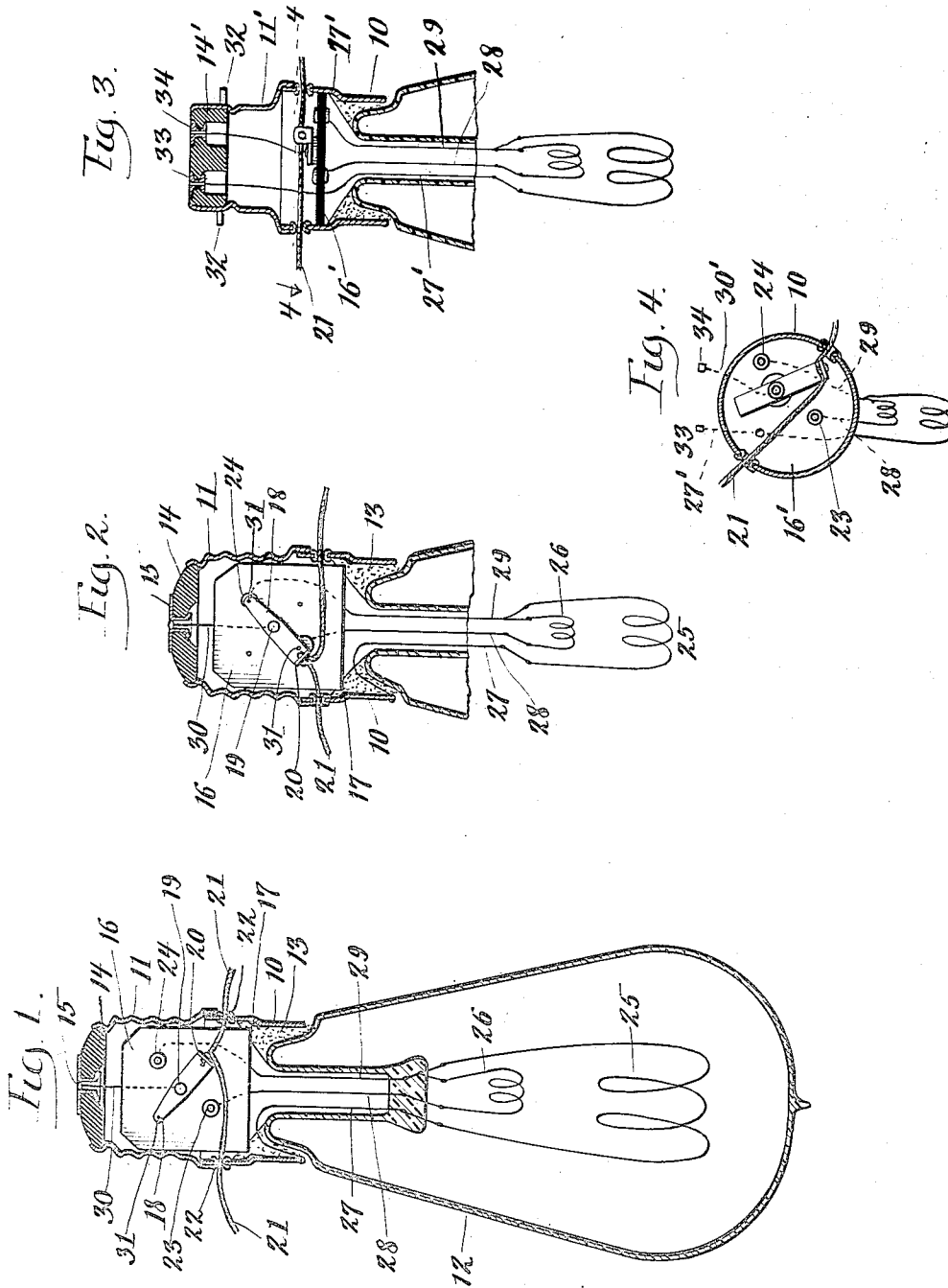


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ELECTRIC INCANDESCENT LAMP.

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TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC INCANDESCENT LAMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES W. PHELPS, a citizen of the United States, and a resident of Detroit, county of Wayne, and State of Michigan, have invented certain new and useful Improvements in Electric Incandescent Lamps, of which the following is declared to be a full, clear, and exact description.

The invention relates more particularly to electric incandescent lamps having two or more incandescing filaments or filament sections arranged to emit light of different intensity, and the improvement seeks to provide a simple and effective form of such a lamp which requires no special form of lamp-holder, but may be employed for those already in use and having a simple and easily operated switch mechanism.

