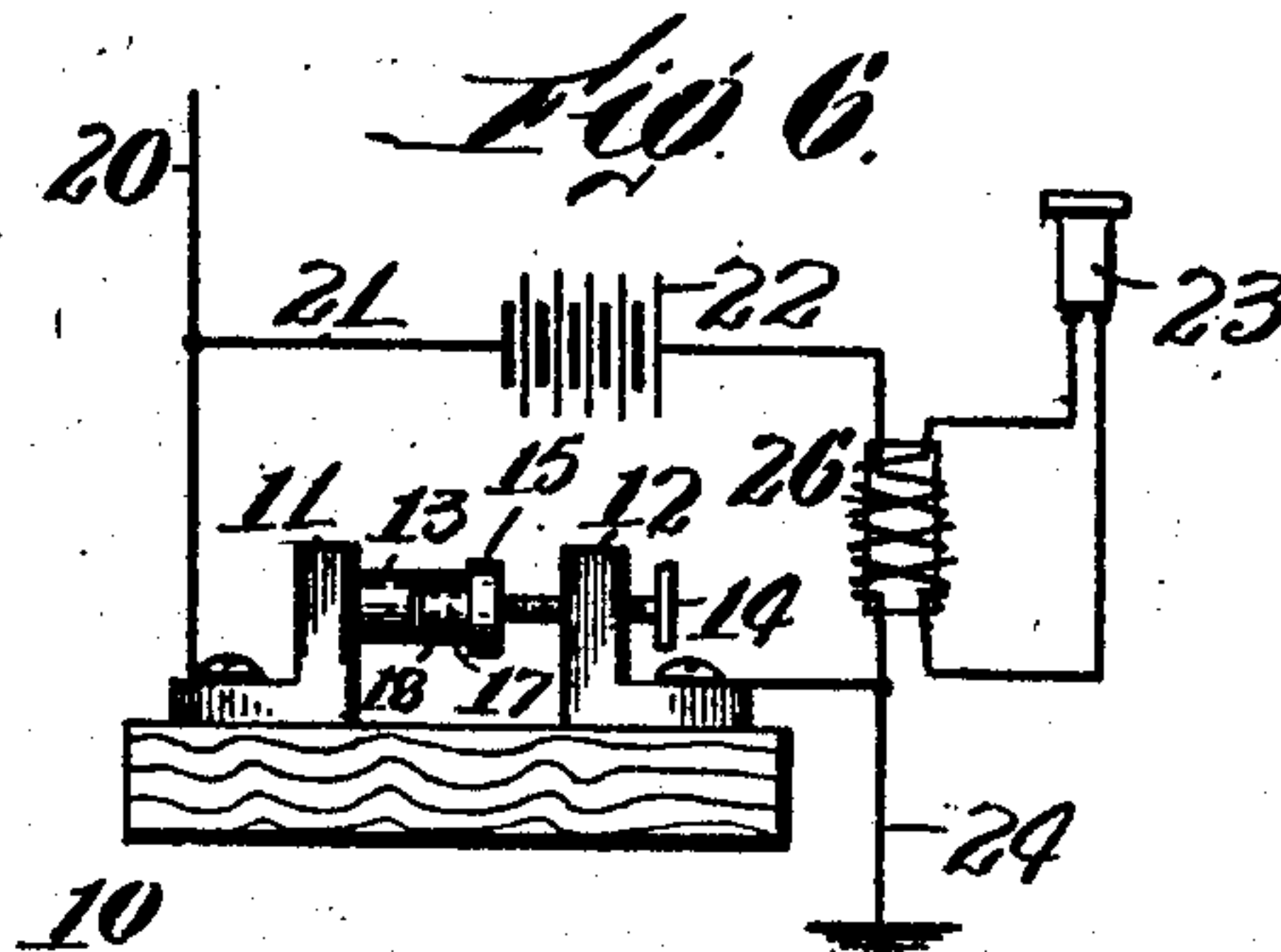
