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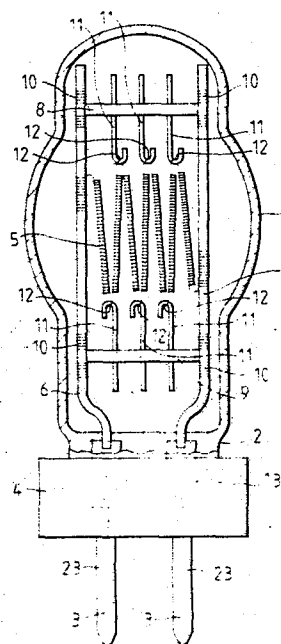
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54 **Incandescent lamps.**

57 Conventional incandescent filament lamps have an even number of filament sections so that the connections of the filament to the support wires are both at the same end of the bulb. It is found that in the horizontal position such bulbs burn out very quickly compared to their lifetime in the vertical position. Hence a lamp is provided with an odd number of filament sections (5) with the connections to the support wires (6, 7) being at opposite ends of the bulb. This significantly prolongs the lifetime of the bulb when in the horizontal position.



This invention relates to electric incandescent filament lamps, and particularly to halogen cycle studiolamps of the type comprising, within a sealed envelope, a filament having a plurality of closely adjacent filament sections lying substantially in the same plane supported within a framework consisting of a pair of longitudinally extending support wires fixed in position within the envelope at one end, and a pair of insulating bridge members extending between the support wires and carrying a number of anchor wires which engage and support different parts of the filament.

Conventionally, such lamps have an even number of filament sections and are connected end to end in a zig-zag pattern with each end of a filament being connected to a respective support wire. It is clear, therefore, that both of the connections to the support wires take place at the same end of the lamp in relation to the longitudinal extent of each of each filament section.

When such lamps are in use vertically, meaning that the axis of the lamp, the support wires and the filament sections are all substantially vertical, they present no problem. When, however, lamps of this construction having a high power output, for example 2 kW or more, are used in the horizontal position, it has been found that the lamps burn out after a very short period of time compared to their lifetime when in the vertical position.

The invention therefore provides an electric incandescent filament lamp of the type specified in which there is an odd number of filament sections such that the connection of one end of the filament to one support wire is remote from the connection of the other end of the filament to the other support wire. It has been found that this modification significantly prolongs the life of the lamps when used in the horizontal position. The number of filament sections employed in a lamp in accordance with the invention will usually be at least five and not more than nine, although the most suitable number

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will depend upon the form of lamp and its required power output.

One form of the lamp in accordance with the invention will now be described by way of example with
5 reference to the drawing in which:-

Figure 1 represents a sectional elevation through a conventional studio lamp and,

Figure 2 represents a sectional elevation through a studio lamp in accordance with the invention.

10 In Figure 1 the lamp comprises a transparent quartz envelope 1 of generally tubular form with a bulbous central portion, the envelope being domed at one end, and closed by a pressing at its opposite end. Current leads through the pinch 2 are provided by strips 13 of molybdenum
15 foil, against which the quartz is pressed, the inner and outer ends of the strips being connected to filament support conductors 6, 7 and terminal pin conductors 3 adjacent ends of which are also embedded in the quartz of the pinch 2. The terminal pin conductors 3 pass through
20 a ceramic support member 4 which supports the pinch 2 and are brazed or arc welded at their outer ends into respective terminal pins 23.

Within the envelope there is mounted a coiled tungsten filament 5 comprising an even plurality of sub-
25 stantially parallel and closely-spaced filament sections each lying perpendicular to the pinch 2, the filament sections lying either in a common plane or in a staggered relationship in two closely-adjacent parallel planes.

The filament 5 is mounted within a rectangular
30 supporting framework consisting of the two support wires 6 and 7 which extend longitudinally along the envelope, and two short quartz rods 8 and 9 extending transversely between the support wires at a greater and a lesser distance respectively from the pinch. The rods 8 and 9
35 are rigidly connected to the support wires 6 and 7 by means of connecting wires 10 passing through the ends of the rods and attached to the support wires.

Anchor wires 11 are fixed in the rods, two in rod 8

and three in rod 9, and are hooked at their ends facing each other and engage the hooked portions 12 connecting adjacent filament sections. Each end of the filament 5 is connected to a respective support wire.

