May 19, 1942. T. PRICE 2,283,287

ELECTRIC LAMP AND TERMINAL DEVICE

Filed Oct. 11, 1940

Fig. 1.

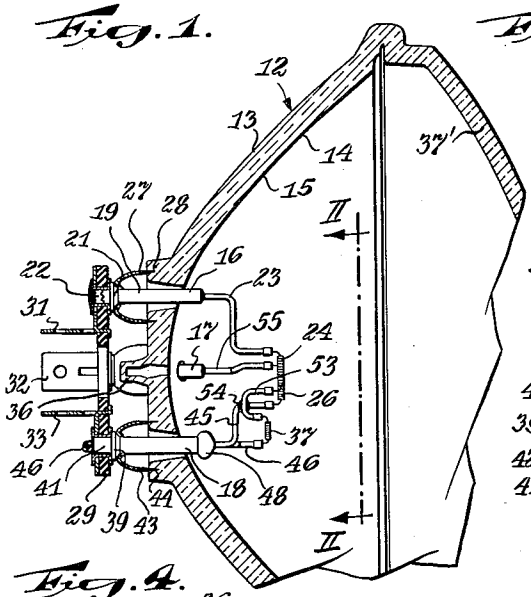


Fig. 5.

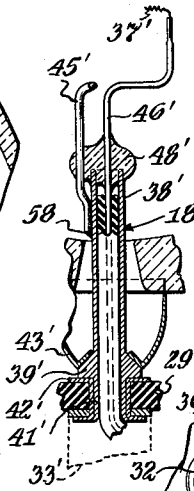


Fig. 2.

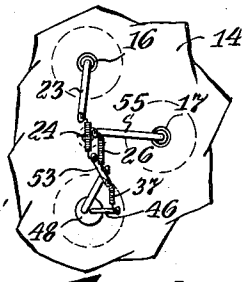


Fig. 3.

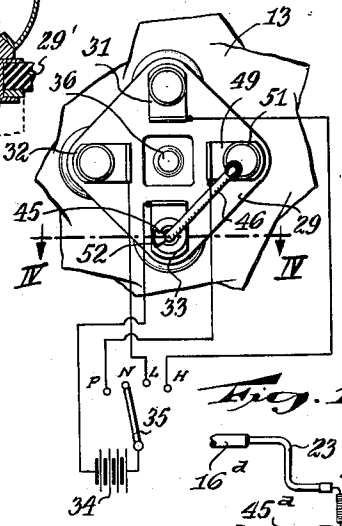


Fig. 4.

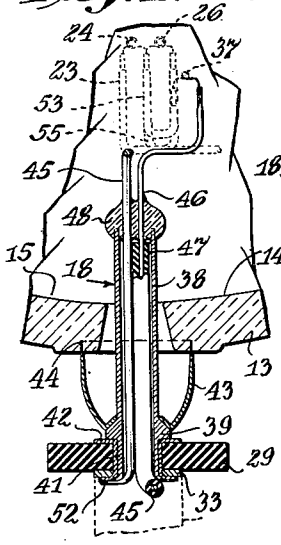


Fig. 6.

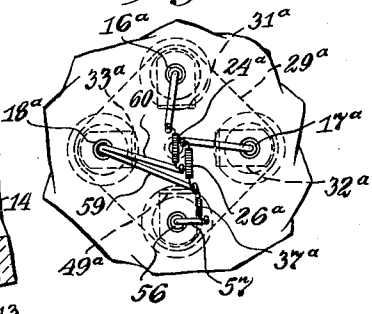


Fig. 12.

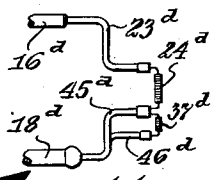


Fig. 7.

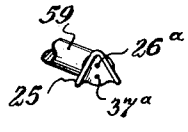


Fig. 8.

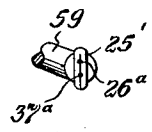


Fig. 11.

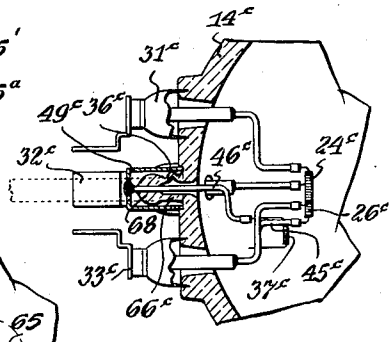


Fig. 9.

