

May 29, 1923.

G. W. JANSON ET AL

1,457,249

ELECTRICAL PROTECTOR

Filed July 12, 1921

Fig. 1.

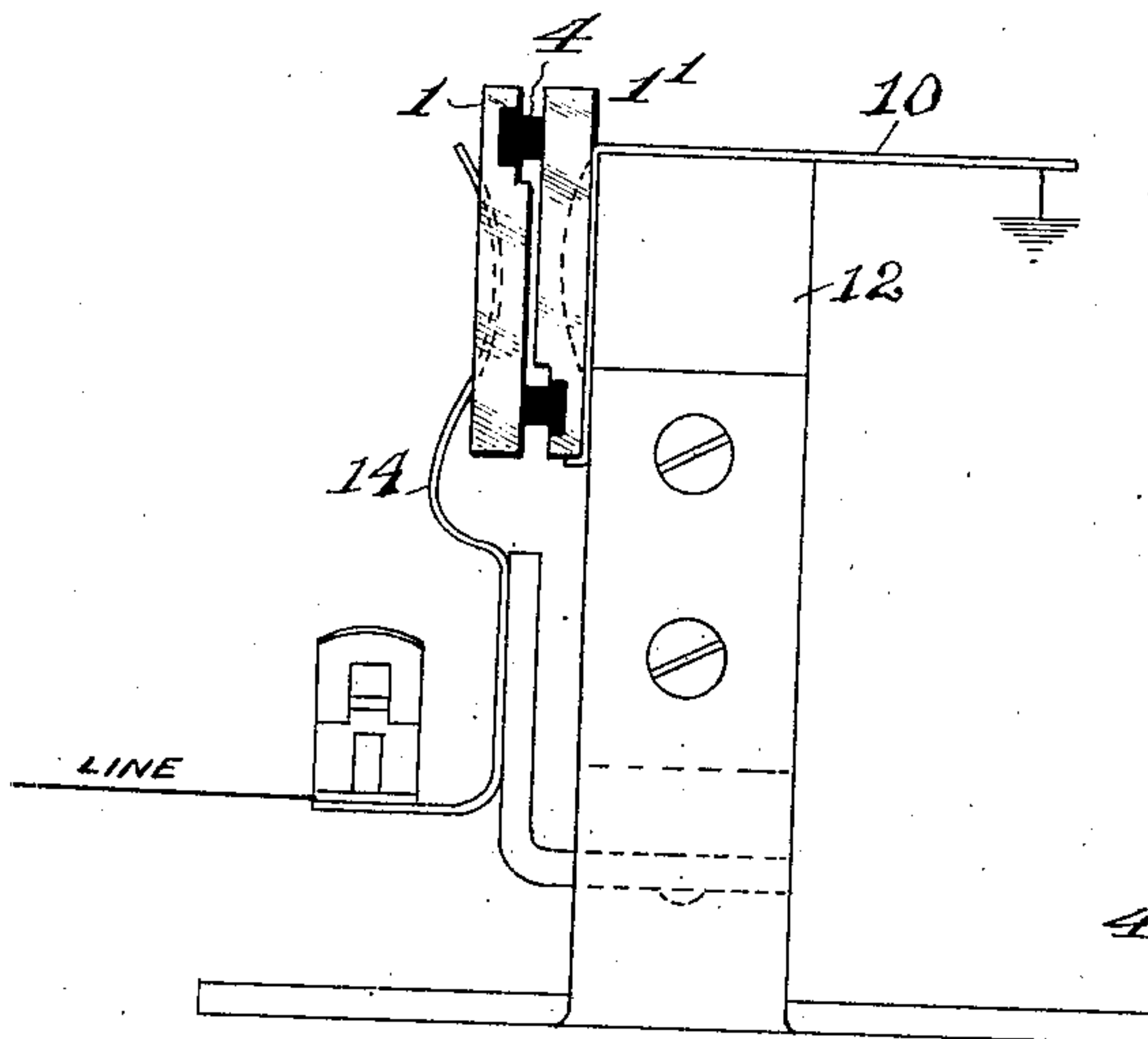


Fig. 3.

