

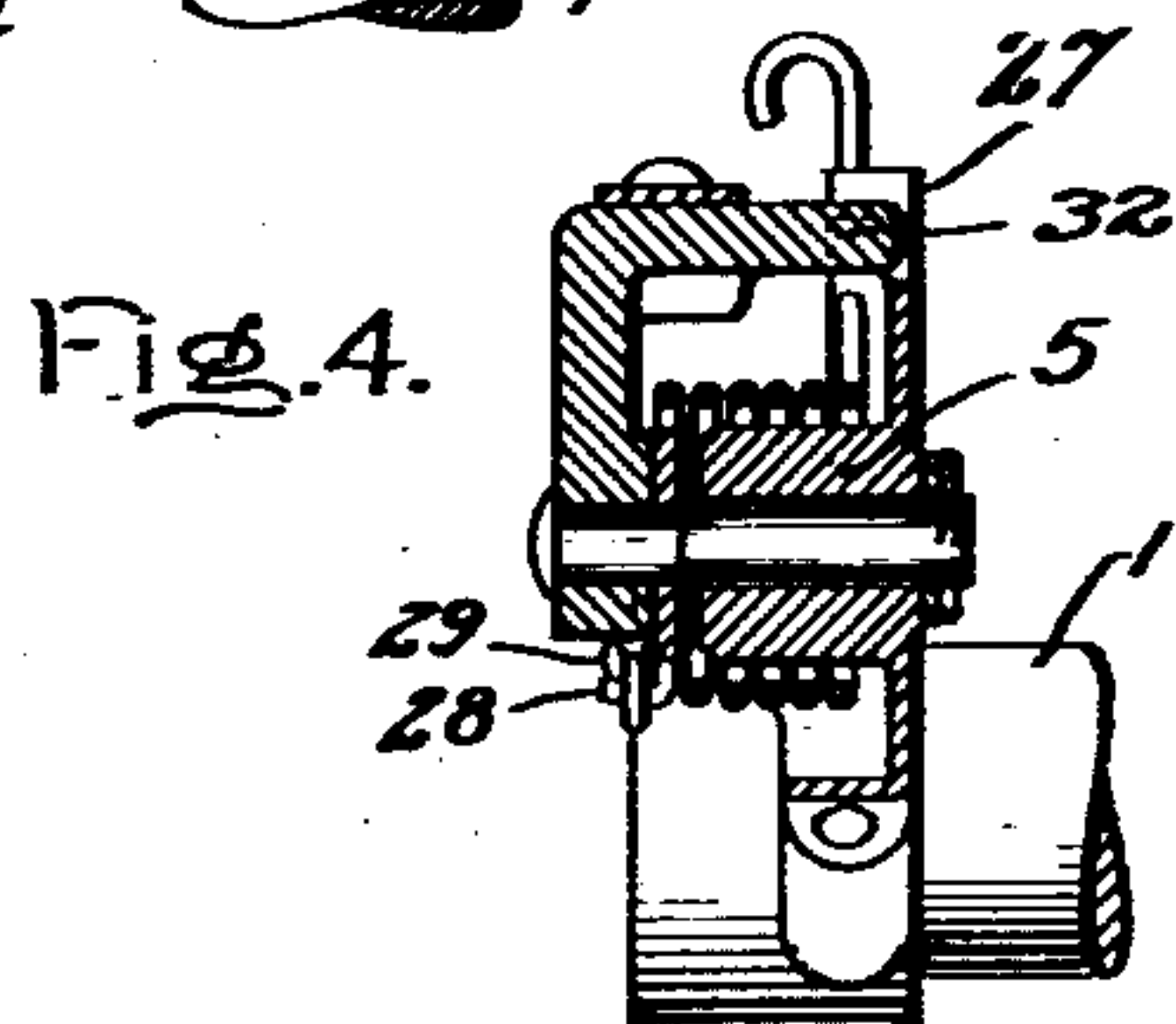
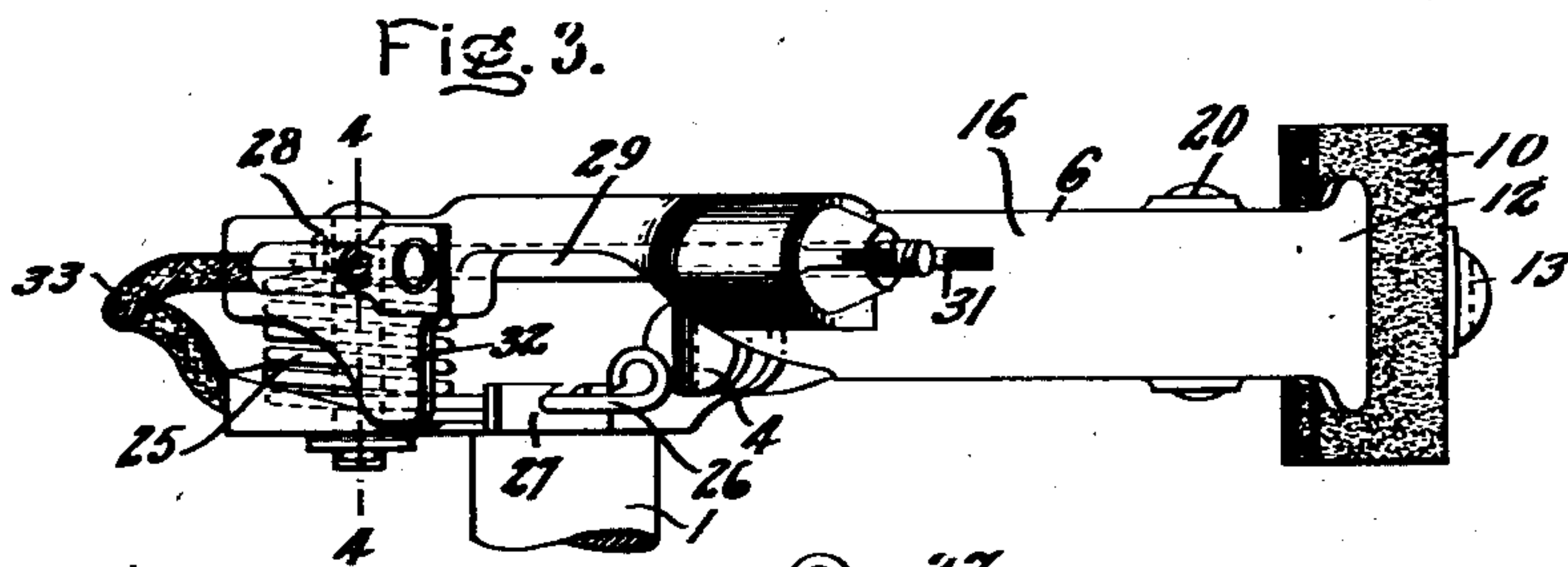
