

E. L. WALES.
FABRIC REDUCING MACHINE FOR FELT HATS.
APPLICATION FILED NOV. 4, 1908.

930,001.

Patented Aug. 3, 1909.
2 SHEETS—SHEET 1.

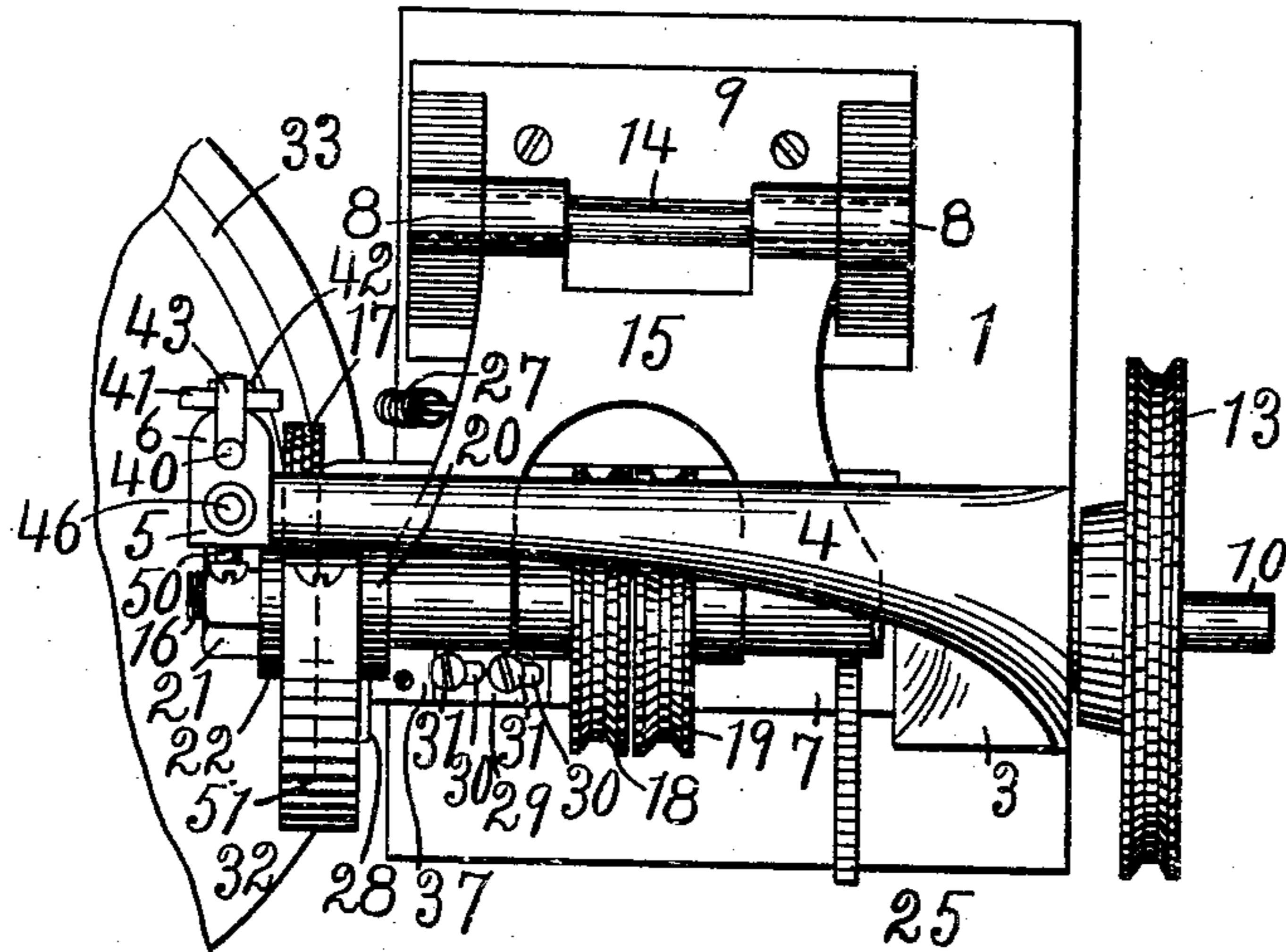


FIG. 1.

