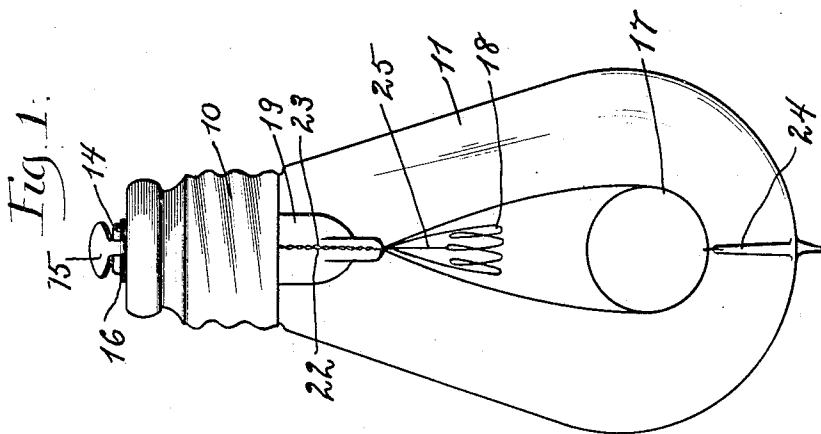
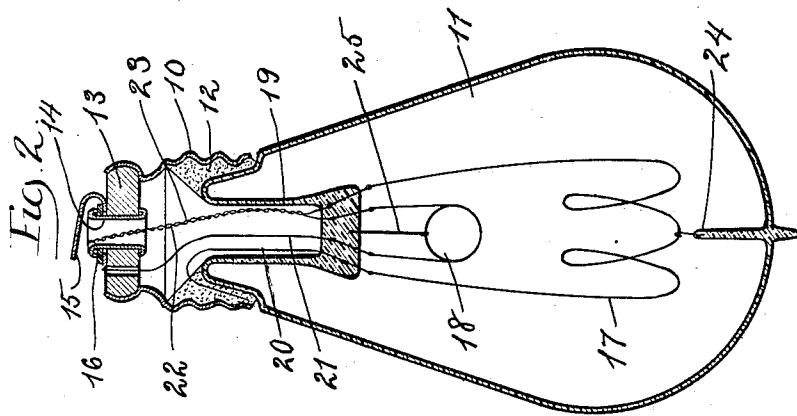


No. 819,793.

PATENTED MAY 8, 1906.

W. J. PHELPS.
ELECTRIC INCANDESCENT LAMP.
APPLICATION FILED JUNE 1, 1903.



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ELECTRIC INCANDESCENT LAMP.

No. 819,793.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed June 1, 1903. Serial No. 159,547.

To all whom it may concern:

Be it known that I, WILLIAM J. PHELPS, a citizen of the United States, and a resident of the city 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 to electric incandescent lamps having two filaments mounted within a single vacuum-bulb and designed to emit light of varying intensity—such, for example, as described in prior Letters Patent of the United States No. 603,705, issued to me May 10, 1898.

The present improvement relates particularly to lamps of this type designed for use in connection with an electrical supply of high voltage and seeks to provide an effective arrangement of the separate filaments within the vacuum-bulb which will prevent short-circuiting between them and which will allow the employment of long filaments of high efficiency, but will prevent them from excessive vibration and from drooping.

The invention consists in the features of construction and arrangement of parts set forth in the following description, illustrated in the accompanying drawings, and more particularly pointed out in the appended claim.

In the drawings, Figure 1 is an elevation of the improved form of lamp. Fig. 2 is a vertical section of the same.

The base of the lamp may be of any well-known or desired type and adapted to be used with any suitable form of lamp-holder.

To illustrate the present improvement, the Edison type of lamp-base is shown, which comprises a screw-shell 10, forming one of the lamp-terminals for the reception of current and supporting within its outer end the glass vacuum-bulb 11, the latter being held in place by a suitable composition filling 12. A disk 13, of porcelain or other similar material, mounted within the inner end of screw-shell 10, carries a central contact in the form of a tubular rivet 14, which passes through a central opening in the disk and is flanged at either end to hold it securely in place. A bent spring-metal piece 15 is clamped to the face of the disk 13 by the upper flanged end of the tubular rivet 14, but is insulated from the latter by a suitable washer 16. The metal piece 15 forms the second terminal of the lamp and

engages the central terminal of the lamp-holder for the reception of current therefrom. As shown, the upper end of the lamp-terminal 15 extends above and normally out of engagement with the contact 14, but may be depressed into engagement with such contact by any suitable means, as, for example, when the lamp is screwed into and out of its holder or by means within the lamp-holder itself.

