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# INSTRUCTIONS

*for*

UNPACKING ■ HANDLING  
and INSTALLATION

*of*

HEWITTIC

Mercury Arc Rectifier Bulbs

*Issued by*

HEWITTIC ELECTRIC CO. LTD.

WALTON-ON-THAMES

*Surrey - England*



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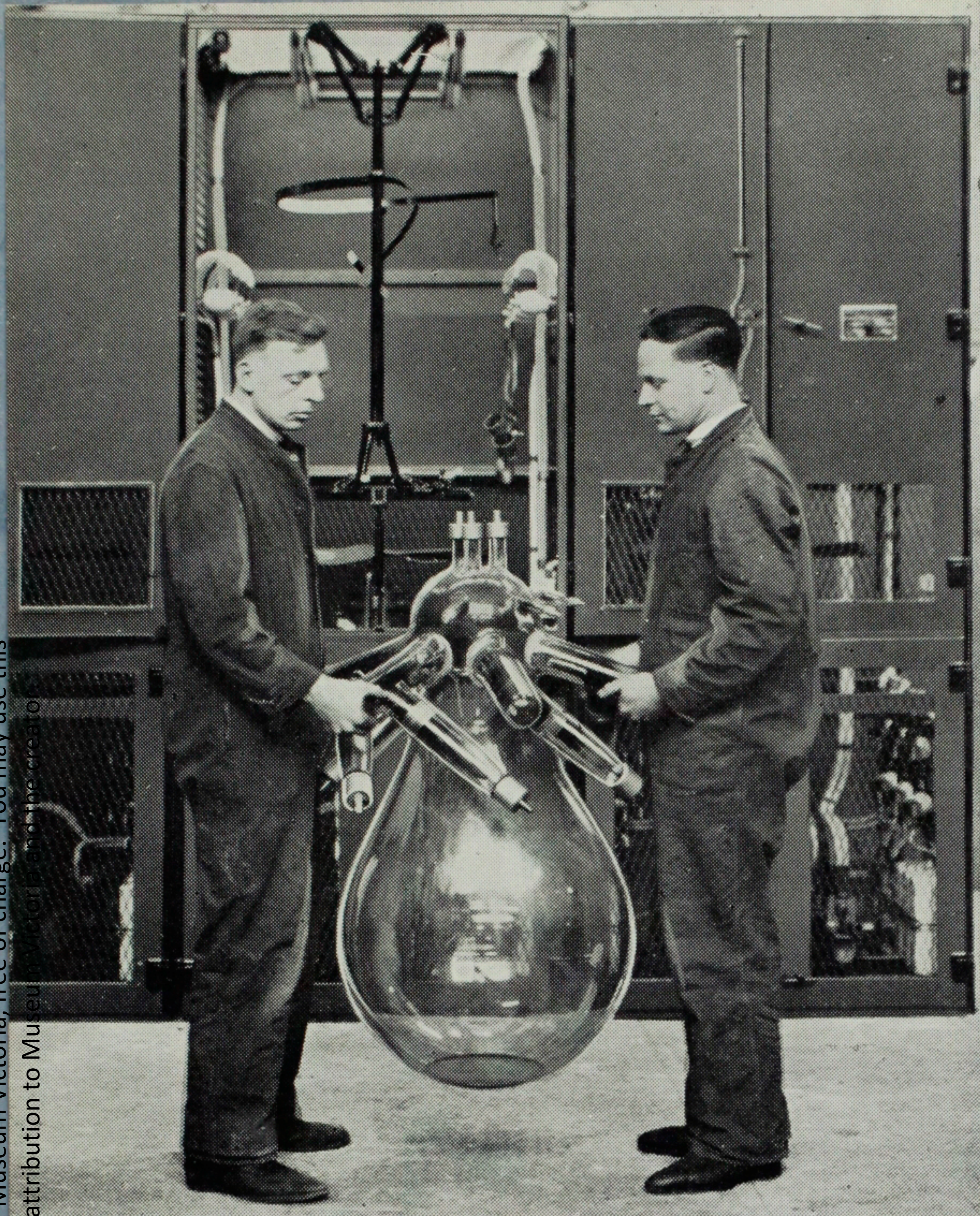
**Instructions**  
for  
*Unpacking . Handling  
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*Hewittic Mercury Arc Rectifier Bulbs*

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**Fig. 1.** The bulb after being taken from its case, which should be opened near the cubicle, is supported by the anode arms.

**General.** The bulb which is a sealed glass vessel, exhausted to a high degree of vacuum and containing heavy liquid mercury, is shipped in a specially sprung case provided with wire gauze windows so that the contents may be clearly seen from the outside (see Fig. 8). The bulb is carried in a sling and is secured in position by means of spring straps. It is shipped upside down with the mercury in the condensing chamber.

On no account should the case be jolted violently or tilted out of the vertical position.

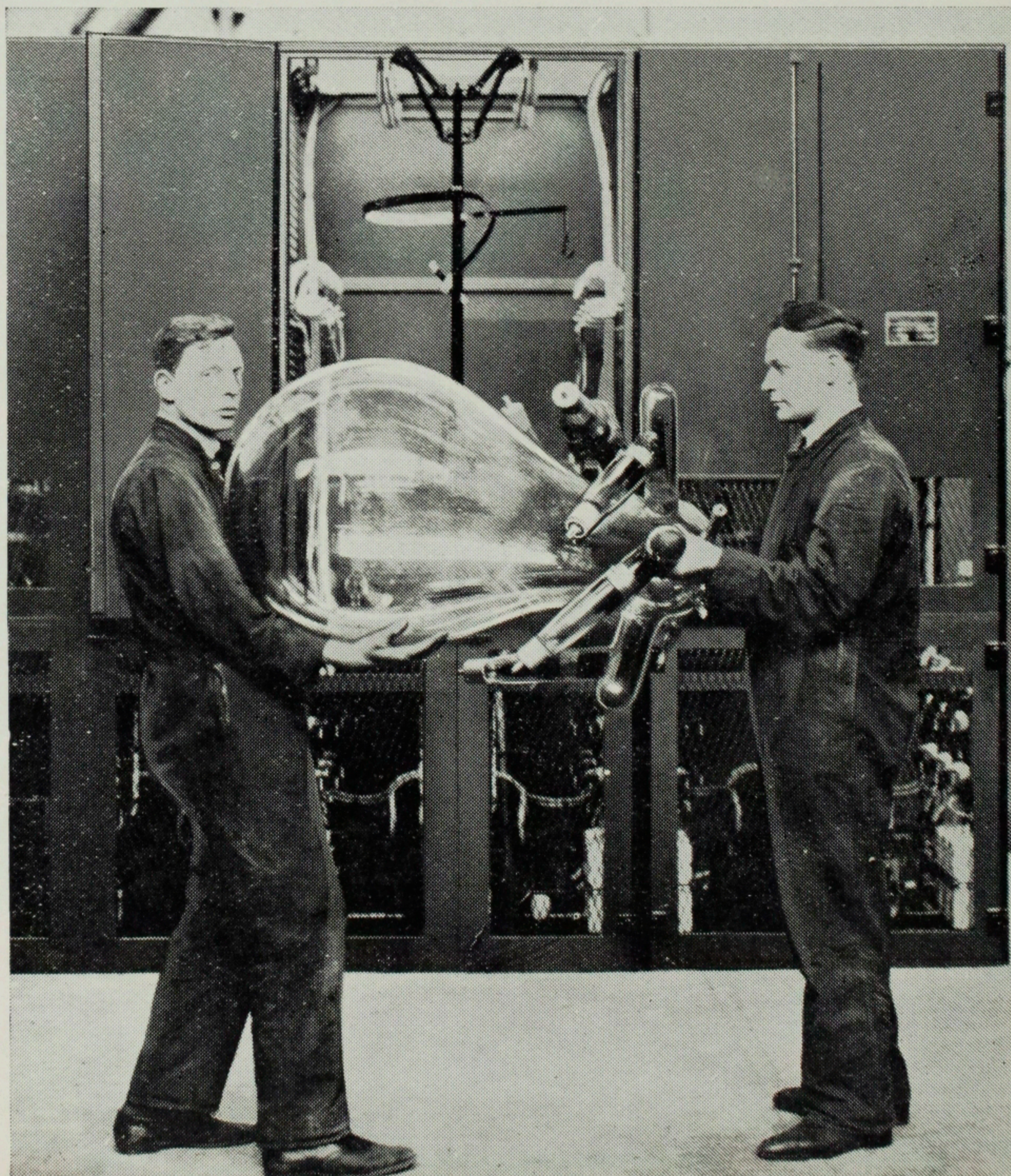
To unpack the bulb unscrew and remove the lid and unfasten the spring straps. Then lift the bulb clear of its supports, holding it up by the bulb arms, as shown in the illustration (Fig. 1).

