

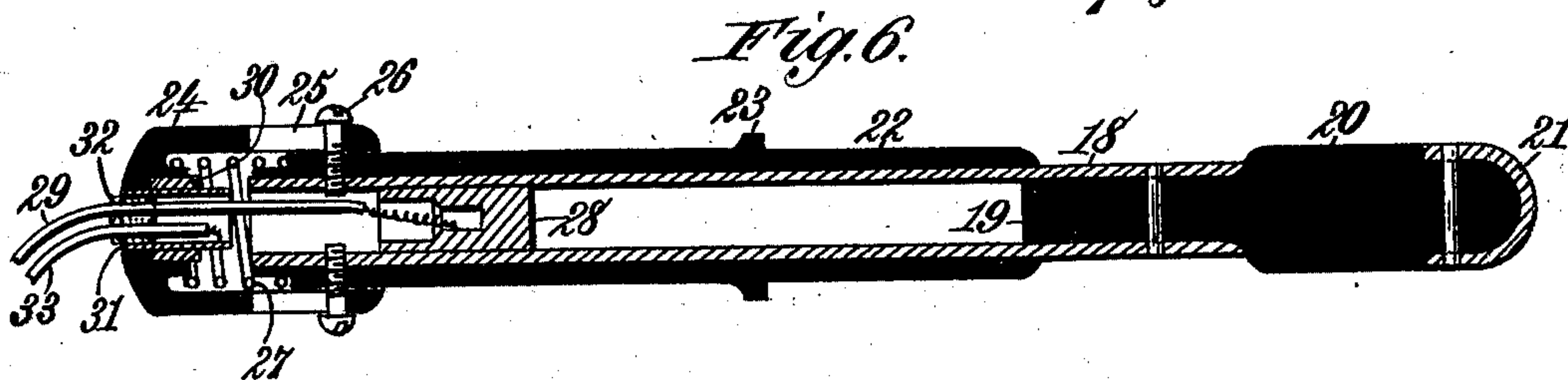
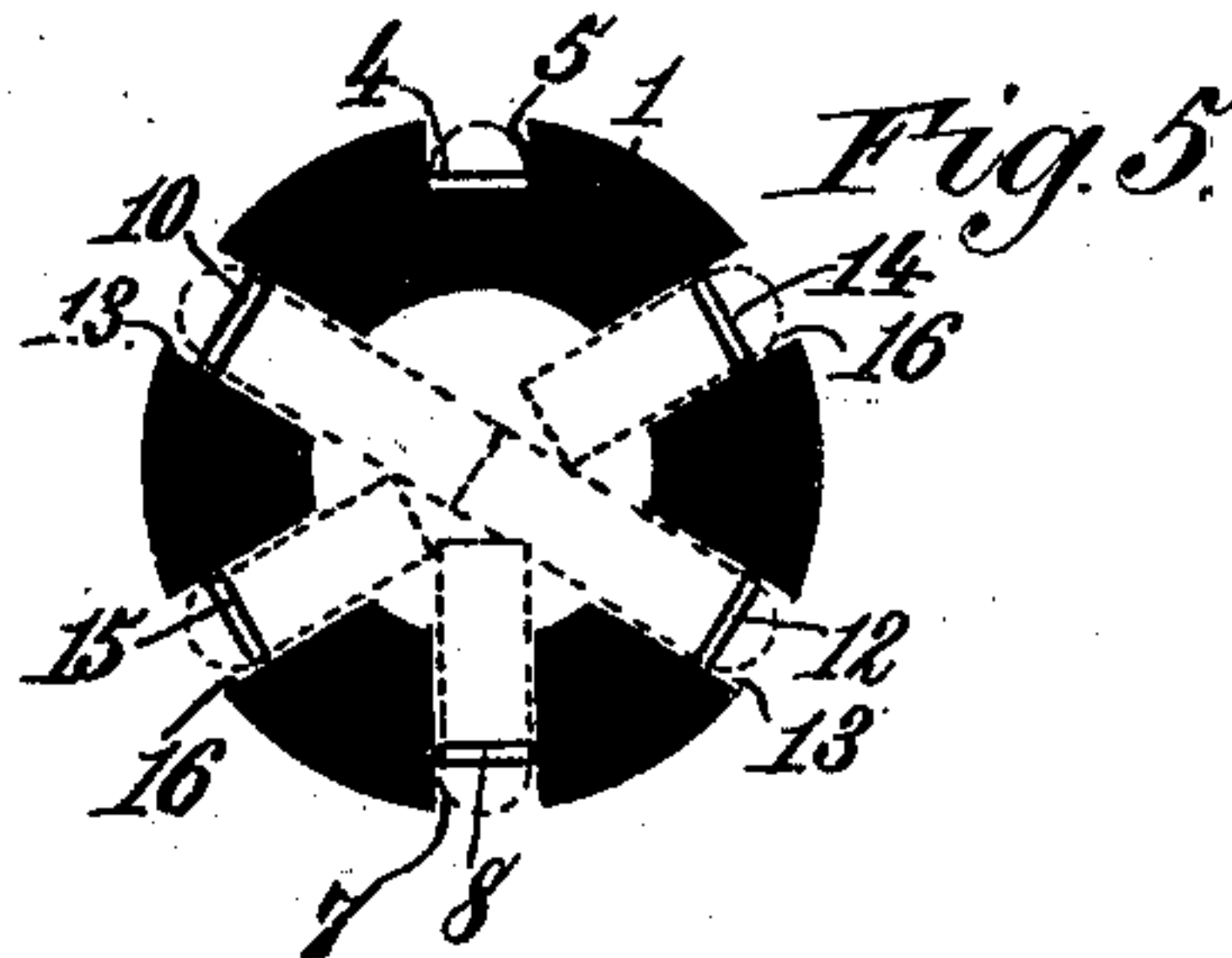