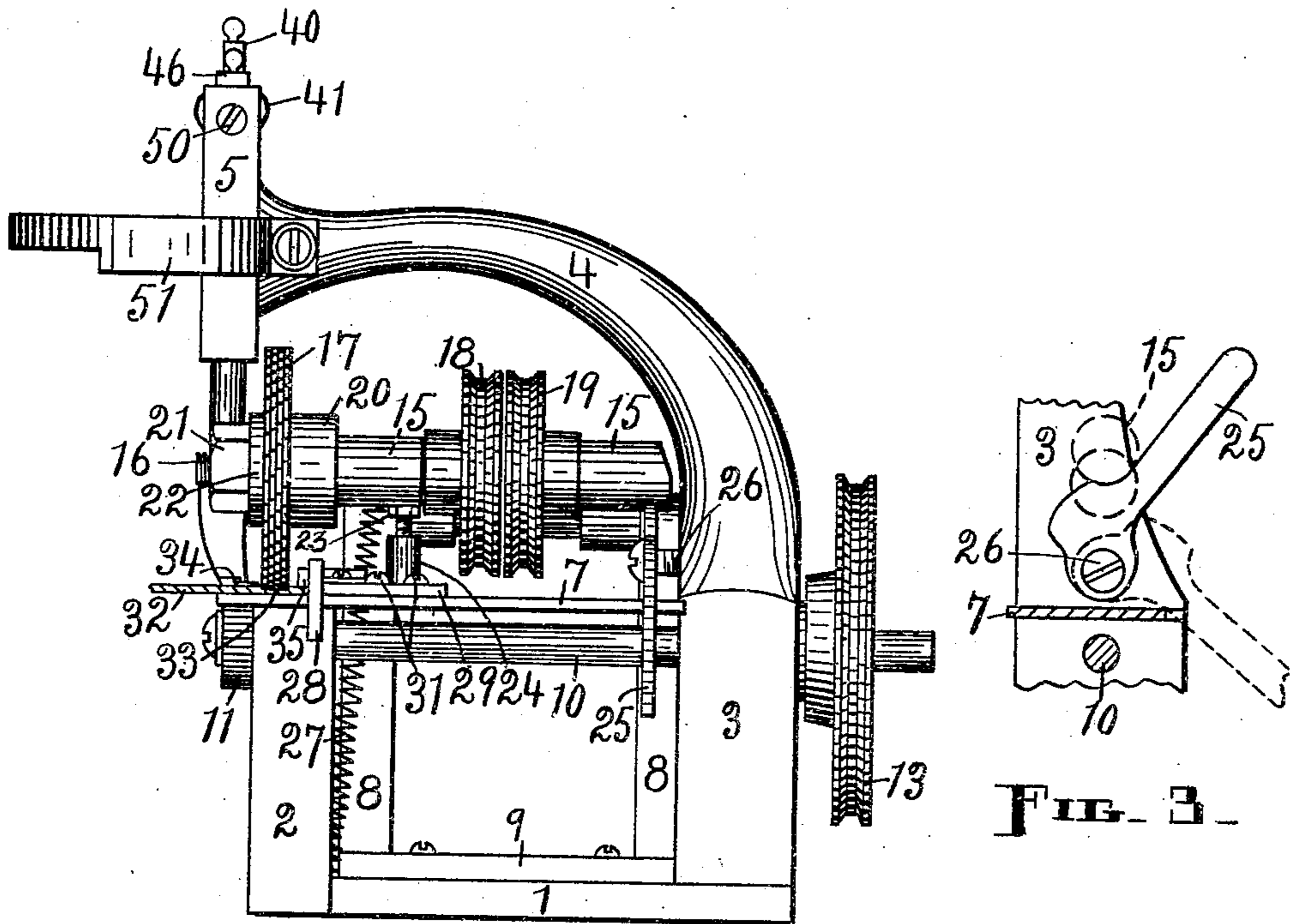


FIG. 2.

WITNESSES:

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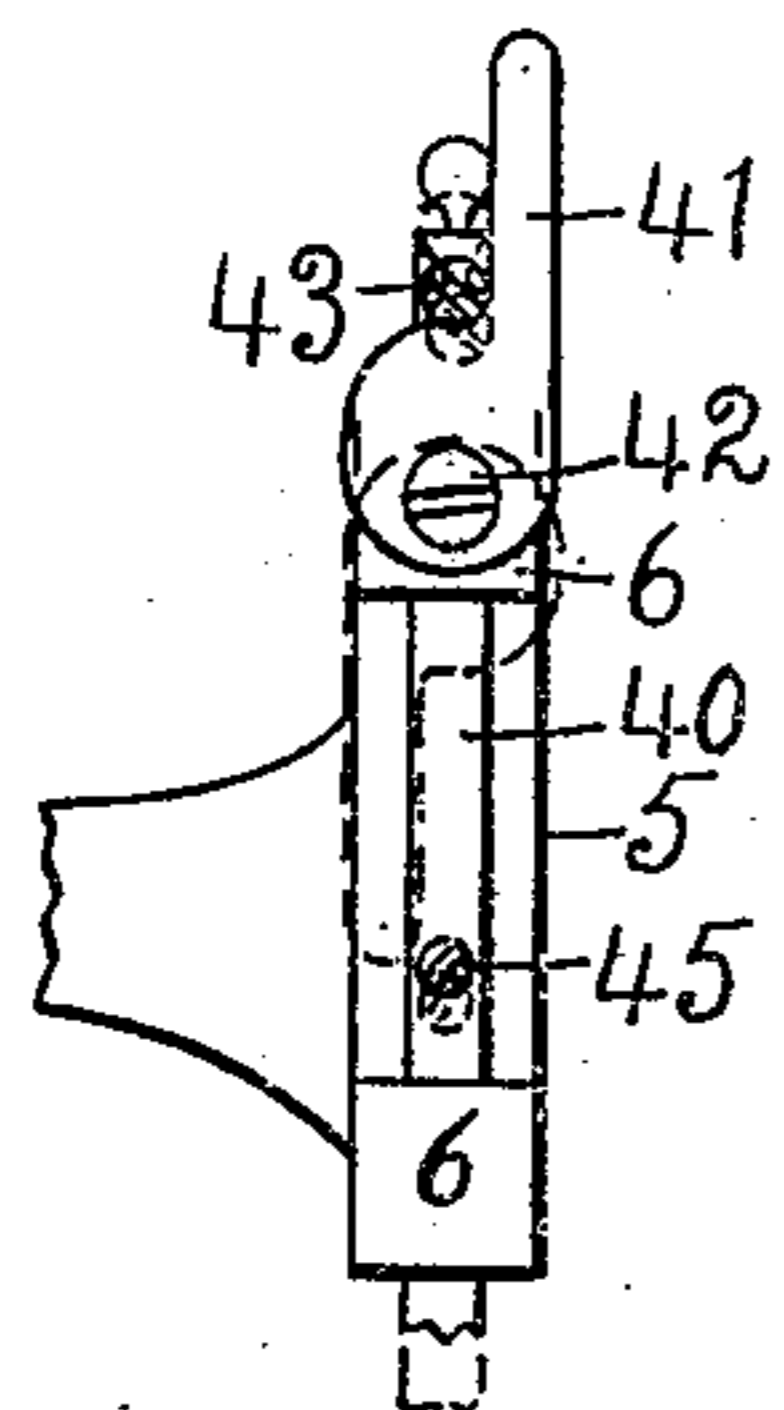


