

No. 723,272.

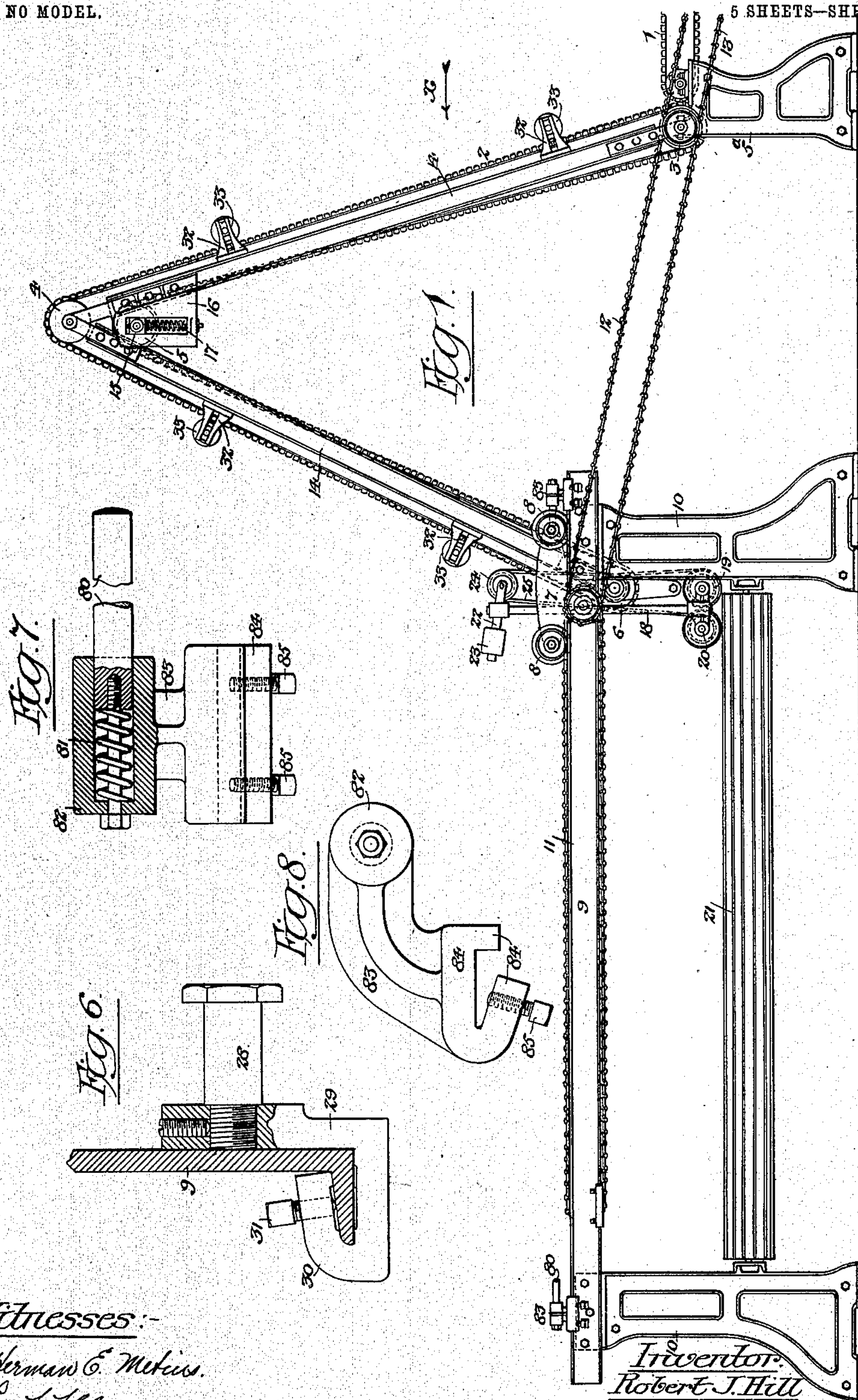
PATENTED MAR. 24, 1903.

R. J. HILL.  
LAPPING MACHINE.

APPLICATION FILED JAN. 14, 1901.

NO MODEL.

5 SHEETS—SHEET 1.



Witnesses:-

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John W. Hollishead.

