

(No Model.)

5 Sheets—Sheet 1.

L. ORSER.
FEEDER FOR PRINTING PRESSES.

No. 503,063.

Patented Aug. 8, 1893.

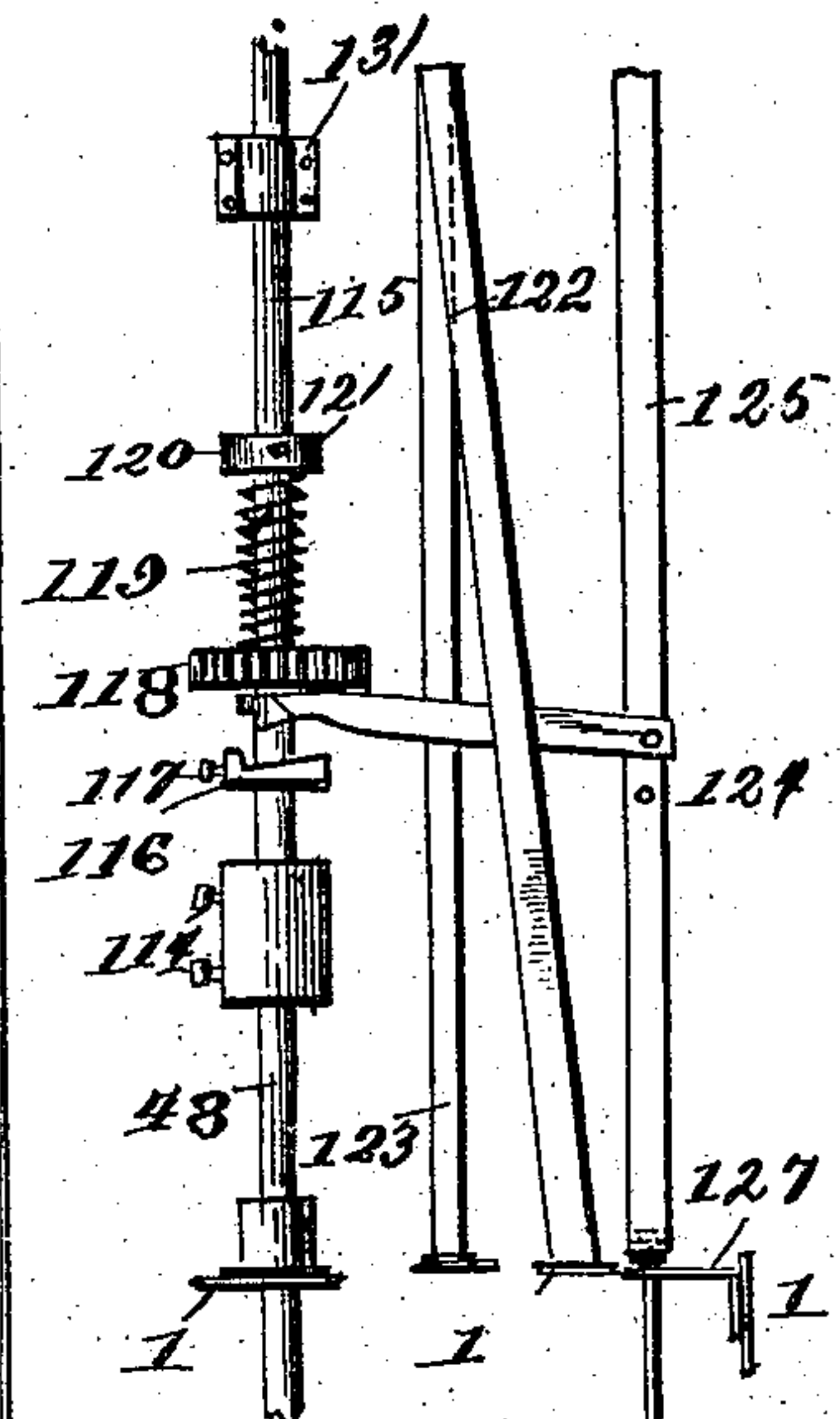
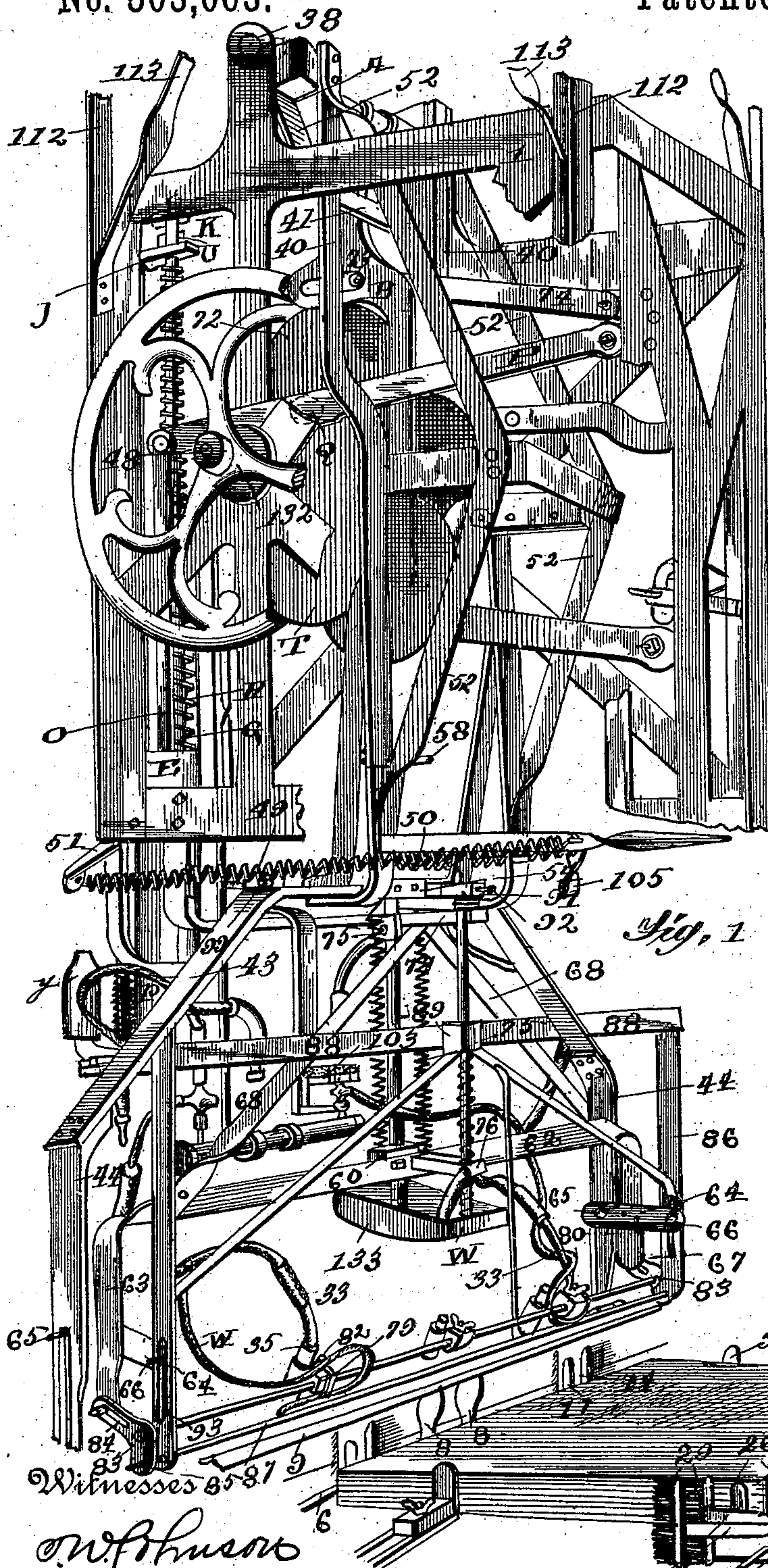


Fig. 2.

