

**No. 692,690.**

**Patented Feb. 4, 1902.**

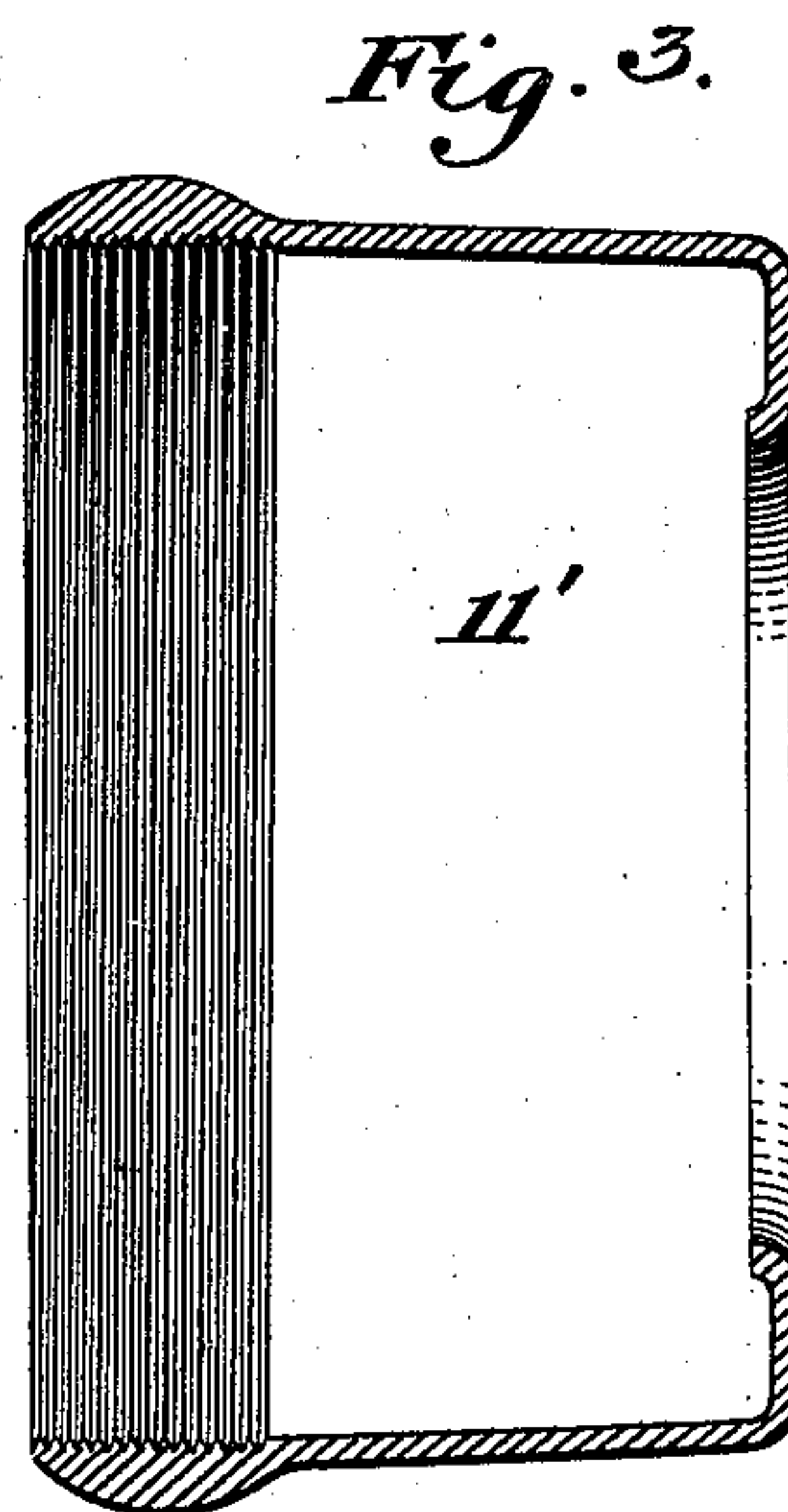