Inventor:  
Robert J. Hill

by his Attorneys:- *Howson & Howson*



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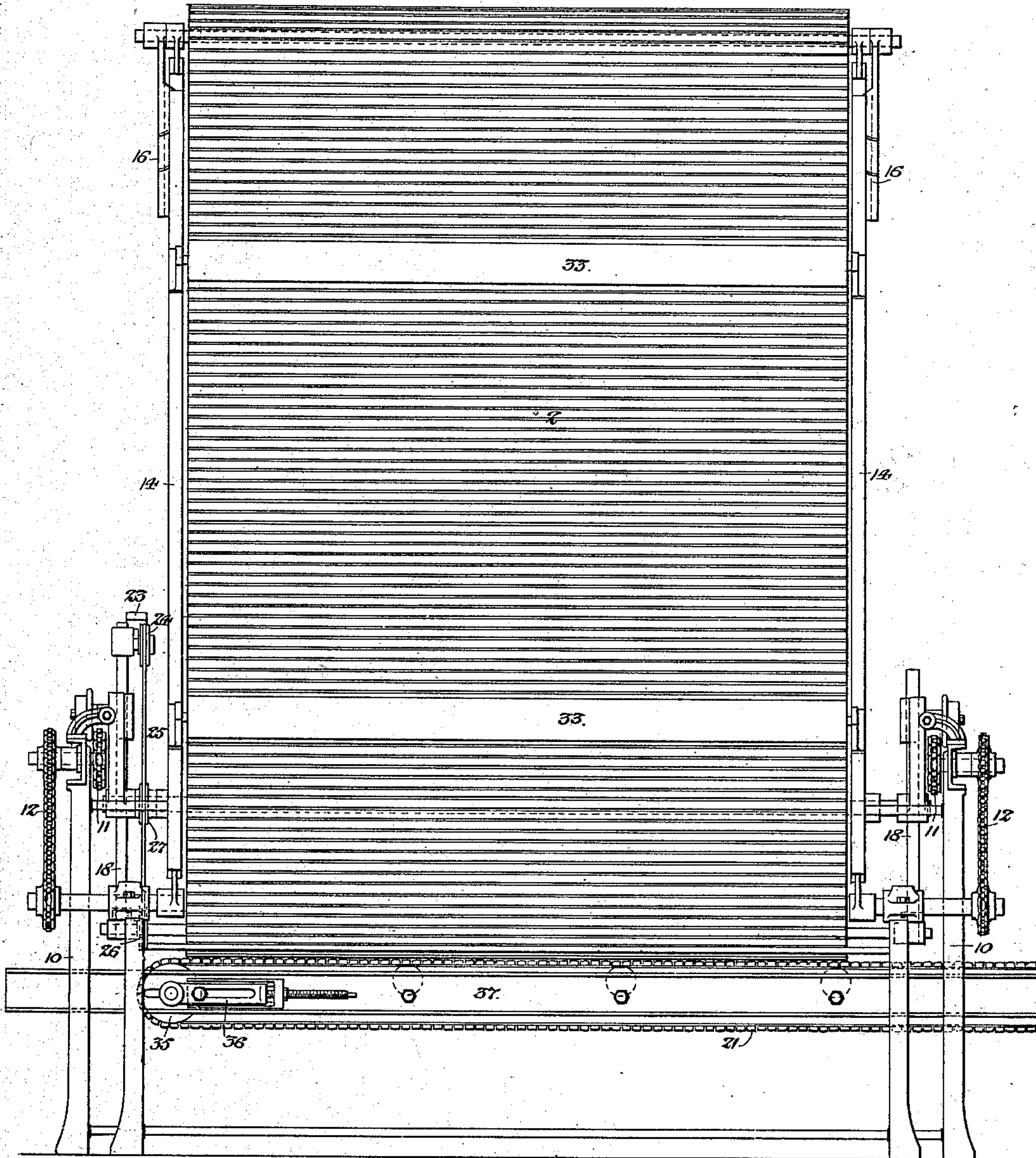
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5 SHEETS—SHEET 2.

Fig. 2.



