March 15, 1949. J. D. KENNELLY 2,464,318

OSCILLATING WARNING LIGHT

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Fig. 1

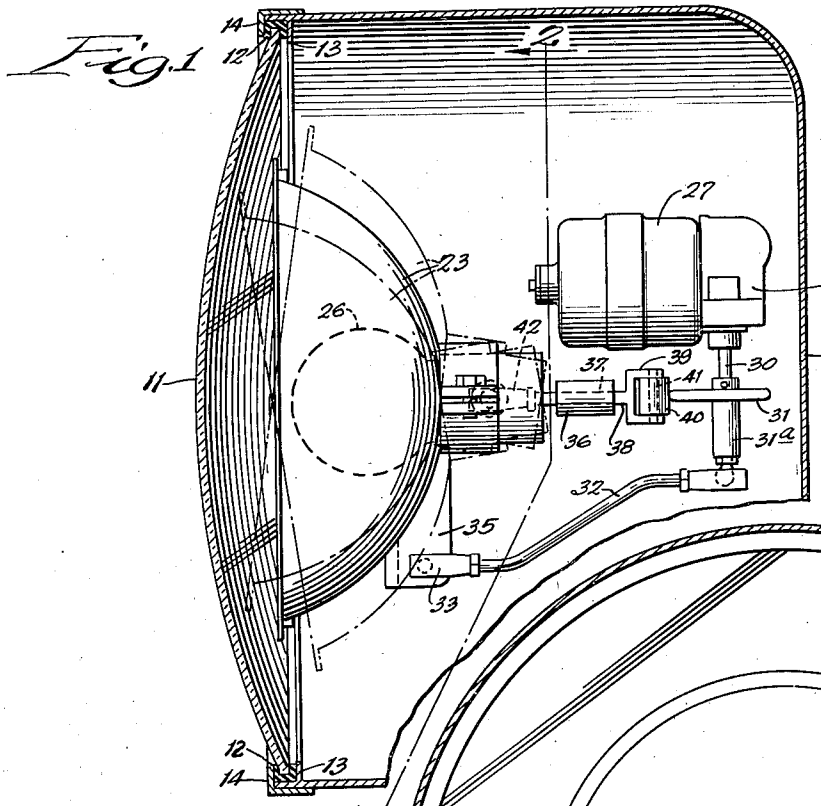


Fig. 2

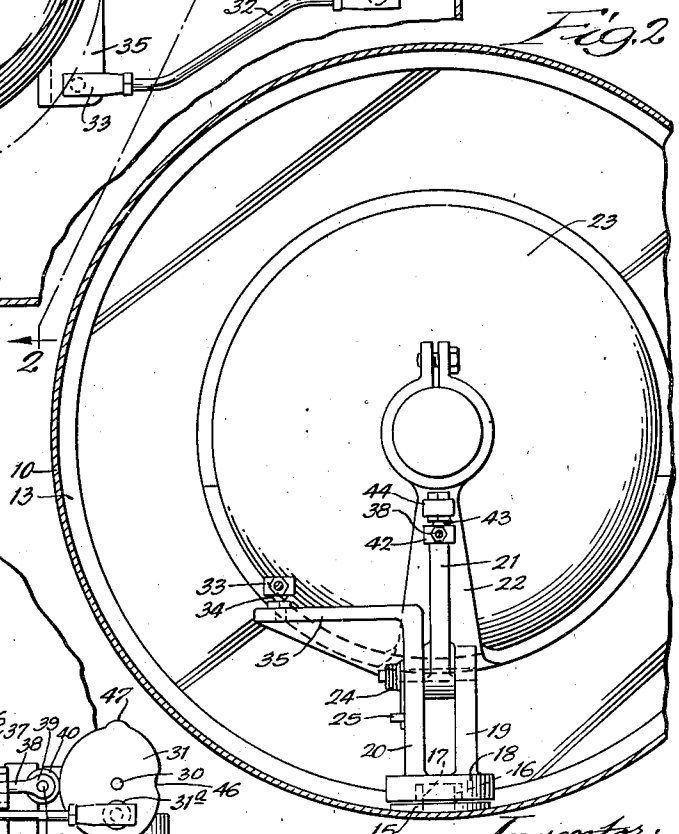
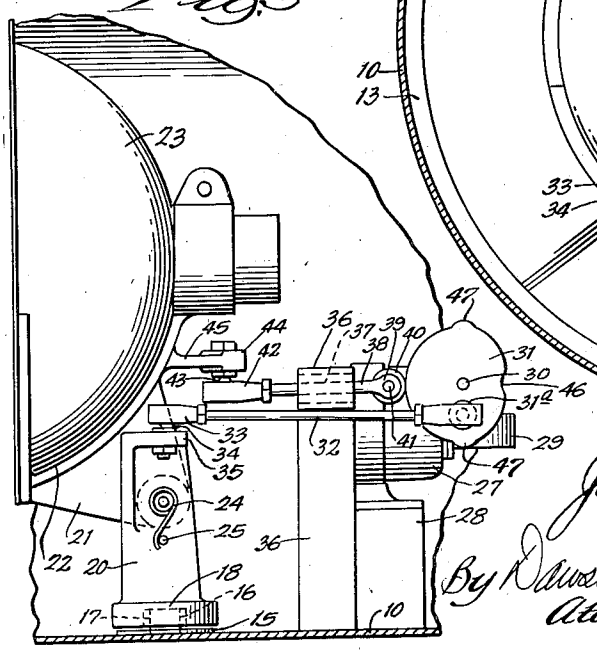


