March 25, 1941. C. N. SMYTH 2,236,222

TELEVISION RECEIVER

Filed Oct. 25, 1939 2 Sheets-Sheet 1

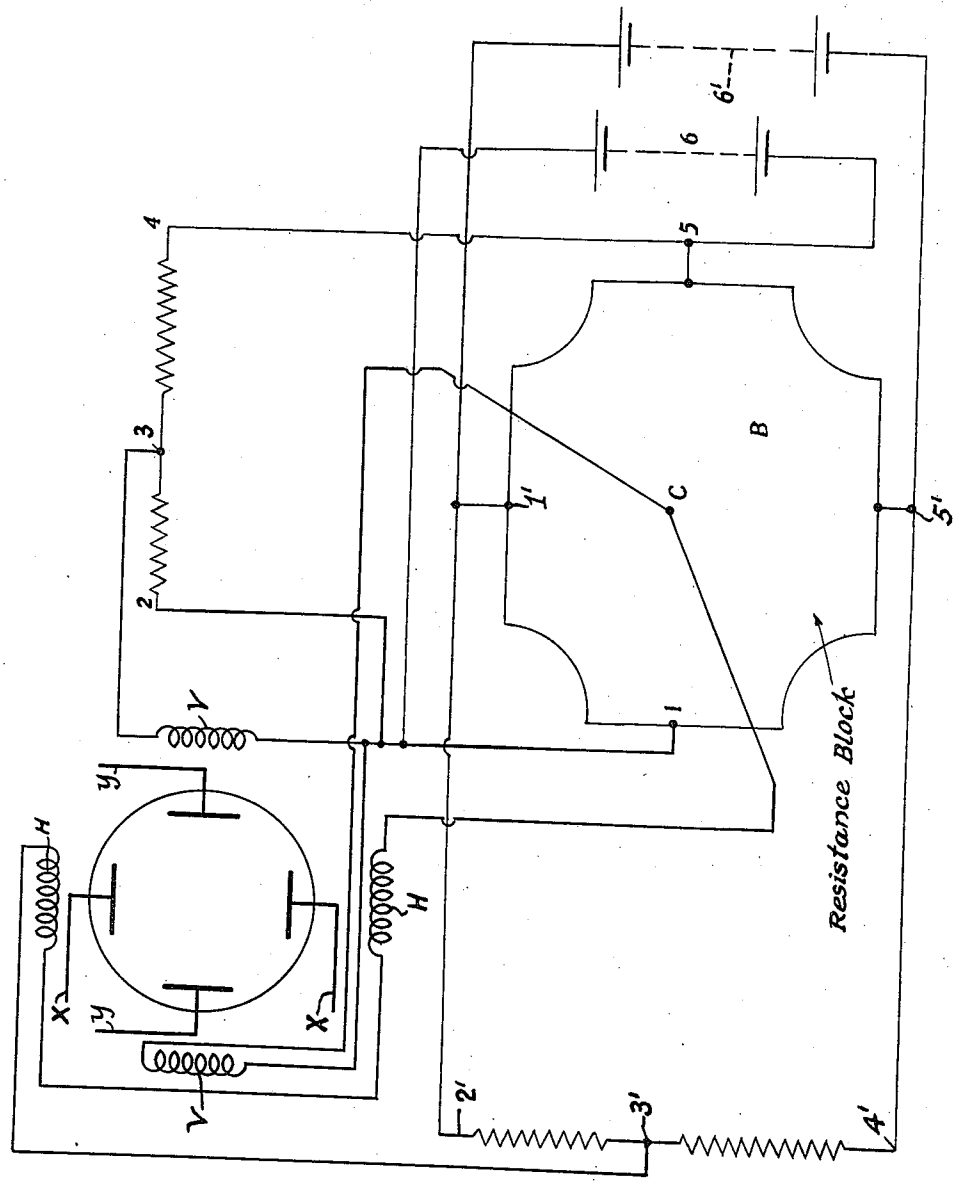


Fig. 1.

