

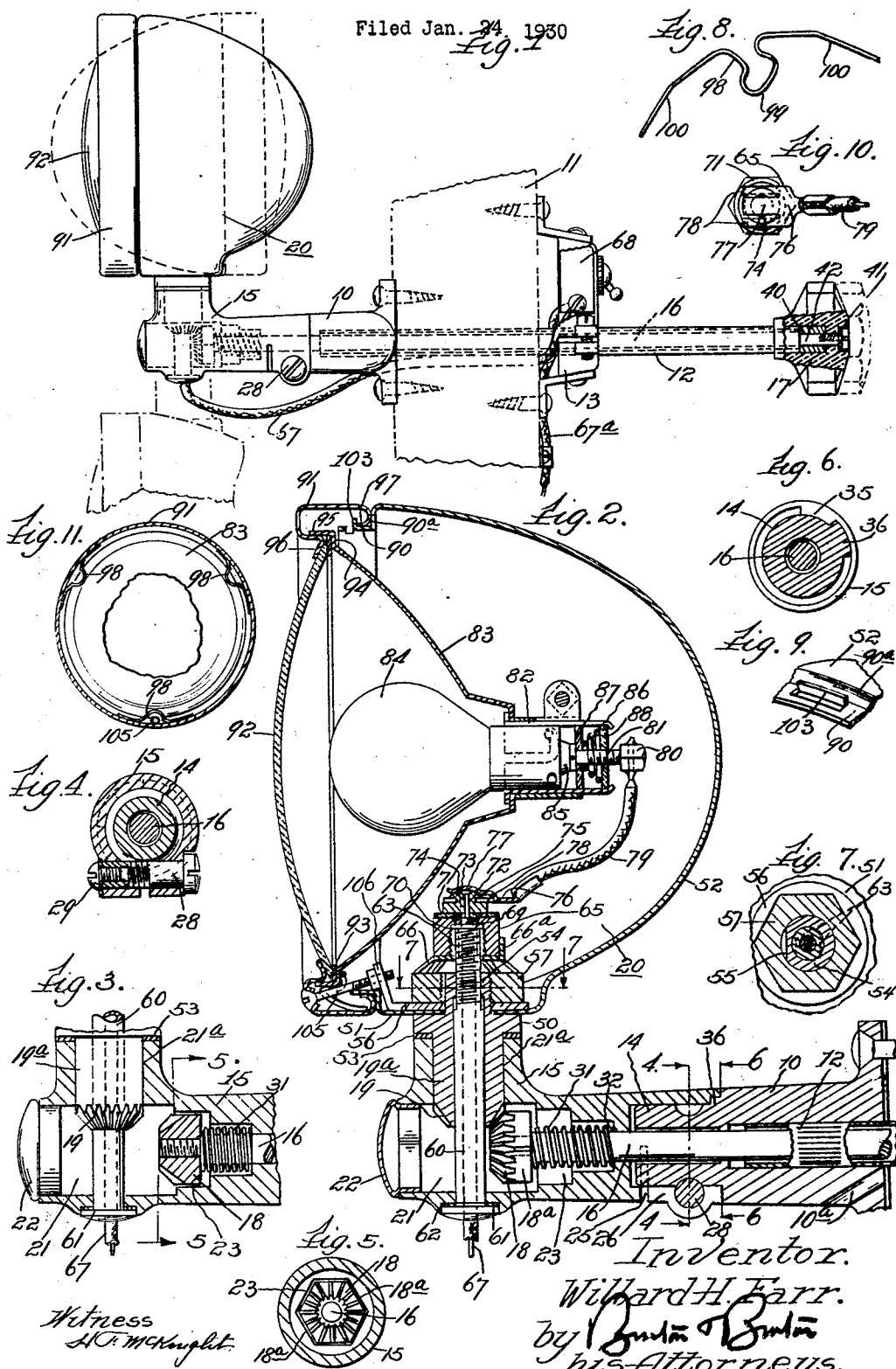
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DIRIGIBLE SPOTLIGHT

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DIRIGIBLE SPOTLIGHT

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This invention relates to dirigibly mounted lights, and more particularly to a spotlight of the "inside controlled" type especially suitable for automobiles or other vehicles. The main object of the present invention is to provide a light of improved and simplified construction which is capable of adjustment through a relatively wide range of vertical and horizontal movement. Another object is to provide an improved control for a light of this general character by means of which the light may be quickly and easily manipulated. A further object resides in so constructing certain elements of the light as to permit their pre-assembly as a unit. It consists in certain features and elements of construction in combination as herein shown and described, and as indicated by the claims.

