

May 21, 1929.

W. L. OVERTON

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ELECTRIC PICTURE TRANSMITTING APPARATUS

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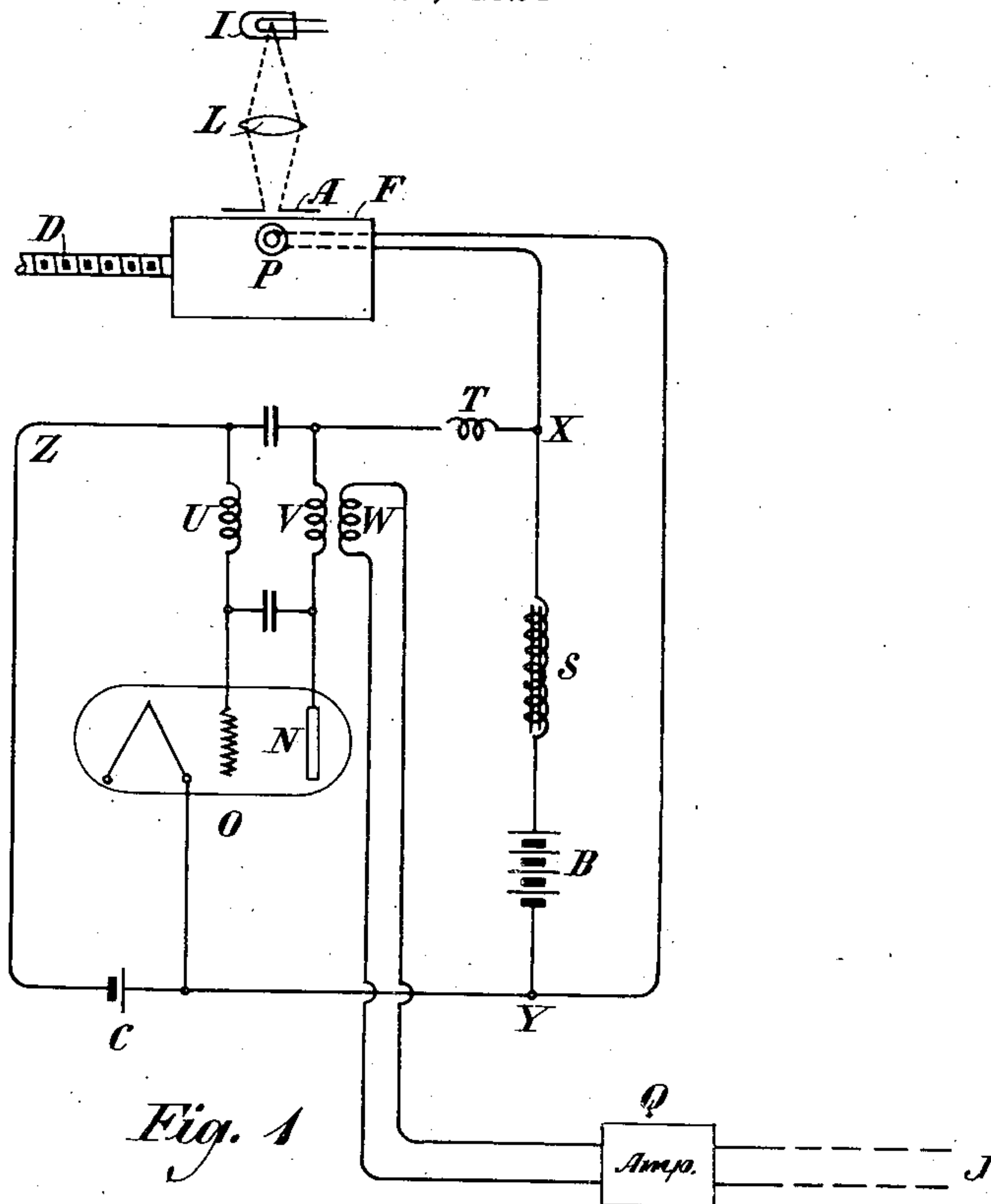


