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F. R. HOUSE

UNATTENDED BEACON

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Fig. 1.

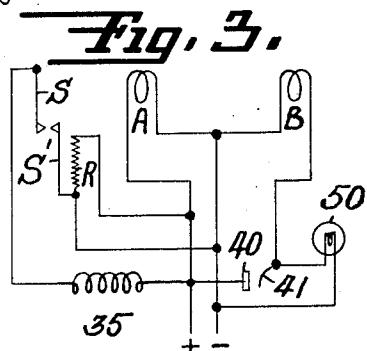
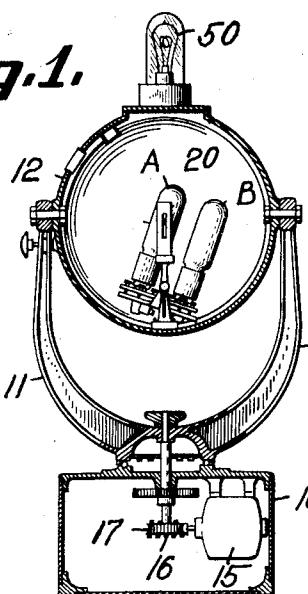


Fig. 2.

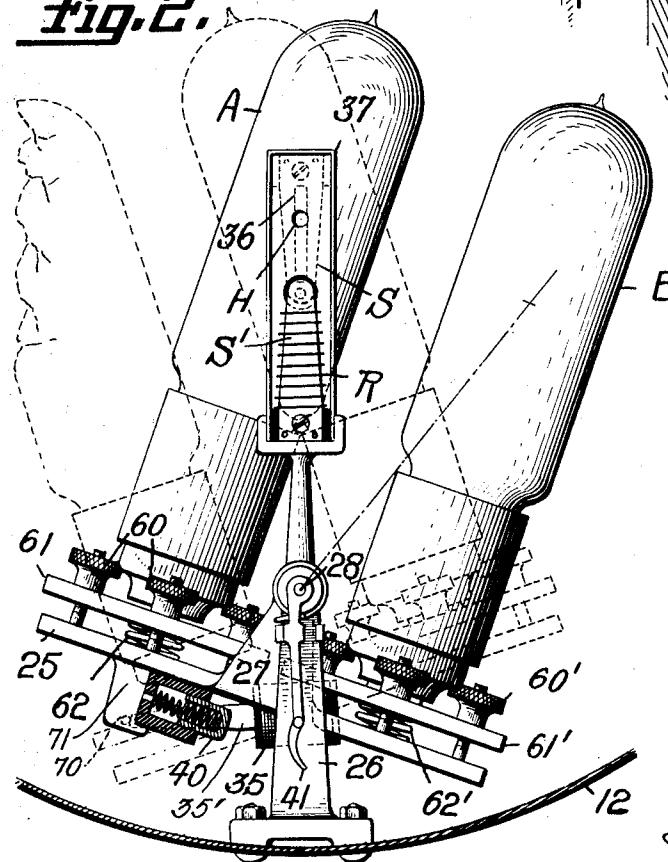


Fig. 5.

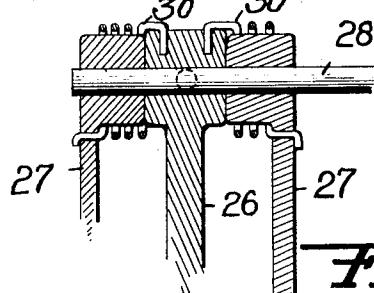
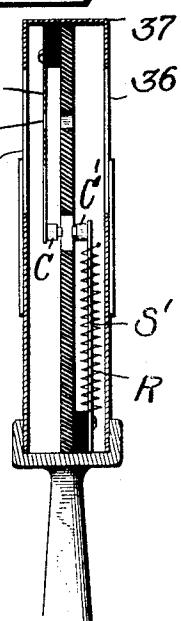


Fig. 4.



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## UNITED STATES PATENT OFFICE.

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## UNATTENDED BEACON.

Application filed July 8, 1928. Serial No. 120,376.

This invention relates to unattended beacons or searchlights which are adapted to operate automatically over an extended period without requiring the attention of an operator. For this purpose there is usually employed a plurality of sources of light, such as especially designed incandescent lamps, one of said lamps being effective while the others are ineffective. It is one of the objects of my invention to provide simple but effective means requiring no attention and not likely to get out of order whereby a second lamp is moved into effective position when the first lamp fails. This invention thus constitutes an improvement over the forms of automatic lamp control mechanism disclosed in the copending application of Preston R. Bassett, Serial No. 646,651, filed June 20, 1923.

