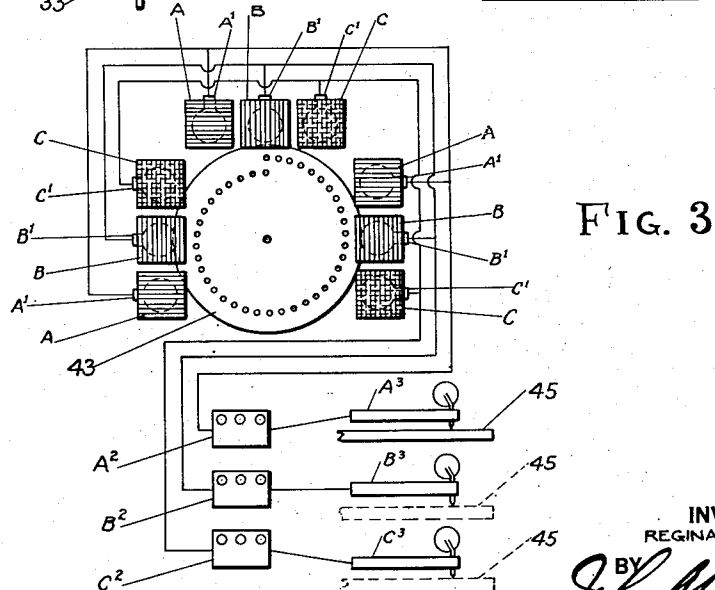
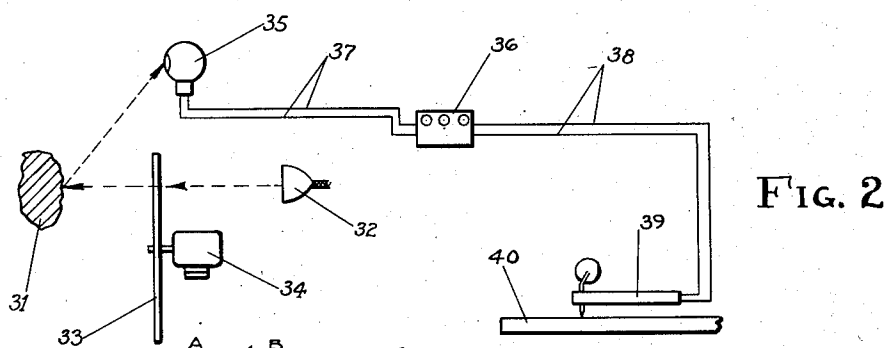
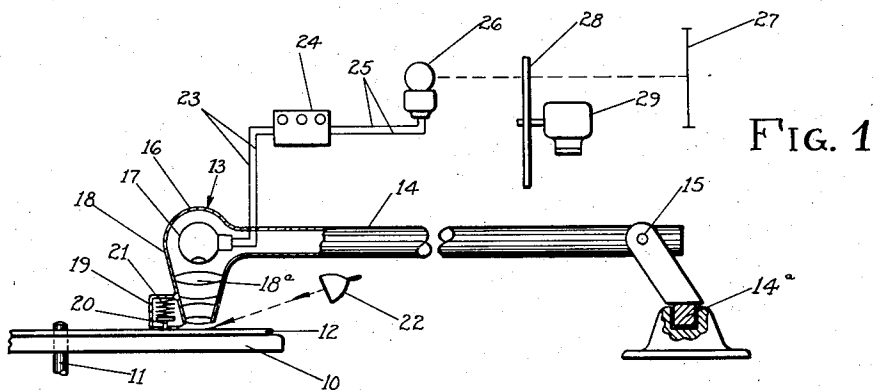


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MEANS AND METHOD OF REPRODUCING PICTURES OR SCENES FROM RECORDED IMPULSES

Filed Sept. 25, 1929 3 Sheets-Sheet 1



BY

ATTORNEY

Sept. 13, 1932.