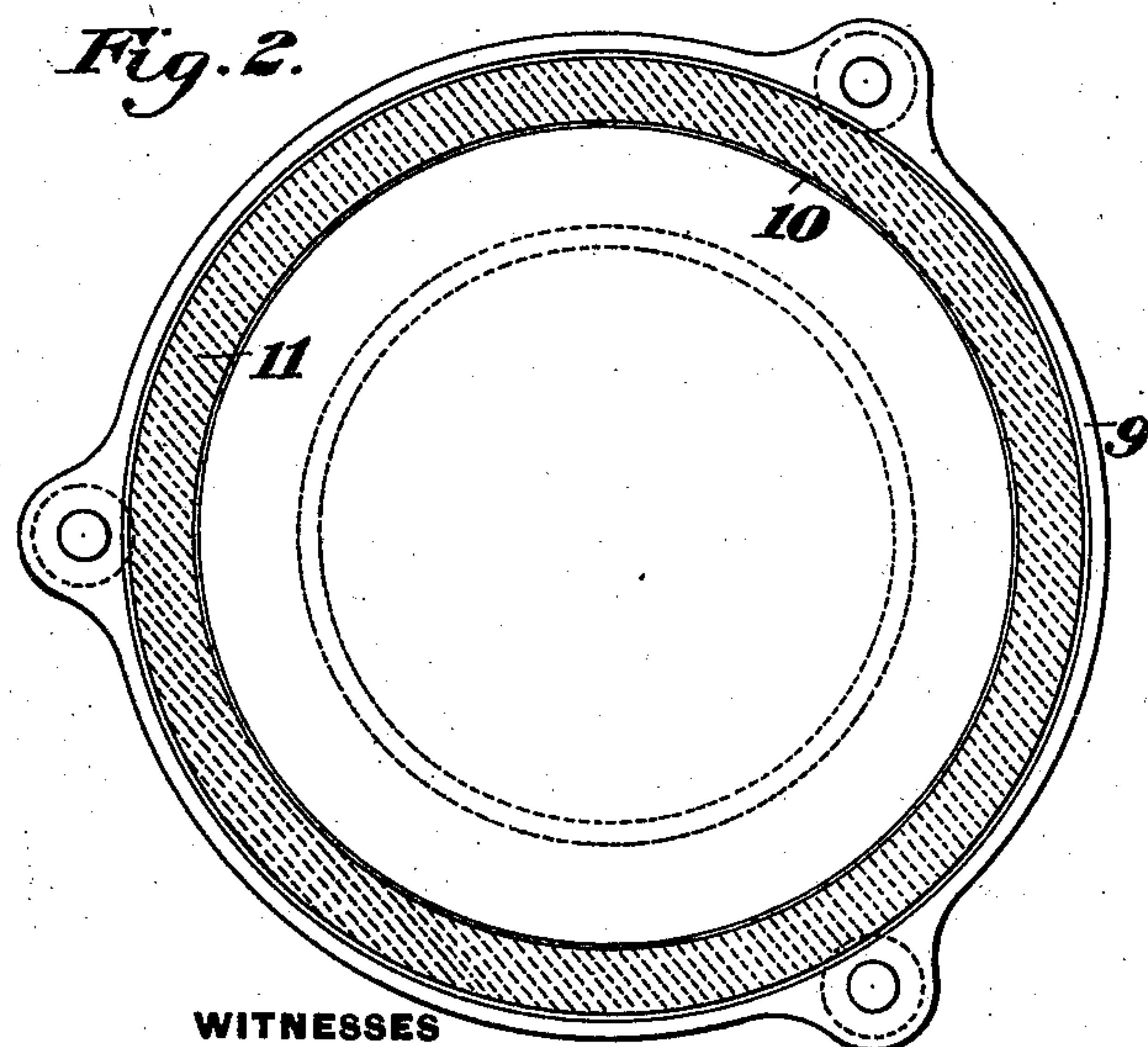
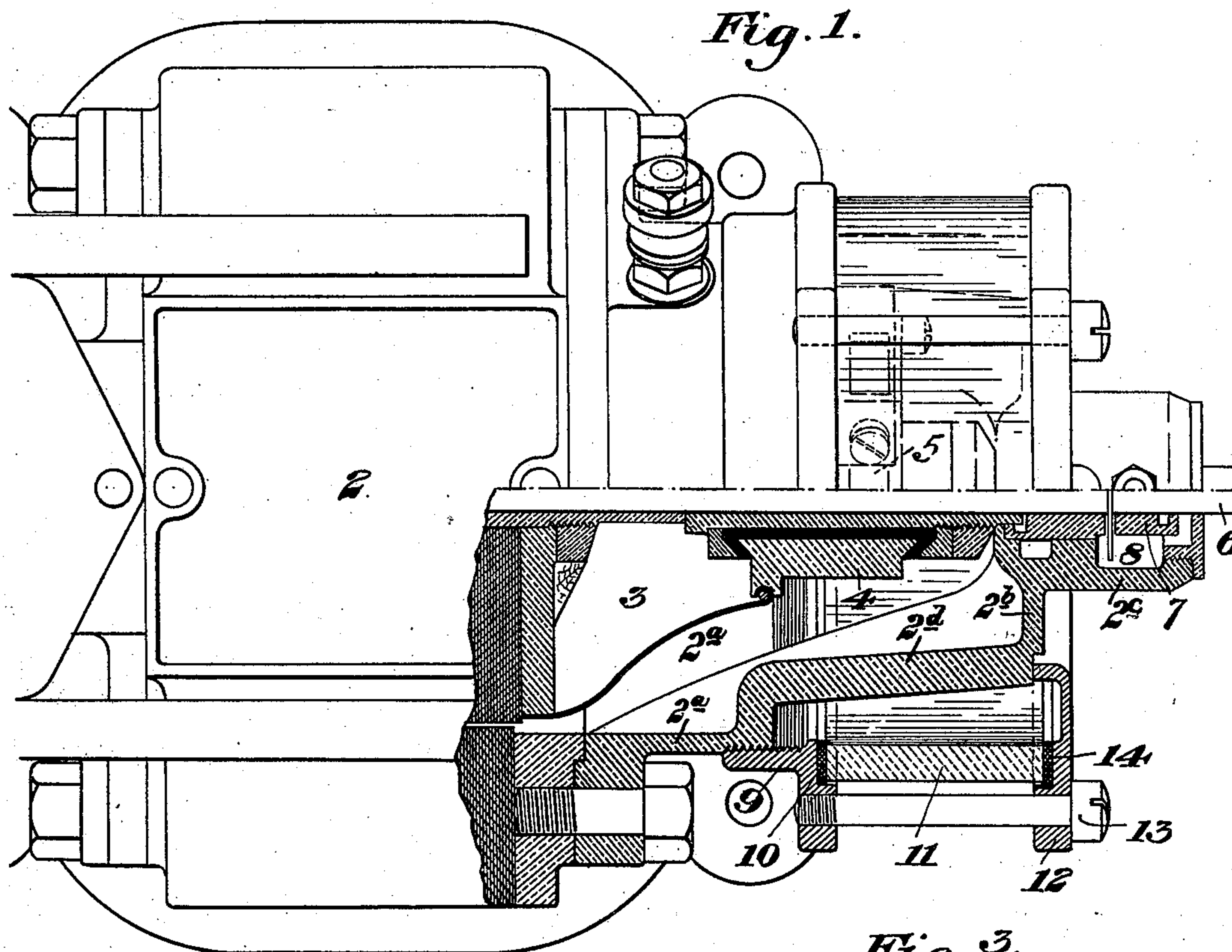
**H. D. MILES.**

