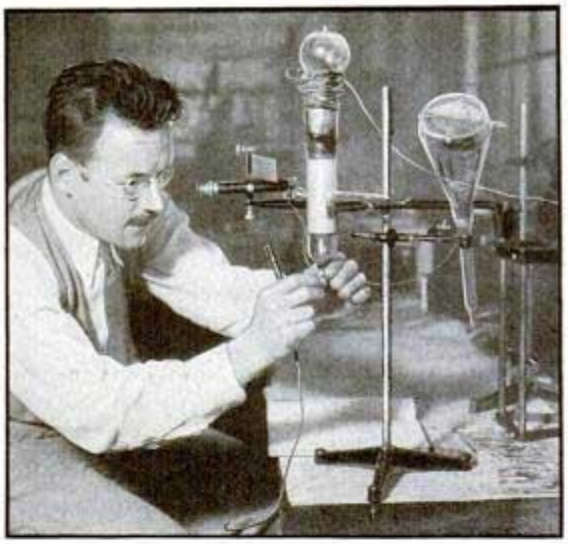

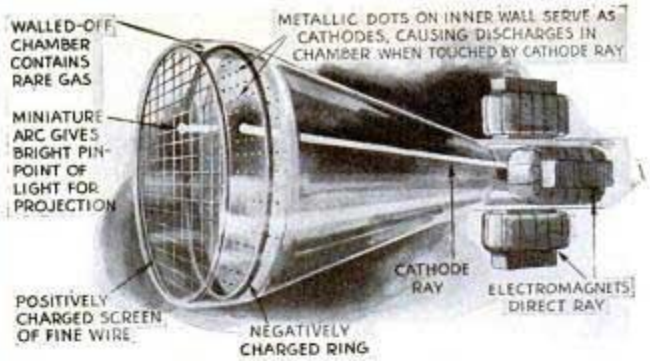

Left, Gilbert F. Schmidling, inventor of new cathode-ray tube for television, is seen with two of the experimental models built to test his design. Above, diagram showing principle of new system

Close-up of combination window in model of new tube, built to contrast the brightness of projected image of the old and new types

Myriad Dots of Light Give New Television

MYRIADS of tiny twinkling electric arcs build up a picture on a screen, in a new type of television receiver now under experimental development for home and theater use. Described for the first time in this magazine, it aims to produce an image brilliant enough to be projected upon a screen of virtually unlimited dimensions, for parlor or public entertainment. Moreover, this is to be done without the complication of the moving parts that characterize most present-day television sets. The secret of the new receiver, developed in an effort to provide practical television for the man in the street, is a cathode-ray tube that departs boldly from conventional lines.

When a television broadcast transmitter dissects the image of a studio scene and translates its high lights and shadows into a rapid-fire series of radio impulses, the problem at the receiving end is to reconvert these impulses into light and put them together again in the form of a picture. Of the many devices contrived to do this, the cathode-ray tube has always particularly attracted experimenters because of its freedom from moving parts. In the standard funnel-shaped form of this tube, a speeding beam of electrons constantly sweeps a circular window at the wide end, which is coated with fluorescent chemicals. Wherever the beam strikes the window, the chemicals glow. By directing the beam magnetically, and controlling its intensity by means of incoming radio signals from the distant transmitter, it is made to redraw the studio scene upon the glass wall of the tube. One drawback, however, has limited the usefulness of this system. The resulting image is too dim to be magnified to an appreciable size, and must therefore be viewed directly in a window a few inches in diameter.

Seeking a cathode-ray tube with an image brilliant enough for projection, Gilbert T. Schmidling, New York radio experimenter, tried out thousands of fluorescent materials without avail. His search yielded interesting by-products, including the cold lamp described last month in this magazine, but revealed nothing that combined, to his satisfaction, the two vital qualities of a television screen, high luminosity, and quick fade-out. Then he solved his problem by the remarkable expedient of discarding the fluorescent screen altogether. What he substituted in its place makes his cathode-ray tube one of the strangest of radio creations.

In design the new type resembles a standard cathode-ray tube minus its fluorescent screen, with a cylindrical extension of glass added at the large end. As shown in the accompanying diagram, this extension is a walled-off chamber containing three types of electrodes—a screen

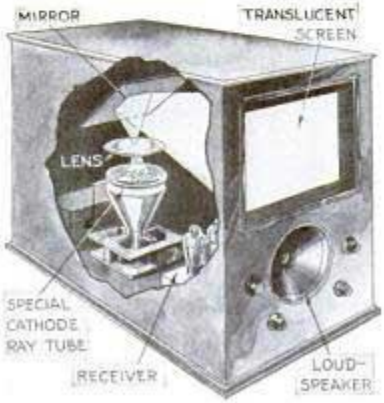

Diagram shows construction of proposed home television set, which produces a large image

of fine wire, a circular ring, and a pattern of thousands of metallic dots printed on the inner wall. The chamber is filled with a rare gas such as neon.

When the moving cathode ray, or electron beam, passes over one of the metallic dots, it acts like a trigger to set off an electric discharge between electrodes in the auxiliary chamber. The luminous discharge resembles that of the neon crater lamps used in other television systems. Thus pin-points of light, opposite the dots that receive the full intensity of the moving ray, merge to form a brilliant image that with a suitable lens can be thrown on a screen. The wire-screen electrode between the original image and the observer does not obstruct his view of the picture, since the fine wires are thrown out of focus and rendered invisible in projection.

For home television, a tube with a window about four inches in diameter would be used. Its pictures would be thrown from the rear upon a translucent screen approximately eighteen inches in diameter. According to Schmidling, the images would be bright enough for onlookers to see them without the inconvenience of turning off the living-room lights. Larger tubes would throw television pictures on theater screens.

As early as 1927, Schmidling told POPULAR SCIENCE MONTHLY, he tested his invention with a crude model, building another of more elaborate design the following year. These two models, illustrated at left and right respectively in the photograph at the top of this page, demonstrated to his satisfaction that his theory was sound. Improved tubes developed in more recent tests, he believes, have paved the way for commercial application of the new system.