

J. E. SNEVELY.  
BRUSH MAKING MACHINE.  
APPLICATION FILED JUNE 19, 1907.

913,314.

Patented Feb. 23, 1909.

4 SHEETS—SHEET 1.

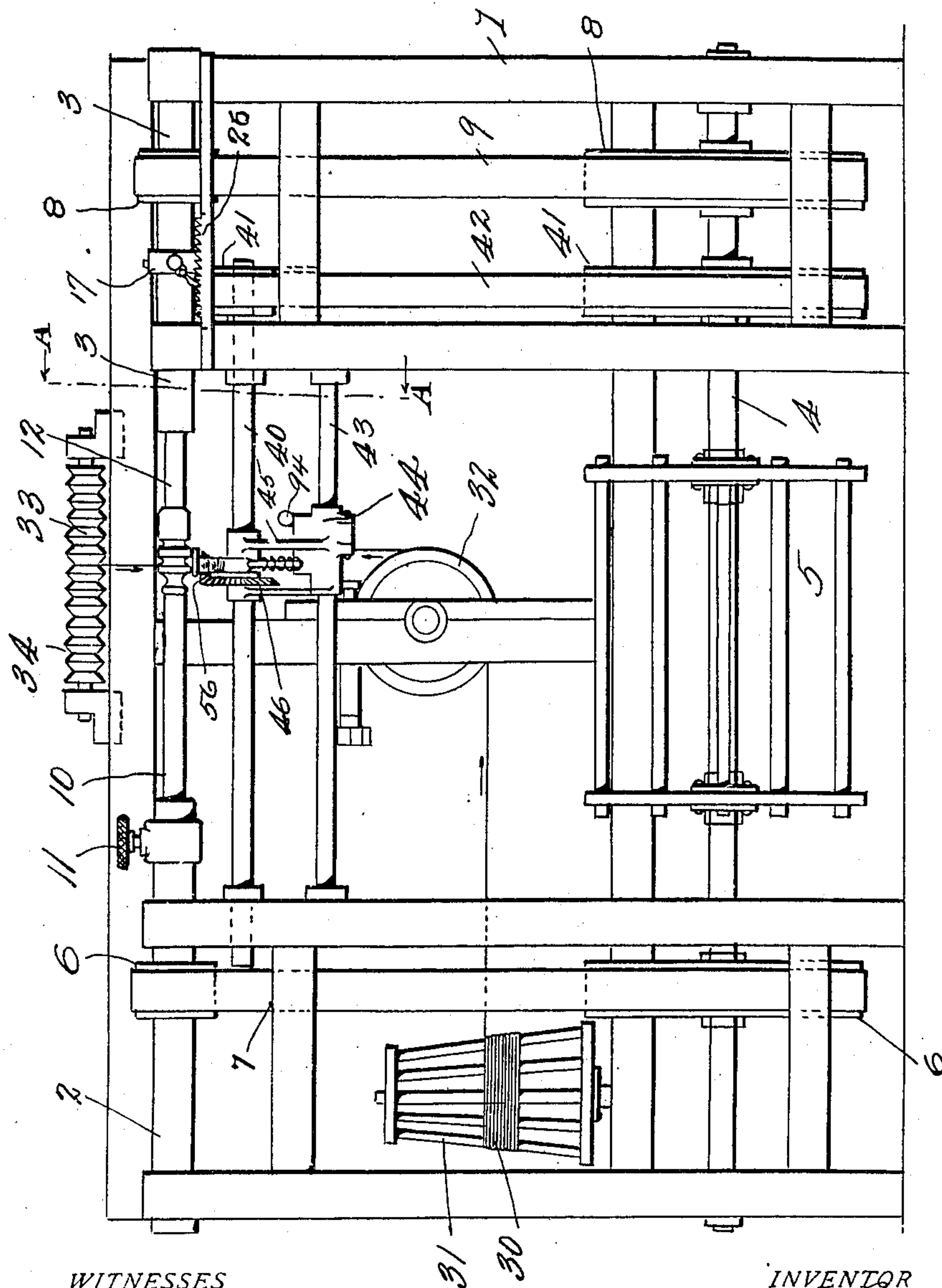


