

No. 828,473.

PATENTED AUG. 14, 1906.

C. GRÜNEBERG.

MACHINE FOR BORING AND FILLING BRUSH BACKS.

APPLICATION FILED SEPT. 28, 1905.

3 SHEETS—SHEET 1.

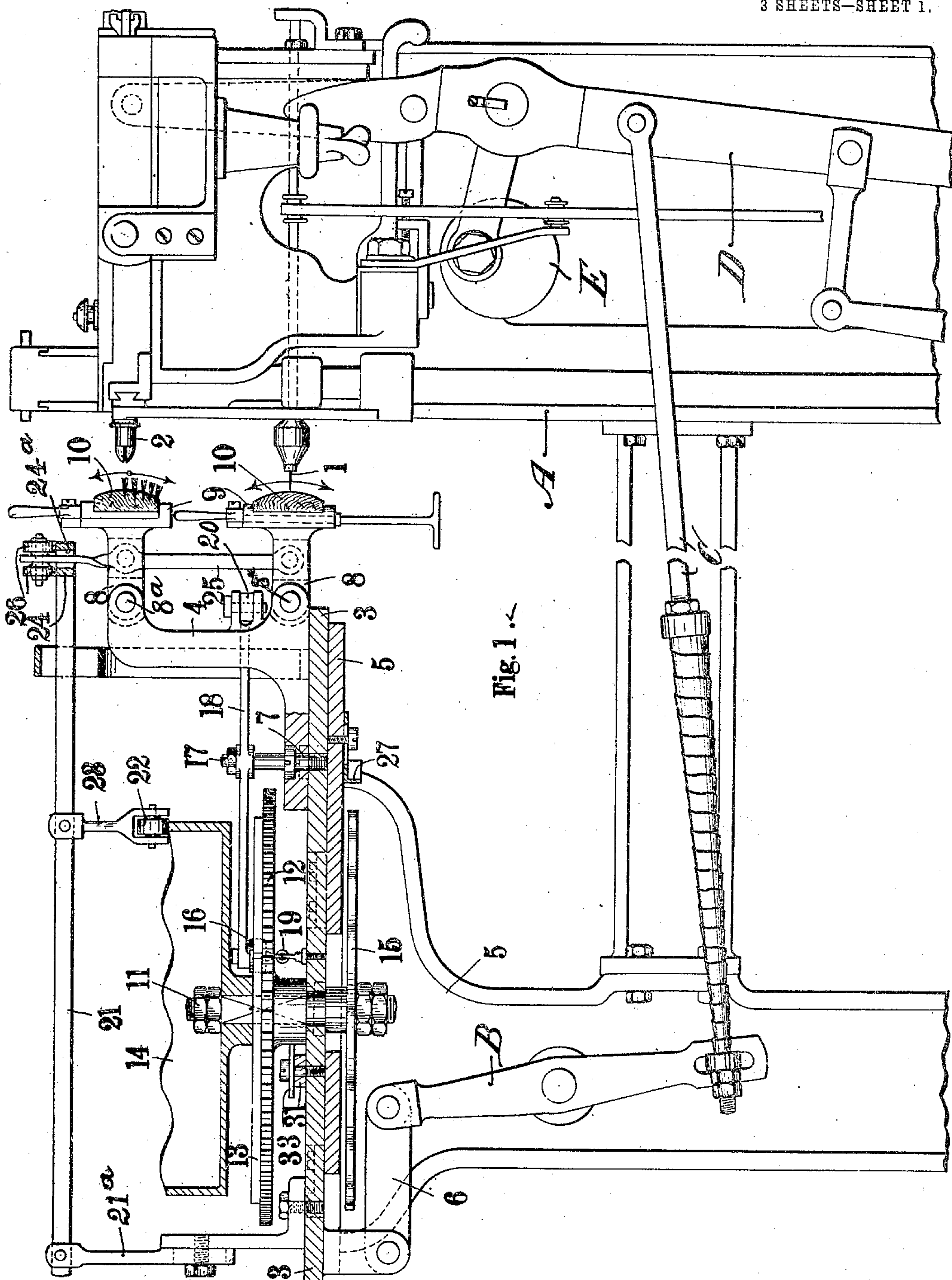


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

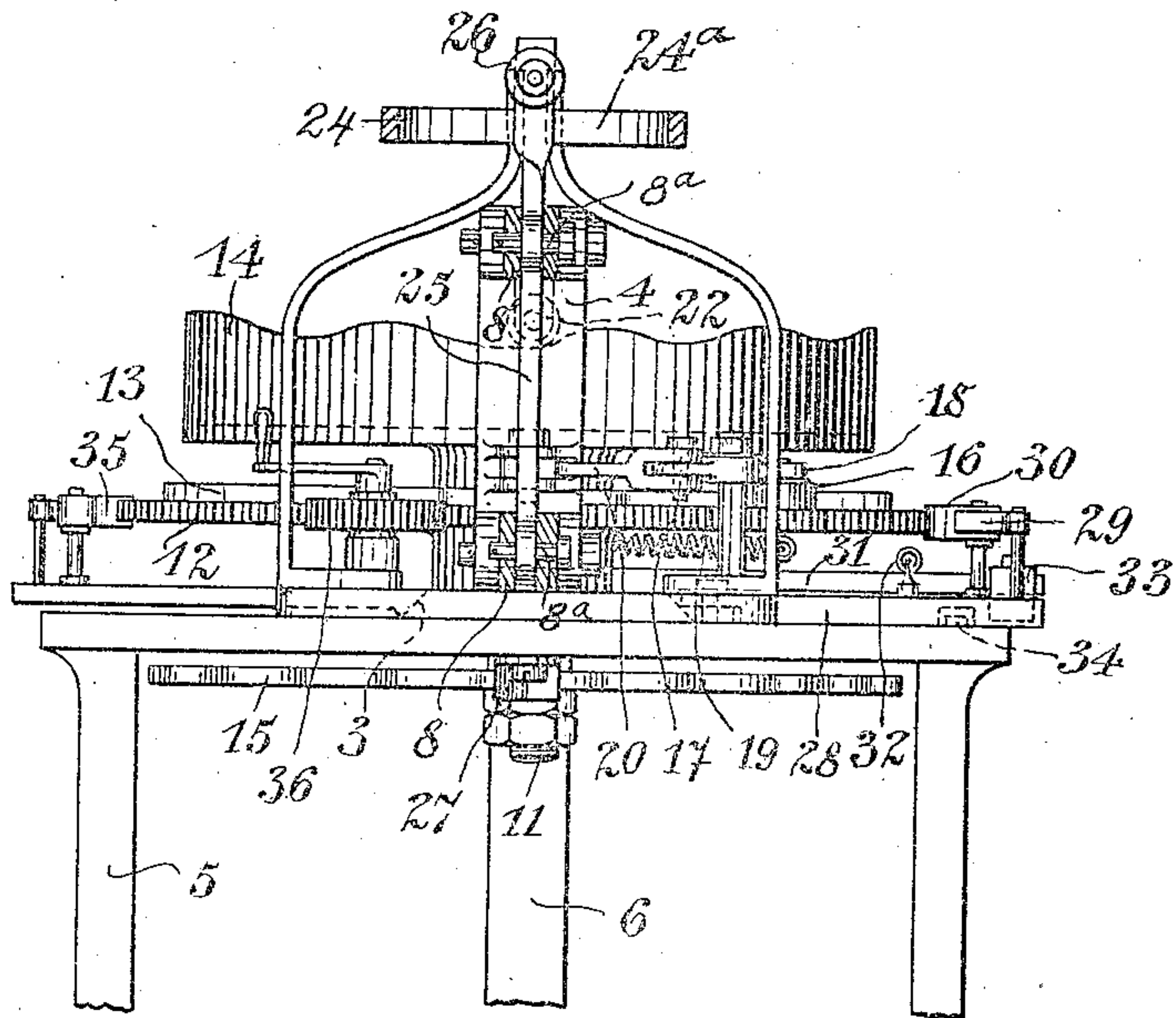


Fig. 4.