Fig. 1

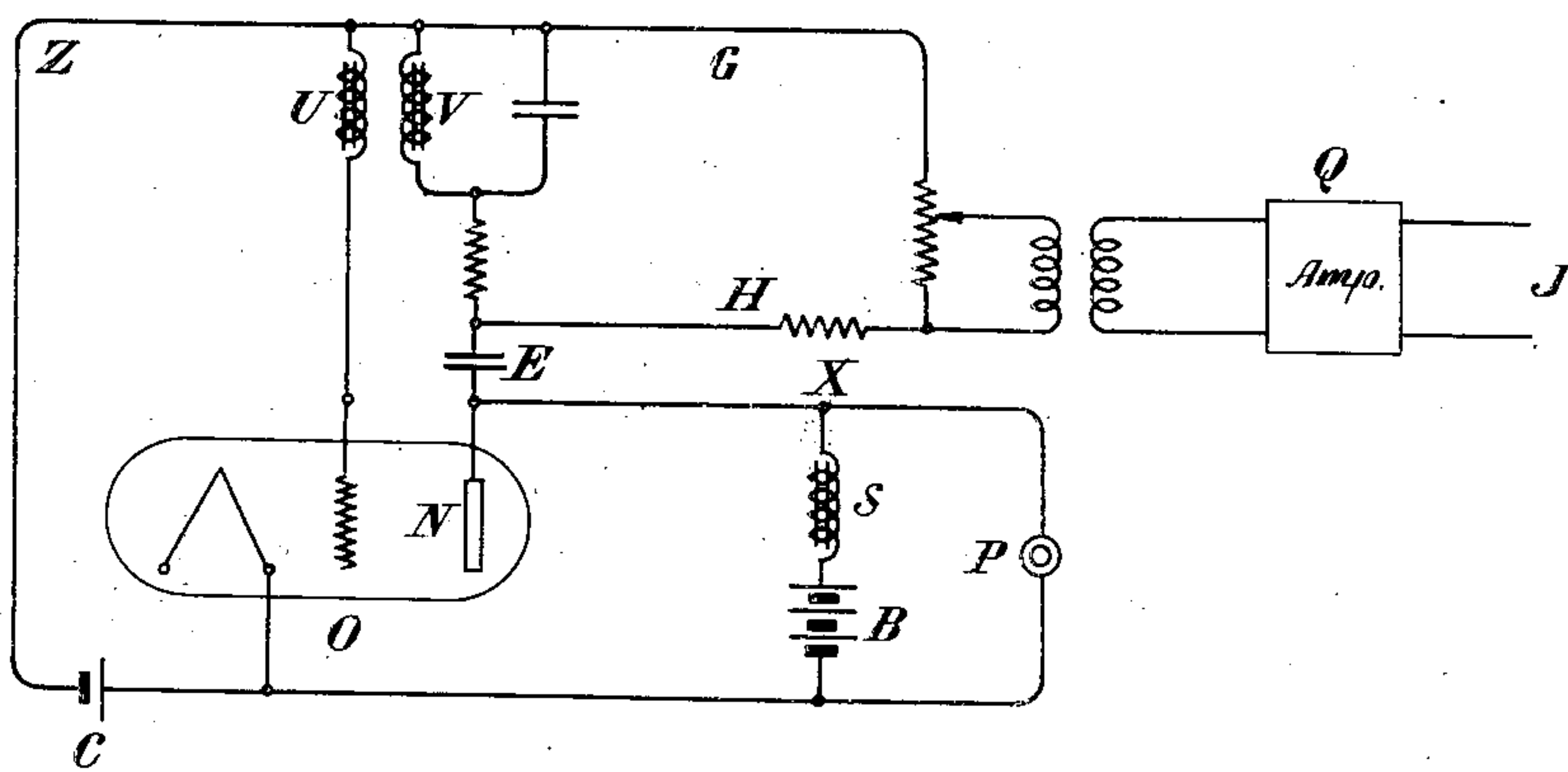


Fig. 2

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ELECTRIC PICTURE-TRANSMITTING APPARATUS.

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An object of my invention is to provide a new and improved system for generating an image transmitting current in an electrical image producing system. Another object of my invention is to provide efficient means for modulating a carrier current in accordance with the degree of shade of the successive elements of a picture or object an image of which is to be produced. Still another object of my invention is to provide a modulating system for efficiently modulating the current from a vacuum tube oscillator by means of a photoelectric cell. These and other objects of my invention will become apparent on consideration of an example of a system embodying the invention which I have chosen for presentation in the following specification taken with the accompanying drawing. It will be understood that the invention is defined in the appended claims and that the following specification relates to the embodiment thereof shown in the drawings. In this embodiment a carrier current is generated by a three electrode vacuum tube oscillator and a photoelectric cell is introduced in parallel with the plate of the plate circuit. The resistance of the cell is varied by the degree of shade of successive elements of the picture or object so as to modulate accordingly the output current from the oscillator.

In the drawings, Figure 1 is a diagrammatic sketch showing transmitting apparatus adapted to put a picture carrying current on a line, and Fig. 2 is a diagram of a modification.

