

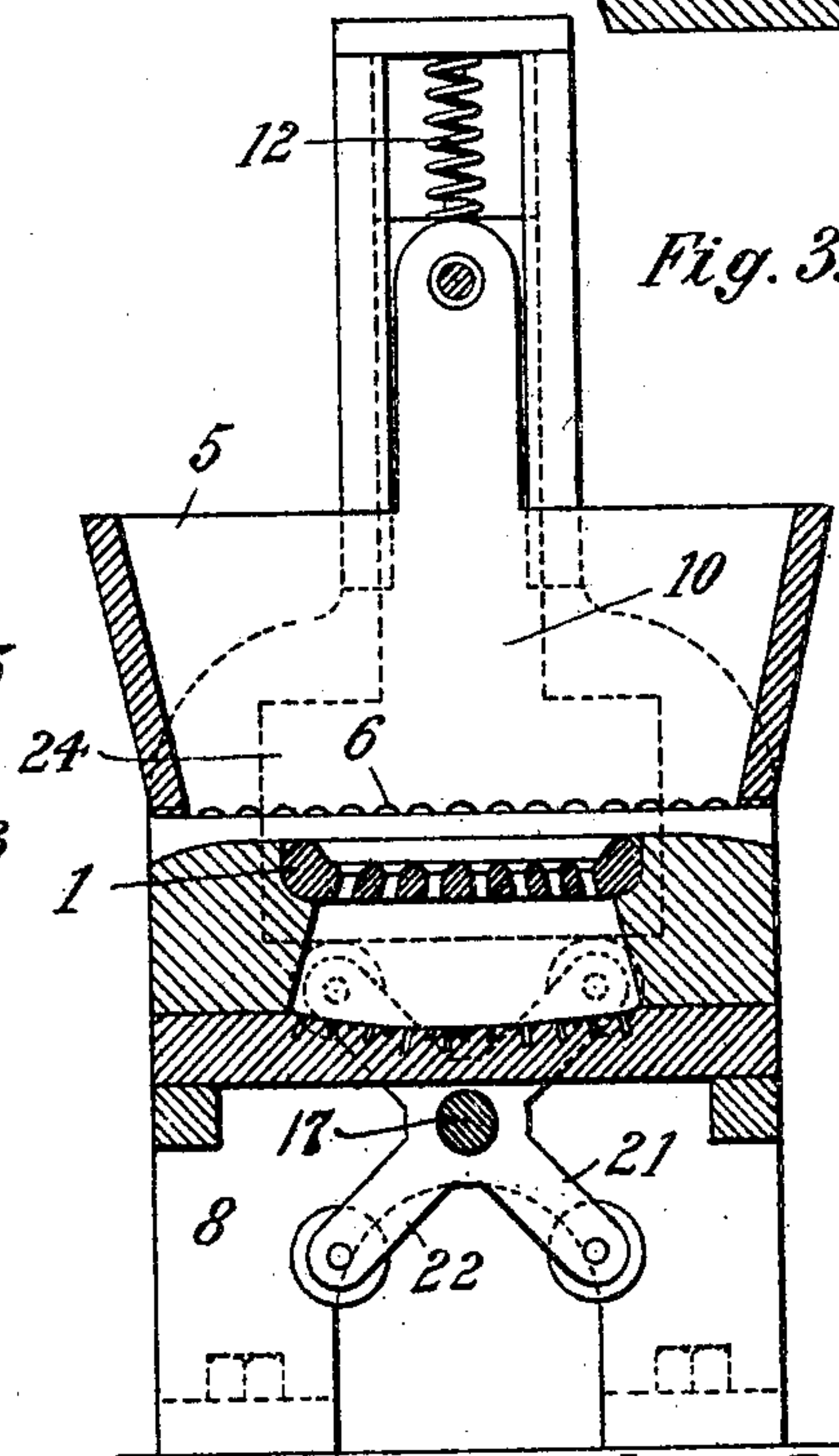
