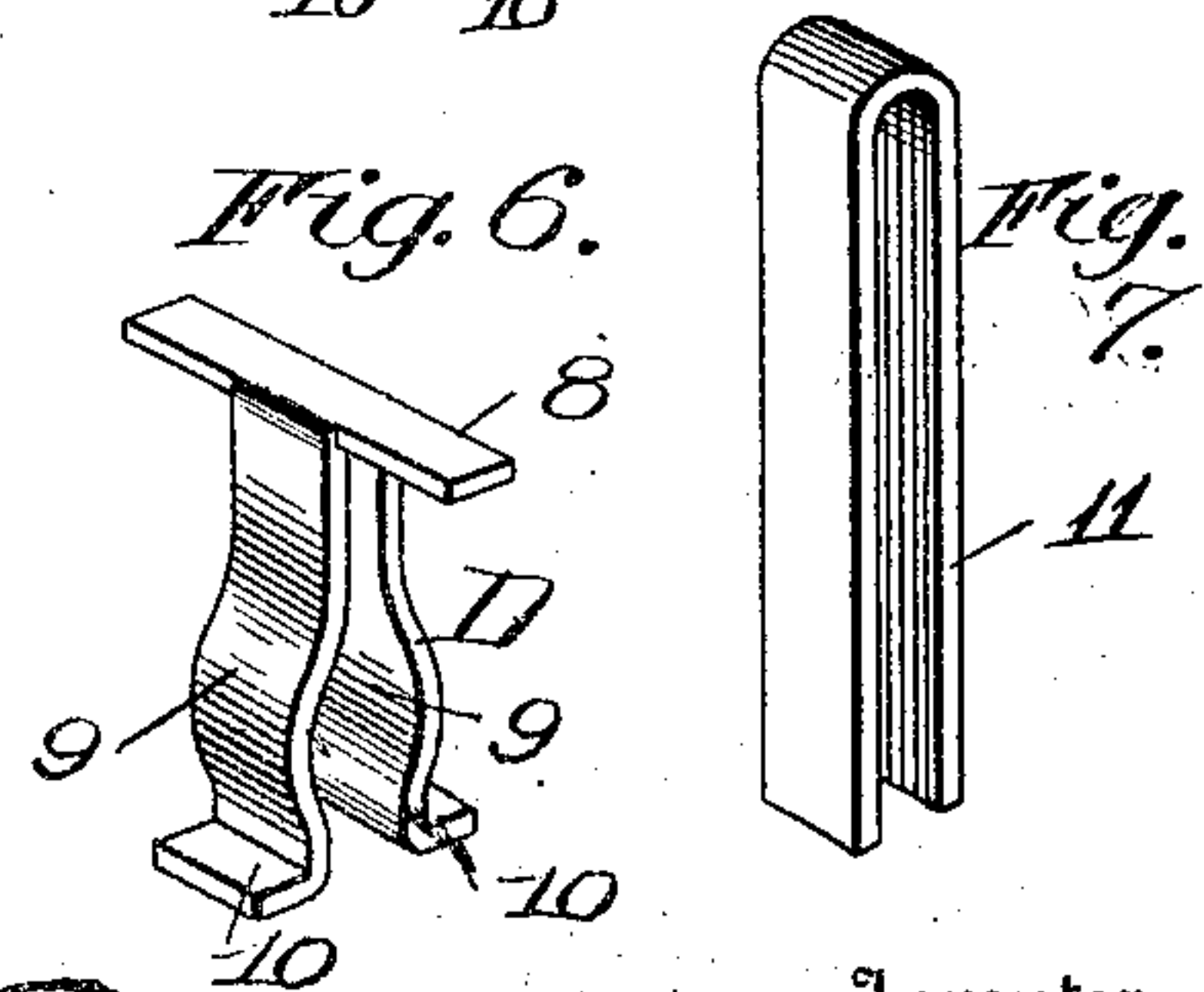
