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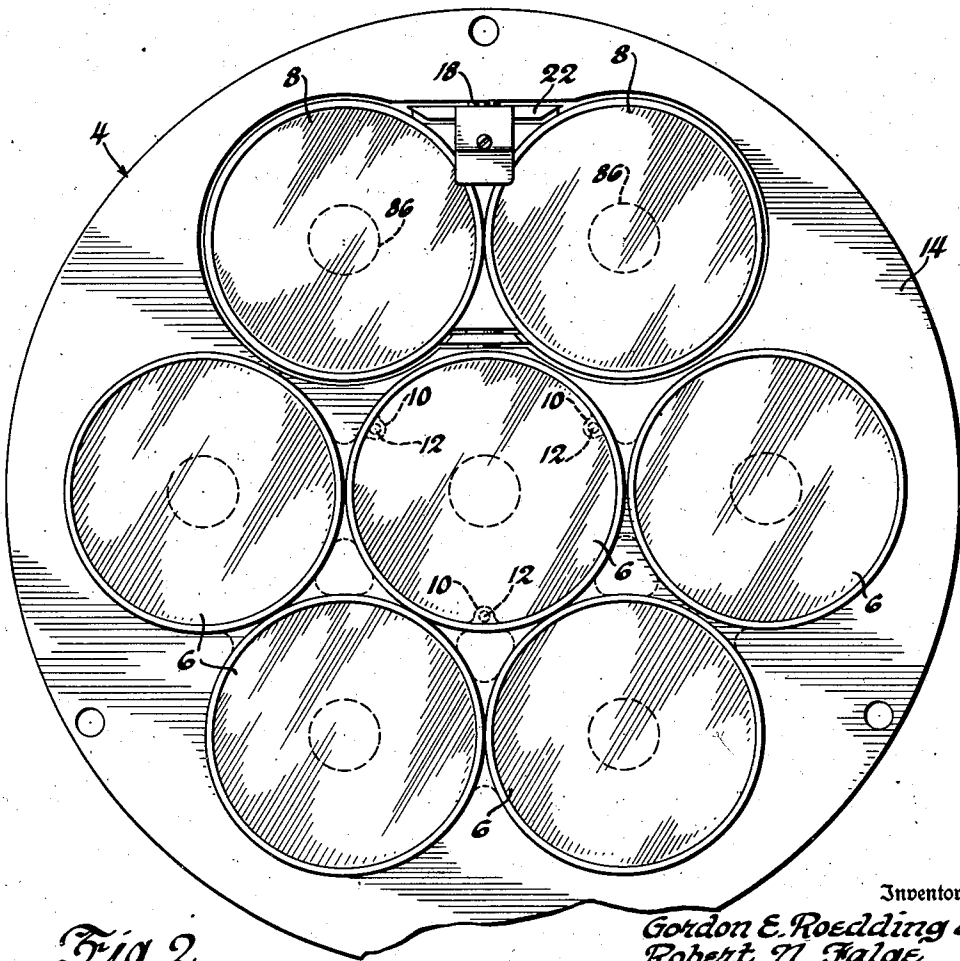
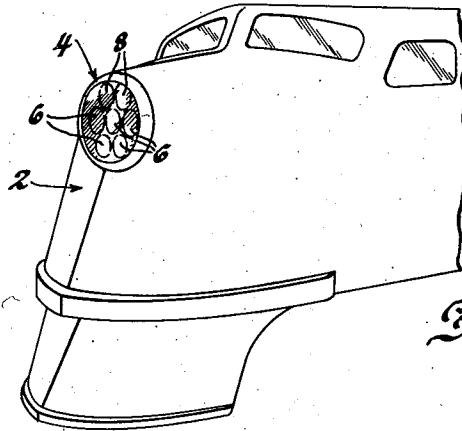
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2,353,082

