3 Sheets--Sheet 1.

W. F. WYMAN.

Printing-Press.

No. 167,379.

Patented Aug. 31, 1875.

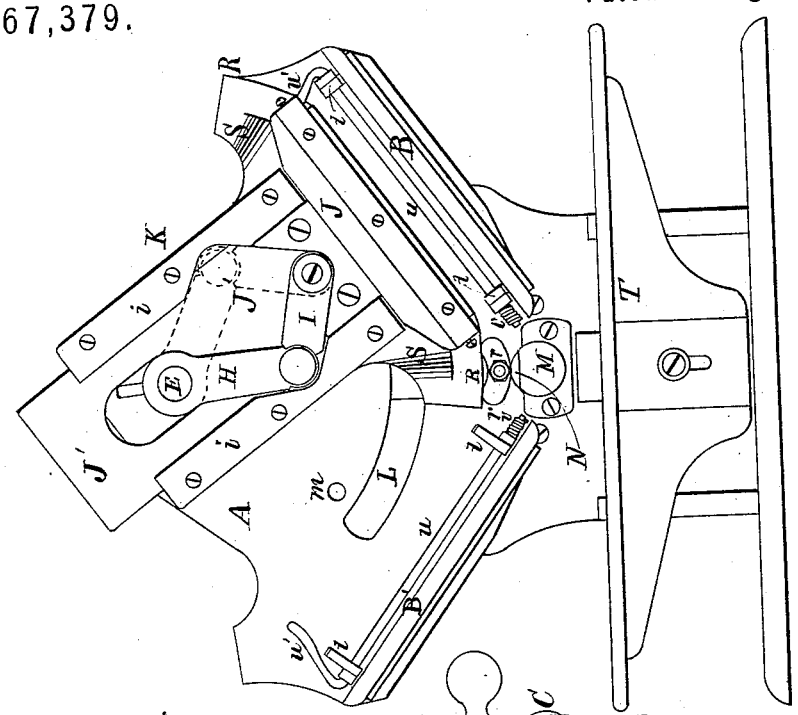

Fig. 1.

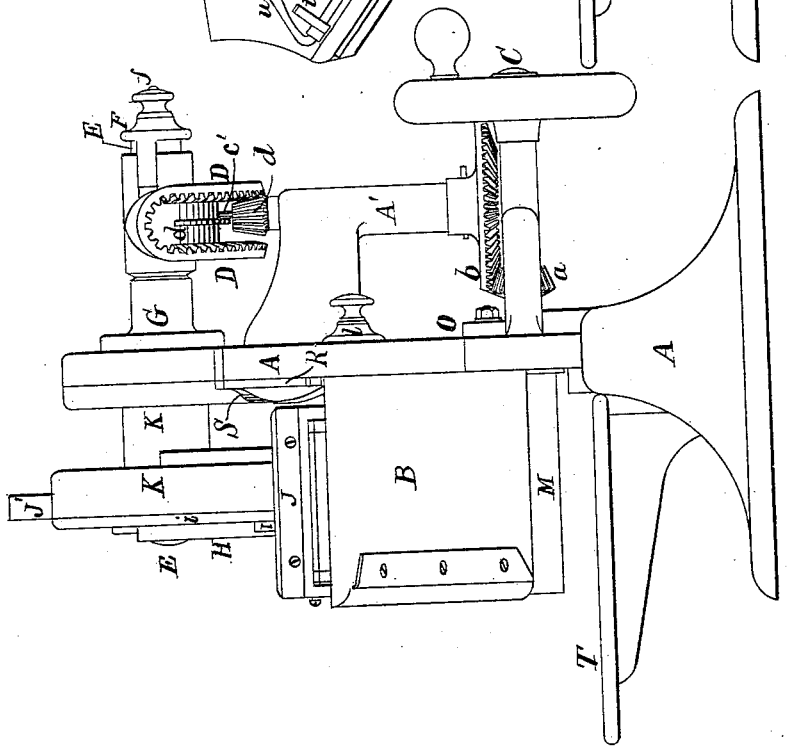

Fig. 2.

Witnesses.

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3 Sheets--Sheet 2.

