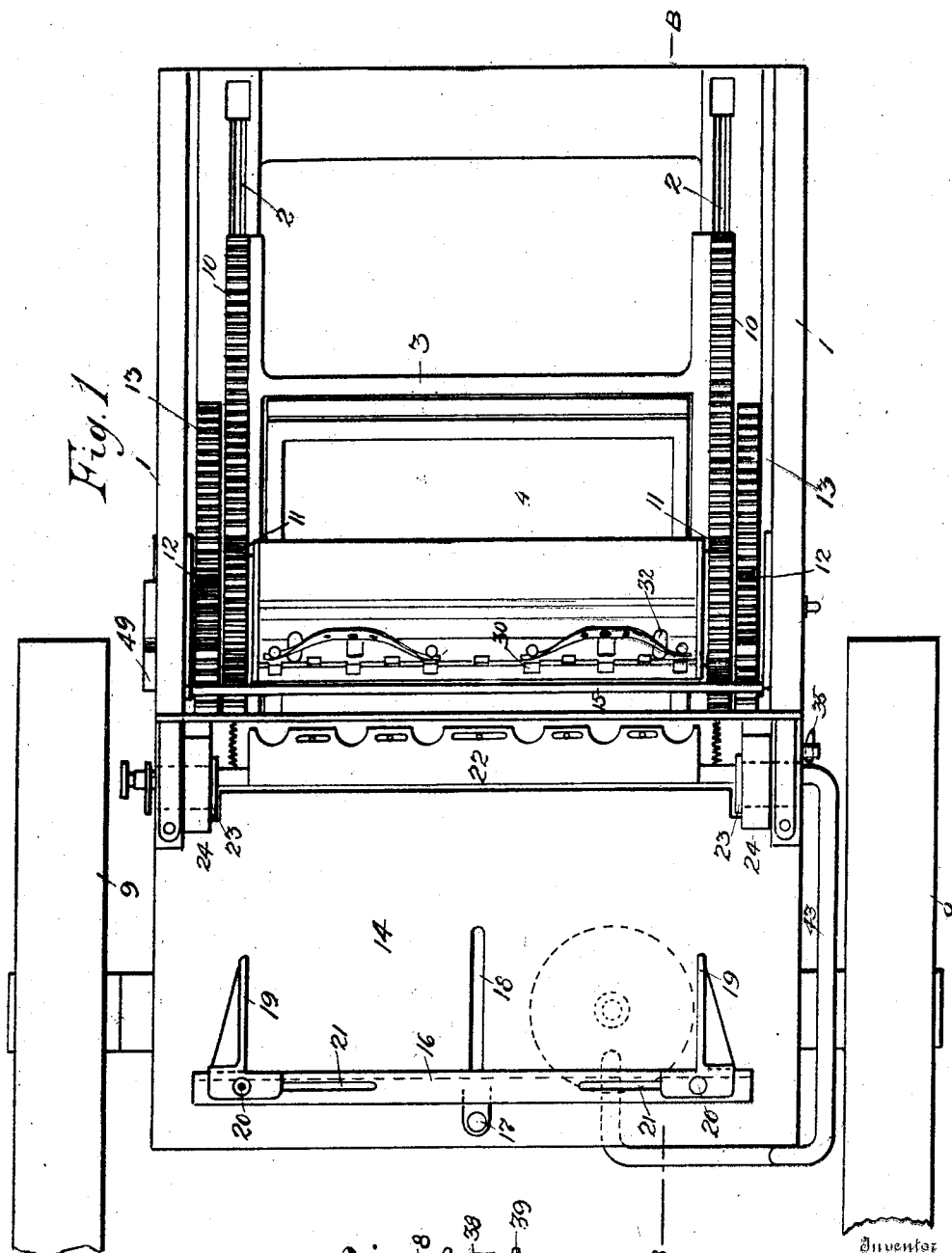


No. 829,248.

PATENTED AUG. 21, 1906.

