

Feb. 14, 1933.

H. P. DUEY

1,897,365

TOOTHBRUSH

Filed Feb. 26, 1930

2 Sheets-Sheet 1

Fig. 1.

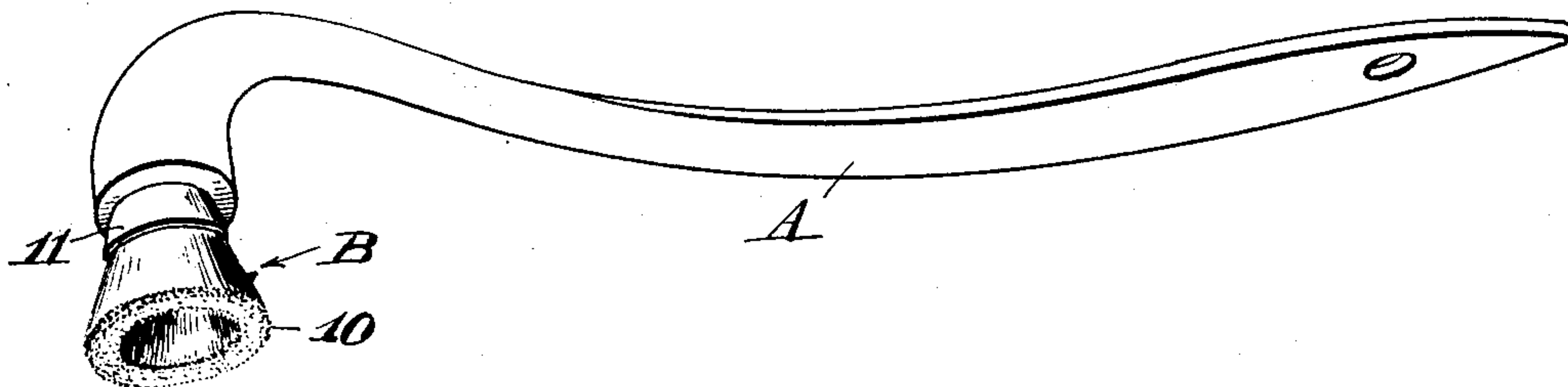


Fig. 2.

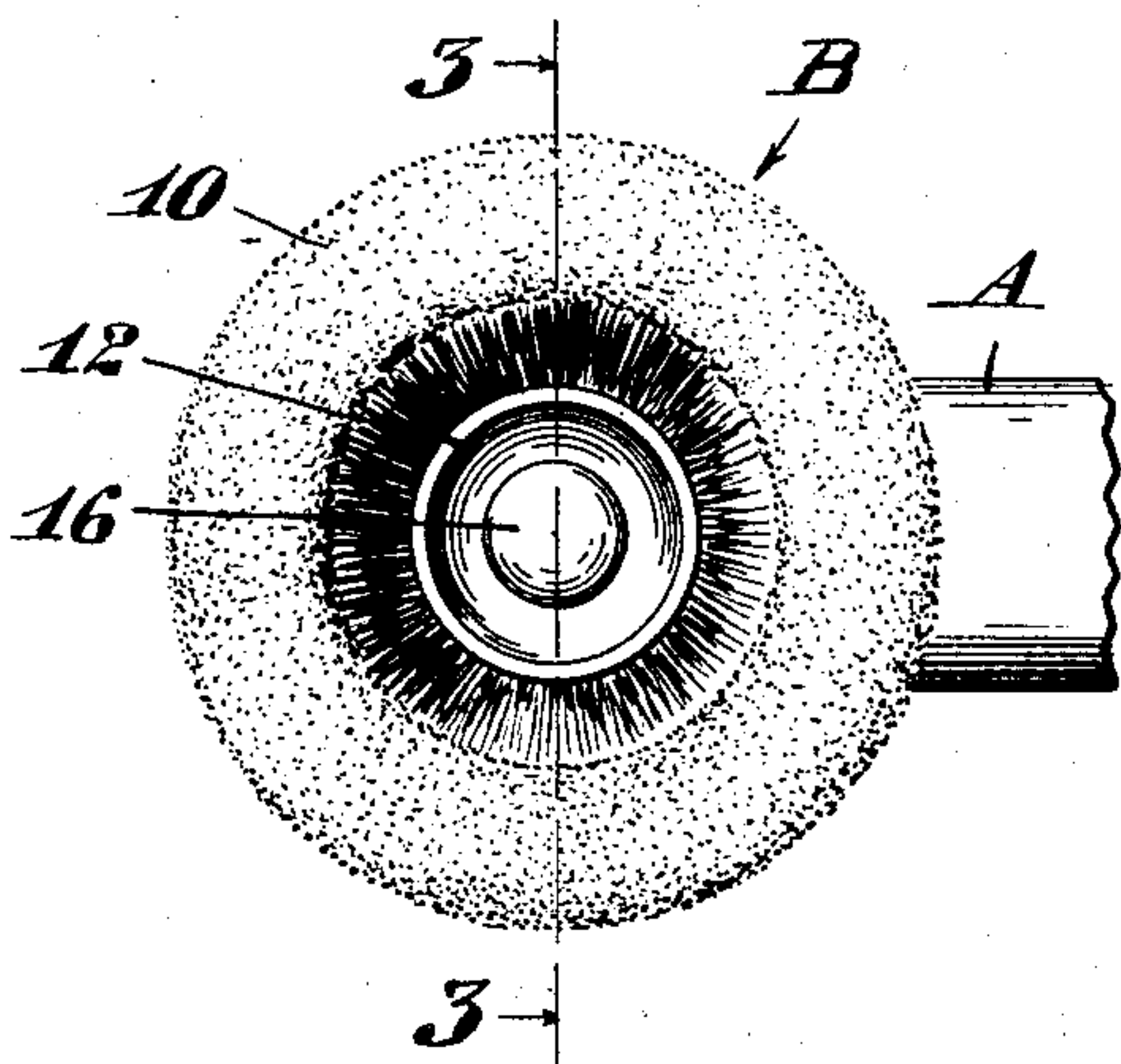


Fig. 3.