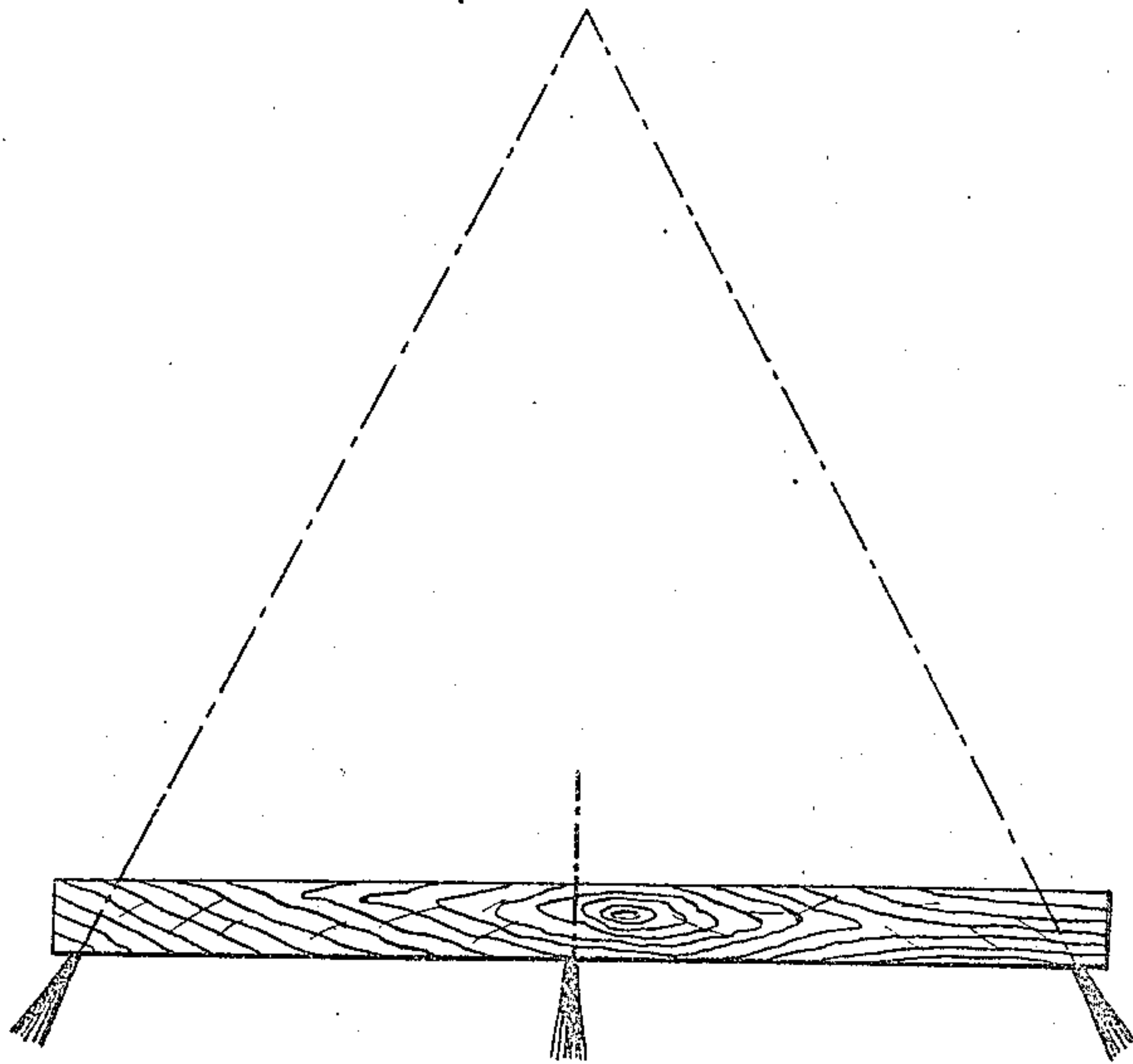
