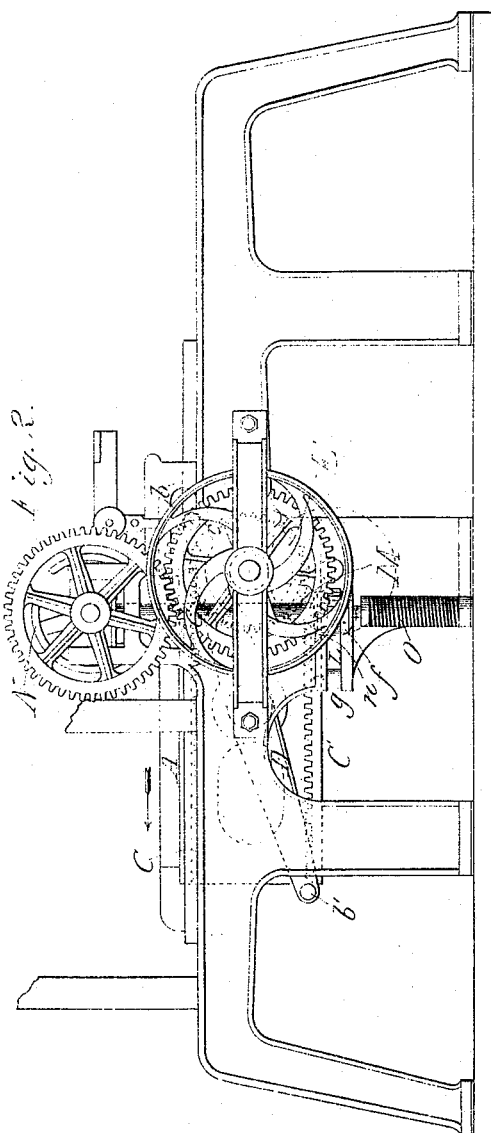
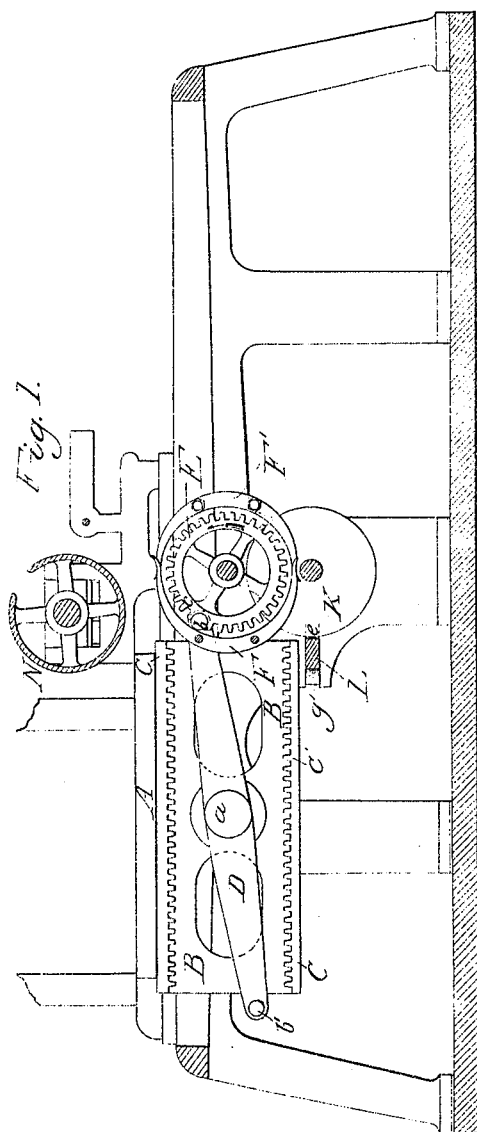


R. M. HOE.
PRINTING PRESS.

No. 5,200

Patented July 24, 1847.



R. M. HOE.
PRINTING PRESS.

No. 5,200.

Patented July 24, 1847.

Fig. 4.

