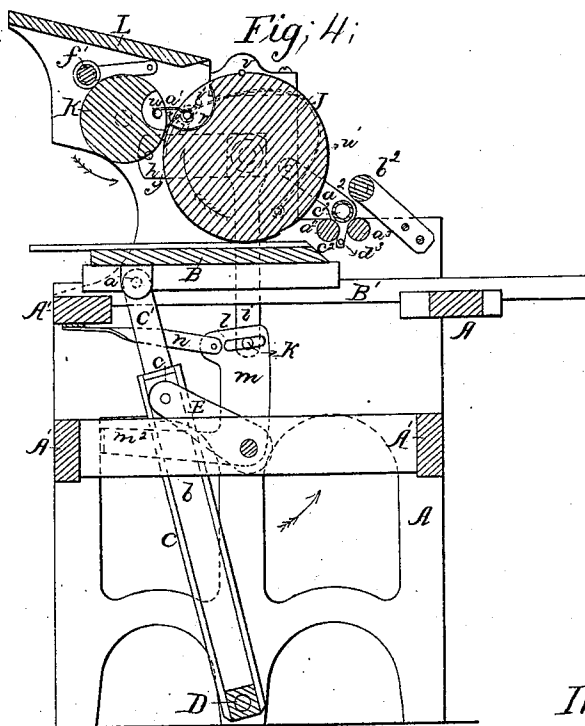
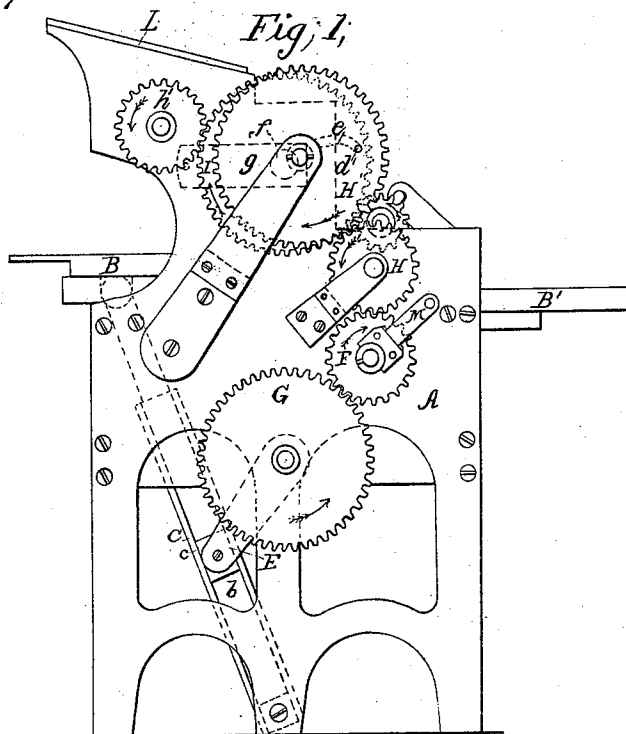


C. Montague. Sheet 1 of 3 Sheets.
Printing Press.

Nº 98,087.

Patented Dec. 21, 1869.



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Section X-X of Fig. 3

C. Montague. Sheet 2 of 3 Sheets
Printing Press.

Nº 98,087.

Patented Dec. 21, 1869.

Fig. 2;