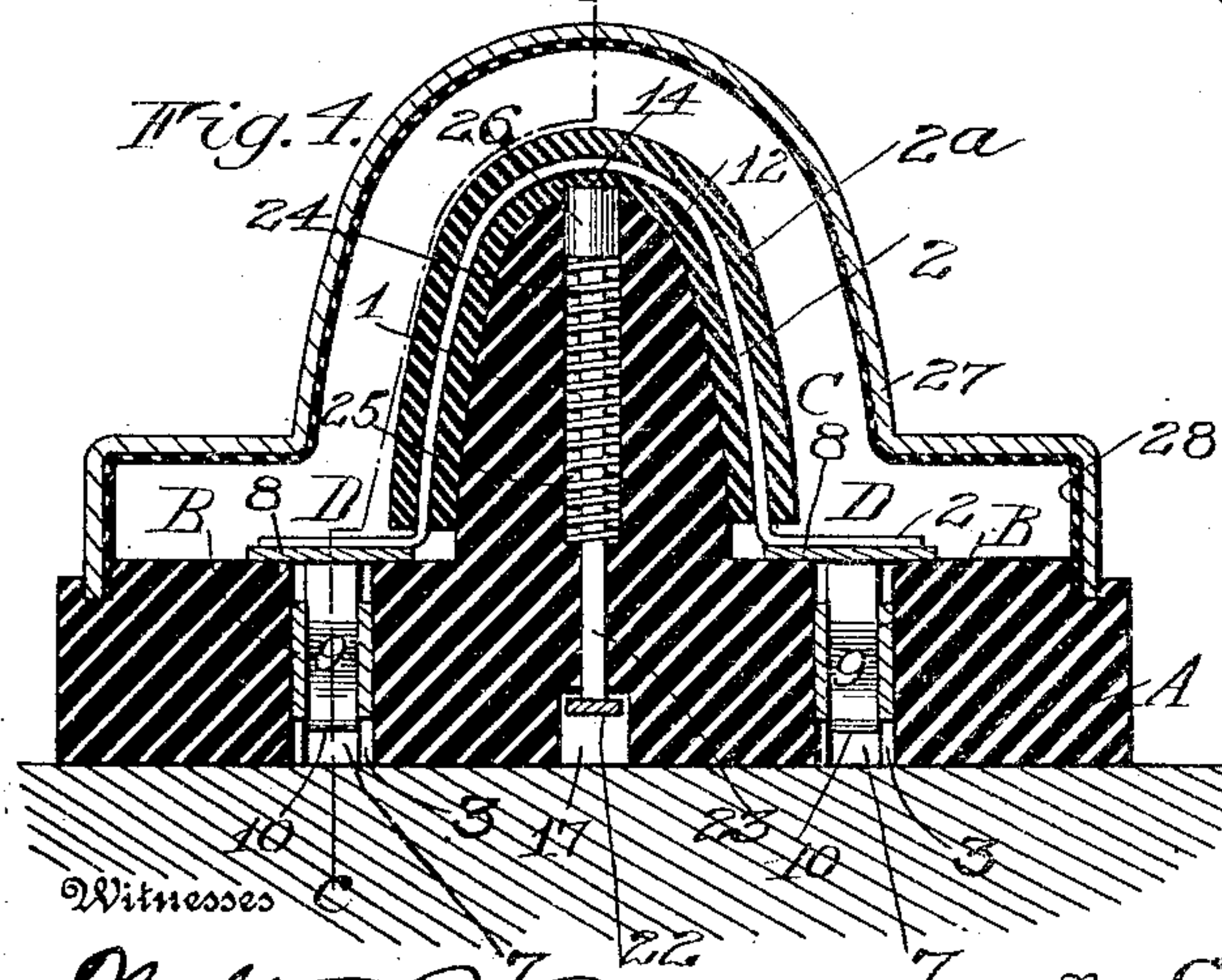
