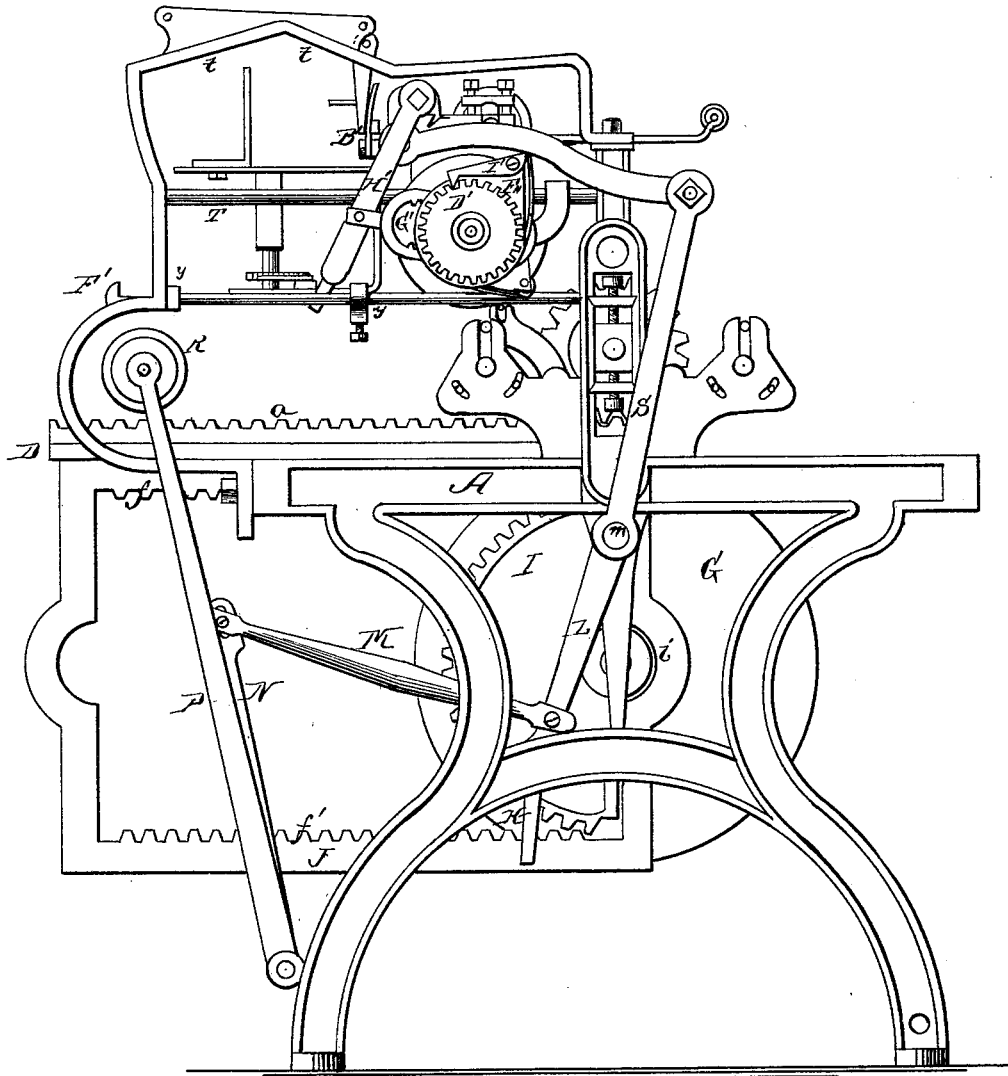


J. L. COX.  
Cylinder Printing-Press.

No. 218,493.

Patented Aug. 12, 1879.

