G. W. PICKARD.

DETECTOR FOR WIRELESS TELEGRAPHY AND TELEPHONY.

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1,104,073.

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Fig. 1.

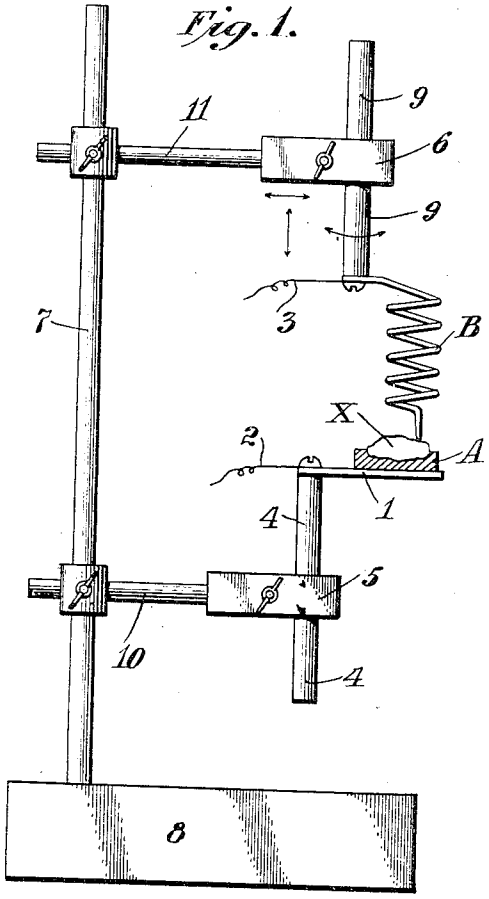


Fig. 2.

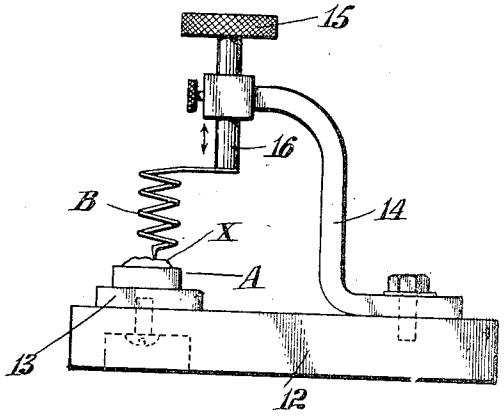


Fig. 3.

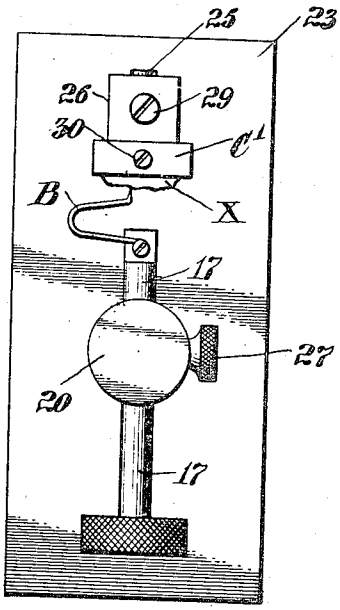
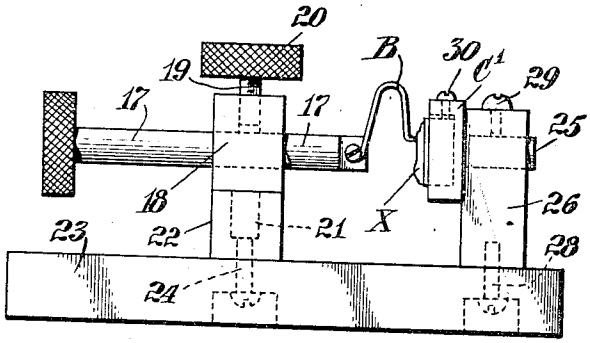


Fig. 4.



Attest:

Inventor:

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UNITED STATES PATENT OFFICE.

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DETECTOR FOR WIRELESS TELEGRAPHY AND TELEPHONY.

1,104,073. Specification of Letters Patent. Patented July 21, 1914.

Application filed June 21, 1911. Serial No. 634,521.

To all whom it may concern:

Be it known that I, GREENLEAF WHITTIER PICKARD, a citizen of the United States of America, and a resident of Amesbury, Massachusetts, have invented certain new and useful Improvements in Detectors for Wireless Telegraphy and Telephony, the principles of which are set forth in the following specification and accompanying drawing, which disclose the form of the invention which I now consider to be the best of the various forms in which the principles of the invention may be embodied.