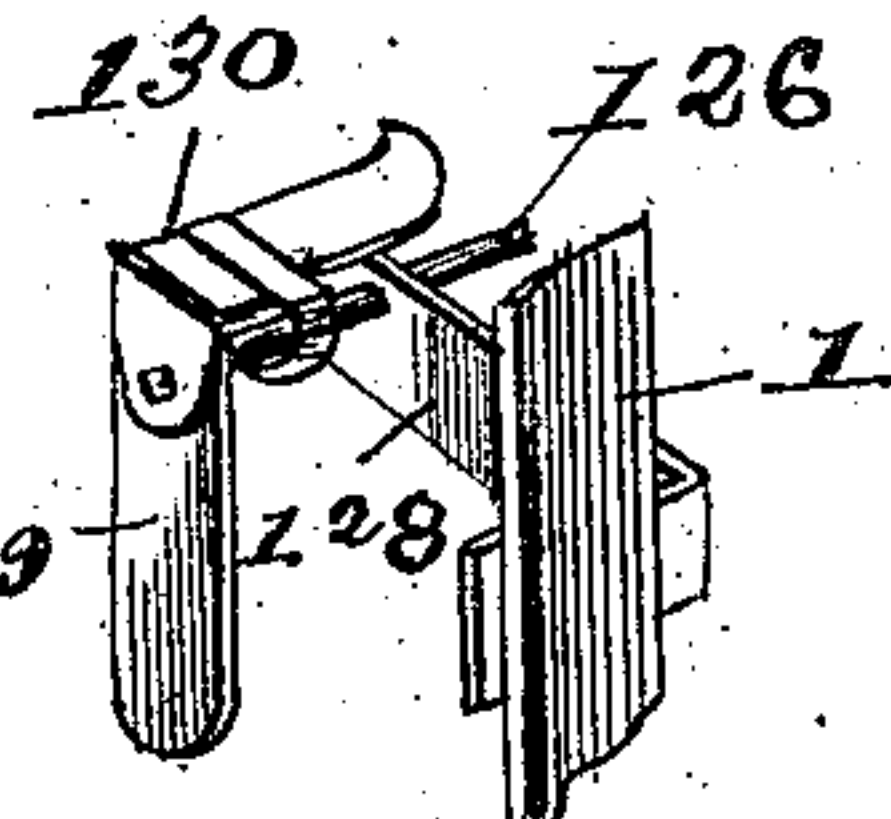


Fig. 3.

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(No Model.)

5 Sheets—Sheet 2.

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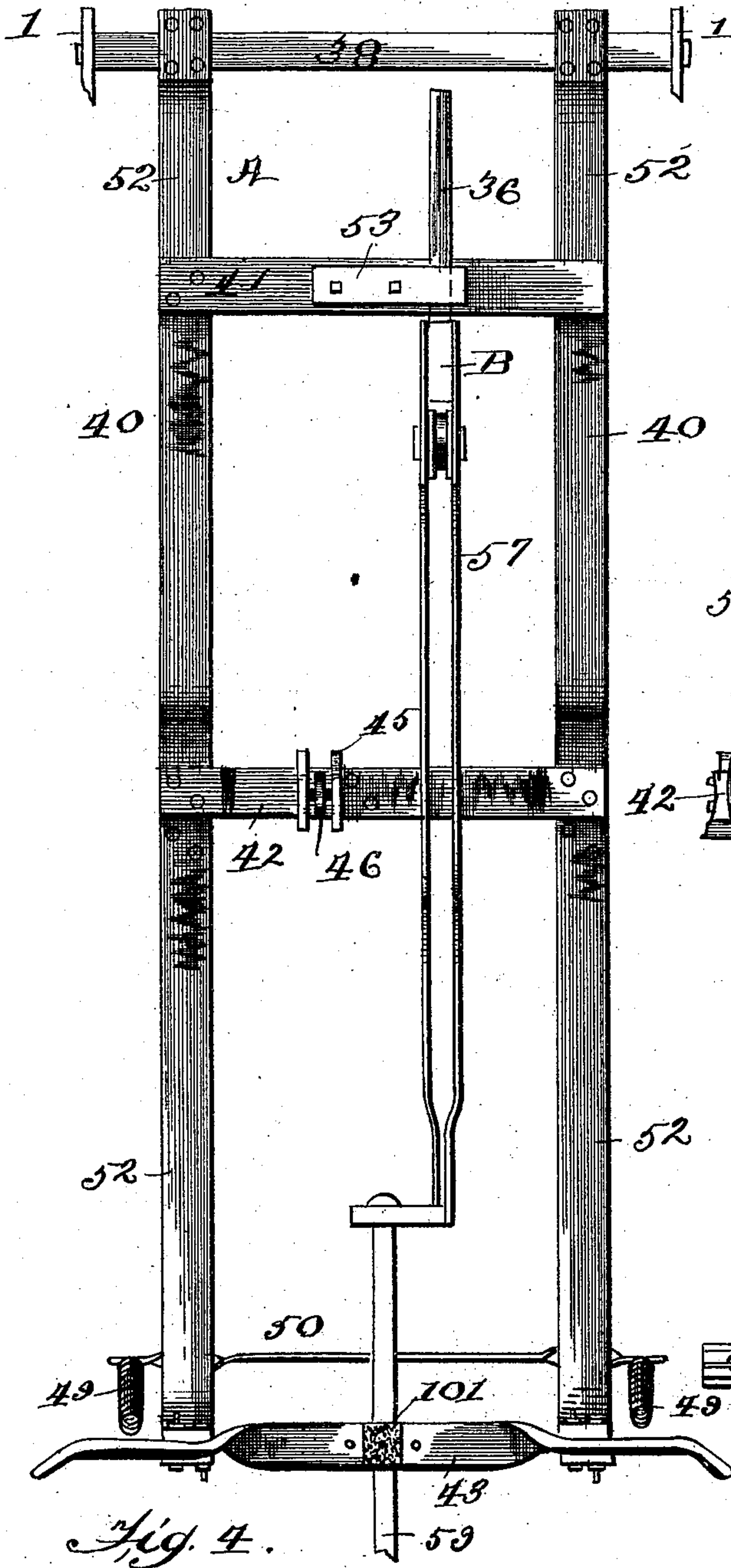


Fig. 4.

