

(No Model.)

C. T. PENTON, C. C. GARTLAND & P. J. CASSERLY.
ELECTRIC SAFETY DEVICE.

No. 532,814.

Patented Jan. 22, 1895.

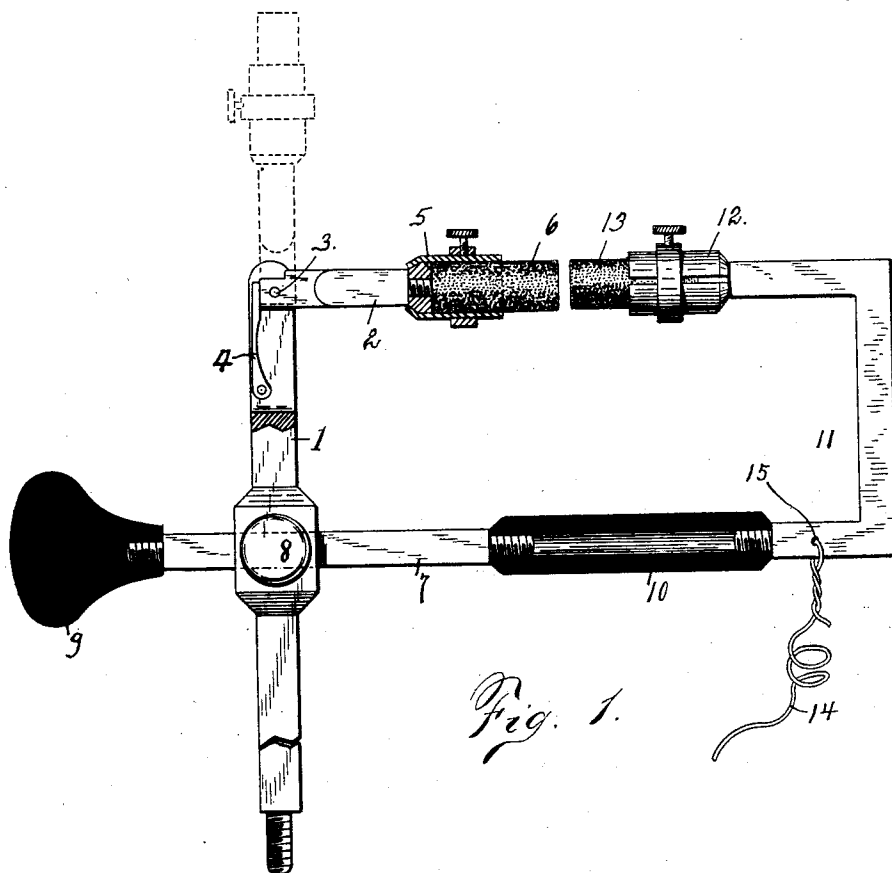
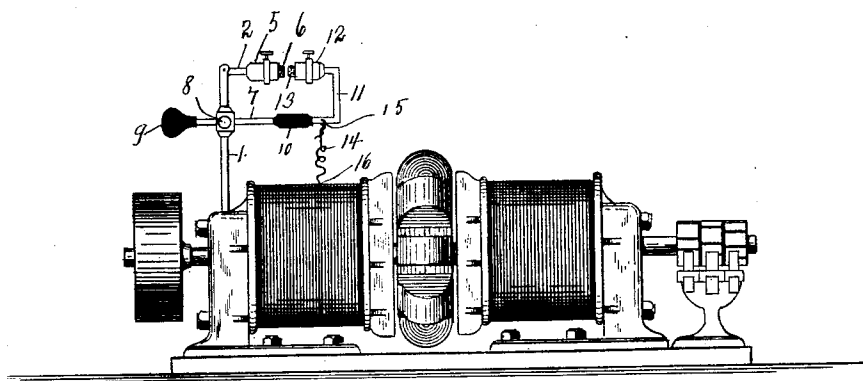


Fig. 1.



Witnesses:
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Fig. 2.

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UNITED STATES PATENT OFFICE.

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ELECTRIC SAFETY DEVICE.

SPECIFICATION forming part of Letters Patent No. 532,814, dated January 22, 1895.

Application filed February 2, 1894. Serial No. 498,870. (No model.)

To all whom it may concern:

Be it known that we, CHARLES T. PENTON, CHRISTOPHER C. GARTLAND, and PATRICK J. CASSERLY, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Apparatus for Detecting the Crossing or Grounding of Wires in an Electric Circuit; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to an apparatus for detecting the crossing or grounding of wires in an electric circuit and protecting the dynamo or motor, to which it is attached, from burning when its electro-motive force is increased by the accidental grounding of its wire or when crossed by another circuit. Its object is to prevent the now frequent puncturing of the insulation of a dynamo or motor caused by an accidental increase of its electro-motive force and also to indicate such trouble when it exists. Its further object is to locate the cause of the increased electro-motive force, and enable the operator to ascertain if the insulation of the machine has become punctured or if the circuit is crossed or grounded outside of the station.

To that end it consists of an auxiliary broken circuit secured to the field of the machine at one end, and to the frame at its other end. The break in the circuit is provided with carbon-points which may be adjusted to and from each other so as to regulate the resistance of the auxiliary circuit and also to cause the current to arc, when passing from one carbon-point to the other.

