June 7, 1932. W. J. BARNECUT 1,862,455

TELEVISION SCANNING DEVICE

Filed March 11, 1931 3 Sheets-Sheet 1

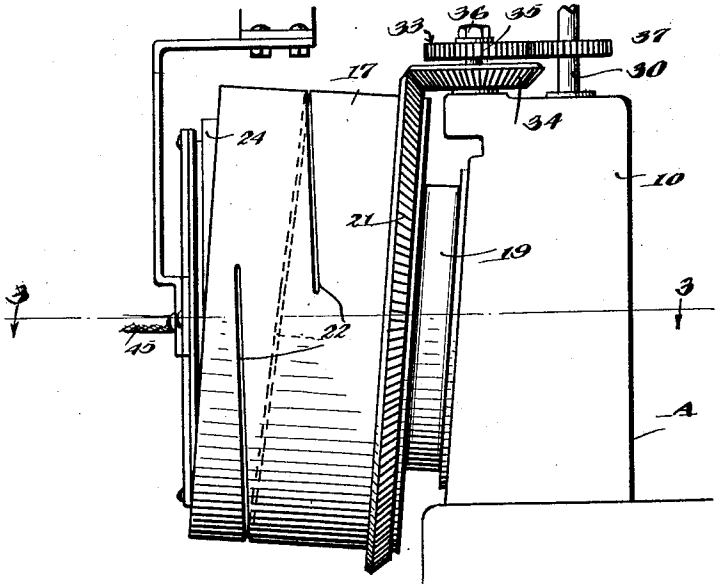


Fig. 1.

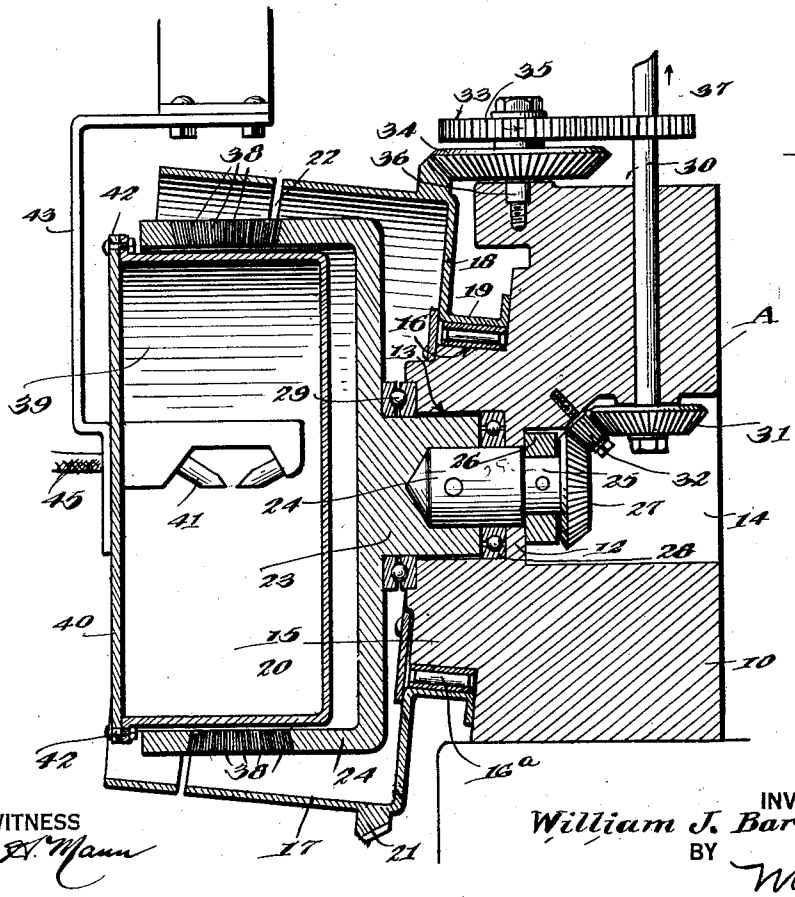


Fig. 2.

