No. 673,529. Patented May 7, 1901.

W. O. VIVARTTAS.

FLOORING MACHINE.

(Application filed Dec. 13, 1900.)

(No Model.) 7 Sheets—Sheet 1.

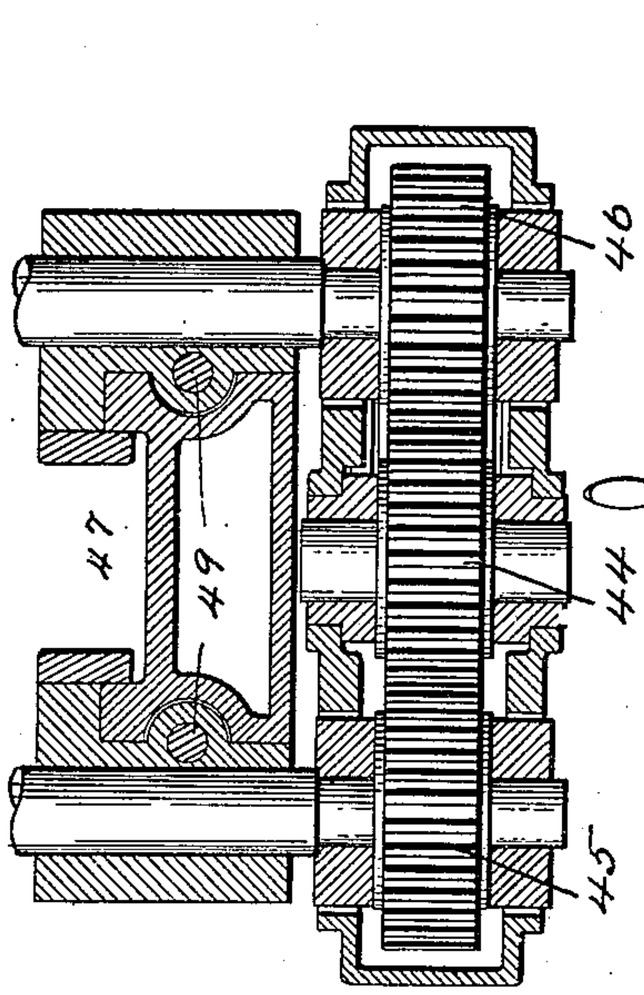

FIG. 11.

FIG. 1.

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(No Model.) 7 Sheets—Sheet 2.

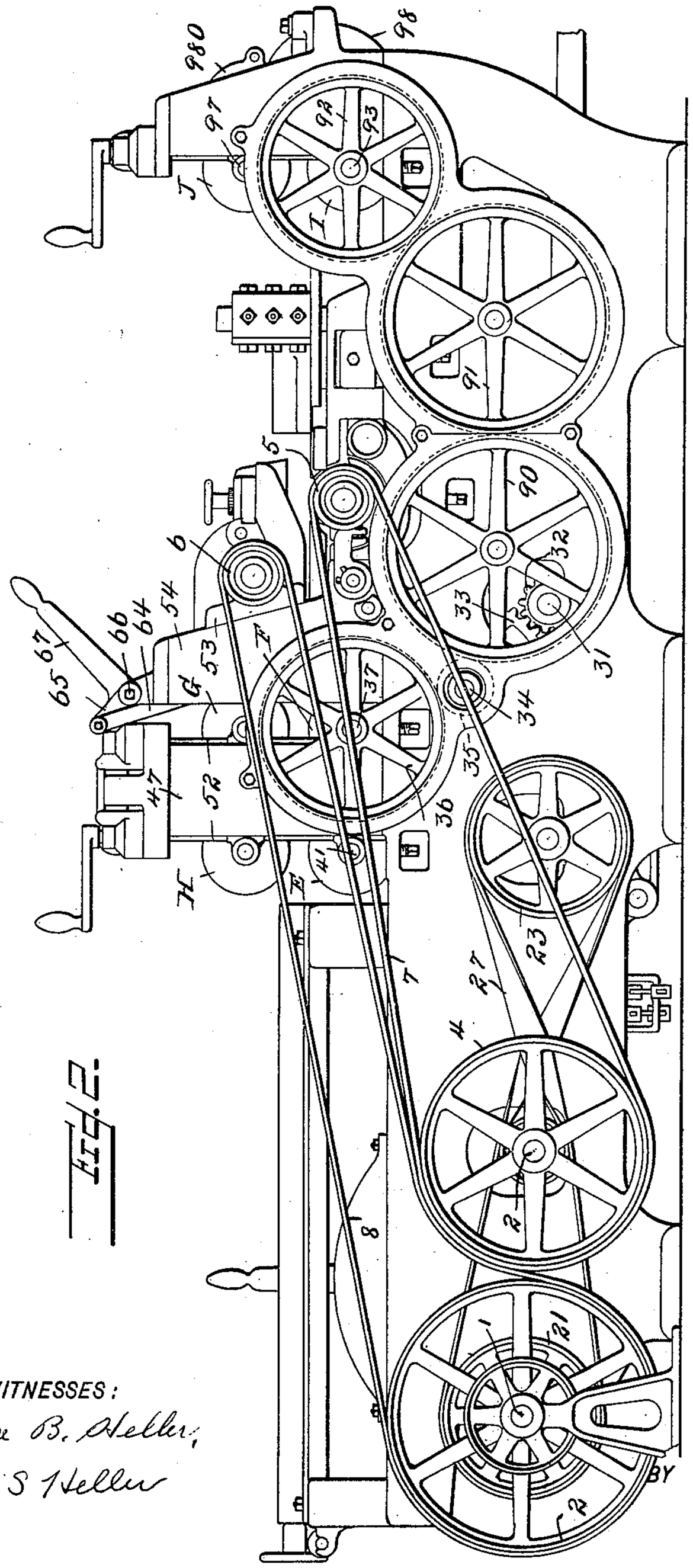

FIG. 2.

