

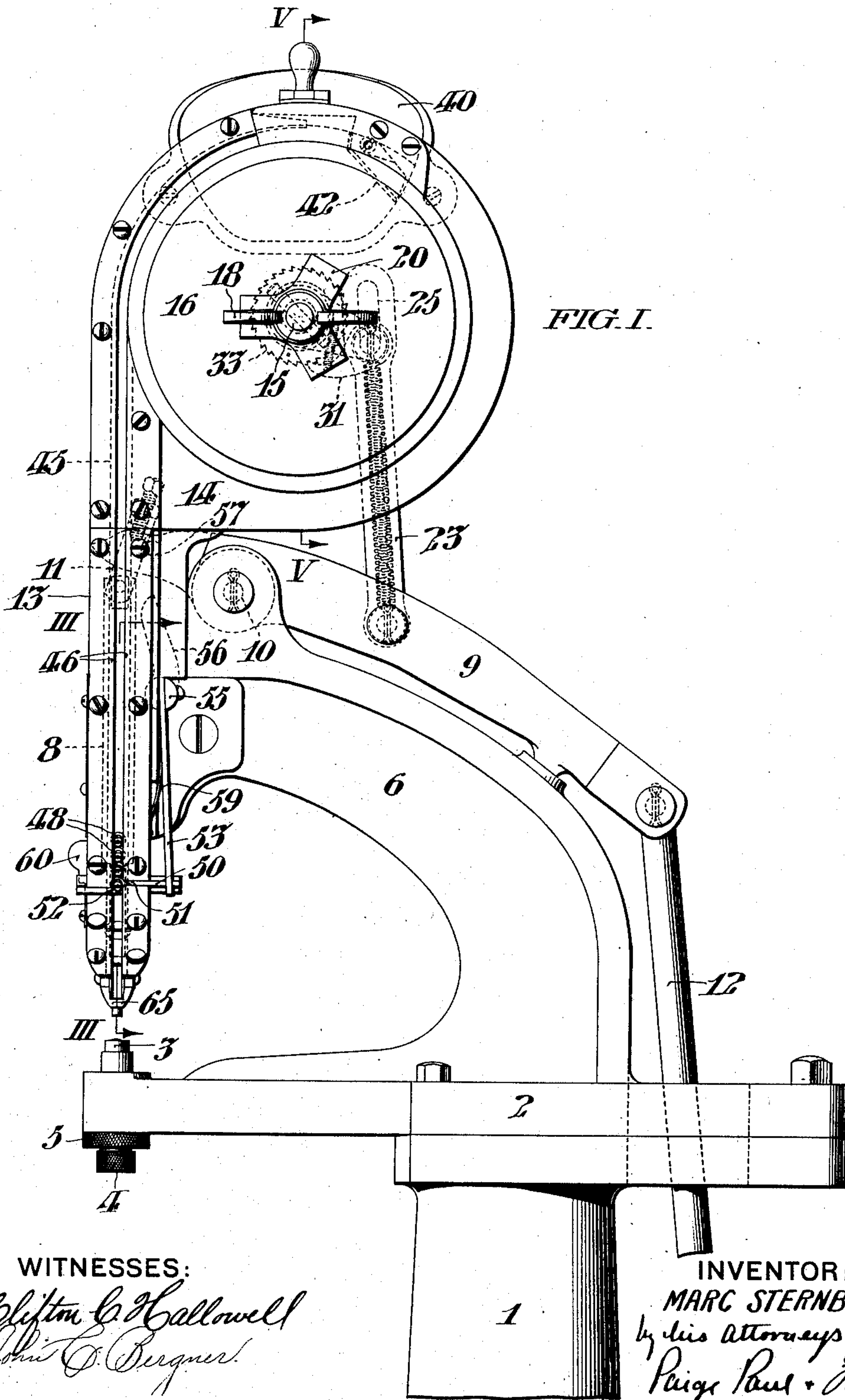
No. 865,132.

PATENTED SEPT. 3, 1907.

M. STERNBERG.
RIVETING MACHINE.

APPLICATION FILED MAY 12, 1905.

