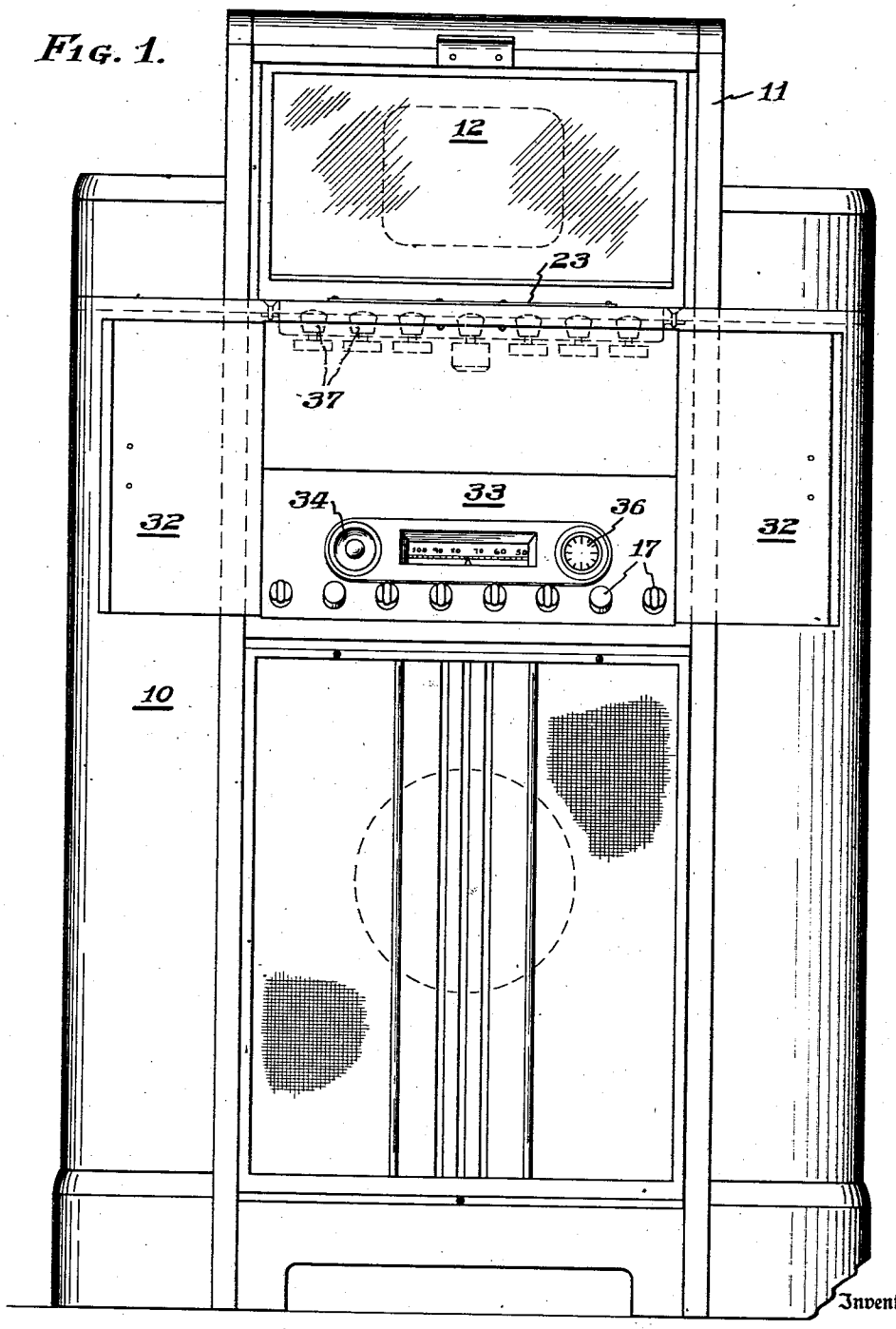
May 31, 1938. M. FLAHERTY 2,119,102

TELEVISION RECEIVER

Filed Oct. 31, 1936 3 Sheets-Sheet 1

FIG. 1.