Referring to Fig. 1, light from the source I is focused by the lens L on the opening in the screen A through which the light passes to the photoelectric cell P. This cell P is within a glass drum F round which the picture is wrapped in the form of a semi-transparent film. The drum F is fixed on an axial shaft D which is screw-threaded, so that by engagement with a suitable support the drum F is traversed slowly along its axis as it is rotated.

The vacuum tube oscillator O has the associated circuits, as plainly shown in the drawing, with the three coils, U, V and W in inductive relation. According to the well known principle of the oscillating three-electrode vacuum tube, oscillatory currents will be generated in the circuit of the plate

N, and a portion of their energy will be fed back into the grid circuit, so that the oscillatory currents will be self-sustaining. The energy for the oscillatory current output of the system is afforded by the plate circuit battery B in series with which is the iron core coil S. It will be seen that the circuit of the battery B branches at X and Y, one branch comprising the photoelectric cell P and the other branch in parallel therewith completing the plate circuit of the oscillator O. The high frequency oscillatory current in the plate circuit will be kept out of the coil S and out of the photoelectric cell P by the air core coil T and will go principally in the circuit through the plate and the coil V and the conductor Z. By the inductive relation between the coils V and W this oscillatory current will be put through the amplifier Q on the line J.

The amplitude of this oscillatory current would depend on the strength of the battery B, in the absence of the shunt from X through the photoelectric cell P to Y.

As the drum F rotates, successive elemental portions of the picture film pass in helical order under the opening in the screen A, and accordingly the quantity of light falling on the photoelectric cell P is determined by the shade of these picture elements, and the resistance of the photoelectric cell will vary to correspond with the varying shade of the picture elements. This variation in the resistance through the cell P causes a variation in potential across the points X and Y and therefore varies the amplitude of the output oscillatory current. This system, as disclosed, puts on the line J a carrier current of a certain frequency with its amplitude varied to correspond with the varying shade of the successive elements of the picture.

The modification of Fig. 2 is adapted for modulation of a low frequency current. Here the carrier frequencies are excluded from the coil S and battery B by virtue of the high inductance of the coil S, and from the cell P by reason of its high reactance, and the carrier current flows principally in the circuit through the plate, the condenser E, the coil V and the condenser shunted around it, and the conductor Z, and also in the shunted output circuit HG, which conducts the oscillatory current to the amplifier Q and thence to the line J.

I claim:

1. In combination, a three-electrode vacuum tube oscillator comprising a plate circuit and a battery therein, a photoelectric cell
5 in parallel with the plate, and means to vary the light on said cell in accordance with the shade of successive elements of a picture or object and thereby to modulate the oscillatory output current accordingly.
- 10 2. In combination, a three-electrode vacuum tube oscillator comprising a plate circuit and a battery therein, a branch circuit in parallel to at least a portion of said plate circuit, and light sensitive means non-inductively
15 ly associated with said branch circuit to vary its resistance in accordance with the shade of successive elements of a picture or object and thereby to modulate the plate circuit oscillatory current accordingly.
- 20 3. In combination, a three-electrode vacuum tube oscillator comprising a plate circuit and a battery therein, a photoelectric cell in parallel with the plate, a source of light casting a beam of light on said photoelectric
25 cell, and means to vary the intensity of the light on said photoelectric cell in accordance with the degree of shade of successive elements in helical order to a picture wrapped in the form of a cylinder and thereby to
30 modulate the plate circuit oscillatory current accordingly.
4. In combination, a three-electrode vacuum tube oscillator comprising a plate circuit and a battery therein, a photoelectric cell
35 in parallel with the plate, a path for oscil-

latory current connecting the plate and filament of said tube, means to confine the oscillatory currents to such path, means for extracting a part of the energy of such currents from said path, and means to vary the resistance of said photoelectric cell in accordance with the degree of shade of successive elements of a picture or object and thereby to modulate the oscillatory current accordingly.

5. The method of modulating the output current of a three-electrode vacuum tube oscillator in accordance with the degree of shade in the successive elements of a picture or object, which consists in shunting part of the current from the plate circuit battery through a photoelectric cell and varying the resistance of said cell in accordance with the degree of shade of the successive elements of the picture or object.

6. An electro-optical system for setting up image currents comprising an oscillator employing a three electrode space discharge device, a high inductance element in series with the space discharge gap of said device, and a high impedance, light-sensitive element non-inductively associated with said source and said high inductance element for varying the space current in said device in accordance with the shade of elemental areas of the field of view whose image is to be produced.

In testimony whereof, I have signed my name to this specification this 23rd day of December 1924.

WARNER L. OVERTON.