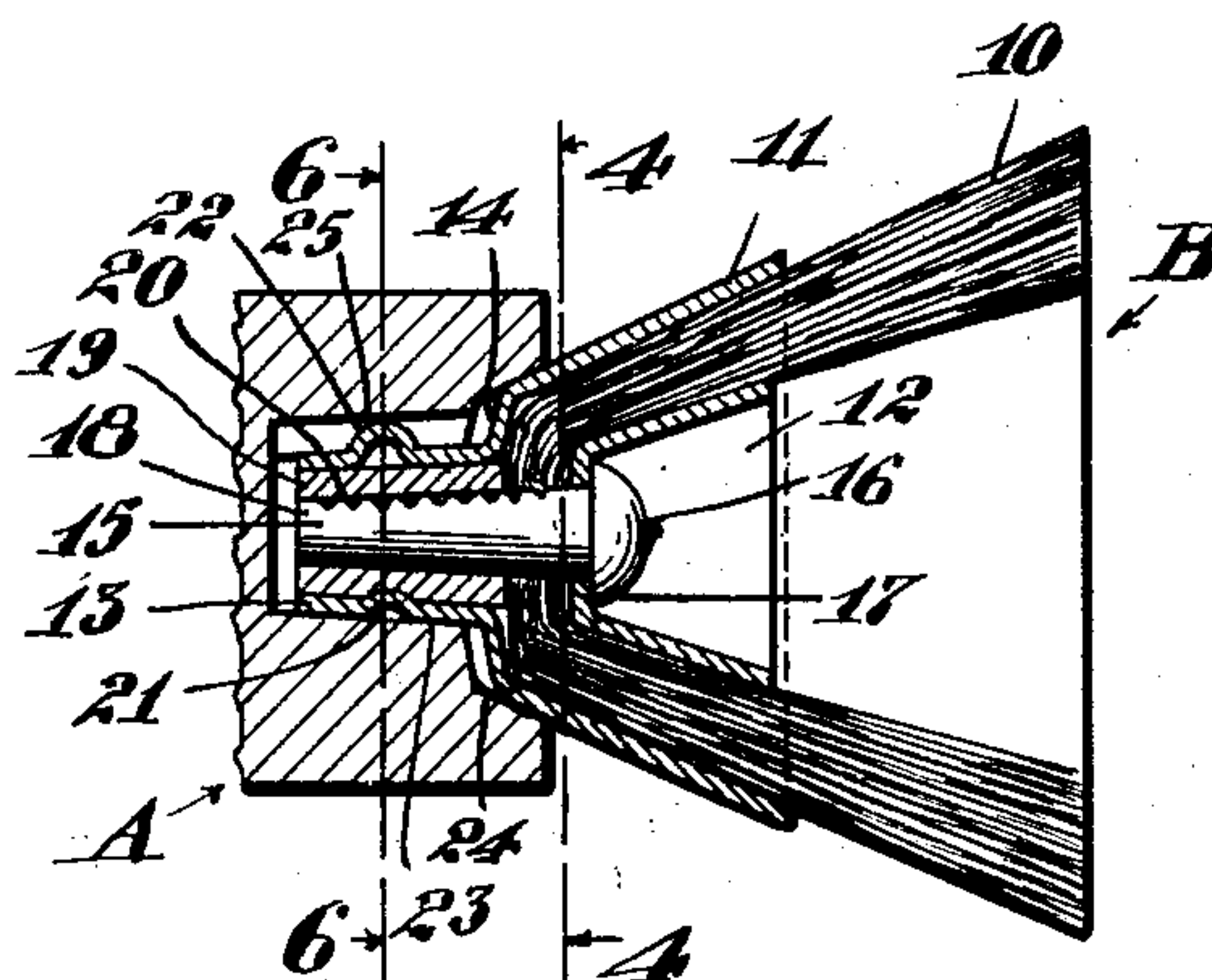


Fig. 4.

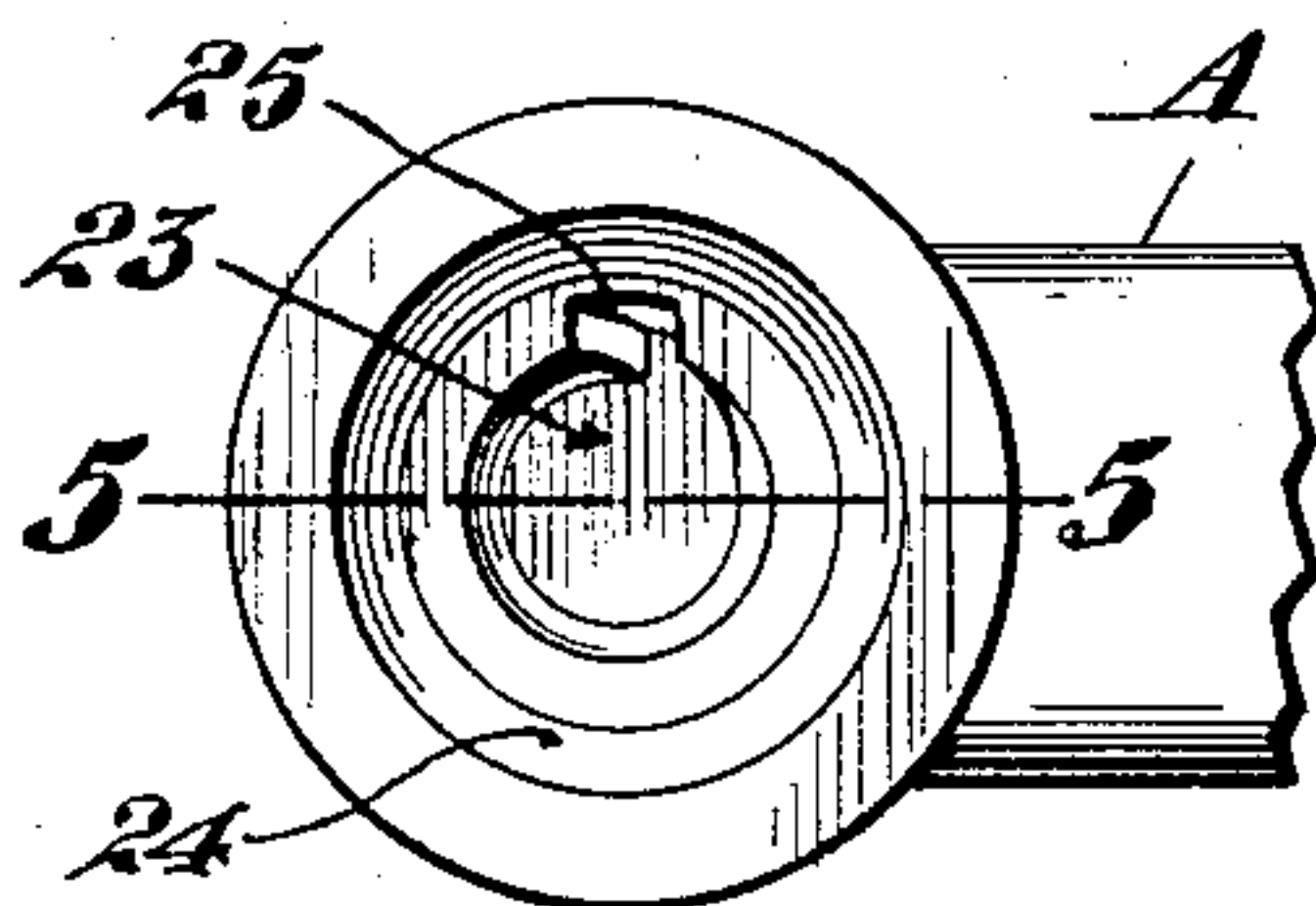


Fig. 5.