*Fig 1*



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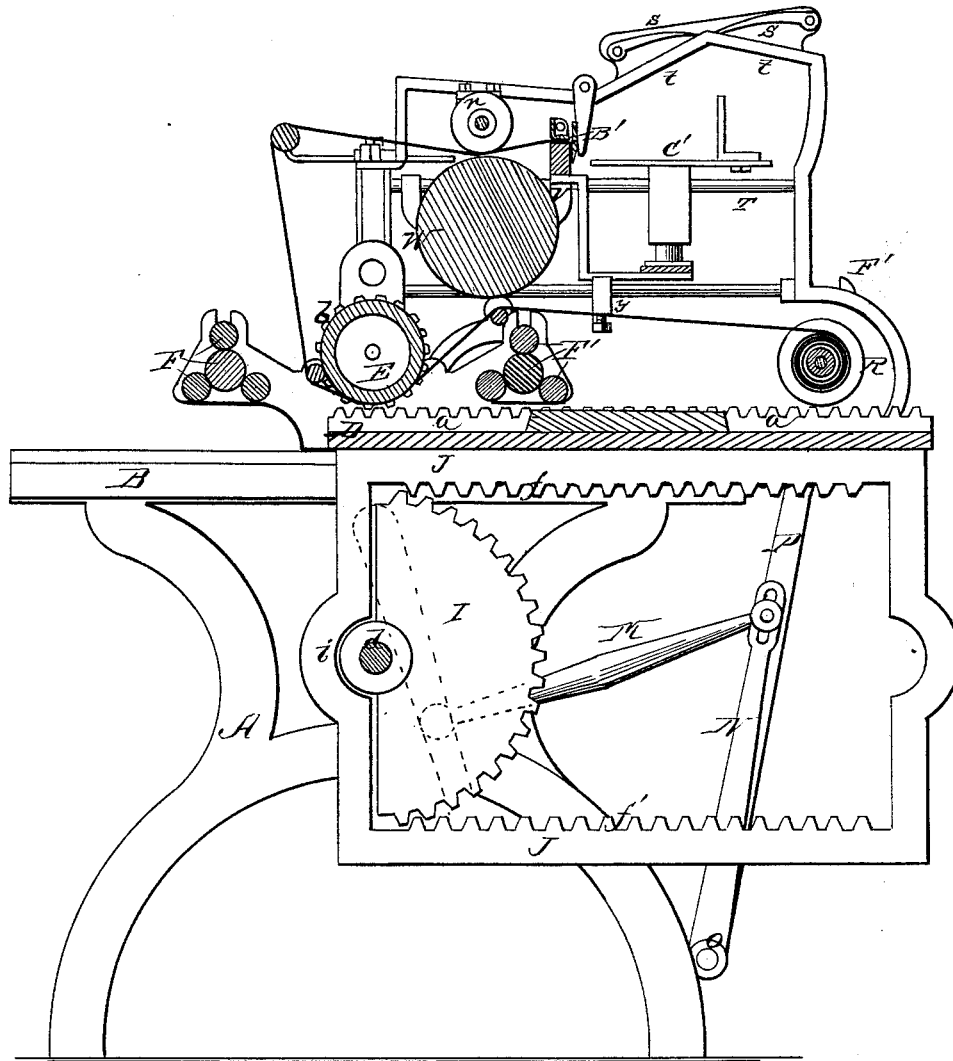
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*Fig 2*



