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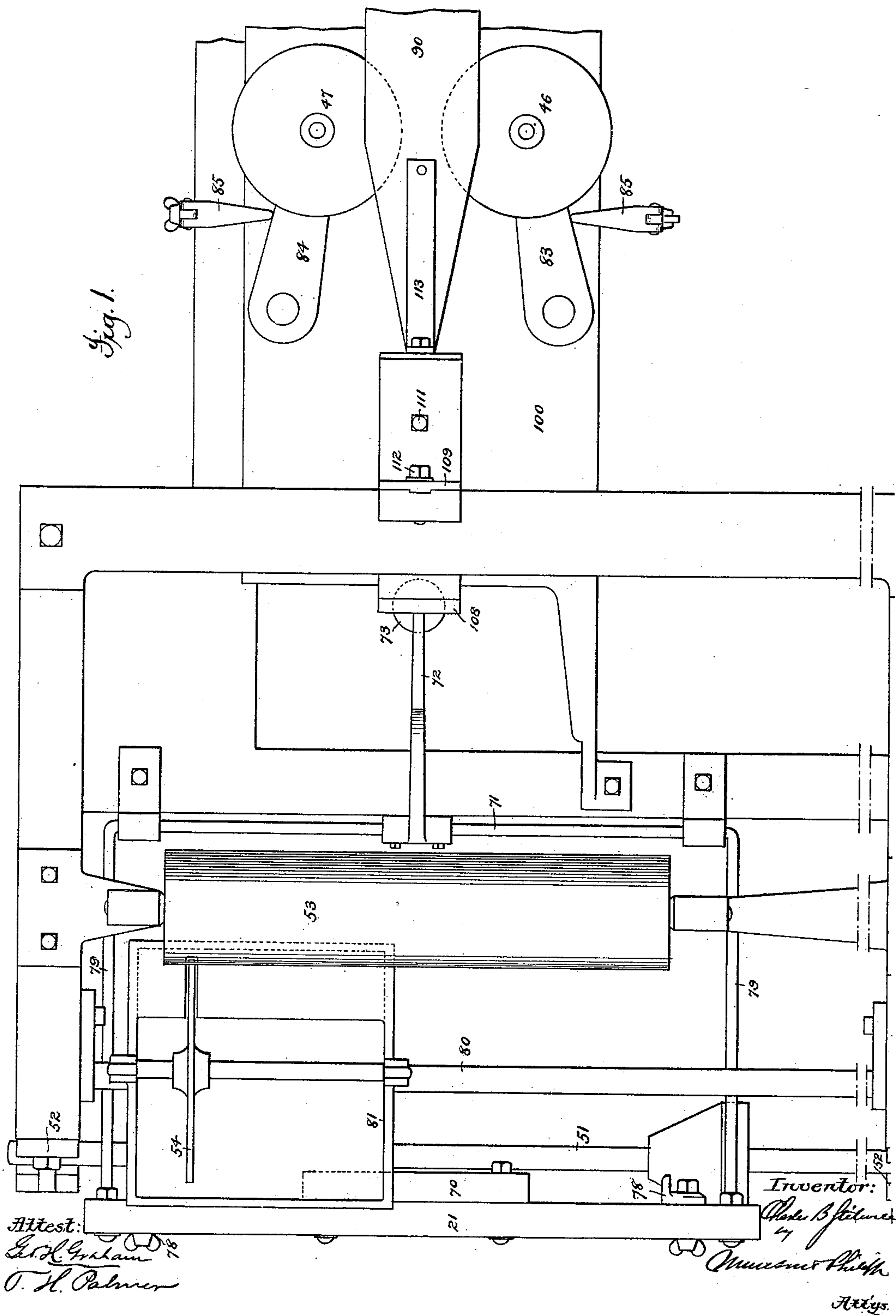
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C. B. STILWELL.

PAPER BAG MACHINE.

No. 370,099.

Patented Sept. 20, 1887.



(No Model.)

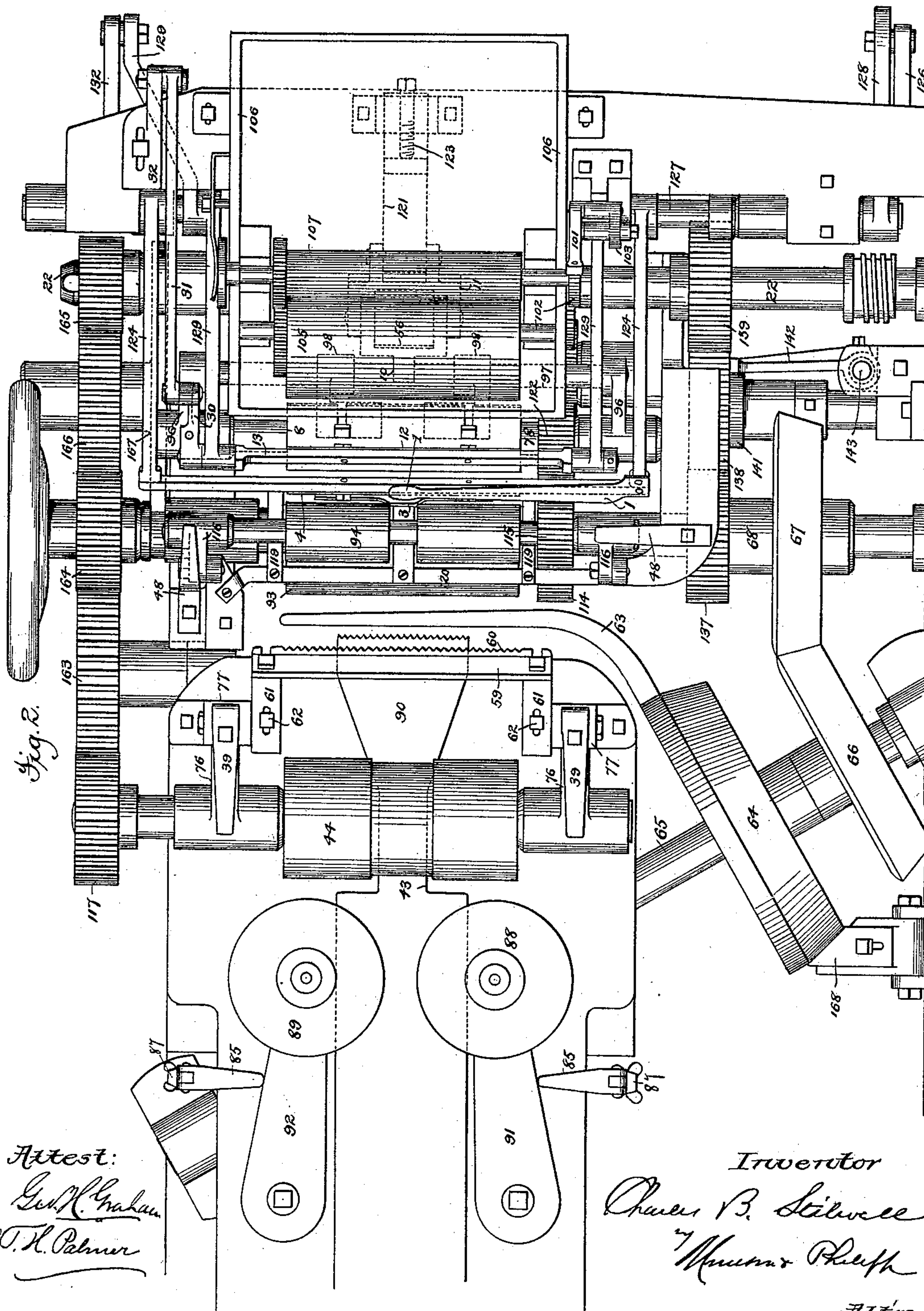
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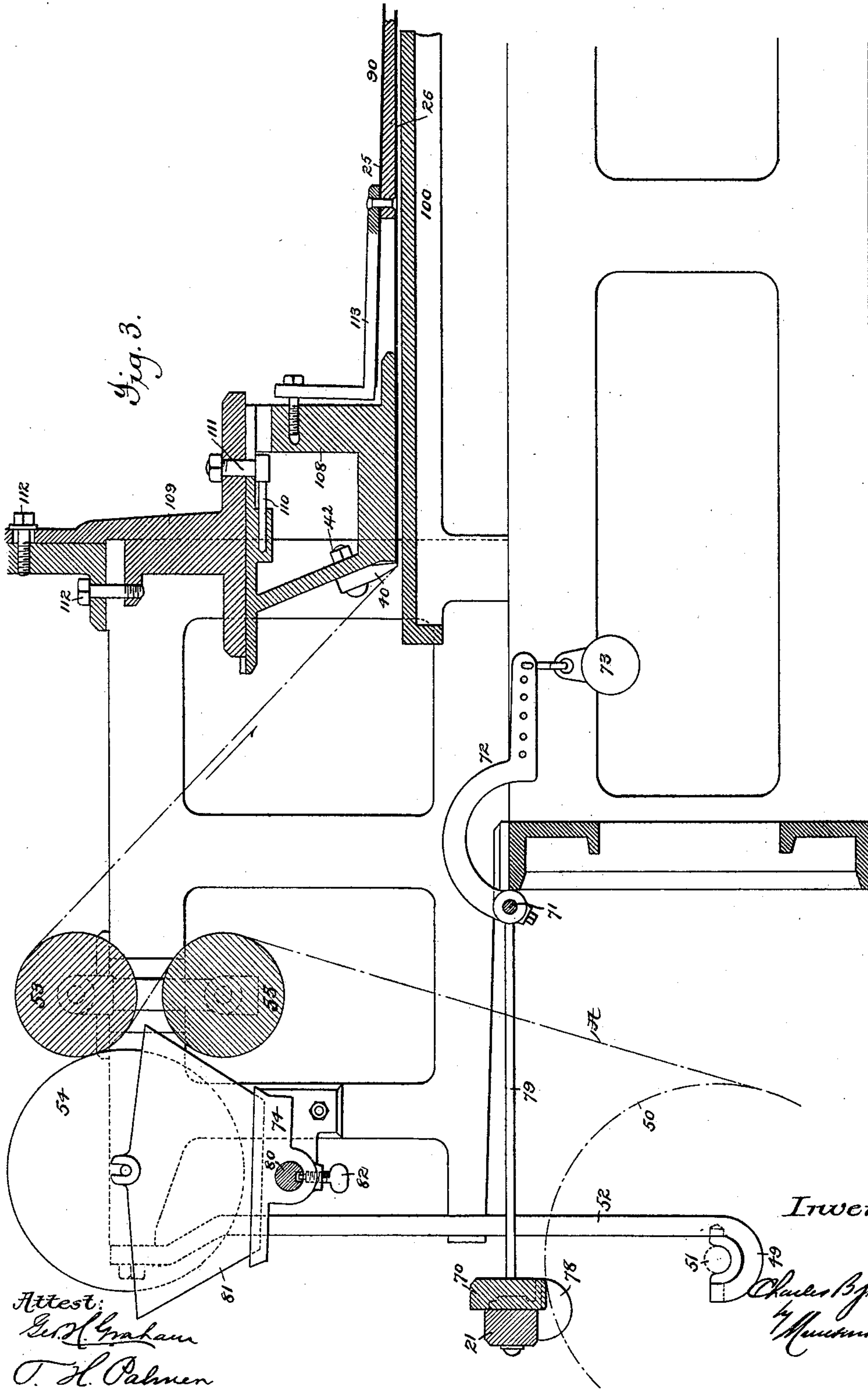
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C. B. STILWELL.