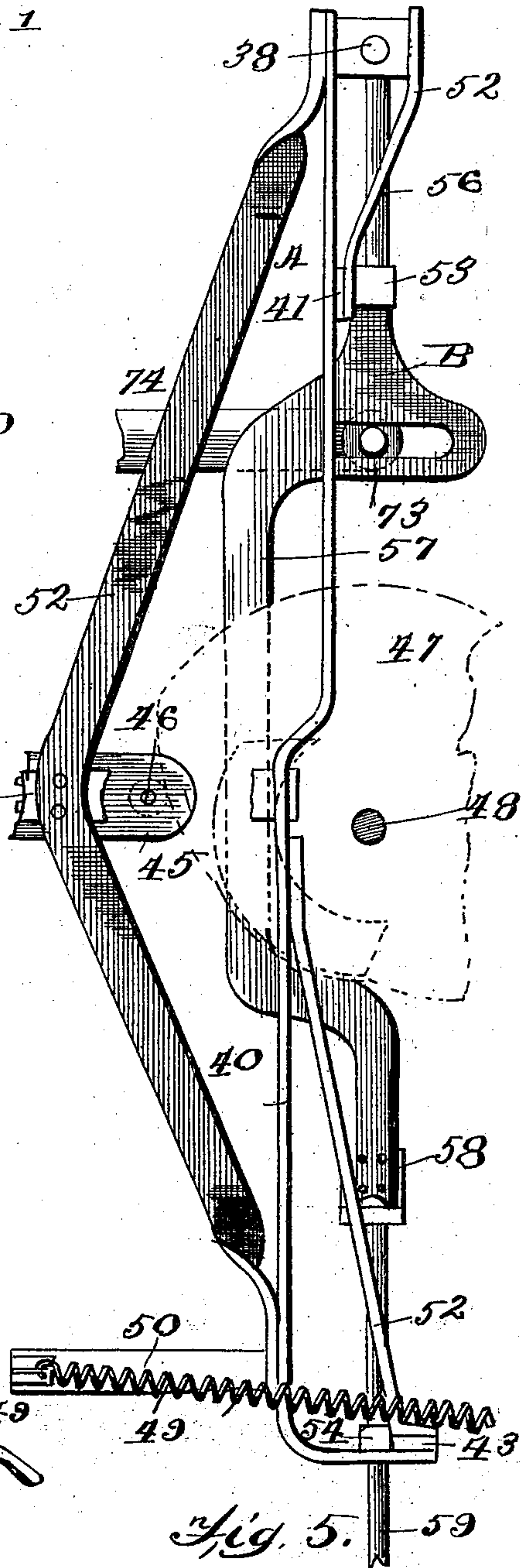


Fig. 5.

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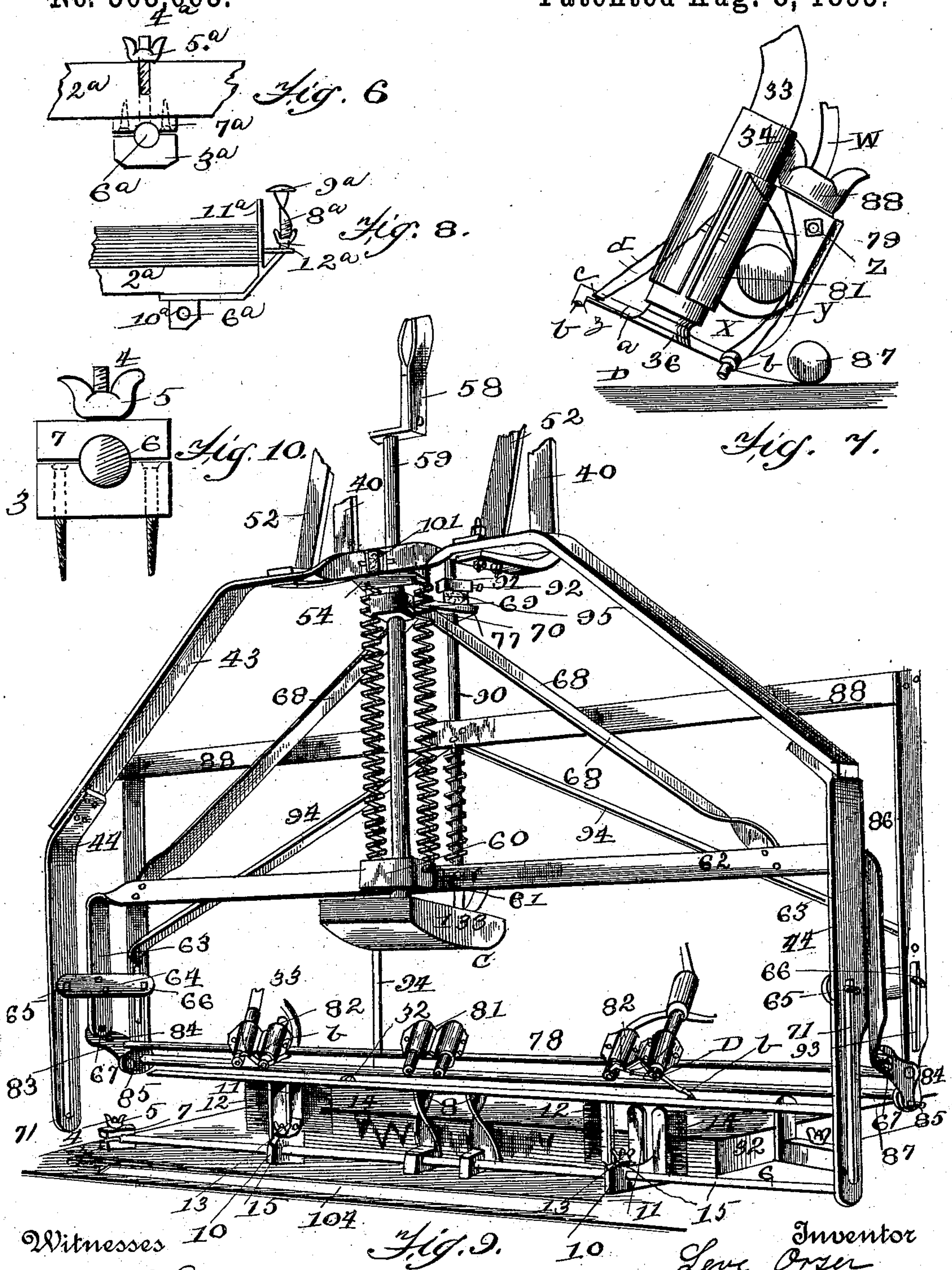
(No Model.)

5 Sheets—Sheet 3.

L. ORSER.
FEEDER FOR PRINTING PRESSES.

No. 503,063.

