R. A. FESSENDEN.

ELECTRICAL SIGNALING.

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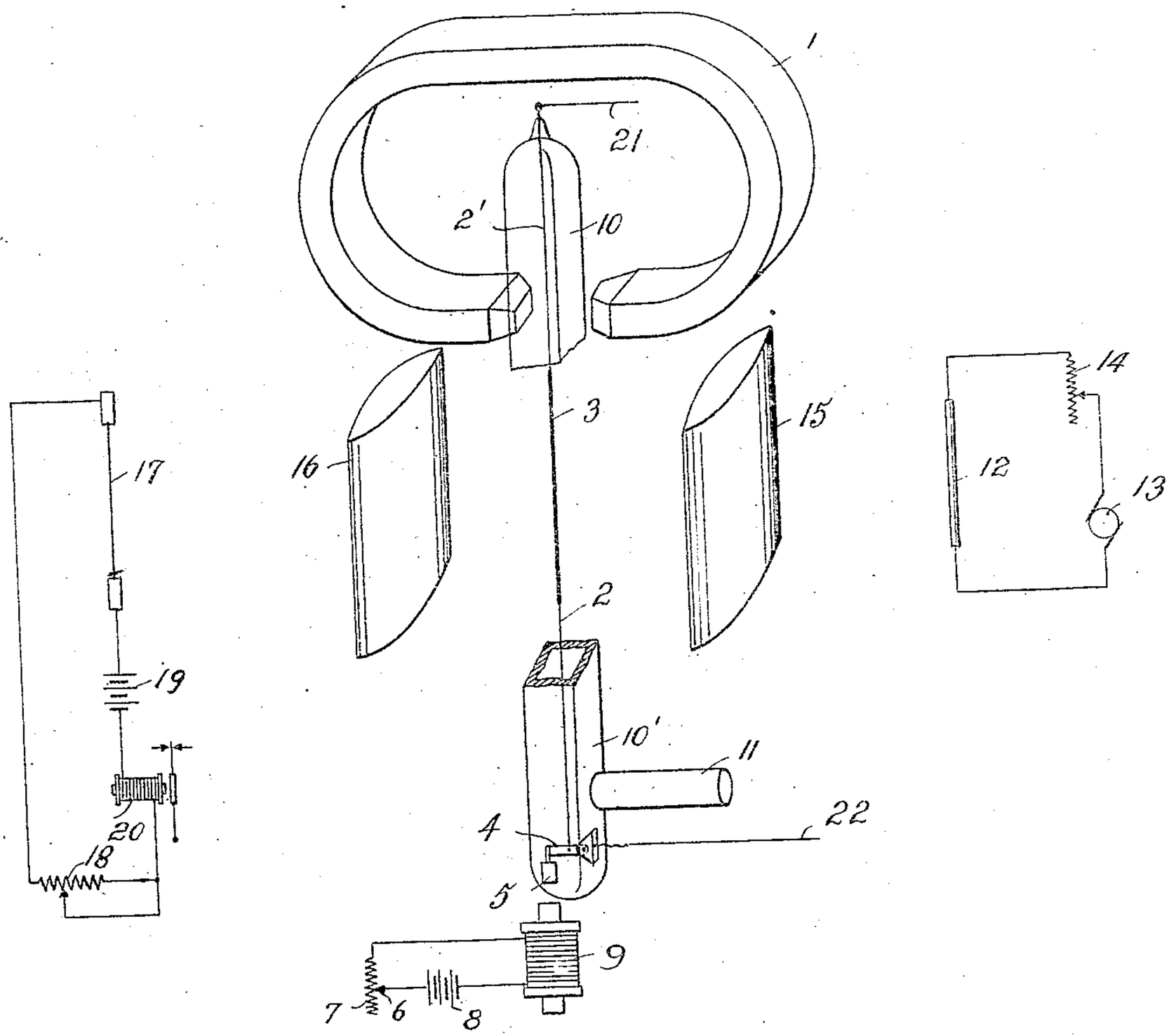
979,145.