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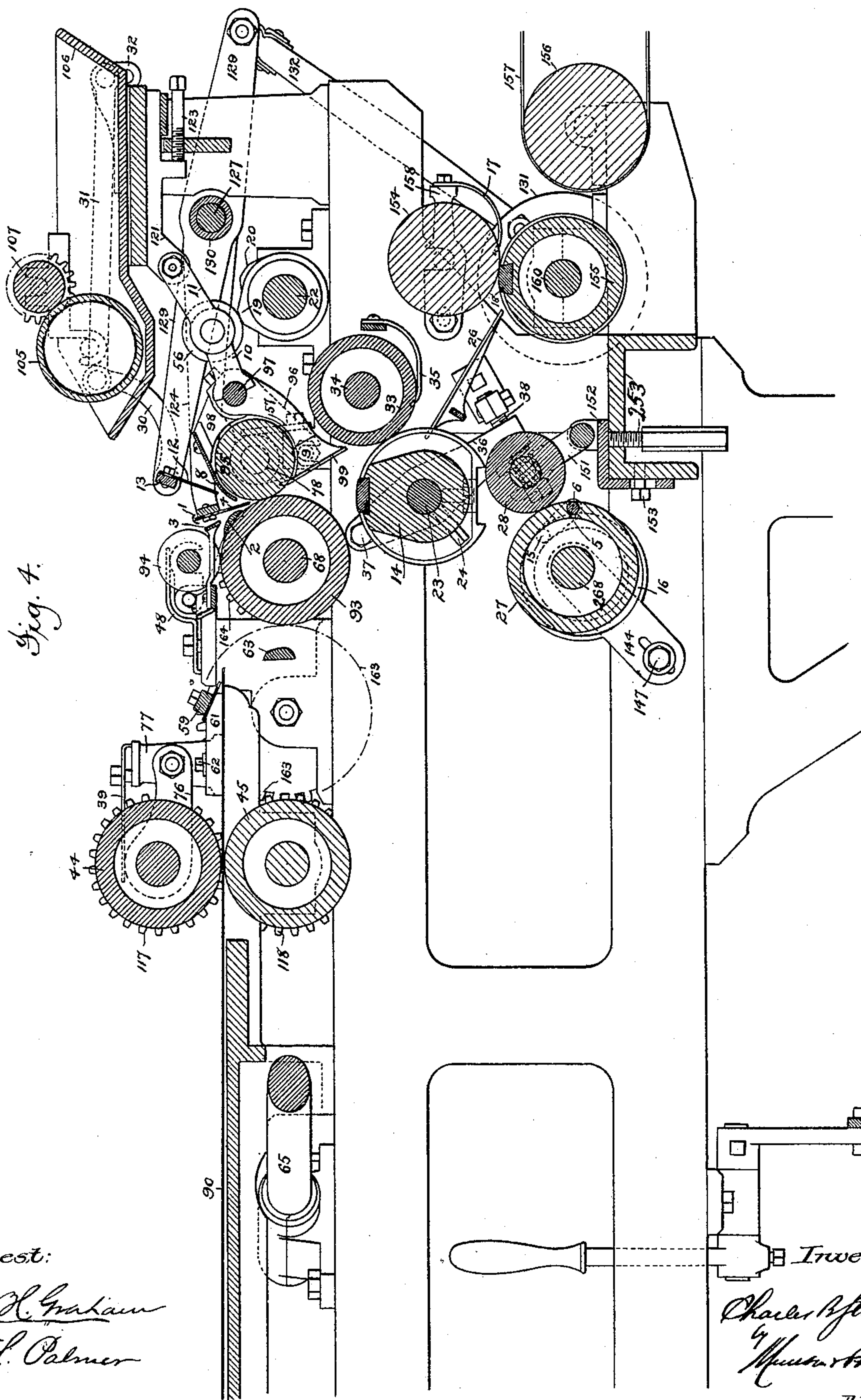
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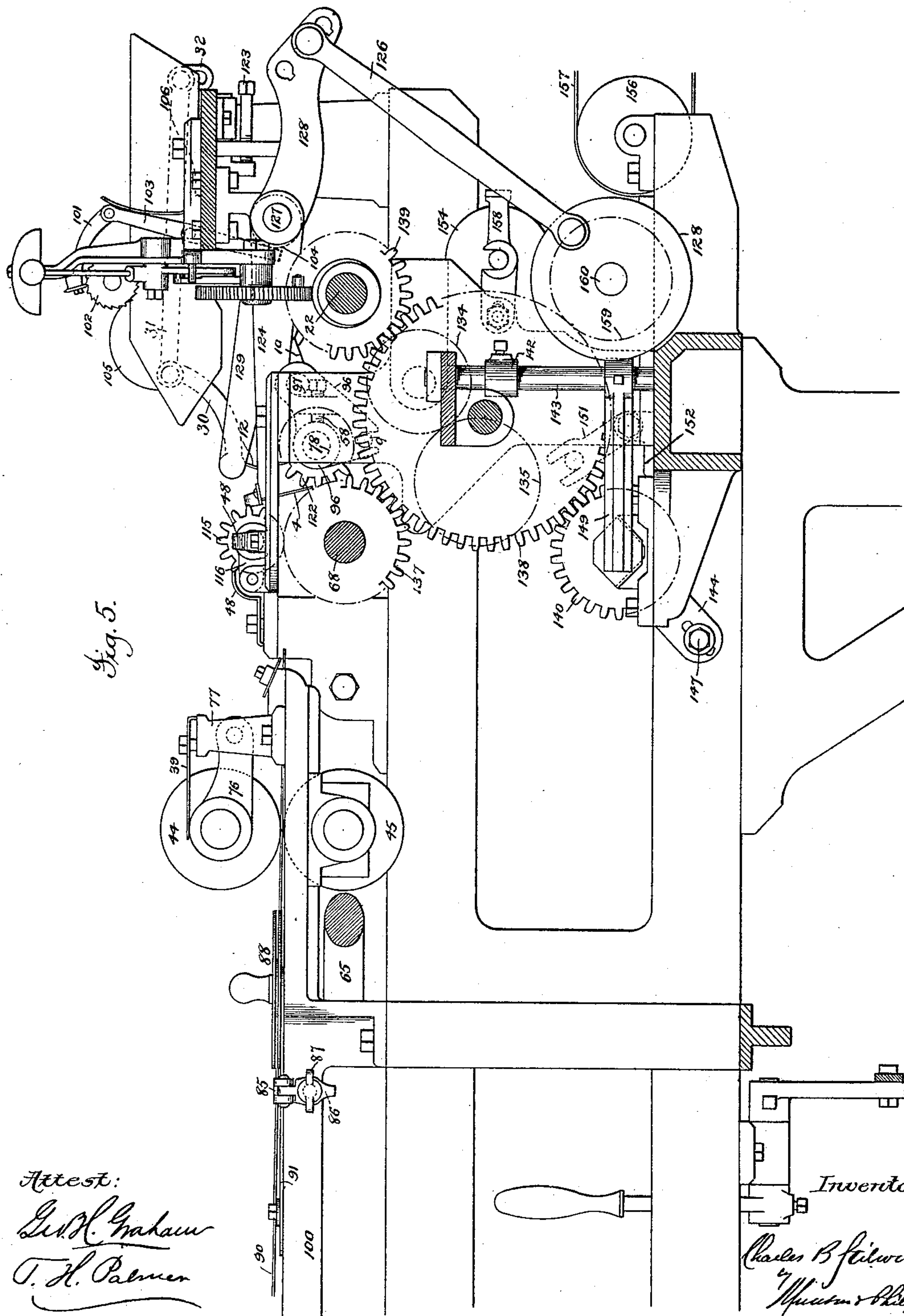
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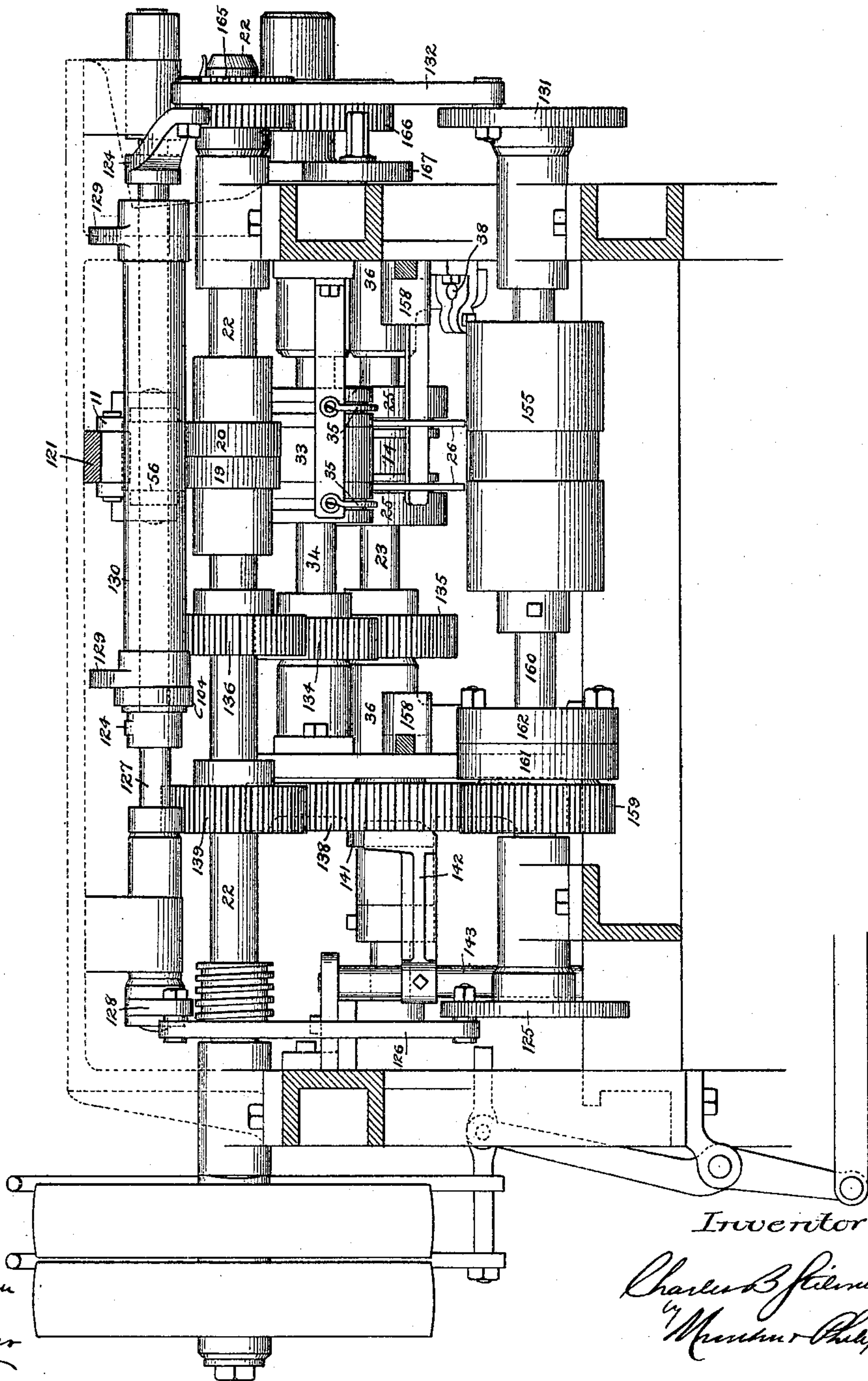
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Fig. 6.



