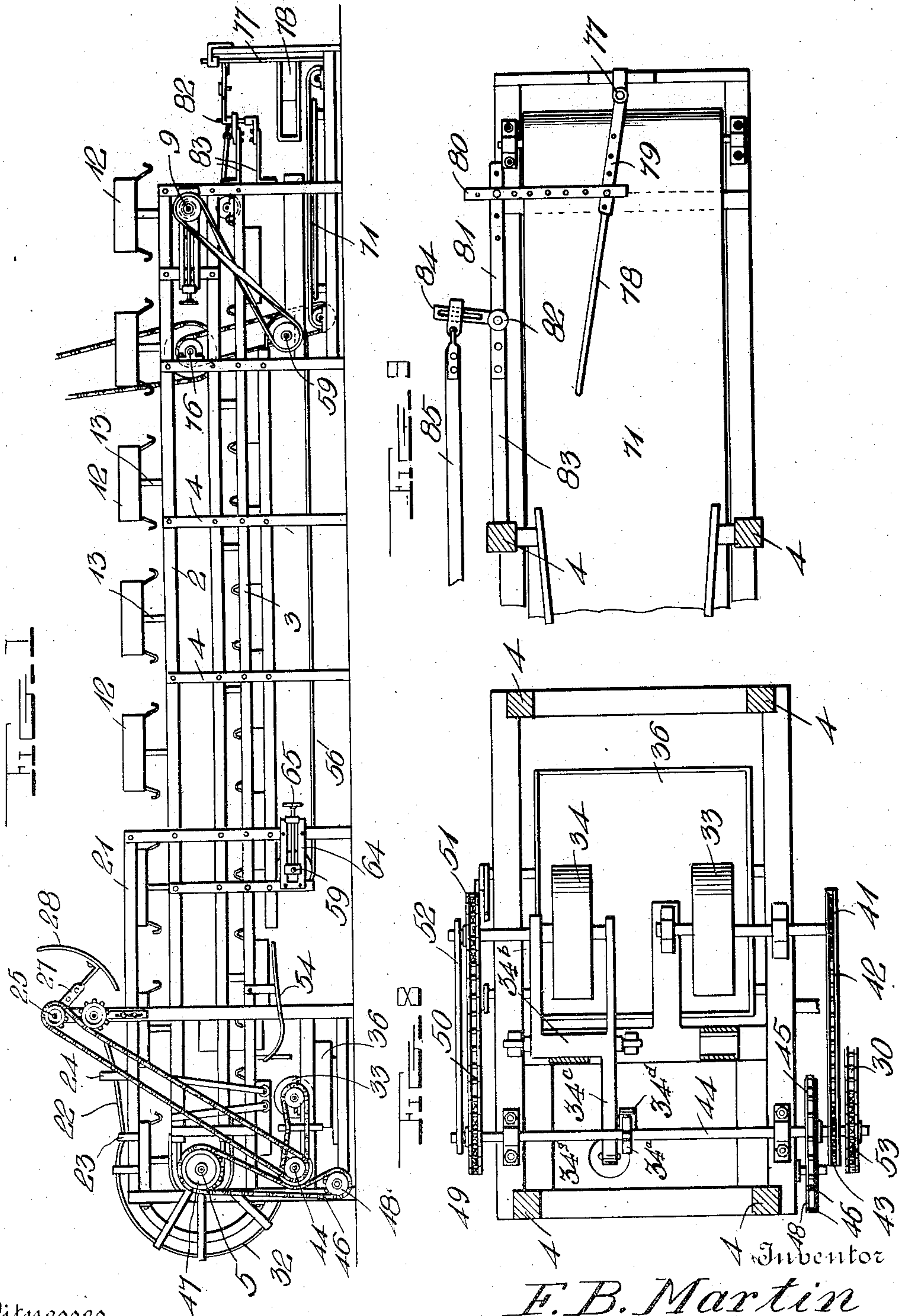


F. B. MARTIN.
 BOTTOM FLAP SEALING MACHINE FOR PASTEBOARD CARTONS.
 APPLICATION FILED AUG. 25, 1909.

956,392.

Patented Apr. 26, 1910.

