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ELECTRIC INCANDESCENT LAMP BULBS FOR VEHICLE LAMPS

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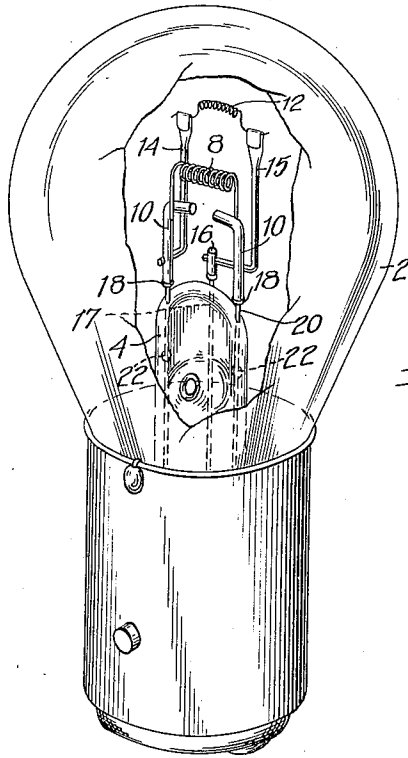


Fig. 1.

Fig. 3.

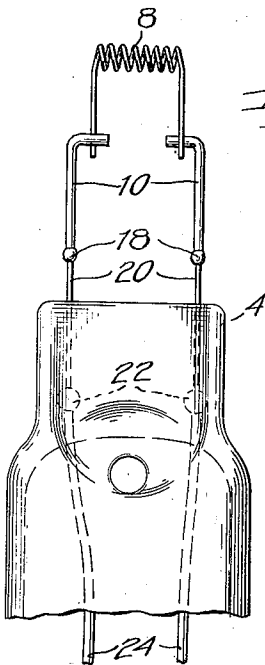


Fig. 2.

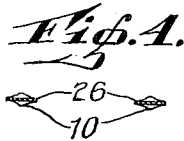
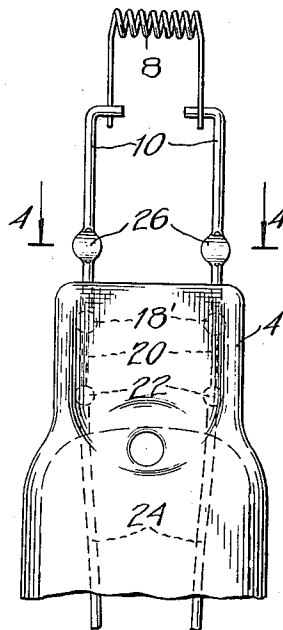


Fig. 4.



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ELECTRIC INCANDESCENT LAMP BULB FOR
VEHICLE LAMPSReginald K. Braunsdorff, East Orange, and Lorin
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10 Claims. (Cl. 176—26)

The present invention relates to lamp bulbs and more particularly to light bulbs used on vehicles, and comprises an improved bulb of this character which will withstand relatively hard duty, as for example, on military cars and trucks.

In the use of conventional headlight bulbs on vehicles subjected to rough usage such as military cars, trucks and tanks, the breakage and failure of the filaments of the bulbs are unduly large. Road shock, gun shock and vibration incidental to gear mechanism are transmitted in some proportion to the filaments and this is accentuated when the lamp bulbs are rigidly soldered into reflectors or metal cans which are rigidly bolted to the vehicle frame, such that the shock to which the military vehicle may be subjected is transmitted through the assembled mechanism and ultimately through the support wires to the filaments. On tests this breakage has in some instances been as high as 50%. The underlying cause of filament failure is somewhat obscure but it is probable that the breakage is due in large part to the filaments becoming somewhat fragile from crystallization during burning which is characteristic of metallic filaments generally, and tungsten in particular, and this theory is supported by the fact that the fracture of the filament often occurs when the filament is cold and unlighted and particularly after the filament has been previously burned.

One object of the present invention is to provide a headlamp bulb in which the breakage of the filament or filaments is substantially reduced.

A further object of the invention is to produce such improved bulb without unduly adding to the cost of manufacture thereof.

More particularly we have found that by providing for limited free flexing movements of the support wires and the entire filaments as units in directions at right angles to the filament lengths, a very substantial improvement results in that the breakage or failure of the filaments is very substantially reduced in percentage and further that this may be effected by the structures described below and without appreciably interfering with the optical functional relationship between the reflectors and the filaments.

For a better understanding of the invention and of the preferred embodiment thereof, reference may be had to the accompanying drawing of which—

Fig. 1 is a perspective view of a lamp bulb embodying the invention and representing one embodiment thereof;

Fig. 2 is an enlarged side view of a part of the

structure of Fig. 1, showing the supporting structure for the major filament;

Fig. 3 is a view similar to Fig. 2 but illustrating another embodiment of the invention; and

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3.

In Fig. 1 the improved lamp is shown as comprising the conventional glass envelop 2 having the press 4 and mounted in the base 6. The major filament comprising the straight coil 8 is mounted at its ends on the nickel support wires 10, and the minor filament 12 has its ends clamped by flattened ends of nickel support wires 14 and 15 of which wire 14 is secured to one support wire 10 and the wire 15 is secured to a third support wire 16. In accordance with this embodiment of the invention, the nickel wires 10, instead of extending down into the press 4 as in the conventional structure, are welded, as indicated at 18, to the ends of the Dumet sealing-in wires 20, above the press 4. We have found that this arrangement by which the relatively large nickel support wires 10 are secured to the smaller wires 20 above the press instead of within the press, imparts to the support structure of the major filament 8 a limited free resiliently flexing movement of the support wires 10 and the filament 8 as a unit in directions at right angles to the length of the filament and substantially reduces the breakage as compared with the conventional bulb. As shown best in Fig. 2, the other ends of the wires 20 are joined as usual within the press 4 by weldings 22 to the copper lead-in wires 24 for the base 8. In the particular bulb illustrated in Fig. 1, the support wire 16 for the minor filament 12 is likewise secured to the sealing-in wire 17 above the press 4.