Patented Dec. 20, 1910.



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ELECTRICAL SIGNALING.

979,145. Specification of Letters Patent. Patented Dec. 20, 1910.

Application filed December 23, 1907. No. 407,748.

To all whom it may concern:

Be it known that I, REGINALD A. FESSENDEN, a citizen of the United States, residing at Brant Rock, in the county of Plymouth, State of Massachusetts, have invented certain new and useful Improvements in Electrical Signaling, of which improvements the following is a specification.

My invention relates to apparatus for receiving electric signals and more particularly to means for amplifying the strength of received signals.

In the accompanying drawings forming a part of this specification the figure shows an arrangement of the apparatus suitable for carrying out the invention.

The invention herein described has for its object the more efficient receipt of electric signals and the amplification of received signals and the elimination of disturbing influences.

In the practice of my invention I employ a single wire D'Arsonval galvanometer of the type described by me at the American Association for the Advancement of Science meeting of 1894 and illustrated in U. S. Patent 706,737 Figure 2, and cause this galvanometer to alter the resistance of a local circuit.

In the figure, 1 is an electro-magnet shown for convenience diagrammatically, but in practice having its pole pieces extending over the greater part of the conducting filament 2, 2′, so that this filament is in an intense magnetic field. To the middle of the filament is attached a somewhat thicker wire of aluminum 3, for the double purpose of giving a wider shadow and of making the filament vibrate at a more definite rate. The lower end of the filament is attached to a small lever 4 carrying a small piece of iron 5 and so arranged that by adjusting the sliding contact 6 of the resistance 7, and so altering the current from the local battery 8, and the strength of the magnet 9, the filament is put under more or less tension and thereby its natural frequency of vibration is adjusted.

The filament and the lever referred to are inclosed in a glass tube 10, 10′ from which leads an offset tube 11 so that the air in the glass tube 10, 10′ may be pumped out.

12 is a moderately thick wire of platinum iridium or the filament of a Nernst lamp, excited by the dynamo 13 and regulated by the adjustable resistance 14.

15 and 16 are cylindrical lenses, for focusing the radiant heat produced by the heated filament 12 on the bolometer wire 17, in such a way that when the wire 3 is in its normal position the bolometer wire 17 is in its shadow, but when the wire 3 is shifted to one side the radiant heat falls on the bolometer wire 17. The bolometer wire 17 is in a circuit comprising the adjustable resistance 18, local battery 19 and a very sensitive telephone, galvanometer relay, or relay 20 as shown.

The conductors 21, 22 lead in the current to be detected.

In operation the wire 3 being in its normal position the bolometer wire 17 has a definite resistance. On the wire 3 being moved to one side or set in vibratory motion the radiant heat from the filament 12 falls on the bolometer wire 17 and changes its resistance, thereby actuating the sensitive relay 20 and producing an indication.

The natural period of the filament 10, 10′ is preferably adjusted by means of the variable resistance 7, so that it is identical with that of the received impulses.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is the following:

1. In a system of signaling, a galvanometer, adapted to produce a motion on receipt of the signals to be detected, a source of radiant heat, a bolometer circuit, and means for focusing the radiant heat so that the movement of the galvanometer determines the amount of said radiant heat falling on the bolometer.

2. In apparatus for signaling, the combination of a galvanometer adapted to produce a motion on receipt of the signals to be detected, a source of radiant heat, a bolometer circuit comprising a wire whose resistance alters on being exposed to radiant

heat, and means for focusing the radiant heat so that the shadow of the moving part of the galvanometer is thrown on or off from the bolometer on the receipt of the signals to be detected.

3. An electrical indicating instrument comprising a galvanometer whose movable part is in the form of a string and means to maintain the string *in vacuo*.

4. An indicating instrument comprising a galvanometer having its movable part in the form of a string, devices for giving the string a pronounced natural period of vibration, and electromagnetic means for adjusting said natural period of vibration.

In testimony whereof I have hereunder signed my name in the presence of the subscribed witnesses.

REGINALD A. FESSENDEN.

Witnesses:

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