8 SHEETS—SHEET 1.



Witnesses

C. H. Griesbauer

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by

F. B. Martin

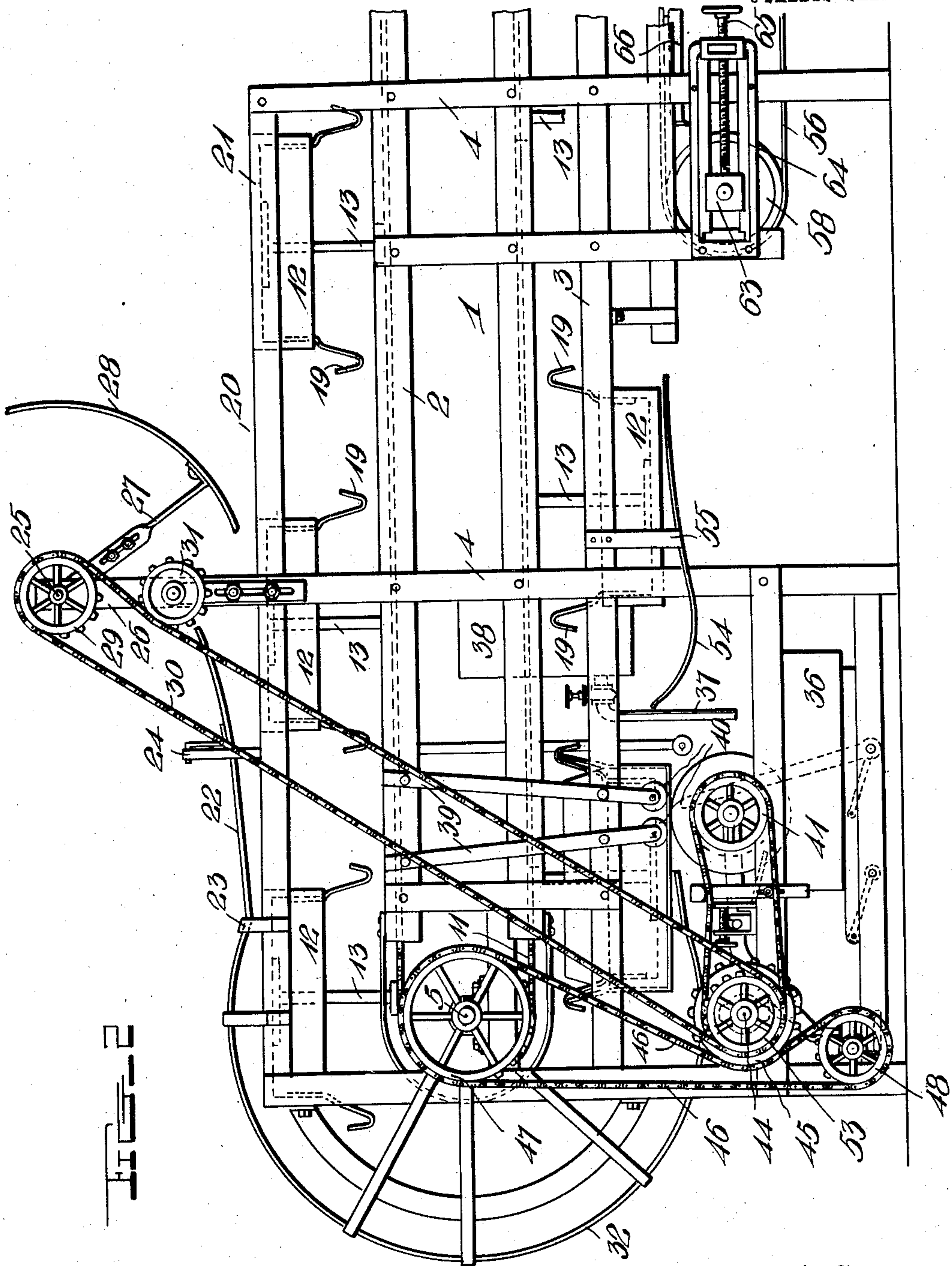
Attorneys

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8 SHEETS—SHEET 2.



Witnesses

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8 SHEETS—SHEET 3.

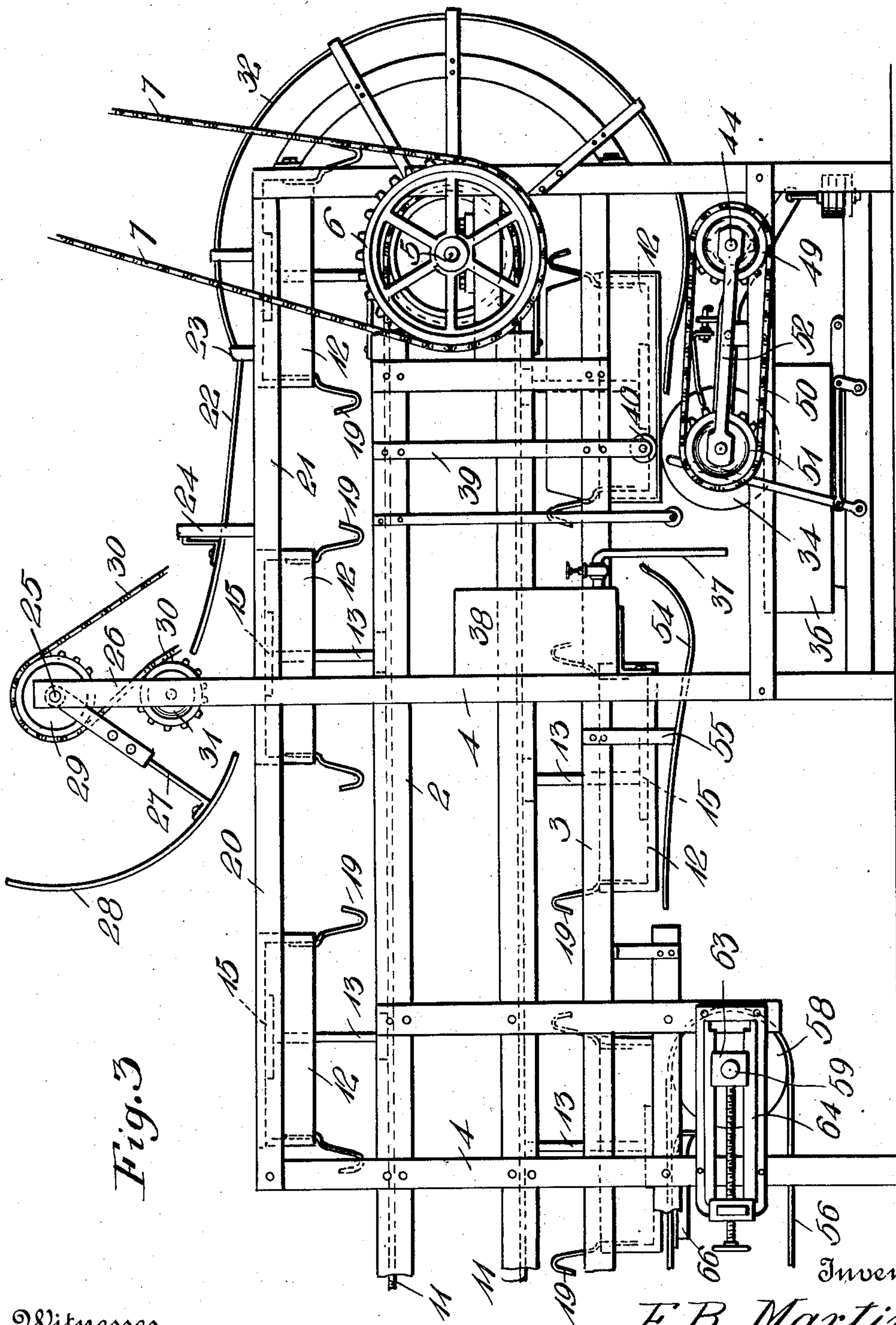


Fig. 3

Witnesses

[Signature]

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by

[Signature]

