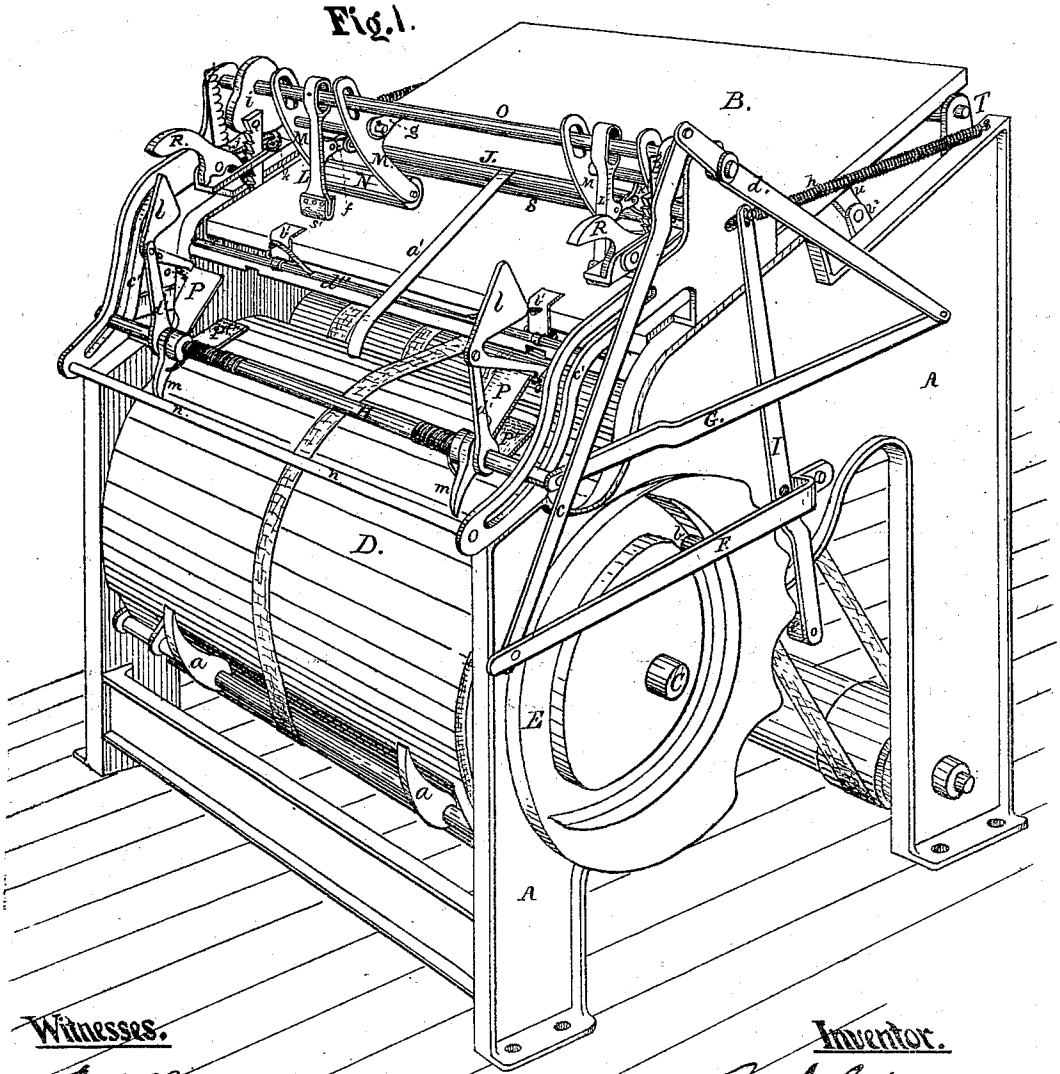
3 Sheets--Sheet 1.

R. J. STUART.

Printing-Press Feeders.

No. 137,156. Patented March 25, 1873.

Fig. 1.



Witnesses.

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3 Sheets--Sheet 2.

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Printing-Press Feeders.

No. 137,156. Patented March 25, 1873.

