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I. W. GREEN

RECORDING SYSTEM

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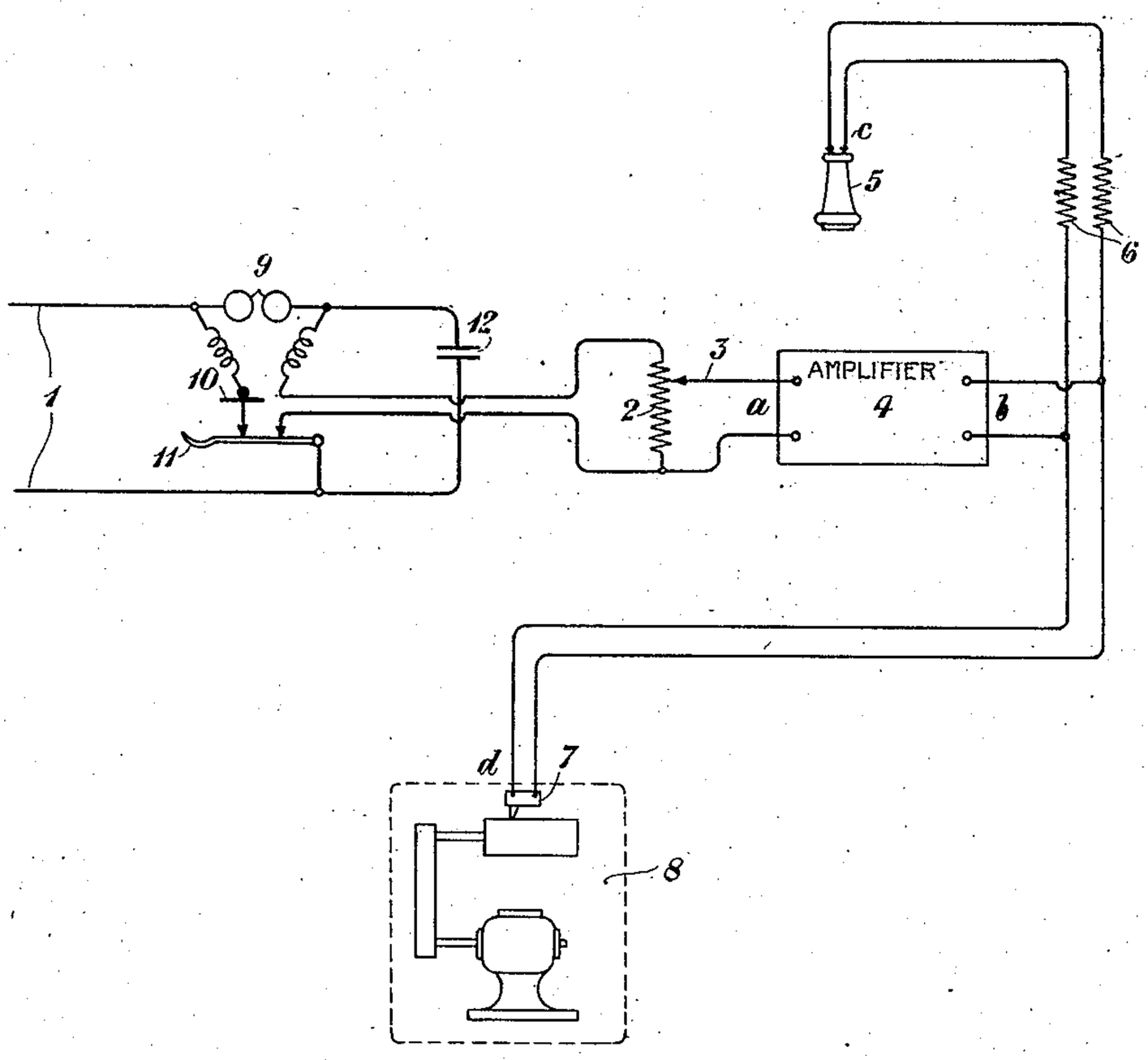

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UNITED STATES PATENT OFFICE.

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RECORDING SYSTEM.

Application filed January 30, 1925. Serial No. 5,869.

This invention relates to recording systems, and particularly to arrangements in such systems for indicating the amount of energy entering the system. One of the objects of the invention is to provide arrangements in telephone circuits for securing sufficient energy in the currents of said circuits for satisfactory recording.

In the former arrangements of such systems the amplifier was connected across the receiver of the telephone circuit, the current in the telephone circuit flowing through the receiver and the input circuit of the amplifier. The output circuit of the amplifier was connected to the sound box or inscribing element of the recorder. With such arrangements the subscriber had no means for indicating whether the gain of the amplifier was sufficient for good recording results. One of the objects of this invention is therefore to provide means whereby the subscriber may determine whether the gain of the amplifier is sufficient for proper recording.

In order that the invention may be more clearly understood, attention is hereby directed to the accompanying drawing which forms a part of the specification.

Referring to the drawing, the usual apparatus of a subscriber's anti-side tone telephone set, in which the telephone transmitter has little effect on the receiver, and vice versa, is indicated as connected to the conductors of line 1. 5 represents the receiver of line 1. The amplifier 4 connects the telephone circuit with the recorder 8. The potentiometer 2 may be adjusted by the movable arm 3.

