

A. VANDERVELD.
BRUSH MAKING MACHINE.
APPLICATION FILED APR. 25, 1904.

3 SHEETS—SHEET 1.

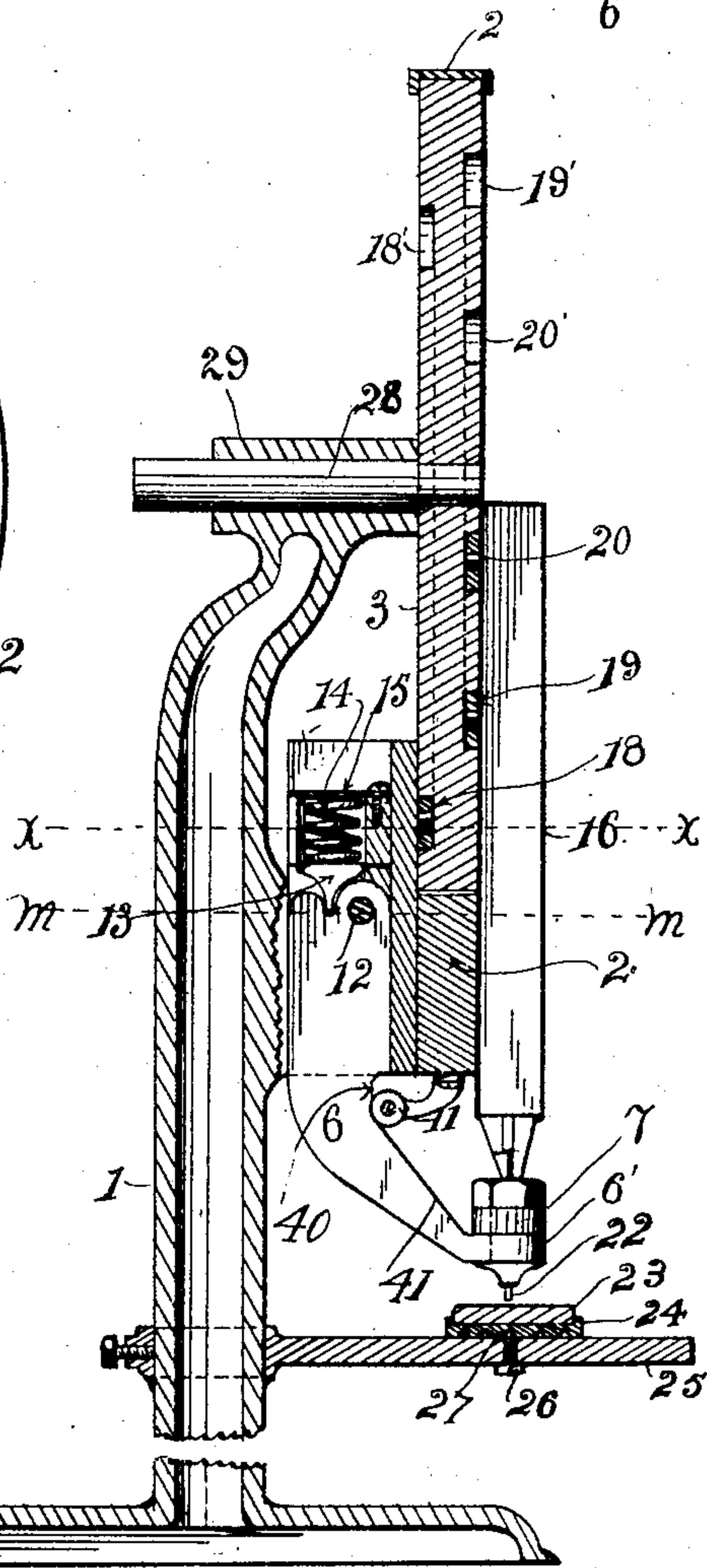
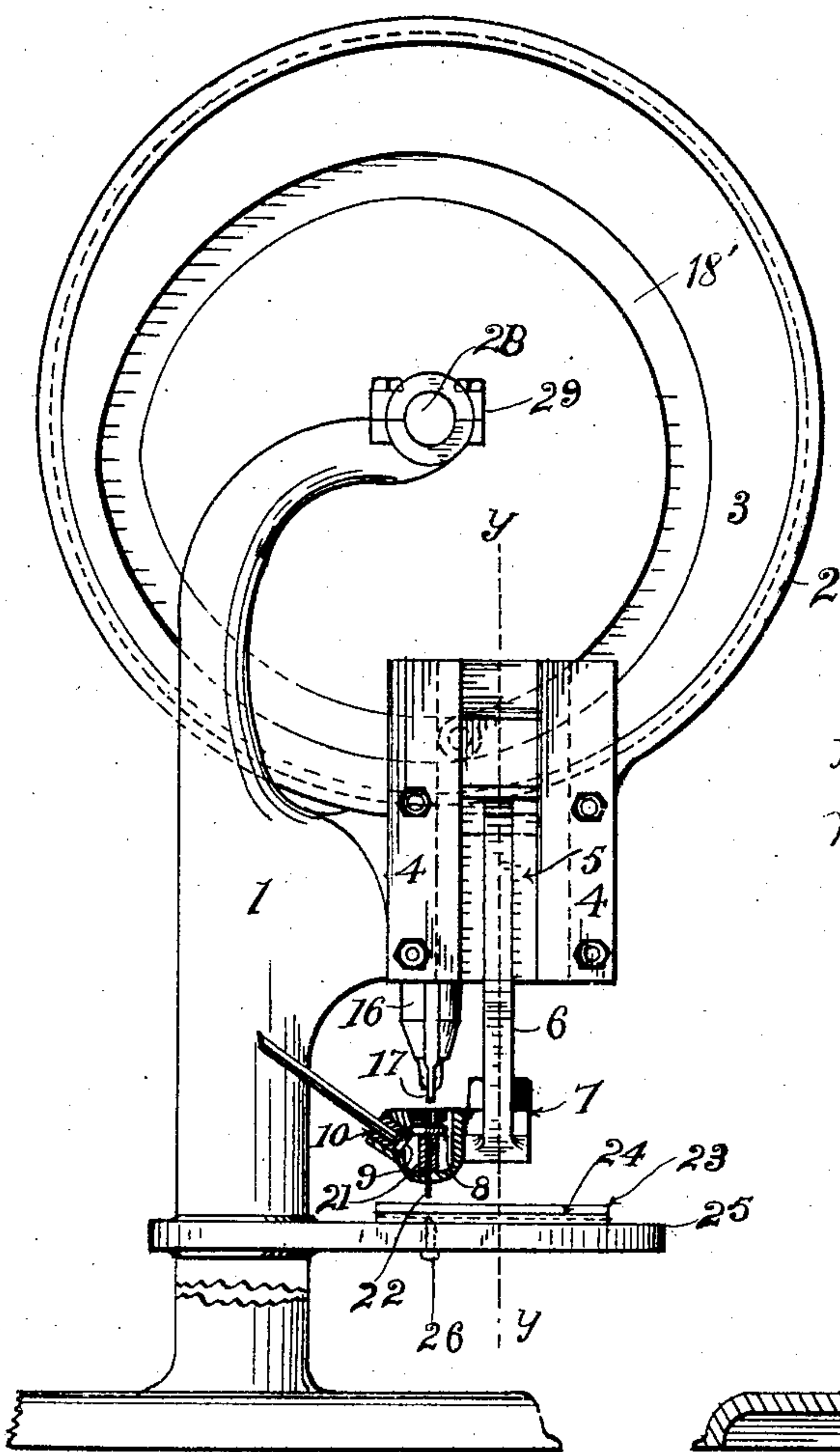