Fig. 2.

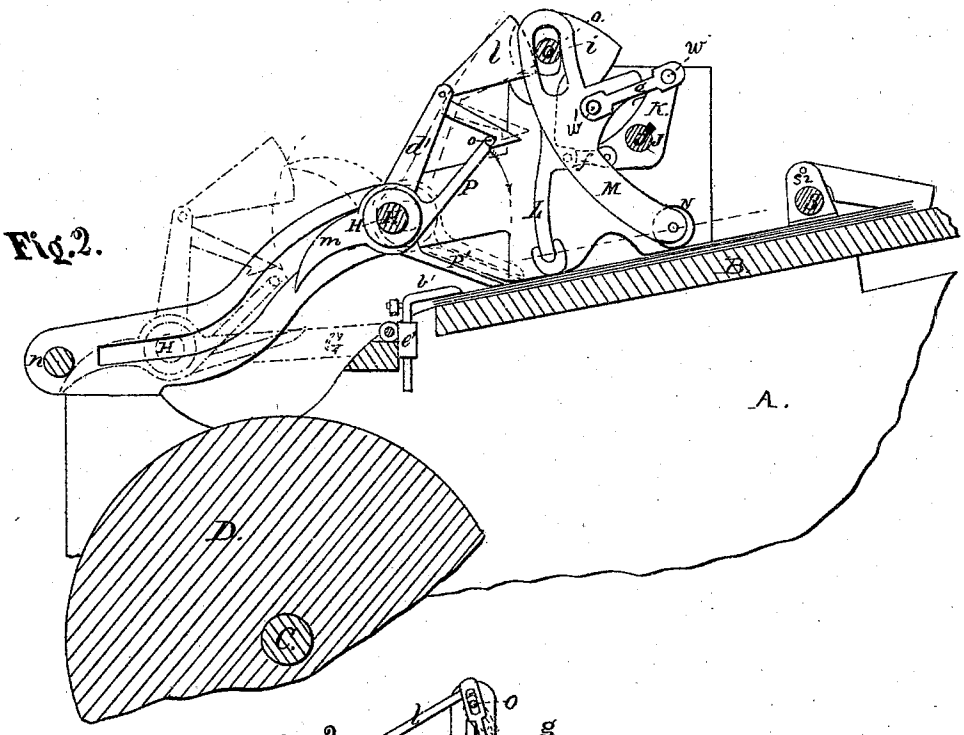

Fig. 3.

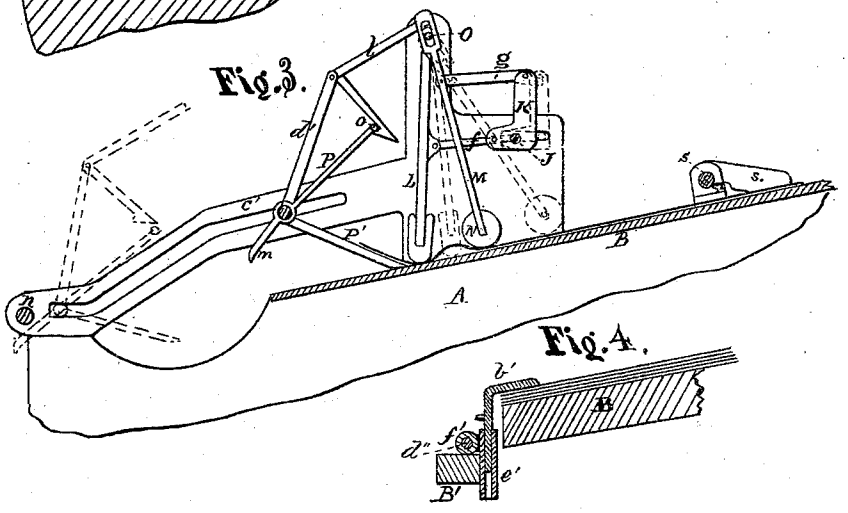

Fig. 4.

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3 Sheets--Sheet 3.

