Sept. 2, 1924. 1,507,095

T. F. UHLEMANN

LAMP FOR PROJECTING APPARATUS

Original Filed July 2, 1920 2 Sheets-Sheet 1

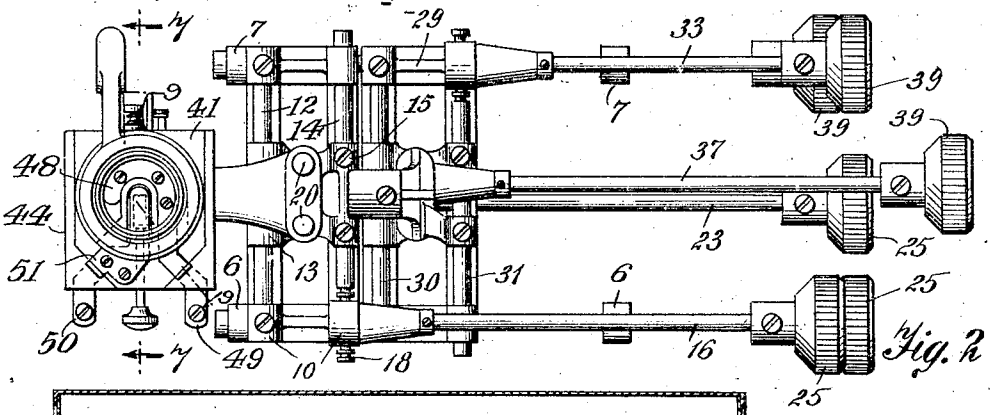


Fig. 2

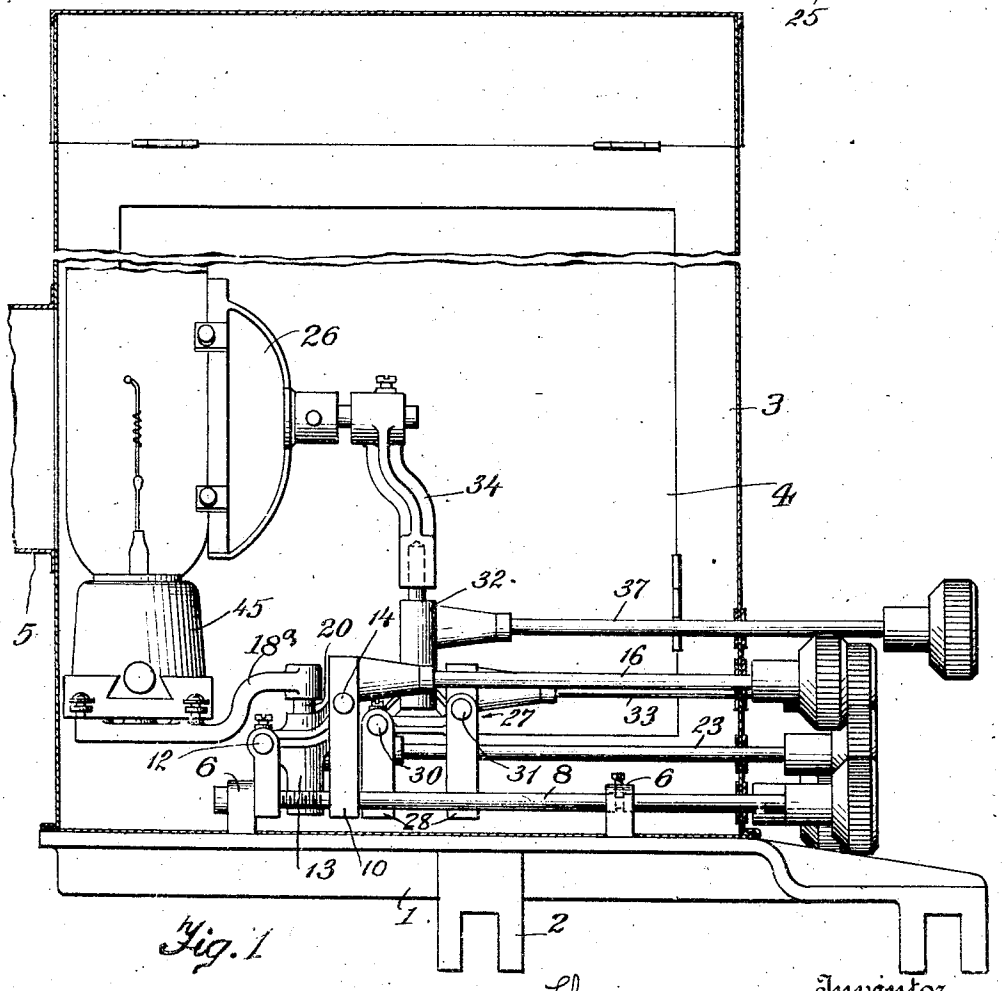


Fig. 1

Inventor
Theodore F. Uhlemann
By his Attorney
W. B. Morton

Sept. 2, 1924. 1,507,095

T. F. UHLEMANN

LAMP FOR PROJECTING APPARATUS