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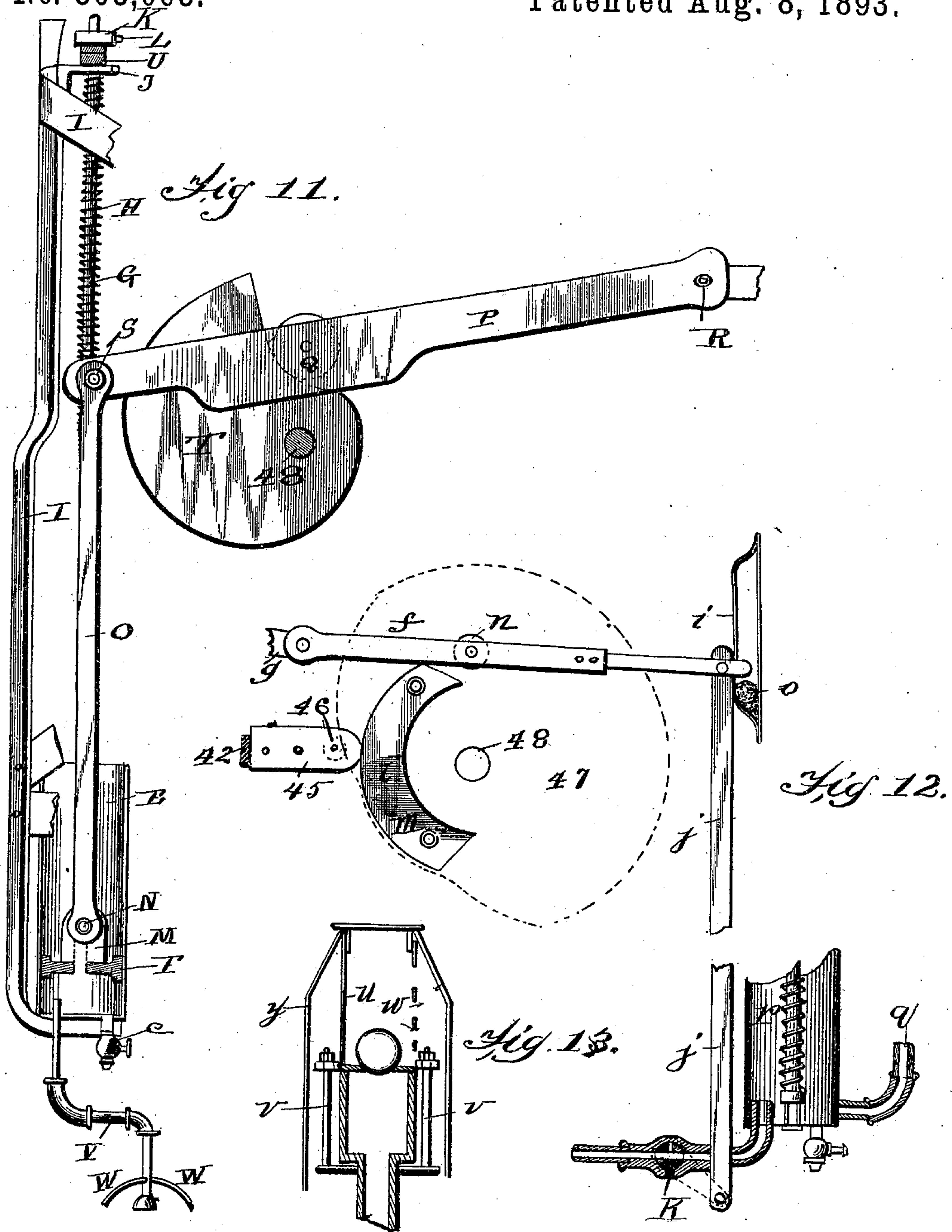
(No Model.)

5 Sheets—Sheet 4.

L. ORSER.
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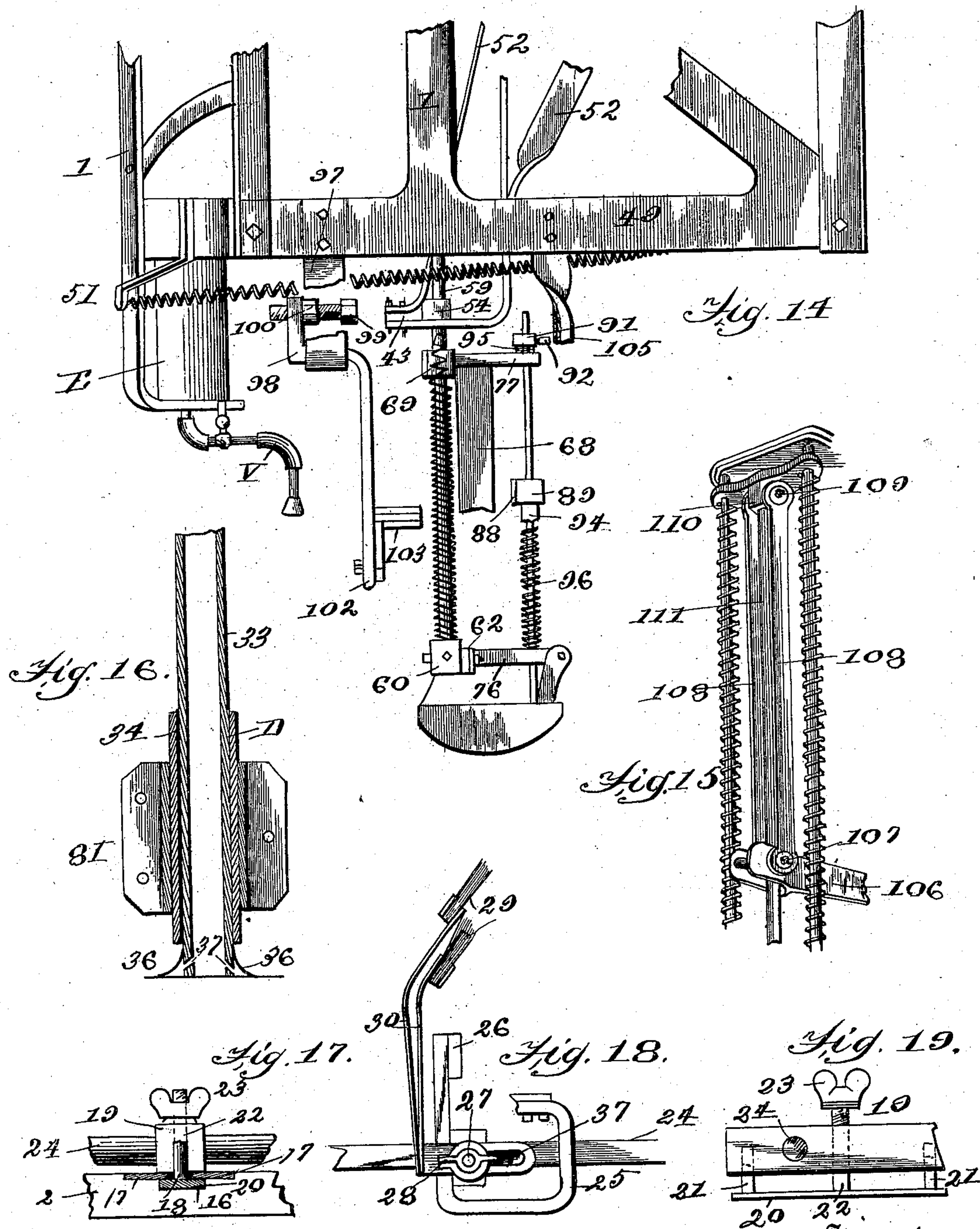
5 Sheets—Sheet 5.

L. ORSER.

FEEDER FOR PRINTING PRESSES.

No. 503,063.

Patented Aug. 8, 1893



Witnesses

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UNITED STATES PATENT OFFICE.

LEVI ORSER, OF GALVESTON, TEXAS.

FEEDER FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 503,063, dated August 8, 1893.

Application filed October 10, 1889. Serial No. 326,651. (No model.)

To all whom it may concern:

Be it known that I, LEVI ORSER, of Galveston, in the county of Galveston and State of Texas, have invented new and useful Improvements in Feeders for Printing-Presses, of which the following is a full, clear, and exact description.

This invention relates to feeders for printing-presses, having special reference to their employment in power-presses, in which the feeder takes one sheet of paper at a time from a pile on the feed-board and delivers it within reach of the nippers of the press, as straight and true as it laid on the feed-board.

