

# Television

Under this heading, RADIO NEWS publishes each month descriptions of the latest developments in the extremely interesting field of television.



## Practical Demonstrations Scheduled for WRNY

By Theodore H. Nakken

**W**ITHIN a short time after the appearance of this issue of *RADIO NEWS*, the first television broadcasting experiments to be conducted by an American broadcast station, on its regular wave in the 200-500-meter band, will be made over WRNY, New York City. This pioneer work will be done under the direction of the writer with apparatus of his own design and construction. The plan is to give an initial demonstration of the system in the Hotel Roosevelt, New York, where the studio of WRNY is located. A television transmitter, or "televisor," will be installed here; and the image of a person will be broadcast on the 326-meter wave of WRNY from the transmitter proper, which is situated at Coytesville, N. J. A receiving set with a televisor attachment will be in operation in a room in the hotel, where the received images will be observed by the editors of *RADIO NEWS*, a group of newspaper men and a number of scientists.

The object of the whole undertaking is to demonstrate the practicability of radio television, on the regular broadcast

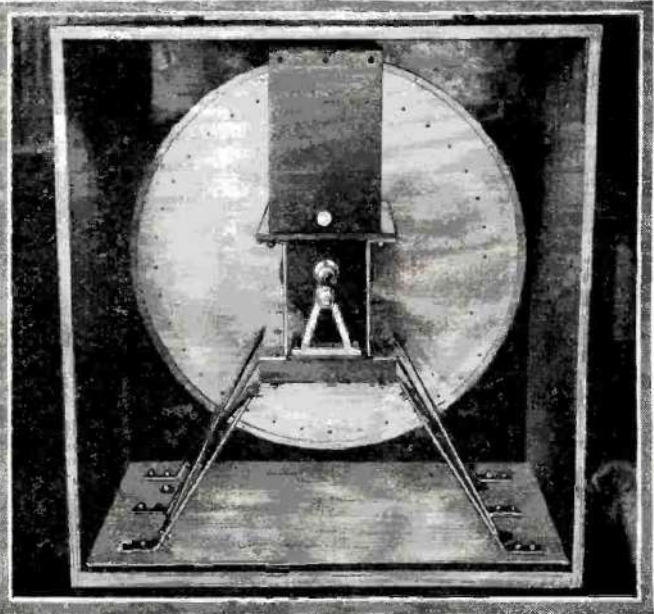
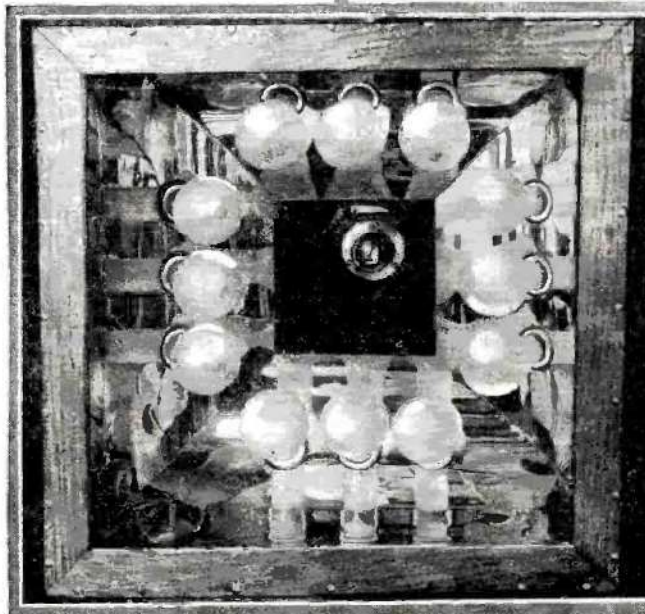
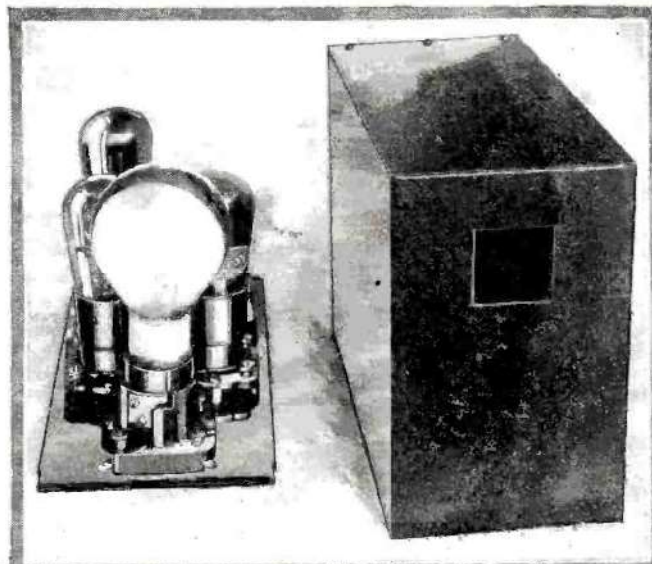
channels, with comparatively simple transmitting and receiving apparatus. Although the writer does not claim he will be able to provide images of great sharpness, their definition will at least be great enough to make them readily distinguishable to the human eye. The degree of distinctness is limited by the fact that broadcast stations must keep their radiated waves within a

10,000-cycle band; which means that a carrier-wave (920 kilocycles in the case of WRNY) can be modulated by impulses up to only 5,000 cycles in frequency.