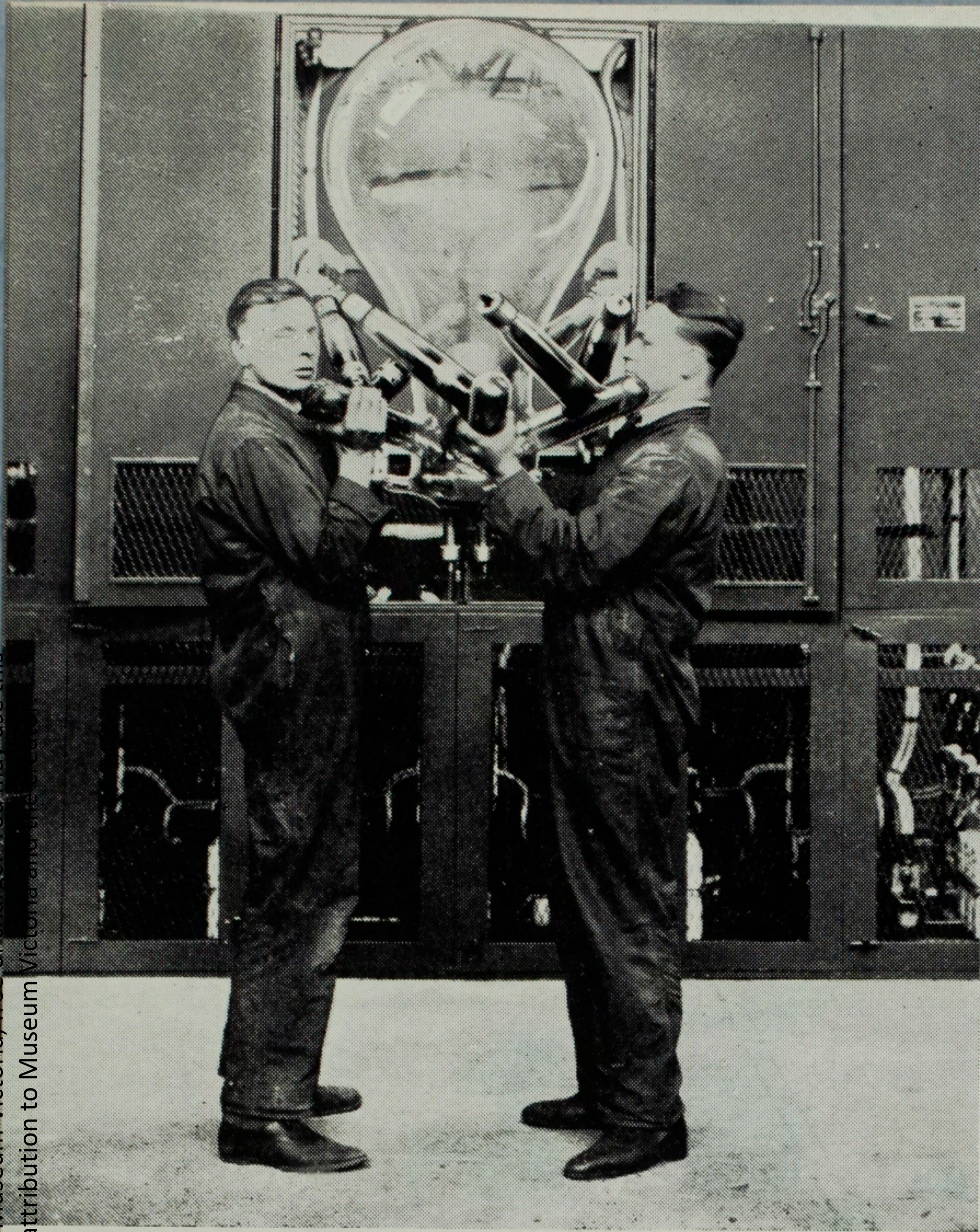
**IMPORTANT.** The case in which the bulb is shipped is supplied on loan only and must be returned as soon as the bulb has been installed.

**Turning bulb into correct upright position.** Having lifted the bulb clear of the case, turn it **slowly** into the upright position i.e. with the cathode stems pointing downwards, allowing the mercury to flow gently down the side of the condensing chamber (between the arms as far as possible) into the cathode pool.

**Mind the seal-off!** It will be noted that the end of one of the main anode caps is painted black. This designates the arm on which the seal-off has been made and care should be taken that in turning the bulb, mercury is not allowed to flow violently into this arm. It is generally quite simple to prevent it flowing into this arm at all.

**Fig. 2.** Raising the bulb into the upright position, the mercury being allowed to run gently down the side into the cathode chamber.