The objects of the invention are: first, to provide an improved form of adjustable retaining plates for the front edge of the feed-board, consisting of a horizontal rod, being fastened to the feed-board, carrying a guard-bar and having sleeves adapted to slide thereon, carrying retaining plates and pins with thumb-screws to hold brushes, with improved form of gage-blocks and retaining plates for the rear and sides of the feed-board; second, an improved form of holders to operate in connection with a vacuum producing mechanism, to hold a sheet of paper, while it is being moved from the feed-board to the nippers; consisting of a holder in which small openings are made near the end of the vacuum-tube to communicate between the space under the disk and the interior of the vacuum tube, by which a stronger vacuum pressure is maintained between the disk and the sheet of paper; third, a combined horizontally swinging, vertically reciprocating and turner movement; consisting of a horizontally swinging frame, combined with a vertically reciprocating frame and turner mechanism, carrying sleeves, provided with double clamping plates, adapted to carry the holders for holding the paper and also to carry rests, the movement operating to first turn up the front edge of a sheet of paper, then lift it up, carry it forward and down, and to accomplish the movement at the required speed smoothly and steadily without vibration, lateral motion or sluing; fourth, an air blast, consisting of a cylinder-piston and piston rod in combination with a lever, operated by a cam to force the piston up and a reacting spring on the piston rod to force it down. From the cylin-

der the air-blast is conducted to nipples, which lie on the sheet of paper to be lifted, projecting over its edges and turning and moving up with it, to deliver a blast of air against the sheet of paper, while it is being turned and lifted, operating in connection with brushes to prevent more than one sheet being lifted at a time.

The construction and operation of the several parts hitherto enumerated will now be described.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a rear perspective view of the machine with a part of the frame 1, hand-wheel 132, connecting rod 126, support 128, latch and handle broken away in order to show the construction of the horizontally swinging, vertically reciprocating and turner movement. Fig. 2 is a plan view of the gear and disconnecting mechanism. Fig. 3 is a rear perspective view of forward end of connecting rod 126 showing support, handle and latch; Fig. 4 a front elevation of the upper part of the horizontally swinging and vertically reciprocating frames, the lower part with turner, being broken away; Fig. 5 a side elevation of the same, showing part of the cam 47 in dotted lines, part of the truss 42 being broken away to show arm 45 and friction roller 46; Fig. 6 an end elevation of horizontal rod 6^a with its several parts. Fig. 7 is a side elevation of the sleeve 79, showing the manner in which it carries the holder D and the nipples b, the vacuum and air blast tubes being broken away; the sleeve is shown in the position in which it stands when the front edge of the sheet of paper has been turned up, being now ready to lift the sheet; Fig. 8 a sectional side view of modified form of adjustable retaining plates for front edge of feed-board. Fig. 9 is a front perspective view of the lower part of the horizontally swinging, vertically reciprocating and turner movements, with its upper part broken away and with the vacuum tubes and air blast tubes broken away showing part of the front side of the feed-board; Fig. 10 a side elevation of the clamp-blocks 3 and 7 showing end of hori-

zontal rod 6; Fig. 11 a sectional side view of the air blast producing mechanism; Fig. 12 a sectional side view of the mechanism for operating the three way stop cock *k*, showing 5 cam 47, friction roller 46, arm 45 and section of truss 42; Fig. 13 a sectional side view of escape valve for vacuum cylinder; Fig. 14 a side view of the lower part of the frame, air blast cylinder and buffets; the lower part of the 10 turner movement broken away so as to show the rod 59, sleeves 60 and 69, guide rod 90, sleeve 91 and guide sleeves 76 and 77, part of the buffet brace being broken away, so as to show the buffet screw 100; Fig. 15 a front perspective view of connecting rods for vacuum pump. Fig. 16 is a vertical section of the 15 holder D with its connecting tube broken away; Fig. 17 an end elevation of gage block 19 showing groove 16; Fig. 18 a plan view of one of the sleeves 25 with retaining plates and 20 brushes; Fig. 19 a side elevation of the gage block 19.

Referring to the drawings, 1, indicates the frame work in which the feeder mechanism 25 is mounted, Figs. 1 and 2. Upon the feed board are secured blocks 3 having upright bolts 4 carrying thumb screws 5, Fig. 10.

6 indicates a horizontal rod with holes through its ends adapted to slip over the 30 bolts 4.

7 are clamp blocks with holes bored through them to slip over the bolts 4, above the horizontal rod 6, the blocks 3 and 7 being grooved in the center to clasp the horizontal rod 6 35 which has, near its center, two arms 8 to the upper ends of which is secured a guard bar 9 being rounded on top and flat underneath. The horizontal rod 6 carries sleeves 10 adapted to slide freely thereon their under sides 40 resting on the feed board 2. The front side extends upward forming retaining plates 11, against which the front side of the pile of paper rests; pins 12 provided with thumb screws 13 project from the upper sides of the 45 sleeves 10, and brushes 14 having horizontal slotted arms 15, slip over the pins 12, and are held by the thumb screws 13, the slotted arms 15 permitting the brushes 14 to be adjusted to any desired position, Fig. 1. When the 50 thumb screws 5 are loose the sleeves 10 may be moved freely, along horizontal rod 6 to accommodate any size of paper, but when the thumb screws 5, are set, they operate to press the sleeves 10 down against the feed board 2 35 holding them firmly in position. The guard bar 9 serves to protect the paper from being injured by the brushes or retaining plates while it is being carried forward.

16 indicates a groove cut in the feed board 60 2 Figs. 1 and 17, having metal strips 17 let into the feed board, their inner edges forming a slot 18; a plate 20, having bolts 21 projecting upward through the slot 18 into a gage block 19 (Figs. 1 and 19,) is adapted to move 65 in the groove 16. From the center of plate 20 is a bolt 22 projecting upward through the

slot 18 and through the gage block 19 and is provided with a thumb screw 23.

Secured to the gage block is a horizontal rod 7c 24 having sleeves 25 adapted to slide thereon, Fig. 1. The under sides of the sleeves 25 rest on the feed board 2, and carry retaining plates 26 adapted to rest against the pile of paper behind said sleeves at the sides, and also carry 75 pins 27 having thumb screws 28, Fig. 18, and brushes 29 carried by arms 30 having bent slotted portions 31 are adapted to slip over the pins 27, and be held by thumb screws 28, the slotted portions permitting the brushes to be adjusted to any desired position. The gage 80 block is adapted to move freely in the slot 18 which extends from the rear side of the feed board nearly to the front. The sleeves 25 are adapted to move freely on the horizontal rod 85 24 sliding over the surface of the feed board but when the thumb screw 23 is set it holds the gage block firm and operates to press the sleeves 25 against the feed board, holding them in whatever position they may stand. Grooves 18^a, the same as the groove 18, extend 90 from the sides of the feed board, nearly to the center, and have gage blocks 19^a, adapted to slide therein similar to the gage blocks 19, except that instead of the horizontal rod 24 they carry retaining plates 32, on their forward 95 ends, adapted to rest against the sides of the pile of paper. By this construction the retaining plates can be quickly adjusted to accommodate any size of paper, Fig. 1.

D, indicates an improved form of holder 100 for holding the paper while being transferred, and consists of, a flexible tube 33, Fig. 16, having an enlarged part 34 by which it may be firmly held by clamping plates 81, and having a flat disk 36 even with its lower end, flaring 105 up toward the center, and being joined to the tube 33, a little above the end. Small holes 37, made through the tube a little above its end, furnish communication between the space under the disk 36, and the interior of the tube 110 33. By this construction the tendency of the paper to adhere to the end of the tube so close as to relieve the vacuum pressure between the disk 36 and the sheet of paper, is avoided; the full force of the vacuum pressure being 115 continuously exerted between the disk and the sheet of paper so that the hold upon the sheet is much stronger and more certain. The end of the tube 33 resting against the sheet prevents it from cupping. Instead of 120 the holes 37 the ends of the tubes 33 may be notched.

