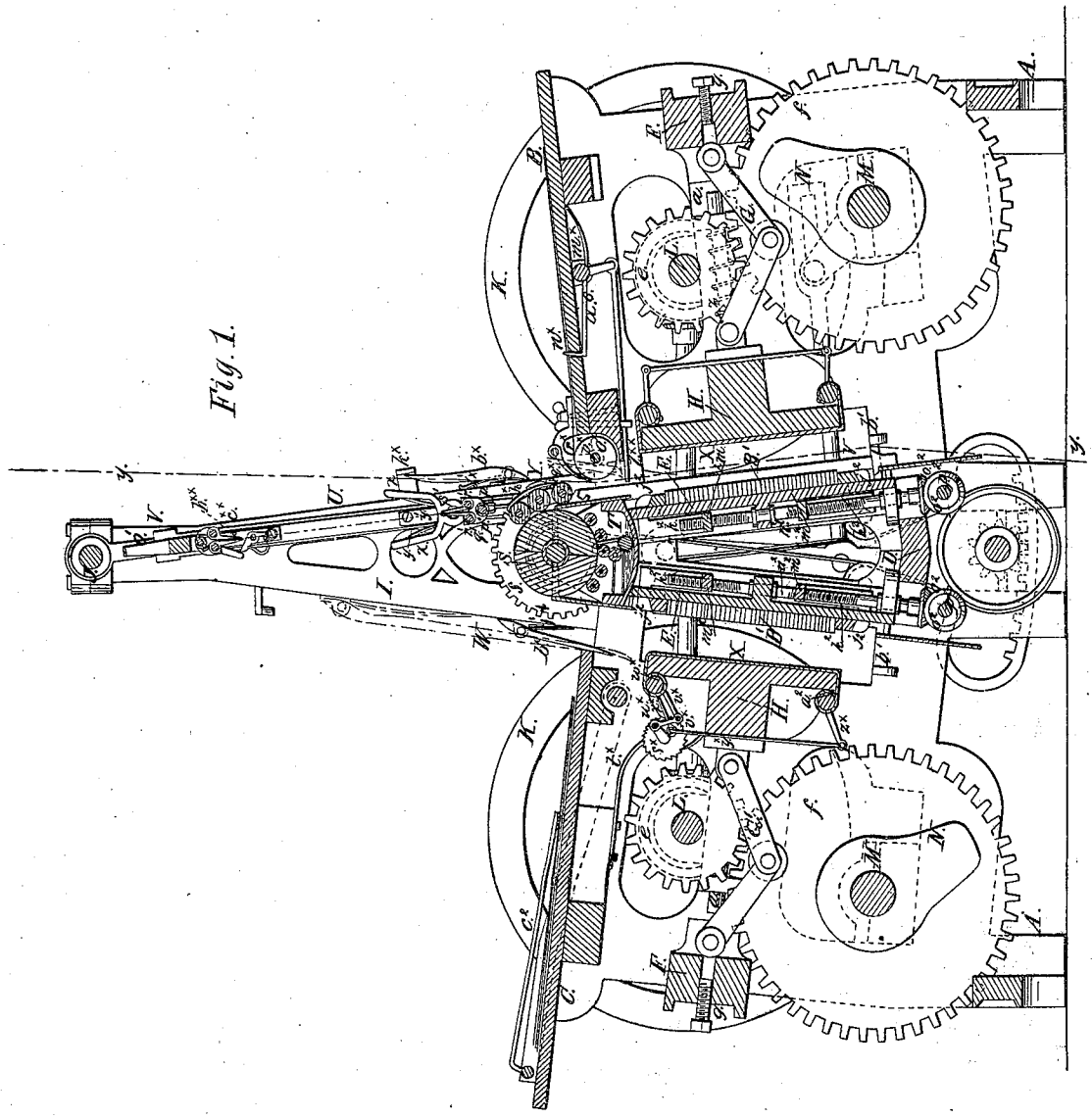
Sheet 1. 3 Sheets.

J. W. Latcher.

Printing Press.

No. 26999. Patented Jan. 31. 1860.

Fig. 1.



Inventor.

John W. Latcher

J. W. Latcher. Sheet 2. 3 Sheets.

Printing Press.

No. 26999. Patented Jan. 31. 1860.

Fig. 3.

