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LUCAS

Quality

EQUIPMENT

VOLUME 2

WORKSHOP INSTRUCTIONS

HEADLAMPS & FOGLAMPS

INCORPORATING THE LUCAS LIGHT UNIT

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HEADLAMPS & FOGLAMPS

INCORPORATING THE LUCAS LIGHT UNIT

1. GENERAL DESCRIPTION

These lamps, which are available either for stem fitting or mounting flush with the wings of the vehicle, incorporate a combined reflector and front lens assembly which is known as the Lucas Light Unit. They also use a "prefocus bulb" which ensures that the filament is always positioned correctly with respect to the focal point of the reflector.

LIGHT UNIT

The construction of the Light Unit ensures that the reflector is permanently protected, with obvious advantages to its efficiency. The outer surface of the front lens is smooth, to facilitate cleaning, but the inner surface has formed in it a series of small lenses which determine the spread and pattern of the light.

BULBS

The "prefocus" bulb eliminates the need for any focusing device in the lamp. The bulb is cylindrical in shape so as to reduce the overall diameter to a minimum, an important feature where, as in this type of lamp, the bulb is fitted through an aperture in the rear of the reflector. The bulb has a large cap, of the same size as those on domestic bulbs, but instead of being located by the usual bayonet fixing, the cap is carried on a flange accurately positioned in relation to the filament during manufacture. A slot in the flange engages with a projection on the inside of the bulb holder at the back of the reflector, thus ensuring the correct positioning of the filament. A bayonet fitting cap with spring-loaded contacts secures the bulb firmly in position, and also carries the supply to the bulb contacts.

On cars not fitted with sidelamps, a pilot bulb is fitted to the bayonet-fitting cap of the headlamps, and the illumination is through a translucent window in the Light Unit.