FIG. 5.

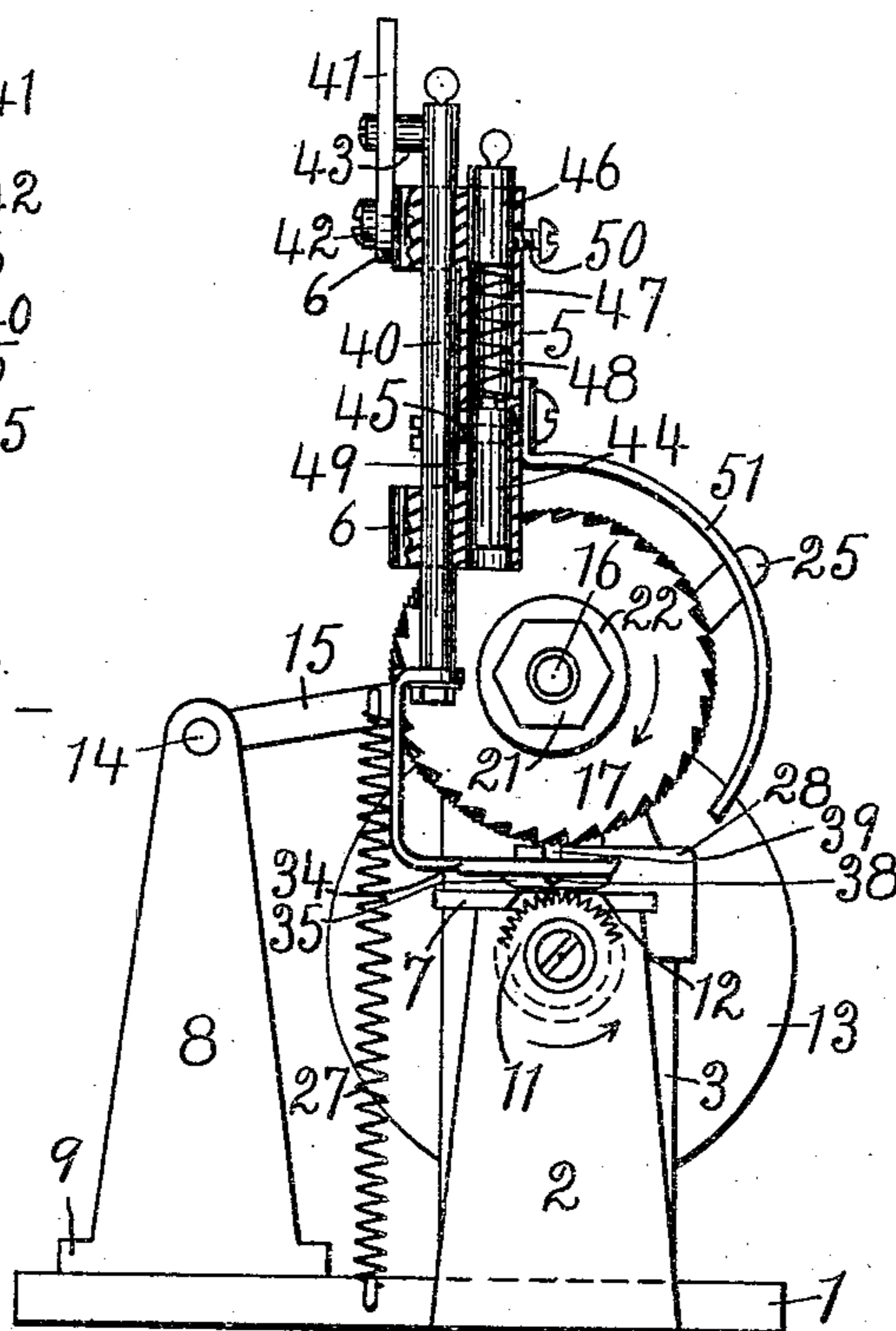


FIG. 4.

