

The Power
behind the
Projector!

TYPE "B"

The
ROSS
HIGH INTENSITY
SEARCHLIGHT

ROSS

HIGH INTENSITY SEARCHLIGHT LAMP

TYPE B

PATENTED

THE eternal striving for efficiency in connection with Cinematograph Projection has resulted in many improvements in the apparatus used. One of the most noteworthy of these has been the development of the Mirror Searchlight Arc using High Intensity Carbons. Porous screens for sound pictures have made the demand for light, and still more light on the screen a very pressing one. Ross, Ltd., were the first to introduce High Intensity Mirror Arcs running successfully at currents as high as 80 and 90 amperes.

To meet the demand for still more light they have brought out a new model 10" Mirror Arc Lamp, Type B showing marked advances on the original lamp.

Many hundreds of the original Type A Searchlight lamps are running day in and day out and are giving entire satisfaction and there is no intention of discontinuing the manufacture of this lamp since it is unequalled when run with ordinary carbons at 20 to 30 amperes. It is also most useful as a High Intensity Lamp, having been originally designed for the purpose.

There are many installations where the output of the generator is not large enough to supply Type B Lamps, and in such cases the Type A would be the more suitable proposition, as with the low voltage of 32 volts across the arc and 60 amperes current density, the Generators would not require to be very heavy.

The new Type B Lamp is essentially a High Intensity Lamp fitted with automatic carbon feed as standard.

The underlying principle in the construction has been to consume the greatest number of watts in the burning of the carbons and to dissipate the minimum number of watts in the resistance, so that with the same amperage a much greater light efficiency could be obtained.

Our original Searchlight Lamp when used as a High Intensity Lamp at say 80 amperes necessitated the low arc voltage of 32 volts, thus the watts consumed in the arc itself were approximately 2½ kilowatts.

A Type B Lamp when working at 80 amperes requires an arc voltage of 55 to 60 volts, thus consuming approximately 4½ kilowatts in the arc itself. This great increase in arc efficiency has been obtained without increasing the current consumption from the mains or generator set.

The improvement has been brought about by a re-arrangement of the Carbons and by a lengthening of the arc gap from 5/16 of an inch to 3/4 of an inch. The new carbon disposition varies from the ordinary Searchlight arc lamp principle in that the negative carbon is no longer in line with the positive carbon but is placed at an angle to it of 22 degrees. This gives a sweeping action of the flame from the negative carbon to the positive carbon and keeps the crater of the positive carbon dead square without having to incorporate in the lamp mechanism the complicated gearing necessary to rotate the positive carbon and feed it forward.

Type B Lamp follows closely the general design of our original Searchlight lamp. It is robust and has few working parts which can get out of order.

Means are provided for moving either the positive or the negative carbon separately from one or other. This is achieved by merely pushing a small lever on the front of the Lamphouse over to the right and moving the respective feeding handles.

When the lever is allowed to fall back to its original position the use of either feeding handle will move both the positive and negative carbons together at a ratio which has been carefully determined to suit 11 m.m. copper covered high intensity carbons and 7½ to 8 m.m. copper covered negatives, which combination has been found to be best for 75 to 80 amperes current density in the arc.

The longer arc gap has brought in its wake the characteristic long flame of the High Intensity Carbons and to control this flame magnets have been arranged close to the positive crater. Much experimental work was needed to arrive at the optimum position of the poles and the strength of magnetic field required. It is essential that the magnetic arrangement should not be disturbed as otherwise the arc crater would be quite out of control and the proper light intensity would not be given by the arc lamp.

Automatic arc feed is incorporated as a standard. Ample regulation is provided by means of a rheostat which can be set by the operator to suit the particular carbons he is using at the time. Copper covered positive and negative carbons are recommended for this lamp. Any of the first class carbons, such as Ship, Conradty, Siemens or Columbia carbons are suitable. The positive carbon locating arm which fixes more or less the position of the positive crater has been retained, since some operators may prefer non-coppered High Intensity Carbons in which case, the locating arm becomes a necessity to prevent the positives from penciling back.

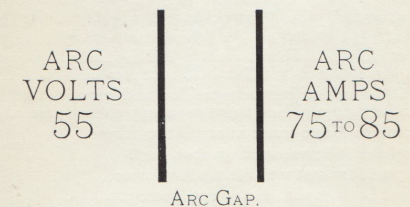
Underneath the crater a small iron tray has been fitted to catch carbon dust and molten copper blobs. It is essential to see that this tray is in position since its absence materially influences the magnetic field.

Another boon to the operator is the device for watching the crater. He no longer has to bend down and look into the lamphouse through the ruby coloured window to see whether the arc gap is the correct length and the crater nice and square.

An optical projection system has been mounted on the sloping top of the lamphouse which throws an image of the exact size of the crater, the arc gap and its position in relation to the mirror face, on a white card which is mounted in an adjustable frame on top of the lamphouse.