In the drawings:

Figure 1 is a side elevation of a dirigibly mounted light embodying the present invention.

Figure 2 is an enlarged sectional view taken along a medial plane.

Figure 3 is a fragmentary sectional view through the gear housing, showing the driving gears out of mesh and with one of the gears interlocked with the housing proper by means of which the housing and lamp may be bodily rotated about a longitudinal axis.

Figure 4 is a transverse sectional view taken as indicated at line 4—4 on Figure 2, illustrating means for varying the friction between the fixed bearing sleeve and the gear housing.

Figure 5 is a sectional view taken substantially as indicated at line 5—5 on Figure 3.

Figure 6 is a sectional view taken at line 6—6 on Figure 2, showing interengaging features of the housing and fixed bearing sleeve by means of which the lamp is limited in its range of rotative movement about the longitudinal axis.

Figure 7 is a fragmentary sectional view taken at line 7—7 on Figure 2.

Figure 8 is a perspective view of a spring member employed for locking the reflector to the bezel ring.

Figure 9 is a fragmentary perspective view

of the casing having an upstanding lug which cooperates with the bezel ring for locking it in position thereon.

Figure 10 is a fragmentary view looking down upon the swivel connection of the terminal post inside the lamp casing.

Figure 11 is a sectional view through the bezel ring showing the arrangement of the spring members which serve to lock the reflector to the bezel ring.

The dirigible spotlight, as illustrated in the drawings is designed for the purpose of playing a concentrated beam of light in a certain direction or upon a particular object, such as along a roadway or on signposts, etc. Since a light of this general character is used only occasionally, and then frequently only momentarily, it is therefore desirable to arrange for control of the light at a point conveniently accessible to the driver of the vehicle.

The light embodying the present invention includes a fixed bearing sleeve 10 adapted to be secured to a mounting member such as the corner post of a vehicle, as indicated at 11, and rigidly secured to said bearing sleeve is a tubular guide member 12 extending through and a substantial distance beyond said post inside of the vehicle. Preferably, although not necessarily, the fixed sleeve and tubular guide are mounted with their axes in a substantially horizontal plane. This guide member 12 is additionally supported by a bracket housing 13 which embraces said member on the side of the post opposite said bearing 10, and is also rigidly secured to the post 11. The outer end of said bearing sleeve 10 is provided with a reduced portion 14 on which is rotatably mounted a gear housing 15. Extending axially through the tubular guide member is a drive shaft 16, having journal support at its forward end in the gear housing, while its rear end is secured to an operating knob or handle 17 which is slidably guided on the rear end of the tubular guide member 12. Rigidly secured to the forward end of said shaft inside of the housing is a bevel gear 18 which engages a similar gear associated with the lamp proper indicated generally at 20. Thus by

rotation of said drive shaft, the lamp proper is rotatable about a transverse axis.

The gear housing 15 is preferably a cast member, being suitably cored out to receive the various elements, and it includes a main bore 21 extending co-axially with the tubular guide member 12, and a transverse bore 21^a, the bore 21^a serving as a journal bearing for the hub portion 19^a of the bevel gear 19. The outer end of the main bore is preferably closed by a cap member 22 so that the gears may be kept free from dust and dirt.