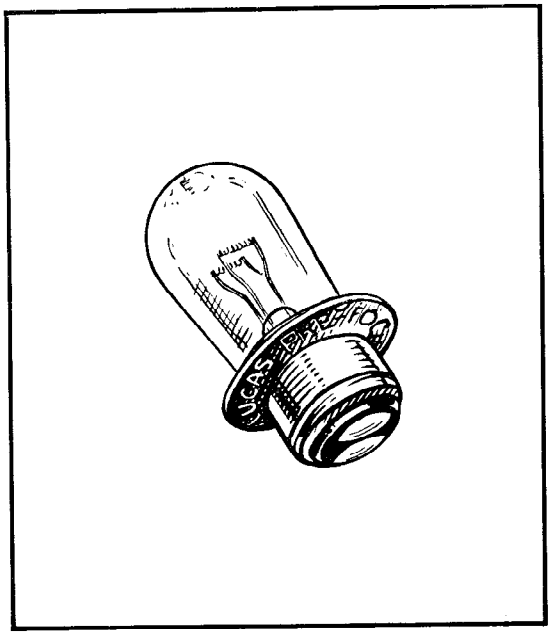

Fig. 1.
Prefocus bulb

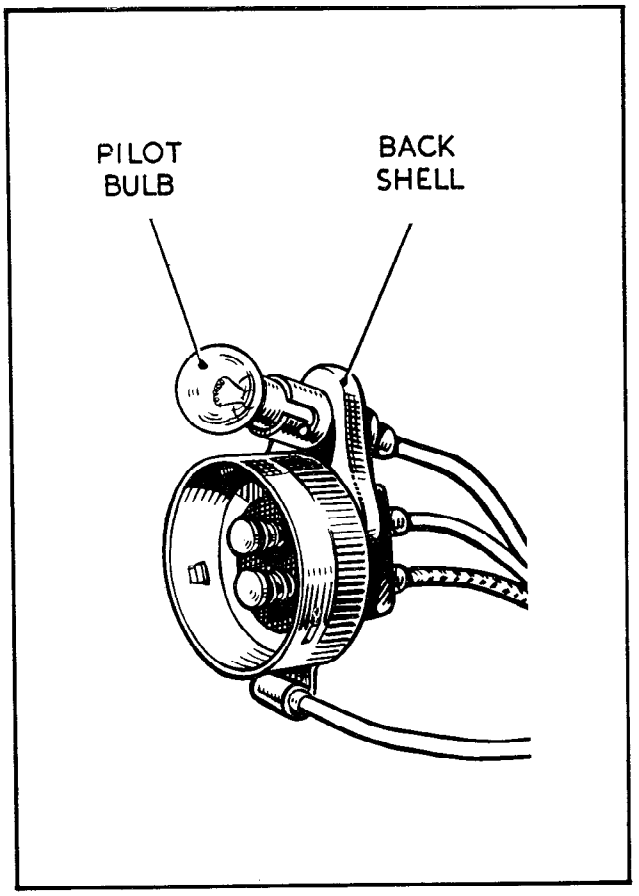

Fig. 2.
Pilot bulb and holder

2. ANTI-DAZZLE SCHEMES

HEADLAMPS

Dipping of the headlamp beams is achieved by the use of double-filament bulbs. The usual arrangement on home models is a double-filament bulb in the left-hand headlamp and a single filament in the right-hand headlamp. For overseas markets, double-filament bulbs are generally supplied in both headlamps. The double-filament bulbs are designed so that the dipping filament dips to left or right according to the requirements of the countries concerned (*i.e.*—for Right-hand Drive cars, beam dips to left).

FOGLAMPS

These lamps have the reflector "stepped" to give a flat topped beam from the lamp, and a shield fitted over the bulb prevents the emission of any direct forward light rays.

3. MODELS

The majority of lamps mentioned below have been manufactured in three different designs, Marks I, II and III. Differention between these types will be possible by reference to the illustrations.

For example, the Mark II Lamp has a split front rim secured by a transverse fixing screw, whereas the Mark I lamp front is not split and is secured by a fixing catch.

(*a*) Headlamps, flush-fitting :
Models F700 (Marks I, II and III)
,, F575 (Marks I and II)
,, F462 (Marks I and II)

(*b*) Headlamps, stem-fitting :
Models S700
,, MBPL147

(*c*) Foglamps, flush-fitting :
Models FFT575 (Marks I and II)
,, FFT462 (Marks I and II)

(*d*) Foglamps, stem-fitting :
Models SFT575
,, SFT462
,, SFT700S

4. SETTING

In overseas markets, lamps must be set to comply with local lighting regulations.

MINISTRY OF TRANSPORT LIGHTING REGULATIONS (UNITED KINGDOM)

The Lighting Regulations state that a lighting system must be arranged so that it can give a light which is "incapable of dazzling any person standing on the same horizontal plane as the vehicle at a greater distance than twenty-five feet from the lamp, whose eye-level is not less than three feet six inches above that plane". The headlamps must therefore be set so that the main beams of light are parallel with the road and with each other.

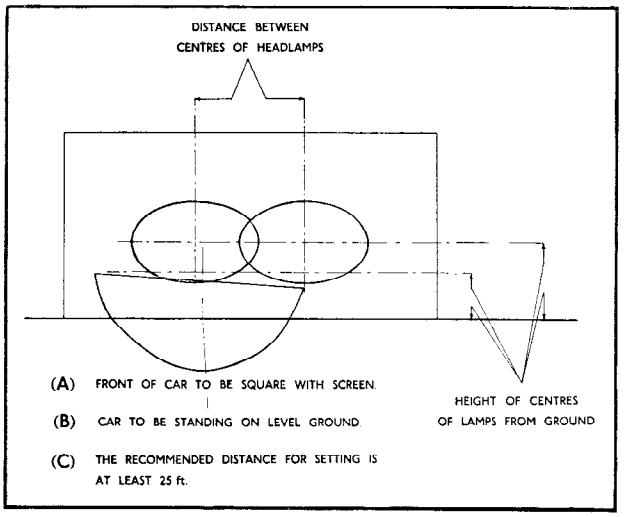

Fig. 3.
Lamp setting diagram

The foglamp must be set so that the beam does not rise above the horizontal when the vehicle is standing on level ground. To ensure this, dip the lamp very slightly to compensate for road inequalities or an extra heavy load in the rear of the car and also tilt the lamp to the right to allow for road camber. In addition, the lamp can be swung slightly to the left in order to give additional illumination on the nearside of the road.