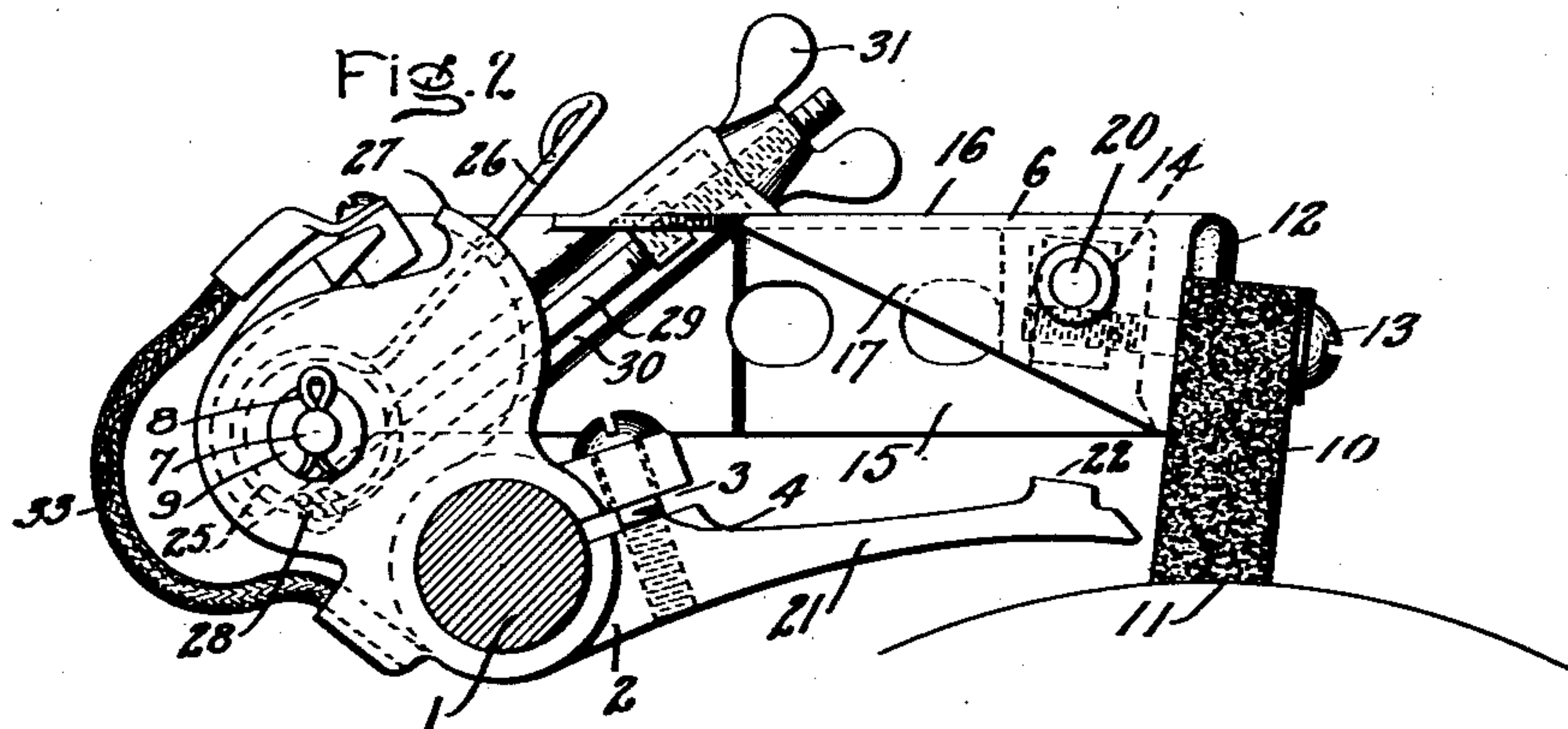
