

F. J. Austin.
Printing Press.

Sheet 1, of 2 Sheets.

No 7,335.

Patented May 7, 1850.

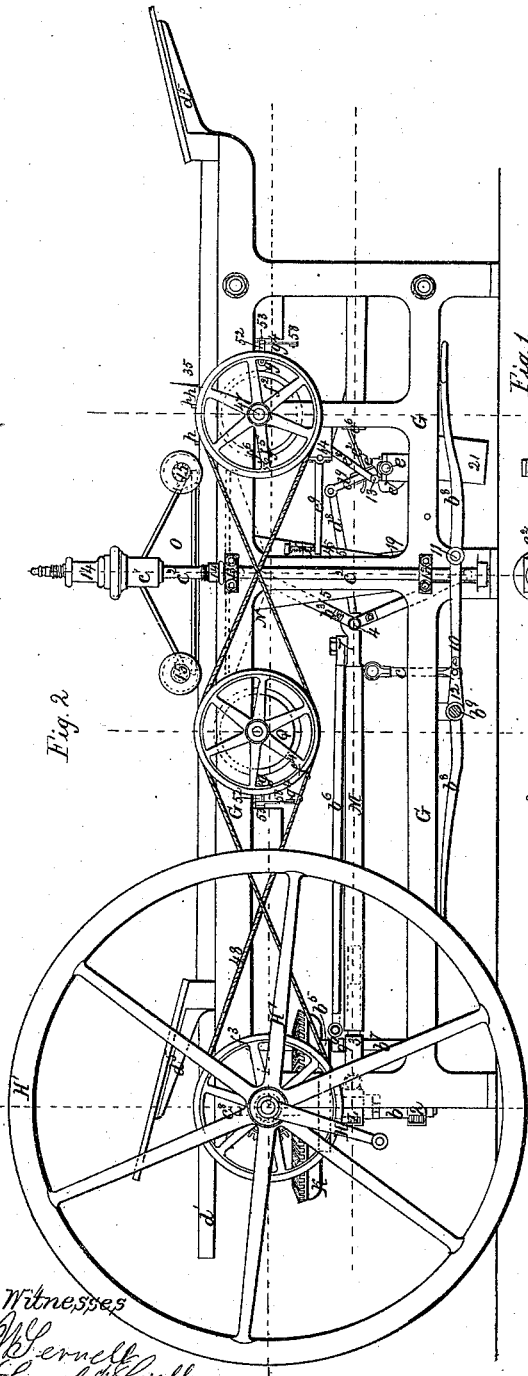


Fig. 2