Sound impinging upon the diaphragm of the transmitter at the distant station fluctuates the current over the conductors of line 1. The bell 9 is of such high impedance that its presence in the line does not appreciably affect transmission. However, when the receiver 5 is on the hook 11, the transmitter circuit and the receiver circuit are both open, thereby conserving the energy of the electrical sources when not required, and preventing the ringing current from flowing through the receiver. When the receiver 5 is off the hook, the ringer 9 is in series with the condenser 12, giving a closed circuit to the alternating current used for ringing, but an open circuit to the direct current from the source of current supply used for signaling the operator.

The potentiometer 2 and the amplifier 4 are arranged in the leads of the receiver 5 through a resistance or other network 6 having a transmission loss which may be made equal to the maximum gain of the amplifier 4. The gain of the amplifier is adjusted by moving the arm 3 of the potentiometer 8; and the sound box or inscribing element 7 is connected directly to the output circuit of the amplifier 4.

With the arrangement described the subscriber may regulate the gain of the amplifier 4 by moving the arm 3 of the potentiometer so as to obtain satisfactory recording. For instance, assuming that the amplifier has a maximum gain of twenty miles and that the resistance 6 has a transmission loss which is equal to the maximum gain of the amplifier, twenty miles, and assuming that the gain of the amplifier is adjusted to the position for the twenty mile gain, this would result in a level at *b*, the output circuit of the amplifier 4, and at *d*, the sound box or inscribing element 7 of the recorder 8, twenty miles in excess of the level applied at *a*, the input circuit of the amplifier 4. The level at *c*, the receiver 5, would be twenty miles less than the levels at *b* and *d*, or, for the case assumed, the level at *c* would be the same as the level at *a*. For all gains at which the amplifier 4 may be set, the level at *d*, the recorder, would always be in excess of the level at *c*, the receiver, by the amount of the loss in the resistance 6. Therefore, if the telephonic currents are properly received at the receiver 5, then the recording level at the recorder 8, which is higher than the level at the receiver by the amount of the loss in the resistance 6, would be sufficient for satisfactory recording.

It will be understood that the levels hereinbefore described are merely illustrative and may be varied in practice as conditions may require.

It will also be understood that the details of the arrangement herein set forth may be varied and the general principles herein disclosed may be embodied in many other organizations widely different from that illustrated without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. In a recording system, in combination, a telephone circuit in which voice currents

may be transmitted and received, means for transmitting and receiving voice currents in said telephone circuit, amplifying means, means for adjusting the gain of said amplifying means, recording means, and means for indicating the amount of energy in the amplified voice currents at said recording means, the level at the indicating means being different from the level at the recording means by a predetermined amount.

2. A recording system comprising an electrical circuit, means for transmitting and receiving voice currents in said electrical circuit, means for amplifying the voice currents in said electrical circuit, means for adjusting the gain of said amplifying means, means for recording said voice currents after amplification, and means for reducing the level of the received currents in said electrical circuit so that the level of said received currents may be utilized for indicating the level at said recording means.

3. A recording system comprising an electrical circuit upon which voice currents may be superposed, means for transmitting and receiving voice currents in said electrical circuit, amplifying means, means for varying the gain of said amplifying means, means for recording said amplified voice currents, and means including an impedance of predetermined magnitude and an audible device for changing the level of the received currents so as to indicate at said audible device whether the level at said recording means is sufficient for proper recording.

4. A recording system comprising a telephone loop circuit, means for transmitting and receiving messages over said loop circuit, amplifying means, recording means, means for adjusting the level of the currents at said recording means for proper recording, and means for indicating the level at said recording means, the level of said indicating means being different from the level of said recording means by a fixed and predetermined amount.

5. A recording system comprising a telephone circuit in which fluctuations in the telephonic currents are established in accordance with voice currents, recording means for said telephonic currents, means for obtaining sufficient energy at said recording means, and means for indicating when the amount of energy entering said recording means is sufficient for proper recording, said indicating means being separated from said recording means by an impedance of definite magnitude.

6. A recording system comprising a telephone circuit, means for transmitting currents in said telephone circuit, means for receiving currents in said telephone circuit, an amplifier, a recorder, a potentiometer for varying the gain of said amplifier, the output circuit of said amplifier being associated with the receiving means and the recorder, and a resistance serially arranged between the inscribing element of said recorder and said receiving means so that the energy level of said receiving means is fixed with reference to the recorder.

7. A recording system comprising a telephone circuit in which fluctuations in the telephonic currents are established in accordance with voice currents, recording means, means for amplifying said telephonic currents so as to be sufficient for proper recording, and a resistance associated with the output circuit of said amplifying means and arranged serially between the receiver of said telephone circuit and the recording means so that the level at said receiver may be used to indicate whether sufficient energy is being applied to said recording means for proper recording.

8. A recording system comprising a telephone line over which telephonic currents may be transmitted and received, a recorder and a telephone receiver between which an impedance of fixed magnitude is interposed, said telephone receiver being so related to the recorder as to provide audible means for indicating when the level of energy received by said recorder is sufficient for good recording.

9. A recording system comprising a telephone line over which telephonic currents may be transmitted and received, a recorder for said telephonic currents, and audible means supplied with current having an energy level less than the energy level at said recorder by a predetermined amount, thus indicating when the level of energy received by said recorder is sufficient for good recording.

In testimony whereof, I have signed my name to this specification this 28th day of January, 1925.

IRVING WALTER GREEN.