4 SHEETS—SHEET 1.



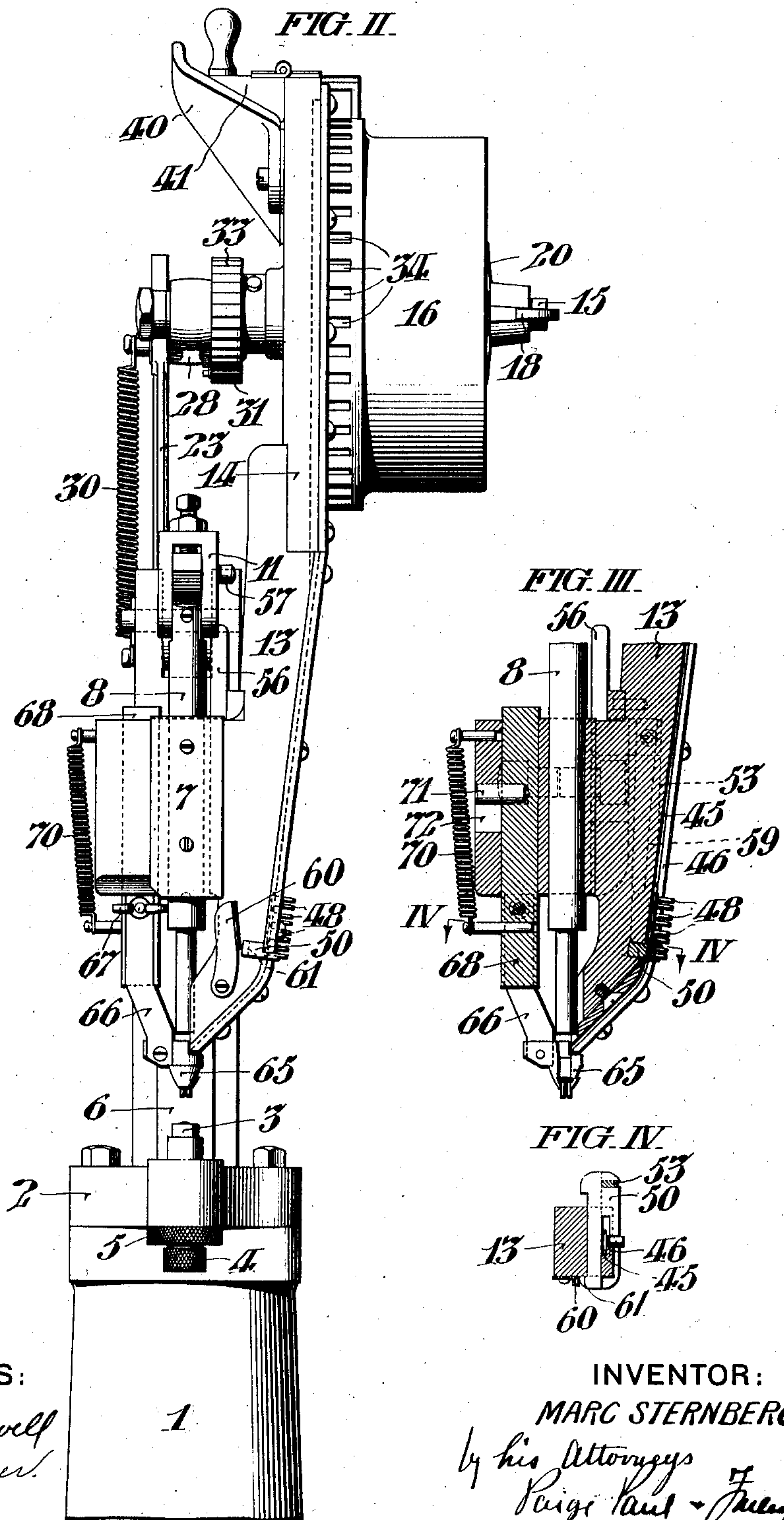
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4 SHEETS—SHEET 2.



WITNESSES:

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-4 SHEETS-SHEET 3.

