

No. 787,089.

PATENTED APR. 11, 1905.

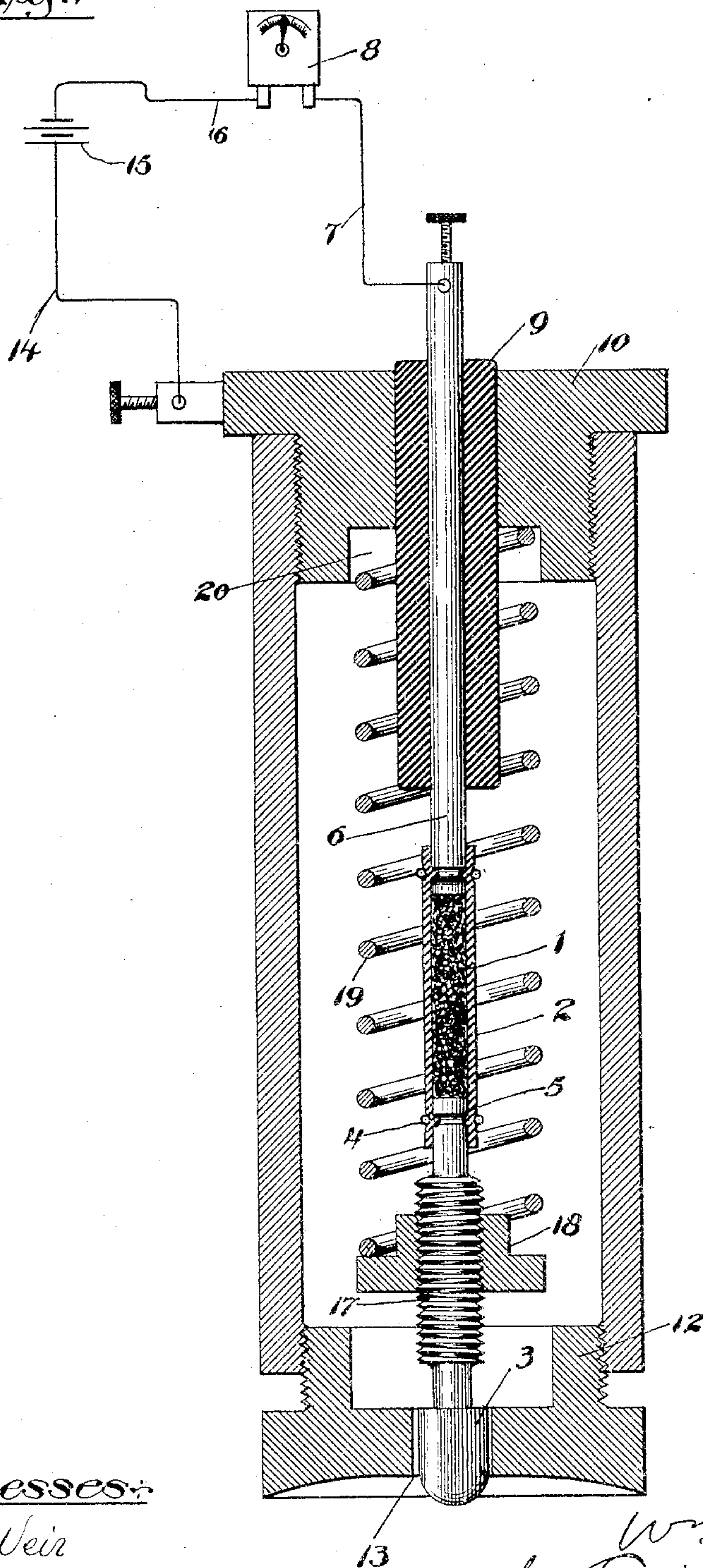
W. H. FAHRNEY.

VARIABLE RESISTANCE OR CONDUCTOR FOR ELECTRIC CURRENTS.