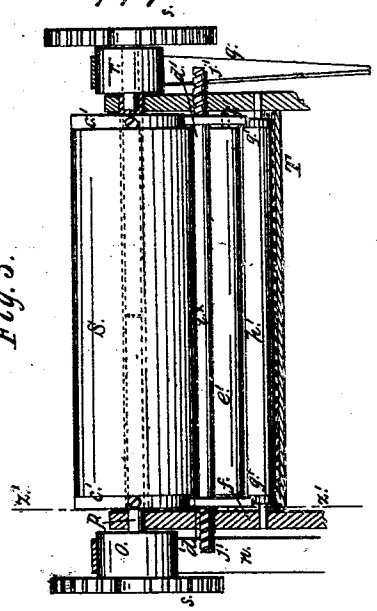


Fig. 4.

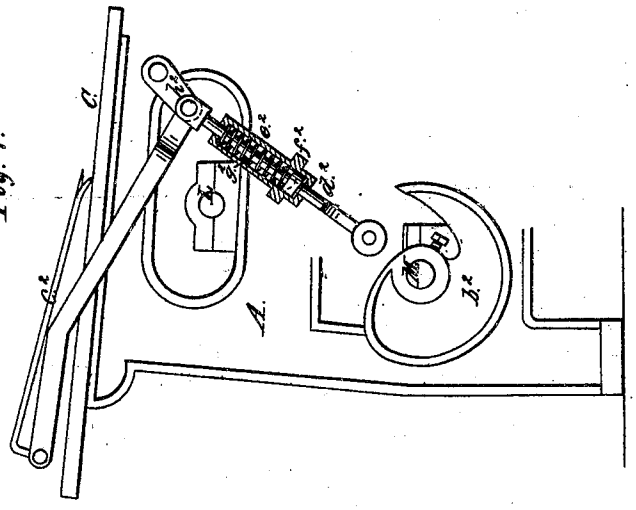
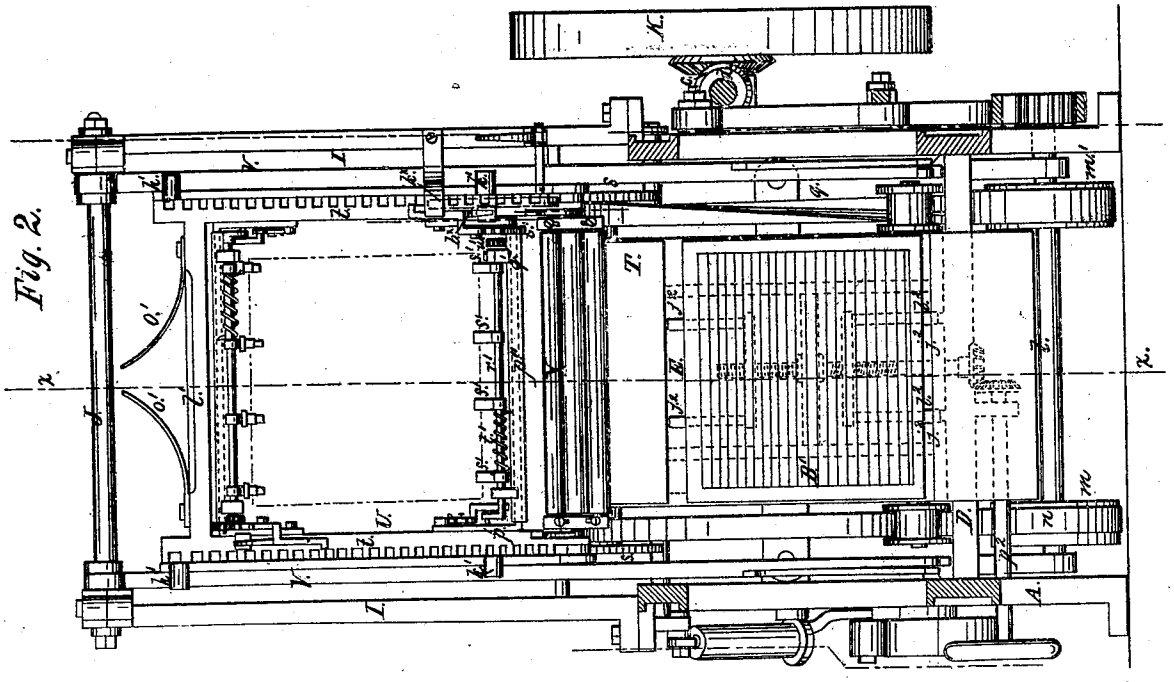


Fig. 2.