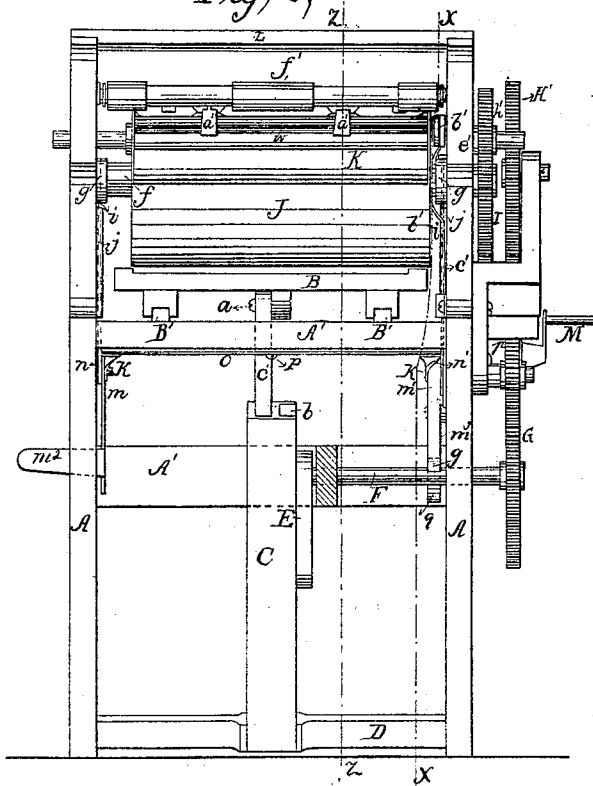
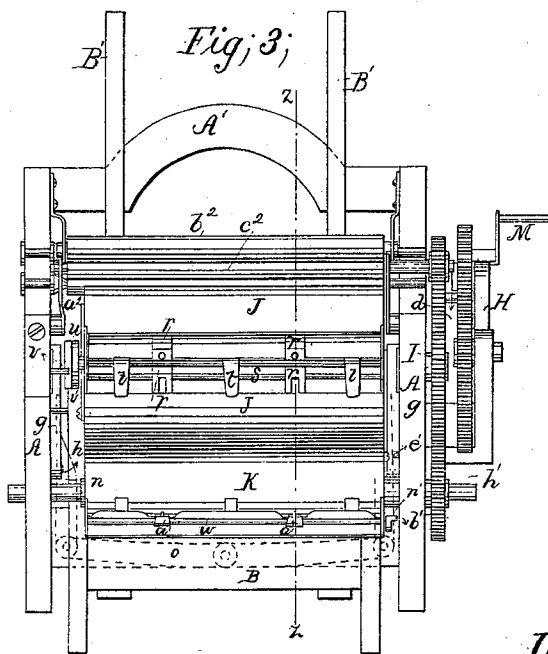


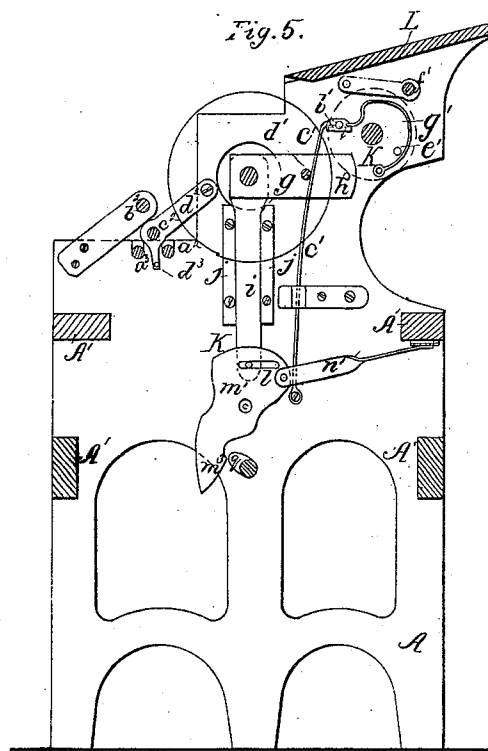
Fig. 3;



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C. Montague. Sheet 3, 3 Sheets.
Printing Press.
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Section L.L. of Fig. 3

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UNITED STATES PATENT OFFICE.

CHARLES MONTAGUE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO CYRIL C. CHILD, OF SAME PLACE.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. 98,087, dated December 21, 1869.

CASE A.

To all whom it may concern:

Be it known that I, CHARLES MONTAGUE, of Boston, in the county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Printing-Presses, said improvements being more particularly applicable to what is known in the trade as the drum-cylinder press; and I do hereby declare the following to be a full, clear, and exact description thereof, taken in connection with the accompanying drawings, making a part of this specification, and the letters of reference marked thereon, in which—

Figure 1 is a side elevation of a press embodying my improvements. Fig. 2 is an end elevation, with the lower girt removed. Fig. 3 is a plan, with feed-table and friction delivery-roll removed. Fig. 4 is a vertical transverse section on line *x x* on Fig. 3; and Fig. 5 is a vertical transverse section on line *z z* on Fig. 3, showing the parts attached to the frame opposite to the one shown in Fig. 4, the position of cylinders being shown by circles.