LUCAS BEAM SETTER

This new optical instrument has been specially designed so as to provide an accurate and rapid method of

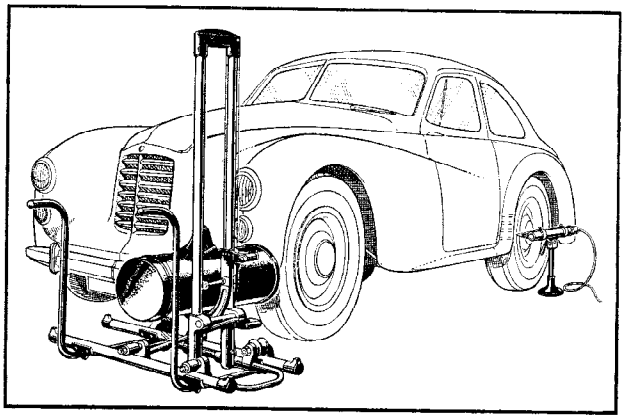

Fig. 4.
Lucas Beam Setter

checking the setting of lamps. Any type of lamp can be set with this instrument and one of its many advantages is that the space required for testing and setting is a minimum. With normal visual methods, the vehicle should be situated at least 25 feet from the viewing screen but with the Beam Setter the space needed is only that occupied by the instrument. For further details of the Lucas Beam Setter see Publication No. 781A.

ADJUSTMENT OF SETTING

(a) STEM-FITTING LAMPS. Slacken the single fixing nut at the base of the lamp and move the lamp on its adjustable mounting to the required position and finally tighten the locknut.

(b) FLUSH-FITTING LAMPS MARK I. Remove the front rim by pressing down the catch at the bottom of the lamp and lifting it off.

Adjust the vertical setting by turning the vertical trim adjustment screw in a clockwise direction to raise the beam or an anti-clockwise direction to lower it. Horizontal adjustment of setting is normally a factory operation, and further adjustment should be unnecessary. If, however, the setting has been disturbed, slacken the two nuts (on some models screws are fitted) and move the Light Unit to the required position ; afterwards tighten the nuts or screws.

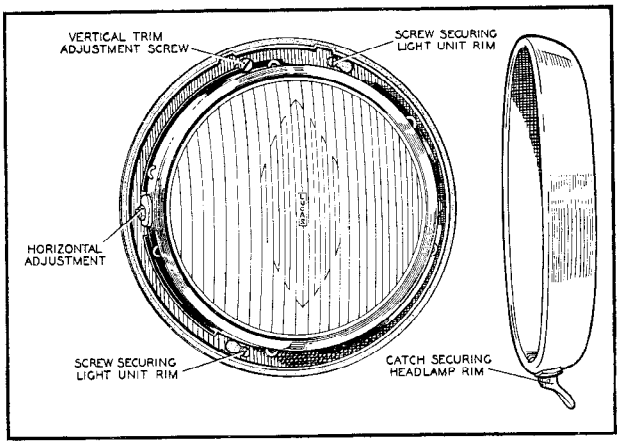

Fig. 5
Headlamp, flush-fitting Mark I, with front rim removed

(c) FLUSH-FITTING LAMPS, MARKS II and III. Remove the front rim by unscrewing the rim securing screw and lifting off the rim, which is split to facilitate removal. Next remove the rubber dust excluder, when three spring-loaded adjustment screws will be visible by means of which the setting can be adjusted as required.

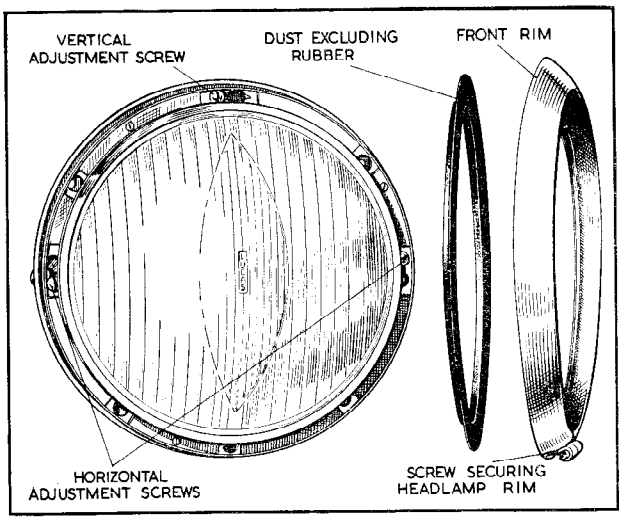

Fig. 6
Headlamps, flush-fitting Marks II and III with front rim removed

5. REMOVAL OF FRONT RIM AND LIGHT UNIT

(a) STEM-FITTING LAMPS. Slacken the securing screw and remove the front rim and Light Unit assembly.

