

Aug. 7, 1934.

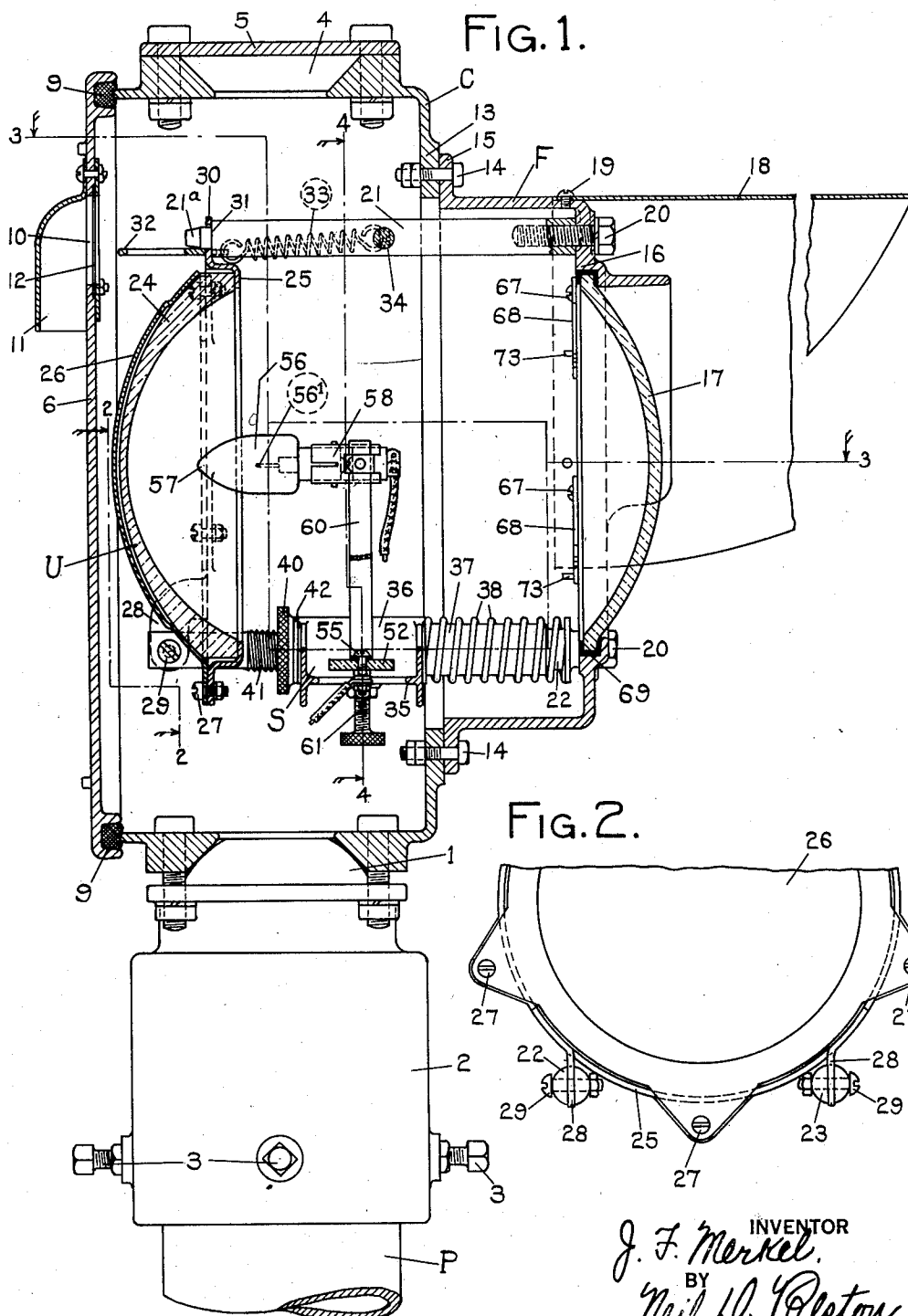
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1,969,089