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Printing-Press Feeders.

No. 137,156. Patented March 25, 1873.

Fig. 5.

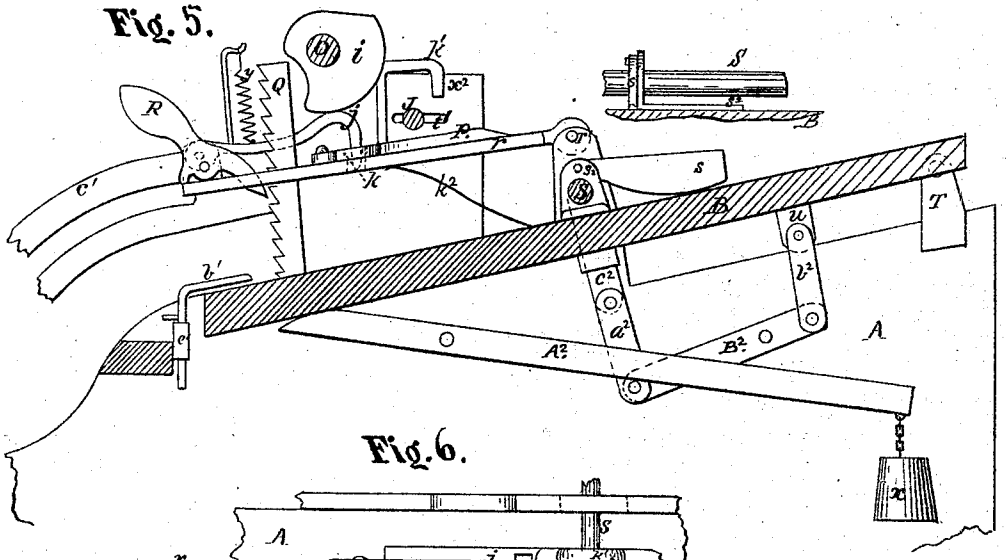


Fig. 6.

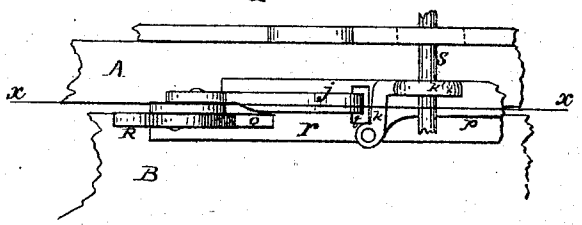


Fig. 7.

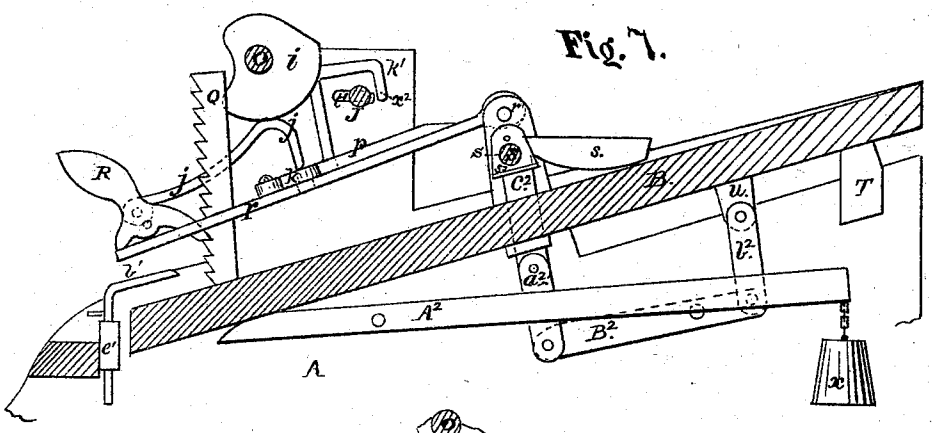
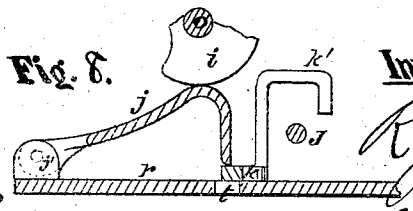


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE

ROBERT J. STUART, OF YONKERS, NEW YORK.