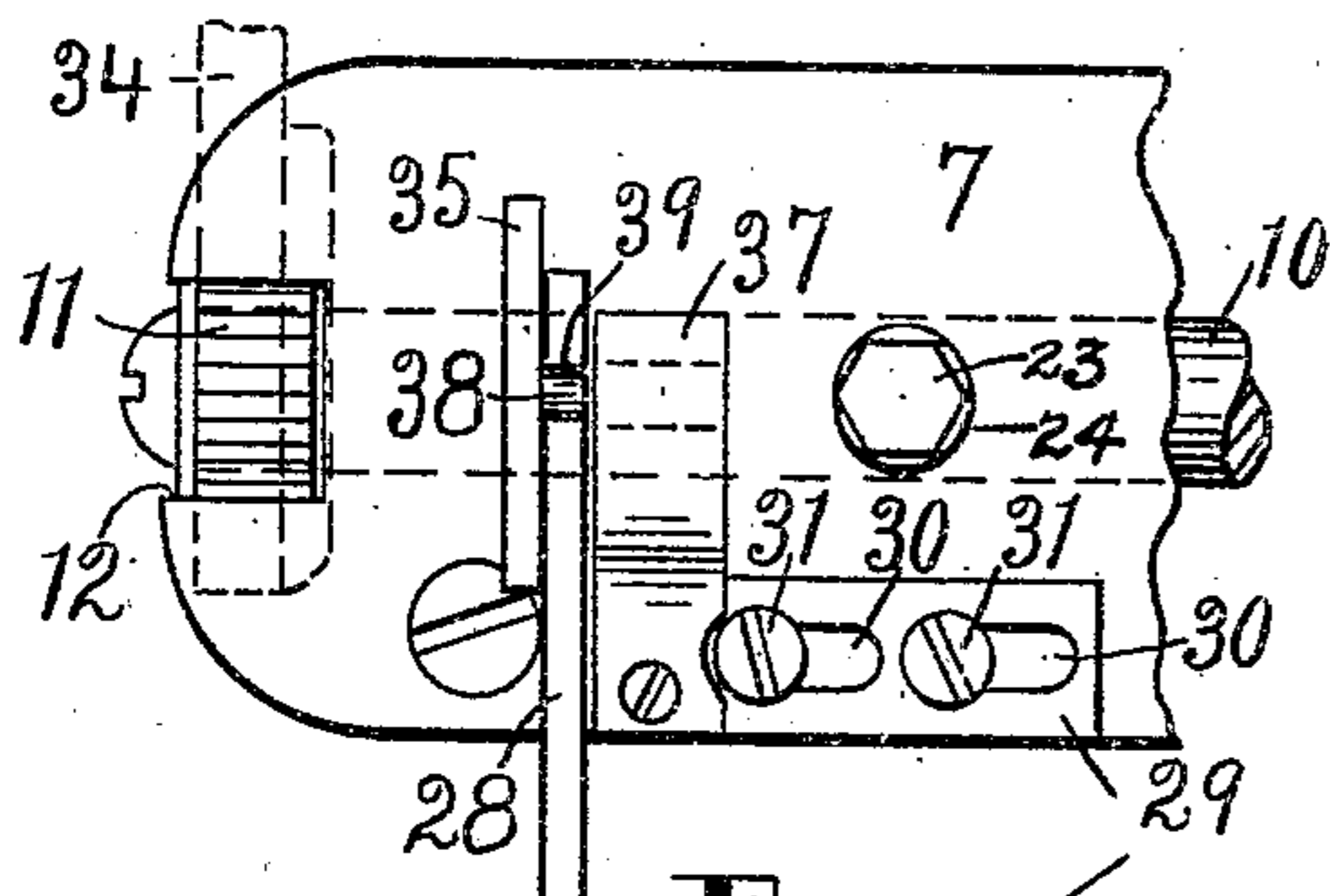


FIG. 6.

