Feb. 5, 1929. 1,701,196

C. H. SPANGLER

ELECTRIC POTENTIAL DETECTOR

Filed Dec. 12, 1925

Fig. 1.

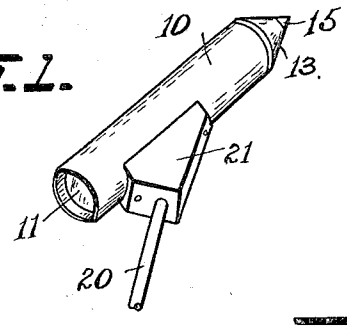
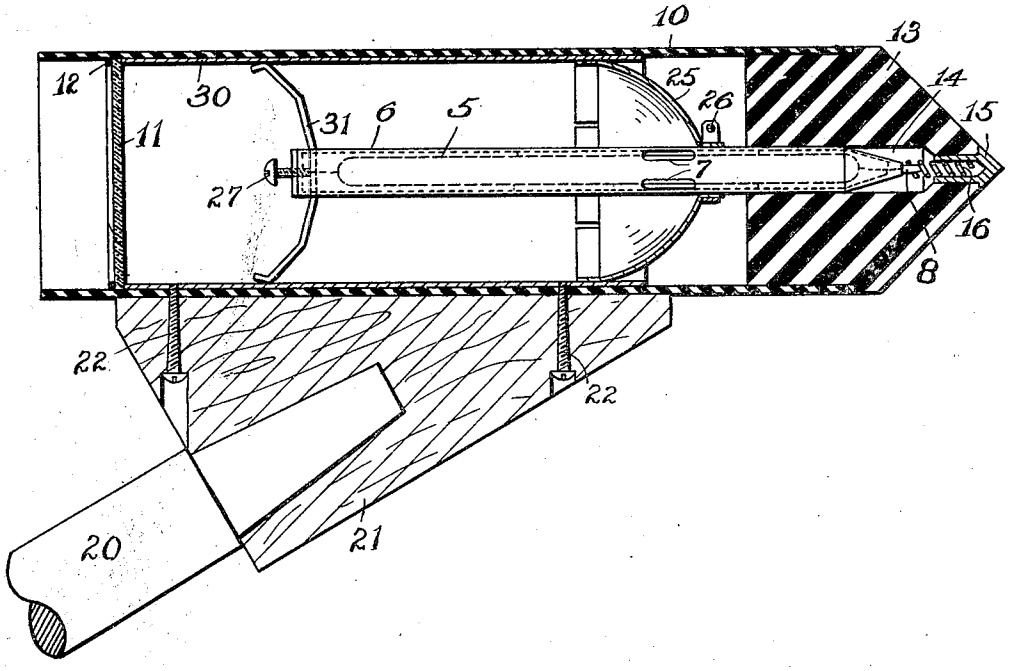



Fig. 2.




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# UNITED STATES PATENT OFFICE.

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## ELECTRIC-POTENTIAL DETECTOR.

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My invention relates to portable testing devices for safely and harmlessly determining the presence of an electric potential, and it consists more particularly in an improved casing therefor for safe operation and for rendering readily visible the rays of a luminous detector tube carried thereby, as hereinafter more fully set forth in connection with the accompanying drawings, and pointed out in the subjoined claims.

Fig. 1 is a small perspective view of a complete device embodying my invention; and Fig. 2 is a substantially full-sized longitudinal sectional elevation of a preferred form of casing for the known type of detector luminous tube indicated.

Detector testing devices of insulatedly covered sealed tubes of neon or like gas that is rendered luminous by discharge of an electrical current therethrough, are well known and more fully described in Metzger Patent No. 1,531,301, of March 31, 1925.

A common type of such detector luminous tube is shown in the drawings, dotted lines 5 indicating the sealed tube of gas, enclosed in the insulating cover 6, which latter has sight apertures or windows 7 to see the enclosed tube, and an end contact 8, which latter when set against a wire or like suspected conductor, will indicate the presence of an electric potential by making luminous the tube of gas, as visible through aperture 7.

Such known type of detector testing device is adequately safe for low voltages, but requires dangerously close approach for high voltage tests; and the main object of my invention is to provide a safety mounting for such old detector tube to adapt it for safe and harmless use with the latter.