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1,877,447

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3 Sheets-Sheet 2

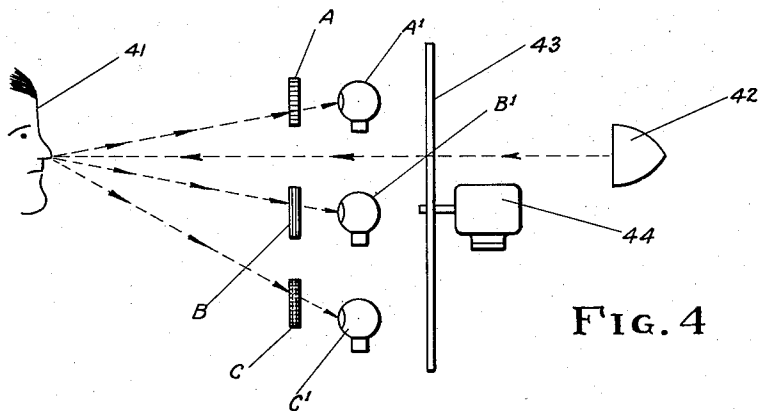


FIG. 4

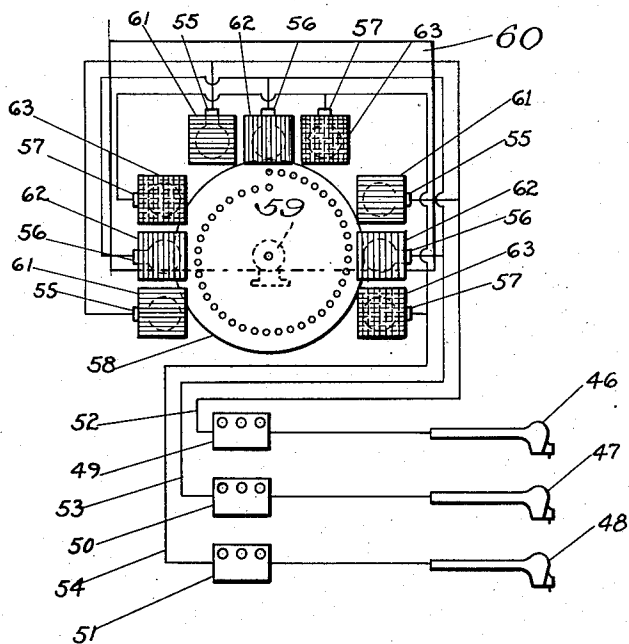


FIG. 5

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3 Sheets-Sheet 3

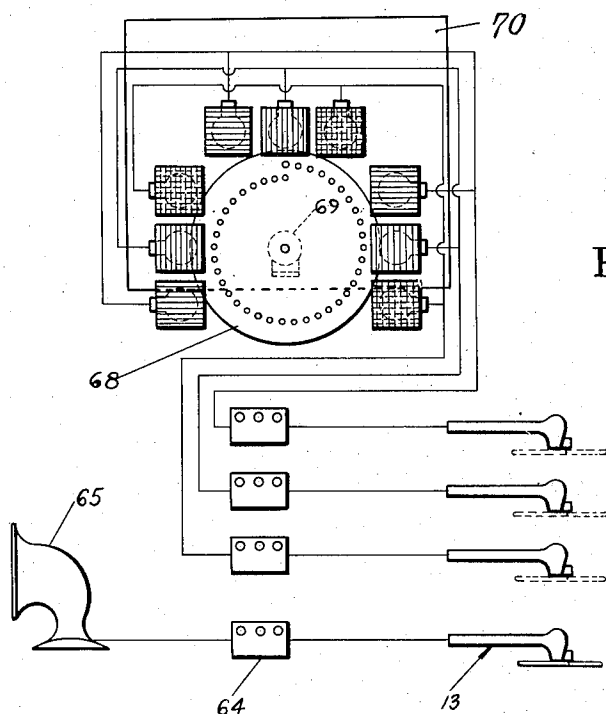


FIG. 6

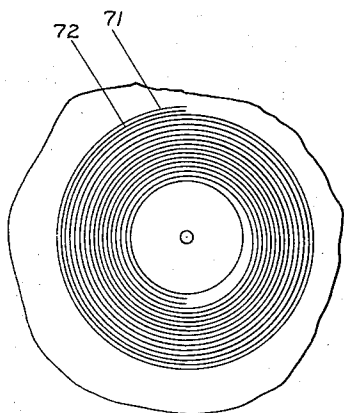


FIG. 7

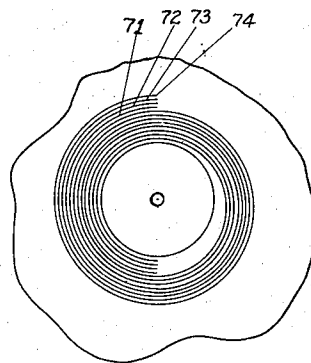


FIG. 8

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MEANS AND METHOD OF REPRODUCING PICTURES OR SCENES FROM RECORDED IMPULSES

Application filed September 25, 1929. Serial No. 394,999.

This invention relates to new and useful improvements in means and methods of recording a series of impulses and to means and methods of reconstructing sound or a visible picture from said recorded series of impulses.

Heretofore, the types of electric pick-ups in use have been too heavy to attempt to pick up as much as fifteen thousand vibrations per second, this being required in television. In my application Serial Number 364,897 Filed May 21, 1929, I have disclosed what I choose to call a light ray pick-up. The means and method disclosed in this application and in other applications about to be filed are capable of handling frequencies of the order of fifteen thousand vibrations per second and therefore make possible the reproduction or reconstruction of a scene or picture recorded in a spiral groove on a disc record.

