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METHOD AND APPARATUS FOR TRANSMISSION OF PICTURES

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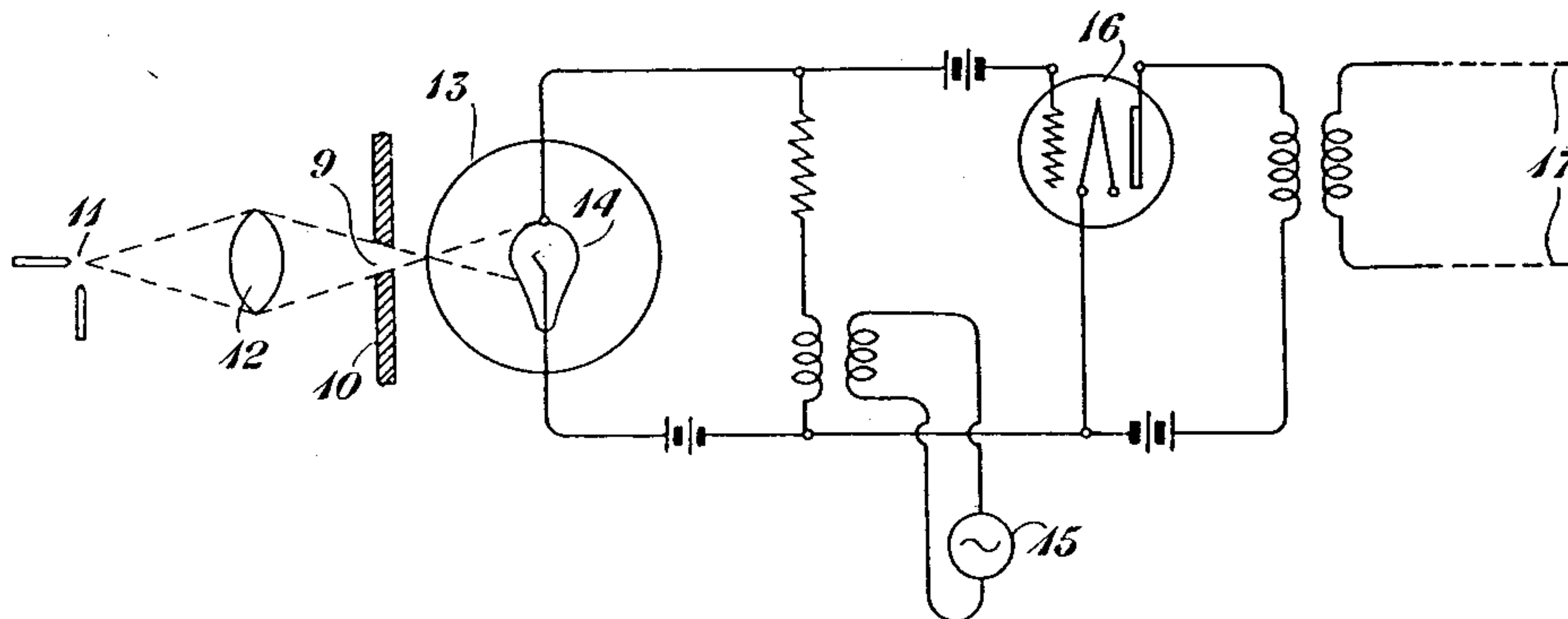