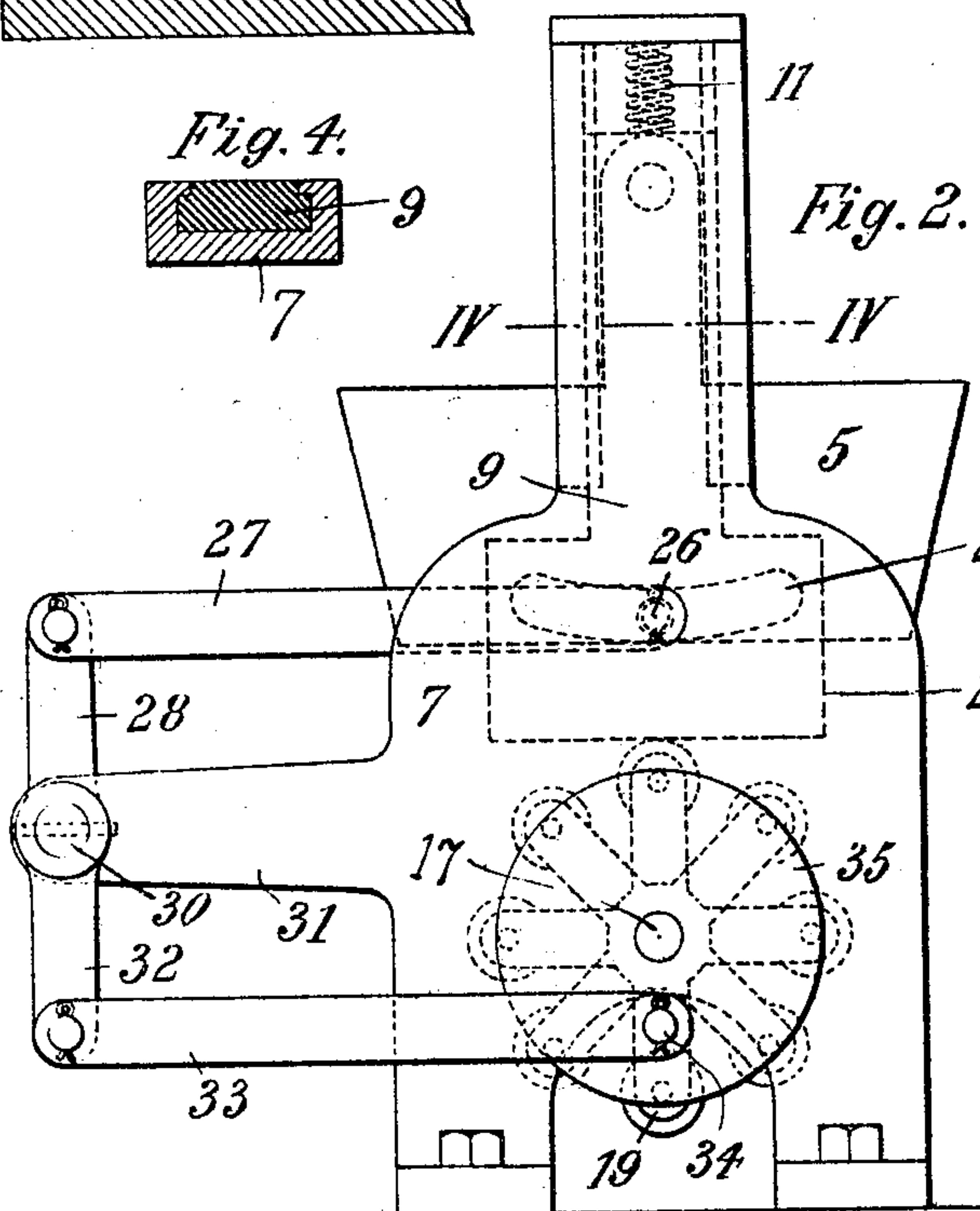
