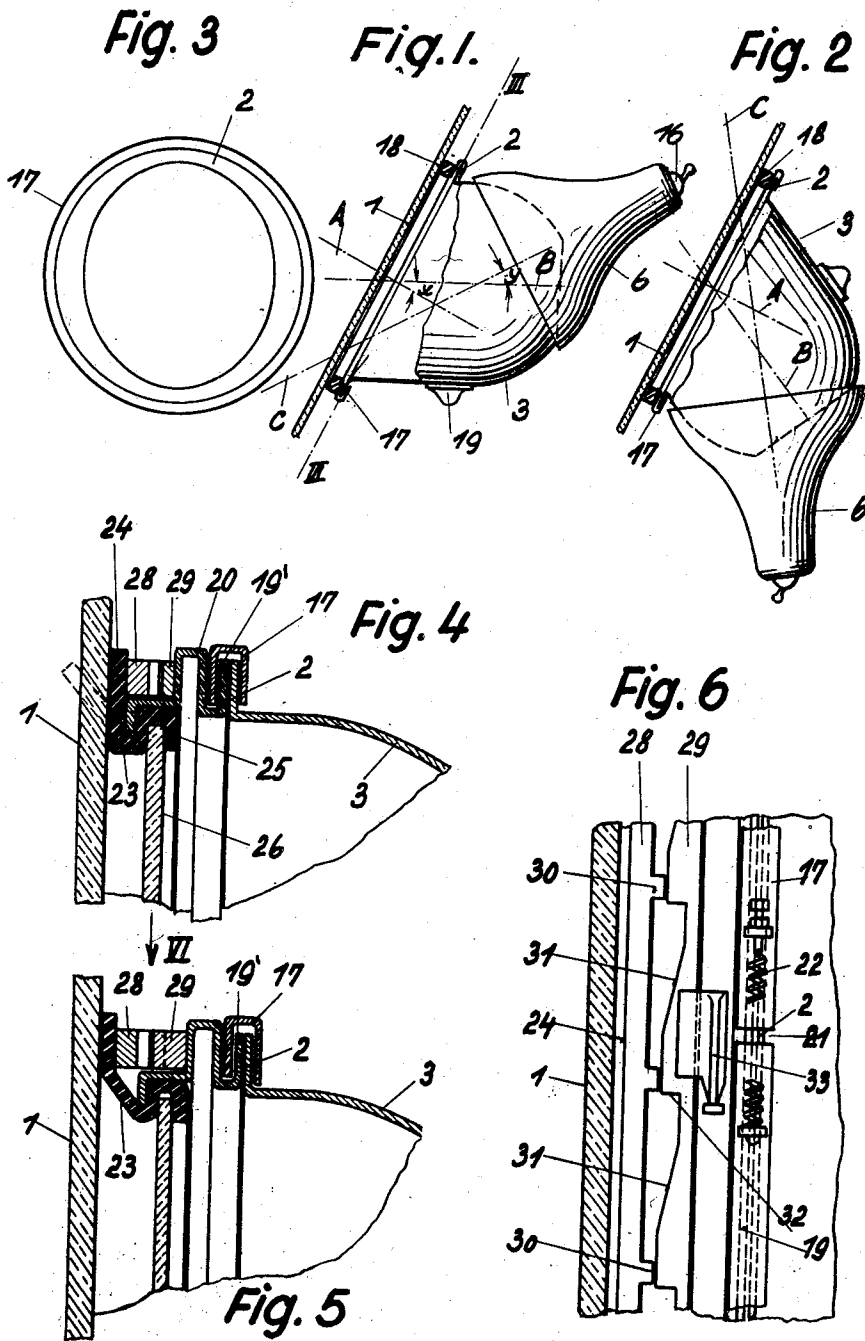


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SPOTLIGHT

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SPOTLIGHT

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6 Claims. (Cl. 240—61.12)

This invention relates to improvements in spot-lights of the type in which the casing is adapted to be directly secured to the inside of the wind-screen, and of which the reflector together with the lamp proper is mounted on the casing in such a manner as to be capable of being swivelled after the fashion of a ball-joint. An arrangement of this type provides a swivelling range of about 60°. In contrast thereto, the improvement according to the present invention enables the beam of light to be swivelled through as much as 120° in all directions, by virtue of the fact that the casing is disposed with its middle axis inclined to the surface of the wind-screen and so mounted on the wind-screen that it is rotatable about an axis at right angles to the wind-screen. In accordance with the invention the spotlight may, further, with advantage be attached to the wind-screen by providing the casing at the side destined to be nearest to the wind-screen with a flange which is disposed obliquely with regard to the middle axis of the casing, and which is rotatably mounted, by means of a tongue and groove joint, on an annular holder member adapted to be directly attached, by adhering means, to the glass of the wind-screen. This annular holder member may itself conveniently be made in the form of a pneumatic adhering device of the type of the known suction cups made of rubber.