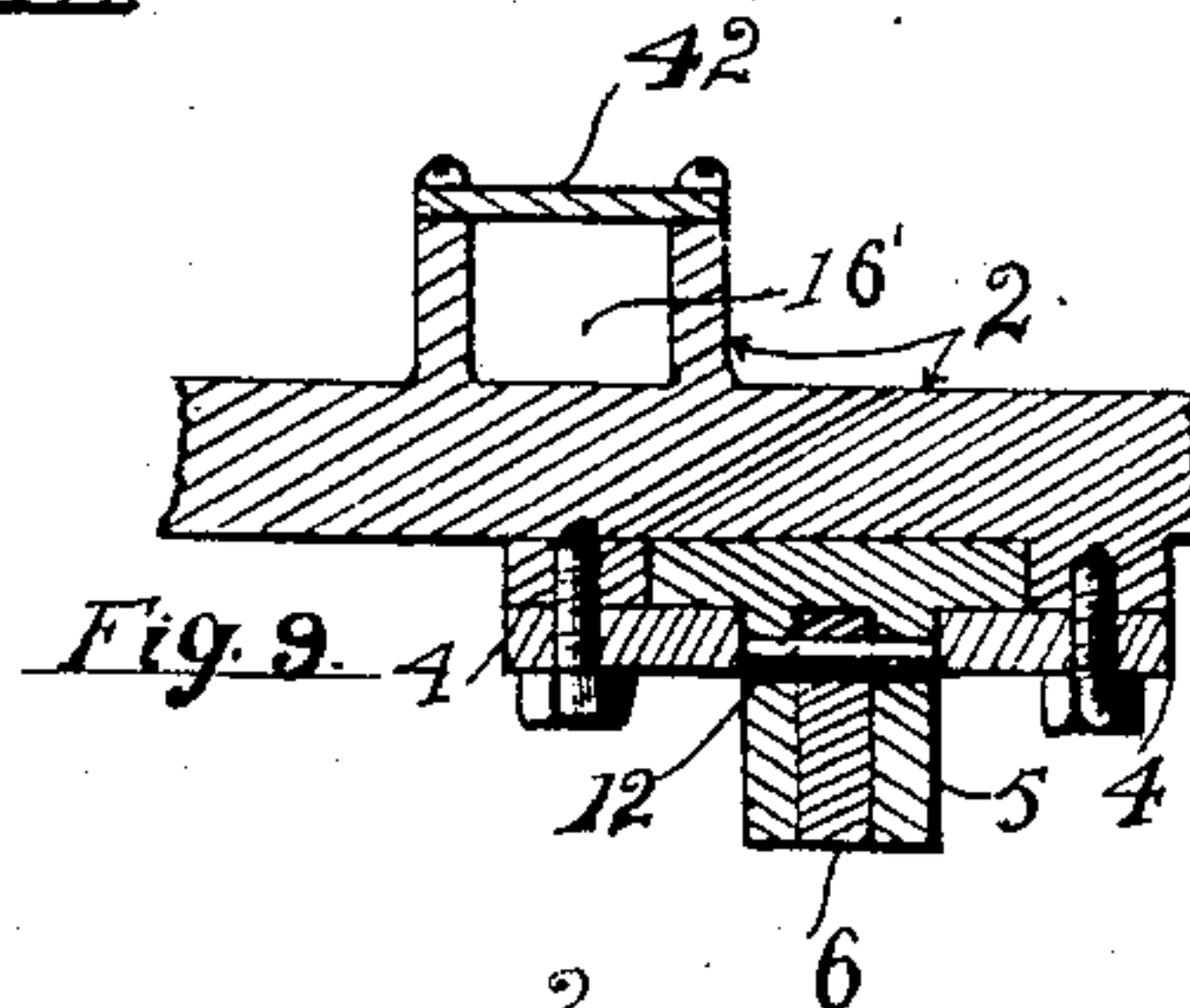
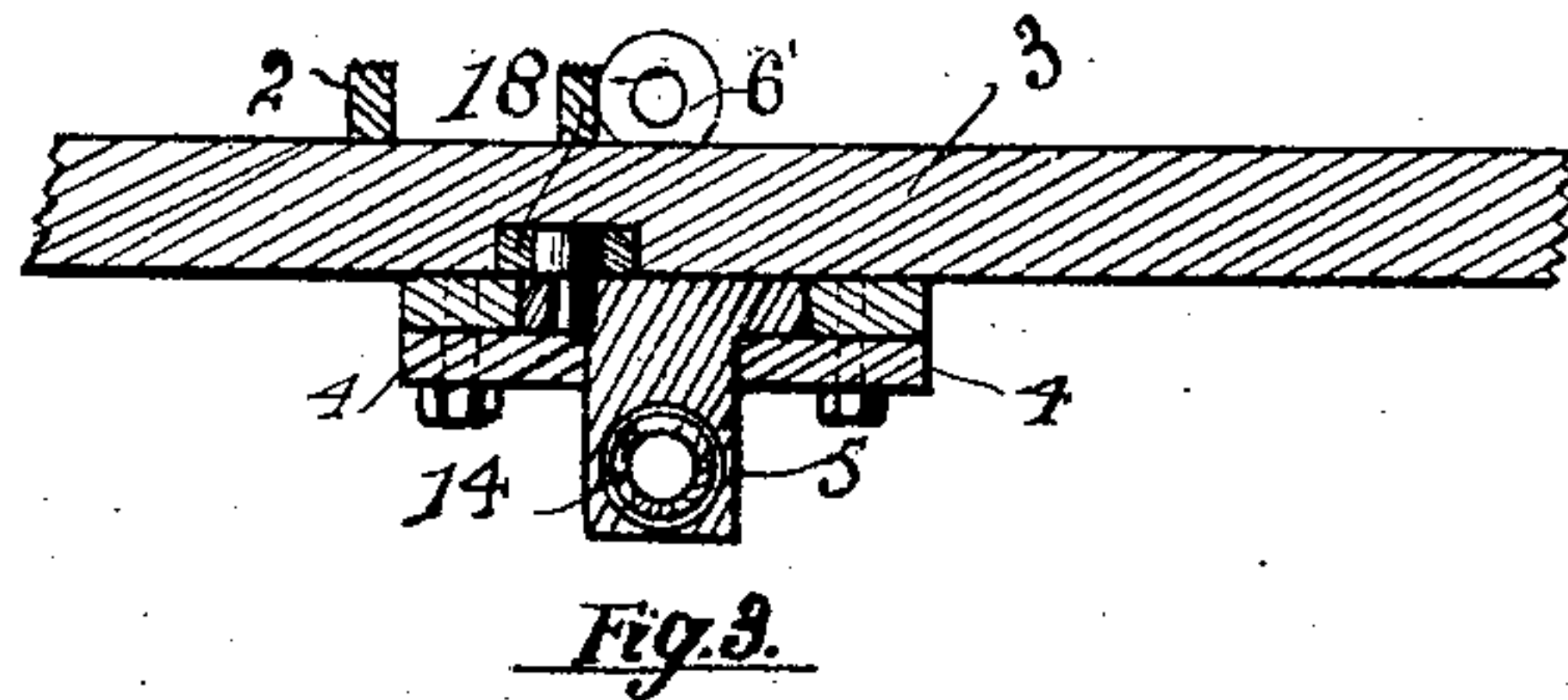


