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D. A. HOWLES ET AL

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ELECTRIC LAMPS

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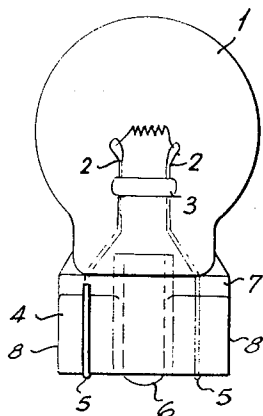


Fig. 1.

Fig. 2.

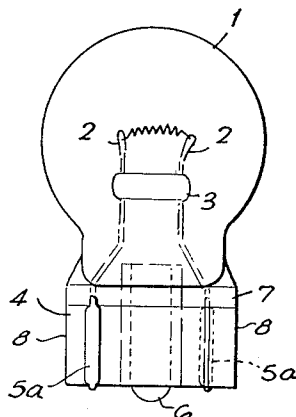


Fig. 3.

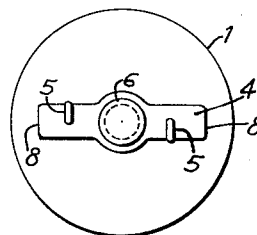
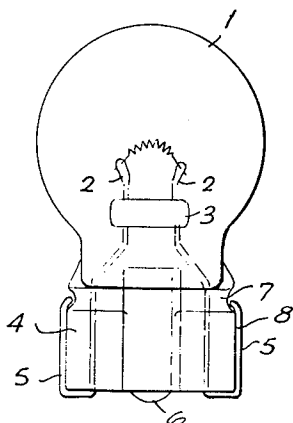


Fig. 4.

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2,999,180 ELECTRIC LAMPS

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This invention relates to electric lamps.

Our co-pending application Serial No. 608,019, which is now U.S. Patent No. 2,937,308, granted May 17, 1960, describes an electric lamp comprising a glass bulb, a flattened glass pinch sealed to close the bulb, the lead wires being brought through the seal, looped and returned into the seal, the loop portions of each lead wire being flattened down on to the pinch.

For lamps capable of passing a heavier current than that originally envisaged in the above referred to application lead wires of correspondingly larger diameter are employed. It may be somewhat disadvantageous to return the ends of lead wires which have a diameter greater than 0.12" into the seal. The formation of loops and the subsequent bending of the loop portions raises problems due to the inherent stiffness of the wire and difficulty is experienced in getting the loops to nestle against the pinch, during which steps cracking the glass of which the pinch is formed is to be avoided.

We have now found that suitable contacts may be formed merely by bending the lead wire tails back against the surface of the pinch leaving the free ends unsecured and relying on the rigidity of the heavier gauge wire to achieve positional stability of the contacts.

According to the present invention therefore, a capless electric lamp is provided which comprises a glass bulb, a flattened glass pinch sealed to close the bulb, a plurality of lead wires brought out through the glass pinch and bent back against the surface thereof to form contacts which are preferably flattened down on to said surface, said lead wires being of such thickness that the contacts are rigidly supported at the points at which the lead wires emerge from the glass pinch.

The invention may be better understood from the following description read with the accompanying drawing in which FIGURES 1, 2 and 3 show three embodiments of a single filament lamp constructed in accordance with the present invention, and in which FIG. 4 is a plan view of the under side of the lamp illustrated in FIG. 1 showing the flattened glass pinch of the type used in connection with all of the lamps illustrated in the drawing.

In the figures the invention is illustrated by a lamp which comprises a glass bulb 1 the neck portion of which is formed into an external flattened pinch 4. A filament mount comprises a pair of lead wires 2 of a diameter rather larger than that usually encountered in lamps of this type maintained in spaced-apart relationship by a glass bead 3. As is well known in the art the wire from which the lead wires 2 are formed is made compatible with the glass of the bulb, that is to say their relative coefficients of thermal expansion are matched to a considerable degree. In the manufacture of the lamps illustrated the lead wires 2 are introduced into the bulb 1 and an exhaust tube 6 is then introduced into the neck, which tube is maintained in position during the subsequent pinching operation of the neck portion of the bulb 1. In order that the exhaust tube 6 remains open at its inserted end during the pinching operation we have found that it assists in preventing the collapse of the exhaust tube to provide therein means such as a

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thin metal sleeve, thin rod of porous material (e.g. asbestos or carbon) or a coating of refractory material such as zirconium dioxide powder.

After the pinch 4 has been formed, those portions of the lead wires 2 external to the pinch are bent over against the side faces of the pinch in the manner shown in FIGURE 1. In FIGURE 1 the tail portions 5 of lead wires 2 are bent in opposite directions across the base of the pinch 4 and then upwards on each side face thereof. For convenience the lead wire tails are made long enough for their ends to be turned over into horizontal notches 7 formed on each side face of the pinch. By this means the positional stability of the lead wire contacts due to their stiffness is supplemented.

Alternatively, as shown in FIG. 3 the tail portions 5 of lead wires 2 are brought up round the end faces 8 of the pinch to leave the side faces of the pinch 4 entirely unobstructed to facilitate holding the lamp more rigidly in its holder should this be required.

