Nov. 18, 1924. 1,515,994

A. W. BOWMAN

OSCILLATION DETECTOR

Filed April 4, 1923

Fig. 1.

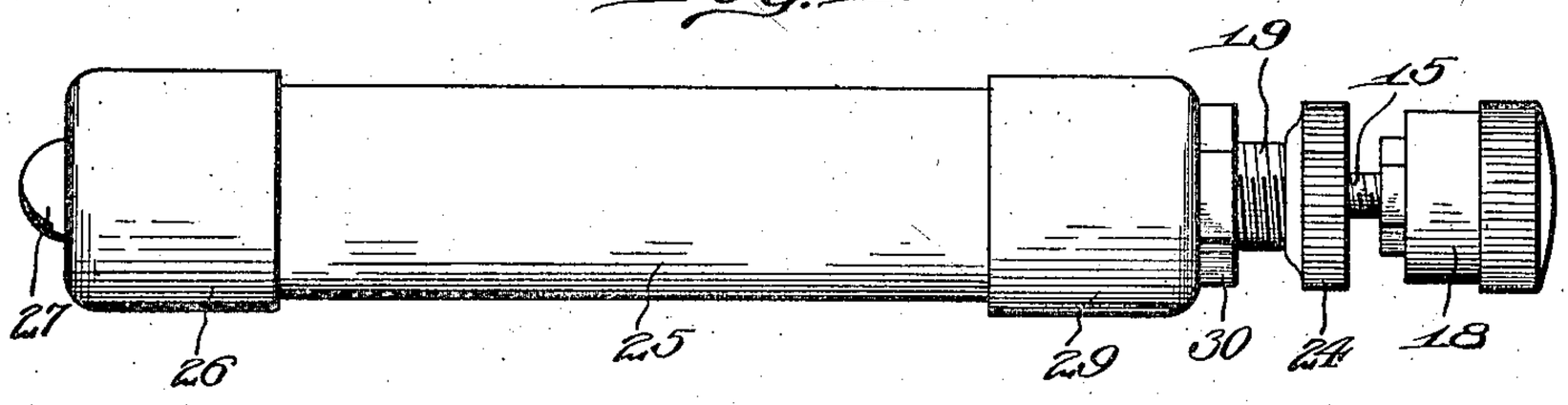


Fig. 2.