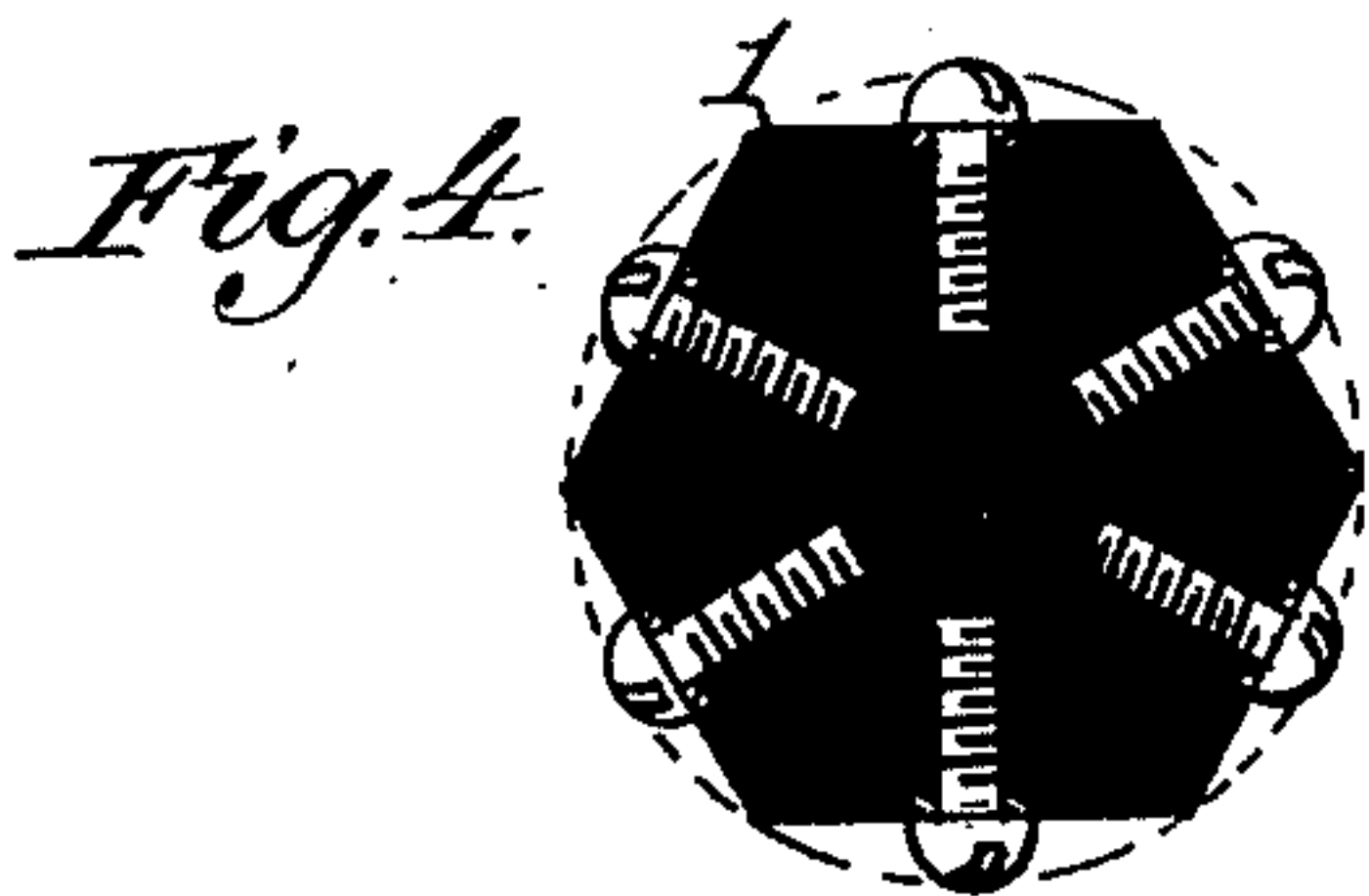