Suspended from a rock shaft 38, in the top of the machine is a horizontally swinging 125 frame A, consisting of two downward projecting bent arms 40, connected together by cross bar 41, and truss 42, and carrying at their lower ends a horizontal bar 43 whose ends bend downward, terminating in two downward projecting slotted arms 44, Figs. 1 130 and 9. The rock-shaft 38 being pivoted in the frame 1 and the frame A, secured rigidly

thereto is adapted to swing back and forth like a pendulum, Figs. 4 and 5. On the inside of the truss 42 is an arm 45 carrying a friction-roller 46, which is adapted to operate in connection with a cam 47, mounted on the shaft 48, to swing the frame A, back, which, on being released by the cam, swings forward by its own weight being accelerated as much as may be necessary by springs 49, attached to a brace 50 carried by the lever A; the forward ends of the springs are fastened to arms 51, projecting from the front side of the frame 1. The frame A is provided with braces 52, so disposed as to give it the required strength and rigidity, and permit it to swing to its forward limit by its own weight and without striking the shaft 48. The cross bar 41 carries a sleeve 53, and the horizontal bar 43 carries in its center a sleeve 54.

B, indicates a frame which reciprocates vertically and swings horizontally, and consists of a rod 56, a bent slotted portion 57 having shoulder 58, Figs. 4 and 5. Rod 59 carries at its lower end a sleeve 60 held by set screw 61, Figs. 1 and 9. Secured to the sleeve 60, is a horizontal-bar 62, having downward projecting portions 63, secured to which are cross pieces 64, having in their forward ends pins 65, and in their rear ends pins 66. The downward projecting portions 63 carry at their lower ends pins 67. The shoulder 58, serves as an off-set to bring the rod 59 in the center of the movement. A brace 68 secured to the horizontal bar 62, thence bolted to a sleeve 69 held by set screw 70 to the rod 59, serves to hold the horizontal bar rigid, Figs. 1 and 9. The frame B is adapted to move freely through sleeves 53 and 54, Figs. 1, 4 and 5, and its pins 65 to move freely in the slots 71, Figs. 1 and 9. By this construction it will be seen, that the frame B will swing horizontally with the horizontally swinging frame A, and be, at the same time, free to reciprocate vertically, being raised vertically by a cam 72 which moves in the slotted portion 57, Figs. 1 and 5, and bears against the friction roller 73 on the lever 74, and is drawn down by its own weight. Reacting springs 75 attached to the sleeves, 54 and 60, Figs. 1 and 9, serve to counterpoise so much of the weight of the frame B as is not necessary for its proper operation. The horizontal-bar 62 carries a guide-sleeve 76, and the sleeve 69 carries a guide sleeve 77 Figs. 1, 9, and 14.

The turner mechanism C, which operates in combination with the horizontally swinging and vertically reciprocating frames, will now be described.

In lifting a sheet of paper from a pile, it is necessary to first turn up the front edge so as to allow the air to enter between the sheet being lifted and the one lying next to it. For this purpose I provide the following described mechanism: A horizontal rod 78 carries sleeves 79, adjustably held thereon by thumb screws 80 said sleeves being provided with double clamping plates 81, which

carry the holders D and also the rests 82, Figs. 1, 7, and 9. Secured to the end of the horizontal rod 78 are levers 83 having slots 84 in their forward ends, in which the pins 67 are adapted to move, Figs. 1 and 9, their rear ends being pivoted on pivot pins 85 carried by vertical bars 86 which are connected together, near their lower ends, by the horizontal rod 87, and at their upper ends by horizontal bar 88 carrying at its center a sheave-block 89 through which passes a vertical guide rod 90, the lower end of which is adapted to move freely in the guide sleeve 76 and the upper part in guide sleeve 77, Figs. 1, 9, and 14. Near the upper end of the guide rod 90 is a collar 91, held thereon by set screw 92. The vertical bars 86 have slots 93 in which the pins 66 are adapted to move. Braces 94, extend from the sheave-block 89 to the vertical bars 86, to give the several parts the required rigidity and strength. By this construction it will be seen that the vertically reciprocating frame B can move up independent of the turner C, until the guide sleeve 77 abuts against the collar 91 when the turner C will be carried up. Leather washers 95 on the guide sleeve 77 serve to cushion the stroke. A reacting spring 96, on the lower part of the vertical guide rod 90, serves to counterpoise so much of the weight of the turner as is not necessary for its proper operation, Figs. 1 and 9. The distance that the vertically reciprocating frame rises before raising the turner may be varied by setting the collar 91, higher or lower on the guide rod 90.

97, indicates a buffet brace, the ends of which turn upward and are bolted to the frame 1. In the center of the brace is a shoulder 98 through which passes a buffet screw 99 having a jam nut 100, Figs. 1 and 14. As the turner movement swings forward, the cushion 101, on the horizontal bar 43, Fig. 9, strikes against the head of the buffet screw 99, thus terminating its forward motion; the buffet screw may be set forward or back, thus varying the forward swing of the turner movement and consequently the point at which the paper will be delivered. The jam-nut serves to hold the buffet screw at whatever place it may be set.

Projecting downward from the center of the buffet brace 97, is an arm 102 carrying a rest 103. As the vertically reciprocating frame B is descending at the point of delivering the paper the sleeve 69 comes in contact with the rest 103, thus terminating its downward stroke, which may also be varied by changing the position of the rest 103 on the arm 102. The rest is cut away in the center to clear the rod 59 and is faced with leather to cushion the stroke.

104 indicates a strip of leather or like substance attached to the feed board 2, Fig. 9, to serve as a rest for the foot rod 87, and upon which the sheet of paper is held by the foot rod, after being released by the holders D until it is taken by the nippers of the

press. Projecting downward from the frame 1 are buffets 105, Figs. 1 and 14, faced with leather, operating to limit the backward motion of the horizontal swinging frame A by the horizontal bar 43 striking against them.

In lifting a sheet of paper from a pile it is necessary to have jets of air impinging against its edges to act in combination with turner mechanism C, and brushes 14, to prevent more than one sheet from being lifted at a time. For this purpose an air blast is provided, consisting of a cylinder E, piston F, and piston rod G, having a reacting spring H coiled about it. A brace I attached to the frame 1, serves to hold the cylinder in position, and to hold at its upper end a guide J through which the piston rod is adapted to move. Near the upper end of the piston rod G is a collar K, held by set screw L. The piston F has a shoulder M carrying pins N on which connecting rods O are pivoted. A lever P, carrying a friction roller Q, is pivoted at R to the frame 1. The forward end of the lever P is forked so as to pass on the opposite sides of the piston rod, and carries at its ends pins S on which the upper ends of the connecting rods are pivoted. A cam T, on the shaft 48, operates, in connection with the friction roller Q, to raise the lever P, thus forcing the piston to the top of the stroke, which, being released by the cam, is forced down by the reacting spring H, the downward stroke of the piston being stopped by the sleeve K abutting against the guide J. The length of stroke of the piston may be varied by moving the collar K. Leather washers U, on the guide J, serve to cushion the stroke. A pipe V, having flexible tubes W attached to it, serves to convey the air to tubes X having lugs Y (Fig. 7) by which they are bolted to sleeves 79 by bolts and nuts Z. The air is conveyed from the tubes X, by flexible tubes *a* to the nipples *b*, the ends of which are turned down at right angles and have small openings *z*, on their inner sides. Plates on the under sides of the nipples have ears *c*, by which they are fastened to the clamping plates 81, by cords *d*, being so adjusted as that when the holders D are brought down upon the pile of paper the nipples *b* will lie on the top sheet, their ends projecting a short distance beyond the edges of the paper. By this construction it will be seen that the nipples turn and move with the edge of the sheet of paper. The mechanism is so timed that the air blast will be continued during the time the edge of the sheet is being turned and lifted. The pipe V, projects some distance above the bottom of the cylinder E, to prevent any oil from entering it. A stop cock *e* serves to draw off the oil that may pass below the piston F; or an ordinary check valve may be used, which will let the oil drain off but prevent the air from escaping.

