

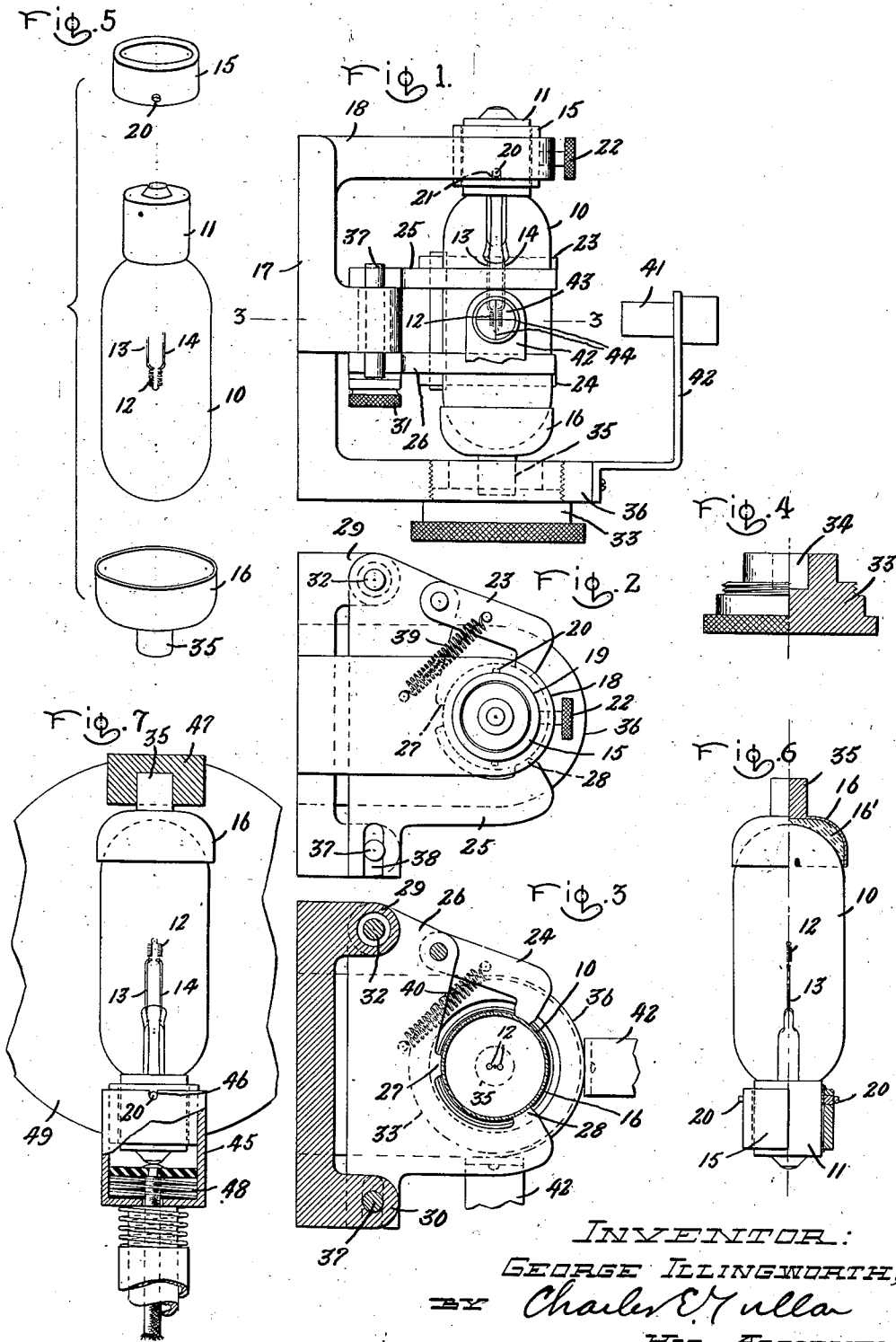
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G. ILLINGWORTH

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PRECISION ELECTRIC LAMP AND METHOD OF MANUFACTURING THEREOF

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INVENTOR:
GEORGE ILLINGWORTH
BY *Charles E. Mulla*
HIS ATTORNEY

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PRECISION ELECTRIC LAMP AND METHOD
OF MANUFACTURING THEREOFGeorge Illingworth, East Cleveland, Ohio, as-
signor to General Electric Company, a corpo-
ration of New York

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My invention relates to electric lamps and more specifically to such lamps in which the light source is definitely located with reference to the base or other portion of the lamp which serves to locate the lamp in a projection device. My invention also comprises a method of manufacture of such lamps. A salient feature of my invention is the provision of a cap located at the tip end of the lamp which serves to more definitely locate the lamp in the projection device. The method of simultaneously locating the light source with reference to the base and cap is also a feature of my invention. Other features and advantages will appear from the following description and from the accompanying drawing.

In the drawing Fig. 1 is a side elevation of an apparatus for adjusting a lamp so that its filament bears a definite relation with respect to end members later united to the said lamp; Fig. 2 is a top plan view thereof; Fig. 3 is a horizontal section along the line 3—3 of Fig. 1; Fig. 4 is an elevation partially in section of a gauging cup; Fig. 5 is a perspective of the lamp and parts to be assembled thereon; Fig. 6 is an elevation partially in section of the assembled lamp; and Fig. 7 shows the lamp and associated sockets ready for use.

