June 16, 1931. W. M. JONES, JR 1,810,610

TELEVISION APPARATUS

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Fig. 1

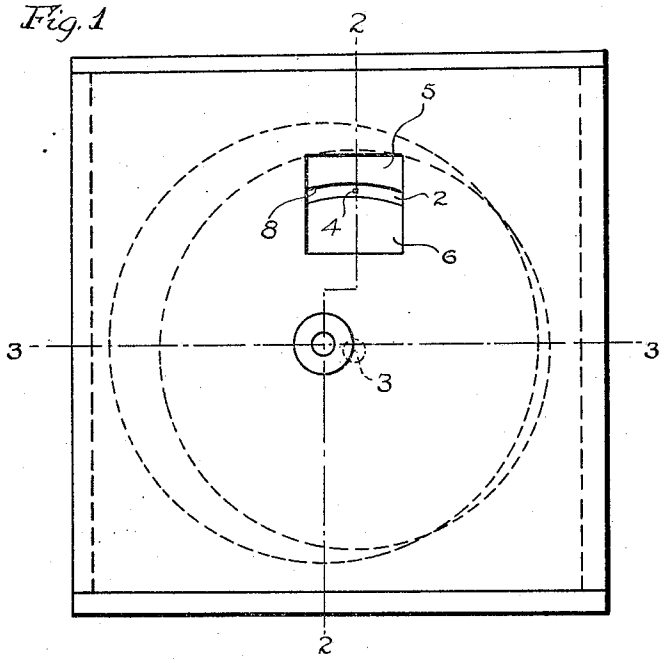
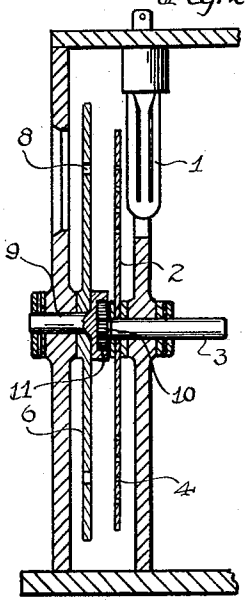


Fig. 2



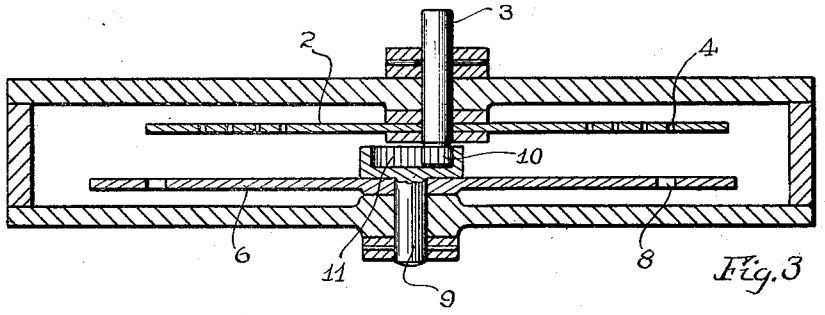


Fig. 3

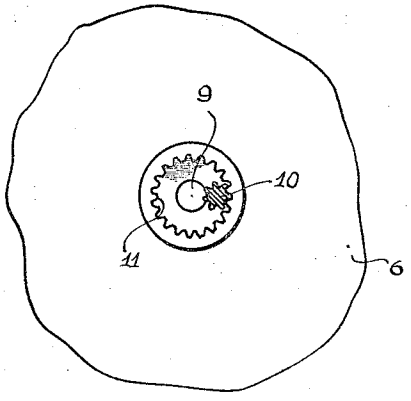


Fig. 4

INVENTOR
William Martin Jones, Jr.
BY
his ATTORNEY

June 16, 1931. W. M. JONES, JR 1,810,610

TELEVISION APPARATUS

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Fig. 5

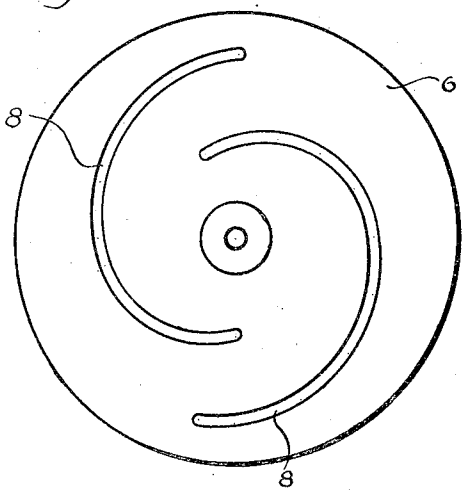
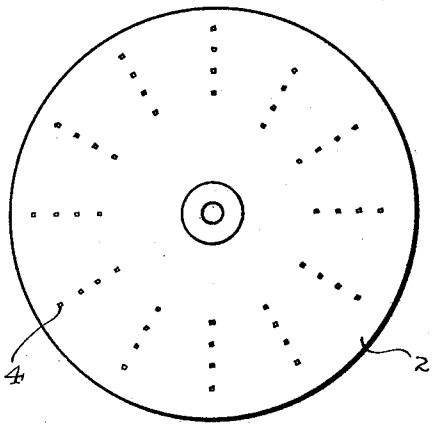


