

No. 685,807.

Patented Nov. 5, 1901.

F. N. & W. C. WEIS.
BRUSH MACHINE.

(Application filed July 3, 1901.)

(No Model.)

2 Sheets—Sheet 1.

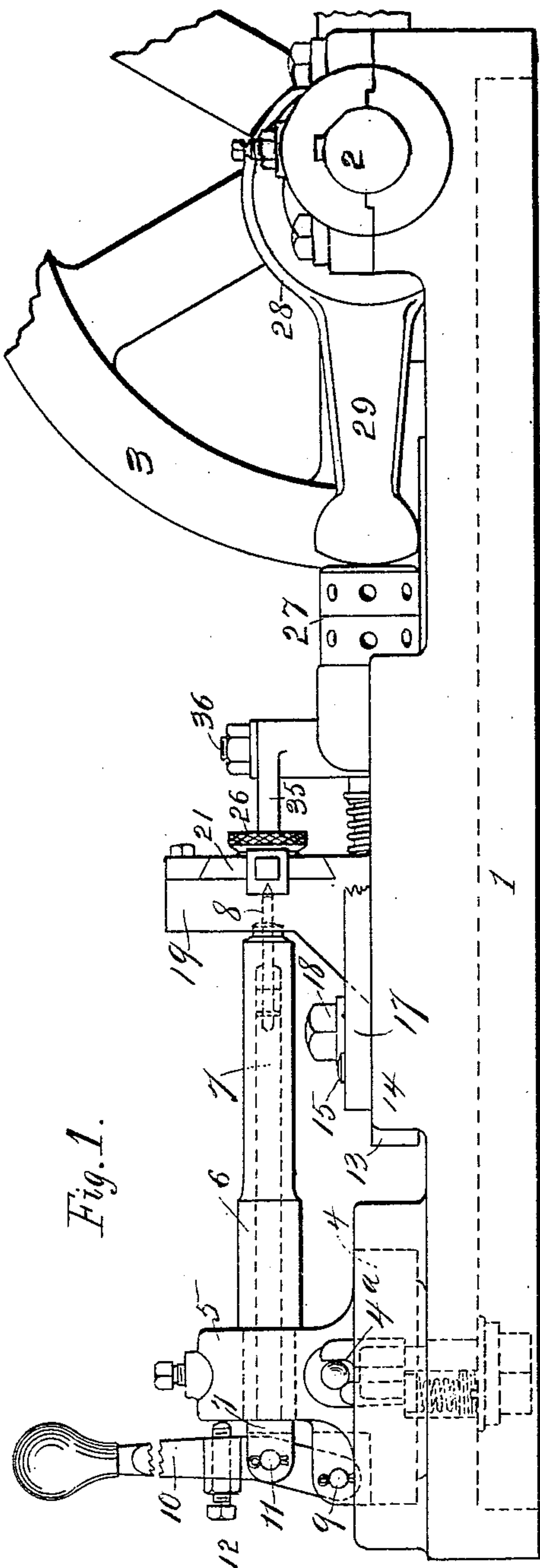


Fig. 1.

