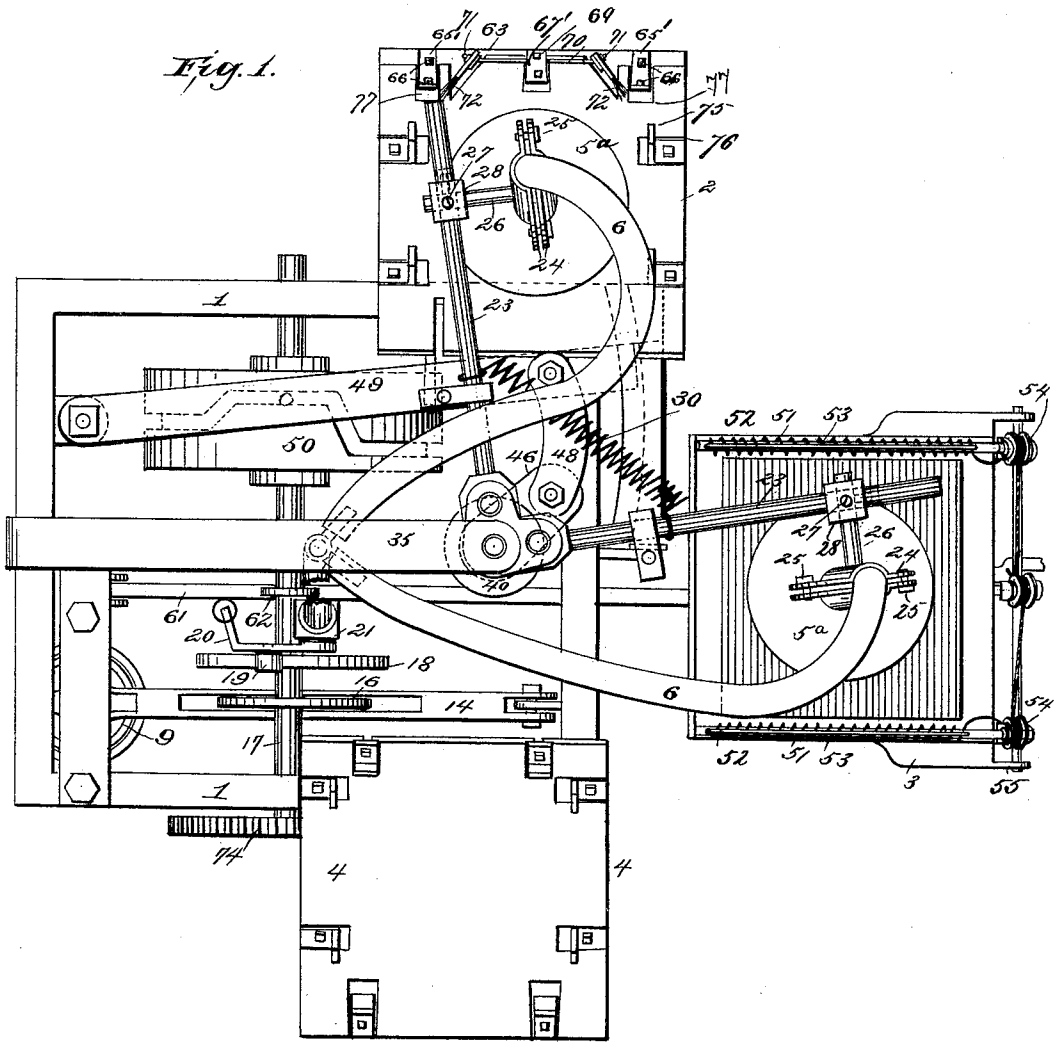
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L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 1.



WITNESSES:

Francis McArdle.

C. Sedgwick

INVENTOR:

L. Orser

BY Munn & Co.

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

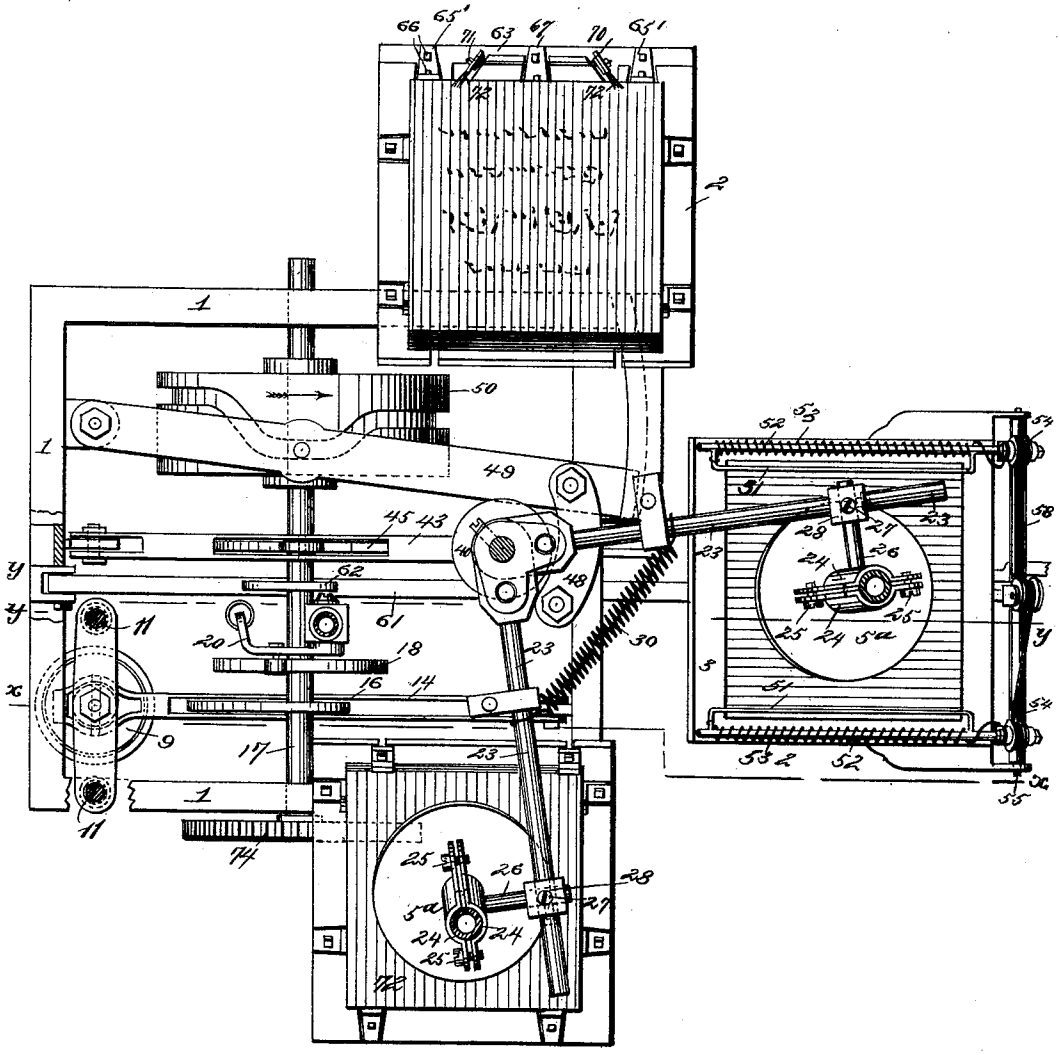
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L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 2.