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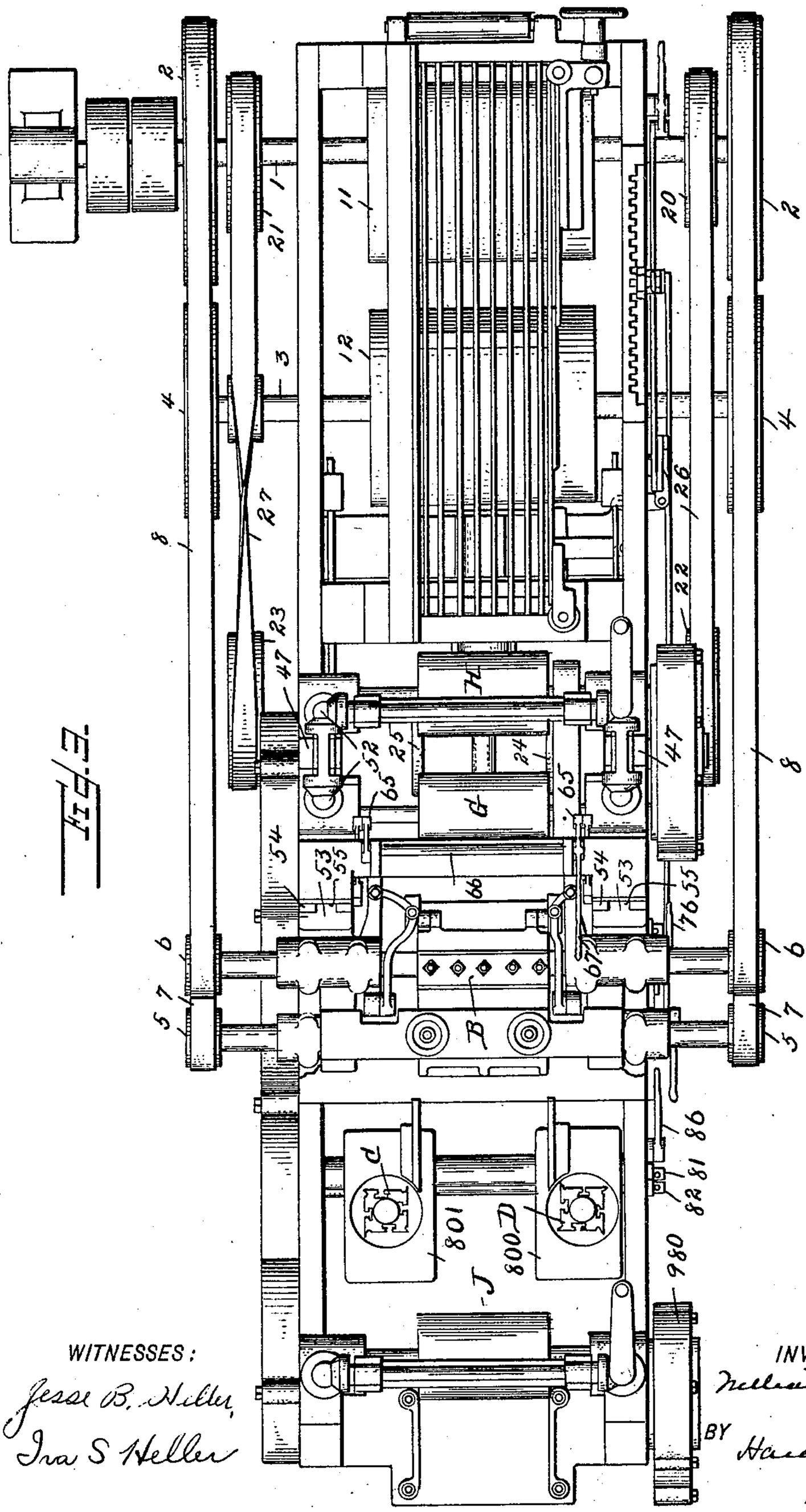
(No Model.) 7 Sheets—Sheet 3.

FIG. 3.



WITNESSES:

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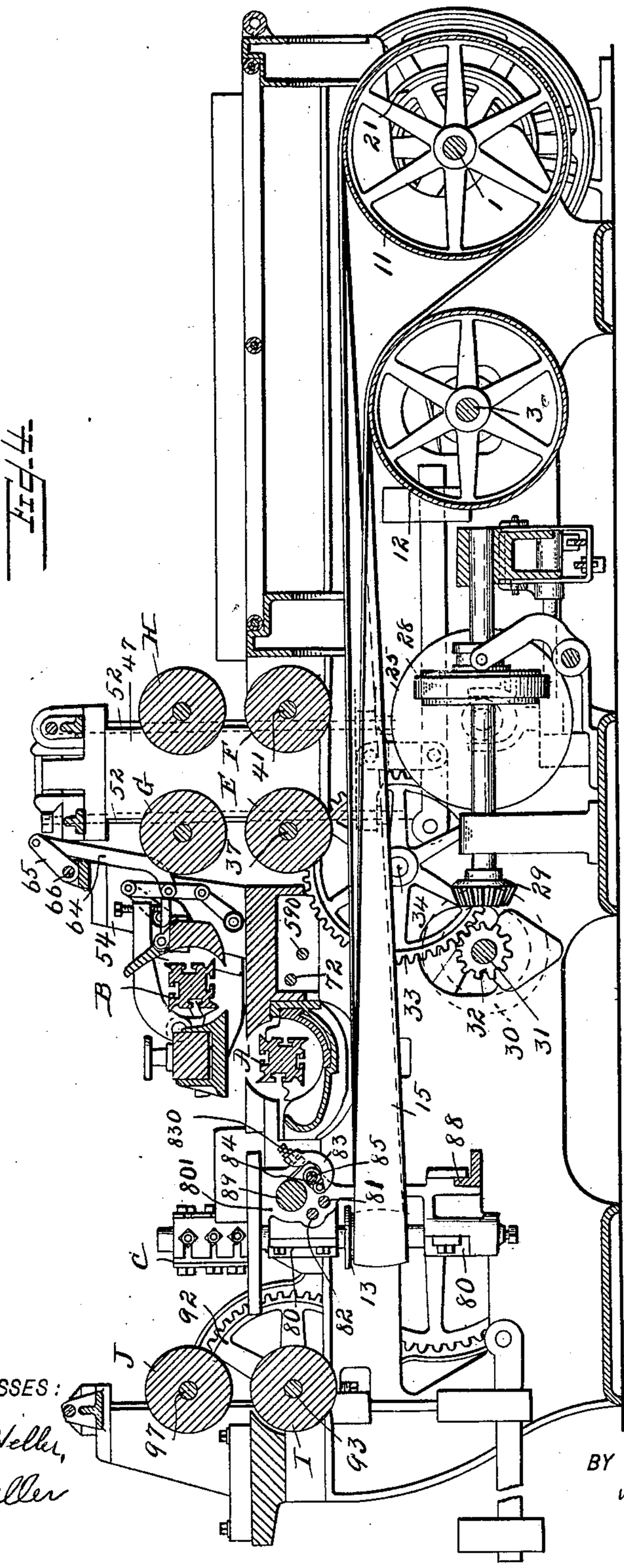
(No Model.) 7 Sheets—Sheet 4.