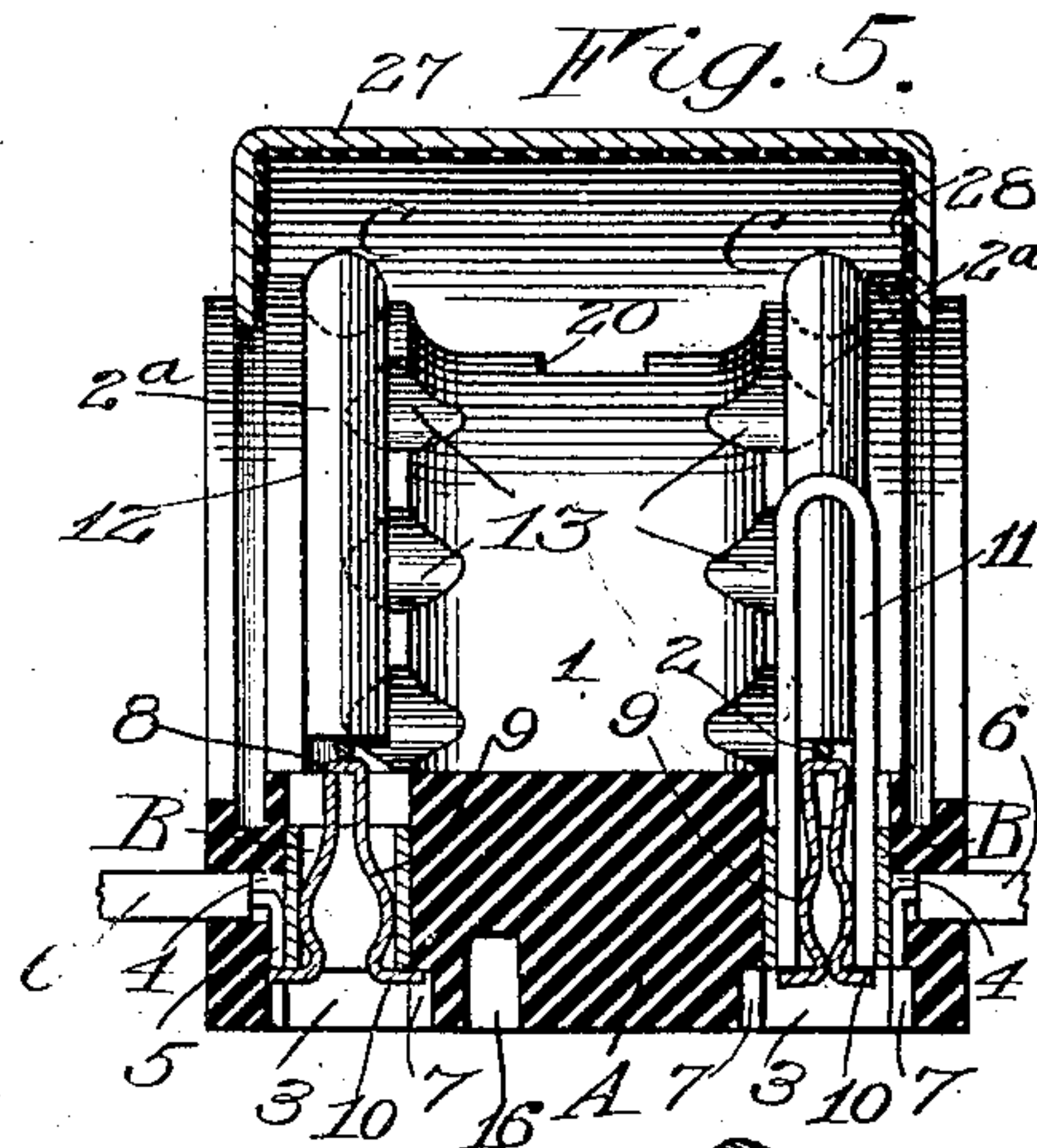
