

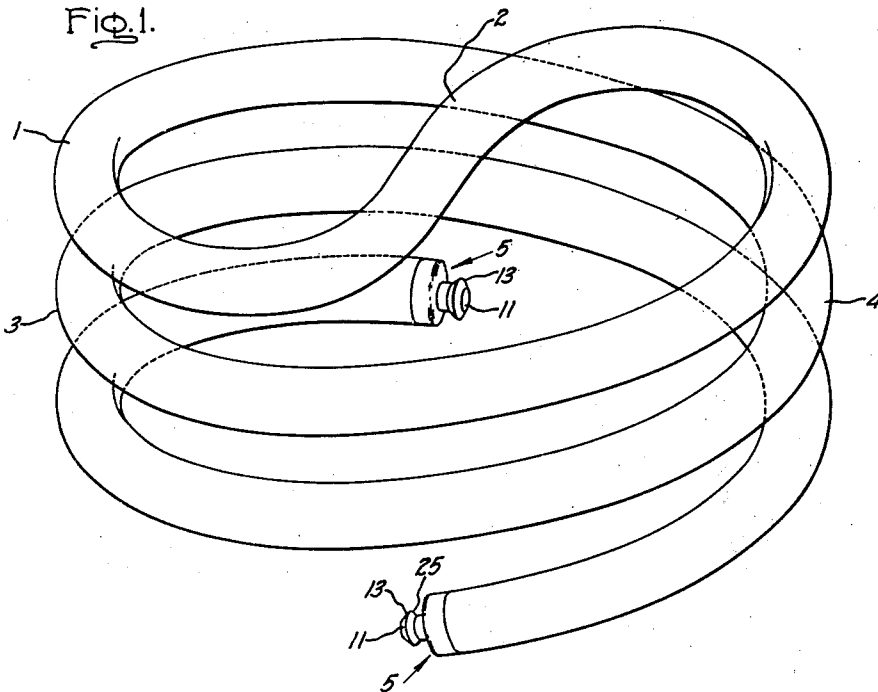
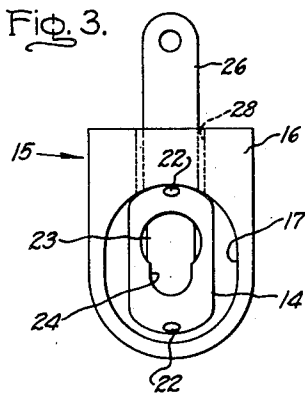
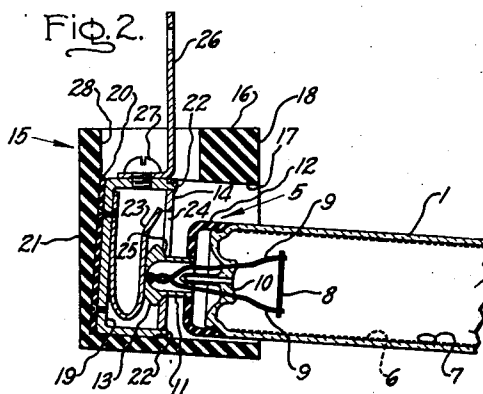
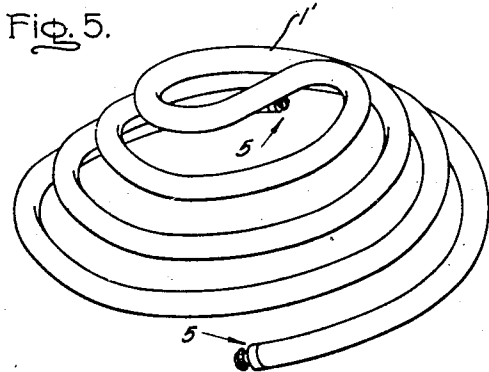
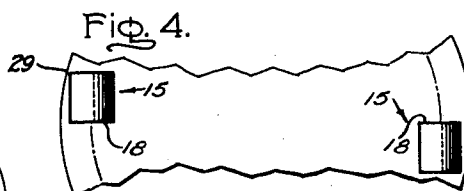
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2,473,878