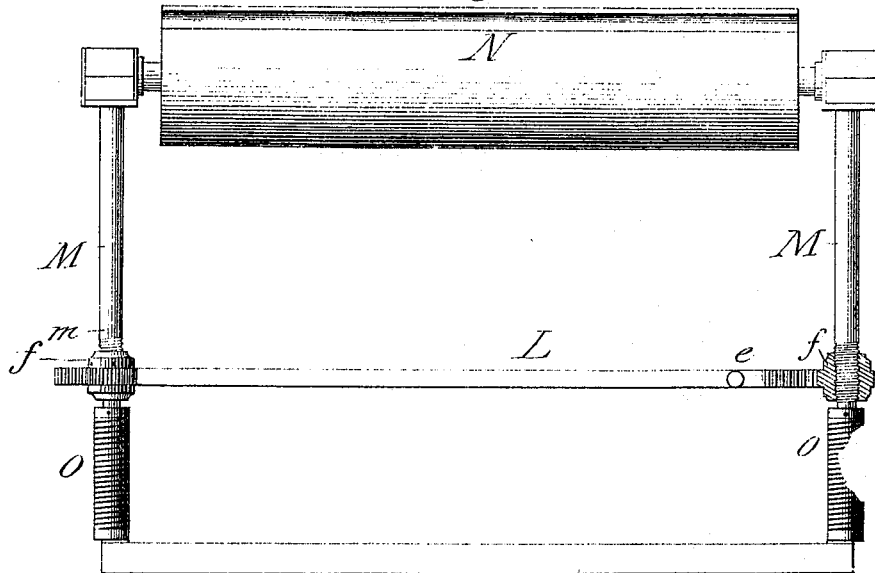
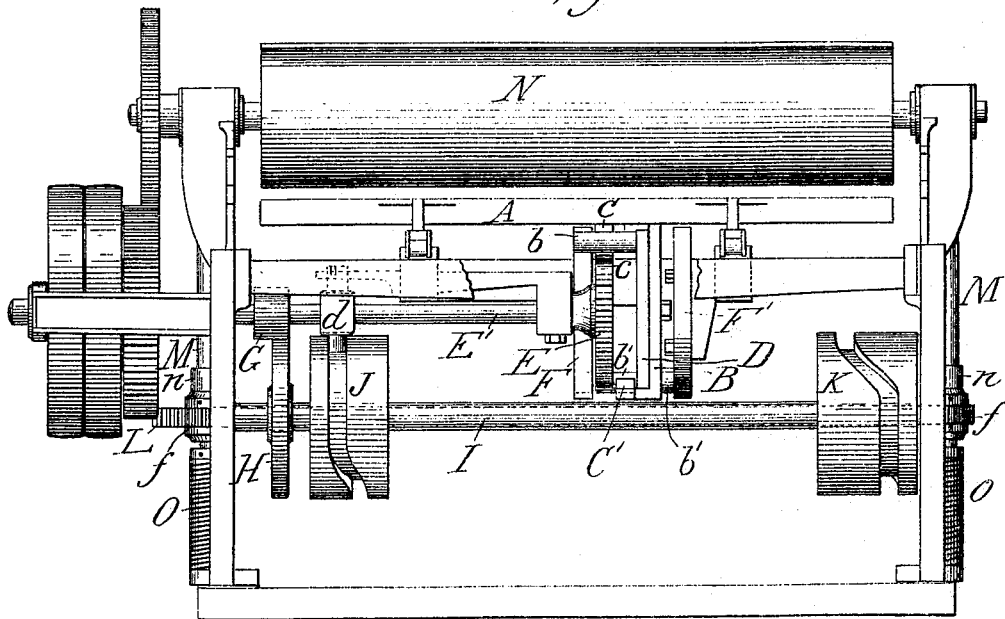


Fig. 3.



UNITED STATES PATENT OFFICE.

RICHARD M. HOE, OF NEW YORK, N. Y.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. 5,200, dated July 24, 1847.

To all whom it may concern:

Be it known that I, RICHARD M. HOE, of the city, county, and State of New York, have invented a new and useful Improvement in the Method of Giving the Reciprocating Rectilinear Motion to the Bed of the Napier Printing-Press, applicable to other purposes; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal vertical view of a part of a Napier press with my improvement applied; Fig. 2, a side elevation, Fig. 3 an end elevation, and Fig. 4 an end elevation, of the machinery which elevates and depresses the pressing roller.

The same letters indicate like parts in all the figures.

The first part of my invention relates to an improved method of giving the rectilinear reciprocating motion required for moving the bed in and out as an improvement on the "mangle-wheel movement," and this consists in combining with the top and bottom racks a lever provided with a spur at each end, which at the end of each movement takes into a notch or recess in the periphery of the cog-wheel which carries the racks, so as to finish each movement by what is equivalent to a crank motion to arrest and start gradually the reciprocating parts and to insure the proper presentation of the cogs of the wheel when they commence to take into the teeth of that rack with which it is to engage. The cog-wheel, which acts alternately on the upper and lower rack, is of such diameter as to have its cogs mesh into the cogs of the two racks at the same time, and to prevent this the two racks are placed in different planes and the wheel and its shaft are at the end of each operation made to slide so as to leave the plane of one rack and pass into that of the other, which is effected by means of a cam on another shaft.

The second part of my invention relates to the mode of raising and lowering the cylinder that gives the impression. The journals of the cylinder work in boxes in the upper

ends of vertical rods that slide in the frame and rest on springs, the tension of which forces up the cylinder when it is relieved, and on each of these rods there are screw-threads embraced by a screw-nut, so that the two nuts can be turned together by racks on the ends of a sliding bar, which receives a reciprocating movement to raise and lower the cylinder by a cam on the shaft of the cam that shifts the wheel of the improved mangle-movement.