FIG. V

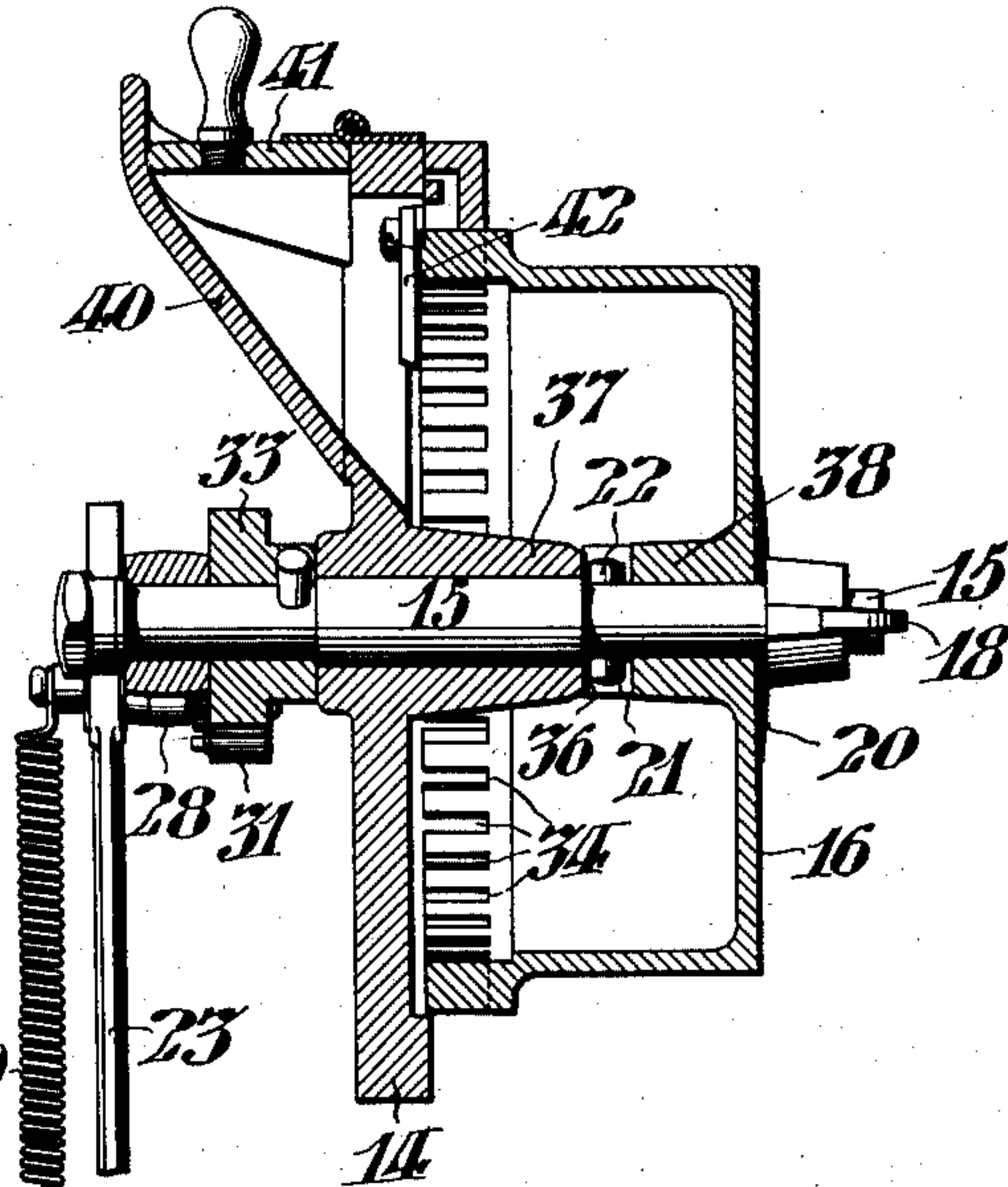


FIG. VII

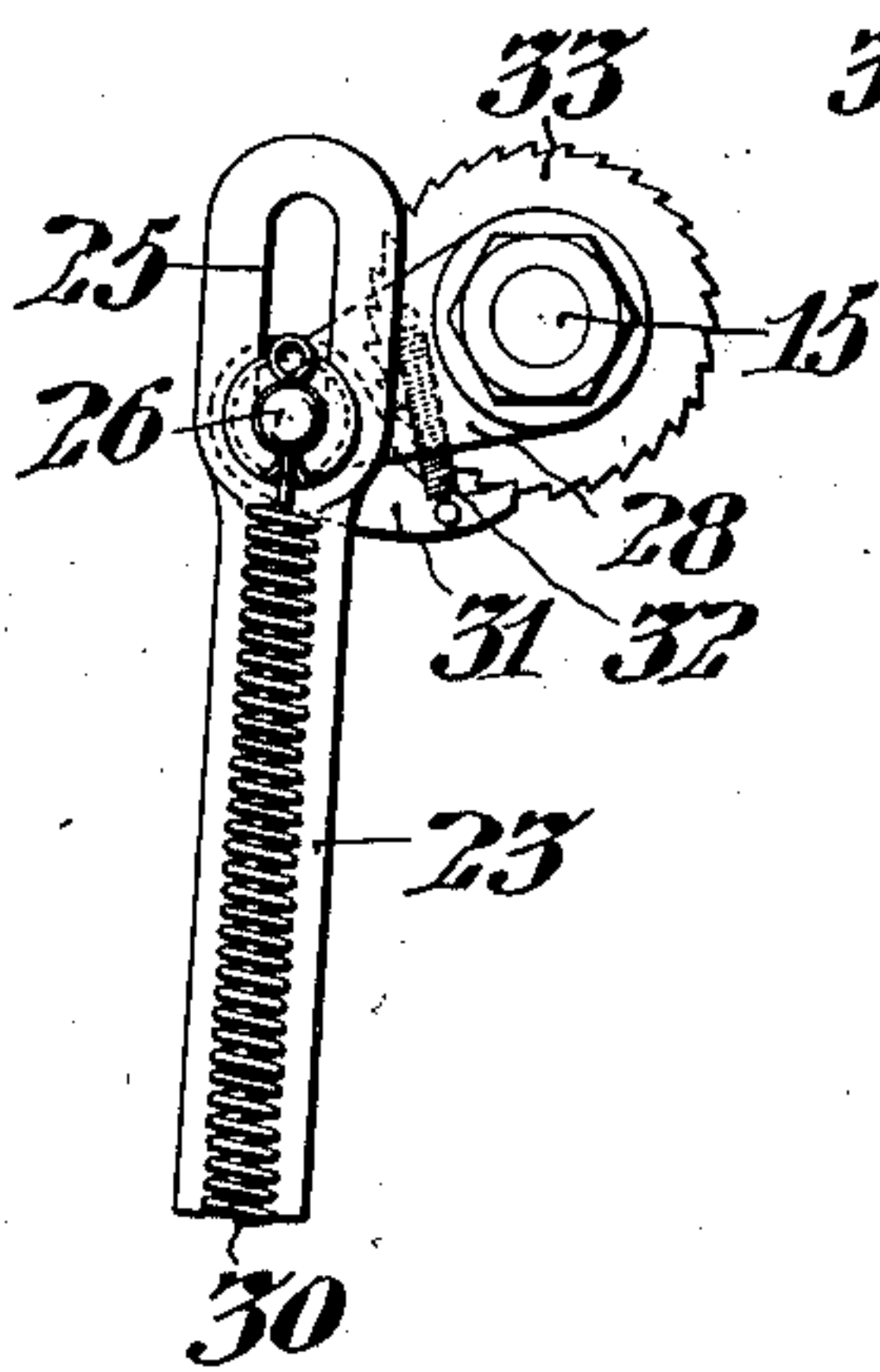