Original Filed July 2, 1920 2 Sheets-Sheet 2

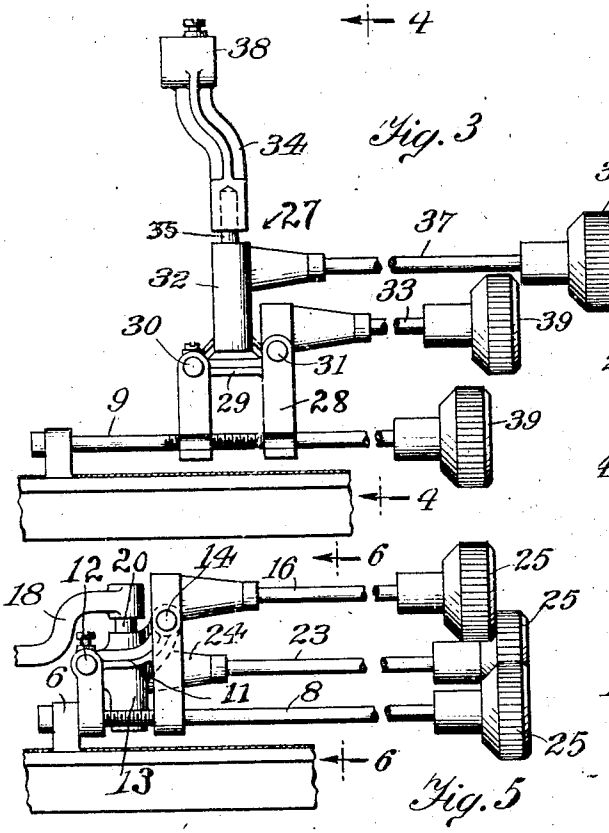


Fig. 3

Fig. 5

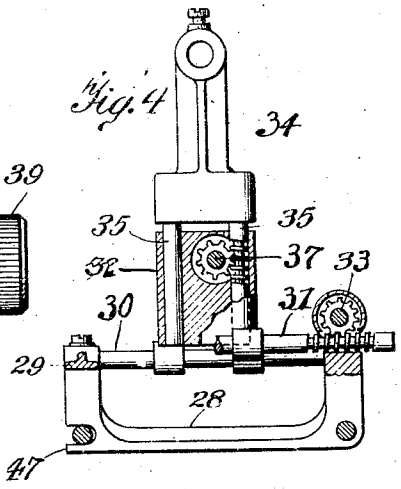


Fig. 4

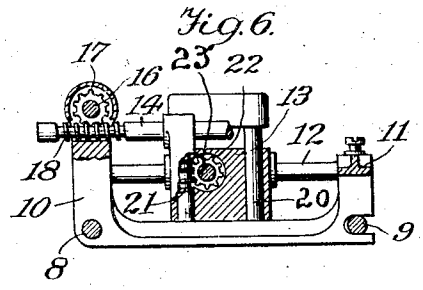


Fig. 6

Inventor
Theodore F. Uhlemann
By his Attorney
W. B. Morton

Patented Sept. 2, 1924. 1,507,095

UNITED STATES PATENT OFFICE.