LIGHTING FIXTURE

Filed Aug. 4, 1941

4 Sheets-Sheet 1



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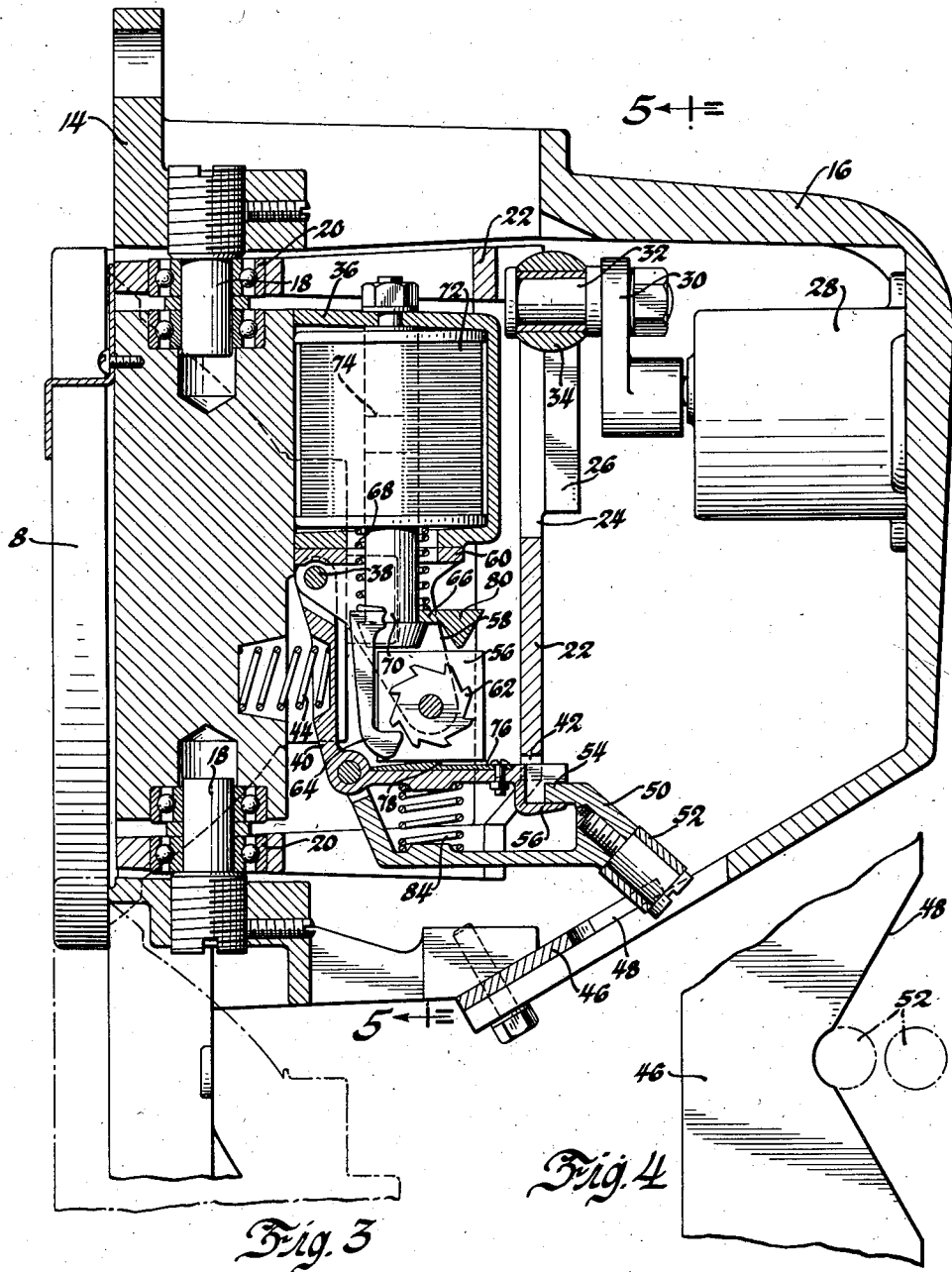
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