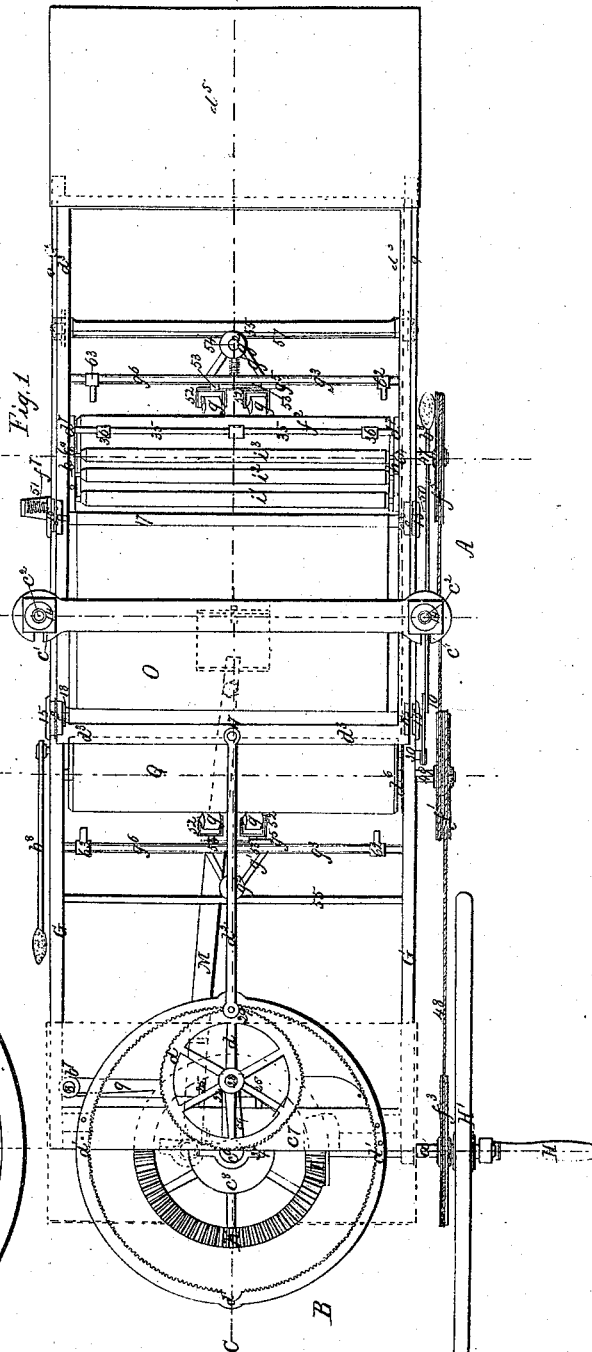


Fig. 1

Witnesses
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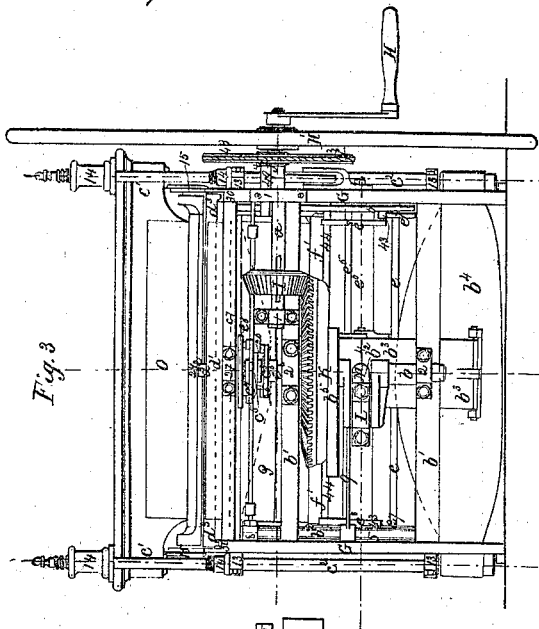