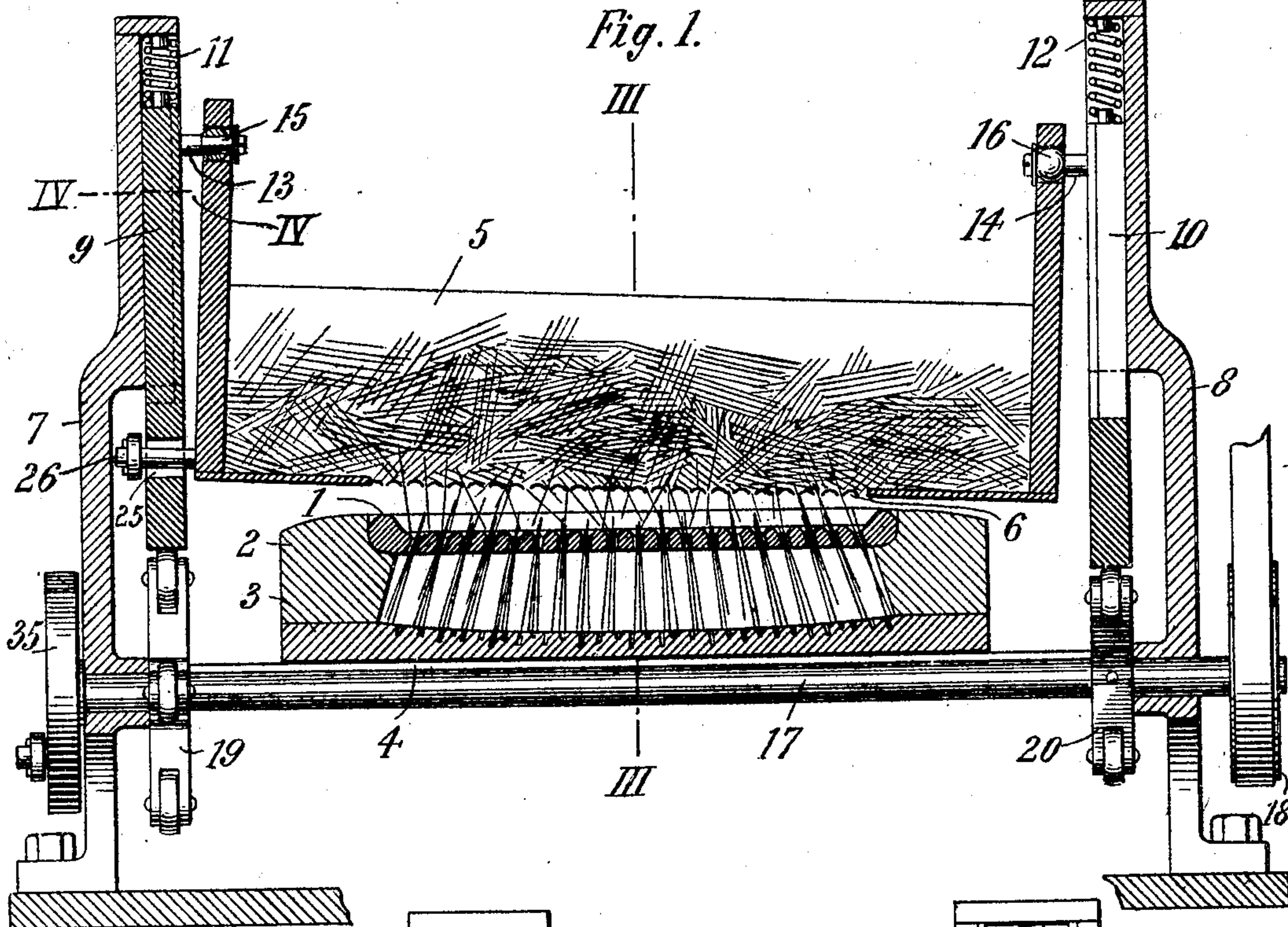
No. 798,381.