WITNESSES:

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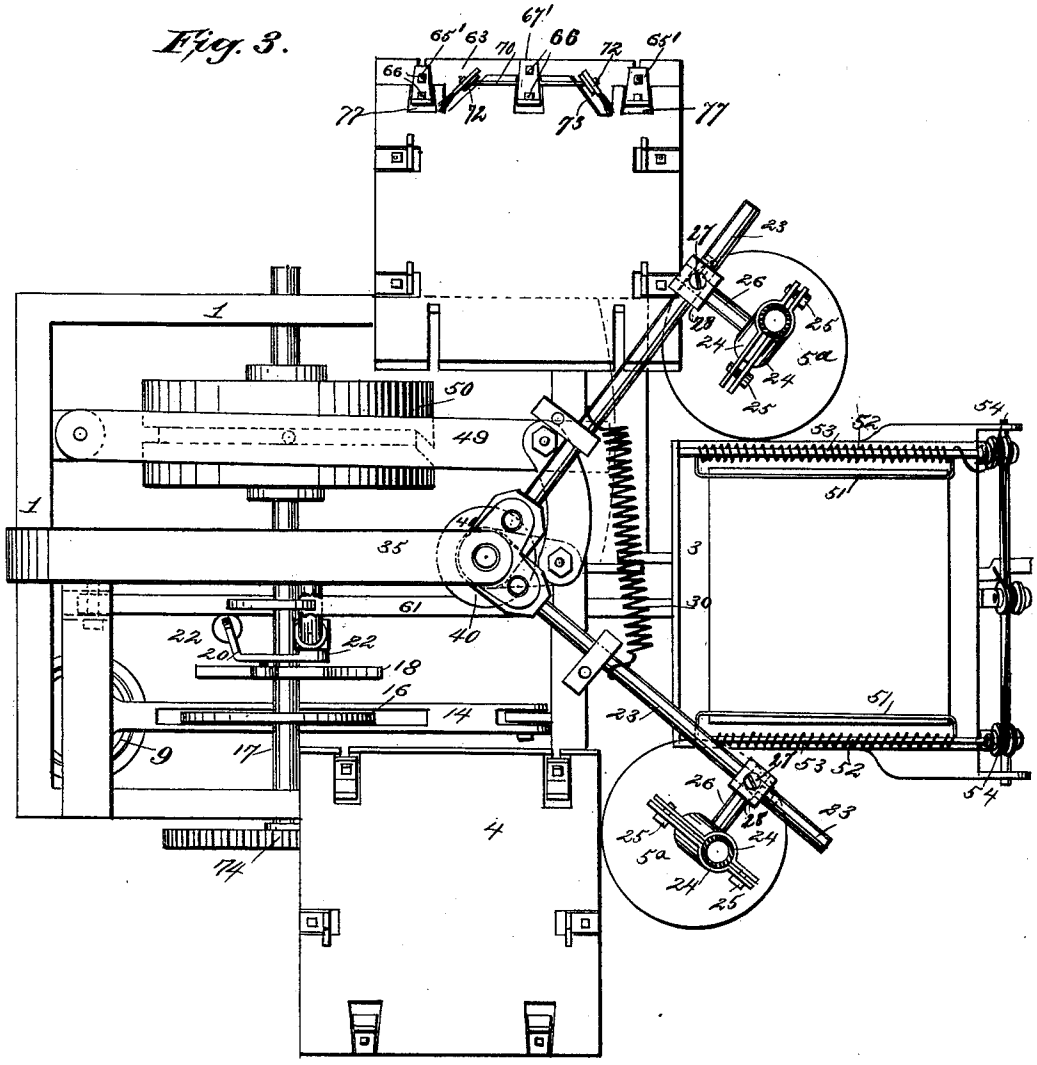
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L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 3.



WITNESSES:

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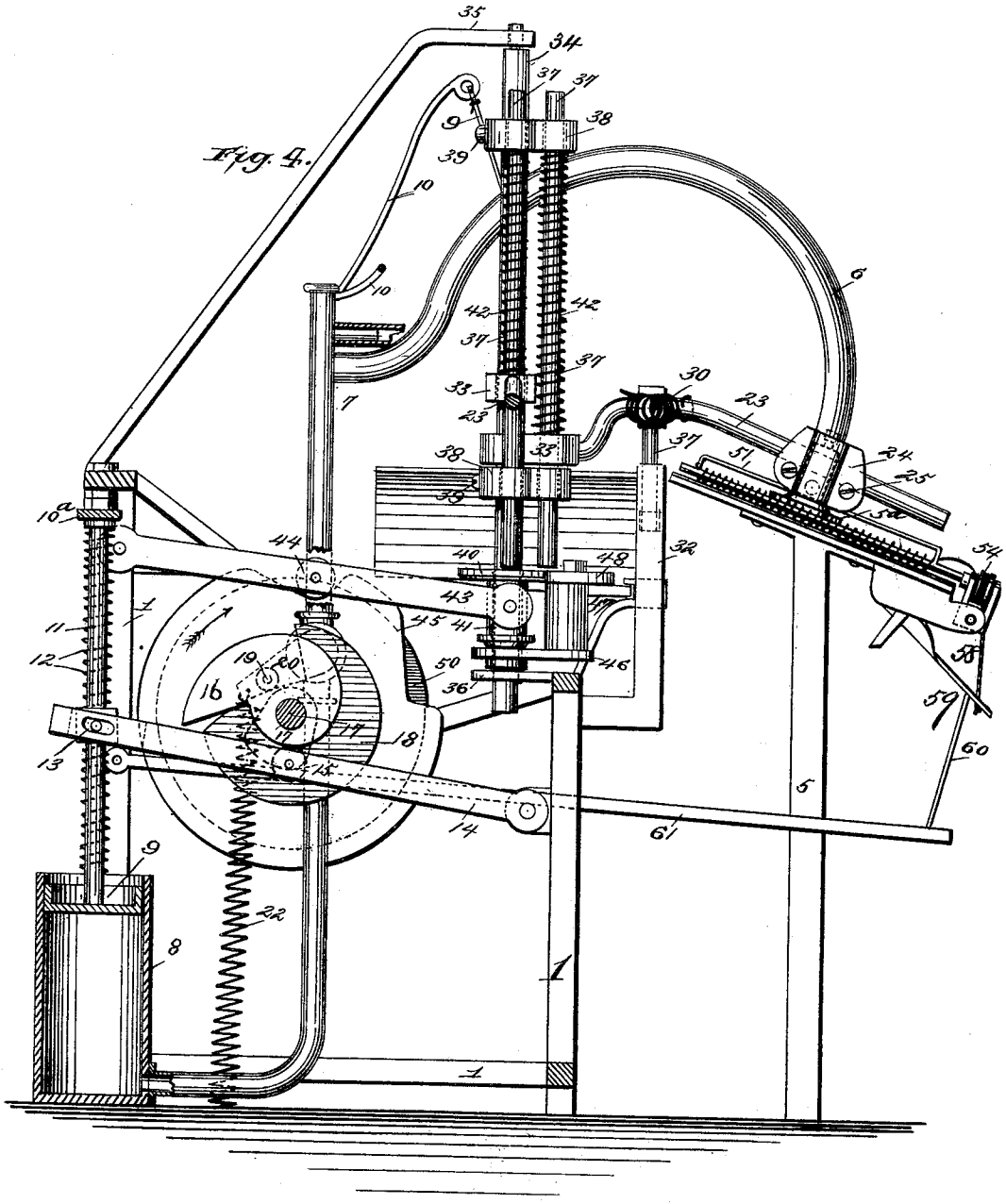
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L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 4.