Fig. 3

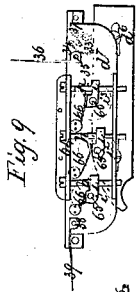


Fig. 9



Fig. 10

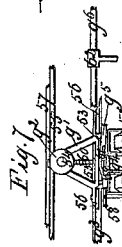


Fig. 1

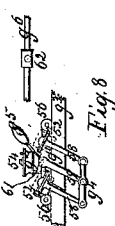


Fig. 8

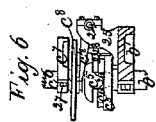


Fig. 6

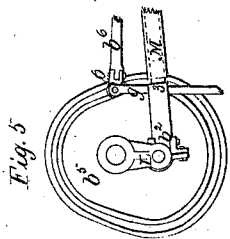


Fig. 5

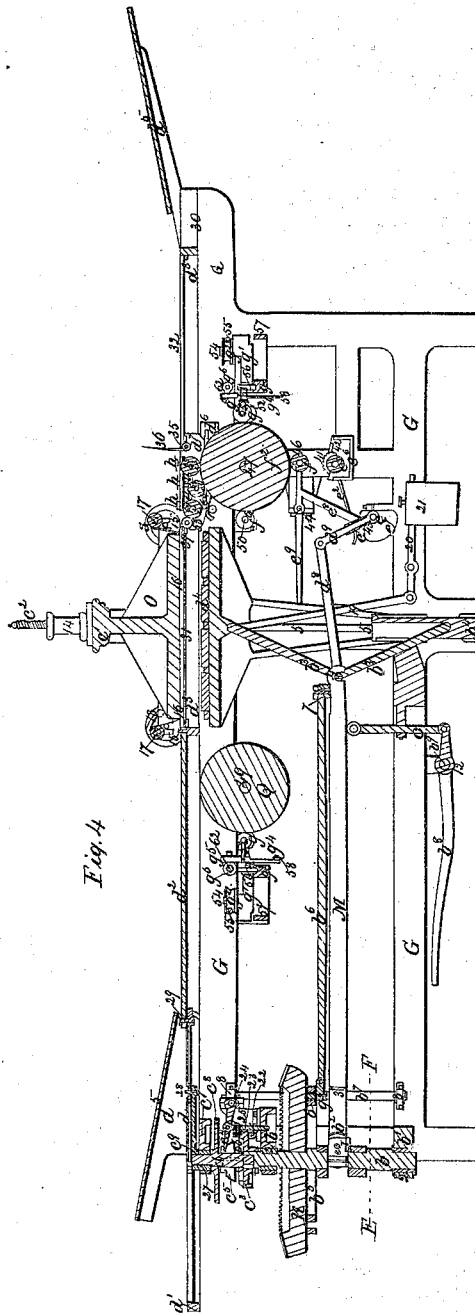


Fig. 4

Witnesses
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Inventor
F. J. Austin

UNITED STATES PATENT OFFICE.

FREDERIC J. AUSTIN, OF NEW YORK, N. Y.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. 7,335, dated May 7, 1850.

To all whom it may concern:

Be it known that I, FREDERIC J. AUSTIN, machinist, of the city and State of New York, have invented and made and applied to use certain new and useful improvements in the application, arrangement, and constructive combination of well-known mechanical means with parts invented, improved, or newly applied by me to produce a double-acting printing-press, which can by a limitation of the parts be applied to single presses in a mode for which it is my intention to seek a separate patent hereafter, and such present improvements being generally based upon a caveat entered by me the 27th of July, 1844, and for which improvements I now seek Letters Patent of the United States; and I do hereby declare that the said improvements as now completed by me and the uses and effects thereof are collectively, constructively, and substantially set forth and shown in the following description and in the drawings annexed to and making part of this specification, wherein—

Figure 1, Sheet 1, is a general plan of the parts in place for use. Fig. 2 is a side elevation on the side A of Fig. 1. Fig. 3 is an end elevation at the end B of Fig. 1. In the Sheet 2, Fig. 4 is a sectional elevation through the line C D, Fig. 1, Sheet 1. Fig. 5 is a plan of the cams and cranks, as at the line E F of Fig. 4, seen in reverse or as from beneath the parts. Fig. 6 is a detached elevation of the clutch-box and cams, which when unconnected leave the paper-frames stationary, and when connected move the paper-frames by an alternating motion. Fig. 7 is a plan, and Fig. 8 an elevation, of the ink-distributing apparatus. Fig. 9 is a side elevation of the apparatus for inking the type, and Fig. 10 is a side elevation of the ink-lifting apparatus.

Many of these parts thus represented are not new; but their motions and operations are so connected with and controlled by parts that are either new in themselves or newly applied and combined for the intended purposes, or new and old parts applied and combined together in a way that renders it needful to describe the whole machine; and the same letters, numbers, or other marks of reference used herein apply to the like and corresponding parts in all the figures or sepa-

rately in those which for convenience are hereinafter directly referred to.

G G are the main frames of the machine throughout, sustaining and connecting the motive parts.

H is the drum or may be a crank to connect with any proper motive power, and H' is a fly-wheel. These are fitted on a shaft *a*, that revolves in bearings 1 1 (see Fig. 3) and carries a bevel-pinion I, working into a bevel gear-wheel K, that is mounted on a vertical shaft *b*, set in journals 2 2 on a cross-bearing *b'*. This shaft *b* is in two parts, that carry between them a crank L, that has a pin-journal box and joint *b*², that connects the crank L to the end of a toggle-joint pitman or pressing-bar M, made in two parts, that are made one as a hollow cylinder, that receives a sliding rod, shouldered as at 3, so as to form a stop. The bar thus made is hooked at the forward end to take the pin of the toggle-joint *b*³ at 4. The toggle-joint *b*³ is jointed below to the fixed cross-head *b*⁴ between the frames and at the top to the type-bed N, which moves on slides 5 5 in the usual manner.