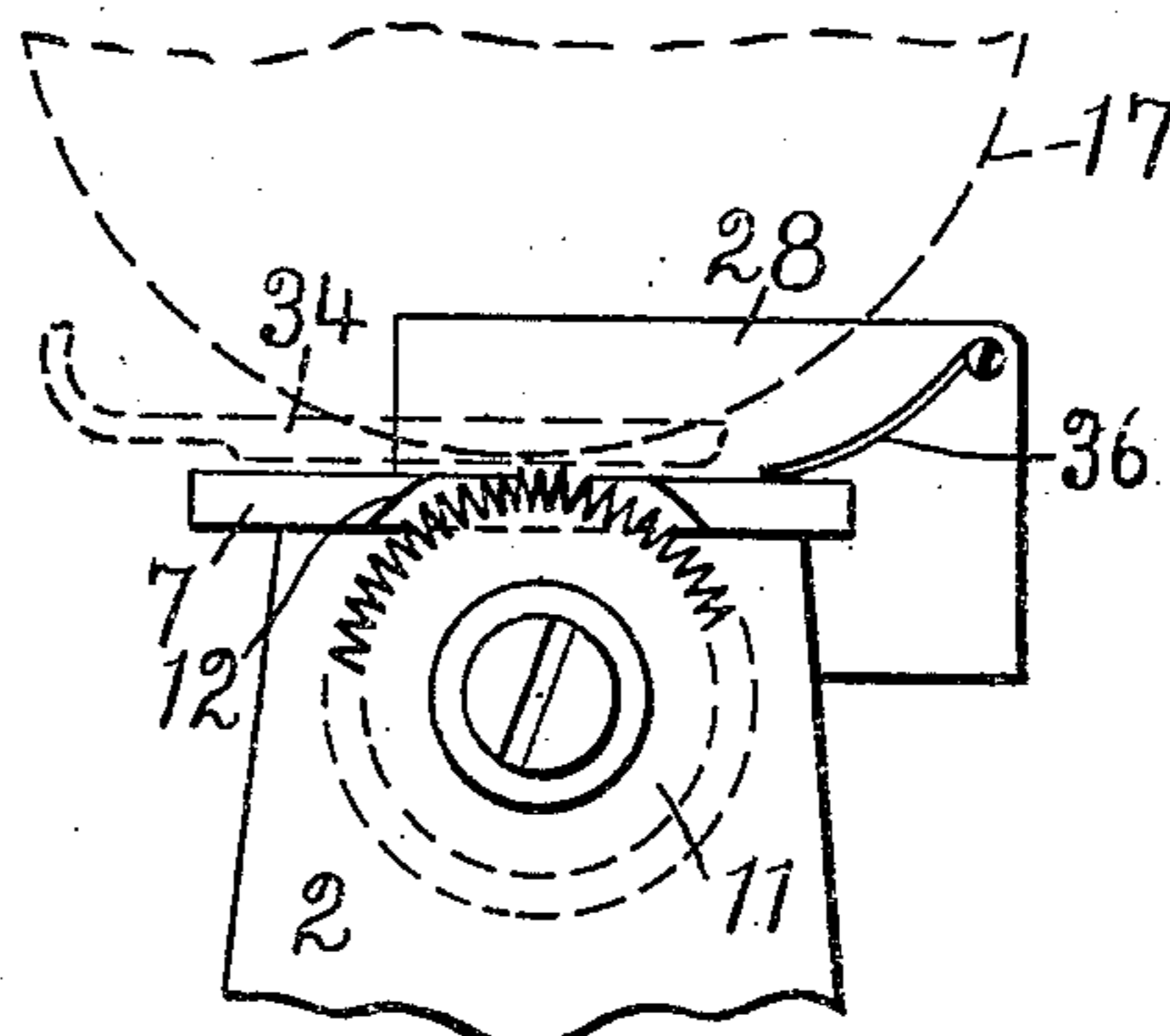
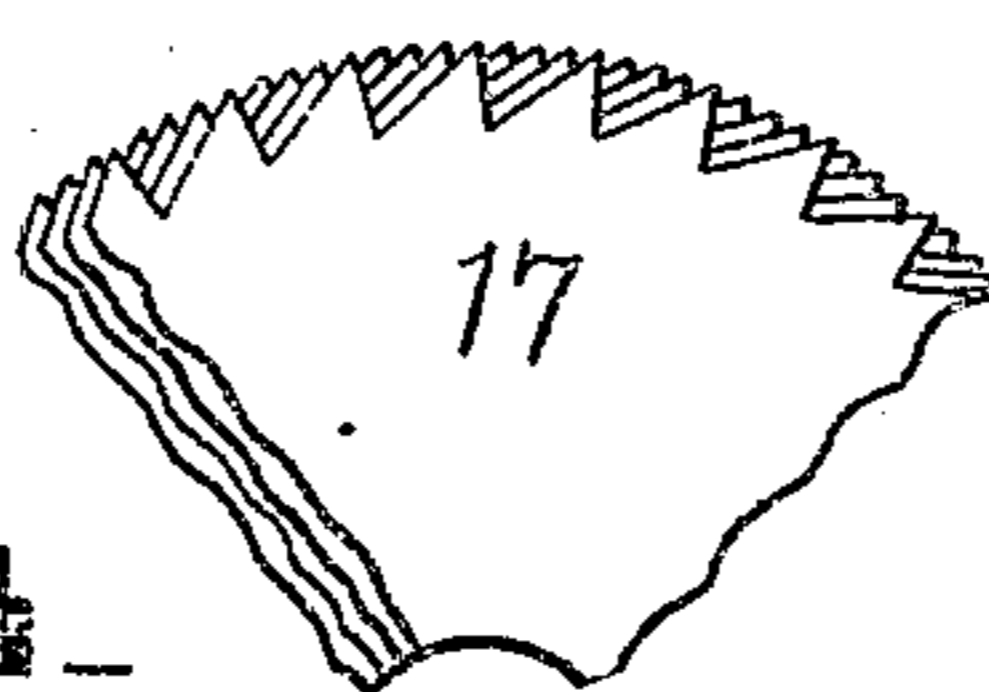


FIG. 7.