FIG. 1

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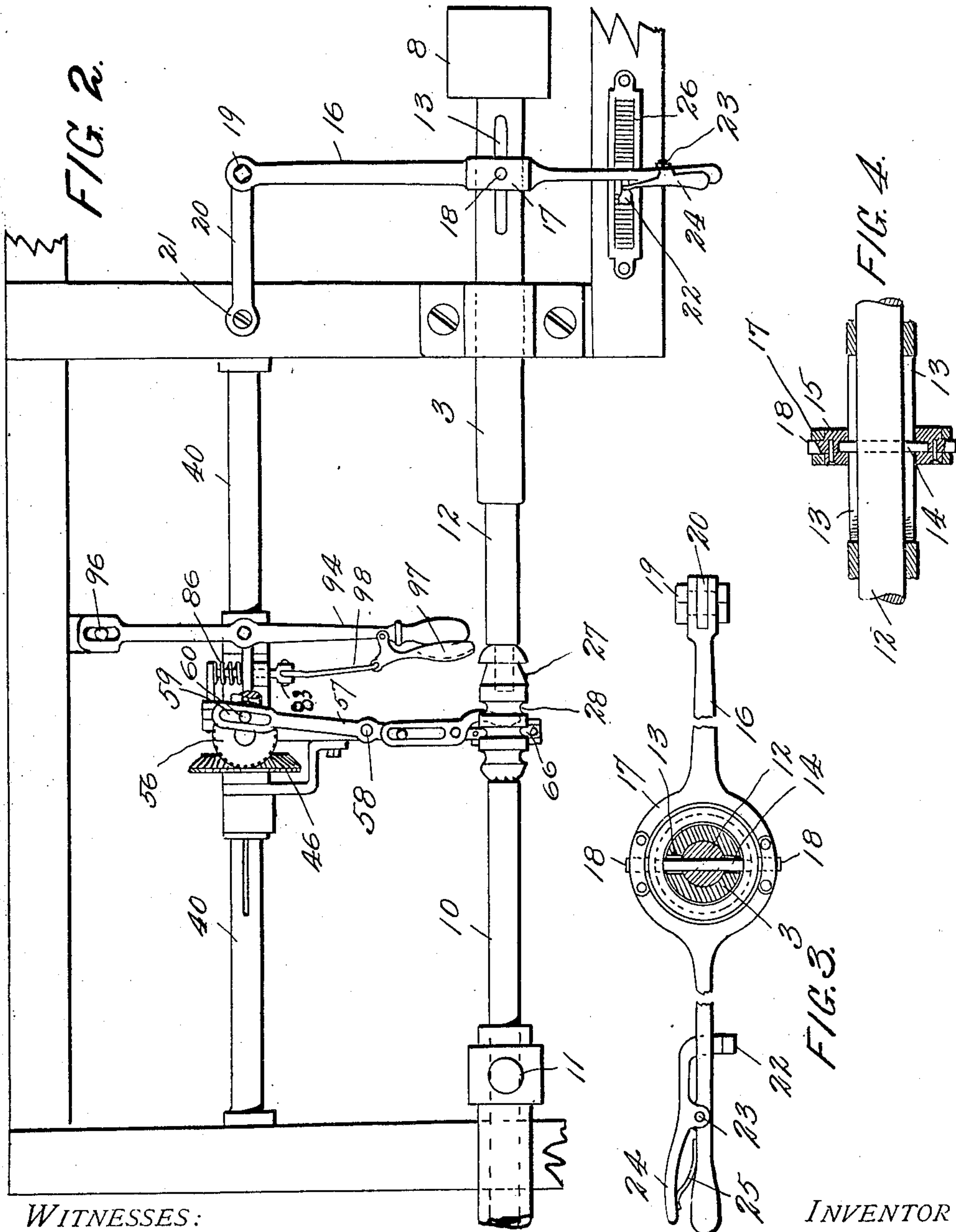
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