Fig. 1.

Fig. 2.

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No. 786,537.

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3 SHEETS—SHEET 2.

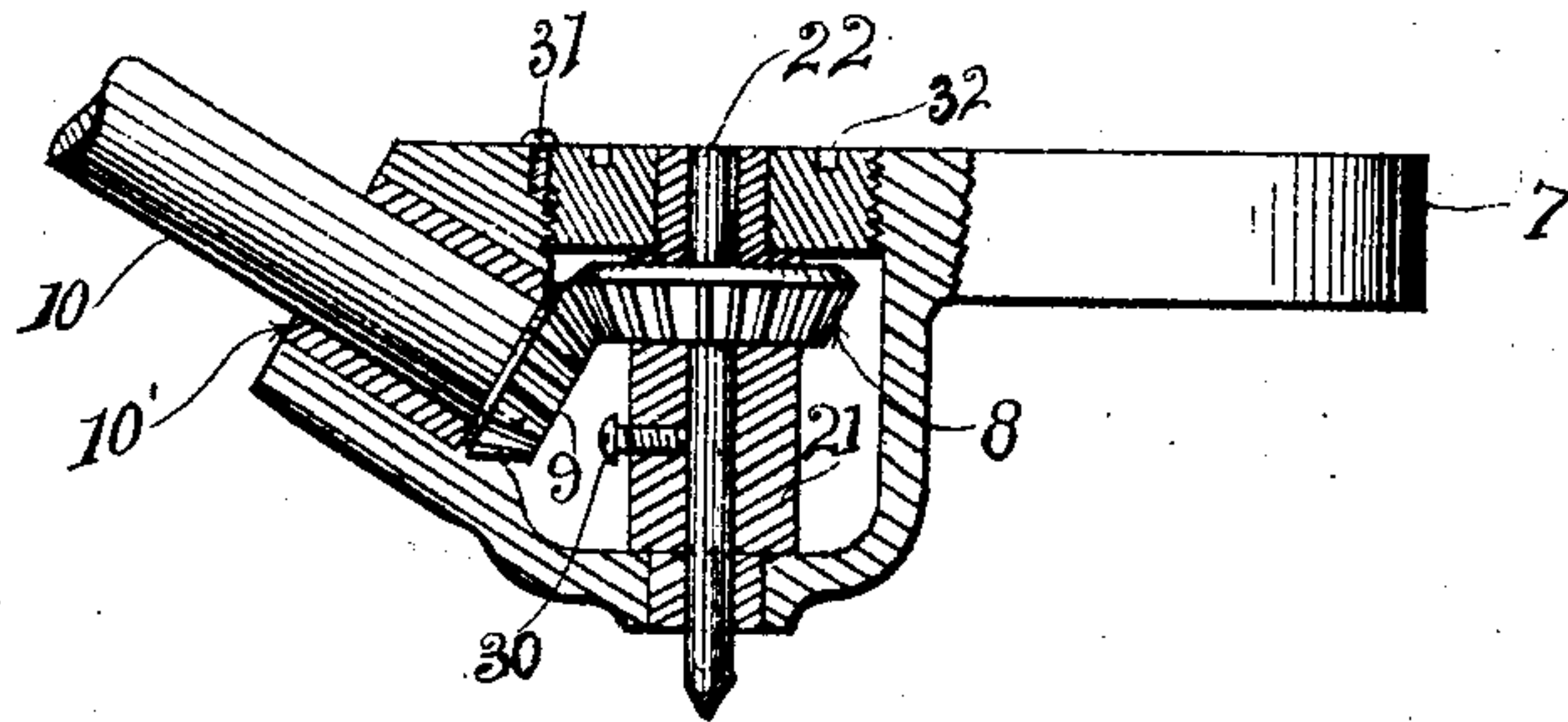


Fig. 4.

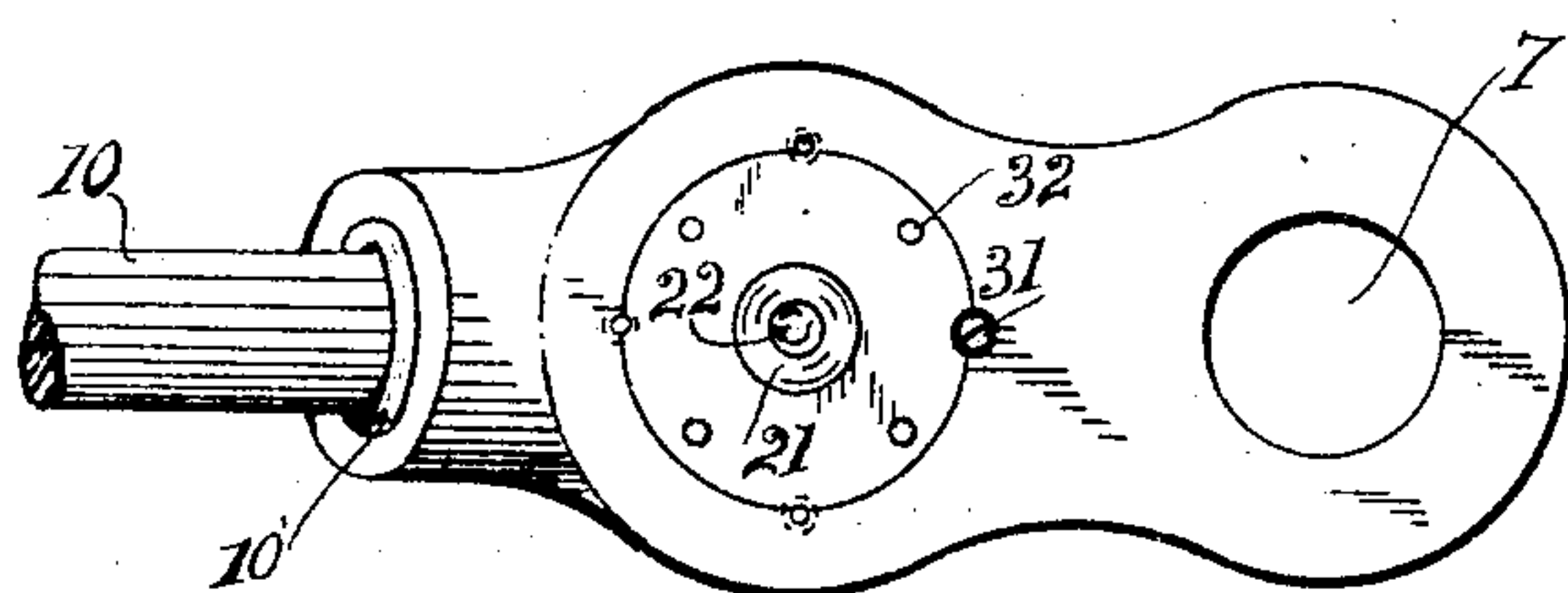


Fig. 5.