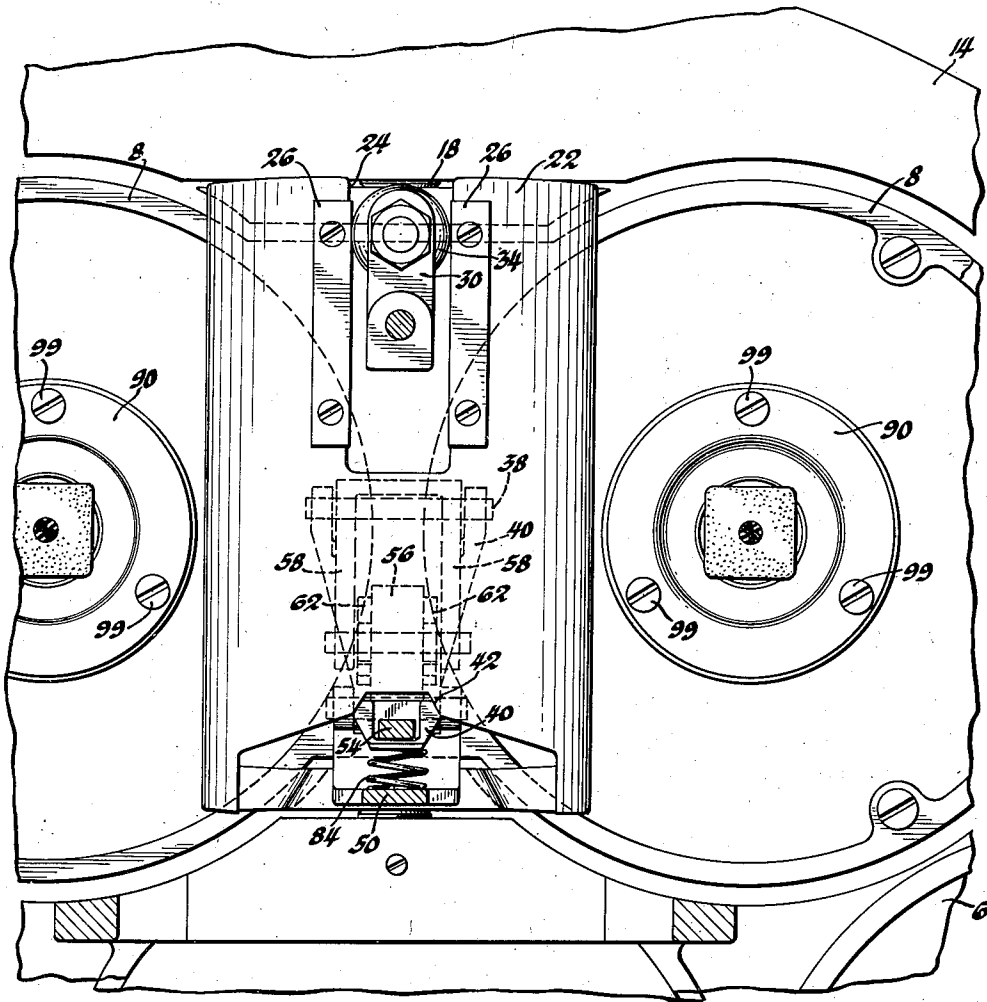


Fig. 5

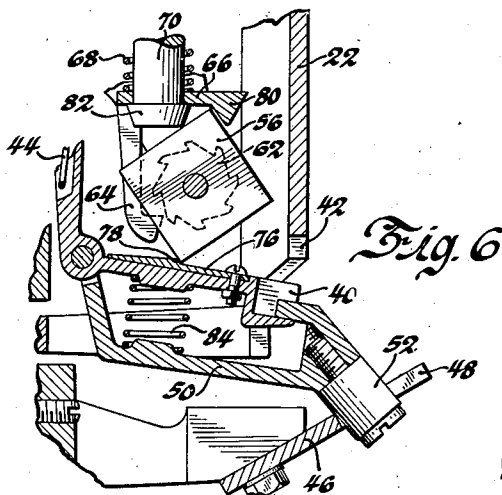


Fig. 6

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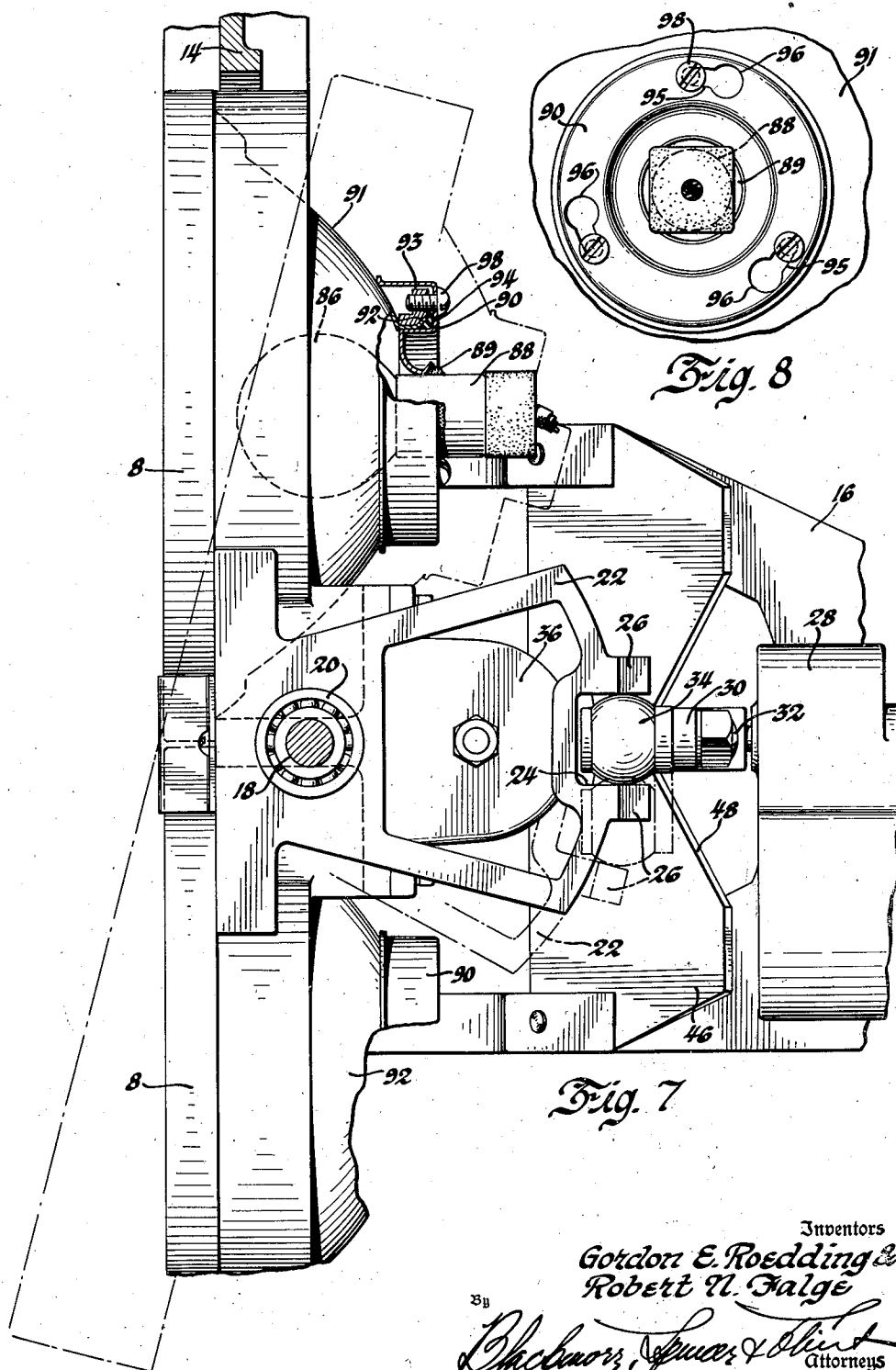
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,353,082

LIGHTING FIXTURE

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3 Claims. (Cl. 240—48)

Our invention relates to lighting fixtures, and particularly to lighting fixtures of the type used on railroad locomotives as headlamps.

With the high speeds obtained by modern locomotives the headlamp becomes increasingly important. It is highly desirable that the headlamp be of such design that it cannot be easily damaged and thus put out of service. It is furthermore desirable that the design of the headlamp be such that the beam may be controlled as to spread and elevation. It is furthermore desirable that the beam may be controlled laterally as to direction.