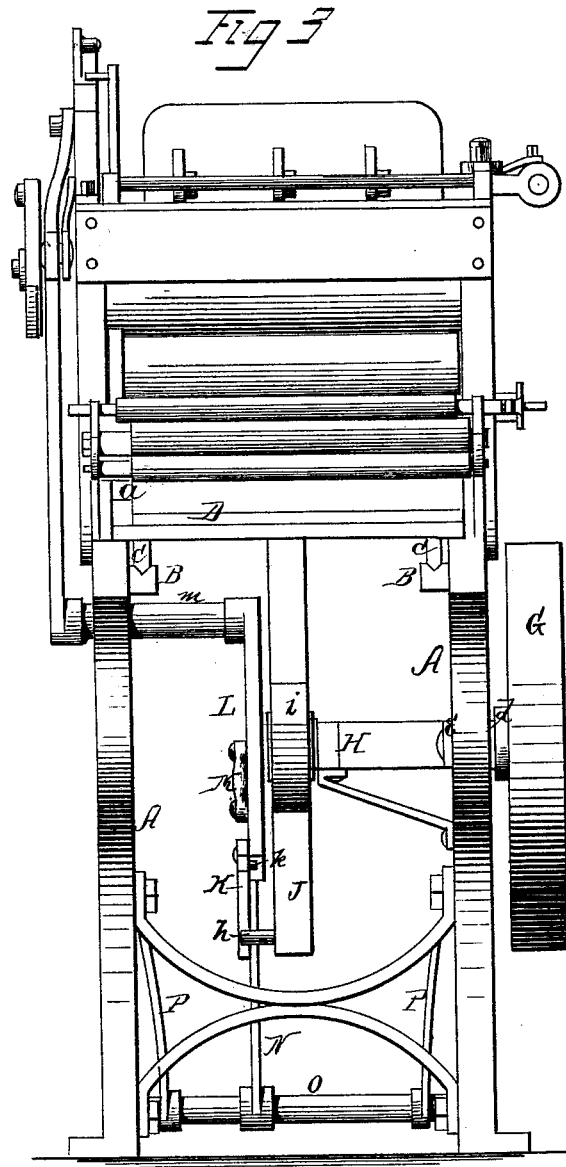
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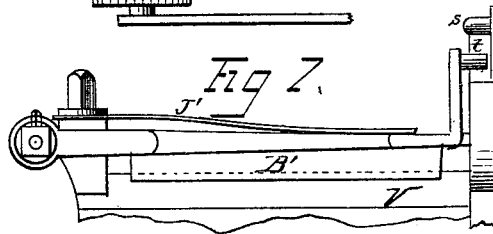
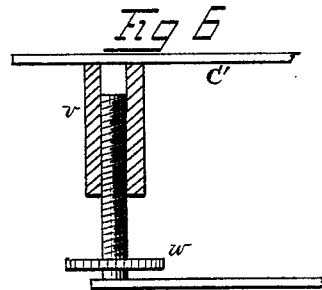
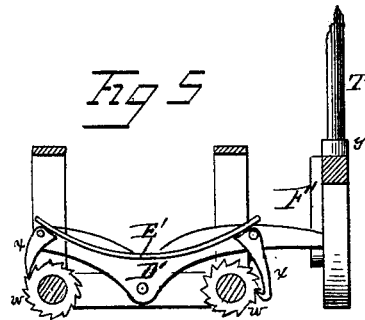
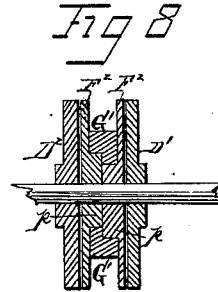
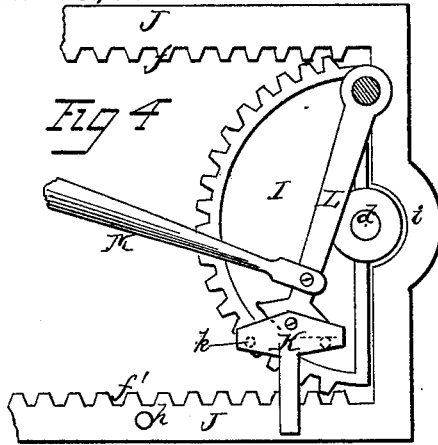
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# UNITED STATES PATENT OFFICE.

JOSEPH L. COX, OF LA FAYETTE, INDIANA.

## IMPROVEMENT IN CYLINDER PRINTING-PRESSES.

Specification forming part of Letters Patent No. **218,493**, dated August 12, 1879; application filed June 7, 1879.