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TELEVISION RECEIVER

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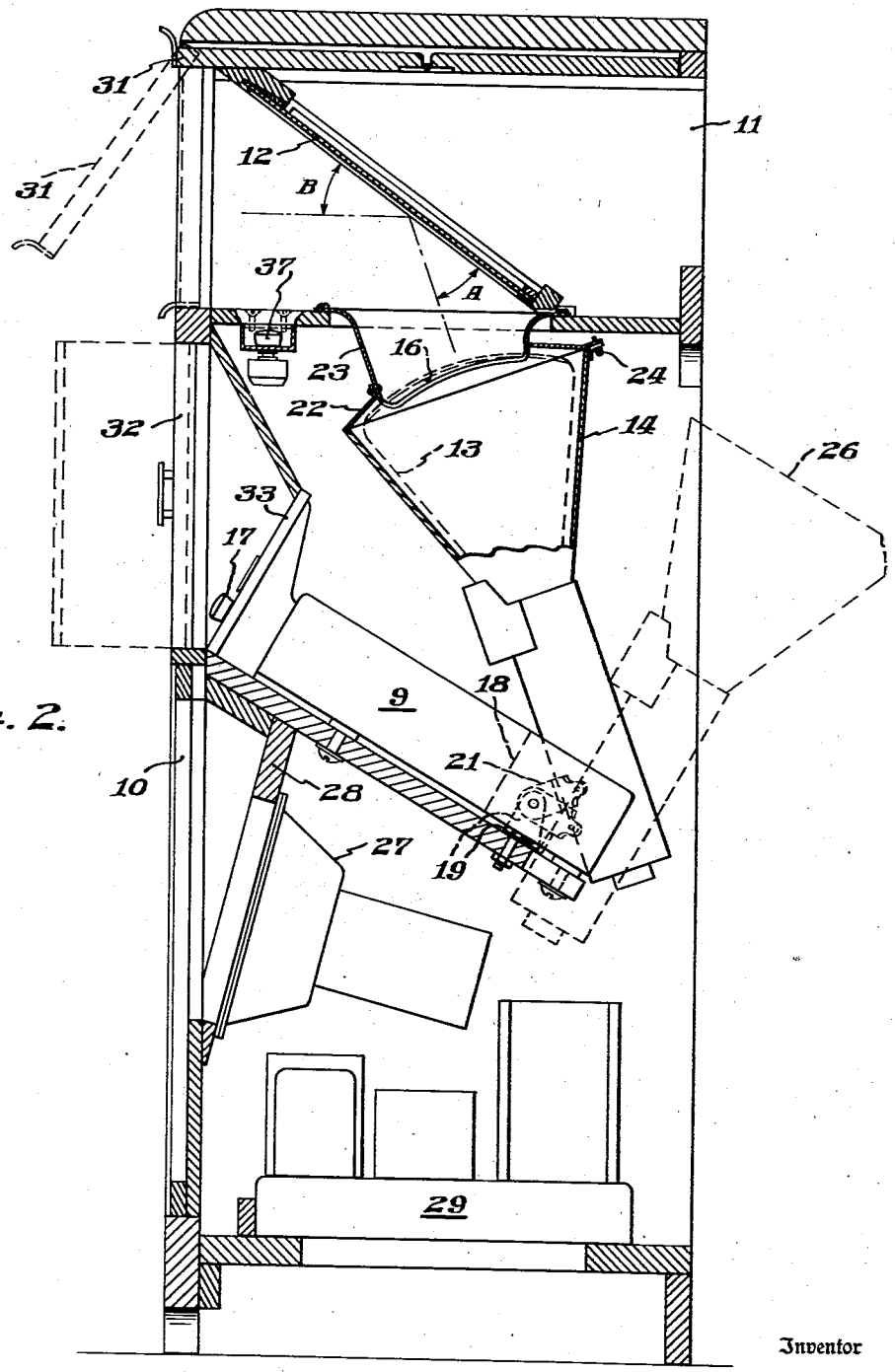


FIG. 2.