THEODORE F. UHLEMANN, OF GLEN MORRIS, NEW YORK, ASSIGNOR TO NICHOLAS POWER COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

LAMP FOR PROJECTING APPARATUS.

Application filed July 2, 1920, Serial No. 393,602. Renewed January 19, 1924.

To all whom it may concern:

Be it known that I, THEODORE F. UHLEMANN, a citizen of the United States, and a resident of Glen Morris, Queens County, Long Island, New York, have invented new and useful Improvements in Lamps for Projecting Apparatus, of which the following is a specification.

This invention relates to lamps for projecting apparatus, particularly incandescent electric lamps, and has for its object to provide a lamp of this character in which the light bulb and the reflector may be universally and independently adjustable, whereby the light and reflector may accurately and exactly focus with reference to each other, and both may be focused with reference to the condensers of the optical system, notwithstanding irregularities in the placing of the filament in the bulb.

My invention also contemplates various improvements in the adjusting mechanism whereby the lamp and reflector may be easily and rapidly adjusted from without the lamp house, which improvements will be more readily understood from the following description and appended claims.

In the accompanying drawings I have illustrated my invention applied to a lamp adapted primarily for the projection of motion pictures, and in said drawings

Figure 1 shows the lamp in side elevation, the enclosing lamp house being shown in section;

Fig. 2 is a plan view of the lamp with the light bulb and reflector removed;

Fig. 3 is a side elevation of the reflector support and its adjusting mechanism with the rest of the lamp detached;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3 with portions of the supports broken away for clearness of illustration;

Fig. 5 is a side elevation of the bulb-adjusting mechanism with the rest of the lamp detached;

Fig. 6 is a sectional view on line 6—6 of Fig. 5 with parts broken away for the sake of clearness.

Referring to the drawings, 1 indicates the base of the lamp house which is provided with the forks 2 for support on the usual sliding carriage, not shown. The lamp-house 3 consists of the usual sheet metal box of rectangular cross section with hinged top and side doors 4 for affording access to the interior. The front wall of the lamp house is provided with a funnel 5 in which the condensers will be supported in the usual manner.

Projecting upward from the base 1 through the bottom of the lamp house are four fixed ears arranged in pairs 6, 6 and 7, 7 on opposite sides of the middle longitudinal line of the lamp house. In one pair of ears there is rotatably supported an adjusting rod 8, the rod being held against longitudinal movement by a screw set in one of the ears and working in a groove in the rod.

The rod 8 is threaded near its front end as indicated in Fig. 5, the threaded portion cooperating with a correspondingly threaded hole through the corner of a supporting frame 10 for the lamp bulb. The opposite corner of the supporting frame is supported on a similar adjusting rod 9, which rod is rotatably mounted in the other pair of ears 7 and similarly held against longitudinal movement. The portion of the rod 9 on which the frame 10 is supported is without threads, so that the rotation of the adjusting rod 8 in its bearings will cause the carriage to be longitudinally adjusted toward and away from the front wall of the lamp house in which the condensers are supported, the carriage sliding on the rod 9 as a supporting guide.