ELECTRIC LAMP OF DOUBLE SPIRAL CONVOLUTION

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ELECTRIC LAMP OF DOUBLE SPIRAL
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Application November 25, 1947, Serial No. 787,949

3 Claims. (Cl. 240—51.12)

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My invention relates to electric lamps generally, and more particularly to lamps having elongated tubular envelopes. The invention is particularly applicable to electric discharge lamps, especially the now well-known fluorescent lamps having long positive-column discharge paths and having their envelopes coated internally with fluorescent powders.

Such lamps are usually made in straight lengths, although lamps of simple circular shape have recently been made available. Other shapes, such as grids, spirals, etc., have been proposed but have not been manufactured commercially to any appreciable extent because of the difficulty and expense of manufacture. However, there are definite fields of use for such compact lamps, and it is therefore an object of my invention to make available a compact lamp of novel configuration. Another object is to provide a compact lamp of a configuration adapting it to manufacture on a mass production basis. Another object is to provide a compact lamp which is easily installed and which does not require a complicated fixture for its support.

Other objects and advantages of my invention will appear from the following description of species thereof and from the drawing.

In the drawing, Fig. 1 is a perspective view of an electric lamp comprising my invention; Fig. 2 is an elevation, in cross-section, of one end of the lamp and a suitable socket therefor; Fig. 3 is a front end view of the socket; Fig. 4 is a somewhat diagrammatic plan view of a fixture showing the arrangement of the sockets; and Fig. 5 is a perspective view of a lamp of modified configuration.

Referring to Fig. 1, the lamp comprising my invention has an elongated tubular glass envelope 1 which is formed to a bifilarly coiled, or double helical, configuration wherein the mid-portion 2 of the envelope extends laterally across one end of the helix and the alternate turns 3 and 4 are coiled in the same direction. In the preferred form illustrated in the drawing the ends of the helix extend substantially tangentially of the coil and terminate in bases 5, 5 at diametrically opposite sides of the coil and substantially in a common plane normal to the longitudinal axis of the coil. The helix may be formed by coiling the heated glass tubing around a suitable drum as fully described and claimed in my copending application Serial No. 787,948, filed of even date herewith.

The lamp illustrated in Figs. 1 and 2 is of the fluorescent type wherein the envelope 1 is coated

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on its inner surface with fluorescent powder 6 and contains a filling of gas such as argon, neon, krypton, etc., and a small quantity of mercury 7 which, during operation of the lamp, furnishes a mercury vapor atmosphere of low pressure such as approximately 10 microns. The mercury vapor discharge emits ultraviolet radiations which excite the phosphor coating 6 to luminescence. Although any type of electrodes may be employed, I have illustrated the thermionic, activated type which may comprise a coiled filament 8, preferably of tungsten wire coated with electron emissive oxides of alkaline earth metals. The electrode 8 at each end of the lamp is mounted on lead-in wires 9, 9 which extend exteriorly of the envelope 1 through a conventional stem 10. The leads 10 are preferably twisted together and connected, as by solder, to a pin 11 projecting axially outward from the insulating shell 12 of the base 5. It will be obvious that, when desired, each base 5 is provided with two pins or prongs, the leads 9 in that case being separated and connected to individual pins.

The base pins 11 are in this case of "collar button" design, being provided with an enlarged head portion 13 and engaging keyhole type contacts 14 in the sockets 15. It will be noted that the lamp, as shown in Fig. 2, is mounted in an inverted position from that shown in Fig. 1 so as to be suspended from the sockets 15.

