

(No Model.)

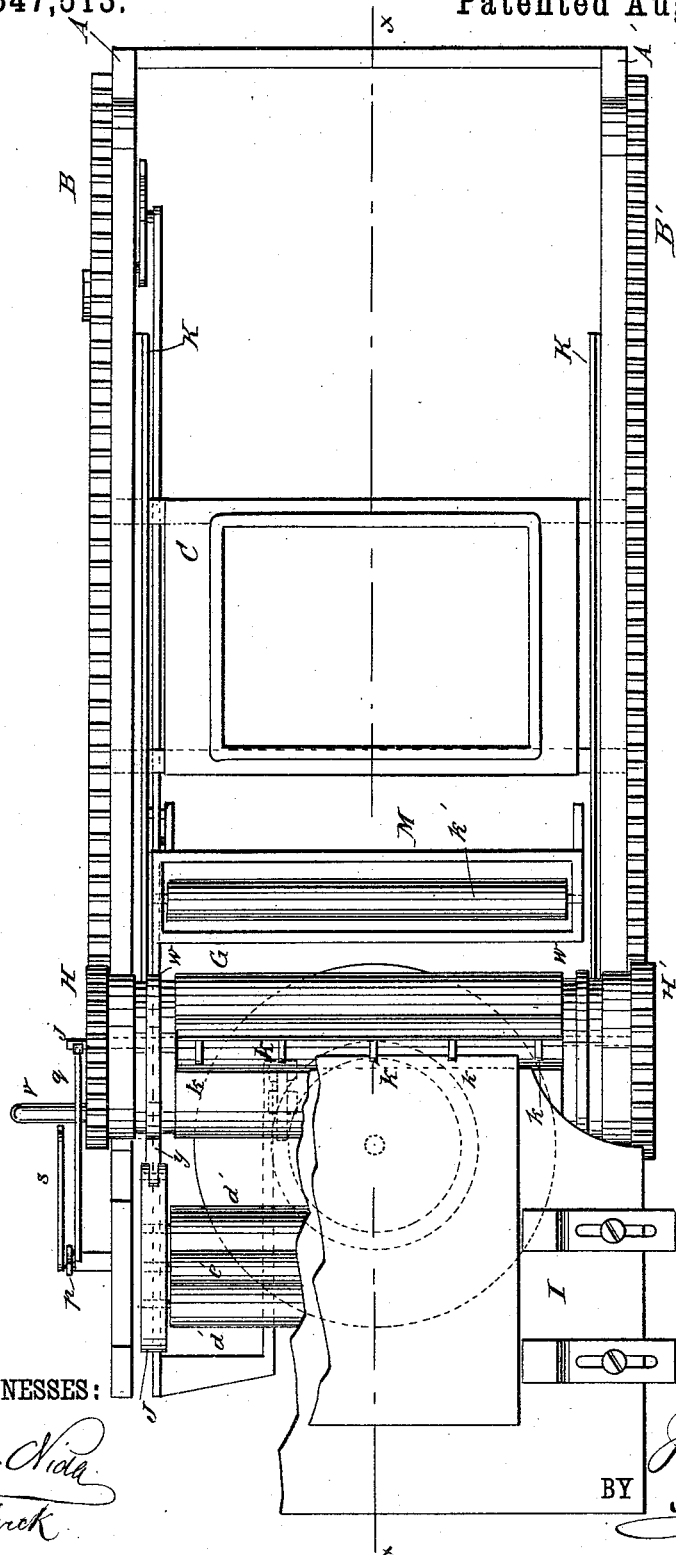
2 Sheets—Sheet 1.

J. C. RAIRIGH.  
CYLINDER PRINTING MACHINE.

No. 347,513.

Patented Aug. 17, 1886.

Fig. 1.



WITNESSES:

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INVENTOR:

*J. C. Rairigh*  
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BY

ATTORNEYS.

(No Model.)