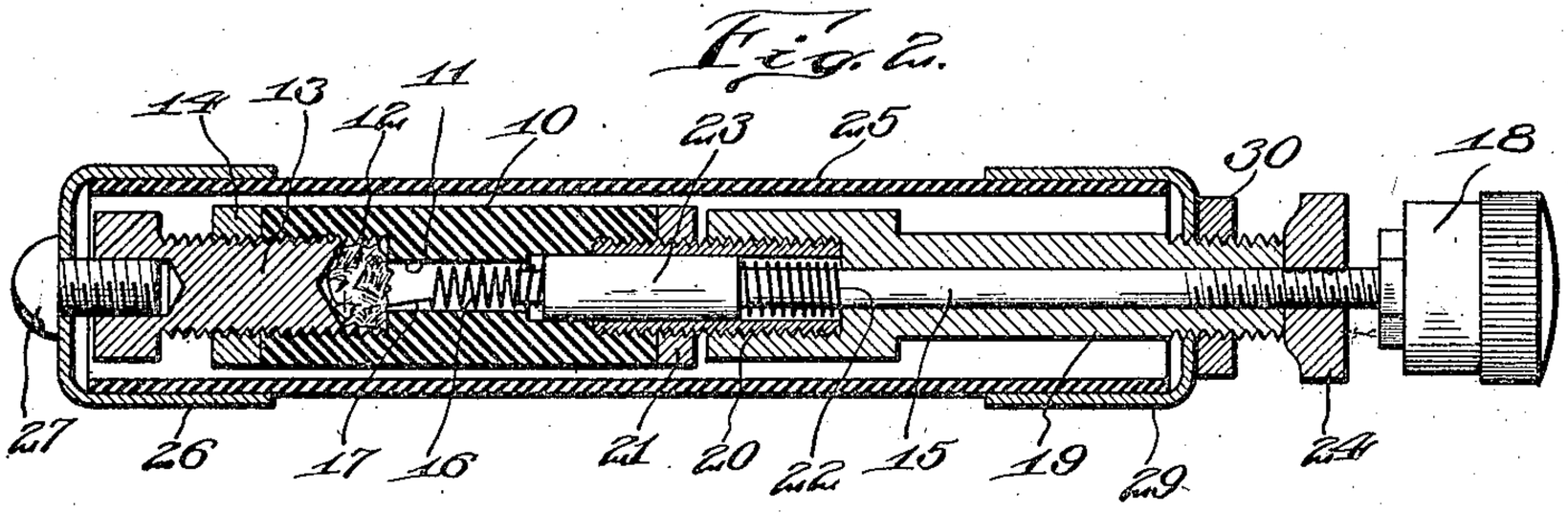
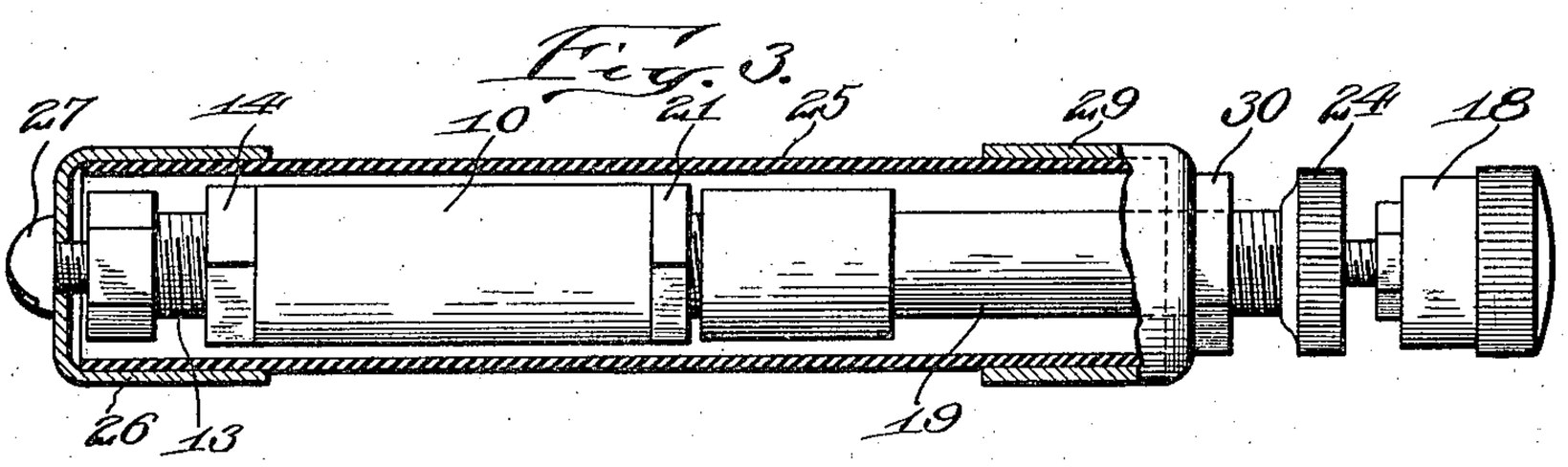


Fig. 3.



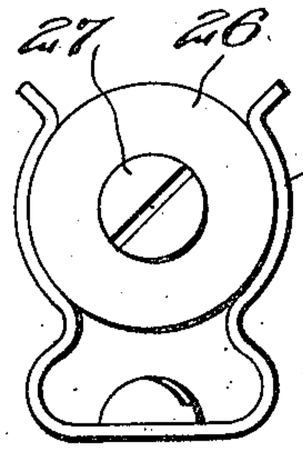


Fig. 4.