A form of construction embodying the invention is shown, by way of example, in the accompanying drawing, in which—

Fig. 1 is a diagrammatic vertical section (partly in elevation) of a spotlight according to the invention attached to a wind-screen.

Fig. 2 is a similar sectional view of the same spotlight swivelled to the maximum extent in the opposite direction.

Fig. 3 is a section taken on the line III—III in Fig. 1.

Fig. 4 is a radial section taken through the attaching means.

Fig. 5 is a similar section of the same parts in a different operative position.

Fig. 6 is an elevational view of a portion of the attaching means as seen from the direction of the arrow VI in Fig. 5.

Referring to the drawing, on the inner side of the wind-screen glass 1 there is attached the spotlight casing 3 which terminates in a flange 2, and on which the lamp and reflector may be swivelled through about 60° in all directions, in the manner of a ball-joint, with the aid of a handle 6 on which there is provided a switch

16. The flange 2 engages in an annular groove 17 in a holder ring 18 (shown diagrammatically), so that the entire fitting may be rotated, with the aid of a knob 19, about an axis A at right angles to the wind-screen 1. Since the plane of the flange 2 is inclined to the middle axis B of the casing 3 the casing intersects this plane in an ellipse. The flange 2 is therefore in the shape of an ellipse inside and circular outside so that it may be rotated in the annular groove 17. When the casing is rotated about the axis A the axis B describes a cone of which the angle at the apex is twice the angle α . Since by swivelling the reflector casing 6 a tilting of the middle axis C of the beam of light emitted by the lamp through twice the angle γ is effected it follows that the total swivelling range amounts to $2(\alpha \text{ plus } \gamma)$. Figs. 1 and 2 show the extreme downwardly tilted and extreme upwardly tilted position of the beam of light, respectively. If these sections be assumed to be taken through the wind-screen in a horizontal direction it will be understood how wide the side to side sweep of the spotlight according to the invention is.

Figs. 4 to 6 show, by way of example, a form of attaching means according to the invention. The casing 3 extends with its end flange 2 into an annular member 17 of U-shaped or channelled cross-section. Into this annular member there also extends a flange 19' pertaining to a profiled sheet metal ring 20. The annular member 17 is provided with a gap as at 21 (Fig. 6) the two ends being joined together at this point by an adjustable spring 22 or other resilient and/or adjustable element. This type of joint enables the annular member 17 to be pressed against the flanges 2 and 19' with just enough force to allow the required rotation to be readily effected while providing sufficient friction to retain the spot-light in any position to which it may be adjusted.

At the other edge of the sheet metal ring 20 there is fitted a rubber ring 23 consisting of a rim portion 24 which is conical in the non-stressed state (shown in chain-dotted lines in Fig. 4) and of a part 25 of U-shaped cross section. In the latter there is fitted, in such a manner as to form an airtight joint, a sheet of glass 26 which fills out the area enclosed by the ring. Fitted to the outside of the sheet metal ring 20 are two further metal rings 28 and 29 which are rotatable relatively to each other and at the same time axially adjustable. To this end the ring 28 is provided with evenly spaced outwardly extending teeth 30, and the ring 29 with the same number of S-

shaped cam-surfaces 31 of initially steep and subsequently almost imperceptible pitch which are adapted to co-act with the teeth 30, and which merge into each other by steps 32, so as to produce a ratchet-wheel effect. Each of these two rings is provided with two actuating knobs 33 (only one shown) disposed opposite each other.