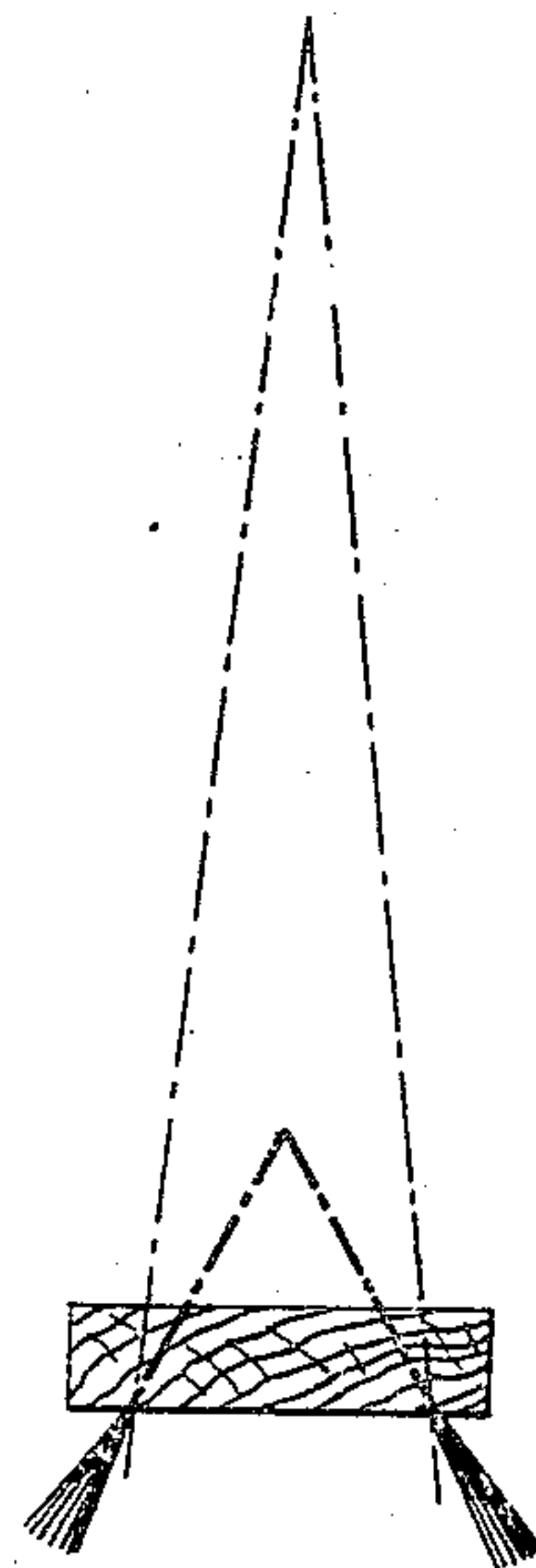