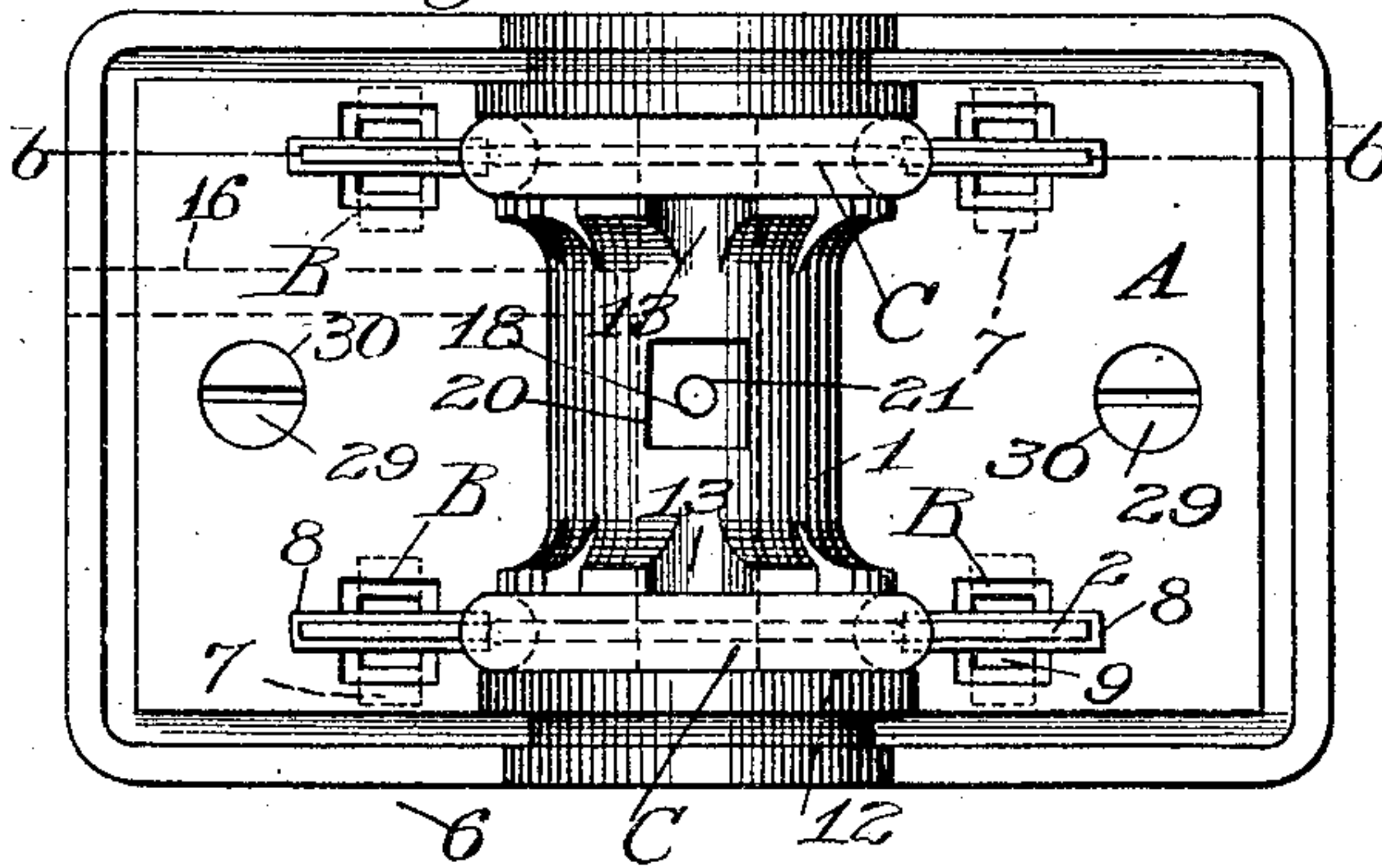
