Oct. 26, 1926.

H. C. RENTSCHLER

1,604,134

MOVING PICTURE LAMP

Filed Feb. 14, 1921

Fig. 1.

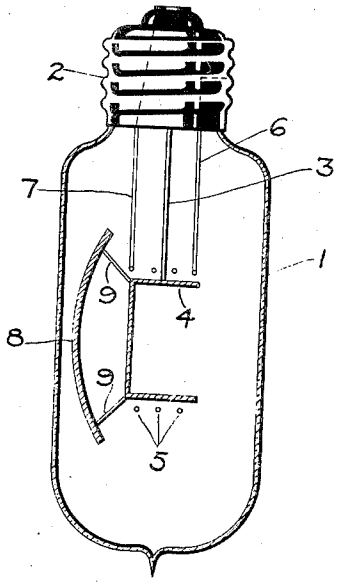


Fig. 2.

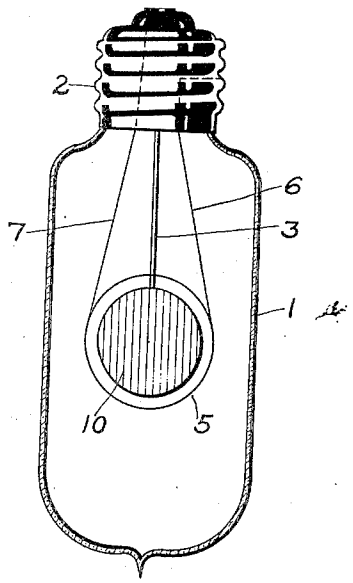


Fig. 3.

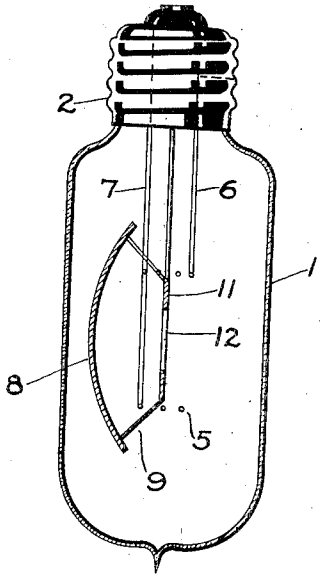
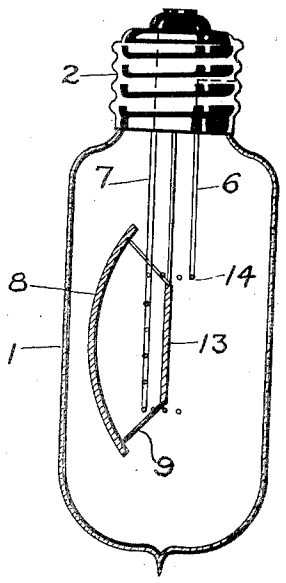


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HARVEY C. RENTSCHLER, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE LAMP COMPANY, A CORPORATION OF PENNSYLVANIA.

MOVING-PICTURE LAMP.

Application filed February 14, 1921. Serial No. 444,842.

This invention relates to incandescent lamps, more especially to lamps adapted for use in concentrating light upon an object, such as in motion-picture projectors, searchlights and the like.

Hitherto, in lamps of this character, it was customary to form a filament of great length, wind the same and so arrange it as to form a relatively large number of coils in a relatively small space. Generally, two sets of series-connected coils were utilized, one being placed behind the other and out of line therewith so that the second set of coils filled the interstices between the elements of the first set in order that the light might be as uniform as possible. A complex arrangement for supporting the coils to avoid their disalignment was generally provided. This arrangement was necessary also to prevent breaking or distortion of the various elements of the filament.

The light projected from such a filament upon a moving picture screen through the film, if the light was focused upon the film by the condenser lens, caused a reversed image of the filament to appear on the screen. In order to avoid this, the source of light was generally placed out of focus with the film, thus preventing the image of the filament from appearing on the screen but resulting in a materially decreased efficiency because of the light source being out of focus.

My invention is designed to obviate these defects, it being among the objects thereof to devise an incandescent lamp which is simple in construction, is capable of emitting light of great intensity and may be focused to give the maximum efficiency of illumination without any danger of an image of a filament appearing on the screen or other object being illuminated.