f, indicates a lever pivoted to an arm *g*, attached to the frame 1, Fig. 12. The forward end of this lever is adapted to move in a guide

i, and is connected to the three way stop cock *k* by a connecting rod *j*, a bearing *l*, attached by studs *m* to a cam 47, operating upon the friction roller *n* forces the lever up to cut off the vacuum pressure and open communication between the tubes 33, and the atmosphere, and when released by the bearing, falls by its own weight to turn on the vacuum pressure, at the same time, closing communication between the tubes 33 and the atmosphere. In falling the end of lever *f* strikes a cushion *o*.

Attached to the vacuum pump *p*, is a blow off valve, consisting of an upward projecting tube *q*, Fig. 13 having a seat *r*, in the center of which is an opening in which a ball *t* is adapted to fit to make an air tight joint, Fig. 13. *u* is a case held in position by bolts and nuts *v* and having openings *w*, the whole being surmounted by a hood *y*. When the piston (not shown) descends the air, that is in the vacuum cylinder *p*, forces the ball up and passes out through the openings *w*, and the cap *u* serves to catch the ball and cause it to drop back upon its seat to prevent the air from entering. Any oil which may accumulate in the cylinder will be blown out with the escaping air, and will be caught by the hood *y*. A piece of kid or other thin leather may be used as a packing between the seat *r* and the ball, the cap *u* serving to hold it in place; the cap may be screwed on the tube *q*. Instead of the blow-off valves as shown a common check valve may be used, so arranged as to allow the air to escape but to prevent it from entering.

The lever 106 at its forward end carries bolts 107 on which are pivoted connecting rods 108, Fig. 15, the upper ends of which are pivoted on bolts 109 carried by a shoulder, 110, at the top of the piston rod 111, of the vacuum pump *p*, Figs. 1 and 9. By this construction the connection between the lever 106 and piston rod 111 is direct and the movement easy.

112 indicates angle-iron bars, bolted to the frame 1, Fig. 1, which extend upward to the ceiling to be thereto attached by brackets, (not shown) to hold the machine in position, being strengthened and braced by cross-braces 113.

The several cams, hitherto mentioned, are mounted on the shaft 48, coupled to which, by a coupling, 114, is a shaft, 115, having a clutch, 116, held by set screw 117, Fig. 2. 118, indicates a sprocket wheel in the collar of which is cut a clutch adapted to engage the clutch 116. A coil spring 119 presses the sprocket wheel against the clutch, and a collar 120, held by set screw 121, serves to hold the spring in place. The sprocket wheel being loose on the shaft when turned forward will turn the shaft 48, but when turned backward will slip around, leaving the shaft at rest. A brace 122, bolted to the frame 1, serves to hold a horizontal bar 123, on which is pivoted a lever 124. The forward end of said lever being forked it is adapted to push

the sprocket wheel back, disengaging the clutch so that the sprocket wheel may turn forward, leaving the shaft at rest. The rear end of the lever 124 is pivoted to a connecting bar, 125, attached to a connecting rod, 126, which latter is held in position by supports 127 and 128, said rod being provided with a handle 129 at its forward end and to the upper end is hinged a latch 130 Fig. 3. When the handle is drawn it operates to throw the machine out of gear, the latch dropping by its own weight against the support 128, to hold it in that position. When the latch is lifted the spring 119 forces the sprocket wheel against the clutch, throwing the machine in gear and pushing the lever back. The sprocket wheel is to be driven by an endless chain from a corresponding wheel attached to the press to be fed (not shown). The sprocket wheel 118 and clutch 116 may be set at any point on the shaft, so that it will stand in line with the corresponding wheel on the press, the shaft being made long enough so that the sprocket wheel may be set to suit any press with which the feeder may work. The lever 124 may be pivoted at any point on the horizontal bar 123 and connecting bar 125, to suit the position of the sprocket wheel. The free end of the shaft 115 is supported by a journal box 131; the shaft 48, carries a hand wheel 132, Fig. 1, by which the machine may be turned by hand for adjustment or other purposes. The machine is provided with ample drip pans one of which (133, Figs. 1 and 9) only is shown.

When it is desirable to locate the feed board below the point of delivery of the paper, the adjustable retaining plates for the front edge of the feed board may be arranged as shown at Fig. 8, in which 6^a, indicates the horizontal rod located under the feed board 2^a. Secured to the sliding sleeve 10^a are the retaining plates 11^a, bent upward and carrying pins 12^a, provided with thumb screw 13^a. Arms 8^a, projecting forward and upward from the horizontal rod 6^a, carry the guard bar 9^a. Clamp blocks 3^a, Fig. 6, has bolts 4^a, which pass through the horizontal rod, blocks 7^a and feed board, and has thumb screw 5^a which, being set, draws the horizontal bar up against the feed board holding the retaining plates 11^a firmly in position. When the thumb screw is loose, the sleeves 10^a may be moved to any position.

The operation of the machine is as follows:

When, by the rotation of the shaft 48, the holders D are brought down upon the pile of paper, the lever *n*, being released by the bearing *l*, drops by its own weight, operating the three way stop cock *k* to turn on the vacuum-pressure to the holders D, causing the disks 36 to adhere firmly to the top sheet; any air that may leak in between the disk and the sheet of paper is rapidly drawn through the holes 37 into the tube 33, thus maintaining the pressure; simultaneously the cam T releases the lever P. When the spring H acts to force down the piston F, the latter in turn

forces the air, that is in the cylinder E, in jets through the nipples *b*, impinging against the edge of the sheet of paper, which acting with the turner C and brushes 14, serves to prevent more than one sheet of paper being lifted at a time. By the further rotation of the shaft 48, the vertically reciprocating frame B is raised by the cam 72, causing the front ends of the lever 83 to be raised by the pins 67, the turner remaining at rest. The rear ends of the lever 83 turn upon the pins 85, as pivots, so that the holders D, nipples *b* and front edge of the sheet of paper move up in an arc of a circle, the pivot pins 85 being the center. This action continues until the guide-sleeve 77 abuts against the sleeve 91. When the turner is carried up to a height sufficient for the foot-rod 87 and sheet of paper to be carried over the guard bar 9, it will be seen that the nipples move with the edge of the sheet of paper and the air blast, which is so timed as to continue while the sheet is being turned and lifted; now ceases. The horizontally swinging frame A being now released, by the cam 47, swings forward until the foot-rod 87 has passed forward of the guard-bar 9. The vertically reciprocating frame B being now released, by the cam 72, begins to descend; both frames, now moving simultaneously, carry the sheet of paper forward and down until the cushion 101 abuts against the head of the buffet-screw 99, terminating the forward movement of the horizontally swinging frame A; the vertically reciprocating frame B and turner C still continue to descend until the foot-bar 87, of the turner C, strikes the rest 104 on the feed-board 2. When the turner stops the vertically reciprocating frame B still continues to descend, causing the pins 67 to carry the front ends of the levers 83 downward, thus turning the front-edge of the sheet of paper down until the sleeve 69 abuts against the rest 103, which terminates the downward motion of the vertically reciprocating frame B; meanwhile the bearing *l* has raised the lever *n*, operating the three way stop-cock *k*, to cut off connection of the holders D with the vacuum cylinder P. The sheet of paper being thus released from the holders, is held, between the foot rod 87 and rest 104, on the feedboard 2. By the further rotation of the shaft 48, the cam 72 raises the vertically reciprocating frame B, again turning the holders and nipples upward as hitherto described, until the guide sleeve 77 abuts against the sleeve 91, when the turner is again lifted, the revolution of the feeder being so timed with that of the press that, the nippers (not shown) will take the sheet the instant it is released by the foot rod 87. By the further rotation of the shaft 48, the cam 47 operates to swing the horizontally swinging frame A back; both levers moving simultaneously upward and back until the vertically reciprocating frame B has reached the top of its stroke; the horizontally swinging frame