Referring now to the drawing and more particularly to Fig. 5, the lamp shown comprises a tubular bulb 10, a plain cylindrical base 11 without the usual threads or pins, and a concentrated filament 12 preferably of closely coiled tungsten wire, electrically connected to the said base through the customary lead and support wires 13 and 14 respectively. There is also shown a pair of supplemental bases 15 and 16. The base 15 is in the form of a ring and is placed over the regular base 11. The base 16 is in the form of a cap and is placed over the opposite end of the lamp bulb. For accurate assembling of the lamp and supplemental bases, I provide an apparatus such as shown in Figs. 1 to 4 inclusive. This comprises a standard 17 having at its upper end a horizontal arm 18 having an aperture 19 formed therein for receiving the base or ring 15. The ring 15 is definitely positioned in the aperture 19 through its projecting pins 20 which ride in the slots 21 and is held by the thumb screw 22. The incandescent lamp is next placed in the apparatus so that its base 11 extends through the ring 15. A pair of spring pressed jaws 23 and 24 pivotally mounted on the upper and lower plates 25 and 26 contact with the bulb 10 of the said lamp and frictionally hold it against the lugs 27 and 28 extending from the said plates. The plates are

adjustably mounted on the intermediate projections 29 and 30 forming part of the standard 17 and held in the desired position through the clamp 31 which is threaded on the end of the pin 32 carried by the said plates.

The supplemental base or cap 16 is next placed in a gauge 33 having an opening 34 to receive the projecting pin 35 carried by the said cap after which the gauge is screwed or otherwise placed in the base 36 of the standard 17. The apparatus is designed so that the ring 15, and cap 16 when assembled as shown in Fig. 1 are in accurate axial alignment with each other.

After the lamp and supplemental bases have been properly assembled as shown in Fig. 1, the lamp bulb may be moved in a vertical or a horizontal plane so as to definitely locate the filament 12 with respect to the said bases simultaneously. By loosening the clamp 31 the plates 25 and 26 which form a carriage for the lamp may be moved in a horizontal plane being accurately guided in their travel by the fixed pin 37 which extends through the slots 38 formed in the said plates. The clamp 31 is then tightened so as to hold the plates in the adjusted position. The lamp bulb may be moved in a vertical plane by simply raising it up or down through the jaws 23 and 24 which frictionally hold in any placed position through the springs 39 and 40 attached to the said jaws and the plates 25 and 26 respectively.

In order to determine when the filament 12 is accurately located with respect to the supplemental bases 15 and 16, I have provided suitable optical means comprising in combination a lens and a ground glass screen mounted in finders 41 supported by brackets 42 carried by the base 36 of the apparatus. The ground glass screens 43 are provided with cross hairs 44. The finders 41 are so located and adjusted that when the filament 12 is in the proper position with relation to the supplemental bases 15 and 16, its image on each screen will lie at the intersection of the cross hairs. The finders 41 are preferably disposed 90° apart. After the adjustment of the lamp is completed the ring 15 is united by means of solder to the base 11 and the cap 16 is united to the bulb 10 by means of any suitable adhesive such as cement 16'.

In Fig. 7 the completed lamp is shown mounted in a projection apparatus comprising a lower socket 45 having oppositely disposed slots 46 for the reception of the supplemental base pins 20. An upper socket 47 definitely located with respect to the lower socket is provided for receiving the projecting pin 35 of the cap 16, the lamp being

securely held in position by means of a spring 48 housed in the lower socket 45. With the sockets definitely located with respect to each other and to the reflector, the lamp filament assumes the proper position with respect to the reflector upon insertion without further adjustment.

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

1. An electric lamp for light projection comprising a bulb, a concentrated light source mounted therein, leading-in conductors for said light source sealed in one end only of the said bulb, a base united to said end of the bulb and having lateral projections located a fixed predetermined distance from said light source, and a cap united to the opposite end of said bulb and comprising a longitudinally extending projection from said lamp definitely and accurately disposed with respect to the axis of the said bulb and light source.
2. An electric lamp for light projection comprising a bulb, a filament mounted therein, leading-in conductors for said filament sealed in one end only of the said bulb, a base united to said end of the bulb and having lateral projections located a fixed predetermined distance from said filament, and a cap united to the opposite end of said bulb and comprising a longitudinally extending projection from said lamp definitely and accurately disposed with respect to the axis of the said bulb and filament.
3. In a projection apparatus, the combination of a reflector, a pair of aligned sockets definitely located with respect to each other and with respect to said reflector mounted in front of the said reflector and an electric lamp comprising a bulb, a concentrated light source mounted therein, leading-in conductors sealed into one end only

of said bulb, a base united to said end and having lateral projections therefrom located a fixed predetermined distance from said light source and engaging slots in one of said sockets, and a cap united to the opposite end of said bulb and comprising a projection definitely and accurately disposed with respect to the axis of said bulb and light source and engaging a depression in the other of said sockets.

4. An electric lamp for light projection comprising a bulb, a concentrated light source mounted therein, leading-in conductors sealed into one end of said bulb, the opposite end of said bulb being free from leading-in conductors, a base united to the first-mentioned end of said bulb and connected to the said leading-in conductors, and a cap united to the opposite end of said bulb and comprising an aligning member having a definite relation to the longitudinal axis of said light source, said base being provided with locating members positioned a fixed predetermined distance from said light source.

5. An electric lamp comprising a bulb, a concentrated light source mounted therein, leading-in conductors for said light source sealed in the said bulb, a cylindrical base united to one end of said bulb, a supplemental base comprising a ring surrounding said cylindrical base and having a pair of laterally extending pins mounted thereon, said ring being mounted on said cylindrical base so that said pins are a definite predetermined distance from said light source, and a cap united to the opposite end of said bulb and comprising a longitudinally extending projection from said lamp definitely and accurately disposed with respect to the axis of said bulb and light source.

GEORGE ILLINGWORTH.