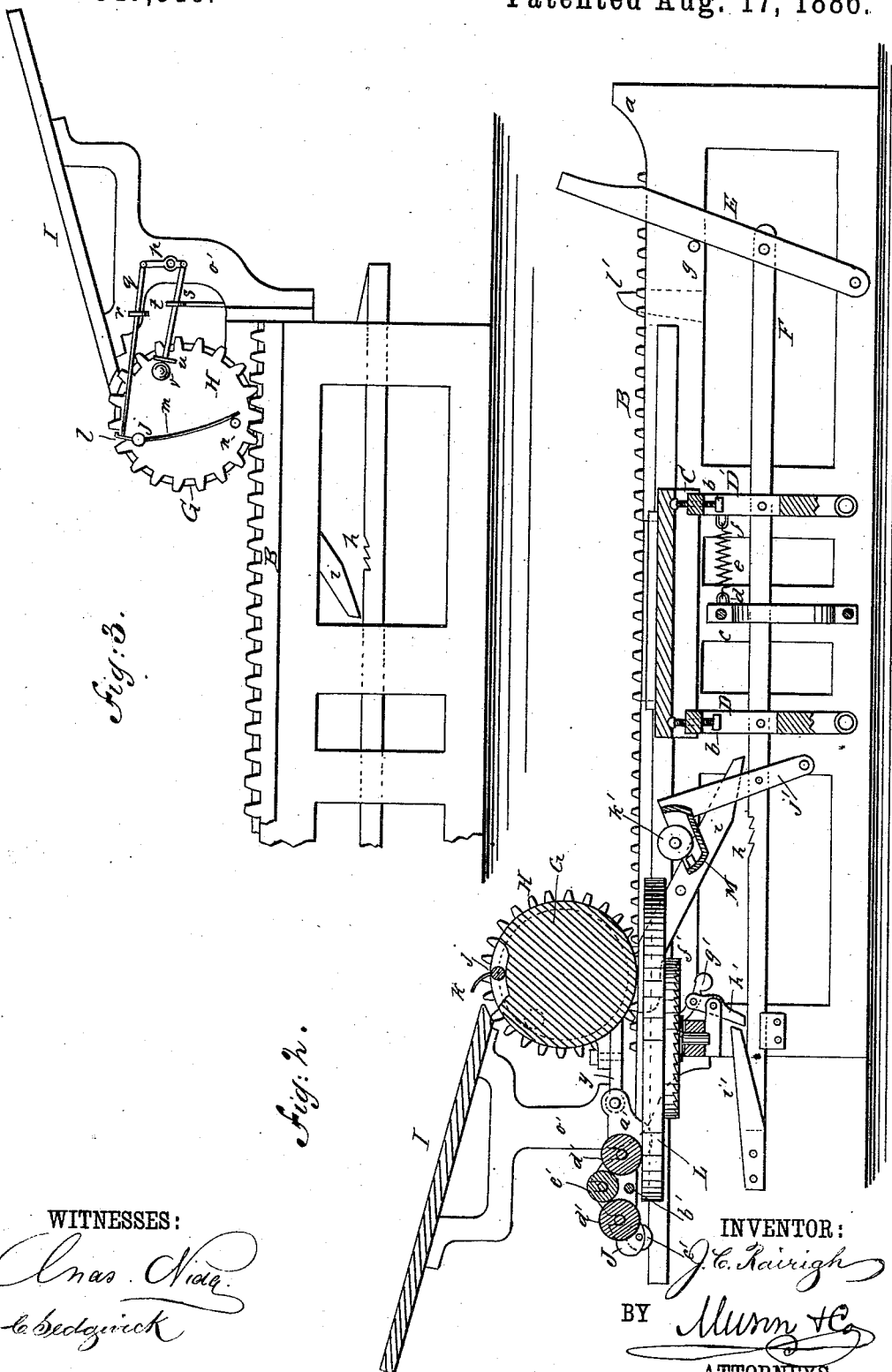
2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

JACOB CULLEN RAIRIGH, OF BROCKWAYVILLE, PENNSYLVANIA.

## CYLINDER PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 347,513, dated August 17, 1886.

Application filed March 4, 1886. Serial No. 193,989. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB CULLEN RAIRIGH, of Brockwayville, in the county of Jefferson and State of Pennsylvania, have invented a new and useful Improvement in Cylinder Printing-Machines, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a plan view of my improved printing-press. Fig. 2 is a longitudinal section taken on line *xx* in Fig. 1. Fig. 3 is a partial side elevation.

Similar letters of reference indicate corresponding parts in the different figures of the drawings.

The object of my invention is to construct a simple, easily operated, inexpensive, and efficient hand printing-press.

My invention consists in the combination, with a supporting-frame and movable bed, of a cylinder arranged to roll over the frame and carry the paper over the type supported by the bed, in novel means for inking the type and distributing the ink; also, in a novel device for lowering the bed on the return movement of the cylinder and raising the bed after the cylinder has returned to the point of starting.

It also consists in mechanism for operating the paper-nippers carried by the cylinder and for releasing the paper from the nippers, all as hereinafter more fully described.

The bed or main frame of the machine is composed of the side pieces, *A A'*, and cross-pieces at the ends and at suitable intervals between the ends. The side pieces, *A A'*, at the foot of the machine are curved upward to form stops *a*, for arresting the movement of the printing-cylinder, and upon the outer side of the side pieces along their upper edges are arranged racks *B B'*.

In the center of the frame is supported the bed *C* upon frames *D D'*, pivoted at their lower ends to the side pieces of the main frame and provided with adjusting-screws *b*, which extend upward through the horizontal parts of the frames *D D'* with their rounded upper ends received in hemispherical cavities formed in the under surface of the bed. By means of these screws the bed may be adjusted as to height or leveled.

