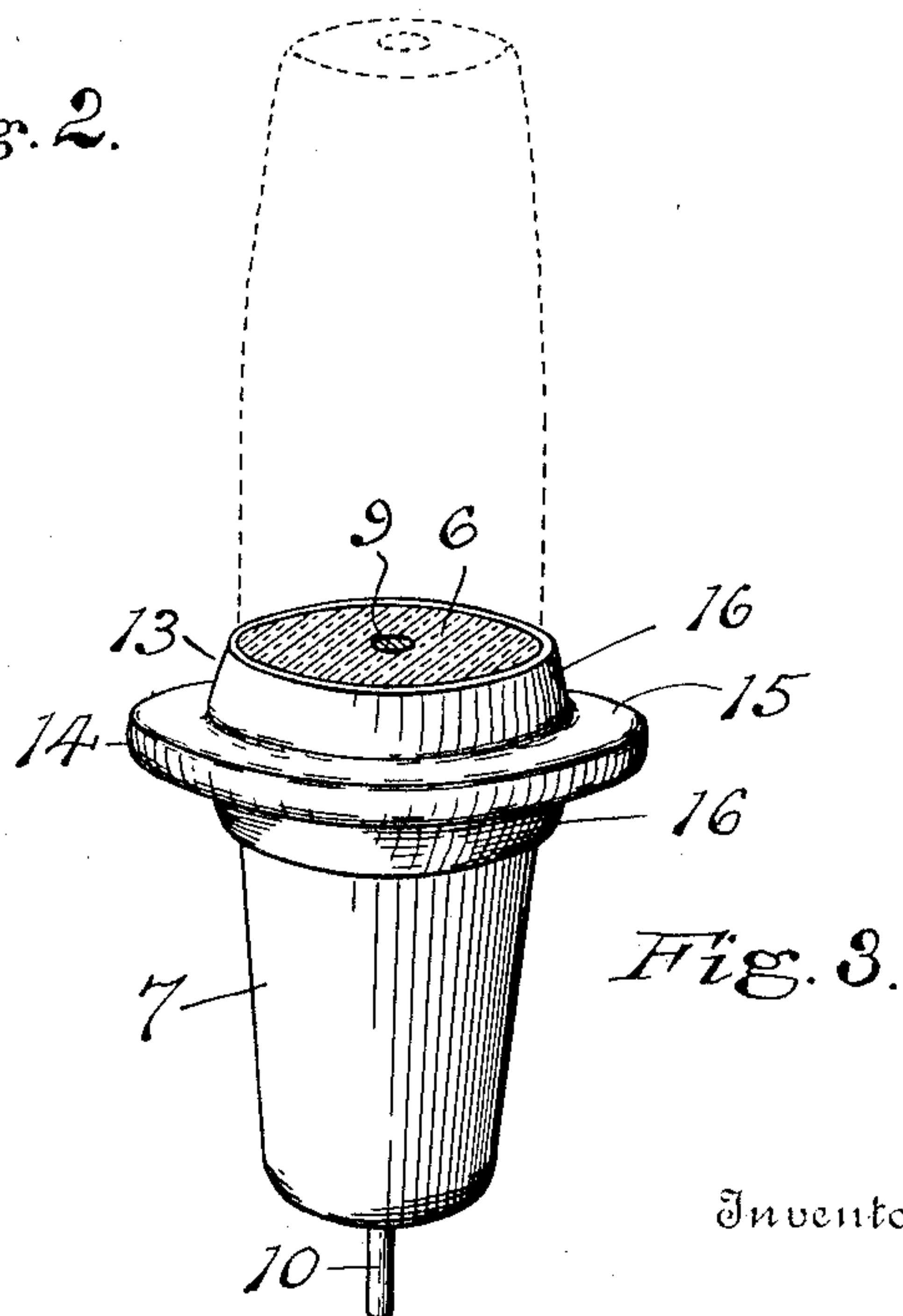