Still another problem which confronts railroad engineers is that presented by the presence of animals on the track. It is desirable that no animals be on the track for the reason that injury may result to the train and its cargo and that the railroads are known to be the target of the owners of animals not worth a great deal but which become practically invaluable as soon as destroyed by the railroad. It is therefore desirable that some means be provided which will frighten animals off the track as the train approaches. It has been found that the ordinary railroad whistle is inadequate.

It is an object of our invention to provide a lighting fixture which may be used as a locomotive headlamp and which is not easily put out of service; which furthermore has a beam controllable as to spread and direction. It is a further object of our invention to provide a lighting fixture usable as a locomotive headlamp which will serve to frighten animals to the extent that they will get off the track if on the track when the train approaches, or that they will stay off if not already on the track but if they are in the vicinity of the track.

More specifically, it is the object of our invention to provide a lighting fixture made up of a plurality of light sources. These sources are independently controlled as to direction so as to provide a beam which may be regulated as to depth and direction. One or more of these light sources may be mounted so as to oscillate transversely of the direction of travel of the locomotive. It has been found that a swinging beam of light is very effective in frightening birds, cows and other animals off the track or in keeping them off. It has furthermore been found that such an oscillating beam of light is very effective in keeping human beings at a respectful distance from the track at railroad crossings. Furthermore, since our lighting fixture is made up of a plurality of units, damage to one of these units

which is great enough to put it out of service does not affect the remaining units so that, although the total beam candle power may be reduced somewhat, the beam is not extinguished completely.

Figure 1 of the drawings shows our lighting fixture installed in the nose of a locomotive to serve as a headlamp therefor.

Figure 2 is a close-up front view of our lighting fixture.

Figure 3 is a side view with parts broken away and in section.

Figure 4 is a view of a centering cam which we may provide for our lighting fixture if desired.

Figure 5 is a view in section substantially on line 5—5 of Figure 3.

Figure 6 is a view with parts broken away and in section showing the location of the parts to effect centering of the oscillatable units.

Figure 7 is a plan view of our light fixture with parts broken away and in section.

Figure 8 is a view showing details of one method of securing the light bulb in the reflector.

Referring now to the drawings in detail, 2 designates the front of a locomotive in which is mounted a lighting fixture 4 made according to our invention. Our lighting fixture is made up of a plurality of light sources some of which are normally stationary designated by the numeral 6, and some of which are mounted so as to be oscillatable, designated generally by 8. Although the light sources 6 are normally stationary they may be adjusted on their supports as to direction. This adjustment of the direction of the individual beams provides a means for regulating the depth and direction of the beam as a whole. The details of the mounting means are not shown or described here beyond the showing of Figure 2 in which ears 10 having openings 12 therein are shown in dotted lines. Any of a number of suitable supports available may be used. The ears 10 provide means for adjustably securing normally stationary sources 6 to member 14 which for the sake of convenience we call a face plate.

Face plate 14 may be an integral part of the frame, the back part of which serves also as a housing 16; see Figure 3. Near the forward portion of the frame, immediately behind the face plate, we provide a pair of pivots 18. Oscillatably mounted on these pivots in bearings 20 is a generally D-shaped frame 22 (see Figure 7). At the back of oscillatable frame 22 we provide a vertical slot 24. To increase the wear resistance of the sides of slot 24 we may provide

guides 26 of any suitable wear resistant material.

Mounted in housing 16 is an actuating means 28 such as an electric motor. The shaft of motor 28 may be geared at any desired ratio to crank 30. We have found a crank speed of 60 R. P. M. satisfactory. Crank 30 carries a pin 32 on which we may mount a substantially spherical member 34. Member 34 is likewise preferably of a hardened wear resistant material and is mounted so as to engage guides 26. Therefore, as crank 30 rotates in response to the rotation of motor 28, frame 22 oscillates back and forth. One extreme position of oscillation of frame 22 is shown in dotted lines in Figure 7.

