Dec. 24, 1940. W. C. CASSON 2,225,981

HEAD LAMP ASSEMBLY

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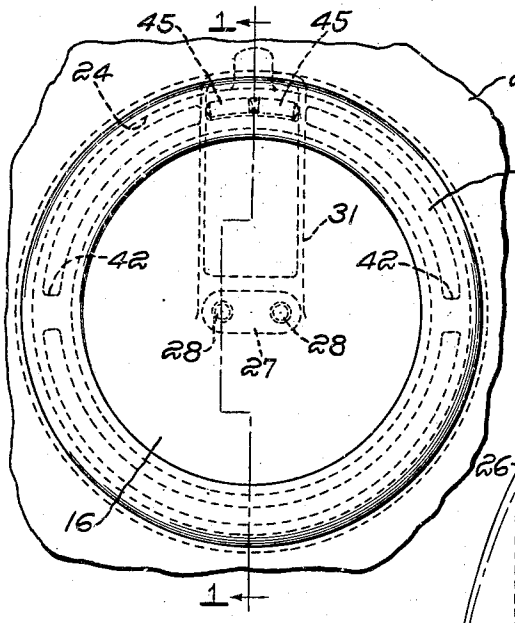


Fig. 2

Fig. 3

Fig. 1

Fig. 4

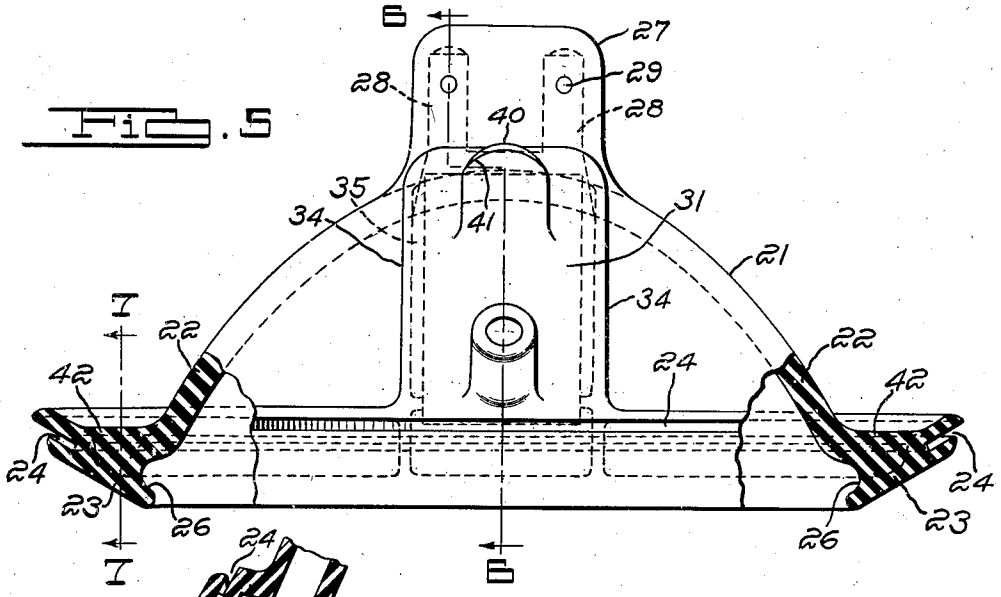
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Fig. 5