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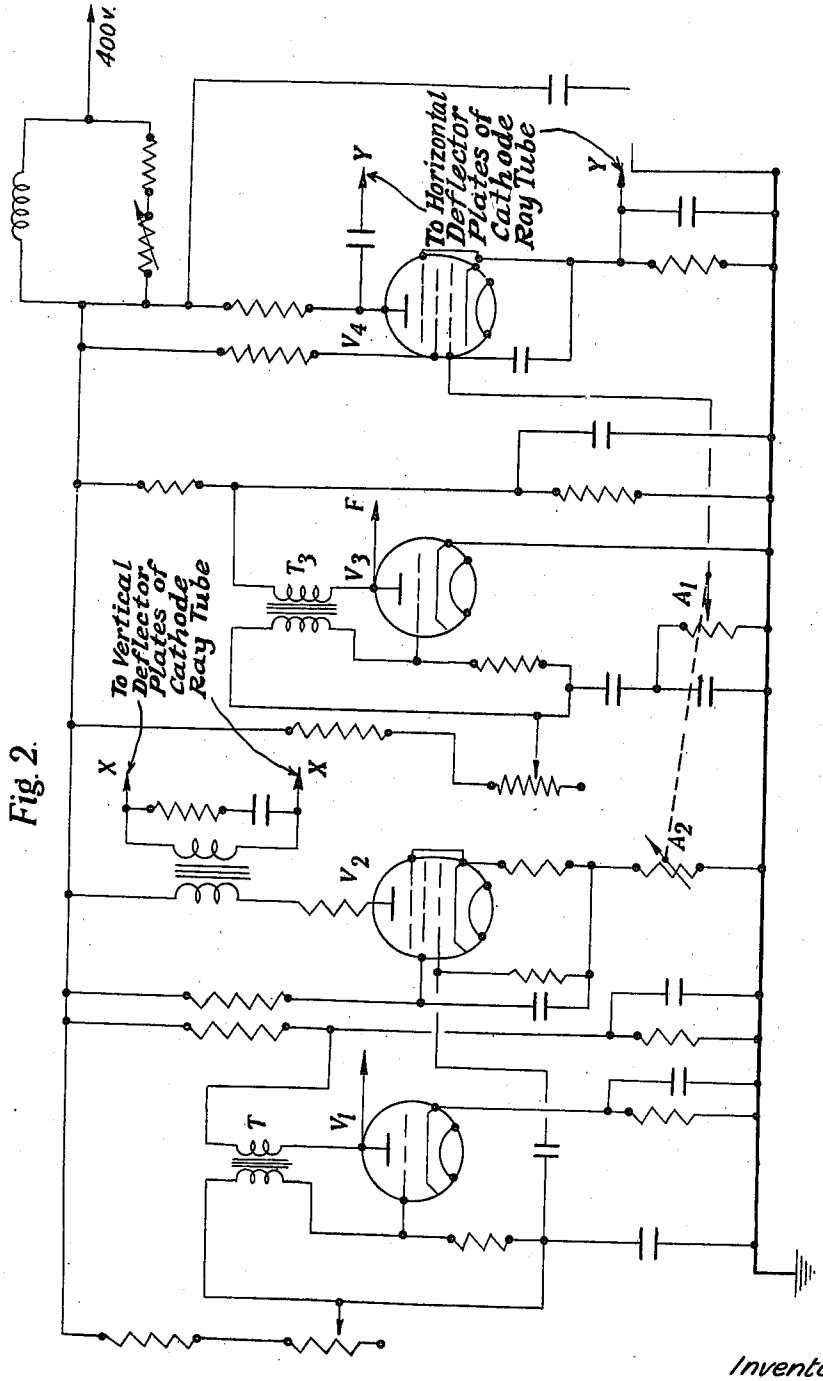


Fig. 2.

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UNITED STATES PATENT OFFICE

2,236,222

TELEVISION RECEIVER

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Application October 25, 1939, Serial No. 301,128
In Great Britain October 11, 1938

2 Claims. (Cl. 178—7.7)

This invention relates to television receiving apparatus and comprises arrangements applicable to television receiving apparatus particularly of the cathode ray type for centering and magnifying any part of the image.

In a preferred form of the invention the required part of the picture is first located approximately in the central portion of the raster and then the scanning fields are increased in intensity until the required element of the picture is of the requisite size. The circuit arrangements producing the magnification are interlocked so that equal magnification is given to the line and frame scanning fields.

