mounted so that its body may be rotated through any angle, and if this be done slowly, say, by means of a handle operating through worm gearing, it will be found that the phase difference can be corrected without upsetting the synchronism. Obviously the use of a jerky or rapid motion will put the discs out of step. The effect on the received image of this "phase difference" is to displace it sideways to left or right, so that it is part in, part out of the field of view.

The effect is similar in many respects to the corresponding effect sometimes seen in a cinematograph theatre where a black bar appears across the screen. Above this bar a portion of the picture appears, and below it another part of the picture is seen. The only difference is that in this case the displacement of the image is in a vertical direction instead of sideways.

In the machine shown in Figs. 4 and 5 this phase-correcting refinement has been omitted for the sake of simplicity, but the amateur who cares to try it should find no difficulty in designing a simple arrangement to suit his own motor-alternator.

In the photo there will also be seen a neon tube on a pedestal, behind which is placed a 4-in. concave mirror, and in front of which is a ground-glass or ground gelatine screen. This neon tube is connected at will through the D.P.D.T. knife switch previously mentioned to the output of the amplifier.

This completes the receiving set, which will be seen to be a comparatively simple piece of apparatus.

General Remarks.

The experimenter will soon find that the simplest way to get his discs synchronised is to watch the image at the receiving machine, the flash lamp bulb being shorted, before any trouble is taken to get the discs properly synchronised. It will then be noticed that the received image, instead of being stationary, is in motion either in an upward or downward direction. If the image moves in the direction of rotation of the receiving disc the latter is going *too fast*, so that more resistance is needed in the armature circuit of the driving motor.

If, however, the motion of the image is opposite to the motion of the disc, the latter must be speeded up by cutting out some of the armature resistance. In this manner it will be found quite easy to adjust the armature resistance until the image is perfectly steady, and the synchronising current will then control the speed so that the discs always remain perfectly in step.

Then if the receiving set has been fitted with an adjustment for "phasing," as explained above, this may be used to bring the picture to the centre of the field of view. If no special adjustment has been fitted for the purpose, the entire carcase of the motor-alternator will have to be *slowly* and *steadily* rotated by hand. To facilitate this adjustment the top of the pedestal supporting the motor-alternator may be shaped like a cradle, so that the cylindrical carcase of the motor can rest in it and be turned freely.

Suggestions for Research.

While the above method of synchronisation with the spiral discs mounted directly on the spindles of the motor-alternators is quite satisfactory, it is really somewhat easier to obtain perfect synchronism with

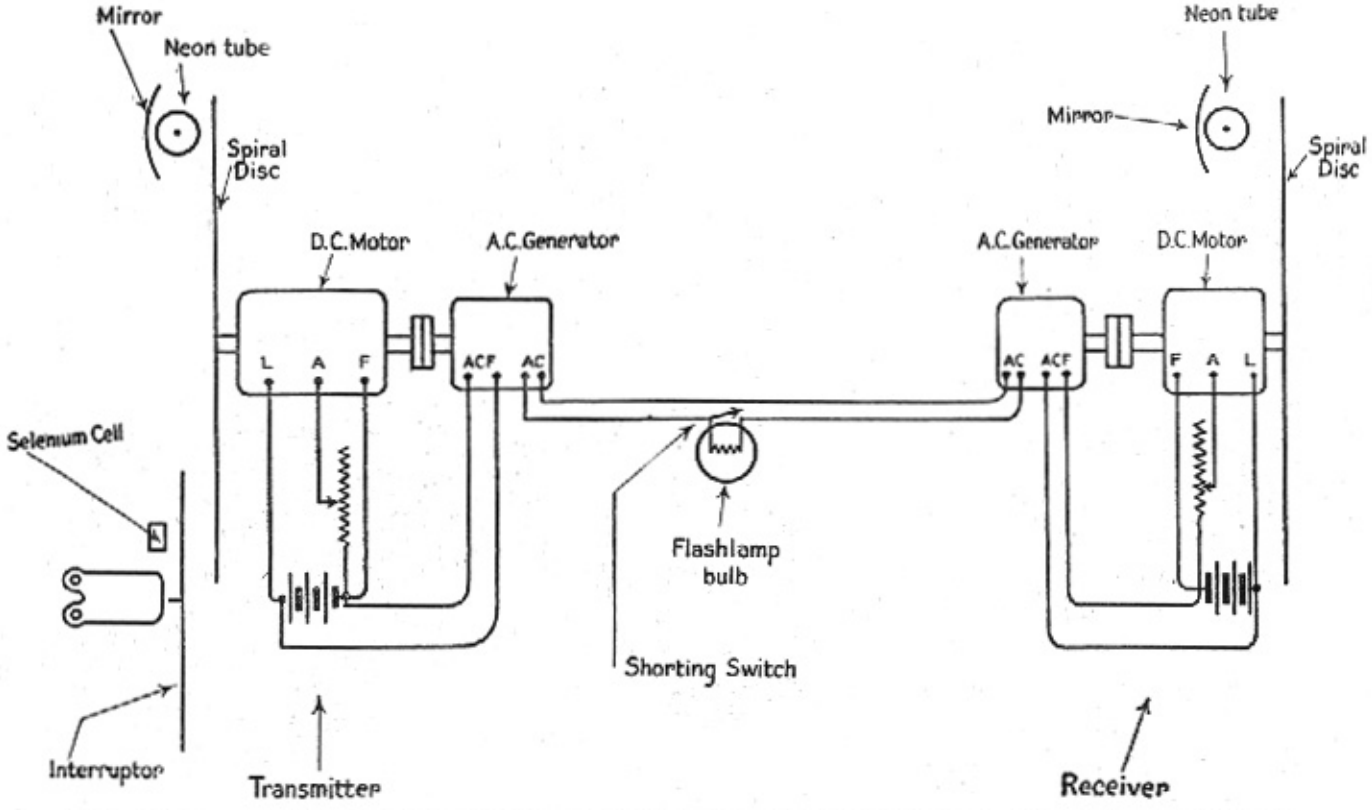

Fig. 1.—Diagrammatic sketch of arrangement of transmitter and receiver. Projector lamp, optical system, and amplifier have been omitted for the sake of clearness.