My invention relates, in the first place, to the mode of operating the type-bed and the impression-cylinder; and it consists, first, in the use of a vibrating lever, for moving the type-bed, constructed in two parts, one of which is made to slide out and into the other, somewhat like the joints of a telescope, so that the upper end of said lever may be attached directly to the under side of the bed, (dispensing with the use of a link,) and move in a direct line with the bed, the upper portion of said lever moving out or into the lower portion, as the distance from the fulcrum of said lever to the point of attachment to the bed is greater or lesser in the different parts of the movement of the bed.

It also consists in communicating the motion of the crank-shaft, that operates the bed, to the impression-cylinder, by the use of a gear-wheel hung upon a stud outside of the end of said crank-shaft, and so hung that its axis shall be eccentric to the axis of said shaft, and carrying a crank-pin permanently attached thereto, which projects inwardly, and fits into a slot cut in the main gear on the end of the crank-shaft, as represented in the

drawings; or the slot may be made in a plain crank or lever, distinct from the main driving-gear, and said gear may be placed at any intermediate point between the two ends of the shaft, the slot being of such a form as required, acting, in conjunction with the pin working in said slot, to give to the impression-cylinder a movement that will exactly coincide with the motion of the bed during the whole time of taking the impression.

My invention also relates to a device by means of which the cylinder may be raised so as to throw off the impression at the will of the operator; and it consists in hanging the impression-cylinder in bearings formed in radius arms or levers, placed horizontally, and pivoted to the frame of the machine, and attaching to said levers, at a point directly under the cylinder, pendent bars or rods, fitted to slide in bearings attached to each frame, the lower end of said bars or rods being provided with wrist pins or studs, which fit into cam-slots, cut in vibrating arms or levers, on either side of the machine, and connected together by a system of links, so that they will both move together, and raise or lower both ends of the cylinder alike, one of said vibrating cam-levers being provided with a long arm or handle, by means of which the operator can raise the cylinder, to throw off the impression at pleasure.

My invention also relates to the means of operating and controlling the nippers; and it consists, first, in the use of a spring-hook for closing the nippers of the take-off cylinder upon the sheet on the impression-cylinder, said spring-hook being moved into position, to operate the nipper-shaft attached to the take-off cylinder, at the proper time, by a pin set in the end of the impression-cylinder.

It also consists in giving to the nippers a movement through an arc of about one hundred and sixty degrees, and also in forming the clamps that secure the fly-sheet to the impression-cylinder in the form of a fork bent over onto the impression-surface of the cylinder, but not to extend beyond the space allotted for the margin of the sheet, thus serving the purpose of raising the edge of the sheet slightly above the surface of the cylinder, the

nippers being so arranged on the take-off cylinder as to strike under the sheet through the space between the two prongs of the fork, and thus facilitate the taking off the sheet.

In the drawings, A represents the side frames of the machine, connected together by girts A', and B is the type-bed, mounted upon suitable slides B'. C is a vibrating lever, made in two parts and attached to a rocker-shaft, D, hung in bearings near the bottom of the frame, said lever being provided with an extension-arm, C', fitted to slide in the part C, the upper end of said arm being attached to the bed by the pin *a*. The lever C is also provided with a slot or groove, *b*, in which the block *c* is fitted so as to slide freely therein, said block being fitted to the wrist-pin on the crank E, mounted upon the inner end of the shaft F, arranged to rotate in suitable bearings provided for the purpose. G is a spur-gear wheel mounted on the outer end of the shaft F, and is acted upon by the pinion F', by which the machine is driven.