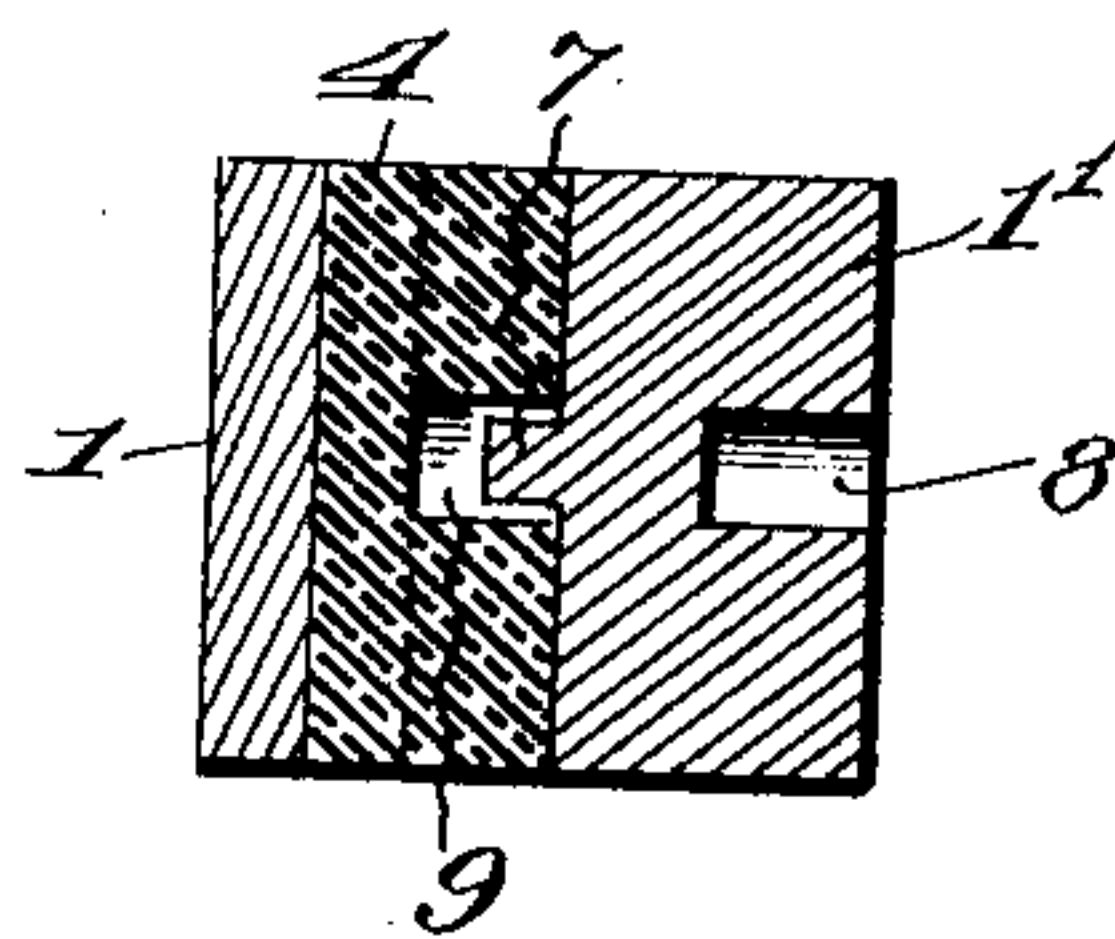


Fig. 2.