It is therefore, an object of the present invention to apply the light ray pick-up principle to the reconstructing or reproducing on a projection screen of a scene or picture recorded by a series of impulses.

A co-extensive object of the invention is to apply this principle of light ray pick-up to the recording of a picture or scene in the form of a series of impulses.

A further object is to provide a means and method whereby through the use of the principle of the light ray pick-up scenes or pictures may be recorded on and reproduced from a disc recorded in such a manner as to present them in colors when reproduced.

An additional object is to provide a means and method whereby through the employment of the principle of the light ray pick-up scenes or pictures may be recorded on and reconstructed from a record in black and white accompanied by sound or in colors, accompanied by sound.

The accompanying drawings show, and in the following description there is described satisfactory embodiments of the invention. However, it is to be understood that this description is for the purpose of making clear the principle of construction and operation of the invention, and that the invention is not limited to the embodiments shown. Many

changes may be made within the scope of the appended claims and reference must therefore be had to them for a definition of the limitations of the invention.

In the drawings:—

Fig. 1 is a more or less diagrammatic view showing the invention used in reproducing a picture or scene in black and white;—

Fig. 2 is a somewhat diagrammatic view showing the arrangement for recording a scene or picture in black and white;—

Fig. 3 is a similar view but showing the arrangement of the invention for recording a picture or scene in color;—

Fig. 4 is a detail view showing specifically the arrangement for recording in colors;—

Fig. 5 is a similar view showing the arrangement for reproducing in colors;—

Fig. 6 is a diagrammatic view showing the arrangement for reproducing a picture and sound from the same recording;—

Fig. 7 is a plan view showing a portion of the record on which a scene is recorded in black and white together with a sound recording;—

Fig. 8 is a similar view showing a record on which a scene is recorded in color together with a sound record.

Referring in detail to the drawings and particularly to Fig. 1, at 10 is shown a suitable turntable mounted on a turntable shaft or spindle 11 driven by any means (not shown). On the turntable 10 is disposed a disc record 12 having a scene recorded thereon in the form of a series of impulses in a spiral groove.

Mounted so as to be disposed above the record 12 is a light ray pick-up device 13 the detailed construction of which is given in a co-pending application Ser. No. 394,998 filed Sept. 25, 1929. Briefly, this pick-up 13 includes a supporting arm 14 mounted for pivotal movement both horizontally and vertically as indicated at 14 and 15, and carrying at its forward end a head portion 16 within which is mounted a light sensitive cell as for example the photo-electric cell 17.

The head 16 also includes a depending portion 18 in which is fitted a lens system comprising lenses 18a. To the forward side of

the portion 18 is secured or otherwise formed, a housing 19 from which a pin 20 is maintained projected by light coil spring 21. The housing 19 rests on the record surface and the pin operates in a record groove to guide the pick-up and maintain the lens system correctly positioned relative to the record groove. Spring 21 is not of sufficient strength to maintain the weight of the pick-up and keep the housing 19 off the record.

Briefly, the operation of the pick-up is as follows:—Light, from a suitable source 22, is cast onto the record and owing to the formation of the groove in the recording operation, light and dark spots of various shades are formed in the groove and light reflected upwardly from the groove is passed through the lens system and onto the cell 17. Wires or conductors 23 connect the cell 17 with an amplifier indicated at 24 which in turn is connected by wires 25 to a neon lamp 26. Between the neon lamp 26 and a projection screen 27 a scanning wheel 28 is interposed, the scanning wheel being driven by a synchronous motor 29. It will be apparent that the picture or scene recorded on the disc 12 is reconstructed on the screen 27.

The recording of a disc such as 12 involves a rearrangement of parts and is shown in Fig. 2. Here, the object 31 to be recorded has interposed between it and an illuminating lamp 32 a scanning wheel 33 driven by synchronous motor 34. Light, reflected from the object is caught by the photo-electric cell 35 connected with an amplifier 36 as by conductors 37, the amplifier in turn being connected by wires 38 with an electric recorder 39. This recorder, which is of any known construction, operates to engrave the record groove in a wax master 40 from which by proper method duplicate copies may be produced. From the foregoing it will be seen that there is but a slight change in the arrangement of parts when they are used for recording and reproducing.

In Figs. 3 and 4 is more or less diagrammatically illustrated the arrangement for recording a scene or picture in color. The object 41 is, of course properly positioned relative to the apparatus. As shown, the apparatus includes a light source 42 arranged to direct light rays against a scanning wheel 43 driven by synchronous motor 44. Different portions of the object are illuminated by these light rays and the reflected rays passing through the filter screens A, B, and C engage the respective photo-electric cells A', B', and C'.