FIG. 4.



WITNESSES:
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(No Model.) 7 Sheets—Sheet 5.

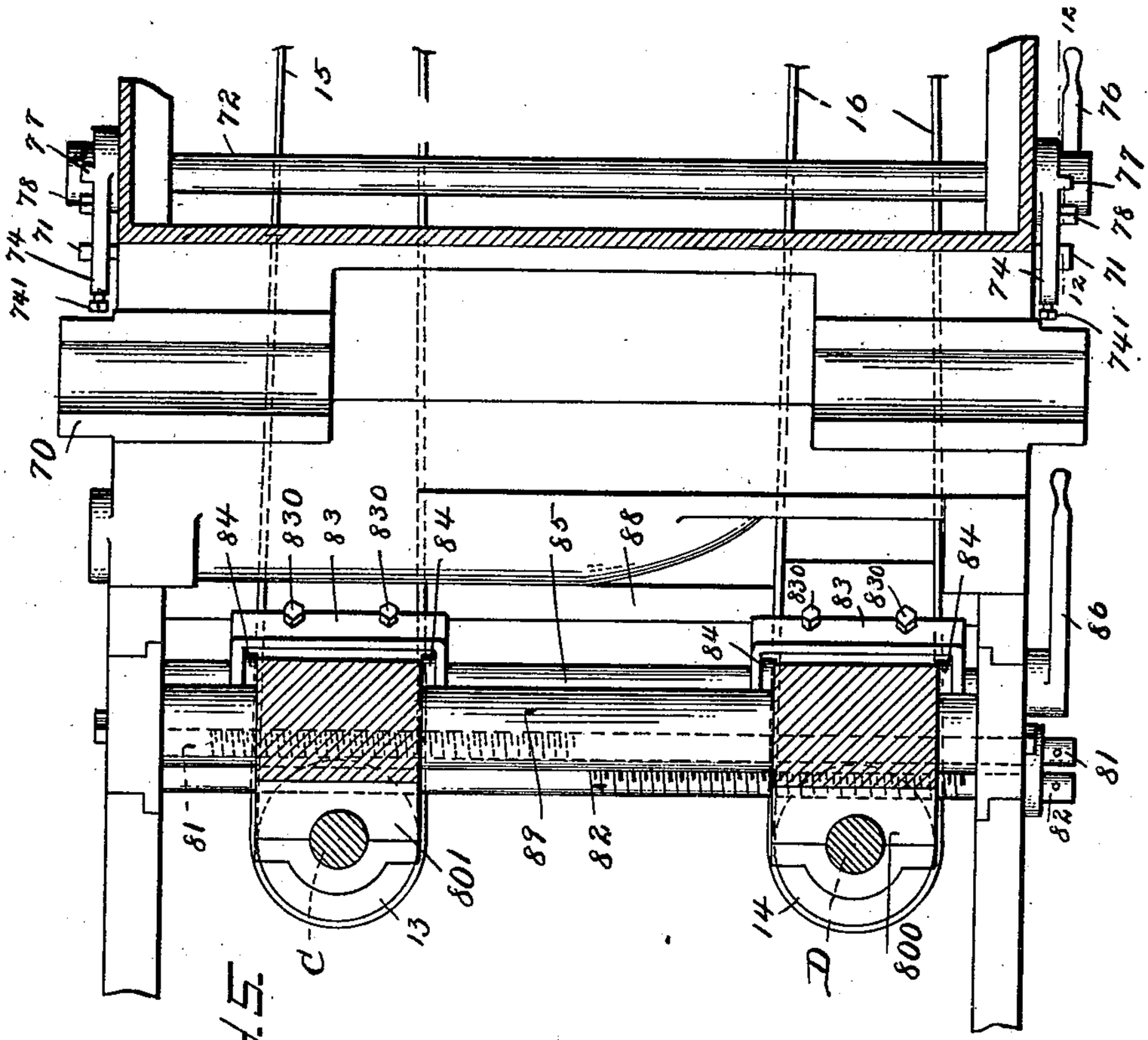

FIG. 13.

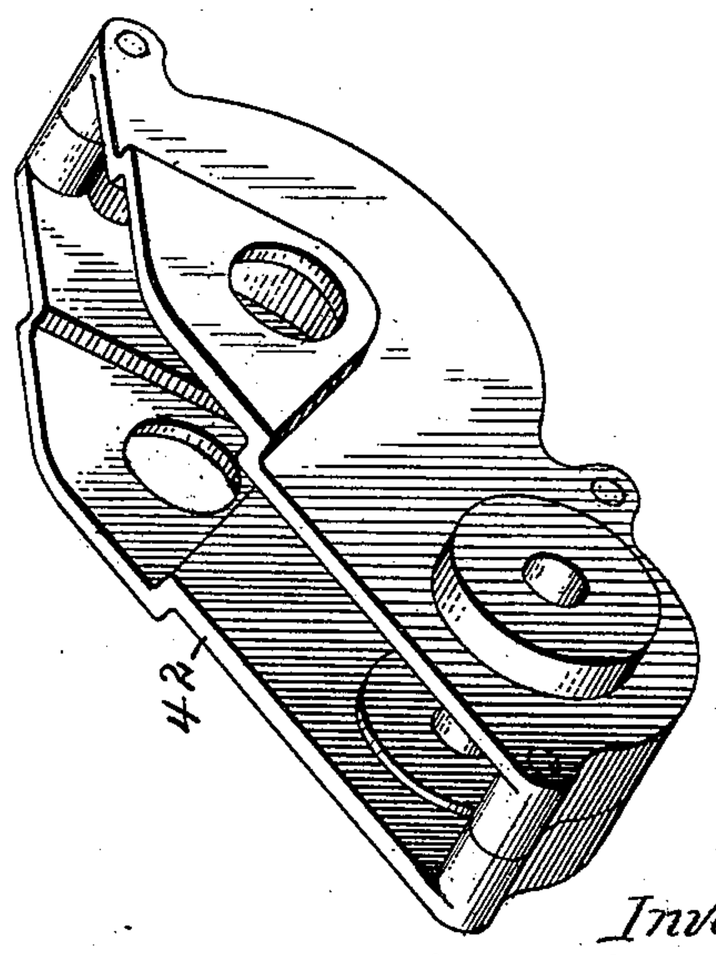

FIG. 12.