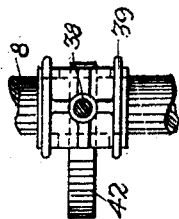
M. J. BARNETT.
FEEDER FOR PRINTING PRESSES.
APPLICATION FILED JULY 11, 1904.

4 SHEETS—SHEET 1.



Witnesses
John E. Carson
James J. Pinkel

Fig. 2.



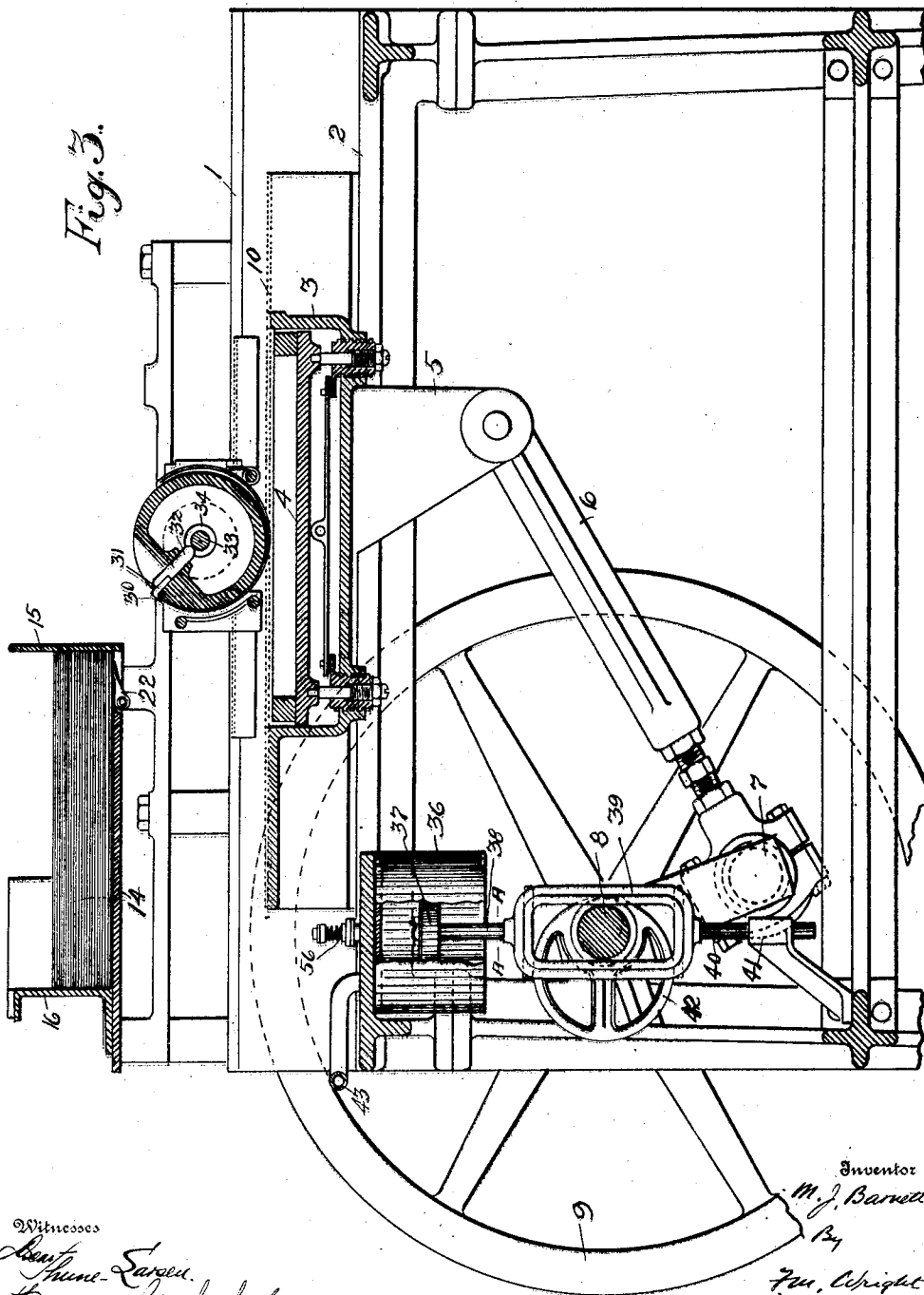
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4 SHEETS—SHEET 2.



