

No. 641,161.

Patented Jan. 9, 1900.

L. J. STEELE.
EARTHING DEVICE FOR ELECTRICAL CIRCUITS.
(Application filed June 17, 1899.)

(No Model.)

Fig. 1.

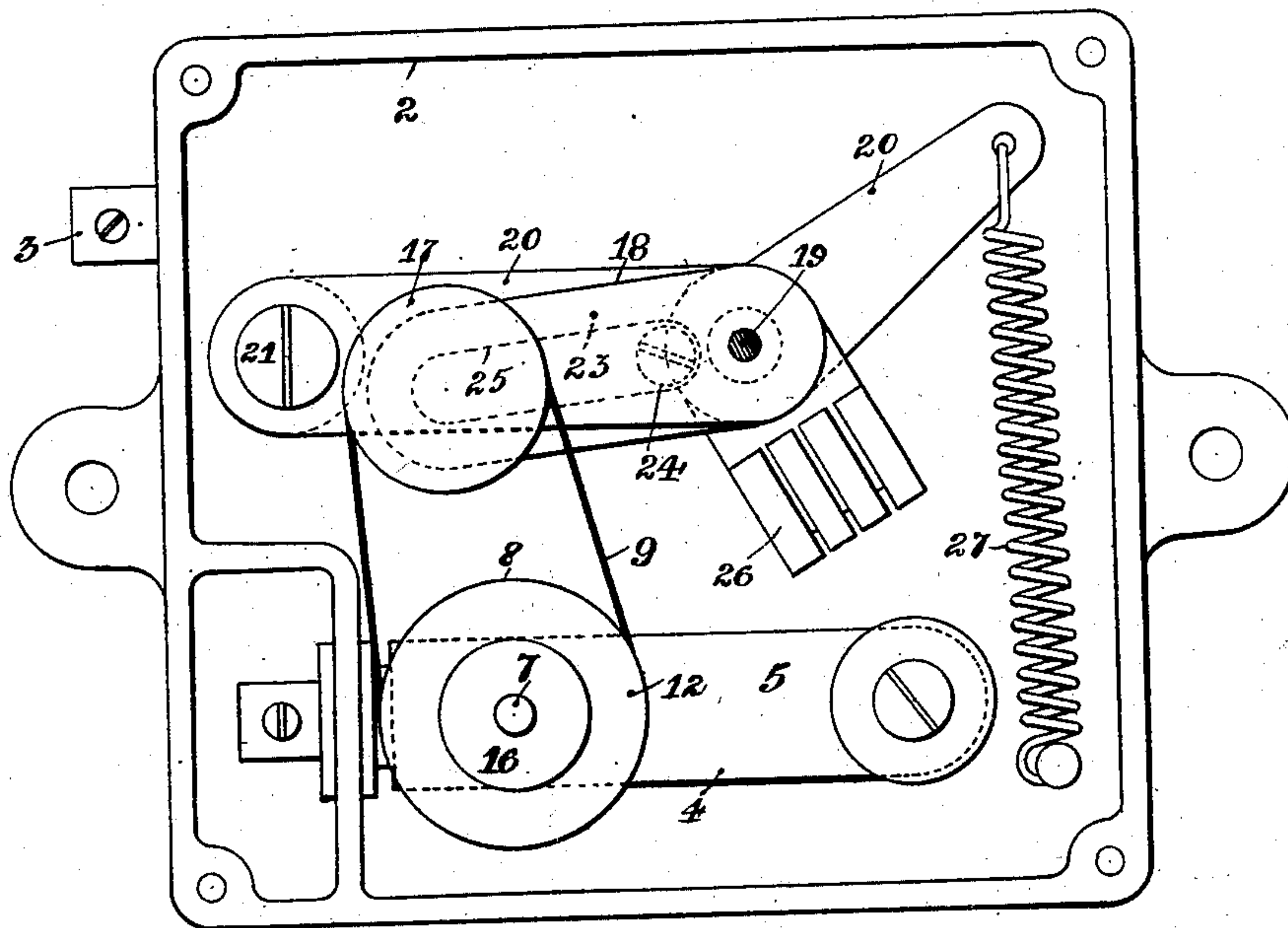


Fig. 3.