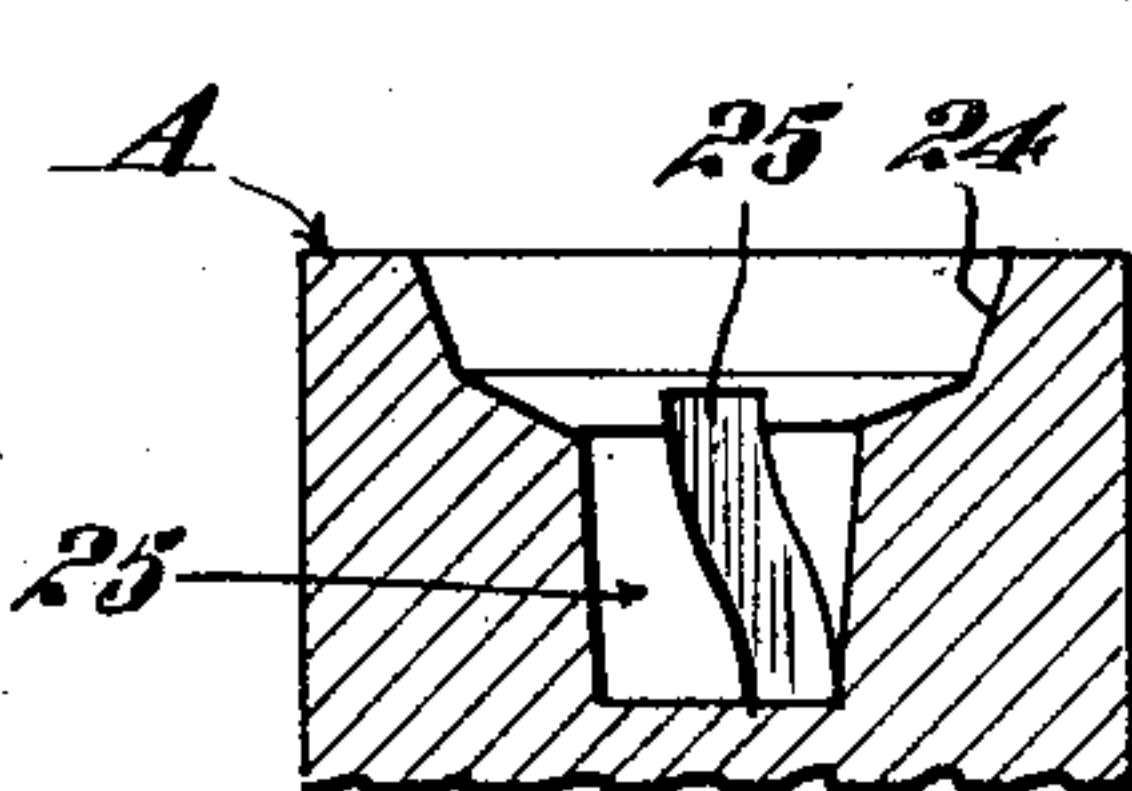
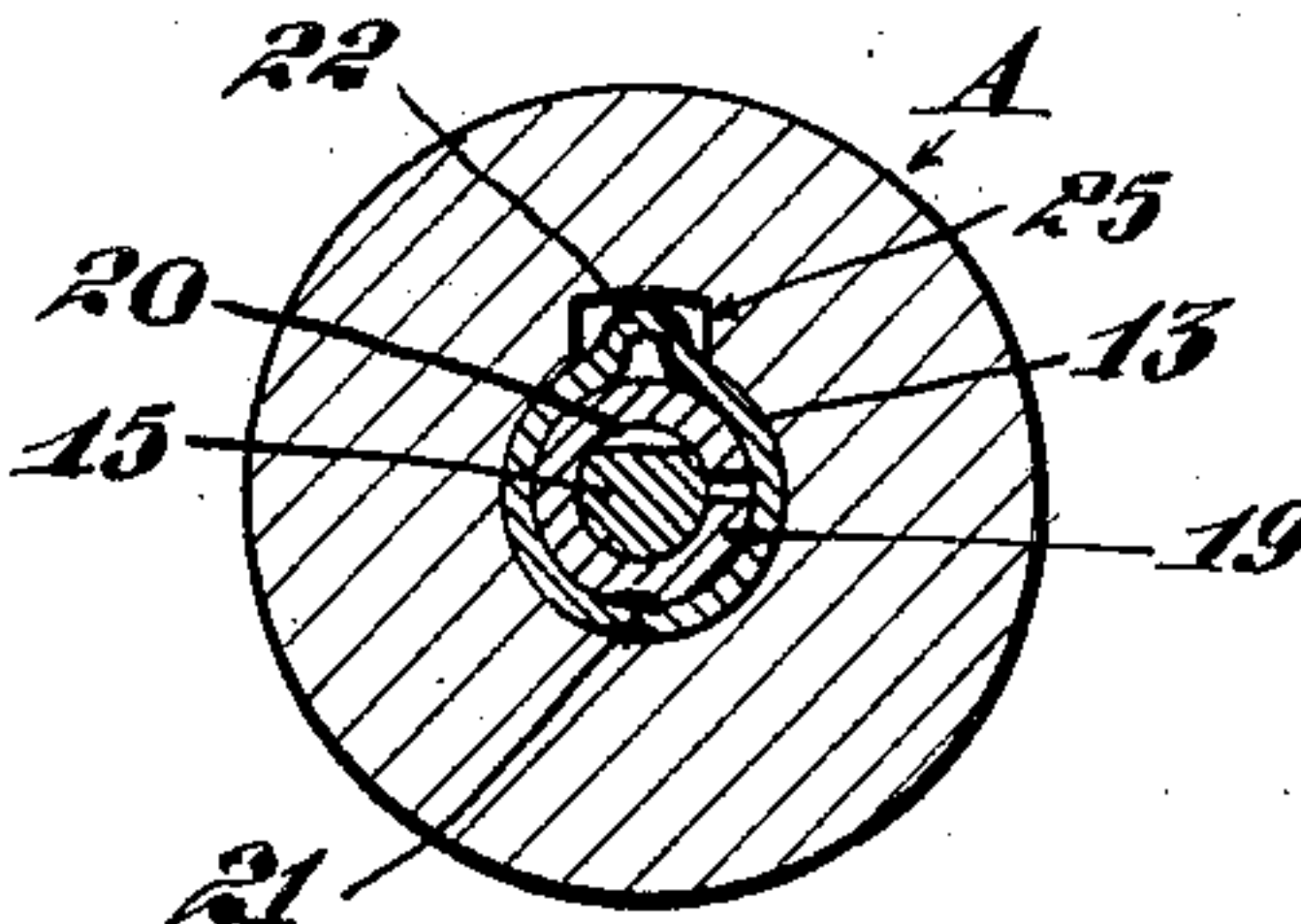


Fig. 6.



