July 14, 1931. V. G. GUSTAFSON 1,814,382

TELEVISION RECEIVING APPARATUS

Filed Dec. 3, 1928

Fig. 1

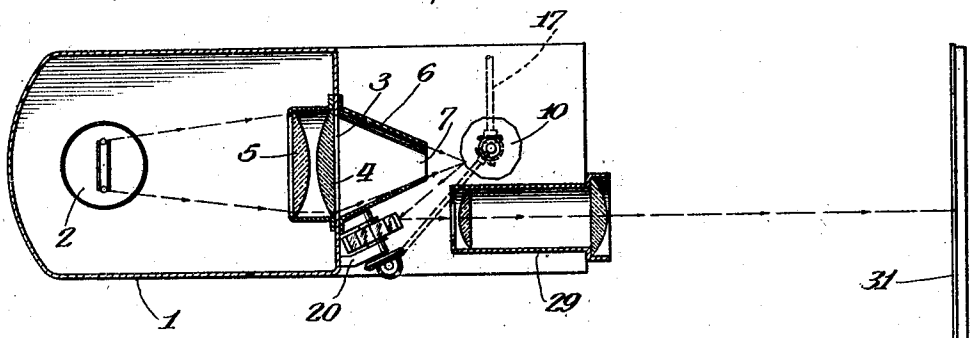


Fig. 2

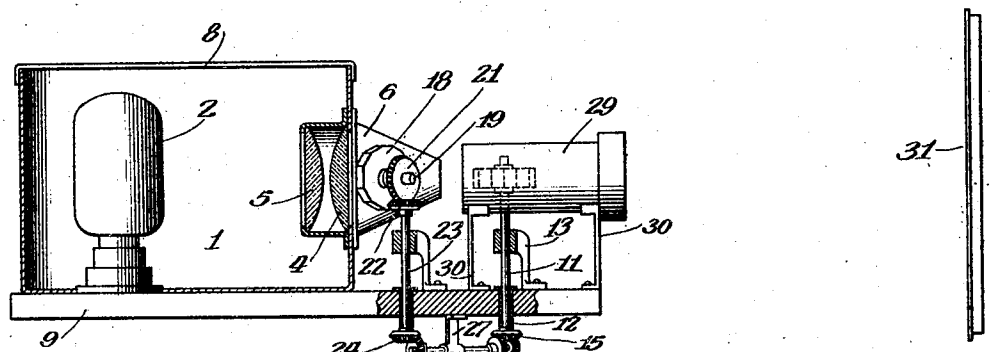


Fig. 3

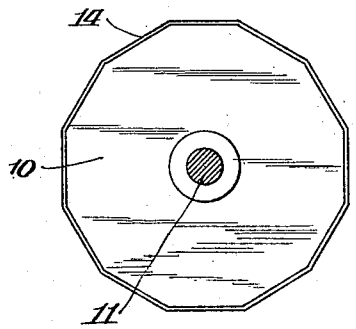
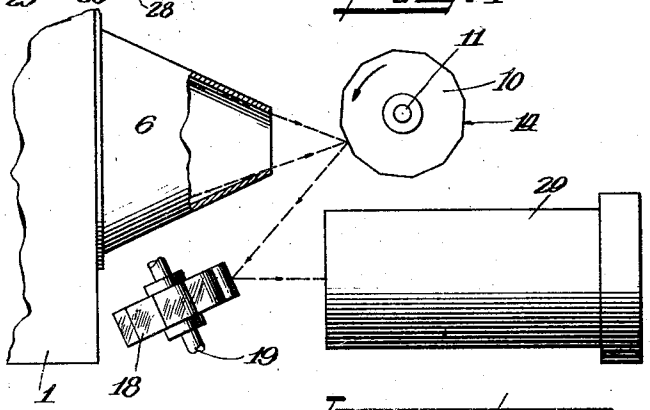


Fig. 4



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UNITED STATES PATENT OFFICE

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TELEVISION RECEIVING APPARATUS

Application filed December 3, 1928. Serial No. 323,298.