(b) FLUSH-FITTING LAMPS, MARK I. Remove the front rim as described under "Setting". Slacken the

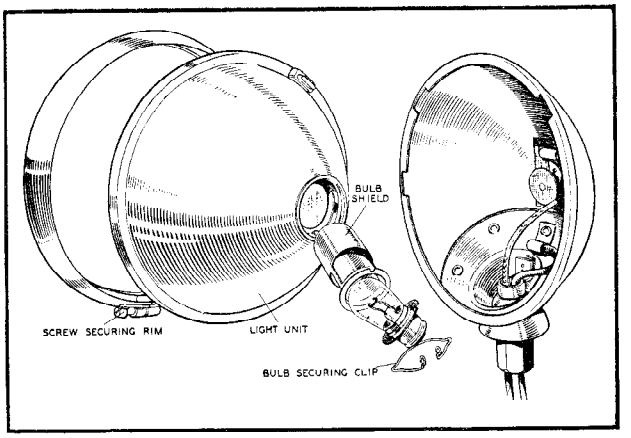

Fig. 7
Foglamp, model SFT700S

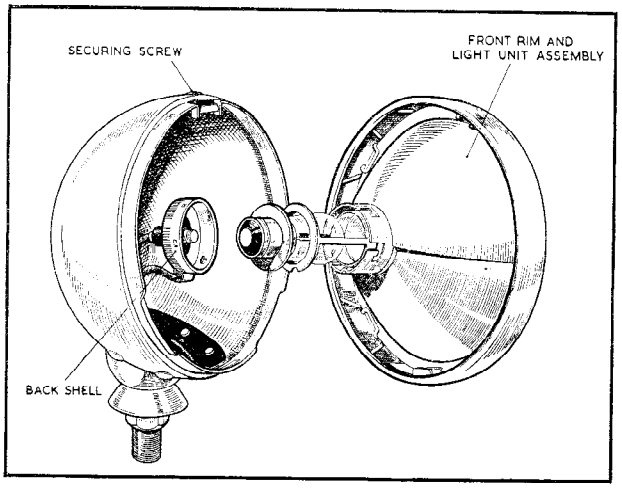

Fig. 8.
Foglamp, model SFT462

screws which secure the flange of the Light Unit assembly and turn it in an anti-clockwise direction to detach the flange from the securing screws. Lift the Light Unit assembly out of the lamp body.

(c) FLUSH-FITTING LAMPS, MARKS II and III. Remove the front rim and dust excluding rubber as described under "Setting". Press the Light Unit in against the tension of the adjustment screw springs and turn it in an anti-clockwise direction until the heads of the screws can be disengaged through the slotted holes in the Light Unit rim. Do not disturb the screws when removing the Light Unit or the lamp setting will be altered.

6. BULB REMOVAL

On all lamps except foglamp model SFT700S, the bulb is made accessible by removal of the back shell. To do this, twist the back shell in an anti-clockwise direction and pull it off. The bulb can now be removed from the rear of the reflector and the new bulb fitted.

Engage the projections on the inside of the back shell with the slots in the bulb holder, press on and secure by twisting to the right. If a pilot bulb is incorporated the back shell must be positioned so that when fitted, the pilot bulb is adjacent to the translucent window in the reflector.

7. REFITTING LIGHT UNIT AND RIM

(a) STEM-FITTING LAMPS. Engage the side of the rim opposite to the fixing device with the lamp body, press on and secure with the fixing device. On some