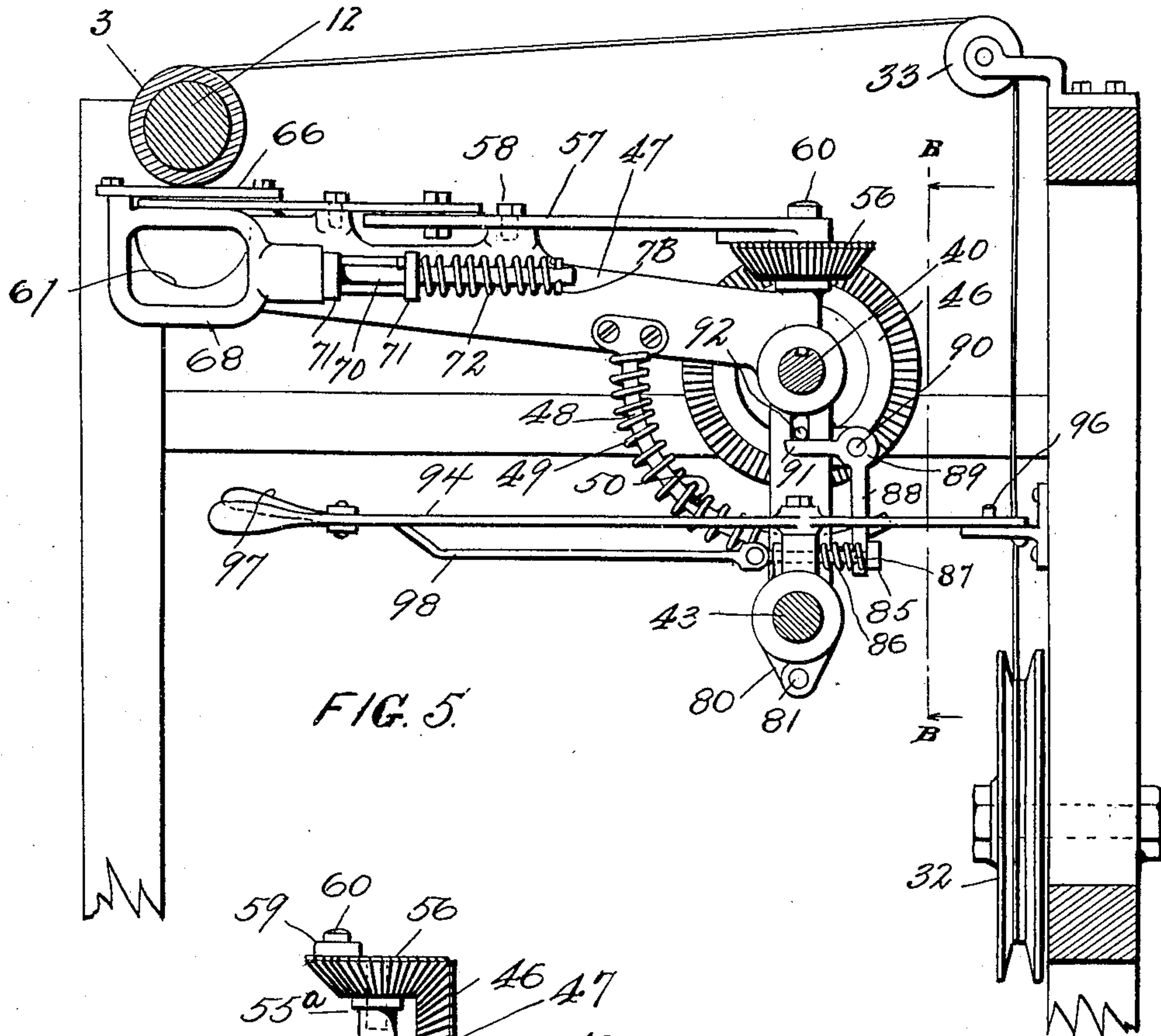


FIG. 5.

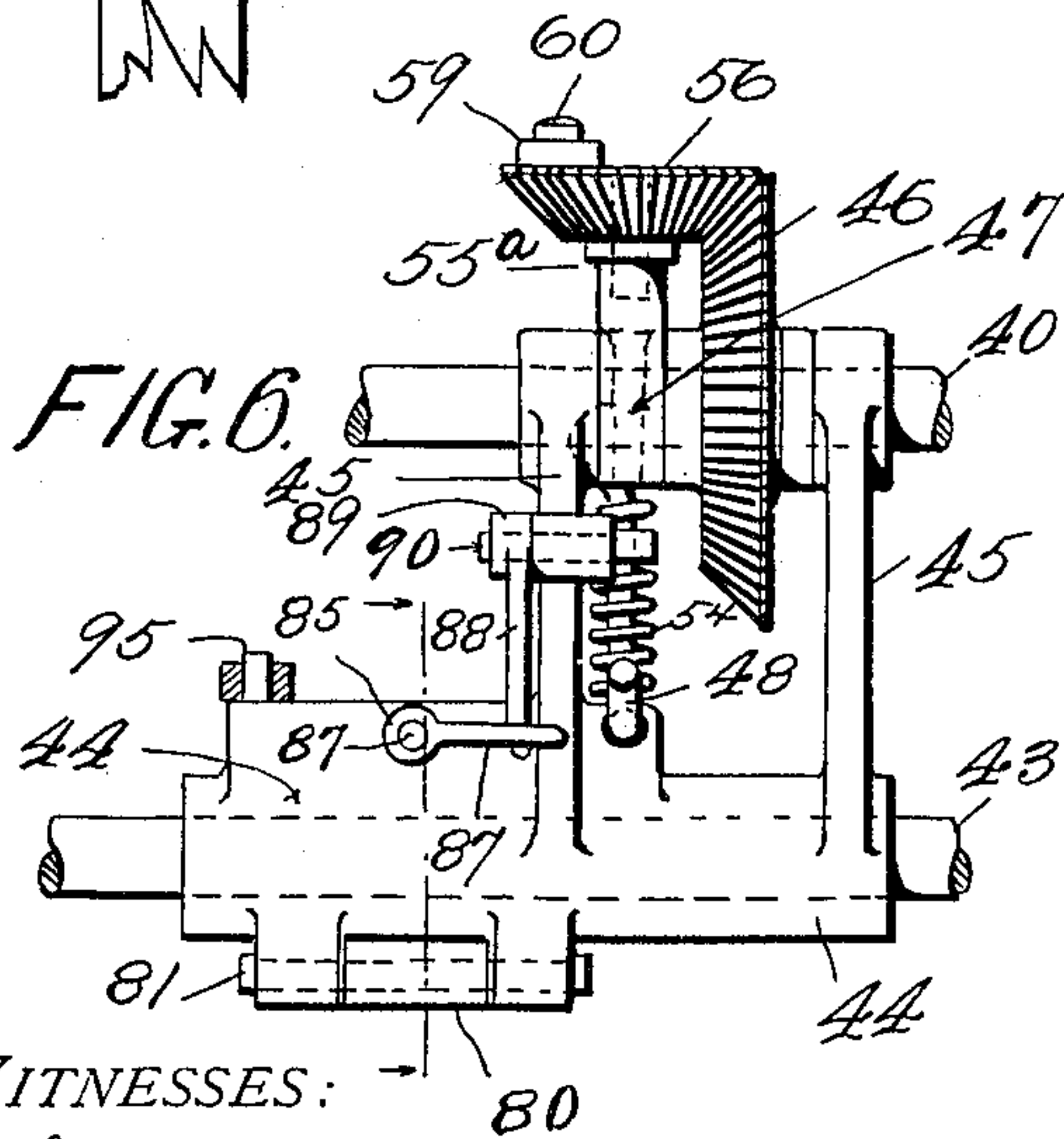


FIG. 6.