In practising my invention, I provide a lamp bulb with a coil, the terminals of which are secured to terminals in the socket of the lamp. A disk or other suitably shaped member is placed within the coil and closely spaced, but insulated, therefrom. High-frequency current is passed through the coil which constitutes a primary circuit, the flow of current therethrough inducing secondary currents in the disk or other member therewithin, thereby converting a large part of the energy into light of great intensity.

If desired, I may place a reflector behind the secondary, either within or outside of the bulb, in order to reflect the energy radiated from the back of the disk upon the disk and thus increase the efficiency of the bulb. The light from the disk is uniform and may be concentrated to a focus without showing any image upon the object illuminated. The construction is comparatively simple, and the light-emitting member does not require complicated supporting apparatus.

In the accompanying drawings forming a part hereof and which illustrate several embodiments of my invention,

Fig. 1 is a vertical sectional view of a lamp made in accordance with my invention;

Fig. 2 is a front elevational view of another embodiment of my invention;

Fig. 3 is a view similar to Fig. 1 showing a slightly modified form of lamp, and

Fig. 4 a similar view showing a still further modification of my invention.

I provide a lamp bulb 1 of any suitable form but generally cylindrical having a base 2 thereon. Projecting from the base 2, and electrically insulated therefrom, is a support 3 carrying a metallic member 4 of cup-shape the open end of which faces in the direction of the object to be illuminated. A coil 5, the leads 6 and 7 of which are connected to their respective terminals in the base 2, is disposed around the member 4 in close proximity thereto. I may provide a reflector 8 behind the cup 4, if desired. A supporting structure for the reflector 8, as here shown, comprises a spider 9 secured to the reflector and to the cup 4.

In illuminating a moving picture film, for instance, the light emitted from the open end of the cup 4 is substantially black-body radiation and uniform throughout. It is apparent, therefore, that I have provided a structure which not only provides uniform illumination but one which gives maximum efficiency in that a large proportion of the light developed in the lamp may be concentrated upon the object being illuminated.

Various modifications of my invention are possible, some of which are illustrated herein. In Fig. 2 is shown a structure comprising the bulb 1 with its base 2 in which the illuminating member consists of a disk 10 placed within, and closely spaced from, the coil 5. In this modification of my invention, no reflector is used. The embodiment shown in Fig. 3 includes a disk 11 placed

within the coil 5, there being an opening 12 in the central portion of the disk. The reflector 8 may be placed behind the disk so constructed that it focuses the light from the rear side of the disk and from the coil in the opening 12, thus producing, apparently, uniform radiation from the entire surface of the disk.

In the embodiment shown in Fig. 4, is illustrated a disk 13 within a coil 14 of cup shape, that portion of the coil lying behind disk 13 being parallel thereto. The light projected from the front of disk 13 is focused on the film, and the reflector 8 is so arranged that it focuses the energy developed on the rear of the disk. I generally utilize a base for my lamp in which the terminals may be spaced about 3/8 of an inch apart since the high-frequency current would jump between the electrodes of the ordinary base in which the terminals are normally spaced a somewhat shorter distance apart.

Many other modifications of my invention may be made and I do not limit myself to the embodiments shown herein, they being shown merely for illustrative purposes.

I claim as my invention:

1. An incandescent lamp comprising an envelope containing a conductive body, a coil within said envelope having relatively few turns adapted to carry high frequency currents, said coil having its turns disposed so as to prevent their being overheated by induction and being closely coupled to said conductive body to heat the same by high frequency induction currents.

2. An incandescent electric lamp comprising an envelope containing a conductive body, a single layer coil within said envelope having relatively few turns and adapted to carry high frequency current, said coil being disposed about said conductive body in closely spaced relation whereby to heat the same by high frequency induction.

3. An incandescent electric lamp adapted for projection purposes comprising an envelope containing a metallic plate, a coil within said envelope having relatively few turns adapted to carry high frequency currents, said coil having its turns disposed so as to prevent their being excessively heated by induction and being disposed about said plate and closely coupled therewith whereby said plate will be heated to incandescence by high frequency induction.

4. An incandescent electric lamp comprising an envelope containing a perforated conducting disk, a coil within said envelope having relatively few turns and adapted to carry high frequency currents, said coil being closely coupled to said disk to heat the same by high frequency induction and a reflector disposed to one side of said disk to reflect the light from the disk through a perforation therein.

In testimony whereof, I have hereunto subscribed my name this 10th day of February 1921.

HARVEY C. RENTSCHLER.