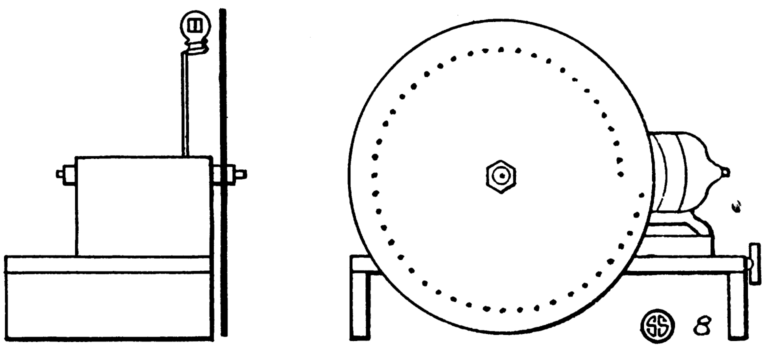
# Making Your Own Radiovisor

*Radiovision*



This is the sixth of a series of articles especially prepared for Science Service by one of the first of radiovision inventors. In future articles Mr. Jenkins will describe other kinds of radiovisors.

By C. Francis Jenkins

The radiovisor is now complete. To work with it, you will need a radio set just as you need a receiver to feed the detected and amplified impulses into your loud speaker.

For satisfactory results you will probably have to have a receiving set with a resistance-coupled amplifier. Ordinary radio sets, built with transformers in the audio stages of amplification, will distort the image of the radiomovies too much. You can, however, experiment with the set you have. If you do, remember this warning and do not get discouraged.

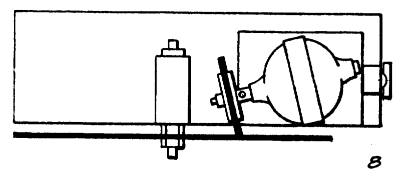
Most radiovision broadcasting is now on short wave lengths and ordinary commercial receivers, even if they had resistance coupling which very few do, would probably not be able to reach these ranges.

You will therefore probably desire to build your own receiver and the accompanying circuit diagram of proven worth will guide you.

Standard parts, easily obtainable, are used as follows:

C1—2 pieces 1½-inch square copper plates spaced ¼-inch.
C2—.01 M. F. D. Mica coupling condensers
C3—At least 1 M. F. D.
C4—At least 4 M. F. D.
C5—.00025 M. F. D.
C6—.00014 M. F. D. Variable condensers
C7—.001 M. F. D.
SW—Speaker and Neon Lamp cut-out switch
All resistors must be non-inductive
R—2 to 7 megohms
R1—.025 megohms
Rp—.25 megohms
Rg—1 megohm
Rg1—.5 megohms
L1—5 turns 3-inch dia. No. 18 D. C. C. Wire
L2—6 turns 3-inch dia. No. 18 D. C. C. Wire
L1 and L2—Spaced ¼-inch
Antenna—50 to 100 feet total length

Now that the radiovisor is assembled and ready for use, you can tune in for radiomovies. (*Turn to next page*)



# Films of Gold Show Electronic Waves

*Physics*

A thin film of pure gold, far thinner than the thinnest gold leaf, affords new evidence that electrons are waves, or at least, accompanied by waves. Electrons, the building blocks of which atoms are supposed to be made, were formerly thought of as being like small particles, but modern physicists think that they more nearly resemble waves like light or even radio waves; though much shorter in length, or higher in pitch.

Prof. George P. Thomson, of the University of Aberdeen, and son of Sir J. J. Thomson, one of the most eminent of present-day English physicists, has made the gold-film experiments, which he recently reported to the Royal Institution. A thin film of metal, such as he used, is a screen of molecules that permits the physicist to tell waves from particles. The arrangement of the gold molecules forms a lattice. If a stream of tiny particles is aimed at the screen, they hit molecules at a variety of angles, and so the stream emerges from the other side spread out as a cone. But waves are affected differently. When they go through such a screen they prefer to bend at certain angles. Therefore, if a photographic plate, which is darkened by the electrons, is placed a short distance back of the gold film when the electrons are passed through, a black spot will appear on the plate, surrounded by a series of concentric rings. The black spot represents the bulk of the electrons, which pass through without deviation, the rings represent those which are bent at various angles.

In performing this experiment, Prof. Thomson obtained exactly this effect. Furthermore, to prove that it was not due to light, which is known to behave in a similar manner, he repeated the experiment with a magnet nearby. Electrons are pulled out of their course by a magnet, while light is not. With the magnet, the rings were displaced, as they should be if the effect was due to the electrons. So it is demonstrated rather conclusively that a stream of electrons contains waves. Whether these waves are the electrons themselves, or merely accompany the real electrons, is still a speculation. However, he has measured their wave length and has found that their pitch is more than a million times higher than that of visible light, far higher than that of X-rays, and, except for the cosmic rays, higher than that of any known radiation.

But Prof. Thomson points out that the electron waves are not like light waves. Even if they were as low in pitch as light waves, they would not be the same. They travel at different speeds, the electron waves are bent by electric and magnetic fields, while ordinary light is not, and their penetrating powers are quite different. "If they are actual motion of an ether," he says, "it must differ in some way in the two cases."