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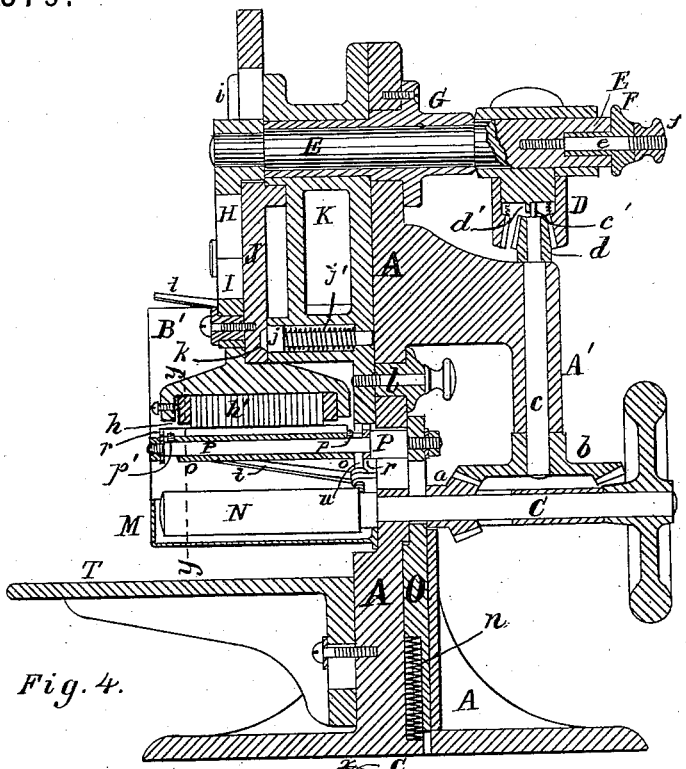

Fig. 4.

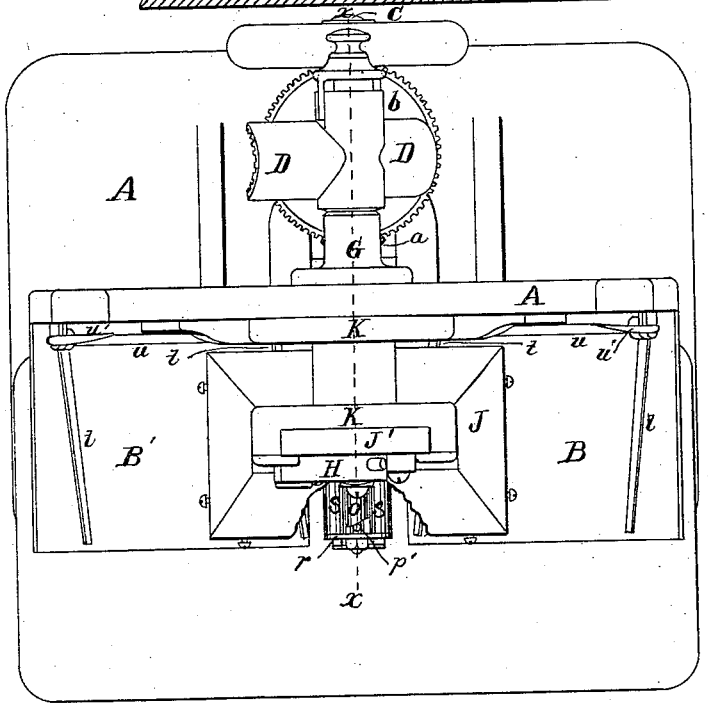

Fig. 3.

Witnesses.

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3 Sheets--Sheet 3.

W. F. WYMAN.

Printing-Press.

No. 167,379. Patented Aug. 31, 1875.

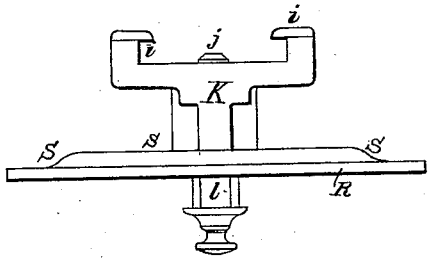

Fig. 7.

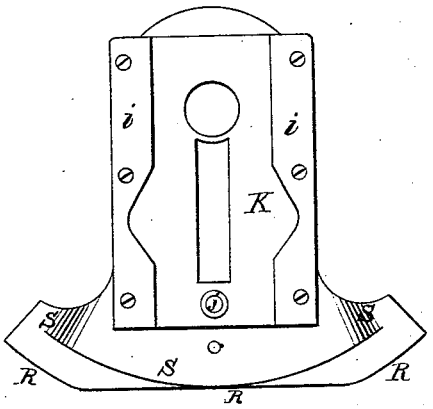

Fig. 6.

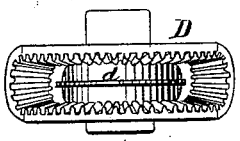

Fig. 9.

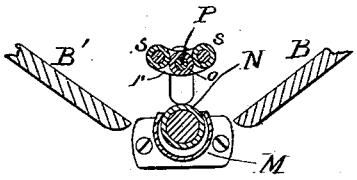

Fig. 5.