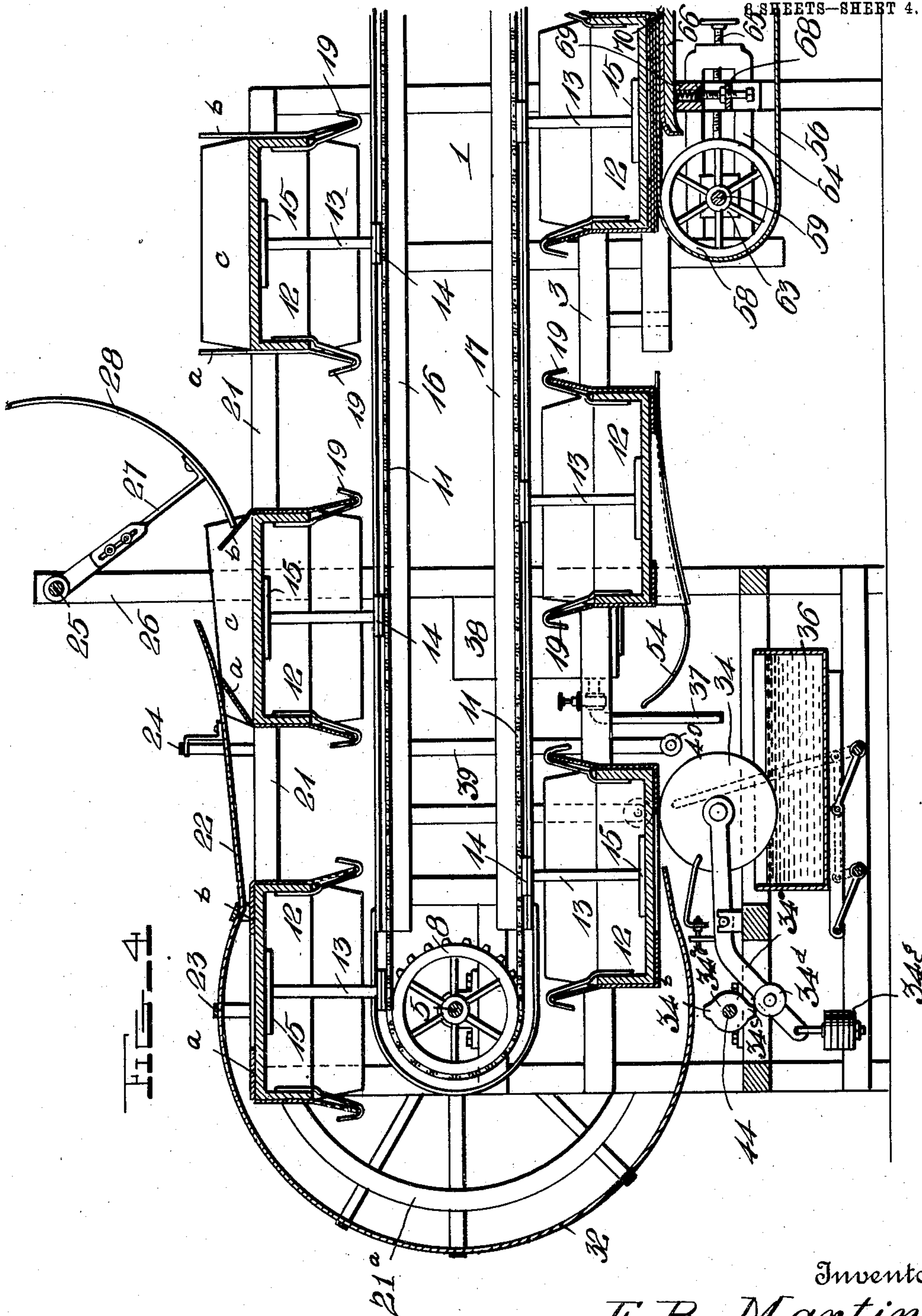
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2 SHEETS—SHEET 4.



Witnesses
 C. H. Griesbauer.

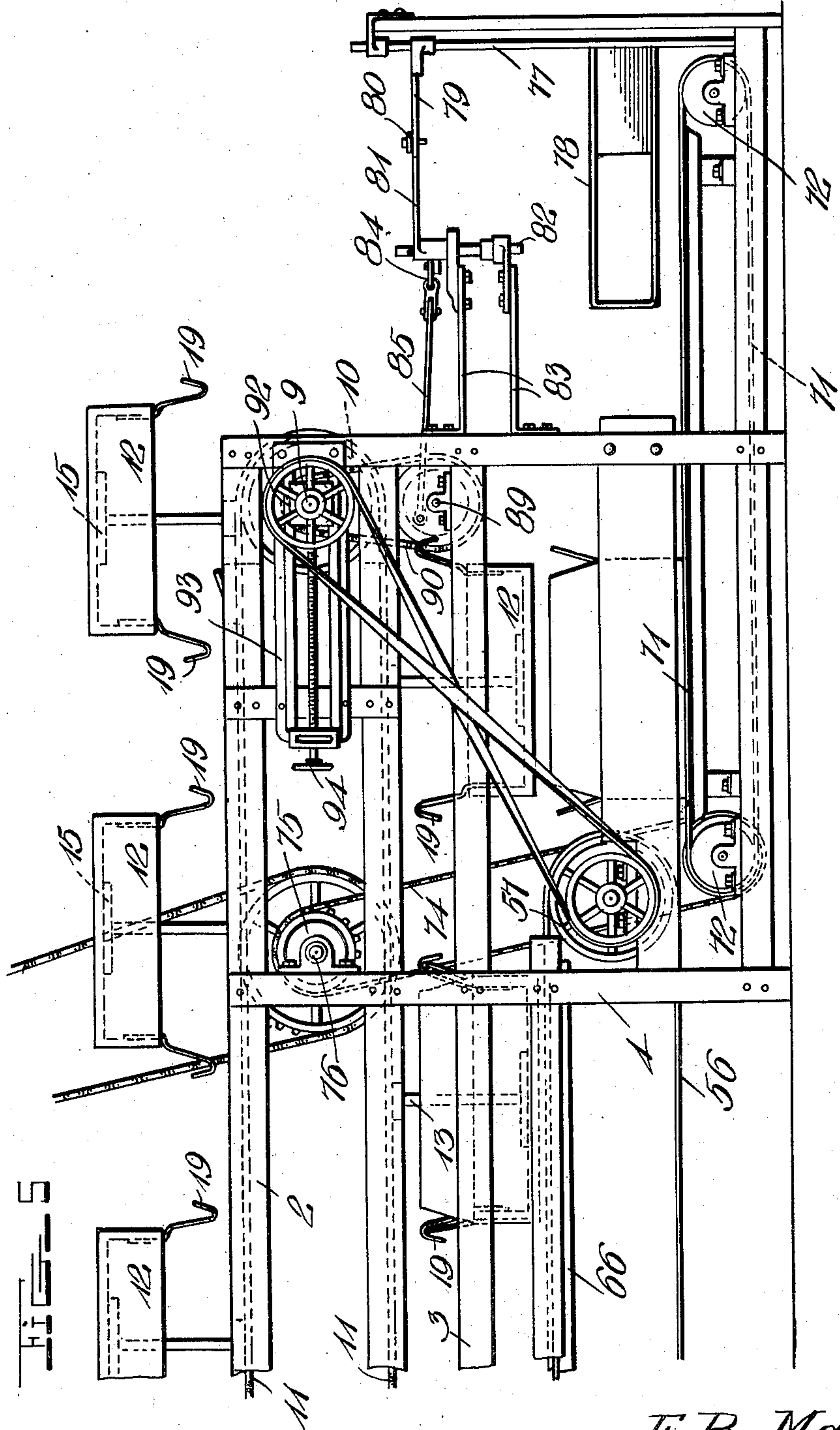
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8 SHEETS—SHEET 5.