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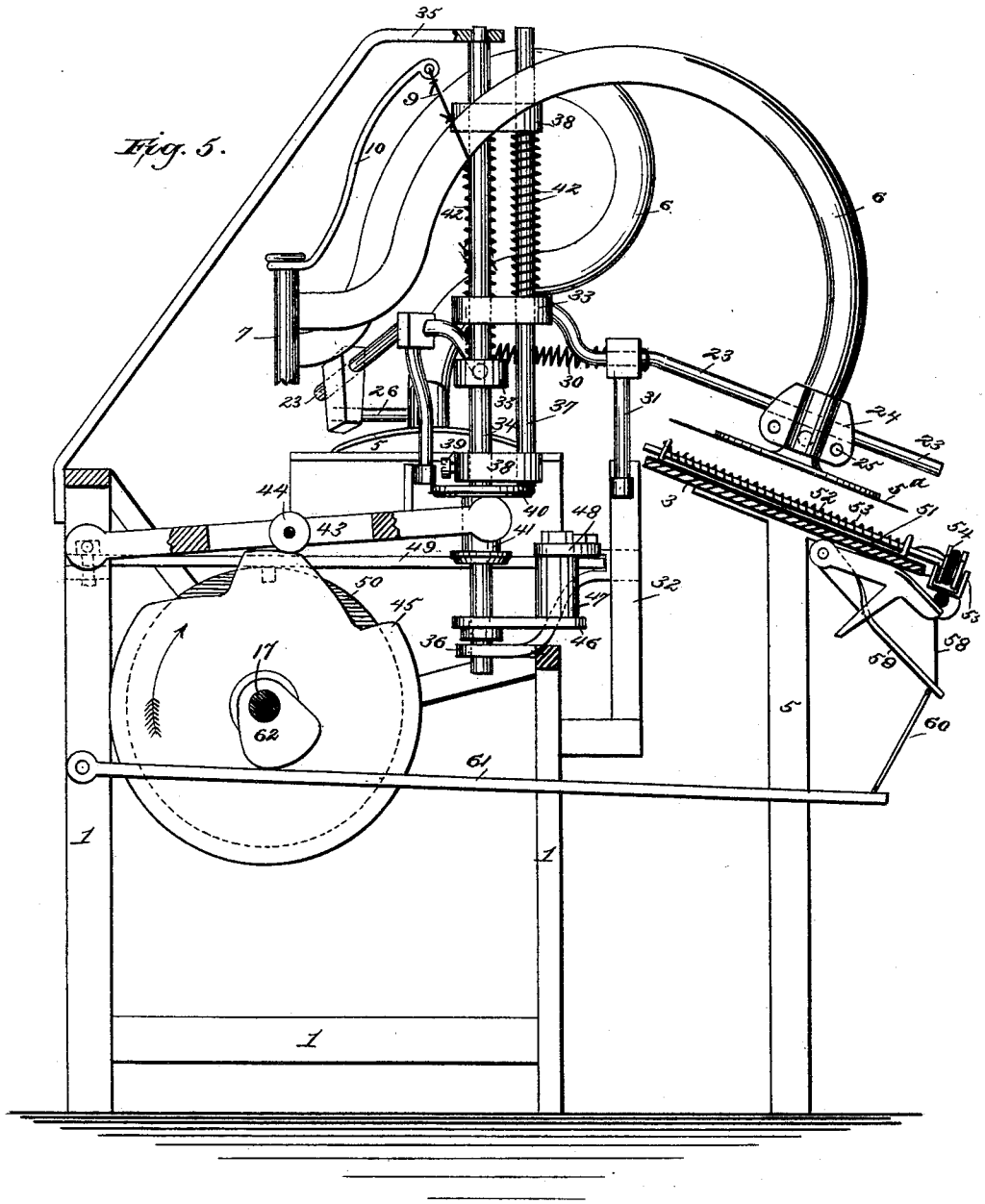
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L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 5.



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L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

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Fig. 6.

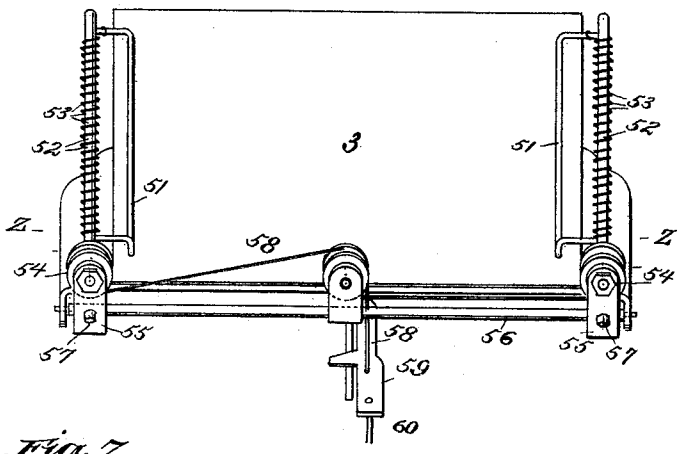


Fig. 7.