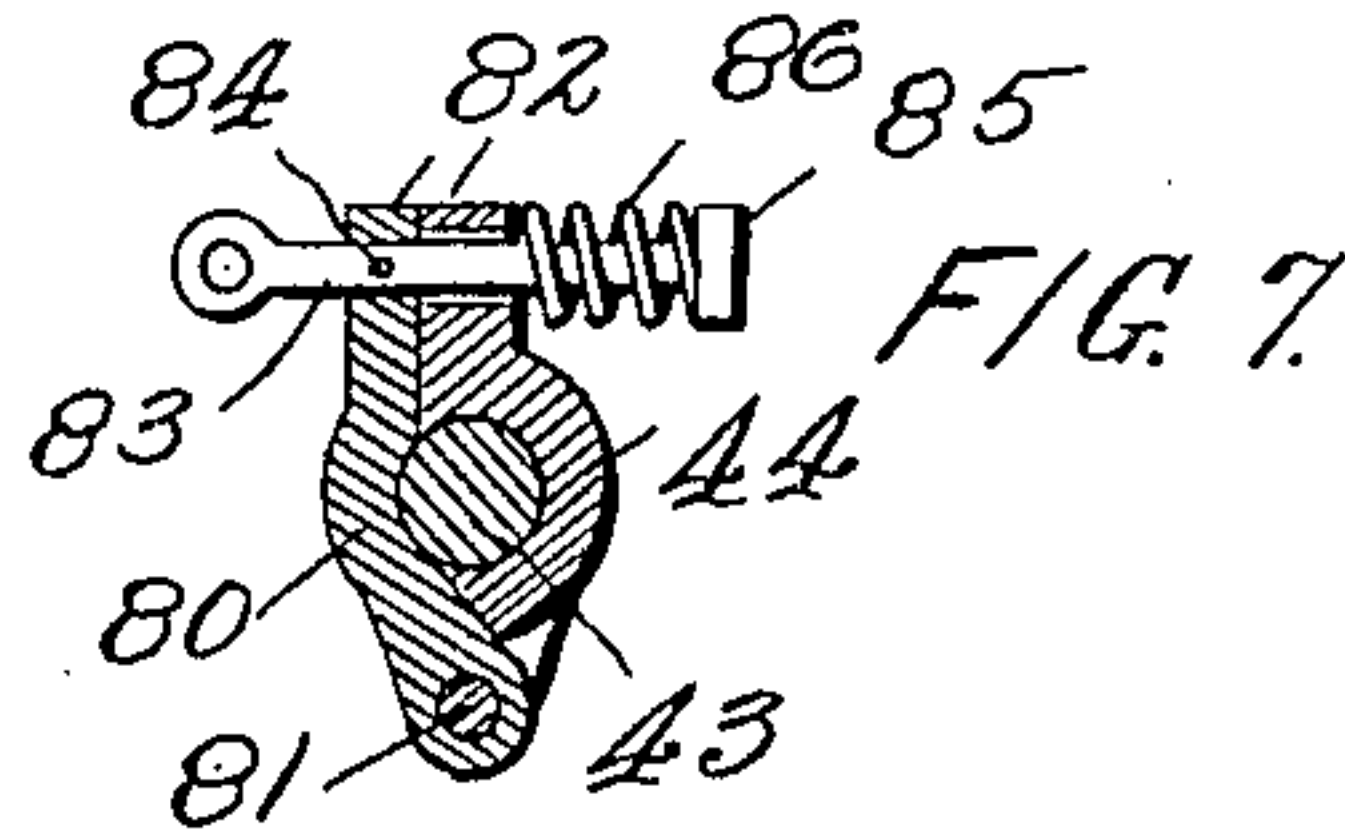


FIG. 7.