Fig. 5.



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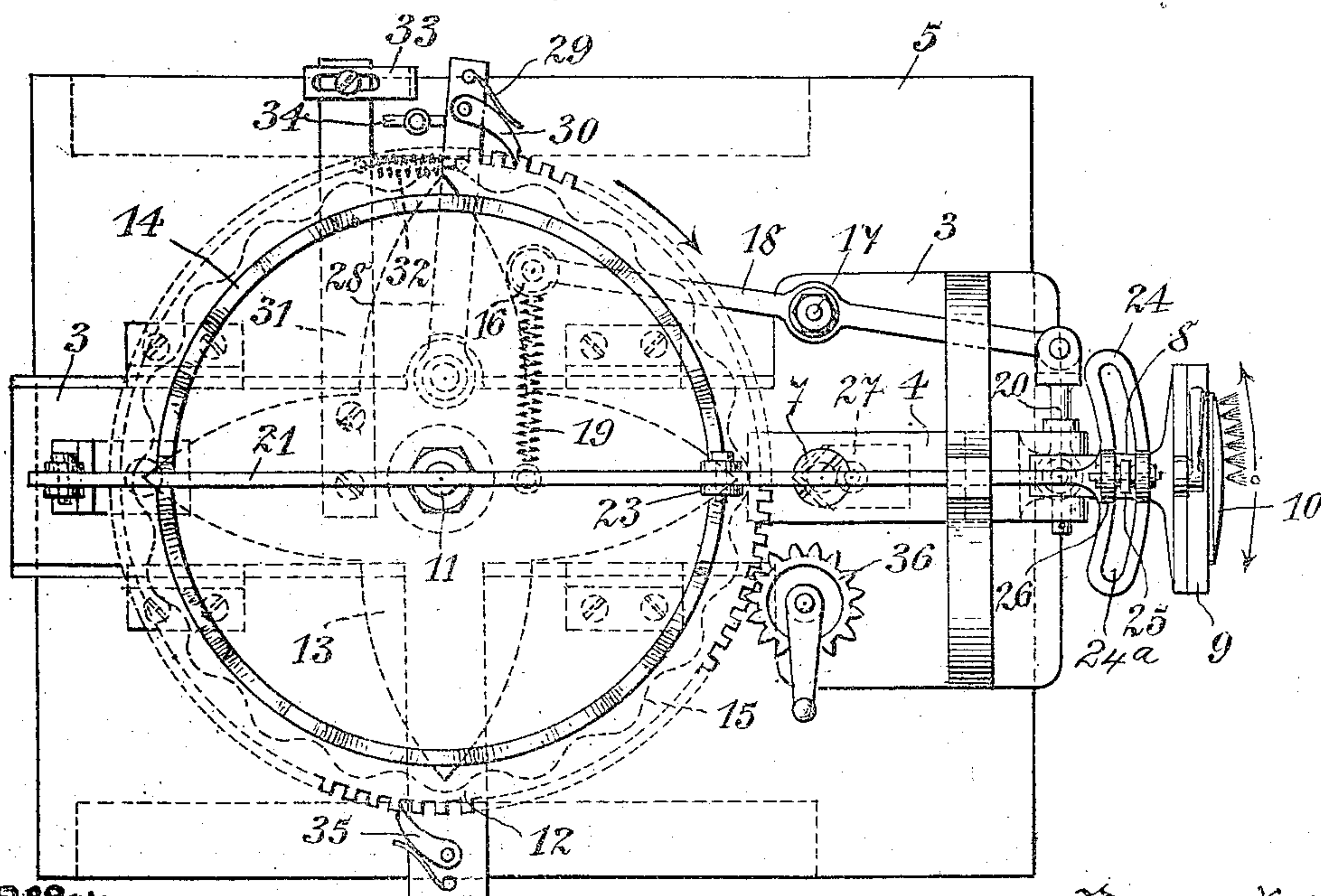
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3 SHEETS—SHEET 3

Fig. 3.



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# UNITED STATES PATENT OFFICE.

CARL GRÜNEBERG, OF POZSONY, AUSTRIA-HUNGARY.

## MACHINE FOR BORING AND FILLING BRUSH-BACKS.

No. 828,473.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed September 28, 1905. Serial No. 280,443.

*To all whom it may concern:*

Be it known that I, CARL GRÜNEBERG, manufacturer, a subject of the Emperor of Austria-Hungary, residing at Pozsony, in the  
5 Empire of Austria-Hungary, have invented certain new and useful Improvements in Machines for Boring and Filling Brush-Backs, of which the following is a specification.

My invention has relation to brush-making  
10 machines; and in such connection it relates particularly to means for supporting and moving a plurality of brush-backs in horizontal and vertical planes and for bringing the same into and out of engagement with a  
15 stationary drill and a filler, so as to drill and fill two brush-backs at a time.