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FIG. 8.



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UNITED STATES PATENT OFFICE.

ELISHA L. WALES, OF MONSON, MASSACHUSETTS, ASSIGNOR TO HEIMANN & LICHTEN, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

FABRIC-REDUCING MACHINE FOR FELT HATS.

No. 930,001.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed November 4, 1908. Serial No. 461,063.

To all whom it may concern:

Be it known that I, ELISHA L. WALES, a citizen of the United States of America, residing at Monson, in the county of Hampden and State of Massachusetts, have invented a new and useful Fabric-Reducing Machine for Felt Hats, of which the following is a specification.

My invention relates to improvements in machines which pertain to the manufacture of felt hats, and consists generally of certain peculiar presser and feed mechanism for the brims of such hats, and of a suitable cutter which is capable of properly reducing such brims adjacent to the edge thereof by removing some of the felt as said brims are fed to the machine and pass beneath said cutter, together with such auxiliary and subsidiary parts and members as are required to make up a complete machine, all as hereinafter set forth.

The object of my invention is to produce a simple, practicable, and efficient machine with which to furrow, score, or excoriate the brim of a felt hat, at or near its edge, in such a manner as to produce a continuous strip of less thickness than the remaining portions of such brim, for the purpose of subsequently enabling the brim to be turned or folded over on the line of such excoriation to form a welt-edge, the welt-edge so formed being more desirable than when made without thus previously channeling or rabbeting the brim.

I attain this object by the means illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a preferred form of my machine, a fragment of the brim of a hat being shown in place in the machine in the act of being channeled; Fig. 2, a front elevation of said machine, showing all of the parts in operative position relative to the aforesaid fragment of brim which here appears in section; Fig. 3, a detail view of the bearing-arm-operating lever, showing the two extreme positions of the same; Fig. 4, an elevation of the working end of the machine with the cutter and main presser foot raised and inactive, the head of the frame being in section; Fig. 5, a detail view of the main presser-foot-operating lever, showing the two extreme positions of the same; Fig. 6, an enlarged detail in plan showing the auxiliary presser member used in the

machine shown in Figs. 1, 2 and 4; Fig. 7, an enlarged elevation of a part of the working end of the machine, in which appears a different auxiliary presser-foot from that previously illustrated, and, Fig. 8, an enlarged side view of a portion of a cutter, showing to better advantage than in the other views how the teeth are arranged relative to each other.

Similar figures refer to similar parts throughout the several views.

The frame of the machine shown in the drawings consists of a bed-plate 1 with two uprights 2 and 3 at the ends, the upright 3 being continued upward and over the bed-plate and the upright 2 in the form of an arm 4 which terminates at its free end in a head 5 having two lugs 6 at the back side. A flat horizontal table 7 is supported by the uprights 2 and 3 and projects a little beyond the face of the frame at the left-hand end. Two more uprights 8 having a connecting base 9 are mounted on the bed-plate 1 at the rear, said base being suitably fastened to said bed-plate. A shaft 10 is journaled in the uprights 2 and 3, and tight on the end of this shaft which extends beneath the projecting end of the table 7 is a serrated feed roll 11 which revolves at the top through a slot 12 in such end of said table, while tight on the opposite end of said shaft is a driving pulley 13 for the shaft and feed-roll. The pulley 13, like the feed-roll 11 is outside of the frame. The feed-roll is large enough to extend slightly above the table 7 so as to enable it to act on the material being scored, in the manner presently to be explained.

Mounted to swing up and down at its front end, on a shaft 14 supported by the uprights 8, is a bearing-arm 15 for a shaft 16, such shaft 16 being above and parallel with the shaft 10. Tight on the end of the shaft 16 which is over the upright 2 is a cutter 17, the exact location of such cutter being above the table 7 inside of the vertical plane of the right-hand side of the feed-roll 11 and inside of the head 5 which latter extends to the left over said feed-roll. The shaft 16 with its cutter 17 is driven by means of a pulley 18 tight on such shaft. The shaft 16 is also provided with a loose pulley 19. The pulley 13 and either the pulley 18 or 19 are connected by belts (not shown) with suitable driving mechanism. The arrows in Fig. 4

indicate the directions of rotation of the feed-roll and cutter. While the cutter 17 might possibly be made out of one piece of stock, I prefer to use for its construction a number of thin serrated disks, four being employed in the present instance, although there might be more or less than that number, and to arrange them in proper order, that is, with the teeth of one, the right-hand disk for example, slightly in advance in the direction of rotation of those of the next or second disk, with the teeth of the second disk slightly in advance of those of the third, and with the teeth of the third slightly in advance of those of the fourth, as shown. By having the cutter teeth arranged in this manner I avoid the harsh action on and probable consequent ruin of the felt which would result if a cutter provided with continuous teeth, or, in other words, with teeth that extend from side to side of the cutter in unbroken lines like the teeth of an ordinary machine cutter, were employed. The cutter 17, therefore, has teeth the width of any one of which is less than that of the cutter, and which are arranged out of lateral alinement with each other, or at least so that no two contiguous teeth will be in alinement. The disks, which together constitute the cutter 17, are held securely on the shaft 16 by and between a collar 20 tight on said shaft and a nut 21 and washer 22, this terminal of the shaft being screw-threaded to receive said nut.