Also mounted on pivots 18 is the frame 36 for oscillatable light sources 8. Pivoted to frame 36 at 38 is a generally L-shaped latch member 40. The horizontal tip of member 40 is adapted to engage a notch 42 in frame 22. Member 40 is biased into latching position by a spring 44. Member 40 is shown latched to the frame 22 in Figure 3. With the parts in this position, oscillation of frame 22 in response to rotation of motor 28 will also oscillate frame 36 through latch member 40, causing oscillation of light sources 8. One limit of oscillation of lamps 8 is shown in dotted lines in Figure 7.

It is readily evident that oscillatable lamps 8 will come to rest in a position which is determined by the rest position of motor 28. It is evident therefore that the direction of oscillatable lamps 8 when at rest may be controlled within the limits of oscillation by the operator. If the lamps do not come to rest in the position desired, we may change that position by momentarily closing the switch of motor 28. We may, therefore, direct the beam of the oscillatable lamps to the right or to the left as desired to illuminate the road while rounding a curve. It may be desirable, however, to provide a device whereby the engineer or other user of our lighting fixture may center the beam of the oscillatable lamps by some means which will require less attention than manipulation of the motor switch requires. To this end we have provided a centering cam 46 having a V-shaped notch 48. Pivoted to latch member 40 is a lever 50 carrying a projection or roller 52. A projection 54 provides a return bend on lever 50 which engages the offset end 56 of latch member 40 to keep roller 52 from dropping down into engagement with notch 48 of cam 46.

To effect engagement of roller 52 with cam 46 we have provided a cam 56, mounted in downwardly extending arms 58 of bracket 60. Integral with cam 56 are two ratchets 62. One ratchet would suffice for operation but we find that operation is smoother if we provide a ratchet on each side of cam 56. A pawl 64 is reciprocally mounted so as to cooperate with the teeth of ratchet 62. Pawl 64 is mounted on bracket 66 which is biased to the position shown in Figure 3 by a spring 68. Pawl 64 may be lifted by plunger 70 of solenoid 72 mounted in frame 36. A stop member 74 integral with the mounting means limits the upward travel of plunger 70.

When solenoid 72 is actuated, pawl 64 engages a tooth of ratchet 62 and rotates cam 56 through slightly more than $\frac{1}{2}$ of a revolution. We may provide a wear plate 76 on latch member 40 having a shoulder 78 which serves as a stop for the corner or edge of cam 56. See Figure 6. The energizing of solenoid 72 is only momentary.

Therefore, plunger 70 quickly drops down again to its lowermost position. The loose mounting of bracket 66 on plunger 70 permits pawl 64 to be pushed to the left against the bias of spring 68, permitting the pawl to drop down past the tooth of ratchet 62 without disturbing the position of the cam. With the parts in the position shown in Figure 6, dog 80 cooperates with head 82 of plunger 70 to engage the upper edge of cam 56 to hold the cam in this position. As can be seen from the drawings, this rotation of cam 56 pivots latch member 40 out of engagement with notch 42 in frame 22. A further result is that spring 84 biases lever 50 down so as to engage roller 52 in the notch 48 of cam 46. If the oscillatable lamps 8 are not centered when solenoid 72 is energized, roller 52 will strike one side of notch 48; spring 84 will force lever 50 and roller 52 into their lowermost position which is that shown in Figure 6, in which roller 52 rests in the bottom of V-shaped notch 48. With the parts in this position, oscillatable lamps 8 are centered so that the beam is directed straight ahead. When it is thereafter desired to engage lamps 8 with the oscillating motor, it is merely necessary to energize solenoid 72 again to rotate cam 56 through slightly less than $\frac{1}{2}$ of a revolution, and the parts will resume the positions indicated in Figure 3.

It is desirable that the locomotive headlamp be so constructed that repairs thereon may be made from the rear of the fixture with the repairman or operator on the inside of the locomotive. If the headlamp construction is such as to permit repairs in this manner, repairs may be made while the locomotive is in motion. To this end we have made our lighting fixture such that the light bulbs may be removed from the rear of the fixture. As best seen in Figures 7 and 8, the bulb 86 is mounted in a socket 88 which is held in place, as by solder 89, in a base 90. The reflector 91 is flared as at 92 to provide a circumferential channel carrying ring 93, which comprises a base for the reflector. We may provide a gasket ring 94 of any suitable weatherstrip material to seal the inside of the reflector against dirt. Socket base 90 is removably secured to reflector base 93 by any suitable means. One method which may be employed is the bayonet slot connection shown in Figure 3. In this figure we have shown the socket base 90 as being provided with slots 95 having enlarged ends 96. Projections 98 may be provided on reflector base 93 for engagement with bayonet slots 95. These projections may be screws, studs or rivets having enlarged heads which fit through the enlarged ends 96 of the bayonet slots and which engage the narrow portions of these bayonet slots when socket base 90 is rotated clockwise through a fraction of a revolution.