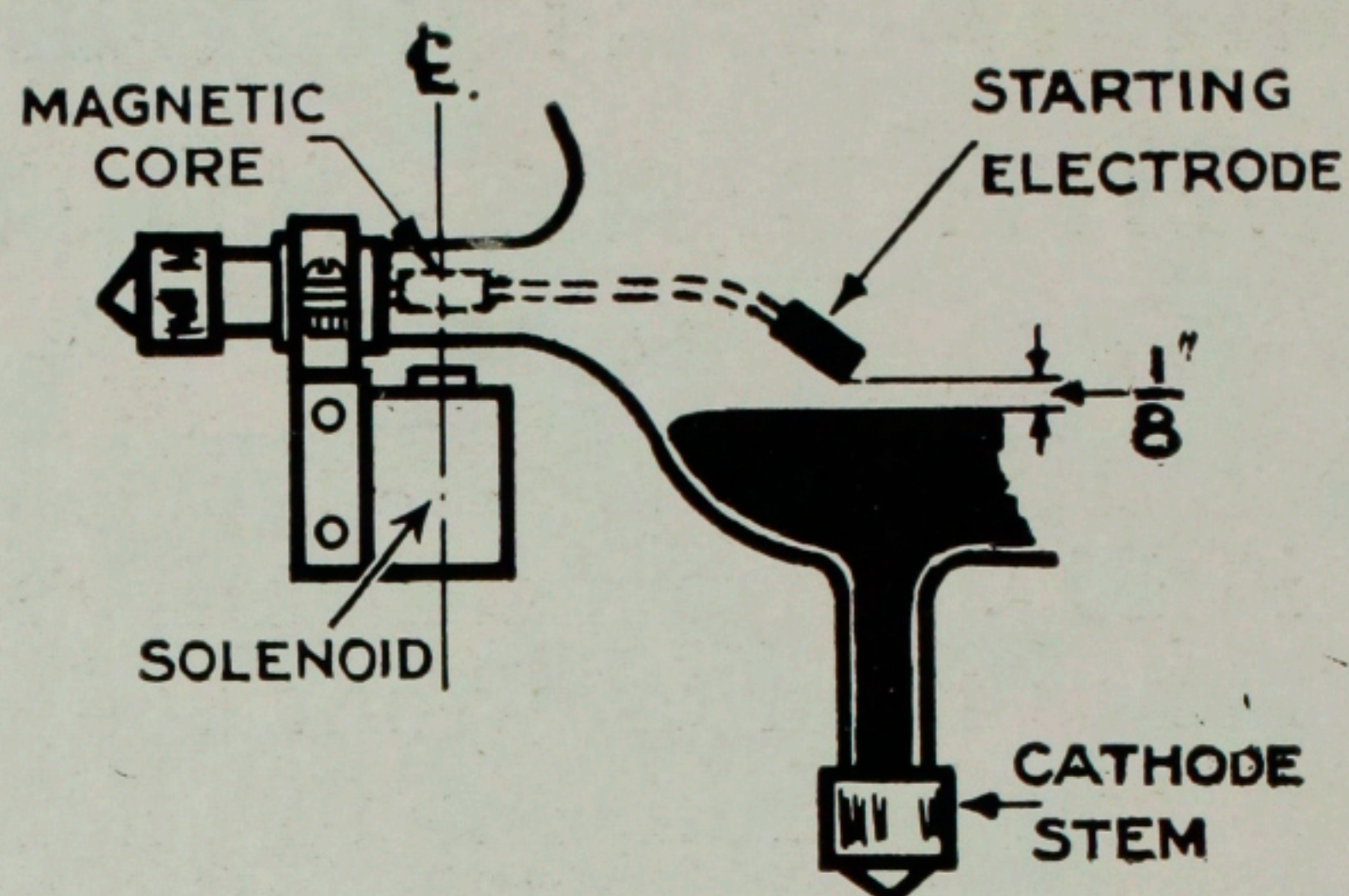
**Fig. 3.** The bulb ready for insertion in the cradle.

**Mounting bulb in cradle.** When the bulb is placed in the cradle, the exciter electrodes should point towards the left hand side of the cubicle, and the starting electrode to the front. (See Fig. 5).

**Removal of grease from bulb caps.** Grease should be removed from the caps of the bulb by running along the length of the cap with a rag, but **under no circumstances must the cap be twisted round in any way, or be subjected to any twisting or wrenching strain.**

**Fitting of starting coil.** Fig. 4 shows how the starting coil is clamped on to the starting electrode. It will be noted that the diameter of the glass envelope round the starting electrode is increased near to the electrode cap, and the fixing clip for the starting coil fits round this enlarged section.

**Fitting of clip connections.** The clips should be fitted on to their corresponding caps. (See Fig. 5). They must not be rotated, but must be loosened so that they are easily slipped on. When tightening each clip on to its cap it should be held gripped by the projecting flanges whilst the knurled nut is being tightened.