In the accompanying drawings, A represents the bed of the press running on ways in the usual manner. To the bottom of the bed are attached two straight racks C C', similar to the straight part of the double mangle-rack. One of them is attached directly to the under surface of the bed and the other by means of a flange-plate B. The mangle-wheel E is on a shaft E that runs in fixed boxes, and is of such diameter as to have the pitch-line of its cogs corresponding with the pitch-line of the cogs of the two racks, and to prevent the cog-wheel from acting on both racks at the same time one of them is placed by the side of a vertical plane projected upward from the other, so that by sliding the wheel first to one side and then to the other of this plane it will act on the two racks alternately. When the wheel has carried one of the racks with the bed or carriage in one direction to the extent of its length, it is necessary gradually to arrest this motion of the bed, which is effected by what is equivalent to a crank motion by the following means: A lever D turns on a fulcrum pin or stud on the flange-plate B, and at each end of this lever there is a round spur *b b'*, which falls into a recess *c* in the periphery of the mangle-wheel, and so soon as the cogs of the wheel are liberated from the cogs of the rack its rotation carries down that end of the lever which then acts to complete this, and commences the return motion at a connecting-rod, and by the time that the lever is carried down the other rack is in a position to mesh properly in consequence of the connection of the periphery of the wheel with the spur on the lever. The connection of the wheel with the rack being effected, the spur on the lever is liberated by the rotation of the wheel, and then the preponderance of the other end of the lever carries it back to the original posi-

tion. The same thing takes place at the end of the return movement with the other end of the lever. For the purpose of keeping the spurs *b b'* of the lever *D* in the notch of the mangle-wheel, there are two semicircular guard-plates *F F'*, the circle of which is a little greater than the diameter of the wheel, and attached to the frame, one on each side of the wheel, and so situated that the center of their inner curvature shall be the axis of the wheel. The one *F* guides the pin *b* on one end of the lever, and the other *F'* guides the spur *b'* on the other end of the lever, which, for this purpose, projects on both sides of the lever, for the two guards must be on its opposite sides to admit of the reciprocating movement of the lever which moves with the bed or carriage; but the mangle-wheel has to be moved endwise on its axis at the end of each movement to be shifted from the vertical plane of the rack that it has acted on and to be placed in the frame of the one on which it is to act. For this purpose the axle *E'* of the wheel slides in its bearings, and is provided with a long pinion *G*, which drives a cog-wheel *H* on a parallel shaft *I*, on which there is a cam *J*, which operates at the required time a slide *d*, collared on the shaft *E'*, and the cam is so formed as to move this collared slide, and with it the shaft and mangle-wheel, at the end of each movement of the bed or carriage, and this sliding of the wheel takes place while it is operating the bed or carriage by the lever *D*, the spurs *b b'* of which are of sufficient length to admit of this and yet remain in connection.

It will be obvious that instead of sliding the wheel to bring it alternately into line with the racks the same result can be obtained without changing the principle of my invention by sliding the racks instead, and it will also be evident that the wheel and shaft can receive this end movement by various mechanical arrangements well known to mechanics, and which therefore need no description. Should it be desired to reverse the motion of the machinery, it only becomes necessary to have the lever *D* provided with a shifting weight or spring, so as to throw the preponderance on the opposite end.

The shaft of the pressing-cylinder has its bearings in the upper ends of two vertical rods *M*, that slide vertically in appropriate

boxes in the frame of the press. The lower ends of these rods are of reduced size and are surrounded with helical springs *o o*, the tension of which bears them and the pressure-cylinder up when they are permitted to rise. At *m m* these rods are threaded and pass through screw-nuts *ff*, that have cogs on their peripheries by which the two can be turned simultaneously and in either direction to depress or elevate the cylinder, by means of a set of cogs on each end of a horizontal bar *L*, provided with a cam-pin *e*, which takes into a cam-groove *k*, cut in a cylinder *K* on the shaft *I* of cam *J*, so that at the appropriate periods the cam-groove shifts the bar *L*, which turns the nuts *ff* and thus either elevates or depresses the cylinder. The nuts are prevented from rising when turned to depress the cylinder by projections *nn* from the frame. The bar *L* is kept with its racks in action with the cogs of the pinions *ff* by rollers *g g* back of it at each end. When it is desired to adjust the cylinder to the bed of the press, these rollers can be taken out to throw the racks of the bar and the cogs of the nuts out of gear, so that either or both of them can be turned.

It will be evident from the foregoing that the first part of my invention is applicable to other machines as well as printing-presses.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method of ending and commencing the alternating motions of rectilinear reciprocating movements and insuring the proper relative positions of the cogs of the racks and wheel when the wheel begins to act on them by means of the two racks and cog-wheel in combination with the vibrating lever substantially as described.

2. The method of elevating and depressing the pressing-cylinder by means of the threaded sliding rods that carry the pressing-cylinder, in combination with the cogged nuts and sliding bar with a rack at each end, and so arranged that the racks and cogged pinions can be thrown out of gear for the adjustment of the cylinder, for the purpose and in the manner substantially as described.

RICHD. M. HOE.

Witnesses:

T. A. C. GREEN,
HORACE N. MARTIN.