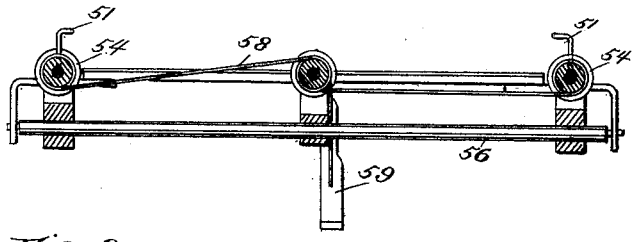


Fig. 8.

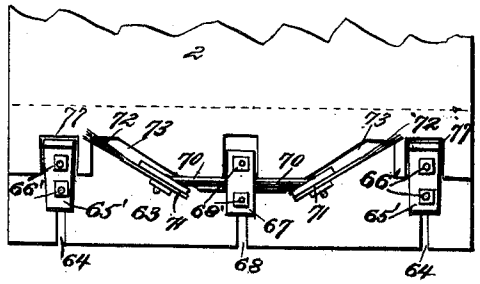
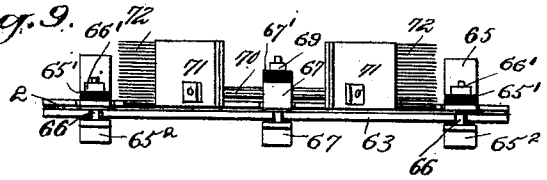


Fig. 9.

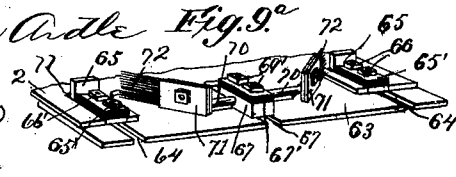


WITNESSES:

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Fig. 9ª.



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L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 10.

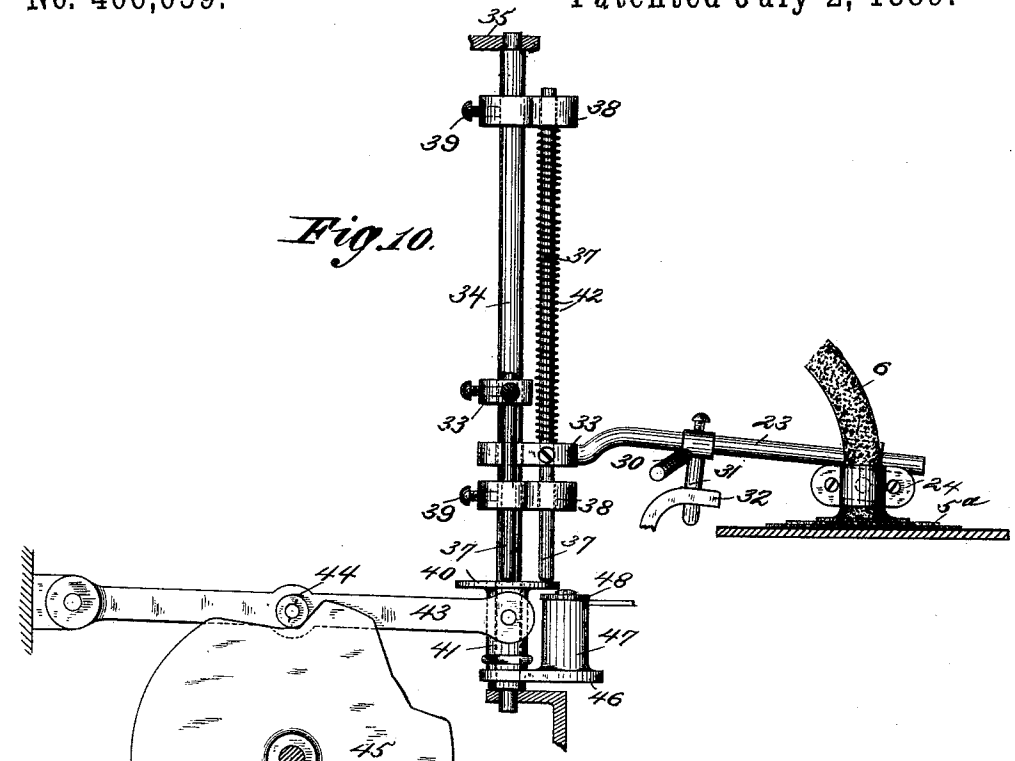
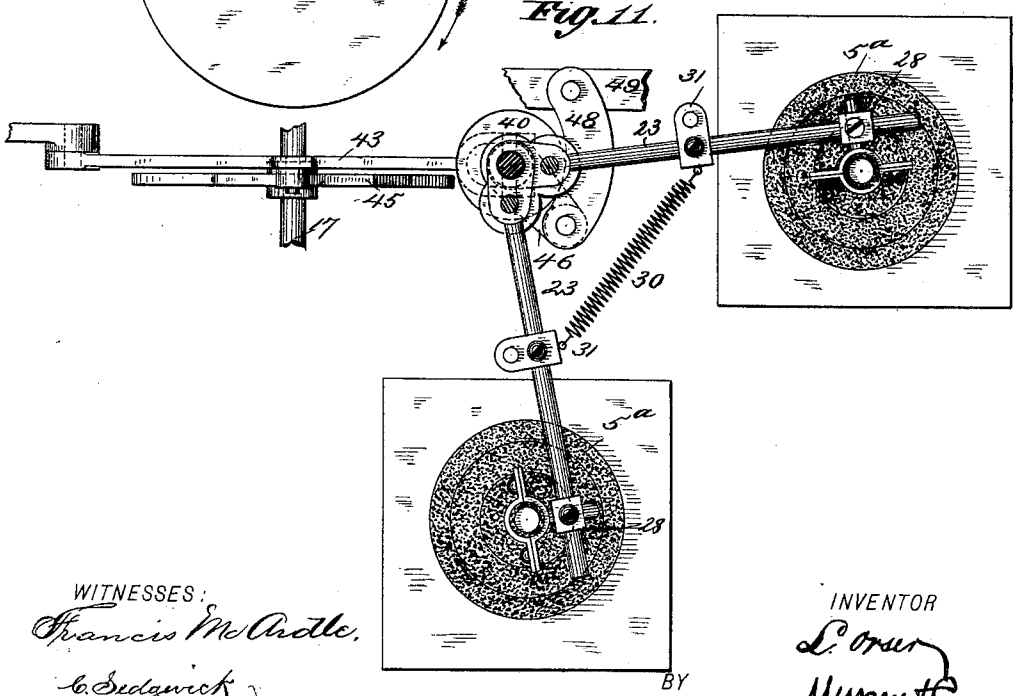


Fig. 11.



WITNESSES:
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(No Model.) 9 Sheets—Sheet 8.

L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 12.