Beneath the wheel K is a grooved cam *b*⁵, with a part of the groove as an arc of a circle, the remainder eccentric, as shown in Fig. 5, to take a pin 6 on the end of a backing-bar or rod *b*⁶, the other end of which is secured at 7 by a pin-journal to the head of the pressing-bar M, so that during a part of the motion the bar *b*⁶ travels with the movement of the bar M. On this sliding in the socket the backing-bar *b*⁶ ceases to act as soon as the pin 6 comes into the arc of the circular groove in the cam *b*⁵. A vertical shaft *b*⁷ set in journals *b* on the frame G has an arm 9 that receives and supports the traversing end of the backing-bar *b*⁶ and prevents the pin 6 dropping out of the groove in the cam *b*⁵. By this arrangement of these parts the shaft *b*⁷ and its arm 9 supports the bar *b*⁶ on the return motion, and the cam and pin lower the type-bed by drawing back the center of the toggle-joint *b*³ through the bar *b*⁶ only so much as is needed, while the crank L withdraws part of the rod from the cylinder in the bar M, and leaves the type-bed N stationary during part of the revolution of the crank L, and in the opposite part of each revolution; the shoulder 3, taking the end of the cylinder,

forces the bar M forward, and straightening the toggle-joints lifts the type-bed at the time required to make the impression; and to stop the motion of the type-bed N while in work, or what is technically termed "throw off the impression," the lever b^8 is made in two parts, connected by a slotted joint and pin 10, and set on a fulcrum 11, and jointed at 12 to the end of a cross-rod b^9 , that carries an arm connected to a vertical bar c with a roller on its top lying under the pitman M, so that by depressing either end of the lever b^8 the pitman-hook at 4 is lifted from the toggle-joint, and the vertical movements of the type-bed are suspended until the hook at 4 is again lowered into place. This mode of disconnecting is the same as is in common use.

The platen O, with ears c' , impression-rods c^2 , journals and boxes 13, adjusting-screws 14, and rollers 15 15 are all made as usual, except that the journal-boxes to the rollers 15 are set in half-pieces above the journals of the rollers, with the adjusting-screws s , (see Fig. 4,) in the bearings to act from above and set the rollers at an equal bearing all round.

The fixed tympan 16 is fitted with rollers 17 17, and these are tightened by a small ratchet and pawl 18, (see Fig. 4,) and the type-bed N is fitted with vertical rods 19, jointed below to a lever 20, the other end of which carries a weight 21 (see Fig. 4) to balance the type-bed, all made as usual.

The vertical shaft b carries on its top a cam c^3 , made with a half-round flange on both the upper and lower faces, (see Fig. 6,) to retain two rollers 22, one above and one below the cam, each on a pin on a vertical slide-rod 23, stepped in the cross-tie b' and going upward to a joint on a horizontal forked arm c^4 above, jointed on a shaft 24 in bearing-brackets 25, set on the cross-piece b' . The forks of the arm c^4 , take by pins a groove in the upper-half clutch-box c^5 . This has two clutches 26, taking to clutches in the body of the cam c^3 , (see the dotted lines in Fig. 6,) and the half-clutch c^5 slides vertically on a key on a shaft c^6 in a socket in the top of the shaft b , and held at the top by a journal 27 on the cross-piece c^7 . On this shaft is a disk c^8 , having two holes at the half-motions to take the pins * * on the ends of the fork c^4 , so that at each half-motion of the shaft b , the cam c^3 , by the rollers 22, lifts the vertical rod 23 and forks c^4 on the shaft 24. These lift the upper half-clutch c^5 , and disengage the clutches 26, and at the same time lock the pins * * into the holes in the disk c^8 , stopping the motion of the shaft c^6 , while on the opposite half-motion the reverse operation takes place, and the intermittent and semi-rotary motion thus given to the shaft c^6 is communicated to a crank-arm c^9 with a pin-journal 28, that carries a common or male cog-wheel d . This revolves with the crank c^9 within a fixed rim d' , formed as a female gear-wheel with teeth on the inside edge to interlock with those of the wheel d , which has a boss 29. The projection of the boss 29 interlocks at each half-