The two horizontal notches 7 are formed in the glass pinch 4 during the pinching operation on the bulb side of the seal so that a spring clip type of holder which is envisaged for use with the lamp as well as making electrical contact with the tail portions 5 of the lead wires 2 can be so designed to locate with these notches to hold the lamp in position. In FIG. 3 the notches extend round the end faces of the pinch 4 if it is desired to tuck the lead wire tails 5 into it. Although notches are provided in the present example for locating the lamp in a spring clip holder the use of notches and or protuberances for this purpose is also contemplated. To increase the contact area of the external portions of the lead wires 2 they may be flattened as at 5A in FIG. 2.

As shown in the figures the notches 7 are positioned at the junction of the bulb and the pinch but it may be preferable for the notches, particularly in the case of FIG. 3 where the faces of the pinch are unobstructed, to move the position of the notches 7 to across approximately the middle of the pinch 4.

In pressing the pinch itself it is preferred to place some restriction to lateral flow as the jaws close on the faces of the pinch in order to square up the ends of the pinch.

Lateral movement of the lamp in the holder can be restricted if desired by providing a suitable location on the faces (or ends) of the pinch perpendicular to the notches.

While we have described a lamp of the incandescent type it will be apparent that inasmuch as the invention relates more specifically to the base of the lamp the ends of the leads within the bulb need not be terminated by a filament but could for the purposes of making a neon indicator lamp or the like be the basis of a pair of electrodes.

The design and manufacture of the lamp according to the present invention offers several advantages among which are a shorter overall length for a given bulb size, and lower cost due to a reduction in the number of parts and steps in the process of making a complete lamp and no two-part lead.

What we claim is:

1. A capless electric lamp comprising a glass bulb, an external glass pinch sealed to close said bulb and having opposed flat surfaces and formed with a transverse notch on each of said opposed flat surfaces engageable by co-operating parts of a suitable holder for correctly locating said lamp within the holder, and a plurality of relatively thick lead wires which enter said bulb through said pinch and which have external free end portions bent back against the flat surfaces of said pinch to

provide lamp contacts, the thickness of said lead wires being such that each of said contacts is firmly supported against a flat pinch surface solely from the point at which the respective lead wire enters said pinch.

2. A capless electric lamp comprising a glass bulb, an external glass pinch sealed to close said bulb and having opposed flat surfaces and formed with a transverse notch on each of said opposed flat surfaces engageable by co-operating parts of a suitable holder for correctly locating said lamp within the holder, and a pair of relatively thick lead wires which enter said bulb through said pinch and which have external free end portions bent back against respective flat side faces of said pinch to provide lamp contacts, the thickness of said lead wires being such that each of said contacts is firmly supported against a flat side face solely from the point where the respective lead wire enters said glass pinch.

3. A capless electric lamp comprising a glass bulb, an external glass pinch sealed to close said bulb and having opposed flat surfaces and formed with a transverse notch on each of said opposed flat surfaces engageable by co-operating parts of a suitable holder for correctly locating said lamp within the holder, and a pair of relatively thick lead wires which enter said bulb through said pinch and which have external free end portions bent back against respective flat end faces of said pinch to provide lamp contacts, the thickness of said lead wires being such that each of said contacts is firmly supported against a flat end face solely from the point where the respective lead wire enters said pinch.

4. A capless electric lamp comprising a glass bulb, an external glass pinch sealed to close said bulb and having opposed flat surfaces and formed with a transverse notch on each of said opposed flat surfaces engageable by co-operating parts of a suitable holder for correctly locating said lamp within the holder, a pair of relatively thick lead wires which enter said bulb through said pinch and which have external free end portions bent back and flattened against respective flat side faces of said pinch to provide lamp contacts, the thickness of said lead wires being such that each of said contacts is firmly supported against a flat side face solely from the points where the respective lead wire enters said pinch.

5. A capless electric lamp comprising a glass bulb, an external glass pinch sealed to close said bulb and having flat opposed surfaces and including transverse notch means on said flat opposed surfaces engageable by co-operating parts of a suitable holder for correctly locating said lamp within the holder, and a plurality of relatively thick lead wires which enter said bulb through said pinch and which have external free end portions bent back against the flat surfaces of said pinch to provide lamp contacts, the thickness of said lead wires being such that each of said contacts is firmly supported against a flat surface solely from the point where the respective lead wire enters said pinch.

6. A capless electric lamp comprising a glass bulb, an external glass pinch sealed to close said bulb and having flat opposed surfaces and formed with a transverse notch on each of its flat side faces engageable by cooperating parts of a suitable holder for correctly locating said lamp within the holder, and a pair of relatively thick lead wires which enter said bulb through the base of said pinch and which have external free end portions respectively bent back and flattened against said flat side faces to provide lamp contacts, the tips of said free ends being turned over into the respective notches and the thickness of the lead wires being such that each of said lamp contacts is firmly supported against a flat side face of said pinch solely from the point where the respective lead wire enters said pinch.

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