Fig. 3



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OSCILLATING WARNING LIGHT

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5 Claims. (Cl. 177—329)

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This invention relates to a light-signal device. The invention is particularly useful in connection with locomotives, trains and other powered vehicles, and also in stationary strategic locations.

An object of the invention is to provide a simple structure which may be operated at low power cost and which will effectively project light rays from a light source which moves in a selected transverse and vertical path. A further object is to provide simple means whereby a light projecting member may be caused to follow an effective path across a field at an elevated position while successively moving to a lower position for transverse movement. A further object is to provide means driven by a single power source for producing a unique path for a light projecting member while projecting beams in a vertical and sidewise direction. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawing, in which—

Figure 1 is a broken transverse sectional view; Fig. 2, a vertical sectional view, the section being taken as indicated at line 2 of Fig. 1; and Fig. 3, a broken side view in elevation of the apparatus employed for actuating the light projecting means.

In the illustration given, 10 designates a casing which is open at its forward end, the open end being provided with a transparent plate or lens 11. The lens 11 is secured within a rubber ring 12 or any other suitable resilient body and the ring is held in position by a flange 13 welded to the inner side of casing 10 and by an L-flange 14 having its longitudinal portion welded to the casing 10.

Supported within the casing 10 on the bottom wall thereof is a base member 15 which may be welded to the casing wall. The base member 15 is provided with a stud 16 which is received within a socket 17 provided by a rotatable support member 18. The support member 18 is equipped with two vertically extending standards 19 and 20. Pivotally supported between the standards 19 and 20 is an elevating arm 21 which merges into laterally extending flanges 22, which are welded to the light reflector 23. By this means, the reflector 23 is pivotally supported upon the swing arm 21 carried by the standards 19 and 20. As shown more clearly in Fig. 3, a spring 24 encloses the pivot of the swing arm 21 and the free end of the spring engages a pin 25. The spring 24 normally urges the arm 21 in a clockwise direction so as to elevate the reflector 23. A light bulb

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26 is secured within the reflector and is provided with an electric cable leading to a suitable source of current.

The rotatable support 18 may, if desired, be carried by anti-friction rollers with which the base 15 may be provided or any other suitable means for reducing the friction between the parts may be employed.

Any suitable means for rotating the member 18, as well as swinging the elevating arm 21 may be provided. In the illustration given, I provide a motor 27 carried by a standard 28 upon the bottom wall of casing 10. The motor 27 is provided with reduction gears 29 through which a shaft 30 is driven. The shaft 30 carries a cam 31 of the shape more clearly shown in Fig. 3, and eccentrically connected to the cam 31 on the outer face thereof is a cam arm 31a. The cam arm 31a is pivotally connected to the drive arm 32. The drive arm 32 is equipped at its end with a head 33 which is connected through a ball joint 34 with a laterally extending arm 35 formed integrally with the standard 20. When cam 31 is rotated, arm 32 is reciprocated and thereby causes the support 18 to oscillate back and forth.

The cam 31, in addition to driving the arm 32, also actuates the swing arm 21 to elevate and lower the reflector 23. A standard 36 secured to the bottom wall of the casing is provided with a guide passage 37 at its top and receiving the plunger member 38. The plunger member 38 carries at its inner end a yoke 39 within which is mounted a roller 40. The roller 40 is carried by the shaft 41 whose ends are received within the yoke 39. At its forward end the plunger 38 is provided with a head 42 secured by a ball joint 43 to an arm 44 connected by web 45 to the reflector 23.