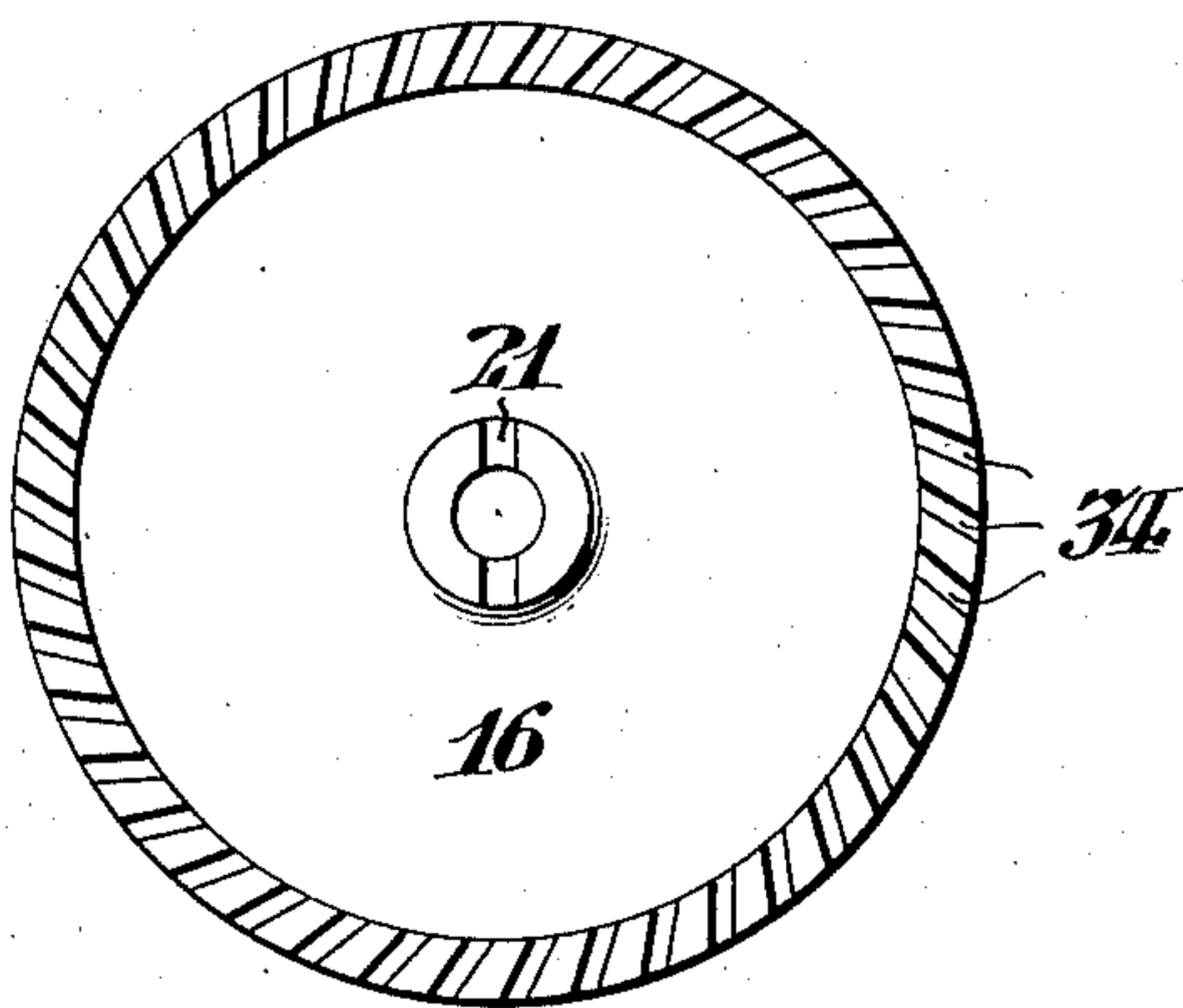


FIG. VI



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4 SHEETS—SHEET 4.

FIG. VIII.