956,392.



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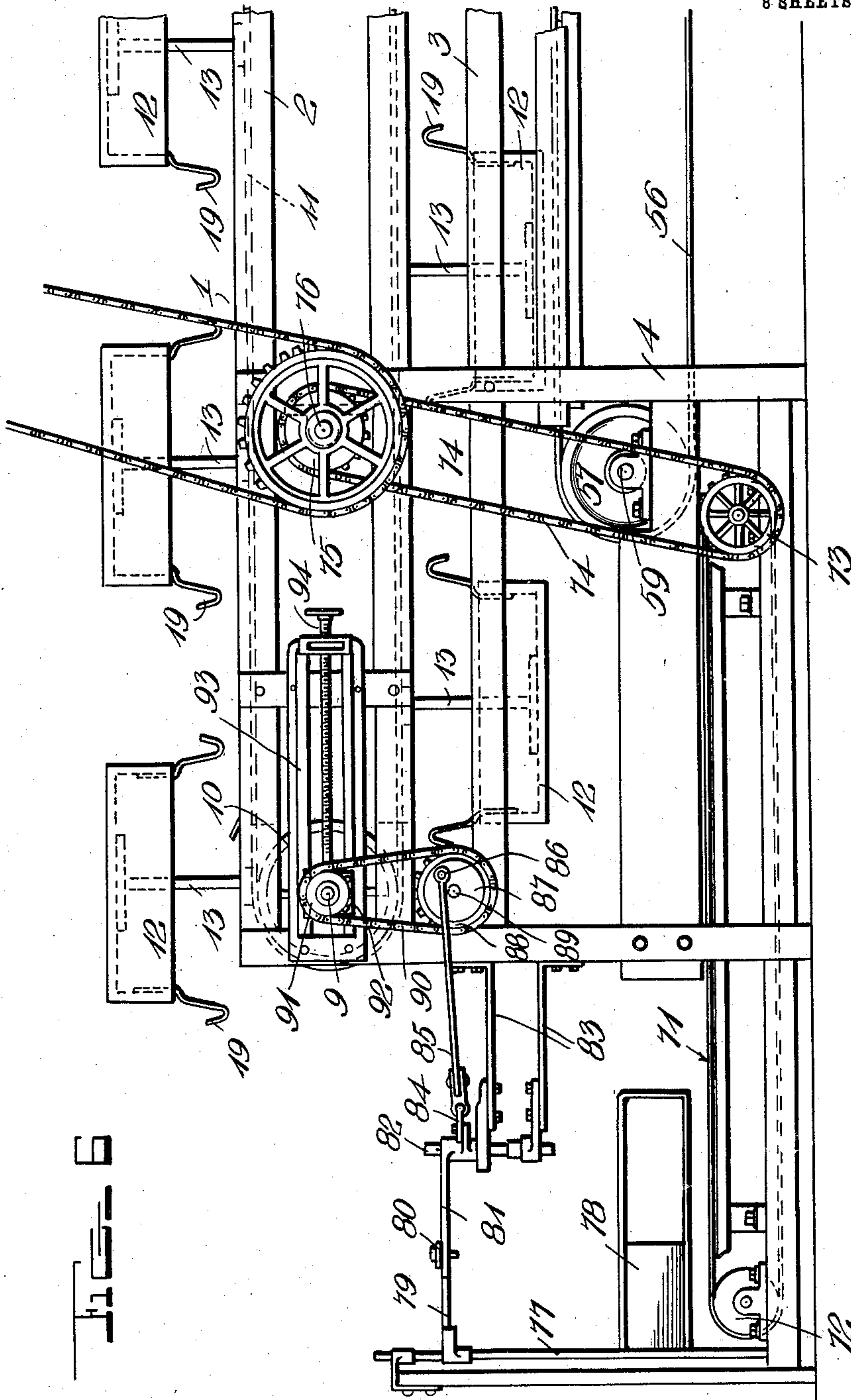
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8 SHEETS—SHEET 6.