Inventor.

John W. Latcher

J. W. Latcher. Sheet 3. 3 Sheets.

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Fig. 9.

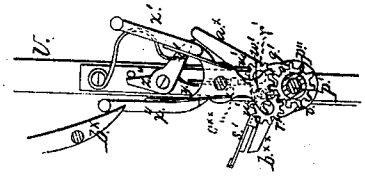


Fig. 10.

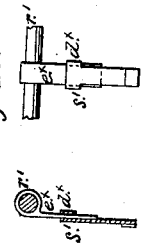


Fig. 8.

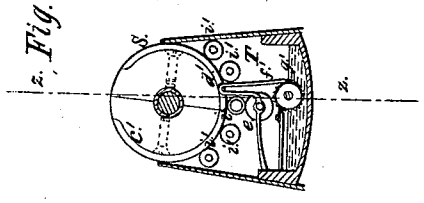


Fig. 7.

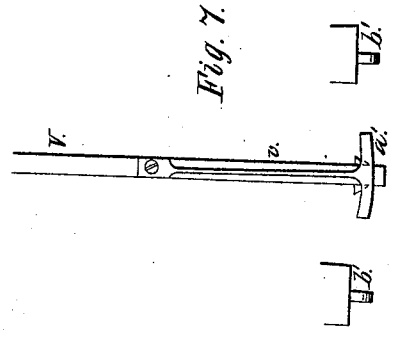


Fig. 6.

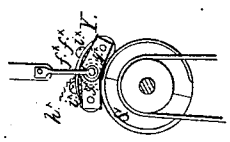


Fig. 5.

Inventor.

John W. Latcher.

UNITED STATES PATENT OFFICE.

JOHN W. LATCHER, OF NORTHVILLE, NEW YORK.

PRINTING-PRESS.

Specification of Letters Patent No. 26,999, dated January 31, 1860.

To all whom it may concern:

Be it known that I, JOHN W. LATCHER, of Northville, in the county of Fulton and State of New York, have invented a new and Improved Printing-Press; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a side sectional view of my invention, taken in the line *x*, *x*, Fig. 2; Fig. 2, a transverse vertical view of my invention, taken in the line, *y*, *y*, Fig. 1; Fig. 3, a longitudinal vertical section of the ink fountain, taken in the line X, X, Fig. 8. Fig. 4, a detached side view of the mechanism employed for operating the fly; Fig. 5, a detached view of a portion of the mechanism employed for operating the frisket; Fig. 6, a detached view of a portion of the inking device; Fig. 7, a detached view of a portion of the mechanism which controls the movement of the frisket; Fig. 8, a transverse vertical section of the ink fountain; Fig. 9, a detached view showing the mechanism by which the grippers are operated; Fig. 10, a detached view of the grippers showing the means by which they may be lengthened or shortened.

The object of this invention is to obtain a flat-impression press, that will print rapidly, be very compact, simple in construction, print both sides of the sheets at one operation; or, with but one passage through the press, and one that will admit of having certain necessary parts readily adjusted for the printing of different sized sheets, and also one that will admit of polychromatic printing with a perfect register.

To enable those skilled in the art to fully understand and construct my invention I will proceed to describe its construction and operation.

A represents the frame of the press, constructed of cast iron, and of a suitable form to sustain the necessary parts. The upper part of the frame is doubly inclined, so as to give the feed and fly board B, C, an inclined position, the outer ends of both being elevated about 10° above a horizontal plane as shown clearly in Fig. 1. In the middle of the frame A, a bed-plate D, is permanently secured, and E, E, are two beds, the lower ends of which are bolted down to the bed plate D, the backs of the beds being connected at their upper and lower ends. The faces of the two beds E, E, are inclined, one having a reverse position to the other, each forming an angle of about 10° from the vertical and consequently each bed is at right angles with the board B, or C, which is above it. At each end of the frame A there is a transverse bar F, against which the outer ends of toggles G, G, bear, the inner ends of the toggles being attached to platens H, H, which are provided at each end with a guide rod, *a*, said rods working in suitable bearings, and having spiral springs *b*, placed on them. One of these springs is shown by dotted lines in Fig. 1, and they have a tendency to keep the platens H, back from the beds E. The faces of the platens are parallel with the faces of the beds as shown clearly in Fig. 1. From the middle of the frame A, and at each side a standard or upright, I, rises, the upper ends of which uprights form bearings for a shaft J, which is allowed to turn freely in its bearings.

