


Fig. 1.

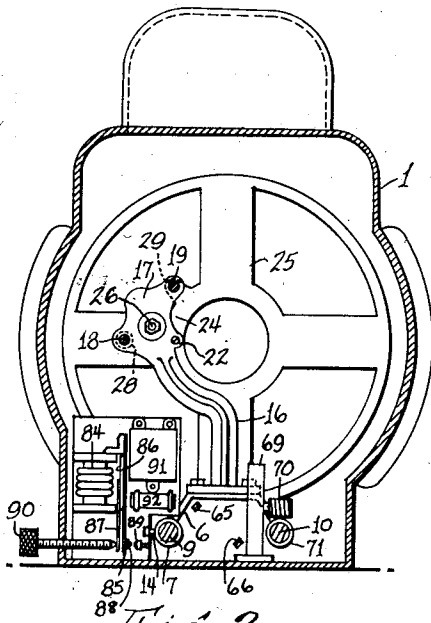


Fig. 2.

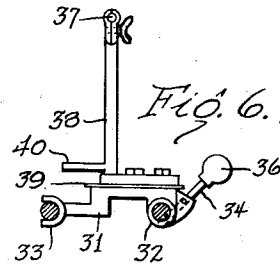


Fig. 6.

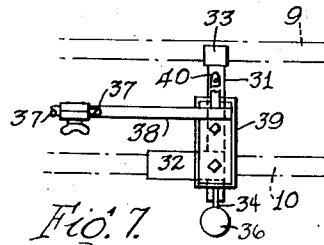


Fig. 7.

INVENTOR.
WALTER G. PREDDY
BY *Mumma & Co.*
ATTORNEYS.

Dec. 29, 1936.

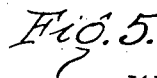
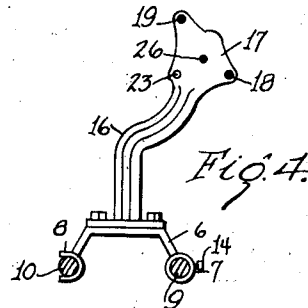
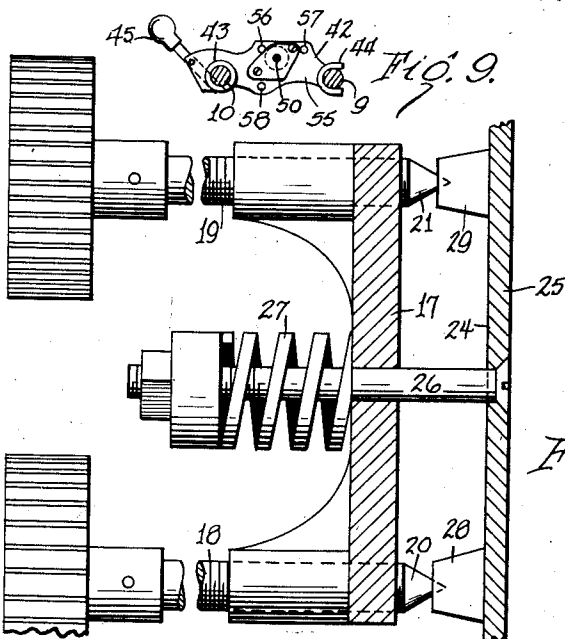
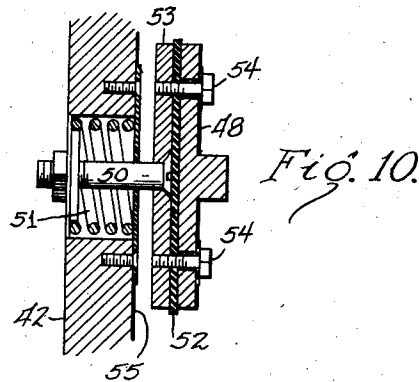
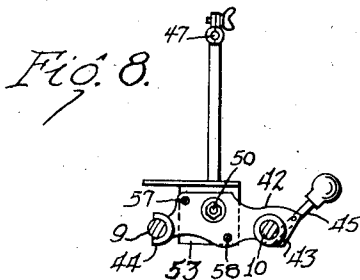
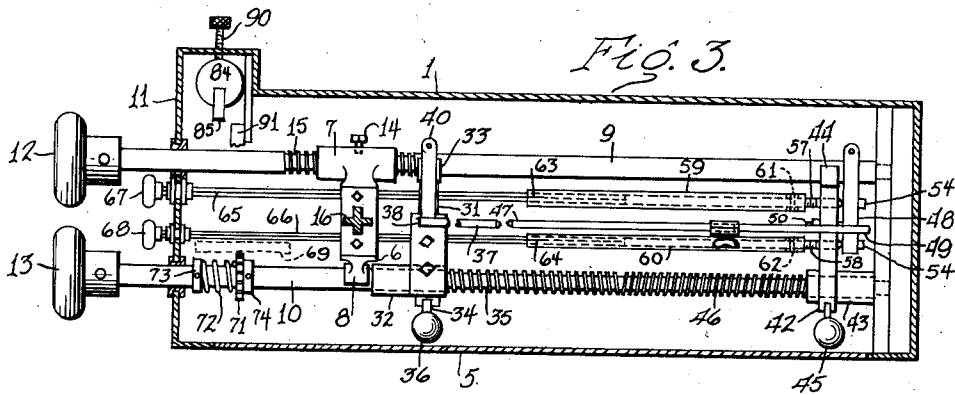
W. G. PREDDEY