Preferably two filaments 17 and 18 of different candle-power are employed within the vacuum-bulb 11. The filaments are carried on the stem or mount 19 in the neck of the vacuum-bulb 11. The high-power filament 17 is connected by leading-in wire 20 with the lamp-terminal 10. The low-power filament 18 is connected by the leading-in wire 21 with the lamp-terminal 15. The joined ends of the filaments are connected, as shown, to the contact 14, and this connection is preferably formed of two leading-in wires 22 and 23, twisted together and connected, respectively, to the filaments 17 and 18.

The lamp is designed for use with an electric lighting-current of constant or fairly constant potential, and preferably the long or high-power filament 17 is of lower resistance per unit of length than the short low-power filament 18. If the current flows from lamp-terminal 15 to lamp-terminal 10 through both filaments in series, low-power filament alone will glow with small candle-power, while the high-power filament 17 acts as a relatively dark and dead resistance, cutting down the amount of current used; but when spring-terminal 15 is depressed into engagement with the contact 14 the low-power filament 18 is short-circuited, and the current will flow through the high-power filament 17 alone, which will glow with full candle-power.

The parts thus far described may be widely varied without departure from the essentials of the present invention. The lamp base and terminals may be adapted to any suitable lamp-holder and the modification of the flow of current to the separate filaments may be effected in any suitable manner. The electrical connections and arrangements of the filaments may also be varied. Filaments of the same candle-power per unit of length—for example, two of medium candle-power—may be used. Also by connecting leading-in wire 20 to the contact 14 and wires 22 and 23 to the lamp-terminal 10 two fila-

ments may be burned, one singly or both in parallel. The preferred arrangement, however, is as previously described.

In the ordinary single-filament lamp an efficient length of thin filament is usually provided by employing a filament with a single coil and connecting the coil by an anchor with the stem or mount of the lamp to prevent drooping; but with the two filaments in the same bulb an anchor connected to the long filament 17 would interfere with the short filament 18 and would be likely to effect a short circuit. To obtain the desired length of filament in the present construction, each of them comprises a central coiled portion and leg portions, the length of such leg portions being such that the central coiled portion of the low-power filament 18 is supported above the central coiled portion of the high-power filament 17 within the elongated or pear-shaped bulb 11. The helical coil of the high-power filament 17 preferably comprises, as shown, two complete turns, while that of the low-power filament 18 may comprise three, four, or more complete turns. This arrangement effectively provides for long filaments of high efficiency, and the helically-coiled central portions tend to prevent drooping. The present lamp is designed for use in connection with a high-voltage current—for example, as high as two hundred and twenty volts—and to be efficient the filaments must be of considerable length. To prevent too great vibration and drooping of these long filaments, a tip-anchor 24 is connected to the central coiled portion of the high-power filament 17. This tip-anchor may be of nickel wire or partly of glass and partly of nickel wire, as shown. A stem-anchor 25, preferably of nickel wire, is connected to the central coiled portion of the low-power filament 18.

In the manufacture of the lamps the hollow stem or support 20, to which the filaments are attached, is provided in the sealing process with a flattened end, as shown, so that the extreme ends of the filaments or the

short platinum mounts thereof sealed in the end of the stem necessarily lie in the same plane; but with a double filament the extreme ends of the filaments are necessarily brought into close relation near the flattened end of the stem. To give the maximum distance between the legs of the filaments and to insure that the legs shall diverge to prevent short-circuiting between them, the central portions or coils of the filaments 17 and 18 are arranged at an angle to each other and in different planes, preferably at right angles, as indicated in the drawings. This arrangement insures that the adjacent legs of the separate filaments shall diverge from each other outwardly from the end of the lamp-stem, and there is no danger that they will come in contact.

Variations from the construction set forth may be readily made without departure from the essentials of the invention.

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

An electric incandescent lamp comprising a single vacuum-bulb, two incandescing filaments therein, a stem extending within said bulb and having a flattened end portion to which the ends of the filaments are attached in substantially the same plane, said filaments having central coiled portions supported one above the other and arranged at an angle to each other and in different planes, a tip-anchor connected to the central coiled portion of the lower filament and a stem-anchor connected to the central coiled portion of the upper filament, the arrangement being such that the adjacent legs of the filaments diverge and the central coiled portions thereof are held out of contact whereby long filaments of high efficiency may be employed in a single vacuum-bulb.

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