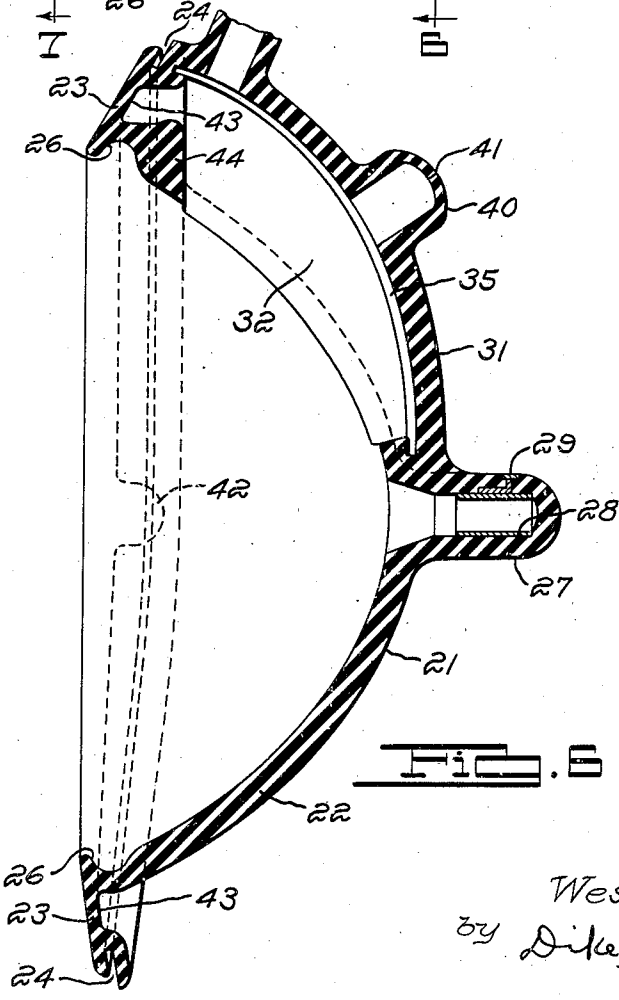
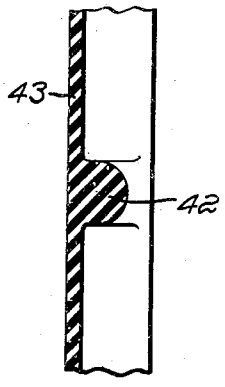


Fig. 6

Fig. 7



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HEAD-LAMP ASSEMBLY

Wesley C. Casson, Detroit, Mich., assignor to Briggs Manufacturing Company, Detroit, Mich., a corporation of Michigan

Application March 9, 1938, Serial No. 194,905

7 Claims. (Cl. 240—61.10)

This invention relates to means for mounting and adjusting head lamps of motor vehicles, especially, although not exclusively, single filament head lamps producing a single light beam and in which the lamp bulb, reflector and lens are formed in a single unit.

The general object of the invention is to provide an improved mounting for movably supporting a head-lamp unit capable of convenient operation from the driver's station for the purpose of controlling the position of the unit and thereby varying the direction of the projected light beam, as, for example, elevating or depressing the same, in accordance with driving conditions.

The invention is in the nature of an improvement on the head-lamp mounting described in my prior application filed October 8, 1937, Serial No. 168,022, and has for certain of its more particular objects to provide a simpler and more compact assembly in which the lamp unit is more securely supported against the effects of shock and vibration and its position more accurately and efficiently controlled.

The foregoing and other objects of the invention, together with means whereby the latter may be carried into effect, will best be understood from the following description of a preferred embodiment thereof illustrated in the accompanying drawings; this, however, having been chosen for purposes of exemplification merely, it being obvious to those skilled in the art that the invention, as defined by the claims hereunto appended, may be otherwise embodied without departure from the spirit and scope thereof.

In said drawings:

Fig. 1 is a vertical section of the complete assembly taken on the line 1—1 of Fig. 2, the lamp unit being shown in elevation.

Fig. 2 is a front elevation thereof.

Figs. 3 and 4 are sections taken substantially on the lines 3—3 and 4—4, respectively, Fig. 1.

Fig. 5 is a plan view, partly broken away, of the casing or mounting member with the lamp unit and certain other parts removed.

Figs. 6 and 7 are sections taken substantially on the lines 6—6 and 7—7, respectively, Fig. 5.

The head-lamp unit proper comprises a single hollow bulb 15 of glass or other transparent material, said bulb comprising a convex front portion 16 constituting a lens, a convex rear portion 17 the inner concave surface of which constitutes a reflector, and an annular bead 18 at the junction of said portions. The filament carrier or plug 19 has a single filament 20 projecting centrally from the back portion 17 of the bulb 15 into the interior thereof.