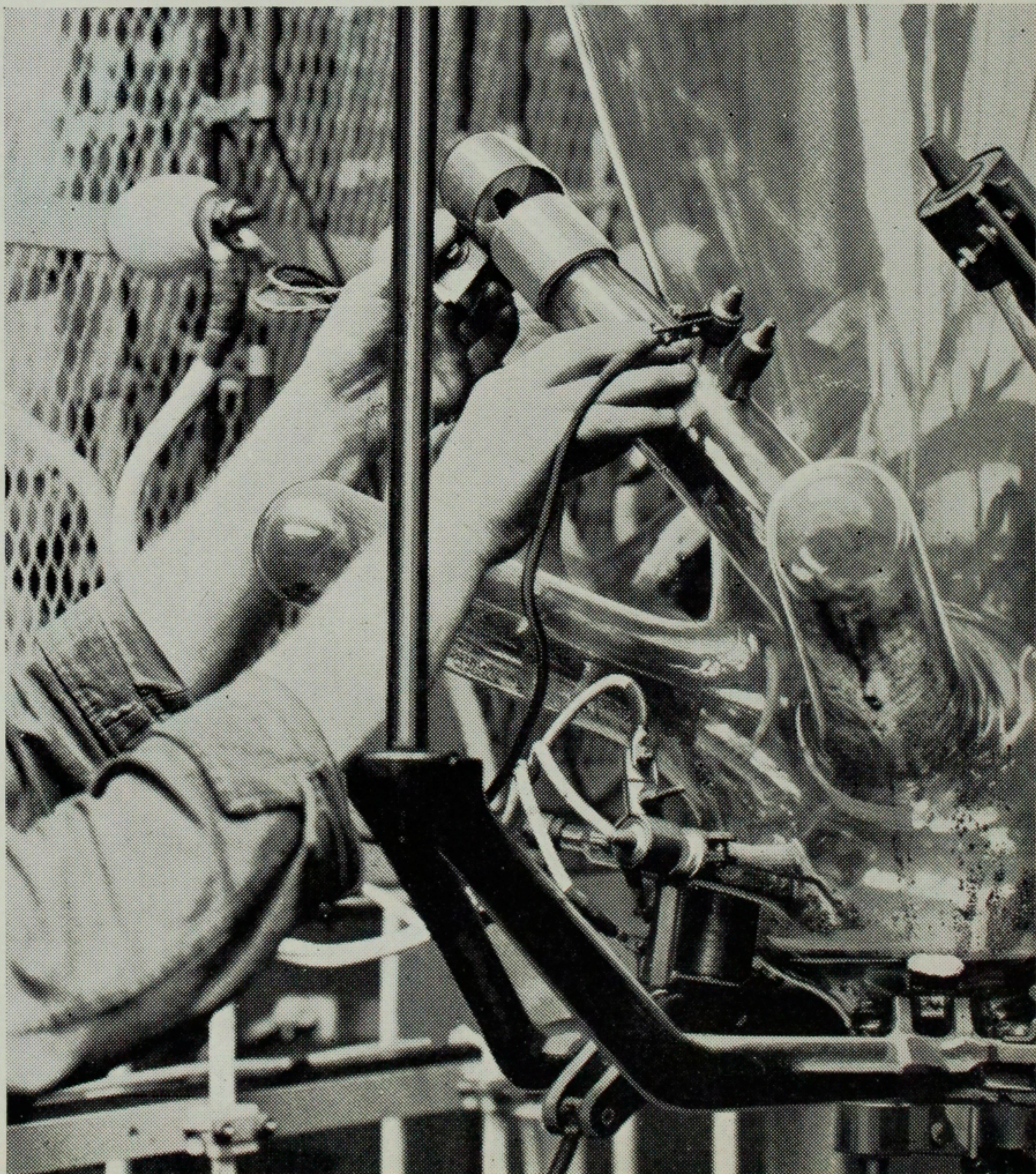


**Fig. 4. Adjustment of the Starting Electrode.** Showing correct alignment of magnetic core and solenoid and correct spacing of electrode from the cathode pool (see also Fig. 5).

**Under no circumstances must Pliers be used on these nuts.**

When the bulb has been connected up as above, the equipment is ready to be put on load.

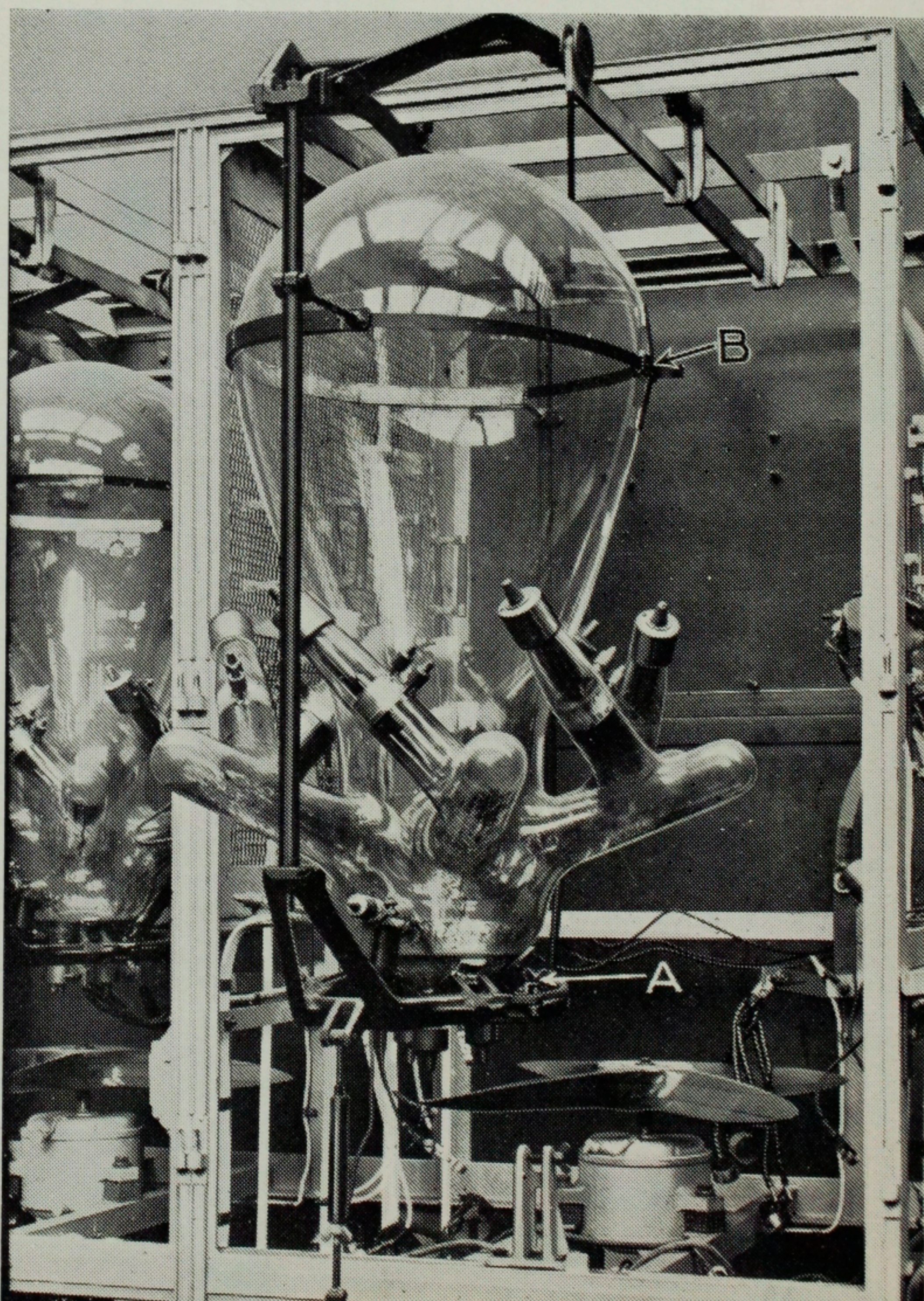
**Fig. 5. Fitting the clip connections.** Note also position of the starting electrode arm—to the front of the cubicle.



