H. B. DENNY.

Cylinder Printing-Machine.

No. 213,098 Patented Mar. 11, 1879.

Fig. 1.

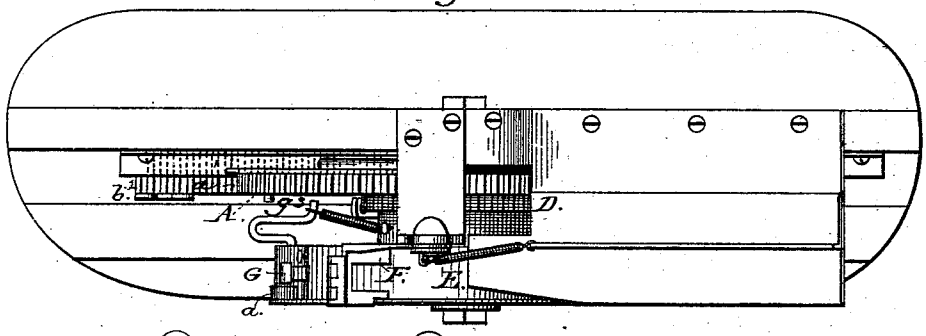


Fig. 4.

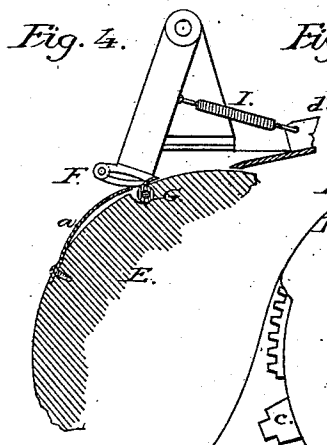
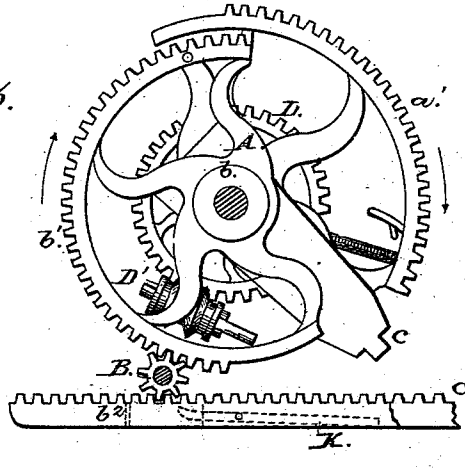


Fig. 2.

Fig. 3.



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HERVEY B. DENNY, OF CIRCLEVILLE, OHIO.

IMPROVEMENT IN CYLINDER PRINTING-MACHINES.

Specification forming part of Letters Patent No. **213,098**, dated March 11, 1879; application filed October 8, 1878.

To all whom it may concern:

Be it known that I, HERVEY B. DENNY, of Circleville, in the county of Pickaway and State of Ohio, have invented certain new and useful Improvements in Cylinder Printing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention is an improvement in the machinery by which a drum-cylinder press is operated.

It consists, first, in substituting for the shaft and rack motion now in use of a wheel formed of two segments of different radii, a small connecting or reversing spur-wheel, and a rack on the edge of the type-bed, by which a reciprocating movement is given to the type-bed while the impression-cylinder moves, rotating about an axis in common with the axis of the segmental wheel.

It consists, secondly, in the use of two sets of fingers or nippers, in connection with an impression-cylinder, one set of which receives the sheet to be printed when it is at rest, and moves while delivering it to the other set, which hold it during the operation of printing, as will be hereinafter described.

In my drawings, Figure 1 is a plan view of my invention. Fig. 2 is a side elevation, looking toward the cylinder. Fig. 3 is a sectional view, showing the relation of the segmental wheel to the rack, cylinder, &c. Fig. 4 is a detached section, showing the relation of the nippers to the cylinder.

Similar reference-letters indicate like parts in all of the figures.

Referring to drawings, A is the toothed wheel, composed of two segments, a' b^1, firmly fixed together, and hung upon a shaft, b, about which it and the impression-cylinder revolve. This segmental wheel is constructed by taking two half spur-wheels and joining them together so that they will be side by side on the shaft b, but arranged with reference to each other so that their functional continuity will be broken. These segments need not necessarily be of the same radii; but by having them unequal, as described, the connecting or reversing wheel B will be brought nearer to the center of the double segmental wheel and the construction rendered more compact. If the segments are made of equal radii, and a corresponding part of the rack lowered, the wheel B must necessarily be placed distant from the center of said wheel A and a longer rack provided. The two segments need not necessarily be of equal proportions as to length of arc, as shown, but may be varied in this respect, always keeping in view, however, to provide sufficient toothed surface to give a proper reciprocating movement to the type-bed.