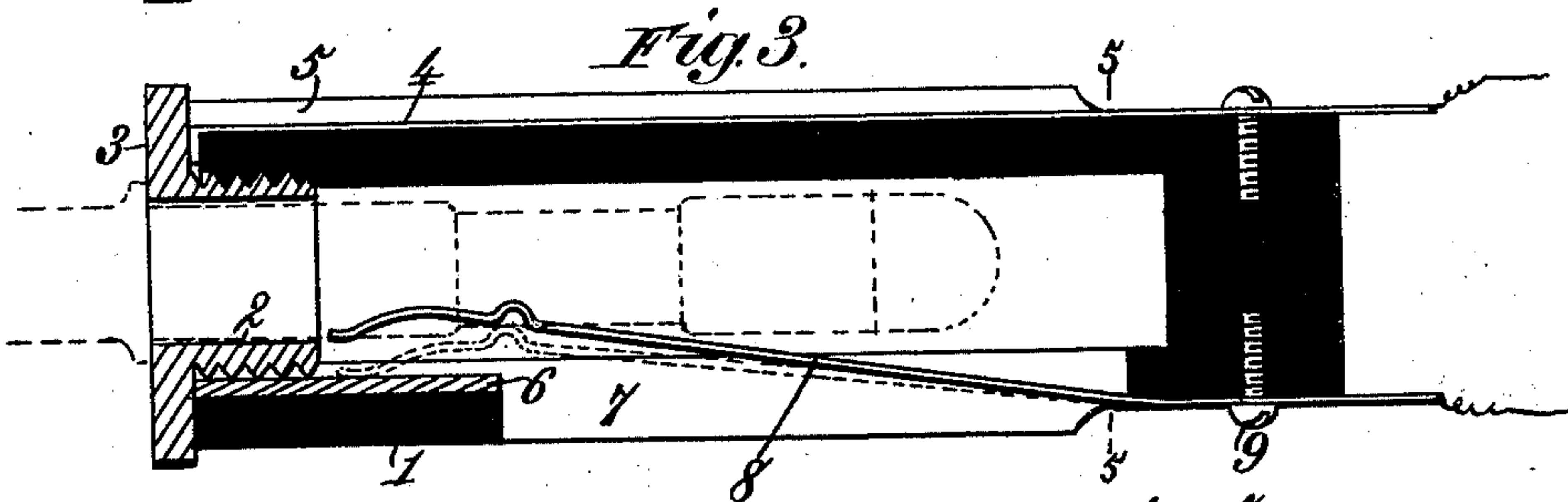
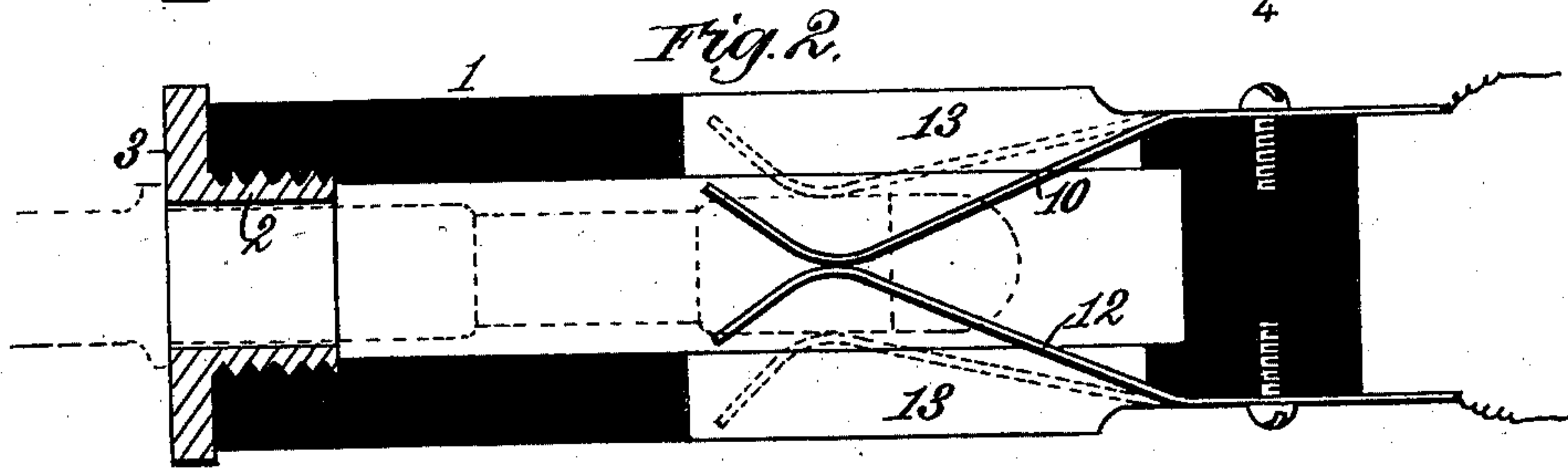