LIGHT SIGNAL FOR RAILROADS

Filed Aug. 25, 1926

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

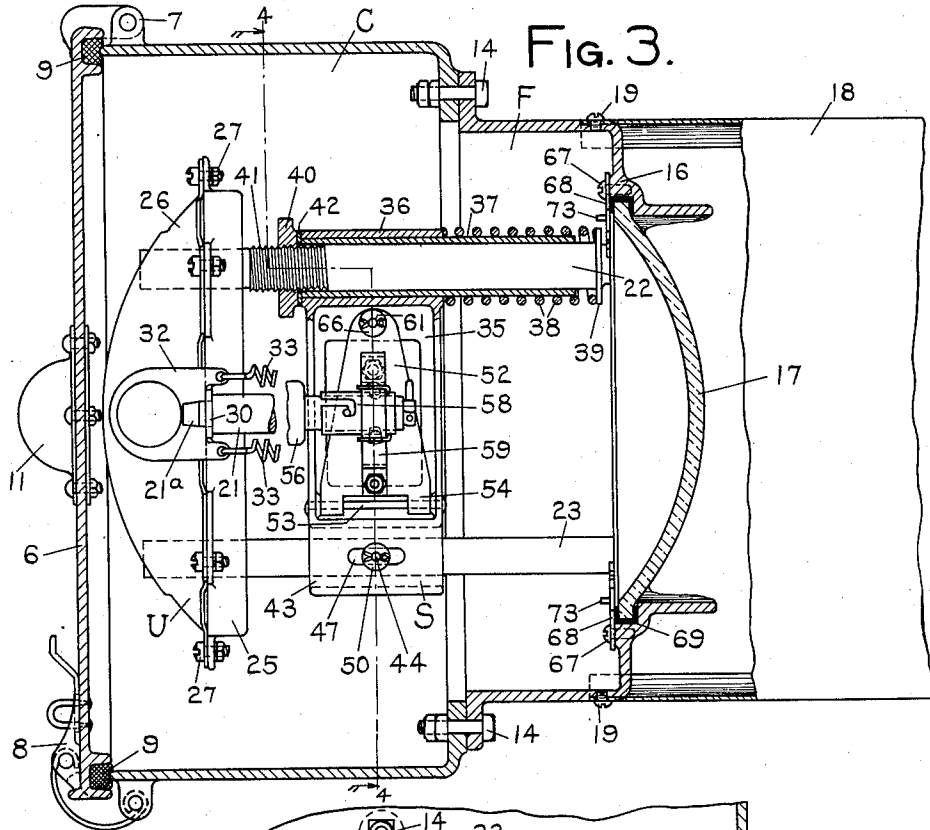
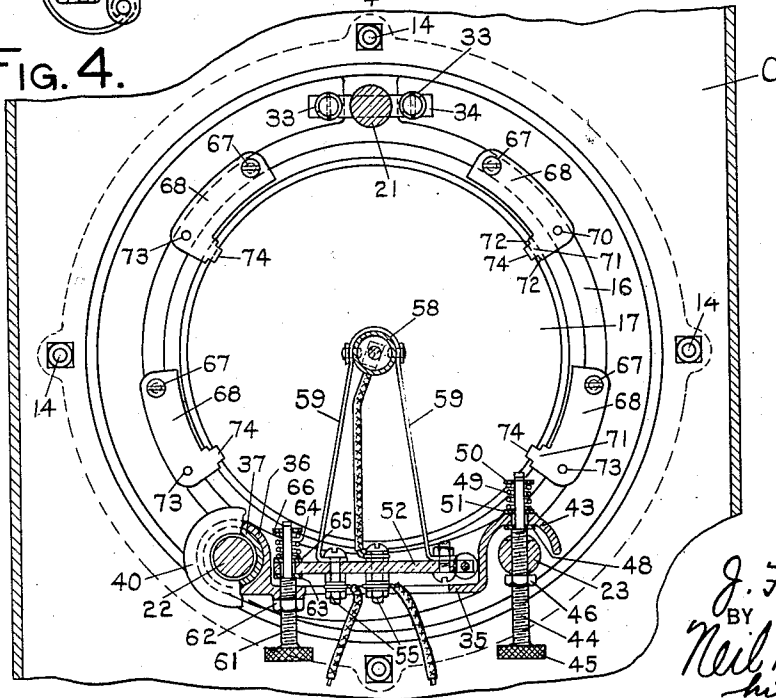


FIG. 4.



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1,969,089

LIGHT SIGNAL FOR RAILROADS

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Application August 25, 1926, Serial No. 131,465

5 Claims. (Cl. 177—329)

This invention relates to light signals for railway signaling purposes, and has more particular reference to means for adjustably supporting a light source in a light signal, and means for determining when the light source is properly positioned in such signal with reference to light concentration and projected means.