Fig. 1

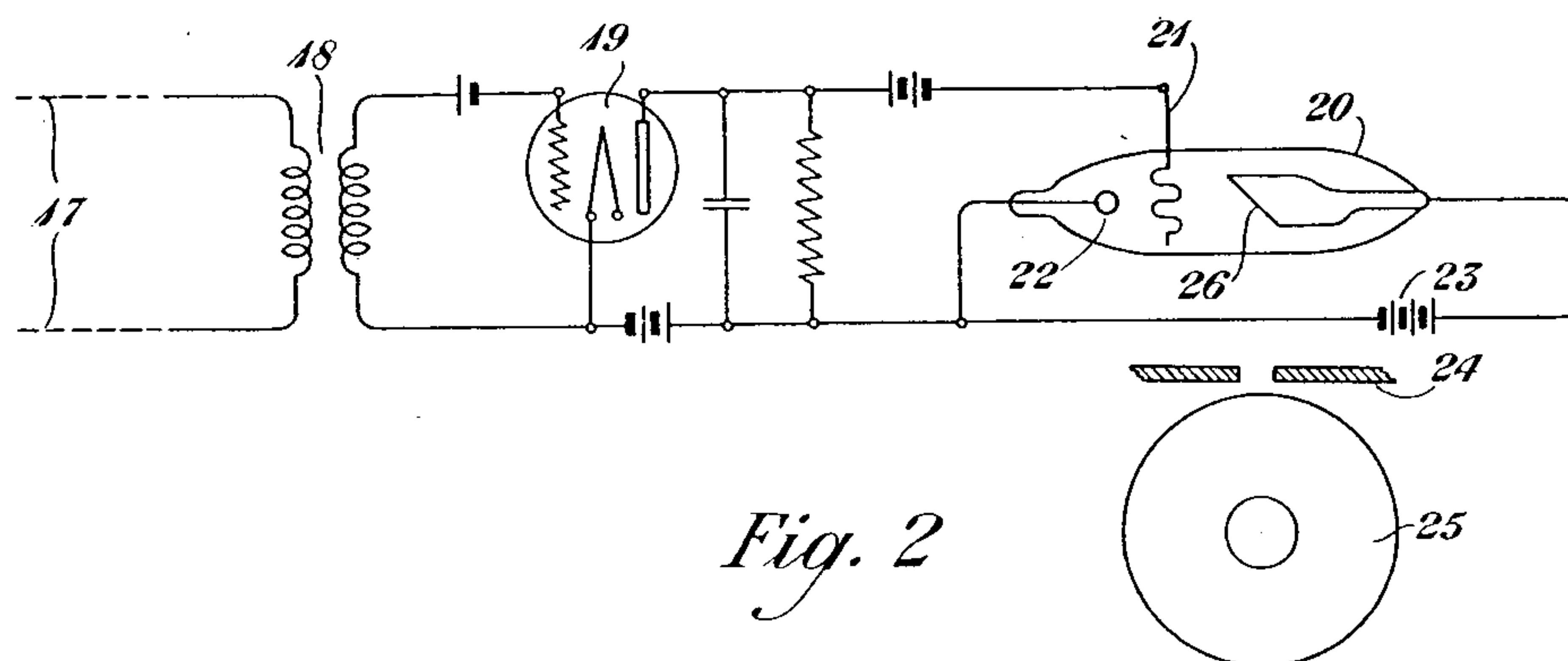


Fig. 2

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METHOD AND APPARATUS FOR TRANSMISSION OF PICTURES.

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The principal object of my invention is to provide a new and improved method and appropriate apparatus for transmitting and receiving pictures electrically. In a more specific aspect my invention involves recording the picture at the receiving end by means of X-rays governed by the modulated picture transmitting current. The nature and objects of my invention will become more readily apparent on the consideration of a specific example of practice in accordance therewith. In the following specification and the accompanying drawings I have disclosed an example of the practice of my invention. It will be understood that the invention is defined in the appended claims and that the following description is directed to the particular embodiment chosen for illustration.

Referring to the drawings, Figure 1 is a diagram showing the apparatus at the transmitting end, and Fig. 2 is a diagram showing the apparatus at the receiving end.

The picture to be transmitted is recorded in a semi-transparent film which is wrapped on the glass drum 13. This drum is rotated and at the same time traversed slowly in the direction of its axis so that the opening 9 in the screen 10 travels relatively to the film in a helical course.

Light from the source 11 is directed by the lens 12 through the opening 9 in the screen 10 and through the underlying spot of the film 13 on the photoelectric cell 14 inside the drum. The resultant varying current through the cell 14 is combined with the output from the oscillator 15 and applied to the modulator tube 16 to give a modulated carrier current which is then applied to the line 17.

The amount of light reaching the cell 14 will be determined by the lights and shades of the film on the drum 13, and accordingly the amplitude of the transmitted current will be small or large according as the portion of the film involved is dark or light. With its amplitude determined thus, the transmitted carrier current will have the frequency determined by the oscillator 15.

