

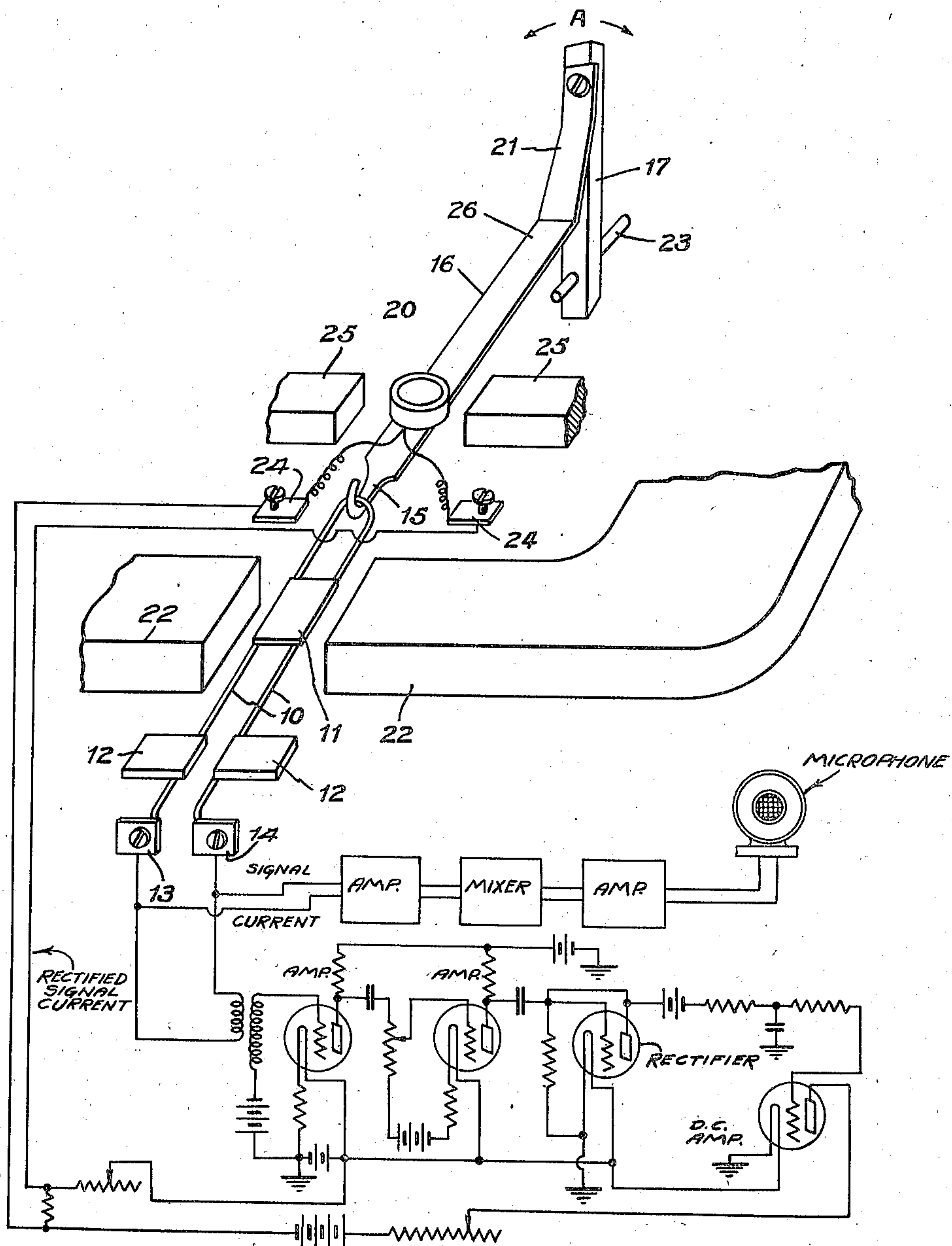
Aug. 2, 1938.

E. GERLACH

2,125,608

OSCILLOGRAPH GALVANOMETER

Filed July 23, 1936



INVENTOR
Erwin Gerlach
BY *J. J. J.*
ATTORNEY

UNITED STATES PATENT OFFICE

2,125,608

OSCILLOGRAPH GALVANOMETER

Erwin Gerlach, Berlin-Siemensstadt, Germany,
 assignor to Klangfilm G. m. b. H., Berlin, Ger-
 many, a corporation of Germany

Application July 23, 1936, Serial No. 92,086
 In Germany September 24, 1935

3 Claims. (Cl. 171—95)

This invention relates to the recording of elec-
 trical impulses, such as those of audio frequency,
 and has for its principal object the provision of
 an improved impulse recording device which is
 responsive both to the signal impulses and to a
 current which varies as the envelope of these im-
 pulses. It is an improvement on the recording
 device disclosed by my copending application,
 Serial No. 34,930, filed August 6, 1935 and relates
 more particularly to the provision of means
 whereby the device of the aforesaid application
 may be more readily adjusted and operated.