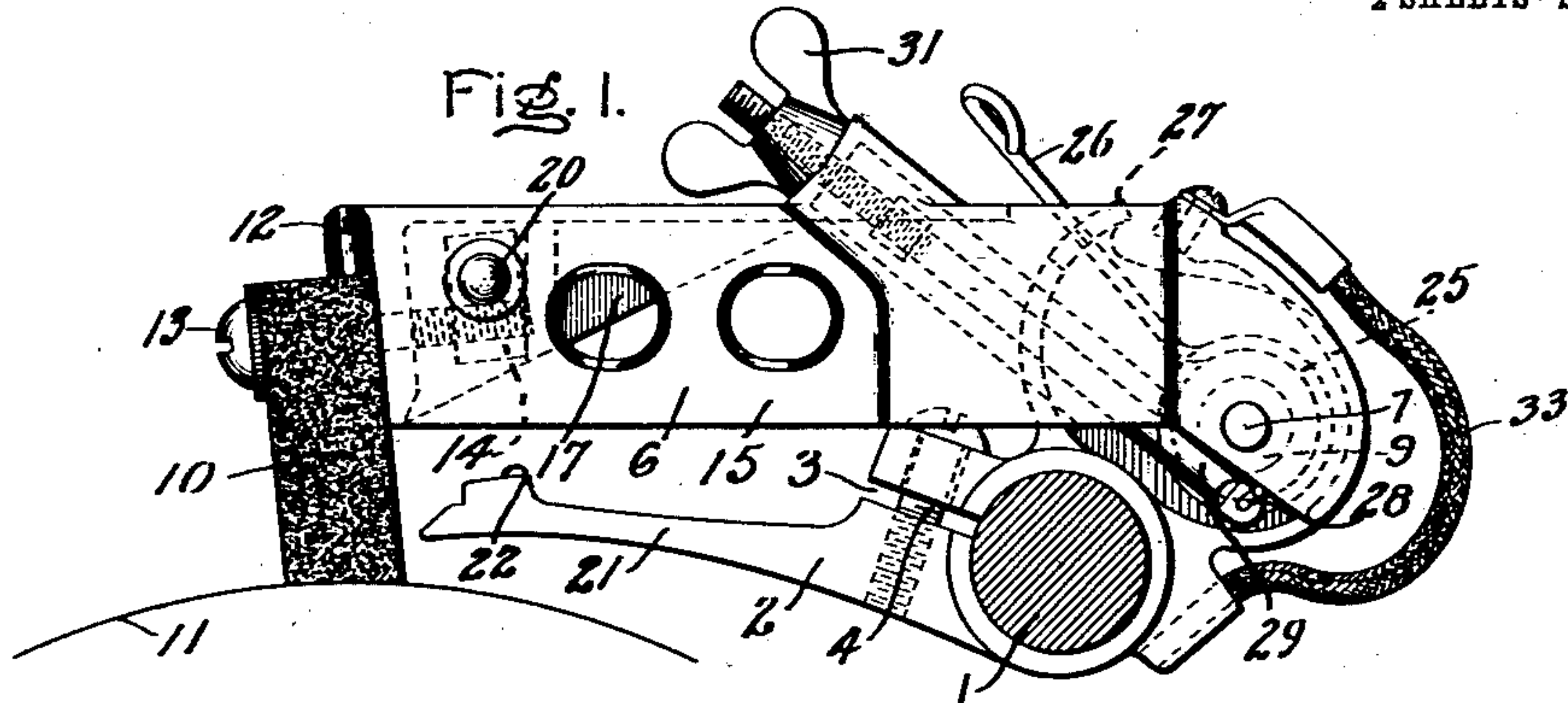
E. R. WHITNEY.
BRUSH HOLDER.

