

M. G. SJÖSTRÖM.
CRYSTAL DETECTOR FOR WIRELESS TELEGRAPHY.
APPLICATION FILED AUG. 17, 1916.

1,319,804.

Patented Oct. 28, 1919.

FIG. 1.

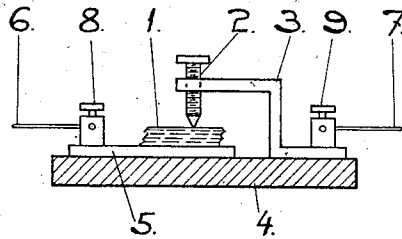


FIG. 2

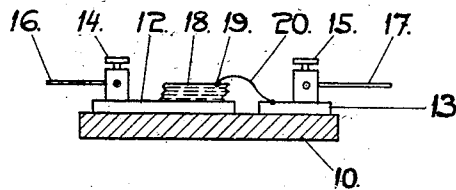
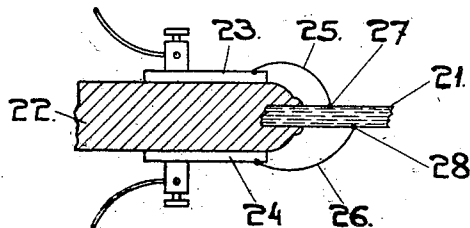


FIG. 3



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CRYSTAL DETECTOR FOR WIRELESS TELEGRAPHY.

1,319,804.

Specification of Letters Patent.

Patented Oct. 28, 1919.

Application filed August 17, 1916. Serial No. 115,501.

To all whom it may concern:

Be it known that I, MARTIN GEORG SJÖSTRÖM, subject of the King of Sweden, residing at Upsala, Sweden, have invented new and useful Improvements in Crystal Detectors for Wireless Telegraphy, of which the following is a specification.

In wireless telegraphy detectors are employed, which have for an object to make the currents of high frequency in the oscillating circuits of the receiving station perceptible. During the technical development of such detectors efforts have been made to construct a detector, which possesses a very high and simultaneously a very unchangeable sensibility. These efforts have led to the construction of the so called crystal detectors, in which a conducting pointed bar is pressed against the surface of a crystal piece, having a unipolar conducting power. Such detectors are very sensitive, they have however the inconvenience, that a very small displacement of the point of contact between the pointed bar and the crystal piece results in considerable changes of sensitiveness.

The inventor has found out the reason of this inconvenience of the said detectors and has found that in the surface of the crystal some spots have a positive action of transmitting the current in one direction only whereas other adjacent spots have a negative action of transmission, that is to say, the current is in the second case transmitted in an opposite direction to the direction of transmission in the first named case. Between the small spots within which said action of the one or other kind is very distinctly perceptible, other spots are present, within which such action is very feeble or is not at all perceptible. Such spots are called neutral. If now the whole surface or part of the surface of the crystal piece is brought in contact with a metallic conductor, and an alternating current is led through the surface of contact, the current will not be converted into a continuous current, as the current in the one direction passes the positive and neutral spots, and in the other direction will be distributed over the negative and neutral spots. It will thus be necessary for the purpose of obtaining a distinct transmission in one direction only to limit the contact to a spot,

having a powerful action of transmitting the current in one direction only.

According to the present invention the surfaces of contact are made very small and the contact is adjusted in such a manner, that it embraces the most sensitive spot or spots. A contact of this kind is called "effective," whereas the contact above described, having a large area, is called "neutral."

For further illustration of the invention reference is made to the accompanying drawing, in which Figure 1 is a side view of a detector of the type already known, whereas Fig. 2 is a side view partly in section of a detector according to the invention. Fig. 3 shows in side view partly in section a modified construction.

In Fig. 1 1 indicates a piece of a crystal and 2 a screw, the point of which is pressed against the crystal piece. The screw 2 is carried by a standard 3 of metal, fixed on an insulating base 4, carrying a metal plate 5, to which the crystal piece 1 is soldered. Conducting wires 6, 7 are fixed in pole screws 8, 9 on the metal plate 5 and the standard 3 respectively. The effective contact above referred to is established in the construction according to Fig. 1 by pressing the point of the screw 2 against the surface of the crystal piece 1, whereas the neutral contact is obtained between the crystal piece 1 and the metal plate 5 or between said metal plate and the soldering metal of the crystal piece. In view of the fact that the sensitive spots of the surface of the crystal piece have a very small area, it will be seen, that a slight displacement of the standard 3 or of the screw 2, such as will occur by a thrust, will decrease the sensitiveness of the detector very considerably. The sensitiveness is also dependent upon the pressure between the point of the screw and the crystal piece, said sensitiveness being greatest in case of a small pressure, and decreasing rapidly when the pressure is augmented. A variation of the temperature, resulting in an irregular expansion of the parts of the detector, is sufficient to establish variations of sensitiveness. All these circumstances combine in making the detector incompetent as a means of measuring the intensity of radiotelegraphic signals in a reliable manner.

According to the present invention in

order to obviate the inconveniences of the effective contact, previously employed in form of a pressure contact, such as a screw, a metal spring or the like, a concrete or cohesive contact is used, the area of which is limited so as to cover only a sensitive spot of the surface of the crystal. Such a contact may be established by soldering a very small metal ball or the like on the said spot.

- 10 According to the construction shown in Fig. 2 two metal plates 12, 13, provided with pole screws 14, 15 for the conducting wires 16, 17 are fixed on an insulating base 10. On the plate 12 a crystal piece 18 is soldered.
- 15 On the upper side of said crystal piece a very small metal ball or the like 19 is soldered on a very sensitive place or spot, said ball 19 being electrically connected with the plate 13 by means of a thin metal wire 20.
- 20 The metal ball 19 may be fixed directly on the sensitive spot of the crystal piece, or said spot may be provided with an electrolytic cover or a metal powder cover, constituting the concrete or cohesive contact.

- 25 In order to protect and secure the contact it may be covered by an insulating material, such as a varnish.

Such concrete or cohesive contacts may be applied on several sensitive spots of the

crystal surface, permitting the resistance and the sensitiveness of the detector being varied within wide limits.

According to the construction shown in Fig. 3 the neutral contact is made concrete or cohesive. A crystal piece 21 is fixed in an insulating carrier 22, on which two metal plates 23, 24 are fixed, each of which is connected by a thin metal wire 25, 26 with a very small ball, soldered on the crystal piece.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. A detector for wireless telegraphy comprising a crystal and a contact cohesively connected to only a sensitive spot on the crystal.

2. A detector for wireless telegraphy comprising a contact immovably secured to the active material of the detector at a predetermined point thereon.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARTIN GEORG SJÖSTRÖM.

Witnesses:

WALDEMAR BOMAN,
GRETA PRIEN.