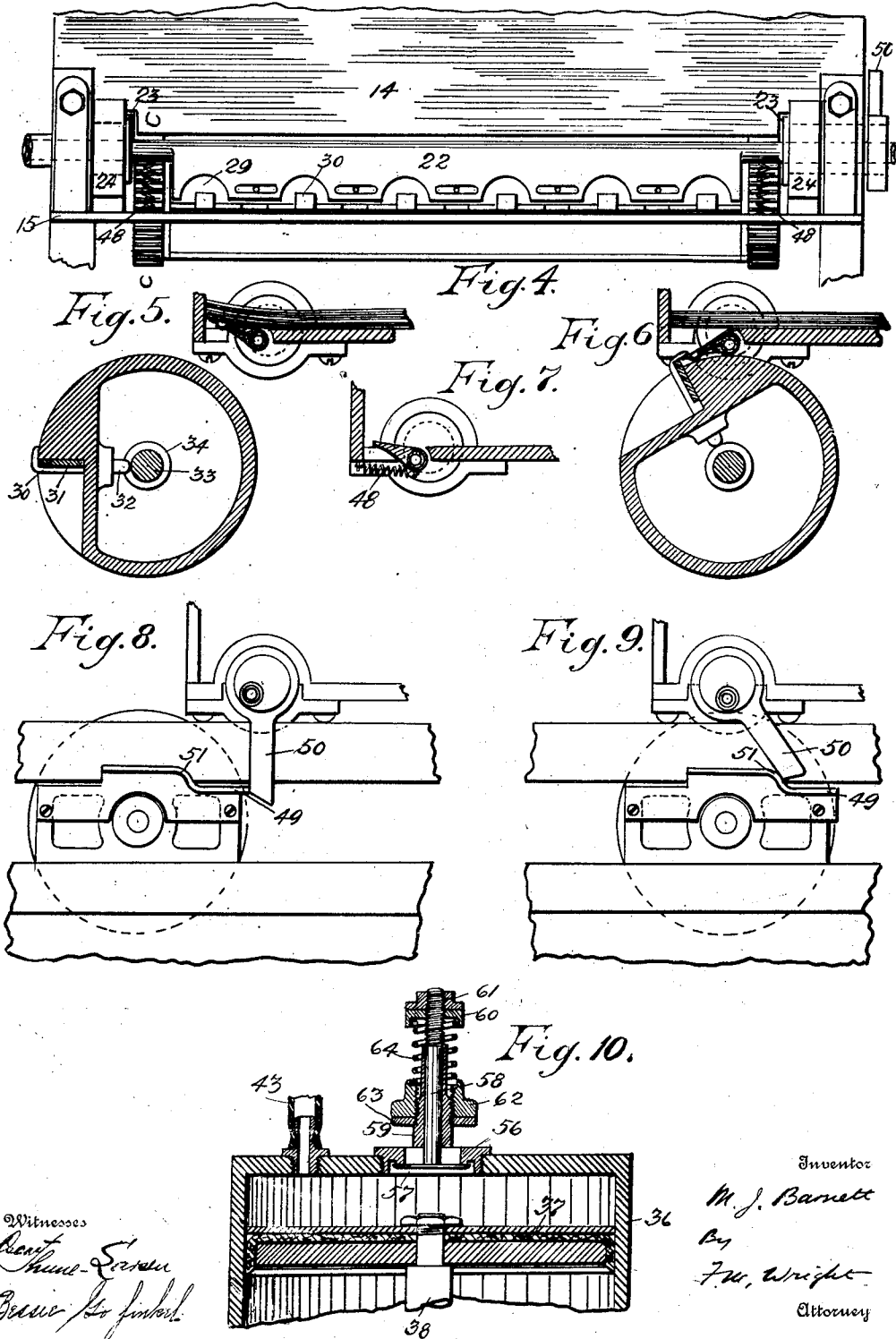
Witnesses
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4 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

MORRISON J. BARNETT, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO WHITSON AUTOPRESS COMPANY, A CORPO-
RATION OF NEW YORK.