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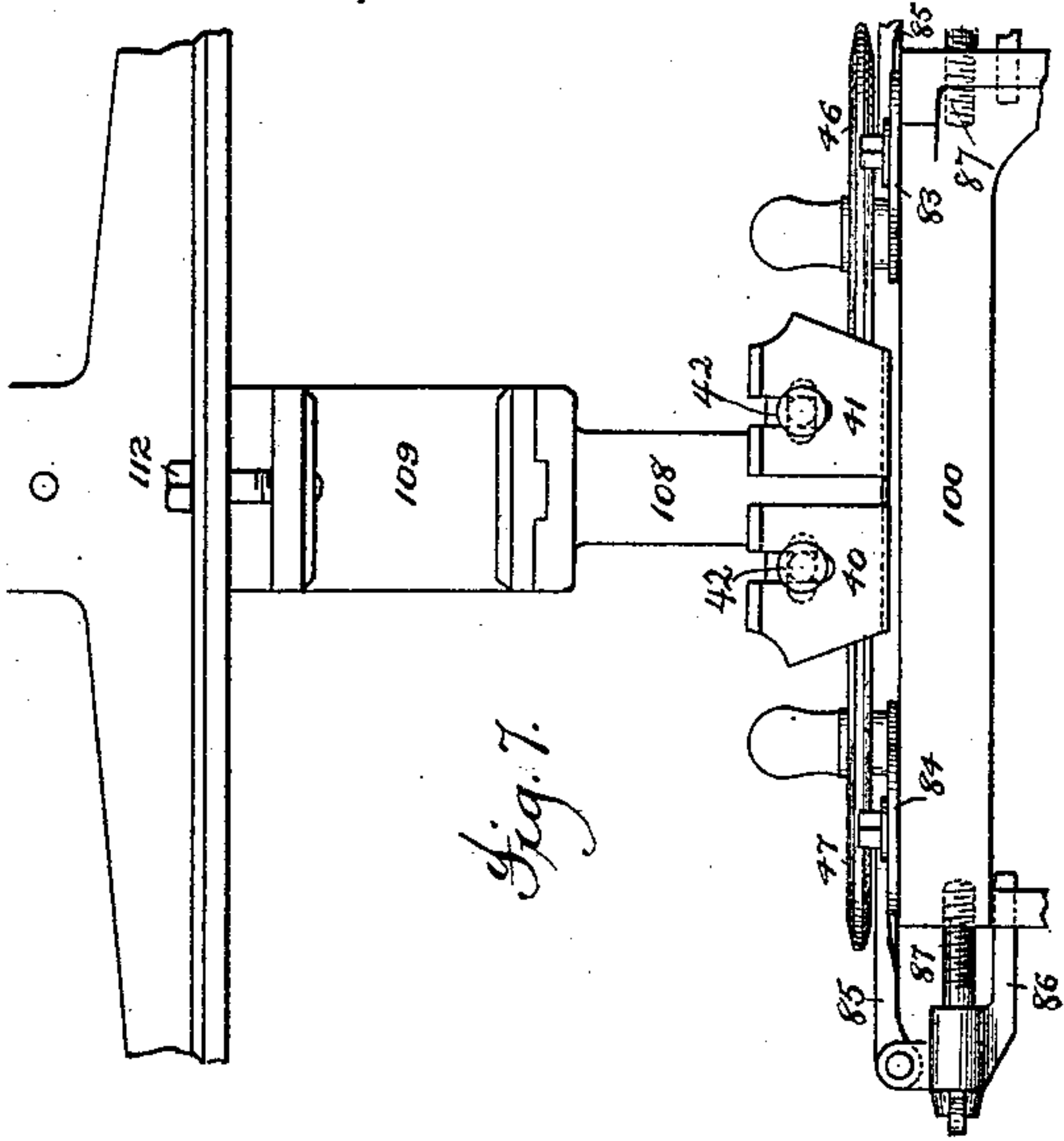


Fig. 7.