K. K. are two fly wheels to either of which the driving power may be applied. These wheels are placed on shafts L. L. which extend across the frame A. and near each end of it, and the two shafts are connected with bevel gears C and a shaft *d* which insure a simultaneous and uniform movement of the two shafts by the application of power to either. On each shaft L. a pinion *e* is placed, and these pinions gear into wheels *f*. *f*. which are placed on the shafts M. M. in the lower part of the frame A., each shaft M. having a cam N. placed on it, the cam of one shaft having a reverse position to that of the other, as shown clearly in Fig. 1. The cams N. act against the toggles G. G. and force the platens H. H. toward the beds E. E. in order to give the necessary impression, and as the two cams are placed in reverse positions, relatively with each other on their shafts, the platens will be actuated alternately. The cams are so formed that while each is in contact with its toggle and gives the forward impression movement to its platen, the cam will have moved somewhat less than one-eighth of its revolution. The backward movement is given the platens by the springs *b*.

The toggles G. G. are secured at their inner ends to the platens H. by roller joints

and the outer ends of the toggles are connected with screws *g* in the bars F. By turning or adjusting these screws *g* the impression may be regulated as desired.

To one of the shafts M at its outer end a crank O. is attached, see Fig. 5. This crank has a pin *h.* at its outer end, and said pin is fitted in a slot *i* at one end of a rod P., the opposite end of which is connected to a radius bar Q. having a segment gear *j.* at its lower end and into which segment a pinion *k.* gears, said pinion being on a shaft L. in the lower part of the frame A. The pin of the crank O. moves in the slot of the rod P. for about one-fourth of its revolution without actuating the rod, and during this cessation of movement of the rod P. and consequently of the shaft L. one of the platens H. is giving its impression, and after the impression of the platen is given the pin *h.* actuates the rod during nearly one-fourth of a revolution of the crank O. and the bar Q. is moved, the gear and segment *j.* rotates the pinion *k.* and consequently the shaft L. At each movement of the rod P. the segment *j.* makes one vibration. On the shaft L. two pulleys, *m. m.'* are placed. Around the pulley *m.* a straight band *n.* passes, said band passing around a pulley, *o.* on a shaft, *p.*, which passes through the hollow shaft of an ink cylinder S. placed over a fountain T. Directly above the two beds E. E. the shaft *p.* passes loosely through the cylinder S. Around the pulley *m'.* a cross band *q.* passes, said band also passing around a pulley *r.* at one end of the ink cylinder S.

On each end of the shaft *p.* a pinion *s.* is attached, and these pinions gear into sunken racks *t.* in the sides of a frisket U. which is fitted between guides V. V. that have their upper ends attached to the shaft J. To the other end of each guide V. a spring *v.* is attached, and to the lower end of each spring a transverse bar *a.'* is secured. These bars *a.'* as the guides V. swing back and forth, work between stops *b.'* attached to the inner sides of the frame A; these stops are shown in Fig. 7.

At each end of the ink cylinder S. there is a cam *c'*. These cams bear against springs *d.'* which are placed in the fountain T. and are of the form shown in Fig. 8. In these springs the bearings of a roller *e.'* are fitted. The lower end of the springs *d.'* serve as pawls *f.'* and act when the springs *d.'* are depressed by the cams *c.'* against ratchets *g.'* which are at the ends of a roller *h.'* at the lower part of the ink-fountain T. and directly below the cylinder S. a series of small ink distributing rollers *i.'* are placed, said rollers bearing against the periphery of the cylinder S. One of the rollers *i*× has the usual longitudinal vibration movement given it by screws *j.'* at its ends, see Fig. 3. The ink distributing rollers *i' i*× may be constructed of the usual yielding composition, but the cylinder S. may have a hard or metallic surface.