FEEDER FOR PRINTING-PRESSES.

No. 829,248.

Specification of Letters Patent.

Patented Aug. 21, 1908.

Application filed July 11, 1904. Serial No. 215,971.

To all whom it may concern:

Be it known that I, MORRISON J. BARNETT, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Feeders for Printing-Presses, of which the following is a specification.

My invention relates to improvements in feeders for printing-presses, the object of my invention being to provide an apparatus of this character which will feed to the press at a high speed accurately and with certainty sheets of paper of all sizes, thicknesses, and qualities.

My invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a printing-press, showing my improved feeder thereon. Fig. 2 is a detail horizontal section on the line A A of Fig. 3. Fig. 3 is a longitudinal vertical section on the line B B of Fig. 1. Fig. 4 is a plan view of a portion of the apparatus, showing the grippers in position for taking the paper, the paper itself, however, being omitted from the figure. Fig. 5 is a longitudinal section through the impression-cylinder and a portion of the feeder, showing the position of the parts before the gripper-fingers are ready to take the paper. Fig. 6 is a similar view showing the parts in the position in which the gripper-fingers are taking the paper. Fig. 7 is a detail sectional view on the line C C of Fig. 4. Fig. 8 is a detail side elevation of the mechanism for operating the feed by means of a cam on the box of the impression-cylinder. Fig. 9 is a similar view showing the parts in a different position. Fig. 10 is a sectional view of the upper end of the pump. Fig. 11 is a detail plan view of the suction-tube. Fig. 12 is an enlarged broken longitudinal sectional view of the same through the suction-ports looking upward. Fig. 13 is a longitudinal sectional view of the same on the line D D of Fig. 17. Figs. 14, 15, and 16 are views similar to Fig. 13, showing the parts in different positions. Figs. 17 and 18 are views, greatly enlarged, showing the exhaust-pipes in different positions. Fig. 19 is a broken

perspective view of the suction device, showing the two parts thereof partly in section. Figs. 20 and 21 are plan views of modified forms of gates.

Referring to the drawings, 1 represents a frame of a printing-press having the side guides 2 for the bed 3, carrying the platen 4. Said bed is reciprocated through a hanger 5, depending therefrom, pivoted to a pitman 6, operated by a crank 7 on the driving-shaft 8, having the fly-wheels 9 and driven from any suitable source of power. The bed 3 communicates motion in the opposite direction to the impression-cylinder by means of the racks 10 upon the bed engaging the gear-wheels 11 upon the cylinder, smaller gear-wheels 12 upon the cylinder also engaging fixed racks 13 upon the frame of the press. None of the above, however, forms a part of my present invention, which is restricted to the feeding mechanism for the press.

14 represents the bottom of the supply-box, which is bounded by a wall 15, an adjustable wall 16, secured by means of a clamp-screw 17 and a slot 18 in the bottom 14, and side walls 19, which are adjustable laterally by means of clamp-screws 20 in slots 21 in the wall 16. By this means the box can be adjusted to any desired size to conform to the size of the sheets to be printed.