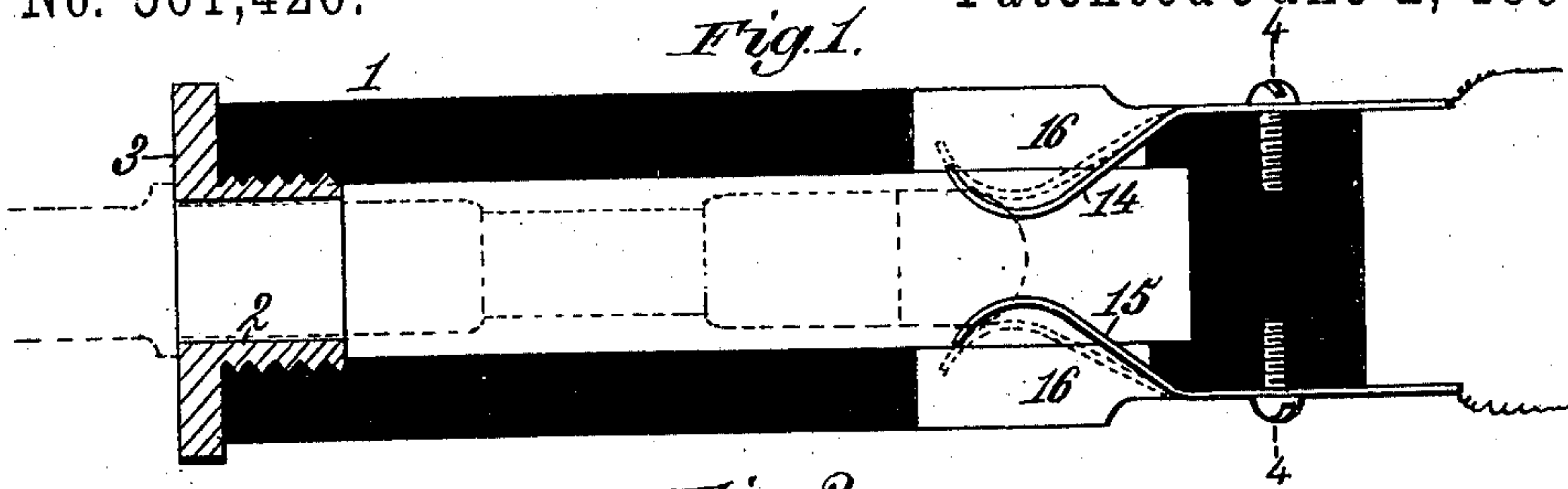
(No Model.)

