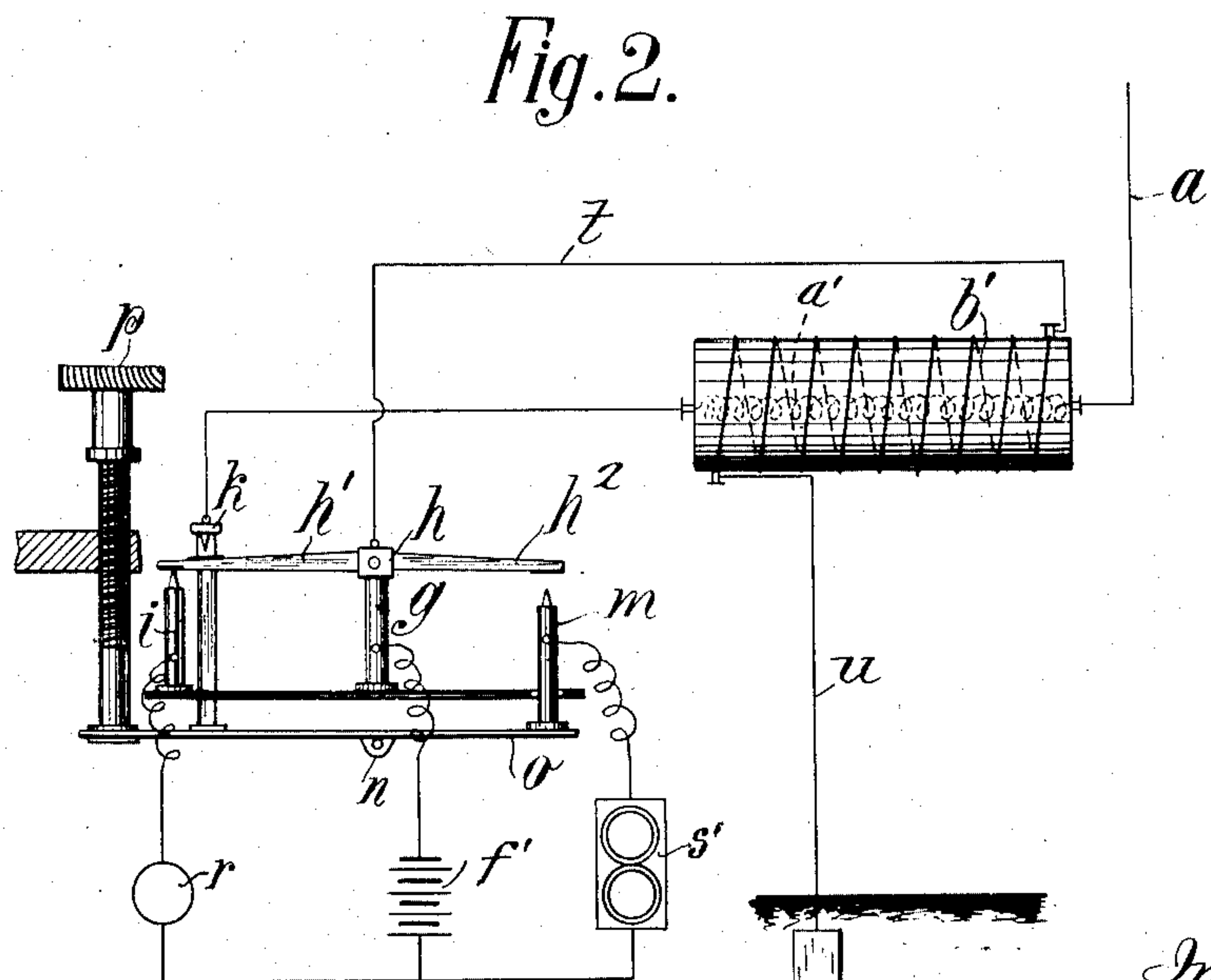