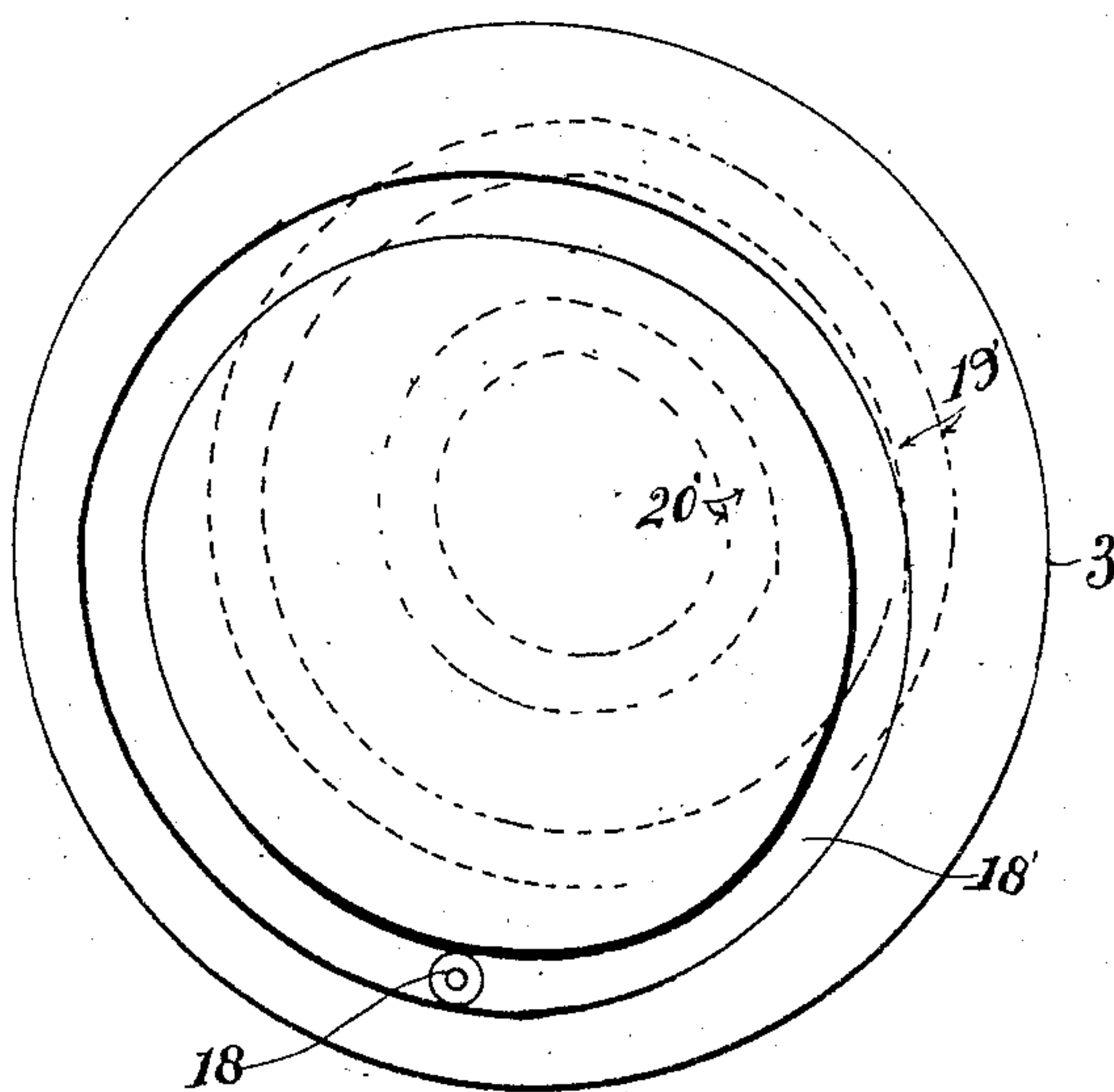


Fig. 8.

