N° 21,653 A.D. 1903

Date of Application, 8th Oct., 1903—Accepted, 14th Jan., 1904

COMPLETE SPECIFICATION.

"Improvements in Coherers for Wireless Signaling".

We, THOMAS EDWARD CLARK, of No. 71 Michigan Avenue, in the City of Detroit and State of Michigan, United States of America, Electrical Engineer, and the "THOS. E. CLARK WIRELESS TELEGRAPH-TELEPHONE CO.", a corporation located at No. 71 Michigan Avenue in said City of Detroit, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:

This invention relates to a coherer adapted for use in connection with a system of wireless telegraphy and signaling.

The objects of the invention are to provide simple and effective means for receiving the impulses or Hertzian waves capable of such adjustment as to insure the operation of the receiving apparatus by light or feeble impulses, and enabling the reproduction of said impulses in the signaling apparatus, at the same time providing for de-cohering the coherer after each impulse is received

A further object is to provide means whereby the coherer may be readily detached without disconnecting any of the circuit wires, and a second coherer quickly replaced in the receiving jaws so as to enable an exchange of coherers should one fail to operate, or to enable the introduction into a circuit of a coherer of different adjustment where the character of the impulse might require such a change.

The above objects are attained by the association and arrangement of parts illustrated in the accompanying drawing, in which:—

Fig. 1 is a sectional view through the parts of the coherer separated.

Fig. 2 is a diagrammatical view showing the coherer in a receiving circuit.

Fig. 3 is a perspective view of the base and contact jaws in which the coherer is mounted.

Fig. 4 is a transverse section through one of the jaws showing a contact terminal of the electrode therein.

Referring to the characters of reference, 1 designates a glass tube provided at its ends with hard rubber or ebony caps 2 which are sealed or cemented on the ends of said tube. The contact terminals 3 are provided with threaded ends 4 adapted to screw into the rubber caps 2, and with longitudinal openings 5 extending therethrough adapted to receive the stems of the electrodes 6 and 7 respectively, which pass through said contact terminals and enter the glass tube from opposite directions. Said electrodes may be formed of any suitable material, but are preferably made of phosphor bronze, and confine between their adjacent faces within the glass tube the metallic filings 8. The stem 9 of electrode 6 is threaded to enable it to be screwed through its contact terminal 5, whereby any desired adjustment of the electrode longitudinally within the glass tube may be accomplished. A lock nut 10 screws onto the stem of said electrode for the purpose of locking it after adjustment. The stem 11, of the electrode 7, is provided with a channel 12 running longitudinally therethrough and opening at its inner end into the interior of the glass tube, the outer opening 13, of said channel, enabling the air to be withdrawn from the glass tube therethrough so as to attain nearly a perfect vacuum within the tube. After the exhaustion of the air, a needle point valve 14 is screwed into

[Price 8d.]

the end of the stem of the electrode against the seat 15 in said channel, thereby closing the channel and maintaining the vacuum. The stem 11, of the electrode 7, is also externally threaded so that it may be screwed through its contact terminal to effect a perfect adjustment of the electrode, and after adjustment it is secured by the lock nut 16 thereon.

By reason of the adjustment of the electrodes, the distance between their adjacent faces within the glass tube may be regulated to increase or decrease the resistance across the filings occupying the space between them.

The contact terminals 5 are provided with flat sides as shown in Fig. 4, adapted to be received between the opposed contact jaws 17 at each end of the coherer mounted upon the hard rubber base 18. Connected electrically to said jaws are the binding posts 19 and 20. The aerials 21 at the receiving station are connected through their conductors 22 with said binding posts 19 and 20 respectively; also connected with said binding posts are the circuit wires 23 and 24 in which is included a battery 25 and a relay magnet 26. This circuit is normally opened at the coherer.

When an electrical impulse is received at the receiving station the wave train is taken up by the aerials and passed along the conductors 22 to the coherer. Operating to cohere the filings in the receiver and close the relay circuit between the electrodes. In said relay circuit may be placed any suitable instrument not shown for recording the pulsations. Upon the closing of the relay circuit, the armature 27 is attracted to close a point 28, the auxiliary circuit 29 including the battery 30 and the electrical tapper 31, the hammer 32 of which is operated to strike the end of the screw 14, in the stem of electrode 7, and decohere the filings, thereby opening the relay circuit as soon as the impulse is received.

It will now be understood that the impulses received through the aerials cause the closing of the relay circuit, and through said relay the closing of the auxiliary circuit operating the tapper to immediately open the relay circuit at the coherer, whereby the dots and dashes or other forms of signals sent, are reproduced in the receiving instrument.

A coherer of this character may be easily evacuated and perfectly sealed, and by means of the adjustable feature of the electrodes, the coherer may be regulated according to the tension or volume of the impulses.