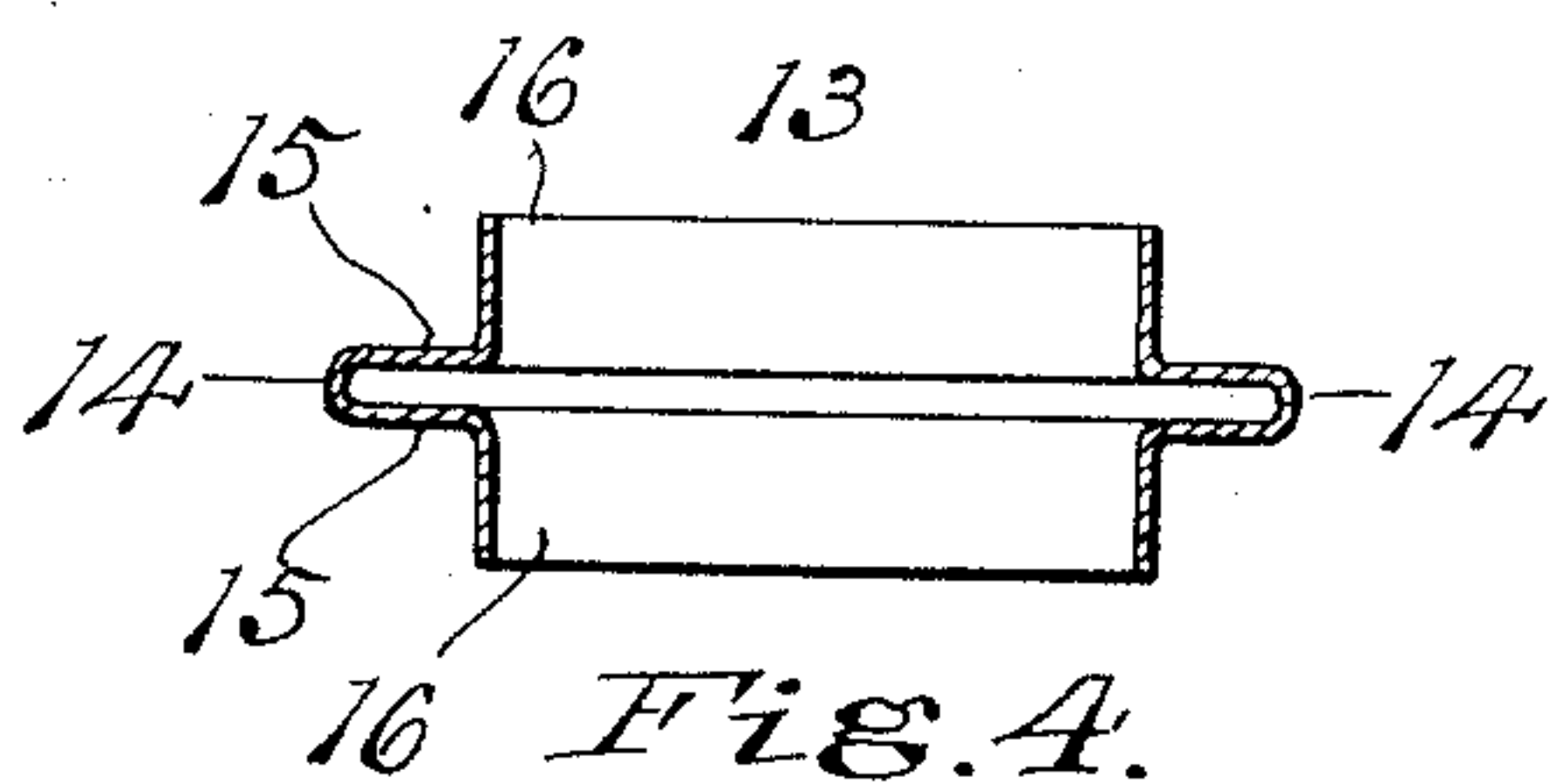