APPLICATION FILED JUNE 24, 1904.

917,223.

Patented Apr. 6, 1909.

2 SHEETS—SHEET 1.



WITNESSES:

George A. Thornton.
Allen Oxford

INVENTOR:

Eddy R. Whitney.
By *Albert S. Davis*
ATTY.

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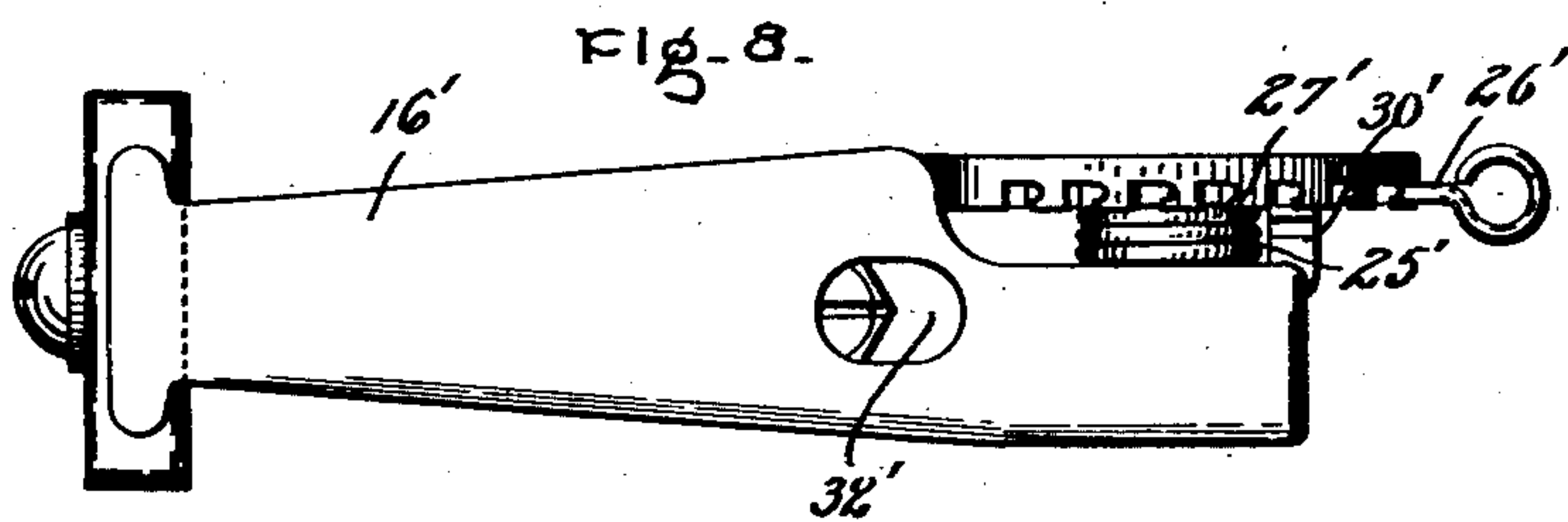