The usual light signal, as used in railway signaling, generally employs a light concentrating and projecting means having a definite focal point, at which point the light source should be located in order to obtain the desired range and spread. Incandescent electric lamps however, such as commonly used as light sources in light signals, are not usually manufactured to have their concentrated filaments always bear the same space relationship to the lamp base, so that the position of the filament relative to the lamp base differs in different lamps. On replacing a lamp in a light signal, it therefore generally is necessary to adjust the position of the lamp support in order to bring the concentrated filament in focus. In connection with adjusting the filament to the focal point, a finding means is necessary for determining when the filament is at the desired point.

With the above and other objects in view, it is proposed according to the present invention to provide means in light signals satisfying the above requirements.

One object of the invention is to provide an adjustable lamp support permitting of positioning the lamp filament at any point in space within the limits of the construction employed, which can cheaply be manufactured, is compact, can be easily manipulated with great precision, and which has means for readily and securely locking the various parts in adjusted positions.

A further object of the invention is to provide a finding means which is simple in construction, cheap to manufacture, very satisfactory in operation and including finder members permitting interchange of such members without changing the adjustment of the finder as a whole and thus facilitate re-assembly of the finder parts.

Further objects, purposes and characteristic features of this invention will appear as the description progresses, reference being had to the accompanying drawings showing solely by way of example one form which the present invention may assume, and wherein:—

Fig. 1 is a longitudinal sectional elevation, with parts shown in elevation, through a light signal embodying the present invention;

Fig. 2 is a fragmentary view in elevation of

the back of the optical unit, viewed in the direction of the arrows 3—3 of Fig. 1;

Fig. 3 is a sectional plan view of the device, on line 3—3 of Fig. 1; and

Fig. 4 is a transverse sectional view on line 60 4—4 of Figs. 1 and 3.

The light signal shown in the drawings as exemplifying the present invention briefly comprises a main casing C, mounted on a signal post P, with a support frame F held in the casing and carrying an optical unit U, an adjustable light source support S, and a finder means.

The device, as described more in detail, and with reference to the drawings, includes the main casing C mounted by means of a universal joint 1 on a cap 2 adjustably supported by means of screws 3 on the upper end of the signal post P. The post, the universal joint, and the bottom of the casing, are perforated in a usual manner to accommodate lead-in wires for an electric light unit, while at the top of the casing is an outlet opening 4 for the passage of wires into a second lighting unit positioned on top of the one shown when it is desired to form a multiple aspect light signal, the opening being shown in the drawings as closed by a covering plate 5.

The casing is open at the rear and carries a closing door 6, hinged to the casing at 7, and having a spring hasp 8 for holding the door in closed position. Packing gasket 9 is carried by the door for effecting a tight joint between the door and casing, and a ventilating opening 10 is provided in the door together with a usual protecting hood 11 and screen 12. The casing C has a large opening in its front wall defined by an inwardly projecting flange 13, to which the support frame F is connected by bolts 14 passing through its flange 15.

The front or outer end of the support frame has an enlarged opening defined by a grooved flange 16, with a cover glass 17 carried in the groove of the flange. A visor or sun hood 18 is fastened to the front of the support frame by screws 19.

Bolted to the flange 16 of the support frame by bolts 20, are three parallel, rearwardly projecting, rods 21, 22, 23, arranged as most clearly shown in Fig. 4 in triangular form, with a central upper rod 21 and two lower rods 22 and 23 in a substantially horizontal plane.

For concentrating and projecting the light from the light unit employed in this signal, there is a combined lens and reflector 24, shown in the drawings as being of the well known Lebbey type, which is held in a grooved receiving ring 25, by means of a dished rear metal plate 26, clamped

to the ring about its periphery by bolts 27 to thereby hold the reflector in place and protect it from any injury at the rear. The ring 25 has two downwardly extending integral ears 28 received in slots in the inner ends of the two lower rods 22 and 23 and is pivoted to these rods by bolts 29, as best shown in Fig. 2.

At the upper edge of the ring 25, is an apertured portion 30, positioned to fit over a reduced end portion 21^a of the upper rod 21 and bear against the shoulder 31 thereon. To hold the reflector in operative position against the shoulder on the rod, a manually operable catch member 32, is carried by springs 33 connecting the catch member to a transverse pin 34 in the upper rod. The catch member can be readily pulled rearwardly against the tension of the supporting springs, and snapped over the end of the rod 21 so as to hold the ring against the rod shoulder 31, and by a reverse operation, the reflector can be readily released so as to permit it to swing about its pivots 29 down into a substantially horizontal position, when the door 6 of the casing is swung out of the way.