A still continues to swing back until it completes its stroke, the buffets 105 preventing the movement from swinging beyond its proper limit. The vertically reciprocating frame B, being released by the cam 72, now descends until the foot rod 87 of the turner reaches the pile of paper. When the turner rests, the vertically reciprocating frame B still continues to descend until the holders D, 10 rests 82 and nipples *b* are brought down upon the paper. The rests 82 serve to bear most of the weight of the vertically reciprocating frame B to release the holders D from undue pressure; meanwhile the piston F has been 15 raised in the air blast cylinder E ready to repeat the operation.

I lay no claim to the frame 1, vacuum cylinder *p*, lever 106, three way stop cock *k*, the shaft 48, friction roller 73, lever 74, horizontal 20 rock shaft 38, as these features were included in patents which have already been granted to me.

Having thus fully described my invention, what I claim as new, and desire to secure by 25 Letters Patent, is—

1. In a feeder for machine power printing the combination of the horizontally swinging lever A, suspended from a rock shaft consisting of two downwardly projecting bent arms, 30 and connecting bars; the horizontal bar 43 having its ends bent downward and terminating in two downwardly projecting slotted arms 44, the arm 45 on the inside of the truss and provided with a friction roller bearing 35 against a cam 47 mounted on the shaft 48, the coiled springs 49 and 50 the bars 64 secured to the bars 86 at one end and to the bars 44 at the other, the said bars 44 and 86 being slotted for the connecting pins 65 and 66 of 40 the bars 64 the parts 63 bolted to said bars the bars and parts 83 and the rods 78, whereby the holders D are operated to bear upon the pile of paper substantially as specified.

2. In a press-feeder, the adjustable retaining-plates arranged at the front edge of the 45 feed-board, and consisting of blocks having upright bolts provided with thumb screws, a horizontal-rod, 6, perforated at its ends to slip over the upright-bolts and adapted to be 50 clamped thereon, a guard-bar, 9, secured to arms mounted on said horizontal-rod, sleeves 10 mounted on the rod 6, and carrying pins provided with thumb screws, and the brushes having horizontal slotted arms 15 adapted to 55 be held adjustably on said pins by the thumb screw, substantially as specified.

3. The combination with the feed-board formed with a groove, 16, and metal strips set in on each side of said groove to form a slot, 60 18, of an adjustable retaining-plate, arranged at the rear side of said feed-board and consisting of a plate, 20, carrying pins projecting into a gage-block, 19, and a bolt, 22, passing through said gage-block and provided with a 65 thumb-screw, the gage block carrying a horizontal-rod 24, having sleeves 25 mounted thereon, said sleeves carrying plates adapted

to rest against the rear sides of the pile of paper, and carrying pins provided with thumb-screws, and brushes carried by arms having 70 bent slotted portions adapted to be adjustably held on said sleeves by the thumb-screws, substantially as specified.

4. In a press feeder, a holder D, consisting of a flexible tube adapted to be clamped to 75 sleeves mounted on the rod 78 and provided at its end with a flaring collar, joined to the tube a little above its end, the free end of said tube provided with perforations to form 80 communication between the interior of the tube and the space under the collar to operate in connection with a vacuum producing mechanism, substantially as specified.

5. The combination with the horizontal swinging frame A and vertically reciprocating frame B of a turner mechanism C, consisting of a horizontal rod 78, having sleeves 79 held by thumb screws, the sleeves having 85 double clamping plates to carry the holders D and to carry rests, levers 83 secured to the ends 90 of the horizontal rod 78 having slots in their forward ends, in which pins 67 are adapted to move; their rear ends pivoted on pivot pins carried by vertical bars 86, being connected 95 together by foot-rod 87 and horizontal bar 88, carrying at its center a sheave block, secured in which is a vertical guide rod 90 and having braces extending from the sheave-block to the foot rod; and vertical bars, having slots, in 100 which the pins 66 are adapted to move the lower end of the guide-rod, adapted to move in the guide sleeve 76, the upper end in the guide sleeve 77 with sleeve 91 and set screw 92, washers 95, counterpoise spring 96 on lower 105 part of guide rod to balance part of the weight of the turner C substantially as described.

6. In a feeder machine for power printing presses the combination with the frames A and B and turner-mechanism of an air blast 110 mechanism, consisting of a cylinder E, piston, piston-rod G, reacting spring, brace attached to the frame 1, guide J through which piston rod is adapted to move, sleeve K, held by set-screw on piston rod G above the guide, shoulder M attached to piston having pins to which 115 are pivoted connecting rods O, a lever P with friction roller pivoted to the frame 1, its forward end forked, carrying pins on which the connecting rods O are pivoted, a cam T to operate with the friction roller to raise the lever, thus forcing the piston up, which being 120 released by the cam, is forced down by the spring H with washers U to cushion the stroke, air blast W, pipe V, projecting up in the cylinder with flexible tubes to convey the blast 125 to tubes X with lugs Y bolted to sleeves 79, by bolts and nuts, tubes 33 flexible branch tubes, nipples *b*, attached by cords *d* to clamping plates to turn and move with the sheet of paper, substantially as described. 130

7. In a press-feeding machine, the combination, with the feed-board thereof, of an adjustable retaining-device arranged at the front edge of said board and comprising mov-

able sleeves mounted on a horizontal-rod, said sleeves carrying vertical retaining-plates and adjustable brushes, and adjustable retaining-plates arranged on the board at the sides and rear edges thereof, substantially as specified.

5 8. In a feeding machine for printing-presses, the combination, with the feed-board thereof, of a retaining-device, arranged on said board at the front edge thereof, comprising movable
10 sleeves carrying vertical retaining-plates and adjustable brushes, said sleeves mounted on a horizontal-rod secured to the feed-board, retaining-plates adjustably secured to the sides of the feed-board, and a retaining-device ar-
15 ranged on the feed-board at the rear thereof, comprising an adjustable gage-block operating in a slot made in the feed-board and carrying a horizontal-rod on which are mounted

two movable sleeves carrying retaining-plates and adjustable brushes, substantially as specified.

9. In a feeder machine for power printing presses, the combination with holders to operate in connection with a vacuum pump to hold a sheet of paper while being transferred, 25 of nipples to operate in connection with an air blast producing mechanism in combination with the frames A and B and turner C having sleeves adapted to carry the vacuum holders in the manner and for the purpose; 30 substantially as described.

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Witnesses:

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