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2 Sheets-Sheet 2

Fig. 7.

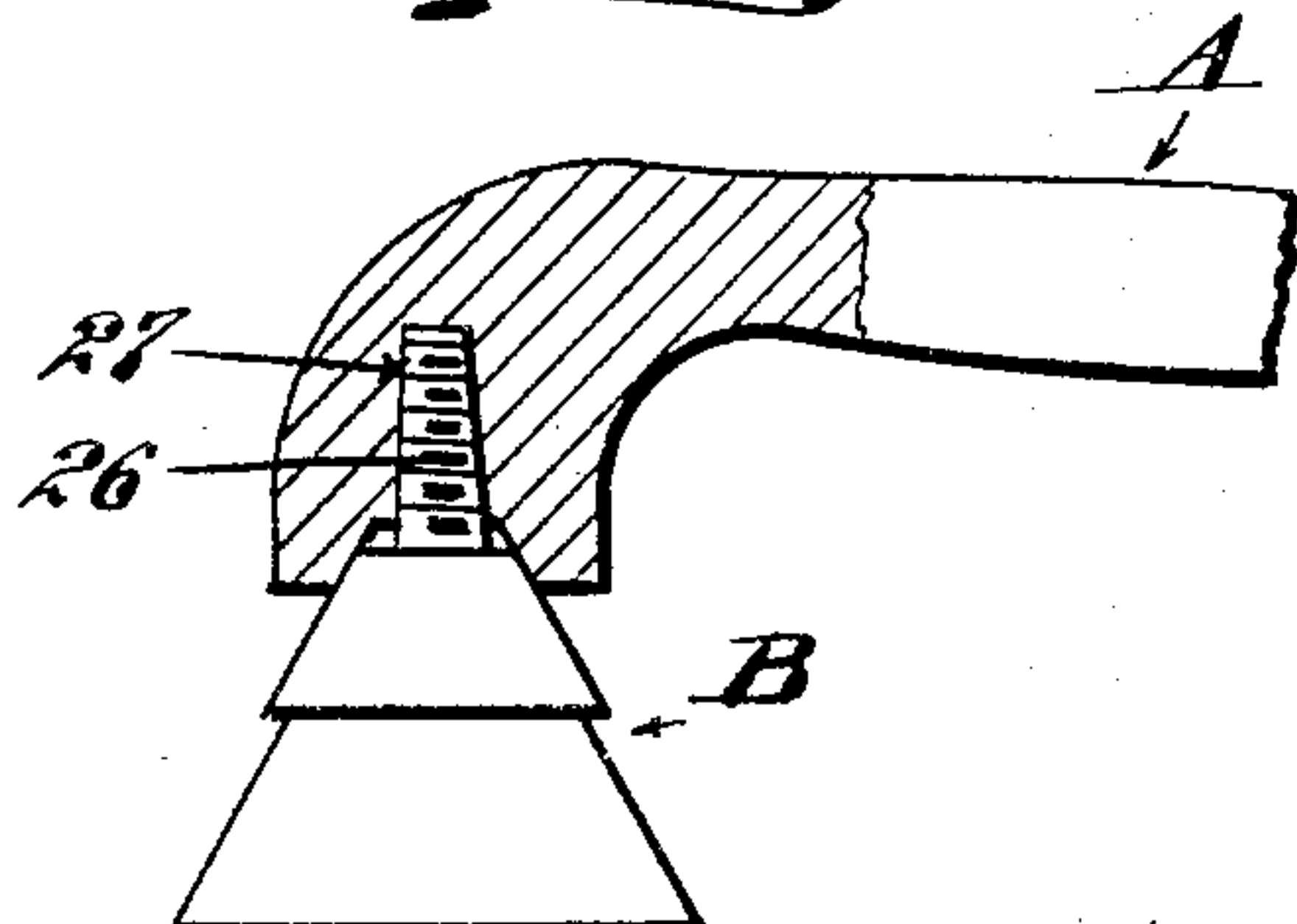


Fig. 8.