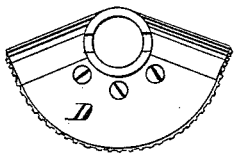

Fig. 8.

Witnesses.

N. C. Lambard

E. A. Hemmenway.

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W. Forestus Wyman

UNITED STATES PATENT OFFICE.

W. FORESTUS WYMAN, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **167,379**, dated August 31, 1875; application filed July 6, 1875.

To all whom it may concern:

Be it known that I, W. FORESTUS WYMAN, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Printing-Presses, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to that class of printing-presses usually termed job-presses; and it consists, first, in the use of two fixed or stationary platens arranged with their upper or face surfaces at an angle to each other of from ninety to one hundred and twenty degrees, and each from forty-five to sixty degrees from a perpendicular drawn between them, in combination with a single type-bed, arranged to vibrate about an axis located at the point where two lines, drawn perpendicularly to the face of said platens from a point equidistant from their upper and lower ends, would cross, and also arranged to be moved in a right line toward and from one of said platens at each extremity of its vibratory motion, for the purpose of giving an impression upon each of said platens alternately in succession.

My invention further consists in the use of a type-bed, fitted to reciprocate in a direction at right angles to its face, in a slide or slides formed in or upon a pendent frame arranged and adapted to be vibrated from a position perpendicular to one of said platens to a position perpendicular to the other platen, said frame being mounted upon a fixed or stationary sleeve or hollow hub, secured to or mounted upon the main frame, through which passes a vibratory or rocking shaft, in combination with a toggle-joint, one end of which is rigidly connected to said vibratory shaft, and the other end is pivoted to the type-bed.

My invention further consists in providing said pendent frame with a self-acting locking-bolt, arranged to alternately lock said pendent frame to the main frame, while it unlocks the type-bed from said pendent frame, and lock the type-bed to the pendent frame, while at the same time it unlocks said pendent frame from the main frame, as will be described.

My invention further consists in the combination of a type-bed, arranged to vibrate partially about an axis, and to reciprocate at two different points in lines radial to said axis, and a bevel-pinion working in a modification of the well-known mangle-gear, so called, applied to a bevel-gear as a means of producing the necessary intermittent vibratory motion from a continuous motion of the driving-shaft.

My invention further consists in the use, in combination with one or more fixed or immovable platens, and a type-bed arranged to vibrate about an axis located on a line drawn perpendicular to the face of said platen, and intersecting the center of its length, and also to move in a right line toward and from said platen or platens in a direction perpendicular to the face-surface of said platen, for the purpose of giving an impression, of an ink-fountain, provided with a suitable ink-cylinder, arranged to be revolved therein, and located just below the lever end of the inclined platen or platens, and an ink-distributing roll, and a pair of inking-rollers, one upon either side of the distributing-roll, and arranged to vibrate about said distributing roll, to adapt themselves to the surface of the type-form as its angle changes, while the same is being moved over the ink-rollers, the ink-rollers and the distributing-roll being mounted in a frame resting upon a spring or springs, so that the ink-rollers may yield in a vertical direction to accommodate themselves to the varying distance of the type-form from the center, about which the type-bed vibrates.

My invention further consists in the use, in combination with a pair of inking-rollers and an ink-distributing roll, mounted upon a yielding frame, all so arranged that said rolls may all move sufficiently in a vertical direction to accommodate themselves to the form of type as it passes over them, of a cam-surface formed upon or secured to the vibratory frame, which carries the type-bed upon one or both sides of the type-form, and arranged to bear upon the shafts of the inking rollers or collars formed or mounted thereon, said cam-surface being so formed that it will force said rollers downward until the distributing-roll comes in contact with the ink-cylinder, and hold them in that position, while the impression is being given at either extreme of the vibratory

motion of the bed, and allow them to rise again, so as to bear against the face of the type with the proper pressure while the form is passing over the inking-rollers.

Figure 1 of the drawings is a front elevation of my improved press, with the parts in the proper position to commence giving an impression upon the right-hand platen. Fig. 2 is a side elevation of the same. Fig. 3 is a plan of same, with a type-bed in the center of its vibratory motion, and directly over the inking-rollers, with a portion of the bed and type-form broken away to show the inking-rollers. Fig. 4 is a vertical section on line *x x* on Fig. 3. Fig. 5 is a vertical transverse section of the inking apparatus, and portions of the two platens, the cutting-plane being on line *y y* on Fig. 4. Figs. 6 and 7 are, respectively, a front elevation and an inverted plan of the vibratory frame detached from the other parts; and Figs. 8 and 9 are, respectively, a side elevation and inverted plan of the bevel mangle-gear for operating the rocker-shaft, and imparting to the type-bed an intermittent vibratory and reciprocating motion.