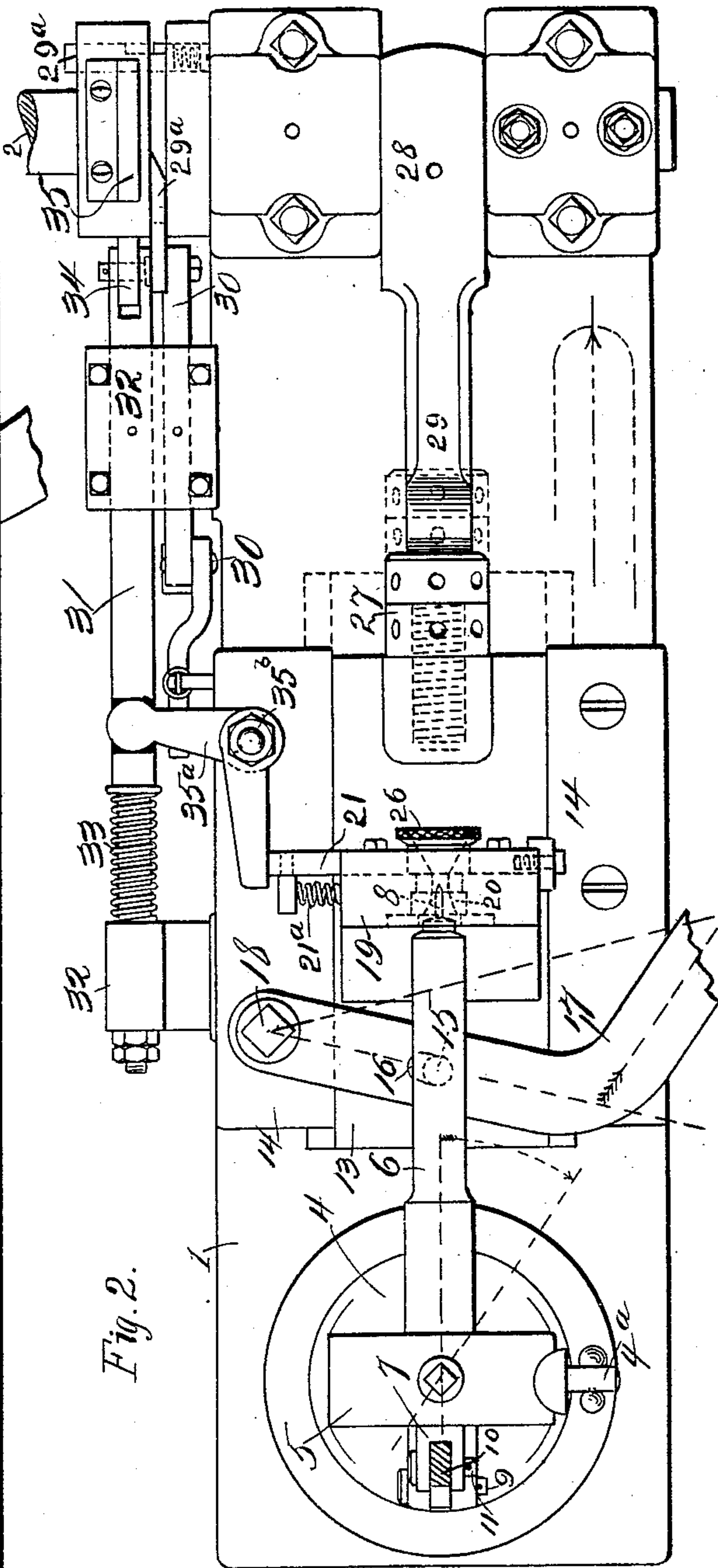


Fig. 2.