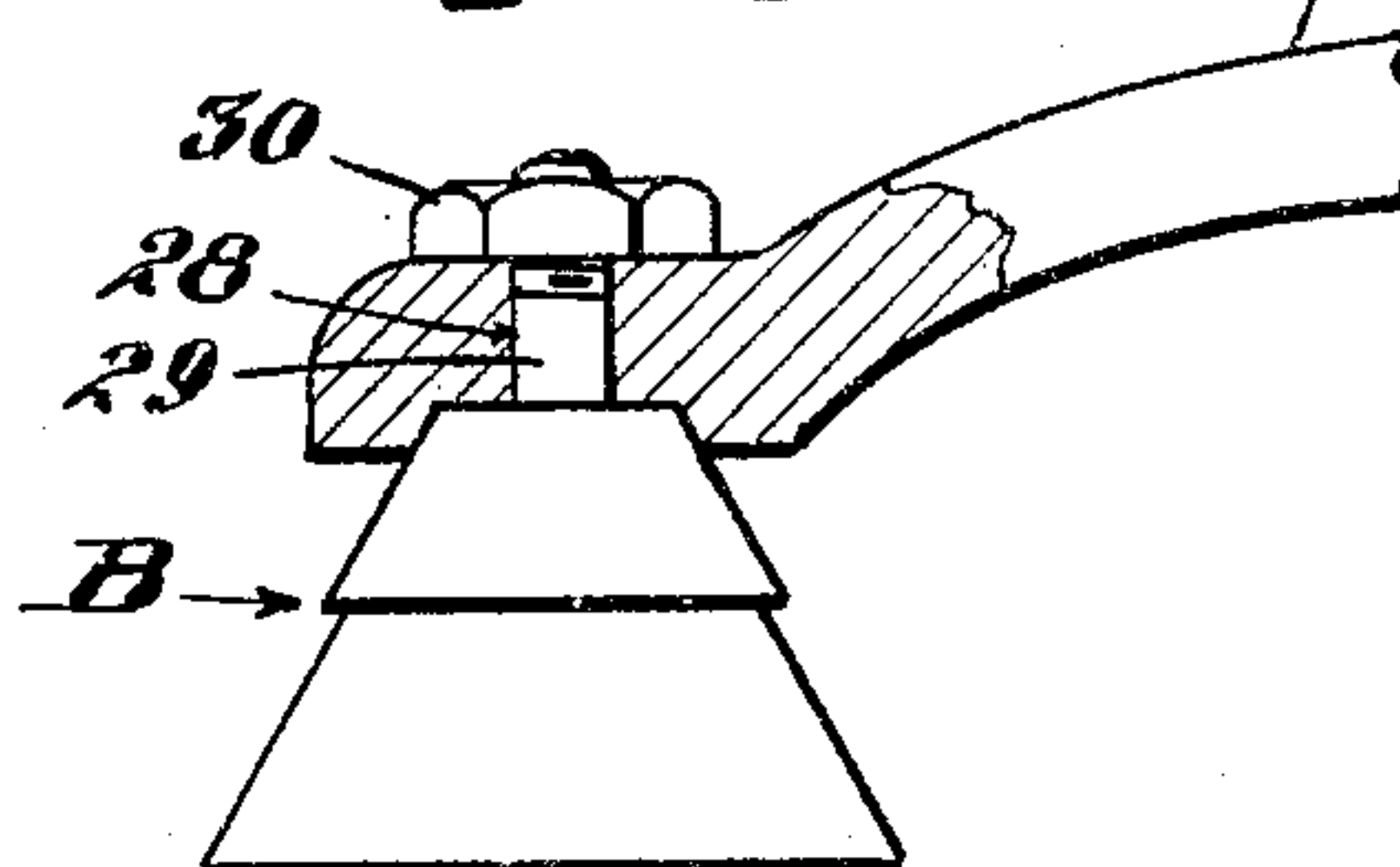


Fig. 9.

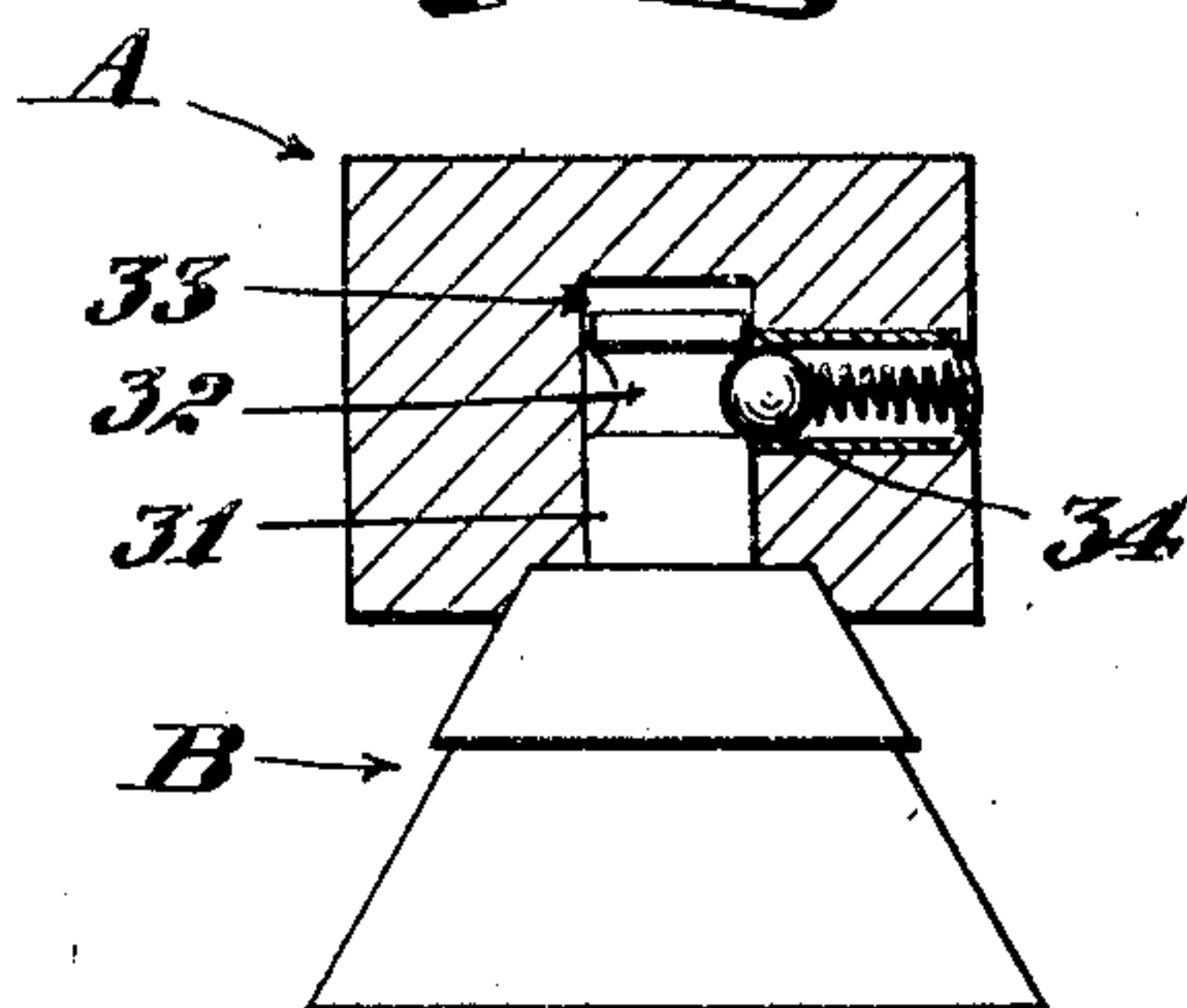


Fig. 10.