### *To all whom it may concern:*

Be it known that I, JOSEPH L. COX, of La Fayette, in the county of Tippecanoe and State of Indiana, have invented certain new and useful Improvements in Job-Printing Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The nature of my invention consists in the construction and arrangement of a series of devices whereby a simple cylinder printing-press may be made to do double the amount of work by printing a copy as well in the forward as the backward movement of the carriage or bed from a continuous roll of paper, and also stack, cut, and count the same, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation, Fig. 2 a central vertical section, Fig. 3 a front elevation, and Figs. 4, 5, 6, 7, and 8 are details of parts, of my invention.

A A represent the two upright frames of the press, which are suitably connected and braced together. To the inside of these frames are fastened the guides B B, of the ordinary V shape, upon which rest and move the runners C C of the carriage or bed D. For about one-third its length the carriage is raised in the center and planed smooth and level for the reception of the forms. Along one side the upper face of the bed D is provided with a rack-bar, *a*, running the entire length thereof, which rack meshes with a gear-wheel, *b*, on the end of the cylinder E, whereby said cylinder is made to rotate first in one direction and then in the other by the reciprocating motion of the bed.

F F' represent two sets of ink-rollers, arranged in arms projecting from the central raised part of the press-frame on opposite sides of the cylinder E, said raised part of the frame carrying the adjustable boxes for the cylinder.

In order to print at both strokes of the bed there must be motion enough to carry the type

clear of the ink-rollers, both at the forward and backward movement of the bed. This motion is obtained as follows: G is the band-wheel or the wheel to which the power is applied for running the press, said wheel being secured on a short horizontal shaft, *d*, having its bearing in a box, *e*, in one of the side frames, and also in a stout bearing, H, suitably braced on the inner side of said side frame. On the inner end of the shaft *d* is attached a semicircular spur or gear wheel, I, of suitable dimensions, which works alternately upper and lower racks, *f* and *f'*, attached to a frame, J, that is bolted to the under side of the bed D, and runs the entire length thereof. As the wheel G is rotated in the proper direction the half spur-wheel I, operating against one of said racks, will move the carriage or bed D to the end of its stroke, at which position the wheel I is entirely out of gear with both racks, but resting with its diametrical flat side against the upright of the rack-frame J, which upright has a semicircular recess or cavity at *i* for the reception of the hub of said wheel I. This wheel will then act as a cam and push the carriage until the first tooth of the half-wheel engages itself fully between the two first teeth of the other rack, and then by the engagement with said rack continue to run the carriage in the opposite direction to the end of the stroke, thus making an easy and sure reciprocating motion without resort to any expensive devices, such as generally used in cylinder-presses.

In order to print from a continuous roll of paper at both strokes of the bed or carriage it is absolutely necessary, first, to keep the paper always at the same tension through the entire operation; second, to have the roller supplying the paper, as well as that which does the feeding, arranged in such a manner as to move accurately with the carriage while the paper is fastened between the type and cylinder; and, third, to have the feeding done as soon as the cylinder is disengaged from the type, at the end of which latter operation the shear drops and cuts off the printed sheet. These conditions are fulfilled by a system of levers and their attachments, as follows:

From the center of the lower rack, *f'*, projects a steel pin or stud or roller, *h*, which op-

erates a T-shaped pawl, K, pivoted to the side of a lever, L, near the lower end thereof, said lever being attached to a rocking shaft, *m*. Each side arm of the pawl K is provided with a pin, *k*, to form a stop and limit the movement of the pawl on its pivot. To the lever L is attached a connecting-bar, M, the other end of which is adjustably attached to an arm, N, projecting from a rocking shaft, O. On this shaft are secured two other arms, P P, which extend upward, one on each side of the press, and carry at their upper ends the paper-roll R.

The rocking shaft *m*, above mentioned, is provided on its outer end with an arm, S, which connects with the upper roller-carriage, V, that slides upon two round bars or guides, T T.

