

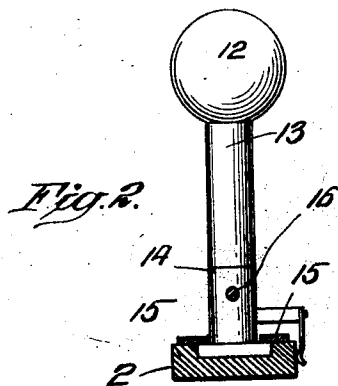
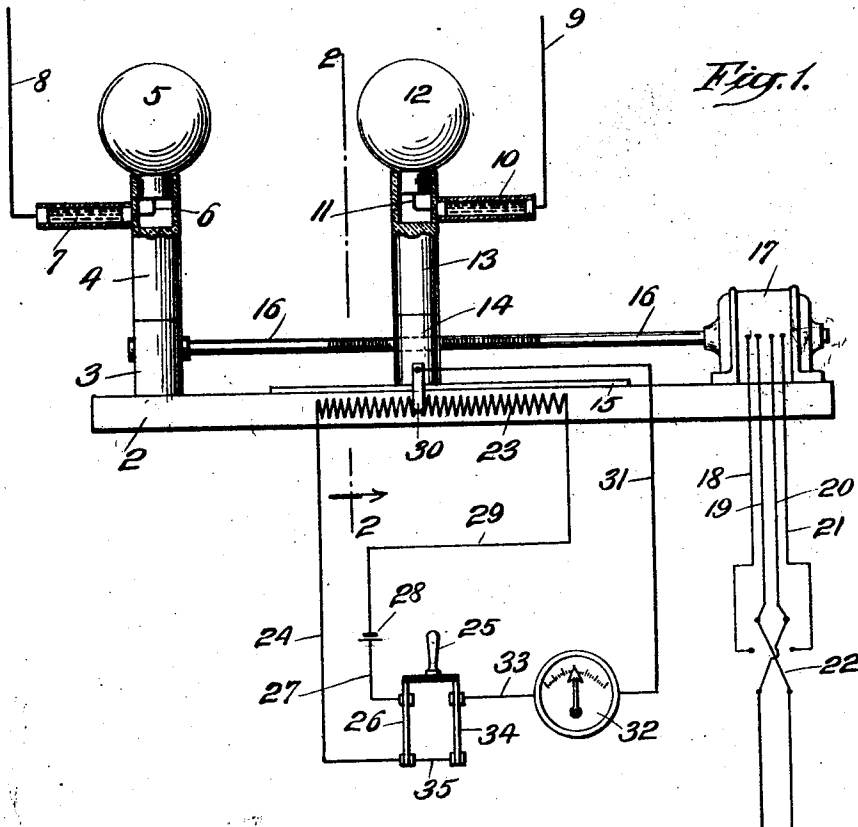
**Aüg. 4, 1925.**

**1,548,074**

H. F. WAITE

# HIGH POTENTIAL VOLTMETER

Filed Oct. 26, 1921



## UNITED STATES PATENT OFFICE.

HARRY F. WAITE, OF NEW YORK, N. Y.

HIGH-POTENTIAL VOLTMETER.

Application filed October 26, 1921. Serial No. 510,643.

*To all whom it may concern:*

Be it known that I, HARRY F. WAITE, a citizen of the United States, and a resident of the city of New York, county of Queens, and State of New York, have invented a new and useful Improvement in High-Potential Voltmeters, of which the following is a specification.

The object of my invention is to provide a high potential volt meter which will enable a person to read high potentials up to say 300,000 volts, more or less, with accuracy and without danger. This and other objects are accomplished by my invention, one embodiment of which is hereinafter more particularly set forth.

For a more detailed description of my invention, reference is to be had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation of my improved volt meter, the wiring being shown diagrammatically.

Figure 2 is a sectional view, taken on the line 2—2 of Figure 1, looking in the direction of the arrow.

Throughout the various views of the drawings, similar reference characters designate similar parts.

My improved volt meter 1 is provided with a base 2 on which is mounted a fixed standard 3 which supports an insulator 4 which is surmounted by a metallic ball 5 of large diameter. This ball is connected by a wire 6 with a high resistance 7, of the conventional kind, to a wire 8 which runs to a source of high potential, as one pole of a rectifying switch for an X-ray machine.