The lamp proper may also be rotated about the longitudinal axis of the drive shaft, and for this purpose I utilize said shaft for this additional function by forming the gear housing 15 and drive gear 18 with detachably connectable interengaging features in the nature of a clutch. This clutch is herein shown as consisting of a hexagonal portion formed as the body of the gear as shown at 18^a, and a similarly shaped counter-bore 23 in the housing 15, whereby axial movement of the drive shaft moves the gear 18 out of mesh with the gear 19, shifting the polygonal portion of the gear into cooperating engagement with the counter-bore 23 in said housing. And then upon rotating the drive shaft when the gear 18 is in such engagement with the housing, the lamp body proper and its supporting gear housing 15 may be rotated together about the longitudinal axis of said drive shaft. However, to insure against too free a movement of the lamp about said longitudinal axis, the portion of the housing telescoping over the reduced portion 14 of said fixed bearing 10 is provided with a friction adjustment by means of which the lamp may be frictionally maintained at any desired angular position relative to the axis of the drive shaft.

The rearward portion of the gear housing adjacent said fixed bearing is formed with a transverse slot 25 extending a substantial distance through the housing and is connected by a longitudinal split 26 opening at the end. On the opposite sides of said longitudinal split 26 are formed suitable lugs through which extends an adjusting screw 28 and a lock screw 29, by means of which the rear portion of the housing may be slightly sprung so as to reduce its internal diameter and cause it to frictionally hug the reduced portion 14.

The housing and fixed bearing are formed with cooperating lugs 35 and 36, respectively, as illustrated in Figure 6, arranged in the same transaxial plane, and adapted to interact with each other for limiting the extent of rotation of said lamp 20 about the longitudinal axis of the drive shaft.

Since it is desired to normally maintain the gear 18 out of clutched engagement with the gear housing 15, I provide a coil spring 31 encompassing said drive shaft and inter-

posed between the end of said gear and a shoulder 32 forming the end of the counter-bore of said housing. This coil spring thus also serves to yieldingly maintain the gears 18 and 19 in operative engagement; and thus to rotate the lamp about the axis of the drive shaft, it is necessary to shift the shaft axially against the reaction of said coil spring to bring the gear 18 into clutching engagement with the housing (as seen in Figure 3). To insure rotation of the drive shaft when the gear 18 and housing are operatively engaged, the knob 17, which is telescopically guided on the end of the guide tube 12, has secured therein a bushing 40 adapted to be fitted onto the end of the drive shaft; and the knob is secured in place thereon by means of a screw 41 threaded into the end of said shaft and abutting against a recess shoulder of said knob, as illustrated in Figure 1. The bushing and the shaft are preferably formed with keys or flat surfaces such as indicated at 42, so as to permit positive rotation of the shaft by turning the knob.

The bevel gear 19 is formed at the outer end of its hub 19^a with an annular flange 50 positioned for abutting against the under side of a depressed portion 51 of a lamp casing 52 and adapted to seat on its other side against the end of the gear housing with a friction washer 53 interposed therebetween. This gear is formed with a reduced shank 54 beyond said flange 50, provided with a flat face 55 which interlocks in a correspondingly shaped aperture in the lamp casing and also in a washer member 56, and threaded on the end of said shank 54 is a nut 57 seated firmly against said washer 56. Extending axially through the gear 19 and through said housing 15 at right angles to the drive shaft is a hollow stud member 60 having a head 61 seated against a recessed shoulder 62 in the end of said housing opposite gear 19, said stud having its opposite end threaded and provided with diametrically opposite flat portions 63, which interlock with cooperatively formed portions in the bore of the reduced portion 54 of the bevel gear 19 (as seen in Figures 2 and 7), by means of which said stud is interlocked with the gear 19 for rotation therewith. Threaded on the upper end of said hollow stud is a nut 65 with a spring washer 66 interposed between said nut 65 and the nut 57. This spring washer 66 is of the frusto-conical type having a plurality of tangs, and as illustrated in Figure 2, one of said tangs 66^a is bent upwardly to engage one of the faces of the nut 65 for locking the same in position. It is to be understood that the nut 66 may be adjusted for varying the amount of friction on the washer 53, so that the lamp proper will not move too freely with respect to the housing 15.