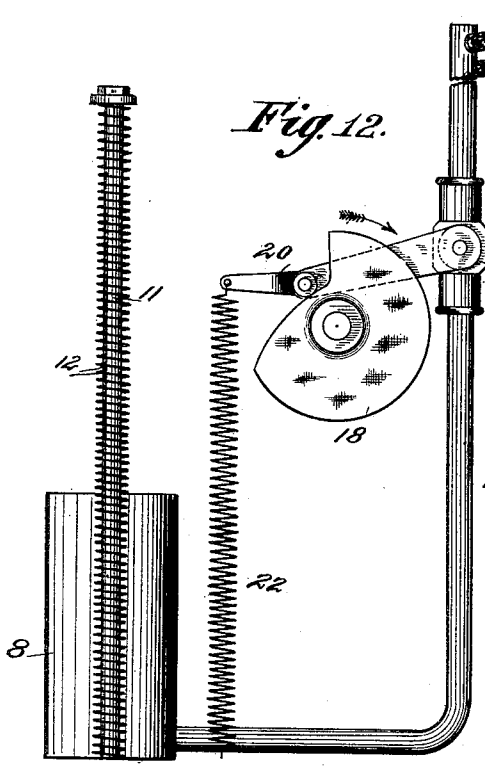


Fig. 14.

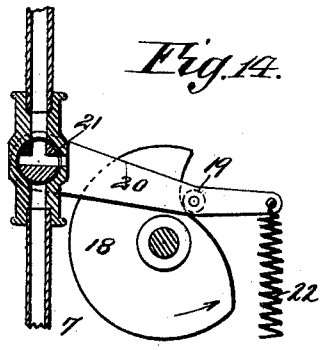


Fig. 15.

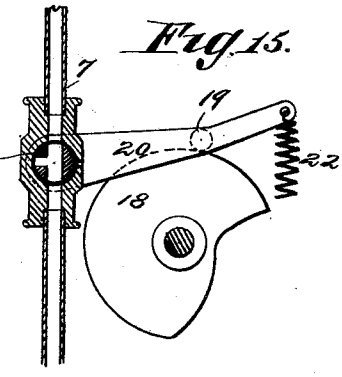
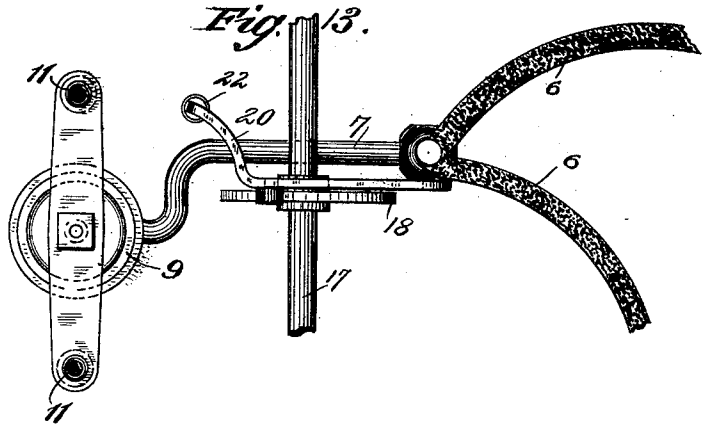


Fig. 13.



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(No Model.) 9 Sheets—Sheet 9.

L. ORSER.

FEEDER FOR TREADLE PRINTING PRESSES.

No. 406,059. Patented July 2, 1889.

Fig. 16.

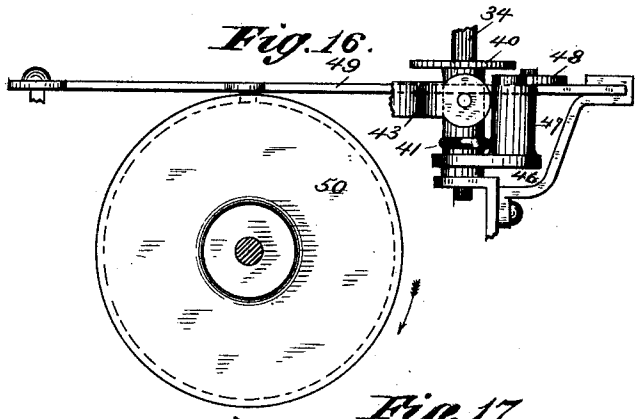


Fig. 17.

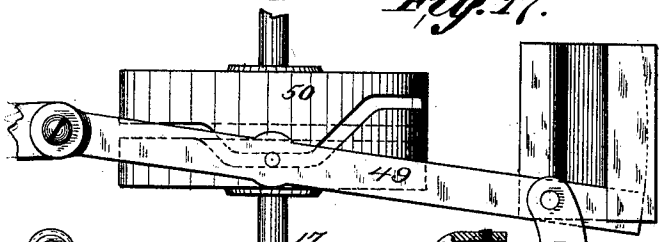


Fig. 18.

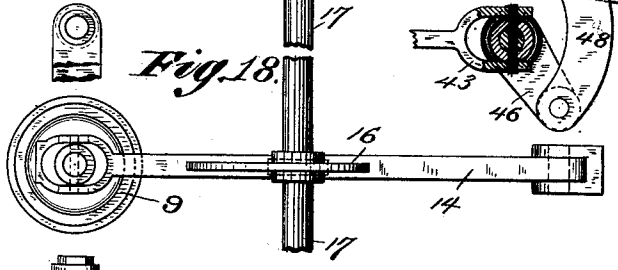
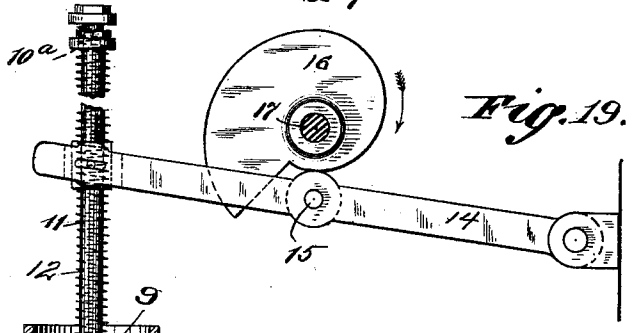


Fig. 19.



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ATTORNEYS

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UNITED STATES PATENT OFFICE.

LEVI ORSER, OF GALVESTON, TEXAS.

FEEDER FOR TREADLE PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 406,059, dated July 2, 1889.

Application filed December 29, 1887. Serial No. 259,293. (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 a new and Improved Feeder for Treadle Printing-Presses, of which the following is a full, clear, and exact description.

This invention relates to feeders for printing-presses, and has especial reference to its employment in treadle-presses, in which the feeder has to lay the paper on the platen and remove it after being printed.

