Aug. 3, 1948. J. D. KENNELLY 2,446,333

OSCILLATING WARNING LIGHT

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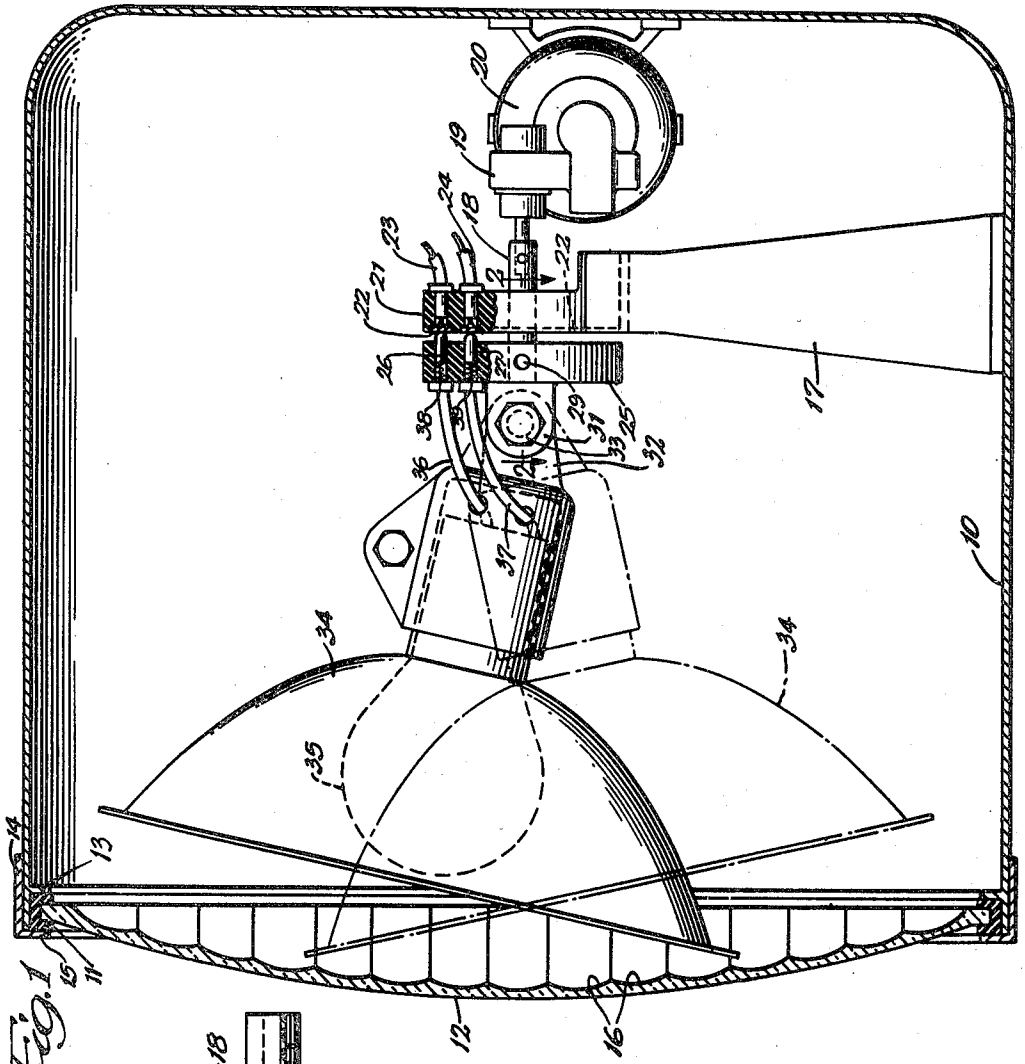