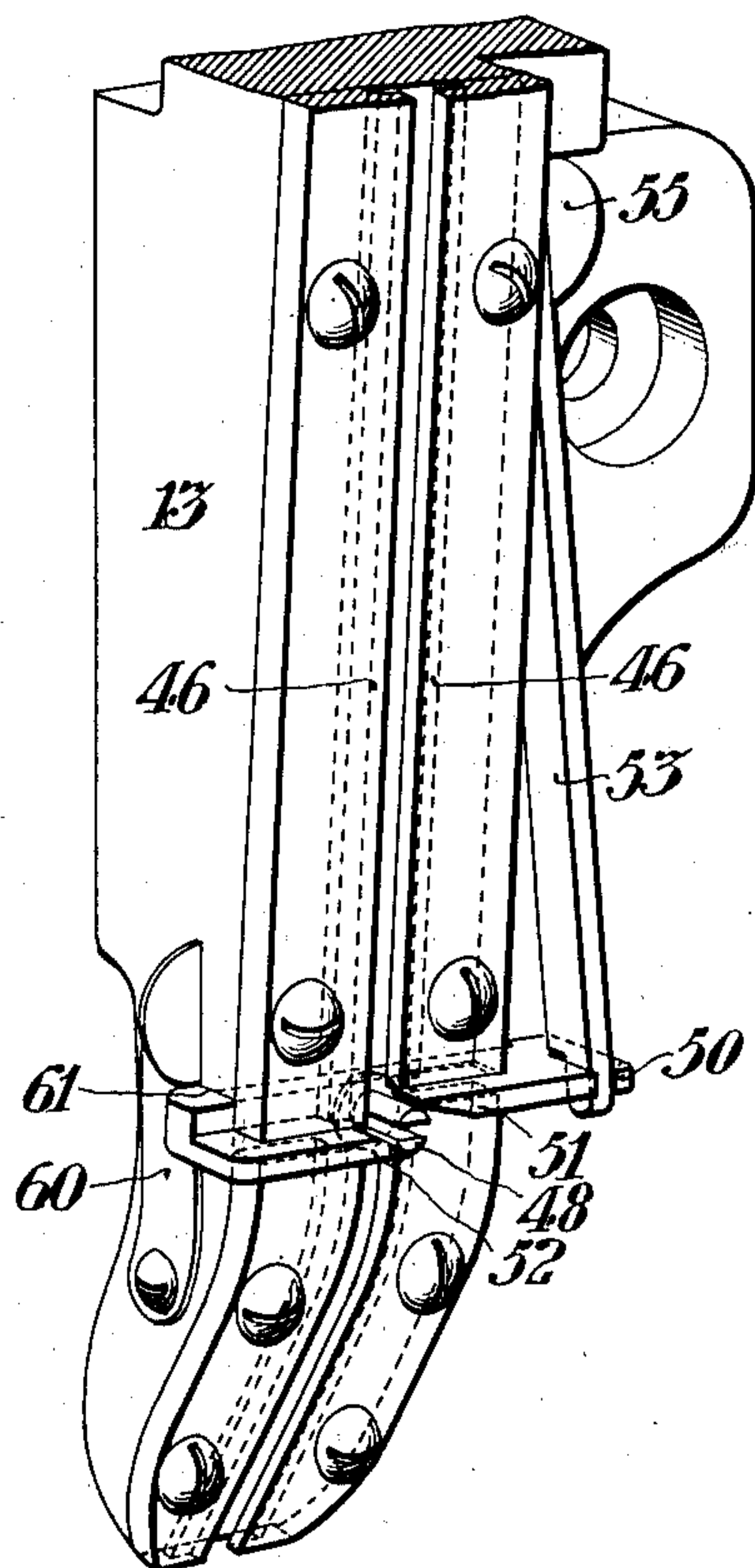
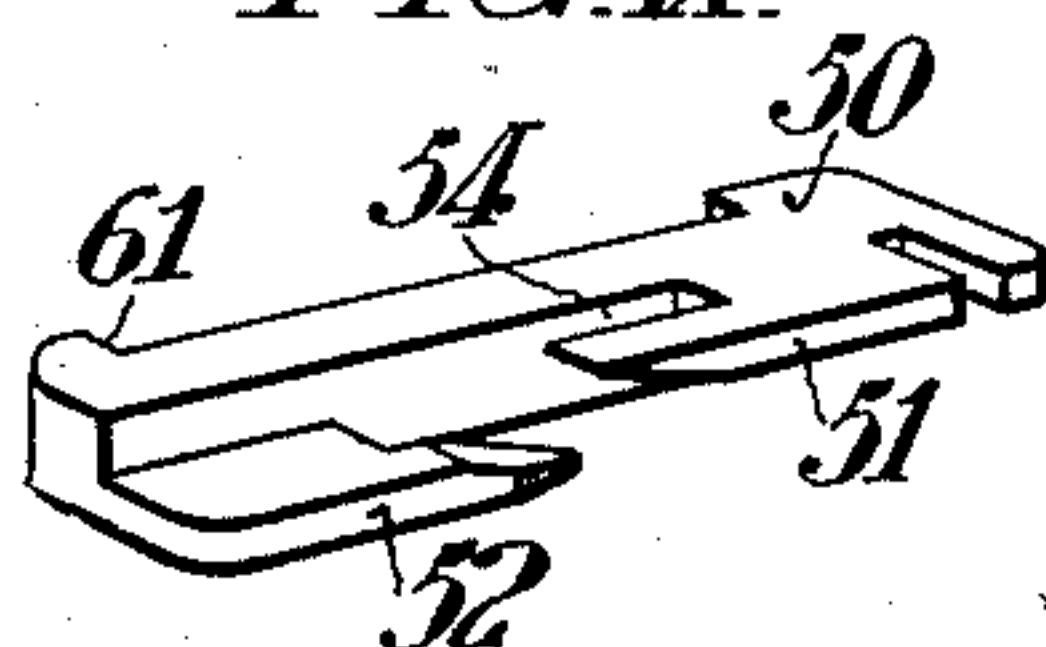
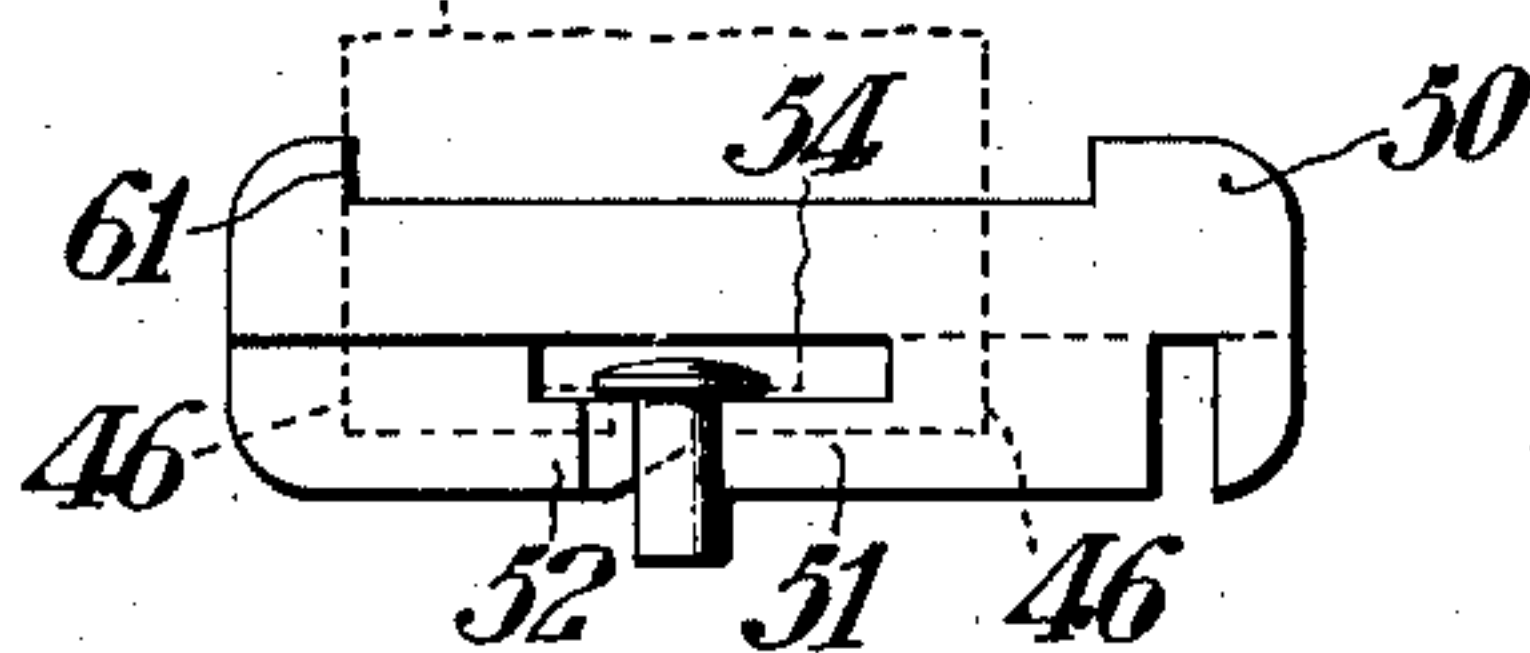