Fig. 3 shows the employment of three sets of color screens and three sets of photo-electric cells, the cells of the various sets being hooked into their respective circuits and electrically connected to the amplifiers A2, B2, and C2. Each amplifier is in turn connected with an electrical recorder of any desired

construction. It will be understood that there is a color screen in each set for each of the primary colors. Further it is to be understood that each recording instrument A3, B3, and C3 records in a separate groove on a wax master 45. It will be obvious that different impulses are recorded in the different grooves depending on the colors in the object being recorded.

For reproducing a record recorded by the arrangement shown in Figs. 3 and 4, the apparatus of Fig. 5 is used. For this purpose three light ray pick-up devices 46, 47, and 48 as disclosed in my application Ser. No. 394,998 above referred to are employed. These pick-ups are the same as that shown at 13 in Fig. 1. Each of the pick-ups 46, 47, and 48 is connected with a suitable amplifier, the amplifiers being indicated at 49, 50, and 51.

From the amplifiers through suitable connections 52, 53, and 54, the electrical impulses are carried to neon lamps 55, 56, and 57. From the foregoing it will be apparent that for each groove on the record there is a corresponding pick-up apparatus. Each of the neon lamps 55, 56, and 57 is arranged forwardly of a scanning wheel 58 driven by synchronous motor 59, and at the opposite side of the scanning wheel 58 is disposed a projection screen 60. Disposed between the respective neon lamps 55, 56, and 57 are color screens 61, 62, and 63 corresponding respectively to the color screens A, B, and C. of Figs. 3 and 4. It will now be apparent that the features of various colors in the object are recorded in the respective grooves and that the various colored features are independently reproduced and a composite picture formed on the screen 60.

In Fig. 6 is shown an arrangement for reproducing a picture and sound from the same recording. Here the sound and scene is in the form of a series of impulses on the same record disc and two reproducing systems are provided. The sound or speech reproducing system includes a light ray pick-up 13 operating through an amplifier 64 to a loud speaker 65. The scene or picture reproducing system includes a light ray pick-up 13 operating through an amplifier 66 connected with a neon lamp 67. The neon lamp 67 is positioned relative to a scanning wheel 68 driven by synchronous motor 69 and in the rear of which is positioned the projection screen 70. This picture or scene pick-up mechanism is the same as that shown in Fig. 1.

In Fig. 7 is shown in plan view a portion of the record on which a scene is recorded in the groove 71, sound being recorded in the groove 72. These grooves as shown are in the form of parallel spiral lines and the record is such as to be used in connection with the apparatus of Fig. 6.

In Fig. 8 is shown a similar view of a portion of a record on which a scene has been

recorded in color in combination with sound. The scene grooves are indicated at 71, 72, and 73, and the sound groove is indicated at 74. These grooves, it will be noted, are in the form of four parallel spiral lines.

Having thus described the invention, what is claimed is:—

1. In a means for taking scene from a disc record, in combination, a disc record having a scene recorded thereon in the form of a series of impulses, means for rotating the disc record, means for casting a beam of light onto the record, a lens system for collecting the reflected light beams, a photo-electric cell positioned to have the reflected light beams thrown thereon by the lens system, an amplifier connected with the photo-electric cell, a lamp connected with the amplifier, a scanning wheel positioned to receive light beams from the lamp, and a projection screen in the rear of said scanning wheel positioned to receive light passing through the scanning wheel.

2. A means for reconstructing a picture from a series of impulses recorded on an opaque record in the form of a spiral groove, in combination, a disc record having a scene recorded thereon in the form of a series of impulses, means for rotating the disc record, means for casting a beam of light onto the record, a lens system for collecting the reflected light beams, a photo-electric cell positioned to have the reflected light beams thrown thereon by the lens system, an amplifier connected with the photo-electric cell, a lamp connected with the amplifier, a scanning wheel positioned to receive light beams from a lamp, and a projection screen in the rear of said scanning wheel positioned to receive light passing through the scanning wheel.

3. In a means for reproducing a scene in color from a record having the scene recorded therein in the form of a series of impulses arranged in substantially parallel spiral lines each representing one of the primary colors, means to rotate the record, a light ray pick-up device associated with each of said lines, an amplifier connected with each of said pick-ups, a lamp connected with each of said amplifiers, a projection screen, a scanning wheel interposed between said lamp and the projection screen, and a color screen interposed between each of the lamps and the scanning wheel.

4. In a means for taking a scene from a record, in combination, a record having a scene recorded thereon in the form of a series of impulses arranged in a spiral groove, means for rotating the record, means for casting a beam of light onto the record, a lens system for collecting the reflected light beams, a photo-electric cell positioned to have the reflected light beams thrown thereon by the lens system, an amplifier connected with

the photo-electric cell, a lamp connected with the amplifier, a scanning wheel positioned to receive light beams from the lamp, and a projection screen in the rear of the scanning wheel positioned to receive light passing through the scanning wheel.

Signed at New York, in the county and State of New York, this 30th day of August A. D. 1929.

REGINALD T. FRIEBUS.

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