motion into a corresponding indentation on the inside and opposite parts of the fixed rim or female wheel d' . (See Fig. 1.) The boss 29 also serves as the center to a pin connected to and communicating the intermittent motion to the connecting-rod 3^2 , which takes the end of the double paper-carriage d^3 . This is commonly called the "roller-carriage," and runs on slides 30 30 on each top piece of the main frames G G, carrying 31 32, the friskets, to lay the paper on over the type d^4 on the bed N. The paper-boards d^5 to receive the supply of paper are fitted and fixed as usual. By the constructive arrangement of these parts and the manner in which the motions are given the movement of the rod d^2 is always in one direct line, so that no side sway or lateral strain is given to the paper-frame, as would be given by a common horizontal crank-motion, nor is there any vertical drag downward or lift upward, as there would be by a crank on a horizontal shaft. Near the opposite sides of the type-bed and on the opposite sides of the frames G are a pair of fixed cams d^6 , whose form is best seen by dotted lines in Fig. 9, where the cam and the parts it operates on are shown twice the size of the other figures. In this d^7 is a small flanged plate on the paper-frame d^8 , and the curve on the upper edge of the cam d^6 is formed to raise 33, a small segment-wheel, the position of which is shown by dotted lines, as behind the plate d^7 , and the teeth of which gear into a small pinion-wheel 34, also shown by dotted lines, as on a shaft 35, lying across the paper-frame d^8 , and carrying the paper-fingers 36.

Behind and above the segment forming the wheel 33 is fixed an expansive scroll-spring 37, and in the opposite end of the plate d^7 is a second cross-shaft 38, with fingers 39, on the shaft, and a segment-wheel, pinion, and spring, not shown in the drawings, but set in reverse, or at the opposite end of the shaft 38, so that at each alternate motion of the paper-frame d^8 the fingers 36 and 39 are successively but oppositely lifted up as they pass from under the platen by the slope of the fixed cams d^6 , alternately throwing up the segment-wheels 33 and pinions 34 and fingers 36 and 39, and these being in the same alternating manner returned or thrown down by the expansion of the scroll-spring 37 to hold the paper. As they enter under the platen the like motions are successively acting in each part of the machine and on each of two sheets of paper.

In Figs. 2 and 4 the means are best seen to work the inking apparatus. In these d^8 is a connecting-rod from the toggle-joint pin 4 to a crank-arm d^9 on a shaft e , set in journals on the main frames G, and having on one end, outside the journal, the slotted crank-arm e' . (See Fig. 10.) A joint and pin in the slot takes the end of a small rod e^2 , having a fulcrum in a pair of slings e^3 on a shaft e^4 and a pawl 40, taking the teeth of a small

ratchet-wheel 41 on the end of the ink-lifting or fountain-roller e^5 , set in the trough e^6 , with a scraper 42 to take off the surplus ink, all as usual.

e^7 are two cams near each end of the shaft e^6 . Inside the journals are arms e^8 , having rollers 43 on their lower ends, in contact with the cams e^7 . These arms form an acute-angled crank with the levers e^9 , which are supported by a cross-shaft 44. The longest ends of the levers e^9 have each an eye receiving a vertical shaft 45, depending from the lower side of a lug on the type-bed N, and having above the eyes of the levers e^9 an expansive helical spring f . The opposite ends of the levers form forked journals 46, with a pin above and securing the journal of the ink-lifting roller f' . A large ink-distributing cylinder f^2 , set on a shaft 47, is driven by a belt 48 from a pulley f^3 on the shaft a , acting round a pulley f^4 on a shaft 49, and thence a second band to a pulley f^5 on the shaft 47, that carries the ink-distributing cylinder f^2 . A roller f^6 , called the "vibratory roller," mounted on a shaft 50, is set on sliding journals in bearings on G, and driven by contact with the cylinder f^2 , and has (see Fig. 1) on one end of the shaft an endless screw f^7 , taking a button 51, which is set on a pivot in a bracket on the frame below, to cause the alternating motion of the vibratory roller, as usual.