This invention relates to television receiving apparatus.

An object of the invention is to provide a television receiving apparatus in which the transmitted light is converted into a frame by rotating mirrors.

Another object of the invention is to provide a television receiving apparatus wherein vertical and horizontal lines of light are combined into frame by rotating mirrors having the axes thereof out of parallelism.

A further object of the invention is to provide a television receiving apparatus which is simple and efficient in operation and economical to manufacture.

The above, other, and further objects of the invention will be apparent from the following description, the accompanying drawings, and the appended claim.

According to the invention, the illumination from a glow lamp which flickers at a high rate of speed is condensed and converged to a single beam or point of light which is directed against a revolving wheel having a number of reflecting surfaces thereon in the path of the converged light beam and arranged in such position as to reflect the light beam onto a second revolving wheel having similar reflecting surfaces on the same. The second revolving wheel is arranged with its axis approximately perpendicular to the axis of the first wheel and is so disposed as to reflect the received light beam onto a screen for forming the frame. An objective lens may be employed to enlarge the pictures projected onto the screen.

One embodiment of the invention is illustrated in the accompanying drawings and the views thereof are as follows:

Figure 1 is a vertical longitudinal section through the illustrated embodiment of the invention.

Figure 2 is a side elevational view partially in section of the apparatus of Figure 1.

Figure 3 is an enlarged plan view of one of the rotating mirrors.

Figure 4 is a fragmental plan view, partially in section, and somewhat diagrammatic in form, illustrating the reflection of light by the illustrated embodiment of the invention.

The form of apparatus chosen to illustrate the invention comprises a chamber 1 in which is suitably positioned an intermittent glow lamp 2 which is connected to a radio receiving apparatus. The receiving apparatus and the manner of connecting the lamp 2 not being shown as it is presumed such apparatus and manner of connection is well understood.

The chamber 1 is closed except for an opening 3 in its front end wherein are mounted condensing lenses 4 and 5. A hood 6 is secured to the outer end of the chamber 1 and is in the form of a truncated pyramid or pyramidal surface having an aperture 7 of relatively small size with respect to the opening 3 in the chamber.

The chamber 1 may have a cover 8 for allowing access to the interior of the chamber. The whole apparatus is carried by a base or support 9.

A revolving wheel 10 polygonal in outline is supported on a vertical shaft 11 which is mounted in the base 9 by a bushing 12 and a guide arm 13. The wheel 10 is disposed with its axis perpendicular to the base 9 and with its margins in the path of the light projected outwardly from the opening 7 in the hood 6. The margins of the wheel 10 comprise a plurality of flat reflecting surfaces 14 which may be of metal, glass, or any substance which will reflect the projected light without refraction. The shaft 11 extends through the base 9 and is provided with a bevel gear 15 at its lower end. A bevel gear 16 in mesh with the gear 15 is supported on a driving shaft 17 which is connected to any suitable source of power such as an electric motor for rotating the wheel 10.

A second wheel 18 is carried by a horizontally disposed stub shaft 19 suitably supported in a bracket 20 secured in the present instance to the front wall of the chamber 1. A bevel gear 21 is fastened to the stub shaft 19 which gear meshes with a bevel 22 on the upper end of a vertically disposed shaft 23 which is arranged and supported in the base 9 in a manner similar to shaft 11. The lower end of the shaft 23 projects through the base and has connected thereto a bevel gear 24 meshing with a bevel gear 25 on a shaft 26 supported by a hanger 27 from the lower surface of the base 9. A bevel gear 28 at the other end of the shaft 26 meshes with the bevel gear 15 on the lower end of shaft 11, so that the shafts 11 and 23 are driven together from the power shaft 17.

The gears driving the wheels 10 and 18 are so arranged that the wheel 10 is driven at a faster rate of speed than the wheel 18.