## INSTALLATION AND REMOVAL OF BULBS WITH DRAW-OUT TYPE BULB CRADLE.

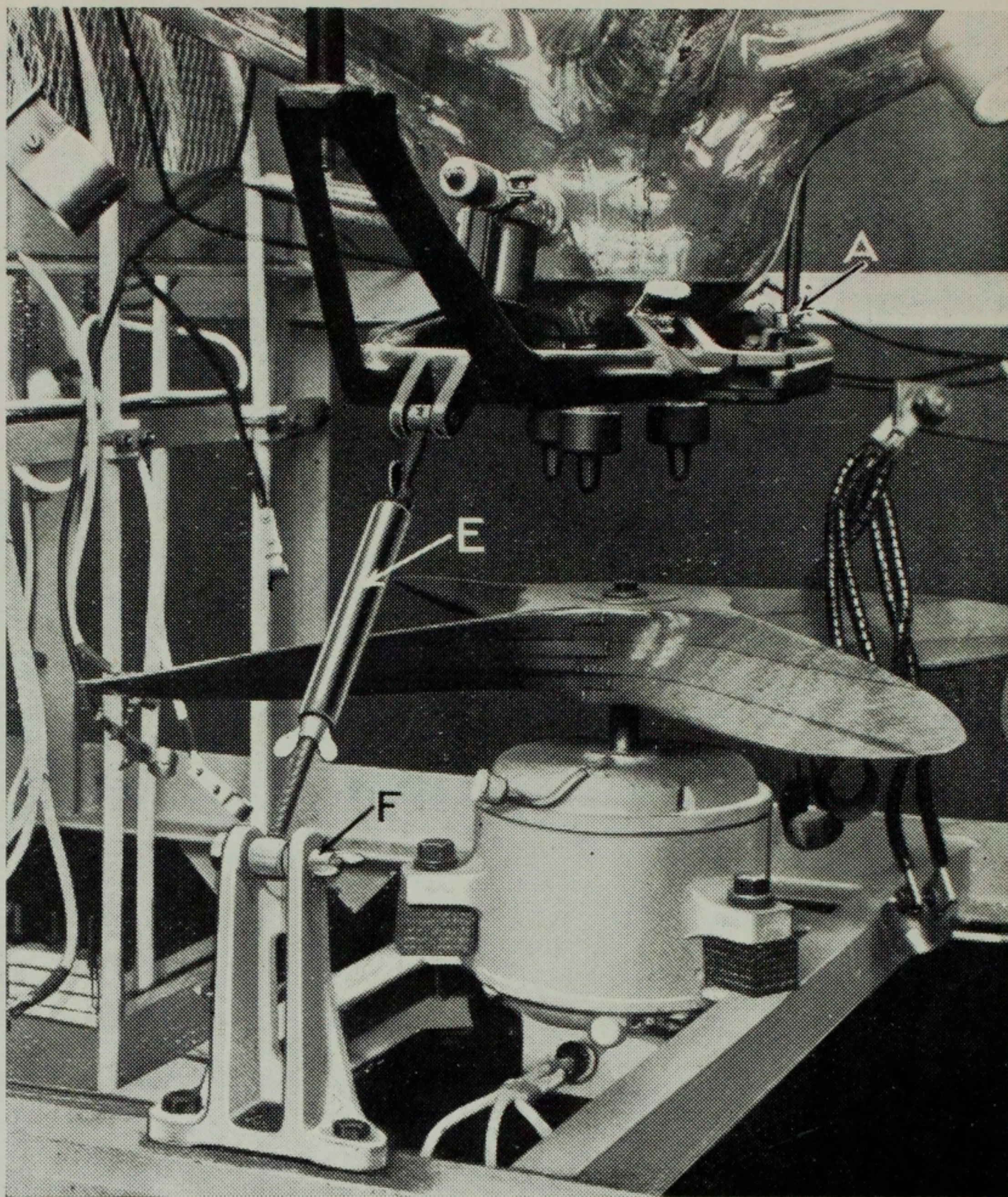
The general arrangement of the bulb cradle is shown in Fig. 6, from which it will be noted that the cradle hangs from draw-out rails (or runner bars), on which it can be run out to afford easy access for fitting or removal.

To fit the bulb, first draw the rails out to their extreme position and bring the cradle out to the end of the rails. Undo the locking screw A in the base gate and swing open the gate. Unhook the band clip B and keep it clear of the bulb. Then lift the bulb into position in the cradle taking care to keep the top of it clear of the underside of the top cradle iron. The asbestos covered supports must seat evenly round the base of the bulb which should be so placed



**Fig. 6.** Showing the cradle drawn fully out of the cubicle and the bulb secured in position, starter electrode to the front.





**Fig. 7.** Bulb and cradle in normal working position. The mercury level is adjusted (see Fig. 4) by means of the adjusting tube E which is then locked by the wingnuts.

that the starting electrode is central in the front of the cubicle.

Now fit the top band round the condensing chamber and fasten the clip B. Swing the gate back into position and if necessary ease the bulb slightly to ensure that no undue pressure is exerted on its base while the gate is secured by the locking screw A.

The magnetic starting coil can now be clipped into position as shown in Fig. 4, and the bulb cradle then slid back into the cubicle so that the wheels finally come to rest in the sliding rail recesses. Before this is done see that the way is clear of obstructions such as hanging anode connections, etc., which might catch the bulb arms.

Fix the mercury level adjusting tube E in position as shown in Fig. 7. Then by manipulation of the adjusting tube and wing nuts carefully set the bulb so that the starting electrode is from  $\frac{1}{8}$  in. to  $\frac{1}{4}$  in. clear of the mercury level.

Finally, make all electrical connections. (See *Fitting of clip connections*).

**Withdrawal of bulb from cubicle.** Remove all anode (grid, if any) and cathode cable clips, etc., being careful to loosen these first, by means of the nuts provided, and not to twist the caps. Unscrew the wing nut F (Fig. 7) and remove the bolt to disconnect the adjusting tube E from the cubicle.

Now grip the front vertical member of the cradle with the left hand and the adjusting tube E with the right and withdraw the cradle and rails together from the cubicle. A slight jerk will dislodge the cradle wheels from the recesses in the runner bars and enable the cradle to be pulled right out to the stops at the end of the bars.