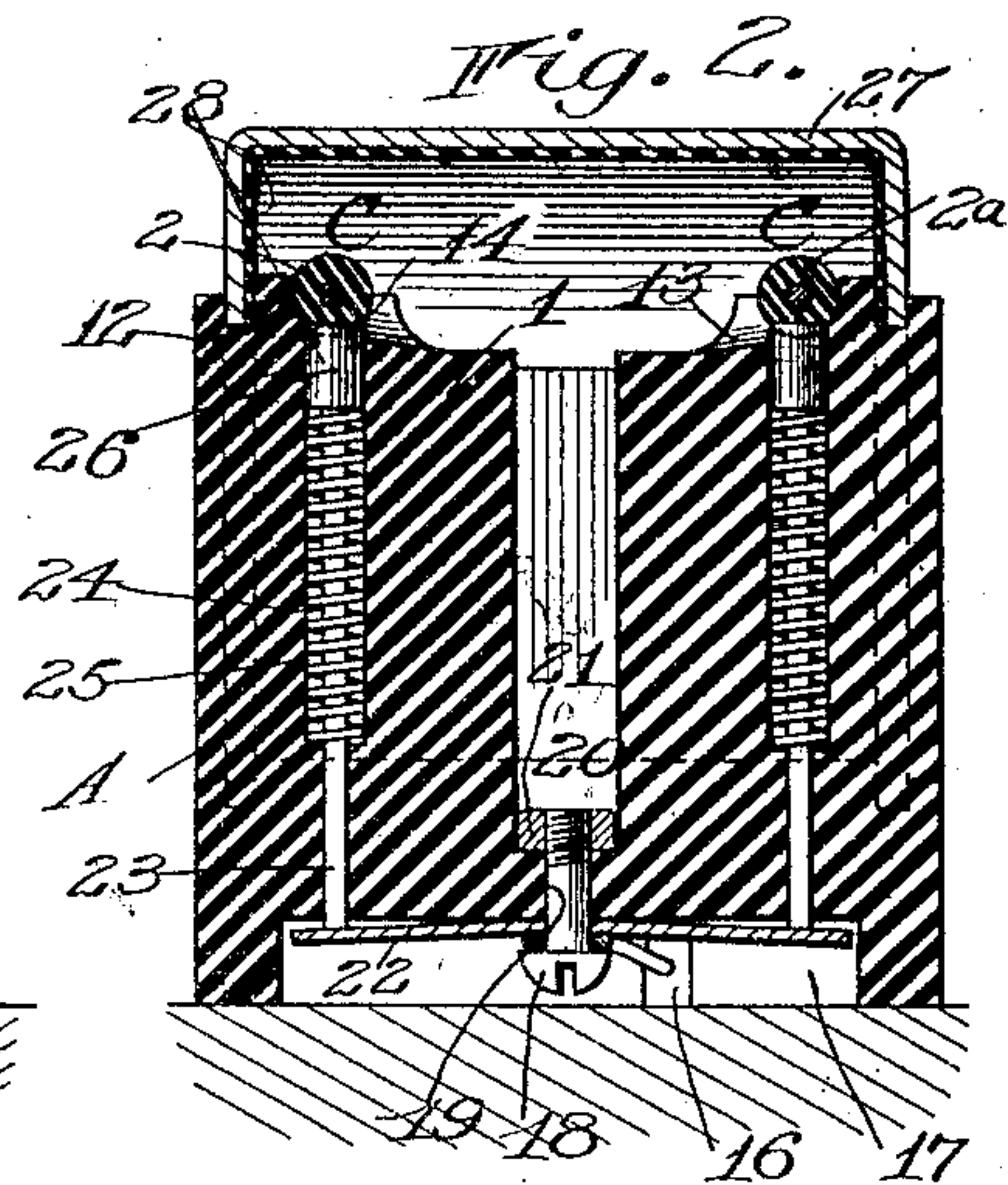