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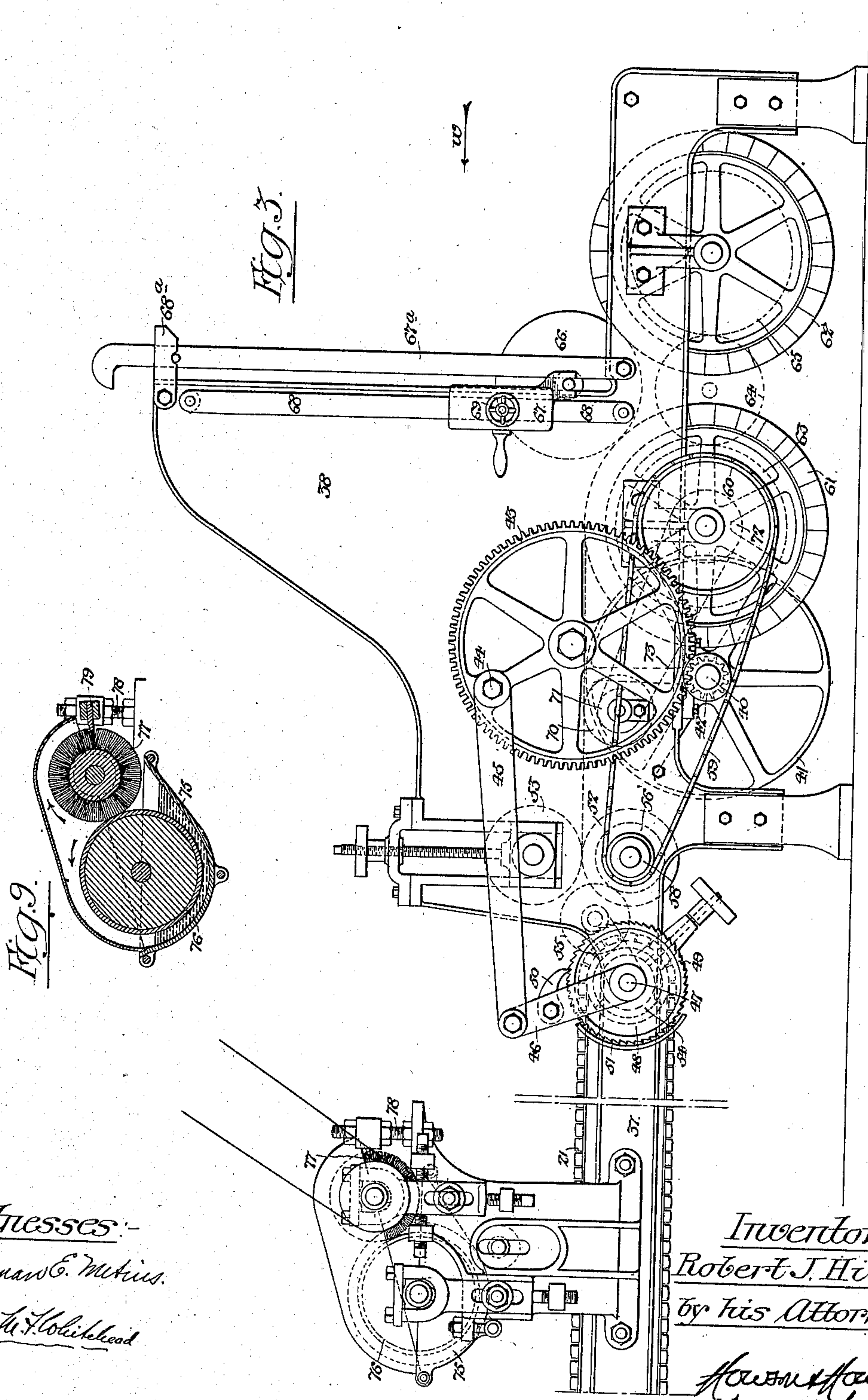
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5 SHEETS—SHEET 3.