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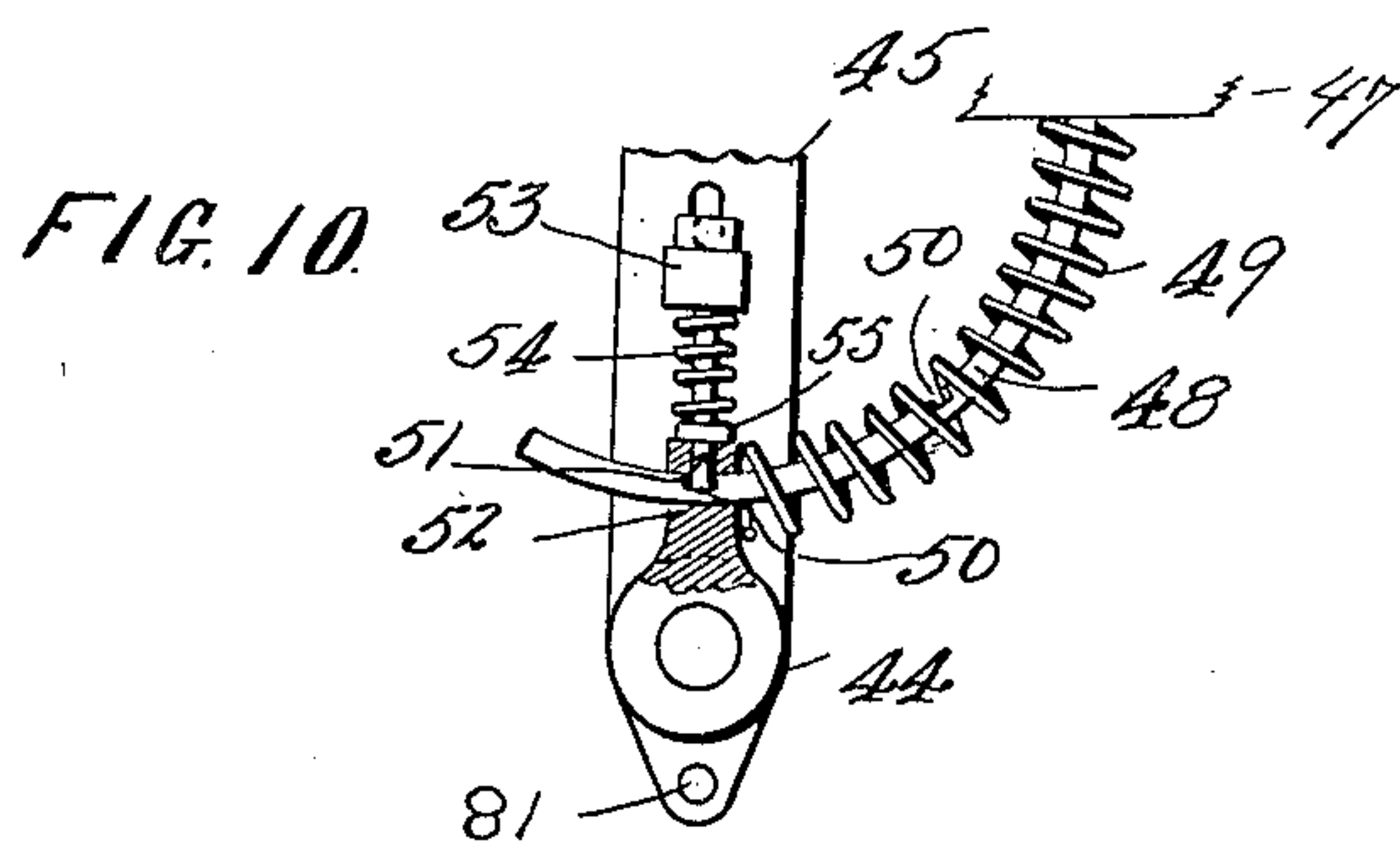