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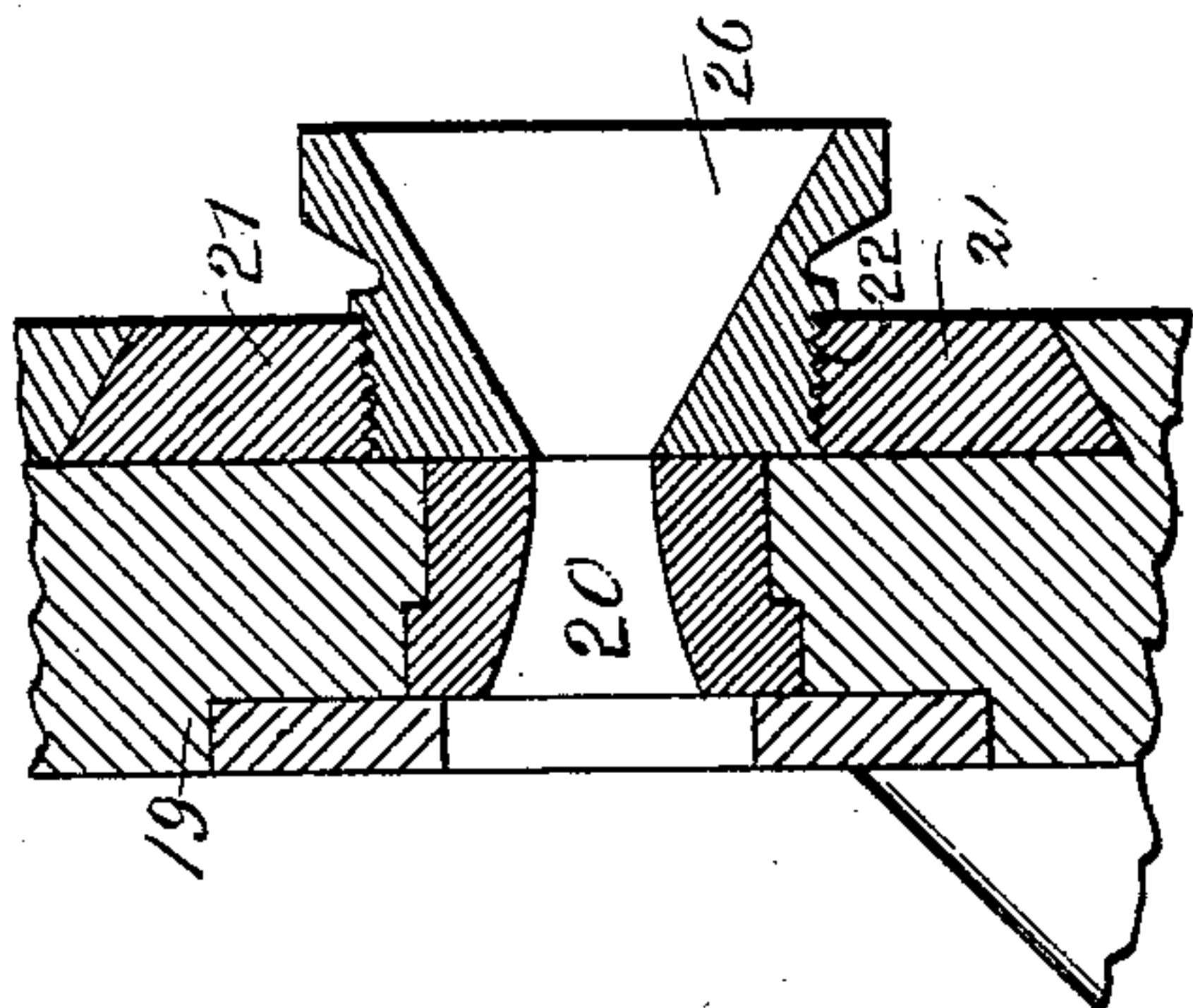


Fig. 3.

