Feb. 10, 1931. F. E. MILLER 1,791,932

ELECTRICAL STETHOSCOPE

Filed Feb. 24, 1928

FIG. 1.

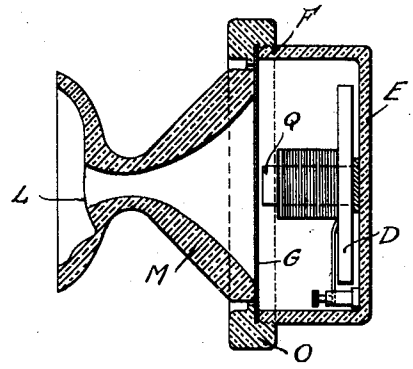
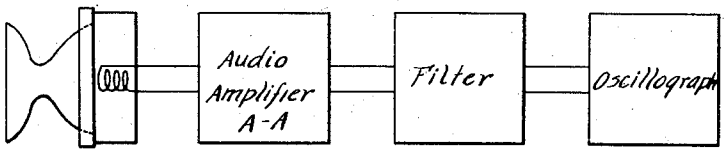


FIG. 2.



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UNITED STATES PATENT OFFICE

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ELECTRICAL STETHOSCOPE

Application filed February 24, 1928. Serial No. 256,658.

It is an object of my invention to design an electrical stethoscope having a transmitting device so constructed that it will be easily and readily adapted to the portions of the human body from which I desire to obtain registration. It is also my purpose to design a stethoscope of this type which will give me a visible oscillograph record of the sounds received and at the same time make it possible to cut out and eliminate from my visible reproduction all extraneous noises from the body either internal or external. My invention will be more readily understood by reference to the attached drawing in which like figures refer to like parts.

Fig. 1 shows my preferred transmitting device in section elevation.

Fig. 2 shows a diagram of the hook up diagrammatically.

Referring particularly to Fig. 1, it will be seen that my preferred transmitting member consists of a permanent iron magnetic member D, non-magnetic case E, a threaded portion F which sets into the screw cap O containing the magnetic vibrating unit G actuated by the electromagnet Q. This drawing also shows the soft rubber securing conductor unit M, having integral therewith the suction resonating chamber L. The chamber L is constructed after the same shape of the tympanum of the ear to respond more readily to the impressed sounds and transmitted through the hollow interior of M to the diaphragm G and the electromagnet, the shape of M being adapted most readily to come in contact with the portions of the body being examined. Referring to Fig. 2 my preferred transmitting unit is electrically connected to the input side of an audio amplifier AA of any conventional type. I prefer to use, however, the type known as "double impedance coupling". The output side of this amplifier is then connected to a specifically constructed electric frequency filter consisting of the proper arrangement of choke coils, that is of inductances, resistances and capacities, and the output of which is connected to a conventional type of visible oscillograph containing the necessary amount of amplifying stages. Having thus described my invention, what I claim and desire to secure by United States Letters Patent is:

1. In an electrical stethoscope an electromagnetic sound transmitting unit consisting of an electromagnet, a diaphragm free to vibrate, a short, flexible, hollow rubber sound conducting portion having an eccentric protruding cavity resembling the tympanum of the human ear adapted to make contact with the human body, in combination with an audio, amplifier and a frequency filter and a visible oscillograph.

2. In an electrical stethoscope an electromagnetic sound transmitting unit consisting of an electromagnet, a diaphragm free to vibrate, a short, flexible, hollow rubber sound conducting portion having an eccentric protruding cavity resembling the tympanum of the human ear adapted to make contact with the human body, in combination with an electric sound frequency filter adapted to preclude the passing of sound waves of any predetermined frequencies internal or external to the human body.

In witness whereof I have hereunto set my hand to this specification this 21st day of February, 1928.

FRANK E. MILLER, M. D.