The frame preferably comprises two U-shaped cross members through the lower corners of each of which the rods 8 and 9 pass in the manner indicated in Fig. 5. At the upper ends the two frames are connected by longitudinal webs 11 which may be integral with the U-shaped pieces and the upper ends of the front frame piece are also preferably connected by a fixed rod 12 extending transversely of the frame and serving as a supporting guide for a socket piece 13 in which the bulb-supporting bracket is mounted for vertical adjustment, as will be later described. In the upper ends of the rear frame piece there is supported for transverse adjustment a cross bar numbered 14, this bar passing through the socket piece 13 and being fixedly connected thereto by screws 15, as shown in Fig. 2. The rod 14 is adjusted by means of an adjusting rod 16 extending longitudinally of the lamp house and projecting through the rear wall thereof, the front end of the rod having a bear-

ing in the upper end of the rear frame piece 10 at one side thereof, the end of the rod lying immediately above the cross bar 14. The adjusting rod 16 is provided with a spur gear 17 which meshes with a circular rack 18 cut on the end of the rod 14, whereby rotation of the adjusting rod will shift the rod 14 transversely of the lamp house and with it the socket block 13 which is attached to the rod, the block sliding on the rod 12 which acts as a guide and a support.

The bulb socket is detachably mounted on a bracket 18ª projecting forwardly from the block 13 in which it is mounted for vertical adjustment by means of two rods 20 attached to the rear end of the bracket and working in corresponding vertical bores in the block 13. One of the rods 20 is smooth while the other is provided with a circular rack 21 meshing with a spur gear 22 on the end of an adjusting rod 23 mounted in a bearing 24 projecting from the rear wall of the block, the end of the rod projecting through a slot in the rear wall of the lamp house, thus providing for a certain amount of transverse motion upon actuation of the rod 16. The projecting ends of the adjusting rods 8, 16 and 23 are all provided with knobs 25 by means of which they may be easily rotated by the operator to adjust the lamp support. The three adjustments, longitudinally, transversely and vertically of the lamp house, give a universal adjustment to the light bulb whereby it may be accurately positioned with regard to the condensers to properly focus the light on the picture to be exhibited, notwithstanding irregularities in the position of the filament in the bulb, the range of movement of each adjustment being sufficient to take care of the variations occurring in the ordinary bulbs of commercial manufacture.

The reflector 26 is also supported for adjustment in three directions. To this end the reflector is supported on a carriage 27 comprising two U-shaped frame-pieces 28 generally similar to the frame-pieces 10 of the bulb carriage, the two pieces 28 being connected at their upper ends by integral webs 29, as shown in Figs. 3 and 4.

The carriage 27 is supported on the adjusting rods 8 and 9 in a position to the rear of the carriage 10. The rod 9 is threaded through the carriage 27 while the rod 8 has an unthreaded surface at this point to act as a supporting guide for the carriage.

At the upper ends of the front frame 28 there is a fixed rod 30 and mounted for sliding adjustment in the upper ends of the rear frame is a rod 31 which passes through and is attached to the bracket supporting block 32 on which the reflector is mounted for vertical adjustment. The rod 31 is transversely adjusted by means of an adjusting rod 33 having a rack and pinion connection with the rod 31.

The reflector-supporting bracket 34 is supported in the block 32 by means of two vertical rods 35, one of which has a rack and pinion connection with an adjusting rod 37 similar in construction and operation to the corresponding parts of the bulb-supporting mechanism. The reflector 26 is attached to the bracket 34 by means of a rearwardly projecting stem set in a socket 38 at the top of the bracket.

The rods 9, 33 and 37 all project through the rear wall of the lamp house, a slot in the wall being provided through which rod 37 extends permitting it a certain amount of transverse motion upon actuation of the rod 33, and are provided with knobs 39 to facilitate their operation, the adjusting rods of both the bulb and reflector adjustments being preferably of several different lengths so that the knobs will not interfere with each other.

By the above described adjusting mechanism, both the lamp and the reflector have a universal adjustment whereby any discrepancy in the focus of either the light filament itself or the reflected image of the filament may be quickly corrected by a partial rotation of the adjusting rods which are all arranged without the lamp house where they will not themselves get heated and not necessitate the opening of the lamp house or reaching in adjacent the lamp where the connections become unavoidably heated.