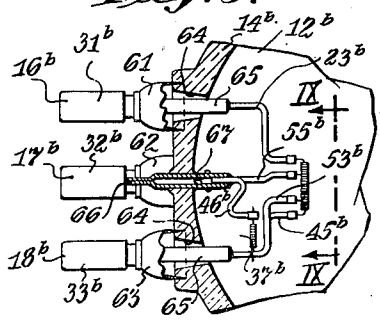
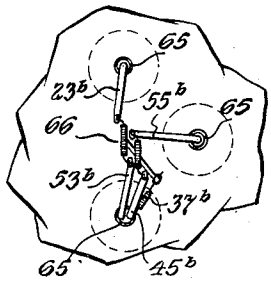


Fig. 10.



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UNITED STATES PATENT OFFICE

2,283,287

ELECTRIC LAMP AND TERMINAL DEVICE

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Application October 11, 1940, Serial No. 360,735

18 Claims. (Cl. 176—34)

This invention relates to incandescent electric lamps, and more particularly to such adapted to function as a combined motor vehicle headlight and parking lamp, or a combined stop and tail light.

The principal object of my invention, generally considered, is to provide an incandescent lamp, preferably of a general type such as described in the Wright Patent No. 2,148,314, or of the "Mazda Sealed Beam" type, adapted to perform a dual function, such as a headlight and parking light, or a stop light and tail light.

Another object of my invention is to provide a motor vehicle headlight lamp adapted, when desired, to function as a parking lamp and thereby avoid the necessity of an additional lamp and lens.

A further object of my invention is the provision of a dual function lamp having at least one major tungsten filament and a minor tungsten filament, said minor filament being smaller in cross section, and the natural tendency of such thinner wire to burn out quicker being overcome by operating it at lower temperature than the major filament.

A still further object of my invention is the provision of a lamp in which the envelope has a conductive or metal exhaust tube serving as a lead for a minor filament therein.

Another object of my invention is the provision of a lamp in which a "dumet," or other conductive, lead wire through the glass exhaust tube of the bulb thereof, serves as a lead for a minor filament therein.

Other objects and advantages of the invention, relating to the particular arrangement and construction of the various parts, will become apparent as the description proceeds.

Referring to the drawing:

Figure 1 is a fragmentary horizontal sectional view of a lamp of the "Mazda Sealed Beam" type, embodying my invention the filament arrangement therein being shown in bottom plan.

Figure 2 is a fragmentary sectional view on the line II—II of Figure 1, in the direction of the arrows.

Figure 3 is a fragmentary elevational view of the lamp looking from the left, as shown in Figure 1, in combination with a circuit diagram.

Figure 4 is an enlarged fragmentary sectional view on the line IV—IV of Figure 3, in the direction of the arrows.

Figure 5 is a view similar to Figure 4 but showing a slight modification.

Figure 6 is a view corresponding to Figure 2, but showing another embodiment of my invention.

Figure 7 is an enlarged detailed view of one of the leads prior to clamping the ends of filaments thereto.

Figure 8 is a view similar to Figure 7 showing the lead after associated filaments have been clamped thereto.

Figure 9 is a fragmentary view corresponding to Figure 1, but showing another modification.

Figure 10 is a fragmentary sectional view on the line IX—IX of Figure 9, in the direction of the arrows.

Figure 11 is a view corresponding to Figure 9, but showing another embodiment of my invention.

Figure 12 is a fragmentary view corresponding to Figure 1, but showing a further embodiment of my invention.

In the well-known "Mazda Sealed-Beam" lamps for automobile headlights, there are two coiled tungsten filaments; that is, one producing an upper or "driving beam," and one producing a lower or "passing beam." The first filament is of higher power (say about 33%) than the other, but they are both high powered filaments. The "driving beam" filament is in focus with respect to the reflector portion of the bulb or envelope and the "passing beam" filament, is slightly out of focus and adapted to direct light somewhat downward and to the right, to thereby avoid blinding drivers of approaching vehicles.

It has heretofore been customary to use a separate fixture for the parking or minor light, when using such sealed beam headlights, thereby necessitating the employment of separate lenses and reflectors, as well as splitting up the streamlining of the fenders, when such parking lights are fixed therein.