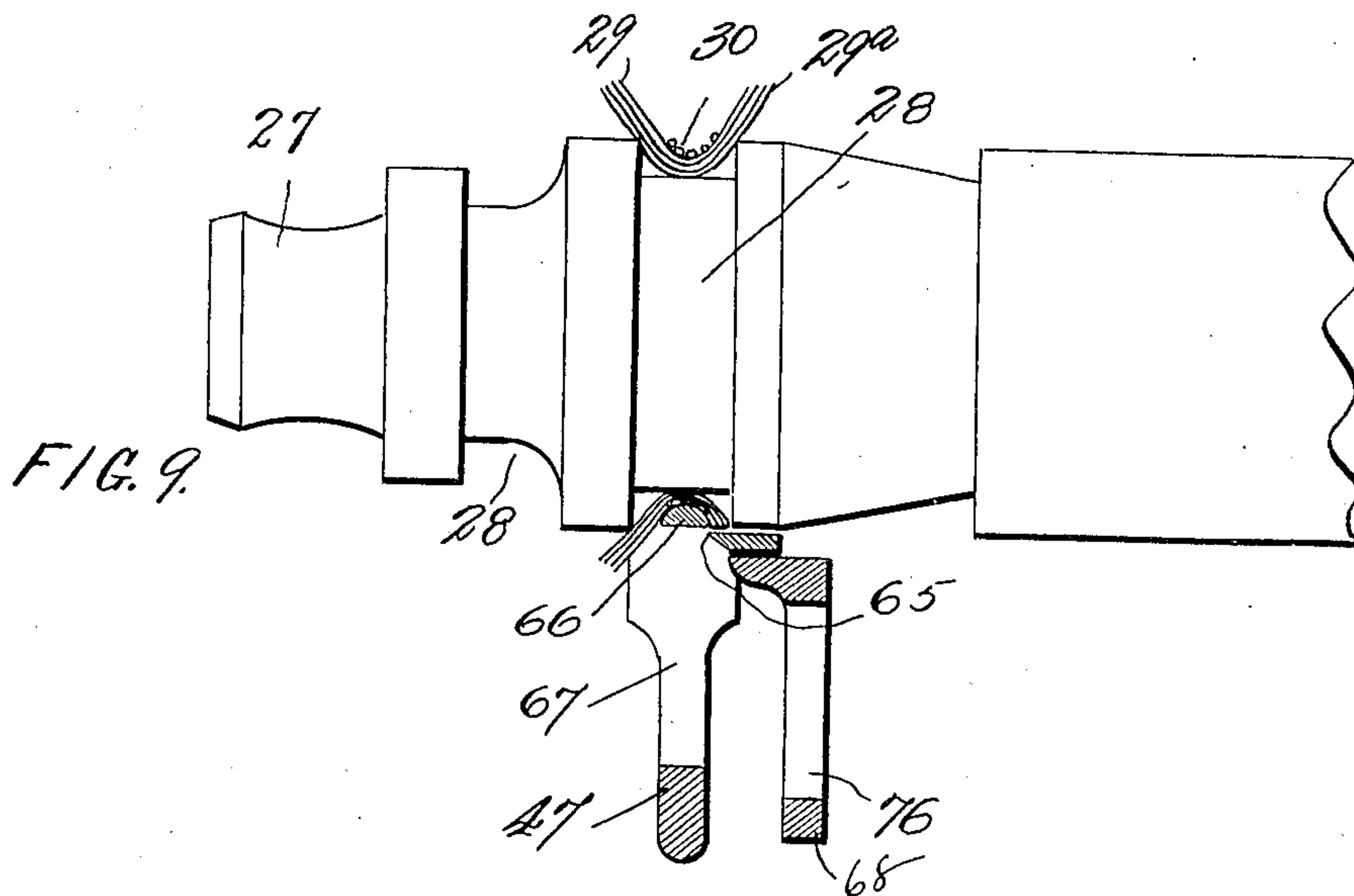
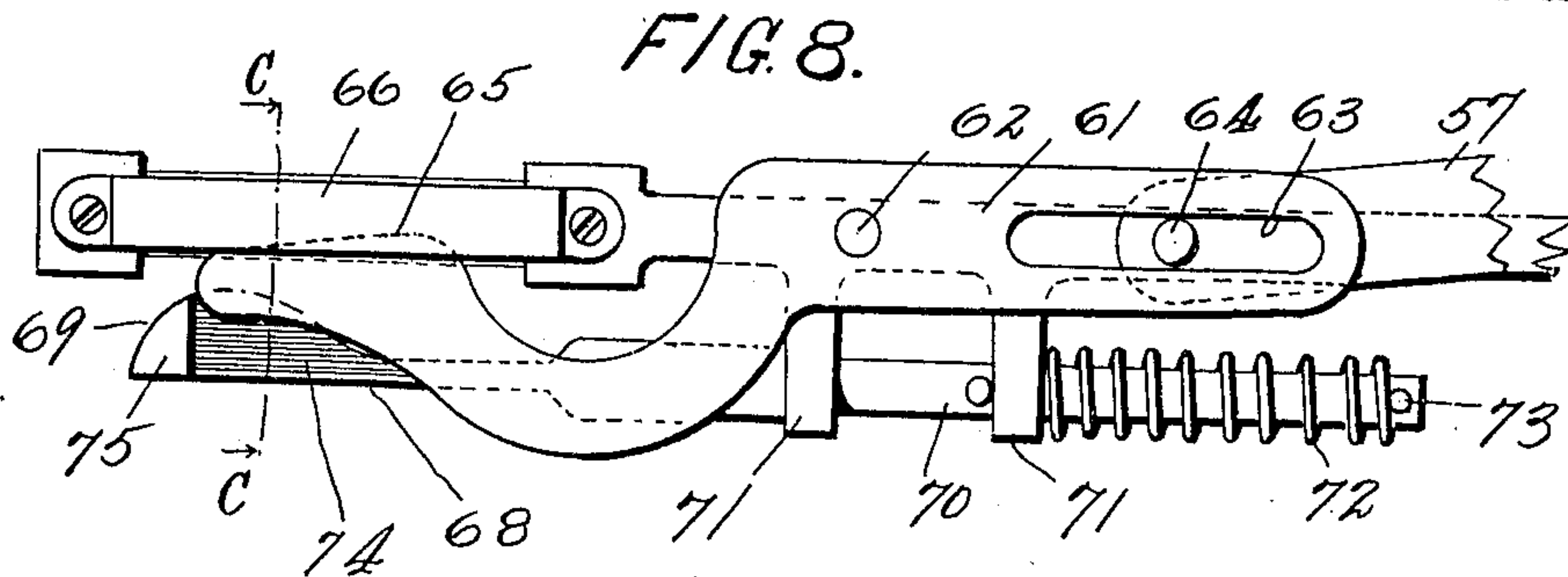