APPLICATION FILED JAN. 10, 1903.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses:

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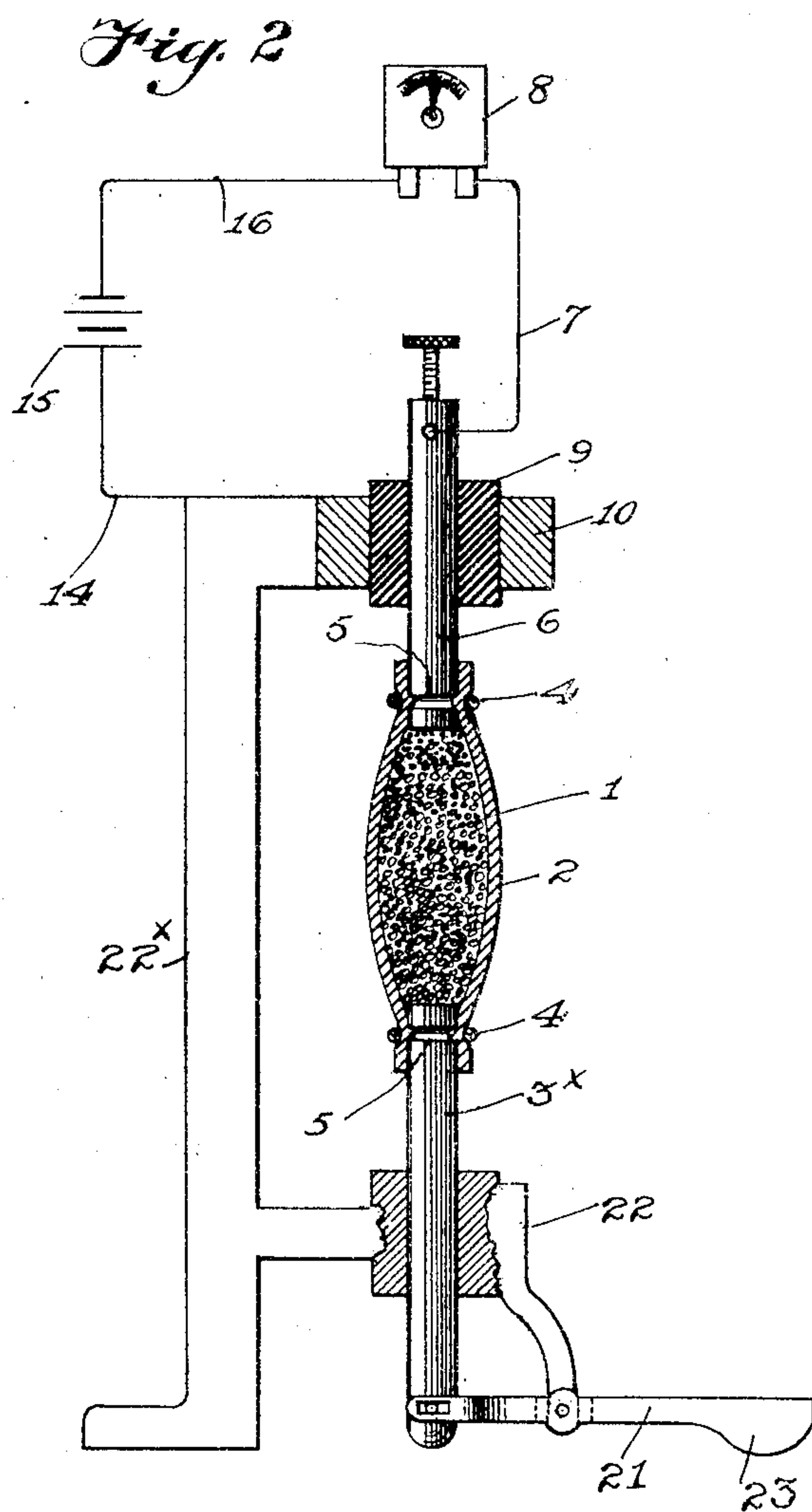
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2 SHEETS—SHEET 2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WILLIAM HENRY FAHRNEY, OF CHICAGO, ILLINOIS.

VARIABLE RESISTANCE OR CONDUCTOR FOR ELECTRIC CURRENTS.

SPECIFICATION forming part of Letters Patent No. 787,089, dated April 11, 1905.

Application filed January 10, 1903. Serial No. 138,465.

*To all whom it may concern:*

Be it known that I, WILLIAM HENRY FAHRNEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Variable Resistances or Conductors for Electric Currents, of which the following is a full, clear, and exact specification.