5 The lamp envelope contains a filling of an inert gas at a cold pressure of at least 2, for example on the order of $2\frac{1}{2}$, atmospheres, together with a small quantity of a halogen, such as bromine, as is customary in halogen cycle studio lamps.

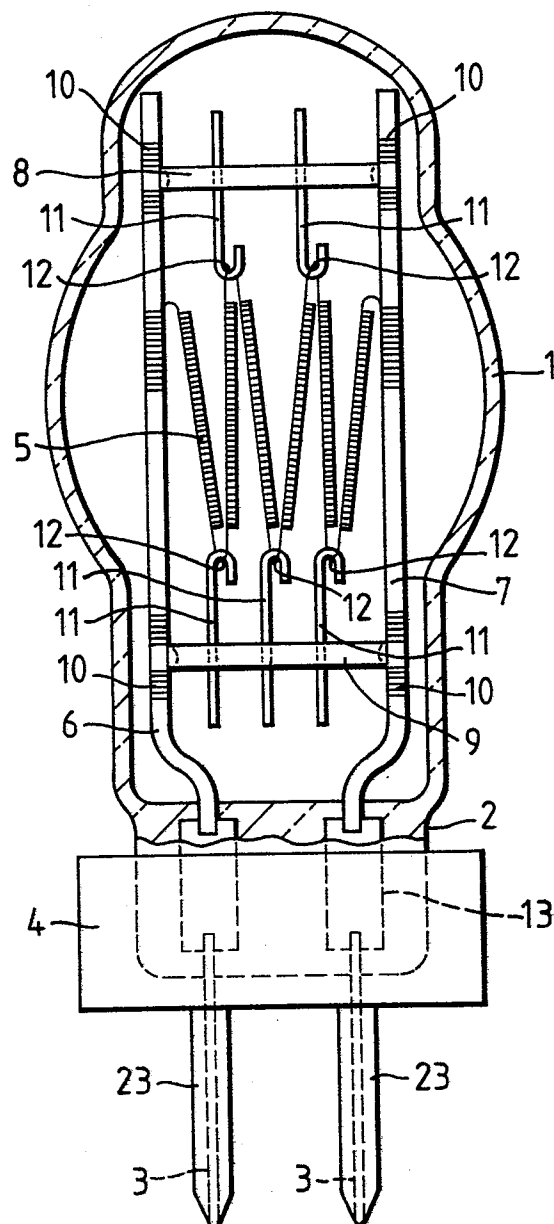
10 When the lamp is in use in a horizontal position it has been found that arcs tend to develop between the two connections to the support wires and the filament melts and breaks in these regions. It is thought that this is due to failure of the convection currents within
15 the envelope to provide effective cooling in the region when the lamp is in the horizontal position leading to space charge breakdown and ionisation of the filling gas.

 In Figure 2, which shows a lamp according to the invention, all the equivalent parts have the same
20 reference numbers as in Figure 1. In this lamp there is an extra anchor wire 11 in the rod 8 and there is an extra filament section thus providing an odd number of filament sections so that the connection between the filament 4 and the support wire 7 occurs at the opposite end of the
25 support wire 7 compared to the equivalent connection between the filament 4 and the support wire 6. Having the former connection as remote from the latter connection as possible has been found to eliminate the arcing effect between the two connection regions and the lamp may be
30 used in the horizontal position for substantially longer periods without failure.

 In tests, only about 50% of conventional lamps survived after 10 minutes burning at an angle of 90° to the vertical, whereas lamps according to the invention
35 were lit for 100 hours in the horizontal position without failure. Thus the advantage of the lamp according to the invention may easily be seen.

CLAIMS

1. An electric incandescent filament lamp comprising a sealed envelope (1) a filament (5) having a plurality of closely adjacent filament sections lying substantially in the same plane supported within
5 a framework consisting of a pair of longitudinally extending support wires (6, 7) fixed in position within the envelope at one end, and a pair of insulating bridge members (8, 9) extending between the support wires and carrying a number of anchor wires (11) which engage
10 and support different parts of the filament, characterised in that the filament is composed of an odd number of filament sections such that the connection of one end of the filament to one support wire is remote from the connection of the other end of the filament to the
15 other support wire.
2. An electric incandescent lamp according to Claim 1 which is a halogen cycle studio lamp.

Fig. 1.

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Fig. 2.