WITNESS
C. F. Mann

INVENTOR
William J. Barnecut,
BY
Munn & Co.
ATTORNEY

June 7, 1932. W. J. BARNECUT 1,862,455

TELEVISION SCANNING DEVICE

Filed March 11, 1931 3 Sheets-Sheet 2

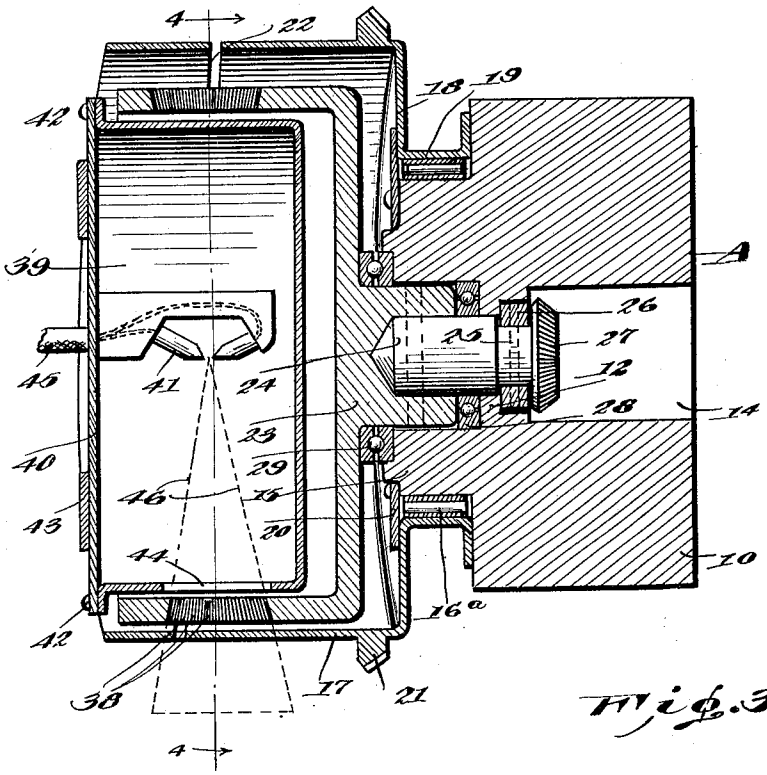


Fig. 3.

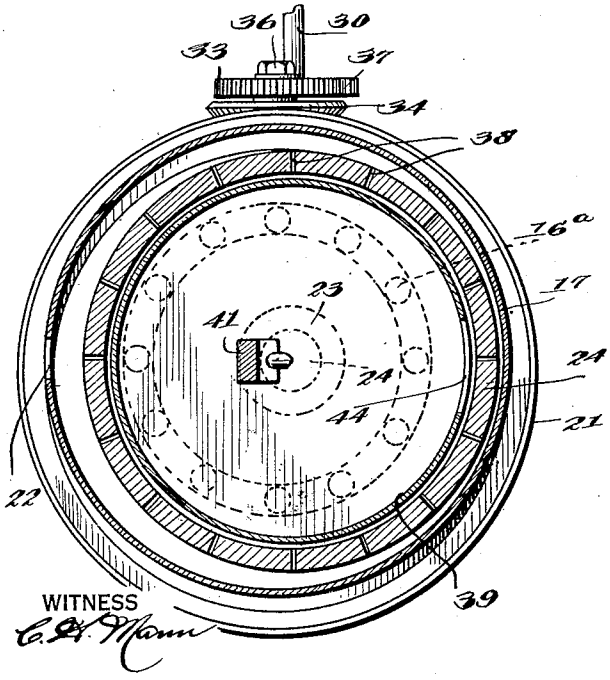


Fig. 4.