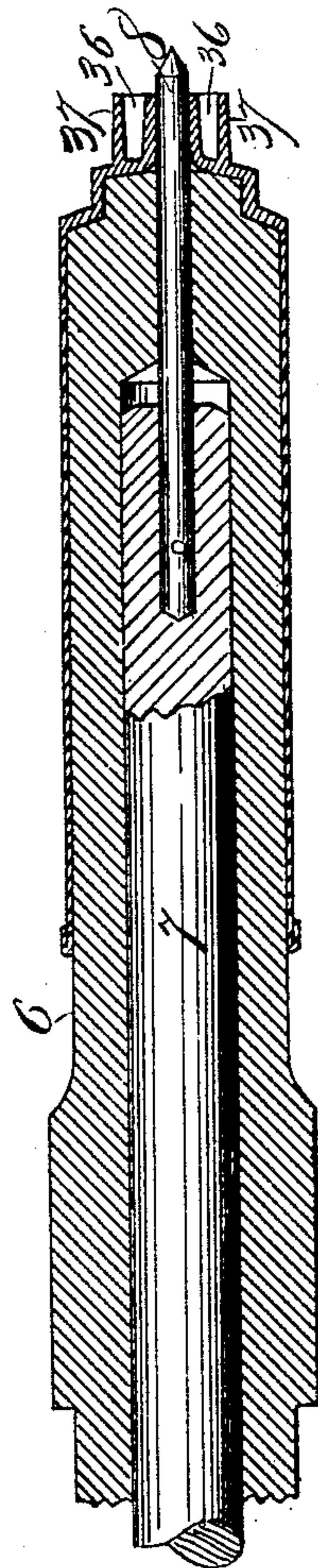


Fig. 4.

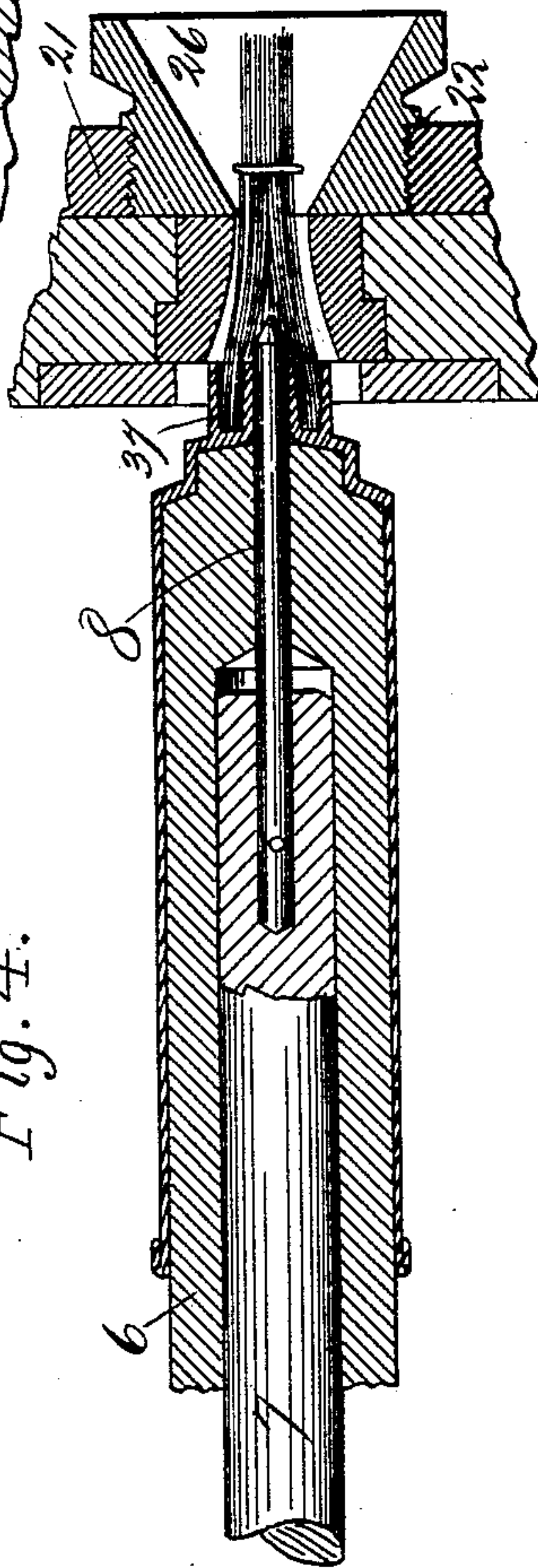


Fig. 5.