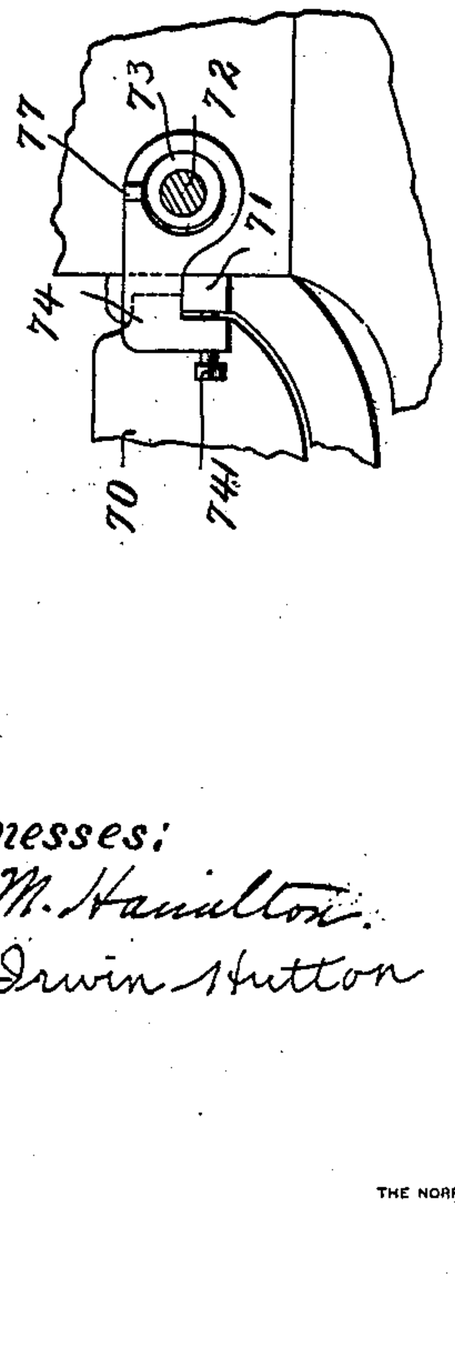

FIG. 14.

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(Application filed Dec. 13, 1900.)

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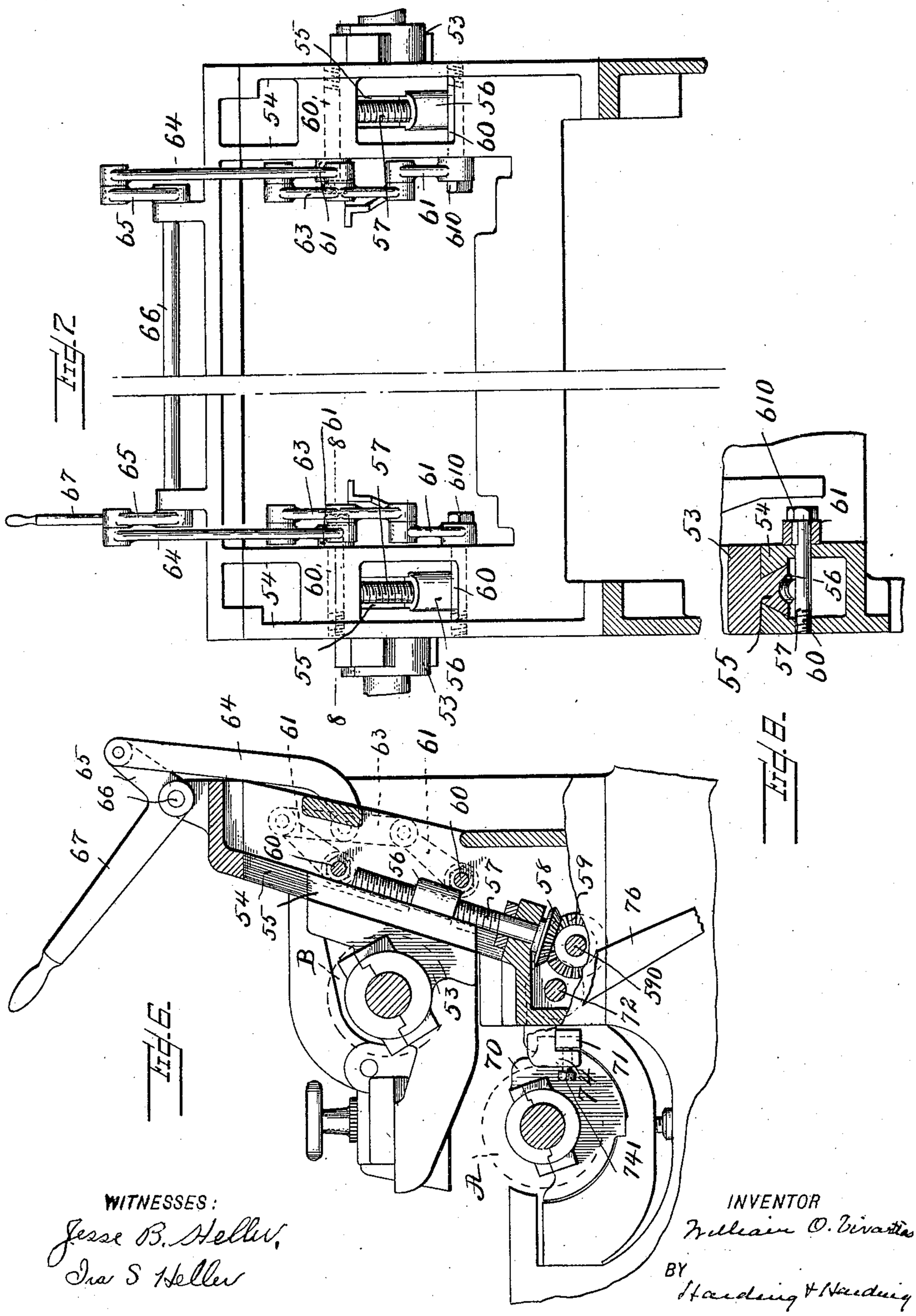

FIG. 1.

FIG. 2.