An objective lens 29 is supported on brackets 30 from the base 9 and with its axis offset with respect to the axis of the hood 6. The objective lense 29 serves the purpose of enlarging the images reproduced by the glow lamp 2 so as to make the same of appreciable size when shown on the screen 31.

The glow lamps 2 as is well understood emits light varying in intensity in synchronism with the light emitted by the transmitted subject matter and impinging on the photo sensitive cell in the sending station transmitting the television pictures. The lamp 2 therefore flickers or glows at a high rate of speed sending out light rays through the condensing lenses 4 and 5 which together with the hood 6 converge the light rays or beams to a single ray or beam where the same leaves the opening 7 in the hood 6. The dotted lines in Figures 1 and 4 represent diagrammatically the projection of the light beam from the hood 6. The wheel 10 is rotated in the direction of the arrow shown in Figure 4 and the light rays projected from the hood 6 are directed against one of the flat surfaces 14 thereof. Rotation of the wheel causes the light beam in effect to travel along the reflecting surfaces 14 so that its angular relation changes constantly. The light ray striking one of the surfaces 14 of the wheel 10 is reflected onto one of the reflecting surfaces of the wheel 18 which is so positioned as to reflect this light ray into the objective lens 29 thence through it onto the screen 31 where the frame is formed.

Rotation of the wheel 10 in a horizontal plane creates a plurality of vertical light lines reflected onto the surface 14 of the second wheel 18. The wheel 18 turning in a plane substantially at right angles to the plane of the wheel 10 sets up light lines in a vertical direction so that the resultant of the horizontal and vertical lines projected on the screen 31 forms the frame or the picture.

The objective lens 29 may be eliminated if desired but it is included in the illustrated form of the invention to show its position when used.

The wheels 10 and 18 are shown as having twelve reflecting surfaces on the same. However, it is to be understood that the number of surfaces may be varied as desired in order to accomplish efficient results.

The electrical impulses received by the glow lamp 2 from the sending station result in intermittent illumination at a high rate of speed. The light from the glow lamp 2 is focused through the condensing lenses 4 and 5 to a narrow beam directed against the first rotating wheel 10 whence the light is reflected from the wheel 10 to the second rotating wheel 18 and from it to the screen 31 through an objective lens 29 or if desired without the use of an objective lens. The difference in speed of rotation between the wheels 10 and 18 results in the reflection of a series of light lines which are vertical as reflected from the wheel 10 against the reflecting faces of the second revolving wheel 18 causing a series of light lines or streaks. Rotation of the second wheel 18 in a different plane sets up the reflection of light lines of different angularity thus changing the light beams received by the first wheel. Changing of the relative positions of the revolving wheels necessarily changes the light effect on the screen and as these wheels rotate at high speed the streaks of light projected on the screen form the frame.

The speeds of the wheels 10 and 18 are determined by the number of lines forming the frame sent out by the sending or transmitting station.

The reflecting surfaces 14 on the revolving wheels are such as to reflect the light rays only and not to refract the same, otherwise certain of the projected rays would be lost.

The invention has been illustrated and described somewhat diagrammatically in form and also more or less precisely as to construction, yet it is to be understood that the invention is not limited as shown and described, as changes may be made in the arrangement and proportion of parts and equivalents may be substituted without departing from the spirit and scope of the invention.

The invention is claimed as follows:

A television receiving apparatus comprising a glow lamp, means arranged to define the light from said lamp as a beam, said means comprising condensing lenses and a truncated pyramidal hood in the path of the light, a wheel having a plurality of flat reflecting surfaces revolvably mounted in the path of the beam of light, a second revolvable wheel having a plurality of flat reflecting surfaces thereon arranged to receive the beam of light reflected by the first wheel,

the axis of the rotation of one wheel being normal to the axis of rotation of the other, and the reflecting surfaces of one wheel being arranged in angular relation to the reflecting surfaces of the other, and means for revolving said wheels in geared association and at different rotative speeds with respect to each other.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County, Illinois.

VICTOR G. GUSTAFSON.