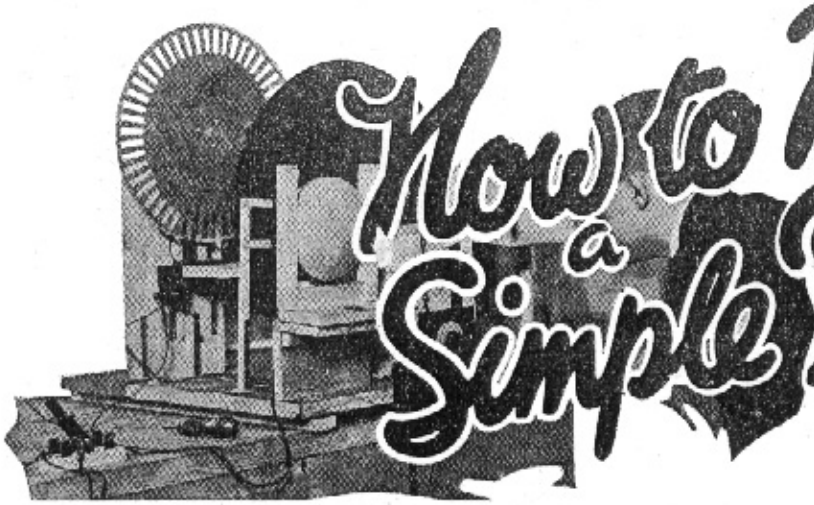


# How to Make a Simple Televisor

*Concluded from our March issue.*

## ADJUSTMENTS AND EXPERIMENTS.

**By Our Technical Staff.**

IT is proposed in this issue to give hints on the operation of the "Televisor" described in last month's issue, but before doing so certain improvements, mainly in the optical system, will be described and explained. In another article in this issue a specially developed amplifier is described which enables the H.T. voltage required to be reduced to 250.

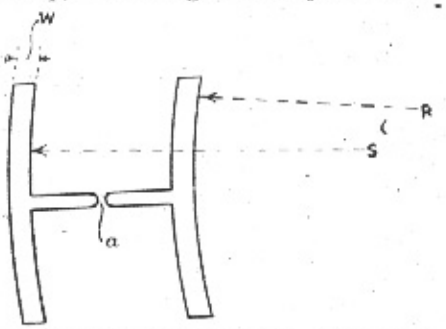
As originally designed, the optical system consisted simply of a concave mirror placed behind a 400 watt projector lamp at such a distance that an image of its filament was reflected on to the selenium cell.

Now the main disadvantage of this method is that the ordinary cheap concave mirror is not perfect, and consequently the image of the filament formed by those rays which pass through a given aperture in the spiral disc is not in the same position as the image formed by rays passing through any of the other apertures. Hence if the spiral disc be slowly rotated the image of the filament will be seen to wander within quite wide limits across the face of the cell, and, in addition, there will be noticed a fleeting and less brilliant image whose motion is in a vertical direction. This latter is formed in the same way as the image produced by a pinhole camera, the "pinhole" in this case being one or other of the square apertures in the spiral disc.

### New Optical System.

This difficulty may be largely overcome by using a pair of exactly similar converging lenses, either plano- or bi-convex. One of these is placed between the projector lamp and spiral disc so that the filament is at its principal focus, while the other is placed behind the spiral disc so as to focus the image of the filament on to the cell. The arrangement is shown diagrammatically in Figure 1, and it will be found to be very much better than a concave mirror. The lenses should be four to five inches in diameter and should have a focal length of about seven inches.

Another point which will require attention is the provision of some suitable screening for the projector lamp, as the light is very brilliant,




**How the stencil is prepared. The radii S and R start from a common centre.**

and in addition to being very trying to the eyes, it will mask the dim light of the neon tube. Any simple contrivance of box form made from sheet tin or cardboard is suitable, but if the latter is used plenty of space must be allowed, because a great deal of heat is radiated from the lamp. In any case some ventilation is advisable as a protection to the lens.

An additional refinement would be to substitute for the stencil holder (the holder for the object whose shadow is to be transmitted) described in last month's issue a "Bulldog" paper clip screwed by one arm to a wooden upright. This enables the stencil to be adjusted in position so that the best results may be obtained.

This concludes the suggested improvements to the original design, so that a few practical hints on operation may now be given.

### Cutting the Stencils.

When considering objects the shadows of which are to be transmitted, simple stencils which the amateur can cut himself out of thin cardboard are perhaps the best with which to commence experiments. A very useful and instructive one is the letter H, and the cutting of such a stencil will be described in some detail.

As each of the square apertures in the spiral disc moves on a circular path, the limbs of the H will be curved in corresponding arcs, so the stencil must be cut accordingly (see Figure 2). Thin card or copper foil is suitable, and the material can be cut with a sharp penknife. It should preferably be coated with dead black celluloid paint after cutting. It is desirable to leave a small strengthening web in the centre of the horizontal crossbar of the H, as shown at *a*, Figure 2.

### Correcting Image Reversal.

While on the subject of stencils, it should be mentioned that the image formed by this simple televisor may be described as a "focussing screen" image. That is to say, like the image seen on a camera focussing screen, it is upside down. Now, in the transmission of the shadow of the H stencil this defect will obviously not be very apparent; but the amateur should bear this fact in mind when constructing on the same principle stencils for the letters T, E, F, G, etc. The experimenter