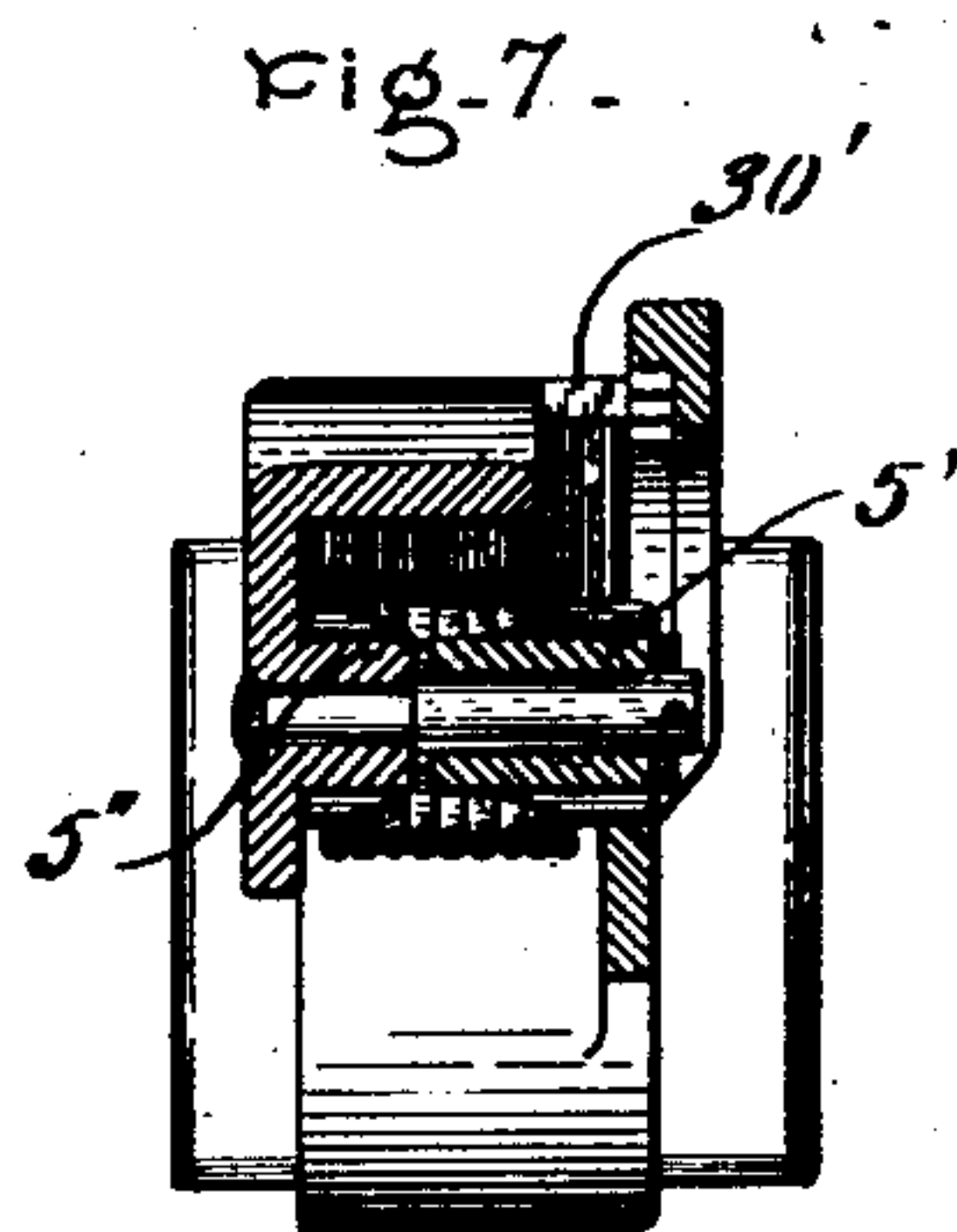
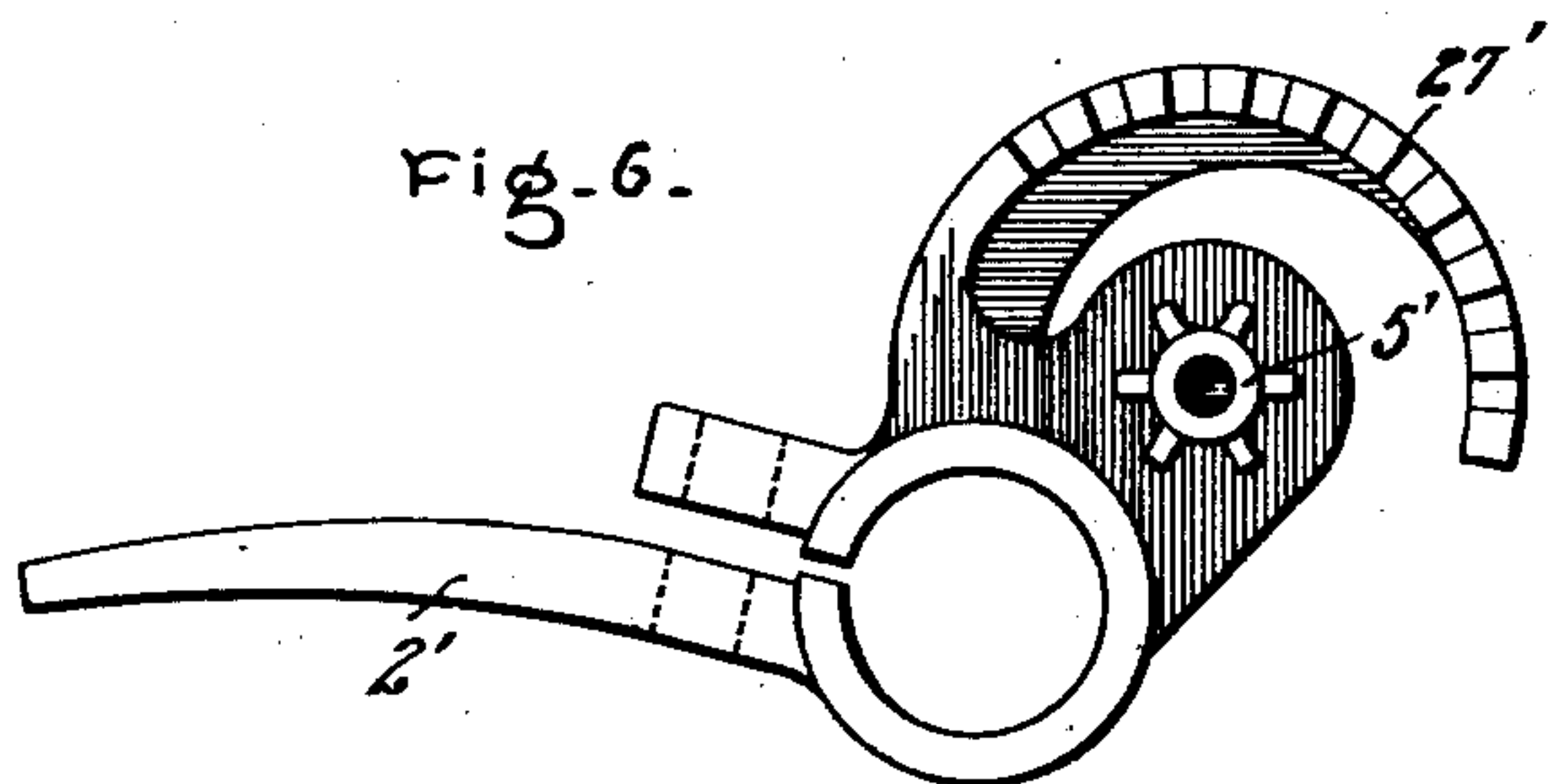
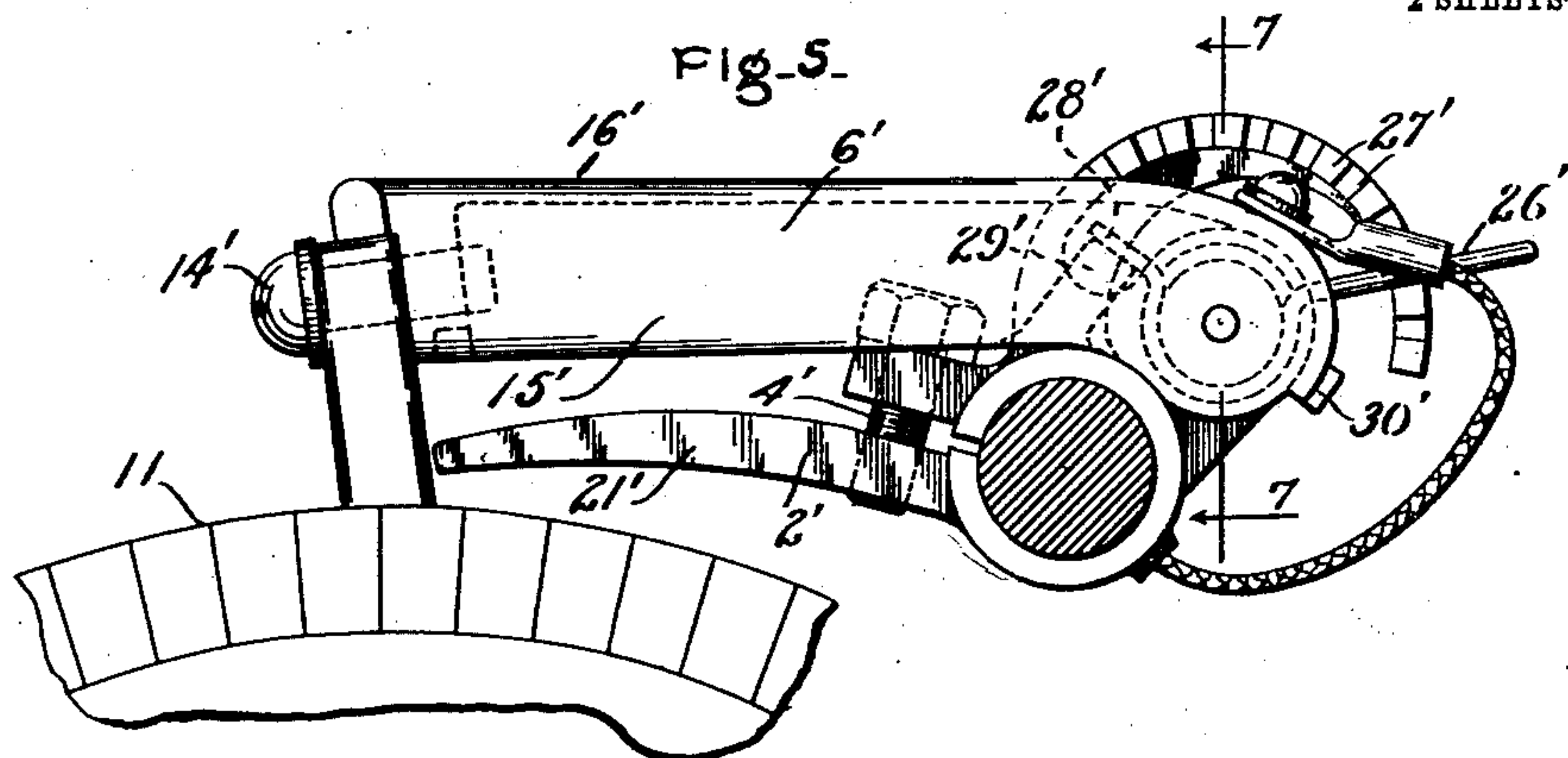
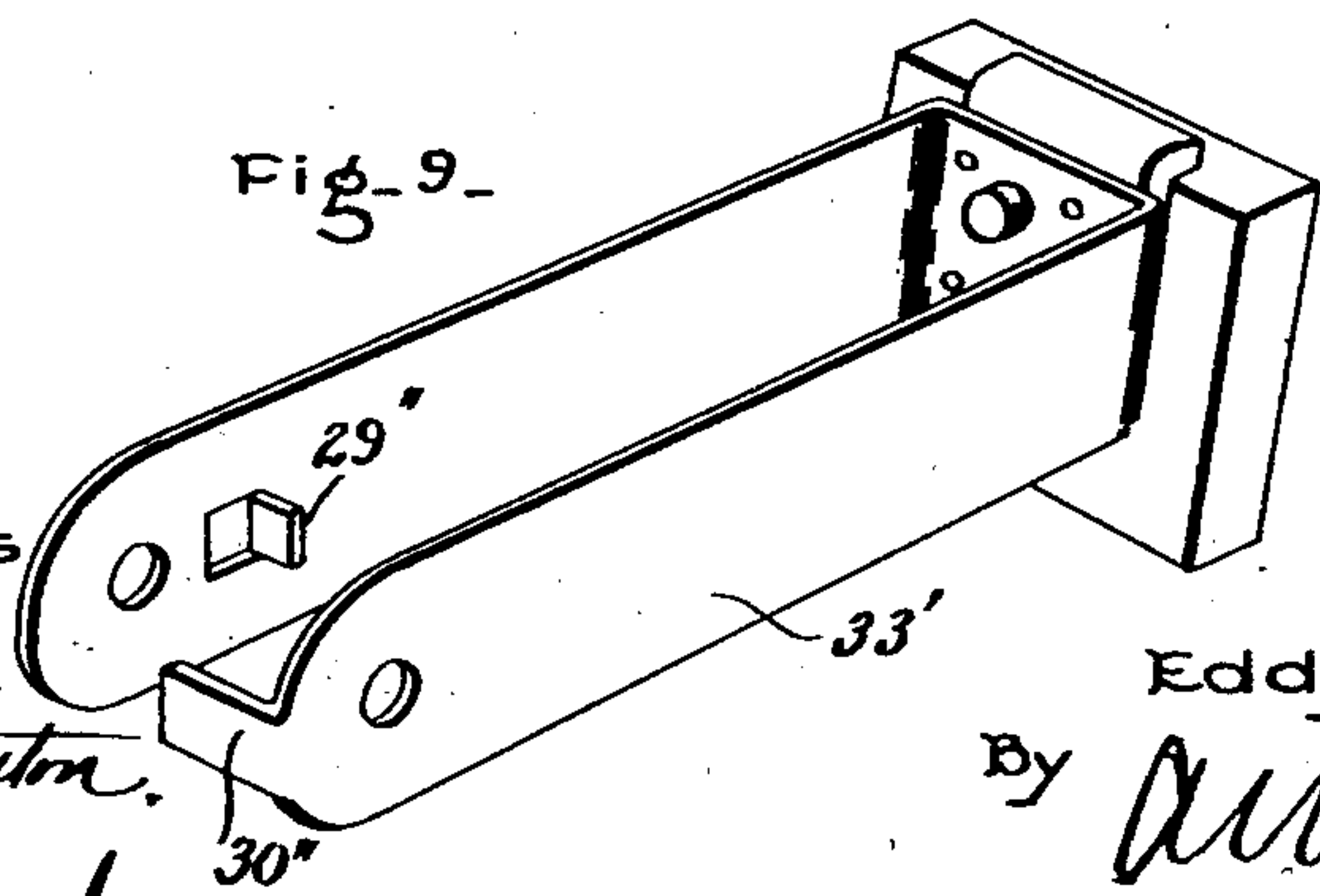