The receiving apparatus necessary for the reproduction of the televised images will be of such comparatively simple construction that any radio experimenter, given the few essential components that he cannot make himself, will be able to assemble a complete instrument in a few evenings. The receiving televisor will form an independent unit, and will be equipped with a cord which will connect to the regular output posts of the broadcast receiver.

### ANNOUNCEMENTS

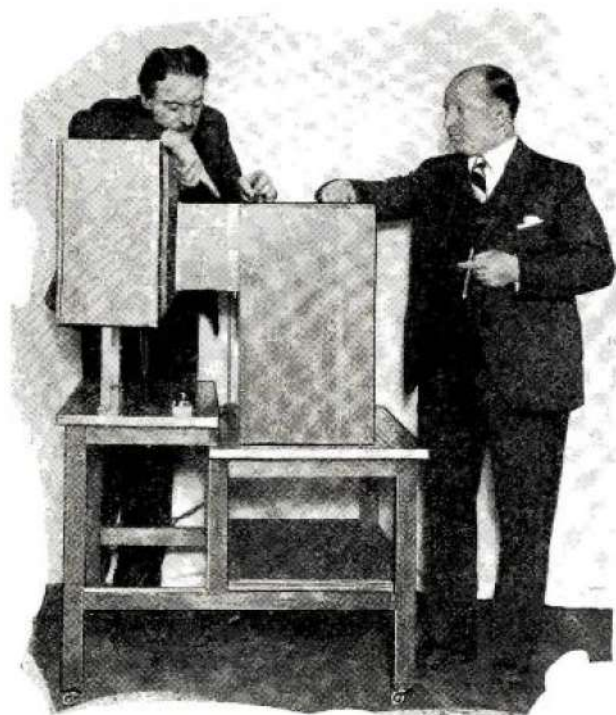
In the present state of affairs, it will not be possible to receive both broadcast voice or music and the television images at the same time, because the electrical impulses carrying either will occupy the full legal "channel" of the transmitting system. First the WRNY announcer will speak, and then the television broadcasting will commence. There will be a slight pause between the end of the speech and the start of the



Top: The photoelectric cell unit, removed from its metal container. The cell itself is the pear-shaped bulb in the foreground, the other tubes being A.F. amplifiers. Left: What you would look at if you were being "televised." The

round object behind the reflector is a lens. Right: The back of the televisor, showing the photoelectric cell's can behind the revolving disc. The driving motor (not shown) fits on the baseboard.





This illustration gives a general idea of the televisior. Mr. Nakken is pointing to a little window through which the edge of the revolving "scanning" disc may be observed.

**M**R. THEODORE NAKKEN, the author of the accompanying article, is a prominent radio engineer and inventor, and the holder of what is probably the most important patent in the television field. This patent, No. 1,522,070, reissue No. 16,870 (February 7, 1928), was granted for means of transforming light impulses into electric-current impulses, and covers all practical arrangements of elements and circuits for such transformation. It will, in all probability, be the subject of a great deal of legal controversy and litigation.

This article, the first of a number by Mr. Nakken, heralds a series of practical television demonstrations through the RADIO NEWS broadcast station, WRNY, New York, on its regular 326-meter wavelength. The subsequent articles will describe the transmitting equipment in detail and will tell how the radio fan can make his own television receiver to reproduce the broadcast images.

televisior, to enable the listener to disconnect his loud speaker and to hook on the televisior or receptor. If the speaker is left in the circuit it will emit a confused babble of totally-meaningless noises.

#### LIMITS OF EXPERIMENTS

It is hoped that, eventually, arrangements will be made for simultaneous transmission of both speech and image, through the use of a separate broadcast station for each purpose. However, radio set owners will have to satisfy themselves with the marvels of television alone until the broadcast licensing situation ceases to be a political football and resumes its proper engineering aspect. The employment of separate transmitting stations will, naturally, necessitate the use of separate receiving sets; but the construction of a second tuner and amplifier to supplement the regular broadcast receiver is a simple matter.