The segmental wheel A is provided with a lug or projection, c, which engages with a similar lug or projection, b^2, on the rack, to insure the proper meshing of the wheel and rack, in connection with a swinging lever on the rack C, which is rigidly secured to the type-bed.

B is a plain spur-wheel, connecting the segmental wheel and the rack, by which a reverse motion is given to the type-bed. C is a rack, of ordinary construction, with width sufficient to be within reach of the inner segment, a', and the reversing-wheel engaged by the outer segment, b^1. It may be made by placing two racks side by side, as shown in the drawings, or constructed of a single piece. It is provided at the forward end with a lug, b^2, against which a similar lug on the wheel A strikes to insure proper meshing of the rack and segment b^1. To assist in a proper meshing of the segment and wheel B, I provide a V-notched projection, b^3, extending up from the side of the rack C, which is engaged by a pin, g^3, on the said segment a'. Immediately in the rear of this lug is a latch or lever, K, which the lug c on the segmental wheel depresses as it passes by, after which said latch rises to prevent the unmeshing of the rack and wheel, and also prevents the press from being turned backward.

D is a toothed wheel, rigidly attached to the double segmental wheel A, with which it moves. D′ is a worm or screw gearing with wheel D, attached to the cylinder E by suitable journal-bearings. This screw or worm is provided with a head, of a proper form, to receive a key by which said screw may be moved.

The segmental wheel A, spur-wheel D, and rack C always preserve the same relation to each other; but as it is sometimes desirable, for the purpose of getting "register," &c., to change the relation existing between the cylinder and type-bed, such change may be effected by turning the screw or worm D′ to move the impression-cylinder to produce the desired change in the register. I mean by "register" the perfect backing of two book-pages, or the equal division of margin on the sheet. To illustrate: suppose a form is placed on a press and properly secured to the type-bed, and an impression taken, the impression is found to have, say, one inch margin on one side and four inches on the other.

To equalize the margins in my press, I use the screw D′ and spur-wheel D to bring about a proper relation between the impression-cylinder and the type-bed, and by means of a lock-nut applied to the head of said screw I preserve this relation during the operation of printing.

After the adjustment in my press, by a lock-nut on the screw motion may be prevented to the register device while the press is in operation.

In presses as now constructed only one set of fingers or nippers are used, and they are attached to the cylinder and move with it. If the press is run at an unequal speed, the time at which these nippers take hold of the sheet to be printed varies, and poor register is the result. To obviate this difficulty I use two sets of fingers. The first set takes hold of the sheet when it and the sheet are at rest. The second set, which is attached to the cylinder, takes the sheet from the first and holds it until it is printed. As the first set receives motion from the cylinder at the time the transfer is made, it always moves with it at about the same speed, and perfect register is the result.

In the drawings but one set of nippers of each kind is shown, although in practice any desired number may be employed.

In my drawings, F represents the receiving-nippers; G, the carrying-nippers; I, the spring that draws the nippers F back to their place; K′, the cam which pushes them forward while the transfer of the sheet is being made, and holds them until they return for the next sheet. The nippers F are closed by contact with the cylinder or a spring, *a*, and opened by their own weight, aided by a spring when necessary. The cylinder-nippers are similar to those now in use, and require no explanation.

The operation of the press is as follows: A sheet is laid on the feed-board with the forward edge between the nippers F and its side edge against the stop or gage *d*. As the cylinder makes a revolution, at the proper time the nippers F are closed, and then swung forward at the same speed at which the cylinder moves. The fingers on the cylinder now take hold of the sheet, and at the same time the nippers F, continuing their forward movement, let go and are withdrawn from contact with the sheet. The sheet is carried around with the cylinder and receives its impression from the type as it moves.

As the cylinder and bed are geared together, the register being first regulated by the worm and gear D D′, accurate register is secured.

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

1. In a printing-press, the impression-cylinder E and the wheel A, formed of two separate segments, a' b^1, hung on the shaft on which said cylinder rotates, in combination with the rack C and spur-wheel B, as and for the purpose specified.

2. The impression-cylinder E and the toothed wheel A, composed of segments a' b^1, having a lug, *c*, projecting from it, in combination with wheel B and rack C, provided with lug b^2 and latch K, as and for the purpose set forth.

3. The nippers F and G, in combination with the cam K′, fixed to the cylinder E, said nippers F receiving motion from said cams while delivering the sheet to said nippers G, as described, for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HERVEY B. DENNY.

Witnesses:

JOHN PICKERING,

J. C. ANDERSON.