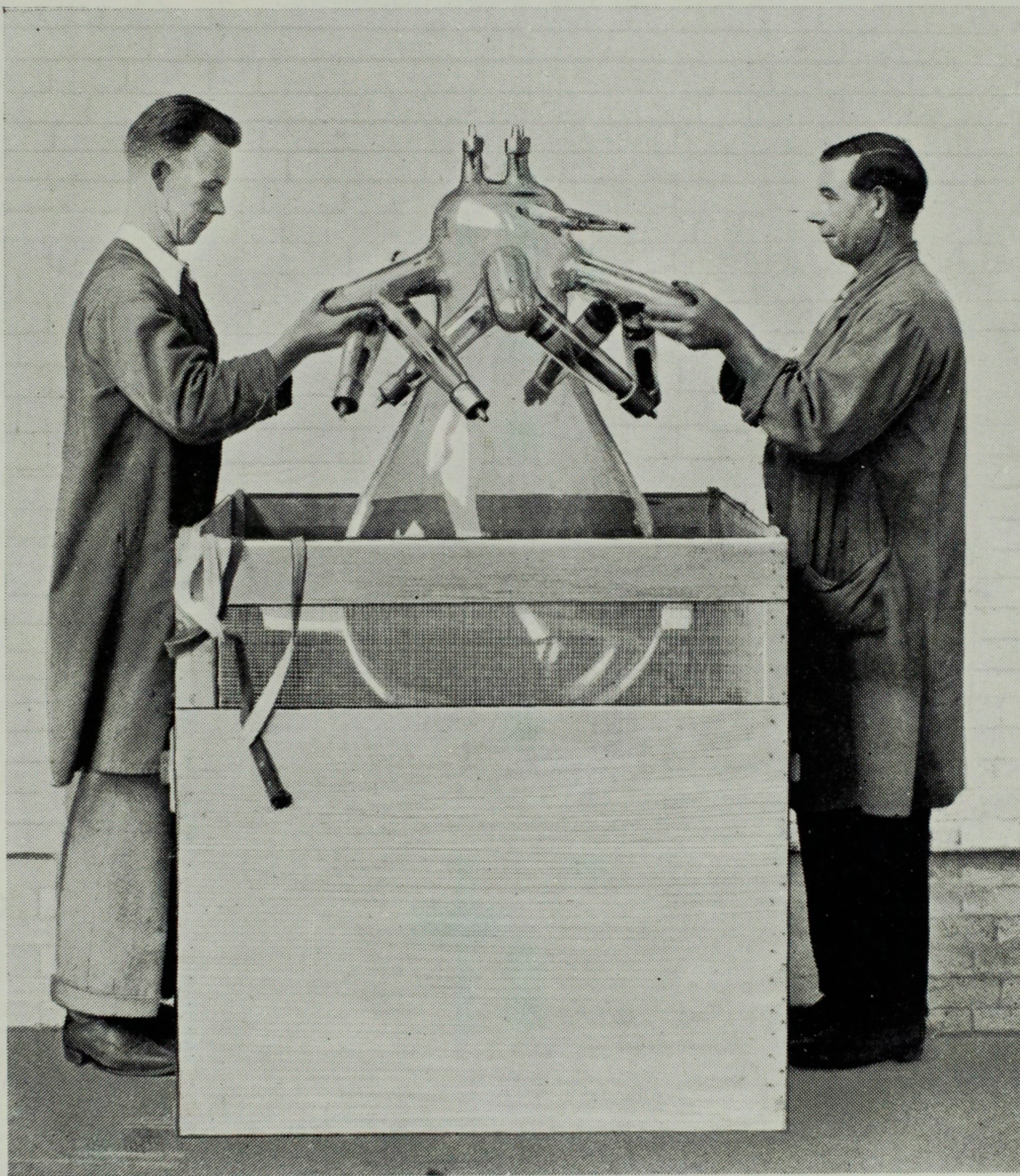
Undo the locking screw A in the base gate and swing the gate open. Unhook the band clip B from the condensing chamber. The bulb may then be lifted out of the cradle (see below).

**Removal of Bulb.** To remove the bulb from the cradle hold it by the arms as shown in Fig. 3 and **slowly** turn it over (Fig. 2), guiding the mercury down the side of the bulb into the condensing chamber as carefully as possible. Some mercury will probably run into one or more of the anode arms and this must be run out of the arms before the bulb is finally packed. **Be very careful to avoid any mercury running into the arm with the seal-off.** As mentioned this arm is marked by having the end of its anode cap painted black.

**Do not remove bulb or connections unnecessarily.** The bulb or its clip connections should be disturbed only when absolutely necessary, e.g., in cases of replacement, removal of plant, etc. If the cubicle is periodically cleaned the bulb may be dusted over but should not be moved or dismantled.

# Supplementary Instructions for handling very large bulbs

(Type 600, etc.)



**Fig. 8.** (a) A very large bulb (e.g. size 600 or over), should be unpacked and removed from its case in the same way as described on page 2. Two men can easily perform this operation. For turning the bulb into the upright position the assistance of a third man is advised. (See Fig. 9).

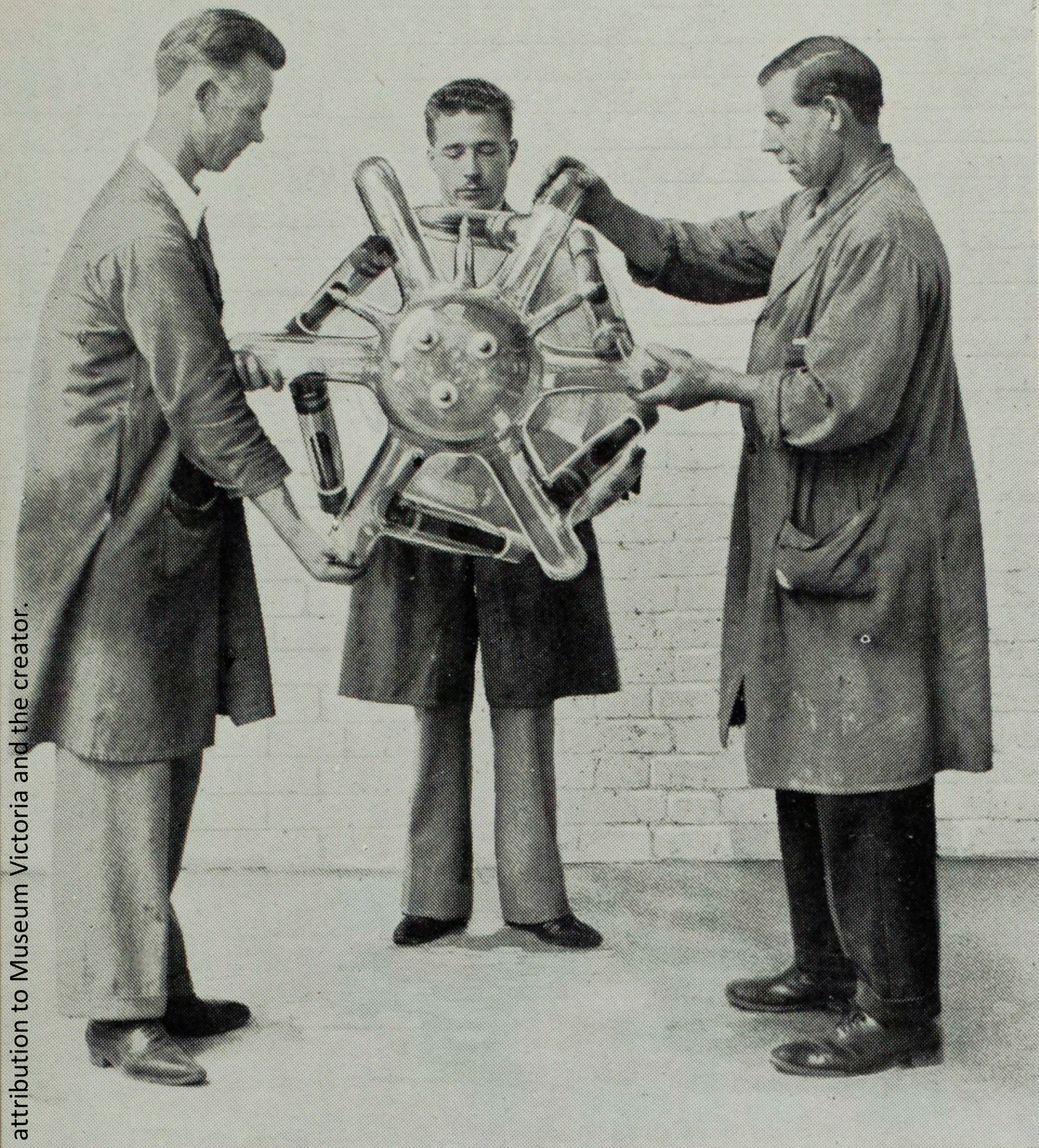


Fig. 9

**Fig. 9.** (b) Turning the bulb into the upright position with the assistance of a third man. As previously mentioned this must be done slowly, allowing the mercury to flow down the side into the cathode chamber. Mind the seal-off! (See page 3).

