No. 830,938. PATENTED SEPT. 11, 1906.

J. B. TAYLOR.

POTENTIAL INDICATOR.

APPLICATION FILED JAN. 3, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

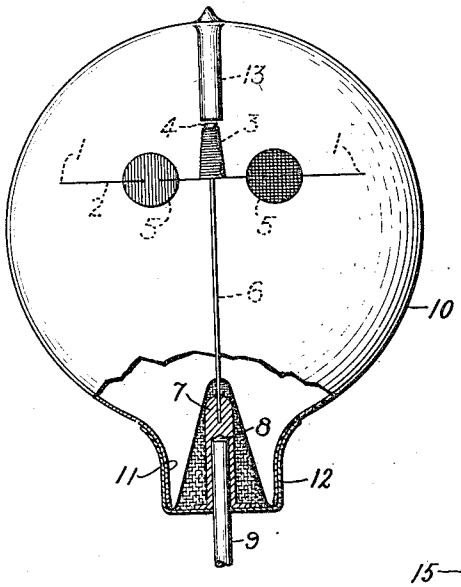


Fig. 2.

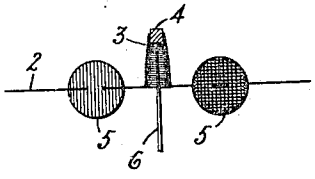


Fig. 3.

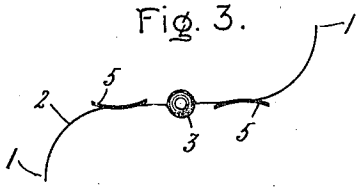


Fig. 4.

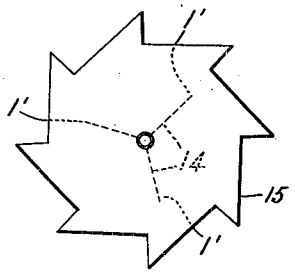
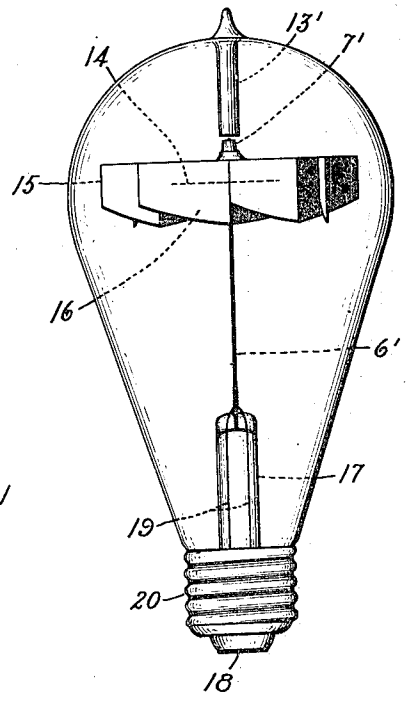


Fig. 5.



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POTENTIAL INDICATOR.

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2 SHEETS—SHEET 2.

Fig. 6.

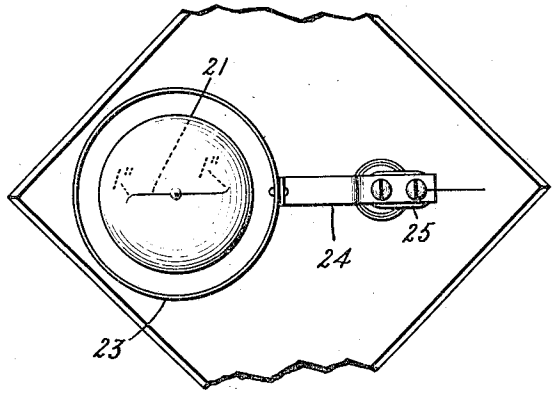


Fig. 7.