IMPROVEMENT IN PRINTING-PRESS FEEDERS.

Specification forming part of Letters Patent No. **137,156**, dated March 25, 1873.

To all whom it may concern:

Be it known that I, ROBERT J. STUART, of Yonkers, in the county of Westchester and State of New York, have invented certain Improvements in Apparatus for Automatically Feeding Sheets of Flexible Material to Printing-Presses, of which the following is a specification:

Nature and Objects of the Invention.

My invention relates to machines for feeding paper to printing-presses; and it consists in a novel construction, combination, and arrangement of parts which have for their object to automatically feed paper to printing-presses, as will be more fully set forth hereafter.

Description of the Drawing.

Figure 1 is a perspective view of my improved feeding apparatus. Fig. 2, Sheet 2, is a vertical transverse section of the same through its center. Fig. 3 is the same simplified, showing the principle of operation of the feeding mechanism. Fig. 4 is a part of the apparatus in detail. Fig. 5, Sheet 3, is a similar section to Fig. 2 without the feeding mechanism, and showing that for operating and adjusting the table supporting the material fed to the press. Fig. 6 is a plan or top view of a portion of Fig. 5. Fig. 7 is a section similar to Fig. 5, the table being depressed, and the parts in different positions. Fig. 8 is a sectional detail of the same part in any of the last three figures.

Similar letters of reference indicate like parts in all the figures.

General Description.

A A represent the frame of an ordinary printing-press; B, the table; C, a shaft, having bearings in the frame-work A A; and D, the impression-cylinder provided with the gripers *a a*, as usual. The table B is pivoted at its upper end to and turns freely on a bearing, T, but supported and regulated by suitable mechanism, as hereinafter described. To the shaft C is keyed or otherwise attached a circular cam, E, having a series of depressions on one portion of its circumference, as plainly shown in Fig. 1. Against this cam presses the stud *e* on the end of the lever I. These depressions are so arranged that, by the rotation of the cam, the lever I will receive a series of short, quick, vibratory motions, and then others which are slower and greater, this being effected by a number of small depressions, being followed by others that are deeper and have greater length. The lever I is connected at its upper end with a shaft or rod, J, as shown in Fig. 1, and, consequently, imparts its vibratory motion to the shaft, which runs in horizontal slots in the frame of the machine. (See Figs. 3, 5, and 7, Sheets 2 and 3.) On this shaft or rod J is feathered a right-angular arm, K, to the upper end of which is attached a horizontal rod, *w*, parallel to the shaft J, and at its lower portion is a small link, *f*. (See Figs. 2 and 3.) O is a shaft parallel to J, having bearings in the frame-work, connected with and receiving an intermittent rotary motion from the lever *d*, Fig. 1. Depending from this shaft O, and resting upon the table, are two arms, M M. (See Figs. 1, 2, and 3.) These arms are capable of a rise and fall in relation to the shaft O by means of slots cut in their upper ends, through which the shaft passes; and to their lower end is pivoted a roller, N, composed of India rubber or other suitable frictional material. These arms are connected together by a rod or bar, *w'*, (see Fig. 2,) and again connected with rod or bar *w* on the arm K and shaft J by links *g;* and thus these arms M M and their roller N will receive an intermittent vibratory motion from the lever I through the shaft J and arm K. From the shaft O, between the arms M, also depends an arm, L, arranged with a slot at its upper end similarly to the arms M M, and provided at its lower end with a frictional rubber, s^1, and connected with the lower part of the arm K by the link *f*, and receiving, along with the roller N, a vibratory motion, which motion, however, is not as great as that of the roller, as the connection of the latter with the shaft J is nearer its center of motion.

The travel of this mechanism, viz., the arms M M, rubbing-finger L, and their connecting-links, can be readily adjusted to any width between the frame of the machine by the arms K, which are adjustable to the shaft J.