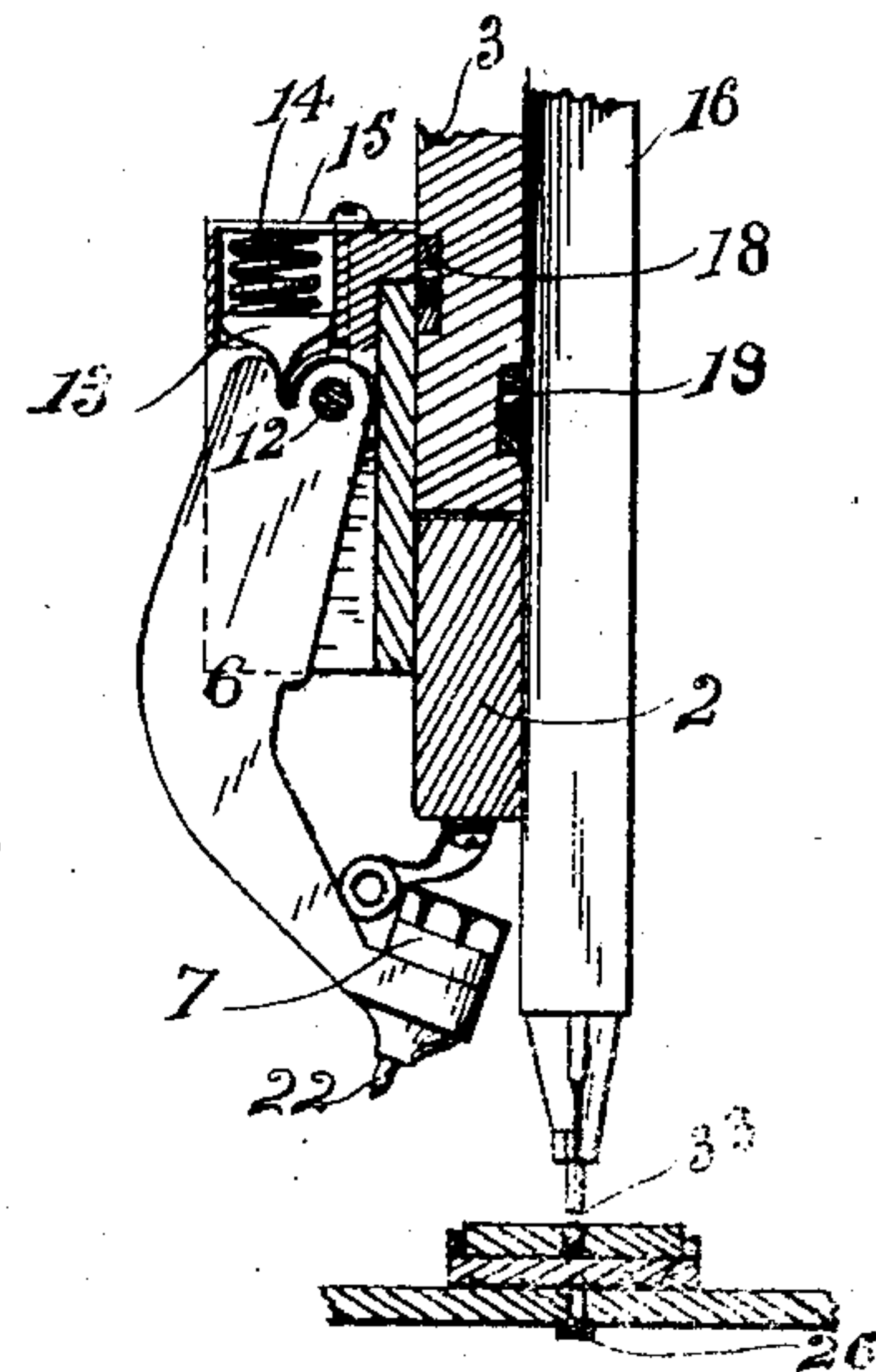


Fig. 6.

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3 SHEETS—SHEET 3.

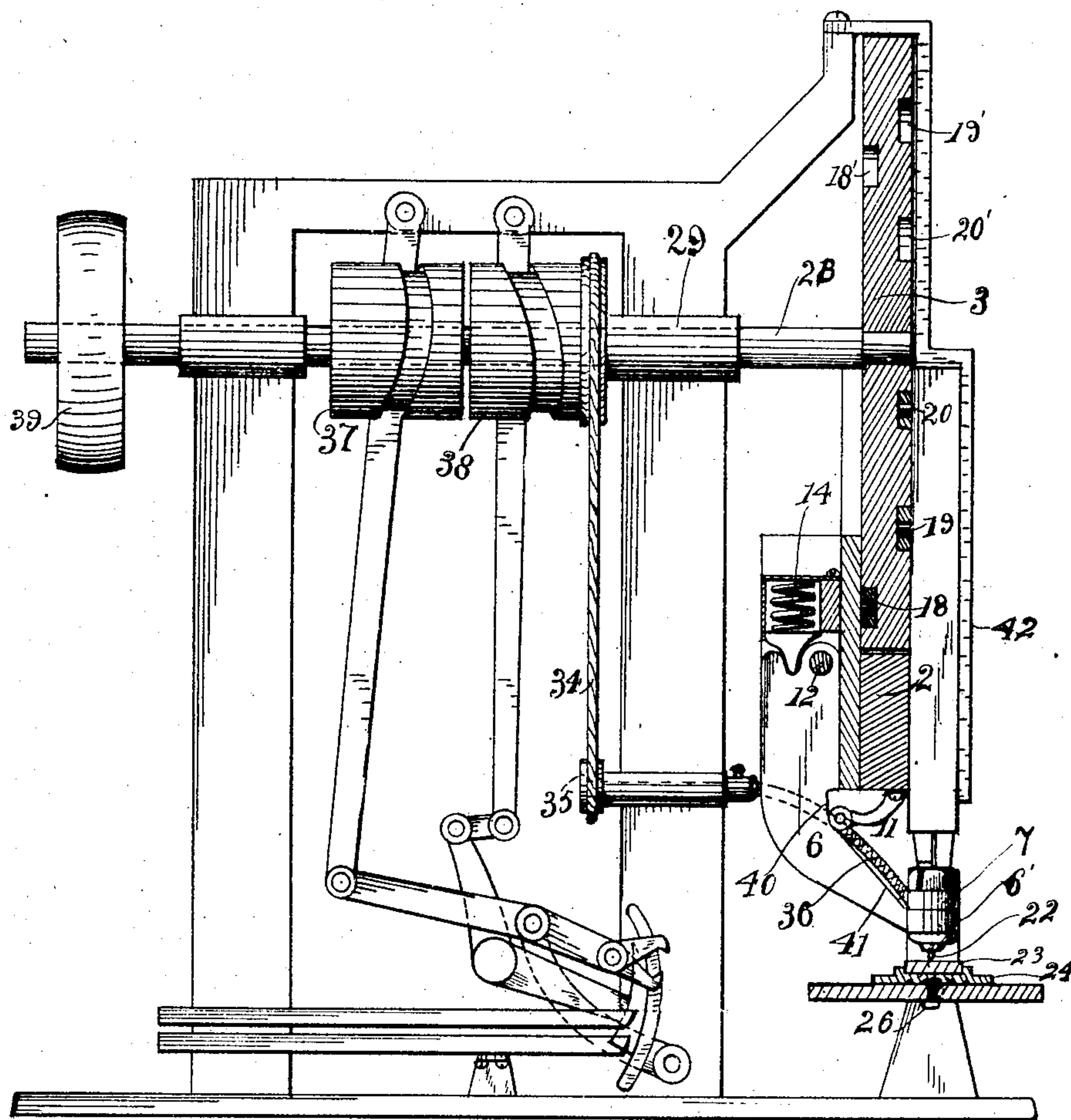


Fig. 7.

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UNITED STATES PATENT OFFICE.

ANTHONY VANDERVELD, OF GRAND RAPIDS, MICHIGAN.

BRUSH-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 786,537, dated April 4, 1905.

Application filed April 25, 1904. Serial No. 204,882.