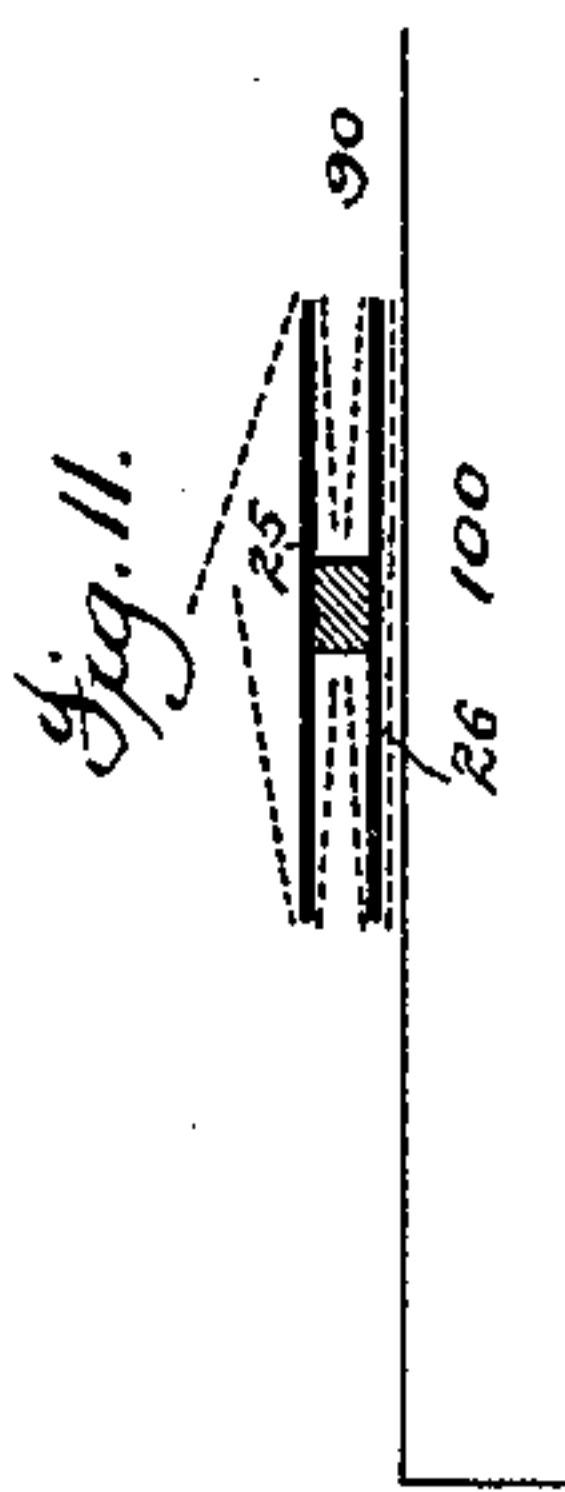


Fig. 11.

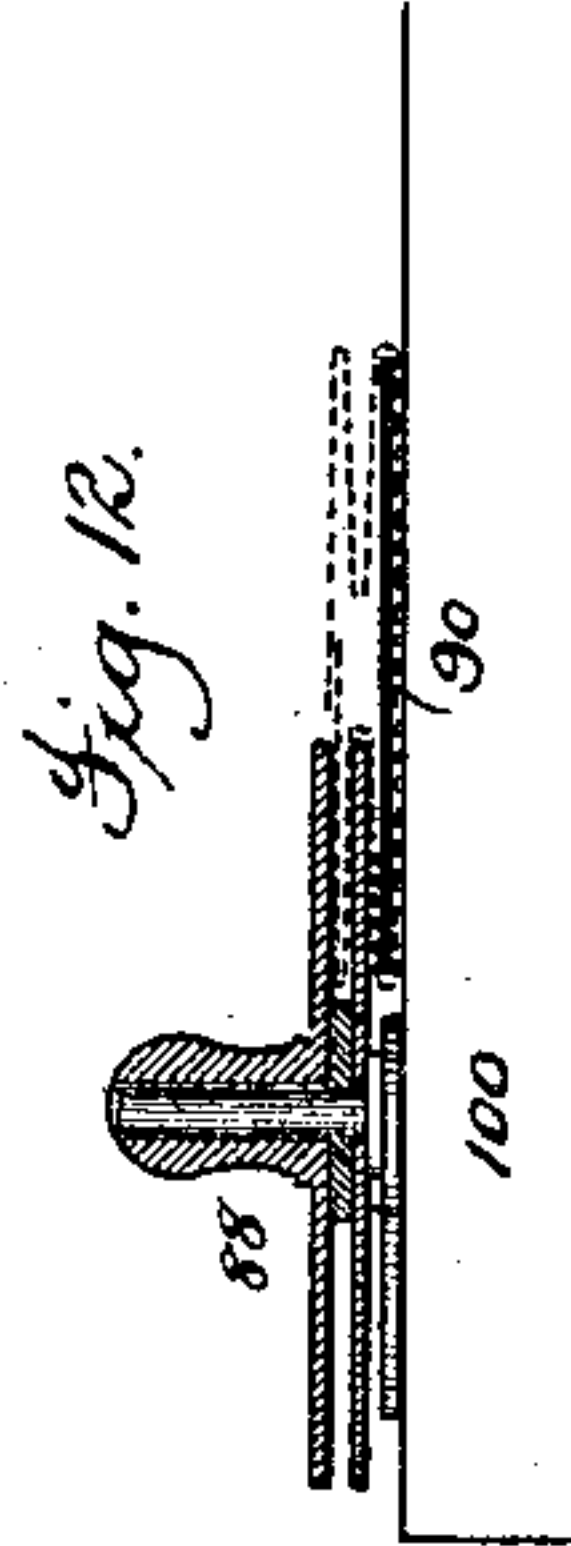


Fig. 12.

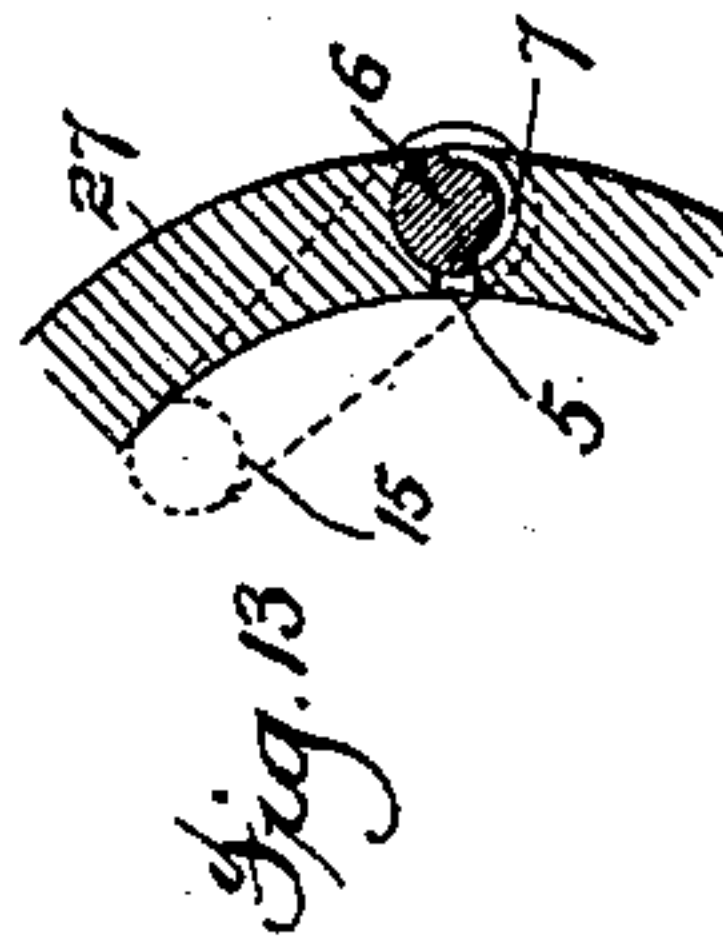


Fig. 13.

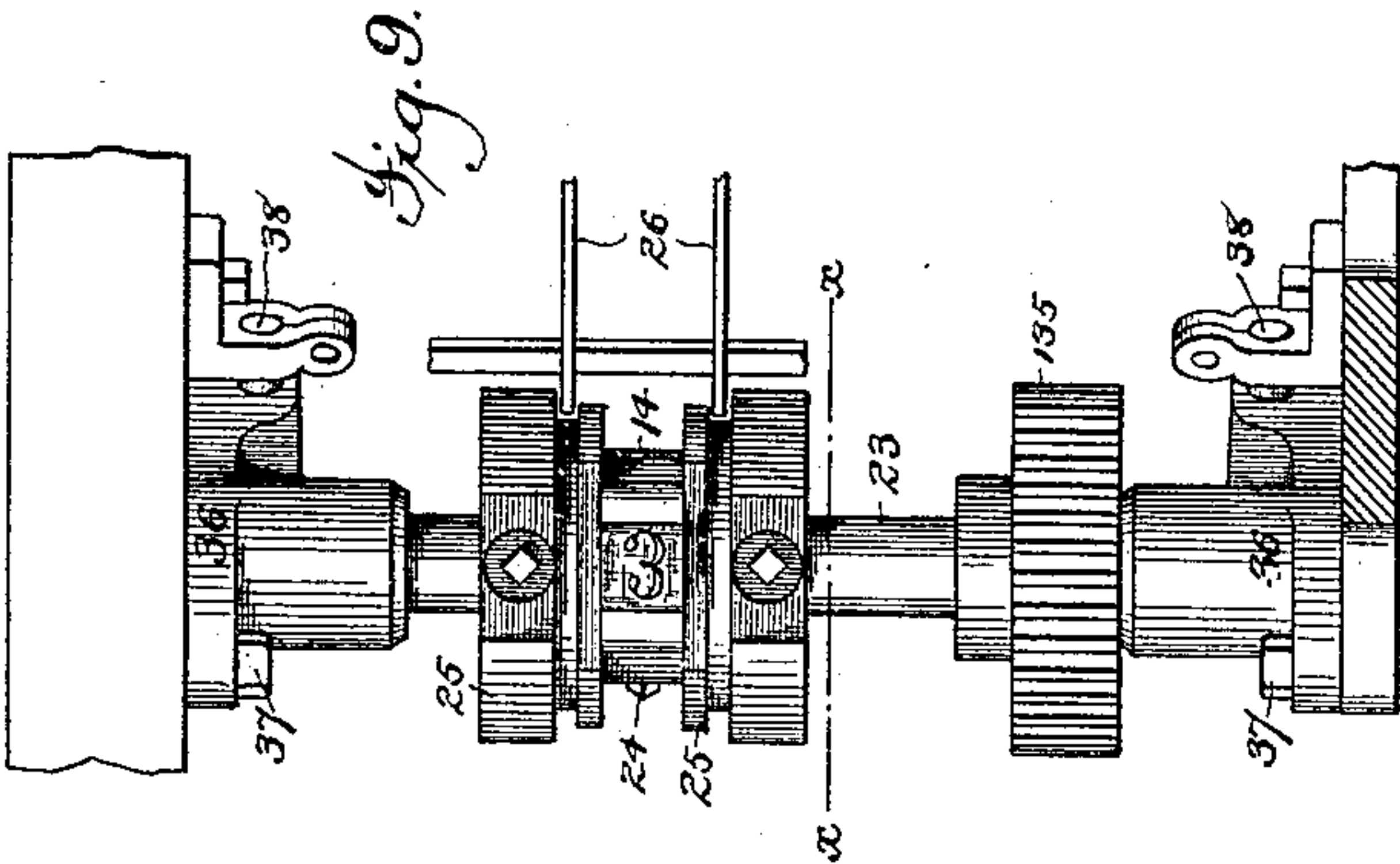


Fig. 9.

