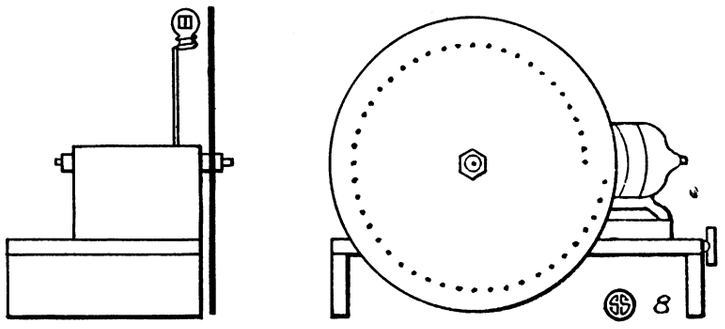
Making Your Own Radiovisor

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.

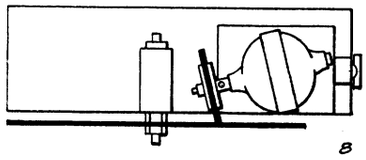
Most radiovision broadcasting is now on short wave lengths and ordinary commercial receivers, even if they had resistance coupling which very few do, would probably not be able to reach these ranges.

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.

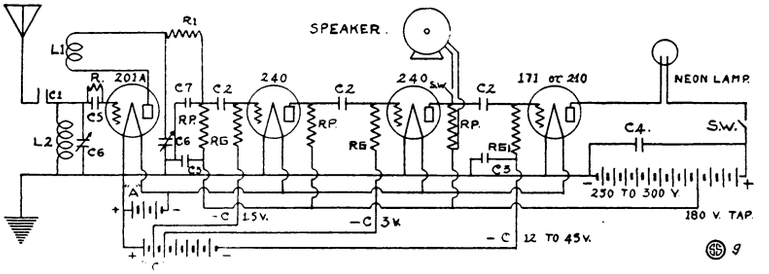
Prof. George P. Thomson, of the University of Aberdeen, and son of Sir J. J. Thomson, one of the most eminent of present-day English physicists, has made the gold-film experiments, which he recently reported to the Royal Institution. A thin film of metal, such as he used, is a screen of molecules that 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."

Science News-Letter, October 20, 1928

Radiovision—*Continued*



Connect your radio output to the lamp, preferably through a switch, with about 180 volts in circuit with the switch and lamp. A power pack can be used instead of "B" batteries.

The glowing electrode (cathode) of the lamp should face the lens and disc, of course. If it does not, reverse the electric connections.

Now go ahead and tune in the station broadcasting pictures (3XK at Washington, D. C., is 46.7 meters, and is broadcasting every Monday and Wednesday and Friday nights at 8 o'clock, Eastern Standard Time), then adjust the speed of the scanning disc to 900 R. P. M., which means only that you slide the motor board outward from the scanning disc center until your picture comes in, as you look through the top of the disc at the neon lamp.

Begin with motor about 2 inches from the scanning disc center, and draw it outward, very slowly or you will go past the point of synchronism. It is surprisingly easy to get synchronism by this mechanism.

At first, with an induction or D. C. motor, there will be only black and white dots and dashes in the picture area, but when the speed of the disc has been brought into synchronism with the speed of the transmitter at the broadcasting station, the picture will suddenly appear, as one looks at the lamp through the flying holes of the scanning disc.

When the transmission of the picture ends, the picture frame on your radiovisor is smooth pink, and you should switch it off and switch on your loudspeaker, so that you may listen to the announcer again.

If the picture appears upside down, take off the disc and turn it around, other side out. This will make the picture right side up.

For best picture reception, the receiver must be on the point of non-oscillation, or just below the point where oscillations begin. A receiver that will bring in good phone reception will produce good pictures, therefore, the receiver must be adjusted similarly.

The image received from 3XK should be in black. In other words, the lamp is continuously lighted until picture signals blink it out to make up the movie pictures in black silhouette on a pink ground.

The amount of light given off is regulated by the "C" bias on the last tube of the amplifier, although the bias must be high enough to permit the incoming picture signals to overcome the plate current, blocking the light given off by the neon lamp. It has been found that a "C" bias voltage between 12 and 45 volts on the last tube will be sufficient on all types of neon glow tubes.

Science News-Letter, October 20, 1928

An old Persian belief held that an agate has power to stop a storm.

Indian Morals

Ethnology

CHIEF BUFFALO CHILD LONG LANCE, in *Long Lance* (*Cosmopolitan*):

Our moral training was entirely in the hands of our mothers. They would tell us about our Great Spirit; and they told us that when we grew older the Great Spirit would appoint some other good spirit in the spirit world to be our guide and look after us. This spirit would give us our "medicine"—lucky charm—our medicine-song and our death song; the former to be sung at all times when in trouble, the latter when we were called to die.

We had no Bible as the white boys have; so our mothers trained us to live right by telling us legends of how all of the good things started to be good. We had a legend for everything—from the care of our feet to the "great shame" befalling those who tell lies. Many long winter afternoons we would sit around our mother as she made skins into clothing, and listen to the magic stories of righteousness which she was passing on to us from the dark, unknown depths of our history. . . .

We had a legend for everything that was good, and the more we youngsters lived up to the legends which our mothers told us, the more highly respected we were in the tribe. We tried hard to remember each legend and to live out the moral that it taught us.

Science News-Letter, October 20, 1928

The Greek physician Hippocrates declared that certain mental diseases were brain disorders, but even in the nineteenth century insanity was still looked upon by many people as a mysterious malady of divine origin.

Thirty years ago, when the Weather Bureau began to issue flood forecasts far in advance for the lower Mississippi, the Bureau was accused of unduly alarming the people; but the warnings soon proved their value beyond question.