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UNITED STATES PATENT OFFICE.

ALBERT W. BOWMAN, OF WINTHROP, MASSACHUSETTS.

OSCILLATION DETECTOR.

Application filed April 4, 1923. Serial No. 629,302.

To all whom it may concern:

Be it known that I, ALBERT W. BOWMAN, a citizen of the United States, and a resident of Winthrop, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Oscillation Detectors, of which the following is a specification.

My invention relates to oscillation detectors of the crystal type, and its object is to provide a detector which, although enclosed within a cartridge or envelope, may be readily adjustable, both as to the point of contact between the usual small-aread member and the crystal, and as to the pressure of such contact.

With this object in view my invention embodies a member of insulation material provided with a bore, one end of which is counterbored to receive the crystal, a metallic plug preferably threaded to the counterbored end of said member to maintain the crystal in position and to afford means for electrically connecting it to one terminal of the detector, a rod of conducting material to the inner end of which the small-aread contact is connected, resilient means for maintaining the small-aread member in contact with the crystal, means for varying the pressure by said resilient means, and means for rotating said rod to vary the point of contact between the small-aread member and the crystal.

One embodiment of my invention is shown in the accompanying drawings in which

Figure 1 is an elevation of a detector embodying my invention;

Fig. 2 is a central longitudinal section;

Fig. 3 is a central longitudinal section of the envelope and terminal caps, the remaining parts being shown in elevation; and

Fig. 4 is an end view showing the detector held in a spring clip which is connected to one terminal of the receiving circuit.

In the particular drawings selected for more fully disclosing my invention, 10 represents a member of insulation material herein shown as a rod provided with a central longitudinal bore 11, both ends of which are counterbored and threaded. Located in one of the counterbored ends of the member 10 is a crystal 12 held in position by the plug 13 which has threaded engagement with the counterbore and is locked in position by the nut 14.

A rod 15 of conducting material is arranged for longitudinal and rotary movement in the bore of the member 10, one end of a spiral of fine wire 16 being secured to the inner end of said rod, and the other end 17 being arranged eccentric to the axis of the spiral and in contact with the crystal near the outer edge of the exposed surface thereof. The outer end of the rod is provided with a head 18 whereby it may be rotated to change the point of contact of the small-aread contact member 17 with the crystal.

Preferably the spiral 16 is of such diameter as to closely fit the bore 11 of the crystal-supporting member.

While various ways may be devised for supporting the rod 15, and for maintaining the fine wire in contact with the crystal under adjustable pressure, I prefer to employ a metallic stud 19 arranged co-axially with the member 10, said stud having a bore through which the rod passes and being connected to the member by a nipple 20 having threaded engagement with said member and said stud.

A nut 21 threaded to said nipple and bearing against the member 10 may be employed to lock these two elements together.

A spiral spring 22 is interposed between the shoulder 23 on said rod and the end of the counterbored portion of the bore of the stud 19, whereby the end of the fine wire 17 is maintained in contact with the crystal.

In order to adjust the pressure of this contact, a nut 24 is threaded to the rod and bears against the outer end of the stud.

The detector preferably is enclosed in an envelope or cartridge 25 of insulation material, and in such case said envelope is closed at one end by the metallic cap 26 connected electrically and mechanically by the screw 27 to the plug 13, thereby constituting one terminal of the detector.

The other end of the envelope is closed

by a similar cap 29 shown in the present instance as threaded to the projecting end of the stud and held in position by the lock nut 30.

It has been found that a detector constructed as above described maintains its sensitiveness for a relatively long period of time, and as will be understood, when the crystal finally loses its sensitiveness, it may readily be removed by simply taking off the cap 26 and unscrewing the nut 14 and plug 13, and a new crystal substituted therefor.

It will be obvious that a very slight movement of the nut 24 will suffice to vary the pressure of the contact between the point and crystal, and that by slightly turning the head 18 when the sensitiveness of the detector disappears another point close by the insensitive point will be found so that practically the entire outer edge of the exposed crystalline surface may be used before the crystal need be discarded.