FIG. IX.



13 FIG. X.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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RIVETING-MACHINE.

No. 865,132.

Specification of Letters Patent.

Patented Sept. 3, 1907

Application filed May 12, 1905. Serial No. 260,174.

To all whom it may concern:

Be it known that I, MARC STERNBERG, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Riveting-Machines, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to machines employed for the purpose of clenching material with split rivets.

The machine is of the anvil and plunger type comprising a rotary hopper with race and feed, a reciprocatory plunger, and a bifurcated finger by which the rivet is held in proper position in relation to the plunger until the moment of its expansion upon the anvil; and my improvements relate more specifically to the construction of the hopper and race, to the feed, and to the pawling device by which the hopper is rotated.

In the accompanying drawings, Figure I, is a side elevation of a riveting machine embodying my invention, part of the stand and its treadle being omitted because of their well known construction. Fig. II, is an end elevation of the same. Fig. III, is a fragmentary vertical section taken along the line III, III, of Fig. I. Fig. IV, is a horizontal section of the race-way and feed taken along the line IV, IV, of Fig. III. Fig. V, is a vertical sectional view through the hopper, taken along the line V, V, of Fig. I. Fig. VI, is an inside view of the hopper removed from the machine. Fig. VII, is a detail view of the pawling mechanism for rotating the hopper. Fig. VIII is a perspective view of the lower end of the race-way shown on an enlarged scale. Figs. IX and X are enlarged detail views of the feed-plate.

The machine is mounted upon the standard 1. At the upper end of the standard 1, is a bed plate 2, within which is adjustably set the anvil 3, the height of the anvil above the bed plate being regulated by means of the set screw 4, which carries the anvil and the jam-nut 5.