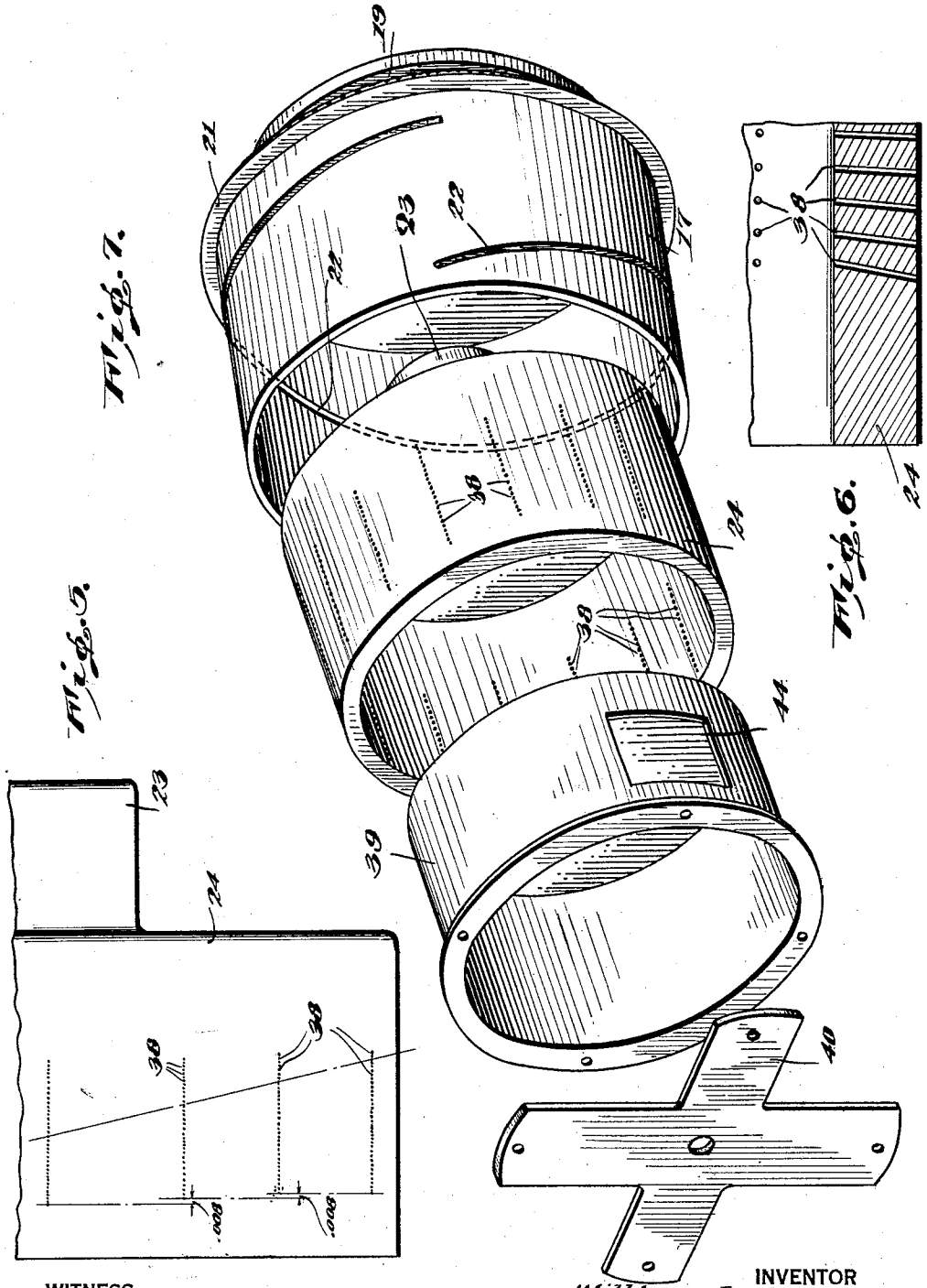
WITNESS
C. A. Mann

INVENTOR
William J. Barnecut,
BY
Munn & Co.
ATTORNEY

June 7, 1932. W. J. BARNECUT 1,862,455

TELEVISION SCANNING DEVICE

Filed March 11, 1931 3 Sheets-Sheet 3



WITNESS
E. A. Mann

INVENTOR
William J. Barnecut,
BY
Munn & Co.
ATTORNEY

Patented June 7, 1932 1,862,455

UNITED STATES PATENT OFFICE

WILLIAM JOHN BARNECUT, OF HIGHLAND PARK, MICHIGAN

TELEVISION SCANNING DEVICE

Application filed March 11, 1931. Serial No. 521,868.