Each of the sockets 15 comprises a body portion or housing 16 of suitable insulating material, such as a molded synthetic resin, having a longitudinally extending oval cavity 17 therein. The cavity 17 has its axis at a small angle to the front face 18 of the socket, the said angle corresponding with the pitch angle of the turns of the helically coiled lamp. The contact 14 is supported in said cavity by a U-shaped bracket 19 which is attached to an insulating disc 20 of substantially the same shape and size as cavity 17, the said disc being, in turn, secured to the rear wall 21 of the housing 16. The contact 14 is secured to bracket 19 by integral lugs or pins 22 projecting from the leg portions of said bracket and peened or riveted in apertures in said contact 14. The contact portion of the socket also includes a U-shaped spring member 23 having one leg portion secured to the bracket 19, and having its free leg portion located behind the keyhole aperture 24 in contact 14. The edge of the smaller, lower portion of the keyhole slot 24 is chamfered or bevelled rearwardly (Fig. 2) to provide a seat for the bevelled or sloping under-side 25 of the pin head 13. The socket

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may be mounted by means of an L-shaped contact prong 26 which is secured to bracket 19 by screw 27 and extends upwardly through a slot or aperture 28 communicating with the cavity 17.

As shown in Fig. 4, the sockets 15 are spaced apart on a suitable mounting support 29 with their open forward ends 18 substantially in a common plane and facing in opposite directions. The lamp is mounted in the sockets by presenting its bases 5, 5 to the sockets and then rotating the lamp a slight amount so that the pins 13 enter the cavity and pass through the enlarged upper ends of the keyhole slots 24 against the springs 23 whereupon the lamp is moved downward slightly so that the necks of the pins 13 drop into the constricted lower ends of the slots 24, thereby locking the lamp in place.

The lamp 1' shown in Fig. 5 is similar to that shown in Fig. 1 except that it is coiled in the form of a conical double helix rather than the cylindrical double helix of Fig. 1.

It will be apparent that the configuration of the lamps in accordance with my invention provides a compact light source while retaining the high efficiency of the long positive-column discharge path. In one advantageous form, for example, a lamp of one inch diameter tubing and eight feet long is coiled into a double helix of twelve inch diameter.

What I claim as new and desired to secure by Letters Patent of the United States is:

1. An elongated tubular electric lamp of bifilarly coiled configuration, having its ends extending substantially tangentially of the coil and terminating at diametrically opposite sides of the coil substantially in a common plane normal to the longitudinal axis of the coil with said ends facing in opposite directions, and bases on said ends having socket engagement means thereon.

2. An elongated tubular electric lamp of bifilarly coiled configuration, having its ends extending substantially tangentially of the coil and terminating at diametrically opposite sides of the

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coil substantially in a common plane normal to the longitudinal axis of the coil with said ends facing in opposite directions, and bases on said ends having socket engagement pins with enlarged outer ends and projecting endwise therefrom.

3. In combination, an elongated tubular electric lamp of bifilarly coiled configuration, having its ends extending substantially tangentially of the coil and terminating at diametrically opposite sides of the coil substantially in a common plane normal to the longitudinal axis of the coil with said ends facing in opposite directions, and bases on said ends having socket engagement means projecting endwise therefrom, and mounting means including a pair of sockets each comprising a housing having in its front face an opening for receiving a lamp base, said sockets being disposed with their faces substantially in a common plane and facing in opposite directions and being spaced apart to receive the lamp bases upon presentation of said bases before the openings in said sockets followed by a slight rotation of the lamp about its axis.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
702,314	Moore	June 10, 1902
1,870,147	Smally	Aug. 2, 1932
1,926,552	Morgan	Sept. 12, 1933
2,117,756	Douglas	May 17, 1938
2,267,318	Aicher	Dec. 23, 1941
2,392,661	Greiner	Jan. 8, 1946

FOREIGN PATENTS

Number	Country	Date
268,046	Great Britain	Mar. 28, 1927
513,715	Great Britain	Oct. 19, 1939