To start with, only faces will be transmitted. The received images appearing on the screen of the televisior will be about two-and-a-half or three inches square, and will appear at the rate of ten per second. This speed is enough to produce the illusion of motion. The minimum number required to produce this effect is eight pictures per second. Because of the inherent limitations and legal requirements of broadcast transmitters, there is little possibility of enlarging the images with pleasing results.

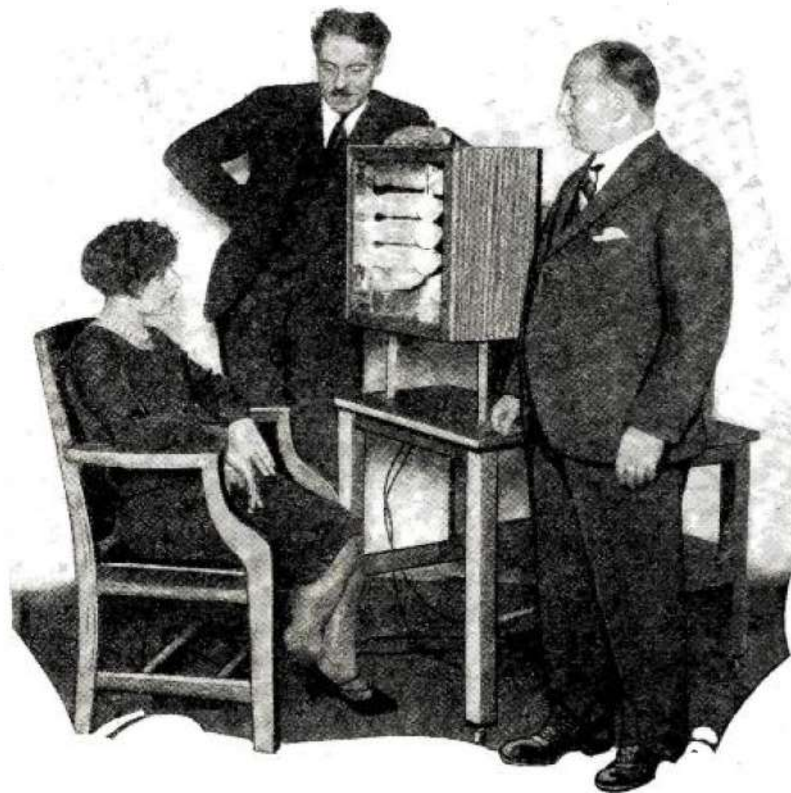
#### SYNCHRONISM

Both transmitting and receiving televisiors will employ revolving discs. The all-important problem of synchronizing them is solved by the use of a manual control at the receiving end. In other words, the operator of the receiving set will adjust the motor by means of a simple regulator (and visible indicator), and thus attain the adjustment that gives the best results. It is not feasible to use synchronous alternat-

ing-current motors for general television work, because the motors running televisior transmitters will not be fed by the same power systems that feed receivers in distant districts.

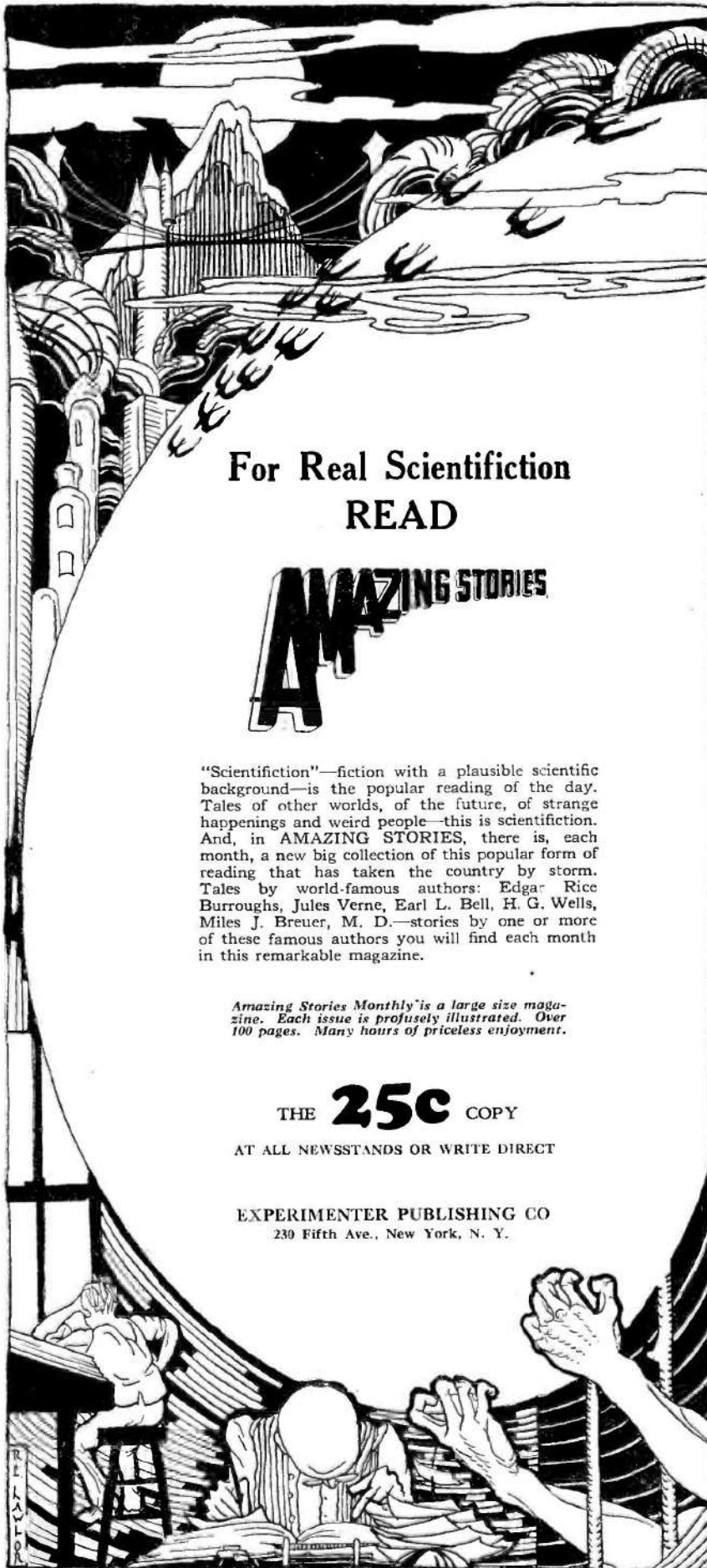
The actual television transmitting apparatus has been practically completed, as the