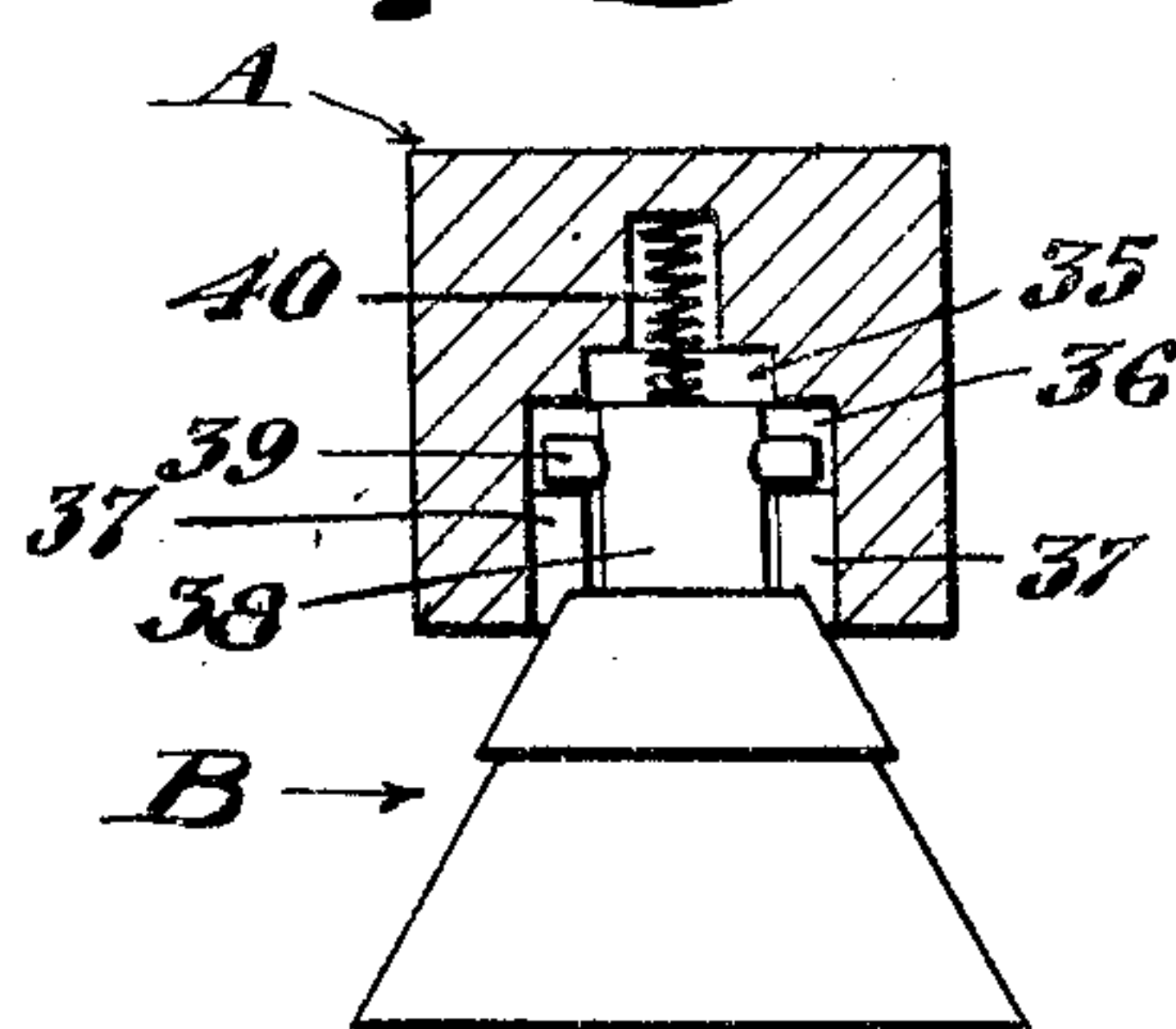


Fig. 11.

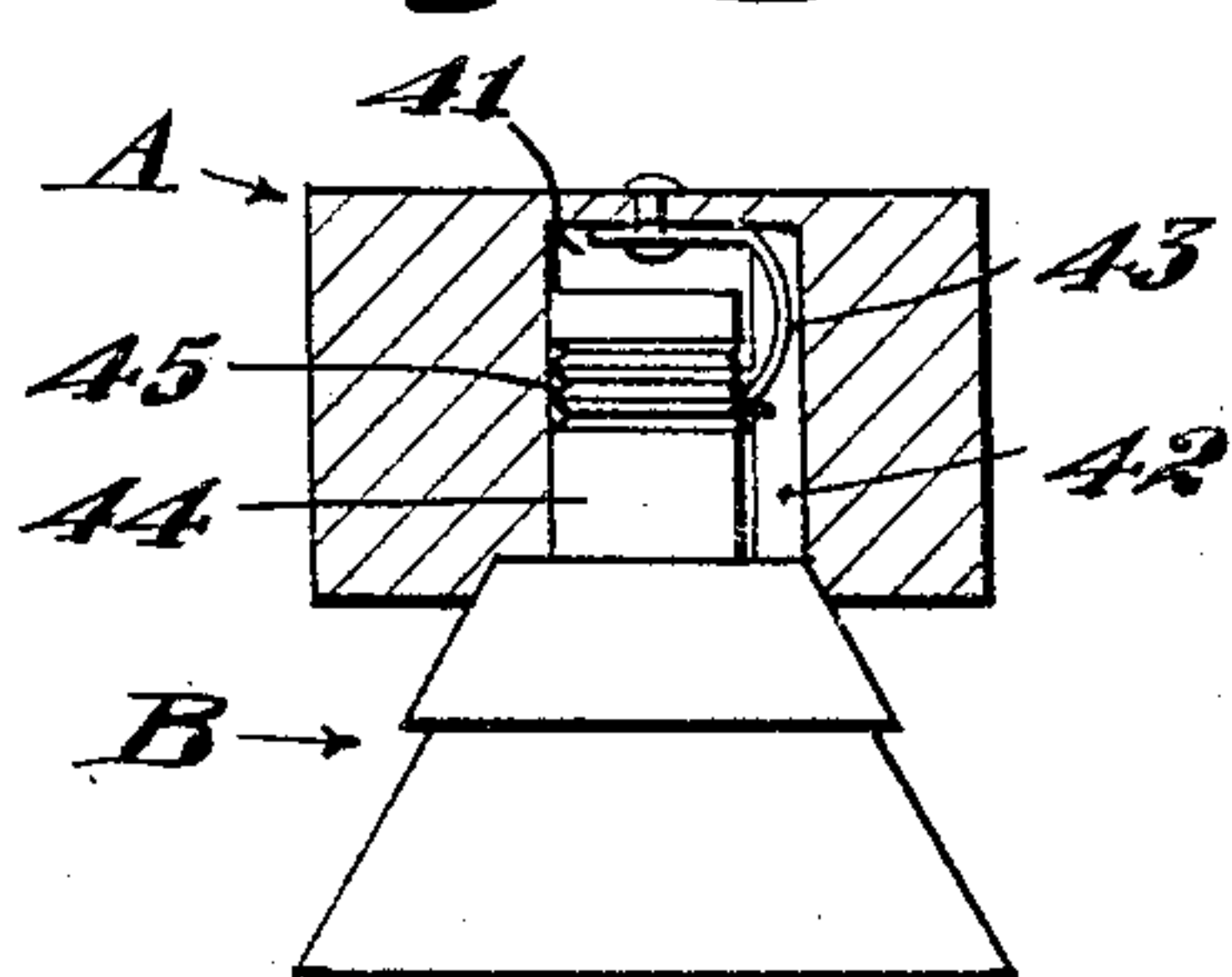
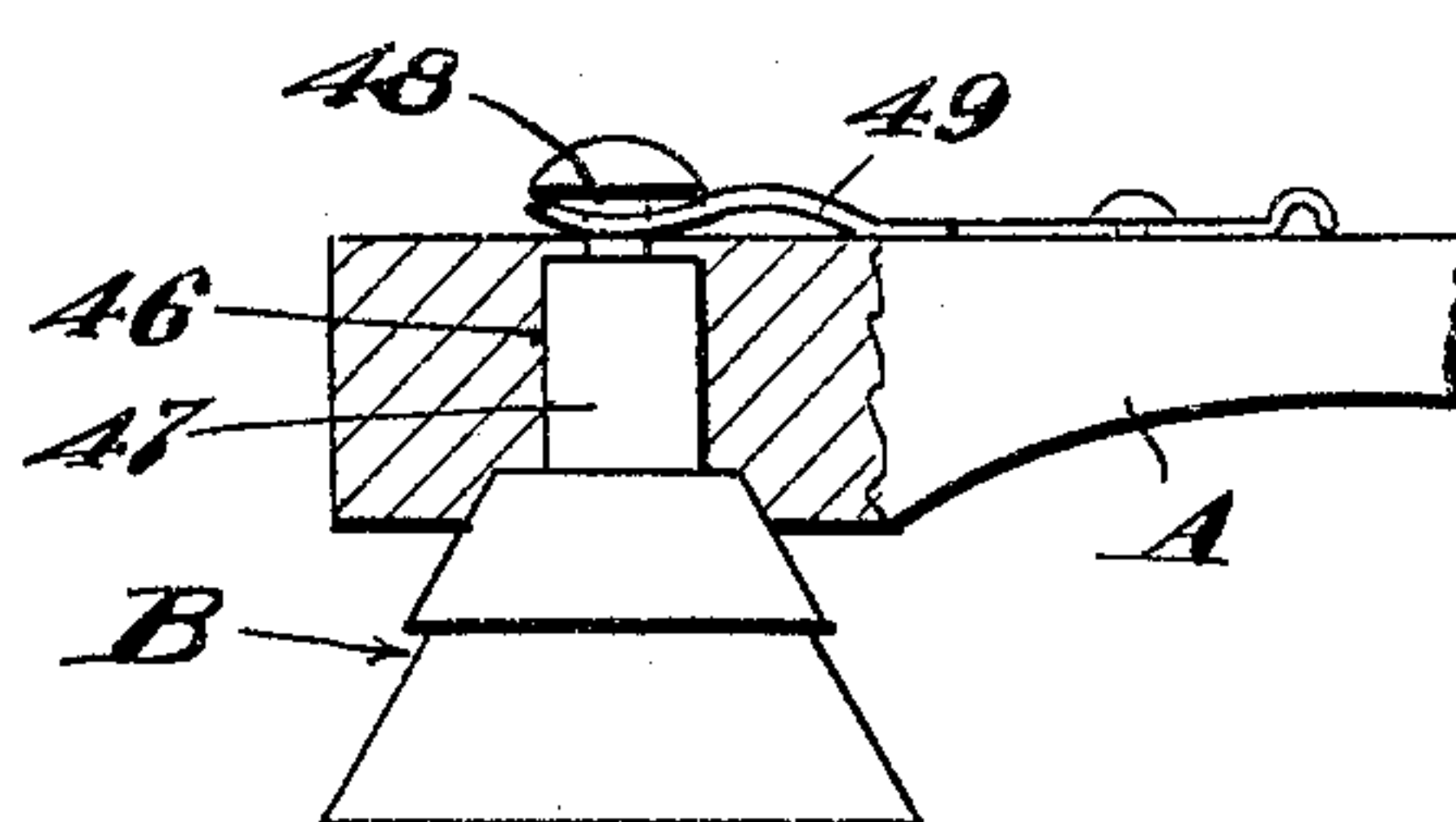