PATENTED AUG. 29, 1905.

P. H. ALEXANDER.
MACHINE FOR THE MANUFACTURE OF BRUSHES.

APPLICATION FILED AUG. 31, 1904.

2 SHEETS—SHEET 1.



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Fig. 5.

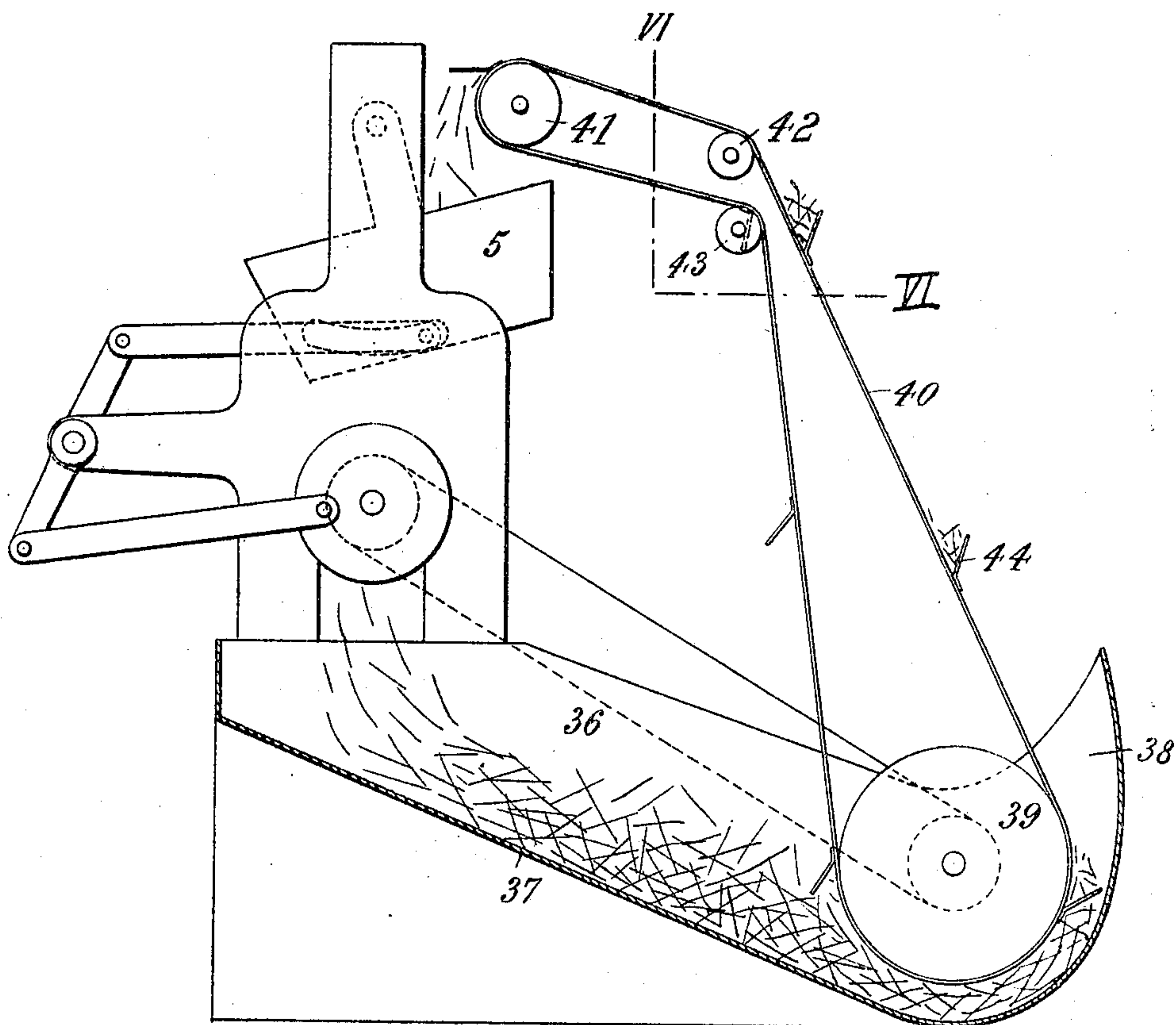
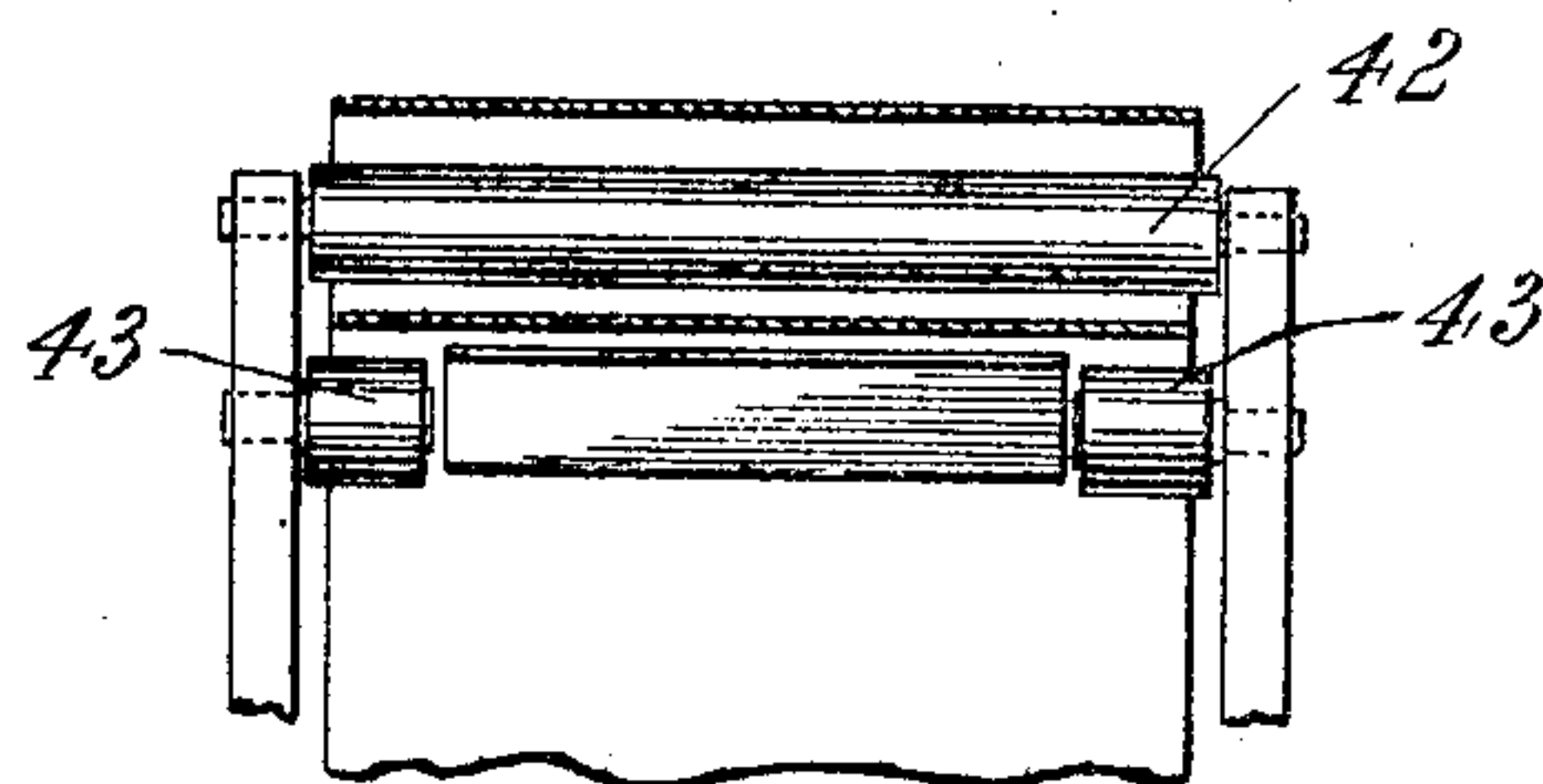