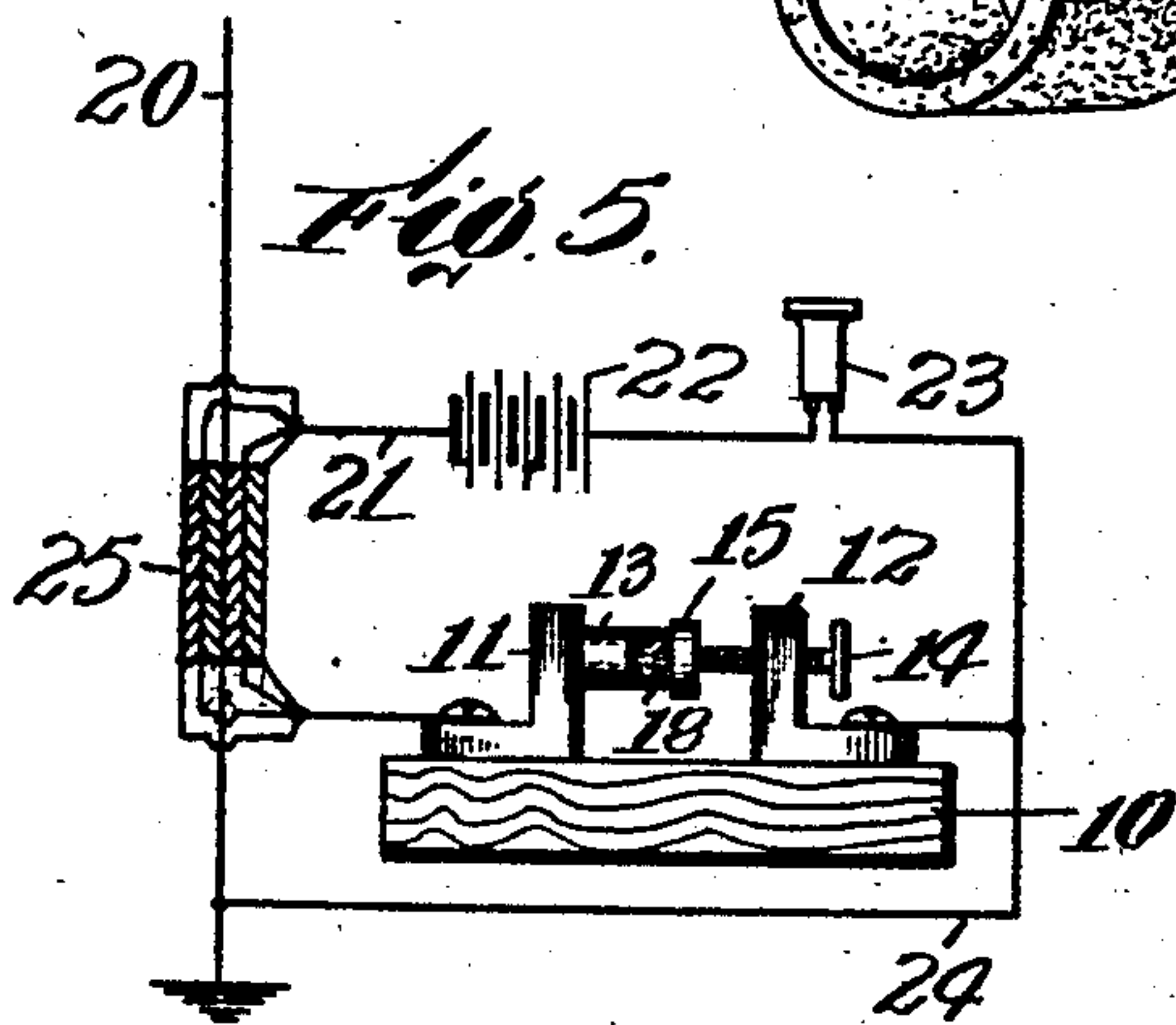