**Fig. 10.** (c) In its upright position the bulb can again be managed easily by two men. The illustration shows the bulb ready for installation in its cradle, which is carried out as described on page 6.

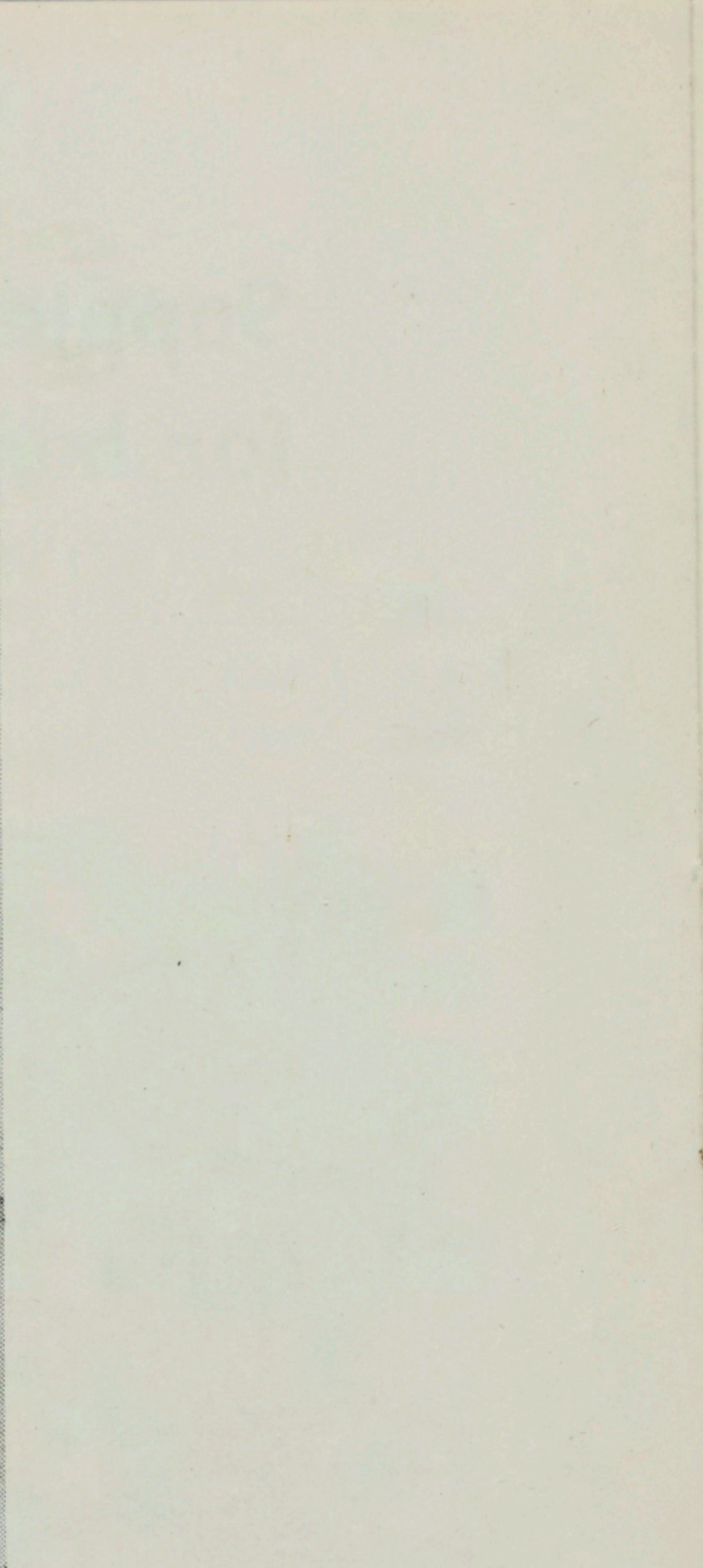
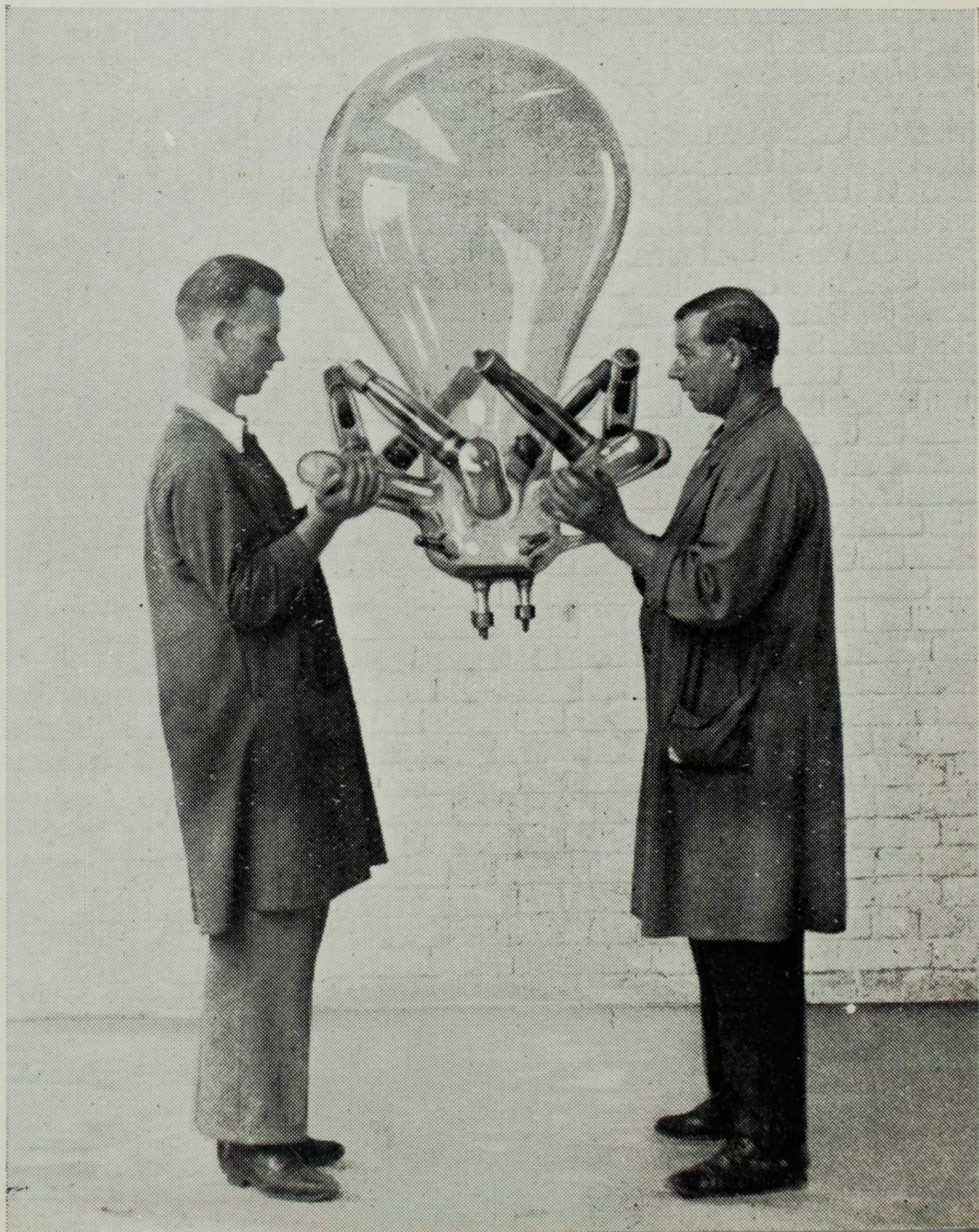
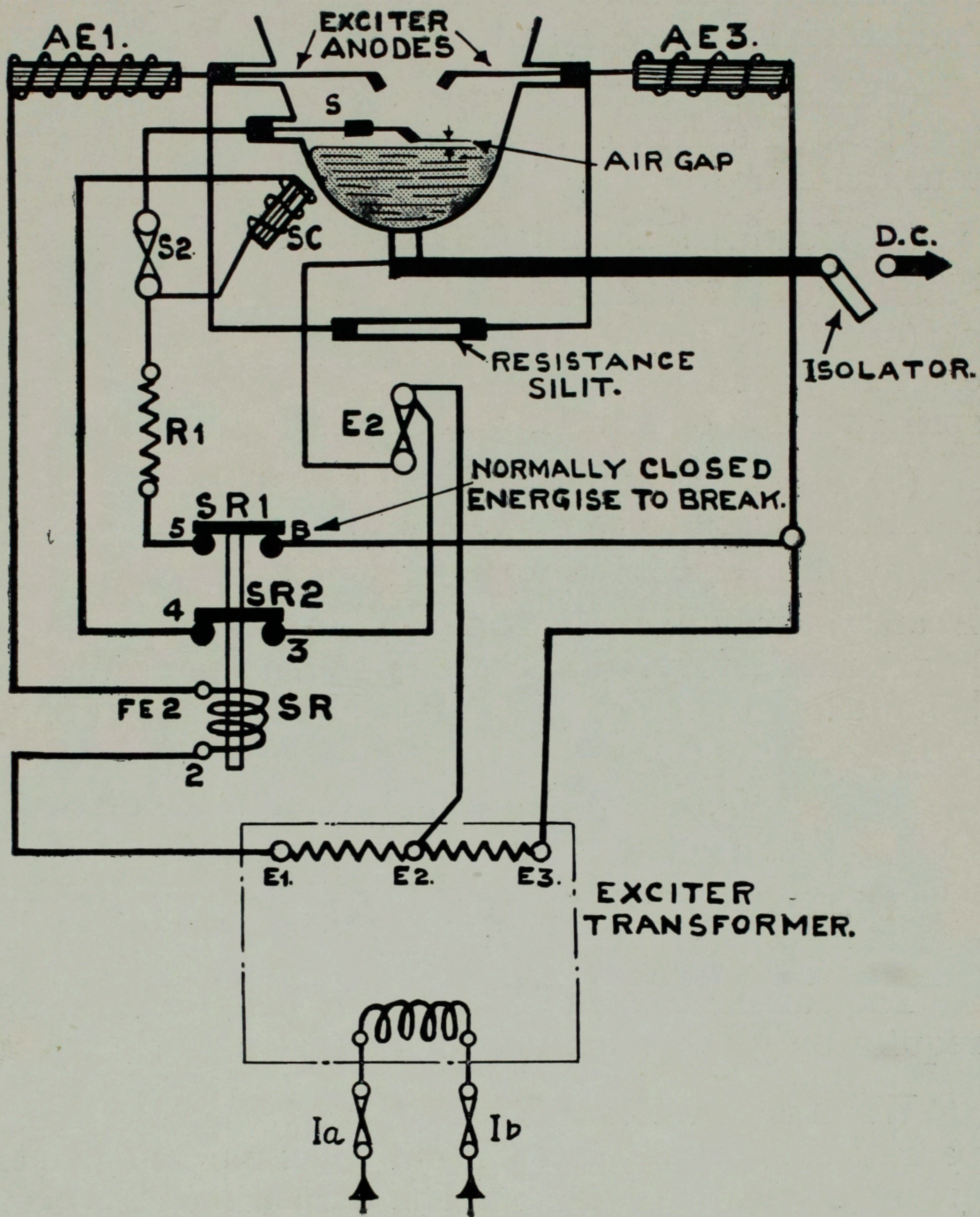