The principal objects of my invention are, first, to provide a brush-making machine with means for supporting a plurality of  
20 brush-backs and for manipulating the backs independently of each other in lateral and transverse directions therein; second, to provide the machine with means for drilling holes of equal depth in the backs and for ar-  
25 ranging the bristle-bunches in a predetermined inclined position with respect to the brush-backs; third, to so arrange the actuating mechanism as to insure true and exact movements of the brush-back holders with  
30 respect to the drill and filler, and, fourth, to provide the machine with means for reciprocating the brush-backs and for intermittently setting the same.

35 The nature and scope of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a view illustrating, partly in  
40 vertical section and partly in side elevation, a machine for boring and filling brush-backs and showing a support for a plurality of brush-backs, means for moving the same in vertical and horizontal planes and for shift-  
45 ing the support and backs and the actuating means toward and away from a stationary drill and filler, and the means for carrying the support and actuating mechanism, all embodying main features of my said invention.  
50 Fig. 2 is a front elevational view of the machine, partly in section. Fig. 3 is a top or plan view of the same, and Figs. 4 and 5 are diagrammatic views illustrating the pivotal points on which the brush-backs are swung  
55 in horizontal and vertical planes to insure

varying inclined positions of the tufts with respect to the base of the brush-back.

Referring to the drawings, 1 represents a drill, and 2 a filler, which are journaled horizontally in a frame A in any well-known  
60 manner. Opposite the drill 1 and filler 2 is arranged a brush-back holder 4, pivotally supported by a slide 3, having a range of reciprocating movement in a frame or support  
65 5, arranged opposite the frame A. The reciprocating movement is imparted to the slide 3 preferably by a link 6, actuated by a lever B, pivotally secured to the support 5, which in turn is actuated by a rod C and lever D, oscillated by an eccentric E, arranged  
70 in the frame A, which eccentric is supported and rotated by means not shown. The brush-back holder or bracket 4 by means of a bolt 7 is pivotally secured to the slide 3, and may thus be swung in a horizontal plane  
75 thereon. The brush-back holder 4 is further provided with two superposed arms 8, pivotally secured thereto in the point 8<sup>a</sup> to permit of an oscillating movement of the same in a vertical plane. The arms 8 terminate in  
80 jaws 9, serving to removably support the brush-back 10. To the horizontally-movable slide or carriage 3 is secured a shaft 11, carrying a gear-wheel 12, serving to impart to the shaft 11 and by the same to cams 13,  
85 14, and 15, secured thereto, a step-by-step movement in one direction for a purpose to be presently fully described. The cam 13, forming a pattern-cam, oscillates the brush-back holder 4, and thus the arms 8 and  
90 brush-backs 10 on the bolt 7, in a horizontal plane, while the cam 14 imparts to the arms 8 and brush-back 10 an oscillating movement in a vertical plane. The cam 15 in turn serves to limit the range of movement of the  
95 slide 3, and thus the holder 4 and brush-backs 10, toward the drill 1 and filler 2 to insure a uniformity of depth of the holes drilled in the backs 10 irrespective of their position in the holder 4. A roller 16 of a lever 18,  
100 pivotally secured in the point 17 to the slide 3 by means of a spring 19, is held in engagement with the pattern-cam 13. This lever 18 by means of a link 20 is secured to the brush-back holder 4 and swings the same on  
105 its bolt 7 when actuated by the cam 13, whereby adjustment of the brush-back 10 in a horizontal plane is effected.

In order to permit of an adjustment of the brush-backs in a vertical plane—i. e., in the



direction of their width, which movement is controlled by the cam 14—the arm 21 is pivotally secured to a bracket 21<sup>a</sup>, carried by the slide 3. The arm 21 is provided with a rod 23, carrying a roller 22, engaging the cam 14. The arm 21 at its free end is provided with a curved extension 24, through the slot 24<sup>a</sup> of which passes a rod 25, which is pivotally connected to the arms 8 and is supported by rollers 26, traveling on the extension 24. By the foregoing arrangement it will be understood that the movement of the lever 21 causes a corresponding movement of the arms 8 in a vertical plane—that is, in the direction of the width of the brush-backs 10.