As a further refinement the magnifying arrangements may be coupled with known arrangements for electrically controlling the size or shape of the scanning spot so that the appearance of line is not unduly exaggerated in the magnified image. Control of the scanning spot may consist in defocussing the spot or in drawing the spot into a vertical line by the application of a suitable high frequency scanning potential as disclosed in copending British Specification No. 32,748/37.

One method by which the invention may be accomplished in the case of a television receiver employing a magnetically controlled cathode ray tube will now be described. It will be clear, however, that the method could be readily applied to electrostatic cathode ray tubes or to tubes with a combination of electrostatic and magnetic focussing and deflection.

Firstly, for centering any desired part of the image the cathode ray tube is provided with two auxiliary sets of deflector coils disposed at right angles and having their fields parallel to the principal coordinates of the picture. These coils are arranged in two bridge circuits and carry no current when the bridges are balanced, but on the application of the centering control, the bridge balance is disturbed and currents flow in these auxiliary coils in such directions that the picture is displaced in the required direction. A suitable arrangement is shown in Figs. 1 and 2 of the accompanying drawings.

Referring to Fig. 1, the pair of auxiliary deflector coils marked V are responsible for the deflection of the spot in a vertical direction, that is up or down the picture, and those marked H for the deflection in the horizontal direction or from side to side of the picture. The coils are connected in a bridge circuit as shown and carry no current when the control contact C is in the centre of the carbon block B. Displacement of the contact C in a vertical direction on the surface of the block causes unbalance in the bridge network 1, 2, 3, 4, 5 and a current flows through the vertical auxiliary coils V. Similarly, displacement of the contact C in a horizontal direction causes a corresponding current to flow in the coils H.

It will be noticed that by the use of independent power supplied from sources 6, 6', one carbon block can be used to obtain the necessary currents in the separate bridge networks. This block is specially shaped so that the equipotential lines over the useful surface intersect orthogonally.

Secondly, for the purpose of magnifying the image two amplitude controls for the vertical amplitude and for the horizontal amplitude are coupled together mechanically and are arranged with suitable resistance values so that the picture is increased in amplitude in each direction in the same proportion, thereby maintaining a satisfactory aspect ratio under the enlarged or reduced conditions.

In Fig. 2 of the accompanying drawings, a scanning circuit is shown providing line scanning potentials at XX and frame scanning potentials at YY for application to the cathode ray tube of a television receiver for connection to the principal deflecting electrodes of a cathode ray tube, as shown in Fig. 1.

The valves V_1 and V_3 in conjunction with their associated transformers T_1 and T_3 are employed to generate the sawtooth wave forms for the line and frame scanning fields respectively. The valves V_2 and V_4 are used to amplify these voltages and supply adequate energy to energise the deflector coils associated with the cathode ray tube. The output from the frame amplifier valve V_4 is controlled from the potentiometer A_1 in its grid circuit, and that from the line amplifier valve V_3 by the inverse feedback resistance A_2 in its cathode circuit.

These variable impedances A_1 and A_2 provide for the magnification of the image and are coupled together, as already stated.

Instead of adjusting the sweep voltages to enlarge the centered part of the image the velocity of the beam could be reduced. This would alter both deflections in the same ratio so the aspect ratio would be unaltered. It would also alter the focus and this effect could be made to compensate for the magnification of the line spacing.

What is claimed is:

1. A scanning system for a television device

having a scanning means, a pair of deflecting means for effecting said scanning in two directions, sweep voltage generating means for each of said deflecting means, and means for independently centering said scanning means vertically and horizontally, comprising two sets of auxiliary deflecting elements, bridge circuits for each of said sets so that said deflecting elements carry no current when said bridges are balanced, a common control element forming a part of said bridges, and means for supplying exciting currents to said bridge circuits for independent adjustment of the deflection.

2. A scanning system for a television device having a scanning means, a pair of deflecting means for effecting said scanning in two directions, sweep voltage generating means for each of said deflecting means, and means for independently centering said scanning means vertically and horizontally, comprising two sets of auxiliary deflecting elements, bridge circuits for each of said sets so that said elements carry no current when said bridges are balanced, a plate of resistance material forming a part of each of said bridges, separate sources supplying transverse currents in said plate, and a movable connection common to said bridges adjustable on said plate to independently control the potential across said electrodes.

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