

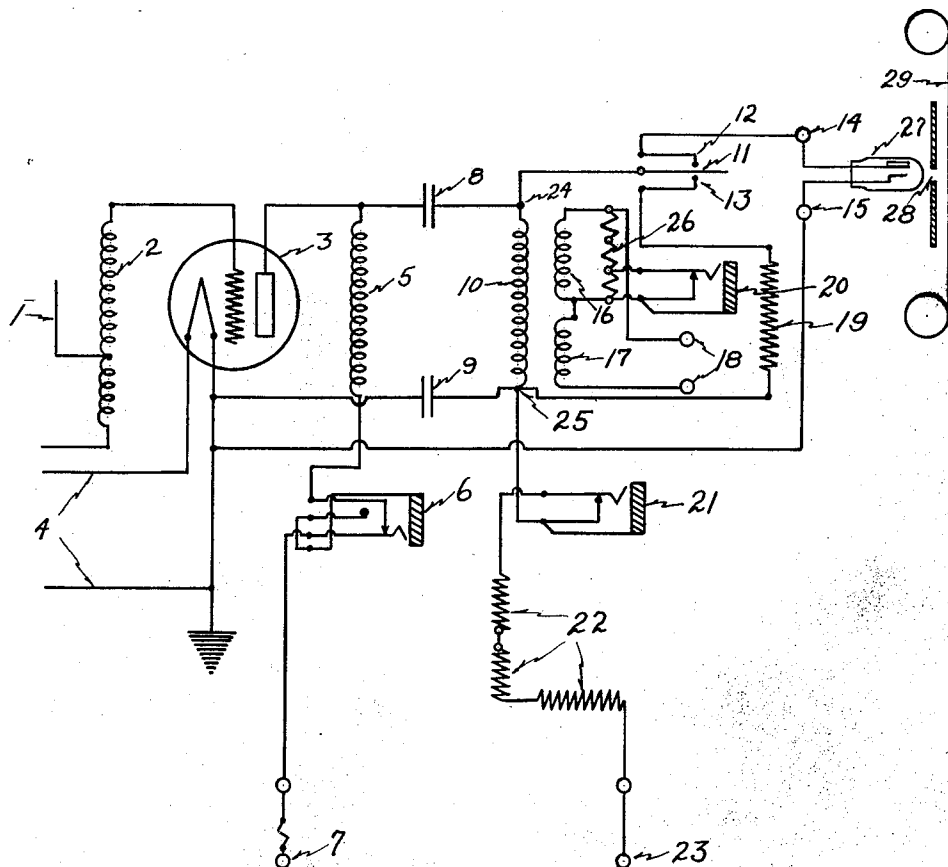
Nov. 21, 1933.

D. F. WHITING

1,935,966

AMPLIFIER

Filed Aug. 31, 1929



WITNESS.

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1,935,966

AMPLIFIER

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Application August 31, 1929. Serial No. 389,831

8 Claims. (Cl. 179—100.3)

This invention relates to a new and improved amplifier for recording sound.

Amplifiers used in public address systems and radio work, can easily be adapted to the process of making a sound record.

In the usual method of making a sound record, the sound to be recorded is detected by a microphone, which may be equipped with an auxilliary amplifier placed as near as practicable to the source, the resulting electric currents are then transmitted by wire to the recording amplifier, the amplification of which is under control, and finally allowed to actuate an electro-sensitive light-controlling recording device. This device may be electro-magnetic, electrostatic or glow-discharge in character. The device to be described will be of the latter type.

It is an object of my invention to provide an amplifier for the purpose of making a sound record. Generally all amplifiers have many common features. Any good amplifier for sound amplification can be adapted to the process of sound recording.

A further object of my invention is to adapt a conventional amplifier so as to make it useful in the process of recording sound by means of light pulsations impinging on a sensitized film.

Further objects and advantages will be apparent with reference to the accompanying drawing in which a schematic diagram of the last stage of a recording amplifier with the adaptations for a recording glow lamp are shown. Electric pulsations corresponding to the sound to be recorded enter coupling impedance 2 by means of connection 1. Impedance 2 transmits its energy to the grid of vacuum tube 3. Tube 3 is of the three electrode type having its filament circuit connected to a proper source of potential at 4.

The plate circuit of tube 3 is coupled to an output stage consisting of impedance units and condensers. Impedance 5 connects the plate of tube 3 with a jack 6, which in turn is connected to a proper source of plate potential at 7, the other terminal of which source is connected to the filament circuit of vacuum tube 3. Jack 6 provides a means for metering the plate current of the last tube of the amplifier which is desirable in maintaining the output of the circuit constant. The output from the tube 3 also feeds through condensers 8 and 9 to junction points 24 and 25 respectively at either end of primary winding 10 of an output transformer having two secondary windings 16 and 17. From junction point 24 a connection is made to the transfer contact 11 of a key. The junction point 25 connects with one

end of resistance 19 which connects at its other end to make contact 13 of the same key. The opposite contact 12 of the same key is connected through terminal 14 to the plate of glow lamp 27. The cathode of glow lamp 27 is connected through terminal 15 to the filament circuit of vacuum tube 3.