By one vibration of the bar Q and geared segment *j.* the pulleys *m. m.'* on the shaft L. turn the pinions *s.* two and a-half revolutions or a little more, which causes said pinions *s.* to raise the frisket U. to be more particularly described hereafter. From the stops *b.'* at the lower ends of the swinging guides V. V. and from in front of one bed E over the pinions *s.* (the lower end of the frisket racks having large round end cogs and there being an absent cog in each of the pinions *s.*) the frisket is passed down on the opposite side, or in front of the other bed E. and again rests on the stops. This movement is effected while the platens are both inactive or thrown back from the beds E. E. The springs *v.* which are attached to the guides V. V. are as the guides V. swing, arrested by the stops *b.'* near the end of each vibration. These springs prevent the frisket from being thrown out of gear while passing over the upper half of the pinions *s. s.*

The frisket U, consists of two rack-pieces, *t, t,* previously referred to, made of steel, and having ears or projections *k'* by which the frisket is fitted to the guides. The lower set of ears *k'* are about one third the distance up the rack-pieces *t, t,* so as to allow the inking rollers, hereinafter described, to pass down below the bed plate D, on a plane with the face of the type, and to give the grippers both the upper and lower sets an equal position on the face of the bed when the said guides or ears are on the stops *b'*. The upper parts of the rack-pieces *t, t,* are connected by a transverse bar *l'* and to this bar *l'*, springs *o'* are attached which come in contact with the shaft J, while the frisket is being carried over the pinions *s, s.*

The gripper apparatus is constructed in the following manner. An angle bar *p'*, extends from one rack-piece *t,* to the other and passes through a hollow cylinder, *p''*, the cylinder *p''* being allowed to turn freely on said bar *p'* To the cylinder *p''* at each end a double journal box, g^2 is attached, and in these boxes two shafts *r', r',* are fitted. To the shafts, *r', r',* the grippers, *s',* are attached, and around the shafts *r', r',* springs *t',* are coiled and bear against the cylinder *p''*. These springs cause the grippers to be pressed closely together, the shafts, *r', r',* are connected at one end by pinions *u'*, and the hollow cylinder *p''*, has a pinion *v'*, on it, which pinion gears into a toothed segment *w'*. The segment *w'*, is forked or provided with two arms *x', x'',* which are of a crank-shape, as shown in Fig. 2, and the arms spread in V form, as shown clearly in Fig. 9, and are provided with springs *y', y',* which keep the grippers in a line, with the frisket racks, by pressing

against the angle bar p'. When the arm x'', is forced inward toward the frisket rack, see Fig. 9, a dog z'', keeps back the furthermost gripper shaft r', a crank a^x, being attached to said shaft, which comes in contact with said dog, and the front gripper shaft is geared open, by the pinions u', and is carried around until the lower set of grippers open (in the manner as shown in Fig. 9). When the crank a^x drops or leaves off the dog z'', the grippers close upon the sheet of paper at a mid-line at which they stood after which the stationary spring cam b^x hereinafter described and which are represented in Figs. 1, 2, and 9, being passed, the grippers resume their position in a line parallel with the before-mentioned frisket-racks by the springs y', y'. The upper set of grippers are likewise operated upon by cams, only that they do not open but about half as wide so as to grip the upper end of the sheet, while passing through the feeding apparatus as hereinafter mentioned and described. The two sets of gripper apparatus are constructed alike, the ends being reversed only that the dog z'', in the upper set is not so deeply hitched on the crank a^x, as that of the lower one. The sheet is held tightly until both impressions are given when it passes up, the arm x' coming in contact with a long inclined cam W shown in red in Fig. 1, to be hereinafter described, and both the gripper jaws of the upper set are thrown out beyond the lower ends of the fly-fingers the said fingers passing between the shafts of said grippers, and the gripper ends, which still firmly retain the sheet; and thus the upper set rise up until the lower one presents itself at the lower ends of the fly-fingers, when the arm x', of the upper set comes in contact on a more abrupt inclination inside of the cam W, before alluded to, and the gripper jaw at the fly side is suddenly thrown open, which is effected by a lever b^{xx}, attached to the near jaw being kept back by a pin c^{xx}, in the angle bar before mentioned, and at the same time the lower set are also opened very slightly in the same manner. The grippers are arranged with slides as shown clearly in Fig. 10, d^x being the slide which is fitted on the main piece c^x. By this arrangement the grippers may be lengthened or shortened to suit different sized sheets.