In accordance with my invention, I propose to obviate the use of a separate lamp by incorporating a "parking" filament in the bulb with the high powered filaments, or as an alternative, as when used with only one high powered filament, in the same bulb with said filament. For example, my invention is adapted for incorporation in a headlight that has only one high-powered filament, or stop light in which the minor filament may serve as a tail light in the same bulb with the stop light filament. If used with "driving" and "passing" filaments operating for efficiency in an inert gas atmosphere at temperatures of about 2630° and 2610° C., my minor filament, which may be about 3 watts rather than, respectively 40 and 30 watts, may be oper-

ated at about 2200° C. to thereby insure that it will normally burn as long as the major filaments to avoid prematurely spoiling the lamp.

Referring to the drawing in detail and first considering the embodiment of my invention illustrated in Figures 1 to 4, inclusive, there is shown a lamp 12 of the type commonly designated as a "Mazda Sealed-Beam" lamp, adapted to serve as a headlight for a motor vehicle. Said lamp may be constructed in accordance with the teachings of the Wright Patent, No. 2,148,314, except as specifically described, and comprises a dished glass portion 13, preferably formed of "Pyrex," which is a borosilicate glass the inner or concave surface 14 of which is desirably parabolic, or substantially so, and coated with light reflecting metal 15, such as aluminum, applied in a customary manner, as by vaporization thereon.

Through the glass portion 13 project metal contact terminal devices 16, 17 and 18. The contact terminal devices 16 and 17 are termed "simplex" by me as they each involve only one lead, and are each desirably of the form conventionally used in such lamps, so only one need be described in detail. The device 16 comprises an iron or steel post member 19, having a head 21 from which projects a boss 22, and from the other end of which extends a relatively stiff lead 23 (to which is secured an end of the "driving" or "in-focus" filament 24), which may be formed of nickel-plated copper. The connection is desirably effected by splitting the end of the lead, as indicated at 25 in Figure 7, and after insertion of the filament end portion, forcing the leaves of the split portion together, as indicated at 25' in Figure 7, to thereby hold the filament in place. The corresponding end of the "meeting" filament 26 is supported from the device 17 in a similar manner.

To the under surface of the head 21 is secured, as by brazing or welding, a skirt member 27, preferably formed by "Kovar," "Fernico," or other material of suitable coefficient of expansion for sealing into the lamp envelope, having a sharp edge portion connected to the base portion of the lamp 12 by a fused glass seal, said edge portion being desirably embedded in the glass of the base portion, as indicated at 28.

In the present embodiment all of the three terminal devices have their outer bosses fitted in metal ferrules or hollow rivets in a disk 29, formed of Bakelite or other heat-resisting insulating material, and connected thereto as by means of solder or the like. From said ferrules, extend contact plates 31, 32 and 33, for connection with the battery 34 of the vehicle through any desired switch 35, as indicated in Fig. 3.

The bulb of the lamp 12 is completed, for exhausting and gas filling through the exhaust tube 36, indicated as tipped off, by fusing the lens or cover glass member 37' thereto in the customary manner, after the filaments 24—25 and the parking filament 37 have been positioned, as shown.

The manner of application of the parking filament in the bulb of the lamp will now be described. The metal contact terminal device 18, termed "duplex" by me as it involves two leads, instead of being of conventional form, is, as shown in Figure 4, made of a hollow metal post member 38, having a head 39 and a boss 41, extending from said head and secured to the ferrule 42 and associated contact plate 33, as by solder or the like.

As in the case of the other terminal devices, a thin skirt member 43 is secured to the head 39, as by welding, and its sharp edge portion embedded in the glass of the lamp base, as indicated at 44.

In the present embodiment, the member 18 carries two leads, 45 and 46, insulated from one another in any desired manner, as by coating the lead 46 with asbestos, glass, lavite, or other heat-resisting insulating material, where it passes through the member 18, as indicated at 47.

The portion of the leads 45 and 46, where they emerge from the inner end of the member 18, are desirably insulated from one another and held in place by a glass bead 48, fused to the free edge of the member 38, preferably with the inner end portion of said member embedded therein, as illustrated in Figure 4, and through which the leads 45 and 46 pass, thereby making a vacuum-tight seal.