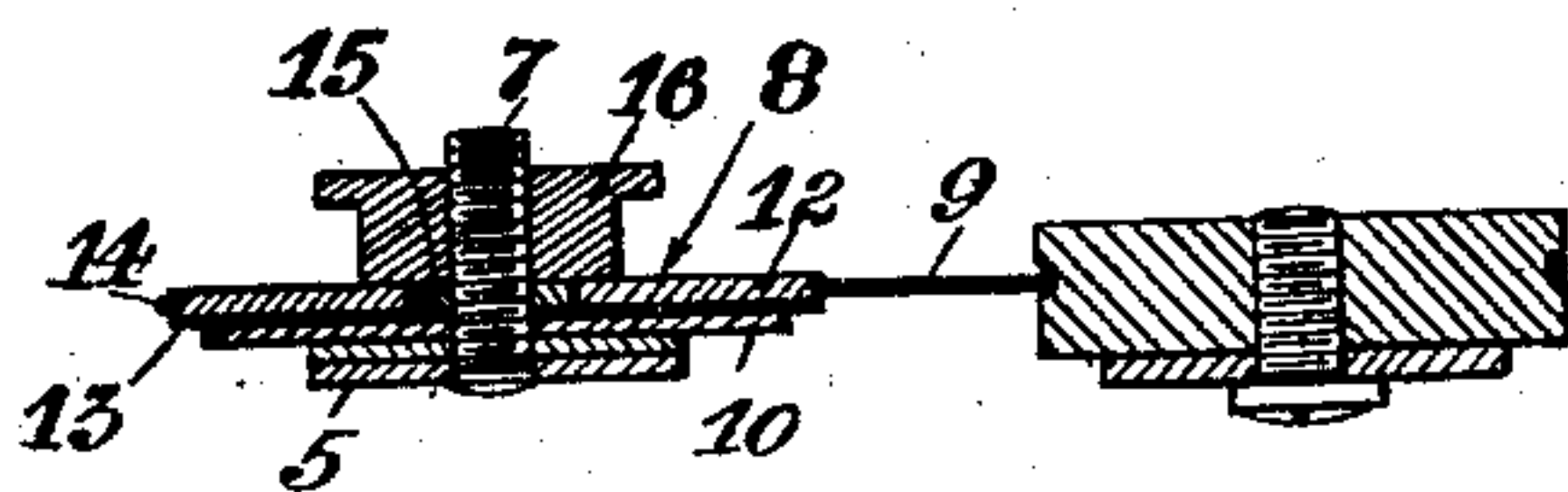


Fig. 4.