H is an intermediate gear, which serves to transmit motion from the driving-pinion to the large gear H', mounted upon a stud set in the inner side of a stand, bolted to the frame in such a manner as to leave a free space in which the gear may revolve, and carries the wrist-pin *d*, projecting inwardly from the inner face of said gear-wheel, and fitting into the slot *e* made in the gear-wheel I. The gear I is mounted on the shaft *f* of the cylinder J, the two gears being so arranged as to revolve side by side, but in paths eccentric to each other, the gear I, and consequently the cylinder J, being driven by the action of the pin *d* in the slot *e*, the form of the slot *e* and the amount of eccentricity between the two gears H' and I being such as required to give to the cylinder J a motion that shall exactly coincide with the motion of the bed B during the whole time of taking the impression.

The impression-cylinder J is of the kind usually termed a "drum-cylinder," and has a portion of its circumference cut away or reduced to a smaller diameter in the usual manner, and is mounted in bearings in the radius arms or levers *g g*, which are pivoted to the frames by the pins *h h* nearly in a horizontal position. *i i* are two bars or rods, attached by their upper ends to the movable ends of the levers *g*, and fitted to move in the slides *j*, attached to the frames, and provided with pins *k* at their lower ends, which fit into the cam-slots *l* in the vibrating levers *m* and *m'*. The levers *m* and *m'* are pivoted to the frame, and are connected together by the links *n* and *n'*, and the lever *o* pivoted to the rear girt by the pin *p*. The lever *m* is provided with a horizontal arm, *m*², arranged so as to be accessible to the operator, by depressing which he can raise the impression-cylinder at any moment, and prevent the sheet from being printed.

The lever *m'* is provided with an arm, *m*³, extending downward from its fulcrum-pin,

against which the cam *q* acts to reverse the motion of the levers *m* and *m'*, to move the impression-cylinder down again into the proper position to give an impression.

r r are clamps for securing the fly-sheet to the cylinder, and are forked and bent over onto the impression-surface of the cylinder, but do not extend beyond the width of the narrowest margin, and also serve to raise the edge of the sheet that is being printed a little above the surface of the cylinder, and thus facilitate the removal of the sheet by the nippers attached to the take-off cylinder. *s* is the nipper-shaft, and *t t* the nippers attached to the same, and serve to take the sheet from the feed-table and hold it while the impression is being printed. The nipper-shaft *s* is provided at one end with an arm, *u*, attached by its middle to said shaft, and having a cam face or lip upon one side, which strikes against the pin *v* as the cylinder revolves in the direction of the arrow, and gives a half-revolution to the nipper-shaft, and causes the nippers to close upon the sheet and carry it around with the cylinder. *v'* is another pin, set in the frame in the proper position to be struck by the cam-face of the arm *u* as the cylinder continues to revolve, and turn the nipper-shaft in the opposite direction, and cause the nippers to release the sheet and place them in a position to take another sheet. *w* is a spring by which the nippers are held in either position in which they may be placed. K is the take-off cylinder, hung in fixed bearings in the frame, and provided with a nipper-shaft, *w*, carrying a set of nippers, *a' a'*, so arranged and constructed that when they are revolved they strike under the sheet, through the space between the forks of the clamps *r r*, just at the right time to take the sheet as it is released from the nippers attached to the impression-cylinder. *b'* is the arm, by which the nipper-shaft *w* is vibrated in a manner similar to the nipper-shaft on the impression-cylinder, except that it is not operated at every revolution of the take-off cylinder, but once to each revolution of the impression-cylinder. *c'* is a spring-hook, attached to the frame in such a position that the arm *b'* may revolve with the cylinder K without coming in contact with it, except when it is thrown into the position shown in Fig. 5 by the pin *d'* inserted in the end of the impression-cylinder J, and as the pin can come in contact with said spring-hook but once to every revolution of the impression-cylinder, it follows that the nippers attached to the cylinder K cannot be operated more than once to each revolution of the impression-cylinder, without regard to the number of revolutions that the take-off cylinder K may make. *e'* is a pin, fixed in the frame in such a position as to strike the arm *b'* if the nippers approach it while closed upon a sheet, and open the nippers, and allow the sheet to be conveyed to the fly by means of friction-roll *f'*. *g'* is a spring by which the nipper-shaft is held in

either position which it may happen to be in until it is acted upon by the pin e^1 or the hook c^1 . The cylinder K is geared from the impression-cylinder by the wheel h^1 , so that their outer surfaces shall move at the same speed.