FIG. 3.

WITNESSES:
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(Application filed Dec. 13, 1900.)

(No Model.) 7 Sheets—Sheet 7.

FIG. 10.

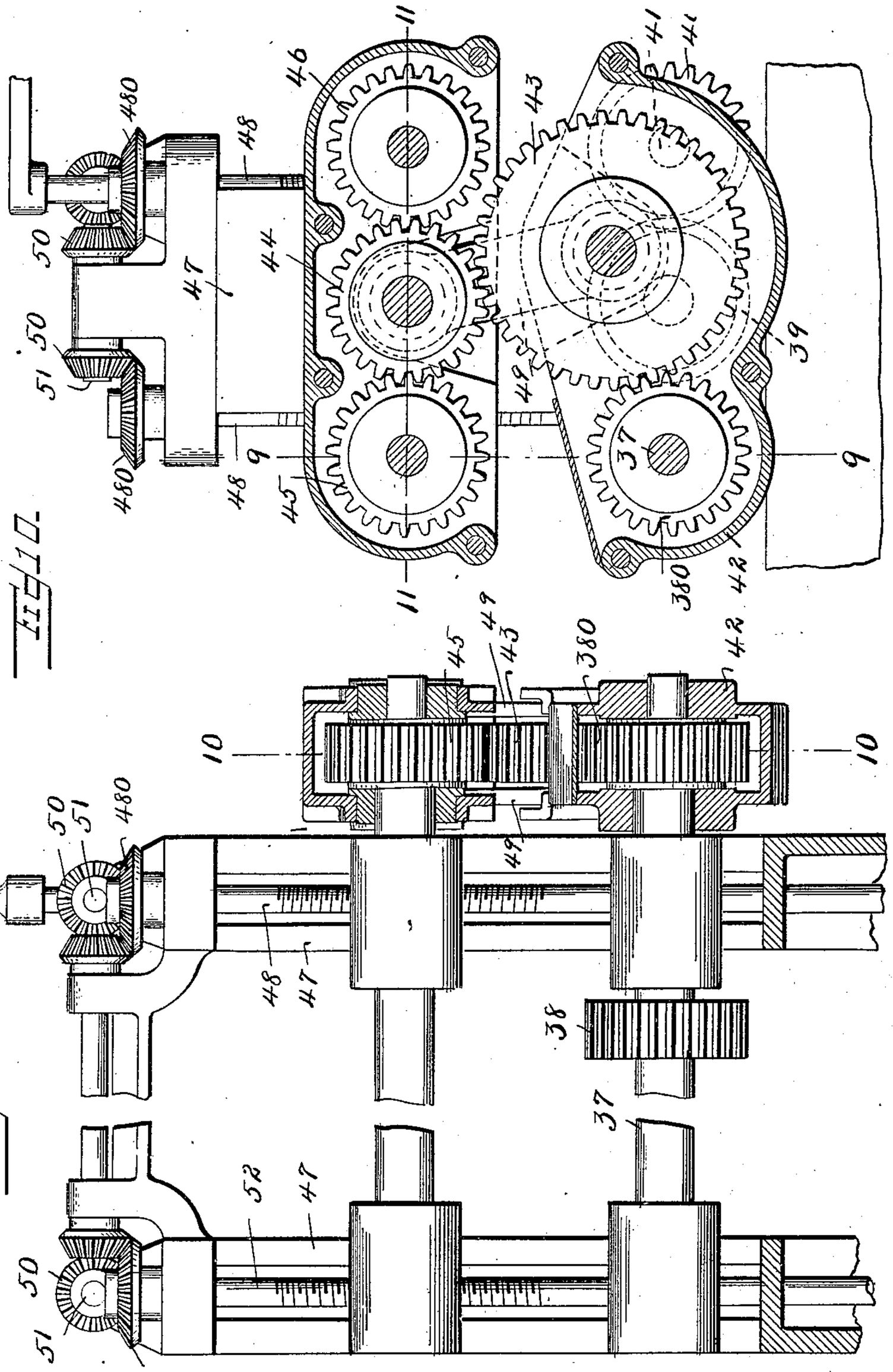

FIG. 11.

WITNESSES:

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Hendricks & Hendricks

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM O. VIVARTTAS, OF WEEHAWKEN, NEW JERSEY, ASSIGNOR TO THE H. B. SMITH MACHINE COMPANY, OF SMITHVILLE, NEW JERSEY.

FLOORING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 673,529, dated May 7, 1901.

Application filed December 13, 1900. Serial No. 39,799. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. VIVARTTAS, a citizen of the United States, residing at Weehawken, county of Hudson, and State of New Jersey, have invented a new and useful Improvement in Flooring-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to machines for planing and grooving floor-boards and molding-boards generally, and is more specifically intended for application to those machines provided with upper and lower cutters and side cutters for acting upon all sides of the work.

The object of the invention is to remedy the defects now existing in the method of driving the cutter-heads and adjusting the feed-rollers and to provide means for locking the cutter-heads firmly in position after adjustment.

My invention consists in novel means for securing removability of the lower cutter-head and in novel means for locking the top cutter-head and the side cutter-heads in their adjusted positions.

In the drawings, Figures 1 and 2 are side elevations of opposite sides of the machine. Fig. 3 is a plan view. Fig. 4 is a vertical longitudinal section through the machine. Fig. 5 is a sectional plan on line 5 5 of Fig. 1. Fig. 6 is an enlarged detail side elevation of the mechanism for raising, lowering, and locking in position the upper cutter-head, a portion being broken away. Fig. 7 is an end view of the same. Fig. 8 is a section on the line 8 8 of Fig. 6. Fig. 9 is an enlarged detail sectional view on line 9 9 of Fig. 10, showing the gear connections between the four infeed-rollers. Fig. 10 is a section on the line 10 10 of Fig. 9. Fig. 11 is a partial section on the line 11 11 of Fig. 10. Fig. 12 is a section on line 12 12 of Fig. 5. Fig. 13 is a perspective view of the casing 42 shown in Figs. 9 and 10.

Referring to Fig. 1, 1 is the main driving-shaft; 2, a driving-pulley thereon; 3, a supplemental shaft; 4, a pulley thereon; 5, a pulley on the shaft of the lower cutter-head A; 6, a pulley on the shaft of the upper cutter-head B; 7, a belt extending around pulleys 4 and 5, and 8 a belt extending around pulley 2, over belt 7, and around pulley 6. By these means, first, the upper cutter-head is driven; second, the supplemental shaft is driven, and, third, the lower cutter-head is driven through the medium of the supplemental shaft. These parts are duplicated on the other side of the machine. (See Fig. 2.) This is substantially an old and well-known means for driving the upper and lower cutter-heads.