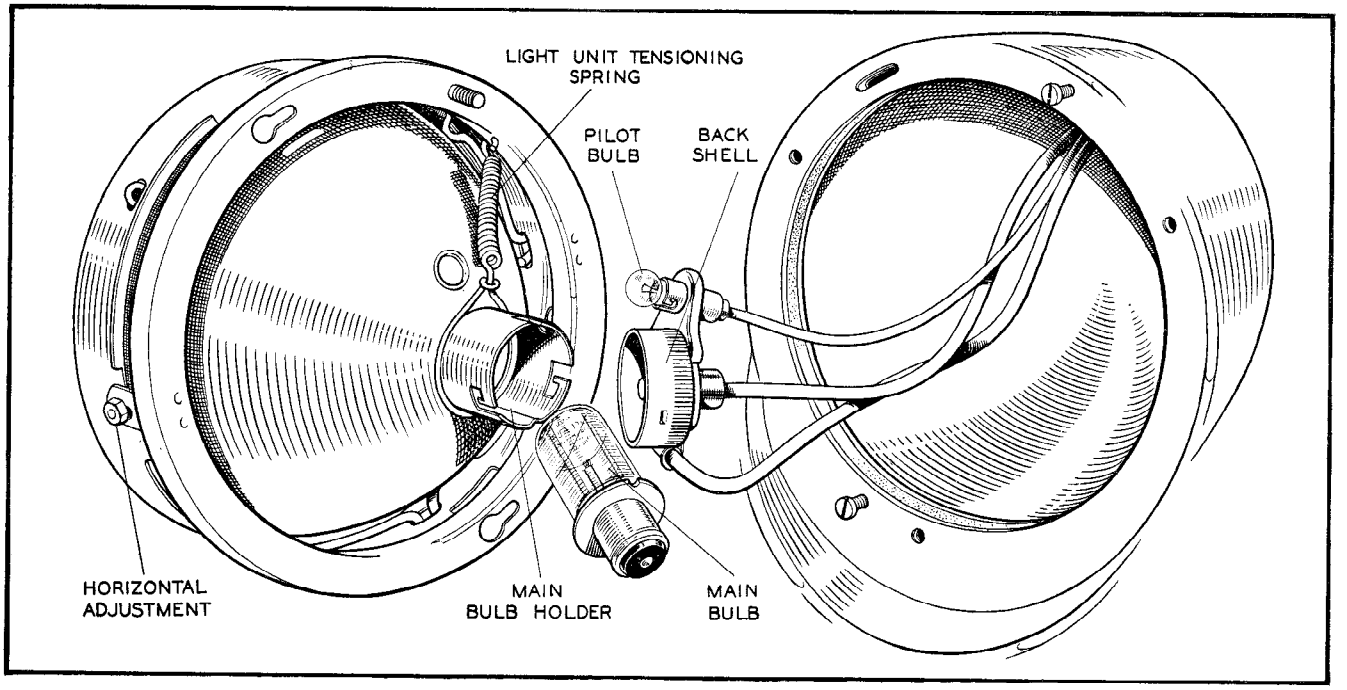

Fig. 9.
Headlamp, flush-fitting Mark I with light unit removed

lamps a metal tongue on the inside of the front rim must be engaged with a slot on the lamp body.

(*b*) FLUSH-FITTING LAMPS, MARK I. Position the Light Unit in the lamp body so that the vertical trim adjusting screw locates in the slot in the body rim, and the heads of the fixing screws protrude through the holes in the flange of the Light Unit. Twist the Light Unit in a clockwise direction and secure by tightening the fixing screws. Locate the top of the rim first, press on at the bottom and secure by means of the fixing catch or screw.

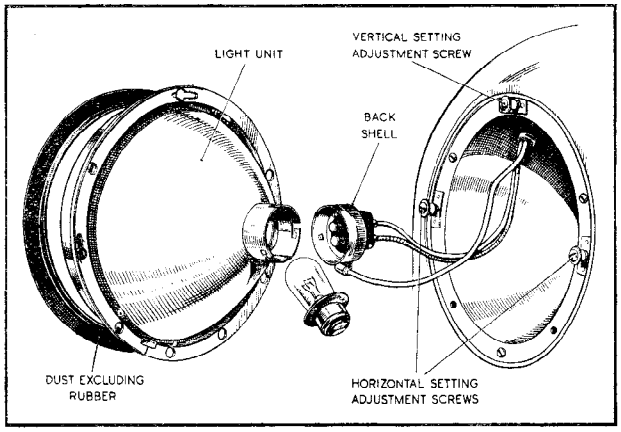

Fig. 10.
Headlamps, flush-fitting Marks II and III with light unit removed

(*c*) FLUSH-FITTING LAMPS, MARKS II and III. Position the Light Unit so that the heads of the adjusting screws protrude through the slotted holes in the flange, press the unit in and turn in a clockwise direction. Replace the rubber dust excluder so that the thicker inner edge rests in the recess around the Light Unit rim. Refit the front rim, locating the top of the rim first and securing by means of the fixing screw.

8. RENEWAL OF LIGHT UNIT

In the event of damage to either the front lens or reflector, a replacement Light Unit must be fitted as described below.