Attached to the lower part of the frisket racks t, t, is the roller apparatus Y, the same being attached to the racks by two springs f^x, f^x, which are screwed to the rack pieces see Fig. 6. These springs, are much stiffer than those of the vibrating guides before mentioned. When the impression is being given, the frisket is forced about one-half to three-quarters of an inch toward the beds E, E. These springs are of course bent with the roller Y, about one inch. There are slight projections from platens, and when the blanket X, on the face of the platen touches the sheet the projection comes in contact with the frisket. When the platens recede the aforesaid springs will resume their former elasticity, and quickly lift the frisket gripping the sheet from the form. The apparatus consists of joints g^x at the insertion of the roller pivots as shown in Fig. 6, and these joints are held together by short concave or curved springs, h^x having slots or holes cut through them for the insertion, and free movement of screws i^x, having large sized heads. These springs are quite light. The rollers Y, move over the ink cylinder S which is turned in a reverse direction to the rollers Y, by means of the cross-band, q, and the whole surface of the cylinder, S, will be touched by the inking rollers. Any odd number of rollers Y, may be used from one to eleven at one time, according to the kind of work to be done. A uniform color will be given to both sides of the sheets as the distribution of ink is the same, each time that the rollers bear on the cylinder S. Each form is rolled twice once in passing up, and once in passing down before the impression is given.

The stationary spring cams b^x are made to swing at their butt end on axes, attached to which are the springs j^x, the ends of which set against the standards or uprights I, which press or force out the points of the cams from the standards, and said cams rest against projections k^x. When the frisket passes up on the feed-board side and down on the fly-board side the arms x', x'' pass over the outside of the cams without affecting the grippers a particle and after the crank of the arms are past the points of the cams they spring against the projections k^x. In passing up the fly-board side and down the feed-board side, the grippers are affected in the manner previously described.

A registering or pointing apparatus, see Fig. 1, is attached to the feed-board B, for doing polychromatic printing. The rod l^{xx} extends out beyond the front edge of the feed-board and so far as to come in contact with the guides V, V, and being moved back slightly by the said guides. The rod l^{xx} is connected to a rock shaft m^x, to which also is attached a spring which forces the rod l^{xx} in the direction of the guides V. The said rock-shaft m^x, has also two arms a^6 a^6 extending along under the aforesaid board with two spurs n^x, $n^{x'''}$ passing through slots in said board. These arms pass through the rock shaft, and may be regulated to print sheets of different widths. There is sufficient room on the feed-board to lay a pile of sheets and abundant space to point and feed in sheets.

The feeding apparatus is placed on the front edge of the feed-board B, or at that

side or edge part, which the grippers move. This feeding apparatus consists of a number of rollers or circular disks $o^{\times}$ placed on a shaft $p^{\times}$. These disks are placed in lines opposite the centers of the spaces between the grippers and over each roller or disk are stationary guards, $q^{\times}$ between which and the disks the sheets pass. The shaft $p^{\times}$ turns independently, when a sheet passes over it and the pivots of said shaft are fitted in adjustable bearings $r^{\times}$. By this means the feeding apparatus may be adjusted to suit the length of the grippers.

The off-set or blanket moving device is shown clearly in Fig. 1. It is attached to the second impression platen. After every impression is given by said platen, the ratchet wheel $s^{\times}$ is turned, the ratchet coming in contact with a stationary pawl $t^{\times}$, attached to the under side of the fly-board, C. To the shaft of the ratchet $s^{\times}$ there is a crank $w^{\times}$, which is connected by rods $v^{\times}$ with a shaft $w^{\times}$ at the upper end of the platen. The shaft $w^{\times}$ has an arm $x^{\times}$ attached, and to this arm a rod $y^{\times}$ is secured, the lower end of rod $y^{\times}$ being connected to the arm $z^{\times}$ of a shaft a^2, at the lower part of the platen. To the shafts $w^{\times}$ and a^2 a blanket X is secured, said blanket extending over the face of the platen. At every receding movement of the platen the ratchet $s^{\times}$ is actuated, the shafts $w^{\times}$ and a^2 turn and the blanket slightly shifted in position on the platen. By this arrangement the blanket will be intermittingly moved up and down, so as to present a fresh surface to each sheet, and thus prevent the smudging of the same, a contingency which would be likely to occur if the blanket were pressed without a change of position, on the printed sides of the sheets, in order to give the second impression.

To the end of the shaft M which is below the fly-board a cam b^2 is attached see Fig. 4, which operates the inverted fly c^2. This fly acts against a rod d^2 which is fitted in a hollow cylinder e^2 secured to the frame A, by a swivel bearing f^2. Within this hollow cylinder, a spiral spring g^2 is placed, said spring encompassing the rod d^2 and having its lower end bearing down on a collar at the lower end of the rod d^2. The upper end of the rod d^2 is connected to a crank h^2 at one end of the shaft M to which the arms or fingers of the fly c^2 are attached.