To all whom it may concern:

Be it known that I, ANTHONY VANDERVELD, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Brush-Making Machines, of which the following is a specification.

This invention relates to a new and useful machine for making brushes; and the invention consists in combining in a brush-making machine a boring mechanism and a bristle-setting mechanism in such a manner that the boring mechanism makes a hole in the brush-back and is then removed and the bristle-setting mechanism brought into position to set a tuft of bristles in the hole made before the back is moved for another operation.

The objects of the invention are, first, to produce a machine which will work with great accuracy in setting the bristles into the brush-back; second, to facilitate the operation of making brushes; third, to cheapen the construction of machinery for completing the brush, including the boring of the back and setting of the bristles; fourth, other objects hereinafter described and claimed. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of the main parts of the machine which operate the boring-drill and the bristle-setting mechanism, the boring-drill and operating parts being shown in cross-section. Fig. 2 is a sectional view on the line *yy* of Fig. 1. Fig. 3 is a sectional view on the line *xx* of Fig. 2. Fig. 4 is a vertical sectional view of the part which operates the drill, the same being shown on an enlarged scale. Fig. 5 is a plan view of the parts shown in Fig. 4. Fig. 6 is a side elevation of the drill-arm and the bristle-setting slide with connecting parts in section. Fig. 7 is an elevation, partially in section, showing one form of feeding the bristles to the bristle-setting mechanism. Fig. 8 shows the cam-wheel detached, the solid lines showing the groove for operating the drill-arm and the dotted lines showing the grooves for operating the bristle-setting mechanism. Fig. 9 is a cross-section on the line *mm* of Fig. 2.

Similar numerals refer to similar parts throughout the several views.

1 shows the main frame of the machine, which is preferably constructed of metal and is of suitable shape for supporting the operative parts of the device.

2 is a stationary bearing-frame, preferably secured to the frame 1, and is adapted to support the sliding block 5 and the sliding block 16.

3 is a cam-wheel supported on a suitable shaft and provided with cam-grooves 18', 19', and 20'.

4 4 are projections which form the ways in which the sliding block 5 is adapted to move. These projections are shown in Figs. 1, 2, and 3.

5 is the sliding block which carries the drill-arm 6. The sliding block 5 is preferably provided with a roller 18, which engages with and travels in the cam-groove 18', whereby it receives its reciprocating motion hereinafter described.

6 is the drill-arm, which carries the drill and its operative machinery and is pivoted to the sliding block 5 by the pivot 12.

6' is the head of the drill-arm 6, constructed substantially as shown in Fig. 7 and other figures.

7 is a gear-case which supports the small gearing used in giving the revolving motion to the drill.

8 is a gear-wheel upon the drill-spindle 21, which gear-wheel 8 engages with a gear-wheel 9, which gear-wheel 9 is made rigid with the shaft 10 (see Fig. 4) and which operates the gear-wheel 8 and the drill-spindle and drill.

10 is the driving-shaft, connected with the gear-wheel 8, and 10' is a bushing for the shaft 10.

11 is a roller supported on a suitable arm connected to the stationary bearing 2, which roller travels on the perpendicular face and inclined face of the drill-arm 6, as hereinafter described.

The drill-arm 6 is secured to the slide 5 by means of the pivot or pin 12, on which the said arm 6 turns or swings when the machine is in operation. I prefer also to use a bearing-block 13, held in contact with the drill-

arm 6 by means of a spring 14, which spring 14 is compressed between the said block 13 and the bearing 15, as more fully shown in Fig. 6.

5 16 is a slide which carries the bristle-setting mechanism. This bristle-setting mechanism preferably consists of jaws and a punch of any ordinary construction, which are adapted to receive the bristles and to force the same into
10 the openings made in the brush-back by the drill.

16' is the way or guide for the slide 16.

The slide 5 is provided with a roller 18, which engages with the cam-groove 18' on the rear
15 of the cam-wheel 3, thereby giving a reciprocating motion to the slide 5 and imparting a reciprocating and swinging motion to the drill-arm 6. The slide 16 is also provided with a roller or other suitable means, (shown by 19,) which travels in the cam-groove 19', thereby
20 operating or giving motion to the slide 16. 19' is the cam-groove on the wheel 3 for operating the said slide 16.

20 is a roller, which enters the cam-groove
25 20' and operates the punch in the slide 16, driving the staples and bristles when the jaws are brought into position to deliver the bristles into the opening bored by the drill. This punch is of any suitable form and does not
30 need any further description.

20' is a groove in the cam-wheel 3 for the roller 20.

21 is a drill-spindle, (shown more fully in Fig. 4,) which drill-spindle operates the drill
35 22 in boring the hole into the brush-back.

The brush-back is shown by 23, secured to a templet 24 and supported upon a suitable table or other support. Projecting through the table is a pin or screw, (shown by 26,) which
40 is adapted to engage with depressions in the templet, the depressions in the templet being directly under the point to be drilled by the boring-drill. The table or support is shown in Figs. 1 and 2 by 25, and the openings or
45 depressions in the templet are shown by 27 in Fig. 2. The support 25 may be constructed in any suitable manner and adapted to receive and support templets of different sizes and forms, so as to adapt the machine for boring
50 brush-backs of different sizes and shapes.

The cam-wheel 3 is mounted on a suitable shaft (shown by 28) and revolves therewith, said shaft revolving in a suitable journal-box 29.

55 30 is a set-screw for adjusting and retaining in position the drill 22 and its spindle 21.

31 is a screw for holding the upper bearing of the spindle 21, the same being shown more plainly in Fig. 4.

60 33 is the punch for the brush-setting machine.

34 is a belt for driving the pulley 35, which pulley 35 operates the shaft connected to the short shaft 10, and thereby operates the boring-drill.