Fig. 1

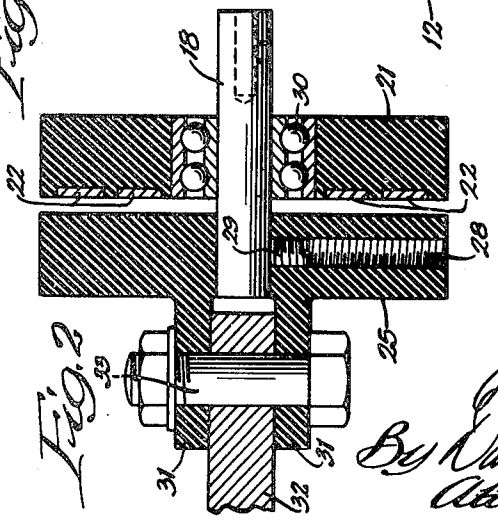

Fig. 2

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Fig. 4

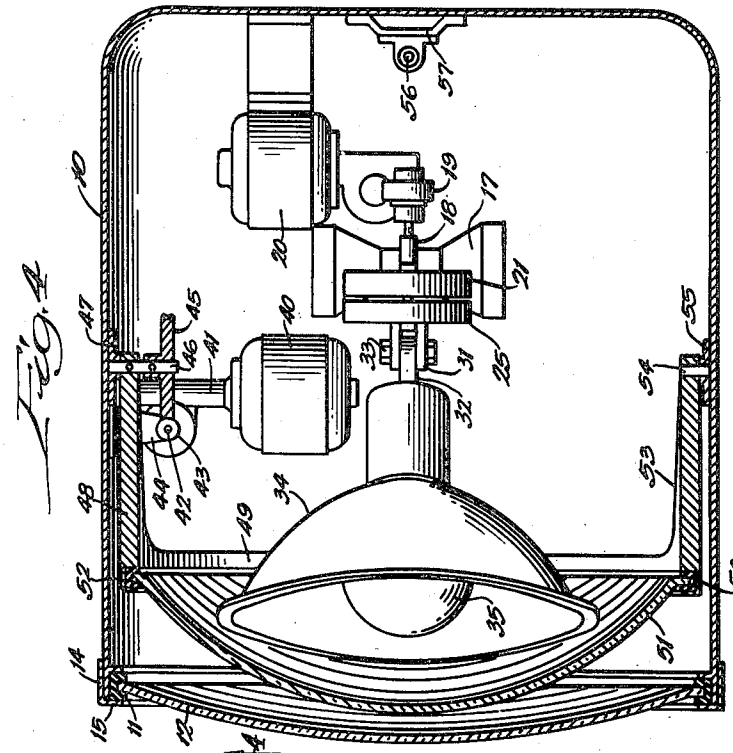
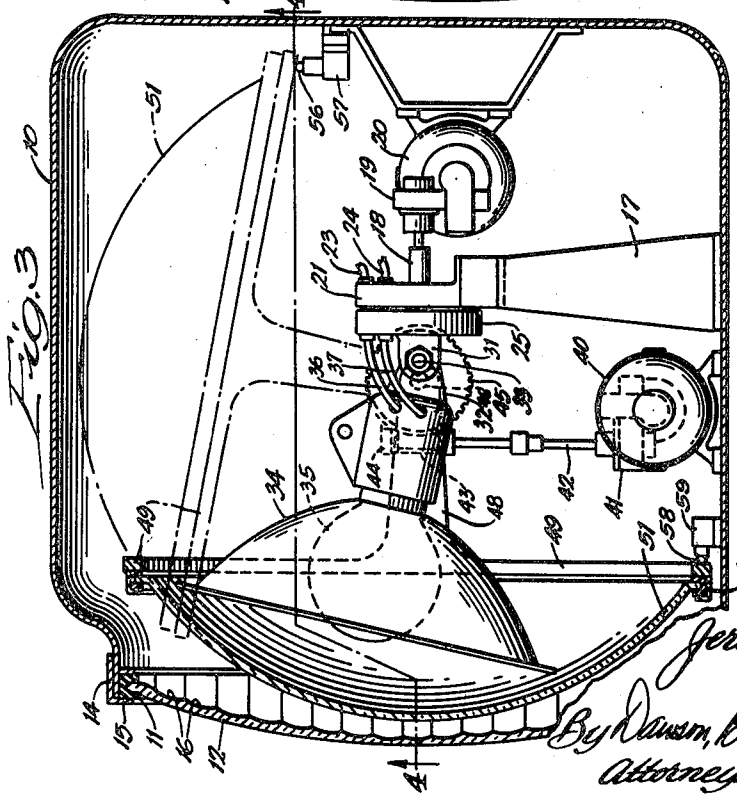


Fig. 3



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OSCILLATING WARNING LIGHT

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7 Claims. (Cl. 177—329)

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This invention relates to signal light apparatus and is particularly useful as a warning or signal light for vehicles such as locomotives, railways trains, trucks, aeroplanes and other moving structures.

An object of the invention is to provide extremely simple means for the projection of light beams which will attract the attention of any observer and thus serve as a warning or signal means. A further object is to provide mechanism in which a lens may be mounted as a stationary member and in which the light or light-reflecting source may be caused to move in a predetermined arc or course. A further object is to provide in such a structure an adjustably mounted reflector or light member for variation of the pattern of light projected therefrom through the lens or from the signal device. Yet another object is to provide means for changing the color characteristics of the projected rays by automatic or motor driven means. Yet another object is to provide in combination with a light source, means for producing a change of color of the projected beams at any desired moment as a signal effect while also providing means for automatically stopping the color changing mechanism at either limit of its movement. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in preferred embodiments, by the accompanying drawings, in which—

Figure 1 is a broken side view in elevation of light signal apparatus embodying my invention; Fig. 2, a longitudinal sectional view, the section being taken as indicated at line 2—2 of Fig. 1; Fig. 3, a vertical sectional view of a modified form of apparatus equipped with means for changing the color or character of the projected rays, and Fig. 4, a plan sectional view, the section being taken as indicated at line 4—4 of Fig. 3.