The forms B′ are inserted through the sides of the frame A and pushed to the middle of the beds E, E, and between the jaws or clamps j^2 which are attached to slides k^2 at the backs of the beds E, the jaws or clamps being fitted in slots l^2 in the beds. The slides k^2 of the upper and lower jaws of each bed are provided with nuts m^2 which are fitted on a right and left screw shaft n^2, and the lower end of the screw shafts are connected by bevel gears, o^2 with shafts p^2 each of which is provided with a hand-wheel and by turning which the upper and lower jaws are made to move simultaneously toward and from each other. By this arrangement the forms however much they may vary in size, may always be secured centrally to the beds E, E.

From the above description the operation will be readily seen. Motion is given one of the wheels K, by any convenient power, and the sheets are presented, one at a time, to the lower grippers of the frisket, between the guards $q^{\times}$ and the disks, o. The lower grippers grasp the end of the sheet, and carry it down, and the upper grippers seize the upper end of the sheet. The two sets of grippers hold tightly the sheet in the frisket, and the latter remain stationary directly in front of the form B′ at the feed board end of the machine, by reason of the operation of the crank, O, on the rod, P, as previously described. During this cessation of the movement of the frisket the platen under the feed board is moved forward by its toggle and the side of the sheet receives an impression. The platen aforesaid then recedes, and the frisket U is elevated, the crank, O, actuates the rod P, and consequently the segment j. The frisket during this latter movement is elevated over the ink cylinder S, and passed down in front of the other bed, E, and form B′ and between said form and the platen below the fly-board. The movement of the frisket then ceases and the platen which rested or remained stationary during the movement of the frisket, is shoved forward by its toggle, and the other side of the sheet receives its impression. This latter platen then recedes, and the frisket rises, the printed sheet being carried upward in front of the fly-fingers and when the frisket is fully elevated the grippers are opened, and the fly c^2 is thrown, by the action of the spring g^2 down on the board, the fly depositing the printed sheet on the same. The inking of the forms, as well as the operation of the grippers, and movement of the blankets X, having been described in detail it is unnecessary to repeat their operation in the description of the movement of the principal parts.

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

1. The employment or use of two platens H, H, arranged with two beds E, E, and used in connection with a frisket U, so arranged as to pass down between one platen and bed, to receive one impression, and then rise, and pass down between the other platen and bed to receive the other impression substantially as described.

2. In combination, with the platens, beds, and frisket arranged as above, an inking de-

vice, comprised of the cylinder S, distributing rollers i', dipping roller, e', and fountain roller h', in connection with the rollers Y, attached to the frisket, U, the whole being arranged for joint operation substantially as set forth.

3. Securing the forms B′, in or to the beds E, E, by means of the movable jaws j^2 fitted in the upper and lower parts of the beds and connected to right and left screw shafts u^2 substantially as described, to admit of the simultaneous movement of the upper and lower jaws for the purpose of securing the forms centrally to the beds.

4. Giving the blanket X of the second impression platen H, a movement by means of ratchet s^x connecting rods v^x, v^x, shafts w^x, a^2, and rod g^x, put in motion by the movement of said platen and the stationary pawl t^x, at the under side of the fly board C, substantially as and for the purpose set forth.

5. The arrangement as shown of the crank, O, rod P, and radius bar Q, provided with the slotted segment j, in connection with pinions s, s, racks t, t, and shafts l, p, for the purpose of operating, intermittingly the frisket U.

6. The arrangement of the cam b^2, hollow cylinder e^2, and rod, d^2, the latter being attached to the fly by the crank h^2, for the purpose of operating the fly as set forth.

7. The operating of the gripper shafts r', r', by means of the double journal boxes g^2, attached to the hollow cylinder p'', the pinions u', on the shafts r', r', the geared segment w', gearing into pinion n', of the hollow cylinder, the arms x', x'', provided with springs y', y', and the dog z'', crank a^x, and pin c^{xx}, operated upon by the cams b^x, W, substantially as set forth.

8. Having the grippers s', formed of two parts so that one part d^x may slide on the other part e^x, for the purpose specified.

9. The employment or use of the paper feeding apparatus, composed of the disks or rollers o^x, placed on the shaft p^x, and the guards q^x, directly over the disks or rollers, the above parts being secured at the inner edge of the feed board B substantially as described.

JOHN W. LATCHER.

Witnesses:

MICH. HUGHES,

M. M. LIVINGSTON.