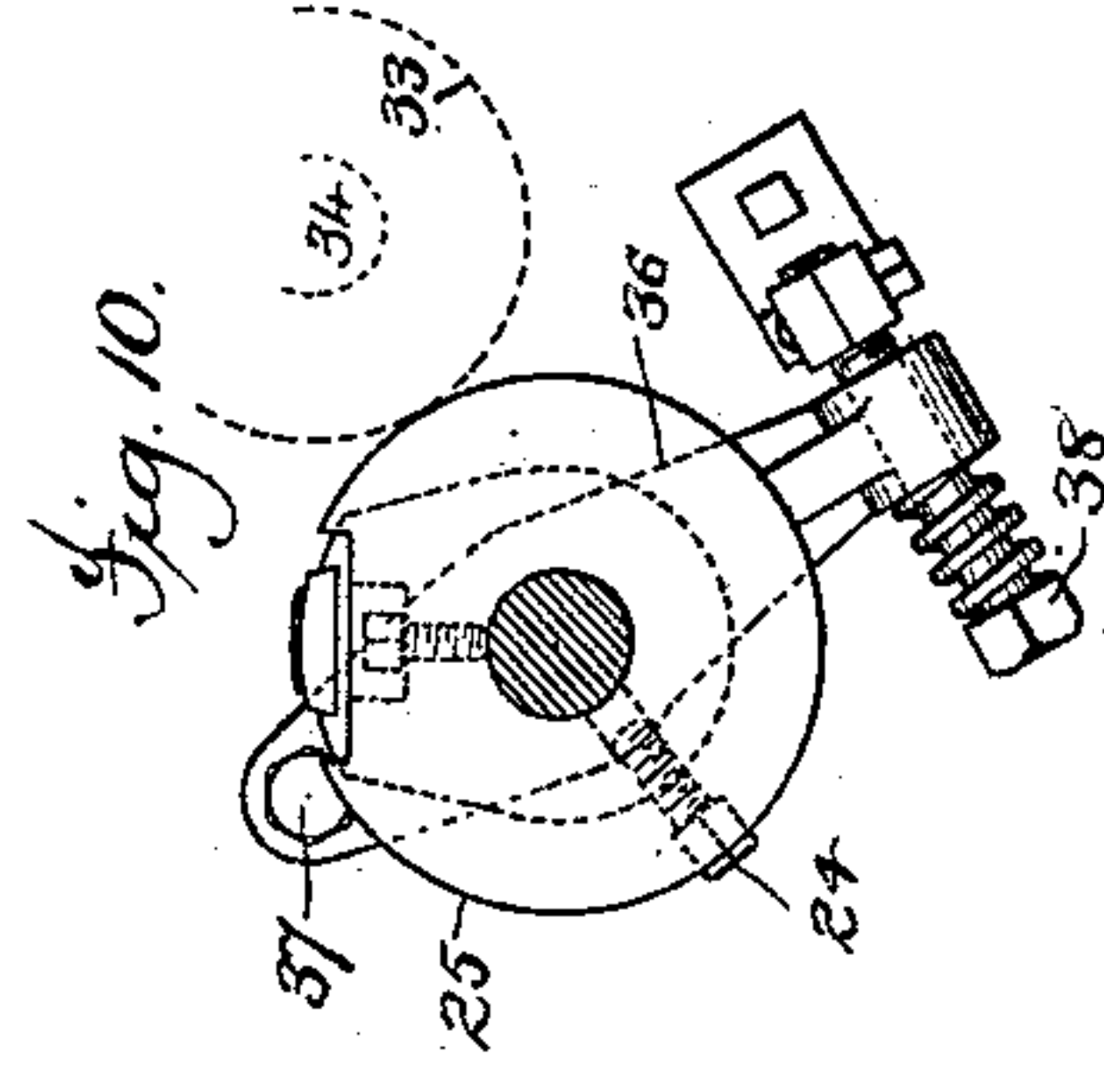


Fig. 10.

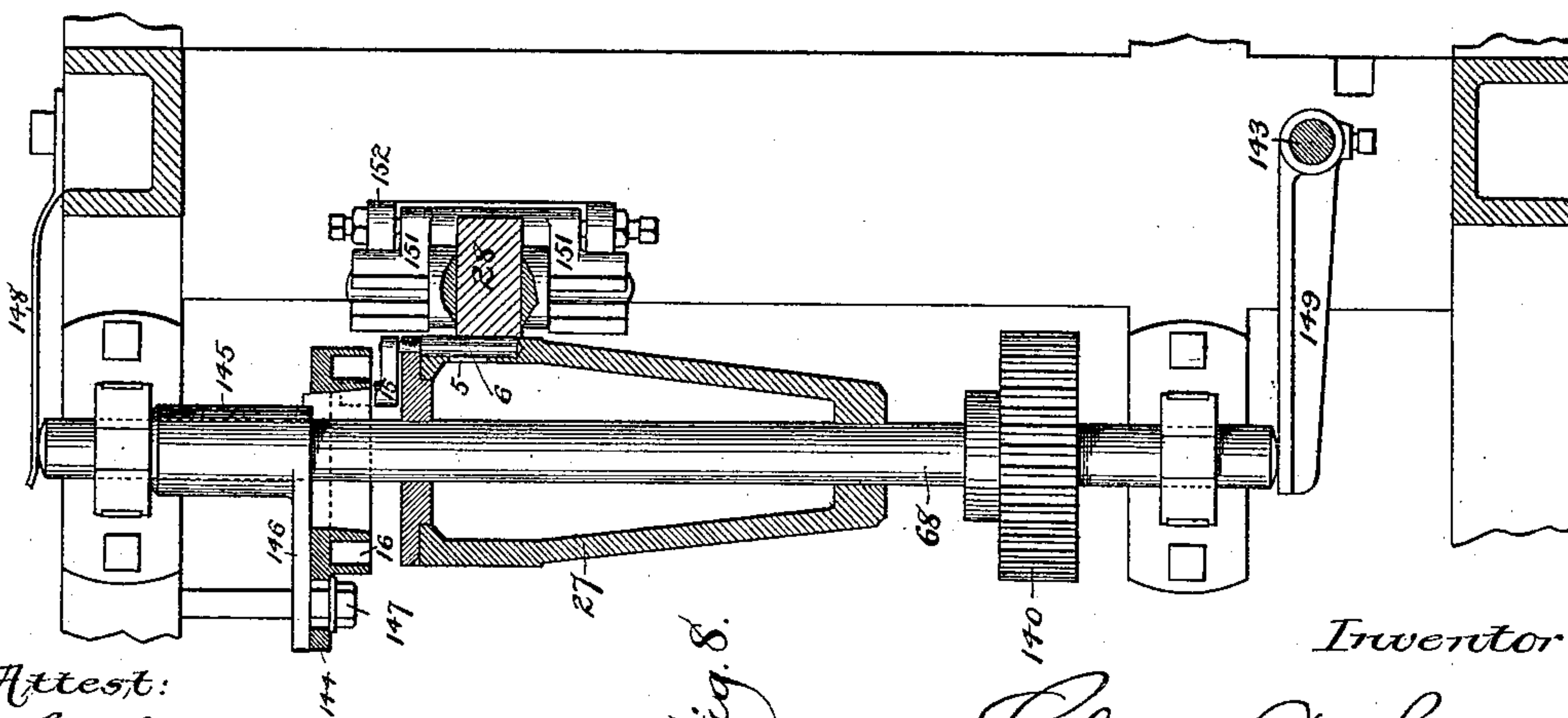


Fig. 8.

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UNITED STATES PATENT OFFICE.

CHARLES B. STILWELL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE UNION PAPER BAG MACHINE COMPANY, OF SAME PLACE.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,099, dated September 20, 1887.

Application filed April 4, 1885. Serial No. 161,170. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. STILWELL, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Paper-Bag Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 In said drawings, Figures 1 and 2 together constitute a plan or top view of the machine. Figs. 3 and 4 together constitute a longitudinal sectional elevation thereof. Fig. 5 represents a side elevation of the forward part of the machine with the side frame and some other parts removed. Fig. 6 represents an end elevation of the machine with the frame, the paste-box supported thereby, and some of the rollers removed. Fig. 7 is a rear end elevation of the former, its support, and the table. Fig. 8 is a sectional view of the ink-fountain roll. Fig. 9 is a plan view of the type-cylinder. Fig. 10 is an end elevation thereof. Fig. 11 is a sectional elevation of the "former."