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FIG. 3.

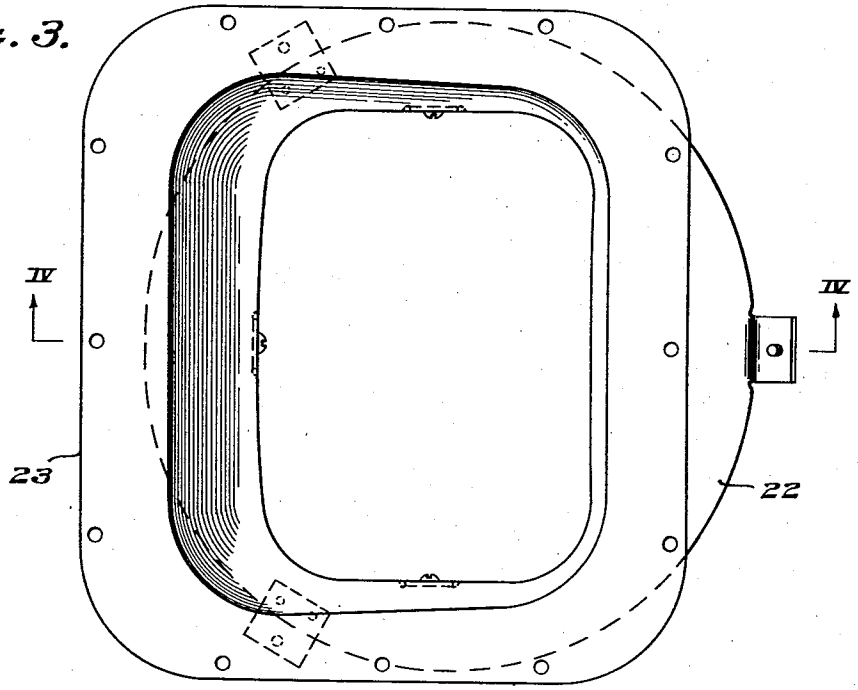
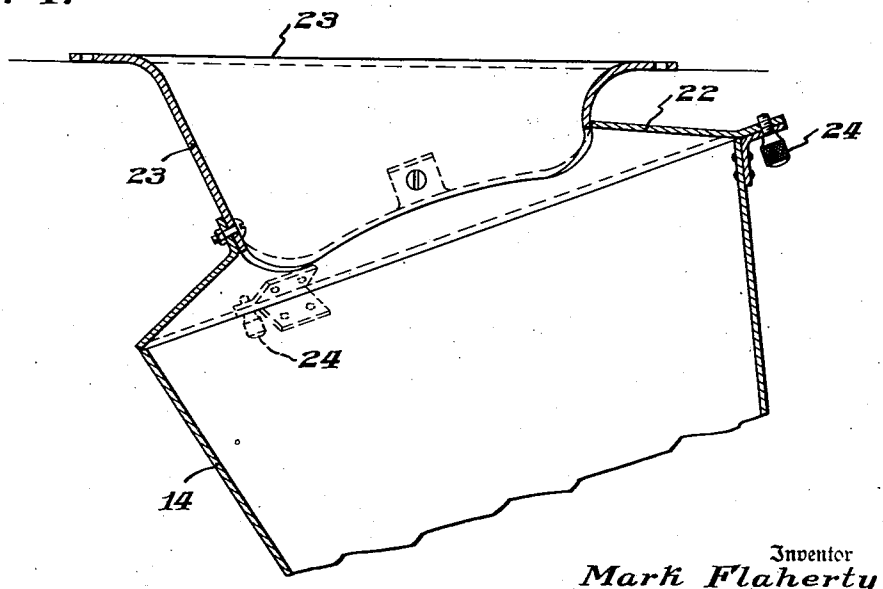


FIG. 4.