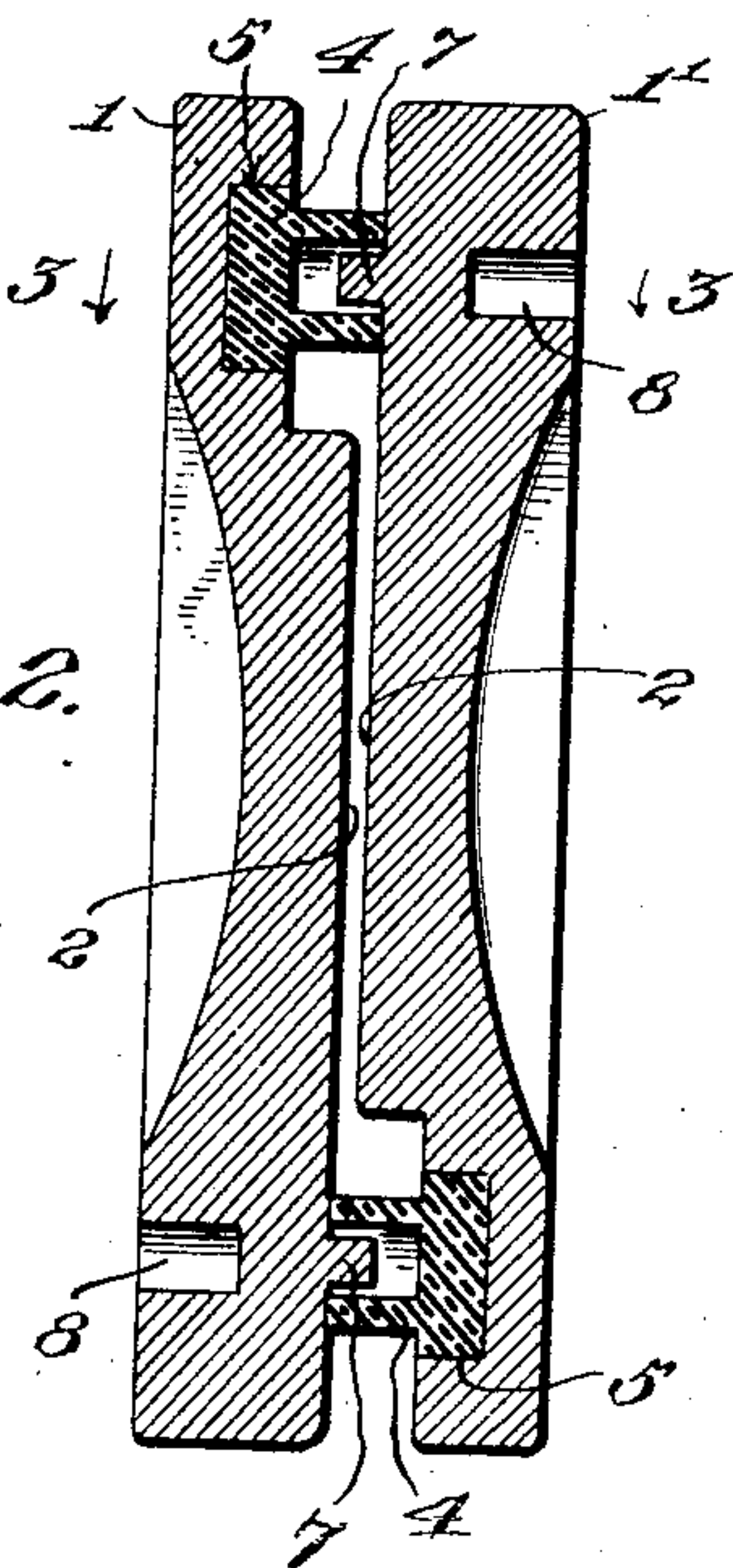


Fig. 4.