Witnesses
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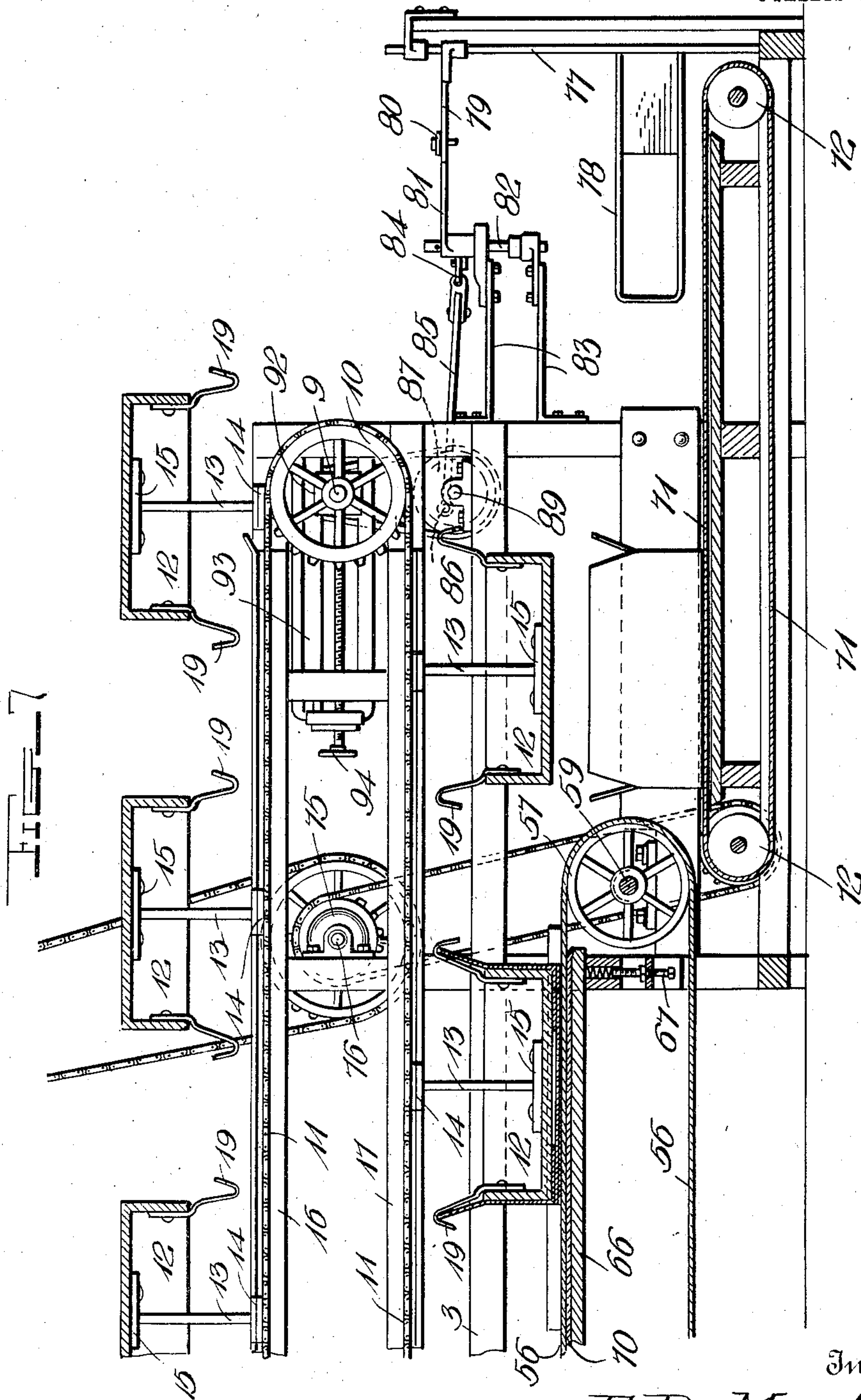
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8 SHEETS—SHEET 7.



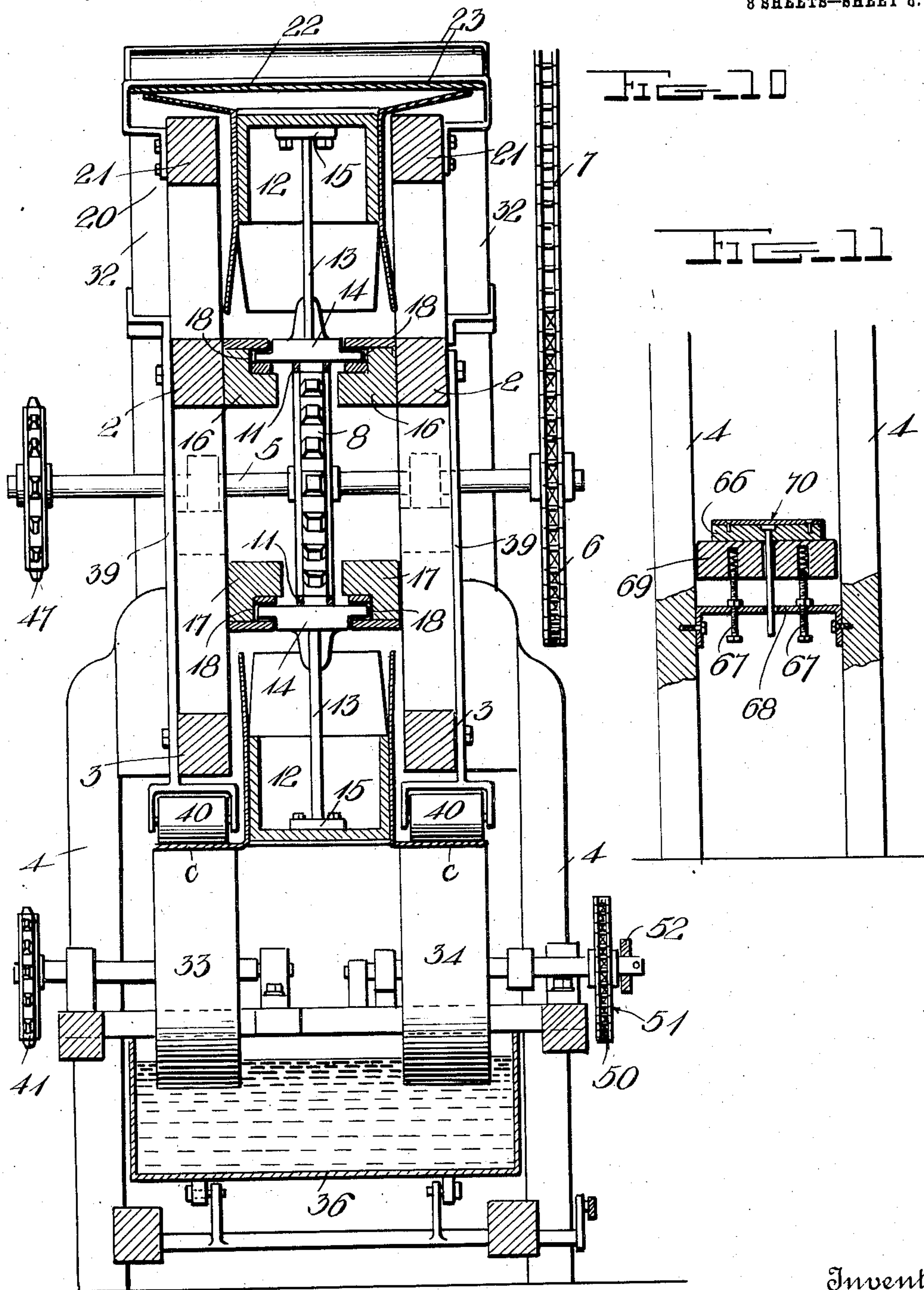
Witnesses
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 APPLICATION FILED AUG. 25, 1909.