In the operation of the structure, the cam 31 is rotated by shaft 30 and by means of its eccentric connection with arm 32, causes arm 32 to reciprocate and thereby causes the support member 18 to oscillate within casing 10. Simultaneously, the cam 31 moves the plunger 38 forward and backward according to the contour of the cam 31, the spring 24 serving to maintain the roller 40 constantly in engagement with the face of the cam 31.

The contour of the cam 31 is so designed as to elevate the reflector 23 and to maintain it in elevated condition while the reflector is being swung through one complete transverse sweep. The cam then permits the reflector to swing downwardly and to return across the transverse path at a lower elevation. To accomplish this, the

cam 31 has on one side a convex face of relatively long radius which, when it engages the roller, advances the plunger and thus keeps the reflector in a lower position, as illustrated more clearly in Fig. 3. The opposite face of cam 31 has a generally convex surface which is of smaller radius. When this face is brought into contact with roller 40, the spring 24 is thus allowed to move the plunger 36 rearwardly and thus elevates the reflector 23. While in this general elevated position, the oscillating arm 32 causes the reflector to move laterally across the path. The elevating face of the cam may be provided with a dip 46 which provides the shortest radius in the course of the cam and produces a sharp elevation in the light near the center of its transverse course. Also, the ends of the cam may be provided with outwardly extending ribs or bulges 47 which cause a rapid rising and falling of the reflector near the ends of its transverse stroke where the light makes its sharpest rise and fall. Thus the cam 31 produces not only a transverse stroke at the bottom and top portions of the vertical movement of the light, but also accentuates the change of direction of the light, as well as to the center of its transverse stroke by the abrupt changes which thus bring about a simulation of the "figure 8" light or a similar light ring. Breaks in the direction of movement enhance the signal effect upon the observer.

The operation of the light structure is brought about through a single motor-driven cam. While the cam has been designed for producing the strokes above mentioned, it will be understood that the face of the cam may be modified widely to permit varying strokes and strokes of light movements of different paths.

While in the foregoing specification, I have set forth certain details as illustrating one mode of the invention, 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 signal-light apparatus, a casing, a support member pivotally mounted in said casing for oscillation, an elevating arm pivotally mounted on said support, a light projecting member carried by said arm, means for actuating said elevating arm to raise and lower said light, and means for actuating said support for oscillating the same and the arm carried thereby.

2. In signal-light apparatus, a casing, a support member pivotally mounted in said casing for oscillation, an elevating arm pivotally mounted on said support, a light projecting member carried by said arm, means for actuating said elevating arm to raise and lower said light, and means

for actuating said support for oscillating the same and the arm carried thereby, said first mentioned actuating means including a cam adapted to raise said arm and maintain said arm in raised position while said support is oscillated by said second mentioned actuating means.

3. In signal-light apparatus, a casing, a support member pivotally mounted in said casing for oscillation, an elevating arm pivotally mounted on said support, a light projecting member carried by said arm, means for actuating said elevating arm to raise and lower said light, and means for actuating said support for oscillating the same and the arm carried thereby, said first mentioned actuating means including a cam and spring means adapted to raise said arm and maintain said arm in raised position while said support is oscillated by said second mentioned actuating means.

4. In signal-light apparatus, a casing, a support member pivotally mounted in said casing for oscillation, an elevating arm pivotally mounted on said support, a light projecting member carried by said arm, means for actuating said elevating arm to raise and lower said light, and means for actuating said support for oscillating the same and the arm carried thereby, said first mentioned actuating means including a cam and spring means adapted to raise said arm and maintain said arm in raised position while said support is oscillated by said second mentioned actuating means, and said cam having one long face with relatively long radius and a long face with relatively short radius.

5. In a signal-light apparatus, a casing, a support member pivotally mounted in said casing for oscillation, an elevating arm pivotally mounted on said support, a light projecting member carried by said arm, spring means normally urging said elevating arm toward raised position, a cam having a convex face of relatively long radius on one side and a convex face of relatively short radius on the other side and a projecting bulge of extreme radius between said faces of relatively long and relatively short radius, said face of relatively short radius having a dip of extremely short radius in its central portion and motor means for rotating said cam.

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