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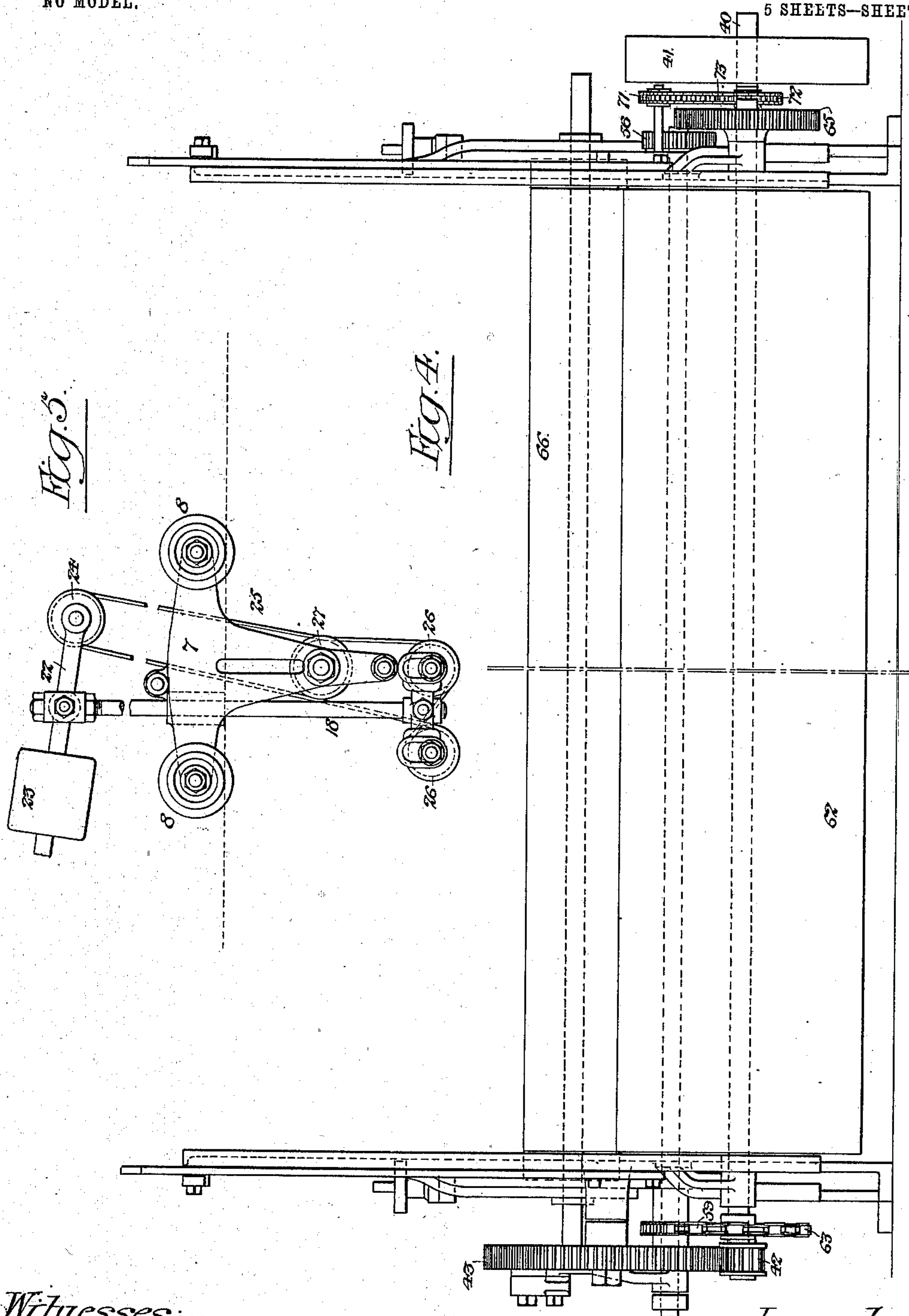
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NO MODEL.