The holder ring 20 is attached to the glass screen 1 by first pressing the described assembly against the screen (Fig. 4). When released, the glass plate 26 is lifted clear of the screen by the inherent elasticity of the rubber ring 23, and the resulting partial vacuum between the plates 1 and 26 causes the assembly to adhere to the former. The two rings 28 and 29 are then rotated relatively to each other, with the aid of the knobs 33, so that the teeth 30 engage the inclined surfaces 31 (Figs. 5 and 6). During this rotary movement the ring 28 is supported against the rim 24 of the rubber ring 23, while the ring 29 forces the sheet metal ring 20, the portion 25 of the rubber ring 23, and the plate 26 away from the screen 1. In this manner the space between the plates 1 and 26, and consequently also the vacuum prevailing therein, is increased, and experience shows that the flange 24 becomes so firmly pressed, by the pressure of the outside atmosphere, against the screen 1 that a hundred times the weight of the fitting may be suspended therefrom without the least danger of its becoming dislodged.

The described attaching means may also be employed for securing a great variety of other articles to glass plates or panes.

I claim:

1. An inside windshield spotlight and support therefor, comprising a ring of elastic material including a wall portion adapted to rest with one face thereof against the windshield, a transparent plate airtightly secured to said elastic ring along a peripheral line spaced inwardly from the outer periphery of said wall portion, said plate forming with said elastic ring a transparent suction cup, a holder ring associated with and surrounding said transparent plate, said holder ring having at its edge remote from said wall portion of the elastic ring an outwardly projecting flange overhanging said wall portion, a spotlight casing having a reflector connected to said holder ring, and means operable between said wall portion of said elastic ring and said outwardly projecting flange of said holder ring for spreading the latter and said transparent plate away from said wall portion of the elastic ring to increase the vacuum in the space between the windshield and said transparent plate, said spreading means including at least one annular element rotatable relative to said wall portion of the elastic ring.

2. An inside windshield spotlight and support therefor comprising a resilient vacuum ring of double-loop cross-section having one wall adapted to rest against a windshield, a holder ring having a flange supported in the channel of one of said loops, a transparent plate being supported in the other loop of said vacuum ring, a spotlight casing having a reflector rotatably connected to said holder ring, and means operable between the wall of said vacuum ring and the holder ring for pressing said wall and holder ring with the transparent plate in opposite directions to in-

crease the vacuum in the space between the windshield and plate.

3. An inside windshield spotlight and support therefor comprising a resilient vacuum ring of double-loop cross-section having one wall adapted to rest against a windshield, a holder ring having an inwardly extending flange on one side supported in the channel of one of said loops, a transparent plate being supported in the other loop of said vacuum ring, said holder ring having an outwardly extending flange at its free end, a spotlight casing having a reflector with a flange thereon disposed adjacent to said outwardly extending flange, an inverted U-shaped securing ring straddling said adjacent flanges and supporting said casing in said holder ring, and means operable between the wall of said vacuum ring and said holder ring for pressing said wall and holder ring with the transparent plate in opposite directions to increase the vacuum in the space between the windshield and plate.

4. An inside windshield spotlight and support therefor comprising a resilient vacuum ring of double-loop cross-section having one wall adapted to rest against a windshield, a holder ring having a flange supported in the channel of one of said loops, a transparent plate supported in the other loop of said vacuum ring, a spotlight casing having a reflector rotatably connected to said holder ring, and cam means operable between the wall of said vacuum ring and holder ring for pressing said wall and holder ring with the transparent plate in opposite directions to increase the vacuum in the space between the windshield and plate.

5. An inside windshield spotlight and support therefor comprising a resilient vacuum ring of double-loop cross-section having one wall adapted to rest against a windshield, a holder ring having a flange supported in the channel of one of said loops, a transparent plate being supported in the other loop of said vacuum ring, a spotlight casing having a reflector rotatably connected to said holder ring, and a pair of rings rotatable with respect to one another seated on said holder ring and operable, when rotated with respect to one another, to press said vacuum ring wall and said holder ring with the transparent plate in opposite directions to increase the vacuum in the space between the windshield and plate.

6. An inside windshield spotlight and support therefor comprising a resilient vacuum ring of double loop cross-section having one wall adapted to rest against a windshield, a holder ring having a flange supported in the channel of one of said loops, a transparent plate being supported in the other loop of said vacuum ring, a spotlight casing having a reflector rotatably connected to said holder ring, and a pair of annular rings seated on a portion of said holder and between said holder and said wall of said vacuum ring, one of said annular rings having at least one lateral projection, the other of said annular rings having at least one lateral cam surface co-operating with said projection, so that when said annular rings are rotated with respect to one another, said wall of said vacuum ring and the holder ring with said plate are pressed in opposite directions to increase the vacuum in the space between the windshield and plate.

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