25 Fig. 12 is a sectional elevation of a portion of the former and certain duplex disks. Fig. 13 is an enlarged sectional elevation of the ink-feeding plug or valve.

This machine is designed to produce that class of paper bags made from flat tubes having infolded sides or bellows folds, short sections of which tube, having one end closed by a straight fold, constitute bags that will open or distend into square form when filled. It may, however, produce common flat bags by simply putting out of operation the devices that produce the bellows folds.

The object of the present invention is the production of such bags by the consumption of the least quantity of material. This is attained by the construction and combination of mechanisms fully hereinafter explained, and specifically pointed out in the claims.

That these improvements may be readily comprehended, their practical embodiment, as represented in the drawings, will be explained in detail.

It should first be understood that a long web of paper of suitable width for the purpose is first pasted along one edge, then has its two edges brought together and united about a

former with its opposite sides bent inward to form a bellows-sided tube, that this tube is then cut transversely to constitute bag-lengths, and that each bag-length has a narrow portion of its forward end pasted and folded onto the body to close the tube and form a flat bag, and that the several mechanisms perform these various operations.

The paper web A, in the form of a roll, 50, 60 is supported upon a shaft, 51, that is mounted to turn in bearings 49 at the lower ends of bars 52, that are capable of swinging laterally. Proper tension is imparted to the roll of paper by means of a tension bar or brake, 21, that carries adjustable side guides, 78, and a shoe, 70, which bar 21 is hung at the ends of arms 79, projecting from a rock-shaft, 71, and counterbalanced by a central arm, 72, that is provided with an adjustable weight, 73. In the main these devices are shown and described in Patent No. 279,505, granted June 12, 1883.

The pasting apparatus for applying a line of paste to one edge of the paper web consists of a disk, 54, mounted in bearings in the ends of a vat, 81, in which it may turn freely. The vat rests upon a table, 74, that is supported on a shaft, 80, mounted in bearings in the side frames and capable of a partial rotation therein, which table may be adjusted laterally by sliding on the shaft 80, to which it may be fixed by a set-screw, 82, that enters a longitudinal groove in said shaft. This vat may thus be removed and replaced with convenience, and when in operative position will, by means of the weighted inner side of the table 74 and the movement of the shaft 80, be tipped forward, so that the disk will rest by gravity in constant contact with the roll 53. In advance of this pasting-disk are mounted two guiding-rollers, 53 55, the latter guiding the web and the former supporting it for contact with the paste-disk 54.

Over the central table, 100, of the machine the tube-forming mechanism is mounted. This consists of a former, 90, of a proper width, whose sides are recessed (see Fig. 11) to cooperate in producing the bellows sides, as is now common. This former 90 is supported by a stock, 108, that is held by a bracket, 109, to which it is attached by a bolt, 111, which bracket is adjustably attached to a cross-frame

by bolts 112. The stock 108 is provided with a projection from which projects a wooden pin, 110, that abuts against the head of the bolt 111 and serves as a convenient means for regulating the position of the forward end of the former when it has become shortened by reason of the sharpening of the teeth of its serrated end, the adjustment being effected by shortening the length of the wooden pins and moving the former forward lengthwise until the end of the pin again abuts against the head of the bolt 111. The heel of the former is provided with a braking-shoe consisting of two members, 40 41, that are constructed with vertical slots and attached to the stock by means of bolts 42, that pass through transverse slots in the stock. They thus constitute stationary means for imparting the preliminary fold to the web of paper.

The former 90 is composed of two plates, 25 26, separated for a short distance by a central core-piece, to which the upper and lower plates are secured by rivets. The plate 25 terminates at some convenient point short of the feed-rollers 44 45, while the plate 26 is contracted to form a narrow neck, 43, to continue it past said feed-roller, and its forward end terminates in a serrated or cutting edge of the width of the tube. The former is also provided with an arm, 113, one end of which is secured thereto and the other end provided with a screw-bolt that taps into the stock 108, and by the adjustment of which the height of the forward end is regulated. The sides of this former are recessed to a depth equal to the dimensions to be given to the bellows folds, as in Fig. 11, in which recesses forming disks or wheels 46 47 extend for co-operation in forming the bellows fold. These disks or wheels revolve on studs projecting from arms 83 84, pivoted to the table 100, and are provided with means for their adjustment relative to the former, which means consists of holding-fingers 85, that are each pivoted to a sliding arm, 86, which is moved to and from the edge of the table by means of a screw, 87. Other disks, 88 89, co-operate with the former at a point just in the rear of the feeding-rolls 44 45, which revolve on studs projecting from arms 91 92, that are pivoted to the table 100 and rendered adjustable with respect to the former by means of holding-fingers 85 and adjusting-screws 87 in like manner as are the wheels 46 47. These disks 88 89 are each duplex, (see Fig. 12,)—that is, one disk is mounted above another on the same stud—the two being separated sufficiently by a thin washer to admit the folded plies of the bag-sides between them. The lower disk thus running in the bellows fold holds the lower edge of the bellows fold close to the former and the upper disk overlying the upper ply thereof, while the separating-washer controls the upper edge of the fold, against which it runs, and secures the proper formation of the tube.

The feeding-rollers 44 45 are centrally recessed, as shown in Fig. 2, to admit the pas-

sage of the neck of the former and at the same time nip the outer edges of the tube. The upper roller is mounted in bearings secured in swinging arms 76, that are pivoted to pillars that rise from the sides of the table, and this roller is pressed to duty by springs 39, that bear on said arms.

The forward end of the table 100 terminates just in advance of the feeding-rollers 44 45, and just above the end of the former there is provided a serrated cutting-blade, 60, that is stiffened by a bar, 59. This blade and the bar are secured at their extremities to the angular faces of blocks 61, which rest upon the table, the blade having slots that embrace holding-screws attaching it to the blocks, and said blocks are adjustably fixed thereto by means of having elongated slots through which fastening screw-bolts 62 pass, by which devices the edge of the blade is adjusted into proper relation to the cutting-edge of the former.

The serrated edges of the former and the blade 60 coact with a striker, 63, to sever the tube, and as all the plies of the tube except the bottom ply are between the blade 60 and the former, while the bottom ply is beneath the former, it follows, since the severing is performed by an upward blow of the striker, that such severance will leave one side of the severed end of the tube as much shorter than the other sides as the blade 60 is distant from the forward edge of the former.

The rotating striker 63 is secured to a head or stock, 64, fast on an angularly-mounted shaft, 65, that is driven by miter-gears 66 67 from the main shaft 68. The striker is bent at a proper angle relative to the shaft 65 to bring its operative edge in parallelism with the cutting-edges of the blade 60 and the former, which are provided with means for adjusting them, as before described, so as to bring their serrated edges more or less distant from the striker-arm.

The mechanisms thus far described accomplish the formation of the tube and provide for its severance into bag-lengths. The remaining mechanisms are employed in the finishing operations, converting a bag-length of the tube into a bag.

The main shaft 68 supports a roller, 93, above which is mounted a pressing-roller, 94. The roller 94 is journaled in pivoted arms 116, and is pressed by springs 48 in contact with the roller 93, by which it is frictionally driven.

The roller 93 is provided with a plate, 2, for sustaining the bag end during the folding operation, which plate is as long as or longer than the roller, has an under surface coinciding with the periphery of the roller, and an upper surface curved to provide for the uninterrupted passage of the tube. It is held stationary by means of arms 119, attached to its ends and to a cross-bar that is secured to the frame.

The roller 94 is provided with a guard, 3, that is attached to the bar 120 by a central curved plate that lies in a recess of the roller, which guard, while parallel with the periph-

ery of the roller 94, extends forward tangentially therefrom, so as to overlies the plate 2. The purpose of this guard is to direct the tube end properly onward.

5 For co-operation with the roller 93 there is arranged a nipping-roller, 95, the shaft 78 of which, while driven by a wheel, 122, that meshes with wheel 114, is mounted in arms 96, that have their upper ends secured to a shaft, 97, while their lower ends rest on fixed pivots 9. This shaft 97 is embraced by one arm, 10, of a toggle-lever, the other arm, 11, of which is pivoted to an adjustable frame, 121, which toggle is operated by adjustable cams 19 20 on a shaft, 22, that bear upon a friction-roll, 56, carried by the central pivot of the toggle. When these cams straighten the toggle-lever, the roller 95 will be pressed into nipping-contact with the roller 93, and when the low part 20 of the cams permits the toggle to drop, the arms 96 of the roller 95 will move slightly, so as to suspend the nipping action of said roller; but this roller is at the same time held up sufficiently to operate to feed with modified pressure by means of a spring, 57, and adjustable stop 58. (See Fig. 5.) Above this roller 95 is arranged a plate, 8, curved to conform to the periphery of the roller, which plate is supported by arms 98 from the shaft 97, and below the roller 95 are arranged stripping-fingers 99, that are supported by arms from the shaft 97 and run in grooves in said roller. The frame 121 slides in guides, and is adjusted by means of a screw, 123, so as to vary the nipping pressure of the roller 95 as may be requisite. 35

The plates 2 and 8 operate as stationary supports for the bag end during the operation of folding it, and the folding-blade 4, co-operating therewith and the rollers 93 95, is mounted at 40 the ends of pivoted arms 124, fixed to a rock-shaft, 127, the vibrating motion of which is accomplished by a crank-disk, 125, through a connecting-rod, 126, and a rock-arm, 128. (See Figs. 2, 5, and 6.) This folding-blade 4 is loosely attached to a cross-piece connecting the ends of the pivoted arms 124 by means of bolts which pass through slots cut in said blade, and is constantly pressed outward to the extent allowed by the said slots by a spring, 1, the end of which is attached to and carried at the end of one of the arms 124, (see Fig. 2,) whereby the blade 4 may yield against the pressure of said spring during the operation 50 of folding, should a choke occur between it and rollers 93 95, and thus prevent any accidental disarranging or breaking of the parts.