It is a further object of my invention to provide in connection with the above mentioned novel automatic lamp positioning means an especially adapted type of thermostat for controlling said mechanism.

Further objects and advantages of this invention will become apparent in the following detailed description thereof.

In the accompanying drawings

Fig. 1 is a front view of a vertical section taken through a type of lamp embodying what I now consider to be the preferred form of my invention.

Fig. 2 is an enlarged view of the lamp mechanism of Fig. 1.

Fig. 3 is a wiring diagram of my invention.

Fig. 4 is a vertical section through a control thermostat.

Fig. 5 is a vertical section through the pivotal support of the lamp mechanism.

Referring to the drawings, I have shown a type of automatic searchlight or beacon adapted particularly for guiding aircraft over land or water at night or in fog. Such a beacon being placed usually in isolated

positions must be capable of operation without the attendance of an operator. In this particular form, the lamp comprises a base 10 upon which is mounted for rotation about a vertical axis a support comprising a pair of

trunnion arms 11 in which is pivoted about a horizontal axis the search-light drum 12. Within the base 10 there may be provided a motor 15 for rotating said searchlight in azimuth through suitable gearing 16-17. The searchlight may comprise the usual drum 12 having a parabolic deflector 20 or other light projecting means at the rear thereof and provided with a source of light at the focus of said reflector in order to cast a beam forwardly. In the present invention the said source of light may be an incandescent lamp A or B, the filament of which is adapted to be positioned in the focus of said mirror. Since the beacon is designed to be unattended by an operator I provide the following novel means whereby when the lamp's filament fails the other lamp will be automatically moved to focal position and the first lamp moved out of said position. For this purpose I provide in the present case an oscillatory platform 25 pivoted on a support 26 in the form of an upstanding bracket fixed to the drum. The said platform 25 may be provided with preferably two upstanding lugs 27 whereby said platform is pivoted up on the bracket 26 for rotation on a shaft 28 fixed in the upper end of bracket 26. Shaft 28 is shown as located parallel to but below or to one side of the major or optical axis of the drum and the lamps extend upwardly across the drum. A pair of coil springs 30 mounted at one end in the fixed bracket 26 and connected at their other ends to the lugs 27 normally bias the platform 25 in one direction to tend to bring (in this case) the lamp B in focal position. The device is originally set, however, with the lamp A in focal position, the platform being oscillated for this purpose against the action of springs 30 to wind up said springs. The platform is held in this position with lamp A in focal position by means of any suitable trigger device, against the action of said springs 30.

I now provide means whereby upon failure of lamp A the trigger will be released to permit springs 30 to oscillate platform 25 through a small angle and in a direction to bring lamp B into effective focal position.

For this purpose I may employ a coil 35 in circuit with a controlling thermostat shown in Fig. 4, said thermostat being adapted to close the circuit through coil 35 when lamp 5 A fails. The aforesaid trigger device includes coil 35 which is in the form of a solenoid, the armature 35' of which is normally maintained outwardly, i. e., to the left in Fig. 2 by a spring (not shown). Said armature at its end bears against a pin 70 extending laterally from a lug 71 on base 25, thus holding the platform in the position shown in full lines. When, however, the solenoid is energized, it draws inwardly the armature 35' thus releasing the pin and permitting the platform to be oscillated by the springs 30 as described. Said thermostat may comprise two insulated contact strips S—S' carrying contacts C—C' normally spaced from each other to form a predetermined gap. One of the thermostat strips, such as S', may be surrounded by a heating coil R in parallel with the main circuit which supplies current to the lamps. The other of said strips S is so positioned that the heat rays from the lamp in effective position passes through a window 36 in the thermostat casing 37 to strike upon said contact strip S but not upon the contact strip S'. 10 When the main supply line is closed and lamp A is set in focal position, coil R will immediately begin to heat up to supply heat to contact strip S', while lamp A will begin to heat up to supply heat to contact strip S. 15 When both contact strips are thus being heated they are designed to curve in similar directions and have the same final deflections, thus maintaining the gap between contacts C and C'. When the lamp A fails, 20 however, heat is no longer supplied to contact strip S while coil R continues to supply heat to contact strip S'. The contact strip S will then cool off and straighten, causing contacts C—C' to engage and close the circuit through coil 35 to release the trigger and permit springs 30 to swing platform 25 in a direction to render lamp B effective. Suitable stops not shown may be provided for stopping the platform 25 when the respective 25 lamps A—B reach the focal position.