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Patented May 31, 1938

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UNITED STATES PATENT OFFICE

2,119,102

TELEVISION RECEIVER

Mark Flaherty, Haddonfield, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application October 31, 1936, Serial No. 108,511

8 Claims. (Cl. 178—7.5)

My invention relates to television receivers, and particularly to television receivers of the type including a cathode ray tube.

One of the objects of my invention is to provide an improved television receiver of the console type.

More specifically, an object of my invention is to provide an improved receiver which will produce a picture that may be viewed without the receiver being in complete darkness.

A further object of my invention is to provide an improved arrangement of receiver elements whereby a received picture may be viewed on an inclined mirror in a "shadow box" without the picture appearing to be at the back of the "shadow box".

A further object of my invention is to provide a comparatively compact receiver in which the control knobs and tuning scale are positioned at a convenient height for the operator.

A still further object of my invention is to provide an improved mounting for a cathode ray tube whereby a defective cathode ray tube may be readily replaced.

In practicing my invention, the top portion of a console receiver is designed to function as a "shadow box", which is coated on its inner surface with dead black material to prevent reflection of light upon the picture to be viewed. The picture is seen on an inclined mirror in the "shadow box", this mirror reflecting the picture appearing on the end of a cathode ray tube located underneath.

In the past, when viewing a television picture from a mirror, it has been the usual practice to mount the cathode ray tube vertically underneath the mirror with the mirror set at an angle of 45 degrees to the vertical. If this practice were followed when a "shadow box" is used, the picture would appear to be at the far end of a dark tunnel, since a cathode ray tube of even moderate size must be located at the back of the cabinet to conserve space.

In accordance with one feature of my invention, I overcome the above-mentioned difficulty by inclining the cathode ray tube toward the front of the cabinet and setting the mirror forward in the "shadow box" and inclining it at less than 45 degrees to the horizontal.

In accordance with another feature of my invention, I mount the television chassis in the cabinet at an acute angle to the horizontal, with the front edge of the chassis located at the proper height for the control knobs and with the back edge located below the front edge to provide the necessary space for the cathode ray tube. The cathode ray tube is preferably mounted in a metal shield which is pivotally supported at the back edge of the chassis, whereby the shield may be swung to the rear of the cabinet to permit a tube replacement.

Other objects, features and advantages of my invention will appear from the following description, taken in connection with the accompanying drawings in which

Figure 1 is a front view of a combined sound and picture receiver embodying my invention,

Figure 2 is a side view, taken partly in cross-section, of the receiver shown in Figure 1,

Figure 3 is a plan view of a portion of the receiver shown in Figure 1, and

Figure 4 is a view taken in cross-section along the line IV—IV of Figure 3.

Referring to Figs. 1 and 2, my improved television receiver comprises a cabinet 10 of the console type which, in the particular model illustrated, is wide enough to permit the installation of both a television chassis and a broadcast receiver chassis indicated at 9 (Fig. 2). At the top of the cabinet there is a "shadow box" 11, which has a mirror 12 mounted in the front end thereof for viewing the television picture. It will be understood that by "shadow box" is meant a tunnel-like structure or enclosure for surrounding a mirror or screen upon which a picture is to appear, this structure being employed for the purpose of keeping stray light from the mirror or screen surface.

The inner surface of the shadow box 11 is coated with some suitable dead black material for aiding further in keeping undesired light from the mirror surface. It will be apparent that the narrower the shadow box, the greater will be its effectiveness in shielding the mirror from the light in a room. It will also be apparent that if the shadow box is made too narrow, the "viewing angle" will be so reduced that too few people can view the picture at one time. Accordingly, it is made as narrow as the desired viewing angle will permit.

Referring more particularly to Fig. 2, it will be seen that the mirror 12 is set toward the front of the shadow box and inclined at an angle B of less than 45 degrees to the horizontal. The cathode ray tube, indicated at 13 in dotted lines, is mounted in a tube shield 14 below the mirror 12, with its longitudinal axis at an acute angle to the vertical.