The insulated lead 46 may be adapted for connection with the battery 34, in any desired manner, as by continuing it outwardly and across to connect with a fourth contact plate 49 held on the Bakelite disk 29 by a ferrule 51, like the other contact members 31, 32 and 33.

The uninsulated lead 45 is connected to the ferrule 42 and associated contact plate 33 in any desired manner, as by welding, brazing or soldering, as indicated at 52.

Figure 5 shows an alternative construction for the third metal contact terminal device which, in this instance, is designated as 18', and comprises a hollow metal post member 38' having a head 39' and a boss 41' extending from said head and secured to a ferrule 42' and associated contact plate 33', as by solder or the like, so as to thereby fasten it to the disk 29', corresponding with the disk 29 of the first embodiment.

As in the case of the other terminal device, a think skirt member 43' is secured to the head 39' with its sharp edge portion embedded in the glass of the lamp base, as in the other forms.

In the present embodiment the metal post member 38' serves as part of the return lead, the filament-connected portion of which is designated by the reference character 45'. The lead 45' is secured to the member 38' in any desired manner, as by welding to the inner portion thereof, as indicated at 58. The lead 46' to the parking filament 37', is insulated from the tubular member 38' and held in place, as by a glass bead 48', fused to the free edge of the member 38', preferably with the inner edge portion of said member embedded therein, as illustrated, and through which the leads 45' and 46' pass, thereby making a vacuum-tight seal. The bead 48' also desirably "wets" a portion of the lead 45', spaced from the point of connection with the member 38', during the process of manufacture, and serves as a brace therefor.

The insulated lead 46' is adapted for connection with the battery 34, in any desired manner, for example, as described in connection with the embodiment illustrated in Figure 4. The uninsulated lead 45' is, of course, electrically connected to the contact plate 33' through the tubular member 38' by virtue of the manner of formation.

The lead 45 is desirably formed to serve as a return conductor for the filaments 24 and 26, as well as for the parking filament 37, and thereby desirably has a U-shaped branch member 53, secured thereto by welding or the like, as indicated at 54. The filament 24 has its ends respectively secured to the lead 23 and the near arm of branch lead 53, in any desired manner,

or as indicated in Figures 7 and 8. The filament 26 forming the depressed beam, has its ends respectively secured to the lead 55 of the device 17 and the lead 45, and the parking filament 37 has its ends connected to the other arm of the branch lead 53 and the lead 46, as illustrated in Figs. 1 and 2.

Reference to Figure 2 will show that while the filament 24 is in focus, the filament 26 is slightly above the focal point thereby giving a depressed beam. The parking filament 37 is also desirably out of focus in the same direction as the filament 26.

Reference to Figure 3 will show that the filaments 24, 26 and 37 may be alternatively energized at will from the battery 34 by moving the "three-way" switch member 35 to engage the desired contact H, L or P, as the case may be, to respectively energize the high beam, low beam, and parking light filaments.

Referring now to the embodiment of my invention illustrated in Figures 6, 7 and 8 a construction is there disclosed which is identical with that of Figures 1 to 4, inclusive, except that the filaments 24^a, 26^a are supported from the leads exactly in accordance with conventional construction, that is, the metal contact terminal devices 16^a, 17^a and 18^a correspond respectively with the two lead-in terminals and common or return terminal of a conventional "Mazda sealed-beam" headlight. Thus the devices 16^a and 17^a respectively correspond with the devices 16 and 17 of the preceding embodiment, while the device 18^a differs therefrom only in having two electrically connected filament supporting leads 59 and 60 extending therefrom. The terminal 56 desirably corresponds in construction with one of the terminals 16^a and 17^a and supports a lead-in conductor 57, to the free end of which is secured one end of a parking filament 37^a corresponding with the parking filament 37 of a preceding embodiment. The return lead branch 59 is slit, as shown in Fig. 7, to receive, not only one end portion of the meeting-beam filament 26^a, but also the adjacent end portion of the parking filament 37^a, as illustrated in Figs. 7 and 8 which respectively show the open and connected positions of the lead ends.

All of these contact terminal devices are secured to an insulating disk 29^a and have outer terminal plates 31^a, 32^a, 33^a and 49^a, as in the preceding embodiment, except that said contact members are not arranged in the same order as those designated 31, 32, 33 and 49.