Paste is supplied to the end of the tube that is to be folded or lapped by means of a pasting-blade, 12, the shaft 13 of which is journaled in arms 129, that are connected by a pivoted sleeve, 130, that surrounds and turns on the shaft 127, and the vibrating movement of the arms 129 is imparted by a crank-disk, 55 131, through a connecting-rod, 132. The pasting-blade is supplied with paste from a fountain-roller, 105, that is journaled in the ad-

justable vat 106, and said roller 105 is given a step-like rotation to properly charge it with paste by means of the like movement given 70 to its doctor-roller 107, with which it is geared, which doctor-roller is thus moved by means of a pawl, 101, and ratchet 102, which pawl is carried by a pivoted lever, 103, that is vibrated by contact of its lower end with a tappet, 104, 75 on the sleeve 130 of the paster-arm 129.

One end of the shaft of the pasting-blade 12 has secured to it a curved rock-arm, 30, that is jointed to one end of an arm, 31, the other end of which is adjustably pivoted in a slotted 80 bracket, 32, which bracket 32 is also adjustably secured to the frame, by which the end of the pasting-blade is properly guided in its vibrations so as to take paste from the fountain-roller 105 and present the same in position 85 so that the end of the bag will take the paste therefrom, as will presently appear.

There is provided a mechanism for printing the bags. This is composed of an impression-roller, 33, on a shaft, 34, and a type-roller on 90 a shaft, 23, which are geared together by wheels 134 135, the former gearing with a wheel, 136, on the cam-shaft 22 and deriving motion from a gear-wheel, 137, on the main shaft through an intermediate, 138, and a wheel, 139, on the 95 outer end of the shaft 22. The impression-roller shaft 34 is journaled in the side frames, and the shaft 23 of the type-roller is journaled in arms 36, (see Fig. 10,) held at one end by pivots 37 to the side frames and provided at 100 the other end with hubs that embrace screw-bolts 38, that are tapped into brackets attached to the side frames, and between the bolt-heads and the hubs of the arms 36 spiral springs are interposed to elastically seat the 105 said type-roller with respect to the impression-roller 33. The impression-roller 33, blanketed or not, is provided with stripping-arms 35 to prevent the bags passing between the printing-rollers from following said roller 110 33. The type-roller is composed of a holder, 14, for the printing device, and of disks 25, that confine said printing device and also operate in connection with the impression-roller 33 as a means for feeding the bag. (See Fig. 115 9.) This holder has a dovetailed seat to support a stereotype plate or plates, and is mounted on the shaft 23, between the two disks 25, which are fixed to said shaft, and the holder may be turned to any suitable position and be 120 fixed stationary by means of a set-screw, 24. The disks 25 each have a portion of their periphery cut away to allow the printing device to be inserted into or withdrawn from the holder when the latter is turned, so that its seat coincides with said cut-away portions of the disks. 125 When the printing device is inserted in the dovetail seat, as in Fig. 9, the holder 14 may be revolved, so as to prevent any lateral movement of the printing device by confining its 130 ends between the walls of the disks 25, as in Fig. 4. Extending beyond the type-roller, conductors 26 are arranged to bridge the space between the printing mechanism and

the delivery mechanism, the rear ends of the conductors entering grooves formed in the disks 25 to properly strip the bags from the printing-roller.

5 The inking mechanism consists of a fountain-roller, 27, fixed to a shaft, 68, that is rotated by a wheel, 140, from the intermediate, 138, and of a form-roller, 28, that is driven by surface contact with the roller 27. The fountain-roller 10 27 (see Fig. 8) consists of a hollow cylinder that may be filled with liquid ink through a proper opening in its tapered end, which cylinder has an eduction-orifice, 5, that is controlled by an oscillating valve-plug, 6, which 15 is a small shaft that may have its periphery cut away, as at 7, to a longitudinal extent corresponding with the orifice 5, whereby one part of the plug will close the orifice, while the cut-away portion will allow the ink to pass the 20 plug and reach the roller 28. It may be remarked, however, that when thin liquid ink is used the cut-away portion 7 of the plug may be dispensed with and the plug be so fitted that its oscillations will feed the required amount of ink to the roller 28. This 25 plug is rocked by means of a crank, 15, the end of which runs in the groove 16 of a cam that surrounds the shaft 268, which cam has an arm, 144, whereby it is made fast to an arm, 146, that is hung upon said shaft by a sleeve, 145. This arm 144 may be adjusted radially 30 within narrow limits by its slots and the bolt 147, that is fixed to the side frame and passes through the arm 146 and the slot of the arm 144. The purpose of this radial adjustment 35 of the cam is to increase or diminish the throw of the valve or plug 6, whose oscillations the cam produces, and thus to regulate the amount of ink supplied at each revolution of the 40 roller 27.

The shaft 268 of the fountain-roller is seated against a spring, 148, at one end, and at the other is borne upon by a vibrating lever, 149, the movements of which lever are produced 45 by means of a cam, 141, on the hub of wheel 138, a lever, 142, and the wheel-shaft 143, (see Fig. 6,) through which the fountain-roller is vibrated endwise for the purpose of enabling its inking-surface (which is constituted by its 50 circular portion) to properly distribute the ink that is deposited on the form-roller 28 over the surface of that roller. The form-roller 28 is a pure-rubber roller, the shaft of which is hung in open bearings provided at 55 the ends of arms 151, that are pivoted to a bracket, 152, that is vertically adjustable on screws or studs 153 by means of screws 253.

The delivery apparatus consists of forwarding-rollers 154 155, roller 156, and a belt, 60 157. The roller 154 is hung in open bearings in arms 158, that are adjustably secured to the frame-work, and from a cross-bar connecting the free ends of this arm 158 stripping-guides 17 project into grooves in said roller. The 65 roller 155 is mounted on a shaft, 160, that also supports the crank-disks 125 131, and it carries a toothed wheel, 159, that gears with the

intermediate, 138, and the companion roller 154 is driven by surface contact with the roller 155. This shaft 160 has abutting heads 161 70 162, whereby its separate parts may be relatively adjusted to cause a proper time movement of the parts they drive. The rollers of the belt 157 may be driven in any convenient 75 manner. The feeding-rollers are driven from a toothed wheel, 164, on the main shaft 68 by means of an intermediate, 163, and the cam-shaft 22 is driven by a wheel, 165, and an intermediate, 166, that gears with it and the 80 wheel 164.

The wheel 165 may be changed for one of 80 different size for communicating proper motion to the parts when they are to produce different sizes of bags, the wheel 166 for this 85 purpose having its stud supported by a swinging frame, 167, adjustable to different positions. This change-wheel 165 determines by 90 its pitch-line circumference the length of the bag-blanks, for the reason that while it is in gear-line with the feed-rollers and has a travel equal to the speed of the paper tube it controls the revolutions of the striker, tucker, 95 paster, printer, &c., whose revolutions always coincide with those of the gear 165, which makes one revolution for each bag-length, and thus, if said wheel 165 has substituted 95 for it one of a larger pitch diameter than is shown, a larger bag will be made.

For stopping and starting the machine the 100 common belt-shifting apparatus is provided, and there is connected with it a brake, 168, that is applied to the head 64 of the striker 63 by suitable levers connected with the belt-shifter.

The machine is provided with a counting 105 mechanism, which needs no description.

The web of paper, A, of proper dimensions to form bags of the width which the mechanisms are adjusted to make, is in the form of a 110 roll hung by the shaft 51 in bearings 49, provided by the pivotally-hung arms 52, upon which roll the frictional brake 21 is adjusted with the proper degree of pressure to produce an appropriate tension, the guides 78 serving 115 to hold the web central while unwinding, so that should the roll be unevenly wound originally the pivoted arms will allow it to move laterally without friction to compensate for such uneven winding. The end of the web 120 is led over the roller 55, around the roller 53, in passing which latter roller one of its edges receives a line of paste by pressing contact of the pasting-disk 54 with that edge. The web 125 is then led under the former 90, around which it is converted into a tube. As this web passes under the rear end of the former the breaking-shoes 40 41, properly adjusted, define the lines upon which the web is preliminarily broken or bent, in consequence of the 130 fact that it is supported throughout its entire width by the roller 53, and only in its central portion by the shoes 40 41, and is strained between said roller and brake-shoes. The up- 135 turned sides of the web on opposite sides of

the former 90 are bent in bellows-like folds between the plates 25 26 of said former by means of the forming disks or wheels 46 47, so that the same is doubled, as in Fig. 11. The remaining parts of the sides of the web are ultimately brought together, so that the non-pasted edge of one side will underlie the pasted edge of the other side, and the two sides thus be united to form a tube. This is accomplished by the folding forming disks 88 89, the lower ones of the duplex members of which enter into the bellows fold, while the upper plies of the bellows fold and the upper laps of the web are embraced between said duplex members, the widthwise distention of the tube being maintained in part by the former 90 and the washer separating the duplex disks, which former is at this point a single plate. (See Fig. 12.) These forming-disks 88 89 thus act to lay the upper laps of the tube or unattached sides of the web together by bringing the non-pasted edge of one side into contact with the pasted edge of the other side, whereby the two sides become attached by a pasted seam. These folding-disks are accurately positioned by means of adjusting devices to accomplish the making of an even and perfect tube, and are free to rotate in order to lessen frictional obstruction to the free onward movement of the tube. The bellows-sides tube, with its freshly-pasted seam, thence passes between the feeding-rollers 44 45, which feed it positively onward, its pasted seam being protected from distortion or spreading of its paste by the recessed portions of said rollers by contact of the peripheries with the sides of the tube, the folds whereof are thus pressed smoothly together.