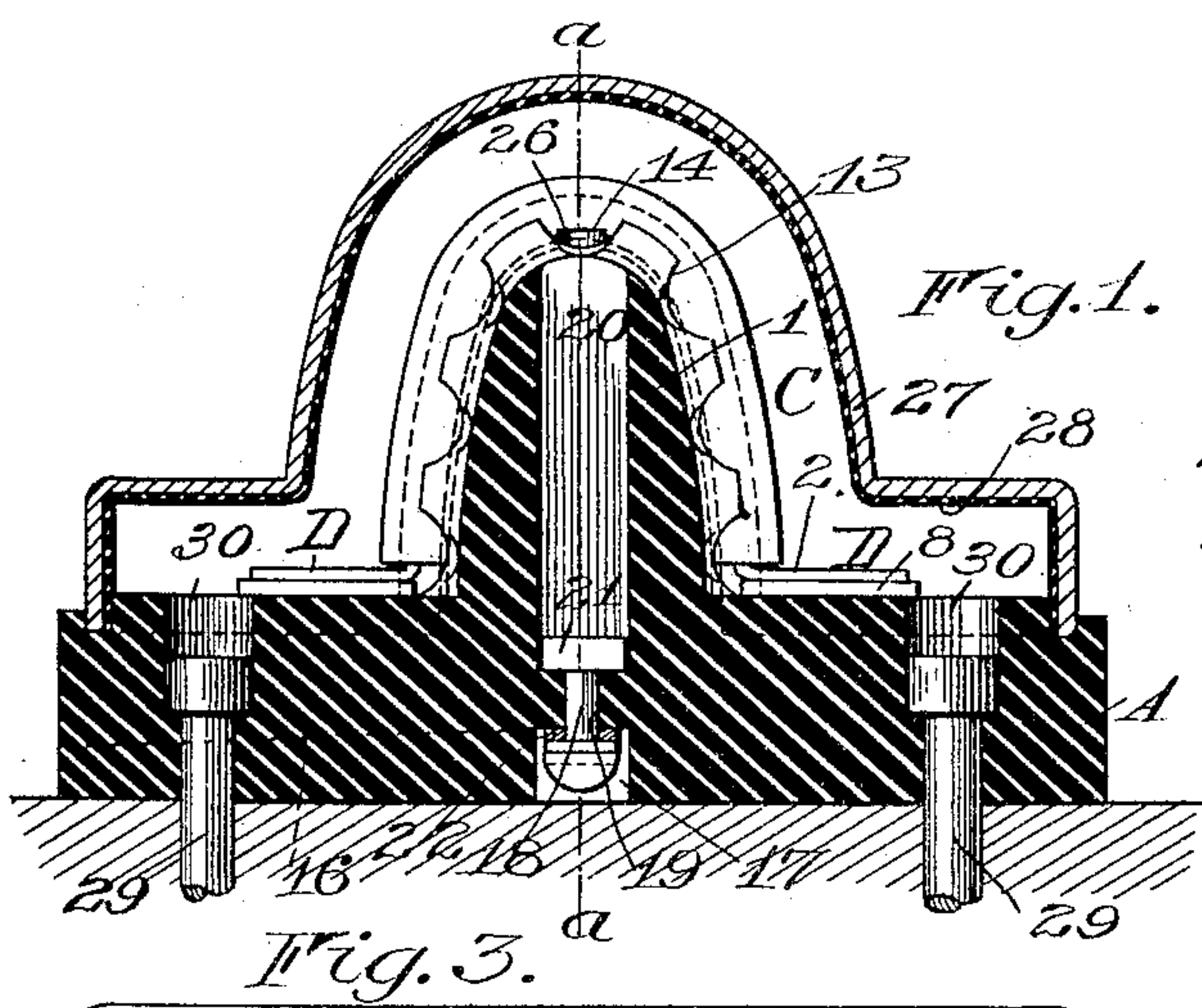