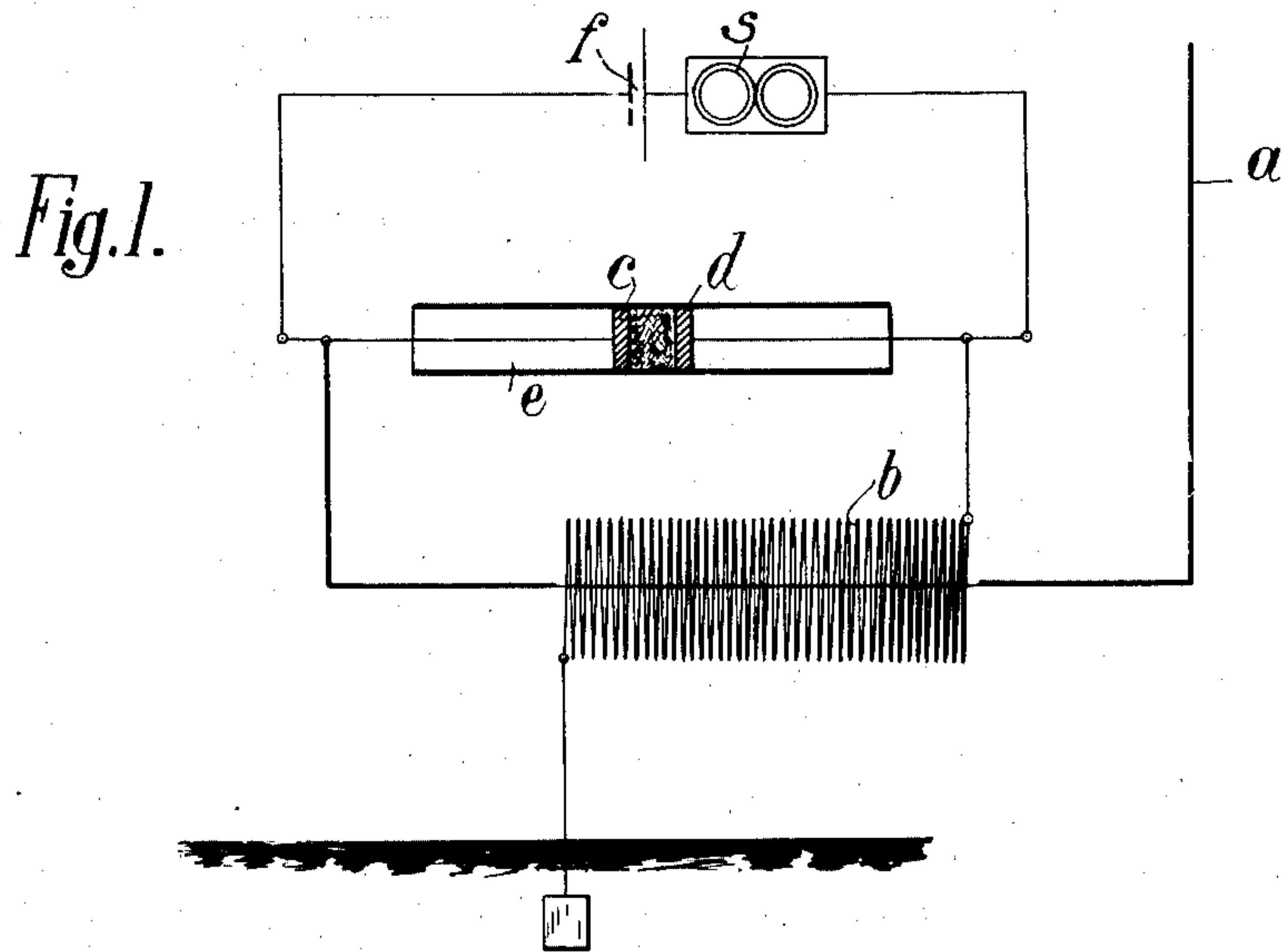