Fig. 6



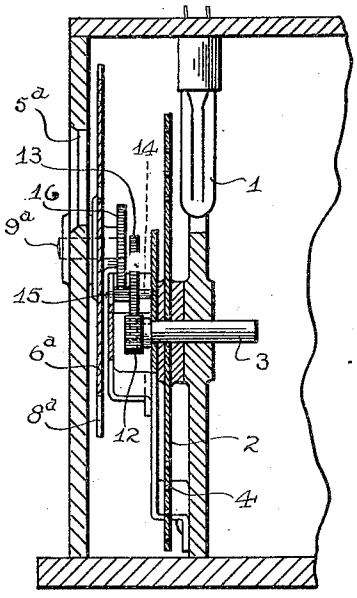


Fig. 7

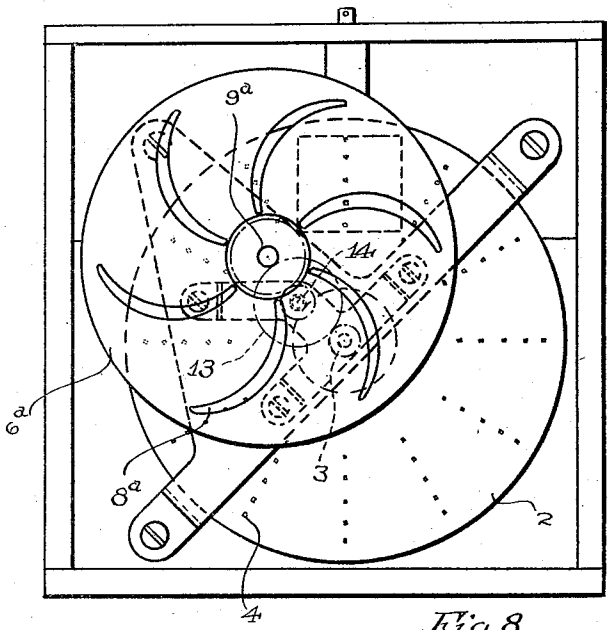


Fig. 8

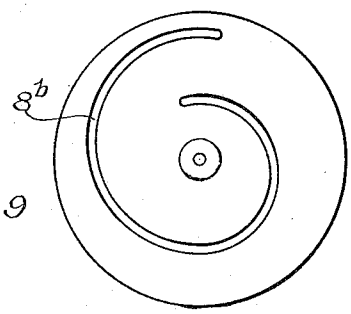


Fig. 9

INVENTOR
William Martin Jones, Jr.
BY
His ATTORNEY

Patented June 16, 1931 1,810,610

UNITED STATES PATENT OFFICE

WILLIAM MARTIN JONES, JR., OF ROCHESTER, NEW YORK

TELEVISION APPARATUS

Application filed April 26, 1930. Serial No. 447,713.

The present invention relates to television apparatus and more particularly to means for analyzing or composing a picture.

An object of the invention is to provide a scanning mechanism by which a larger picture may be obtained, and at the same time insuring against the projection of more than one beam of rays at one time in the picture field.

To this and other ends, the invention consists of certain parts and combinations of parts, all of which will be hereinafter described: the novel features being pointed out in the appended claims.

In the drawings:

Fig. 1 is a front view of a composing device embodying the present invention;

Fig. 2 is a vertical section on the line 2—2, Fig. 1;

Fig. 3 is a horizontal section on the line 3—3, Fig. 1;

Fig. 4 is a detail view of the driving connection between the scanning member and the shutter;

Fig. 5 is a detail view of the shutter;

Fig. 6 is a detail view of the scanning disk;

Fig. 7 is a vertical section through another embodiment;

Fig. 8 shows the interior of the embodiment illustrated in Fig. 7; and

Fig. 9 is a plan view of a shutter having a single exposure slot.

A scanning member in the form of a rotary disk having openings successively presented to the picture field limits the width of the picture to the distance between the successive openings, and the height of the picture to the number of such openings, or, to be more exact, to the distance between the first and the last opening of the series measured from the center of rotation of the rotary disk. By placing the openings in a single convolution about the axis of the disk, the size of the picture is controlled by the size of this convolution. To obtain a large picture from a single convolution a large disk must be employed. It has been suggested to form in the disk a series of openings in a plurality of convolutions, and this has required the use of a shutter which will shut off those openings which are not supposed to pass the light rays, for otherwise two or more openings will be passing the light rays at the same time. A shutter which has been suggested for confining the light rays to one opening when a rotary disk having a series of openings in a plurality of convolutions has been employed, embodies a disk rotating about the axis of the scanning disk and having a single volute slot, and this shutter disk is rotated at a slower speed than that of the scanning disk so that one rotation of the shutter will take place while the scanning disk is rotating a number of times corresponding to the number of convolutions in the series of openings in the scanning disk. The slot in the shutter disk limits the width of the picture if made too narrow and if made too wide it will expose more than one opening to the passage of light.