I will now describe the part of the structure embodying the means for driving the side cutter-heads. (See Figs. 4 and 5.) 11 is a drum on shaft 1. 12 is a drum on shaft 3. 13 is a pulley on the side cutter-head C. 14 is a pulley on the side cutter-head D. 15 is a belt extending around drum 11, over drum 12, and around pulley 13. 16 is a belt extending around drum 11, over drum 12, and around pulley 14. By these means, first, the cutter-heads C and D are driven, and, second, additional means (drum 12) are provided for driving the supplemental shaft 3. This is more advantageous than the old construction, wherein the driving connections to the side cutter-heads did not engage the supplemental shaft, for while the driving connections between belts 15 and 16 and the drum 12 on the supplemental shaft 3 do not interfere with the efficiency of the driving connections between drum 11 and the side cutter-heads additional means are thereby provided for driving the pulley 4 on the supplemental shaft, and thereby the driving means for the side cutter-heads assist in driving the lower cutter-head A, and, conversely, (inasmuch as pulley 4 helps to drive the drum 12, which engages belts 15 and 16,) the driving means for the lower cutter-head A assist in driving the side cutter-heads. In other words, the power of the driving connections to the several cutter-heads is, as far as possible, equalized. I lay no claim, however, to the foregoing mechanism in this application.

I will now describe the means for rotating the infeed-rollers. (See Figs. 1, 2, 4, and 5.) 20 21 are pulleys on opposite ends of main driving-shaft 1. 22 23 are pulleys, respectively, on the shafts of driving friction-disks 24 25. 26 is a straight belt between pulleys

20 and 22. 27 is a crossed belt between pulleys 21 and 23, whereby the friction-disks are driven at the same rate of speed in opposite directions. 28 is a driven friction-disk between and engaging disks 24 25. On the shaft of disk 28 is a bevel-wheel 29, meshing with bevel-wheel 30 on shaft 31. The specific mechanism for driving shaft 31 from the main driving-shaft forms the subject of another application, Serial No. 37,422, filed November 23, 1900. 32 is a pinion on shaft 31, meshing with a gear 33 on shaft 34. 35 is a pinion on shaft 34, meshing with a gear 36 on shaft 37. 38 is another gear on shaft 37, which gear drives the gear 40 on shaft 41 through the medium of an intermediate idler 39. On shafts 37 and 41 are respectively the lower feed-rollers E and F. 42 is a casing pivoted on shaft 37, the sides of which casing extend on each side of gear 38^0 on shaft 37. This casing 42 coustitutes the bearing for the shaft of gear 43, which, like gear 38^0, is between the walls of the casing. Gear 43 engages a gear 44, which drives gears 45 and 46, the said gears 44 46 being on shafts having their bearings engaging and supported by screw-shafts 48, said bearings sliding in guides 47. The shaft of gears 45 and 46 carry, respectively, the upper feed-rollers G and H. 49 49 are links on each side of gears 43 and 44 and pivoted on the shafts of said gears.

The mechanism for raising and lowering the upper feed-rollers so as to provide for work of different thicknesses is as follows: The screw-shafts 48 48, having their bearings in frame or guide 47, have at their upper ends the bevel-gears 480 480, meshing with bevel-gears 50 50 on shaft 51. Two other screw-shafts 52 52, having their bearings in frame or guide 47, are provided, which shafts are connected with each other by a train of gearing similar to the train connecting screw-shafts 48 48, and one of the screw-shafts 48 is connected with one of the screw-shafts 52 by another similar train of gearing. By turning one of the screw-shafts all the screw-shafts are turned, thereby raising or lowering all the bearings of the upper rollers G and H, the driving connections between gear 380 and gear 44 being maintained by means of the intermediate gear 43, links 49, and casing 42.

It will be obvious that the adjustment of both the rollers G and H simultaneously and equally by one manual operation is decidedly advantageous over the ordinary forms of construction. There is also a decided advantage in the means for maintaining the driving connection between gears 380 and 44, in that the casing 42 is substituted for links on either side of gears 380 and 43. By means of this casing the liability to twisting of the shaft 37 and the shaft of gear 43 by constant adjustment of the upper feed-rollers is removed. By specifying a "casing" I do not refer to a device which actually incloses the gears 380 and 42, but intend to refer to a unitary device pivoted on each side of the gears or (which is in substance the same thing) to devices pivoted on either side of the gears and positively connected together, as distinguished from independent links or the like, which permit any tendency to destroying the necessarily perfect alinement between the shafts mentioned. I lay no claim, however, to the casing in this application, as this forms the subject-matter of a division of this application, such divisional application being filed March 16, 1901, Serial No. 51,467.

The mechanism for rotating the outfeed-rollers is as follows: The pinion 35 on shaft 34 also drives the gear 90, which through gear 91 drives gear 92 on shaft 93. This shaft carries the lower outfeed-roller I. A gear 930 on shaft 93 through gears 94 and 95 drives gear 96 on shaft 97. This shaft carries the upper outfeed-roller J. The bearing in which the shaft of gear 96 is journaled is adjusted vertically by mechanism the same as that described for adjusting the upper infeed-rollers G H, there being, however, only two vertical screw-shafts. 98 is a casing similar to casing 42, pivoted on shaft 93 and constituting the bearing for the shaft of gear 94, while links 99 99 are pivoted to shaft of gear 94 and secured to another similar casing 980, pivoted on shaft 97 and acting as the bearing for gear 95. Casings 98 and 980 embody the same principle of construction as casing 42 and perform the same function.