Referring now to the embodiment of my invention illustrated in Figures 9 and 10, there is shown a fragmentary portion of a projector lamp 12^b, of the same type as the previous embodiments, except that the contact terminal devices 16^b, 17^b, and 18^b are of the medium bipost type, for example, such as shown in the Wright Patent No. 2,098,080, dated November 2, 1937.

Said devices 16^b, 17^b and 18^b comprise generally cylindrical outer contact terminals 31^b, 32^b and 33^b having sealing flanges 61, 62 and 63 of flaring cup-like conoidal form, whose outer edges are attached to the base or reflector portion of the lamp 12^b by glass fusion and embedding therein, around the holes 64, through which the inner extensions 65 of said terminal devices extend, making gas and vacuum-tight joints. From the inner ends of said extensions 65 extend filament supports 23^b, 55^b, 53^b and 45^b, the last two of which extend from the return contact member 18^b.

In the present embodiment the lamp envelope is shown provided with a metal exhaust tube 66, which extends through approximately the axial portion of the reflector 14^b of the lamp envelope. Said metal exhaust tube may be made of "Kovar," "Fernico" or other material having a coefficient of expansion sufficiently close to that of the "Pyrex" or other glass envelope to seal satisfactorily thereinto.

From the inner end of the metal exhaust tube extends a filament supporting conductor 46^b and between the free end of said conductor and a portion of the lead-in conductor 53^b is a minor or parking filament 37^b, the ends of which are connected to the respective lead-in conductors in any desired manner, or as disclosed in connection with the preceding embodiments.

In order to make it possible to use the tube 66 for exhausting and gas filling purposes, even though its inner end is plugged by the conductor 46^b, desirably brazed, soldered or welded thereto, a hole 67 is provided in the side thereof.

Except as specifically disclosed in connection with the present embodiment, the same may correspond with the first embodiment, the tipping-off of the exhaust tube 66 being, however, in accordance with the difference in material, that is, said exhaust tube must be tipped-off by means of a hotter flame than required for melting glass in order to fuse the end portion thereof into sealing condition, or said end may be closed by brazing, soldering or welding.

Referring now to the embodiment of my invention illustrated in Figure 11, there is shown a construction which is almost identical with that of Figures 9 and 10, except that the contact terminal devices 31^c, 32^c and 33^c are of the separated type which have been largely used for "Mazda sealed beam" headlights, that is, they have outstanding plate contact pieces, such as indicated by the reference characters 31, 32 and 33 in connection with the first embodiment without, however, using the insulating plate 29.

In addition to the driving beam filament 24^c and the meeting beam filament 26^c, I provide a parking filament 37^c, one end of which is connected to the return lead branch 45^c and the other end to a lead 46^c, extending through the reflector portion 14^c along the axis thereof in the normal location of the exhaust tube. In fact this lead 46^c may extend through a normal glass exhaust tube, designated by the reference character 66^c, the end of which is sealed therearound, as indicated at 68, so that the position of the lead 46^c is fixed prior to exhaust. A supplemental exhaust tube may be taken off from the side of the portion 66^c, or from other suitable location and tipped off at the appropriate time, leaving a tip designated by the reference character 36^c. The projecting portions 68 and 36^c are normally covered by a contact terminal member 49^c, which serves not only as a contact terminal for the parking filament 37^c, but also as protection for the tip 68—36^c.

Referring now to the embodiment of my invention illustrated in Figure 12, a construction is there disclosed which is identical with the embodiment of Figures 1 to 4, inclusive, or that of Figure 5, except that one of the major filaments is omitted leaving only say the major filament 24^d and the minor or parking filament 37^d. The major filament extends between a conductor-support 23^d from a metal contact terminal device 16^d, like 16 in the first embodiment, and a lead 45^d extending from a metal contact ter-

minal device 18d, like that designated 18 in the first embodiment, or 18', except that there is no U-shaped extension corresponding with 53 of the first embodiment.

The parking filament 37d extends between the same lead 45d, using a connection such as illustrated in Figure 8, and a lead 46d corresponding with the lead 46 of Figure 4, or Fig. 5. Such a construction is suitable for a lamp, either of the headlight type, where only one major filament is employed, or of the stop light type, where the major filament may furnish the stop light, and the minor filament act as a tail light. As an alternative, both filaments 24d and 37d may be high powered filaments, one furnishing the driving and the other the meeting beam.

