

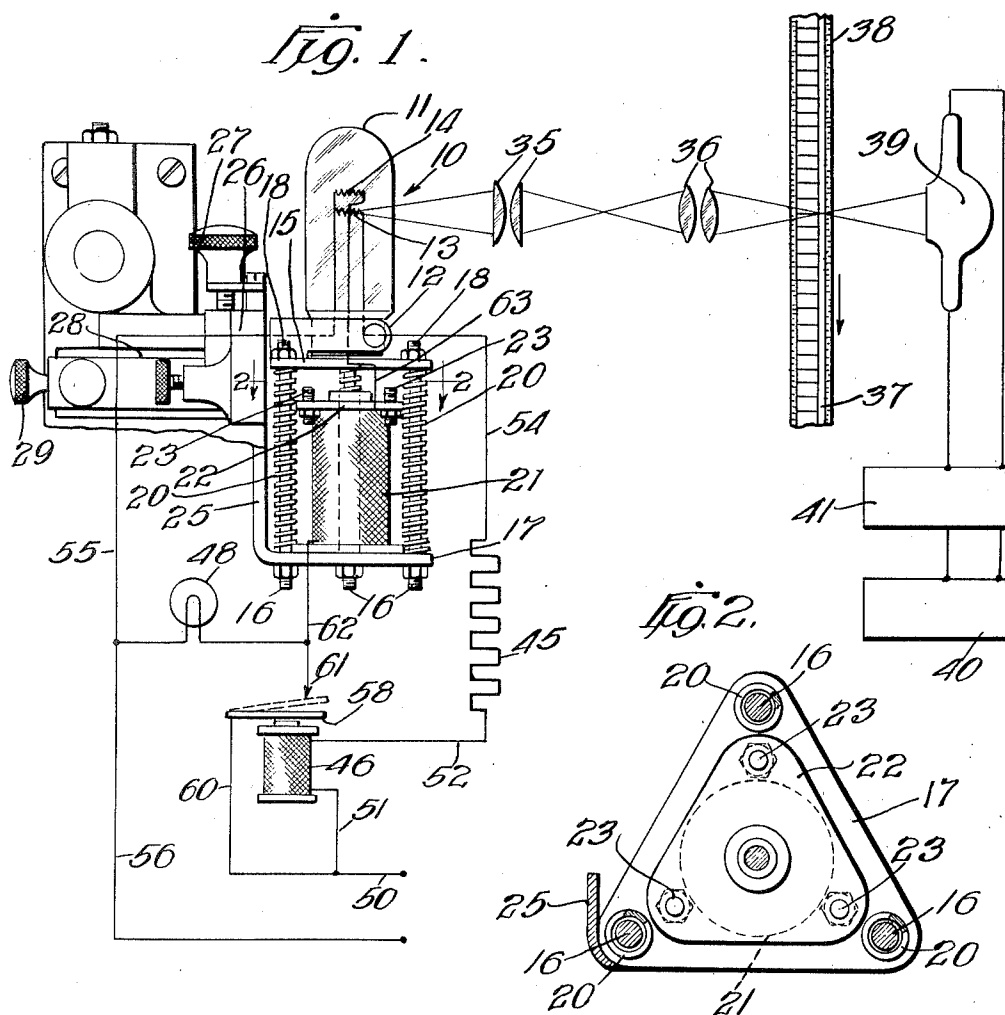
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INCANDESCENT LAMP

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INCANDESCENT LAMP

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This invention relates to incandescent lamps, and more particularly to a lamp unit for picture projecting apparatus.

In the production of cinematographic programs, it sometimes occurs that the source of light for the projector fails and there results an interruption in the continuity of the performance until the burned-out lamp can be manually removed from its socket and replaced by a new one. In the case of pictures accompanied with sound, any interruption in the sound reproduction accompanying a pictorial record of events is especially disconcerting to an audience and is to be avoided.

The principal object of the present invention is to provide an incandescent lamp unit responsive automatically to predetermined conditions for insuring a continuous operation thereof.

One embodiment of the invention contemplates the provision of a lamp unit, particularly for use with sound picture projectors, wherein an auxiliary filament, preferably of the ribbon type, is rendered effective upon the failure of the main filament also of the ribbon type, whereupon a relay in series with the main filament releases to establish an energizing circuit to operate an electromagnet for changing the position of the lamp to focus properly the auxiliary filament. A warning lamp also is lighted when the main filament burns out to indicate the actual condition to the operator.

It is believed that a clear understanding of the invention can be had from the following description when taken in conjunction with the accompanying drawing, in which—

Fig. 1 is a schematic view of one embodiment of the invention showing the lamp unit associated with a sound projector system, and

Fig. 2 is a horizontal sectional view taken on line 2—2 of Fig. 1, disclosing the lamp supporting structure.