Near the wall 15 of the box is movably supported, so as to be on the same general level as the bottom, a rocking gate 22, which has enlarged cylindrical portions 23, which rock in bearings 24, supported upon the table near the ends of the wall 15. Said gate comprises an inner tube 25 and an outer tube 26. The inner tube 25 is cylindrical in form, but the outer tube 26 is of an irregular pear-shaped cross-section having an enlarged portion substantially cylindrical and surrounding the cylindrical inner tube and an extension or lip 27, extending in a general tangential direction from said cylindrical portion and having a thin free or outer edge, as shown at 28. This free edge is serrated, having semicircular recesses 29, which register with gripper-fingers 30 on a gripper-plate 31, having pins 32 passing through a thickened portion of the wall of the impression-cylinder. The rounded ends of said fingers rest upon a shaft 33 in the cylinder, having cam-shaped portions 34. By means of a fixed

cam 35, mounted upon the frame of the press in the path of the end of the cam-carrying shaft, said latter shaft is moved longitudinally, and thereby through the engagement of the cam-shaped portions 34 with the ends of the pins 32 moves said pins 32 outwardly, thereby also moving the gripper-fingers 30 outwardly, so as to allow the same to pass over the edge of the sheet of paper, which is at that time in close contact with the lip 27, and thus to be in position to grip said paper and hold it to the impression-cylinder.

The means for causing the lowest sheet of the pile to adhere to the lip are as follows: 36 is a pump supported upon the frame of the press and having a piston 37, secured to the upper end of a rod 38, attached to a yoke 39, to the lower portion of which is also attached a rod 40, sliding in a bearing 41. Said yoke is a two-way yoke having a transverse opening to permit the driving-shaft 8 to pass therethrough and to allow the yoke to reciprocate vertically over said driving-shaft, and also a longitudinal opening to permit an eccentric 42 on said shaft 8 to revolve therein, the revolution of which eccentric imparts a reciprocating motion to the yoke, and thereby also to the piston of the pump. The downward motion of the piston sucks the air through a tube 43, leading to one end of the inner tube 25 of the rocking gate, producing an exhaust in said inner tube. Said inner tube has a series of oblong holes or slots 44 45, of which there are here shown five, although the number may be varied according to the size of the machine or the nature of the work to be done, the central slot 44 of the series being somewhat longer than the other four slots 45. The outer tube 26 has a corresponding number of ports 46, leading from said slots or from proximity thereto to elongated depressions 47, cut in the upper face of the lip and alternating with the semicircular recesses 29 cut out of the edge of the lip.

Springs 48 normally hold the lip in the position shown in Figs. 5 and 7, in which it is holding up the edges of the pile of paper, but when the cylinder has reached the stage in its movement illustrated in Figs. 6 and 9 the end of a cam-piece 49, mounted upon one of the boxes of the cylinder, engages an arm 50, extending from the enlarged end of the gate, and rocks the same so as to allow the lip 27 being brought down onto the surface of the cylinder into a substantially horizontal position. In this position it remains until the top of the cylinder begins to pass forward from directly underneath the free edge of the lip, whereupon said free edge is caused to descend in order to remain in contact with the surface of the cylinder, as the top of the cylinder moves away from said free edge. This depression of the free edge is effected by means of a sloping shoulder 51

in the cam 49, which still further rocks the arm 50, attached to the gate, causing the free edge of the lip to descend in contact with the cylinder.

It will be observed that the axes of the tubes 25 and 26 are eccentric to the enlarged ends 23. The object of this arrangement is to permit of the rocking of the gate without imparting any longitudinal movement to the sheets of paper lying over said gate. The axis of vibration of the gate coincides with the line of contact of the lowest sheet of the pile with the upper surface of said gate, and therefore with the rocking of the gate said lowest sheet is bent on that line without advancing or moving longitudinally said sheet.

While the lip of the gate is falling the pump is exhausting, so as to produce a vacuum under the free edge of the paper and to cause it to adhere closely to said lip, thus bringing it under the grippers, which advance and grip the paper to the cylinder and hold it thereto as the cylinder reverses its movement.

The object of causing the gate to rock upward is to raise the edges of the pile of paper into an oblique direction, so that as the gate again descends the lowest sheet of paper is more easily withdrawn by suction from the remaining sheets, which are held up by friction of their edges against the fixed wall of the box. The vertical reciprocation of the edges of the sheets and the consequent friction against the wall of the box tend to separate the paper and are particularly advantageous for this purpose when the sheets of paper tend to adhere to each other by reason of their raw edges, produced by the cutting of the sheets, interlocking with or clinging to each other. This movement of said edges against the wall serves to disturb or break up the interlocking or adhesion of the sheets, so that the lowest sheet is more easily separated from the rest.