**MOTOR FOR RAILWAY DEVICES.**

(Application filed Mar. 12, 1901.)

(No Model.)

**2 Sheets—Sheet 1.**



**WITNESSES**

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**INVENTOR**

Henry D. Miles  
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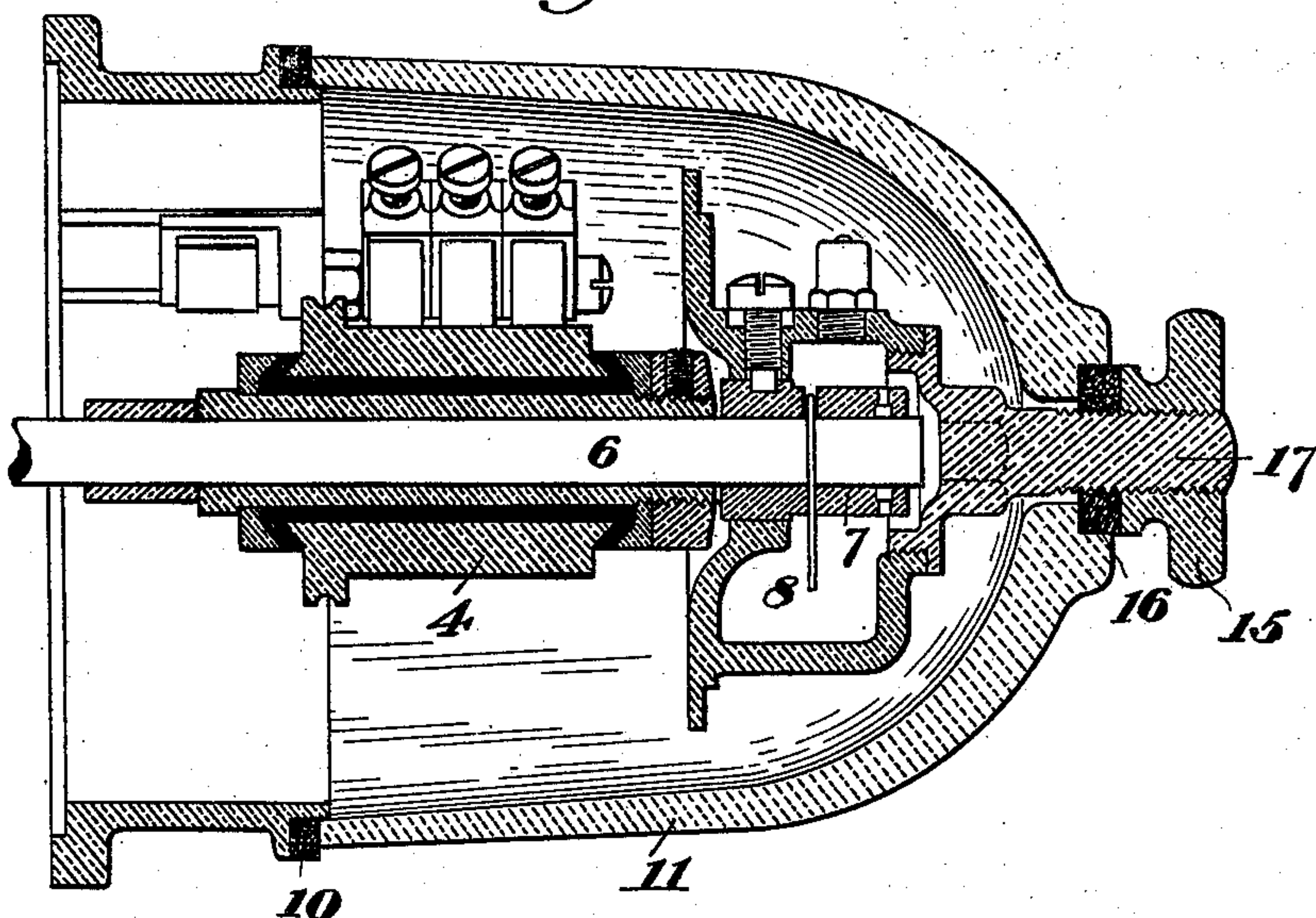
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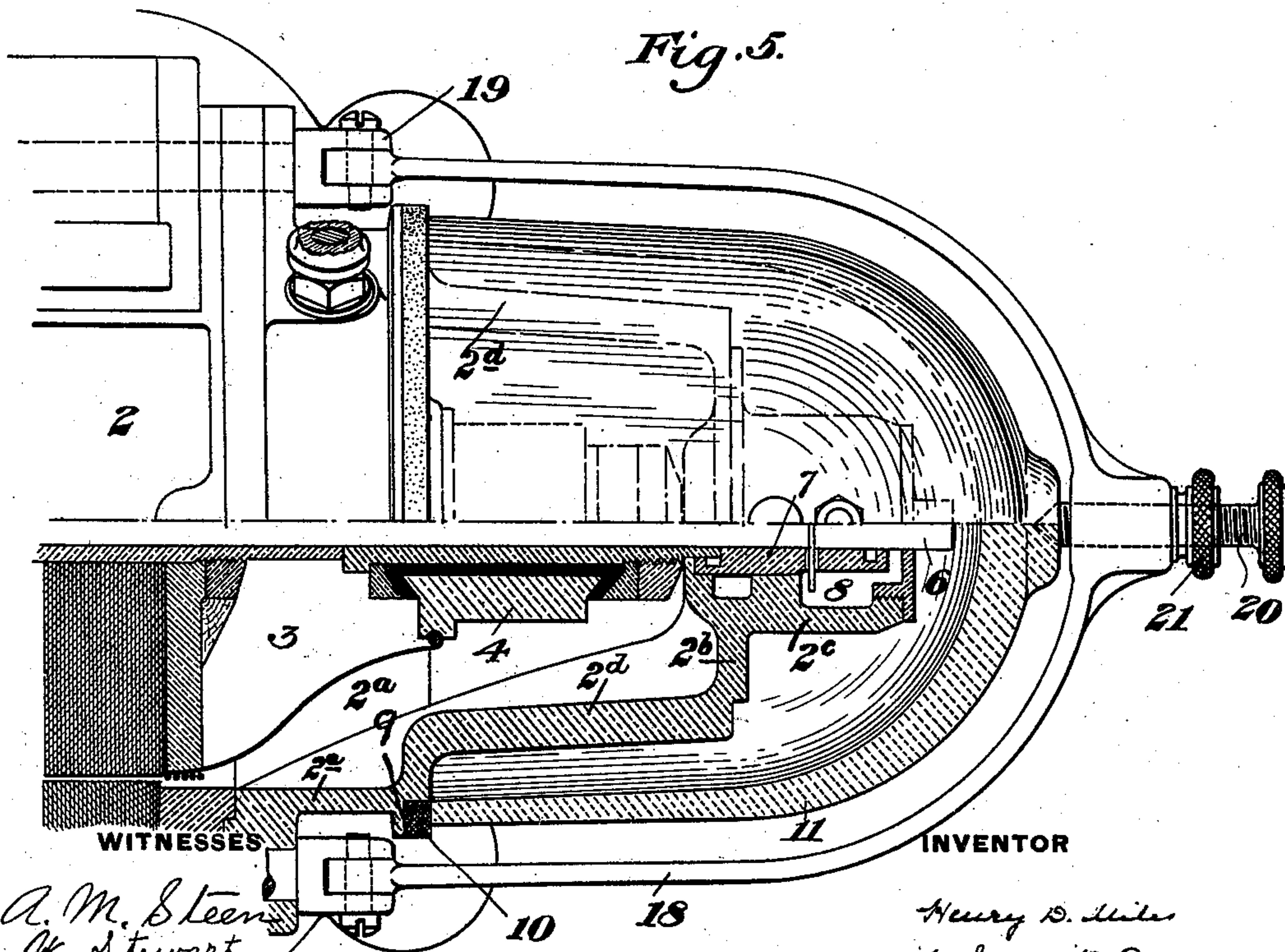
(No Model.)