For adjustably supporting the light source so as to permit independent or simultaneous movement of the same in three directions in space, conveniently chosen at substantially right angles to one another, for focusing the light source relative to the reflector, the following structure is provided. A carrier arm 35 having a hollow hub 36, has an elongated sleeve 37 entered into the hub and fixed thereto. The sleeve and hub are slidably and pivotally mounted on lower rod 22 and the parts are proportioned so that the sleeve forms a snug fit on the rod, free from lost motion. A spring 38 is sleeved on the rod and sleeve, bearing at one end against an abutment 39 integral with the rod, and at the other end against the hub 36 of the carrier arm, so as to normally bias the arm and the sleeve to slide toward the rear end of the rod 22. An adjusting nut 40 is carried on a threaded portion 41 of the rod 22, and bears, through a washer 42, against the hub and sleeve, so as to permit ready and accurate sliding adjustment of the arm 35 along the rod and against the tension of the spring 38.

The carrier arm extends substantially horizontally to bridge across the two lower rods 22 and 23, and has a semi-circular end portion 43 passing over the upper side of the rod 23 (see Fig. 4). An adjusting screw 44, with a knurled head 45, is threaded upwardly through the rod 23 and can be firmly locked in position by nut 46. The adjusting screw passes through an elongated slot 47 in the portion 43 of the carrier arm, and has a washer 48 bearing against a shoulder on the screw, and arranged to bear against the lower surface of the arm. A coil spring 49 is carried on the outer end of the adjusting screw between an outer washer 50, held on the outer end of the screw, and an inner washer 51, slidable on the screw and pressed against the outer surface of the arm by the spring 49. Operation of the adjusting screw to move it in rod 23 will cause the arm to rock about its pivot rod 22 in a substantially vertical plane.

Connected to the carrier arm 35, is an arm 52, conveniently designated a socket arm. This arm is made of insulating material of any suitable character and is pivoted adjacent the free end of the carrier arm at widely spaced points by means of a pin 53 passing through spaced apertured lugs 54 on the socket arm. The socket arm carries terminal posts 55, for lead-in wires for

the light source 56 which is shown in the drawing as an incandescant bulb with a concentrated filament 56¹. The end 57 of the bulb is preferably made of varying thickness in order to constitute a lens to aid in concentrating and projecting the light from the filament. The bulb is supported in a socket 58, carried by a flat strip bent to form two arms 59 positioned with their flat sides 60 parallel to the direction of light projection and bolted to the socket arm 52 as shown (Fig. 4).

In order to rock the socket arm about its pivot pin 53, an adjusting screw 61 is furnished, which is carried by the arm 35 adjacent its pivot end, and operates in connection with the socket arm in substantially the same manner as does the adjusting screw 44 for the carrier arm, and includes, in the same manner, a lock nut 62, a washer 63 bearing against the lower surface of the arm 52, and a spring and washers 64, 65 and 66. The adjusting screw 61, however, passes through a circular aperture in the socket arm, since in this case, there is no necessity for a slot, such as slot 47 of the carrier arm.

With the structure described just above, it will be seen that with carrier arm 35, and with it the socket arm 52, can be moved rectilinearly parallel to the direction of light projection by sliding arm 35 along the rod 22, so as to position the filament of the incandescant bulb in various vertical planes substantially at right angles to the direction of light projection. By means of the carrier arm 35 and the socket arm 52 and their adjusting screws 44 and 61, the filament can be moved along circular arcs of relatively long radii positioned substantially at right angles to each other, and in a common vertical plane. Thus provision is made for readily and accurately moving the filament in three directions in space conveniently selected substantially at right angles to each other, with the said adjusting screws and adjusting nut 40 permitting making the adjustments with great precision.

In order that it may be readily determined when the light source is positioned at the focus of the optical unit, a finding means is provided in the following character. Pivoted to the flange 16 by means of screws 67, is a plurality of finder units 68, all exact duplicates of each other so as to permit their interchangeability. The finder units are pivoted to the flange 16 of the carrier frame F so as to project inwardly of the flange in order to securely hold the cover glass 17 in place, a suitable gasket 69 being employed in the usual manner.