5 SHEETS—SHEET 4.



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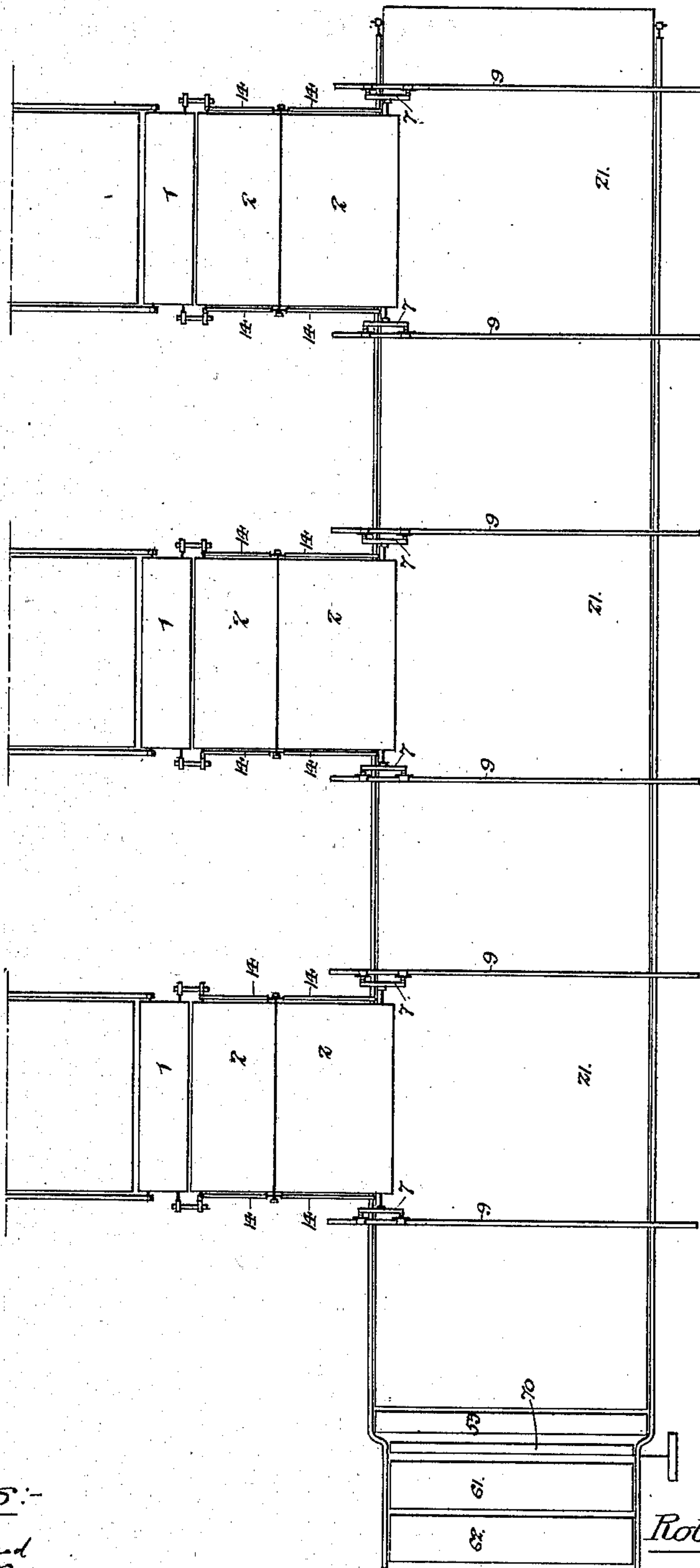
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NO MODEL.

5 SHEETS—SHEET 5.

*Fig. 10.*



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# UNITED STATES PATENT OFFICE

ROBERT J. HILL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE JAMES SMITH WOOLEN MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## LAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 723,272, dated March 24, 1903.

Application filed January 14, 1901. Serial No. 43,238. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT J. HILL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Machines for Forming Bats, of which the following is a specification.

My invention consists of a lapping device operating on the well-known "camel-back" principle, but varying from the latter in certain parts and having certain additions whereby it is adapted for making laps of any width and various thicknesses, such as are employed in the manufacture of mattresses, quilts, comfortables, cushions, carpet-lining, stair-pads, commercial bats, &c.

The special object of my invention is to provide a lapping device or machine having a wide range of application and which will simplify and improve the process of making said laps. The machine is adjustable to any width of lap, thereby enabling me to deposit a good grade of stock on the transverse apron by one carding or garnet machine, an inferior grade of stock on top of that by a second machine, and by a third machine to cover this again with good material, thus producing a fine-surfaced bat at the least expense.

In the accompanying drawings, Figure 1 is a side view of sufficient of a bat-forming machine to illustrate the invention. Fig. 2 is an end view of the same looking in the direction of the arrow *x*, Fig. 1. Fig. 3 is a view on a larger scale than Fig. 2, illustrating a part of the machine forming a continuation of that there shown. Fig. 4 is an end view looking in the direction of the arrow *w*, Fig. 3. Fig. 5 is an enlarged elevation of part of the mechanism shown in Fig. 1. Figs. 6, 7, and 8 are enlarged views of parts of the mechanism shown in Fig. 1. Fig. 9 is a sectional view of part of the mechanism shown in Fig. 3, and Fig. 10 is a diagram illustrating the method in which the device is used to form a multiple bat.

In Fig. 1 part of the apron of a carding or garnet machine is represented at 1, this apron delivering its web or fleece onto an endless slatted conveyer apron or belt 2, which passes around four drums 3, 4, 5, and 6, the drum 3