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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

JAMES E. SNEVELY, OF SALT LAKE CITY, UTAH.

## BRUSH-MAKING MACHINE.

No. 913,314.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed June 19, 1907. Serial No. 379,723.

*To all whom it may concern:*

Be it known that I, JAMES E. SNEVELY, a citizen of the United States, residing at Salt Lake City, in the State of Utah, have invented a new and useful Brush-Making Machine, of which the following is a specification.

The invention relates to machines for making brushes and especially feather dusting brushes.

Among the objects of the invention are to provide means for readily inserting, adjusting and removing brush heads to be operated upon and to provide power-operated means for clipping off the ends of quills after the feathers are mounted on the brush heads.

The foregoing and other characteristics and advantages of the invention will be hereinafter fully set forth in connection with a detailed description of the accompanying drawing, which illustrates an exemplifying structure embodying the invention.

Figure 1 is a front side elevation; Fig. 2 a partial plan view on an enlarged scale; Fig. 3 a detail of the tail-stock adjusting lever, partly in section; Fig. 4 a longitudinal section through the tail-stock and spindle, showing the shifting collar; Fig. 5 a vertical section on line A—A, Fig. 1; Fig. 6 a detail view from the position indicated by section line B—B, Fig. 5; Fig. 7 a detail cross-section of the clamp for the cutter-carrier; Fig. 8 a detail enlarged view, in plan, of the cutter and guide; and Fig. 9 a detail vertical section at C—C, Fig. 8.

Reference numeral 1 designates the frame, carrying spindles 2—3 for the head and tail-stocks respectively. Near the bottom the frame carries shaft 4, on which is mounted the horizontally-spoked drum 5. This drum provides a foot drive for the machine, but can, if desired, be replaced by a power drive pulley. Pulleys 6 and belt 7 connect spindle 2 revolubly with the driving shaft, and pulleys 8 and belt 9 similarly connect spindle 3 with the driving shaft. The head-stock 10 is slidably mounted within its spindle and secured in adjusted position by hand-nut 11. This adjustment is for bringing the brush head in convenient relation to the winding mechanism, as will hereafter appear. Ordinarily when working on a given size of brush the head-stock is not disturbed, the brush heads being inserted and removed by moving the tail-stock, as will appear.

The tail-stock 12 (see Figs. 2 and 4) telescopes in spindle 3, the latter being slotted on opposite sides at 13. A pin 14 passes through a hole in the tail-stock. Collar 15 surrounds the spindle and has sockets receiving the ends of pin 14. Shifting lever 16 has a ring 17 formed at about its center. This ring is engaged by trunnions 18 on collar 15. The inner end of the lever is pivoted at 19 to link 20, in turn pivoted to the frame at 21, and the outer end of the lever is provided with a pawl 22, pivoted to the lever at 23, and having a hand-piece 24 pressed outwardly by spring 25 to hold the pawl in engagement with a ratchet 26. The brush head 27 is held between the head and tail-stocks, which are provided with suitable jaws to rotate the head.

In inserting a brush head lever 16 is moved to the right, as in Fig. 2, by depressing hand-piece 24 and withdrawing pawl 22 from the rack, thus moving tail-stock 12 away from head-stock 10. The brush heads are usually bored to receive the brush handles, and the bored end is placed over the end of the tail-stock and the latter then moved to the left until the brush head is brought into engagement with the head-stock at its other end. By releasing hand-piece 24 the lever is locked in position, and upon rotation of the driving-shaft 4 the brush head is rotated.

The brush heads are provided with grooves 28, in which the quills 29 of the feathers are bound by one or more turns of wire or strands of other material 30 (see Fig. 9). The wire is carried in a coil on spool 31, passes over idler pulley 32 and guide roll 33 at the top of the frame, which has any desired number of grooves 34, over which the wire is run to direct it to the desired groove of the brush head. The wire is nailed or otherwise suitably connected to the brush head at the start, and the head being then rotated the quills 29 of the feathers are laid across the groove in the head and bound in position by the wire, which is run off of spool 31 by the rotation of the brush head. The wire may be cut and bound at the completion of each row of feathers, or it may run from one groove to the other until the brush is completed and be then bound by nailing or in any other suitable manner.

Heretofore brushes of this class have generally been made by hand, and it has been customary to clip off by hand the protruding



ends 29<sup>a</sup> of the quills after each row of feathers is completed. I have devised means for performing this operation automatically during the winding process, which will now be described.

Splined shaft 40 is revolvably mounted in the frame, preferably at a lower level than the brush head, and driven by means of pulleys 41 and belt 42 from the driving-shaft. Carrier shaft 43, which is irrevolvable, is carried on the frame parallel with shaft 40. Sleeve 44 of the cutter carrier is slidably mounted on shaft 43 and has two arms 45, the ends of which encircle shaft 40 and are adapted to slide upon it. Between arms 45, bevel gear 46 is feathered on shaft 40 so that it revolves with the shaft but is free to move longitudinally thereon. Also between arms 45 the inner end of cutter arm 47 is pivotally mounted on shaft 40. The cutter arm has an arc-shaped supporting rod 48, which passes through a hole in the carrier sleeve and is encircled by a helical spring 49, compressed between the arm and the sleeve, which serves to urge the cutter arm upward. Rod 48 is provided with a notch 50 adapted to be engaged by the end of the plunger 51, which is reciprocally mounted in a socket 52 formed in the carrier sleeve and a lug 53 on one of arms 45. The plunger is urged to engage the notch by spring 54, compressed between lug 53 and collar 55 on the plunger.

To remove the cutter arm from operative relation to its work, it is simply moved downward, compressing the spring 49 until notch 50 in rod 48 comes opposite the plunger, whereupon plunger 51 enters the notch under influence of its spring 54 and retains the cutter arm in depressed, inoperative position.