Fig. 6.



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UNITED STATES PATENT OFFICE.

PHOEBUS H. ALEXANDER, OF AMSTERDAM, NEW YORK.

MACHINE FOR THE MANUFACTURE OF BRUSHES.

No. 798,381.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed August 31, 1904. Serial No. 222,787.

To all whom it may concern:

Be it known that I, PHOEBUS H. ALEXANDER, a citizen of the United States, residing at Amsterdam, in the county of Montgomery, State of New York, have invented certain new and useful Improvements in Machines for the Manufacture of Brushes, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

In a copending application, Serial No. 222,786, I have described and claimed a method of manufacturing brushes, in which method the bristles or other fibers are inserted into tuft-holes in a perforated blank and then glued or cemented in place. I prefer to insert the bristles by sifting them into the holes from a suitable hopper having a perforated or reticulated bottom.

It is the object of the present invention to provide such a hopper and devices combined therewith to effect such reciprocating and oscillatory movements of the hopper as will cause the bristles to be sifted out of the latter and into the brush-blank in a rapid and satisfactory manner, the machine being simple in construction and inexpensive to manufacture.

To these and other ends the invention consists in the novel features, arrangements of parts, and combinations of elements hereinafter described, and more particularly pointed out in the claims.

A convenient embodiment of the invention is shown in the accompanying drawings, in which—

Figure 1 is a longitudinal section. Fig. 2 is an end view. Figs. 3 and 4 are sections on lines III III and IV IV in Figs. 1 and 2, respectively. Fig. 5 is a side elevation, partly in section, showing the machine combined with a suitable conveyer for carrying bristles to the hopper; and Fig. 6 is a section on lines VI VI of Fig. 5.

The blank into which the bristles are to be sifted is indicated by 1. As shown, it is thickly covered with perforations, having their upper edges beveled or countersunk, constituting the tuft-holes. The blank is supported in a suitable holder 2, having an opening conforming to the contour of the blank and resting on a plate 3, whose surface is thickly pitted with pits or cavities of varying depths, so that the bristles in falling through the tuft-holes will strike pits of different depth, and therefore project from the face of the blank in different lengths. This gives

the brush the quality known as "penetration," and I have therefore termed the plate 3 a "penetration-plate." The blank-holder and penetration-plate are supported on platform 4, and over them is suspended the hopper 5. In the present embodiment this is a box of rectangular shape, having flaring sides, as shown in Figs. 2 and 3, with a bottom composed of wire-gauze 6. The hopper is given a reciprocatory and oscillatory movement over the top of the brush-blank by the following mechanism. At either end are end pieces or standards 7 8, each having in its upper end a slideway, as shown in the sectional view, Fig. 4. In these slideways are bars 9 10, which abut at their upper end against coil-springs 11 12. Projecting inwardly from the bars are studs 13 14, which support the hopper 5, by means of ball-and-socket joints 15 16, to permit limited movement of the hopper in any plane about the said studs. To raise and lower the ends of the hopper alternately, I provide the following devices: Journaled in the lower parts of the end pieces 7 8 is a shaft 17, driven by a pulley 18 and carrying at its ends cams or star-wheels 19 20. The latter consist, preferably, as shown in Figs. 2 and 3, of arms 21 22, arranged at right angles to each other and carrying antifriction-rollers on their ends. The lower ends of the slides or bars 9 10 are widened, as shown at 23 24, Figs. 2 and 3, and rest upon the rollers of the arms 21 22. It will now be evident that rotation of the shaft will cause the slides to reciprocate in their ways, and thereby raise and lower the hopper. The arms of the cams are in staggered relation to each other, as shown more clearly in Fig. 2, so that the ends of the hopper will be lifted alternately, as will be readily understood. It is desirable that the hopper should also have a movement across or substantially parallel to the brush-blank, and to effect such movement the following mechanism is provided. In one of the slides, in its widened lower end, is a curved slot 25, into which projects a stud 26 from the hopper. Connected with the stud is a pitman 27, pivoted at its other end to an arm 28 on a rock-shaft 30, which latter is journaled in arms projecting from the end pieces 7 8, one such arm being shown at 31, Fig. 2. Rigidly connected to the rock-shaft is a second arm 32, to which is pivoted a pitman 33, the other end of the latter being connected with a wrist-pin 34 on a crank-disk 35. The crank-disk is mounted on the shaft 17, so that rotation

of the latter will rock the shaft 30 and so cause the stud 26 to move from end to end of the slot 25, carrying with it the hopper 5, simultaneously with the up-and-down movement of the latter imparted by the cams 19 20.

From the foregoing it will be seen that the mechanism described will give the hopper the movements necessary for sifting the bristles out at various angles, thus enabling the bristles to drop easily into the tuft-holes, which, as shown, are inclined at various degrees of inclination.