My invention relates to television scanning devices, and it consists in the constructions, arrangements and combinations herein described and claimed.

In scanning devices as heretofore constructed and employing a rotating disc, a relatively large disc is necessary in order to transmit or receive a picture of practical dimensions. This is due to the fact that the picture produced is controlled by light rays projected through the scanning disc. Also, it is a well known fact that the disc method of scanning will not allow a rapid movement of the light spot across a screen, due to the size of the disc and spacing of the scanning apertures thereof.

It is therefore an object of my invention to provide a scanning device in the form of a drum rotating at high speeds, having scanning apertures so arranged as to produce a picture of ample size without the employment of a specially large drum.

A still further object of the invention is the provision of a scanning drum which will produce a rapid movement of the light spot upon a screen.

It is a still further object of the invention to provide a scanning drum so constructed as to avoid the necessity of employing lenses, thus permitting unobstructed passage of light rays to the screen.

Additional objects, advantages and features of invention will be apparent from the following description considered in conjunction with the accompanying drawings, wherein

Figure 1 is a front elevation of my invention.

Figure 2 is an enlarged vertical sectional view thereof.

Figure 3 is a cross section on the line 3—3 of Fig. 1.

Figure 4 is a cross section on the line 4—4 of Fig. 3.

Figure 5 is a fragmentary side elevation of the main scanner drum.

Figure 6 is an enlarged cross section of a portion of the drum, illustrating the scanner apertures.

Figure 7 is a perspective view of the drum in disassembled relation.

In carrying out my invention, I provide a base 10 having a bore 11. The bore 11 has an apertured partition 12, defining compartments 13 and 14. A hub 15 is provided, integrally formed with the base member 10 and projecting therefrom, this hub forming a bearing surface 16 for a roller bearing 16[a] which in turn revolubly supports a drum 17 as clearly shown in Figs. 2 and 3.

The drum 17 is of cylindrical shape, open at one end and having a rear wall 18 which is centrally apertured and has a hub 19 of a size to engage over the roller bearing 16. A retaining flange 20 is secured to the hub 15 and overlies the end of the bearing 16 and projects over a portion of the wall 18 for securement of the drum 17 to the base 10.

It should be noted that the drum 17 has a tilted relation with regard to the base 10, and this is effected by the formation of the hub 15. The hub 15 is eccentric with respect to the bore 10 and the bearing surface 16 is formed at an inclination with regard to the horizontal axis of the bore 10, so as to give an upward tilt to the drum, as shown in Figs. 1 and 2.

Adjacent the rear wall 18 and upon the outer periphery of the drum 17, a ring gear 21 is formed, as an integral part of the drum, or this gear may be made separately, and secured to the drum in any manner desired, as by welding. This gear 21 forms a means for driving the drum, as will be explained hereinafter.

A spiral slot 22 is formed in the drum 17, this slot extending at an angle of approximately 3° and 36′ to the axis of the drum, and is of a length slightly more than one revolution, so that the beginning and end of the slot will be in an overlapped relation. (See Fig. 1.)

Revolubly mounted within the chamber 13, there is a trunnion 23 of a drum 24. The trunnion 23 is centrally recessed for reception of a stud shaft 24 which may be suitably fixed to the trunnion as shown. The stud shaft 24 projects from the trunnion a suitable distance and is of a diameter to project

through the aperture of the partition 12. The shaft 24 is reduced as at 25, and receives a retaining collar 26, which may be keyed to the shaft or otherwise. Upon the extremity of the reduced portion 25, a beveled gear 27 is keyed.