The shaft end of the cutter arm 47 has a lug 55<sup>a</sup> which carries revoluble pinion 56, engaging gear 46. Lever 57 is fulcrumed at 58 on the cutter arm and at one end has a slot 59 engaged by crank pin 60, carried by pinion 56. The movable cutter 61 is pivoted at 62 on the cutter arm, and has at its inner end a slot 63 which is engaged by a pin 64 carried by the outer end of lever 57. On the outer end of the movable cutter is the blade 65, the cutting edge of which rests against the flat bottom face of the fixed cutter 66, which is secured to the end of the cutter arm above the yoke-shaped depression 67. Opposite the cutter arm is a guide 68 which has a beveled end 69, between which and the fixed cutter the projecting ends 29<sup>a</sup> of the quills pass as the brush head rotates. The guide is carried by the stem 70 reciprocally mounted in lugs 71 on the cutter arm and held in the position shown in Fig. 8 by a spring 72 compressed between one of the lugs and a pin 73 carried by the stem. The upper flat face 74 of the guide provides a bottom bearing surface for the movable cutter blade, and at the end an upward projec-

tion 75 formed on the guide adjacent to the end of the movable blade serves to prevent the operator from getting his fingers into contact with the cutting apparatus.

Evidently as shaft 40 rotates gear 46 revolves, rotating pinion 56 and pin 60, which causes lever 57 to oscillate, and by means of pin 64 the movable cutter 61 is oscillated, moving the cutter blade 65 back and forth under the fixed blade 66 and shearing off the projecting ends of the quills as the brush head rotates and brings them successively to the cutter. A loop 76 formed in guide 68 affords means for grasping and retracting the cutter arm from the work.

A portion of carrier sleeve 44 is cut away at one side, and in the recess thus formed a clamping member 80 (see Figs. 5, 6 and 7) is pivoted at 81 so that it bears against shaft 43. The upper ends of the clamp and the sleeve project above the shaft as at 82 and a clamping rod 83 passes through these members, being secured to the clamp 80 by a pin 84. At its rear end the rod has a collar 85 and a spring 86 compressed between the collar and the projection of the sleeve normally urges the clamp into engagement with shaft 43 and prevents the cutter carrier from moving thereon. Collar 85 on rod 83 has a lateral finger 87, which engages one arm 88 of the bell crank 89 pivoted to one of the carrier arms 45 at 90, and whose other arm 91 underlies a finger 92, projecting from the upper end of plunger 51, through a slot in arm 45.

Shifting lever 94 for the carrier is pivoted to it at 95 and at its rear end is slotted to embrace a pin 96 carried by the frame. The lever carries a pivoted releasing member 97 connected by a link 98 with rod 83. Now supposing that the cutter arm has been depressed and is retained in depressed position in the manner which has been described, to release it hand-piece 97 on lever 94 is grasped, which pulls link 98 and rod 83; finger 87 carried by the rod engages arm 88 of bell crank 89, rotating the bell crank; the other arm 91 of the bell crank raises finger 92, carried by plunger 51, retracting the plunger from notch 50 in curved rod 48, whereupon cutter arm 47 rises to operative position with fixed cutter 66 resting against the brush head under the influence of spring 49. At the same time movement of rod 83 withdraws clamp 80 from engagement with shaft 43, freeing the carrier on its shaft, and by lateral movement of lever 94 the whole carrier and its related parts are shifted on their shafts 40-43 to bring the cutter in proper relation to the groove on the brush head on which it is desired to work.

Many obvious modifications may be made in the structure shown and described without departing from my invention.

I claim—

1. In a brush machine, the combination of



means for holding and rotating a brush head, means for continuously winding a binder on the head to secure feathers successively fed between the wire and the head with their quill ends projecting, a clipper for cutting off the projecting quill ends as the head revolves and means for adjusting the position of the clipper.

2. In a brush machine the combination of means for holding and rotating a brush head means for securing feather quills in grooves therein, and a power-driven clipper for cutting off the projecting quill ends as the brush head revolves and means for adjusting the clipper longitudinally of the brush head to correspond with different grooves therein.

3. In a brush machine, the combination of a head and a tail stock arranged to hold a brush head, a cutter drive shaft parallel to the stocks, a cutter arm carried by the cutter shaft, a cutter on the arm and means by which the cutter is driven by the cutter shaft and means for adjusting the position of the arm longitudinally in relation to the brush head means for swinging it toward and from the head and means for securing it in operative position.

4. In a brush machine the combination of

a head stock and tail stock one of which is adjustable carrying a brush head, means for rotating the head and tail stock, means for securing feather quills in annular grooves in the brush head, a cutter carrier adjustable longitudinally in relation to the brush head, a cutter arm mounted on the carrier normally in operative relation to the brush head, means for retracting the cutter arm from the brush head, and means for retaining the carrier in adjusted position in relation to the head.

5. In a brush machine the combination of a splined shaft, a driving shaft connected to rotate the splined shaft, a gear having a key engaging the splined shaft, a cutter arm slidably pivoted on the splined shaft and having a pinion engaging the gear, a cutter carried by the cutter arm and impelled by the pinion, means for retracting the cutter arm and cutter from working position and means for adjusting the cutter arm longitudinally on the splined shaft.

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