Fig-9-



Witnesses

George A. Thomson.
Allen Arford

Inventor,

Eddy R. Whitney,

By

Wm. A. Dain

Atty.

UNITED STATES PATENT OFFICE.

EDDY R. WHITNEY, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

BRUSH-HOLDER.

No. 917,223.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed June 24, 1904. Serial No. 213,914.

To all whom it may concern:

Be it known that I, EDDY R. WHITNEY, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Brush-Holders, of which the following is a specification.

My present invention relates to brush holders for dynamo electric machines, and consists in various novel features of construction and arrangement all of which are pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention, however, reference may be had to the accompanying description and drawings in which I have described and illustrated several forms in which my invention may be embodied.

Of the drawings, Figure 1 is an elevation of a brush holder constructed in accordance with my invention; Fig. 2 shows the opposite side of the brush holder from that shown in Fig. 1; Fig. 3 is a plan view of the brush holder shown in Figs. 1 and 2; Fig. 4 is a sectional view taken on the line 4 4 of Fig. 3; Fig. 5 is an elevation showing a slightly modified form of my invention; Fig. 6 is an elevation of a detail employed in the brush holder shown in Fig. 5; Fig. 7 is a section on the line 7 7 of Fig. 5; Fig. 8 is a plan view of the brush holder shown in Fig. 5; and Fig. 9 is a perspective view of a modified detail which may be employed in the brush holder shown in Fig. 5.

Referring particularly to the brush holder shown in Figs. 1 to 4 of the drawings, 1 represents the bolt or stud on which the brush holder is mounted. A supporting member 2 is formed with an aperture through which the stud 1 passes. A kerf 3 is formed in the portion of the supporting member 2 surrounding the stud 1. A screw 4 forms a means for pulling together the portions separated by the kerf to clamp the member 2 to the stud 1. The member 2 is formed with a hollow boss 5 which extends parallel to the stud 1. A brush carrying member 6 is pivoted to the member 2 by a bolt 7 which passes through the opening in the hollow boss 5. The bolt may be secured at one end to the member 6 and a cotter pin 8 passing through the end of the bolt 7 and cooperating washer 9 may be

employed to secure the members 2 and 5 together.

A brush 10 the lower end of which normally engages the collector ring or commutator surface 11 is carried at the free end of the member 6 which is formed with an end portion against which the side of the brush abuts, and a projecting portion 12 against which the end of the brush abuts. A bolt 13 passing through an aperture formed for the purpose in the brush into a threaded nut 14 carried by the member 6 serves as a means for firmly clamping the brush 10 to the member 6.

As shown in the drawings, the member 6 comprises a comparatively thin portion 15 extending in a plane transverse to the supporting stud 1 which is reinforced at its free end by an upper portion 16 extending parallel to the stud 1, and a triangular portion 17 extending parallel to the portion 15. The nut 14 into which the end of the bolt 13 is threaded is secured between the parallel portions 15 and 17 by a pin or lock 20.

A projection 21 from the member 2 is so located that an engaging portion 22 will engage the lower surface of the nut and prevent the member 6 from engaging the surface 11 of the commutator or collector ring when the brush 10 is shortened by ordinary wear or otherwise.

A helical spring 25 is coiled about the boss 5. One end 26 of this spring which extends radially from the axis of the helix can be detachably hooked over a locking projection 27 formed for the purpose on the member 2. The other end 28 of the spring passes through an aperture formed for the purpose in the end of a rod 29 which is slidingly located in a recess or groove 30 formed for the purpose in the member 6.

The upper end of the rod 29 passes through an aperture formed for the purpose in the upper wall or portion 16 of the member 6 which is shaped to form a seat for the thumb nut 31 threaded upon the upper end of the rod. As clearly appears in the drawing, this seat is dished while the seat engaging portion of the nut 31 is convex. This prevents the nut from working loose while at the same time it offers no opposition to the adjustment of the tension on the spring by threading the nut along the rod.

A projection 32 from the member 6 forms

a shoulder against which the end 26 of the spring may rest whenever it is desired to release the spring from its engagement with the locking projection 27 for any purpose.

5 A flexible conductor or pigtail 33 having one end secured to the member 2 and the other end secured to the member 6 is ordinarily employed to insure good contact between the members 2 and 6. This may be
10 dispensed with, however. The member 2 may be formed of some good conducting metal such as copper or brass. The member 6 is preferably formed of metal such as aluminum or an aluminum alloy having a low
15 specific gravity.

It will be observed that the brush holder described forms a very simple and compact construction in which the brush carrying parts have comparatively small amount of
20 inertia. The screw 4 it will be observed is readily accessible by reason of the cutting away of the upper portion 16 of the member 6 at a point adjacent the screw.

The tension of the spring 25 and consequently the pressure with which the brush
25 is forced against the surface 11 can be adjusted by giving successive half revolutions to the thumb nut 31. When it is desired to remove the brush 10 from the surface 11
30 without moving the member 2 the end 26 of the spring may be released from its engagement with the notch or shoulder 27 and allowed to rest against the shoulder 32 of the member 6 in which case, of course, the spring
35 no longer urges the brush against the surface. The use of the shoulder 32 located as shown makes certain that the spring 25 is always held under sufficient tension to prevent the spring from being displaced.