P. J. McDONALD.  
FUSE BOX.  
APPLICATION FILED MAR. 18, 1908.

995,702.

Patented June 20, 1911.



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# UNITED STATES PATENT OFFICE.

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## FUSE-BOX.

995,702.

Specification of Letters Patent. Patented June 20, 1911.

Application filed March 18, 1908. Serial No. 421,934.

*To all whom it may concern:*

Be it known that I, PATRICK J. McDONALD, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Fuse-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of the specification, and to the reference-numerals marked thereon.

This invention relates to fuse boxes, and more particularly to devices of this kind adapted to be used as lightning arresters in high tension current circuits.

An object of the invention is to provide a fuse box in which the terminals are so arranged and separated that the jumping of a spark from one terminal to another is practically impossible.

Another object is to provide for fuse boxes and the other electrical devices, co-operating terminals in which firm contact is secured, and which are interlocked to prevent them from becoming accidentally separated.

Still another object is to construct a fuse box in which a ground conductor is so arranged and constructed that upon the burning of a fuse, the excess of current will be conducted to the ground, and the ground circuit will then automatically open to prevent particles of the fuse establishing a circuit between the terminals and the ground conductor.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a longitudinal section of a fuse box embodying my improvements. Fig. 2 is a transverse section on the line *a—*a** of Fig. 1. Fig. 3 is a top plan view of the box with the cover removed. Fig. 4 is a longitudinal section on line *b—*b** of Fig. 3. Fig. 5 is a transverse section on the line *c—*c** of Fig. 4. Fig. 6 is a perspective view of one of the compressible terminals, and Fig. 7 is a view of the key for removing the compressible terminals.

With more extended reference to the drawings. A indicates an insulating support

or base which in this instance is provided with two pairs of terminals B, to be more particularly described. To prevent a spark jumping from one terminal of one pair to a terminal of the other pair, there is arranged between the two pairs of terminals, an insulating barrier 1 which is integral with the base A and extends transversely of said base between the pairs of terminals.

Insulated fuses C, as for instance, fuse wires 2 and insulations 2<sup>a</sup>, pass about the barrier and each carries at its ends, terminals D to coöperate with the terminals B on the support. These terminals B and D may be of any suitable construction, but the novel forms, herein shown, have special advantages in fuse boxes, as they are so arranged that they prevent spark jumping.

As shown, the terminals B are hollow and are rectangular in cross section, being arranged in pockets 3 in the base or support and spaced from the upper and the lower ends of the said pockets. Each of the pockets 3 is provided with a lateral outlet 4 and has one of its walls formed with a vertical groove 5 branching from the outlet, the line wire 6 having its insulation inserted in the outlet 4 and its conductor wire bent laterally into the groove 5 to bear against a wall of the terminal B. Below the lower end of each terminal B, the pockets are enlarged on opposite sides, as at 7, to receive locking projections on the coöperating terminal D, as will be described.

Each of the terminals D, herein shown, is compressible and comprises a wire attaching portion 8 or head, adapted to rest upon the base or support A about a pocket 3, the wire 2<sup>a</sup> being, in the present instance, soldered thereto. A pair of yielding members, preferably in the form of two spring arms, is carried by the wire attaching portion and each of said arms has an outwardly curved contacting portion 9 and, preferably, means for interlocking the terminal D with a terminal B, this means, in this instance, comprising a laterally extending projection 10 adapted to engage beneath the lower end of contact B and to extend into an enlarged portion 7 of a pocket 3. To remove a terminal D, a key, in the form of a U-shaped member 11, has its arms adapted to be inserted into a pocket 3 on opposite sides of the spring arms of the terminal D so that



the ends of the key will ride on the curved contacting portions 9 and compress the said terminal to move the interlocking projections 10 from engagement with the lower end of the terminal B.

The barrier 1 is formed with grooves 12 corresponding in number to the fuses C, to hold the latter against lateral displacement; and these grooves have lateral outlets 13 to permit the escape of fused portions, thus preventing the grooves holding the fuses together and thereby maintaining connections between the terminals after a fuse has been blown.

To conduct the excess of current away from a blowing fuse, I provide a ground conductor, which rests against a fuse C, between the terminals of the latter, the fuse having its insulation weakened, as for instance, recessed at 14, and the ground conductor being arranged to project into this recess. This ground conductor comprises a circuit breaking or opening device, which is held in circuit closing position by one of the fuses C, and which automatically moves to break the ground circuit from the fuse, when the fuse has been destroyed, thus preventing particles of the fuse maintaining a circuit from a terminal to and through the ground conductor.