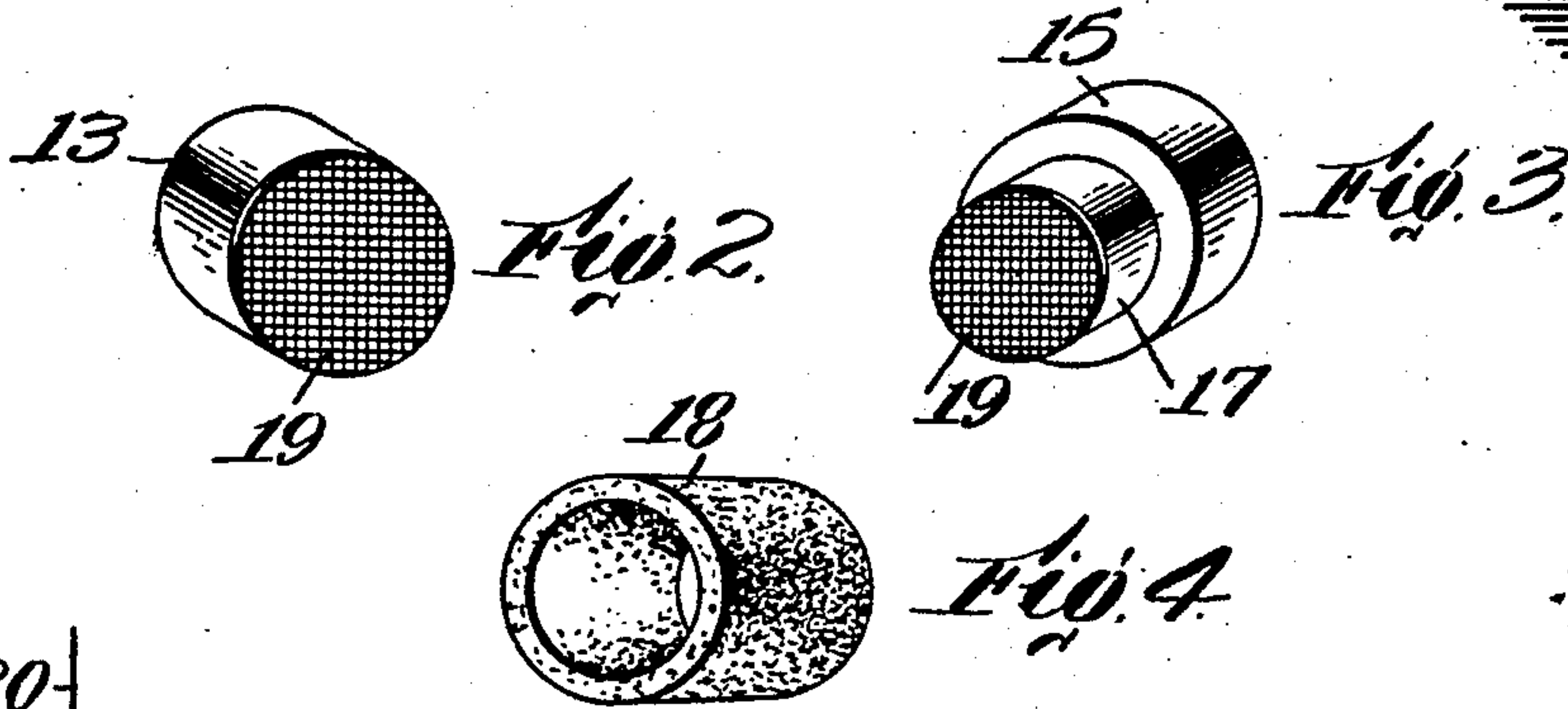