By reason of the contact jaws 17 adapted to receive between them the contact terminals of the electrodes, a coherer may be readily slipped into said jaws to place it in circuit, and quickly and easily removed without detaching any of the conductors, making it possible to change coherers while a signal is being received without losing any material part of the message.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:

(1) In a coherer for wireless signaling, the combination with suitable receiving conductors, of a coherer comprising a tube of glass, or other non-conducting material, non-conducting caps fitted to close the ends of the tube, contact terminals fitting into said caps, electrodes having threaded stems screwed through said terminals, the inner ends of said electrodes standing opposed to each other within said tube, metallic filings occupying the space within the tube between said electrodes, contact jaws embracing said contact terminals and connected with a source of energy.

(2) In a coherer for wireless signaling, the combination with a receiving conductor, of a coherer connected electrically therewith, said coherer comprising a non-conducting tube, caps fitted to close the ends of said tube, electrodes passing from the tube through the caps, a relay circuit connected with said coherer, and an electrical tapper operated by said relay circuit adapted to strike directly upon the projecting end of one of said electrodes.

(3) A coherer for wireless signaling comprising a non-conducting tube, caps fitted to the end of said tube, contact terminals upon said caps, electrodes

screwed through said terminals, metal filings between the ends of the electrodes within said tube, the stem of one of the electrodes having a longitudinal channel therethrough communicating with the interior and exterior of the tube whereby air may be exhausted from the tube, and means for closing the channel in the electrode after the exhaustion of air.

(4) In a coherer, the combination of a suitable base, contact jaws mounted upon said base, having parallel contact faces, conductors connected electrically with said jaws, a relay circuit including therein, a source of electric energy, the terminals of said circuit being also connected electrically with said jaws, a coherer provided with suitable electrodes, tapped contact terminals through which said electrodes are screwed, said contact terminals having squared portions adapted to fit between the contact faces of the jaws, whereby the coherer may be placed in and removed from said jaws without disconnecting any of the circuit wires.

Dated this 8th day of October 1903.

ALLISON BROS.
Agents for the Applicants.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1924.

A.D. 1903. Oct. 8. Nº 21,653.

CLARK & *others'* Complete Specification.

(1 SHEET)

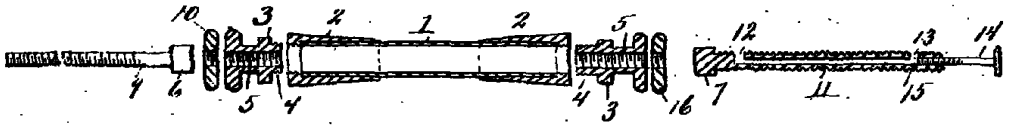

Fig. 1.

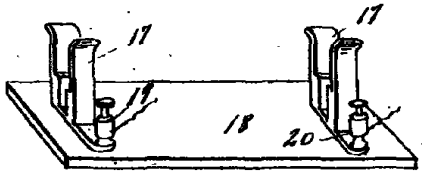

Fig. 3.

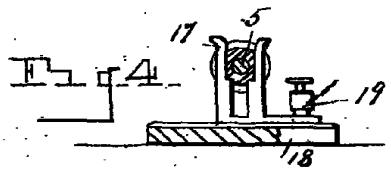

Fig. 4.

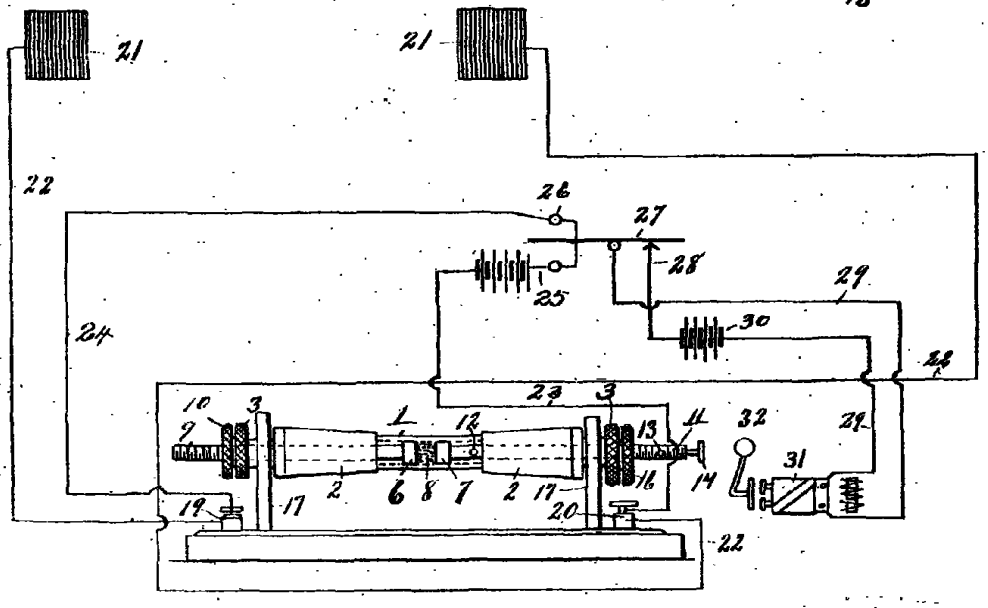

Fig. 2.

This Drawing is a reproduction of the Original on a reduced scale.

Malby&Sons, Photo-Litho.