Generally speaking the arc lamps are sent out from the Works with this card adjusted, but it is found that the best adjustment can only be made on the spot, as the position of the positive crater depends to a certain extent on the length of the throw. Once the correct position has been found and the frame securely tightened, all the operator has to do is to set his carbons so that the burning tips of both the positive and negative craters are inside the black lines drawn on the white card, and to adjust the rheostat of the automatic carbon feed to such a speed that this position of the crater is the same throughout the run of the reel.

ROSS PATENT H.I.ARC.



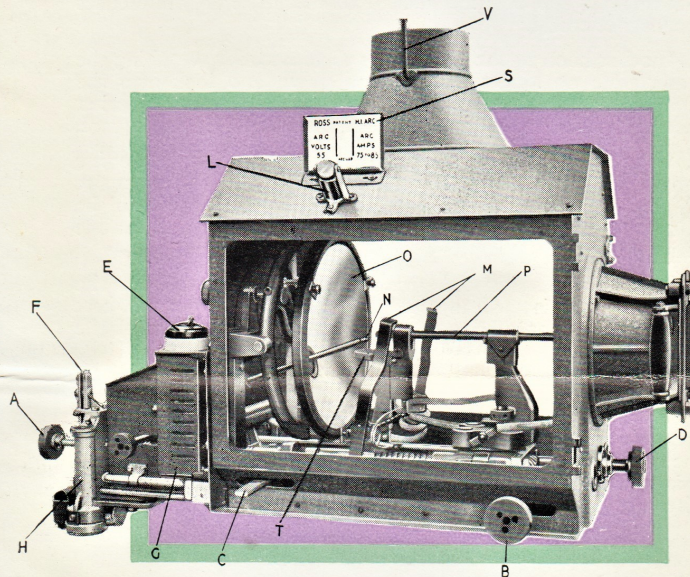
The correct position of the arc gap is of the utmost importance in obtaining the maximum light on the screen, which the arc lamp is capable of giving. Fig. 1 is a facsimile of the card with the positions of the positive and negative craters clearly indicated. Both craters should be just inside the black lines.

Owing to the high efficiency of the arc it is essential to strike the arc very carefully and to build up the amperage gradually, as otherwise intense jets of flame will spurt from the crater to the mirror, to the detriment of the latter. To obviate this damage to a certain extent a flap with rotary movement is fitted in front of the upper half of the mirror. Operators should make a practice to lower the flap before striking up and to raise the same only after the carbons have settled down to proper burning. By observing this precaution the life of the mirror will be considerably increased.

The lamp that defies fog and smoke and uses *less current!*

DESCRIPTION of the essential parts of TYPE B HIGH INTENSITY ARC LAMP (PATENTED)

In external appearance and size the type B does not differ materially from the well known Type "A" Lamp.



- A. Back feeding handle. Feeds positive and negative if is in normal position; feeds negative only if C is held over to the right.
- B. Front feeding handle. Feeds positive and negative if C is in normal position; feeds positive only if is held over to the right.
- C. Lever actuating coupling between positive and negative feed screw must be moved to the right and held there to disengage feed screw.
- D. Focussing screw to locate crater in respect to mirror O.
- E. Switch to stop and start automatic carbon feed.
- F. Clutch to engage feed screw to carbon feed motor.
- H. Automatic feed bracket with motor and gearing.
- L. Optical projection unit, throwing image of burning crater on card.
- S. Card receiving image from L to be adjusted in each case to best screen illumination.
- O. Mirror.
- N. Negative Carbon.
- P. Positive Carbon.
- M. Magnets, arranged to draw flame away from mirror; must not be altered in any way.
- T. Tray underneath Crater, made of iron, asbestos lined. Must be in position when using arc lamp.
- V. Ventilating flap in cowl.

INSTRUCTIONS FOR USE OF ROSS SEARCHLIGHT ARC LAMP Type "B"

Use 7.5 m/m x 8" Negative } carbons, both coppered
11 m/m x 12" Positive }

See that hole in mirror comes equally round Negative Carbon.

When carboning up allow small amount of back play on each carbon rack.

Adjust Positive Carbon to leave $1\frac{1}{4}$ " through locating arm.

Adjust Negative Carbon to strike with centre on bottom edge of Positive when same is in its correct position.

Strike Arc on 20 amps. by throwing out centre clutch, and bringing Negative up to Positive.

Open Arc by withdrawing Negative as amperage is built up leaving Positive stationary.

See that correct Arc Voltage is supplied.

Drop in Auto Feed Clutch and switch on.

Adjust Rheostat to give proper feed.

Adjust Ventilator until crater remains steady.

When finishing run, switch off Auto Feed and throw out clutch before cutting off supply to Arc.

Centre light with tips of carbons just inside the two lines on card. If card is not in correct position then centre light on screen and adjust card position to correspond.



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