2,065,735

ALTERNATING CURRENT LAMP

Filed March 31, 1933

3 Sheets-Sheet 2



INVENTOR.
WALTER G. PREDDEY
BY *Yum Co.*
ATTORNEYS.

Dec. 29, 1936.

W. G. PREDDEY

2,065,735

ALTERNATING CURRENT LAMP

Filed March 31, 1933

3 Sheets-Sheet 3

FIG. 11.

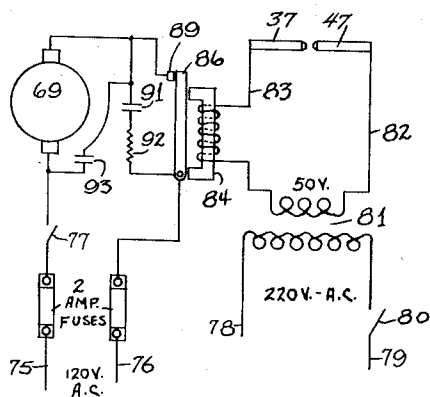
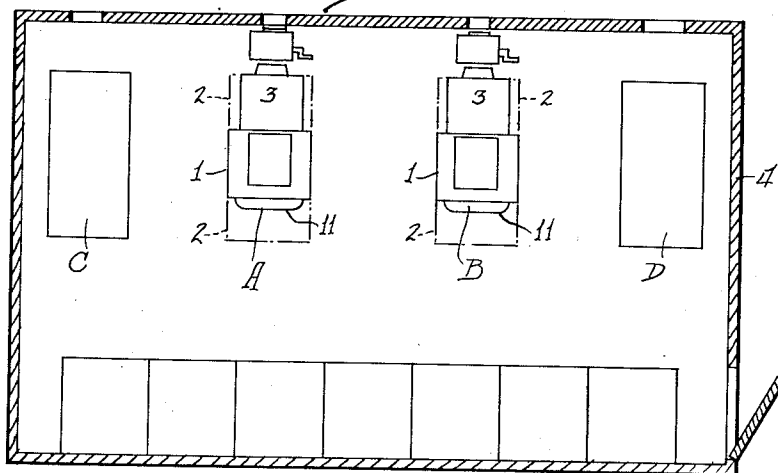


FIG. 12.

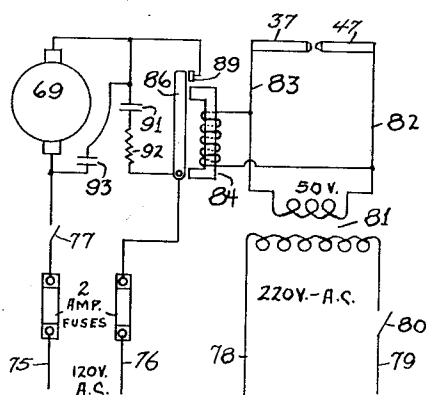


FIG. 13.