The cathode ray tube 13 is of the type having a fluorescent screen 16 positioned substantially

normal to the axis of the tube's electron gun, this axis also being the longitudinal axis of the tube. In the specific embodiment illustrated, the fluorescent screen 16 is on the end of the tube envelope, but it may be preferred to put the fluorescent material on a separate flat piece of glass inside the tube envelope.

The cathode ray tube 13 is so inclined with respect to the mirror 12 that a line normal to the fluorescent screen 16 makes an acute angle A with the mirror which is equal to the acute angle B that the mirror makes with the horizontal. With this arrangement, the picture appears to be positioned vertically and far enough forward in the shadow box so that it does not have the objectionable appearance of being at the far end of a tunnel. At the same time the lower end of the cathode ray tube 13 is at the rear of the cabinet, where it does not interfere with the receiver chassis when the chassis is properly mounted.

The receiver chassis 9 is mounted in the cabinet with its front edge located at the proper height for convenient operation of the control knobs 17, and with its back edge enough lower than the front edge to avoid interference with the cathode ray tube 13. In the specific embodiment illustrated, the back edge of the chassis 9 is notched, as indicated by the dotted line 18, to avoid either tilting the chassis at a sharper angle or utilizing a cabinet of greater depth.

The cathode ray tube shield 14 is mounted at its lower end upon the same member that supports the chassis 9, the shield being supported from a bracket 19 and a U-shaped member 21. The closed end of the U-shaped member 21 is pivotally fastened to the bracket 19 while the other end is riveted to the tube shield 14.

The tube shield 14 is further supported at the upper end by a ring-shaped member 22 which is bolted to a light shield 23 extending from the shadow box 11. This structure is shown in detail in Figs. 3 and 4. It will be seen that the upper edge of the tube shield 14 is fastened to the member 22 by several threaded fasteners 24. If it is desired to replace a cathode ray tube, the fasteners 24 are removed and the shield 14 is swung to the rear of the cabinet, as indicated by the dotted lines 26.

The light shield 23, like the interior of the shadow box 11, is a dead black to prevent reflections. It will be apparent that, with the structure just described, stray light cannot enter the shadow box from either the rear or interior of the cabinet.

The loud speaker is mounted below the chassis as indicated at 27, preferably on an inclined baffle 28. The power pack 29 for the receiver is set on the bottom of the cabinet.

If desired, a sliding door 31 may be provided for closing the open end of the shadow box when a picture is not being viewed. The door 31 is closed by pulling it forward from the solid line position and letting it drop to close the front of the shadow box, as indicated by the two dotted line positions. Also, hinged doors 32 may be provided for concealing the receiver control panel.

Referring to the receiver control panel 33 shown in Fig. 1, on the left side of the tuning scale there is a tuning indicator 34 such as the cathode ray device known by the trade-mark "Magic Eye". On the right side of the tuning scale there is a vernier tuning indicator 36, a rotatable line of light across the face of the indicator serving as a "pointer". The control knobs 17 are located in a row underneath the tuning scale, this row of knobs including the tuning knob, the volume control knob, the band changing switch, the picture contrast control, etc. At the top of the cabinet there is a row of control knobs 37, as shown in dotted lines, which normally do not require adjustment unless some change is made in the receiver, as when a tube is changed.

From the foregoing description, it will be apparent that various modifications may be made in my invention without departing from the spirit and scope thereof, and I desire, therefore, that only such limitations shall be imposed thereon as are necessitated by the prior art and are set forth in the appended claims.

I claim as my invention:

1. A television receiver comprising a cabinet having a shadow box located at the top thereof, a mirror positioned in said shadow box and located toward the front thereof with the reflecting surface facing the open end of the shadow box, said mirror being inclined at an angle to the horizontal which is less than 45 degrees, and a cathode ray tube including a fluorescent screen upon which a received picture appears, said cathode ray tube being located below said mirror and at such an angle thereto that a line normal to said screen makes an acute angle with said mirror which is substantially equal to the acute angle which said mirror makes with the horizontal.