Referring to Figs. 17, 18, and 19, it will be observed that the upper surface of the lip is slightly concave, as shown at 52, between the cylindrical portion and that portion of the lip which contains the elongated depression 47. The object of this is, by sucking the free edge of the paper into said concave portion of the lip, to withdraw the edge of the paper from contact with the wall of the box, so that it can be separated with more certainty from the other sheets of the pile and its descent with the lip insured.

Provision is made in the following manner for different sizes, thicknesses, and qualities of paper: The inner tube is slidable within the outer tube and is adjustably secured in various positions therein by means of the engagement of a pin 53 on the inner tube with one of a series of notches 54, formed in a slot in the outer tube. On account of the differences in the sizes and relative positions

of the slots 44 45 in the inner tube a longitudinal shift of the inner tube within the outer tube gives rise to different effects desirable for different kinds of paper. For instance, in Figs. 12 and 13 it will be seen that the central slot 44 is in communication by the corresponding port 46 with the under surface of the paper, and so also are the terminal slots 45, but the intermediate slots 45 are shut off. This gives a suction upon the paper which is suitable for fairly light weight paper of considerable width extending over all of the slots. In the next figure all of the slots are in communication by their ports. This will be desirable for a heavier grade of paper. In Fig. 15 the middle three slots are in communication, but the outer slots are shut off. This would be suitable for narrow paper. In Fig. 16 only the middle slot of the five is in communication. This would be suitable for very narrow paper or for paper in which only a small degree of suction was required.

The degree of exhaust is also an important factor in operating the device successfully with different grades of paper. In order to vary the degree of exhaust, the following construction is provided: 56 represents a valve closing a port 57 and having a stem 58, which slides in a bearing 59 and has on its end a nut 60 and a lock-nut 61. Upon the bearing is also screwed an adjusting-nut 62 and a lock-nut 63, and between the two sets of nuts is interposed a spiral spring 64. The utility of this valve appears when, for instance, porous paper is being used, in which case unless the degree of exhaust was suitably reduced the suction might be so great as to draw air not only from the near side of the bottom sheet, but also through the sheet itself, and then to draw down the next sheet also. This is prevented by using the above-described valve, for now the pressure of the external atmosphere upon the piston overcoming the strength of the spring said piston is forced inwardly, admitting air into the pump and raising the pressure, or, in other words, reducing the suction.

The degree of maximum suction can be readily adjusted by means of the nuts and

lock-nuts, which will vary the strength of the spring which governs said maximum suction.

In Fig. 20 is shown a modified form of gate in which a number of holes 67 are provided at a greater distance from the edge than the depressions in the first modification. In this form of the device the edge is not recessed or serrated; but the paper extends over the edge of the lip and is drawn down over it.

In Fig. 21 is shown a further modification in which a large depression 68 is formed in the upper surface of the gate, this gate being thereby particularly well adapted for feeding envelops.

I claim—

1. In an apparatus of the character described, in combination with the feed-box, a feeding device comprising inner and outer tubes, a pump connection between the pump and the inner tube, the outer tube having a serrated extension or lip having recesses and having depressions in the upper face thereof between the recesses, and having also ports leading from the inner tube to said depressions, and the inner tube having corresponding oblong holes leading to said ports, and a gripper having gripper-fingers registering with the recesses, substantially as described.

2. In an apparatus of the character described, in combination with the feed-box, a feeding device comprising inner and outer tubes, a pump connection between the pump and the inner tube, the outer tube having an extension or lip and having depressions in the upper face thereof, and having also ports leading from the inner tube to said depressions, the inner tube having corresponding holes leading to said ports, and means for moving the inner tube longitudinally relative to the outer tube, substantially as described.

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

MORRISSON J. BARNETT.

Witnesses:

FRANCIS M. WRIGHT,
BESSIE GORFINKEL.