From the foregoing, it will be seen that I have devised a lamp adapted to perform dual functions, such as furnish a parking light, as well as major beams for driving or as a combination stop and tail light, or as a modification of the conventional two filaments sealed beam headlight. I have also provided a combination metal contact terminal device adapted to provide two leads through one bulb aperture. Although when used in a headlight a reflector portion is desirably incorporated as part of the bulb, it will be understood that such a reflector portion may be omitted when serving as a stop and tail light.

It will also be understood that I preferably, but not necessarily, employ supporting conductors of smaller gauge, when serving only a minor, parking or tail light filament, than the conductors for the major filament or filaments. Any of the several contact terminals may be employed in connection with any embodiment. This statement also applies to other features which are obviously interchangeable between the various embodiments. I do not wish to be limited, other than by the claims, to the form of terminal devices disclosed, as electric current may be supplied to the filaments by straight-through leads, devices without skirt portions, or other means known for the purpose.

Although preferred embodiments of my invention have been disclosed, it will be understood that modifications may be made within the spirit and scope of the appended claims.

I claim:

1. An electric lamp comprising a vitreous envelope with a base-forming portion shaped and coated with specular metal to provide a reflector, metal leads extending through holes in said reflector and sealed thereto, end portions of said leads extending inward into the envelope to provide filament supports, and outward for connection with filament-energizing means, a lead of smaller gauge than said first-mentioned leads mounted in said reflector, a major filament with its ends secured to a pair of said metal leads, and a minor filament secured to one of said pair and said lead of smaller gauge.

2. An electric lamp comprising a vitreous envelope with a base-forming portion shaped and coated with specular metal to provide a reflector, metal contact terminal devices extending through holes in said reflector and having thin skirts therearound with their edges sealed to said reflector by fused glass seals, end portions of said terminal devices formed as leads extending inward into the envelope to provide filament supports and outward for connection with filament-energizing means, a lead of smaller gauge than said first-mentioned leads mounted in said reflector, a major filament with its end secured to a pair of said filament supports, and a minor filament, operable at a lower temperature than said major filament when equivalent voltage is applied thereto, secured to one of said pair and said lead of smaller gauge.

3. An electric lamp comprising a vitreous envelope with an integral base-forming portion, metal leads extending through holes in said base-forming portion and sealed thereto, said leads extending inward into the envelope to provide filament supports and outward for connection with filament-energizing means, a lead of smaller gauge also mounted in said envelope, a major filament with its ends secured to a pair of said metal leads, and a minor filament secured to one of said pair and said lead of smaller gauge.

4. An electric lamp comprising a vitreous envelope with a base-forming portion, metal leads extending through said base-forming portion and sealed thereto, end portions of said leads extending inward into the envelope to provide filament supports, and outward for connection with filament-energizing means, a lead of smaller gauge also mounted in said envelope, a major filament with its ends secured to a pair of said metal leads, and a minor filament of higher nominal voltage, so that it operates at a lower temperature than said major filament when the same voltage is applied thereto, secured to one of said pair and said lead of smaller gauge.

5. An electric lamp comprising a vitreous envelope with a base-forming portion, metal contact terminal devices extending through said base-forming portion and sealed thereto, end portions of said terminal device extending inward into said envelope to provide filament supports and outward for connection with filament-energizing means, a wire of smaller gauge also mounted in said envelope to provide an additional lead, a driving beam filament mounted on a pair of said supports, a meeting beam filament mounted on another of said supports and a branch of a driving beam filament support, and a minor filament also mounted on a branch of the common support and said lead of smaller gauge.

6. An electric lamp comprising a vitreous envelope with a base-forming portion, metal contact terminal devices extending through said base-forming portion and sealed thereto, end portions of said terminal devices extending inward into the envelope to provide filament supports and outward for connection with filament-energizing means, some of said contact devices being simplex and one duplex, the latter comprising a hollow metal tube, a lead-in conductor extending through said tube and insulated therefrom, a driving beam filament connected to one of said simplex terminal devices and the tube of said duplex device, a meeting beam filament connected to another simplex device and with said tube forming a common return for both, and a minor filament connected to said insulated lead-in conductor and tube.