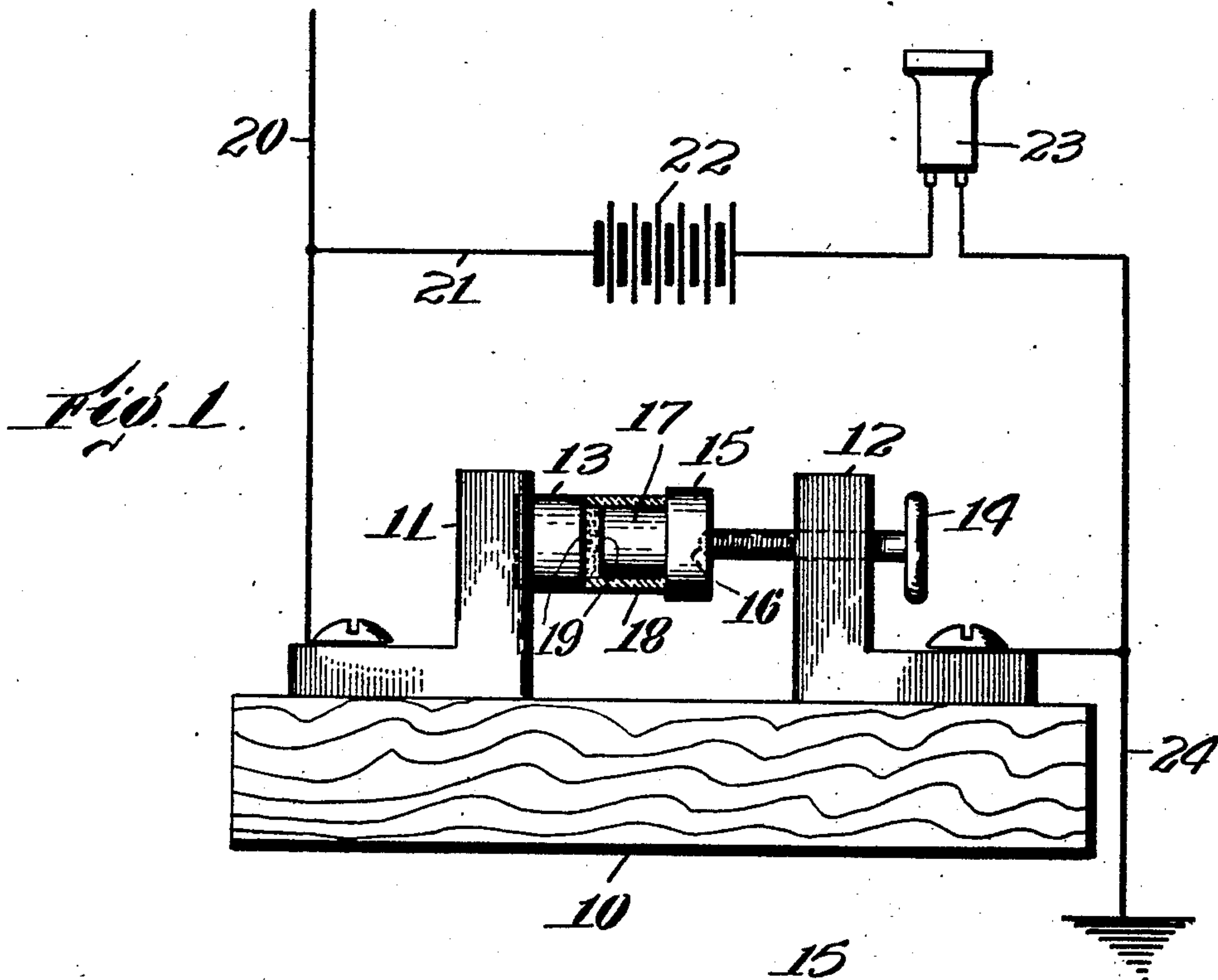