INVENTOR.
WALTER G. PREDDEY
BY *Munn & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,065,735

ALTERNATING CURRENT LAMP

Walter G. Preddey, San Francisco, Calif.

Application March 31, 1933, Serial No. 663,865

8 Claims. (Cl. 176—51)

My invention relates to improvements in alternating current lamps, and it consists of the combinations, constructions and arrangements hereinafter described and claimed.

5 An object of my invention is to provide an alternating current lamp in which the top front of the casing is cut away to permit an operator, standing along side of the lamp, to look over the front of the lamp casing and inspect other machines which might be operating at the same time.

A further object of my invention is to provide an alternating current lamp in which the rear carbon holder is placed in front of the reflecting mirror, thus obviating the necessity of placing the holder operating mechanism in back of the mirror. The overall length of the casing can be materially reduced with this arrangement.

15 Still a further object is to provide a front carbon holder with adjusting means, operable from the rear of the casing, for moving the carbon laterally into alignment with the rear carbon. This does away with the necessity of moving the rear carbon laterally and the opening in the mirror can be made smaller, giving a greater reflecting surface.

The mirror in the lamp employs novel means for adjustment in a horizontal and vertical plane. In the conventional reflector lamp, the parts for operating the mirror are complicated, costly to build, and will readily get out of order. A three point suspension is utilized in the present device and is simple and inexpensive to construct, and which when once set, will remain in this position.

5 A further object is the provision of a wiring circuit for the electrical feed of the carbons toward each other in which a relay switch is used and a condenser and a resistance or a reactance placed in series parallel with the switch for quenching the spark between the switch terminals. This will cause the terminals to last as long as the lamp.

Other objects and advantages will appear in the following specification, and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming a part of this application, in which

Figure 1 is a longitudinal section through the device, portions being shown in elevation;

5 Figure 2 is a transverse section through the device, portions being shown in elevation;

Figure 3 is a horizontal section through the device, portions being shown in elevation;

Figure 4 is an elevation of the mirror support;

Figure 5 is an enlarged sectional detail view of the adjustable means for the mirror;

Figure 6 is an elevation of the rear carbon holder;

Figure 7 is a top plan view of Figure 6;

Figure 8 is an elevation of the front carbon holder;

Figure 9 is an elevation of a portion of Figure 8 looking at the holder from the opposite side;

Figure 10 is an enlarged sectional view through the portion of the front carbon holder;

Figure 11 is a schematic view of a moving picture operator's room; and

Figures 12 and 13 are wiring diagrams illustrating how the spark is quenched in the relay contacts.

20 In carrying out my invention it will be best to describe the casing, then the mirror holder, the rear carbon holder, the front carbon holder, and then the wiring diagrams. These various features will be taken up in the order set forth.

Casing

The casing is indicated generally at 1, see Figures 1, 2 and 11. The old type lamp casing is indicated by the broken lines at 2 in Figures 1 and 11. One of the features of the present invention is to provide a casing with a depressed portion indicated generally at 3, so that the operator standing along side of the lamp can look over this portion of the casing and see the adjacent machines so as to check their operation. In order to more clearly explain this feature of the invention I have shown in Figure 11 an operator's room 4 with two motion picture projecting lamps indicated at A and B, and a slide projector at C, and a spot light projector at D. The space in an operator's room is at a premium and the fire hazard is exceedingly high because celluloid film is being used. It is, therefore, necessary that the operator be in line of vision with all of the machines. With the old type lamp it was impossible to see over the projectors and check an adjacent projector. With the casing cut away as at 3, the operator can view the other projectors while standing along side of either one of the motion picture projectors A or B. In this way the device has a distinct advantage over the former type of lamp casing.