Each of the finder units has a hole 70 drilled through it at a point bearing exactly the same relation to the pivot screw in the case of each unit. The units each have a projecting end 71 bearing notched shoulders 72, defining an index line across the projecting end 71. The individual units are held in fixed position by means of dowel pins 73 passing through the holes 70 in the finders and registering holes drilled in the inner face of the flange 16. In determining the positions of the individual units, the light source, shown in the present case as an electric bulb, is adjusted in position, by means of the light support structure S, until its filament is in focus, as determined by any convenient and well known photometric method. The individual finder units are then swung on their pivot screws 67 until the edge of the projected light beam cuts across the shoulders 72 so as to illuminate the reduced tip 74, of each, while leaving that part back of the shoulders, in

darkness. A hole is then drilled in the flange 16 directly in line with the hole 70 in each finder unit, and the dowel pins 73 are inserted in place to securely hold the units in position. At any future time, when it becomes necessary to focus the light source, this can be readily done without the aid of a dark room or usual photometric equipment, by adjusting the position of the light source, by means of the structures, until the projected beam of light assumes the position just described with reference to the various finder units.

In practice it has been found very advantageous to use the indicating means defined by the shouldered portions of the finder units instead of a mark placed on the surface of the unit as has heretofore been done. It is much more readily and accurately determinable when the edge of the projected light beam cuts across the shoulders, than when it just reaches a given mark on the finder unit surface.

A very decided advantage is obtained by having the individual finder units all exact duplicates, and furnished with pivot holes and fastening holes positioned in exactly the same position relative to each other in each finder unit. With such a construction, should it become necessary, due to breakage of the cover glass, or for any other reason, to dismount the finder units in order, for example, to fit a new cover glass in place, the finder units can be interchanged when fastening them back on the flange, without disturbing the adjustment of the finder as originally determined by photometric methods. This would not, by any means, be the case if the fastening holes 70 in the individual finder units were drilled at the same time as the holes in the flange, and without any particular reference to their position relative to the pivot screw for each unit.

The above specific description of one form of device embodying the present invention has been given solely by way of illustration, and is not intended in any manner whatsoever, in a limiting sense. Obviously this invention can assume many different physical forms and is susceptible of numerous modifications, and all such forms and modifications are desired to be included by the invention, as come within the scope of the appended claims.

Having described my invention, I now claim:—

1. In a light signal, a casing, two rods fixed to the casing and extending therein, optical means, means pivoting the optical means to the two rods,

a carrier arm, means slidably pivoting the carrier arm pivoted to one of the two rods, a socket arm means pivoting the socket arm at spaced points to the carrier arm, a light socket on the socket arm, and means for adjusting the arms.

2. In a light signal, a casing, two rods fixed to the casing and extending therein, a reflector, means pivoting the reflector to the two rods, a carrier arm, means slidably pivoting the carrier arm to one of the two rods, a socket arm, means pivoting the socket arm at spaced points to the carrier arm, a light socket on the socket arm, means for sliding the carrier arm along its rod, an adjusting screw threaded through the other of the two rods and engaging the carrier arm for swinging the carrier arm on its rod, and a second adjusting screw threaded through the carrier arm, for swinging the socket arm about its pivotal axis.

3. In a light signal, a support, a carrier arm, means slidably and pivotally mounting the arm on the support, means for adjustably sliding the arm on the support, an adjusting screw engaging the arm for swinging the arm about its axis, a socket arm carrying a light socket, means pivoting the socket arm to the carrier arm, and an adjusting screw mounted in the carrier arm and engaging the socket arm for swinging the socket arm on its pivot.

4. In a light signal, two spaced rods, optical means, means pivoting the optical means to two ends of the rods, a casing fixed to the other ends of the rods, a carrier arm having an elongated sleeve means slidably and pivotally connecting the sleeve to one of the rods, adjusting means on the two rods for respectively sliding the carrier arm along and pivoting it about its support rod, a socket arm, means pivoting the socket arm to the carrier arm, and adjusting means on the carrier arm for swinging the socket arm about its pivot.

5. In a light signal, two spaced rods, a reflector means pivoting the reflector to two ends of the rods, a casing fixed to the other ends of the rods, a carrier arm connected to an elongated sleeve which is slidably and pivotally connected to one of the rods, adjusting means on the two rods for respectively sliding the carrier arm along and pivoting it about its support rod, a socket arm pivoted to the carrier arm, and adjusting means on the carrier arm for swinging the socket arm about its pivot.

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