Referring now to the drawings wherein like reference numerals designate similar parts throughout the several views, the numeral 10 designates a lamp unit comprising an incandescent lamp 11 suitably mounted in a socket 12 and having a main and auxiliary

filament 13 and 14, respectively, preferably of the ribbon type to prevent sagging. The socket 12 is secured to a metallic plate 15, composed of any suitable magnetic material, which is slidably mounted on three rods 16—16 spaced one hundred and twenty degrees apart, the lower ends of the rods being threaded into a bracket 17. Surrounding the rods 16 and interposed between the plate 15 and the bracket 17 are coil springs 20—20 for maintaining the plate 15 and lamp 11 in their uppermost position, as controlled by adjusting nuts 18—18 threaded on the upper ends of the rods 16. Mounted centrally of the bracket 17 is an electromagnet 21, the upper spool head 22 of which is provided with adjustable screws 23—23 for regulating the distance through which the plate 15 will be permitted to travel downward.

The bracket 17 is provided with an upwardly extending portion 25 slidably mounted in a guide 26 having a screw 27, so that by turning this screw the bracket can be moved vertically. The guide 26 in turn is slidably mounted in another guide 28 having an adjustable screw 29 for moving the bracket in a horizontal direction. Thus, the lamp is provided with an adjustable feature to permit the main filament to be properly focused in projecting a beam of light through condensing lenses 35—35, objective lenses 36—36, and through a striated sound track 37 of varying density at one side of a picture film 38 whereby the narrow light beam of high intensity is caused to fall upon a photoelectric cell 39 which is electrically connected to a sound reproducer unit 40 through a thermionic vacuum tube amplifier 41.

The main filament 13 of the lamp 11 is connected in series with a non-inductive resistance 45 and the winding of a low resistance relay 46, so that upon failure of the main filament, the winding of the relay 46 is deenergized to establish operating circuits for the auxiliary filament 14, a warning lamp 48, and the electromagnet 21 to attract the metallic plate 15 against the compression of the springs 20—20 thus to bring the light producing auxiliary filament into focus with the lenses and the striated sound track 37 of the

film 38. In order that the main and auxiliary filaments will have the same intensity of illumination, the non-inductive resistance 45 is adjusted to such a value that the total resistance of each of the operating circuits for the filaments is equal to each other.

In the operation of the apparatus, the main filament 13 of the lamp 11 is connected to any suitable source of electrical power (not shown) through conductors 50—51, the winding of the relay 46, conductor 52, non-inductive resistance 45, conductor 54, main filament 13, conductor 55, and conductor 56. The incandescent filament 13 is then focused by means of the adjusting screws 27 and 29 until a narrow beam of light of high intensity passes through the sound track 37 in the film 38 into the photoelectric cell 39. Upon intermittently moving the film in front of the photoelectric cell at desired speeds by any suitable mechanism (not shown), the varying density of the striated sound track interposed between the exciting lamp 11 and the photoelectric cell causes variations in the intensity of the light beam passing into the photoelectric cell thereby to vary its resistance.

The character of the photoelectric cell is such that when it is polarized by a proper voltage from the amplifier unit 41, the current through the photoelectric cell is proportional to the incident light in the striated sound track. This variable current produced by the incident light is received and amplified by the amplifier unit 41 for the sound reproducer unit 40 where the current is transformed into sound.

If, during the performance, the main filament burns out, its operating circuit, hereinbefore described, is simultaneously opened, and the winding of the relay 46 is deenergized to release a contact spring 58 of the relay 46. The release of this spring establishes an operating circuit for the electromagnet 21 and the auxiliary filament 14 from the source of electrical energy (not shown), through conductor 50, conductor 60, contact spring 58, conductors 61—62, the winding of the electromagnet 21, conductor 63, auxiliary filament 14, and conductors 55—56 to the source of electrical energy. Energization of the electromagnet 21 effects the attraction of the plate 15 to compress the springs 20 and move the plate into engagement with the adjustable screws 23, whereby the now incandescent, auxiliary filament 14 is brought into position to focus a beam of light upon the film without any interruption in the performance. Simultaneously with the movement of the auxiliary filament into position, an operating circuit for the warning lamp 48 is established from the source of electrical energy through conductor 50, conductor 60, contact spring 58, conductor 61, the filament of the lamp 48, and conductor 56 to the source of electrical energy. Lamp 48 is thus operated to signal the

operator that the auxiliary filament of the lamp 11 is in operation so that, if necessary, the operator may make more minute adjustments with the screws 27 and 29 better to focus the beam of light upon the film.

Although the invention as herein described and illustrated is particularly well adapted for use with the production of sound pictures, it will be understood that the invention is capable of many other modifications and applications without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. In an incandescent lamp unit, a lamp having a main filament, an auxiliary filament therefor, and means responsive to the failure of the main filament for automatically and simultaneously focusing and rendering the auxiliary filament effective.