a^2 and a^3 are the composition rollers for rolling the type-form, mounted in fixed bearings on the frame. b^2 is the cylinder or roll on which the ink is distributed from the fountain by the traversing roll in common use, but not shown in the drawings. c^2 is the ink-cylinder, hung in bearings in the radius arms or levers d^2 , pivoted to the frame, and having an arm projecting downward between the shafts of the inking-rollers, in the lower end of which is inserted a pin, d^3 , which, being acted upon by the incline e^2 on the side of the bed as the bed is moved under the inking-rollers when moving from the rear to the front of the machine, lifts the ink-cylinder c^2 off from the inking-rollers a^2 and a^3 , leaving them free to roll the type-form without being pressed down with any unnecessary weight. When the cylinder c^2 is lifted, it is brought in contact with the distributing-cylinder b^2 , where it remains revolving in contact with said cylinder until the bed has moved back and nearly completed the impression, when it is again let down in contact with the composition-rollers, and supplies them with ink, remaining in contact with said rollers until the incline e^2 again comes in contact with the pin d^3 . L is the feed-table, and M is a crank by means of which the machine is operated.

The operation of my machine is as follows: The sheets are placed upon the inclined feed-table L, and fed to the machine in the usual manner, the machine being set in motion by operating the crank M. The bed B is made to reciprocate upon its slides, and by means of the gearing rotating in eccentric paths and connected by pin d and slot e . The impression-cylinder is made to revolve in exact correspondence with the bed, and at the proper time in the revolution of the impression-cylinder the arm u comes in contact with the pin v , and gives a semi-revolution to the nipper-shaft s , and causes the nippers to catch the sheet, the spring u serving to hold the nippers firmly onto the sheet when they have taken hold of it. Just at this point the bed has completed its motion in one direction, and, by passing under the full or impression side of the cylinder J, has given an impression to the sheet carried by it, which has been released and caught by the take-off cylinder K. By the continuation of the motion of the crank-shaft the bed is moved on its return-stroke, passing under the side of the cylinder that is cut away or reduced in diameter, so that the type will not come in contact with the cylinder.

As the machine continues to revolve the

sheet is carried around with the impression-cylinder and carried between the cylinder and bed, and receives an impression, and when the impression-cylinder has arrived at the position shown in Fig. 4 the nippers $t t$ release the sheet just in time to allow the nippers $a^1 a^1$, attached to the take-off cylinder, to take it as they close upon it by the action of the spring-hook c^1 upon the arms b^1 on the end of the nipper-shaft w , the spring-hook c^1 being thrown into such a position by the action of the pin d^1 (inserted in the end of the cylinder J) that the arm b^1 will come in contact with it, and cause the nippers to make a semi-revolution, the combined action of the spring-hook c^1 and the spring g' , serving to effect the closing of the nippers, and the combined action of the pin e^1 and the spring g' serving to open the nippers at the proper time, just after the sheet has been carried under the friction-roll f' , which conveys it to the fly. (Not shown in the drawings.)

If at any time the operator wishes to throw off the impression to prevent a sheet from being printed, or to give his type an extra amount of rolling, he can do so by simply depressing the horizontal arm m^2 , which causes the levers m and m^1 to vibrate, and, by the action of the cam-slots in said levers, raise the cylinder, so that the bed may pass under it without giving an impression.

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

1. The extensible vibrating lever C, in combination with a reciprocating type-bed, substantially as described.
2. In combination with the impression-cylinder of a cylinder-press, the gears H' and I, connected together by the slot e and pin d , constructed and operated substantially as described.
3. Raising the cylinder J to arrest the impression, at the will of the operator, by means of the cam-levers m and m^1 and the hand-lever m^2 , substantially as described.
4. In combination with the cam-levers m and m^1 and hand-lever m^2 , the cam p , for throwing on the impression, substantially as described.
5. In combination with the cylinder J, the pin d^1 , set in the end of said cylinder, the spring-hook c^1 , spring g' , and arm b^1 , constructed and operated substantially as described, for the purposes specified.

Executed at Boston this 11th day of June, 1869.

CHAS. MONTAGUE.

Witnesses:

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