By means of this invention a sheet of paper on the feed-plate and a printed sheet on the platen are simultaneously lifted therefrom and carried respectively to the platen and holder-plate, where they are deposited. To accomplish this, lifters are employed which hold the paper by means of a mechanism which produces a partial vacuum in combination with mechanism for cutting off the suction and releasing the paper and moving the lifters in the proper time and direction. The platen is provided with clamps to hold the paper, which are automatically opened and closed, and the feed-plate has a removable and adjustable device to prevent more than one sheet being lifted at a time.

In the construction of this device holders for holding and transferring the paper are mounted on horizontal arms connected by sleeves to vertically-reciprocating rods and a vertical rotating shaft upon which the sleeves are adapted to slide. A vertical rotating shaft has secured to it sleeves or blocks in which vertically-reciprocating rods are adapted to move. The vertically-reciprocating rods are raised by a sleeve which slides upon the vertical rotating shaft, the sleeve being pivoted to a forked lever which is acted upon by a cam. The vertical rotating shaft mounted in suitable bearings is provided with a crank-arm connected by a link with a horizontally-vibrating lever actuated by a slotted cam. The holders for holding and transferring the paper communicate with a vacuum-pump operated by a lever acted upon by a cam. A second cam on the same shaft as the latter acts upon a valve to open and close the connection between the vacuum-pump and to release the paper. The several cams heretofore mentioned are mounted on the same shaft driven by any suitable power. The cams are so timed in their construction that the vacuum will be produced to hold the paper on the feed-plate and platen against the holders which are raised by the vertically-reciprocating rods acted upon by the sleeve, sliding on the vertical rotating shaft and its connections, and then swung laterally over the platen and holding-plate by the slotted cam and laterally-vibrating lever acting upon the vertical rotating shaft carrying the vertically-reciprocating rods, and lowered to the platen and holder-plate by the cam, forked lever, sleeve, and vertically-reciprocating rods. At this point the vacuum is cut off from the holders by a cam acting on a valve in the pipe connecting the lifters with the vacuum-pump. By the further rotation of the main shaft and its cams the lifters are raised and swung to a position out of the way between the feed and holding plates, where they rest till a sheet is printed, when the cams further act to move the lifters over and down upon the feed-plate and platen and create a partial vacuum for the lifters to hold the paper.

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

Figure 1 is a plan view of the feeder, showing the lifters in position to transfer the paper from the feed-plate and platen to the platen and holding-plate. Fig. 2 is a plan view of the feeder with the lifters in position when the paper is transferred to the platen and holder-plate. Fig. 3 is a plan view of the feeder, showing the lifters at rest between the feed and holder plates with the platen clear for printing. Fig. 4 is a section on the line $x\ x$ of Fig. 2, showing the position of the parts when the paper has been placed upon the platen. Fig. 5 is a section on the line y y, Fig. 2, showing the position of the parts when the nippers or holders on the platen are closed and the paper has been lifted to be transferred. Fig. 6 is a view of the platen with the paper-holders closed. Fig. 7 is a detail in cross-section on line $z\ z$, Fig. 6, with clamps in raised positions. Fig. 8 is a plan view of the feed-plate, partly broken away, showing the device attached for separating

the sheets. Fig. 9 is a front edge view of the same. Fig. 9ª is a perspective view of the same. Fig. 10 is a detail view showing the position of the cam and sleeve operating lever when the paper-holding disks have been lowered to the platen and holding-plate. Fig. 11 is a plan view showing the same position of the cam and sleeve operating lever as in Fig. 10. Fig. 12 is a detail view of the vacuum cut-off mechanism, showing the position of the cam when the valve is opened to destroy the vacuum. Fig. 13 is a detail plan view, showing the cylinder-tube and cut-off valve-lever, with cam and vacuum cut-off lever in the position shown in Fig. 12. Fig. 14 is a reverse view of the cam, lever, and vacuum-valve in the position shown in Fig. 13, with the valve in vertical section. Fig. 15 is a detail reverse view of the cam and valve-lever in Fig. 12, showing the valve in vertical section and its lever and actuating-cam in the position when the valve is closed and the printing is taking place. Fig. 16 is a detail view showing the side of the slotted cam and lever actuated thereby, the sliding sleeve and lever-connection and crank-arm of rotating shaft. Fig. 17 is a plan view of the slotted cam and lever for giving lateral movement to the paper-holder arms. Fig. 18 is a plan view of the vacuum-forming cylinder, its piston-actuating lever, and cam; and Fig. 19 is a side view thereof with one of the piston cross-head uprights and springs for throwing up the piston.

Referring to the drawings, 1 indicates a frame-work, in which the feeder mechanism is mounted, and 2, 3, and 4 the feed-plate, platen and holding-plate, respectively, mounted on suitable supports 5, one of which only is shown in Figs. 4 and 5. The holders for holding the paper when transferred consist of suction-disks 5ª, of rubber or other suitable material, connecting by flexible tubes 6 with a pipe 7, leading to the cylinder 8 of a vacuum-pump, as shown in Fig. 4. The tubes 6 are held up out of the way by cords 9 and arms 10 on the pipe 7, as indicated in said figure. The tubes 6 are flexible, in order to allow for the vertical and lateral movements of the holders 5ª. Instead of flexible tubes rigid tubes might be employed, connected to the pipe 7 by universal joints to permit of the same range of movement.

The vacuum-pump consists of the cylinder 8 and a piston 9, having a cross-head 10ª, sliding on the standards 11 in the frame-work, and bearing against reacting coiled springs 12. The piston-rod of the piston 9 is jointed about midway, as at 13, to a slotted lever 14, pivoted to the frame-work 1, as shown. The lever 14 carries a friction-roller 15, which is acted upon by a cam 16 on shaft 17, to force down the lever 14 and piston 9. Upon the cam 16 ceasing to bear upon the roller 15 the lever 14 and piston 9 are drawn up by the reaction of the coiled spring 12. Adjacent to cam 16 on shaft 17 is a second cam 18, which bears against a friction-roller 19 on a lever or arm 20 of a three-way stop-cock 21 in pipe 7, to hold the arm 20 up and permit the formation of the vacuum for holding the paper against the holders. When the paper is deposited, the cam 18 ceases to hold up the arm 20, and the latter is drawn down by a spring 22, thus opening the valve or stop-cock 21 and destroying the vacuum, thereby releasing the paper from the holders 5ª. The position of the parts is shown in Fig. 4. The holders 5ª are secured to lifting-arms 23 by means of clamps 24, fastened together by screws 25, so as to be detachable, and having an arm 26 held by a set-screw 27 to a block 28, fastened to arm 23 by a set-screw. The arms have a spring 30 connecting them to form a yielding joint, and a depending arm 31, which strikes against a buffer 32 to limit their lateral movement.