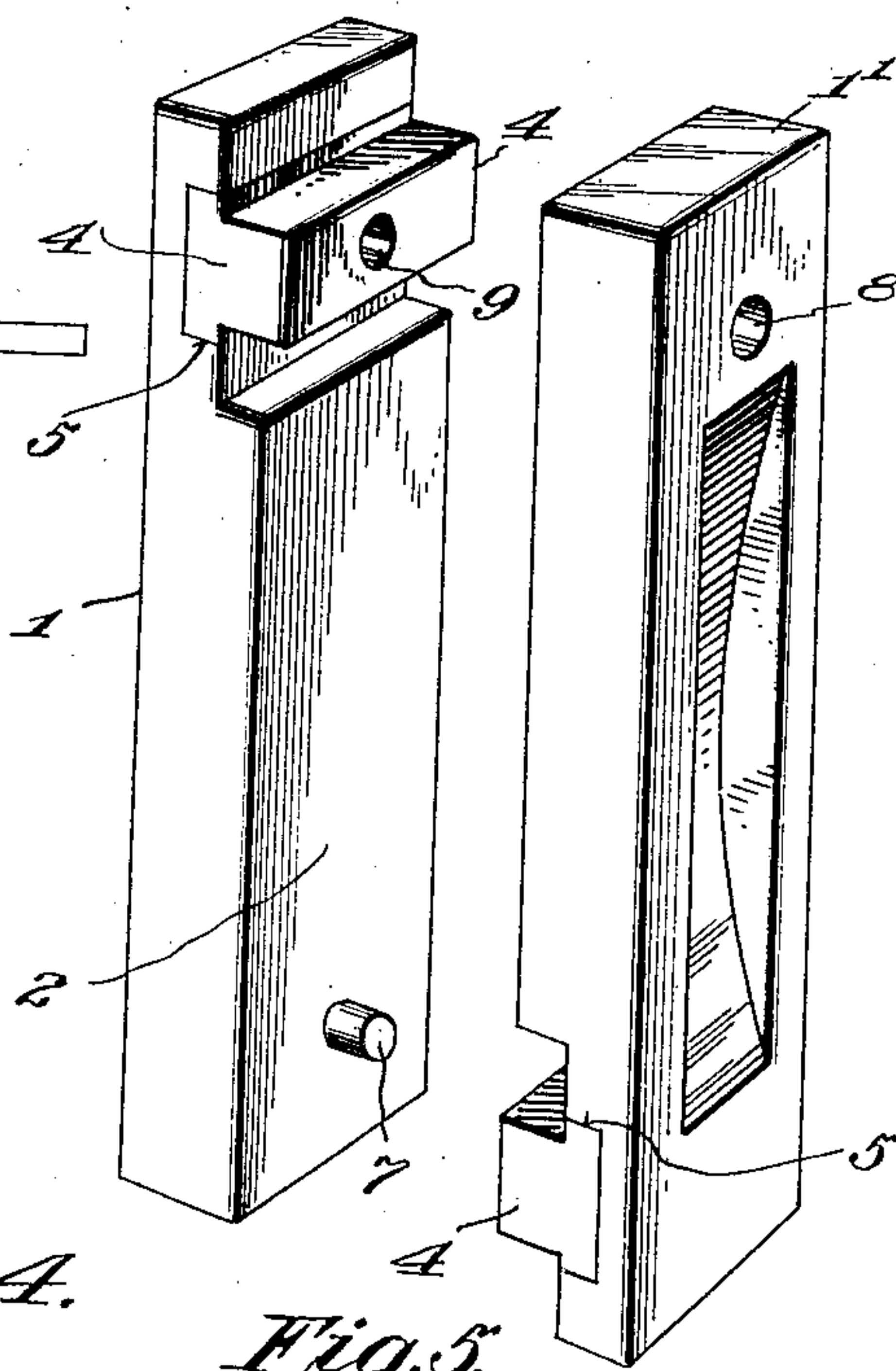


Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE W. JANSON, OF BROOKLYN, AND LEWIS H. ROVERE, OF RICHMOND, NEW YORK, ASSIGNORS TO THE WESTERN UNION TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTRICAL PROTECTOR.

Application filed July 12, 1921. Serial No. 484,238.

To all whom it may concern:

Be it known that we, GEORGE W. JANSON and LEWIS H. ROVERE, citizens of the United States, residing at Brooklyn, New York, and Richmond, New York, respectively, in the counties of Kings and Richmond, respectively, and State of New York, have invented certain new and useful Improvements in Electrical Protectors, of which the following is a specification.

This invention relates to protective devices for electric circuits, commonly referred to as lightning arresters.

In modern telegraph and telephone practice, the arresters used to protect cables and apparatus against breakdowns which might result from excessive voltage arising from lightning discharges and accidental contacts between the telegraph or telephone line wires and high tension circuits, usually consist of two electrodes of metal or carbon with an air-gap between them, the thickness of which is accurately maintained by means of a separator of mica or similar insulating material. When the arrester is operated by a continued heavy current, severe arcing between the faces of the electrodes will take place. To prevent the continuance of such arcing for more than a predetermined period, it is customary to provide one of the electrodes with an insert of fusible metal which will melt under the action of heat due to the arcing and will then form a solid metallic connection between the two electrodes and thereby stop the arcing by providing a low resistance connection from the protected circuit to the ground.