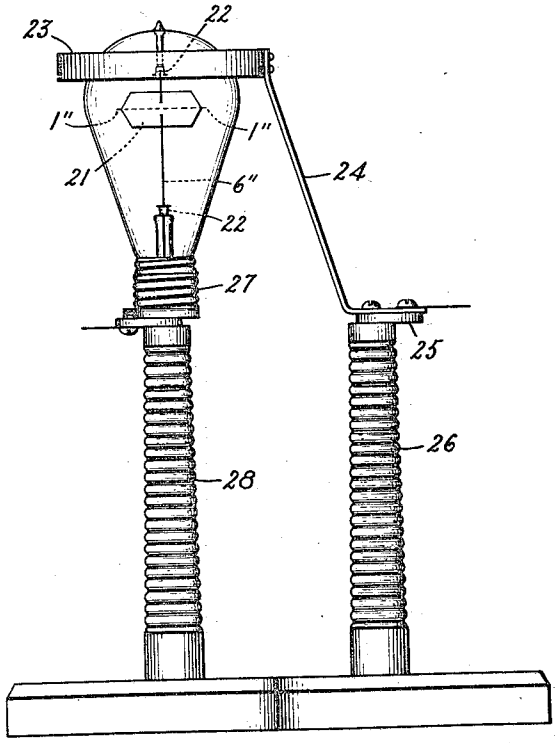
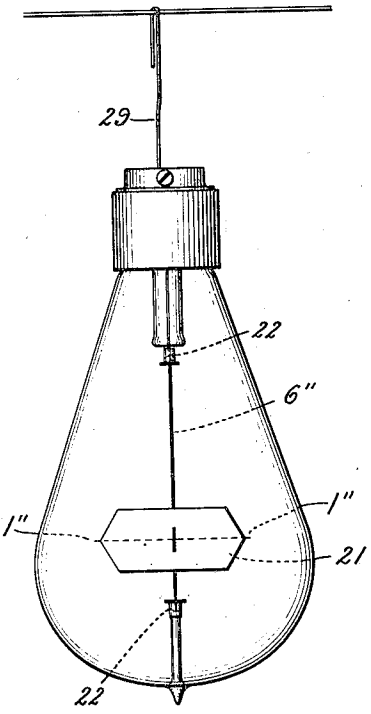


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN B. TAYLOR, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

POTENTIAL-INDICATOR.

No. 830,938. Specification of Letters Patent. Patented Sept. 11, 1906.

Application filed January 3, 1905. Serial No. 239,369.

To all whom it may concern:

Be it known that I, JOHN B. TAYLOR, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Potential-Indicators, of which the following is a specification.

The present invention relates to potential-indicators for use in indicating the presence or absence of voltage in electrical conductors.

It has been customary heretofore to employ for this purpose a potential-transformer and a voltmeter. For systems of high potentials these transformers are of expensive construction and require considerable space for their installation, and as a consequence it has been customary to employ only one for each substation or place of distribution placed upon the bus-bars rather than upon the several conductor-lines, so that no indication was had as to the condition of the individual lines.

The object of my invention is to provide a highly-efficient potential-indicator which will be of simple and inexpensive construction and adapted to be made of such small dimensions that it can be used wherever desired without interference with other apparatus.

In carrying out my invention I provide suitable discharge-points which are either pivotally mounted so as to rotate freely under the repulsive action of the static discharges when directly or indirectly connected to a charged conductor or else they are stationarily mounted, and an indicator-vane is pivoted in proximity thereto, so as to be rotated by the currents of air or other gas set in motion by the static discharges from the points, and in order to protect the parts from dust, mechanical injury, and oxidation due to the formation of ozone and acids the parts are hermetically sealed in a glass globe with a conducting member extending to the outside for connection with the conductor on which electrical potential is to be detected.

For a more complete understanding of my invention reference may be had to the following detailed description and the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation, with a part broken away, of a potential-indicator with rotary discharge-points. Figs. 2 and 3 are detail views of the rotary points and bearing therefor. Fig. 4 shows in plan a rotary vane for use with stationary discharge-points. Fig. 5 is a side elevation of a potential-indicator fitted with a vane as shown in Fig. 4. Figs. 6 and 7 show in plan and elevation a potential-indicator arranged in proximity to an inducing-band, and Fig. 8 shows in side elevation a potential-indicator adapted to be suspended from a line conductor.

In the construction shown in Figs. 1 to 3 the discharge-points 1, of platinum or other non-corrosive metal, are formed at opposite ends of a reversely-curved wire 2, having a conical coil 3 at its center, which carries a metal bearing-block 4, and intermediate the ends of the wire 2 and the central coil 3 are arranged circular disks 5, with one surface of one color and the opposite of another, so that as the flier thus formed rotates at high speed on its axis a flashing of the disks will make the movement visually apparent from a considerable distance. The flier is mounted upon a needle-pointed metal rod 6, supported vertically in a metal base-block 7, having an axial bore 8 for the reception of a wire 9 or other part in electrical communication with the conductor in which the voltage is to be detected. Surrounding the flier is a glass globe 10 with a neck 11 at its lower end, which is sealed into a thimble or shell 12, to the inner side of which the base-block 7 is secured. The globe has depending from its upper inner surface a guard 13 with its transverse lower end positioned just above the top of the bearing-block 4 of the flier and serves to prevent the latter from becoming displaced from the point of the rod 6. Surrounding the base-block 7 is a cone-shaped gauze upon which are deposited particles of some salt having an affinity for water, such as calcium chlorid, so that as the air within the globe circulates therethrough it becomes dried, and thereby prevents the formation of acids within the globe.