The mounting for the lamp unit comprises a casing 21 of flexible resilient material, preferably molded rubber, having a rear or body portion 22 which encloses and, except as hereinafter pointed out, engages and fits the rear portion 17 of the lamp unit bulb 15 throughout the exterior surface of the latter except at the locality of the vacuum chamber, said body portion 22 terminating in an annular forward wall or rim 23. The rim 23 is formed about its exterior periphery with a groove 24 in which is received and held by a tight fit, or secured as by vulcanizing or bonding if desired, the edge of an aperture in the portion of the automobile by which the head lamp is to be supported or carried, herein the down-turned end of a front fender 25. The rim or wall 23 is also formed with an interior groove 26 within which fits and is bonded the bead 18 of the head lamp unit 15. The body portion 22 of the casing 21 is formed centrally with a rearwardly extending portion 27 in which are located sockets 28 to receive the branches of the filament plug 19, said sockets being suitably connected, as through contact members 29, with wires 30 leading from the usual battery or other source of electrical current, not shown. Said body portion 22 is further formed with an offset, channel-shaped portion 31 which preferably extends vertically from the central portion 27 of the casing to the top of the front wall or rim 23 thereof and forms, with the adjacent portion of the rear of the lamp unit, a differential fluid pressure or vacuum chamber 32 which may be put into communication, through a tube 33, with a suitable source of vacuum or suction, as, for example, the motor intake manifold, under the control of a suitable hand or foot operated vacuum and relief valve, not shown. As shown most clearly in Figs. 3 and 4, the side walls 34 of the channel portion 31 are somewhat thinner than the remainder of the body portion 22, thereby facilitating the collapse of said portion under the influence of the vacuum, as indicated in broken lines in Fig. 3. In order to insure the restoration of the parts to normal position upon release of the vacuum, and for other purposes hereinafter explained, the outer wall of the portion 31 is formed with a groove 35 to receive a curved, laterally resilient but longitudinally substantially rigid, leaf spring 36 so shaped as normally to tend to hold the parts in normal or distended condition and engaging the outer wall of the channel portion 31 throughout the length of the latter. In order to

limit the extent of collapse of the portion 30, and consequently the relative movement of the outer wall thereof and the lamp unit 15 toward one another, the spring 36 is formed with a threaded socket 37 to receive a stop screw 38, the head 39 of which is located in an extension 40 formed in the outer wall of the portion 31 and slotted, as shown at 41, to afford access to said head for purposes of inserting and adjusting the screw 38. The front wall or rim 23 of the casing 21 is formed at diametrically opposite points (herein the opposite ends of the horizontal diameter, which is perpendicular to the central plane of the offset portion 31) with thickened or stiffened portions or reinforcements 42 which resist flexure of said wall at this point, said wall being otherwise relatively thin and flexible, as shown at 43 in Figs. 1, 6 and 7, except at the upper or forward end of the channel portion 31 where it is formed with another thickened portion 44 having a recess to receive rollers 45 which act as supports for said front wall at this point to prevent collapse thereof under the influence of the vacuum in the chamber 32.

From the foregoing it will be seen that the casing 21, which forms the sole support and housing of the lamp, completely encloses the latter at the rear and firmly, but resiliently, supports the same against shock and vibration. It will also be observed that, except for the differences in convexity, the lamp unit is supported with its outer face substantially flush with the outer face of the fender 25 or other support, thereby presenting a neat and attractive appearance and obviating the necessity of any other closure for the opening in said support.

The normal position of the parts is shown in full lines in Fig. 1. In this position the plane of the annular bead 18 is slightly inclined forwardly from the perpendicular, so that the axis L of the beam of light projected from the lamp unit is slightly depressed from the horizontal in order to strike the road at a predetermined but relatively short distance in front of the vehicle. In order to elevate the beam, as indicated by the axial line H, to illuminate the road at a greater distance, the resilient casing 21 is distorted from its normal shape by subjecting the chamber 32 to vacuum or suction through the tube 33. The effect of this is to partially collapse the channel portion 31, flatten the spring 36, and cause the outer wall of said channel portion and the upper portion of the lamp unit to approach one another to the extent permitted by the stop screw 38, or, as more fully explained in the prior application above referred to, to an intermediate position determined by control of the degree of vacuum employed. The partial collapse of the channel portion 31 causes a flattening of the spring 36, as indicated in broken lines in Fig. 1, and as said spring is longitudinally substantially rigid, and as its upper or forward end is substantially fixed, flattening thereof causes it to exert a downward thrust upon the lower portion of the body 22 which is transmitted to the lower part of the rim or wall 23 forcing the latter, and consequently the lower portion of the lamp unit, forwardly. This forward movement of the rim is limited to the lower half thereof, since said rim is substantially firmly anchored at its horizontal diameter to the support 25 by the stiffened or reinforced portions 42. Since, however, the lamp unit itself is substantially rigid, and since it, as well as the rim 23, is held against forward movement by the anchoring portions 42, forward movement thereof at the bottom is accompanied by a rearward movement at the top (this action being assisted to a more or less extent by the effect of the vacuum or suction in the chamber 32) so that the lamp unit is tilted about the axis of the reenforcements 42 into the position shown in broken lines in Fig. 1 to elevate the axis of the projected light beam into the position H.