G. JAHR.  
RECEIVER ARRANGEMENT FOR WIRELESS TELEGRAPHY.  
APPLICATION FILED JUNE 12, 1907.

905,537.

Patented Dec. 1, 1908.



Witnesses

Chas. H. Smith  
A. G. Serrill

Inventor

Gerhard Jahr.  
per Harold Serrill

his atty.



# UNITED STATES PATENT OFFICE.

GERHARD JAHR, OF BERLIN, GERMANY.

## RECEIVER ARRANGEMENT FOR WIRELESS TELEGRAPHY.

No. 905,537.

Specification of Letters Patent.

Patented Dec. 1, 1908.

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*To all whom it may concern:*

Be it known that I, GERHARD JAHR, a subject of the King of Prussia, residing at Turmstrasse 47, Berlin, Germany, have invented certain new and useful Improvements in the Receiver Arrangement for Wireless Telegraphy; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The subject matter of the present application is a receiver-arrangement for wireless telegraphy the essential feature of which consists in the antenna not being earthed but being led through a coil of wire and being connected with one pole of the coherer or another receiving apparatus; the end of the coil at which the antenna enters into the interior of the coil being connected with the other pole of the coherer while the other end of the coil is earthed. The coherer serves in the wellknown manner for closing a local circuit containing the recording apparatus. By using the coil it is possible for the coherer to work even when the electric waves are very feeble. The sensibility is still further increased if the part of the antenna which is inside the coil or the coil consists of very thin wire and is wound in the form of a helix.

Instead of the ordinary coherer which always requires a separate tapping device for the purpose of doing away with the connection formed by the coherence of the particles in the coherer a device may be employed which serves to open and close a circuit by means of the action of static electricity and the essential features of which consist in the surface of the part of the device which is to be charged being very small, for example consisting only of a small metal pin or pencil, and also in that this part of the device which is to be charged is not in electrical connection with any other conductive bodies but its conductor and that the device is capable of being adjusted readily and quickly in correspondence with the strength of the waves employed at the time.

By means of this contrivance it is possible to make the receiver work with certainty

even in the case of very weak electric waves in cases in which other such like apparatus does not work. In comparison with the ordinary coherer the apparatus possesses the advantage that no separate device is necessary for the purpose of bringing about decoherence.

In devising this apparatus account has been taken of the fact that the parts to be charged by the electric waves and discharged must be limited in size as much as possible and that the capacity of the parts to be charged must not be increased by connecting them with parts which conduct or collect static electricity, as for example, local batteries, recording apparatus and so on, as is the case in other such like apparatus the result of which is that it is impossible for them to perform their functions when the electric waves are feeble.

The invention is illustrated in the accompanying drawings in which

Figure 1 shows the device and connections when an ordinary coherer is used and Fig. 2 the connections when instead of the coherer another receiver is used forming also part of the invention.

Referring to Fig. 1 the antenna *a* is led through a coil of wire *b* and is connected with the terminal *c* of the coherer *e*. The coil *b* is not electrically connected with the antenna. That end of the coil at which the antenna enters said coil is connected with the other terminal *d* of the coherer *e* while the other end of the coil *b* is earthed. The electrodes of the coherer *e* are moreover connected with the poles of a local battery *f* the circuit of which contains the recording apparatus *s* and is closed in the well-known manner by said coherer when electrical waves reach it.

In order to increase the sensitiveness that part of the antenna which is in the interior of the coil *b* may be made out of very thin wire and be arranged in the form of a helix *a*<sup>1</sup> as shown in Fig. 2.

The receiver in this form of the invention preferably consists of a two-armed lever *h* pivotally mounted on the pillar *g*, the one arm *h*<sup>1</sup> of which lever in its position of rest rests on the fixed contact *i*, and above the arm *h*<sup>1</sup> an adjustable contact *k* is arranged against which the arm *h*<sup>1</sup> rests when on the arrival of electrical waves the lever is oscillated. As a result of this oscillation the



other arm  $h^2$  of the lever  $h$  comes into contact with a third adjustable contact  $m$  so that a local circuit is closed. The contacts  $k$  and  $m$  are arranged on a plate  $o$  which is pivoted at  $n$  and which with the aid of a suitable device for example by means of a set screw  $p$  can be turned so that the distance of the contacts  $k$  and  $m$  from the lever can be increased or decreased according to the strength of the waves employed.

