INCANDESCENT ELECTRIC LAMPS


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5 Claims. (Cl. 313—275)

This invention relates to electric incandescent lamps and more particularly to lamps for projection in which a number of filaments are connected in parallel.

For some purposes rapid incandescence and niggrenescence is required and the desired high wattage is obtained by the use of a number of relatively low wattage filaments connected in parallel. This requires the use of fine wire filaments to assist the rapid cooling after the lamp has been switched off.

As it may be required to use a projection lamp in a situation in which it is liable to be subjected to shock or considerable vibration, it is necessary to take precautions against damage to fine wire filaments from this cause. It is also desirable to guard against complete failure should one filament fail. When a number of fine wire filaments are connected in a parallel formation there is a danger not only of contact with an adjacent filament by a failed filament but of arcing between the failed filament and an adjacent sound filament.

In the present invention a projection lamp is provided with a number of filaments connected in parallel and disposed circumferentially in superimposed parallel horizontal planes. The filaments are arranged in two sets and are supported by massive support rods, which may also serve as conductors to the filaments, secured in the lamp, conveniently in a pinched form. The filaments of each set are in the form of semicircles and are terminated in separate support rods, there being a pair of rods for each set of filaments. The support rods for the ends of the filaments of each set may spring from the same point in the pinched form or they may be formed as two parallel branches from a single sealed stem. To guard against damage of the filaments by excessive vibration it is arranged that the filaments are supported along their lengths at equipotential points and these supports are anchored at each end to rigid members. The rigid members may be secured in insulating bridge pieces between the support rods at opposite ends of the赏片a arrangement providing improved rigidity and ensuring that the system vibrates as a whole.

For a clearer understanding of the invention an exemplary embodiment will now be described with reference to the accompanying drawing in which a perspective view of a projection lamp according to the invention is shown. For the sake of clarity only one set of filaments and intermediate supporting means are shown in the drawing and it should be understood that the two sets of filaments are similarly disposed and supported.

In the drawing, a lamp required to operate for example at 200 volts and rated at 5.6 kw comprises a gas filled spherical bulb 1 having a copped neck 2 in which there is a pinch 3 in which are secured two nickel rods 4 and 5 which are electrically connected to contact points in the cap by wires sealed into the pinch 3 in known manner. Each of the rods 4 and 5 extends from the pinch 3 parallel with the axis of the bulb 1 and is bent outwards oppositely and again parallel with the axis of the bulb and after extending for a short distance it is welded to a pair of molybdenum rods forming pronged extensions of the rods, the prongs 4a and 4b forming extensions of rod 4 and prongs 5a and 5b forming extensions of rod 5, the rods 4 and 5 and their extensions 4a, 4b and 5a, 5b forming support rods for the filaments. Assuming that the bulb is disposed with its axis vertical, the filaments 9 are arranged in a vertical plane as horizontally disposed semicircles with their ends welded to one prong of each support rod. In the present embodiment fourteen 200 watt filaments are supported in two similar sets of seven, the filaments of the two sets being co-planar and spaced vertically at a distance of 6 mm. and the ends of the filaments of the two sets being welded to prongs 4a, 5a and 4b, 5b respectively. Each filament consists of a semi-circle of wire of tungsten or tungsten in which a small percentage of alkali or metal silicate is incorporated or a tightly wound helix of such wire, the one intermedially with the whole assembly of filaments being a circle of, for example, 48 mm. diameter with two diametrically opposite gaps formed by the spacing between the prongs of each support. Two ceramic bridge pieces 6 and 7 extend from between prongs 4a, 4b to between prongs 5a, 5b at points above and below the filaments 9 respectively and are held in position between the prongs by nickel strips 8 welded to the prongs of each support immediately above and below the bridge pieces and by molybdenum wires 9a two of which pass through holes in each bridge piece at each end thereof and are bent respectively so as to lie against the strips 8 to which they are welded. Secured in the bridge pieces 6 and 7 by bending round it and passing through suitably disposed holes in it are a number of rods 10, of for example, molybdenum, projecting from each side, there being four sets of, for example, six rods in each set and two sets for each bridge piece the lengths of corresponding rods of each set being equal and such that their ends lie along a circular path of the same diameter as that of the semicircularly disposed filaments 9. Between the ends of correspondingly positioned rods 10 in each of the two bridge pieces 6 and 7 and welded thereto are two molybdenum wires 11 over which each of each and before it is secured to the rods 10 is passed a helix of molybdenum wire 12, the helix 12 being interrupted at distances corresponding to the position to be occupied by the filaments 9 and there formed into loops 13 in the form of turns of large pitch and diameter to support the filaments 9 which pass through the loops so formed. The helices 12 are spot welded at their ends to the molybdenum wires 11. The bulb 1 may be provided with a mirror surface as required.

What is claimed is:

1. An electric incandescent lamp comprising a transparent sealed bulb, a plurality of filaments disposed within the bulb in co-planar sets as semicircles with their centres laying on a common axis, support rods one pair for each set of filaments to which the ends of the filaments are connected, intermediate support wires anchored at each end and disposed at right angles to the planes of the filaments so that each support wire intersects the filaments of a set at equipotential points and means for supporting the filaments at each of said intersections.

2. An electric incandescent lamp according to claim 1 including a base for said bulb sealed thereto, the support rods being forked and the common part of the forks being secured to said base, refractory insulating members secured between the forked parts of each support rod beyond the planes of the planes of the filaments providing means for the anchoring of said intermediate support wires.

3. An electric incandescent lamp according to claim 1 including a helix of wire surrounding closely each intermediate support wire the ends of each helix being welded to the surrounding support wires, a loop being formed.
in each helix at each intersection of a support wire and a filament through which loop the filament passes.

4. An electric incandescent lamp according to claim 2 including rods of different lengths secured in and projecting from each of said refractory insulating members on each side thereof the ends of said rods lying along the circumference of a circle of radius equal to that of the filaments, the intermediate support wires for one set of filaments being secured to the free ends of said rods projecting from the corresponding side of the refractory insulating members and the intermediate support wires for the other set of filaments being secured to the free ends of the rods projecting from the other side of said refractory members.

5. An electric incandescent multi-filament lamp comprising a translucent sealed bulb capped at one end, a pinch sealed to said capped end, forked support rods secured in said pinch and spaced equidistantly from the bulb axis and extending in planes parallel to said axis, a plurality of semicircular filaments disposed within the bulb in parallel planes in two sets one on each side of and at right angles to the bulb axis the centres of the filaments lying along the said axis and the ends of the filaments being connected to one fork of each of the forked support rods, refractory insulating members held between the forked ends of the support rods for each end of the filaments and lying in planes beyond those of the filaments, rods secured in and projecting from the refractory insulation members on each side thereof and at right angles thereto the ends of said projecting rods lying along the circumference of a circle of radius equal to that of the filaments, intermediate support wires disposed parallel to the bulb axis and welded to the free ends of said projecting rods and a closely wound wire helix surrounding closely each intermediate support wire the ends of a helix being welded to the support wire, said helix being formed with open turns at the points of intersection of the surrounded support wire with a filament between which and the support wire the filament passes.

No references cited.