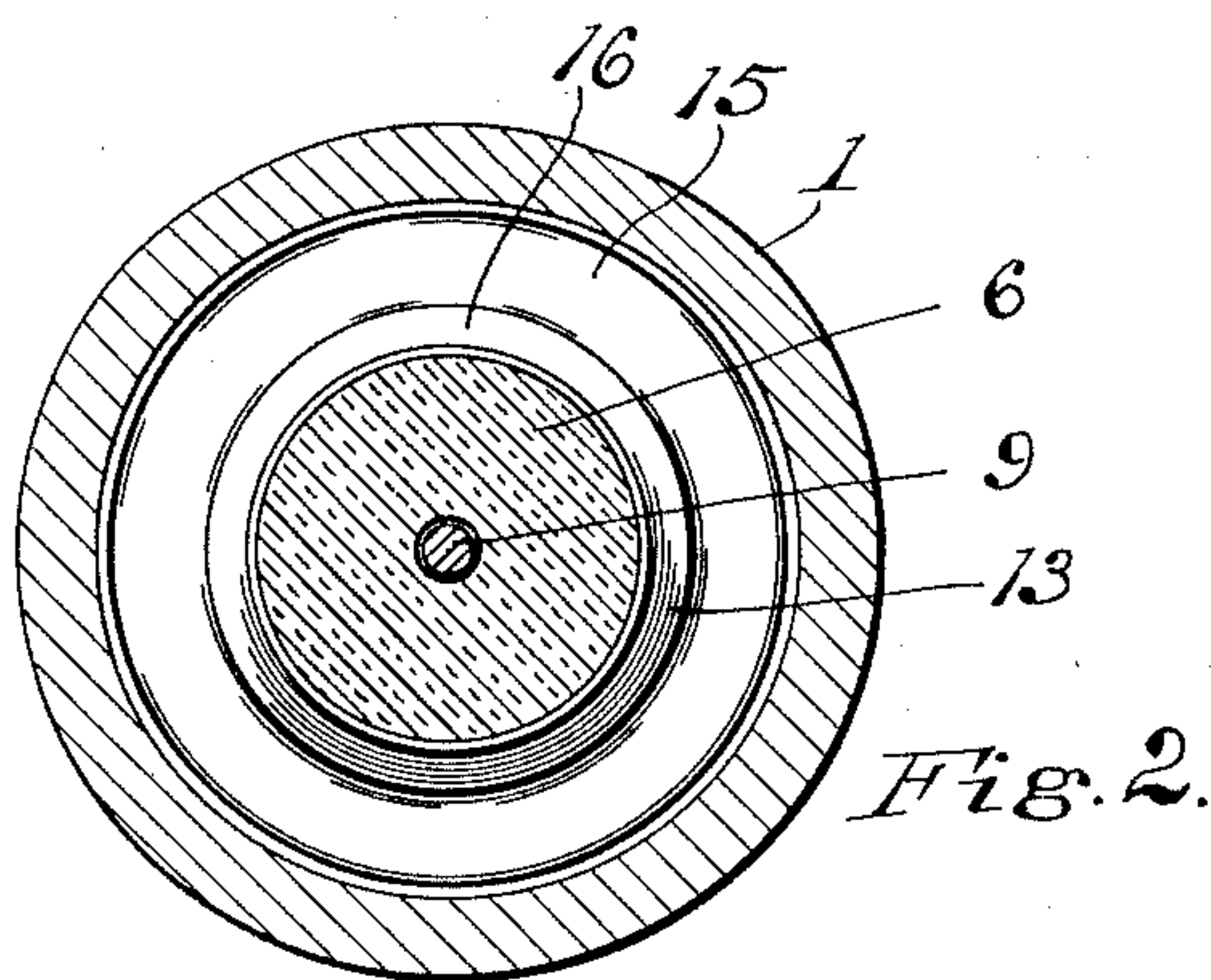