The contact  $k$  is connected with the antenna  $a$ . The lever  $h$  in consequence of gravitation normally rests with its arm  $h^1$  on the fixed contact  $i$  and so closes a local circuit through  $i$   $h^1$  and  $g$ . The lever  $h$  is connected to earth by means of the conductor  $t$ , coil  $b^1$  and conductor  $u$ . This circuit  $i$   $h^1$   $g$  only serves for testing by means of a circuit indicator  $r$ , whether the receiver is in good condition or not. On the arrival of electrical waves the lever  $h$  is oscillated in virtue of which the arm  $h^1$  is brought into contact with the charged contact  $k$  and the arm  $h^2$  with the contact  $m$  so that a local circuit is closed through  $g$   $h$   $h^2$  and  $m$  while the circuit through  $i$   $h^1$  and  $g$  is broken. After  $k$  has been discharged the lever  $h$  drops back again into its position of rest the local circuit  $g$   $h^2$  and  $m$  being broken. In this local circuit the recording apparatus  $s^1$  is arranged in the well-known manner with local battery  $f^1$ .

The advantages of the present apparatus consist in the receiver working even when the waves are very weak as the capacity of  $k$  is very small and consequently requires only an extremely small amount of static electricity to charge it and a tapper for doing away with the connection produced by the waves is not necessary in the case of the arrangement shown in Fig. 2. Moreover the apparatus can be readily and quickly adjusted in correspondence with the strength of the waves employed. The apparatus may also be used with advantage in cable-telegraphy particularly in cases in which very long conductors are used and the signals or signs are indicated by means of alternating current or induced current.

The action of the hereinbefore described apparatus depends entirely upon the electrical principle of induction and experiment has demonstrated the fact that the apparatus is most efficient when the coil is approximately 40 millimeters in diameter and 120 millimeters in length.

I claim as my invention:

1. Receiving means for wireless telegraphy comprising in combination a coil of wire, a receiving device, terminals therefor, an antenna passing through said coil, connected with one terminal of said receiving device, a conductor connecting that end of said coil at which said antenna enters into the same with the other terminal of said receiving

device and a conductor connecting the other end of said coil to earth.

2. Receiving means for wireless telegraphy comprising in combination a coil, a receiving device, having parts of small capacity which are to be charged by static electricity and discharged, terminals for said receiving device, an antenna passing through said coil and connected with one terminal of said receiving device, a conductor connecting that end of said coil at which said antenna enters into the same with the other terminal of said receiving device, and a conductor connecting the other end of said coil to earth.

3. Receiving means for wireless telegraphy comprising in combination a coil, a receiving device, terminals therefor, an antenna, a very thin wire wound in the form of a helix within said coil, connected with said antenna and with one terminal of said receiving device, a conductor connecting that end of said coil at which said antenna enters into the same with the other terminal of said receiving device and a conductor connecting the other end of said coil to earth.

4. Receiving means for wireless telegraphy comprising in combination a coil, a receiver having a local circuit, adjustable terminals therefor, means connected with one of said terminals adapted to contact the other terminal under the action of electrical waves and to simultaneously close said local circuit and to return to its normal position under the action of gravity, an antenna passing through said coil connected with one of said terminals, a conductor connecting that end of said coil at which said antenna enters into the same with the other terminal of said receiver and a conductor connecting the other end of said coil to earth.

5. Receiving means for wireless telegraphy comprising in combination a coil, a receiver having a local circuit, adjustable terminals therefor, a lever connected with one of said terminals adapted to contact the other terminal under the action of electrical waves and to simultaneously close said local circuit and to return to its normal position under the action of gravity, an antenna passing through said coil connected with one of said coils at which said antenna enters into the same with the other terminal of said receiver, and a conductor connecting the other end of said coil to earth.

6. Receiving means for wireless telegraphy comprising in combination a coil, a receiver, a fixed contact  $i$  therefor, a pillar  $g$ , a revoluble two-armed lever  $h^1$   $h^2$  mounted thereon and normally bearing against said fixed contact, a pivoted plate  $o$ , two adjustable contacts  $k$   $m$  thereon and adapted to be contacted by said lever, a local circuit connected with said pillar and said fixed contact  $i$ , a local circuit adapted for recording apparatus connected with said pillar and said

adjustable contact *m*, an antenna passing  
through said coil connected with said contact  
*k*, a conductor connecting that end of said  
coil at which said antenna enters into the  
5 same with said pillar and a conductor con-  
necting the other end of said coil to earth.

In testimony whereof I have signed my

name to this specification, in the presence of  
two subscribing witnesses.

GERHARD JAHR.

Witnesses:

JOHANNES HEIN,  
HENRY HASPER.