The broken lines 2 also indicate the length of the old type of lamp casing. This length was

required because the rear carbon holder had its actuating mechanism disposed in back of the mirror. In the present invention I will show how the rear carbon holder can be actuated from a position in front of the mirror, and this will permit the casing to be shortened at least six inches. More room is provided for the operator in this way. Figure 3 indicates a door 5 which gives access to the interior of the casing 1. The broken lines *a* in Figure 1 show the path taken by the light beams from the mirror and it will be noted that the cut away portion 3 of the casing is positioned a slight distance above the uppermost light beam. In this way none of the effectiveness of the machine is done away with, and at the same time as much vision for the operator as is possible is provided by the cut away portion 3.

Mirror holder

The mirror holder is shown in Figures 1, 2, 4 and 5. It will be noted from Figures 2 and 4 that the holder comprises a carriage 6 having a sleeve 7 and a forked member 8. The sleeve 7 is slidably mounted upon a screw rod 9, see Figure 3, while the fork 8 slides on a second screw rod 10. The rods extend throughout the entire length of the casing 1 and project beyond the rear wall 11 of the casing and are provided with actuating knobs 12 and 13. A set screw 14 is carried by the sleeve 7 and enters a threaded portion 15 in the rod 9. It will be seen that a turning of the knob 12 will advance the carriage 6 in the desired direction.

An upright 16 of the shape shown in Figures 2 and 4 is secured to the carriage 6, and this upright has a face 17 at its upper end. In the enlarged sectional view shown in Figure 5, it will be noted that the face 17 has hand screws 18 and 19, and these screws have pointed ends 20 and 21. The face is also provided with a fixed screw 22, see Figure 2, that has a pointed end 23, see Figure 4, that bears against the rear face 24 of a mirror holder 25. The mirror holder is secured to the face 17 by a bolt 26, see Figure 5, and a spring 27 urges the holder 25 toward the face 17.

It will be noted from Figure 1 that the adjusting screws 18 and 19 extend through the rear face 11 of the casing and the pointed ends 20 and 21 bear against projections 28 and 29 integral with the holder 25. The two hand screws 18 and 19 together with the fixed screw 22 form a triangle, and the securing bolt 26 is disposed within the area of this triangle. Referring to Figure 2 it will be noted that when the screw 18 is manually adjusted the holder 25 will be swung through a horizontal plane. When the screw 19 is adjusted the holder will be swung through a vertical plane. By adjustment of both of the screws the holder 25 can be positioned correctly so as to hold a mirror 30, see Figure 1, in the desired place. The mirror is removably secured to the holder 25 by any means such as clips not shown. It will be seen from the foregoing that the mirror 30 can be adjusted into any desired position by means of the knobs 12 and the adjustable screws 18 and 19.

Rear carbon holder

The rear carbon holder is shown in Figures 1, 3, 6, and 7. Heretofore the holder has been disposed in back of the mirror 30, and the actuating mechanism has also been disposed in back of the mirror. This increases the overall length

of the lamp casing to at least six inches beyond the length of the present casing. It will be seen that the rear carbon holder has a carriage 31 with a sleeve 32 and a forked portion 33. Figure 3 shows how the sleeve 32 is slidable on the rod 10, while the fork 33 slides on the rod 9. A pivoted finger 34 is carried by the carriage 31, and its lower end engages with threads 35 on the rod 10, so that a rotation of the rod will move the carriage. The finger 34 has a handle 36, and this may be swung for disengaging the finger from the threads, permitting quick movement of the carriage when it is desired to adjust, focus or trim the end of the carbon stick 37, see Figure 1.

The upright 38 is secured to the carriage 31 and is insulated therefrom by an insulating piece 39. A binding post 40 is integral with the upright 38, and is designed to receive a wire, not shown. The upright 38 takes the shape shown in Figure 1, and normally extends through an opening 41 in the mirror 30. A turning of the knob 13 will actuate the screw rod 10 for advancing or retracting the carriage 31 in accordance with the wishes of the operator. The electrical mechanism for actuating the rod will be described later.