In the embodiment of the invention illustrated in Figs. 3 and 4, the nickel support wires 10 for the major filament 8 are secured to the Dumet wires 20 within the press by the welds 18' as in the conventional structure, and limited free resilient flexing movements of the support wires 10 and the filament 8 as a unit in a direction at right angles to the filament length is effected by pinching or otherwise flattening the wires as indicated at 26. As shown best in Fig. 4, the pinching of the wires at 26 provides flattened surfaces which are in planes parallel to the plane passing through the longitudinal axes of the wires. This local flattening of the support wires 10 of the embodiment of Figs. 3 and 4 has been found very effective in reducing the breakage of major filament. The cold working incident to the pinching or flattening operation to form the

flats 26 tends to harden or strengthen the support wires so that the over-all strength of the lead or support wires is not weakened either mechanically or electrically and a controlled springiness or flexibility is thereby introduced in the direction indicated so as to interrupt the flow of the shocks imparted to the bulb.

With the usual operating position of the headlamp reflectors mounted on vehicles, the bulbs are disposed with their axes and their filaments in horizontal planes, and the invention, as measured by severe factory vibration tests, has reduced the premature breakage substantially and on the average to less than 10% and in some instances premature breakage has been completely eliminated.

From the standpoint of manufacture the arrangement of Figs. 1 and 2, which requires no additional operational step, is preferred.

The following is claimed:

1. In a lamp of the character set forth, the combination comprising a press, a coiled major filament, a minor filament and a support structure for said filaments, said support structure including a pair of support wires projecting from the press and forming the sole support for said major filament and both of said wires being reduced in dimension at a point intermediate the press and the major filament to increase the resistance of the major filament to fracture.

2. A two-filament stop and tail lamp comprising in combination a bulb, a straight coiled major filament and a minor filament therein, a press and structure mounted on said press and supporting said filaments, said support structure including a pair of sealing-in wires secured in the press and extending thereabove, a pair of spaced vertically disposed wires secured at one end to the major filament and welded at their other ends above the press to the ends of the sealing-in wires, the diameter of each of said sealing-in wires being less than that of each of said spaced wires.

3. A two-filament stop and tail lamp comprising in combination a bulb, a straight coiled major filament and a minor filament therein, a press and structure mounted on said press and supporting said filaments, said support structure including a pair of sealing-in wires secured in the press and extending thereabove, a pair of spaced vertically disposed wires secured at one end to the major filament and welded at their other ends above the press to the ends of the sealing-in wires, the diameter of each of said sealing-in wires being less than that of each of said spaced wires, said support structure including a third sealing-in wire secured in the press and extending thereabove, a third support wire secured to said third sealing-in wire above the press, and means secured to one of said spaced wires and said third support wire for supporting said minor filament.

4. The method of reducing breakage of the major coil filament of a stop and tail lamp having a major and a minor filament which comprises locally reducing the support structure of the major filament in dimension intermediate the press and the major filament so as to minimize the transmission of shocks to said filament through the support structure.

5. In a miniature electric incandescent bulb for vehicle lamps, a press, a coiled metallic filament and support wires for said filament extending from said press, each of said support wires having a section of reduced dimension having limited resilient flexing movements of the filament and wires about said sections generally at right angles to the filament length and minimizing the transmission of rupturing shocks to said filament through the support wires.

6. In a miniature electric incandescent bulb for vehicle lighting, a press, a coiled metallic filament and support wires for said filament extending from said press, each of said support wires having a flattened section intermediate its length, the plane of the flattened sections being disposed parallel to the plane of the filament length.

7. In a miniature electric incandescent lamp, a press, a metallic coiled filament and a pair of parallel support wires for said filament extending from said press, said support wires being flattened in the common plane of the wires at points intermediate their length and equidistant from the press.

8. In a miniature electric incandescent lamp bulb for vehicle headlamps, a metallic coiled filament, a press and support wires for said filament projecting from the press and forming the sole support for the filament, each of said support wires comprising a relatively rigid part to which the filament is fastened and a resiliently flexible section intermediate the rigid part and the press having limited flexing movements of the rigid portions of the support wires and the filament as a unit, in a direction generally at right angles to the filament length, minimizing the transmission of shocks to the filament.

9. In a miniature electric incandescent lamp bulb for vehicle headlamps, a metallic coiled filament, a press and support wires for said filament projecting from the press and forming the sole support for the filament, each of said support wires comprising a relatively rigid part to which the filament is fastened and a resiliently flexible section intermediate the rigid part and the press having limited flexing movements of the rigid portions of the support wires and the filament as a unit, but only in a direction generally at right angles to the filament length, minimizing the transmission of shocks to the filament.

10. In the manufacture of a miniature electric incandescent lamp bulb for vehicle lighting, comprising a metallic coil filament, a press and a support structure for said filament mounted on said press, the method of reducing premature breakage of the metallic filament from shocks transmitted generally at right angles to the filament length which comprises incorporating in the support structure a section of reduced dimension to give said support structure and the filament a limited resilient flexing movement in directions generally at right angles to the filament length, within the bulb and spaced from said press.

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