At the receiving end the current from the line 17 will go through the transformer 18 to the detector 19 whose output is applied to the grid 21 in the X-ray tube 20 whose electron emitting cathode is 22 and whose anode or target is 26.

The battery 23 will cause an electron bom-

bardment of the anode 26 which will cause it to emit X-rays. These will pass through the opening in the screen 24 and fall on the adjacent spot of the receiving film 25. This receiving film 25 is rotated and traversed in synchronism with the film 13 by well known apparatus, not shown here.

The grid 21 in the X-ray tube 20 has a varying electromotive force applied to it corresponding to the picture transmitting current. This voltage on the grid controls the electronic current flowing from the cathode to the anode or target 26. The X-ray beam from the target 20 will be modified accordingly, and the sensitive film 25 will also be modified accordingly so that the lights and shades of the transmitted picture will be reproduced in the received picture at 25.

It is to be understood that the terms used herein in reference to a picture both in the specification and claims, do not limit this invention to the production of a picture record at the receiver from a picture record at the transmitter. The invention is equally applicable to systems, for example, in which a transitory image of a still or moving picture or object is produced at the receiver, as in certain forms of television systems.

I claim:

1. An X-ray tube, a sensitive film, means to direct a beam of X-rays from said tube on a restricted portion of said film, means to traverse said film relatively to said beam, a grid in said X-ray tube, means to generate and transmit a modulated carrier current corresponding to a picture or object an image of which is to be produced, and means at the receiving end to apply a corresponding electromotive force on said grid and thereby to modify the X-ray beam and correspondingly to modify the record on said film.

2. The method of receiving and recording a picture by means of a transmitted carrier current modulated in accordance with the elements of the picture or object an image of which is to be produced which consists in applying the received current to modify a beam of X-rays from an X-ray tube, and applying said beam of X-rays to a relatively moving sensitive film.

3. A source of radiation of wave length outside the visible light range, a sensitive film on a spot of which said radiation is directed, means to traverse said film, a grid to modify said radiation, and means to apply a modu-

lated picture transmitting current to said grid and thereby to record a picture transmitted by said current upon said film.

4. The method of recording an electrically transmitted picture which consists in directing a beam of radiation outside the visible light range upon a spot of a moving film, and modifying said beam in accordance with the intensity of a received modulated picture transmitting current.

5. An X-ray tube, a picture receiving film on which the X-rays fall, means to move the film, and means to modify the X-rays in accordance with a received picture transmitting modulated carrier current.

6. An X-ray tube having an electron emitting cathode, an anode for producing X-rays and an auxiliary control electrode, means for applying potentials to said control electrode in accordance with received signals to correspondingly control the characteristics of the X-rays from said anode.

7. In a picture transmitting system, a source of picture current having characteristics varying in accordance with the tone values of the elemental areas of a picture or object an image of which it to be produced, a source of X-rays, a sensitive viewing surface upon elemental areas of which X-rays from said source are directed, and means for controlling the intensity of said X-rays in accordance with current from said picture current source.

8. In a picture transmitting system, a source of picture current having characteristics varying in accordance with the tone val-

ues of the elemental areas of a picture or object an image of which is to be produced, an X-ray tube having an electron emitting cathode, an anode for producing X-rays, and an auxiliary control electrode, means for applying potentials to said control electrode in accordance with current from said source of picture currents to correspondingly control the characteristics of the X-rays from said anode, and a sensitive viewing surface upon elemental areas of which said X-rays are directed.

9. In a picture transmitting system, a source of picture currents having characteristics varying in accordance with the tone values of the elemental areas of a picture or object an image of which is to be produced, a source of alternating current, means to modulate alternating current from said source of alternating current in accordance with picture currents from said source of picture currents, a source of X-rays, a sensitive viewing surface upon elemental areas of which X-rays from said source are directed, and means for controlling the intensity of said X-rays by modulated current produced by said modulating means.

10. A system for producing images electrically comprising means controlled by incoming image currents for producing a modulated beam of X-rays at a receiving station.

In testimony whereof, I have signed my name to this specification this 13th day of December, 1923.

ALLAN WEAVER.