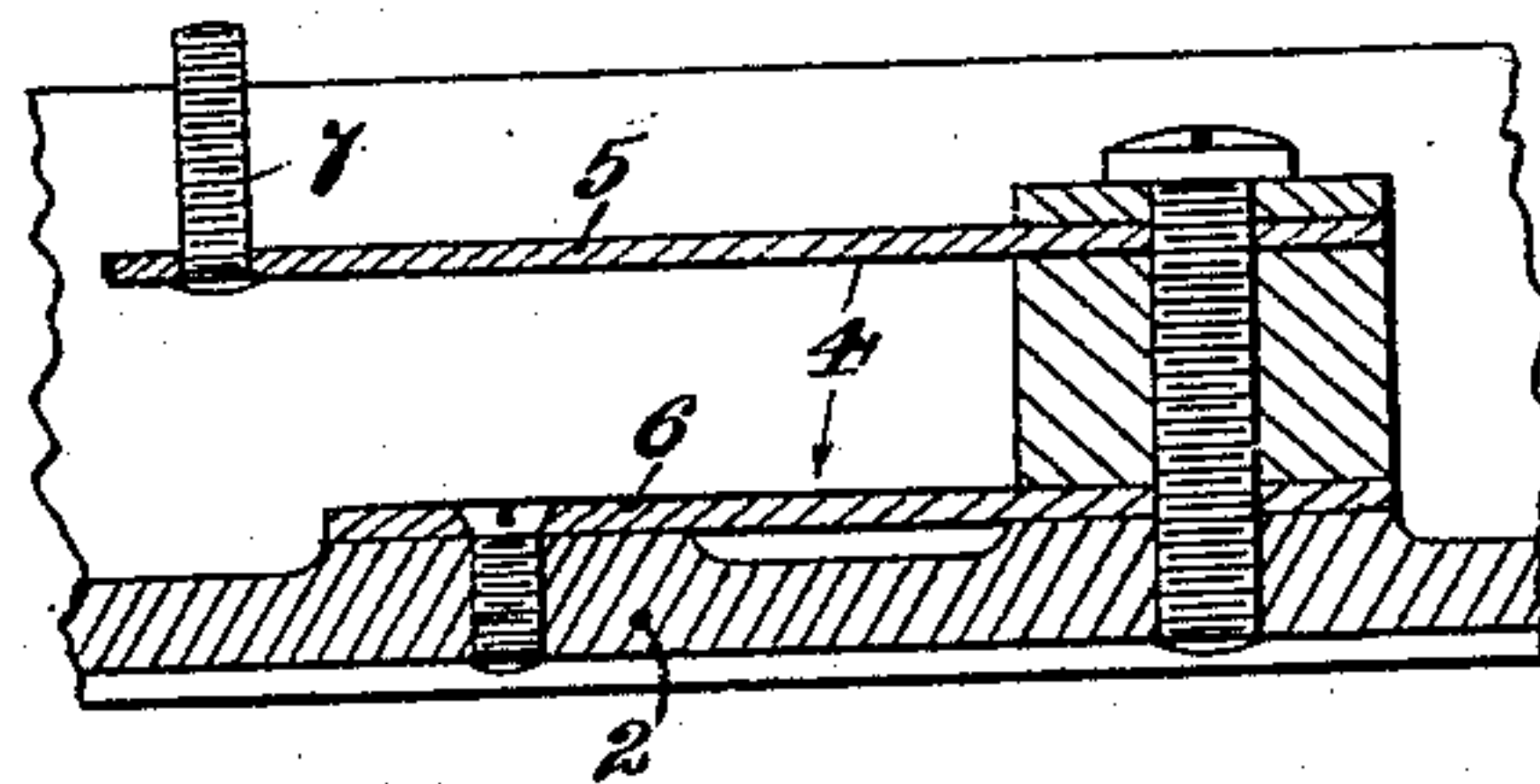
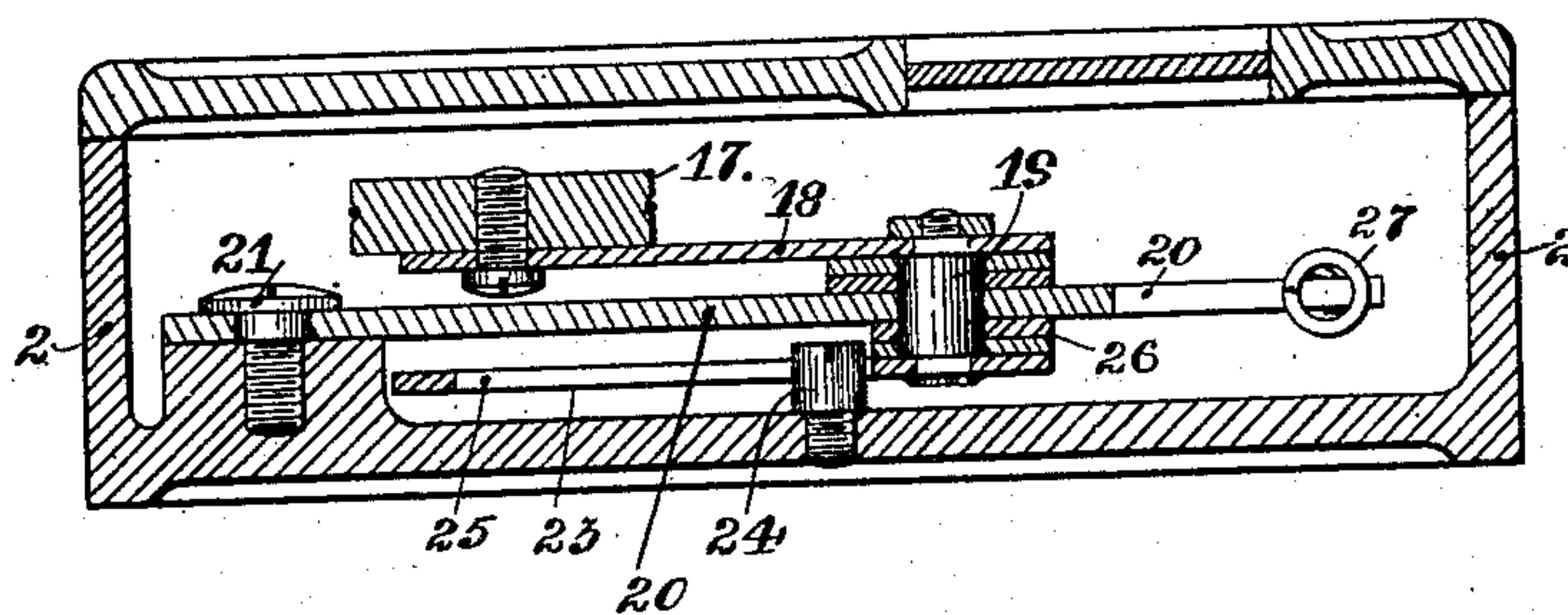