In the present instance, the ground conductor passes through a groove 16 in the under side of the base or support, to a transverse pocket 17 in which is arranged a binding screw 18 extending through a vertical bore 19, to a vertical pocket 20, having an anchoring nut 21 arranged therein. The binding screw 18 also retains within the pocket 17, a leaf spring 22 which projects from both sides of the binding screw and branches the ground conductor. Each branch of the ground conductor embodies an automatic circuit breaking device, which, in this instance, is in the form of a plunger 23, arranged in a vertical bore in the support, and held against one free end of the leaf spring 22 by one of the fuses C, positioned within a groove 12; the leaf spring yielding slightly, as shown in Fig. 2, so that a firm contact is formed between it and the plunger 22. The plunger is, through a coil spring 24, moved automatically when its retaining fuse C burns, the bore in which the plunger moves being enlarged at its upper portion, as at 25, to provide a seat for the spring, and the plunger being formed at its upper end with a head 26 to provide an abutment for the spring.

The fuse parts are housed by a cover 27, preferably shaped to conform to the upper surface of the support, and having an insulating lining 28. The device is mounted in any suitable manner, as for instance, by bolts 29 passing through openings 30 in the support A.

I claim as my invention:

1. In a fuse box, a support, open ended hollow terminals on the support, and a removable fuse carrying terminals at opposite ends, each formed to pass through one of the hollow terminals and having locking devices to engage below the lower end of the latter.

2. In a fuse box, a support, hollow terminals carried by the support, and a fuse carrying at each end a terminal formed of spring arms adapted to engage the inner walls of a hollow terminal and provided with means to interlock with said terminal.

3. In a fuse box, a support, hollow terminals carried by the support, and a fuse carrying at each end a terminal formed of spring arms adapted to engage the inner walls of a hollow terminal and provided with lateral projections to interlock with said latter terminal.

4. In a fuse box, a support, open ended hollow terminals carried by the support, and a fuse carrying at each end a terminal comprising spring arms adapted to engage the inner walls of a hollow terminal and formed with outwardly curved contacting portions and with lateral projections at its ends, the curved portions engaging opposite inner walls of a hollow terminal, and the lateral projections engaging an end of the said hollow terminal.

5. A fuse provided at its ends with terminals each comprising a fuse-wire attaching portion, and spring arms projecting from the attaching portion, each spring arm being formed with an outwardly curved contacting portion between its ends, and with an outwardly turned lateral projection at its free end.

6. An electric terminal, comprising a wire attaching portion, and spring arms extending from said portion and provided with outwardly curved contacting portions between their ends and with outwardly turned lateral extensions at their free ends.

7. The combination with an insulating support, of a hollow terminal arranged on the support, and a compressible terminal adapted for cooperation with the hollow terminal, and provided with means moved out of interlocking connection with the hollow terminal upon the compression of the said cooperating terminal.

8. In a fuse box, a support, an insulated fuse having a portion of its insulation weakened, and a ground conductor held yieldably in engagement with the weakened portion.

9. In a fuse box, a support, an insulated fuse having a portion of its insulation provided with a notch, and a ground conductor held yieldably in contact with the notch.

10. In a fuse box, a fuse, and a ground connection comprising means held in circuit



closing position by the fuse and moved automatically to break the circuit when the fuse blows out.

11. In a fuse box, a fuse, and a ground connection comprising a plunger held in circuit closing position by the fuse, and means moving the plunger automatically to break the circuit when the fuse blows out.

12. In a fuse box, a fuse, and a ground connection comprising a member held in circuit closing position by the fuse, and a spring moving the member to break the ground circuit when the fuse blows out.

13. In a fuse box, an insulating support, a fuse arranged on one side of the support 15 and a ground conductor comprising a flat spring, a plunger adapted to engage the free end of the spring and to be held thereagainst by the fuse, and a spring for moving the plunger out of contact with the flat spring 20 when the fuse blows out.

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