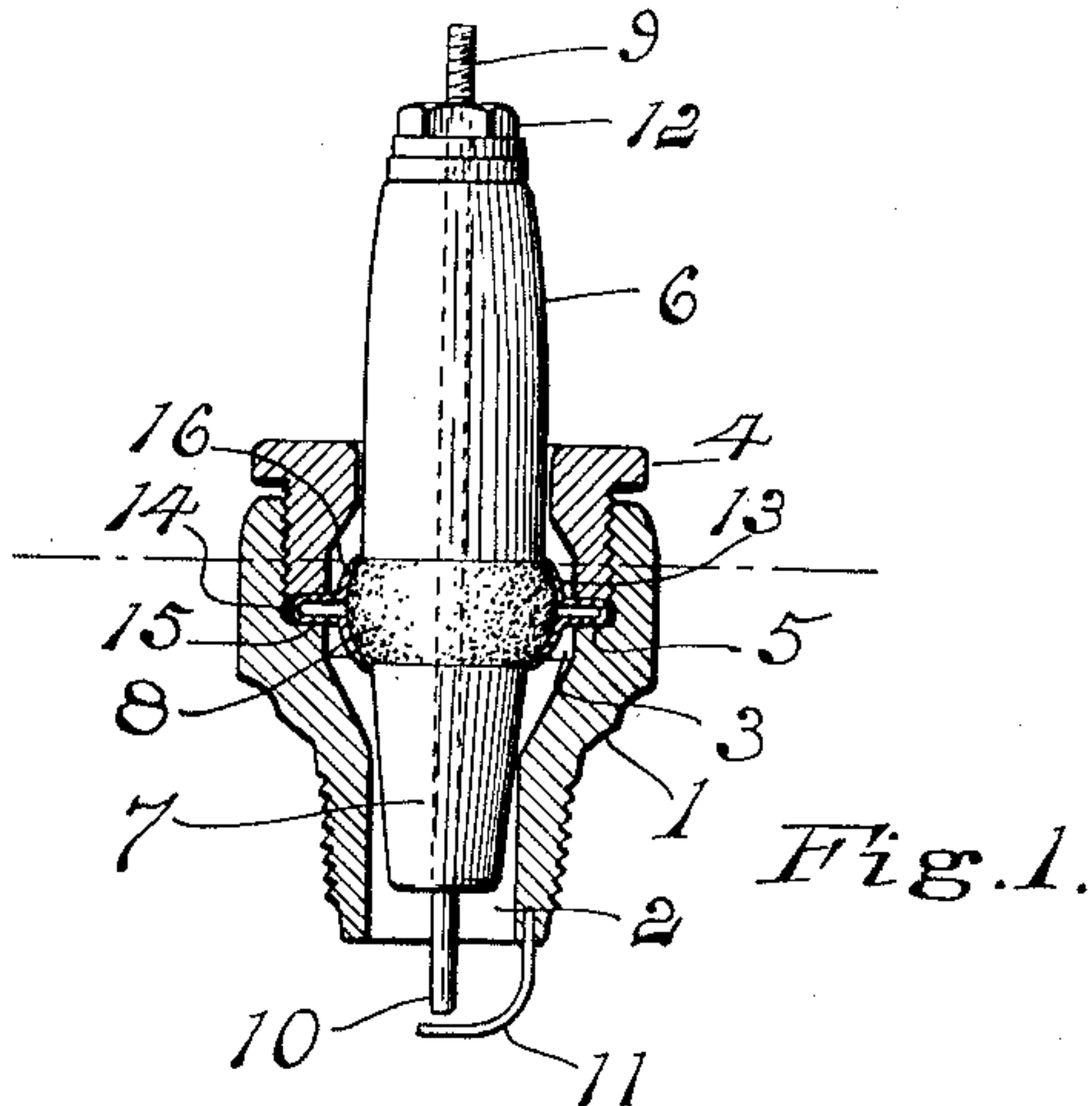