No. 883,241.

PATENTED MAR. 31, 1908.

F. G. SARGENT.
WIRELESS RECEIVING INSTRUMENT.

APPLICATION FILED MAY 22, 1907.



Witnesses:

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UNITED STATES PATENT OFFICE.

FREDERICK G. SARGENT, OF WESTFORD, MASSACHUSETTS.

WIRELESS RECEIVING INSTRUMENT.

No. 883,241.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed May 22, 1907. Serial No. 375,124.

To all whom it may concern:

Be it known that I, FREDERICK G. SARGENT, a citizen of the United States, residing at Westford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Wireless Receiving Instrument, of which the following is a specification.

This invention relates to a receiving instrument and certain connections therewith for use with the systems of transmitting intelligence by the Hertz waves.

The principal objects of the invention are to provide an improved form of coherer of such a nature that the difficulty which has been experienced in the existing types of coherers, of providing means for de-cohering the powdered particles, will be entirely or substantially avoided; also to provide an improved form and combination of materials for the electrodes of the coherer, an improved cohering composition, and improved means for connecting the receiving circuit with the main wire.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings which show certain forms in which the invention may be embodied and in which,

Figure 1 is a side elevation of a coherer and certain connections showing parts in section. Figs. 2, 3 and 4 are perspective views of three of the elements of the coherer. Fig. 5 is a view similar to Fig. 1 on a smaller scale showing a different way of connecting the parts, and Fig. 6 is a similar view showing further modifications.

In its preferred form the instrument is mounted on a non-conducting base 10 which is provided with a pair of metallic brackets 11 and 12. On the bracket 11 is a disk 13 which is preferably formed of carbon and may be made wholly or in part of graphite or plumbago mixed if desired with amorphous carbon or of the latter alone. This disk constitutes one electrode of the coherer.

On the other bracket 12 is mounted an adjusting screw 14 which engages a second electrode 15 made of metal, preferably steel. This electrode has a depression 16 into which the end of the screw 14 engages so as to properly center the same and hold it in proper position with respect to the disk 13. It will be observed that the two electrodes

are formed of materials of different conductivity, one of them preferably being metallic and the other non-metallic.

The electrode 15 is provided with a reduced projection 17, the face of which constitutes the active surface of this electrode. In order to form the coherer, a tube or cylinder 18 of non-metallic material, preferably rubber, is placed over the projection 17 and held in position by its contact therewith. It extends beyond the active face of this electrode a short distance which is exaggerated in the drawing but which in practice may be only about one-sixteenth of an inch, and is brought into contact with the active face of the disk 13. The space formed between the active faces of the two electrodes is the chamber of the coherer in which is located the cohering material when used. This cohering material is of finely divided particles preferably a mixture of two substances having different degrees of electrical conductivity, so that the particles will not be acted upon with entire uniformity when caused to cohere, which assists de-cohering. There may be several of these substances but one of them, at least, is preferably a metal and another a non-metal. I prefer to use zinc filings for the metallic ingredients and granulated amorphous carbon for the non-metallic ingredient but I find that emery and powdered glass may be substituted for, or added to, the carbon, while finely divided nickel may take the place of the zinc or used in connection with it. Other metallic or non-metallic materials may of course be added. I find moreover, that it is not absolutely necessary to use any cohering substances at all in this chamber. As shown in Fig. 6, the active faces of the two electrodes may be brought near together at a distance say of about one-thirty-second of an inch, and being resiliently held apart by the rubber tube 18, may be adjusted by the screw 14 to such a position that the two faces of the electrodes barely touch. I find that this construction gives very good results and as the rubber acts to move the electrodes apart, after they have moved together by the action of the Hertz waves, it will be seen that the troubles due to the difficulty of decohering are avoided in this construction. When the finely divided particles are used as a covering substance, however, I find that the same results can be

obtained by the use of means on the faces of the electrodes whereby the particles are in contact with their surfaces only at isolated points. This is preferably done by the use of a series of non-conducting protuberances interspersed throughout the active face of the electrodes separated from each other sufficiently to permit the particles to touch the faces of the electrodes at certain points. This is accomplished in a convenient way by the use of a fabric 19 on the face of one electrode or both. The fabric may be cloth and therefore a non-conductor and if it is made of wire I have found that very good results can be obtained as the particles are then not in as intimate contact with the faces of the electrodes as they would be if the fabric were removed.

A coherer constructed in accordance with the above mentioned principles may be connected up in an ordinary way as shown in Fig. 1, by connecting the main wire 20 with a conductor 21 having a battery 22 connected in series therewith and a telephone receiver 23, this conductor being connected with one of the brackets and the wire 20 with the other and the system being grounded by a conductor 24. I prefer, however, to pass the wire 20 through a bundle of wires 25. This bundle of wires consists of a plurality of wires insulated from each other throughout their lengths but having their ends electrically connected so that the bundle of wires can be connected in series with the conductor 21. In this case the main wire 20 is not connected with one of the brackets but is taken directly to the ground. It is obvious that this construction can be applied to either a single wire 20 or a plurality of similar wires and that the bundle of wires 25 can be wound around the wires 20 or placed parallel therewith. They receive an induced current from the wire 20 and operate the device in an effective manner.