To permit the arms 23 to have a vertical and lateral movement, each is connected by a sleeve or block 33 to a rotating shaft 34, mounted in bearings 35 36 of the frame 1, and to a vertically-reciprocating rod 37, sliding in sleeves or blocks 38, secured by a set-screw 39 to shaft 34. The sleeve or block 33 slides on the shaft 34 and is fixed to the rod 37. The lower ends of the rods 37 rest on a flange 40 of a sleeve 41, adapted to slide on the shaft 34. When the sleeve 41 is raised, it pushes up the rods 37 and their arms 23, and the springs 42 are compressed by the blocks 33, and upon the sleeve 41 being lowered the springs 42 react to force down the blocks 33 and the arms 23.

By the construction above described it will be seen that the lifter-arms 23 are raised up and down by the movement of the vertically-reciprocating rods 37, moving in sleeves or bearing-blocks 38 on the rotating shaft 34, and that the rotation of the shaft 34 will carry with it the rods 37 and arms 23, so as to give the latter a lateral movement. To produce the vertical and lateral movement of the parts just described, the sleeve 41 is connected to a forked slotted lever 43, having a friction-roller 44 acted upon by a cam 45 on the shaft 17, which acts to raise and lower the sleeve 41, and the shaft 34 is connected by a crank 46, pivot 47, and pivoted link 48 to a horizontally-vibrating lever 49, actuated by a slotted cam 50 on shaft 17, which acts to rotate shaft 34.

In order to hold the sheets of paper on the platen 3 while being printed, the platen 3 is provided with clamps 51, constructed of light rods, bent, as shown, and mounted on shafts 52, having springs 53, which normally hold the clamps against the paper. At one end of the shafts 52 are pulleys 54, mounted in blocks 55, secured by set-screws 57 to a rod 56, mounted on the platen. Upon the pulleys 54 is wound the cord 58, so as to pull back the clamps 51. The cord 58 is secured to a lever 59, which in turn is connected by a cord 60 to the end of a lever 61, as shown in Fig. 5.

The lever 61 is depressed by a cam 62 on shaft 17 to draw down the cord 60 and lever 59, which pulls upon the cord 58 to raise the clamps 51. This action takes place just before the paper is placed upon or removed from the platen by the holders 5^a.

63 is a plate secured in any suitable way to the lower face of the feed-plate 2 and projecting beyond the outer edge thereof. The plate 63 has parallel slots 64 64, extending inwardly from its outer edge at opposite sides of its center, and 68 is a central or intermediate slot parallel with slots 64. The feed-plate 2 is provided at its outer edge with slots 77, wider than the slots 64 68, but in line therewith. The edge of the plate 2 is also cut away between the central and outer slots to form the recesses 73.

65 are the angular gages adjustable in and out of the slots 77 by means of bolts 66, projecting upwardly through the slots 77, and gages 65 from plates 65^2. Between horizontal flanges of the gages 65 and the nuts 66′ on the bolts rubber blocks 65′ are placed, so that the gages will be held by friction in any adjusted position.

67 is a clamp formed of upper and lower plates connected by bolts 69, which pass through the slot 68. A rubber block 67′ is held between the upper plate of the clamp and the nuts 69′ on the upper ends of the bolts 69, so that the clamp will be held by friction in its adjusted position, and the nuts 69′ 66′ may be adjusted to increase or lessen the tension of the several rubber blocks, so that the gages and clamp may be moved with greater or less force, as will be readily understood.

70 is a transverse rod passed through the clamp above the plate 63 and provided with inclined brush-holding clamps 71, resting at their lower edges on the plate 63 and clamping in place the brushes 72. By having the feed-plate recessed the brushes may be adjusted to engage the edge of the entire pile of paper and prevent more than a single sheet at a time from being raised, the said pile projecting more or less beyond or over the recesses 73. The feed-plate is further provided with gage-blocks 75, constructed similarly to the gage-blocks 65, and adjustable in slots 76 in said plate. The elastic blocks 65′ and 67′ and similar blocks for the blocks 75 hold said gage-blocks in position by tension and permit said gage-blocks to be adjusted without releasing their nuts. The elastic blocks may be either of rubber or a bent elastic metallic strip. The gage-blocks hold a pile of sheets in position on all sides and are adapted to be adjusted to sheets of different sizes.

The operation of the feeder is as follows: A printed sheet lying on the platen 3 and a pile of blank sheets on the feed-plate 2, the holders 5^a are brought in contact with the sheets, as shown in Fig. 1, by the revolution of the shaft 17 from the position shown in Fig. 3, the cam 50 acting to rotate shaft 34 and swing lifter-arms 23 to the left, at the same time the piston 9 being drawn up by the springs 12, and the cock or valve 21 being closed by the cam 18 lifting the arm 20, a vacuum is produced in tubes 6 and the paper is held against the holders 5^a. The further rotation of shaft 17 will cause cam 45 to raise lever 43, sleeve 41, rods 37, and arms 23 with holders 5^a, and thus lift the sheet from plate 2 and platen 3. The action of cam 50 on lever 49, link 48, and crank 46 will rotate shaft 34, and swing the arms 23 and holders 5^a, with paper attached, around to the right over the platen 3 and holder 4. The cam 45 will then have rotated, as shown in Fig. 4, to allow springs 42 to carry down rods 37, sleeve 41, and lever 43, and place the holders 5^a and paper upon the platen, as shown in Fig. 2. The cam 18 meanwhile has rotated to permit spring 22 to pull down arm 20 and open stop-cock 21, thereby destroying the vacuum in tubes 6 and releasing the paper from the holders 5^a. The clamps 51 also on platen 3 have been opened prior to the paper being placed upon the platen by the cam 62 acting on lever 61 to pull down lever 59 and cord 58. Upon the further rotation of shaft 17 and cams 45 and 50 the arms 23 and holders 5^a are lifted and moved to the left to the position shown in Fig. 3, where they rest while the printing goes on. The springs 53 meanwhile have been permitted to throw back clamps 51 against the paper by the cam 62 releasing the lever 61. The cams 45 and 50 having continued to rotate, the arms 23 and holders 5^a are carried to the left from the position shown in Fig. 3, and are brought down against the paper or plate 2 and platen 3. The vacuum-pump has been meanwhile operated by cam 16, lever 14, springs 12, and piston 9, to produce a vacuum in tubes 6 and hold the paper against holders 5^a. The sheets are then ready to be lifted and transferred, and the operation of the feeder commences again from the position shown in Fig. 1.

It will be noticed that the holders 5^a may be adjusted on arms 23 to sheets of different sizes by means of blocks 28 and set-screws 27, and set at the proper angle to the plates 2 3 by set-screws 27 and arms 26. While specific constructions have been described and shown for the various parts and mechanisms, I do not intend to limit myself thereto, as other forms of construction and mechanism may be employed to accomplish the same results.