2 Sheets—Sheet 2.

*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

HENRY D. MILES, OF DETROIT, MICHIGAN, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## MOTOR FOR RAILWAY DEVICES.

SPECIFICATION forming part of Letters Patent No. 692,690, dated February 4, 1902.

Application filed March 12, 1901. Serial No. 50,796. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY D. MILES, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Motors for Railway Signaling Devices, for Railway-Switches, and for other Purposes, of which the following is a specification, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view, partly broken away, showing my improved apparatus partly in section. Fig. 2 is a cross-section of the removable casing used in connection with the same. Figs. 3, 4, and 5 show modifications of my improvement.

Like symbols of reference indicate like parts in each.

My invention relates to an improvement in electric motors for automatic railway signaling devices, for railway-switches, and for other purposes in which the signals are operated and controlled by the motors; and it has for its object the protection of the motors from dust and from frost and moisture, which in cold weather render the motors inoperative and prevent the automatic operation of the signals of the switches or other devices by the same.

In the use of automatic railway-signals, railway-switches, or other devices in which the signals, switches, or other devices are operated and controlled by electric motors great difficulty has been experienced in cold weather from the collection and freezing of moisture around the commutators and brushes, interfering with the proper operation of the motors. This difficulty has been so serious a one as to render automatic electric railway-signals unreliable in cold weather. To obviate the same, many expedients have been adopted—as, for instance, acids have been used as an absorbent, ventilating-pipes leading from the casing in which the motor is placed have been employed, alcohol and alcohol-lamps have been placed inside the motor-box, and casings of various constructions have been employed to protect and prevent the access of moisture to the parts liable to be affected.

My invention consists in inclosing the commutators and brushes of such motors in airtight casings of a particular construction, whereby the moisture is perfectly excluded and the formation of ice, which would prevent a proper contact, is prevented.

I will now describe my invention, so that others skilled in the art may manufacture and use the same.