Extending from the bed-plate is an overhanging frame 6, upon the extremity of which is set a block 7, and within which is mounted the plunger 8. Upon the upper side of the frame 6, the plunger lever 9, is pivoted at 10. One end of this lever is connected to the top of the plunger by means of the swinging link 11. The other end of this lever is pivoted to the treadle-bar 12, which is connected to a treadle mounted in the standard, near the bottom, but which is not shown as it is of any well known construction and forms no part of my invention.

By the operation of the parts thus referred to, the plunger is depressed by the treadle in order to drive a rivet through a yielding material such as leather, and expand its split end against the anvil so as to clench the rivet. The rest of the machine consists of a rotary hopper for sorting the rivets preparatory to their entry

into the race, a race-way and feed by which the rivets are carried and delivered, one by one, under the plunger, and a finger by which the rivets are held in proper relation to the plunger during their descent. These parts will be described in the order named.

The frame 6, supports an upwardly extending bracket 13, the upper end of which carries a plate 14, within which is journaled a short horizontal shaft 15, upon one end of which is set a cylindrical rotary hopper 16, its shape and construction being best shown in Figs. V, and VI. It is held in engagement with the shaft by the thumb-screw 18, with interposition of a spring washer 20, coincidence of rotation being effected by the engagement of groove 21, in the hub of the hopper, with a pin 22, which pierces the shaft.

Intermittent rotation of the shaft 15, in order to turn the hopper and agitate its contents is effected by a pawling motion as follows:—to the plunger lever 9, is pivoted a link 23, the upper end of which is provided with a slot 25, which receives a stud 26, carried by the pawling arm 28,—as best shown in Fig. VII. The stud 26, is additionally connected to the plunger arm 9, by the coiled spring 30. The pawling arm 28, is freely pivoted upon the shaft 15, and carries at its free end the pawl 31, which is constantly pressed by the spring 32, against the teeth of the ratchet wheel 33, which is secured on the shaft 15. The perimeter of the hopper 16, is provided with a continuous series of inclined slots 34, as best shown in Fig. VI. When the hopper is in place its slotted perimeter does not contact with the surface of the plate 14, the shoulder 36, of the journal bearing 37, for the shaft 15, maintaining the hub 38, at such a distance from the plate 14, that the space between the hopper and plate slightly exceeds the thickness of the heads of the rivets upon which the machine is operated. At the top of the plate 14, a feeding trough 40, is formed which leads to the interior of the hopper. It is protected by a hinged lid 41. At that edge of the feeding trough towards which the upper part of the hopper rotates there is affixed an inclined plate 42, which abuts closely upon the slotted perimeter of the rotating hopper. A vertical race-way comprising a slot 45, extends through the bracket 13, and is provided with overhanging edges 46, arranged so that the heads of the rivets are held within the slot while the bifurcated stems project outwardly between the overhanging edges. The race-way has its origin in the plate 14, at a point tangential to the rotating hopper about midway to one of its sides, and extends downwardly with an inward bend near the lower end, so as to feed directly below the reciprocating plunger.

The operation of the hopper is as follows:—The hopper is partly filled with rivets 48, through the feeding trough 40. As the machine is operated, the constant oscillation of the plunger lever 9, effects, through the

pawling connections which have been described, a more or less constant rotation of the hopper. It will be observed however, that by reason of the length of the slot 25, in the link 23, there is an allowance for a very considerable lost motion. This the spring 30, normally prevents by holding the stud 26, at the bottom of the slot 25; but in case of any hindrance to the rotation of the hopper, as by accidental jamming of a rivet within it, this spring yields and permits the pawling motion to proceed without injury to the hopper or adjacent parts. As the rivets are tossed about within the rotary hopper a certain number of them fall near the perimeter with their heads flat against the plate 14, and in this position the head slips out with the stem of the rivet lying within one of the slots 34. Any rivet so lying is carried by the rotation of the hopper up to the entrance of the race-way and at this point delivered into said race-way on account of the inclination of the slot, falling by its own weight down the race-way, until stopped by the rivets already lying within it. But no rivets are allowed to leave the hopper except those which lie in proper position to be fed into the race-way. Any rivets which by reason of malformation or otherwise have tended to stick within the slots 34, are driven out of the same as the hopper rotates by the inclined plate 42, and fall to the bottom of the hopper.