accompanying illustrations show. The model receiver was still in "breadboard" form when this article was being written, so it could not be photographed. However, a detailed description of it will be published in a forthcoming number of RADIO NEWS, (Continued on page 84)



How a person would be "televised." Mr. Nakken, the author, is standing behind his apparatus. At the right is Mr. I. Goldberg, president of the Pilot Electric Mfg. Co., makers of the televisior.





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## Television Demonstrations Through WRNY

(Continued from page 21)

after it has undergone thorough tests both in the laboratory and in practical service,

### OPERATION

The television transmitter is made mostly of wood, and stands about five feet high, three feet wide, and about four feet deep. The legs are fitted with casters, so that the whole machine may readily be moved from place to place. As a subject prepares to be "televised," he or she merely sits down in front of the "illuminator," shown on page 20. It is a square box fitted with twelve 50-watt lamps and a highly-polished reflector. Directly behind an opening about six inches square in the latter is a very "fast" lens (f. 1.5) which concentrates the image of the subject on the revolving disc behind it, which is pictured separately at the lower right. The disc's driving motor, which is not shown, will be placed on the baseboard in the immediate foreground.

Behind the perforated disc is a small box containing a photo-electric cell and a three-tube amplifier. As the disc revolves and allows the reflected light from the subject's face to pass through the small holes, one at a time, into the cell, the latter translates the light impulses into electrical impulses, which are led to the broadcast transmitter. (A close-up of the photo-electric cell unit appears in the panel above; the cell is the large round bulb at the left; the square opening in the steel can allows the light rays to affect the cell in the proper manner.)

In his next article, the writer will discuss his television transmitter, the amplifier and the exact method of putting the images "on the air."

(On the very closing day of this number of **RADIO NEWS**, an announcement was made by the General Electric Company that station **WGY**, transmitting on its regular 380-meter wave, would commence broadcasting television programs on a regular schedule. The pictures will be sent from the **WGY** laboratories in Schenectady, N. Y., on Tuesday, Thursday and Friday each week, between 1.30 and 2.00 p. m., Eastern Standard Time.

Only the faces of men talking, laughing or smoking will be broadcast, the announcement said; no elaborate effects are planned at this early stage.

The regular schedule of transmission is designed primarily to assist engineers in the development of a reliable and complete television system; but, since the signals may be picked up with ordinary broadcast receivers, amateur experiments may readily use them for the testing of television apparatus of their own construction.

As heard from the loud speaker, the television signals have an intermittent, high-pitched whirr; the pitch varying with the action before the transmitter. This description is contained in the announcement.

The television transmitting apparatus is a modification of the Alexanderson machine described in the April, 1928 number of **RADIO NEWS**. No information on the construction of receivers suitable for the reproduction of the broadcast images was available at the time this number of **RADIO NEWS** closed; but, as soon as the data can be presented in useful form, **RADIO NEWS** will publish them.—EDITOR.