Front carbon holder

The front carbon holder is shown in Figures 1, 3, 8, 9, and 10. This holder comprises a carriage 42 of the shape shown in Figures 8 and 9, and the carriage has a sleeve portion 43 and a forked portion 44. Referring to Figure 3 it will be noted that the sleeve portion 43 is mounted on the rod 10, while the forked portion 44 slides on the rod 9. The carriage also carries a finger 45 which is similar to the finger 34, which is designed to be received in a threaded portion 46 of the rod 10. The threads 35 extend in an opposite direction to the threads 46 so that a rotation of the rod 10 will cause the carriages 31 and 42 to advance toward each other or move away from each other at the same speed. The finger 45 may be freed from the threads 46 when the operator wishes to quickly adjust the carriage 42 for the purpose of adjusting, focusing or trimming the end of the carbon 47, see Figure 1.

Adjusting means for the front carbon holder

It is necessary to adjust one of the carbons with respect to the other in order to perfectly align the adjacent ends, and thus produce a proper arc. Heretofore the adjustment of the carbon has been accomplished in the rear carbon holder. This necessitated a large central opening 41 in the mirror in order to permit lateral movement of the carbon in the opening. It is obvious that a large opening in the mirror will reduce the effective reflecting surface of the mirror. In order to overcome this I have provided the adjustment on the front carbon holder, and this permits a relatively small opening in the mirror to be provided. In the present invention the rear carbon holder is not adjusted laterally.

The adjustment of the front carbon holder is performed on the same principle as the adjustment of the mirror holder. The carriage 42 of the front carbon holder is secured to the base 48 of an upright 49 by a bolt 50, and the base 48 is urged toward the carriage 42 by means of a spring 51. The base 48 is insulated from the carriage 42 by an insulating strip 52. The bolt 50 is connected to the base 48 through the

medium of a block 53, and the block in turn is secured to the base 48 by cap screws 54, or other suitable fastening means.

The block 53 contacts with the carriage 42 at three points which are arranged in the form of a triangle. The face 55 of the carriage 42 shown in Figure 9 is the one that is disposed opposite the block 53. It will be noted from Figure 9 that the face 55 has a pointed projection 56 that is designed to contact with the block 53. The carriage 42 also carries pointed screws 57 and 58, and the pointed ends of these screws contact with the block 53. The screws are clearly shown in Figure 3, and it will be noted that they are connected to sleeves 59 and 60 by pins 61 and 62, and the arrangement is such that a universal connection is provided between the sleeves and the screws. The sleeves have non-circular ends 63 and 64, and these slidably receive non-circular rods 65 and 66 respectively. The rods extend through the rear wall 11, and are provided with actuating knobs 67 and 68.

Referring to Figure 9 it will be noted that when the screw 57 is actuated the base 48 will be swung through a horizontal plane, whereas an adjustment of the screw 58 will cause the base to be swung through a vertical plane. Movement of the base in these two directions will move the upright 49, and this will cause the carbon 47 to be moved with respect to the carbon 37. When the carriage 42 is moved longitudinally in the casing by means of the knob 13, the rods 65 and 66 will telescope within the sleeves 59 and 60. In this way the carbon 47 can be moved longitudinally, or laterally, into the desired position.

Motor actuating mechanism for the carbons

In an alternating current lamp both carbons 37 and 47 will be consumed at the same rate and therefore the holders must be simultaneously fed toward each other in direct ratio and at the same speed as the carbons are consumed. To effect this electrically I provide a motor 69, see Figures 1 and 2. This motor actuates a worm 70, and the worm in turn actuates a worm gear 71, which is loosely mounted upon the rod 10. A spring 72 has one end bearing against a collar 73 secured to the rod 10, and has its other end bearing against the worm gear 71. A second collar 74 is secured to the rod 10. It will be seen from this construction that the actuation of the motor 69 will drive the worm gear 71, and the worm gear will be frictionally held against the collar 74 by the spring 72, so that the worm gear will rotate the collar 74, and this in turn will rotate the rod 10. The rotation is in a direction to cause the carriages 31 and 42 to move toward each other. The carriages may be manually moved by actuating the knob 13 irrespective of the motor actuating means. When the knob 13 is turned the collar 74 merely slides with respect to the worm gear 71.