In the drawings, Figure 1 is a longitudinal section of the improved lamp with the switch shown at the extreme end of its shift in one direction. Fig. 2 is a similar view with the switch shown at the extreme end of its shift in the opposite direction. Fig. 3 is a longitudinal section of the upper part of the lamp illustrating a modification. Fig. 4 is a cross section on line 4-4 of Fig. 3 with the filaments and terminals diagrammatically illustrated.

The base of the lamp may be designed for use in connection with any of the well-known lamp-holders. In the form shown in Fig. 1 the lamp base is adapted for the Edison type of holder while the form illustrated in Fig. 3 is arranged for the Ediswan lamp-holder. The base or cap preferably comprises separate cylindrical metal sections 10 and 11 fitted one within the other and secured together in any suitable manner. The glass globe of vacuum bulb 12 is secured within the outer end of the base 10 by a suitable composition filling 13, while the upper base section 11, shown in Figs. 1 and 2, is screw-threaded to engage the corresponding threads of the Edison lamp-holder and forms one of the lamp-terminals for the reception of current from the lamp-holder. A porcelain disk 14 is secured within the outer end of the base section 11 and carries a central terminal 15 for the reception of current from the central terminal of the lamp-holder.

The switch mechanism is preferably

mounted within the base of the lamp and for this purpose, a thin insulating plate or support 16 is arranged within the base of the lamp. In the form shown in Fig. 1, the insulating mount is arranged in vertical position and rests upon a ledge 17 in the lower base section 10, and is held securely in place by the composition filling 13 which surrounds its lower edge. A switch-arm 18 is pivoted between its ends to the insulating mount 16 by a rivet 19. This switch-arm is conveniently formed of a flat piece of sheet brass or copper and is provided with an up-turned end 20 to which the flexible operating cords 21 are connected.

The flexible operating cords extend in opposite directions through guide ferrules 22 fixed within diametrically opposed openings in the upper portion of the base section 10. These openings are located as shown, below the pivot point 19 of the switch and opposite the lower arm of the switch to which the operating cords are attached, so that by pulling on the cords the switch may be shifted to one or the other extreme positions shown in Figs. 1 and 2. The flexible cords 21 hang down from the lamp within convenient reach.

Contacts, preferably in the form of flat plates 23 and 24, are secured to the face of the insulating support 16 on opposite sides of the pivot of the switch and are adapted to be engaged by the lower and upper arms respectively of the switch 18. These contacts are so disposed with reference to the switch that, as the latter is shifted from the position shown in Fig. 1 to that shown in Fig. 2, it will first engage the contact 23 and subsequently the contact 24. They are however, also so disposed that when the switch engages the contact 24 it will still be in engagement with contact 23. That is to say, the relation of the parts is such that the switch 18 will only make and break engagement with the contact 24 while it is in engagement with the contact 23.

The lamp is provided with two incandescing filaments or filament sections 25 and 26 which are preferably of different candle power and arranged as shown, one above the other in the vacuum bulb 12. The filaments or filament sections are connected as shown, in series. The end of the high power filament 25 is connected by the leading-in wire

27 with the metal shells 10 and 11, which form one of the lamp terminals for the reception of current from the lamp holder. One end of the low power filament 26 is connected by leading-in wire 28 with the contact 23. The joined ends of the filaments are connected by the leading-in wire 29 with the contact 24. The switch 18 is connected by the conductor 30 with the lamp terminal 15. The arrangement and connections of the filaments may be varied, but that above described is the preferred arrangement.

The lamp is designed for use with electric lighting current of constant or fairly constant potential and filament 26, of low candle power, has a higher resistance per unit of length than the filament 25 so that when the current is passed through both filaments in series the low power filament 26 will alone glow with small candle power, while the high power filament 25 acts as a relatively dark resistance and thereby considerably cuts down the amount of current used. When the low power filament 26 is short-circuited by the switch, the high power filament 25 will glow with full candle power.