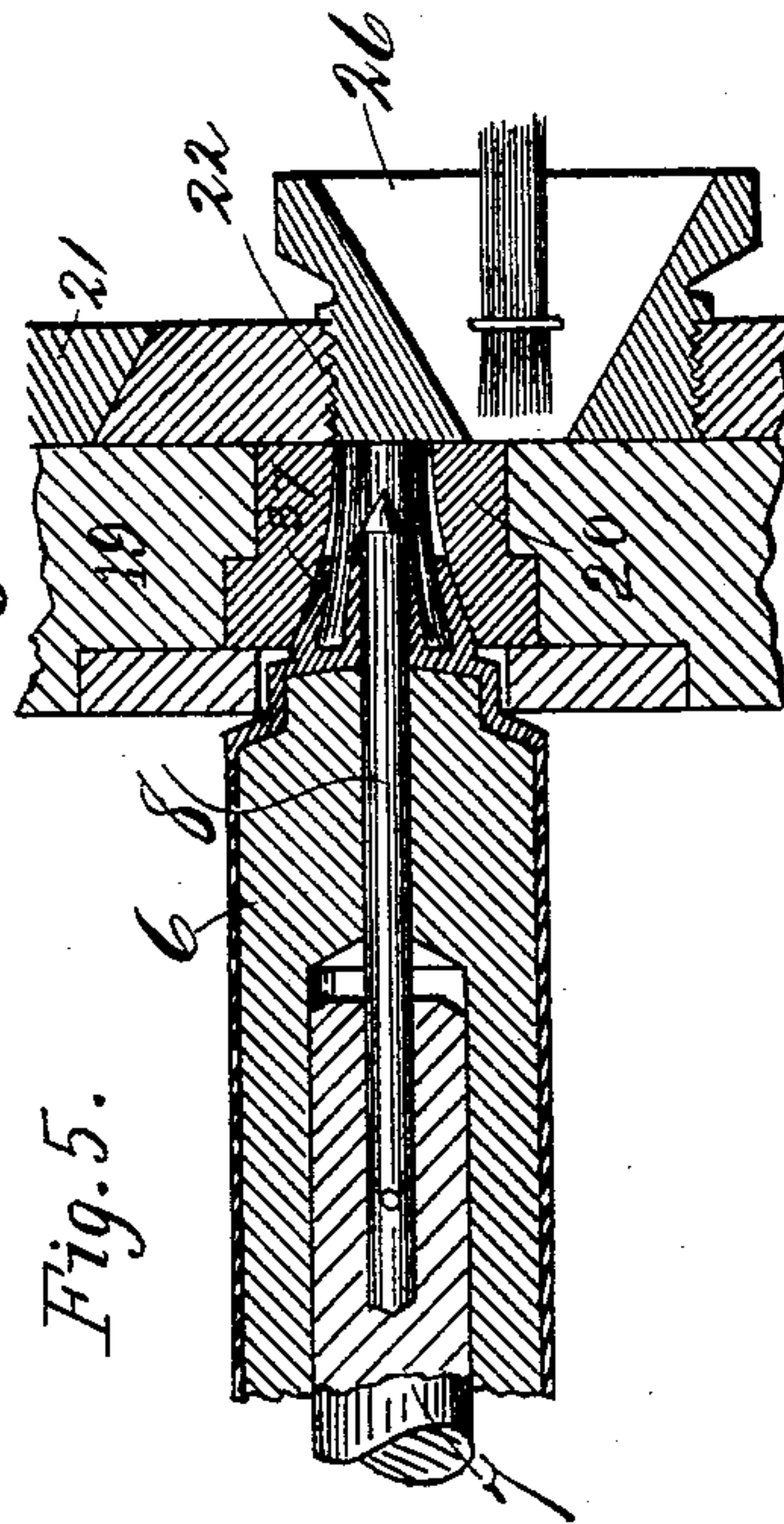


Fig. 6.

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UNITED STATES PATENT OFFICE.

FRANK N. WEIS AND WILLIAM C. WEIS, OF TOLEDO, OHIO, ASSIGNORS TO
THE WEIS BINDER COMPANY, OF TOLEDO, OHIO.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 685,807, dated November 5, 1901.