I claim:

1. In a lighting equipment for projection apparatus, the combination of a light support, a reflector support and means for independently adjusting said supports in the same plane comprising a pair of guide rods upon which both said supports are mounted, power-transmitting connections between one of said rods and one of said supports, and power-transmitting connections between the other rod and the other support whereby the adjustment of each rod will effect the adjustment of one of said supports without adjusting the other.

2. In a lighting equipment for projection apparatus, the combination of a light support, a pair of guide rods mounted thereon for independent rotation, a lamp supporting carriage mounted on both said rods, and having a threaded connection with one of said rods, a reflector supporting carriage independently mounted on both said rods and having a threaded connection with the other rod whereby the rotation of each rod will effect the adjustment of one of said supports without shifting the other.

3. In a lighting equipment for projection apparatus, the combination of a lamp supporting frame, a reflector support, means

for independently adjusting the supports in the same plane comprising a pair of guide rods upon which both said said supports are mounted, power transmitting connections between one of said rods and one of said supports, power transmitting connections between the other rod and the other support whereby the adjustment of each rod will effect the adjustment of one of said supports without adjusting the other, means for independently adjusting the lamp in a different plane, comprising a cross rod supported for longitudinal adjustment in said lamp supporting frame a socket piece in fixed relation with said rod for supporting the lamp, and connections for effecting adjustment of said rod.

4. In a lighting equipment for projection apparatus, the combination of a lamp supporting frame, a reflector support, means for independently adjusting the supports in the same plane, comprising a pair of guide rods upon which both said supports are mounted, power transmitting connections between one of said rods and one of said supports, power transmitting connections between the other rod and the other support whereby the adjustment of each rod will effect the adjustment of one of said supports without adjusting the other, means for independently adjusting the lamp in a different plane, comprising a cross rod supported for longitudinal adjustment in said lamp supporting frame, a socket piece in fixed relation with said rod for supporting the lamp, connections for effecting adjustment of said rod, means for independently adjusting the lamp in a third plane, comprising a lamp carrying bracket, guide rods associated therewith and mounted for longitudinal movement relative to said socket piece, and connections for imparting movement to said rods.

5. In a lighting equipment for projection apparatus the combination of a lamp supporting frame, a reflector support, means for independently adjusting the supports in the same plane comprising a pair of guide rods upon which both said supports are mounted, power transmitting connections between one of said rods and one of said supports, power transmitting connections between the other rod and the other support whereby the adjustment of each rod will effect the adjustment of one of said supports without adjusting the other, means for independently adjusting the lamp and reflector in a different plane, comprising cross rods supported by longitudinal movement in said lamp supporting frame and reflector support, respectively, a socket piece in fixed relation with the lamp adjusting cross rod and a bracket supporting block fixed to the reflector adjusting cross rod, and connections for imparting movement to said cross rod.

6. In a lighting equipment for projection apparatus, the combination of a lamp supporting frame, a reflector support, means for independently adjusting the supports in the same plane comprising a pair of guide rods upon which both said supports are mounted, power transmitting connections between one of said rods and one of said supports, power transmitting connections between the other rod and the other support whereby the adjustment of each rod will effect the adjustment of one of said supports without adjusting the other, means for independently adjusting the lamp and reflector in a different plane, comprising cross rods supported for longitudinal adjustment in said lamp supporting frame and reflector support, respectively, a socket piece in fixed relation with the lamp adjusting cross rod and a bracket supporting block fixed to the reflector adjusting cross rod, connections for imparting movement to said cross rods, means for independently adjusting the lamp and reflector in a third plane, comprising a lamp carrying bracket and reflector supporting bracket, guide rods associated therewith and mounted for longitudinal movement relative to said socket piece and bracket supporting block, respectively, and connections for effecting adjustment of said rods whereby an independent universal adjustment of said lamp and reflector is obtained.

Signed at New York, in the county of New York, and State of New York, this First day of June, 1920.

THEODORE F. UHLEMANN.