It will be seen that, in position shown in Fig. 1, the current to the filaments of the lamp is entirely interrupted and the lamp will remain dark. As the switch is shifted in one direction to the position shown in Fig. 2, it will successively engage the contacts 23 and 24. As soon as it engages the contact 23 the current will pass from lamp terminal 15 by leading-in wire 30, to switch 18 by contact 23 and leading-in wire 28, through the filaments 26 and 25 in series by the leading-in wire 27 to the other lamp terminal. The low power filament will then glow with small candle power as above described. Upon further movement of the switch in the same direction, it will engage the contact 24 and the current will pass through the high power filament alone from terminal 15, by leading-in wire 30, contact 24 and switch 18, leading-in wire 29 through the high power filament 25 alone and back to the other lamp terminal by the leading-in wire 27. In this position the low power filament 26 is shunted or short-circuited since the switch bridges the gap between the contacts 23 and 24. As the switch makes and breaks engagement with the contact 23, the amount of current flowing through the lamp filaments is very small, since cut down by the resistance of both filaments arranged in series, so that there will be little or no spark when the switch makes and breaks engagement with the contact 23. By arranging the parts so that the switch will only make and break engagement with the contact 24 while it is still in engagement with the contact 23, there can be no spark

when the switch makes and breaks with the contact 24, since this operation merely serves to close and open a short-circuit around the low power filament. In this way, the simple noiseless form of switch shown can be safely employed. Preferably, the switch is provided at its opposite ends with punch marks 31 to form raised portions upon the face of the switch which engages the flat contacts 23 and 24, so that good contact may be made therewith.

The form of lamp shown in Figs. 3 and 4 is adapted for use in connection with the Edison sockets or lamp-holders. For this purpose the base section 11' is provided with oppositely extending projections 32 adapted to engage with the bayonet slots of the Edison lamp-holder and the porcelain disk 14' at the end of the base, is provided with two terminals 33 and 34 for engagement with the corresponding terminals of that type of lamp-holder. The insulating support for the switch is in the form of a disk 16' of fiber or other suitable material and rests, as indicated, in horizontal position upon a ledge 17' in the lower base section 10. The arrangement of the switch 18, contacts 23 and 24 and filaments 25 and 26, is similar to that shown in Figs. 1 and 2. The switch 18 is connected by leading-in wire 30' with the lamp-terminal 34, and leading-in wire 27', extending through an opening in the disk 16' connects the end of the high power filament 25 with the other lamp terminal 33. The end of the low power filament 26 and the joined ends of the filaments are respectively connected by the leading-in wires 28 and 29 with the contacts 23 and 24, as in the form shown in Fig. 1. It will be noted that the switch 18 is pivoted on the disk 16' to one side of the center and to one side of the diametrical line between the openings through which the operating cords 21 pass, so that the switch may be shifted by the cords to and from the position shown in Fig. 4. As the switch is shifted from such position, it will first engage with the contact 23 and then with contact 24, so that the lamp will first glow with small candle power and then with full candle power. On the return movement of the switch the lamp will first be turned down and then out. As in the form previously described, the contacts 23 and 24 are so arranged that the switch 18 will only make and break engagement with the contact 24 (which is connected with the joined ends of the filaments) while it is in engagement with the contact 23 so that no sparking will occur at this point.

It is obvious that the power and arrangement of the filaments and their connections may be varied as desired and that the lamp base may be adapted for any suitable form of lamp-holder.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In constant potential electric lighting, the combination with an electric incandescent lamp having two incandescing filaments connected in series, the resistance of which being so proportioned that one glows and the other acts as a relatively dark resistance when the current flows through them in series, of a switch therefor, separate contacts arranged to be successively engaged by said switch, one connected to the end of one of said filaments and the other to the joined ends of said filaments, said switch and switch contacts being relatively so arranged that said switch member will make and break engagement with said second contact only when in engagement with the other of said contacts.

2. An electric incandescent lamp having two filaments in series, a base for said lamp provided with means for detachably engaging a lamp holder and with terminals for the reception of current therefrom and a switch carried by said base comprising a movable switch member connected to one of said terminals and a pair of contacts connected respectively to the end of one of said filaments and to the joined ends of said filaments, said switch member and switch contacts being relatively so arranged that said switch member will make and break engagement with said second contact only when in engagement with the other of said contacts.

3. An electric incandescent lamp having a plurality of filaments, a base secured thereto and provided with means for detachably engaging a lamp-holder, an insulating support within said base, a switch arm pivoted to said insulating support and connected to one of the lamp-terminals, separate contacts on said insulating support arranged to be successively engaged by said switch arm and connected respectively to the end of one of said filaments and to the joined ends of said filaments, said switch and switch contacts being relatively so arranged that said switch member will make and break engagement with said second contact only while in engagement with the other of said contacts and flexible operating cords connected to said switch and extending through guide openings in the sides of said base.