being adapted to suitable bearings on a frame 50 5<sup>a</sup>, which also carries the bearings for the end drum of the apron 1. The shaft of the drum 6 is adapted to bearings in a reciprocated frame 7, having rollers 8, which run upon rails formed by beams or girders 9, mounted upon frames 10, said frame 7 engaging with pins projecting from endless belts or chains 11, one at each end of the frame 7. These chains at points adjacent to the conveyer-belt 2 are carried and driven by sprocket-wheels on short shafts mounted in bearings in the beams 9 and each driven by means of a chain belt 12 or other suitable power-transmitter from a wheel or pulley on the shaft of the drum 3, to which shaft power is applied by another chain belt or equivalent power-transmitter 13, driven by any available shaft of the carding or garnet machine. Back-and-forth reciprocation is thus imparted to the frame 7 to an extent equal to the length of the belts 11, and as the distance between the drums 3 and 6 is thus constantly varying there is a corresponding rise and fall of the intermediate drums 4 and 5, which support the conveyer-apron 2, and in order to permit this the shaft of the upper drum 4 is carried by the upper ends of a pair of bars 14, one pivoted at its lower end in line axially with the shaft of the drum 3 and the other pivoted at its lower end to the carriage 7 in line axially with the shaft of the drum 6, the upper ends of the bars being connected together in line axially with the shaft of the drum 4. The shaft of the drum 5 is adapted to bearings 15, movable vertically in a bracket-plate 16, secured to one of the bars 14, said bearing-boxes being supported upon springs 17, so that the conveyer belt or apron 2 is kept under proper tension in all of the varying angles in respect to each other assumed by the bars 14 of the carrying-frame.

At each of the ends of the beams 9 are elastic buffer-pins 80, projected by springs 81, contained in sockets 82, which form part of brackets 83, as shown in Figs. 7 and 8, each bracket having jaws 84 for embracing one of the flanges of the beam and set-screws 85 for securing the bracket to the beam, so that it



can be adjusted longitudinally thereon to suit different lengths of belt 11, the buffers serving to gradually arrest the movement of the carriage 7 at each limit of such movement.

5 Mounted so as to be adjustable vertically in a bearing at each end of the carriage 7 is a rod 18, having at its lower end bearings for the shafts of a pair of drums 19 and 20, between which the web or fleece delivered by the conveyer belt or apron 2 passes and by which such web or fleece is laid upon the upper run of the conveyer belt or apron 21, which travels in a direction at right angles to the travel of the conveyer-belts 1 and 2, the vertical adjustability of the rods 18 on the carriage 7 providing for the disposal of the drums 19 and 20 at any desired distance from the upper run of the belt or apron 21, depending upon the thickness of the web which is being acted upon.

To the upper end of each of the rods 18 is pivoted a lever 22, one arm of which carries a weight 23, the other arm of the lever having a pulley or sheave 24, around which passes a belt 25, which also passes around pulleys 26 on the shafts of the drums 19 and 20 and at an intermediate point is caused to pass around or in contact with a pulley or sheave 27 on the shaft or drum 6, thereby imparting movement in opposite directions to the drums 19 and 20, so that they will properly lay the web or fleece upon the upper run of the transverse belt or apron 21, the weighted lever 22 keeping the belt 25 under normal tension, which is not interfered with by the vertical adjustment of the drums 19 and 20. These features are shown most fully in Fig. 5.

The endless driving-chains 11 are carried at their outer ends by sheaves or pulleys each mounted upon a stud 28, carried by a bracket 29, which has a projecting foot 30 embracing the lower flange of the beam and secured thereto by a set-screw 31, as shown in Fig. 6, so as to constitute a clamp whereby the bracket 29 can be secured upon the beam in any desired position of longitudinal adjustment and the chain belts 11 can thus be kept under proper tension.

In order to compact the web or fleece carried by the endless belt or conveyer 2, I secure to the side beams 14 of the camel-back frame brackets 32, which receive the boxes for the journals of rollers 33, the latter resting upon the web or fleece as it is carried by said conveyer-belt 2.

At one end of its run the transverse belt or conveyer 21 passes around a drum 35, the shaft of this drum being carried by adjustable bearings 36, mounted upon beams 37, which extend throughout the entire length of the run of the belt 21, each of the beams terminating in a frame 38, which carries mechanism for operating the belt 21 and for winding up upon the drum or cylinder the web or fleece delivered by said belt 21.

The mechanism for driving the belt or apron 21 is as follows: A shaft 40, mounted in bear-

ings on the frame 38, has at one end a pulley 41 for receiving a suitable driving-belt and at the other end a spur-pinion 42, which meshes with a spur-wheel 43, turning on a stud projecting from said frame 38, this spur-wheel having a crank-pin 44, connected by a link 45 to an arm 46, hung so as to swing freely upon a shaft 47, to which is secured the drum 48, whereby the endless belt 21 is driven, the shaft 47 also having secured to it a ratchet-wheel 49, with which engages a pawl 50, hung to the arm 46. Hence as the spur-wheel 43 is rotated the arm 46 will be caused to swing upon the shaft 47, and intermittent movements of partial rotation will be imparted to the ratchet-wheel 49, and hence to the shaft 47 and drum 48, so as to cause intermittent forward movements of the conveyer belt or apron 21, the extent of each movement being dependent upon the adjustment of a segmental shield 51, loosely mounted on the shaft 47, and which can be adjusted so as to cover more or less of the teeth of the ratchet-wheel within the limit of swing of the pawl 50, thus determining the number of teeth which remain in action, and consequently the degree of fractional rotation imparted to the ratchet-wheel on each swing of the arm 46.