956,392.

Patented Apr. 26, 1910.
 8 SHEETS—SHEET 8.



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UNITED STATES PATENT OFFICE.

FRANK B. MARTIN, OF BATTLE CREEK, MICHIGAN.

BOTTOM-FLAP-SEALING MACHINE FOR PASTEBOARD CARTONS.

956,392.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed August 25, 1909. Serial No. 514,575.

To all whom it may concern:

Be it known that I, FRANK B. MARTIN, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Bottom-Flap-Sealing Machines for Pasteboard Cartons; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in bottom flap closing and sealing machines for paste-board cartons.

One object of the invention is to provide a machine of this character having means whereby the bottom flaps of the cartons are folded down in the proper position and glued to close the bottom of the carton.

Another object of the invention is to provide an improved construction and arrangement of glue applying mechanism whereby the glue is applied to the flaps in such manner that none of the glue is exposed to the contents of the carton.

Still another object is to provide a separating mechanism adapted to operate in conjunction with the operating mechanism of the machine whereby when two styles of cartons are being operated upon by the machine, they may be separated upon delivery from the machine and thrown in different directions.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side view of my improved sealing machine; Fig. 2 is a side view on an enlarged scale of one side of one end of the machine; Fig. 3 is a similar view of the opposite side of this end; Fig. 4 is a central longitudinal sectional view of the parts shown in Figs. 1 and 2; Fig. 5 is a side view of one side of the opposite end of the machine; Fig. 6 is a similar view of the opposite side of this end; Fig. 7 is a central longitudinal section of the parts shown in Figs. 5 and 6; Fig. 8 is a detail horizontal section of a portion of one end of the machine, showing the construction and arrangement of the glue applying rollers; Fig. 9 is a detail plan view

of the carton deflecting mechanism at the discharge end of the machine; Fig. 10 is a vertical transverse section on an enlarged scale taken through the glue applying mechanism and the adjacent parts; Fig. 11 is a detail vertical section through the pressure belt supporting mechanism for pressing the glued flaps of the carton together and for conveying the sealed cartons to the discharge end of the machine.

Referring more particularly to the drawings, 1 denotes a main supporting frame which comprises upper and lower parallel longitudinal side bars 2 and 3 which are connected to and supported by a series of vertical standards 4, as shown. Journaled in suitable bearings in one end of the frame is a main drive shaft 5, on one end of which is fixedly mounted a drive sprocket 6 which is connected by a sprocket chain 7 to a suitable operating mechanism (not shown). On the shaft 5 between the side bars of the frame, is fixedly mounted a sprocket gear 8.

Journaled in suitable bearings in the opposite ends of the frame 1 is a drive shaft 9 on which, between the side bars of the frame, is fixedly mounted a sprocket gear 10.

Arranged on and driven by the sprocket gears 8 and 10, is an endless sprocket chain 11 to which is secured a series of carton supporting blocks or forms 12 upon which the cartons are placed and carried around and their bottom flaps brought into engagement with the folding and sealing mechanism of the machine. The blocks or forms 12 are secured to the chain 11 by standards 13 which are provided on their inner ends with guide and chain engaging plates 14 which are riveted or otherwise suitably secured to the links of the chain. The standards 13 are also provided on their outer ends with form or block engaging plates 15 which are secured to the under side of the forms or blocks 12 in any suitable manner whereby said blocks are held in position and secured to the chain.

Secured to the inner sides of the upper portion of the supporting frame adjacent to the upper and lower stretches of the chain 11 are pairs of upper and lower track bars 16 and 17. The track bars 16 and 17 are provided on their inner sides with longitudinally disposed guide grooves or channels 18 with which the projecting side edges of the guide plates 14 of the standards 13 are engaged, as they are carried around by the

chain 11. When the plates 14 are thus engaged with the guide grooves of the tracks 16 and 17, the standards and blocks 12 are supported in position to carry the cartons arranged thereon and to hold the same in position, while the flaps thereof are being folded and sealed.

To the underside of the blocks or forms 12 adjacent to their opposite ends are outwardly projecting hooks 19 with which the end top flaps of the carton are engaged when the carton is placed on the block, said hooks thereby holding the carton in proper position on the blocks or forms.

On one end of the main frame of the machine is arranged a folder supporting frame 20 comprising longitudinal side bars 21 which are secured to and spaced a suitable distance above the side bars 2 of the main frame 1 by an extension of the standards 4. Arranged above the bars 21 of the frame 20 is the first end flap folding device which is here shown and preferably consists of a flat metal plate 22, the outer end of which is spaced a suitable distance above the bars 21 and is riveted or otherwise secured to a bracket frame 23. The inner end of the folding plate 22 is turned upwardly to facilitate the engagement of the end flap *a* there- with when the carton is brought beneath the folder by the chain 11 and the forms arranged thereon. The inner turned-up portion of the guide plate 22 is supported by a bracket frame 24 which is secured to the bars 21, as shown.

The folding mechanism for the second end flap *b* comprises the shaft 25 which is revolvably mounted in the upper ends of bearing standards 26 which are secured at their lower ends to the frame 20. On the shaft 25 is fixedly mounted an arm or bar 27 on the lower end of which is secured a substantially arc-shaped folding plate or shoe 28, one end of which is extended a considerable distance beyond the bar or arm 27 and is curved upwardly, as shown. The shaft 25 is revolved by means of a sprocket gear 29 mounted on one end thereof and connected by a sprocket chain 30 to a suitable operating mechanism hereinafter described. The chain 30 has engaged therewith a suitable chain tightening device 31 whereby the slack in the chain is taken up. When the shaft 25 is driven by the mechanism just described, the arm or bar 27 and the flap folding shoe or plate 28 will be revolved at the proper time to bring said shoe or plate into engagement with the second end flap *b* of the carton, as the latter is brought to a position beneath the shaft 25. When the second end flap *b* has thus been engaged by the shoe 28, the flap will be held down by the curved extension of the shoe until the carton is brought beneath the folding plate 22 which has already folded the first end flap *a*. While the