In the drawings, A is the frame of the machine, upon which are mounted all the operating parts. B and B′ are two platens, placed at an angle of, say, from forty-five to sixty degrees from a perpendicular line, one upon each side of said line, and inclined toward each other, as shown. These platens may be cast with the frame A, or they may be adjustably connected thereto; but in either case they maintain a fixed or stationary position during the operations of the press. C is the driving-shaft, operated by a belt and pulley, or a treadle and crank, (not shown in the drawings,) mounted in suitable bearings in the frame A, and carrying the bevel-pinion *a*, which meshes into and acts upon the bevel-gear *b*, secured to the lower end of the vertical shaft *c*, also mounted in bearing A′, formed upon, or secured to, the frame A, and carrying at its upper end the bevel-pinion *d*, which acts upon the bevel mangle-gear D. The gear D, consisting of two segmental bevel-gears placed with their teeth toward each other, the extremities of said segmental gears being connected together by a semicircular section of an internal bevel-gear of a diameter somewhat greater than the diameter of the pinion engaging therewith, all cast in one piece or made up of several pieces secured together by screws or bolts, as desired, is fitted loosely to the rocker-shaft E, so that it is free to slide endwise thereon, but coupled to said shaft, so as to compel said shaft to vibrate with it by means of the clutch F, secured in position by the bolt *e*, set in the end of the shaft E, and the nut *f*. The gear D is also provided with the guide-flange *d′*, which, acting in conjunction with the pin *c′*, formed upon, or inserted in, the end of the shaft *c*, controls the position of the gear D on the shaft E, and thereby the direction of the motion of the gear D itself, and through it the motion of the shaft E and type-bed operated thereby. The shaft E has its bearing in the pipe-box G, cast upon, or secured to, the frame A, and has mounted upon its front end and firmly secured thereto the crank-arm H, the movable end of which is pivoted to one end of the toggle-link I, the opposite end of which is pivoted to the type-bed J at *g*. The bed J is provided with the usual facilities for securing the chase *h*, containing the type *h′*, thereto, and has cast thereon, or otherwise secured thereto, the arm or plate J′, projecting upward therefrom at right angles to the face of the bed, and fitted to the slides *i i*, formed in or upon the front face of the vibratory frame K, so as to be capable of being moved up and down therein for the purpose of giving an impression. The frame K has its bearing upon the sleeve or hub G, about which it may be vibrated for the purpose of moving the type-bed from a position over one platen to a position over the other platen, and is provided with the locking-bolt *j*, surrounded by the spring *j′*, arranged to lock the vibratory frame to the stationary frame or the type-bed.

One end of the pin *j* is enlarged to form a shoulder, against which the spring *j′* acts to force said pin toward the plate J′ of the bed J, in the rear side of which is formed a conical recess, *k*, into which the end of the pin *j*, which is also made conical, is forced by the action of the spring *j′*, when the type-bed is raised to the upward extreme of its reciprocating motion.

When the vibratory frame K, carrying the platen with it, has reached either extreme of its vibratory motion, the stop *l* strikes the end of the slot L, when, the resistance to the vibratory motion being more than the resistance presented by the spring *j′* on the pin *j*, the toggle-link begins to straighten, causing the type-bed to move toward the platen, forcing the pin *j* back against the tension of the spring *j′*, the conical shape of the end of the pin *j* and the recess *k* enabling this to be done. The instant that the pin *j* commences to be moved back its rear end enters one of two holes, *m*, formed in the frame A in the proper position, where it is held by the plate J′, and effectually preventing any vibration of the frame K and bed J while the impression is being made, and until the bed has again been raised to the extreme of its upward motion, when the recess *k* is again brought in front of the pin *j*, and the pin *j* will again be forced into said recess by the action of the spring *j′*, and at the same time withdrawn from the hole *m*, unlocking the frame K, so that it is free to be vibrated into position over the other platen, when it is again locked to the frame A, as before.

In Fig. 1 the parts are shown in position to commence taking the impression, or, rather,

to move the bed toward the platen for that purpose, the bed having just been moved from the left to the right, with the toggle in the position shown. The stop *l* has come in contact with the right-hand end of the slot L, and, of course, there can be no more movement of the frame K to the right; but as the vibration of the shaft E, gear D, and crank-arm H in that direction is not completed, the motion of the arm H toward the right will cause the toggle to straighten and the bed J to be moved toward the platen B, forcing back the pin *j* and locking the frame K to the frame A. The motion of the arm H toward the right continues until it assumes the position shown in dotted lines in Fig. 1, when the impression will have been completed and the bed raised again to the extreme of its upward motion, where it is again locked to the frame K by the pin *j*. At this point the change of motion in the gear D takes place, and the movement of the arm H is from the right toward the left; and as there is less resistance to the vibration of the frame K than there is to the downward motion of the bed the frame K and bed J are moved to the other extreme of the vibratory motion and a position over the platen B′.