2. In a projecting apparatus, an incandescent lamp having a plurality of independent filaments offset from each other, and an electromagnetic means responsive to the failure of one of the filaments for automatically focusing another of the filaments and simultaneously rendering the other filament effective.

3. In a projecting apparatus, an electric lamp having a main filament, an auxiliary filament spaced vertically therefrom, an electromagnetic means responsive to the failure of one of the filaments for automatically focusing the auxiliary filament and simultaneously rendering the other filament effective.

4. In a projecting apparatus, an incandescent lamp having a main filament, an auxiliary filament therefor, means for maintaining the main filament in a predetermined focusing position, and means responsive to a failure of the main filament for rendering the main filament maintaining means ineffective and for simultaneously therewith automatically moving the lamp to bring the auxiliary filament into focusing position.

5. In a projecting apparatus, an incandescent lamp having a main filament, an auxiliary filament therefor, resilient means for retaining the main filament in a predetermined focusing position, and electromagnetic means for overcoming the resilient means and for automatically moving the lamp to bring the auxiliary filament into focusing position upon failure of the main filament.

6. In a projecting apparatus, an incandescent lamp having a main filament, an auxiliary filament therefor, an electromagnetic means for automatically moving the lamp to bring the auxiliary filament into a focusing position, and adjustable means operatively associated with the electromagnetic means for regulating the travel of the lamp.

7. In a projecting apparatus, a main filament, an auxiliary filament, means respon-

sive upon a predetermined condition for automatically focusing and rendering the auxiliary filament effective, and means effective when said main filament is operative for insuring the same intensity of illumination as when said auxiliary filament is energized.

8. In a projecting apparatus, an incandescent lamp having a main filament, an auxiliary filament therefor, a magnetic member for supporting the lamp, means for positioning the main filament in a predetermined focusing position, an electromagnet, means for effecting the energization of the electromagnet upon failure of the main filament to move the magnetic member and the lamp to bring the auxiliary filament into a focusing position, means effective when said main filament is operative for insuring the same intensity of illumination as when said auxiliary filament is energized, and adjustable means for governing the movement of the lamp.

9. In a projecting apparatus, an incandescent lamp having a plurality of independent filaments offset from each other, a bracket, resilient means disposed upon said bracket for supporting said lamp, and electromagnetic means disposed upon said bracket and operatively connected to said resilient means for moving said lamp when one of said filaments becomes ineffective whereby another of said filaments may be made effective.

10. In a projecting apparatus, an incandescent lamp having a plurality of independent filaments offset from each other, a bracket, resilient means disposed upon said bracket for supporting said lamp, electromagnetic means disposed upon said bracket and operatively connected to said resilient means for moving said lamp when one of said filaments becomes ineffective whereby another of said filaments may be made effective, and means for varying the movement of said lamp.

11. In a projecting apparatus, an incandescent lamp having a plurality of independent filaments offset from each other, a bracket, resilient means disposed upon said bracket for supporting said lamp, electromagnetic means disposed upon said bracket and operatively connected to said resilient means for moving said lamp when one of said filaments becomes ineffective whereby another of said filaments may be made effective, and means for adjustably supporting said bracket whereby said bracket and said lamp may be moved independent of the movement imparted to said lamp by said electromagnetic means.

12. In an incandescent lamp unit, a main source of light, an auxiliary source of light, means responsive to the main source of light for rendering said auxiliary source of light effective, and means actuated simultaneously with the rendering of said auxiliary source of light effective for moving said latter light

source into the same focal plane as the main source of light.

13. In an incandescent lamp unit, a main source of light, an auxiliary source of light, means responsive to the main source of light for rendering said auxiliary source of light effective, and an electromagnetic device energized when said auxiliary source of light is effective for moving said latter light source into the same focal plane as the main source of light.

14. In an incandescent lamp unit, a main source of light, an auxiliary source of light, means responsive to the main source of light for rendering said auxiliary source of light effective, and means operated simultaneously with the rendering of said auxiliary source of light effective for moving it vertically into the same focal plane as the main source of light.

15. In a projecting apparatus, an incandescent lamp having a plurality of independent filaments offset from each other in the same vertical plane, and means responsive upon a failure of one of the filaments to render automatically and simultaneously the other filament effective and move the lamp vertically to have the then effective filaments in the focal plane of the projecting apparatus.

16. In a projecting apparatus, a lamp unit including two filaments, means responsive upon a failure of one of the filaments to render the other filament effective and simultaneously therewith bring said effective filament in the focal plane of the other filament, and means operated when said second filament is rendered effective for indicating the condition of the first filament.

In witness whereof, I hereunto subscribe my name this 22nd day of March, A. D. 1929.

ERNEST GLEN RAMSEY.