

THE RADIO EXPERIMENTER'S MAGAZINE

HUGO GERNSBACK
Editor

**SHORT
WAVE
AND
TELEVISION**

September

WORLD'S
LARGEST
SHORT WAVE
CIRCULATION



New **ELECTRON GUN**
Projects Large
Television Images
See Page 214



25¢
IN U.S. AND
CANADA

New "Electron Gun" Projects Large Television Images



Dr. Law of the RCA Laboratories views a Television image projected by his new "Kinescope."

● NEW television projection tubes capable of reproducing televised scenes brightly on a relatively large screen were described before the *Institute of Radio Engineers* in New York City recently by V. K. Zworykin, W. H. Painter and R. R. Law of the Radio Corporation of America's laboratories. Dr. Zworykin and Mr. Painter disclosed that present achievements with such tubes result from research directed to this end and which has been carried on for years. A demonstration by Dr. Law came as a highlight in a symposium of technical reports on the status of television by RCA scientists, whose laboratory work along with the experimental field tests now in progress in the New York City area are vital parts of RCA'S television program.

The tube, which is about eighteen inches in length, produces an image about $1\frac{1}{4} \times 2\frac{1}{4}$ inches on its fluorescent

screen. This is so brilliant that a simple optical system will project it onto a large screen. A projected picture 18 x 24 inches compares favorably in brightness with home motion pictures. In the demonstration, a picture 3 x 4 feet in size was shown, which was bright enough to be seen by the audience of several hundred engineers.

The principal feature of the demonstrated device is a new type of "electron gun," developed by Dr. Law and a group of associates in the RCA laboratories at Harrison, N.J. The gun is the structure in a television receiving tube which focusses flying electrons into an extremely slender beam. In projection, it is necessary to start (Continued on page 252)



Dr. R. R. Law points to a newly developed "Electron Gun" in the new "Kinescope" for projecting Television images.

New "Electron Gun" Projects Large Tele- vision Images

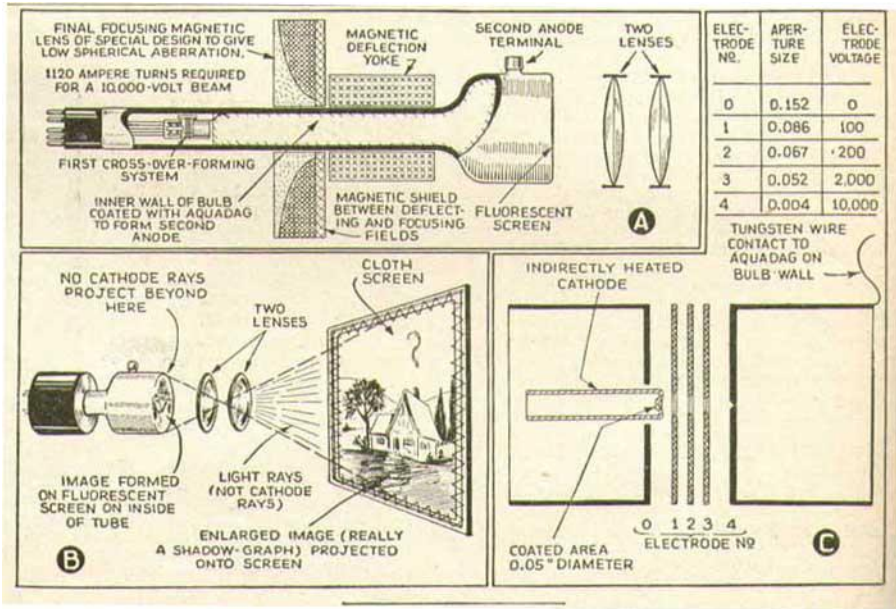
(Continued from page 214)

with a much smaller and brighter picture than in the case of a "Kinescope," which is viewed directly. Since the brightness is dependent on the current in the beam, the smaller picture requires a much larger beam current in a smaller "spot."

The television images shown were on the 441 line standard, which RCA adopted some months ago for its practical field tests. Despite the enlargement, it was difficult if not impossible for the eye to detect *line scanning* or other details by which the illusion of direct vision was accomplished.

The detailed construction of the newly devised electron gun which makes this advance possible calls for specifications so rigid that the idea was nearly discarded as impracticable, when first proposed. A flood of electrons must be regimented into the solid column of a narrow beam, to "paint" the received picture more vividly on the fluorescent screen of the "Kinescope." The electrons are "conditioned" for the job by being passed through three metal discs, each having an aperture in its center about the diameter of a pencil lead. Then, they pass through a fourth and last disc, similar to the others, but with an opening too small to pass a human hair. Electrons are made to pour through this tiny opening to the fluorescent screen at the tube's end. The bombardment is so intense that the light produced on the screen of the projection "Kinescope" may be spread over an area 100 to 400 times greater in a projected picture.

Although it is regarded in scientific circles as a distinct technical advance in RCA's television developments, engineering opinion is that Dr. Law's contribution could not at this stage be incorporated in home television receivers.



Shortwave and Television, September 1937