In order to insure a uniform depth of the holes in every position of the brush-backs, the cam 15 is arranged so as to limit the advance of the slide 3 toward the drill and filler by striking against an adjustable stop 27, secured to the under side of the support or frame 5. The gear-wheel 12, which, if desired, is connected with the pattern-cam 13, is rotated with a step-by-step movement in the direction indicated by the arrow in Fig. 3 at each return of the slide 3 to the extent of one tooth—that is, one hole-pitch—whereby the cams 13, 14, and 15 are advanced to the extent of the hole-pitch. The preferred mechanism for imparting a step-by-step movement to the gear-wheel 12 consists of an arm 28, pivotally secured to the slide 3, which is provided with a pawl 30, held in engagement with the wheel 12 by a spring 29. An arm 31, rigidly secured to the slide, is connected to the pivotal arm 28 by a spring 32, and on the return of the slide 3 the arm 28, striking against the stop 34 by means of the pawl 30, rotates the gear-wheel 12 in the direction indicated by the arrow for the distance of one tooth. On the forward movement of the slide 3 the spring 32 brings the arm 28 into engagement with the stop 33, by which movement the pawl 30 slides over one of the teeth of the gear-wheel 12, so that on the next return movement of the slide 3 the gear-wheel 12 will be again turned for the distance of one tooth. A locking-pawl 35, arranged opposite the pawl 30, prevents the gear-wheel 12 from being turned backward.

The operation of the machine is as follows: For each type of brush-back 10 is used, preferably, a separate set of cams 13, 14, and 15, for which purpose the cams are movably mounted on the shaft 11. Opposite the drill 1 an undrilled back and opposite the filler 2 a drilled back 10 is introduced into the respective jaws 9, and the gear-wheel 12 and cams 13, 14, and 15 by means of a hand-wheel 36, meshing with the gear-wheel 12, are thus brought into an initial position. The slide 3 by means of the links 6 is now moved toward the drill 1 and filler 2 until the cam 15 abuts against the stop 27, during which movement the drill 1 drills a hole in the

lower brush-back and the filler 2 fills a corresponding hole in the upper back with the bristles, which are supplied to the filler in the usual manner. It must be borne in mind, however, that during the forward movement of the slide 3 the cam 15 only comes into operation and limits the forward movement thereof, while no rotary movement is imparted to the wheel 12 and cams 13 and 14. When the slide 3 is moved backward by means of the links 6, the gear-wheel 12 remains stationary on the slide 3 until the arm 28 abuts against the stop 34 and is held against further movement, while the slide 3 continues its backward movement. By the arrest of the arm 28 the pawl 30 thereof rotates the gear-wheel 12 for a distance of one tooth, which movement by the intervention of the pattern-cam 13 is transmitted to the brush-back holder 4, swinging the same for the distance of one drill-hole to the other sidewise on the slide 3. At the same time the cam 14 is turned to such an extent that the roller 22 and the lever 21 become displaced, with the result that the arms 8 are swung in a vertical plane. From the foregoing description it will be understood that if the slide 3 again moves forward different spots of the brush-back are exposed to the drill 1 and filler 2, respectively, so that a machine according to the present invention is self-acting until the drilling and filling of the respective brush-backs are completed. The machine may either be stopped automatically or by hand in order to remove the brush-back 10 and to place two other backs in their place.

The brush-back holder 4, as illustrated, has two different pivotal points for longitudinal and transverse adjustment thereof, and it is possible to drill with this machine brush-bodies of any desired curvature and size with the same oblique position of the tufts, as shown in Figs. 4 and 5, irrespective of the securing of the tufts by loops or anchors. The latter way of fastening the tufts is possible, as the drill and filler are fixed while the brush-bodies travel toward them. It also will be understood that the shape of the cam 15 is dependent upon the curvature of the brush-back.