Fig. 10.



# THE STARTING CIRCUIT.

## Operation and Adjustment.



**Starting Operation.** Starting electrode S is magnetically attracted by starting coil SC and makes contact with mercury.

S then short circuits SC and S is released.

On leaving the mercury an arc is formed and exciters AE1 and AE3 will strike up.

Exciter current passes through coil SR, opening relay SR and disconnecting starting circuit.

**Adjustments.** If starting is unsatisfactory, check:—

(1) *Mercury Level.* This should show an air gap of approximately  $\frac{1}{8}$  in. to  $\frac{1}{4}$  in. between S and the mercury. Adjustment is made by altering angle of bulb cradle.

(2) *Starting Coil Operation.* Check by removing fuse S2 and switch on. S should be pulled down and touch mercury.

(3) *Contacts.* Examine contacts on SR and clean as required.

(4) *SR Spring.* SR should remain open until exciters strike and then close. Adjust by altering spring tension on knurled thumb nut behind relay.

(5) *Fuses.* Examine and renew as required. These should be fused to carry 10 amps.

(6) *Exciter Current.* This should be between 7 and 10 amps per bulb and is correctly set when the rectifier leaves the factory. If necessary the current value can be adjusted by altering the air gap in the exciter choke AE1/AE3.

## MAINTENANCE OF FAN MOTORS.

The fan motors are fitted with ball bearings and require only the minimum of attention.

When the motors leave the factory the bearings are packed with grease, and it is only necessary to give the grease lubricators one complete turn after each 5,000 hours of running.

**Shell-Mex F.3.** or equal type of grease should be used.

It is recommended that the motors should be taken down and the housings cleaned and re-packed after approximately 15,000 running hours.



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