(*a*) STEM-FITTING LAMPS (except foglamp model SFT700S). Remove the Light Unit and front rim, twist off the back shell and withdraw the bulb (and bulb shield in the case of foglamps.) Disengage the Light Unit securing springs from the rim and pull the Light Unit away. Position the new unit in the rim so that the projection on it lies inside the locating bracket on the rim. Secure the clamping springs equally around the rim. Replace bulb, bulb shield if provided, back shell and Light Unit and rim.

(*b*) FLUSH-FITTING LAMPS, MARK I. Remove the Light Unit assembly from the lamp body and take out the bulb. Detach the end of the Light Unit tensioning spring from the hole in the fixing flange and lift the spring off the bulb holder. Unscrew the vertical trim adjusting screw, and unscrew the two nuts (or screws) securing the rim in which the Light Unit is mounted to the two trunnion arms. (If nuts are fitted, it will be necessary to take out the two trunnion bolts). Remove the Light Unit together with its rim. Press the projections on the Light Unit fixing spring from the slots in the rim and lift out the spring and Light Unit.

Position the new Light Unit in the rim so that the diecast projection at the edge of the Light Unit is slightly to the right of the location provided for the vertical trim adjusting screw. Secure the Light Unit by means of the fixing spring, which must fit over the projection on the reflector and locate in the slots in the rim as shown. Place the flange over the reflector so that the hole provided for the vertical trim adjusting screw lines up with the screw location in the rim.

Position the rim between the two trunnion arms and refit the two screws. (If nuts are fitted refit the two trunnion bolts and fit and tighten the two nuts.) Clip the Light Unit tensioning spring over the bulb holder and insert the end into the hole in the Light Unit flange. Screw in the vertical adjusting screw.

Replace the bulb, etc.

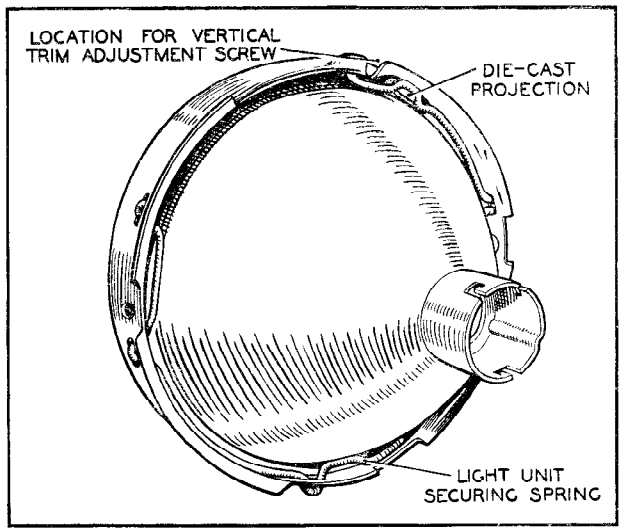

Fig. 11.
Headlamp, flush-fitting Mark I. Rear view of light unit assembly showing correct positioning of light unit in rim

(*c*) FLUSH-FITTING LAMP MARK II. Remove the Light Unit assembly and bulb. Take off the small clamping bracket on the rim in which the Light Unit fits by bending back the two metal tags. Remove the rim from the Light Unit. Position the replacement Light Unit in the rim so that the diecast projection at the edge of the Light Unit fits into the indentation in the rim.

Replace the rim clamping bracket, ensuring that the edges of the rim make a neat and secure joint. Replace the bulb, etc.

