

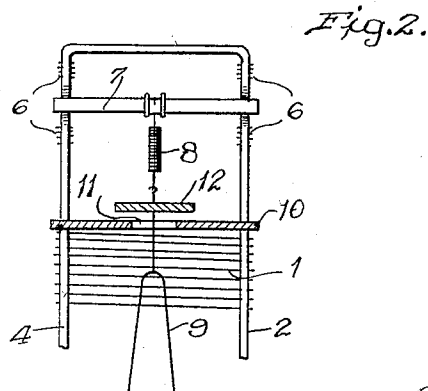
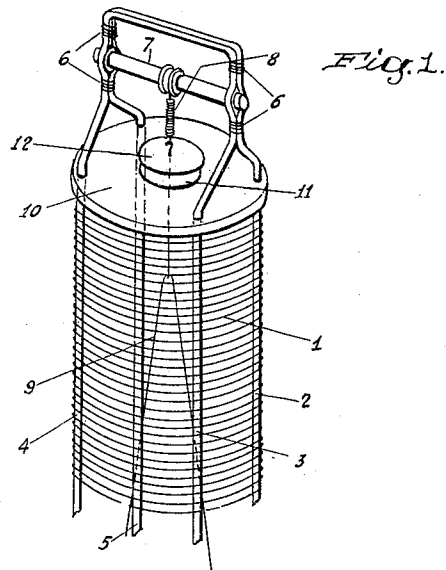
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DISCHARGE TUBE

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DISCHARGE TUBE

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The invention is concerned with electric discharge tubes, more particularly with those comprising an incandescent cathode and a grid provided with supporting wires.

5 The term "supporting wires" is to be understood to include not only thin but also thick wires, the latter being sometimes referred to as "supporting rods".

10 In such discharge tubes the grid supporting wires are often assembled so as to form a rigid unit by being soldered together. This may have certain disadvantages, however, for example, when grid supporting wires consisting of a metal of high melting-point
15 are soldered together with the aid of a metal having a lower melting-point. At the high temperature at which the latter metal is heated during the operation of the tube, occluded gases are set free, the vacuum in the tube being deleteriously affected by these
20 gases. In addition, the soldering metal volatilizes and settles on the wall of the tube, due to which the heat radiation is made difficult.

25 The invention has for its object to provide a sturdy grid construction whereby the said disadvantages are obviated.

According to the invention, in an electric discharge tube comprising an incandescent
30 cathode and a grid with supporting wires, at least two of the said wires consist of a single bent wire. The grid-supporting wires which do not consist of a single wire may be secured at their bent portions to each other
35 with the aid of metal wire. Between the bent portions of the grid supporting wires may be provided an insulating member to which the cathode may be secured, preferably elastically.

40 The invention will be explained more fully with reference to the accompanying drawing, in which Fig. 1 is a perspective view of part of the grid and the cathode of a discharge tube according to the invention and
45 Fig. 2 is a longitudinal section in the plane of the rod 7.

50 In the drawing, a grid 1 is helically wound on supporting wires 2, 3, 4, and 5 made of a metal of high melting-point, for example, molybdenum. The wires 2 and 5 on the one

hand and the wires 3 and 4 on the other hand constitute a single bent wire their bent portions being secured to each other with the aid of metal wires 6, for example, tungsten and being in effect a projecting end of the grid support which extends beyond the upper
55 end of the grid.

Between the bent portions of the grid supporting wires is clamped an insulating rod
60 7 which is in effect mounted on the projecting end of the grid support and which consists, for example, of glass and on which a filamentary cathode 9 is hung by means of a spring 8.

At the top the grid 1 is covered by a metal
65 disc 10, which is secured to the grid supporting wires by reason of the fact that under and above the metal disc these wires are slightly pinched. A small circular plate 12 is secured to the spring 8, being arranged
70 over an aperture 11 of the disc 10 and spaced therefrom. The metal disc 10 and plate 12 prevent escape of electrons from the filament through the top of the grid. For this purpose, the plate 12 may be slightly larger than
75 the aperture 11. The spacing between the disc 10 and the plate 12 permits the heat due to the filament 9 to escape without injuring the filament support.

I claim:

1. In an electron discharge device the combination with a looped filamentary cathode, and a grid surrounding said cathode and comprising support rods and a helix of grid wire on said rods, of a metal disc supported
85 on said rods in position to cover one end of said helix and having a central aperture, an insulating bar mounted on said rods adjacent said disc, a filament support extending through said aperture and secured at one end
90 to said bar, and a metal plate larger than said aperture mounted on said filament support to be over said aperture but spaced away from said disc.

2. In an electron discharge device the combination of a cathode, and a helical cooperating electrode surrounding and coaxial with said cathode and comprising an electrode support with a projecting end which extends beyond one end of said electrode, of a con- 100

ductive disc secured to and covering said end
of said helical electrode and having a central
aperture, an insulator carried by the
projecting end of said electrode support, and
5 a conductive plate larger than said aperture
and mounted on said insulator in registry
with said aperture but spaced away from said
disc.

3. In an electron discharge device the combination with a cathode and a helical grid
10 surrounding and coaxial with said cathode
and having a grid support projecting beyond
one end of said grid, of a metal disc
with a central aperture on said end of said
15 grid, an insulator mounted on said grid support
adjacent said end of said grid, a cathode
support carried on said insulator and projecting
thru the central aperture of said metal disc,
20 and a plate larger than said aperture
mounted on said cathode support adjacent
and spaced away from said metal disc
and in registry with the aperture in said disc.

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