This invention relates to detectors for wireless telegraphy and telephony, particularly of the solid rectifier type, and it more particularly concerns the contacts used with the rectifying material.

The object of the invention is to provide a detector which shall have improved properties of stability (mechanical and electrical), ease of adjustment, and simplicity of construction.

The invention comprises the various features of novelty disclosed herein and shown in the drawings, of which—

Figure 1 is an elevation of one embodiment I have employed, Fig. 2 is an elevation of another embodiment, and Figs. 3 and 4 are a plan and elevation respectively of an embodiment preferred for use by telegraph operators in commercial telegraphy.

In Fig. 1 the two detector members B, X (connected, in use, to the two sides of the circuit indicated at 2, 3), are carried on hard rubber rods 9, 4 mounted in brackets or clamps 5, 6, adjustable on a vertical standard 7 carried by a broad base 8. The rectifying material X (silicon in this case), is mounted in a mass A of readily fusible metal, which, in turn, is mounted on a brass plate 1 screwed to the hard rubber insulating rod 4 held in clamping-jaws 5. The member B contacting with rectifier X is preferably in the form of a wire helix or loop, carried by a hard rubber insulating rod 9. The two rods 4 and 9 are held in flat-jawed clamps 5 and 6, respectively, so that the rods can be swung into any desired position in the plane of the jaws. Also the entire jaws with the rods can be bodily rotated by the rotation of the jaw-supports 10, 11; and may be reciprocated horizontally by corresponding reciprocation of said jaw-supports 10, 11. The directions of adjustment are indicated by the arrows.

In Fig. 1, the wire B is of No. 22 manganin, well-known as a hard, springy, non-oxidizable metal alloy which is frequently employed in standard resistance windings on account of its physical constancy. The manganin is of course a very good conductor of electricity relative to the high-resistance rectifier X. The upper end of wire B is screwed to the rod 9, and its lower end projects free beyond its looped portion and engages the surface of the rectifier X. This lower end of the wire is shown as offset from the center of the supporting rod 9, so that the turning of the rod in the jaws of its clamp 6 permits the selection of any desired point of contact of the end of B on X. The loop or loops of B permit a gradual adjustment of contact-pressure, as distinguished from the adjustment possible with a straight wire. Also the contact point of B is held stably against X owing to the springiness or elasticity of B, and this effect is enhanced by the loop or loops of B. The small inertia of B near the contact with X also tends to prevent contact-slipping in case of shocks or jars.

Fig. 2 shows a simple form, mounted on an insulating base 12 of hard rubber. The rectifier X (as of silicon) is mounted in readily fusible metal contained in a metal cup A, said cup being adapted to be slid, for adjustment, over the surface of a metal sur-base 13 which is to be connected to one side of the circuit. The looped wire B, as of manganin or equivalents, is soldered to the end of a brass rod 16 provided with an adjusting handle 15 of hard rubber, the rod 16 being adjustable vertically through a bracket 14 screwed to the base 12 and intended to be connected to the other side of the circuit.

In Figs. 3 and 4 the wire B is of platinum-gold alloy or "platinized gold," about one-fiftieth inch or less in diameter, this being by far the best material and form I have employed for this purpose as yet, and having strongly marked properties of general stability, being extremely hard and non-oxidizable, and being also very springy. This wire B is screwed to a metal (brass) rod 17, is

formed with a loop between its ends as shown, and has its contact end offset from or eccentric to (as in Figs. 1 and 2) the axis of its operating rod 17, in order to permit selection of contact at any point of the surface of X. Freedom of movement is provided for rod 17 by the following construction. Rod 17 is free to slide through and rotate in metal block 18, and may be held rigidly therein by screw 19 having hard rubber insulating head 20. Block 18 has a downwardly-depending centrally-disposed pin 21, which, as a pivot, engages in a hole in lower metal block 22 which is screwed to hard rubber insulating base 23 by screw 24. A set screw 27 (Fig. 3) is provided to engage pin 21 and thereby fix upper block 18 rigidly in any desired position. Thus rod 17 can swing about pin 21 as a pivot, and can rotate and reciprocate in block 18, and the eccentric contact end of wire B can engage any point of the surface of X. The rectifier X (of silicon, iron pyrite, Pyron or Périkon, etc.) is embedded in a mass of readily fusible metal as shown, which in turn is held by a screw 30 in a metal cup C^1, (as in my Patent 933,263 granted September 7, 1909), which cup is rigidly carried with a rod 25 which can rotate and reciprocate in a metal block 26 screwed to the hard rubber base by screw 28; the rod 25 being held in block 26 by screw 29.