Application filed July 3, 1901. Serial No. 66,963. (No model.)

To all whom it may concern:

Be it known that we, FRANK N. WEIS and WILLIAM C. WEIS, citizens of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Brush-Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to and its object is to provide a machine for making brushes for the ends of flexible tubes designed to hold paste and other liquid and semiliquid substances. In these brushes the contents of the tube are expelled through an opening leading into and through the bristles of the brush by compressing the tube, which is usually made of sheet-lead.

Our machine is especially well adapted for making the brushes of the combined cement-tube and distributing-brush described in the patent to Andrew L. Weis, granted April 12, 1898, No. 602,204. In the device of that patent there is a central orifice in the end of the tube, which orifice is surrounded by two concentric outwardly-projecting flanges or walls. The annular channel between these flanges or walls receives the ends of the bristles forming the brush, and the bristles are secured in place by stamping the outer flange or wall inwardly, thus clamping the bristles tightly between the two flanges or walls. Our machine is designed to facilitate these operations; and it consists of the devices and arrangement of parts hereinafter described, and shown and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of our machine; Fig. 2, a top plan view of the same; Fig. 3, a central longitudinal sectional elevation of the mandrel and centering-pin hereinafter referred to, together with a central longitudinal sectional elevation of the die and knife or shear hereinafter referred to; Fig. 4, the same with the parts brought together and the bristles of the brush in place; Fig. 5, the

same, showing the parts in the position which they assume at the moment the bristles are secured in place and are cut; and Fig. 6 is a perspective view of the complete brush with its cap in section.

Like numerals of reference indicate like parts throughout the drawings.

In the drawings, 1 is a base or frame, at one end of which is mounted and journaled a shaft 2, upon which is mounted loosely a band-wheel 3. At the opposite end of the base or frame is a horizontally-revoluble turn-table 4, which carries a block 5, from which projects horizontally a mandrel or blank-holder 6. This holder is of exactly the size and shape to receive the blank tube which is to be provided with bristles and which is to form the holder for the paste or other substance. The mandrel 6 has an axial bore throughout its length. In this bore is a rod or plunger 7, which carries at its extremity a pointed pin 8. This pin by the longitudinal movement of the rod or plunger 7 is projected to and fro out of and into the mandrel. Fulcrumed upon the turn-table, as at 9, is a hand-lever 10, which is pivotally connected with the rod or plunger 7, as at 11. An adjustable stop 12 limits the throw of the lever inwardly. A detent 4^a limits the horizontal rotary movement of the turn-table 4 and the mandrel which it supports in one direction, while permitting their free movement in the opposite direction, as indicated by the dotted lines in Fig. 2.

13 is a sliding plate mounted in guides or ways 14, secured to the top of the base or frame. An upwardly-projecting pin 15, secured to the plate 13, projects into an elongated opening 16 in a hand-lever 17. This lever is fulcrumed upon the bench or frame, as at 18, and by its swing the plate 13 is caused to move to and fro in its guides 14. Secured to the sliding plate 13 is a head 19, in which is secured a die 20. The flaring opening through this die is in alignment with the pin 8 when the mandrel and its carriage are in engagement with the detent 4^a. In the face of the head 19 opposite the mandrel are guides or ways, in which is disposed a sliding plate 21. The plate 21 is tapped, as at 22, (see Figs. 3, 4, and 5,) and into this hole is secured a piece 26, having a funnel-

shaped opening therethrough which leads into the opening through the die 20. The back faces of the die 20 and the piece 26 are in close contact, and the latter piece slides upon the die as a shear-blade. The plate or bar 21 is by means of a spring 21^a held normally in such position that the axis of the opening through the piece 26 coincides with the axis of the die 20 and the centering-pin 8.