36 is a flexible portion of the shaft for the drill.

37 and 38 are cams for operating the brush separating and carrying devices, the same being of any ordinary construction and which
70 need no other description, as they form no part of the invention.

39 is a driving-pulley on the shaft 28.

40 is a straight or perpendicular surface of the drill-arm 6, and 41 is the inclined surface
75 of the said drill-arm, and as the drill-arm is given its vertical motion by means of its connected slide the pulley or antifriction-wheel 11 passes along the surface of the straight or perpendicular face 40 and the inclined face 41.
80

The slide 16 is inclosed by a cap (shown by 42 in Figs. 7 and 9.)

The operation of my invention is as follows: Starting with the drill in the position shown in Fig. 2, the roller 11 resting against the
85 lower part of the incline 40, the cam-wheel 3 is moved so as to depress slightly the arm 6 and the drill carried thereby. The drill being revolved by means of the mechanism already described bores the hole in the brush-back the depth indicated by the length of the straight part or face of the drill-arm 6. The continuous revolution of the wheel in the same direction first lifts the drill-arm 6 perpendicularly, together with the drill, until the drill
95 is free from the brush-back. The roller 11 then comes in contact with the incline surface 41 of the drill-arm, and the roller traveling upon the said surface 41 carries the drill-arm, together with the drill, backward to the position shown in Fig. 6. When the drill and drill-arm are carried backward into this position, the operation of the cam-wheel 3 is to depress the slide 16, which has already been supplied with a tuft of bristles, and to drive
105 the same down into the hole made by the drill, thereby setting one tuft of bristles in the hole already drilled, as above described. The further operation of the cam-wheel then lifts the jaws and punch from the brush-back a sufficient distance to allow the drill to be swung into the position beneath the bristle-setting mechanism to bore another hole. In the meantime the templet, with a brush-back thereon, is moved so that the pin or screw 26
115 engages with another depression on the under side of the templet, and thus by the operation of the cam-wheel the drill and the tuft-setting mechanism are brought in contact one at a time with the brush-back, so that the
120 drill first bores the hole and before the brush-back is moved the brush-setting mechanism descends and sets a tuft of bristles in the hole, the hole being gaged so accurately that the bristle-setting mechanism registers exactly
125 with the hole bored by the boring-drill, and when the brush-back is bored it is set with bristles, so that the boring operation and the bristle-setting operation are carried on consecutively.

This machine may be used for setting bristles in all kinds of brush-backs where the hole is bored by a boring-bit, but is peculiarly applicable to small brushes, where great accuracy is required. The machine also presents the advantage of a complete machine which bores and sets the bristles by the continuous operation of the machine, and by changing the templet all forms of brushes can be made without changing the boring mechanism further than changing the form or size of the drill.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent of the United States, is—

1. In a brush-making machine, the combination of a boring-drill, means for holding and setting bristles in tufts, mechanism for presenting the drill and boring a hole in a brush-back and automatically removing the said drill as soon as the hole is bored, and mechanism for advancing the bristle-setting device to the position previously occupied by the drill and setting the tufts of bristles in the hole bored by the drill.

2. In a brush-making machine, the combination of a boring-drill supported on a swinging arm having both a reciprocating and swinging movement mechanism for presenting the drill to a brush-back to bore a hole in the latter and for lifting the drill from the hole and positively engaging the swinging arm to move the drill away from the hole, a bristle-setting device having a reciprocating motion, and mechanism for advancing the bristle-setting device to the position previously occupied by the drill and setting a tuft of bristles in the hole made by the drill.

3. The combination of a boring-drill, a swinging arm supporting the said drill, a reciprocating sliding block to which said drill-arm is pivoted, a cam, giving a reciprocating motion to the said slide and arm, mechanism for swinging the drill into position to bore a hole in the brush-back and for swinging the said drill away therefrom when the hole is completed, a bristle-setting device having a reciprocating motion and mechanism for moving the said device into position to set a tuft of bristles in the brush-back as soon as the hole has been completed by the drill.

4. In a brush-making machine, the combi-

nation of a reciprocating swinging drill having rotating mechanism directly engaging the same, a bristle holding and setting device, an adjustable support for a brush-back, mechanism for swinging the drill over the brush-back and boring a hole therein and for moving the drill away from the back after the hole is completed, and mechanism for operating the bristle holding and setting device to bring the latter into the position previously occupied by the drill with respect to the back, said drill and bristle-setting devices operating over the same side of the brush-back.

5. The combination of a boring-drill, a swinging arm supporting the said drill, a reciprocating block to which the said arm is pivoted, a cam giving the reciprocating motion to the sliding block, means for swinging the drill into position to drill the hole into the brush-back and for removing the same therefrom as soon as the hole has been bored, a bristle-setting device and means for moving the said bristle-setting device and setting a tuft of bristles in each hole bored by the drill as soon as said drill has been removed, substantially as described.

6. The combination of a boring-drill and a bristle-setting device, suitable means for giving a rotary motion to the said drill, a swinging arm supporting the said drill, a slide to which the said swinging arm is pivoted, a cam for giving a reciprocating motion to the slide and arm, an incline upon the said swinging arm bearing upon a roller, means for holding the said swinging arm in contact with the said roller, whereby the drill is swung to and from the brush-back to be bored, a bristle-setting device having a reciprocating motion, a cam for giving a reciprocating motion to the bristle-setting device, adjusted so as to set the tuft of bristles in the hole bored by the drill as soon as the said drill is removed therefrom, whereby the said block is bored and set with bristles alternately, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ANTHONY VANDERVELD.

Witnesses:

EDWARD TAGGART,
MARY S. TOOKER.