P. MINNIS.

LINE JACK FOR TELEPHONIC SWITCHBOARDS.

No. 561,420.

Patented June 2, 1896.



Witnesses.  
*Robert Covett.*  
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Inventor:  
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By *James L. Norris.*  
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# UNITED STATES PATENT OFFICE.

PAUL MINNIS, OF MOBILE, ALABAMA, ASSIGNOR OF ONE-HALF TO THE HOME TELEPHONE COMPANY, OF SAME PLACE.

## LINE-JACK FOR TELEPHONIC SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 561,420, dated June 2, 1896.

Application filed February 17, 1896. Serial No. 579,648. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL MINNIS, a citizen of the United States, residing at Mobile, in the county of Mobile and State of Alabama, have invented new and useful Improvements in Line-Jacks for Telephonic Switchboards, of which the following is a specification.

My invention relates to line-jacks for telephonic switchboards, my purpose being to provide a construction whereby the insertion of a plug constructed in harmony with the line-jack shall have the effect of opening the call-circuit between the corresponding line-station and the central station, switching in the communicating wires or service-wires which connect the line-stations with the central station and with a common return-wire, and finally completing a circuit which restores a visual call-signal at the central station to its normal position, in readiness to respond to the next call from the line-station.

It is my purpose, also, to combine with a line-jack of the kind specified a plug having such construction that it shall coöperate with the jack and its contacts in producing the results mentioned, and having such an organization that two separate wires entering the plug may be coupled electrically at any moment by a simple, slight, and rapid movement of the finger of the operator and again separated automatically, whereby the operator's head-phone may be cut in and out.

My invention also comprises other novel features, all of which will be fully explained hereinafter and then particularly pointed out and defined in the claims which complete this specification.

To enable those skilled in the art to which my invention pertains to fully understand and to practice the same, I will now describe said invention in detail, reference being made for this purpose to the accompanying drawings, in which—

Figure 1 is a central longitudinal section of a line-jack constructed in accordance with my invention. Fig. 2 is a central longitudinal section of the same, the section-plane being at an angle with that in Fig. 1. Fig. 3 is a similar section with a further angularity

of the section-plane. Fig. 4 is a cross-section in the line 4 4, Fig. 1. Fig. 5 is a transverse section taken in the line 5 5, Fig. 3. Fig. 6 is a central longitudinal section of the plug.

In said drawings the reference-numeral 1 denotes one of the line-jacks of the switchboard. It is formed of a substantially cylindrical body of insulating material of any suitable kind, having an opening for the insertion of the plug. The mouth of this opening is provided with a bushing 2 and face-plate 3, the bushing being screwed into the opening.

Connected electrically to the face-plate 3 is a conducting-strip 4, lying in a longitudinal channel 5 in the exterior face of the body 1 and extending a little beyond its rearward end. In the interior is a conductor 6, also in touch with the face-plate and extending rearward till it meets the end of a slot 7, cut longitudinally through from the exterior and extending to a point a little distance from the rear end of the jack.

In the slot 7 lies a spring-contact 8, fastened at one end by a screw 9 at the rearward end of the jack, its free end passing into the opening beyond the forward end of the slot 7 and lying opposite the conductor 6, from which it is normally separated. Upon the same rearward portion of the jack are also mounted two contacts 10 and 12, lying opposite each other and passing through slots 13 into the interior, their oppositely-curved ends lying normally in electric contact, but capable of being separated by the entrance of the plug. The line-jack is also provided with two contacts 14 and 15, also mounted on the rear end and lying partly in slots 16 and partly in the opening for the plug. These contacts are never in contact, their oppositely-curved ends being separated by an interval somewhat less than the diameter of the plug. All the contacts point toward or have their free ends nearest to the open end of the jack where the plug enters. The free end of the contact 8 lies nearest the open entrance end, and the two closed contacts 9 and 10 meet at a point between the free end of the contact 8 and the contacts 14 and 15.

The conducting-strip 4 is connected by wire,



as are the contacts 8, 10, and 12, and 14 and 15, to the several circuits and multiples of the switchboard. The contact 8 forms part of the talking-circuit, the two closed contacts 10 and 12 form part of a call-circuit, and the two open contacts 14 and 15 are parts of a circuit which restores the call-signal to its normal or original position.