An adjustable rest, in the form of a screw 23 tapped into a post 24 on the table 7, is provided for the front or free end of the bearing-arm 15, such rest being situated under one of the bearings which said arm affords for the shaft 16. A lifting lever 25 is pivoted at 26 to the upright 3 inside thereof and has its rear or upper end, according to the position of said lever, in engagement with or ready for engagement with the under side of the adjacent bearing of the arm 15 for the shaft 16. The lever 25 is so positioned and that part of said lever that engages with the bearing-arm 15, that is to say, the head or cam-end of such lever, is so shaped that said bearing-arm is raised when the free end of said lever is elevated, and lowered when such end of the lever is depressed, and it is in this way that the cutter 17 is placed in operative position and removed from such position. In Fig. 3 the lever 25 is shown in its elevated position in full lines and in its depressed position by dotted lines. When lowered the bearing-arm comes to rest on the head of the screw 23 and is thus supported together with the shaft 16 and the rotary members on said shaft including the cutter 17, and in this manner the depth of the cut which said cutter will make in the material between it and the table 7 is determined, such depth

being regulated or increased or decreased by turning said screw up or down a trifle as may be required. The force of gravity which retains the bearing-arm down on the screw 23 or on the lever 25 may be augmented by a spring 27 attached at the bottom to the bed-plate 1 and at the top to said arm. A guide 28, for the edge of the hat brim, is fastened on the table 7 crosswise thereof, a short distance to the right of the cutter 17, by means of a slide 29, slotted at 30—30 and screws 31—31 which pass through said slots into threaded engagement with said table. The slotted slide 29 and the screws 31 permit the guide 28 to be adjusted so as to locate it nearer to or farther from the cutter and thus determine the distance of the cut from the edge of the brim. A fragment of a felt hat brim is represented at 32, and a channel, made and being made therein by the cutter 17, at 33, in the first two views.

The hat brim is forced against the feed-roll 11 by a yielding presser-foot 34, presently to be described, and against the table 7 by either of two yielding, auxiliary presser-feet 35 and 36. The auxiliary presser-foot 35 is preferably employed when the brim is to be channeled, as at 33, and the presser-foot 36 when said brim is to be rabbeted, although said presser-foot 36 might be used in the first case, if desired, that is, in place of the other. Either of these auxiliary presser-feet is designed to hold down on the table that portion of the brim that is immediately adjacent or contiguous to the guide 28. The presser-foot 35 is situated between the guide 28 and the cutter 17 when down in operative position, and is held with a yielding pressure through the medium of a bow spring 37, and a rod 38 which extends from the right side of said presser-foot, through a slot 39 in the top of said guide, and under the free terminal of said spring. The spring 37 has its forward end fastened to the top of the slide 29. The presser-foot 36 consists merely of a bow spring rigidly attached to the left side of the guide 28, the lower, free terminal of such spring bearing on the table or on the brim immediately adjacent to the place where the cutter acts on said brim, but behind such place in the direction of travel of the brim, although on the front part of the table, as shown in Fig. 7.

The shank of the presser-foot 34 is secured to the base of a rod 40 arranged to move up and down in the lugs 6 on the head 5. A lifting lever 41, for the rod 40 with its presser-foot, is pivoted at 42 to the back side of the upper lug 6, and the head or cam-end of such lever is so constructed and arranged that it acts on a dog 43 projecting backward from said rod above said upper lug to raise the rod or to permit the

same to descend, accordingly as the free end of said lever be swung upward into the position shown by full lines in Fig. 5 or swung downward into the position indicated by dotted lines in such view. To afford the necessary yielding force with which the presser-foot 34 is held down or tensioned downward, and to make provision for regulating such force, I provide a plunger 44 with which the rod 40 is connected by means of a horizontal pin or screw 45, an adjustable plug 46, and a spiral spring 47, a vertical passage 48 being provided in the head 5 for the accommodation of said plunger, plug, and spring. The connecting screw 45, for the vertically-movable members 40 and 44, extends through and plays up and down in a slot 49 in the rear wall of the passage 48. The plunger 44 is in the lower terminal and the plug 46 in the upper terminal of the passage 48, with the spring 47 between them. A set-screw 50 is tapped into the front side of the head 5 at a sufficient height to engage the plug 46 and retain it in place wherever it may be adjusted. By loosening the set-screw 50, moving the plug 46 up or down and then retightening said set-screw, the tension of the spring 47 is decreased or increased accordingly. A curved guard 51 may be provided in front of the cutter 17 to prevent the thin particles produced by the action of said cutter on the felt from flying into the face of the operator, such guard being pivotally attached to the arm 4 so that it can be swung up out of the way when necessary.