Fig. 2.



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EARTHING DEVICE FOR ELECTRICAL CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 641,161, dated January 9, 1900.

Application filed June 17, 1899. Serial No. 720,956. (No model.)

To all whom it may concern:

Be it known that I, LOUIS JOHN STEELE, electrical engineer, a subject of the Queen of Great Britain, residing at 14 Clarendon road, Holland Park, London, W., England, have invented certain new and useful Improvements in Earthing Devices for Electrical Circuits, of which the following is a specification.

10 This invention is an improved earthing device for use in an electrical circuit for insuring an automatic connection of the said circuit to earth if an abnormal and dangerous current should at any time arise therein.

15 The said device is set forth in the annexed sheet of drawings, in plan in Figure 1 and in vertical section in Fig. 2, the position of the parts being one "set" or shutting out the earth connection from the circuit. In this
20 device a fuse-wire is used, and the particular manner in which it is applied and fitted to form a part of the earthing device is particularly shown by the section Fig. 3. Fig. 4 is a section of a part forming an earth-terminal
25 to the device in the protected circuit.

In the sheet of drawings, 2 represents a casing of a box construction to inclose and form a carrier for the active parts of the device, the said casing being connected in a suitable
30 way from a connection 3 to earth.

4 represents a conductive portion comprising two plates 5 and 6, connected to the circuit to be protected and insulated from the casing 2, the said part constituting the earth-terminal of the protected circuit. A screwed
35 post or peg 7 stands up from the plate 5, and upon it is placed a carrier 8 for the fuse-wire 9, the said carrier being formed by two circular plates 10 12, connected together, with a
40 layer 13 of perforated micanite between them. The fuse-wire 9, which is in the form of a loop, passes around the boundary edge or periphery 14 of the plate 12, the latter being insulated from the plate 10, which is in electrical communication with the post 7 and the
45 plate 5, by the micanite layer, as aforesaid, and a non-conducting bush 15, let into the center of the plate 12 to surround the post 7 and face the micanite layer. A screwed
50 thumb-nut 16 engages the post 7 and holds the fuse-carrier 8 in position thereon and pre-

vents the parts of it becoming in any way displaced.

The outer end of the looped fuse-wire 9 passes around a circular disk 17, carried upon
55 the one end of a short arm 18, fulcrumed at 19 to a second arm 20, jointedly connected at 21 to the casing 2, an under lever 23 being also fulcrumed to the arm 20 at 19, so as to move as one piece with the arm 18. The ful-
60 crum to this under lever 23 is formed by a stud 24, standing up from the bottom of the casing 2, and a slot 25 in the under lever, with which the said stud engages, the fulcrum becoming thereby a shifting one. A yielding
65 contact-piece 26 is carried upon the arm 20 for engaging the plates 5 and 6 by forcing itself wedge-like between them by the action of a spring 27, which, however, is held in
70 check by the looped fuse-wire 9 so long as the said fuse-wire is intact or "not blown." When the contact-piece 26 engages the plates 5 and 6, the protected circuit, of which the
75 portion 4 forms part, is put to earth.