In advance of the drum 48 are a pair of press-rolls 52 and 53, the bearings of the upper roll being suitably controlled, so that any desired amount of pressure may be imparted to them, and the shaft of the lower press-roll is driven from the shaft 47 through the intervention of three spur-gears 54, 55, and 56, as shown by dotted lines in Fig. 3, the spur-wheel 54 being secured to the shaft 47, the spur-wheel 56 being secured to the shaft of the lower drum 52, and the spur-wheel 55 being carried by a swinging arm mounted upon the shaft 47, so that it will properly mesh with the spur-wheels 54 and 56 and will impart to the lower press-roll 52 movement equal in surface speed to the speed of the belt 21, whereby the web or fleece will be drawn forward by the press-rolls 52 and 53 just as fast as it is delivered by the belt 21.

A sprocket-wheel 58 on the shaft of the drum 52 drives, by means of a chain 59, a sprocket-wheel 60 on the shaft of a drum 61, this shaft being mounted in suitable bearings on the frames 38 and serving to drive the shaft of another and similar drum 62 through the intervention of spur-gears 63, 64, and 65. (Indicated by the dotted circles in Fig. 3.) Hence both of the drums 61 and 62 will be rotated in the same direction and at the same surface speed.

The drum 66, upon which the bat is to be wound, rests upon the drums 61 and 62 and as the bat is wound thereon rises, each spindle of the drum being adapted to a bearing in a weight 67, which can slide upon a bar 68, mounted on the frame 38, this weight determining the degree of compactness with which the bat is wound upon the drum 66. When the use of the weight is not desired, it may



be raised to the top of the bar 68 and secured thereto by means of a locking-screw 69. In order to guide the journals of the drum 66 when the weight 67 is not employed, I may employ a bar 67<sup>a</sup>, held in upright position by a catch 68<sup>a</sup>, so that it can be readily released when it is desired to insert or remove the drum 66.

In order to support the web or fleece in its passage from the rolls 52 and 53 to the drum 61, I employ an intermediate supporting-roll 70, as shown by dotted lines in Fig. 3, this roll being driven from the shaft of the drum 61 through the medium of sprocket-wheels 71 and 72 and a chain 73 or other equivalent power-transmitting device.

When it is desired to deposit upon the web or fleece upon the conveyer belt or apron 21 a coating of size for the purpose of uniting the surface fibers of the web or securing together successive webs deposited thereon, I employ one or more sizing devices, such as shown in elevation in Fig. 3 and in section in Fig. 9, these sizing devices being suitably located upon the frame 37. On reference to Fig. 9 it will be observed that the sizing device comprises a pan 75 for containing the glue or other sizing fluid, in which is partially submerged a drum 76, the shaft of which is adapted to vertically-adjustable bearings in side frames mounted upon the beams 37. Vertically-adjustable bearings carry the shaft of a rotating brush 77, this brush-shaft and the shaft of the drum 76 being suitably connected, so that said brush and drum will rotate in the directions of their respective arrows, Fig. 7. Upon suitable upright studs 78 on the side frame is mounted so as to be vertically adjustable a blade or strip 79, which can be adjusted from and toward the brush 77 so as to project to any desired extent into the mass of fibers or bristles constituting said brush. Hence as the latter rotates it will gather the liquid glue or other sizing compound from the surface of the drum 76, and when the fibers or bristles are first bent backwardly and then suddenly released by contact with the blade 79 the sizing liquid thus gathered by said fibers will be forcibly thrown or projected onto the surface of the web or fleece upon the endless belt or conveyer 21, and a continuous rain or spray of the sizing fluid thus caused to descend upon said web or fleece, so as to impart a uniform covering or coating of size to the latter as it is carried forward by the conveyer.