folding plate 22 is folding the first end flap *a*, said plate is also acting upon the opposite side flaps of the carton to bend the same back or outwardly beyond the sides of the carton to a position at right angles thereto and when said side flaps *c* are thus bent back and the end flaps *a* and *b* folded down, they will be held in this position while being carried around the end of the machine by a semi-cylindrical guard or retaining plate 32 which is secured to the end of the frame of the machine and conforms in shape to the curved end portions 21^a of the frame 20, being spaced therefrom a sufficient distance only to permit the carton-carrying blocks to pass under said shield which holds the flaps in position, until said side flaps *c* are brought into engagement with a glue applying mechanism. This glue-applying mechanism is here shown and preferably consists of suitably mounted glue applying rollers 33 and 34 which are adapted to revolve in a glue tank 36 arranged beneath the frame of the machine and which is connected by a supply pipe 37 with a glue supply tank or reservoir 38 arranged on the side of the machine, as shown. Above the glue applying rollers, are mounted in suitable brackets 39 flap holding rollers 40 which are adapted to hold the side flaps *c* of the carton into engagement with the glue applying rollers as the cartons are carried past the glue applying mechanism. On the shaft of the glue applying roller 33 is mounted a sprocket gear 41 which is connected by a sprocket chain 42 with a sprocket wheel 43 on a counter-shaft 44 which is mounted in suitable bearings, in the adjacent end of the frame and on which is mounted a sprocket gear 45 which is driven by a sprocket chain 46 engaged with a sprocket gear 47 on the main drive shaft 5. The chain 46 after engaging the gear 45 passes around an idle gear 48 mounted in a suitable shaft in the frame 1 below the gear 45, as shown. On the opposite end of the shaft 44 is fixedly mounted a sprocket gear 49 which is connected by a sprocket chain 50 with a sprocket gear 51 on the shaft of the glue applying roller 34 whereby said roller 34 is operated. The shaft 44 is connected with the shaft of the glue applying roller 34 by a link 52 and said shaft of the glue applying roller 34 is mounted and provided with a suitable mechanism whereby said roller may be periodically raised and lowered as the side flap *c* of the carton passes over the same and the movement of said roller is so timed that only the opposite side edges of the flap *c* are engaged by the roller. By this arrangement, the glue is simply applied to the side edges of the flap *c* so that when the flaps are glued together in position to form the bottom of the carton, no glue will appear on the inner side or exposed part of the flaps

forming the bottom of the carton, the glued ends of the inner side flap *c* being covered by the opposite end flaps *a* and *b*. The means for periodically raising and lowering said roller 34 preferably comprises a cam disk 34^a fixed to the revoluble shaft 44 and having oppositely disposed lugs 34^b and 34^c on its periphery adapted to engage periodically with a roller 34^d which projects laterally from one side of an arm 34^e fixed to and extending rearwardly from the roller supporting frame 34^f. The counter-balancing weight 34^g depends from the free end of the arm 34^e. On the shaft 44, adjacent to the gear 43, is mounted a sprocket gear 53, with which the sprocket chain 30 of the gear 29 is engaged and whereby said gear 29 is driven to operate the second end flap folding shoe 28. After the glue has been applied to the side flaps *c* of the carton, in the manner described, said side flaps will be brought into engagement with a suitable folding mechanism which is here shown and preferably consists of a pair of curved converging bars 54 which are arranged beneath the lower side bars 3 of the frame and are secured thereto by suitable hangers or brackets 55. After the side flap has thus been folded to form the bottom of the carton, said bottom is brought into engagement with a pressure belt 56 which is arranged over belt pulleys 57, and 58 mounted on suitable shafts 59 journaled in bearings in the lower portion of the frame 1, adjacent to the opposite ends thereof. The shaft of the belt pulley 57 has mounted on one end a drive pulley 60 which is connected by a drive belt 61 with a drive pulley 62 on the end of the shaft 9 of the sprocket wheel 10 whereby motion is imparted to the belt 56. The shaft of the pulley 58 is mounted in adjustable bearing boxes 63 which are mounted in suitable guide frames 64 on the opposite sides of the machine and are provided with adjusting screws and hand wheels 65 whereby the tension of the belt 56 is regulated. The upper stretch of the pressure belt 56 is yieldingly supported by a board or platform 66 which is secured to the upper ends of bolts 67 which have a threaded engagement with cross bars 68 arranged between the standards 4 of the frame 1. The upper ends of the bolts 67 are loosely engaged with platform supporting bars 69 on which the board or platform 66 rests and between said bars 69 and the threaded bars 68 on the bolts 67 are arranged coiled springs whereby said bars 69 and the platform 66 are yieldingly supported to hold said pressure belt in position. On the upper side of the board or platform 66 between the same and the belt 56 is arranged a smooth iron plate 70 which permits the upper stretch of the belt to freely slide over the platform. By means of the

yieldingly supported platform and the pressure belt, the glued flaps of the carton will be pressed into engagement with each other and thus sealed together. The belt 56 is geared to travel at the same speed as the chain 11 which moves the cartons so that the latter will not be dragged back or in any way restricted in their forward movement. As the forms or blocks containing the cartons with the sealed bottom flaps reach the end of the pressure belt, the cartons drop by gravity from the forms and will fall onto a delivery belt 71 arranged on the operating rolls 72 which are mounted in a portion of the adjacent end of the frame 1, as shown. The shaft of one of the rolls 72 is provided with a sprocket wheel 73 which is connected by a sprocket chain 74 with a sprocket gear 75 mounted on a shaft 76 which is journaled in suitable bearings on the side of the frame 1 and is operatively connected with a driven part of the operating mechanism of the machine. By means of the belt 71, the cartons after leaving the forms are carried away from the sealing machine and may be delivered by the belt 71 at any suitable point.