The plate 13 is provided at its end next the shaft 2 with an adjustable buffer 27. Upon the shaft 2 is a cam 28, having an extension or arm 29, the extremity of which is in line and adapted to contact with the buffer 27.

The driving-pulley runs loose upon the shaft 2. A clutch 29^a, which is fixed upon the shaft, engages the shaft with the hub of the driving-pulley and causes the shaft to rotate at the will of the operator. This clutch is governed by means of a foot-lever, (not shown,) which operates the clutch-rod 30, which throws the clutch into and out of engagement with the driving-pulley.

31 is a plunger which reciprocates in brackets 32 and is held normally in operative position by the thrust of an encircling coiled spring 33. This plunger 31 has journaled at its extremity next the shaft a roller 34. On the clutch-wheel is an eccentric 35, adapted and arranged to contact with the roller 34.

35^a is a bell-crank lever fulcrumed upon the bench of the machine, as at 35^b. One end of this lever is engaged by the plunger 31, the other arm of the lever pressing against the end of the plate 21.

The operation of our device is as follows: The mandrel is swung toward the observer, and a blank tube is slipped into place upon the mandrel, which is now turned back to place, so that the detent 4^a holds the turn-table and the mandrel with its blank in the position indicated in Figs. 1 and 2. The lever 10 is pressed inwardly, causing the rod 7 to project its pin 8 through the central opening in the end of the tube-blank. The lever 17 is now thrown to the left, causing the plate 13, with its attached parts, to move in its guides, so that the parts assume the relative positions illustrated in Fig. 4. A tuft of the required number of bristles having been prepared, the end of the tuft is pushed into the funnel-shaped mouth of the piece 26, and the bristles are guided and pressed against the end of the centering-pin 8, which spreads the tuft so that the ends of the bristles enter the annular groove 36, which surrounds the central orifice of the tube-blank. Now by a pressure of the foot-lever above referred to the clutch 29^a is thrown into engagement with the hub of the driving-pulley, and the shaft causes the arm 29 of the eccentric 28 to come in contact with the buffer 27, which crowds the plate 13 toward the mandrel 6. The flaring surface of the die 20 comes in contact with the margin of the outer wall 37 of the annular channel 36, which now contains the ends of the bristles, and the wall 37 being of soft metal

is upset and crimped inwardly, as shown in Fig. 5, in such fashion that the bristles are now securely clamped and secured between the inner and the outer walls of the annular chamber. In this operation the inner wall of the channel 36 is prevented from yielding to the pressure of the die by the centering-pin 8, which occupies the central orifice of the tube-blank. At the instant that the metal is stamped, as just described, the plunger 31 actuates the bell-crank lever 35^a, which moves the plate or cutter-bar 21 transversely in its guides. The sharp edges or angles of the funnel-shaped opening 26 and the die serve as a cutter or shears, and the tuft of bristles is sheared off smoothly, leaving the tuft in condition to be used in forming the next succeeding brush, until the bristles become too short for use. The foot of the operator is immediately removed from the foot-lever, the clutch and the shaft are immediately disengaged from the driving-pulley, the springs 21^a and 33 restore the cutter-bar and its actuating mechanism to their original position, the head 20 is thrown back by means of the lever 17, the mandrel is manually turned to point toward the operator, the pin 8 by means of the hand-lever 10 is withdrawn from the orifice of the blank, and the blank is slipped from the mandrel. The blank is now provided with a brush and is ready to be filled at its large end in the usual manner, while the machine is in position to receive another blank for the repetition of the operation here described.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a brush-machine, a mandrel or holder for a tube-blank, a pin disposed in the axial line of said mandrel, and means for reciprocating said pin longitudinally.

2. In a brush-machine, a die adapted to stamp into conical shape the outer wall of an annular groove on a tube-blank, and a pin adapted to enter the central orifice of such blank and to support the inner wall of such annular groove against the action of the die.