40 The brush member engaging projection 21 of the member 2 located adjacent the brush as shown forms a gage by means of which the position in which the member 2 shall be clamped to the stud can readily be deter-
45 mined. With the projection 21 located as shown it is impossible to clamp the brush holder to the stud in such a manner that the member 6 can ever engage the surface of the commutator or collector ring while at the
50 same time any proper angular adjustment of the member 2 about the stud 1 which may be desirable can be obtained.

In the form of my invention shown in Figs. 5 to 8 inclusive, the supporting member 2' is
55 formed with a series of projections 27' arranged in the form of an arc of a circle about the axis of the spring 25'. One end 26' of the spring 25' normally engages one of the projections 27'. The other end 28' of the
60 spring rests against the stop 29' carried by the brush carrying member 6'. The tension of the spring can, of course, be adjusted by moving the end 26' from its position of engagement with one of the teeth 27' to a posi-
65 tion of engagement with another of the teeth

27'. A stop 30' is formed on the member 6' against which the end 26' can bear when it is desired to move the brush out of engagement with the surface. In this form of my in-
vention the brush securing bolt 14' is screwed 70 into a threaded aperture formed in the end of the member 6', the projection 21' from the member 2' engaging the under portion of the member 6' directly, to prevent the latter from moving into contact with the surface. 75
The member 6', used in this form of my invention comprises a portion 16' parallel to the shaft, and a portion 15' extending at right angles thereto. A recess 32' is formed in the portion 16' through which the clamp- 80
ing screw 4' may be adjusted. Instead of a single boss 5 as in the construction shown in Figs. 1 to 4 inclusive, the members 2' and 6' are formed with bosses 5' and 5'' respec- 85
tively. These bosses are formed with tapered ribs on their peripheries and only the ends of the helix into which the body of the spring 25' is formed engage the bosses. This gives the utmost flexibility to the spring. This feature of construction may, of course, 90
be employed in the brush holder first described. In this form of my invention also the member 6' may be formed of cast metal having a low specific gravity. I may, how-
ever, form the brush carrying member out of 95 a U-shaped piece 33' of sheet metal as shown in Fig. 9. An integral projection 29'' may be formed on the U-shaped member as shown corresponding in function to the projection 29' of Fig. 5. A projection 30'' correspond- 100
ing in function to the projection 30' shown in Fig. 5 may also be integrally formed on the U-shaped member.

What I claim as new and desire to secure by Letters Patent of the United States, is,— 105

1. In combination, a stud, a supporting member clamped thereto, a brush carrying member pivoted to the supporting member, a helical spring wound about the pivotal connection between the members, and a projec- 110
tion from the supporting member adapted to engage the brush carrying member near its brush carrying end, said projection being positioned so as to prevent the brush carrying member from moving into contact with the 115
surface against which the brush bears.

2. In combination, a supporting member, a brush carrying member pivotally connected thereto, a helical spring wound about the pivotal connection between the members, a 120
notch formed in one of said members against which one end of the spring is secured, and a bolt slidably mounted in the other of said members to which the other end of the spring is secured. 125

3. In combination, a supporting member, a brush carrying member pivotally connected thereto, a helical spring wound about the pivotal connection between the members, a projection formed on one of said members 130

against which one end of the spring is secured, a bolt slidingly mounted in the other of said members to which the other end of the spring is secured, and a shoulder carried by said other member against which the projection engaging end of the spring may rest.

4. In combination, a stud, a supporting member clamped thereto by a threaded bolt, and a brush carrying member pivotally connected to the supporting member, said brush carrying member having two portions at right angles to each other, and one of said portions being cut away to give access to the bolt.

5. In a brush holder, a supporting member, a brush carrying member pivoted thereto, a bolt and nut for clamping a brush to said brush carrying member, and a projection from the supporting member adapted to be interposed between the nut and the surface against which the brush bears to prevent engagement between the brush carrying member and said surface.

6. In combination, a supporting member, a brush carrying member pivotally connected thereto, a helical spring wound about the pivotal connection between the members, means for securing one end of said spring to one of said members, and a bolt slidingly mounted in the other of said members to which the other end of the spring is secured.

7. In combination, a supporting member, a brush carrying member pivotally connected thereto, a helical spring wound about the pivotal connection between the members, means for detachably securing one end of said spring to one of said members, a bolt slidingly mounted in the other of said members, and means for disengaging the first

mentioned end of said spring and for securing it to the other member.

8. In a brush holder, a supporting member, a brush carrying member, a helical tension spring, means for normally securing one end of said spring to one of said members and the other end of said spring to the other of said members, and means for shifting the engagement of one end of said spring from the member to which it is normally secured to the opposite member.

9. In a brush holder, a supporting member, a brush carrying member pivotally connected thereto, a spring formed into a helix, means for securing one end of said spring to one of said members, a bolt carried by the other of said members to which the other end of said spring is connected, said bolt being substantially tangential to said helix, and means for longitudinally adjusting the bolt.

10. In a brush holder, a pair of relatively movable members, a tension spring in the form of a helix having one end secured to one of said members, and the other end secured to the other of said members, a support carried by one of the members for engaging one end only of the helix, and a support carried by the other of said members for engaging the other end only of the helix, the axis of said helix being substantially at right angles to the direction of movement of the members.

In witness whereof, I have hereunto set my hand this twentieth day of June, 1904.

EDDY R. WHITNEY.

Witnesses:

DUGALD McK. McKILLOP,
JOHN JAY WALKER.