In connection with the delivery mechanism, I provide a separating mechanism whereby boxes of different kinds may be separated and delivered from the machine in different directions. The separating mechanism is here shown and preferably consists of a vertically disposed revolubly mounted shaft 77 which is arranged in line with the center of the delivery belt 71 and is provided with a carton engaging and deflecting frame 78 which projects over the belt 71 a suitable distance. On the upper end of the shaft 77, is secured a crank arm 79 which is connected by a link 80 with a crank arm 81 on the lower end of an operating shaft 82 which is pivotally mounted in suitable bearing brackets 83 secured to the end of the frame 1. On the upper end of the shaft 82 is arranged a crank arm 84 which is connected by a pitman rod 85 to a wrist pin 86 which is eccentrically arranged on a crank disk 87 secured to and forming part of a sprocket wheel 88 which is revolubly mounted on a stub shaft 89 which is journaled in suitable bearings on the side of the frame 1, as shown. The sprocket wheel 88 is connected by a chain 90 with a sprocket pinion 91 on the adjacent end of the shaft 9 of the sprocket gear 10. By thus connecting the shaft 77 with the operating mechanism of the machine, the carton deflecting frame 78 will be swung back and forth across the delivery belt 71 at the proper time so that each stroke of the frame will engage a carton as it is brought forward by the belt thereby pushing one carton in one direction and the next in the opposite direction from the belt. By this arrangement, when two different styles or kinds of cartons are being

sealed by the machine, a different kind of carton is placed on every other form or block so that when the cartons are dropped onto the delivery belt, first one kind and then the other will be brought into position to be engaged by the deflecting frame 78 which will push or throw one kind of carton in one direction and the other kind in the opposite direction, as will be understood.

10 The shaft 9 of the sprocket gear 10 is preferably mounted in adjustable bearing boxes 92 which are arranged in guide frames on the sides of the frame 1 and are adjusted in said frame by a feed screw and hand wheel 15 94 whereby the slack in the chain 11 may be taken up.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction, may be resorted to without departing from the principle or sacrificing any of the advantages of the invention, as defined in the appended claims.

Having thus described my invention, what I claim is:

30 1. In a bottom flap sealing machine for cartons, a supporting frame, an endless carrier operatively mounted in said frame, a series of carton supporting devices secured to said carrier, end flap folding devices arranged on said frame and adapted to fold the end flaps of the carton down in closed position and to bend the side flaps outwardly, a glue applying mechanism adapted to apply glue entirely across one of said side flaps and to the opposite edges only of the other side flap, means to fold said side flaps down into engagement with each other and with said folded end flaps, and means to press said folded flaps into closed engagement to seal the same.

2. In a bottom flap sealing machine for cartons, a supporting frame, an endless carrier operatively mounted in said frame, a series of carton supporting forms arranged on said carrier, means to hold and guide said forms as they are carried around by said carrier, a first end flap folding plate arranged on said frame in position to engage the first end flap to fold the same into closed position and simultaneously bend the side flaps back to an open position, a revolubly mounted second end flap folding device adapted to fold the second end flap of the carton to closed position, means to hold said end flaps folded and said side flaps in an open position, a glue tank, a pair of glue applying rollers revolubly mounted in position to apply glue from the tank to the side flaps, means for raising and lowering one of said rollers periodically to apply glue to the

opposite edges only of one side flap, means to hold said flaps in engagement with the glue applying rollers, a side flap folding mechanism adapted to fold said side flaps to a closed position, and a pressure mechanism 70 to hold the flaps in folded positions whereby they are sealed by the glue applied to the side flaps.

3. In a bottom flap sealing machine for cartons, a supporting frame, guide track 75 bars arranged in said frame, an endless carrier operatively mounted in said frame, a series of carton supporting and holding forms, standards to secure said forms to said carrier, combined attaching and guide plates 80 on the ends of said standards adapted to be secured to said carrier and to travel in said guide tracks whereby said forms are held in operative position while being moved by said carrier.

4. In a machine of the character described, a supporting frame, an endless carrier operatively mounted therein, carton holding forms arranged on said carrier, a first end flap folding plate adapted to fold down the first end flap of the carton and to open out the side flaps thereof, a second end flap folding device, said device comprising a revolubly mounted arm, an arc-shaped flap engaging shoe connected near its front end 95 to the end of said arm and adapted to be brought thereby into engagement with the second end flap whereby the latter is folded down and held in a closed position, means to operate said arm, a guard or retaining plate adapted to hold said end flaps in closed position and said side flaps in open position, a glue applying mechanism adapted to apply glue to said opened side flaps, a pair of side flap holding bars adapted to hold said side flaps into closed position after the glue is applied thereto, and a flap pressing mechanism whereby said glued and folded flaps are pressed together and sealed.

5. In a bottom flap sealing machine for cartons, a supporting frame, an endless carrier operatively mounted in said frame, a series of carton holding forms arranged on said carrier, means to fold the end flaps of the carton and to open out the side flaps thereof, a glue applying mechanism comprising a tank, glue applying rollers revolubly mounted in said tank and adapted to receive and apply glue to said side flaps, flap holding rollers to hold said flaps into engagement with said glue applying rollers, means to raise and lower one of said glue applying rollers whereby the glue is applied only to the opposite side edges of the flap engaging the same, a side flap folding mechanism adapted to fold said side flaps to a closed position, and a pressure mechanism to press the folded flaps together whereby they are sealed by the glue applied to the side flaps and form the bottom of the carton. 100

6. In a bottom flap sealing machine for cartons, a supporting frame, provided with flap folding and sealing means, a delivery mechanism arranged at the discharge end of the machine, a carton separating mechanism adapted to separate the cartons as they are delivered from the machine, said separating mechanism comprising a revolubly mounted shaft, a carton deflecting frame arranged on said shaft and adapted to be swung thereby in opposite directions, an operating shaft, crank arms arranged on said operating shaft and said deflecting frame shaft, a link to connect said crank arms, a crank arm on the upper end of said operating shaft, a crank disk operatively mounted on the machine and driven from a moving part of the same, and a pitman rod to connect said crank disk with the crank arm on the upper end of said operating shaft, whereby the latter is actuated to impart an oscillatory movement to said deflecting frame whereby the cartons are pushed first one way and then the other from said delivery belt.

7. In a bottom flap sealing machine for cartons, a supporting frame, an endless

sprocket chain carrier operatively mounted in said frame, a series of carton holding forms arranged on said carrier, an end flap closing and side flap opening mechanism, a glue applying mechanism adapted to apply glue entirely across one side of one of said flaps and on the edges only of one side of the other side flap, a side flap closing mechanism, a flap pressing mechanism to hold the glued flaps in engagement with the other flaps thereby sealing said flaps to form the bottom of the carton, said pressing mechanism comprising an endless belt, means to drive said belt at the same speed as the carrier, means to take up the slack in said belt, a platform to support the upper stretch of the belt, supporting springs beneath said platform to yieldingly hold the same in engagement with the belt, and an anti-friction plate on said platform.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK B. MARTIN.

Witnesses:

JOHN C. DAVIS,

HOWARD H. BALDORFF.