Nov. 13, 1928.

1,691,358

A. K. PHILLIPPI

DETECTOR

Filed Oct. 7, 1921

Fig. 1.

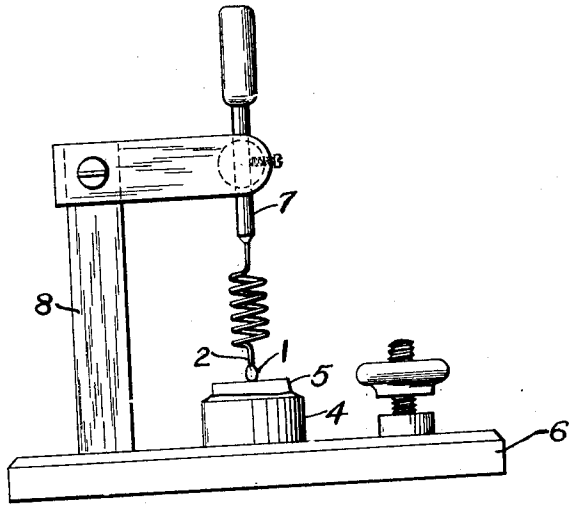
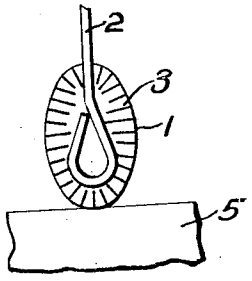


Fig. 2.



WITNESSES:
Albert Schiefelbein
H. L. Godfrey

INVENTOR
Arthur K. Phillippi.
BY
Wesley G. Carr
ATTORNEY

Patented Nov. 13, 1928. 1,691,358

UNITED STATES PATENT OFFICE.

ARTHUR K. PHILLIPPI, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

DETECTOR.

Application filed October 7, 1921. Serial No. 506,172.

My invention relates to wireless telegraphy and more especially to detectors adapted to rectify received wireless impulses.

The object of my invention is to provide a detector crystal which, in combination with certain other well known crystals, has an unusually large number of sensitive points and which is readily adapted to simple and inexpensive detector constructions.

According to my invention, I have found that a small bead of tellurium, which is formed upon the end of a wire when dipped into the molten metal and then rapidly cooled, may be employed to replace the fine metallic point heretofore employed in certain forms of detectors.

I have further found that the frozen surface of the crystallized bead possesses unusual rectifying properties and that, in combination with a galena crystal, it provides a detector of unusal sensitivity and ease of adjustment.

Furthermore, I have found that the unusual rectifying property of the frozen surface, which is formed upon a rapidly cooled pellet of tellurium, may be utilized in a high-pressure-crystal combination, such for example, as tellurium and zincite.

These and other objects of my invention, as well as details of construction, whereby my invention may be practised, will be apparent from the following description, when read in connection with the accompanying drawing and claims, wherein:

Figure 1 is a side elevational view of a simple form of light-pressure detector embodying my invention.

Fig. 2 is an enlarged transverse sectional view of the tellurium bead, supporting wire and galena crystal shown in Fig. 1.

A tellurium bead 1, which is shown in Fig. 1 and in a greatly enlarged view in Fig. 2, may be formed by dipping a fine wire 2, preferably of nickel, into a molten mass of tellurium and then withdrawing the wire and cooling the coated tip rapidly in air. Upon cooling the bead, it is found that it is of a crystalline structure and that the planes of the crystals are normal to the initially chilled surface, as indicated by lines 3 in Fig. 2. This unusual arrangement of crystals is not limited to the tellurium beads but is also present in tellurium pellets. Here, again, the planes of the crystals are found to be normal to the initially chilled surface, which surface, as hereinbefore stated, possesses the highest rectifying properties.

In Fig. 1, I have shown one form of light-pressure detector employing tellurium as one element thereof, though I do not wish to be limited to such structure. A cup 4, which has rigidly secured therein a detector crystal 5, such, for example, as galena, is mounted upon a base 6. The resilient wire 2 has the bead 1 rigidly secured at its lower end and a rod 7 at its upper end. The rod 7 is adjustably mounted upon a supporting structure 8.

In operation of the detector, I have found that best results are obtained upon first increasing the pressure between the crystals and then decreasing the pressure until the crystals are almost disengaged.

Since heavy-pressure-detector structures adapted for use with my tellurium-zincite combination are old, such detector structure has not been shown or described.

One advantage of my invention is the provision of a crystal having unusual rectifying properties, which, in combination with galena or zincite, is substantially unaffected by the quality of the galena or zincite employed.

Other advantages of my invention will be apparent from the foregoing description when read in connection with the accompanying drawings and claims.

While I have shown only one embodiment of my invention, it is capable of various changes and modifications without departing from the spirit of my invention and I desire, therefore, that only such limitations shall be imposed upon my invention as are specifically set forth in the appended claims or indicated by the prior art.

I claim as my invention:

1. In a detector of electrical oscillations, a resilient member of conducting material and a bead of tellurium mounted upon said resilient member and adapted to serve as an element of said detector.

2. In a detector of electrical oscillations, the combination with a flexible wire, of a crystallized bead of tellurium mounted upon said wire, whereby said tellurium bead may serve as one element of said detector.

3. As an element of a detector, a material having a frozen surface which is formed

upon the cooling of said material from a molten state, said frozen surface serving as a contact surface.

4. In a detector, an element comprising a mass of tellurium having a frozen surface, said frozen surface serving as a contact surface.

5. As an element of a detector, a crystallized mass of tellurium having a working surface consisting of a frozen skin, the plane of the crystals forming said mass being normal to the surface of the mass.

6. In a detector, an element consisting of a crystallized bead of tellurium having a frozen skin, a second element in electrical contact with said frozen skin and means for adjusting the pressure between said elements.

7. In a detector, a resilient wire, a crystallized bead of tellurium having a frozen surface mounted upon said wire and an element in electrical contact with said frozen surface.

8. In a detector, a resilient wire, a crystallized bead of tellurium having a frozen surface mounted upon said wire and a mass of galena in contact with said frozen surface.

9. In a detector, an element comprising a mass of tellurium having a frozen-skin surface and a second element in electrical contact with said surface, said second element comprising a mass of galena.

10. In a detector, an element comprising a mass of tellurium having a frozen-skin surface and a second element in electrical contact with said surface, said second element comprising a crystalline mass of conducting material.

11. A crystal detector comprising two crystalline substances having contacting surfaces, one of said substances being a mass of tellurium having a frozen surface co-operating therewith.

In testimony whereof, I have hereunto subscribed my name this 30th day of September, 1921.

ARTHUR K. PHILLIPPI.