From the foregoing it will be readily seen that any motion given to the lever I will be imparted to the roller N and rubbing-finger L.

Situated behind the rollers N is a shaft, S, having bearings in a bar, c^2, (see Fig. 5, Sheet 3,) and provided with a clamp, s^2, and pivoted gage s, which gage readily follows the table as it descends. On the outside area of the cam E, Fig. 1, is formed a grooved cam, in which runs a stud, b, attached to the lever F, and this lever, through the connecting-rod c and lever d and connecting-rod G, imparts an intermittent reciprocating motion to the rod H, running in curved slots c^1. On this rod H work two pairs of jaws or nippers, P P′ P P′, the under one, P′, being made stationary to the shaft, and the upper one, P, which is provided with a toe or beak, m, at its rear, and at its other end with a small projection or pin, o, turns freely thereon, but is kept in contact with its mate, P′, by springs on the shaft H. From the shaft H, (see Figs. 1, 2, and 3,) on the outside of the jaws, rises perpendicularly an arm or support, d', and to the upper end of this is pivoted the latch l, which is shaped as a bell-crank, the upper part being simply a weight to keep the latch down, and the lower portion the latch proper. This latch is kept in position by a pin on its side resting against the arm w, so as to catch and detain the upper jaw P when the projection o of the latter is thrown into the latch by the toe m striking against the bar n. The interior surfaces of these jaws may be suitably roughened to produce requisite friction, by rubber or other means. Immediately in front of the table B (see Fig. 4, Sheet 2) is situated a bar, B^1, upon which is affixed, longitudinally, a rod, d'', having a collar, f', running upon it, and attached to this is a socket, e', in which rises and falls freely, by its own weight or by means of a spring, the clamp b^1. By referring to Sheet 3 and the figures thereon, the manner of operating and adjusting the table will be perceived. The table B, as before mentioned, is pivoted at T, and is supported at its forward end by a lever, A^2, provided with a counter-balance, x. By moderate pressure on the table this weight will allow it to fall, and when the pressure is withdrawn the table will be returned to its proper position by the lever. Pivoted to a standard, r', which is attached to the frame of the machine, is a bar or plate, r, having a standard at its lower end, to one side of which is pivoted a latch or pawl, R, and to the other a bent bar, j, supported by a spring, y. Situated about midway between the ends of the plate r, and immediately under the bar j, is a slot, t, through which, if the bar j be pressed down, it will pass. Pivoted by the side of this slot t is another bar, $k\,k'$, bent as shown. The lower portion of this bar k is horizontal with, and slides on, the plate r, and is arranged to be forced over and cover the slot t, in which position the bar j would, by being pressed downwardly by the cam i on the shaft O, be prevented from passing through the slot by the bar k, and the cam, continuing to press on the bar j, would force the plate r and latch R downward. To the side of the table B, toward its lower end, is attached permanently a serrated bar, Q, situated immediately in front of the latch R, which, moving in the arc of a circle, as the plate r is depressed, will enter one of the serrations of the bar and press the table B downward, and to return it to its former position the shaft J, moving in the slot t', as before described, strikes against the downward projection x^2 of the bar k', and withdraws its lower portion, k, from under the bar j, when the latter, passing through the slot in the plate r, permits the latch Q and table to rise, and as the cam releases the bar j the latter is drawn up by its spring y into the cavity in the cam, and the bar k is immediately forced thereunder by its spring p, whence the slot t is again covered preparatory to another descent of the table. By this arrangement of the latch R and serrated bar Q, the table may be depressed for supplying paper thereto, and by touching the projection x^2 of the bar k' the table may be made to rise. By depressing the table, the space between the clamp b^1 and the clamp s^2 would be unequal, if the latter were not so arranged as to obviate this difficulty, and the difference would be in proportion to the distance of the clamp s^2 from the pivot T. The shaft or rod carrying the clamp s^2 has its bearings in the bar c^2, which passes through a socket in the frame of the machine, and is connected by a link to the lever B^2. This lever B^2 is connected to the table by means of the link b^2 and hanger or bearing u, and thus, as the table is depressed, the lever B^2 elevates the clamp s^2 the difference of the space between it and the clamp b^1, provided the former were stationary.