The shaft 17 is shown with a spur-wheel 74 mounted on its end, which may be connected with a train of gear-wheels operated by any suitable power to drive the machine. Any suitable means may be employed to drive the shaft 17. It is preferably geared by an endless chain or belt with the press which is to be fed.

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

1. In a feeding mechanism for printing-

presses, the combination, with the feed plate or table, the platen, and a receiver or holder, of two horizontally-oscillating vertically-movable paper-holders simultaneously actuated to respectively transfer a sheet from the platen to the receiver or holder, and from the feed plate or table to the platen, and mechanism, substantially as described, for so actuating the paper-holders, substantially as set forth.

2. The combination, with the feed plate or table, the platen, and the receiving or holding plate or table, of a vertical rock-shaft, two vertically-movable lifter-arms oscillated horizontally by said shaft, and a paper-holder on each lifter-arm, substantially as set forth.

3. The combination, with the feed plate or table, the platen, and the receiving or holding plate, of two horizontally-oscillating lifter-arms, a holder at the outer end of each arm, a vertical rock-shaft for oscillating said arms, and on which the arms move vertically, and a spring connecting said arms, substantially as set forth.

4. The combination, with the feed plate or table, the receiving or holding plate or table, and the platen between the two, of the horizontally-swinging lifter-arms having pneumatic holders at their outer ends, flexible pipes leading from said holders, a valved pipe with which they communicate, an air-exhaust pump for said pipe, levers for operating the pump and valve, and cams for operating said levers, substantially as set forth.

5. In a feeding mechanism for printing-presses, the combination, with a rotating cam and a lever and sliding sleeve operated by a cam, of vertically-reciprocating rods carrying lifter-arms on which paper-holders are mounted, substantially as described.

6. In a feeding mechanism for printing-presses, the combination, with the paper-holders, of a mechanism for swinging said holders laterally, consisting of a slotted cam, a horizontally-vibrating lever actuated thereby, a link, and crank-arm, and a rotating shaft carrying vertically-reciprocating rods on which the holder-arms are mounted, substantially as described.

7. In a feeding mechanism for printing-presses, the combination, with a combined mechanism for raising the paper-holding arms, swinging them laterally, and lowering them, consisting of a cam, a vertically-swinging lever, a sliding sleeve mounted on a rotating shaft, and vertically-sliding rods to which the holder-arms are attached raised by the sliding sleeve and lowered by reacting springs, of a slotted cam, a horizontally-vibrating lever actuated thereby, a pivoted link-connection, a crank-arm, and a rotating shaft on which the crank-arm is mounted, and which carry by means of sleeves the vertically-reciprocating rods and paper-holding arms, substantially as described.

8. The combination, with the platen and the feed and holding plates or tables at opposite sides of the same, and the two vertically-movable paper-holders spaced apart to correspond with the platen and plates, and horizontally-oscillating lifting-arms to which said paper-holders are secured, of paper-clamps at opposite sides of the platen, an operating-lever, connections between the lever and clamps, and a cam acting on said lever to open the clamps and allow the paper-holders to respectively remove and deposit a sheet from or on the platen, substantially as set forth.

9. In a feeding mechanism for printing-presses, a platen having a device to hold down the sheet when being printed, consisting of pivoted clamps, springs which hold the clamps against the paper, pulleys on the axes of the clamps, a cord operated by a cam, and a connecting-lever to open the clamps, substantially as described.

10. In a feeding mechanism for printing-presses, a feed-plate provided with adjustable brushes at its edge, whereby but one sheet may be lifted at a time, substantially as described.

11. In a feeding mechanism for printing-presses, a feed-plate having its edges provided with adjustable brushes and gage-blocks, substantially as described.

12. In a feeding mechanism for printing-presses, a feed-plate having a device for permitting the release of one sheet at a time, consisting of a plate secured to said feed-plate, having brushes projecting over the edge of the feed-plate, substantially as described.

13. In a feeding mechanism for printing-presses, the combination, with the feed-plate 2, having slots 73 and 77, of the plate 63, having slots 64 and 68, blocks 67, elastic blocks 67′, bolts 69, nuts 69′, rod 70, brushes 72, brush-clamps 71, blocks 65, elastic blocks 65′, bolts 66, and nuts 66′, substantially as described.

14. In a feeding mechanism for printing-presses, a feed-plate having straight and inclined slots on its edges, in combination with a plate having inclined brushes which lie in the inclined slots in the feed-plate and overlap it, substantially as described.

15. In a feeding mechanism for printing-presses, a feed-plate provided with adjustable brushes inclined to the edges of said feed-plate, substantially as described.

16. In a feeding mechanism for printing-presses, the combination, with suction-disks for holding the paper, of a vacuum and cut-off mechanism consisting of a cylinder and piston, a piston-rod having a cross-head, and reacting springs to move the piston up, a lever and actuating-cam to move the piston down, tubes connecting the suction-disks with a main tube communicating with the cylinder, and a stop-cock in the main tube, and actuating-cam and reacting spring to close and open the vacuum, substantially as described.

17. In a mechanism for raising and swinging laterally and lowering paper-holding clamp-

arms in printing-press feeders, a vertical rotating rod, a vertically-sliding sleeve thereon, sleeves or blocks secured to the vertical rotating shaft, and vertically-sliding rods moving in the sleeves or block and resting upon or moved by the sliding sleeve, and carrying sleeves or blocks secured thereto and moving on the rotating shaft, with reacting springs which carry the sliding rods downward, substantially as described.

18. In a feeding mechanism for printing-presses, the combination, with the lifter-arms, of the suction-disks adjustable longitudinally thereon and at an angle thereto, substantially as set forth.

19. In a feeding mechanism for printing-presses, the combination, with the arms for holding the suction-disks, of the disks having a projecting arm, adjusting-block, and set-screw movable on the disk-holding arm, substantially as described.

20. The combination, with the feed-plate having one edge recessed or notched, of a sheet-separating brush projecting into said notch, substantially as set forth.

21. A feeder for printing-presses comprising the frame, the feed-plate, the platen, and the receiving or holding plate, a vertical rock shaft or rod, lifter-arms connected therewith at an angle to each other and movable vertically, suction-disks on said arms, tubes leading therefrom, a valved tube into which said tubes lead, and a piston and cylinder, paper-clamps at opposite sides of the platen, a transverse shaft journaled in the frame and having five fixed cams, levers acted upon by said cams and connected, respectively, with the piston, the clamps, the pipe-valve, the vertical rock shaft or rod, and the vertically-movable lifter-arms, substantially as set forth.

22. The combination, with a vertical rock shaft or rod, of a lifter-arm oscillated horizontally thereby and movable vertically thereon, and a suction paper-holder on said arm, substantially as set forth.

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Witnesses:
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