3. In a brush-machine, a blank-holder for a metal tube-blank, a pin adapted to enter the center orifice of the blank, a die adapted to stamp inwardly the outer wall of the annular channel of the blank, a bar or plate having therethrough an opening which coincides with the die and the blank-holder, and means for actuating said bar or plate.

4. In a brush-machine, a tube-blank holder, a pin movable axially of said holder and adapted to be projected out of and to be withdrawn into said holder, a die having an opening therethrough adapted to engage and stamp the extremity of a blank on said holder, a cutter-bar having an opening therethrough normally in alinement with the opening through the die and the blank-holder, and means for actuating said die and said cutter-bar.

5. In a brush-machine, a reciprocating plate or bar having a funnel-shaped opening there-through, a die having an opening there-through corresponding with said funnel-shaped opening, said die and said plate or bar being movably secured together and in contact with each other, and means for actuating said plate or bar, whereby the angles of said meeting surfaces and said openings
10 serve as shears or cutters.

6. In a brush-machine, a mandrel adapted to receive a tube-blank, a pin which projects axially in the direction of the length of said mandrel, a die adapted to stamp inwardly the
15 outer wall of an annular channel or groove upon the end of such tube-blank, an opening through said die in axial alinement with the mandrel, a shearing or cutting plate or bar having an opening therethrough correspond-
20 ing with the opening through the die, means for actuating said die toward and away from the mandrel, and means for actuating said shear or cutter.

7. In a brush-machine, means for support-
25 ing a tube-blank, a pin adapted to be entered and withdrawn from the central orifice of said blank, a die adapted to stamp the outer wall of an annular channel or groove in the end of said blank, a plate having therethrough
30 a funnel-shaped orifice adapted to guide the ends of a tuft of bristles into said channel or groove, and means for reciprocating said plate in contact with the die whereby said bristles are cut or sheared.

8. In a brush-machine, a holder for a tube-
35 blank, a die for stamping the end of said blank, means for supporting a central orifice in the end of such tube-blank against the action of the die, means for guiding a tuft of bristles
40 into an annular channel or groove in the end of such blank, and means for cutting or shearing said tuft of bristles.

9. In a brush-machine, a mandrel adapted to receive a tube-blank, supports for said
45 mandrel upon which it may be rotated horizontally, a plunger disposed axially of said

mandrel, a pin controlled by said plunger and adapted to be projected to and fro through a central orifice in the end of said mandrel.

10. In a brush-machine, a plate or carriage, 50
guides or ways therefor, a head on said plate or carriage, a die mounted in said head and adapted to stamp the end of a tube-blank, an opening through said die, a shearing or
cutting plate or bar adapted and arranged to 55
slide in said head and having an opening therethrough corresponding with the opening in the die, means for moving said plate or carriage in its guides or ways, and means for
60 actuating said cutting plate or bar at an angle to the line of movement of the plate or carriage.

11. A brush-machine, comprising in its construction a mandrel adapted and arranged to receive a brush-tube blank, a pin in said man- 65
drel adapted and arranged to be projected through a central orifice in the end of such blank, a die adapted and arranged to stamp the outer wall of an annular channel or groove
surrounding such central orifice of the blank 70
and having an opening therethrough in axial alinement with said mandrel, a cutter plate or bar having a funnel-shaped opening there-through corresponding with the opening
through the die, a head which supports said 75
die and said cutter plate or bar, guides or ways for said head, a shaft, an eccentric thereon having an arm adapted to actuate said head in its guides or ways, connections
intermediate said shaft and said cutter plate 80
or bar whereby the cutter is moved at an angle to the line of movement of said head, and a clutch on said shaft adapted to engage the shaft with the driving-pulley.

In testimony whereof we affix our signa- 85
tures in presence of two witnesses.

FRANK N. WEIS.
WILLIAM C. WEIS.

Witnesses:

M. D. MERRICK,
L. E. BROWN.