Operation.

The parts of my apparatus being thus constructed and arranged, they will operate to feed sheets of paper as follows: The table having been depressed, as described, the paper is passed in between the gages s, under the clamp s^2, and down to and under the clamps $b^1 b^1$, these latter also operating as stops for the paper. The jaws being open, as shown in Fig. 1, and the shaft C rotated, the depressions, as before described, will come in contact with the stud e and vibrate the lever I, which will, through the shaft or rod J and arm K, transmit its motion to the rubbing-finger L and roller N. A series of short, quick, vibratory motions will be first given to the rubbing-finger, which will tend to loosen the upper sheet from the pile and withdraw it from the clamps b^1, and the slower and greater motions following will carry the paper up and form it in an arc, as shown by the heavy line in Fig. 2, Sheet 2. During these motions of the finger the roller N has the same imparted to it, but on a larger scale, and thus the paper is alternately puckered up and smoothed out, thus lessening the probability of two or more sheets adhering to each other, while it prevents any of the paper from forming an

are behind it. By further rotation of the shaft C the groove on the cam E will operate the levers F, *c*, *d*, and G, and thus advance the jaws or nippers P P′ toward the table; the bottom one of which, when it arrives there, lies on the pile of paper, as shown in Figs. 2 and 3, Sheet 2. The finger L and roller N now advance, and the latter brings the paper positively and squarely between the jaws, which, still advancing a slight distance, strike the upper portion of the latch *l* against the shaft O, and release the upper jaw P, the spring of which brings it in contact with the lower one. The table is now depressed by the cam *i* pressing on the plate *r*, and thus engaging the latch R with the bar Q, releasing the pile of paper from the clamp s^2, allowing the upper sheet to be withdrawn by the nippers. The pressure of the roller N and finger L is obviated when the table is depressed by their suspension from the shafts O and J by the slot of the rubbing-finger and the projection on the arms M. The other portion of the cam E, forcing the stud *b* up through the medium of the before-mentioned levers, returns the jaws to the lower end of the slot c^1, where they are opened by the toe *m* of the upper jaw coming in contact with the bar *n*, which throws the pin *o* of the jaw up into the latch *l* for a repetition of its operation. As soon as the sheet is clear of the table the shaft J withdraws the bar *k* from under *j*, and the table is returned to its former position, thus clamping the paper preparatory to its being again operated on by the rubbing-finger and roller.

It will be readily understood that the sheet, after leaving the jaws, is taken by the gripers of the cylinder D, as usual, and transferred from thence to the fly.

Claims.

1. The combination, with the table B, of the vibration rubbing-fingers L L and vibrating rollers N N, for separating sheets of paper upon the pile for delivery to a printing or other machine, constructed and operating substantially as described and specified.

2. The combination, with the separating mechanism described, of clamps b^1 b^1 and s^2 s^2, for holding the paper during the process of separating the sheets, substantially in the manner described and specified.

3. The combination, with the clamping and separating mechanism, as described, of a vibrating adjustable table to automatically present the sheets to the separating mechanism, constructed and operating substantially in the manner described.

4. The combination, with the separating and clamping mechanism, of the jaws P P′ P P′ to seize and deliver the sheets to the gripers *a a*, substantially in the manner described.

5. The vibrating separating-fingers L L and vibrating rollers N N, operated by the undulating cam E, constructed and operated substantially in the manner described.

6. The combination, with the vibrating table, of the clamp-rod S so constructed and arranged that the clamps s^2 shall always bear their proper relative position to the pile of paper.

7. The combination of the following elements, viz: a separating mechanism to separate the sheets of paper, a clamping mechanism to hold the paper during the separation of the sheets, and adjustable table for presenting the paper to the separating mechanism, and a delivering mechanism for delivering the sheets to a printing-press, all co-operating together substantially in the manner described and set forth.

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Witnesses:
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