An alternative means of securing the socket base 90 to the reflector is shown in Figure 5, in which screws 99 are removably fastened to the reflector base. The holes in socket base 90 through which screws 99 project are merely large enough to admit the shanks of the screws, rather than being in the form of bayonet slots as seen in Figure 8.

It is evident from the foregoing description that we have here provided a lighting fixture which has definite advantages over the fixtures now in use as locomotive headlamps. Damage to any individual unit or single light source of our fixture will not affect the remaining units. Furthermore, the construction of our fixture is

such that damaged units may be repaired from the inside of the locomotive while the locomotive is in motion. It is also evident that the depth and direction of the light beam from our fixture may be regulated or controlled because the light sources may be individually adjusted as to direction. One or more of these light sources may be oscillated at the will of the operator or user of the fixture. The fixture may be provided with means for automatically centering the oscillatable light sources or we may leave off this centering device in which case centering may be effected by manipulation of the oscillation motor switch.

Our lighting fixture is not limited in its application to locomotive headlights. It may be used for other purposes such as flood lighting a sports arena, or in a searchlight.

Changes and modifications in our invention will be apparent to those skilled in the art. For example, we may desire to oscillate the lower two units instead of the upper two, or we may desire to oscillate only one of the units or, further, we may find it desirable to oscillate the light fixture as a unit. In this case we may find it advantageous to make all the units oscillatable together for daytime operation with a smaller number mounted so as to be oscillatable for night time operation. Also, where manipulation of the direction of the oscillatable units is not desired, we may connect our centering means with the oscillation motor in such a manner that the oscillatable units will be centered automatically when the oscillation motor switch is opened instead of providing a separate control for the centering device as described above.

We claim:

1. In a multiple unit headlight for locomotives, a housing, a plurality of lamp units in said housing, at least one of said lamp units being so constructed and located in said housing as to project a relatively fixed driving beam to illuminate the roadbed in front of the locomotive, means for mounting at least one of said lamp units in said housing for oscillation relative to said locomotive to project a warning beam which oscillates with reference to said relatively fixed driving beam, power operated means adapted to be connected to

said mounting means to oscillate the same, manually controlled clutch means between said power operated means and said mounting means, and a means operable on disengagement of said clutch means to cause said warning beam to assume a position to supplement said relatively fixed driving beam.

2. In a multiple unit headlight for locomotives, a housing, a plurality of lamp units in said housing, at least one of said lamp units being so constructed and located in said housing as to project a relatively fixed driving beam to illuminate the roadbed in front of the locomotive, means for mounting at least one of said lamp units in said housing for lateral oscillation relative to said locomotive to project a warning beam which oscillates laterally to both sides of said relatively fixed driving beam, power operated means adapted to be connected to said mounting means to oscillate the same, manually controlled clutch means between said power operated means and said mounting means, and centering means for said mounting means whereby said warning beam may be positioned to supplement said relatively fixed driving beam when said power operated means is disconnected from said mounting means.

3. In a lighting fixture, a housing, a frame pivoted on said housing, a light source mounted on said frame, oscillating means to oscillate said frame relative to said housing, manually controlled clutch means between said oscillating means and said frame to connect and disconnect the same at will, means controlled by said clutch means for biasing said frame to a predetermined position relative to said housing when said clutch means is operated to disconnect said oscillating means and said frame, said biasing means including a V-shaped cam surface on said housing and an arm on said frame with yielding means to urge said arm into engagement with said cam surface and means between said arm and clutch means to move said arm out of engagement with said cam surface on operation of said clutch means to connect said oscillating means and said frame.

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