Near its lower end the race-way is interrupted by a reciprocating feed-plate 50. This plate is provided with an opening 54, corresponding in width and position with the main part of the race-way which holds the head of the rivets, but somewhat longer. It is provided with alternating teeth 51, and 52, the former set a short distance above the latter, and both interrupting the slot of the race-way in the manner of an escapement. The lower edge of the tooth 51 and the upper edge of tooth 52 are beveled as shown in Fig. IX of the drawings. Likewise, the outer edge of the tooth 52, is beveled near its point so that when a rivet rests upon it, it is carried by a support in immediate proximity to the head of the rivet. The feed plate 50, is appropriately received within the bracket 13, and its edges 46, so that its teeth lie directly athwart the slot of the race-way, its precise relation thereto being best seen in Fig. X, in which the position of the race-way in the bracket 13, and the slot between its edges 46, are indicated in dotted lines. It will be observed that at the points where they receive the teeth 51, and 52, the edges of the slot of the race-way are completely cut through so as to allow the teeth to reach in and bear against the shank of the rivet descending the race-way, close up against its head. Difficulty has heretofore been experienced with escapement feeds, when used for feeding rivets, by reason of the fact that the teeth of the escapement have handled the shank of the rivet at a point too far distant from its head. This is because in prior constructions the edges of the slot of the race-way have not been completely cut through to receive the teeth, nor have the teeth been so shaped as to reach into the race-way itself. In these prior faulty constructions, a rivet being fed through the escapement and resting upon the lower tooth thereof is liable to have the outer end of its shank turned upward by reason of the overweight occasioned by the head operating upon a fulcrum provided by the lower tooth at some distance from the head. By my improvements I am not only

able to make the reciprocating feed plate and its teeth all of one piece as shown in the drawings, but also I secure such a relation and shape of the teeth in reference to the other parts that when feeding a rivet they bear against its shank in immediate proximity to its head, thus effectually preventing the head from over weighing the projecting end of the shank and turning it upward, and thus preventing that jamming of the action of the feed plate which occurs when a rivet is fed in its wrong position by reason of the upper tooth cutting into the shank of the descending rivets.

Reciprocating motion is imparted to the plate 50, by a flexible arm 53, mounted upon a short rock shaft 55, carried in the bracket 13. This shaft also carries a tappet arm 56, which is caused to oscillate with every swing of the plunger lever 9, by its contact with a pin 57, set upon the side of said lever. A flat spring 59, interposed between the arm 53, and the side of the bracket normally holds the plate 50, in the position shown in Fig. I, of the drawings; but with each contact of the pin 57, with the tappet arm 56, the feeding mechanism is reciprocated, allowing one more rivet 48, to descend to the lower end of the race-way.

Upon the side of the bracket 13, there is pivoted a safety catch 60, which normally stands in the position shown in Fig. VIII, but which when the machine is out of use is capable of being slipped forward so as to engage the shoulder 61, in the adjacent edge of the plate 50. When thus engaged, this plate is held in the opposite position from that of the drawings, and any accidental movement of the treadle occasions no disarrangement of the apparatus because no feeding of the rivets is thus permitted.

A bifurcated finger 65, arranged to receive the rivets as they are delivered from the race-way, is mounted in proximity to the lower end of the plunger. The sides of this finger are flexibly supported by the spring plates 66, 66, the compressive force of which may be varied by the thumb-screw 67. Both are attached to the vertically reciprocating block 68, which is held normally in its uppermost position by the spring 70. The pin 71, set in this block moves in a slot 72, of limited extent which prevents the block with the finger from descending beyond a selected point. A limited descent of the finger is occasioned by the engagement of the lower end of the plunger with the hollow interior of the finger. The upper end of this hollow is slightly conical, and the compression of the sides of the finger by the spring plates 66, is strong enough to overcome the force of the spring 70, so that the finger carrying a rivet which has been fed into it from the race-way is driven down along with the plunger until the pin 71, reaches the lower end of the slot 72, which prevents its further descent; thereupon, the plates 66, yield and allow the finger to open. The rivet is thus freed from contact with the finger and the plunger descends between the separated sides of the finger 65. This however, does not occur until just before the rivet reaches the anvil so that at the moment it is released by the finger it is driven by the plunger into the leather or other material which it is to bind, and the split end of its stem is expanded on the anvil 3.

Having thus described my invention, I claim:—

1. In a riveting machine, a pawling mechanism for imparting motion to a rotary hopper consisting of a shaft 13

upon which the hopper is mounted; a ratchet wheel set thereupon; a pawling arm freely mounted upon the shaft; a spring pressed pawl carried by the pawling mechanism; a stud upon the free end of said pawling arm; a lever by
5 which the riveting mechanism is operated; a link connection between the lever and stud including a slot which receives the stud; and, an elastic connection between the stud and the lever, substantially as set forth.

2. In a riveting machine, the combination of a race-way
10 for feeding rivets from a hopper to a plunger; a reciprocating feed plate interrupting the head receiving portion of said race way and delivering one rivet at a time; said feed plate being provided with alternating teeth, the inner edges of which reach into the head receiving portion of
15 said race-way so as to handle the shanks of the rivets in immediate proximity to the head; and the edges of the slot of the race way being correspondingly cut through to receive said teeth, substantially as set forth.

3. In a riveting machine, the combination of a race way for feeding rivets from a hopper to a plunger; a
20 reciprocating feed plate mounted athwart the race way provided with two alternating teeth, the lower of which is beveled on the outward side near its point but straight on the inward side to form a support for the rivet shank
25 and so set in relation to the race way as to bring the straight inner edge of the tooth into immediate proximity to the head of the rivet which rests upon the tooth, substantially as set forth.

In witness whereof, I have hereunto signed my name, at Philadelphia in the State of Pennsylvania this ninth day
30 of May 1905.

MARC STERNBERG.

Witnesses:

JAMES H. BELL,
E. L. FULLERTON.