Terminals 7 and 23 may be connected to the same battery or to separate batteries as desired. When connections are made to the same battery, terminals 7 and 23 may be attached at the same point on the battery or at different points to give the potential best suited to each circuit. Connections are also made between the battery or batteries and the filament circuit of tube 3.

The sound recording lamp operates from a potential connected between terminal 23 and the filament circuit of tube 3 arriving at the plate of the lamp by means of circuits comprising resistors 22, jack 21, junction point 25, winding 10, key contacts 11 and 12, terminal 14 and thence to the plate. Resistors 22 maintain the recording lamp current at its proper value during operation. Jack 21 is used in gaining an entrance to the circuit for the purpose of making current measurements.

When key contacts 11 and 12 are in contact, operating connection is made to terminal 14, the plate connecting terminal of the sound recording lamp 27. Light pulsations corresponding to sound waves will then pass through slit 28 and form a photographic record on sensitized film 29. When key contacts 11 and 13 are in contact, resistance 19 which is of a value substantially equal to the impedance of the sound recording lamp, replaces the latter in circuit. With this connection, which is that employed during test periods, the amplifier load is the same as though the recording lamp were in the circuit. A saving relative to the useful life of the lamp results, as the lamp need only be energized during the time of recording. Having the resistance of unit 19 equal to the impedance of the recording lamp makes it possible to measure the amplifier output voltage and to adjust the amplification during test periods by means of the usual potentiometer (not shown) so that when everything is in readiness for recording, there will be no further delay.

Transformer secondary winding 16 is shunted with a resistor 26 provided with taps which are connected to a jack 20. This arrangement is used in monitoring the output of the amplifier or sound to be recorded.

The extremities of secondary windings 16 and 17

17 terminate at terminals 18 which connect to a volume indicator, thus giving a relative indication of the voltage level at which the recording lamp is working.

5 The term amplifier previously mentioned and occurring as part of the claims, is not claimed broadly, but in combination with apparatus applicable to the process of making a sound record.

10 Having thus described my invention and having illustrated an embodiment thereof, I do not desire to be restricted by the same, as many changes and modifications can be made within the scope of the appended claims.

I claim:—

15 1. In a sound recording system comprising an amplifier and an electro-responsive recording device to which is supplied a steady current to render it operable, single switching means for simultaneously removing the recording device
20 from circuit, stopping the flow of said steady current, and inserting an equivalent impedance in circuit without causing steady current to flow.

2. In a sound recording system comprising an amplifier and a light controlled electro-responsive recording device to which is supplied a
25 steady current to render it operative, single switching means for simultaneously removing the device from the circuit, stopping the flow of said steady current and inserting an equivalent impedance in circuit without causing steady current
30 to flow.

3. In a sound recording system comprising an amplifier and a light-emitting electro-responsive recording device to which is supplied a
35 steady current to render it operative, single switching means for simultaneously removing the device from the circuit, stopping the flow of said steady current and inserting an equivalent impedance in circuit without causing steady current
40 to flow.

4. In a sound recording system, an amplifier having an output transformer, a sound recording lamp, a suitable source of potential for maintaining the lamp lighted, a tapped resistance in
45 shunt with a portion of the secondary winding of said output transformer, a single circuit jack making connection to taps on said resistance, said jack providing means for connecting a sound reproducer, and single switching means for simultaneously removing the recording lamp from the
50 circuit and inserting therein an equivalent impedance.

5. In a sound recording system, an amplifier having an output transformer, an electro-responsive recording device in circuit with the primary winding of said output transformer to
55 which is supplied a steady current to render said

recording device operative, single switching means for simultaneously removing the device from the circuit stopping the flow of steady current and inserting an impedance equivalent to the impedance of the recording device across the primary winding of said transformer without causing steady current to flow.

6. In a sound recording system, an amplifier having an output transformer, an electro-responsive recording device in circuit with the primary winding of said output transformer to which is supplied a steady current to render said recording device operative, a tapped resistance across a portion of the secondary winding of said transformer, means for connecting a sound indicator to the taps of said resistance, single switching means for simultaneously removing the device from the circuit stopping the flow of steady current and inserting an impedance equivalent to the impedance of the recording device across the primary winding of said transformer without causing steady current to flow.

7. In a sound recording system, an amplifier having an output transformer, capacity means for coupling said transformer to said amplifier, an electro-responsive recording device connected in circuit with the primary of said transformer, means for supplying a steady current through the primary of said transformer to render said recording device operative, current limiting means in circuit with said recording device, an element having an impedance equivalent to that of the recording device adapted to be connected at will across the primary winding of said transformer, and switching means for simultaneously removing the recording device from the circuit stopping the flow of steady current and inserting said element across the primary winding of said transformer without causing steady current to flow.

8. A sound recording apparatus comprising a light emitting electro-responsive recording device, means for supplying a steady direct current to said device to maintain it constantly in light-emitting condition, an amplifier having its output electrically connected to said light-emitting device for modulating the same in accordance with variations in the current flowing in the amplifier circuits, single switching means for simultaneously disconnecting the light-emitting device from the amplifier circuit, stopping the flow of said steady direct current to said light-emitting device and inserting an equivalent impedance in circuit with the output of said amplifier.

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