A. SCHMIDT.
SPARK PLUG.
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Patented Nov. 15, 1910.



Witnesses
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UNITED STATES PATENT OFFICE.

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SPARK-PLUG.

976,101.

Specification of Letters Patent.

Patented Nov. 15, 1910

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To all whom it may concern:

Be it known that I, ALBERT SCHMIDT, a citizen of the United States of America, residing at Flint, in the county of Genesee and State of Michigan, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in spark plugs and its object is to provide means for supporting the insulating member thereof within the bushing in such a manner as to permit the free expansion of the parts to prevent breakage of the porcelain insulation and further to so construct the supporting member that it will tightly clamp the insulating member to form a tight joint therewith and firmly and detachably support said member within the outer member or bushing.

It is also an object of the invention to provide certain other new and useful features in the construction and arrangement of parts all as hereinafter more fully described reference being had to the accompanying drawing in which,

Figure 1 is a vertical section through a device embodying the invention and showing the insulating plug in elevation; Fig. 2 is an enlarged transverse section on the line $x-x$ of Fig. 1; Fig. 3 is a perspective detail of the insulating plug and its supporting ring, showing the plug in transverse section; and Fig. 4 is a sectional detail of the supporting ring before being applied to the insulating plug.

As shown in the drawing 1 is a metal bushing or shell provided with a tapering screw threaded end and a hexagonal portion or head by means of which the bushing may be screwed into a screwthreaded opening in an engine cylinder. This bushing is formed with a bore 2 at its inner end and an enlarged bore or chamber 3 in its outer end is internally screwthreaded to receive a ring nut 4 and also forms an inwardly projecting ledge or shoulder 5 near the bottom of said chamber 3. A porcelain insulating plug 6 is supported within the bushing with its inner reduced and tapered end 7 extending within the bore 2 of the bushing and its outer cylindrical end extending outwardly through the ring 4. Within the chamber 3 the plug is formed with an enlarged portion 8 form-

ing a rounded annular rib or bead upon the surface of the plug and said plug is also formed with an axial hole to receive a rod 9, the inner end 10 of which forms one electrode of the spark plug. The other electrode is formed by a wire 11 secured to the inner end of the bushing and bent laterally over and adjacent to the end 10 of the rod. Said rod is secured within the plug in any suitable manner as by a nut 12 upon its screwthreaded outer end:

The insulating plug is supported within the bushing 1 with a space between said plug and the walls of the chamber 3, by a supporting ring 13 which ring is preferably formed of sheet metal folded upon itself to form a horizontally extending annular flange 14 comprising parallel portions 15 spaced apart a short distance, and the inner edges of the portions 15 are turned laterally in opposite directions to form upwardly and downwardly extending flanges 16, the internal diameter of which is such that the ring will just fit over the enlarged portion or bead 8 of the insulating plug. The ring is attached to the plug by forming these flanges 16 down upon the outer surface of the bead to make a tight joint therewith and firmly hold the plug without the necessity for otherwise securing the ring thereto, the surface of the bead 8 being left rough so that the ring will more firmly adhere thereto. When the plug is placed within the bushing the horizontally extending flange of the ring will rest upon the ledge 5 of the bushing and when the ring nut 4 is screwed into the bushing it will engage the upper side of this flange and firmly clamp the same between it and the ledge.

By spacing the portions 15 forming the flange 14 of the supporting ring, when the nut 4 is turned in, said portions will be forced toward each other, thus moving the flanges 16 toward each other upon the bead and owing to the curve of the bead said flanges will be forced firmly into contact with said bead to make a very tight joint and firmly clamp the insulating plug in position. The harder the ring nut 4 is turned in the more the flange 14 will be compressed and the more closely will the supporting ring engage and clamp the insulating plug. The flange 14 of the supporting ring being formed of thin metal will yield to allow for the difference in contrac-

tion and expansion between the metal bushing and the porcelain plug, and this flange also effectually closes the annular space between the plug and bushing to prevent the escape of products of combustion when the device is in use.

Having thus fully described my invention what I claim is:—

1. A device of the character described comprising a bushing having a chamber, an insulating plug having an annular bead within the chamber, a supporting ring having flanges embracing the bead and a horizontally extending portion to support the plug, and means for detachably securing said horizontal portion to the bushing and forcing said flanges into engagement with the bead.

2. A device of the character described comprising a bushing having a chamber, an insulating plug formed with an annular bead, means for supporting said plug within the chamber of the bushing comprising annular, parallel members spaced apart and each having a laterally extending flange engaging and conforming to the surface of said bead, and means carried by the bushing to engage said annular portions and detachably secure the same to the bushing and force the same toward each other.

3. A device of the character described comprising a bushing having a chamber and a ledge extending into said chamber, an insulating plug formed with an annular bead,

a supporting ring comprising horizontally extending annular portions spaced apart and each formed with an inner edge flange engaging the surface of the bead and formed down upon the same, and a member within the chamber of the bushing engaging the horizontally extending portion of the ring to clamp the same between it and the said ledge on the bushing.

4. A device of the character described comprising a bushing formed with an internally screwthreaded chamber in its outer end and an inwardly projecting ledge, an insulating plug formed with an annular bead, a supporting ring formed of sheet metal folded upon itself to form horizontally extending annular portions, spaced apart and formed with flanges extending laterally from the inner edges of said annular portions, said flanges engaging and conforming to the surface of said bead, a ring nut engaging the screwthreaded end of the chamber and adapted to be turned into the same into engagement with the horizontally extending portions of the supporting ring and clamp said portions between it and the said ledge on the bushing.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT SCHMIDT.

Witnesses:

B. DE GUICHARD,
ALICE SWEETWOOD.