In action the under lever 23 is operated by
80 pulling inward the free end of the arm 18 to withdraw the contact-piece 26 from engagement with the plates 5 and 6 by moving the arm 20, and when the fuse-wire passes around the disk 17 on the said free end holds it in the
85 position represented in Fig. 2—viz., against the action of the spring 27—until such time as the fuse-wire 9 "blows," when the spring 27 acts upon the arm 20 immediately the arm 18 is released from being held in by the fuse-
90 wire.

The blowing of the fuse-wire takes place immediately a current passes through the portion 4 sufficiently strong to jump the air-gaps of the perforations in the micanite layer 13,
95 the thickness of the said layer being accurately predetermined to adjust the sparking distance between the plates 10 and 12.

The arm 18 is mounted on the contact-arm 20 at 19, and the under lever 23 is also carried
95 by arm 20. The spring 27 constantly tends to swing the arm 20 on its pivot or joint 21 toward the conductive portion 4, so that the contact-arm 20 shall engage the portions 4 and 5. The arm 20 is, however, controlled
100 in the direction against the spring 27 by the under lever 23 and the arm 18 through the

fulcrum-stud 24 and the slot 25. The retention of the arm 18 by the fuse-wire is in a similar direction to the action of the spring 27, whereas the fuse-wire in action holds the arm 20 against the spring 27. This comes about by the arm 18 being fulcrumed by the under lever 23 and the stud 24 to the casing and used as another lever to move the arm 20 against the spring 27, the fulcrum of the under lever 23 being a shifting one or one capable of compensating for the radial movement of the arm 20 in bringing forward the contact-piece 26 to engage the portions 4 and 5. Assuming that the fuse-wire has blown and that the contact-piece 26 engages the portions or plates 5 and 6, to break the contact between the parts 26 and 5 and 6 the arm 20 is moved against the action of the spring, so as to withdraw the contact-piece, by pulling inward (toward the carrier 8) the free end of the arm 18 and with it the under lever 23 (it being a rigid part) and rocking them both upon the stud 24. Therefore the lever 20 is moved against the spring by another lever 18 and 23, fulcrumed by the parts 24 and 25.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an earthing device, the combination of a conducting portion forming an earth-terminal of the protected circuit, a looped fuse-wire connected thereto so as to be insulated by a perforated micanite layer, an under lever having a shifting fulcrum and to which the other end of the looped fuse-wire is indirectly connected, a jointed arm carrying a contact-piece and to which the under lever is jointedly connected, and a spring acting upon the arm carrying the contact-piece, substantially as described.

2. In an earthing device, the combination of a conducting portion forming an earth-ter-

minal of the protected circuit, a looped fuse-wire connected thereto by plates 10, 12 having between them a perforated micanite layer, a jointed arm carrying a contact-piece and fitted with a spring, an under lever jointedly connected to said arm and having a slot within it engaging a fixed stud to form a shifting fulcrum, and an arm connected to the under lever so as to move as one with it and over whose free end the other end of the looped fuse-wire passes, substantially as described.

3. In an earthing device, the combination of a suitable box-like casing, a conducting portion 4 arranged therein but insulated therefrom, a looped fuse-wire 9 connected to the said portion by plates 10 and 12, micanite layer 13, bush 15 and post 7, a jointed arm 20 carrying a contact-piece and fitted with a spring, an under lever 23 jointedly connected to arm 20 and having within it a slot 25 engaging a fixed stud 24 on the casing, an arm 18 connected to the arm 20 so as to move as one with the under lever, and a disk 17 around which the other end of the looped fuse-wire is adapted to take, substantially as described.

4. In an earthing device, the combination of a conducting portion 4 forming the earth terminal of the protected circuit, a looped fuse-wire 9 connected thereto by a carrier 8, a lever to which the other end of the looped fuse-wire is indirectly connected, and which holds from contact with the portion 4 a contact-piece, and a spring exerting an influence upon the said lever, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LOUIS JOHN STEELE.

Witnesses:

A. F. BIDDLE,

H. RANFORD.