It is of course evident that some of the bristles which fall from the hopper do not strike holes in the blank, and therefore drop lengthwise upon the same, upon the holder 2, and upon the supporting-table 4. These bristles are brushed off from time to time, as necessary, and returned to the hopper. In Figs. 5 and 6 I have shown mechanism arranged for carrying the bristles back to the hopper. The table or platform 4 is preferably composed of two wooden slats, as shown, the slats being spaced just near enough together to support the penetration-plates. The waste bristles—that is, the bristles which do not drop into tuft-holes and which would otherwise fall upon the table—now drop down through the same into a receptacle 36, having an inclined bottom 37, terminating in an upward curve, as shown at 38. Working in the curved part 38 is a drum 39, rotated by any suitable mechanism, over which drum runs a conveyer-belt 40. The latter also passes over a roller 41, so located that the hopper 5 will be directly under the same when the said hopper has reached the right-hand limit of its path. The upper reach of the belt 40 is supported on an idler 42 and the lower reach on an idler 43, so that the belt adjacent to the drum 41 will be supported in a substantially horizontal plane. On the belt are inclined ribs or flanges 44, which take up bristles from the bottom of the receptacle 36, as shown, and carry them up to the roller 41, where they are delivered to the hopper 5. The ribs 44 are so spaced on the band 40 that one of the former will be in position to deliver its load of bristles to the hopper when the latter is at the limit of its movement, as shown in Fig. 5. In order to permit the ribs to pass the supporting-roller 43, I make the latter in two parts, as shown in Fig. 6, far enough apart to allow the ribs to pass freely between them.

The mechanisms which I have herein specifically shown and described are of course typical merely of the invention, which may be embodied in widely-varying forms without departure from its proper scope.

Having now described my invention, what I claim is—

1. In a machine of the kind described, the combination with a hopper, of means for supporting the same, means for reciprocating the hopper vertically, and means for simultane-

ously oscillating the hopper horizontally, as set forth.

2. In a machine of the kind described, the combination with a hopper, of a pair of standards at opposite ends of the hopper, devices for supporting said hopper and adapted to slide vertically in the standards, means for reciprocating said devices, and means for oscillating said hopper in a horizontal plane simultaneously, as set forth.

3. In a machine of the kind described, the combination with a hopper, and standards at opposite ends thereof, of devices for supporting the hopper and adapted to slide vertically in the standards, cams engaging the said devices to reciprocate the same, and means for oscillating the hopper horizontally, as set forth.

4. In a machine of the kind described, the combination with a hopper, and standards at opposite ends of the same, of devices adapted to slide vertically in the standards, means for connecting the hopper loosely with said devices, mechanism for reciprocating the said devices alternately, and means for oscillating the hopper horizontally, as set forth.

5. In a machine of the kind described, the combination with a hopper, and standards at opposite ends of the same, of supports for the hopper mounted to slide in the standards, devices connecting the hopper loosely with the said supports, and staggered cams engaging the supports to reciprocate the same alternately, as set forth.

6. In a mechanism of the kind described, the combination with a hopper, and standards at opposite ends of the same, of supports for the hopper mounted to slide vertically in the standards, devices for connecting the hopper loosely with the supports, staggered cams engaging the supports to reciprocate the same alternately, and means for oscillating the hopper horizontally, as set forth.

7. In a machine of the kind described, the combination with a hopper, and standards at opposite ends of the same, of supports for the hopper mounted to slide vertically in the standards, universal joints connecting the hopper with the supports, means for reciprocating the supports alternately, and means for oscillating the hopper horizontally, as set forth.

8. In a machine of the kind described, the combination with a hopper, and standards at opposite ends of the same, of supports for the hopper mounted to slide vertically in the standards, devices connecting the hopper loosely with the supports, a shaft bearing staggered cams engaging the said supports, a crank-disk on the shaft, and means connecting the hopper with the crank-disk, as set forth.

9. In a machine of the kind described, the combination with a hopper having a perforated bottom for sifting bristles into a brush-

blank, and means for oscillating the hopper horizontally, of a conveyer arranged to deliver the waste bristles from the blank to the hopper when the latter is at one end of its path, as set forth.

10. In a machine of the kind described, the combination with a hopper having a perforate bottom for sifting bristles into a brush-blank, and means for oscillating the hopper horizontally, of a receptacle below the hopper to receive waste bristles, and a conveyer extending from the receptacle to a point above one end of the path of the hopper, as set forth.

11. In a machine of the kind described, the

combination with a hopper having a perforate bottom for sifting bristles into a brush-blank, and means for oscillating the hopper horizontally, of a receptacle below the hopper to receive waste bristles, and a conveyer adapted to take bristles from the receptacle and deliver the same periodically to the hopper, when the latter is at one end of its path, as set forth.

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Witnesses:

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