Since the lighting and certain other circuits of vehicles such as automobiles usually employ the "grounded system" wherein one terminal of the storage battery of the vehicle is

directly connected to the chassis or frame, the lamp is constructed for use in connection with such systems. It will be understood that one terminal of the lamp will be grounded through the lamp proper to the mounting post 11, thence to the vehicle frame. Extending axially through the hollow stud 60 is an insulated conductor wire 67 trained below, and extending through an aperture 10^a in, the fixed bearing sleeve, thence through the post 11 for connection to a suitable switch inside the vehicle, such as that indicated at 68 carried by the bracket 13; a second conductor wire 67^a connects said switch to the other terminal of the storage battery. Secured on the casing of the wire 67, adjacent its end in said stud is a head portion 69 adapted to seat against the shoulder 70 formed in the nut 65; the wire extending a short distance into an insulating bushing 71 mounted on top of the nut 65 and with the conductor wire proper 72 extending therethrough and soldered or welded to a terminal 73 seated firmly on the bushing washer 71. This terminal is formed with a button head 74 having an under cut groove 75 for swivel engagement by a terminal connection 76 which is provided with a central spring tang 77 shaped to yieldingly snap over the button head 74, and a pair of spaced prongs 78 on each side of said tang formed to straddle said button head in the groove 75.

It will be apparent that by means of this arrangement the connecting member 76 may be swiveled with respect to the terminal 73 for maintaining proper contact at all times. Extending upwardly from said terminal connection 76 is a short conductor member 79 secured at its upper end in a nut 80 threaded on the outer end of the screw terminal member 81. This screw terminal member 81 is supported in the socket 82 which is centrally secured and projects rearwardly from a reflector 83. Said socket is provided with the usual bayonet type of slots in which are engaged the lugs on the base of the electric light bulb 84 in the usual manner; the arrangement of the parts being such that the central contact indicated at 85 at the end of the base engages the head of the terminal screw member 81; and in order to insure contact at all times, the screw member 81 is yieldingly forced in the direction for engagement with said contact by means of a coil spring 86 encompassing said screw member 81 and interposed between a pair of insulating disks 87 and 88, respectively, the former being slidably movable with said screw member 81 inside of the socket, while the insulating disk 88 is permanently anchored in the rear end of said socket.

The casing 52 is of the usual approximately hemispherical shape having the marginal edge formed with an inwardly offset annular flange 90 on which is mounted the bezel ring

91 carrying as a unitary assembly the reflector 83 and the lens 92 with a packing gasket 93 interposed between said lens and reflector. The outer marginal edge of the reflector is formed in a transverse annular flange 94 continuing in an annular flange portion 95 extending parallel to the axis of said reflector. The lens 92 is seated on the flange 94 on top of the gasket 93 and is secured in place by an inwardly extending annular ring portion 96 of the bezel ring, and the bezel ring is formed at its rear edge with an inwardly extending flange portion 97 a short distance rearward of the flange 94 of said reflector. The reflector is yieldingly secured to the bezel ring with the lens locked in position by means of three spring members 98 spaced at suitable distances around said reflector. These springs are formed with a central portion 99 adapted to engage against the rear side of the flat flange portion 94 of the reflector, and leg portions 100, extending from said central portion in opposite directions and adapted to have their ends lodged in the inwardly bent flange portion 97 of the bezel ring, as shown in Figures 2 and 11. Thus the bezel ring, lens and reflector, together with the socket and electric light bulb may be pre-assembled as a separate unit for mounting in the lamp casing. Such an arrangement facilitates assembly of the parts and reduces manufacturing costs as well as renders repair and replacement of parts relatively easy.

Struck out of said annular flange 90 of the casing, preferably adjacent the top, is an upwardly extending lug 103, and spaced away from the shoulder 90^a of the casing a distance to permit the grooved flange 97 of said bezel ring to fit snugly therebetween, as seen in Figure 2, thus serving to secure the upper portion of the bezel ring to the lamp casing. The bottom edge of the bezel ring is provided with an aperture through which extends a screw member 105 having its end threaded in an obliquely extending lug 106 of the washer member 56, thus serving to positively lock the bezel ring and its assembled elements in position in the casing.