In order to provide a freely rotating drum, I prefer to install a roller bearing 28 between the trunnion 23 and the partition 12, and also arrange a thrust bearing 29 between the drum 24 and hub 15, the hub being suitably recessed to seat such bearing. From the construction thus described, it will be apparent that the drums 17 and 24 are revolubly supported and retained upon the base 10.

Means is provided for rotating the drums 17 and 24, independently, but from a common drive shaft, and this is effected in the present instance through a drive shaft 30 journalled in the housing 10, upon one end of which there is fixed a bevel gear 31. An idler gear 32 suitably carried by the housing 10 is provided, this gear being interposed and in mesh between the gear 31 and the gear 27 carried by the drum 24. Thus, the drum 24 will be driven upon rotation of the shaft 20.

The drive for the drum 17 is by way of the compound gear 33. This gear comprises a bevel gear 34 in mesh with the ring gear 21 and a spur gear 35 formed integrally therewith. The gear 33 rotates as a unit, upon the pintle 36 screw-threaded in the base 10. A spur gear 37 fixed to the shaft 30 is in mesh with the spur gear 35, and thus, upon rotation of the shaft 30 the drum 17 will be rotated.

The respective gear trains for the drums 17 and 24 is such that the drums 24 will rotate at a high speed, approximately 35,520 R. P. M., while the drum 17 will rotate at a lesser speed, approximately 960 R. P. M.

The shaft 30 is driven by an electric motor, not shown.

Scanning apertures 38 are provided in the drum 24, these apertures being arranged in spiral formation and involve 16 apertures per circumference of the drum. Preferably there are 37 complete convolutions of these apertures, thus making a total of 592 apertures. The convolutions are spaced .008 of an inch apart, as indicated in Fig. 5 and each aperture 38 extends radially through the drum 24 at such angularity that a line through the center of each aperture would meet at the horizontal medial center of the drum.

A light casing 39 of circular formation, is disposed within the open end of the drum 24, having a plate 40, this plate supporting a suitable light source 41. The drum 24 is flanged and apertured and the plate 40 is similarly apertured for mounting thereof upon the drum, as by bolts 42.

The casing 39 is maintained stationary and in spaced relation to the drum 24, and this may be carried out by a bracket 43.

The light 41 is supported centrally of the casing 39, and the casing is apertured as at 44, whereby the light rays from the source of light may be projected through the apertures 38, as will be explained more fully hereinafter. It should be noted that the casing 39 is only slightly smaller than the drum 24, and thus there is less liability of the light rays becoming diffused or lost otherwise.

As previously stated, the slot 22 of the drum 17 is formed at an angle of 3° and 36′ to the axis of the drum, and the drum 17 is positioned at an angle of about 3° and 30′ to the axis of the drum 24, which would place the slot 22 at an angle of 6′ to the axis of the drum 24. This angle is about the same as that of one complete revolution of apertures 38, and it will therefore be seen that for every 37 revolutions of drum 24, the drum 17 will make but one revolution.

The operation will be readily understood from the following description thereof.

Amplified television signals are impressed upon the light 41 through the conductor 45, as usual and well understood in the art. With the drums 17 and 24 revolving at their desired speeds and in the same direction, the light beams are projected through the aperture 44 as indicated by dotted lines 46 (see Fig. 3). The light beams, of course will be projected through the apertures 38 which are aligned with the aperture 44, but only one light ray will be projected through the slot 22 at a time. This is due to the tilted relation of the drum 17 so as to prevent positioning of more than one scanning aperture before the slot 22. With the drum 24 revolving at 35,520 revolutions per minute and the drum 17 at 960 revolutions per minute, a screen 24″ square would be completely covered with light spots 16 times per second.

From the foregoing, it will be seen that I have produced a scanning device which will permit of the production of large pictures, and wherein the light spots will be caused to traverse a screen very rapidly.

While I have shown the drums 17 and 24 as rotating on a horizontal axis, it will be understood, of course, that this arrangement is not necessary, and the drums 17 and 24 can be disposed so as to rotate on a vertical plane, by merely employing the side wall A as the base or footing. Thus, the scanning device is readily adapted to various conditions and apparatus pertaining to television receiving and transmitting sets.

