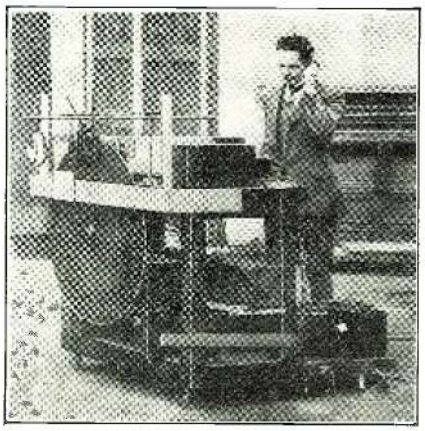
vised merely sits in the chair shown at the left.

As the transmitting and receiving discs are on the same shaft, they are perfectly synchronized. The set-up was completed just before this number of RADIO NEWS went to press, and the editors had the opportunity of observing very good images in it. The discs used were made hurriedly and did not run too smoothly, but in spite of their imperfections showed definite promises of success.

Separate transmitting and receiving units are now under construction, as are improved discs with *square* holes and heavy flanges. Further details of this interesting work, which is being done for WRNY under the supervision of John Geloso, chief engineer of the Pilot Company, will be described in our next number. If things develop as rapidly as they promise, an article telling how to make your own television receiver will also appear.

Television Out of Doors



The new outdoor television camera, with its hood removed to show the scanning disc. A white spot on this disc operates a second photo-electric cell, which sends a synchronizing impulse.

AS this issue of RADIO NEWS goes to press, an important development in the transmission of television is being demonstrated by the Bell Telephone Laboratories in New York City. The engineers of these laboratories, who in April of last year gave the first American demonstration of television, have disclosed the important details of a new television camera which represents the progress they have made during their continued research. This camera is capable of scanning an object in ordinary daylight without the necessity of artificial illumination. The subject may be of any size and at any desired distance from the camera; the only limiting factor being the loss of detail as the size of the televised area is increased.

The importance of this development can be appreciated best by comparing the results obtained with those secured when using older methods. Previous to this, the only television pictures which have been transmitted successfully have shown the head and shoulders of a man, or some other image of equivalent size, and in taking these pictures the subject is placed under intense artificial light within two or three feet of the camera. On the other hand, with the new system, the actions of two men engaged in a boxing match may be shown; and the pictures may be taken out-of-doors with the camera at a distance

of twenty feet or more from the scene. In other words, the new invention removes television from the studio and permits the transmission of larger scenes.

There are three important differences between the new television camera and the old design. First, a new photoelectric cell of greatly increased sensitivity is used. Second, the scanning disc is much larger in diameter and has larger holes, thus providing the photoelectric cell with a greater amount of light. Third, a new optical system is used which employs a six-inch lens to project the image on the disc, thus providing the cell with a still greater amount of light. These three improvements make it possible for the cell to attain sufficient output for the operation of a sensitive amplifier even on a cloudy day. Another feature is that the camera may be focused by moving the lens back and forth.

In the New York demonstrations the pictures are taken on the roof of an office building, while the receiving equipment is located in a darkened room on the seventh floor of the same building. The connection between the television camera and the receiver is as yet by telephone wires; although it is explained that the signals can be sent and received by radio just as easily. The camera is portable, being assembled on a wooden frame which is mounted on four wheels, as the pictures show.

The picture on page 256 shows clearly the appearance of the camera; when it is viewed from the front, the large lens is visible, as well as a black cloth hood which covers the frame and prevents stray light from reaching the photoelectric cell. The scanning disc is of aluminum which has been painted black; it is three feet in diameter and provided with 50 holes, 1/16-inch in diameter, which have been drilled in a spiral path along the outer rim of the disc. The photoelectric cell, which is approximately two inches in diameter, is located in a box mounted directly behind the disc. To turn the disc a D.C. motor is used, which operates also the generator of a synchronizing current used to control the speed of the motor turning the receiving disc. The amplifier equipment is located in a long box at the rear of the frame. Five stages of amplification are used, and distortion has been reduced to a minimum. The images seen by a Radio News representative, though taken just after the sky had clouded over before a violent storm, were remarkably clear and distinct in their movements.

SHORT-WAVE TELEVISION BROADCASTING

Licenses for experimental television transmission which have just been issued by the Federal Radio Commission authorize television transmission by the Radio Corporation of America, New York, under the call 2XBS; Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., under the call 8XAV; J. Smith Dodge, Lexington, Mass., under the call 1XAY; Harold E. Smith, Beacon, N. Y., under the call 2XBU; P. S. Lucas, Los Angeles, under the call 6XBW; F. L. Carter, Long Island City, N. Y., under the call 2XBT, and the Aero Products, Inc., Chicago, under the call 9XAG. These licensees are authorized to transmit in the channels between 4,700 and 4,900 kilocycles (63.79 to 61.19 meters.) The Jenkins Laboratories, Washington, also have been licensed to undertake television transmission, under the call 3XK, on 2,140 and 4,280 kilocycles (140.1 and 70.05 meters.)