In the construction shown in Figs. 4 and 5 the discharge-points 1′ are formed at the ends of a plurality of radial arms 14, fixed upon a vertical rod 6′ in a transverse plane situated

a short distance below the top end of the rod. The top end of the rod 6′ is needle-pointed and serves as a pivot for a vane 15, which consists of a notched disk with downturned blades 16 and a central bearing-block 7′, which may be a jewel or any other non-conducting substance, since no current is required to pass to the movable part. The outer surfaces of one portion of blades 16 are provided with a different color from that on the other blades to produce a flashing effect as the vane rotates. These parts may be inclosed, as shown in Fig. 1; but in the present instance they are inclosed in a globe of a standard incandescent lamp with the rod 6′, secured in the upper end of the usual wire-support 17 and electrically connected to the center contact 18 by wires 19, extending therethrough in the usual manner. The screw-shell 20 is unconnected electrically, but serves as a very convenient means for connecting the indicator to the circuit whose voltage is to be detected by connecting the latter to an ordinary lamp-receptacle. The upper inner surface of the globe is provided with a guard 13′, as in the construction shown in Fig. 1. The globes may be partially exhausted of air to increase the sensitiveness of the devices, and they may be filled with some gas free of oxygen, if desired, in order to protect the metallic parts from corrosion.

In the constructions shown in Figs. 6 to 8 the discharge-points 1″ are formed at the end of a wire supported by a small piece of cardboard 21 in contact with a rotatable rod 6″, pivoted at its ends in cup-shaped bearing-blocks 22, which permit the device to be used in any position, the parts operating by repulsive action of the discharges, as in the construction shown in Fig. 1.

In the arrangement shown in Figs. 6 and 7 the glass globe is surrounded by a metal band 23, supported by a bent arm 24 from a terminal plate 25 at the end of an insulating-post 26, while the indicator is screwed into a lamp-receptacle 27 at the end of a separate insulating-post 28. By connecting the receptacle 27 and the terminal plate 25 to conductors of opposite polarity in a system the opposite polarization of the ring or band 23 and the discharge-points 1 tends to augment the repulsive effect of the discharges from the points, and as a consequence the latter arrangement is adapted for use in connection with systems of comparatively low potentials.

In the construction shown in Fig. 8 the neck of the globe is provided with a bent wire 29, electrically connected to the upper bearing-block 22 and adapted to be hooked over a conductor.

I do not desire to restrict myself to the particular form or arrangement of parts herein described and shown, since it is apparent that they may be changed and modified without departing from my invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A potential-indicator, comprising one or more discharge-points adapted to be brought within the influence of a part under electric tension, a freely-movable part arranged in proximity to said point or points and adapted to be actuated by the discharges therefrom, and means for inclosing and protecting said points and movable part and provided with means for preventing displacement of said movable part.

2. A potential-indicator, comprising one or more discharge-points, a revoluble part adapted to be actuated by the discharges from said points, a transparent inclosure about said parts provided with means for preventing displacement of the revoluble part, and conductor means extending from said points to the outside of said inclosure.

3. A potential-indicator, comprising one or more discharge-points, a revoluble part adapted to be actuated by the discharges from said points, a transparent inclosure about said parts provided with means for preventing displacement of the revoluble part, means for absorbing moisture within said inclosure, and conductor means extending from said points to the outside of said inclosure.

4. A potential-indicator, comprising one or more discharge-points, a revoluble part adapted to be actuated by the discharges from said points, a hermetically-sealed transparent inclosure surrounding said parts provided with means for preventing displacement of the revoluble part, and conductor means extending from said points to the outside of said inclosure.

5. A potential-indicator, comprising one or more discharge-points, a revoluble part adapted to be actuated by the discharges from said points, means carried by said part for rendering the motion thereof visually apparent, a transparent inclosure surrounding said parts provided with means for preventing displacement of the revoluble part, and conductor means extending from said points to the outside of said inclosure.

6. A potential-indicator, comprising a glass globe, a pivotal rod secured at one end to the inside of said globe and electrically connected to the outside thereof, a revoluble part mounted upon said pivotal rod, and one or more discharge-points electrically connected to said rod and arranged to actuate said revoluble part.

7. A potential-indicator, comprising a glass globe, a pivotal rod secured at one end to the inner side of the globe and electrically

connected to the outside thereof, a revoluble member pivoted upon the end of said rod, a guard supported by said globe opposite said point, and one or more discharge-points in electrical engagement with said rod.

8. A potential-indicator, comprising a glass globe, discharge-points arranged within said globe and having electrical connection to the outside thereof, means for visually indicating discharges from said points, and an inducing-band arranged about the outside of said globe.

In witness whereof I have hereunto set my hand this 31st day of December, 1904.

JOHN B. TAYLOR.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.