In forming a multiple bat I combine with the single conveyer belt or apron 21 a series of carding or garnet machines, each with its camel-back lapper, as shown, for instance, in Fig. 10, in which three of such devices are shown, the web or fleece from the second machine being laid upon that from the first machine and the web or fleece from the third machine being laid upon the two previously deposited. By this means I can readily form

a bat having any desired thickness and having outer layers of good material and an interposed layer or layers of inferior material.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of the reciprocated carriage of a camel-back lapper, a transverse conveyer belt or apron, a pair of drums between which the web or fleece passes from the conveyer of the lapper to the transverse belt, a driving-belt for imparting rotating movement to said pair of drums, and a weighted lever carrying a sheave around which said driving-belt passes, substantially as specified.

2. The combination of the jointed frame of a camel-back lapper and its conveyer belt or apron, with rollers mounted upon said camel-back frame, and bearing upon the upper side of the web or fleece as the latter is carried forward by the conveyer, substantially as specified.

3. The combination of the reciprocated carriage of a camel-back lapper, the endless chain for imparting movement thereto, supporting pulleys or sheaves for said chain, and brackets carrying the spindles for said sheaves or pulleys, said brackets having feet embracing the side bars or girders of the frame and provided with clamp-screws for securing them thereto, substantially as specified.

4. The combination of the reciprocated carriage of a camel-back lapper, the endless chains for imparting movement thereto, buffers for the carriage, and brackets carrying said buffers and having jaws for engaging the frame of the machine, said jaws having screws for securing them to said frame, substantially as specified.

5. The combination of the transverse conveyer belt or apron of a camel-back lapper, the driving-drum therefor, a pair of press-rolls in advance of said driving-drum, pawl-and-ratchet mechanism for imparting intermittent movements of partial rotation to said driving-drum, and gearing for transmitting movement from the drum to one of the press-rolls, substantially as specified.

6. The combination of the transverse conveyer belt or apron of a camel-back lapper, the driving-drum therefor, a pair of press-rolls in advance of said drum, a pair of drums in advance of said press-rolls for supporting and operating the bat-winding drum, means for imparting intermittent movements of partial rotation to the driving-drum of the conveyer-belt, and means for transmitting movement from said driving-drum to the press-rolls and to the drums which support the winding-drum, substantially as specified.

7. The combination of the transverse conveyer belt or apron of a camel-back lapper, means for driving the same, a pair of press-rolls in advance of said apron, a pair of drums in advance of said press-rolls for supporting and operating the bat-winding drum, a bat-supporting roll between the press-rolls



and said drums, and means for driving the various parts, substantially as specified.

8. In a machine of the class described, the combination of a transverse conveyer-belt, 5 a series of carding or garnet machines, each provided with a camel-back lapper comprising a jointed frame, a belt carried thereby and operating means for said belt, a carriage connected to said jointed frame, means for 10 moving the carriage transversely of the transverse conveyer, rolls mounted on the carriage and having their adjacent surfaces disposed to engage material passing between the rolls, and operating connections between the belt 15 of the camel-back lapper and said rolls for positively feeding material between the adjacent surfaces of said rolls onto the transverse conveyer.

9. In a machine of the class described, the 20 combination of a transverse conveyer belt or apron, a series of carding or garnet machines each provided with a camel-back lapper, a carriage connected to said lapper, a belt carried by said camel-back lapper and extending 25 from the carding or garnet machine to said carriage, means for reciprocating the carriage transversely of the conveyer belt or apron, rolls mounted on the carriage, a driving-belt operable from the belt of the camel-back 30 for positively operating said rolls to deliver material to the transverse conveyer, and an automatic tightener for said driving-belt.

10. The combination of the camel-back lapper having a conveyer, a transverse carrier 35 belt or apron onto which the fleece is deliv-

ered by the conveyer of said lapper, a pair of drums between the adjacent surfaces of which the fleece is positively passed from the conveyer of the lapper to the transverse belt or conveyer, means for adjusting the said 40 drums vertically with respect to said transverse belt or conveyer according to the thickness of lap upon said belt or conveyer, and means operable from the conveyer of the camel-back lapper to positively drive said 45 drums to deliver material to the transverse belt or apron.

11. In a machine for forming bats, the combination of a transverse conveyer belt or apron, a camel-back lapper adapted to deliver 50 fleece thereto and comprising a jointed frame carrying a conveyer, a carriage connected to one end of said jointed frame, means for operating the conveyer of the camel-back lapper, devices carried by the carriage for de- 55 livering the fleece from the conveyer or lapper to the transverse conveyer belt or apron, and means driven from the conveyer of the lapper for operating said delivering devices, said means comprising a belt and 60 devices for maintaining said belt under operative tension.

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

ROBERT J. HILL.

Witnesses:

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F. E. BECHTOLD.