A second wire 9 which runs from the other pole of this machine or other source of high potential electricity runs to a high resistance 10 which is also connected to a wire 11 which is connected to a large metallic ball 12 which is mounted on an insulator 13 which surmounts a sliding base 14 which is adapted to slide freely in a suitable groove in the base 2 where it is held by guide plates 15 which run on this base and are secured thereto. The slidable base 14 is shifted by means of a screw 16 which passes through this base and is journaled in the fixed base 3 of the ball 5.

The spark gap between the balls 5 and 12 may be made as large or small as desired by turning the screw 16, as is obvious. This

screw 16 is rotated in one direction or another by means of a motor 17 which may be connected in any suitable way and is preferably a motor with a very low velocity. This motor derives power through the four wires 18, 19, 20 and 21 which are of the conventional kind, and have a reversing switch 22 interposed in the conventional manner so that this motor may be run either forward or backward or be stopped or started at the volition of the operator by a simple movement of the switch. By operating this motor, the spark gap between the balls 5 and 12 may be made as large or as small as desired, as is obvious.

The base 2 of the switch which carries a resistance 23 which has one end connected by a wire 24 to a switch 25 so that when this switch 25 is closed a circuit will be closed through the jaw 26 to a wire 27 which runs to a constant potential battery 28 and this battery is connected, as indicated, by a wire 29 with the other end of the resistance 23. This resistance is a bare resistance and is adapted to be engaged by a brush 30 which is suitably supported from the sliding base 14 and it is also connected to a wire or cable 31 which runs to a milli volt meter 32 which is calibrated in kilo volts in the proper dimensions according to the use to which the volt meter is to be put and this volt meter is connected by a wire 33 to a jaw 34 of the switch 25 and this jaw 34 has its pivoted end connected by a wire 35 to the jaw 26 so that whenever the switch 25 is closed, circuits will be closed both through the wires 27 and 33 from the constant potential battery 28.

In view of the foregoing, the use of my improved volt meter will be readily understood. Let it be assumed that the instrument is properly calibrated and the operator desires to have a difference of potential between the balls 5 and 12 of 270,000 volts, it is obvious that he should keep away from these balls and not in any way expose himself to the high potentials in them. He therefore has the wires 24, 29, 31, 18, 19, 20, 21 of sufficient length so that he may operate the switch 22 and switch 25 in safety. He closes these two switches and operates the switch 22 until the volt meter 32 reads at 270,000 volts which it will do when the brush 30 is at the proper point on the resistance 23. When this volt meter so reads, both the switches 25 and 22 are opened

and then the difference in potential between the wires 8 and 9 is regulated until a spark will be maintained between the balls 5 and 12 in the desired manner. When this spark is so maintained the difference in potential between these balls will be 270,000 volts. If desired the operator may leave the switch 25 closed so that the reading of 270,000 volts on the volt meter 32 will be preserved while this high potential current is passing, but this is not necessary. In any event, the operator observes the high potential balls 5 and 12 from a safe distance and knows that as long as the spark exists between them in the correct manner, the desired difference of potential exists. If he desires any other potential within the capacity of the instrument, the reading of the volt meter 32 would be made to correspond and the other proceedings would be had, as above set forth.

While I have shown and described one embodiment of my invention, it is obvious that it is not restricted thereto, but that it is broad enough to cover all structures that

come within the scope of the annexed claim. 25

What I claim is:

In a high potential volt meter, a base, a fixedly mounted ball supported from said base and insulated therefrom, a movable ball supported by said base and insulated therefrom and movably mounted, a screw for shifting the movable ball, a motor for driving said screw, suitable means for starting, stopping or reversing said motor, a resistance mounted on said base, means for passing a constant potential current through said resistance, a brush adapted to engage said resistance and movable with the movable ball and a volt meter connected to said brush and to said source of constant potential electricity that passes through said resistance so that said volt meter will read according to the position of the brush on the resistance. 30 35 40

In testimony whereof, I have hereunto set my hand this 7th day of October, 1921. 45

HARRY F. WAITE.