The purpose of the present invention is to provide an arrester in which the air-gap is very accurately determined and definitely maintained and wherein no mica or other separators are interposed between the arcing surfaces so that an inspector can readily detect any attempt to alter the thickness of the air-gap. We furthermore provide for a direct positive contact between the electrodes whenever the arcing continues beyond a predetermined interval, thus avoiding the expense of providing fusible inserts as well as any uncertainty which may be occasioned by relying upon a connection of fusible metal.

In the following detailed description we shall refer to the accompanying drawings, in which—Figure 1 is a side elevation of an

electrical protector embodying our invention; Fig. 2 is a central longitudinal sectional view of the same; Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 2; and Figs. 4 and 5 are front and rear perspective views of one of the electrode blocks.

The protector or arrester is composed of a pair of metal block electrodes 1, 1' having arcing surfaces 2, 2, accurately planed or ground to a true plane which are positioned to oppose each other with a definite air-gap determined by means of insulating posts 4, 4 solidly held in transverse grooves 5, 5, by a force fit or by crimping or pricking in the marginal metal. The parts are positioned and held against lateral shifting by pins 7, 7 which may either be inserts or may be extruded from the body of the blocks by means of a punch pressing the metal from the back and causing it to flow into a recess in a die bearing against the face of the block. The recess 8 indicates the depth of penetration of the punch. The insulating posts or blocks 4 are provided with apertures 9 to receive the pins.

In the operation of the discharging protector, any transient charge coming on the line of sufficiently high potential to menace any part of the circuit or apparatus, whether due to lightning or to a momentary cross with a power circuit, will discharge between the blocks across the air-gap. Should the overload caused by such lightning discharge or cross with a power circuit, charge the protected line dangerously or develop into a continuous arc, it is important that a direct low resistance connection should be immediately established to ground. We make provision for this by forming the insulating posts or blocks 4, of "hard rubber" or similar softenable insulating material which will remain rigid during normal temperatures, but will soften when subjected to a high temperature. When the two members of a protector are to be connected in circuit, they are mounted between a suitable metal bracket 10, carried by an insulating support 12 and an insulated spring arm 14 which is shaped to fit within a recess in the back of the outer block, so that the electrode blocks of the protector are constantly pressed together by the spring. When, therefore, a heavy or continuous arc is formed across the air-gap between the opposed arcing surfaces, the

electrodes become heated sufficiently to soften the hard rubber posts, permitting the spring to force the electrodes into contact and thus establish a good low resistance path from the line to ground.

The electrodes are identical in structure, thus reducing the cost of manufacture and making it unnecessary for the electricians and repairmen to carry different constructions. Moreover, there are no auxiliary separators, or other parts and the electrodes are all interchangeable. The air-gap is well defined by removing a portion of the metal at one end of each electrode, thereby forming a cut-away portion, and locating the insulating posts at an intermediate point therein, thus leaving a gap between the inner end of the post and the adjacent edge of the plane conducting surface.

We claim:—

1. A protector, comprising a pair of electrodes, each comprising a block having a plane conducting surface and a cutaway portion adjacent one end, and a body of insulating material capable of softening under the action of heat, secured to said cut-away portion and extending beyond said conducting

surface, whereby when the electrodes are placed in opposition to each other in reversed relation they will be separated by a definite air-gap.

2. A protector, comprising a pair of electrodes, one of said electrodes comprising a block having a plane conducting surface and a cut-away portion adjacent one end, and a heat softenable insulating post secured to said cut-away portion and extending beyond said conducting surface.

3. A protector, comprising two identical blocks, each having a plane conducting surface and a cut-away portion, and a heat softenable insulating post secured to said cut-away portion and extending beyond said conducting surface.

4. A protector, comprising two identical blocks, each having a plane conducting surface and a recessed cut-away portion, and a heat softenable insulating post embedded in the recess in said cut-away portion and extending beyond said conducting surface.

In testimony whereof we affix our signatures.

GEO. W. JANSON.
LEWIS H. ROVERE.