The reference-numeral 18 indicates the conducting tubular body of one of the plugs, in one end of which is inserted the shank 19 of a non-conducting point 20, slightly larger than the tubular body. Between the end of the latter and a metallic tip 21 the non-conducting point is exposed, and between the enlarged non-conducting point and a sleeve 22 of non-conducting material covering the tubular body the conducting metal 18 is exposed. Excepting this exposed portion 18 and the metal tip 21 the conducting-body is covered by the sleeve 22, on which is formed a collar 23 to limit the extent to which the plug is inserted in the line-jack.

Upon the open end of the sleeve and tubular body a cap 24 is mounted, having slots 25, through which screws 26 are tapped into the sleeve and body 18. These slots permit a limited longitudinal movement of the cap, which is normally pressed outward by a spring 27, coiled inside the cap.

Within the tubular body 18 is a metal core 28, to which is attached one of the wires 29 of the flexible cord. In the head of the cap 24 is a metal ring 30, inclosing a bushing 31, the ends of the same projecting into the cap and outside the head of the latter, the exterior portion being inclosed and protected by a filling 32. The second wire 33 of the flexible cord is connected to this bushing and ring. By pushing the cap 24 inward the bushing and ring are caused to engage the end of the metallic body, thereby coupling the wires electrically. This arrangement is especially adapted for cutting the head-phone of the operator or a magneto-generator at a central station into and out of the talking-circuit.

When inserted in the line-jack, as shown in dotted lines in Figs. 1, 2, and 3, the contact 8 rests on the exposed part of the conducting-body 18, thus making connection between the service-wire attached to contact 8 and wire 29 of the flexible cord, and the free end of contact 8 is pressed against conductor 6, thus establishing a test-circuit through bushing 2, face-plate 3, contact-strip 4, the test multiple wire, and multiples of contact-strip 4 to the face-plates of the corresponding jacks of the switchboard. The two contacts 10 and 12 are separated and rest upon the exposed non-conducting point, thereby opening the call-circuit. Finally, the metallic tip of the plug presses against the contacts 14 and 15, and thereby completes a circuit which restores the call-signal to its normal position.

The plug and line-jack described form part of an application filed by me, of even date herewith, for a telephone-switchboard.

What I claim is—

1. The combination with a telephone-switchboard of a line-jack consisting of a cylindrical body of non-conducting material, a conducting face-plate and bushing an exterior and an interior conductor in electrical contact with the bushing, a single spring-contact entering the opening for the plug through a slot in the non-conducting body of the jack, its free end normally separated from the interior conductor, two opposite spring-contacts entering said opening and having free ends normally in electrical contact, their points being turned toward the mouth of the plug-opening, and a pair of separated contacts also entering the said plug-opening, a plug having a metallic tip to engage and couple the latter contacts when the plug is inserted, a non-conducting point on said plug to separate and break the electrical contact between the closed spring-contacts and an exposed conducting portion on the plug behind the non-conducting point, to engage the single spring-contact electrically and press it against the interior contact of the jack when the plug is inserted in the jack, substantially as described.

2. A line-jack for telephone-switchboards, comprising a non-conducting body having an opening for the plug, two separated contacts, two normally-closed spring-contacts and a single spring-contact, all insulated from each other and rigidly attached at one end to the outer face of the non-conducting body, and all entering the opening for the plug in the jack through longitudinal slots in the non-conducting body, in combination with a plug having a metal tip to engage and electrically connect the separated contacts, a non-conducting point to separate the two closed contacts, and a metallic body having an exposed portion to electrically engage the single contact, and couple it with the wire of the cord, and with an interior conductor in the jack, substantially as described.

3. In a telephone-switchboard, the combination with a line-jack, having a non-conducting body provided with an opening for the plug, two separated contacts, two normally-closed contacts, and a single contact, all attached at one end to the outer face of the non-conducting body and entering the plug-opening through slots, of a plug having a non-conducting point to separate the closed contacts, a metallic tip to electrically connect the separated contacts and a conducting-body to electrically engage the single contact and press its free end against an interior contact which is engaged with a face-plate, bushing, and exterior contact, the rest of the body being covered by a non-conducting sleeve, a cap mounted on the open end of the body, a



spring pressing said cap off the sleeve, a wire connected to the conducting-body, and a second wire connected to a contact-ring in the cap, the latter being capable of engaging the  
5 metal body portion by pressing the cap inward, substantially as described.

In testimony whereof I have hereunto set

my hand in presence of two subscribing witnesses.

PAUL MINNIS.

Witnesses:

CLAYTON B. CLARK,  
WILLIAM H. SULLIVAN.