It will be observed that, as the construction and arrangement described results in tilting the lamp unit about a substantially diametric axis, as distinguished from an axis at one edge, only a relatively small movement of the lamp is required for a given deflection of the light beam.

In the construction shown the axis of the reenforcements 42 is substantially horizontal, while the central plane of the channel portion 31 and vacuum chamber 32 is substantially vertical, so that the angular movements of the axis of the light beam are in a vertical direction. It will be obvious, however, that, if desired, by slightly changing the angular positions of said axis and plane, while preserving their substantially relatively perpendicular arrangement, the movement of the light beam can be given a horizontal as well as a vertical component in order to project the same toward the center of the road from the side of the road as it is elevated.

From the foregoing it will be seen that the rubber casing for the lamp 15 not only provides a cushion mounting for the lamp, damping out vibrations and absorbing shocks, but also affords protection to the lamp against stones, gravel and other objects thrown up by the wheel of the vehicle.

I claim:

1. The combination with a lamp bulb having an integral portion constituting a reflector, of a resilient casing embracing said reflector to hold said bulb and to provide a resilient mounting therefor, a fluid pressure chamber formed on said casing, and means for varying the fluid pressure within said chamber in order to flex said casing and thereby to vary the position of said bulb.

2. The combination with a lamp bulb having an integral portion constituting a reflector, of a resilient casing embracing said reflector to hold said bulb and to provide a resilient mounting therefor, a chamber formed on said casing, and means creating partial vacuum in said chamber in order to cause distortion of said casing and thereby to vary the position of said bulb.

3. The combination with a lamp bulb having an integral portion constituting a reflector, of a resilient casing embracing said reflector to hold said bulb and to provide a resilient mounting therefor, a chamber formed on said casing, means creating partial vacuum in said chamber in order to cause distortion of said casing and thereby to vary the position of said bulb, and a return spring adapted to restore the casing to its normal shape when the pressure is restored in said chamber and thereby to bring said bulb to its original position.

4. The combination with a lamp bulb having an integral portion constituting a reflector, of a resilient casing embracing said reflector to hold said bulb and to provide a resilient mounting therefor, a chamber formed on said casing, means creating partial vacuum in said chamber in order to cause distortion of said casing and thereby to vary the position of said bulb, a return spring adapted to restore the casing to its normal shape when the pressure is restored in said chamber

and thereby to bring said bulb to its original position, and a stop screw carried by said spring and adapted to limit the operative stroke of said bulb.

5. The combination with a lamp bulb having a portion constituting a reflector, of a resilient casing embracing said reflector to hold said bulb, an annular rim on said casing adapted to be connected to a support thereby providing a mounting for said bulb, and pneumatic means adapted to act directly on said casing and to distort said rim and thereby to change the position of said bulb.

6. The combination with a lamp bulb having a portion constituting a reflector, of a resilient casing embracing said reflector to hold said bulb, an annular rim on said casing adapted to be connected to a support thereby providing a mounting for said bulb, a portion on said casing having a convex exterior wall and forming a chamber, and a curved laterally resilient but longitudinally substantially rigid spring engaging said wall throughout the length of said chamber, whereby creation of a partial vacuum in said chamber results in flattening of said spring to cause it to exert a longitudinal thrust upon said casing and to distort said rim to change the position of said bulb.

7. The combination with a lamp bulb having an integral portion constituting a reflector, of a resilient casing embracing said reflector to hold said bulb and to provide a resilient mounting therefor, a chamber formed on said casing, means creating partial vacuum in said chamber in order to cause distortion of said casing and thereby to vary the position of said bulb, a return spring adapted to restore the casing to its normal shape when the pressure is restored in said chamber and thereby to bring said bulb to its original position, a stop device carried by said spring and adapted to limit the operative stroke of said bulb, and means for adjustably varying the position of said device and consequently the length of said stroke.

WESLEY C. CASSON.