M is an ink-reservoir, bolted to the frame A in a position between the lower ends of the platens B and B′, and perpendicularly under the shaft E.

N is an ink-cylinder formed on or secured to the front end of the driving-shaft C, and arranged to revolve within the reservoir M, with its upper surface projecting a short distance above the top of said reservoir.

O is a plate fitted to slide vertically in a suitable bearing in the frame A, and resting upon a spring, *n*, which tends to move said plate upward.

P is a spindle set firmly in the upper end of the plate O at right angles thereto, and parallel to the cylinder N, and carrying thereon the ink-distributing roll *o*, adapted to revolve thereon between the two pins *p p′*.

The two ends of the tubular roll *o* are cut obliquely and parallel to each other, so as to form thereon edge cams, which, as said roll revolves, will cause it to be moved endwise alternately in either direction. The spindle P also has mounted thereon two curved arms or yokes, *r r*, one at either end of the distributing-roll *o*, in the outer ends of which are journaled the two inking-rollers *s s*, with their peripheries in contact with the distributing-roll *o*. R is a cam-surface formed upon or secured to the frame K, and arranged to act upon the upper end surfaces of the inner yoke *r*, to hold the inking-rolls *s s* in their proper position and relation to the type-form while the form is passing over them, and to force the distributing-roll *o* into contact with the ink-cylinder N, and retain it there while the impression is being taken.

Each of the platens is provided with the usual devices for securing thereon suitable tympan-sheets, and a pair of nippers or fingers, *t t*, adjustably mounted upon a rocker-shaft, *u*, provided with an arm, *u′*, and a torsional spring, *v*, so applied as to hold the fingers *t t* in an elevated position away from the platen.

S is a cam-surface formed upon or secured to the frame K, and arranged to act upon the arms *u′* of the rocker-shaft *u*, to cause the fingers *t t* to descend upon the sheet to be printed, and hold it in place while the impression is being taken and the form is receding. T is a feed-table.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The two fixed platens B and B′, arranged as set forth, in combination with a single type-bed, arranged to vibrate about an axis equidistant from and directly over the center between said two platens, and to be moved in a right line toward and from each of said platens alternately in a direction radial to said axis and perpendicular to the faces of said platens, substantially as described.

2. The combination of one or more fixed inclined platens, B B′, the bed J, vibratory frame K, and mechanism, substantially as described, for imparting a vibratory and reciprocating motion to said bed, for the purposes specified.

3. The type-bed J, constructed, arranged, and operating as set forth, to be vibrated from one position to another about an axis, and to be moved in a right line radial to said axis at both extremes of its vibratory motion, by mechanism substantially as described, for the purpose of giving an impression at two different points, as specified.

4. The combination of the bed J, frame K, rocker-shaft E, crank-arm H, and toggle-link I, all arranged to operate as and for the purposes described.

5. In combination with the bed J and frame K, the locking pin or bolt *j*, arranged to alternately lock the frame K to the frame A and to the bed J, as and for the purposes described.

6. In combination with a type-bed, arranged to vibrate from one position to another about an axis, and to reciprocate in each of said positions in a line radial to said axis, the rocker-shaft E, arm H, link I, bevel-pinion *d*, and bevel mangle-gear D, all arranged to operate substantially as described.

7. In combination with two fixed platens, inclined toward each other, and a type-bed, arranged to vibrate away from said platens in a direction nearly parallel to the face thereof and about an axis, and to reciprocate in a right line toward or from said platens in a direction radial to said axis, one or more inking-rollers, placed near the lever end of said platens, and mounted upon springs, in position to ink the face of the type while the type-bed is being vibrated from one position to the other, substantially as described.

8. The combination of the ink-cylinder N,

spindle P, frame O, spring *n*, distributing-roll *o*, yokes *r r*, and inking-rollers *s s*, all arranged and operating, relative to the type-bed, substantially as described.

9. In combination with the inking-rollers *s s*, mounted in or on a yielding frame, the cam-surface R, formed upon or secured to the frame K, arranged and operating as and for the purposes described.

Executed at Boston, Massachusetts, this 2d day of July, 1875.

Witnesses: W. FORESTUS WYMAN.
N. C. LOMBARD,
E. A. HEMMENWAY.