As the operation is a continuous one, we will assume that the tube has been projected beyond the severing devices and that it extends between the rollers 94 93, which hold it in position, at which time it will bridge the space constituting a part of the path in which the striker 63 rotates, it then enveloping the former 90 and underlying the cutting-blade 60. The tube while running onward being held between the rollers 44 45 and 94 93, and all of its parts, considered widthwise, being supported against the upward movement of the striker by the former and the cutting-blade 60, consequently it follows that as said striker rotates and makes its upward stroke it presses the plies of the tube against the serrated edges of the former 90 and the blade 60, and thereby severs the tube on lines that provide the under ply at the forward end of the tube with a projecting lip which has a length equal to the protrusion of the serrated edge of the former beyond the knife 60, which leaves a corresponding lip projecting at the rear end of the severed bag-length, which rear end is to form the mouth of the bag. During a single revolution of the striker 63, which brings it into position to again sever the tube, said tube will have been fed forward a distance equal to the length of the bag to be formed, its forward end being

guided between the rollers 94 93, and while being moved onward by their contact it is directed over the plates 2 8, its projecting lip then overlying the contact-point of the rollers 93 95 in position to be folded by the folder 4 through the space between said plates 2 and 8.

As the mechanisms are all adjusted and actuated so as to move in proper relative time, the pasting-blade 12, which has been moved up to receive its charge of paste from the fountain-roll 105, will descend into close proximity with the end of the tube, overlying the plates 2 and 8 in such position that the upper surface of the projecting lip of the tube will be brought against said pasting-blade as it is raised from the plate 8 and forced down between the plates 2 and 8, and be dragged against the blade by the folding-blade 4, which descends and doubles the bag end upon a line across its body just in the rear of the severed edges of its plies, said blade entering the folded end between the rollers 93 95. This mode of imparting a line of paste to the projecting lip of the tube that is to form the bag-bottom by a separate pasting-blade through the doubling action of a folding-blade has been found in practice to be of much importance, in that it allows the lapped bottom to be formed of very narrow dimensions, which thus consumes much less paper and still forms a perfect bottom and permitting the tube to be sewed to form a shorter bag-length, the capacity of which is equal to those heretofore made.

The mechanisms are so arranged that at the time the folded end of the tube is between the rollers 93 95 the latter (95) will be vibrated into nipping-contact with the former (93) by the action of the cam 19 upon the toggle-levers, so as to positively nip said folded end and press the pasted lap onto and cause its adherence to the body of the tube, and be released from such contact when the low part of the said cam permits the toggle-levers to drop, when the rollers 93 95, the latter of which being normally held in pressing contact by the spring 57, will operate to feed the tube onward. The toggle-levers again vibrate the roller 95 into nipping-contact with the roller 93 by the action of the cam 20 to positively nip the tube at the time the striker operates to sever it, and cause it to be firmly embraced by the rollers and held between the feeding-rollers 44 45 and the said rollers 93 95, which severing operation then taking place completes a bag, after which the toggle-levers will release the roller 95 from nipping-contact with the roller 93, when the low part of the cam 20 allows said toggle to drop. This feature of the machine is of great importance for the reason that it absolutely determines the length of each bag and produces bags exactly alike, with a bottom fold always at the same distance from the tube end and at right angles to the side edges of the tube, a result which former mechanisms have been incapable of accomplishing, for the reason that they operate to close the bottom end of the bag after the bag has been severed,

in which case any variation of the rollers carrying the bag-length of the tube to the bottom-closing mechanism would result in a like variation in the length of the bag and make it possible for the severed portions of the tube to slue sidewise if irregularly fed.

It may here be observed that the period of time between the two nipping-contacts of the rollers 95 with the companion 93 will vary with the length of the bag to be made. Thus, in making a large-size bag a larger time will elapse between the nipping-contacts than would with a bag of small size, and that in the smallest-size bag the nipping will be nearly simultaneous, the proper timing of such action of the cams 19 20 being readily accomplished by adjusting them with relation to the folding and severing operations on their carrying-shaft 22, as hereinbefore described.

The completed bag fed onward by the rollers 93 95 is entered into the nip of the printing mechanism, the impression-roller 33 and the disks 25 embracing its edges between them and causing its true onward travel. As the bag passes between the printing mechanism, the printing form or type, which has been inked in passing in contact with the form-roller 28, is brought into contact with the bag, that is supported by the impression-roller 23, and the bag will receive an appropriate printed inscription. In leaving the printing mechanism the bag is directed by conductors 26 into the nip of the delivery-rollers, which deliver the bag onto the belt 157, which may convey it to any packing apparatus.

It is to be observed that so far as the other bag-forming mechanisms are concerned the folding-blade 4 might be omitted and the pasting-blade 12 caused to perform the pasting and folding operation, as is common in this class of machines. For this purpose in the present case it would only be necessary to cause the said pasting-blade to vibrate through a longer arc, so as to properly fold the tube end between the plates 2 8 and the rollers 93 95.

The printing and inking mechanism herein shown and described is not claimed, as said mechanism will form the subject-matter of a separate application for Letters Patent.

What is claimed is—

1. In a bag-machine, the combination, with the former, as 90, of the members 40 41 of a braking-shoe, and means for adjusting said members vertically, substantially as described.

2. In a bag-machine, the combination, with the former, as 90, of the members 40 41 of a braking-shoe, and means for adjusting said members laterally, substantially as described.

3. The combination, with the former, of the fold-laying disks 46 47, mounted on the pivoted arms 83 84, and the pivoted finger 85, for holding the arms and disks in position, substantially as described.

4. The combination, with the former, of the pivoted fold-laying disks, fingers 85, sliding

arms 86, and adjusting-screws 87, substantially as described.

5. The combination, with a former having recessed sides, and co-operating means, substantially as described, for laying the sides of the tube in bellows folds therein, of the duplex disks 88 89, substantially as described.

6. The combination, with a folding mechanism adapted to fold the bottom end of a bag-length, of a severing mechanism consisting of a rotary striker, as 63, for severing a tube into bag-lengths, the said folding mechanism operating to fold the bottom end of the bag-length before the severing mechanism severs it from the tube, substantially as described.

7. The combination, with the feed-rollers 44 45, of rollers 93 95, folding-blade 4, and striker 63, said mechanisms being geared together and timed so that said blade 4 and rollers 93 95 operate to impart the bottom fold to the bag-length before the striker 63 operates to sever said bag-length from the tube, whereby the tube is positively held during the severing operation, all substantially as described.

8. The combination, with the rollers 93 94, of the guard 3 and its supporting-arm, whereby the tube is stripped from the roller 94 and suitably guided onward, substantially as described.

9. The combination, with the rollers 93 94, the roller 93 serving as one member of a folding device, of the plate 2, arranged over and in close proximity with said roller 93, substantially as described.

10. The combination, with the rollers 93 94, of the guard 3 and its supporting-arm, whereby the tube is stripped from the roller 94 and suitably guided onward, and plate 2, substantially as described.

11. The combination, with the forwarding and folding rollers 94 93 95, of the fixed plates 2 8 and the folding-blade 4, substantially as described.

12. The combination, with the folding-rollers 93 95, of the folding-blade 4 and the pasting-blade 12, arranged to apply paste to the bag-bottom in the act of folding, substantially as described.

13. The combination, with the fountain-roll 105 and pivoted pasting-blade 12, of the vibrating arms 129 and pivoted arms 30 31, substantially as described.

14. The combination, with the folding-roller 93 and folding-blade 4, of the intermittently-pressed companion folding-roller 95, substantially as described.

15. In a folding mechanism consisting of a pair of rollers and a folding-blade, the combination, with one of said rollers, of means for alternately pressing it forward in contact with its companion roller with a light spring-like pressure, and with means for pressing it forward positively or into nipping-contact with its companion, all substantially as described.

16. In a folding mechanism consisting of a

pair of rollers and a folding-blade, the combination, with said rollers provided with the fixed plates 2 and 8 and the folding-blade 4, of the independent paste-applying blade 12, substantially as described.

17. The combination, with the roller 93 and folding-blade 4, of the roller 95, pivoted so as to swing to and from said roller 93, and provided with a frame, and means for positively moving the same to accomplish said to-and-fro movement, substantially as described.

18. The combination, with the roller 93 and blade 4, of the roller 95 and its swinging frame, and an adjustable frame, as 121, substantially as described.

19. The combination, with the roller 93 and blade 4, of the roller 95 and its swinging frame, the spring for constantly pressing said roller forward, and a movable frame and actuating mechanism for positively moving said roller forward, substantially as described.

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

CHAS. B. STILWELL.

Witnesses:

FRANCIS S. BROWN,

HENRY A. McMURROW.