In practice, assuming that the brim 32 is to be channeled, some part of the brim is placed on the table 7 and forced under the auxiliary presser-foot 35 or 36, whichever is used, with the edge against the guide 28, while the main presser-foot 34 and the cutter 17 are in their elevated positions, and then the lever 41 and the lever 25 are swung downward on their pivots respectively to let down said presser-foot 34, to hold said brim firmly on the feed-roll 11, and said cutter onto the brim, the screw 23 having previously been adjusted to receive the bearing-arm 15 at the proper height to allow the cutter to cut into the brim as deep as is desired. The revolving members which act on the brim now feed it toward the back of the machine and at the same time cut the channel 33, the major portion of the hat being supported by the hand of the operator. When the brim has completed its circuit the lever 25 is turned up to elevate the cutter 17 into its inactive position, and the lever 41 is turned up to elevate the presser-foot 34. The brim is now drawn from beneath the auxiliary presser-foot, and another brim is placed in position for a repetition of the operations just described.

At the end of the cutting operation, or,

in other words, after the brim has been fed through the machine in a more or less circuitous direction, according to the shape or outline of such brim, with the edge of said brim always against the guide 28, it will be found that the channel 23 extends all the way around the brim and that it is equidistant at all points from such edge. When the auxiliary presser-foot 35 is employed, as is usual for cutting the channel 33, such foot bears on the brim 32 between the edge of the same and the part that lies outside of such channel or of the course of such channel. If the cut in the brim is to extend clear to the edge thereof to form a rabbet, then the guide 28 must be moved to the left until it barely clears the cutter 17 when down, and the auxiliary presser-foot 36 is substituted for the presser-foot 35. By changing the width of the cutter I am able to correspondingly change the width of the channel or rabbet made by the cutter in the brim. The cutter 17 revolves at a much greater speed than the feed-roll 11, as the result of belting the pulleys 18 and 13, the latter being considerably larger than the former, to pulleys (not shown) of equal diameter on the main driving shaft, for example, hence said feed-roll in its capacity as a feeding or actuating member for the brim necessarily checks the too rapid movement on the part of said brim which said cutter has a tendency to impart to it. Without the slower revolving feed-roll the cutter itself would actuate the brim with great rapidity and would fail to properly act on the brim to remove the necessary amount of stock therefrom. The presser-foot 34 can be elevated, without the aid of the lever 41, by grasping that part of the rod 40 which extends above the upper lug 6 and raising said rod against the force of the spring 47. The spring 47 exerts its force on the plunger 44 to depress the rod 41 through the medium of the screw 45, as has been explained.

Obviously the machine is subject to numerous modifications which do not affect the essential features thereof or go outside of the scope of the invention.

What I claim as my invention, and desire to secure by Letters Patent is—

1. A fabric-reducing machine, for felt hats, comprising a fixed table having a slot therein and provided with a guide for the edge of a hat brim, a revoluble serrated feed-roll below said table but operating through said slot to act on said brim from below, a vertical revoluble cutter above said table and adapted to act on said brim from above, said cutter being out of line with said feed-roll, means to rotate said cutter at a greater speed than said feed-roll, and yielding means to press said brim onto said table and feed-roll

2. In a fabric-reducing machine for felt

hats, a table, a cutter, a guide on said table for the edge of a hat brim, adjustable means for said guide whereby the latter may be located nearer to or farther from said cutter, a yielding presser-foot connected with the guide for such brim, and feed mechanism for the brim.

3. In a fabric-reducing machine for felt hats, a table, a pivotally-mounted downwardly-tensioned bearing-arm, a rest for such arm, an operating lever for such arm, a shaft journaled in and entirely supported by such arm, a cutter on said shaft above said table, and feed, guide, and presser members for the brim of a hat on the table, such members being adapted to act on the brim while it passes beneath said cutter.

4. In a fabric-reducing machine for felt hats, a table, a pivotally-mounted downwardly-tensioned bearing-arm, a post on such table and a screw tapped into said post to form an adjustable rest for such arm, an operating lever for such arm, a shaft journaled in and entirely supported by such arm, a cutter on said shaft above said table, such cutter having teeth, of less width than the width of the cutter, arranged side by side and out of line with each other laterally, and feed, guide, and presser members for the brim of a hat on the table, such members being adapted to act on the brim while it passes beneath said cutter.

5. The combination, in a fabric-reducing machine, with a table, of a slide provided with a slotted guide adjustably mounted on said table, a spring attached to said slide, a presser-foot lying alongside of the guide and having a rod which extends through the slot in said guide and beneath said spring.

6. The combination, in a fabric-reducing machine, with a frame having a head and provided with a table, and a feed-roll in operative relation to the work on said table, of a rod and a connected plunger arranged parallel with each other in said head, such rod and plunger being adapted to move up and down, an adjustable plug in the head above said plunger, a set-screw tapped into the head to engage such plug, a spring between said plug and plunger, a cam-lever pivotally mounted on the head, a dog extending outward from the rod over the cam-head of said lever, the arrangement being such that said cam-head engages said dog, when the lever is thrown up, and the rod is elevated against the resiliency of said spring, and a presser-foot attached to said rod and adapted to bear on the work engaged by said feed-roll.

ELISHA L. WALES.

Witnesses:

A. C. FAIRBANKS,
F. A. CUTTER.