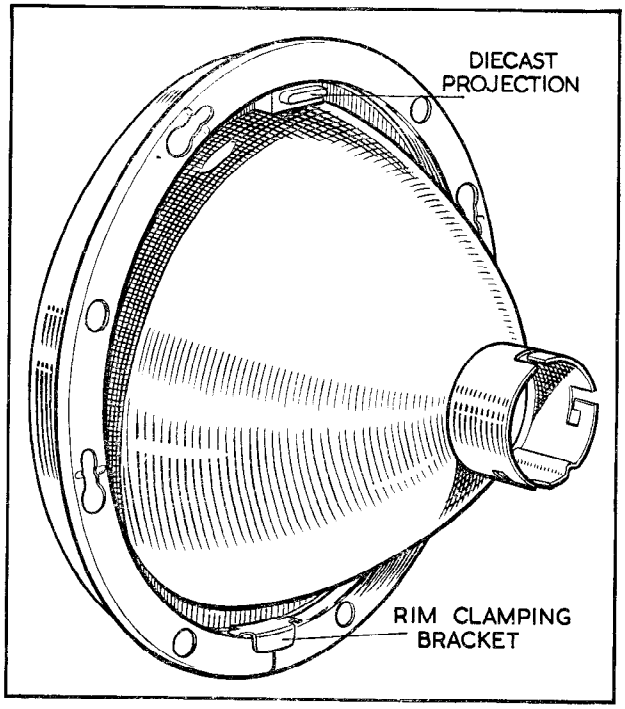

Fig. 12.
Headlamp, flush-fitting Mark II. Rear view of light unit assembly showing rim clamping bracket

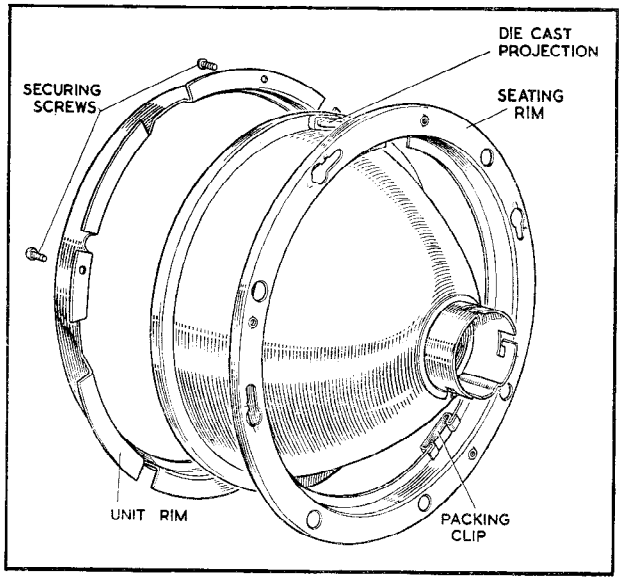

Fig. 13.
Headlamp, flush-fitting Mark III. Rear view of light unit showing unit and seating rims

(*d*) FLUSH-FITTING LAMP, MARK III. Remove the Light Unit assembly and bulb. Withdraw the three screws from the unit rim and remove the seating rim and unit rim from the Light Unit.

Position the replacement Light Unit on the seating rim, taking care to see that the diecast projection at the edge of the Light Unit fits into the slot in the rim. Ensure that the unit rim is correctly positioned and finally secure in position by means of the three fixing screws. Replace the bulb, back shell, etc.

9. SEALED BEAM UNIT

In certain States in the U.S.A., the regulations specify that Sealed Beam Units must be fitted to all headlamps.

The Lucas flush-fitting Mark III headlamp has been designed so that this conversion can be carried out quite easily. Instructions for the conversion are given below :—

(*a*) Remove the Light Unit from the seating and unit rim as already described in "Renewal of Light Unit".

(*b*) Remove the two packing clips from the slots in the seating flange.

(*c*) Fit the Sealed Beam Unit in position, taking care to locate it so that the three die-cast projections on the unit locate in the slots in the seating rim.

(*d*) Refit the unit rim and secure in position by means of the three fixing screws.

(e) Connection to the Sealed Beam Unit is made by means of the three-point adaptor plug. To make the connections proceed as follows :—

(*i*) Remove the three cables from the back shell of the Light Unit and bare the cables for approximately $\frac{3}{8}$ in. Before removing the cables, note the colours and location (*i.e.*, Earth, Main filament and Dip filament.)

(*ii*) Remove the adaptor from the Sealed Beam Unit. It will be observed that the rear of the adaptor is marked "Ground", "Pass" and "Drive".

(*iii*) Remove the three spring contacts from the adaptor.

(*iv*) Solder the core of the cable originally connected to Earth to one of the spring contacts and fit the contact in the recess of the adaptor marked "Ground"

(*v*) Solder the core of the cable originally connected to the Main filament to one of the remaining spring contacts and fit the contact in the recess marked "Drive".

(*vi*) Solder the core of the cable originally connected to the Dip Filament to the remaining spring contact and fit the contact in the recess of the adaptor marked "Pass".

(*vii*) Finally fit the Sealed Beam Unit assembly to the lamp body.