With this main object in view, I employ a carrier casing 10, of non-conductive material and preferably tubular in form, as shown, and of large diameter so as to spacedly surround the detector tube cover 6 which it carries longitudinally disposed within its length. One end of said casing is preferably closed, as shown, by a disc of glass 11, or the like, retained by a spring ring 12, to form a dust proof window aperture. The opposite casing end is provided with an end closure 13, of non-conductive material and preferably conical in shape as shown, and formed with a central tube-cover receiving aperture 14 extending to a conductive contact end 15, against the inner end of which the tube contact 8 may directly contact, but preferably a coiled spring 16 is interposed to provide for longitudinal variation of said tube cover 6 in assembling said contact end 15 merely forming a conductive extension to tube contact 8.

The casing 10 is shown provided with a handle 20, set into a block 21 secured by screws 22, 22 to said casing, whereby the operator is enabled to make tests by engaging the casing contact 15 while remaining at a safe distance; and in order that he may see the effect upon the detector tub 5 without further approach, I provide a reflector 25 within said casing adapted to intensifying and displayingly direct outwardly to make clearly visible through the window 11, any luminous rays appearing in apertures 7. This reflector 25, as shown, closely fits within the casing 10 and is secured as by a clamping bolt 26 to the tube cover 6 adjacent the sight apertures 7 in the latter; and due to the preferred concave shape of the reflector indicated, the luminous rays displayingly directed through the window 11 are magnified so as to be more clearly visible.

To increase the efficiency of the detctor tube 5 for high voltages, I provide the casing 10, as shown, with an inner closely fitting sleeve 30 of conductive material and extending longitudinally between the casing end closures, and electrically connect this by means of a conductor wire 31 directly to tube end wire or to the usual capacity media commonly employed in well known manner within the tube cover 6, as set forth in said Metzger patent; said wire, as shown, passing through the cover 6 in contact with said tube end wire or the capacity media therein contained, and held in place as by set screw 27. Such connecting wire 31 acts to support and carry the tube 6 within the casing 10, and also conductingly adds the sleeve 30 as capacity media to the gas tube 5. My mounting device thus fully described, adapts the known luminous tube 5 for safe distance use, through the handle 10, for testing high voltage potential; and by means of the reflector 25 permits the operator to observe from a distance the reflected luminous rays passing through the tube apertures 7, by intensifying and divertingly direct them outwardly through the casing window 11.

The preferred construction shown and described may of course be changed to adapt it to the particular type of luminous tube employed, and otherwise modified within the spirit of the invention as defined in the claims.

What I claim is:

1. In combination with a luminous potential detector comprising a gas-filled tube with a windowed cover; a safety mounting therefor comprising an insulating carrier casing with reflector means to angularly deflect any luminous rays appearing in said cover window for vision from outside said casing.

2. In combination with a luminous potential detector comprising a gas-filled tube with a windowed cover; a safety mounting therefor comprising an insulating carrier casing with reflector means to intensify and angularly deflect any luminous rays appearing in said cover window for vision from outside said casing.

3. In combination with a luminous potential detector comprising a gas-filled tube with a windowed cover and an exterior contact; a safety mounting therefor comprising an insulating tubular casing to axially support said detector in spaced relation within said casing, comprising an insulating end closure for the latter having a projecting contact in conductive engagement with said detector contact, and an annular reflector within said casing arranged to axially deflect any luminous rays appearing in said cover window.

4. In combination with a luminous potential detector comprising a gas-filled tube with a windowed cover and an exterior contact; a safety-mounting for said detector comprising a tubular insulating casing having an interior capacity media sleeve, means within said casing to axially support said detector, comprising an end closure having a projecting contact conductively engaging one end of said tube, a conductive support connecting said sleeve to the opposite end of said tube, and an annular interior reflector arranged to axially deflect any luminous rays appearing in said cover window.

5. A luminous potential-detector safety mounting comprising a non-conductive casing having a conductive inner lining, an interior support for one end of said detector conductively connecting one end of the latter to said lining, an opposite detector end non-conductive support having a conductive detector end contact extension, and an interior annular reflector arranged to axially deflect any luminous rays of said detector.

In testimony whereof I affix my signature.

CHARLES H. SPANGLER.