It will be understood of course, that various modifications of the structure shown and described may be made, and I therefore retain as my own, all such constructions as fairly fall within the scope of the appended claims.

What is claimed is:

1. In a television scanning device, the combination of a rotating cylinder, a stationary

light casing concentrically mounted within said cylinder, said casing having a light aperture, a source of light within said casing, said cylinder having a plurality of scanning apertures arranged in spiral formation, a second cylinder eccentrically mounted and inclined with respect to said first named cylinder and revoluble therearound, means for rotating said cylinders, and said second named cylinder having a spiral slot adapted for registry with said scanning apertures during rotation of said drums.

2. In a television scanning device, the combination of a pair of rotatable cylinders arranged in nested relation, means for driving each of said cylinders at different speeds, the innermost cylinder having a plurality of scanning apertures arranged in spiral formation, said outermost cylinder having a slot of spiral formation slightly greater than one complete convolution of said cylinder whereby the ends of said slot will lie in overlapping relation, said innermost cylinder revolving at a higher rate of speed than said outermost cylinder and adapted to align respective scanning apertures with the slot of said outermost cylinder, and an apertured lamp housing supported within said innermost cylinder and having a source of light whereby light rays will be projected through said scanning apertures and slot during rotation thereof.

3. In a television scanning device, the combination of a pair of rotatable cylinders arranged in nested relation, means for driving each of said cylinders at different speeds, the innermost cylinder having a plurality of scanning apertures arranged in spiral formation, said outermost cylinder having a slot of spiral formation slightly greater than one complete convolution of said cylinder whereby the ends of said slot will lie in overlapping relation, said innermost cylinder revolving at a higher rate of speed than said outermost cylinder and adapted to align respective scanning apertures with the slot of said outermost cylinder, said outermost cylinder being arranged on an axis so as to tilt said cylinder with respect to said other cylinder, and an apertured lamp housing supported within said innermost cylinder and having a source of light whereby light rays will be projected through said scanning apertures and slot during rotation thereof.

4. A television scanning device comprising a base having a bore, a hub eccentrically formed with respect to said bore and having a bearing surface arranged at an angle to said bore, a cylindrical drum revolubly mounted in said bore. said drum having a plurality of scanning apertures arranged in spiral formation throughout a portion of the periphery of said drum, a second cylindrical drum arranged in nested relation around said first named drum and revolubly mounted upon said hub, said drum having a spiral slot of a length slightly greater than one complete revolution thereof whereby the ends thereof will be in overlapped relation, said slot being arranged to traverse said scanning apertures, a light source disposed within said first named drum, and means for rotating said drums at different rates of speed.

5. A television scanning device comprising a base having a bore, a hub eccentrically formed with respect to said bore and having a bearing surface arranged at an angle to said bore, a cylindrical drum revolubly mounted in said bore, said drum having a plurality of scanning apertures arranged in spiral formation throughout a portion of the periphery of said drum, a second cylindrical drum arranged in nested relation around said first named drum and revolubly mounted upon said hub, said drum having a spiral slot of a length slightly greater than one complete revolution thereof whereby the ends thereof will be in overlapped relation, said slot being arranged to traverse said scanning apertures, a light source disposed within said first named drum, a drive shaft revolubly mounted within said base and having a bevel gear, a bevel gear fixed to said first named drum, an idler gear in mesh with said gears and constituting a drive for said drum, a ring gear carried by said second named drum, a compound gear revolubly mounted upon said base and including a bevel gear and spur gear, said bevel gear being in mesh with said ring gear, and a spur gear carried by said drive shaft and in mesh with the spur gear of said compound gear.

6. In a television scanning device, the combination of a pair of rotatable drums arranged in nested relation, one of said drums having a plurality of scanning apertures, said other drum having a slot adapted for registry with said scanning apertures, said last named drum being eccentrically mounted and inclined with respect to said first named drum, a source of light centrally of said first named drum, and means for rotating said drums at different rates of speed.

WILLIAM J. BARNECUT.