In the form of the invention shown in Fig. 6, I have shown the wire 20 connected with the wire 21 as usual, but with an induction coil 26 in series with the wire 21 having the secondary thereof connected with the receiver 23. Of course, it will be understood that the connections of the system may be varied in any manner, as by the substitution for the telephone, of a sounder or a relay, or a relay to work a sounder.

While I have illustrated and described certain forms in which the invention may be embodied, I am aware that many modifications may be made therein by any person skilled in this art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the constructions shown, but

What I do claim and desire to secure by Letters-Patent is:—

1. A coherer for a receiving instrument of

the class described, comprising a loose, dry mechanical mixture of fine particles of zinc and carbon.

2. A receiving instrument of the class described, having a coherer comprising two electrodes of different conductivity, and a dry mechanical mixture of zinc filings and granulated carbon between said electrodes.

3. A receiving instrument of the class described, having a coherer comprising a steel electrode, a carbon electrode, and a loose dry mechanical mixture of zinc filings and carbon between said electrodes.

4. A coherer having a carbon electrode, and a steel electrode, said electrodes having their active surfaces provided with a series of non-conducting protuberances.

5. A coherer, the active surface of an electrode of which is provided with numerous small nonconducting protuberances interspersed throughout said active surface.

6. A coherer having means whereby the particles forming the cohering material may be brought into contact with small surfaces of the electrodes, said small surfaces being interspersed throughout the whole active surface of each electrode and separated from each other.

7. A coherer having the active surfaces of its electrodes covered with a non-conducting fabric whereby the particles forming the cohering substances will come into electrical contact with said surfaces at isolated points only.

8. A coherer having a cloth gauze covering on the active surface of an electrode thereof.

9. In a coherer, the combination of two electrodes, one of which is metallic and other carbonaceous, having a chamber between them, a non-conducting fabric located on the active face of each of said electrodes, and a body of finely divided material located in said chamber.

10. In a coherer, the combination of a carbon disk, a steel plug having a reduced projection, a non-conducting cylinder mounted on said projection and extending to the face of the disk, a fabric located on the face of said projection, a fabric located on the face of said disk, and a finely divided material located within said cylinder in contact with both pieces of fabric.

11. In a coherer, the combination of a non-metallic disk, a metallic plug, an elastic soft rubber tube or cylinder surrounding said plug and engaging said disk to yieldingly hold it from the plug, and means for adjusting the plug toward and from the disk.

12. In a coherer, the combination of two electrodes, a soft elastic non-conducting tube or cylinder supported by one of said electrodes, engaging the other and yieldingly holding them apart, and means for adjusting one of the electrodes toward and from the other.

13. In a coherer, the combination of a flat
faced disk, a plug, and a non-conducting
tube placed between them and adapted to
resiliently hold them apart, whereby said
5 disk and plug constitute the electrodes of the
coherer.

14. In a coherer, the combination of a flat
faced disk, a plug, a non-conducting tube
placed between them and adapted to resili-
10 ently hold them apart, whereby said disk
and plug constitute the electrodes of the co-
herer, and means for adjusting the plug to-
ward and from the disk.

15. In a coherer, the combination of a
disk, a plug, a non-conducting cylinder sup-
ported by said plug and yieldingly holding

the disk from the plug, finely divided coher-
ing material in said cylinder in contact with
the plug and disk, a conducting bracket for
supporting said disk, a second conducting 20
bracket, and an adjusting screw supported
by the second conducting bracket and engag-
ing the plug to adjust the same and electric-
ally connect it with the second bracket.

In testimony whereof I have hereunto set 25
my hand, in the presence of two subscribing
witnesses.

FREDERICK G. SARGENT.

Witnesses:

ARTHUR E. DAY,
CHAS. G. SARGENT.