My invention relates to that class of variable resistances or conductors more especially adapted for producing undulations in an electric current in concert with some initial mechanical vibration or any other vibration; and the invention has for its primary object to provide an improved, simple, and highly-sensitive device of this character.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said object and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is an illustration of my invention in connection with a sphygmograph, as an example of one of the uses with which it is susceptible, and in which the sphygmograph is shown in longitudinal section, while the circuit, battery, and indicator are illustrated diagrammatically; and Fig. 2 is a modification thereof.

My invention consists of a mass of particles 1 of conducting material and a suitable holder 2. The mass 1 is composed, preferably, of powdered or comminuted plumbago; but any other suitable conducting material, such as finely-divided carbon, may be employed, and the holder 2 is preferably flexible and compressible and composed of india-rubber, it being conveniently constructed of a short section of ordinary rubber tubing. It will of course be understood that an electric circuit traversing the particles 1 will vary in strength as the compactness of said particles varies, and hence in applying my invention to an electric circuit for indicating electrically any mechanical or other vibration the particles 1 should be so interposed in the circuit as to receive such mechanical vibration.

In the example shown in the drawings, 3 is a plunger which is adapted to be pressed at one end against a person's wrist for receiving the heart's pulsations, while the other end is inserted within the tube 2 and is secured thereto by a wrapping of cord 4 around the end of plunger, which is grooved, as shown at 5, and which projects into intimate contact with the particles 1. The upper end of the tube 2 is inserted over the lower end of a rod 6, which also presses against the particles 1 and is connected by conductor 7 to one pole of any suitable indicator 8 capable of manifesting any variation in the strength of the electric circuit. The rod or support 6 is secured in an insulating-sleeve 9, which is in turn secured in the head 10, forming one end of a casing whose body portion is constituted by a cylinder 11, screwed or secured thereto at its upper end and carrying at its lower end a plug 12, which is adjustably screwed therein and constitutes a gage or support for the device while the plunger 3 is resting against the wrist, the plunger being passed through a suitable aperture 13 in the plug 12. The head 10 is connected by conductor 14 to one pole of battery 15, whose other pole is connected by conductor 16 to the indicator 8. The plunger 3 is threaded, as shown at 17, and carries an adjustable flanged nut 18, which forms a support for the lower end of a spring 19, whose upper end bears in a recess 20 in the head 10, and thus presses plunger 3 outwardly, while also constituting electrical communication between the upper end of plunger 3, where it contacts with particles 1, and the head 10. The sphygmograph described and shown in this application, however, is not claimed herein, inasmuch as the same constitutes the subject-matter of the claims in a copending application.

In the modified form shown in Fig. 2 the construction is such as to enable the pulsation which is to be measured or indicated to stretch the tube 2, and thereby lessen the density of the mass of particles 1, while the tube itself contracts, and thereby compresses the mass of particles or increases their density. In this instance the mass of particles is compressed into the tube as much as practicable

and the ends of the tube then pulled over and secured to the support 6 and member or plunger 3<sup>x</sup>. Hence when the plunger 3<sup>x</sup> is pulled downward the tube is elongated and the density of the mass decreased. To accomplish this downward pull, the plunger 3<sup>x</sup> is shown as pivoted to one end of a lever 21, which is pivotally secured to the frame 22 and has its other end provided with a button 23, adapting it to be pressed against the pulse, for example, or for receiving vibration from any other source. The circuit is completed between conductor 14 and plunger 3<sup>x</sup> through frame member 22<sup>x</sup> or any other connection. Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is--

1. In a variable resistance or conductor for electric currents the combination of a compressible elastic tube, a mass of particles of

conducting material filling said tube, an electric circuit having its terminals electrically connected with said mass, means for compressing said tube and a spring for retracting said tube, substantially as set forth.

2. In a variable resistance or conductor the combination of an elastic tube, a mass of particles of conducting material filling said tube, an electric circuit having one terminal electrically connected with the particles in one end of said tube, a plug electrically connected with the particles in the other end of said tube and secured to said tube, a shoulder on said plug, and a spring held against movement at one end and surrounding said tube and bearing against said shoulder.

WILLIAM HENRY FAHRNEY.

Witnesses:

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