I will now describe the novel mechanism for adjusting the upper cutter-head B and my novel locking mechanism for holding the cutter-head in any position to which it has been adjusted. 53 53 are the bearings for the said cutter-head. 54 54 are fixed guides upon which the bearings 53 53, respectively, are adapted to slide to effect vertical adjustment, each bearing being provided with a dovetailed projection 55, fitting and sliding between inclines on the opposing walls or members of the corresponding guide. Extending beyond each projection 55 is a lug 56, having a screw-threaded orifice, through which extends an adjusting-screw 57, the shaft of which at its lower end has the bevel-gear 58, which meshes with a gear 59 on a crank-shaft 590. The latter is turned by hand, thereby moving both cutter-bearings either up or down. It will be understood that this adjusting mechanism is duplicated for both bearings 53 of the cutter-head B. Extending through the two walls of each guide 54 are shafts 60, which are screw-threaded to engage screw-threaded orifices in one of the walls, while on the outer face of the other wall crank-arms 61 are secured to the shafts 60. The outer ends of these crank-arms are connected together by a link 63. Pivoted between the ends of link 63 is the link 64, the other end of which is pivoted to a lever 65, secured upon the shaft 66. 67 is an operating-lever, the same being shown as one arm of a bell-crank lever, the other arm of which

is one of the levers 65, it being understood that the mechanism just described is duplicated on opposite sides of the machine.

As shown in Figs. 6 and 8, each cutter-head bearing 53 is tightly gripped within its corresponding guide 54. By moving the operating-lever 67 up the shafts 60 are turned, thereby, by means of their screw-threaded engagement with the guides 54, moving away from each other the walls of each guide and unlocking the cutter-head bearings 53. This permits the cutter-heads to be adjusted as described. After they are adjusted the operating-lever is returned to its initial position, thereby moving toward each other the walls of each guide and again locking the cutter-head bearings in their adjusted positions. The necessary extent of movement of the guide-walls is minute and within the limit of the inherent flexibility of the casting, although the guide may be in two pieces instead of one, as shown.

The crank-arms 61 are keyed to the shafts 60 and adjusted by means of nuts 610. When the operating-lever 67 is in the position shown in Fig. 6, (in which position it locks the cutter-head bearings 53,) the nuts 610 are tightened to the extent necessary to equalize the pressure on the four crank-arms 61. These nuts also afford a means of taking up wear in the guides.

I have provided the following novel mechanism for permitting the removal and replacement and locking in position of the bearing of the lower cutter-head A. These bearings are secured to a drawer 70, sliding in castings secured to the frame of the machine, thereby permitting the cutter-head bearing to be readily removed and replaced. It is necessary to secure them in their operative positions. To effect this, I provide the following mechanism: Secured at each end of the drawer 70 is a lug 71. 72 is a crank-shaft operated by means of operating-lever 76 and journaled in bearings on the machine-frame. 73 are eccentrics on shaft 72, and 74 are latches pivoted, respectively, on the eccentrics. The hooked ends of the latches 74 are provided with set-screws 741, which engage lugs 71. By operating lever 76 to the position shown in Fig. 1 the crank-shaft 72 is turned to draw the latches 74 toward and bind their set-screws firmly against the lugs 71, thereby locking the cutter-head bearings in position. To unlock the same, the lever 76 is moved to the left, drawing the latches 74 away from the lugs 71. 77 is a lug on each latch 74 and is in line of movement of a lug 78 on each lever 76 and is adapted to be struck thereby after the lever 76 has moved a definite distance, causing the latch to swing upon its pivot away from the lug 71 and permitting the cutter-head bearings to be removed, as before described. The set-screws 741 constitute adjusting means to make both latches lock at the same time and they afford means for taking up wear.

The following means are provided for adjusting the side cutter-heads C D across the machine, (see Figs. 4 and 5:) 80 80 are the bearings for the cutter-heads, said bearings being carried by the cutter-head frames 800 801, which are adapted to slide in guides 88 89 on the main frame. 82 is a shaft in screw-threaded engagement with the cutter-head frame 800 for the cutter-head D. 81 is a shaft extending loosely through the cutter-head frame 800 for the cutter-head D and in screw-threaded engagement with the cutter-head frame 801 for the cutter-head C. By this means either cutter-head may be adjusted transversely independently of the other cutter-head, as is old and well known.

I will now describe the novel means devised for locking the side cutter-heads in their adjusted positions. Each cutter-head frame is split, as shown, at the point through which extends the guide 89. 83 83 are clamps, each in the form of a yoke, the connecting member of which is provided with set-screws 830, extending over and engaging its corresponding cutter-head frame, while the ends of each yoke are secured to crank-arms 84 84, feathered on opposite sides of the corresponding cutter-head frame to a crank-shaft 85, operated by the operating-lever 86. The shaft 85 extends through both cutter-head frames. Before the adjustment the shaft 85 is turned upwardly, thus withdrawing both yokes from engagement with the cutter-head frames. After adjustment the shaft 85 is turned to its original position, thus causing both yokes to bind the cutter-head frames to the guide 89 and holding the cutter-heads firmly in their adjusted positions.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. The combination, with a cutter-head and means for driving the same, a bearing for the cutter-head, a projection on said bearing, a guide composed of two members between which said projection slides during adjustment, a lug on said projection extending beyond said guide, a screw-threaded shaft extending parallel to the guide and engaging said lug, thereby permitting adjustment of the bearing, and means for moving toward each other the members of the guide, thereby locking the cutter-head in its adjusted position.

2. The combination, with a cutter-head and means for driving the same, a bearing for the cutter-head, a projection on said bearing, a guide composed of two members between which said projection slides during adjustment, a lug on said projection extending beyond said guide, a screw-threaded shaft extending parallel to the guide and engaging said lug, thereby permitting adjustment of the bearing, a shaft in screw-threaded engagement with said guide, and means for turning said shaft, thereby moving toward each other the members of the guide and locking the cutter-head in its adjusted position.

3. The combination, with a cutter-head and means for driving the same, a plurality of bearings for said cutter-head, a projection on each bearing, a guide for each bearing composed of two members between which the projection on the corresponding bearing slides during adjustment, a lug on each projection extending beyond the corresponding guide, a screw-threaded shaft engaging each lug and extending parallel to the corresponding guide, means for simultaneously turning both shafts, thereby adjusting both bearings simultaneously, and means for moving toward each other the members of each guide thereby locking each cutter-head bearing in its adjusted position.

4. The combination, with a cutter-head and means for driving and adjusting the same, a bearing for the cutter-head, a projection on said bearing, a guide composed of two members between which said projection slides during adjustment, a lug on said projection extending beyond said guide, a screw-threaded shaft extending parallel to the guide and engaging said lug, thereby permitting adjustment of the bearing, shafts in screw-threaded engagement with said guide, and means for simultaneously turning said shafts, thereby moving toward each other the members of the guide and locking the cutter-head in its adjusted position.

5. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, a lock for each bearing to hold it in its adjusted position, and means for simultaneously operating both locks to clamp and release the bearings.

6. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, an adjustable lock for each bearing to hold it in its adjusted position, and means for simultaneously operating both locks to clamp and release the bearings.

7. The combination, with the upper and lower cutter-heads, one of said cutter-heads having a plurality of bearings, means for driving both cutter-heads, means for adjusting said bearings, a lock for each bearing to hold it in its adjusted position, and means for simultaneously operating both locks to clamp and release said bearings.

8. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, a guide for each bearing within which the bearing slides during adjustment, and means for simultaneously clamping both cutter-head bearings within their guides, thereby locking them in their adjusted position.

9. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, a guide for each bearing composed of two members within which said bearing slides during adjustment, and means for simultaneously moving toward each other the members of both guides, thereby locking both bearings in their adjusted position.

10. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, a guide for each bearing composed of two members within which said bearing slides during adjustment, a shaft for each guide in screw-threaded engagement therewith, and means for turning said shafts simultaneously, thereby moving toward each other the members of each guide and locking both bearings in their adjusted position.

11. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, a guide for each bearing composed of two members within which said bearing slides during adjustment, a plurality of shafts for each guide in screw-threaded engagement therewith, and means for turning all of said shafts simultaneously thereby moving toward each other the members of each guide and locking both bearings in their adjusted position.

12. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, a guide for each bearing composed of two members within which said bearing slides during adjustment, a plurality of shafts for each guide in screw-threaded engagement therewith, an operating-shaft and a system of links and levers connecting the operating-shaft with the screw-threaded shafts, thereby moving toward each other the members of each guide and locking both bearings in their adjusted positions.

13. The combination, with a cutter-head having a plurality of bearings, means for driving the same, means for adjusting the bearings, a guide for each bearing composed of two members within which said bearing slides during adjustment, a plurality of shafts for each guide in screw-threaded engagement therewith, an arm fixed to each screw-threaded shaft, a link connecting the arms fixed to the shafts for each guide, an operating-shaft, arms fixed thereto, and links extending from the arms to the first-named links.

14. The combination, with a horizontal cutter-head, means for driving the same, and a bearing therefor, of guides within which said bearing slides, thereby permitting the removal and replacement of the cutter-head and bearing, and a lock for clamping said cutter-head bearing in operative position, and means for first releasing said lock and then throwing it out of alinement with the bearing.

15. The combination, with a horizontal cutter-head, means for driving the same, and bearings therefor, of guides within which said bearings slide thereby permitting the removal and replacement of the cutter-head and its bearings, a lock for each bearing whereby the cutter-head is held in operative position,

and means for simultaneously operating both locks.

16. The combination, with a horizontal cutter-head, means for driving the same, and a bearing therefor, of guides within which said bearing slides, a lug connected to said bearing, a latch, and means for moving said latch toward and away from said lug to clamp and unclamp respectively the bearing, and for throwing said latch into position to permit the removal of the bearing.

17. The combination, with a horizontal cutter-head, means for driving the same, and a bearing therefor, of guides within which said bearing slides, a lug connected to said bearing, a latch adapted to engage said lug, an operating-shaft, and a cam in said shaft, said latch being pivoted on said cam.

18. The combination, with a horizontal cutter-head, means for driving the same, and a bearing therefor, of guides within which said bearing slides, a lug connected to said bearing, an operating-shaft, a latch pivoted eccentrically thereon and adapted to engage said lug, an operating-handle on said shaft, and a lug connected to the shaft, the first lug being in line of travel of the second lug.

19. The combination, with a horizontal cutter-head, means for driving the same, and bearings therefor, of guides within which said bearings slide thereby permitting the removal and replacement of the cutter-head and its bearings, a lug connected to each bearing, a latch for each lug adapted to engage and clamp the same, and means for simultaneously operating both latches.

20. The combination, with a horizontal cutter-head, means for driving the same, and bearings therefor, of guides within which said bearings slide thereby permitting the removal and replacement of the cutter-head and its bearings, a lug connected to each bearing, an adjustable latch for each lug adapted to engage and clamp the same, and means for simultaneously operating both latches.

21. The combination, with a horizontal cutter-head, means for driving the same, and bearings therefor, of guides within which said bearings slide thereby permitting the removal and replacement of the cutter-head and its bearings, a lug connected to each bearing, a separate latch adapted to engage each lug, an operating-shaft, and cams on said shaft, the latches being pivoted to said cams, thereby enabling both bearings to be simultaneously locked.

22. The combination, with a horizontal cutter-head, means for driving the same, and bearings therefor, of guides within which said bearings slide thereby permitting the removal and replacement of the cutter-head and its bearings, a lug connected to each bearing, a separate latch for each lug, and means for simultaneously moving said latches toward and away from said lugs and throwing said latches out of operative position.

23. The combination, with the two side cutters and means for driving the same, means for adjusting the lateral positions of said cutters, a lock for each cutter to hold it in its adjusted position, and means for simultaneously operating both locks.

24. The combination, with the two side cutters and means for driving the same, means for adjusting the lateral positions of said cutters, a split bearing for the frame of each cutter-head, a clamp for approximating the opposing faces of each split bearing, and means for simultaneously applying and releasing both clamps.

25. The combination, with a cutter-head frame having a split bearing, means for driving and adjusting the cutter-head, a yoke extending over one section of the cutter-head-frame bearing, a rock-shaft, and an arm connecting said shaft and yoke, whereby the rocking of the shaft operates said yoke to fasten the bearing in its adjusted position.

26. The combination, with a cutter-head frame having a split bearing, means for driving and adjusting the cutter-head, an adjustable yoke extending over one section of the cutter-head-frame bearing, a rock-shaft, and an arm connecting said shaft and yoke, whereby the rocking of the shaft operates said yoke to fasten the bearing in its adjusted position.

27. The combination, with the two side cutters and means for driving the same, means for adjusting the lateral positions of said cutters, a split bearing for each cutter-head frame, a yoke for each split bearing extending over one section thereof, a rock-shaft, and arms connecting said shaft and yokes, whereby the rocking of the shaft operates said yokes to simultaneously fasten said bearings in their adjusted positions.

In testimony of which invention I have hereunto set my hand, at Mount Holly, New Jersey, on this 24th day of November, 1900.

WILLIAM O. VIVARTTAS.

Witnesses:
SAMUEL A. ATKINSON,
RICHARD B. ECKMAN.