7. An electric lamp comprising an envelope, a duplex contact terminal device comprising a hollow metal tube extending through said envelope, and sealed thereto, a lead-in conductor extending through said tube and insulated therefrom, a lead-in conductor electrically connected to said tube, and a filament with its ends respectively connected to said electrically connected and insulated conductors.

8. An electric lamp comprising a vitreous envelope with a base-forming portion, metal contact terminal devices extending through said base-

forming portion and sealed thereto, end portions of said terminal devices extending inward into said envelope to provide filament supports and outward for connection with filament-energizing means, one of said supports serving as a common return, and a plurality of filaments with their ends respectively connected to said supports with a plurality of said ends secured in a single slit in said common support.

9. An electric lamp comprising a vitreous reflector portion, a metal exhaust tube sealed through said reflector portion, a cover glass united to said reflector portion to form a hermetically sealed enclosure, and a light source mounted in said enclosure in definite relation to the focus of said reflector portion, said source comprising a major filament and a minor filament, a pair of leads for said major filament, a lead telescoping in said exhaust tube and one of said pair serving as the leads for the minor filament.

10. An electric lamp comprising a reflector portion, an exhaust tube extending therefrom, a cover glass united to said reflector portion to form a hermetically sealed enclosure, and a light source mounted in said enclosure in definite relation to the focus of said reflector portion, said source comprising a major filament and a minor filament, a pair of leads for said major filament and another lead extending through said exhaust tube, sealed thereto, and serving as a lead for the minor filament.

11. A combination return lead and minor filament contact for an electric lamp, comprising a hollow metal tube having a skirt secured to one end portion thereof, a pair of lead-in conductors extending through said tube, and means insulating said conductors from each other.

12. A combination return lead and minor filament contact for an electric lamp, comprising a hollow metal tube having a skirt secured to one end portion thereof, a lead-in conductor extending through said tube, and means insulating said conductor from said tube.

13. A duplex contact and filament lead device for an electric lamp, comprising a hollow metal tube, a lead-in conductor extending through said tube, means insulating said conductor from said tube, and a lead-in conductor electrically connected to said tube.

14. An electric lamp comprising a vitreous envelope with a base-forming portion shaped and coated with specular metal to provide a reflector, metal contact terminal devices extending through holes in said reflector and having thin skirts therearound with their edges sealed to said reflector by fused glass seals, end portions of said terminal devices formed as leads extending into the envelope to provide filament supports and outward for connection with filament-energizing means, a lead of smaller gauge than said first-mentioned leads also extending through a hole in said reflector, a major filament with its ends secured to a pair of said filament supports, and a minor filament secured to one of said pair and said lead of smaller gauge.

15. An electric lamp comprising a vitreous envelope, filament supports in said envelope, some of said supports being simplex and one duplex, the latter comprising a metal tube and a lead-in conductor extending through said tube and insulated therefrom, a major filament electrically connected to one of said simplex devices and said tube, another major filament electrically connected to another simplex device and said tube, and a minor filament electrically connected to said insulated lead-in conductor and said tube.

16. An electric lamp comprising a vitreous envelope with a base-forming portion shaped and coated with specular metal to provide a reflector, metal contact terminal devices extending through said reflector and sealed thereto, inner end portions of said terminal devices in said envelope providing filament supports, and outer end portions providing for connection with filament-energizing means, one of said supports serving as a common return lead and having a longitudinal groove in one side, and a plurality of filaments with one set of their ends respectively connected to said supports and the other set of said ends disposed in said groove and secured to said common return lead.

17. An electric lamp comprising a vitreous envelope with a base-forming portion shaped and coated with specular metal to provide a reflector, metal contact terminal devices extending through holes in said reflector and having thin skirts therearound with their edges sealed to said reflector by fused glass seals, inner end portions of said terminal devices formed as leads in said envelope to provide filament supports, and outer end portions serving for connection with filament-energizing means, another lead passing through the same hole as one of said first-mentioned leads, a major filament with its ends secured to a pair of said filament supports, and a minor filament with its ends secured to one of said pair and said other lead.

18. A duplex filament lead device for an electric lamp comprising a metal tube, a lead-in conductor extending through said tube, means insulating said conductor from said tube, and means sealing said tube vacuum-tight, comprising a bead of glass in which the inner end of said tube is embedded and through which the insulated conductor passes, and another conductor electrically connected to said tube and passing through the same bead.

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