Wiring diagrams

I provide two wiring circuits to automatically start the electric motor to feed the carbons toward each other in order to maintain the distance between the adjacent ends of the carbon constant. The circuit is so arranged that any likelihood of a spark jumping between the contacts of a relay used in the circuit will be quenched. In this way the contact points will last indefinitely. In Figure 12 I show an alternating source of current at 120 volts entering the

wires 75 and 76. A switch 77 controls the flow of the alternating current to the motor 69. It will be noted that I also provide an alternating current of 220 volts entering the lines 78 and 79, and controlled by a switch 80. A transformer 81 is placed in the 220 volt lines and steps down the voltage to approximately 50 volts. Wires 82 and 83 lead from the secondary of the transformer 81 and are connected to the carbons 37 and 47. The wire 83 is wrapped around a relay 84 so that the relay will be in series with the secondary winding of the transformer.

It is best now to describe the particular type of relay switch used, and this is shown in Figure 2. A leaf spring 85 has one end secured to the relay 84, and carries a member 86, and this member in turn carries a second spring 87. The member 86 spaces the members 85 and 87 from each other. The spring 85 has a contact 88 which is designed to engage with a fixed adjustable contact 89. A screw 90 limits the swinging of the switch by contacting the spring 87. The alternating current causes the switch arm to vibrate and the noise of this arm is eliminated by the leaf springs 85 and 87, which gently engage with the contact 89 and the screw 90.

Again referring to Figure 12 I have shown the switch arm 86 without indicating the leaf springs. The arm 86 engages with the contact 89. The relay switch arm 86 and the contact 89 are in series with the 120 volt alternating current.

The novel means for quenching a spark that might jump across the switch arm to the contact comprises a condenser 91 consisting of a one-half microfarad, and a resistance or reactance of 750 ohms, shown at 92. I have found that the condenser and the resistance when placed in series parallel with the switch arm 86 and the wire leading to the contact 89 will quench any spark that is likely to jump across the two points. In addition I have shown a second condenser 93 consisting of a one-half microfarad in parallel with the motor 69, and this arrangement prevents any electro-motive force being built up by the rotating motor after the current is shut off.

When lighting the carbons the switches 77 and 80 are closed and then the carbons 37 and 47 will be brought into contact with each other by actuating the knob 13, and then are immediately moved away from each other a slight distance by rotating the knob in an opposite direction. A potential of 30 volts will be built up between the adjacent ends of the carbons 37 and 47, and this will be sufficient to keep an arc jumping between the carbons. As the carbon material is consumed the current will fall because of the greater distance between the carbons, and this falling of the current will act upon the relay to free the switch arm 86 and to permit it to engage with the contact 89, thus closing the motor circuit. The motor will be actuated and will feed the two carbons toward each other until the current between the adjacent points of the carbons will be raised. This will then cause the current to rise in the relay and to attract the switch arm 86 and again open the motor circuit. This process is repeated automatically and the carbons 37 and 47 are fed toward each other as required. As already stated the quenching of the spark across the relay switch is accomplished by the condenser 91 and the resistance 92.

In Figure 13 I show a similar wiring diagram except that the relay is in parallel with the wires 82 and 83 leading to the carbons 37 and 47. In this form of the device the voltage is built up

instead of the current. However, the remainder of the wiring diagram is identical, and therefore like reference numerals will be applied. It will be noted in this instance that the burning of the carbons will cause the voltage to build up, and to attract the relay switch arm 86, and to close the contact 89 which is disposed on the opposite side of the switch arm, from that shown in Figure 12. The quenching of the spark is accomplished in this wiring diagram by the condenser 91 and the resistance 92.

By means of using a one-half microfarad condenser 91 in series with a resistance or reactance 92, and by varying the amount of resistance or reactance introduced into this circuit, the condenser 91 will absorb considerable of the current, greatly minimizing the sparking and burning of the contacts 88 and 89, thereby greatly lengthening the life of same. The other condenser 93 is placed directly across the motor terminals, absorbing any field or winding discharge current which further reduces sparking across the contacts, and by employing two condensers as specified, the sparking and burning of the contacts is reduced about 90% or better, enabling the contacts to be used practically for the life of the entire lamp.