It will now be evident that by means of such an arrangement, the process of replacing an electric light bulb or inspecting the parts of the lamp within the casing may be quickly and easily performed by merely removing the screw 105, thus permitting the removal of the entire pre-assembled unit. Then by removing springs 98, the bezel, lens and reflector may be separated. By means of the swivel connection to the terminal 73, the connecting member 76 may be rotated or readily detached so that the unit proper may be removed from the lamp casing and transported to any convenient place for adjustment or replacement of the parts.

I claim:—

1. In a dirigible light, the combination of a fixed support and a housing telescopically engaged therewith for rotation about said support, together with a lamp carried by said housing, an external member of said telescopically engaged parts being contractable for frictional hold upon the internal member, the latter having a circumferential groove and the former having a clamping bolt tangentially disposed with respect to said groove and lodged within it, whereby said bolt serves for adjustment of the friction and simultaneously locks said parts against separation.

2. In a dirigible light, the combination of a fixed support, a housing carried by said support for rotation thereon, a shaft extending through the support into the housing along the axis of such rotation, a lamp secured to the support for rotation about a transverse axis, a gear rigid with the lamp and disposed within the housing, and a gear fixed on said shaft adapted to mesh with the first mentioned gear for rotating the lamp on the housing, the shaft and its gear being longitudinally shiftable, the body of said gear being non-circular and the housing having a non-circular recess to receive the gear body when the shaft is shifted so that rotation of the shaft may serve to turn the housing on its support.

3. In a dirigible light the combination of a fixed support, a housing carried by said support for rotation thereon, a lamp casing and a stem therefor rotatively journaled in the housing, said stem comprising the body of a gear whose teeth are disposed in the housing to mesh with the teeth of an operating gear therein, said gear body having a flange and a reduced threaded portion beyond said flange, the lamp casing being clamped against one side of said flange by means of a nut screwed onto said reduced portion and the opposite side of said flange being stopped against an external shoulder of said housing, said gear body having an axial bore with a headed retaining bolt extending therethrough and through the wall of the housing opposite the said shoulder whereby said bolt serves to produce friction at said shoulder resisting rotation of the lamp casing on the housing.

4. In the combination defined in claim 3, said bolt being hollow to accommodate an insulated conductor wire extending there-through and provided with connections inside the casing for energizing an electric lamp therein.

5. In the combination defined in claim 3, said bolt being hollow to accommodate an insulated conductor extending therethrough for connection with an electric lamp in the casing, said support being adapted for mounting on a partition member and having a bore through which a shaft for said operating gear is adapted to extend, said shaft ex-

tending also through such partition, said support having an aperture adjacent the bore and the conductor emerging from the hollow bolt being led through said aperture to extend through the partition adjacent said shaft; the housing and support having interengageable features adapted for limiting the range of rotation of the housing about the support to avoid injury to the conductor.

6. In a dirigible light, a fixed support, a housing carried by said support, a lamp mounted on the housing and rotatable relative thereto and including a casing and an electric light bulb carried therein, a drive shaft journaled in said housing and rotatable about a longitudinal axis, a gear on the end of said shaft, normally meshed with a co-operating gear rigidly associated with the lamp, a hollow stud extending transversely to said shaft through said last mentioned gear into the lamp casing, a conductor wire extending through said hollow stud, a terminal post carried by and insulated from said stud, and connected to the end of said conductor, said terminal being formed with a head and a peripheral groove adjacent said head, and a conductor wire having connections at one end to said bulb, and provided with a clip at the other end for engaging said terminal, said clip including a pair of spaced prongs adapted to straddle the grooved portion of the head, and a spring tang intermediate said prongs adapted to engage the terminal head for yieldingly maintaining said parts in engagement.

7. In the combination defined in claim 6, said terminal head being of button formation and said spring tang of the clip being co-operatively formed whereby to permit free swivelling of said parts while engaged.

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