In the drawings, 2 represents the motor-box; 3, the armature of the motor; 4, the commutator; 5, the brushes, and 6 the motor-shaft, to which the commutator and armature are secured. All these parts may be of the ordinary construction, such as is generally employed in electric motors used in signaling apparatus, railway-switches, &c. The shaft 6 is mounted in suitable bearings 7, provided with an oiling device 8, the bearings 7 being contained within one end of an open-sided spider-like bearing-frame, constituting an extension of the motor-box 2 and composed of an inner solid rim portion 2<sup>a</sup>, a head 2<sup>b</sup>, imperforate excepting at the center for the shaft-bearings, and an extension 2<sup>c</sup> beyond the head, the rim 2<sup>a</sup> and head 2<sup>b</sup> being connected by ribs 2<sup>d</sup>. Secured to the bearing-frame and forming part thereof is an annular seat 9, which is preferably provided with a suitable packing 10.

My preferred form of casing for inclosing the commutator and brushes is shown in Figs. 1 and 2 of the drawings, in which 11 is the transparent part of the casing, preferably formed of glass, and 12 is the outer end of the same, preferably formed of metal, there being a packing 14 interposed between the metal and glass portions of the casing. The annular inner rim of the glass cylinder 11 is seated against the packing 10 in the ring or seat 9 and is held firmly against the same by means of the screw-bolts 13, passing through the outer metal end 12 of the casing and screwing into the ring 9 of the motor-box. The inner rim of the metal end 12 of the casing rests or bears against a portion of the head 2<sup>b</sup> of the bearing-frame. By these means the joints of the casing are hermetically sealed, and all moisture being excluded no frost or ice can form between the commutator and brushes.



At the same time the bearings 7 of the shaft 6 are outside of the casing, and are therefore at all times accessible without removal of the casing itself. I have, however, shown modifications in which the bearings are inclosed within the casing, and in such construction, although the casing may at times have to be removed, yet at the same time a more perfect sealing is obtained, and consequently a more perfect exclusion of moisture from the commutator and brushes. These modifications are shown in Figs. 4 and 5. In Fig. 4 the casing is made entirely of glass and extends outside of and around the shaft-bearing and is secured by means of a lock-nut 15 and packing 16, the nut screwing on the end of an extension 17. In Fig. 5 instead of securing the glass casing by means of a bolt extending through the end of the same the casing is made solid at its end and is secured by means of a yoke or bail 18, hinged to ears or lugs 19, the casing being pressed against the packing 10 in the seat 9 by means of the thumb-screw 20, which is held by a lock-nut 21.

Although I have spoken of the protecting-casing as being formed of glass or partly of glass, I do not desire to limit myself to this material, as it may be formed of brass or other suitable material, as is shown at 11' in Fig. 3, and, if desired, the entire motor and not the commutator alone may be inclosed.

The advantages of my invention will be apparent to those skilled in the art. It not only obviates the use of acids and ventilating and heating devices, which are in themselves expensive and require attention, but it solves a most difficult problem and enables railway signaling, railway-switch, and other apparatus to be controlled without interference with their action by reason of frost on the commutator or brushes.

I claim—

1. In an electric motor, a motor-box, a casing for hermetically sealing the commutator and brushes of the motor, and clamping devices engaging said casing and said motor-

box for clamping the casing tightly against the motor-box; substantially as described.

2. In an electric motor, a motor-box, a casing the inner edge of which abuts against said motor-box, and clamping devices engaging the said motor-box and the outer portion of said casing for clamping the casing tightly against said motor-box, substantially as described.

3. In an electric motor, a motor-box having a clamping-ring extending therefrom, a glass cylinder forming part of a casing the inner edge of which cylinder abuts against said clamping-ring, an outer metal rim also forming part of the casing and abutting against the outer edge of said glass cylinder, and clamping devices for bringing the said clamping-ring and said metal rim into tight engagement with the glass cylinder; substantially as described.

4. In an electric motor, a motor-box having a clamping-ring extending therefrom, a glass cylinder forming part of a casing, the inner edge of which cylinder abuts against said clamping-ring, an outer metal rim also forming part of the casing and abutting against the outer edge of said glass cylinder, clamping devices for bringing said clamping-ring and said metal rim into tight engagement with the glass cylinder, and packing-rings between the glass cylinder and the clamping-ring and between the metal rim and the glass cylinder; substantially as described.

5. In an electric motor, a motor-box, a casing for the commutator and brushes the inner edge of which abuts against said motor-box, and clamping devices secured to the motor-box and abutting against the outer portion of the casing for effecting a tight engagement of said inner edge of the casing with the motor-box; substantially as described.

In testimony whereof I have hereunto set my hand.

HENRY D. MILES.

Witnesses:

E. A. EVERETT,  
JOHN A. JOHNSON.