As set forth in the aforesaid copending appli-
 cation, it is customary to produce variable area
 or variable density sound records by means of
 electrodynamic sound recording apparatus de-
 signed to minimize background noise. Such ap-
 paratus includes a conductor to which is supplied
 both an audio current which varies in accord-
 ance with the sound to be recorded and a recti-
 fied audio current component which varies as
 the intensity or volume of such sound.

This arrangement is disadvantageous because
 the direct or rectified current tends to raise the
 thermal load or stress of the electrodynamic sys-
 tem and for the reason that the resistance of the
 electrodynamic system is extremely low and the
 current required to cause a shift in the zero line
 corresponds only to a small fall of potential
 across the terminals of the electrodynamic sys-
 tem. This is undesirable on the ground that the
 D. C. must be obtained from the microphone
 currents by way of amplification and rectifica-
 tion, and that the tubes used in connection there-
 with present always an internal resistance which
 is high in contrast with the resistance of the
 electrodynamic system. The result is that the
 D. C. energy in major part is consumed in the
 last tube and becomes utilizable only in minor
 part in the electrodynamic system. For the A. C.
 power which is supplied to the electrodynamic
 system, the conditions are more favorable in that
 the insertion of a transformer between the last
 amplifier tube for the voice alternating voltage
 and the sound recorder device arrangements may
 be made so that the said last tube furnishes a
 comparatively high voltage and a correspond-
 ingly low current.

As will hereinafter appear, the apparatus func-
 tions substantially in such manner that the cen-
 tral position of the oscillation of the electro-
 dynamic system excited in accordance with the
 sound oscillations to be recorded, is mechanically
 controlled by a dynamic system in accordance
 with the desired displacement of the zero line.

The invention will be better understood from
 the following description when considered in con-
 nection with the single figure of the drawing and
 its scope is indicated by the appended claims.

An example of an embodiment of the invention
 is shown in the drawing. In a constant magnetic
 field produced by the magnet 22 a U-shaped wire
 10 is placed. At the ends of the wire 10, terminals
 13 and 14 are provided. The wire 10 is held in
 place by claws 12, furthermore it is maintained
 in an outstretched position at its bent portion by
 means of a sheet metal strip 16 whose one end is
 formed into a hook 15. The other end 26 of the
 strip 16 is connected to a part 17 through a spring
 21. The part 17 can be swung about a shaft 23
 in the direction of arrows A. The sheet metal
 strip 16 has fastened thereto a coil 20 having
 connection terminals 24. The coil 20 is situated
 in the constant magnetic field of a magnet 25.
 The wire has a mirror 11 mounted thereon.

As pointed out in McDowell Patent 1,855,197,
 the source of signal impulses might be a micro-
 phone from which the impulses to be indicated
 are supplied through an amplifier, a mixer, and
 an amplifier to the loop 10 of the galvanometer,
 a part of the signal impulses being supplied
 through suitable amplifiers to a rectifier and the
 output of the rectifier being supplied through a
 D. C. amplifier to the coil 20 which is subjected
 to the magnetic field of the magnet 25.

The device operates in the following manner:
 The sound currents are conducted to the wire 10
 through the terminals 13 and 14. Owing to the
 constant magnetic field of the magnet 22, the
 wire moves in the rhythm of the sound currents.
 The zero position of the mirror 11 can be easily
 adjusted to by moving the part 17 about the
 shaft 23.

To displace the zero line, the direct current
 obtained through detection of the sound currents
 is applied to the terminals 24 of coil 20. Hence,
 the coil 20 moves in the constant magnetic field
 of magnet 25 thereby displacing the zero line of
 mirror 11.

As pointed out in Robinson Patent 1,854,159,
 the tilting of the mirror 11 in response to varia-
 tion in the current of the coil 20 has the effect
 of bringing the peaks of the low and high fre-
 quency impulses more nearly in alignment, so
 that a minimum of transparent record track
 area is maintained at all times. Otherwise stat-
 ed, the zero line of the record is shifted in accord-
 ance with the impulse level so that the low and
 high amplitude impulse peaks approach but do

not overshoot the edge of the record track area.

I claim as my invention:

1. A galvanometer including means movable in accordance with impulses to be indicated, a support for said means, means operable to shift said support in accordance with a current which varies as the envelope of said impulses, and means for adjusting the zero position of said support.

2. A galvanometer including means movable in accordance with impulses to be indicated, a support for said means, means operable to shift said support in accordance with a current which varies

as the envelope of said impulses, a coil mounted on said support, and means for subjecting said coil to a magnetic field of force.

3. A galvanometer including means movable in accordance with impulses to be indicated, a support for said means, means operable to shift said support in accordance with a current which varies as the envelope of said impulses, a coil mounted on said support, and means for subjecting said coil to a magnetic field of force, means for adjusting the zero position of said coil.

ERWIN GERLACH.