Fig. 12.



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TOOTHBRUSH

Application filed February 26, 1930. Serial No. 431,357.

This invention relates to a toothbrush and has as its primary object the provision of a toothbrush which is especially adapted to be manipulated with a rotary movement in effecting cleansing of the teeth and whereby a person may cleanse his own teeth in a manner similar to that employed by operators but without the use of power-propelled mechanism.

Another object is to provide a toothbrush which will facilitate cleansing of individual teeth and which is so formed that brushing of the back of the last molar may be effected.

Another object is to provide a toothbrush having a brush head in which the bristles are arranged so that their outer ends will form an annulus thereby imparting to the brush a circular end formation and also to provide a means whereby the brush head may be detachably connected to a toothbrush handle to permit the employment of brush heads of various sizes with a single handle and also permit renewal of the brush heads as occasion may require.

A further object is to provide a means for effecting connection between a brush head and a handle which will permit the ready attachment and removal of the brush head and in which the brush head will be securely held against rotation relatively to the handle when mounted thereon.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed and illustrated by way of example in the accompanying drawings, in which:—

Fig. 1 is a perspective view of the toothbrush;

Fig. 2 is an enlarged plan view of the brush head;

Fig. 3 is a view in vertical section as seen on the line 3—3 of Fig. 2 showing the manner of mounting the brush head on the handle;

Fig. 4 is a view in elevation as seen on the line 4—4 of Fig. 3 showing the brush head receiving portion of the toothbrush handle with the brush head removed;

Fig. 5 is a detail in section and elevation taken on the line 5—5 of Fig. 4;

Fig. 6 is a view in cross section as seen on the line 6—6 of Fig. 3;

Figs. 7 to 12 are views in section and elevation illustrating modified forms of the invention.

Referring to the drawings more specifically, A indicates generally a toothbrush handle and B designates a toothbrush head mounted on the handle A and arranged to project laterally therefrom; the brush handle A, however, having its brush-carrying end portion of goose-neck formation and the brush head B being projected from the end face thereof.

The toothbrush head B embodies a series of bristles 10 arranged in the form of a truncated cone with their outer ends terminating at the base of the cone substantially on a plane whereby the ends of the bristles form a brush of substantially circular or annular shape. The bristles are mounted between a pair of spaced annular outer and inner metallic walls 11 and 12 being seated interiorly of the wall 11 and being held in place thereagainst by the wall 12. The outer wall 11 is tapered and is formed at its smaller end portion with a reduced tubular extension or stem 13 which is slightly convergent or tapered longitudinally from its intersection with the wall 11. The contiguous portions of the wall 11 and the tube 13 are integrally connected through a shoulder 14.

The inner wall 12 is tapered and is rigidly affixed relatively to the wall 11 and tube 13 by means of a pin 15 having a head 16 which seats on the inner face of an intumed flange 17 formed on the convergent end portion of the wall 12 and has a stem 18 which projects into a split sleeve 19 encompassed by the tube 13. The sleeve 19 tightly grips the shank 18 of the pin and the pin and sleeve are held against longitudinal movement relatively to each other by means of transverse serrations 20 formed on the pin shank which effect such frictional or interlocking engagement with the sleeve as to prevent ready separation of the sleeve and pin. The sleeve 19 is held in place within the tube 13 by indenting the lat-

ter into the outer periphery of the sleeve as indicated at 21. The intermediate portions of the bristles 10 constituting the reduced end of the truncated conical formation of the bristles extend between the flanged inner end of the wall 12 and the inner face of the shoulder 14 on the outer wall 11, so that the bristles will thus be clamped in place intermediate their ends and thereby fastening the bristles more securely against being loosened and disengaged than when they are merely secured at their inner ends as heretofore practiced in the construction of circular brushes of this character.

In carrying out the present invention, the tapered tubular extension 13 is formed with an outwardly projecting bulge 22 which constitutes a key.