The adjustment of the brush-backs in the present machine is directly accomplished by the cams and by a set of levers hinged to the brush-back holder 4, thus doing away with the toothed racks heretofore employed, thereby greatly simplifying the construction of the machine, and also avoiding idle working, which has always been productive of unreliable work as to the filling operations.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the character described, a reciprocating slide, a brush-back holder piv-



otally secured thereto and having arms, cams and means for actuating the same supported by said slide, said cams, when actuated adapted to impart to said holder and a brush-back 5 carried by the arms of the holder respectively, movements in horizontal and vertical planes to bring the brush-back at predetermined points into engagement with a tool.

2. In a machine of the character described, 10 a reciprocating slide, a brush-back holder pivotally secured thereto and having arms, a series of cams and means for actuating the same supported by said slide, certain of said cams, when actuated, adapted respectively, 15 to impart to said holder and a brush-back carried by the arms of the holder movements in horizontal and vertical planes to bring the brush-back at predetermined points into engagement with a tool and a certain other of 20 said cams adapted to control the depth of hole drilled by the tool in the brush-back by limiting the movement of said slide in one direction.

3. In a machine of the character described, 25 a reciprocating slide, a brush-back holder having arms for supporting brush-backs pivotally secured thereto, a series of cams and means for actuating the same carried by said slide, certain of said cams, when actuated, 30 adapted respectively, to impart to said holder and its arms independent movements in vertical and horizontal planes so as to bring the brush-backs at predetermined points into engagement with stationary tools, and a 35 certain other of said cams adapted to control the depth of hole drilled by one of the tools in certain of the brush-backs by limiting the movement of said slide in one direction.

4. In a machine of the character described, 40 a reciprocating slide having a shaft, a brush-back holder having arms for supporting brush-backs pivotally secured thereto, a series of superposed cams and means for rotating the same arranged on said shaft, cer- 45 tain of said cams, when rotated, adapted to, respectively, impart to said holder and its arms independent movements in vertical and horizontal planes to bring brush-backs at predetermined points into engagement with sta- 50 tionary tools, and a certain other of said cams adapted to control the depth of hole drilled by one of the tools in certain of the brush-

backs by limiting the movement of said slide in one direction.

5. In a machine of the character described, 55 a support, a reciprocating slide carried by said support, a shaft and a brush-back holder and having arms carried by said slide, a series of superposed cams and a wheel secured to said shaft, means carried by said slide and 60 means carried by said support adapted, when said slide is moved in one direction, to rotate said shaft and by the same said cams with a step-by-step movement, by actuating said wheel, certain of said cams adapted, when 65 rotated, to impart respectively to said holder and its arms carrying brush-backs, movements in horizontal and vertical planes to bring the brush-backs at predetermined points into engagement with tools, and 70 means carried by said support adapted to engage one of said cams, to limit the forward movement of said slide and control the depth of hole drilled by one of the tools in the brush-back. 75

6. In a machine of the character described, 80 a support, a reciprocating slide having a shaft carried by said support, a brush-back holder having arms for supporting brush-backs pivotally secured thereto, a series of superposed cams and a wheel secured to said shaft, means pivotally secured to said slide and means adjustably carried by said sup- 85 port and adapted when said slide is moved in one direction to rotate with a step-by-step movement said shaft and by the same said cams by actuating said wheel, certain of said 90 cams adapted to, respectively, impart to said holder and its arms independent movements in vertical and horizontal planes to bring brush-backs at predetermined points into engagement with tools, and means se- 95 cured to said support and adapted to limit the movement of said slide by engaging one of said cams, when said slide is shifted in a cer- 95 tain direction.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL GRÜNEBERG.

Witnesses:

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ALVESTQ S. HOGUE.