In the illustration given in Figs. 1 and 2, 10 designates a casing which has an open front end in which is mounted a resilient ring 11 of rubber or other suitable material provided with a recess receiving the peripheral edges of the lens 12. The ring 11 is held in position by an annular flange 13 integral with the casing 10 and also by an angle iron member 14 which has a vertical flange 15 engaging the forward end of the ring 11.

The lens 12 may be of any suitable shape or type. If desired, the lens may be provided with arcuate bands 16 or prisms which will tend to bend the rays projected by a moving source of

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light and thus increase the signal effect of the rays.

Within the casing 10 there is mounted a standard 17 which provides a bearing for the shaft member 18. Shaft 18 is driven through reduction gears 19 by the motor 20 which is secured by spot welding or other means to the rear wall of casing 10. The standard 17 supports a switch plate member 21 providing circular switch bands 22 with which electrical connections 23 and 24 are made. The shaft 18 carries a disk 25 in which are mounted the plungers 26 and 27 which are spring-urged against the circular switch plates 22. The disk member 25 is provided with a threaded recess 28 into which a set screw 29 may be urged to lock the member 25 rigidly to the shaft 18. The shaft 18, as shown more clearly in Fig. 2, is preferably mounted upon ball bearings 30 supported within the member 21.

Integrally formed with the disk member 25 are the arms or flanges 31 which provide a yoke within which extends a support lever 32. The support lever 32 is pivotally secured within the yoke by the bolt 33.

The support lever 32 carries the clamp bolt 33 of well-known construction and within the clamp is secured a reflector 34. A light bulb 35 is mounted within the reflector and clamp and has connections with the electric conduits 36 and 37 which make electrical contact with the plungers 26 and 27 through the interposed springs 38 and 39.

In the operation of the structure, when the motor is set into operation, shaft 18 is rotated and the disk member 25 rotates therewith. The support member 32 is maintained at an angle with respect to shaft 18 and by means of the clamping bolt 33 so that as shaft 18 and the member 25 are rotated, the clamping member 33 and reflector 34 are moved in a circular course. The circular course thus provided for the light source 35 and its reflector presents a constantly changing point for projection of light rays, and this movement together with the prismatic lens results in a constantly changing group of projected rays.

Current is supplied through the members 23 and 24 to plates 22 and the current then passes continuously through the plungers 26 and 27, springs 38 and 39 and thence through connections 36 and 37 to the source of light.

If it is desired to change the diameter of the course followed by the light source 35, bolt 33 may be loosened and the support member 32

swung to a different angular position and then bolt 33 is tightened again to lock the structure in the new angular position.

In addition to the signal effect accomplished by the movement of the light source with respect to the prism lens 12, I find that the signal effect is greatly enhanced by changing the color of the projected light beams at any desired point. For example, as shown in Figs. 3 and 4, a colored lens may be drawn over the light source to change the color of the projected beams at any desired moment. For example, motor means may be set into operation by a manually operated switch to draw the colored lens over the light source to any point where it is desired to signal a warning, etc. If desired, the motor may be set into operation to bring the colored lens in front of the light source by automatic means such as, for example, when the pressure in the compressed air brake line drops below a predetermined point or upon any other change of condition in the vehicle.

In the illustration given in Figs. 3 and 4, a motor 40 is supported upon the bottom wall of casing 10 and drives through reduction gears 41 a vertically supported shaft 42. The shaft 42 is provided at its upper end with a worm 43. A bracket member 44 secured to a side wall of casing 10 provides a bearing for the rotation of shaft 42. The worm 43 meshes with the worm gear 45 fixed to shaft 46 which is supported for rotation by the bracket member 47. Bracket 47 has side flanges which are welded to the casing 10. Fixed to the shaft 46 is an arm 48 which is integral with a ring member 49. A resilient ring member 50, centrally recessed to receive the colored lens 51, is secured to the forward end of the metal ring 49 by a metal angle iron 52 having one end preferably welded to the ring 49. The ring 49 is also provided with an integral arm 53 on the side of the casing opposite arm 48 and arm 53 is pivoted upon the pin 54 secured within bracket 55 which is welded to the side wall of casing 10.