4. An electric incandescent lamp having a base provided with means for detachably engaging a lamp-holder, an insulating plate within said base, a switch-arm pivoted between its ends to said insulating plate, separate contacts on opposite sides of said pivot arranged to be suitably engaged by said switch, operating cords connected to said switch-arm and guide openings for said cords on the sides of said base arranged out of line with said pivot.

5. An electric lamp comprising a bulb having a hollow stem, a base at the neck of the bulb, an insulated post carried by the base and conducting the current from the socket carrying the bulb, a series of insulated leading-in wires extending from the base through the stem, lighting filaments having each one end in electric circuit with a corresponding leading-in wire, and their opposite ends coupled to a common wire in electric connection with the base, and a swinging arm or switch mounted about the post and adapted to successively engage the terminals of the leading-in wires.

6. In an electric incandescent lamp having two filaments, a base secured to said lamp having means for detachably engaging a suitable lamp holder and having terminals for the reception of current therefrom, said base being formed of separate cylindrical metal shells one fitting within the other and permanently secured together, an insulating support within said base, a switch arm and contacts all mounted on said support, connections leading from the lamp terminals to said filaments and to said switch arm and contacts whereby the movement of said arm will control and modify the flow of current through said filaments and flexible operating cords connected to said switch arm and extending through guide openings in the wall of said base, substantially as described.

7. An electric incandescent lamp having a base provided with means for detachably engaging a suitable lamp holder and terminals for the reception of current therefrom, an insulating support within said base, a switch arm pivoted to said insulating support, separate contacts also mounted on said common support arranged to be successively engaged by said switch arm and flexible operating cords connected thereto and extending outside of said base.

8. An electric incandescent lamp having a base provided with means for detachably engaging a suitable lamp holder and terminals for the reception of current therefrom, said base being formed of separate sections permanently secured together, an insulating support within said base, a movable switch member and contacts all mounted on said support, and flexible operating cords connected to said switch member and extending through guide openings in the wall of said base, substantially as described.

9. An electric incandescent lamp comprising a bulb having a hollow stem, a base at the neck of the bulb comprising inner and outer cylindrical metal shells secured together and constituting one of the lamp terminals, said inner shell being united to the neck of the bulb and said outer shell having screw threads for engaging the lamp holder, an insulating disk at the end of said

outer shell and a central lamp terminal on said insulating disk, two filaments within said bulb, a switch interposed between and electrically connected to said filaments and said lamp terminals and comprising a pivoted switch arm and a pair of contacts arranged to be successively engaged by said switch-arm, said switch-arm and contacts being arranged within said base upon a common insulating support, and flexible operating cords connected to said switch-arm and extending through openings in the inner portion of said base, substantially as described.

10. In constant potential electric lighting, the combination with a suitable lamp holder, of an electric incandescent lamp having two filaments connected in series, the resistance of which is so proportioned that one glows and the other acts as a relatively dark resistance when the current flows through the filaments in series, a base for said lamp having means for detachably engaging the lamp holder and terminals for the reception of current therefrom, the free end of one of said filaments being connected to one of said lamp terminals, a switch member mounted on the lamp base and connected by the other lamp terminal and a pair of contacts mounted on the lamp base and connected respectively to the free end of the other filament and to the joined ends of said filaments, said switch member being arranged to successively engage said contacts as it is shifted in one direction, substantially as described.

11. A base for electric incandescent lamps comprising means for detachably engaging a lamp holder, an insulating plate within said base, a switch-arm pivoted between its ends on said insulating plate, separate contacts on opposite sides of said pivot arranged to be suitably engaged by said switch, operat-

ing members connected to said switch-arm, and guide openings for said members on the sides of said base arranged out of line with said pivot.

12. A base for electric incandescent lamps comprising means for detachably engaging a suitable lamp holder and terminals for the reception of current therefrom, an insulating support within said base, a switch-arm pivoted on said insulating support, separate contacts also mounted on said common support arranged to be successively engaged by said switch-arm, and operating members connected to said switch-arm and extending outside of said base.

13. A base for electric incandescent lamps comprising means for detachably engaging a suitable lamp holder and terminals for the reception of current therefrom, said base being formed of separate connections permanently secured together, an insulating support within said base, a movable switch member and contacts all mounted on said support, and operating members connected to said switch member and extending inside of said base.

14. A base for electric incandescent lamps carrying terminals and comprising therein an insulating support, a movable conducting switch member connected to one of said terminals and mounted on said support, separate contacts also mounted on said support and arranged to be successively engaged by said switch member, the aforesaid parts being relatively so arranged that said switch member will make and break engagement with a certain one of said contacts only while in engagement with the other of said contacts.

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