The simplicity of construction in this invention having the looped spring contact member B, is due to the fact that the placing of the gradual spring adjustment in the contact member itself permits dispensing with a spring or springs at any other part of the device. To adjust this detector of Figs. 3 and 4 the hard rubber head 20 and the milled head 27 (Fig. 3), are slightly loosened so that the block 18 can be swung, and the rod 17 pushed in or out of block 18, so as to both select the contact point on X and also adjust the pressure on such point. When the best contact point is found, both 20 and 27 are clamped up tight.

I attribute the great mechanical stability of the device of this invention largely to the feature of the looped or humped fine-wire spring contact, inasmuch as the inertia of the end of the spring is very small relative to the frictional resistance of the terminal on the rectifying material, the result being that any motion which may be imparted to the spring by shocks or jars does not move the contact terminal, but moves only the other parts of the spring which may move slightly without affecting the contact. The importance of mechanical stability in this art, particularly under the operating conditions of the apparatus in army and navy use, including gun-fire on shipboard, are so well known as not to require explanation.

The electrical stability of the device is largely due to the hard and non-oxidizing properties of the materials specified. By "non-oxidizable" is meant substantially so. Of all those used by me, the platinum-gold alloy is so far supreme as to stand out prominently as probably the best possible material.

The contact-member of this invention, in the form of a wire, permits contact-selection irrespective of adjusting movements of the rectifying material X (thus differing from the restraining leaf-spring construction of my prior Patent 933,263), and the loop-formation of the present invention, while retaining all the advantages of the wire also employed in this invention, also permits the gradual adjustment of pressure which is so desirable. By means of the construction shown it is very easy to put the point or end of the wire upon any desired part of the exposed surface of the rectifier X, and then to adjust to exactly the desired pressure, without any movement of the rectifier X whatsoever.

I claim:

1. A contact member for a detector rectifier, which consists of a wire of electrically conducting material formed with a loop, in combination with a rotatable support to which one end of the wire is secured, the free end of the wire being offset from the center of the support.

2. The combination with a conducting solid possessing the property of rectification, of a contact member therefor which consists of a metallic terminal of low inertia, constructed with flexibility and freedom of movement in all lateral directions when in contact with said rectifying member, whereby the body of the contact member may be moved by shocks or jars without shifting its contact point on the rectifying member.

3. A contact member for a detector rectifier, which consists of an alloy of platinum and gold.

4. The combination with a conducting solid possessing the property of rectification, of a contact member therefor, which consists of a springy wire of electrically conducting material formed with a loop.

5. A contact member for a detector rectifier, which consists of a platinized gold wire formed with a loop.

6. In a rectifier detector, the combination with the rectifying member, of a contact therefor consisting of an electrically conducting wire spring having a contact terminal of hard good-conducting material.

7. The combination with a conducting solid possessing the property of rectification, of a contact member therefor, which consists of a wire having low inertia near the contact point, and constructed at its other portion to yield to shocks or jars without moving the contact point.

8. The combination with a conducting solid possessing the property of rectification, of a contact member therefor, which consists of a wire of electrically conducting material formed with a loop, in combination with an adjustable support to which one end of the wire is attached.

9. A contact for the rectifying member of a detector, which consists of an electrically conducting wire spring, a support to which one end of the wire is attached, the free end of the wire being offset relative to the support, and the said free end of the wire having a contact-terminal consisting of hard good-conducting material.

10. A contact for the rectifying member of a detector, which consists of a springy wire of conducting material having a contact-terminal of hard good-conducting material, in combination with a conducting solid possessing the property of rectification, with which the contact terminals of said contact engages.

11. A contact for the rectifying member of a detector, which consists of a springy wire of conducting material having a contact-terminal of platinized gold.

12. A contact for the rectifying member of a detector, which consists of an electrically conducting wire looped or coiled into a spring, and having a contact-terminal of noble metal.

13. A contact for the rectifying member of a detector, which consists of an electrically conducting wire looped or coiled into a spring and having a contact-terminal of platinized gold.

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Witnesses:
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M. B. Oliver.