The brush handle A is formed on the end face of its goose-neck end portion with a socket 23; the socket being formed at its inner-end portion with a taper to substantially conform to the tapered exterior of the tube 13 to effect wedge engagement therewith and being enlarged at its outer-end portion to provide a recess for the reception of the convergent end portion of the wall 11 which recess is formed with an inclined wall 24 against which the outer face of the convergent end portion of the wall 11 is adapted to seat.

The side wall of the reduced portion of the socket 23 is formed with an open ended groove 25 of high pitch spiral contour, which groove is designed to receive the projection or key 22 on the tubular stem 13 in such manner as to hold the brush head against free rotation relatively to the handle.

In mounting the head on the handle the tapered stem is inserted in the socket 23 with the key 22 positioned to enter the outer end of the groove 25 whereupon the tapered stem is manually pressed into the socket and by reason of the spiral formation of the groove 25 coacting with the key 22 the stem is given a slight twisting or spiral movement as it comes into seated contact with the walls of the socket. On the stem being thus tightly pressed in place a secure connection is afforded between the brush head and the brush handle; the brush head being sufficiently wedged into engagement with the handle as to hold the brush head in place during manipulation of the brush, which engagement in such by reason of the slight taper of the stem and socket as to permit the brush head being readily detached by imposing a pull thereon with a slight retrograde twist relatively to the handle.

The brush head and the brush-head receiving end portion of the toothbrush handle are formed of such small size as to permit ready positioning in the mouth and the bristles are of such size that at least the major portion of the ends thereof will come within the

boundaries of a single tooth surface thereby facilitating cleansing of the individual teeth. By forming the brush handle with a goose-neck brush-carrying end portion, the brush may be readily positioned to operate on the inner faces of the teeth and to effect brushing action on the back faces of the rear molars.

While the brush may be employed in the manner common to the ordinary toothbrush it is especially adapted by reason of the annular arrangement of the bristles to be manipulated with a circular motion which latter movement is found in practice to be most effective in teeth cleaning operations.

In Figs. 7 to 12 inclusive are shown various modified forms of the detachable connection between the brush head B and handle A. In the construction shown in Fig. 7, the brush head B is formed with a tapered threaded stem 26 which is screwed into engagement with an internally threaded socket 27 formed in the brush handle.

In the construction shown in Fig. 8 the brush handle is formed with an opening 28 extending therethrough and the brush head is formed with a threaded stem 29 which is insertable in the opening 28 and is engaged by a nut 30 whereby the brush head may be demountably clamped on the handle.

In the construction shown in Fig. 9, the brush head is formed with a stem 31 having a peripheral groove 32 and the brush handle is formed with a socket 33 and carries a spring-pressed ball detent 34 arranged to effect engagement with the groove 32 when the stem 31 is placed in the socket 33 to demountably retain the brush head in place.

In the construction shown in Fig. 10 the brush handle is formed with a socket 35, the side wall of which is formed adjacent the bottom of the socket with an annular groove 36 from which open ended channels 37 and the brush head is formed with a stem 38 having laterally projecting studs 39 adapted to be positioned in the annular channel 36. A spring 40 is arranged in the socket 35 to bear against the end of the stem 38 to clamp the studs 39 against a side wall of the channel 36 when the studs are disposed out of alignment with the grooves 37.

In the construction shown in Fig. 11, the brush handle is formed with a socket 41 having a channel 42 in its side wall in which is arranged a spring pawl 43 and the brush head is formed with a stem 44 having one or more serrations 45 adapted to be engaged by the pawl 43 when the stem 44 is disposed in the socket 41.

In the construction shown in Fig. 12 the handle is formed with an opening 46 which projects therethrough and the brush head is provided with a stem 47 having a side groove 48 adjacent its outer end and mounted on the back of the brush handle is a slide plate 49, the outer end of which is adapted to

engage the groove 48 to retain the brush head in place.

I claim:

1. A toothbrush comprising a handle
5 formed with a tapered socket at one end thereof, a brush head including bristles disposed to impart to the brush end an annular formation, and a tapered stem on said brush head having a reduced outer end portion for
10 insertion longitudinally into said socket; said stem and socket being formed to coact and effect wedge engagement between the stem and brush handle.

2. A toothbrush comprising a handle
15 formed with a tapered socket at one end thereof, a brush head including bristles disposed to impart to the brush end an annular formation, a tapered stem on said brush head for insertion into said socket, said stem and
20 socket being formed to coact and effect wedge engagement between the stem and brush handle, and coacting means on said stem and handle for holding said brush head against free-turning movement relatively to the han-
25 dle.

3. A toothbrush comprising a handle formed with a socket at one end thereof having its side walls inwardly converging, a brush head including bristles disposed with
30 their ends arranged in substantially circular formation, a tapered stem on said brush head for insertion in said socket, said stem and socket being formed to cooperate and effect wedge-engagement between the brush head
35 and handle, said socket being formed in its side wall with a spirally extending groove of high pitch, and a key formed on said stem engageable with said groove for holding the brush head against free-turning movement
40 relatively to the handle.

4. A toothbrush, comprising a brush head including a tapered external annular wall formed with a reduced stem at its small end portion, bristles carried interiorly of said
45 wall arranged to form an annular brush, and a handle formed with a socket into which said stem projects, said socket being enlarged at its outer end to form a recess in which the small end portion of said wall seats.

5. A toothbrush, comprising a brush head including a tapered external annular wall, bristles carried interiorly of said wall arranged to form an annular brush, a reduced tubular stem formed on the smaller end por-
55 tion of said wall, said stem being slightly convergent from its intersection with said wall to its outer end, a handle formed with a socket into which said stem projects in wedge engagement therewith, said socket being en-
60 larged at its outer end to form a recess in which the smaller end portion of said wall seats.

6. A toothbrush, comprising bristles bent intermediate their ends and arranged to pro-
65 vide a bristle body in the form of a hollow

truncated cone with the intermediate portions of the bristles extending across the reduced end of the bristle body and with the ends of the bristles terminating at the base of the cone to form an annular brush, a tapered annular
70 wall encircling the reduced end portion of the cone, a stem carried by and protruding axially from said annular wall, a tapered annular wall arranged within the conical body, and means connecting said last named wall to
75 said stem through the reduced end portion of the conical body of bristles to clamp the intermediate portions of the bristles between said walls.

7. A toothbrush, comprising a series of
80 bristles bent intermediate their ends and arranged in a body with their end portions disposed to form an annular brush, a tapered annular wall encircling the intermediate portions of said bristles having an inturned
85 shoulder on its small end, a tubular stem protruding axially of said wall and connected thereto through said shoulder, a split sleeve affixed interiorly of said stem, a second tapered annular wall arranged within the body
90 of bristles, an inturned flange on the small end of said wall, and a pin secured in said sleeve and engaging said flange to clamp the intermediate portions of said bristles be-
95 tween said walls.

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