Figs. 7 and 8 show detached, in plan and elevation, the rollers usually known as the "kneading-rollers." In these figures $g g$ are two rollers set on forked journals 52. These project from shafts 53 53, set near the angles of a triangular frame g' , which at its apex has a journal and stud 54, carrying the grooved roller g^2 , which travels against the round cross-bar 55. The other angles of the triangle have on them two rollers 56 56, running in a groove in the cross-bar g^3 , set on the frames G G. A small flat bar 57 takes a rabbet on the under side of the apex of and to support the frame g' . Two crank-arms 58 on the shafts 53 are jointed at their points to a connecting-bar g^4 . Between these is a third crank-arm 59, jointed on the end of a round shaft 60, going through the base of the triangular frame g' , and having an expansive helical spring acting within the frame, and on this shaft is a collar 61, with a stud that takes the edges of a half-clutch on the crank 59, and the collar carries a short shaft, with a heart-shaped cam g^5 on the outer end. As the machine progresses, the kneading-rollers $g g$, being canted, as seen in Figs. 1 and 4, progress to the side A, Fig. 1, until the heart-shaped cam g^5 , taking the adjustable pin 62 on a collar on the round shaft g^6 , is canted over on the opposite side, and carries by its weight the cranks 58 58 59 and rollers $g g$ into the opposite angular position, so that they travel in the opposite direction to the other side of the machine, where a corresponding pin 63 again changes the angles and the direction of the rollers $g g$.

Q is an ink-distributing cylinder on the shaft 49, with the duplicates of the kneading-rollers and their parts, the same as last described.

The flange-plates d' have two flanges 64, carrying three vertical rods h , that slide in the flanges, having a head above the upper flange, and a worm in the middle, going through to sustain and adjust three elongated nuts i , one end of each of which forms a journal-box 65, and these, collectively, carry the inking-rollers $i' i^2 i^3$. Under the top flange three expansive scroll-springs 66 are so placed that the exterior end presses on the journal-boxes 65 65 65, and thus regulates the pressure on the type d^4 beneath as the inking-rollers pass over it, the vertical position being, in the first instance, regulated by the worms on the bodies of the shafts h . In this arrangement, by regulating the distance between the ink-distributing cylinders f^2 and Q, the ink-rollers $i^2 i^3$ will on one motion be turned, and the ink worked by the cylinder f^2 , and at the other motion of the paper-frames d^3 the two rollers $i' i^2$ are turned and the ink worked by the cylinder Q, and these ink the type on the back motion without any fresh supply of ink from the ink-trough until the return of the rollers to the first position.

Having hereinbefore distinguished the parts that are not new by describing them as made in the usual manner, I do not claim to have invented such parts so described; neither do I claim, in any manner, to have originally invented a printing-press; neither do I claim any exclusive invention of or property in any of the separate parts described herein, except as applied, arranged, and constructively combined for the purposes hereinbefore and hereinafter set forth, as follows:

I claim—

1. The mode of governing the vertical motion of the type-bed N by the conjoint application of the crank L and two-part pressing-bar M, made as a hollow cylinder and slide, with a stop-shoulder to give the upward motion and pressure, and arranged to lengthen by sliding out at the back motion of the crank L, and the combination therewith of the grooved cam b^5 and backing-bar b^6 , to regulate the descending motion of the type-bed, substantially as described and shown.

2. The application of the rotating cams c^3 to act through the fork c^4 and connect or disconnect the clutches 26 to give the shaft c^6 a rotary motion during half the rotation of the shaft b and suspend the motion of the shaft c^6 by the disk c^5 and pins * on the fork c^4 during the other half-rotation, so that the shaft b goes two continuous revolutions to one intermitted revolution of the shaft c^6 , such intermitted revolution being applied to give an intermitted alternate motion to the double paper-carriage in a printing-press or to give any similar intermitted alternate motion by any competent means, substantially as described and shown.

3. The application of the crank c^9 , male wheel d , fixed female wheel d' , and connecting-bar d^2 , for the purpose of communicating the intermitted alternate motion to the double paper-carriage d^3 , substantially as described and shown.

In witness whereof I have hereunto set my

hand, in the city of New York, this 22d day of April, 1847.

F. J. AUSTIN.

Witnesses:

W. SERRELL,
LEMUEL W. SERRELL.