

## STORIES of New Jersey

sharper, clearer picture of the sound. In this way all the lisping and hissing effects are kept out and the voice is recorded almost perfectly.

Other experiments developed the so-called "push-pull" system of recording, which splits the sound waves into two separated tracks, one negative, and one positive. This has resulted in the elimination of noises caused by particles of dust or scratches on the unused portion of the sound track.

RCA engineers conducted one of the first successful demonstrations of television out of doors in the full blaze of the mid-day sun. A special fire alarm was sounded, and, as the firemen rushed up to the scene, the eye of a television camera was poked from a window to record the happening, while a microphone picked up the clang of the bells and the scream of the siren. A mile away, across the city, a small group of spectators with television apparatus watched the blaze as shown in a greenish-hued picture, 5 by 7 inches, placed on top of a radio set. Two new devices developed by Dr. Vladimir K. Zworykin, ace research man of the RCA laboratories, made this demonstration possible. He calls one of them an "iconoscope," which is the electric eye of the television camera. The other is the "kinescope," the receiving mechanism which shows the picture on the television screen.

The radio television camera's eye (the iconoscope) is a large artificial eyeball. Its retina is a plate of mica, covered on one side by millions of particles of light-sensitive material. Platinum covers the back of it. An electric beam passes across this eye 10,000 times a second, to register the image on the radio "brain" of the transmitter. The received picture consists of 343 interlaced lines designed to minimize flicker. The green tint is purposely selected because the human eye is more sensitive to that color, but the ultimate home television receiver may show a pale yellow picture.

Two problems must be solved, however, before television can become an everyday affair. The size of the image transmitted by present equipment is still too small to be enjoyed by more than a limited gathering, and the costs involved are still too great. It will be necessary to enlarge the size of the picture before public exhibitions of television are possible. Another handicap is the necessity of transmitting pictures on short waves. So far as is now known the waves available for transmitting pictures behave very much like light waves. This means that they cannot be seen beyond the horizon. That limits television broadcasting to a radius of about 30 miles. So far no wire facilities have been found that will make possible transmission of iconoscope impulses by land lines, although a new co-axial cable, which may overcome this difficulty, is being tried.

Television is still the problem of the research and development engineers. A fund of \$1,000,000 is being used to check on the new system in outdoor operation. When satisfactory reception is regularly sustained the receivers will be put on the market for the public, and a new era in entertainment and education will be opened.