In order to turn off the motor 40 after the colored lens has been swung to either extreme of its movement, I provide a plunger switch or limit switch 56 supported upon a bracket 57 to cut off the motor after the lens has been swung to the position shown in dotted lines in Fig. 3 and another limit switch 58 supported within the bracket 59 having flanges welded to the bottom wall of casing 10, for closing off the motor circuit when the lens frame 49 is swung to the position shown in full lines in Fig. 3.

In the operation of the structure shown in Figs. 3 and 4, upon the closing of the circuit of motor 40 either by the manual throwing of a switch or by reason of the automatic closing of a switch through the dropping of pressure in the brake line or upon any other changes in condition of the vehicle, the motor sets into operation the vertical shaft 42 and worm 43. Worm gear 45 is thus driven and produces a rotation of shaft 46. The arm 48 which is fixed to shaft 46 thus moves the frame 49 from the position shown in dotted lines in Fig. 3 to the forward position shown in full lines where the lens 51 occupies a position in front of the rotatable reflector 34 and light source 35. When the frame member 49 reaches the forward position shown in Figs. 3 and 4, it presses inwardly the limit switch 58 which thereupon breaks the motor circuit.

Similarly, when a switch is moved, either manually or automatically as above described, the motor 40 is set in operation again and moves the lens 51 to the position shown in dotted lines in Fig. 3 and, in this position, the frame or ring 49 engages the limit switch 56 and opens the motor circuit to stop the motor.

While in the foregoing description, I have set forth certain specific details as illustrative of one mode in which the invention may be used, it will be understood that such details may be modified widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In light signal apparatus, a casing provided with an opening, a lens mounted in the open end of said casing, a source of illumination mounted in said casing for movement, means for moving said source of illumination within said casing relative to said lens, a frame pivotally mounted in said casing for movement to positions in front of and away from said light source, a colored lens carried by said frame, and means for moving said frame to said positions.

2. In light signal apparatus, a casing having an open front end, a lens carried in the open end of said casing, a light source member, a reflector member about said light source member, means for moving at least one of said members in a circular course relative to said lens, a frame pivotally mounted to positions in said casing for movement in front of and away from said members, a colored lens carried by said frame, and means for moving said frame to each of said positions.

3. In light signal apparatus, a casing provided with an opening, a lens mounted in the open end of said casing, a source of illumination mounted in said casing for movement, means for moving said source of illumination within said casing relative to said lens, a frame pivotally mounted in said casing for movement to positions in front of and away from said light source, a colored lens carried by said frame, means for moving said frame to said positions, and limit switch means engageable by said frame at one limit of its movement for stopping said last mentioned means.

4. In light signal apparatus, a casing having an open front end, a lens carried in the open end of said casing, a light source member, a reflector member about said light source member, means for moving at least one of said members in a circular course relative to said lens, a frame pivotally mounted in said casing for movement to positions in front of and away from said members, a colored lens carried by said frame, motor driven means for moving said frame to each of said positions, and switch means engageable by said frame at either limit of its movement for deenergizing said motor.

5. In light signal apparatus, a casing having an open end, a lens equipped with prismatic portions mounted in the open end of said casing, a light source member, a reflector member about said light source member, means for moving at least one of said members relative to said prisms, a colored lens member mounted for movement to positions in front of and away from said light and reflector members, and means for moving said colored lens into each of said positions.

6. In light signal apparatus adapted for use as a warning light on the rear end of a train, a casing open at one end, a red-colored lens supported in the open end of said casing, a light source in said casing, a parabolic reflector behind said light source, the diameter of the reflector being substantially less than the diameter of the lens, an electric motor mounted in said casing, a shaft driven by said motor for rotation substan-

tially in the center of said casing, and bracket arm structure fixed to said shaft and supporting said reflector eccentrically with respect to said shaft whereby as said shaft is rotated at a constant speed said reflector is moved bodily in a circular path within the ambit of said colored lens to project a beam of light through said lens which follows a conical path in space, traversing equal arcs thereof in successive equal intervals of time.

7. In a warning light for vehicles, a casing adapted to be supported upon a vehicle and having an open end, a lens mounted in the open end of said casing, a light source in said casing, a parabolic reflector behind said light source and adapted to project the light rays therefrom in substantially parallel lines, a shaft supported in said casing for rotation, a motor in said casing for rotating said shaft, and a bracket fixed to the forward end of said shaft and supporting said reflector with the axis of said reflector at a small angle with respect to said shaft whereby upon rotation of the shaft at a constant speed said

reflector is moved bodily in a circular path within the ambit of said lens to project a search light beam which follows a conical path in space, traversing equal arcs thereof in successive equal intervals of time.

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