2. A television receiver comprising a cabinet which includes a shadow box, a mirror positioned in said shadow box and inclined at an angle of less than 45 degrees to the horizontal with its reflecting surface facing the open end of the shadow box, and a cathode ray tube including a fluorescent screen, said tube being positioned below said mirror and at an angle such that a line normal to said screen makes an acute angle with said mirror which is substantially equal to the acute angle which said mirror makes with the horizontal.

3. A television receiver comprising a cabinet which includes a shadow box, a mirror positioned in said shadow box and inclined at an angle of less than 45 degrees to the horizontal with its reflecting surface facing the open end of the shadow box, and a cathode ray tube which includes a fluorescent screen located substantially at right angles to the longitudinal axis of said tube, said tube being located below said mirror and at an angle such that said longitudinal axis makes an acute angle with said mirror which is substantially equal to the acute angle which said mirror makes with the horizontal.

4. A television receiver comprising a console cabinet having a shadow box located at the top thereof with the open end of the shadow box at the front of the cabinet, a mirror positioned in said shadow box and inclined at an angle of less than 45 degrees to the horizontal with its reflecting surface facing said open end, said shadow box having an opening in the bottom thereof underneath said mirror, a light shield extending from said bottom opening, and a shield for a cathode ray tube mounted underneath said light shield and in contact therewith to exclude light, said tube shield being mounted at an acute angle to the vertical with its upper end closer to the front of the cabinet than its back end.

5. A television receiver comprising a console cabinet having a shadow box located at the top thereof with the open end of the shadow box at the front of the cabinet, a mirror positioned in said shadow box toward the front thereof and

inclined at an angle of less than 45 degrees to the horizontal with its reflecting surface facing said open end, means for mounting a cathode ray tube below said mirror with its upper end nearer the front of said cabinet than its lower end and with its longitudinal axis making an acute angle with respect to said mirror which is substantially equal to said first-mentioned angle, and a television chassis mounted between said tube and the front of said cabinet with the front edge of said chassis higher than its back edge.

6. A television receiver comprising a console cabinet having a certain width for most of its height which width is great enough to permit the installation of a television chassis, a shadow box located at the top of said cabinet with its open end facing the front of the cabinet, said shadow box being narrower than said certain width and being symmetrically positioned with respect to the front of the cabinet, a mirror positioned in said shadow box and inclined at an angle of less than 45 degrees to the horizontal with its reflecting surface facing the front of the cabinet, means for mounting a cathode ray tube below said mirror with its longitudinal axis making an acute angle with said mirror which is substantially equal to said first-mentioned angle, and a television chassis mounted between said tube and the front of said cabinet.

7. A television receiver comprising a cabinet having a shadow box located at the top thereof, a mirror positioned in said shadow box at an angle of less than 45 degrees to the horizontal with the reflecting surface facing the front of the cabinet, means for mounting a cathode ray tube below said mirror and at an acute angle to the vertical with the upper end of said tube closer to the front of the cabinet than its lower end, said mounting means being characterized in that it includes a link having one end pivoted to a member supported from said cabinet and having the other end fastened to a supporting member for said tube whereby said tube may be swung downwardly and rearwardly for replacement or inspection.

8. A television receiver comprising a cabinet, a cathode ray tube mounted in said cabinet with its longitudinal axis at an acute angle to the vertical and with the upper end thereof nearer the front of the cabinet than its lower end, a television chassis mounted between said tube and the front of said cabinet at an acute angle to the horizontal with the front edge of said chassis higher than the back edge thereof, and means for pivotally mounting said tube to said back edge whereby it may be swung rearwardly and downwardly for replacement or inspection.

MARK FLAHERTY.