Our invention further consists in other details of its construction all of which will be hereinafter described and claimed.

In the drawings, Figure 1 is a full sized view partly in section of our improved apparatus, and Fig. 2 is an elevation of our apparatus secured to a dynamo ready for action.

Referring to the drawings, 1 is a vertical rod secured at its lower end to the frame of

the dynamo, (as seen in Fig. 2.) At its upper end is pivoted a horizontally projecting arm 2. This arm is pivoted as at 3, and held in place by the short spring 4, which acts similar to the spring of a knife-blade, and holds the arm 2 either in a horizontal or vertical position as desired. At the end of this arm 4 is arranged the carbon holder 5, in which is secured the carbon 6.

Adjustably secured in the vertical rod 1 is the horizontal rod 7, held in place by the thumb-screw 8 and at the outer end of this rod 7 is attached the insulated knob or handle 9, and at its inner end is secured the insulated sleeve 10. At the opposite end of the insulated sleeve 10, is secured the U shaped conductor 11 which has arranged at its outer end the carbon holder 12, in which the carbon-point 13 is held. This carbon point 13 is on a line with the carbon point 6 when the arm 4 is in its horizontal position. The U shaped conductor 11 is connected with the circuit of the machine to which it is attached by the connecting wire 14 which is attached to the conductor 11 as at 15 and to any of the field windings of the machine (preferably the first) as at 16. (See Fig. 2.)

In operation when a machine is equipped with our improvement the carbon points 6 and 13 are first adjusted to the desired resistance by the handle 9 and secured in place by the thumb-screw 8. The apparatus is now in position for service.

As long as the machine is carrying the electro-motive force desired or within the variance provided for by the resistance caused in the break of the auxiliary circuit the apparatus will remain inactive but should the potential of the electric current or the electro-motive force increase the overflow of electricity in trying to find its level will pass through the conductor 14 and 11 to the carbon point 13 and arcing to the carbon point 6 passes through the arm 4 and rod 1 to the frame of the machine. The arcing of this overflow will indicate that there is an increase of electro-motive force in the circuit passing to the frame of the machine. The machine is then immediately stopped by the operator. It can now be ascertained where the trouble has occurred by throwing the carbon point 6

to its vertical position and making an electrical contact from any part of the machine frame to the brushes of the machine. Should a current exist in this conductor, (which can
5 be ascertained by causing the current to arc in its passage to the brush) the operator will know that the insulation of the machine has become punctured; but should the conductor from the frame of the machine to the
10 brush remain dead he will know that the trouble has been caused by the grounding or crossing of the circuit outside of the station. The frequent occurrence of such trouble especially in cities where electric lighting and
15 trolley systems are both used has made it almost essential for corporations to place so called lightning arresters at intervals along their circuit. These however are found insufficient and without a provision for the
20 overflow of electricity upon the machine itself the insulation will become punctured thus making it necessary to rewind the machine, while when a machine is equipped with our improvement an auxiliary circuit which offers
25 a less resistance than the insulation of the machine is always ready to take the overflow and prevent the insulation from burning.

We claim—

1. An apparatus for equalizing the overflow
30 of electromotive force in a dynamo or motor, consisting of an upright rod connected with the frame of the motor, a U-shaped conductor one arm of which is adjustably connected with but insulated from said rod and the other arm
35 of which carries a carbon point, electric connections between this conductor and the field windings, a horizontal arm pivoted to the upper end of said rod and carrying a carbon point adapted when the rod is lowered to
40 stand opposite the point carried by the U-shaped conductor, and a spring on the rod bearing on the arm adjacent to its pivot to hold it either raised or lowered, as and for the purpose set forth.

2. An apparatus for equalizing the overflow 45 of electro-motive force in a dynamo or motor, consisting of an upright rod connected with the frame of the motor, a U-shaped conductor one arm of which passes through said rod under a set screw therein, has an insulated handle at its outer end, and also has an insulated
50 section within its body, and the other arm of which carries a carbon point, electric connections between this conductor and the field windings, a horizontal arm pivoted to the upper
55 end of said rod and carrying a carbon point adapted when the rod is lowered to stand opposite the point carried by the U-shaped conductor, and a spring on the rod bearing on the arm adjacent its pivot to hold
60 it either raised or lowered, as and for the purpose set forth.

3. An apparatus for equalizing the overflow of electro-motive force in a dynamo or motor, consisting of an upright rod connected with
65 the frame of the motor, a U-shaped conductor one arm of which passes through said rod under a set screw therein, has an insulated handle at its outer end, and also has an insulated
70 section within its body, and the other arm of which carries a carbon point, electric connections between this conductor and the field windings, a horizontal arm pivoted to the upper
75 end of said rod and carrying a carbon point adapted when the rod is lowered to stand opposite the point carried by the U-shaped conductor, and means for holding said horizontal arm in either raised or lowered position, as and for the purpose set forth.

In testimony whereof we have signed our
80 names to this specification in the presence of two subscribing witnesses.

CHARLES T. PENTON.

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Witnesses:

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