I claim:

1. In a motion picture lamp, a casing, a mirror having a central opening, a rear carbon, a rear carbon holder having a portion projecting through the opening, a front carbon, a holder for the front carbon, means for adjusting the holder for moving the front carbon laterally in a horizontal and a vertical plane for aligning the carbon with the rear carbon, said means including actuating knobs that project clear of the casing.

2. In a motion picture lamp, a casing, a mirror having a central opening, a rear carbon, a rear carbon holder having a portion projecting through the opening, a front carbon, a holder for the front carbon, means for adjusting the holder for moving the front carbon laterally in a horizontal and a vertical plane for aligning the carbon with the rear carbon, said means including actuating knobs that project clear of the casing, and means for moving the holder longitudinally in the casing, said last named means having a knob extending clear of the casing.

3. A motion picture lamp comprising a casing, a mirror disposed adjacent to the rear wall of the casing and having a central opening therein, a rear carbon holder having a portion designed to pass through the mirror opening, an actuating screw extending throughout the length of the casing and being operatively connected to the holder at a point in front of the mirror, a front carbon holder operatively connected to the same screw, the screw when rotated in one direction moving the holders toward each other and vice versa, when rotated in the opposite direction, a mirror holder, a second screw for moving the mirror holder, said screws having actuating knobs extending beyond the rear casing wall, and means for angularly adjusting the front holder for aligning the carbon carried thereby with the carbon carried by the rear holder, said holder adjusting means including actuating knobs projecting beyond the rear casing wall.

4. A motion picture lamp comprising a casing,

a mirror disposed adjacent to the rear wall of the casing and having a central opening therein, a rear carbon holder having a portion designed to pass through the mirror opening, an actuating screw extending throughout the length of the casing and being operatively connected to the holder at a point in front of the mirror, a front carbon holder operatively connected to the same screw, the screw when rotated in one direction moving the holders toward each other and vice versa, when rotated in the opposite direction, a mirror holder, a second screw for moving the mirror holder, said screws having actuating knobs extending beyond the rear casing wall, and means for angularly adjusting the front holder for aligning the carbon carried thereby with the carbon carried by the rear holder, said holder adjusting means including actuating knobs projecting beyond the rear casing wall, and means for angularly adjusting the mirror holder, said mirror holder adjusting means including actuating knobs projecting beyond the rear casing wall.

5. A motion picture lamp comprising a casing, a mirror disposed in the casing and having a small central opening, an electrode carrying member mounted in front of the mirror and having an end projectible through the opening, an electrode carried by the member and also being receivable in the opening, a second electrode carrying member disposed in front of the first electrode, an electrode carried by the second member, a screw for supporting and moving the members, the screw when actuated simultaneously moving the members toward or away from each other, and means for angularly adjusting the second member for bringing the end of the second electrode into registration with the end of the first electrode, whereby the mirror opening can be made smaller than where the first member instead of the second member is the one that is angularly adjusted.

6. In a motion picture lamp, a casing, a mirror having a central opening, a rear carbon, a rear carbon holder having a portion projecting through the opening, a front carbon, a holder for the front carbon, and means for adjusting the holder for moving the front carbon laterally in a horizontal and vertical plane for aligning the carbon with the rear carbon.

7. In a motion picture lamp, a casing, a mirror having a central opening, a rear carbon, a rear carbon holder having a portion projecting through the opening, a front carbon, a holder for the front carbon, means for adjusting the holder for moving the front carbon laterally in a horizontal and vertical plane for aligning the carbon with the rear carbon, and means for moving the holder longitudinally in the casing.

8. In a motion picture lamp, a casing, a mirror mounted in the casing and having a central opening therein, a rear carbon holder having a portion designed to pass through the mirror opening, a rear carbon carried by the holder and also extending through the mirror opening, a screw operatively connected to the holder at a point in front of the mirror, said screw being disposed beyond the rim of the mirror, and means disposed exteriorly of the casing for operating the screw.

WALTER G. PREDDY.