According to this invention, it is possible to employ a rotary scanning disk having a series of openings arranged in a plurality of convolutions about the axis of the disk and to so control the light that rays will pass through only one of the openings while at the some time a wider and longer or higher picture may be scanned for analyzing or composing.

In the drawings are shown three embodiments of the invention designed for the composing of a picture at a receiving station.

In the embodiment shown in Figs. 1 to 6, 1 indicates the source of light, and 2 the scanner in the form of a scanning disk rotatable with the shaft 3 as is common. This scanning disk has a series of openings 4 which are arranged on a plurality of convo-

lutions about the shaft 3 so as to cover a picture area 5.

Associated with the scanning disk is a shutter comprising, in this instance, a disk 6 having spiral slots 8 and supported by the shaft 9 which is eccentric to the axis of turning of the disk 2. The slots are of such shape and the center of the shaft 9 is so situated that that portion of the convolution which is opposite the picture area forms substantially the arc of travel of an opening in the shutter as it travels over the picture area.

The speed of travel is, in this instance, at a ratio of 4 to 1 to the speed of travel of the scanning disk, and this may be effected by providing a small external gear 10 on the shaft 3 geared to an internal gear 11 on the shaft 9.

In the embodiment illustrated in Figs. 7 and 8, 1 indicates the source of light and 2 the scanning disk which is mounted on a shaft 3 the same as in the other embodiment and has the openings 4 arranged in a plurality of convolutions.

The shutter in this embodiment is in the form of a disk 6^a having a plurality of arcuate slots 8^a extending substantially tangential to the axis of rotation of the disk 6^a. These slots are of such shape and width that when sweeping across the picture area, 5^a each will cover the whole picture area. The scanning disk 2 rotates a sufficient number of times during the movement of each slot over the picture area to cause each opening in the plurality of convolutions to be presented to such slot. As four convolutions of openings are provided in the scanning disk, then the latter must rotate four times for each slot or twenty-four times for the six slots or one rotation of the shutter. To effect this, a speed increasing mechanism may be interposed between the scanning disk 2 and the shutter disk 6^a. This mechanism, in this instance, comprises a pinion 12 on the shaft 3 meshing with a gear 13 on a shaft 14 which carries a pinion 15 meshing with a gear 16 on the shaft 9^a of the shutter, said shaft being eccentric to the axis of turning of the shaft 3.

The form of the slots 8^a is such that each slot first strikes at its outer end the upper portion of the picture area as the first opening of the outer convolution reaches the area. The slot and opening then travel together across the picture area until the next opening reaches the picture area when another portion of the same slot uncovers such next opening, the slot moving across the picture area with the opening. At no time is more than one opening exposed by the slot although each slot successively opens all of the openings in all of the convolutions of the scanning disk.

When a single opening 8^b in a shutter is employed, as shown in Fig. 9, this opening may be in the shape of a spiral and when the center of the spiral is placed a short distance from the center of the scanning disc a portion of the spiral can be made nearly to align with the arc cut by any opening in the scanning disc whose radius is the same as the distance of that part of the spiral from the center of the scanning disc.

When using a single spiral it becomes necessary to use a transparent material across the opening to hold the parts of the shutter in place. This difficulty can be avoided by using more than one spiral, as shown in Figs. 5 and 8, each extending but part way around the shutter. When this is done a portion of the spiral can still be made to tally with the arc of any disc opening, by placing the shutter center a correspondingly further distance from the center of the scanning disc. This however, necessitates increasing the gear ratios, so that the most satisfactory shutter will be one with but two spiral openings. By placing the shutter center a considerable distance from the center of the scanning disc several nearly radial openings may be used in the shutter.

In all embodiments of the invention, the shutter rotates about an axis eccentric to the axis of rotation of the scanning disk and the shutter slots are so formed that they permit the scanning of a wide field without at the same time exposing more than one opening in the scanning disk. In two embodiments, a plurality of slots of novel form are employed, making it possible to provide a stronger shutter disk than when a single volute slot extends entirely about the axis of rotation of the disk.

What I claim as my invention and desire to secure by Letters Patent is:

1. A scanning mechanism for the analyzing or composition of pictures in television comprising a rotary scanning disk having exposure openings arranged in a plurality of convolutions about the axis of rotation of the disk, and a rotary disk shutter arranged to turn about an axis eccentric to the axis of rotation of the scanning disk and provided with a curved exposure slot which will open the entire area of said openings successively, and means for connecting the shutter and the scanning disk for rotative movement together so that on the turning of the shutter, the scanning disk will carry the entire series of openings past the curved slot in the shutter.

2. A scanning mechanism for the analyzing and composition of pictures in television comprising a rotary scanning disk provided with a series of openings arranged in a plurality of convolutions about the axis of the disk, a rotary disk shutter hav-

ing a plurality of curved slots arranged about the axis of rotation of the shutter disk, means for supporting the two disks for rotation about two different centers so that each slot in the shutter disk can travel over the entire series of openings in the scanning disk on the rotation of the latter, and means for turning the two disks at such relative speed that, the entire series of openings in the scanning disk will be presented successively to the curved slots in the shutter disk.

WILLIAM MARTIN JONES, JR.