For establishing the circuit through lamp B when the latter has been moved to focal position, platform 25 may carry a resiliently pressed contact 40 adapted to engage with a yielding contact 41 carried by the bracket 26, the latter being in the main supply circuit as shown in Fig. 3. When the lamp B is moved to focal position, any suitable signal may be energized for the purpose of indicating that one of the lamps is burned out. In the present case I may utilize the engagement of contact 40 with contact 41 for closing the circuit through a signal lamp 50 which may be positioned preferably on the 30 outside top of the searchlight drum.

As hereinbefore described, the thermostatic element S is in the direct path of the rays from the reflecting means, and is positioned to intercept the rays along the focal axis. Advantage is taken of this fact to provide a means for properly locating the filament of the lamp at the focus. For this purpose an aperture H may be formed in the thermostatic element S in the focal axis and said aperture is carried completely through the thermostatic element so that by looking therethrough the lamp may be properly adjusted with its filament in the focal axis. This adjustment may be made by means of a plurality of screws 60—60', preferably three extending through auxiliary platforms 61—61', each supporting one of the incandescent lamps A—B, said auxiliary platforms being resiliently connected to the main platform 25 by means such as springs 62—62'. By this means a very accurate adjustment of the filament in the focal axis of the reflecting means may be obtained.

In accordance with the provisions of the patent statutes, I have herein described the principle and operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means. Also, while it is designed to use the various features and elements in the combination and relations described, some of these may be altered and others omitted without interfering with the more general results outlined, and the invention extends to such use.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In a beacon, a plurality of lamps, one of said lamps being in effective position, means normally tending to move said effective lamp to ineffective position and said ineffective lamp to effective position, locking means for holding said effective lamp in the effective position and means including a compensated thermostat whereby said first means is released by the radiant energy transmitted by the lamp in effective position.
2. In a beacon, a plurality of electric lamps, one of said lamps being in effective position, means for moving said effective lamp to ineffective position and said ineffective lamp to effective position, and means whereby said first means is controlled by the rays transmitted by the lamp in effective position, said last named means including a thermostat having two normally spaced contact members controlling said first-named means, means for heating one of said members by the supply current, and means whereby the other of said members is exposed to the rays from the lamp in effective position whereby when said rays

fail when said supply current is on said contacts are closed.

8. In a beacon, a reflector, a plurality of lamps, a support therefor pivoted about an axis in line with but to one side of the focal axis of said reflector, means for normally maintaining one lamp in effective position, 70 means for oscillating said support to bring said second lamp to effective position when the first lamp fails, means for controlling said first means, including a thermostat having an aperture in the focal axis of the reflector to assist in adjusting the effective lamp into the said focal axis, and means whereby said lamps may be adjusted, including a platform for each lamp, a support for said platforms, and a yieldable connection between said support and each platform. 75 80

9. In an aviation beacon, the combination with the drum and reflector, of a plurality of incandescent lamps within the drum, a support for said lamps for holding them side by side across the drum, means for mounting said support for oscillation about an optical axis substantially parallel but to one side of the axis of the drum, means for maintaining said support normally in a position to locate the filament of one lamp in the center of the drum, and means responsive to failure of said lamp for oscillating said support to bring the other filament of the light in the center of the drum. 95

10. In an aviation beacon, the combination with the drum and reflector, of a plurality of incandescent lamps within the drum, a support for said lamps for holding them side by side across the drum, means for mounting 100 said support for oscillation about an axis substantially parallel but to one side of the optical axis of the drum, the lamps lying adjacent but on opposite sides of said axis, means for maintaining said support normally 105 in a position to locate the filament of one lamp in the center of the drum, means responsive to failure of said lamp for oscillating said support to bring the filament of the other light in the center of the drum, and a signal 110 actuated upon failure of said first-mentioned light for indicating that one of said lights had failed.

11. In an incandescent searchlight, the combination with the projector, a lamp support in front of and to one side of the axis of the projector, means for mounting said support for oscillation through a small angle about an axis to one side of the axis of the projector, a pair of lamps on said support on either side of said support axis, means for maintaining said support tilted in one direction to locate the light source of one lamp adjacent the focus of said projector, and means for tilting said support in the opposite direction to bring the light source of the other lamp adjacent the focus of said projector upon failure of the first-named lamp. 120 125

12. In an aviation beacon, a drum, a plurality of incandescent lamps, a support for 130

said lamps for holding them side by side across the drum, means for mounting said support for oscillation about an axis lying between and adjacent the base of said lamps and extending at an angle to the common plane of said lamps, means for maintaining said support normally in a position to locate

one lamp in the center of the drum, and means responsive to failure of said lamp for oscillating said support to bring the other light in 10. the center of the drum.

In testimony whereof I have affixed my signature.

FRANK R. HOUSE.