It will be apparent also that by means of my invention a very small piece of crystal only need be used.

The detector may conveniently be connected to the receiving circuit by means of spring clips 31 which receive the metallic caps 26, 29.

Having thus described an illustrative embodiment of my invention without however limiting the same thereto, what I claim and desire to secure by Letters Patent is:—

1. An oscillation detector comprising a member of insulation material, said member having a central longitudinal bore counterbored at one end, a crystal arranged in the counterbored end of said member, a plug of conducting material in threaded engagement with the counterbored end of said member and clamping said crystal against the bottom of the counterbore, a rod of conducting material longitudinally and rotarily movable in the opposite end of said member, a spiral of fine wire having one end secured to the inner end of said rod and its other end arranged eccentric to the axis of said spiral and in contact with said crystal near the outer edge of its exposed surface, said spiral closely fitting the central longitudinal bore in said member, and a head on the outer end of said rod whereby said rod may be rotated to change the point of contact of said wire with said crystal.

2. An oscillation detector comprising a member of insulation material, said member having a central longitudinal bore counterbored at one end, a crystal arranged in the counterbored end of said member, a plug of conducting material in threaded engagement with the counterbored end of said member and clamping said crystal against the bottom of the counterbore, a rod of conducting material longitudinally and rotarily movable in the opposite end of said member, a spiral of fine wire having one end secured to the inner end of said rod and its other end arranged eccentric to the axis of said spiral and in contact with said crystal near the outer edge of its exposed surface, said spiral closely fitting the central longitudinal bore in said member, a head on the outer end of said rod whereby said rod may be rotated to change the point of contact of said wire with said crystal, and means independent of said spiral for maintaining said fine wire in contact with said crystal.

3. An oscillation detector comprising a member of insulation material, said member having a central longitudinal bore counterbored at one end, a crystal arranged in the counterbored end of said member, a plug of conducting material in threaded engagement with the counterbored end of said member and clamping said crystal against the bottom of the counterbore, a rod of conducting material longitudinally and rotarily movable in the opposite end of said member, a spiral of fine wire having one end secured to the inner end of said rod and its other end arranged eccentric to the axis of said spiral and in contact with said crystal near the outer edge of its exposed surface, said spiral closely fitting the central longitudinal bore in said member, a head on the outer end of said rod whereby said rod may be rotated to change the point of contact of said wire with said crystal, a spring for maintaining said fine wire in contact with said crystal, and means for varying the compression of said spring.

4. An oscillation detector comprising a member of insulation material, said member having a central longitudinal bore counterbored at one end, a crystal arranged in the counterbored end of said member, a plug of conducting material fitting the counterbored end of said member and in electrical contact with said crystal, an envelope of insulating material enclosing said member, a metallic cap closing one end of said envelope, means connecting said plug and said cap electrically and mechanically, a metallic stud in said envelope arranged co-axially with said member, means connecting said stud and said member mechanically, a rod of conducting material longitudinally and rotarily movable in a bore in said stud and in the bore in said member, a spiral of fine wire having one end secured to the inner end of said rod and its other end arranged eccentric to the axis of said spiral and in contact with said crystal near the outer edge of the exposed surface thereof, a spiral spring surrounding said rod and interposed between a shoulder thereon and the end of the counterbored portion of the bore in said

stud, whereby the end of said fine wire is maintained in contact with said crystal, a nut threaded to said rod and bearing against the end of said stud, whereby the compression of said spring may be varied, a head on the outer end of said rod whereby said rod may be rotated to change the point of contact of said wire with said crystal, and a metallic cap closing the other end of said envelope, the last mentioned metallic cap being in threaded engagement with the projecting end of said stud.

In testimony whereof, I have hereunto subscribed my name this 2nd day of April, 1923.

ALBERT W. BOWMAN.