The pawl K hangs in its normal position perpendicularly. Now, as the bed D is moved in one direction the pin *h* turns the pawl until the proper pin *k* thereon forms the stop, when the lever L will be turned until the pin *h* can pass the pawl, when the pawl drops down in a perpendicular position, ready for the return movement of said pin. In this manner the pin and pawl may be made to move the roll of paper on the arms P, and also the feed-roller W, between which and the tape-rollers *n n* the paper is held, at precisely the time when the edge of the bed arrives at the cylinder, continue till it has passed beyond the edge on the other side, and then move still farther on until the paper is moved sufficiently for the size of the copy and margin, then cut off and placed on the stack.

The carriage V contains the feed-roller W and tape-rollers *n*, as shown, and carries also the shears B' and a descending platform, C', on which latter the printed sheets are deposited.

The device for moving the paper just at the time required and just as much as is needed is as follows:

On the shaft of the roll W are secured two ratchet-wheels, D<sup>1</sup> D<sup>2</sup>, which have placed between them two loose disks, F<sup>2</sup> F<sup>1</sup>, carrying pawls I' I' to engage with the ratchet-wheels. These disks are formed with pinions *p p*, so arranged that a double rack, G', placed around them, will have the upper rack engaging with one pinion and the lower rack with the other pinion.

H' is a lever pivoted to the double rack (G', and its upper end attached to the carriage V, and having its lower end working between two adjustable stops or collars, *y*, on a rod below one of the guides T. As the carriage V is moved back and forth the lower end of the lever strikes one of the stops, and by means of the double rack turns one of the disks F<sup>1</sup>, and this, through its pawl I', turns the roll to feed any sized sheet, according to the adjustment of the stops.

The paper, after leaving the feed-roller, enters the shear B', whose downstroke is caused by a spring, J'. It is raised in proper time by two inclined planes, *t t*, secured to the frame of the machine, and when raised it is kept in position by the pivoted tongues *s s*, and dropped at each end of the stroke. The paper is then deposited on a platform, C', which is adjustable as to width, and which, by means of two long nuts, *v v*, ratchets *w w*, and spring-pawls *x x*, is made to descend as the paper is piled on, thus obviating the necessity of flies.

The pawls *x* are operated in the following manner: They are pivoted on a rocking bar, D<sup>1</sup>, and a double-acting spring, E', is attached to said bar to bear on the pawls. One end of the rocking bar strikes hooks or projections F<sup>1</sup> on the frame of the machine at the completion of the stroke, thereby turning the bar D<sup>1</sup> sufficiently to cause the pawls to rotate the ratchets *w*, and thus turn the nuts to lower the table a certain distance.

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

1. The combination of a reciprocating type-bed, a reciprocating feed-roller, and a reciprocating paper-roll, all operating or moving substantially as herein set forth, for printing from a continuous roll both at the forward and backward movement of the bed.

2. The combination of the reciprocating type-bed D with rack-frame J, having projecting pin or roller *h*, the T-shaped pawl K, with stops *k k*, and the lever L, for operating the paper-roll and feed-roller, substantially as herein set forth.

3. The combination of the lever L, connecting-bar M, rocking shaft O, with arms N and P P, and the paper-roll R, substantially as and for the purposes herein set forth.

4. The combination of the feed-roller W, tape-rollers *n*, shear B', and platform C' upon or with a reciprocating carriage, V, substantially as herein set forth.

5. The combination of the shear B', spring J', inclined planes *t t*, and pivoted tongues *s s*, substantially as and for the purposes herein set forth.

6. The combination, with the platform C', of the nuts *v v*, ratchets *w w*, rocking bar D<sup>1</sup>, with spring E' and pawls *x x*, and the hooks or projections F<sup>1</sup>, substantially as and for the purposes herein set forth.

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

JOSEPH L. COX.

Witnesses:

ANDREW H. YOUNT,  
ALEX. TILLMAN.