To the side pieces, *A A'*, between the pivoted frames *D D'*, is secured a cross-bar, *c*, provided with one or more eyes, *d*, for receiving one or more spiral springs, *e*, connected with eyes *f* on the frame *D'*, for returning the frames *D* to a vertical position after they have been moved in the manner presently to be described.

To the side piece, *A*, of the main frame near the bottom thereof is pivoted a lever, *E*, which extends above the top of the frame and is pivoted to a bar, *F*, extending past the frames *D D'* to the opposite extremity of the press. The bar *F* is pivoted to the frames *D D'*, so that when the lever *E* is moved forward, the frames *D D'* and the bed *C* will be moved in the same direction, and when the lever *E* is released the spring *e* will return the frames *D D'* to a vertical position. The distance through which the frames, the bar *F*, and the lever *E* move is limited by a stop, *g*, projecting from the side piece, *A*, of the frame in the path of the lever *E*. In the upper edge of the bar *F* are formed ratchet-teeth *h*, in position to be engaged by the pawl *i*, pivoted to the side piece, *A*, and projecting above the upper edge thereof, the lower end of the said pawl being made heavier than the upper end, to insure its engagement with the ratchet.

A cylinder, *G*, whose circumference corresponds with the length of the sheet to be printed, rests upon the upper edges of the side pieces, *A A'*, and is provided at opposite ends with spur-wheels *H H'*, which engage the racks *B B'* and cause the cylinder, as it is moved from one end of the press forward to the other, to preserve a parallel motion, and also to preserve its relation with the paper-feeding table. The cylinder *G* is grooved longitudinally in one side to receive the nipper-shaft *j*, carrying the nippers *k*, which reach over upon the surface of the cylinder at the side of the groove in position to catch and hold the paper sheet to be printed. One end of the shaft *j* projects through the spur-wheel *H*, and is provided with an arm, *l*, which projects outward toward the periphery of the spur-wheel *H*, and from the opposite side of the shaft projects a spring, *m*, which abuts against a pin, *n*, projecting from the side of the wheel *H*.

Above the path of the cylinder G is supported a table, I, by the standards *o o'*, secured to the main frame of the press. The table I supports the unprinted paper in a convenient position for feeding to the cylinder G. To the longer arm of a lever, *p*, pivoted to the standard *o'*, is connected a rod, *q*, which passes through a guide, *r*, and reaches into the path of the arm *l*, and to the shorter arm of the lever *p* is pivoted a rod, *s*, passing through the guide *t*, and having at its free end a T-shaped head, *v*, which is supported in the path of a handle, *v*, projecting from the side of the wheel H, so that when the cylinder G is moved forward toward the table I, the arm *l* and the handle *v* will be simultaneously brought into contact with the rods *q* and *s*. A very slight movement of the cylinder, after the contact of the arm and handle with the rods, pushes the rod *s* back, and through the medium of the lever *p* forces the rod *q* forward, turning the arm *l* and shaft *j* with its nippers *k*, thus opening the nippers for the reception of the sheet to be printed.

Around the ends of the cylinder G are formed circumferential grooves, for receiving rings *w*, provided with the short arms *y*, which are pivoted to opposite ends of the ink-roller frame J, which rests and slides upon the bars K, secured to the inner faces of the side pieces, A A'. The frame J is formed of the end pieces, *a'*, and a cross-bar, *b*, and to reduce the friction of the frame upon the bars K the frame is provided with friction-rollers *c'* in the under surface thereof, which roll upon the bars K. In the frame J are journaled three rollers, *d' d' c'*, the roller *c'* being placed between the rollers *d'* and above the line of their centers under the table I.

The circular ink-distributing table L is journaled vertically in a cross-piece of the main frame in position to be touched by the rollers *d'* as they are moved back and forth by connection with the cylinder G, and the under surface of the table L is provided with a ratchet, *f'*, which is engaged by a pawl, *g'*, pivoted to the end of the lever *h*, which is supported by the main frame of the press in position to be engaged by the arm *i*, secured to the rod F, so that whenever the rod F is reciprocated the inking-table L will be turned through part of a revolution. An ink-trough, M, is supported between the bed C and the inking-table L by arms *j'*, pivoted at their lower ends to the side pieces of the press-frame, one of them being jointed to the rod F, so that as the rod F is moved back and forth the ink-trough M will be oscillated and the ink-roller *k'*, carried by the trough and dipping in the ink contained by the trough, will be alternately moved into and out of the path of the rollers *d'*. To the side piece, A, near the end of the frame opposite the table I, is secured a finger, *l'*, in the path of the arm *l*.

The operation of my improved printing-press is as follows: A quantity of the sheets of paper to be printed having been placed on the

table I, the pressman feeds forward one sheet, which is received by the nippers *k* and the periphery of the cylinder G, and when the cylinder is turned in the direction required to carry it toward the opposite end of the machine the arm *l*, being released from the rod *q*, allows the spring *m* to close the nippers down upon the paper and the paper will be carried forward and wrapped around the cylinder by the rolling motion of the cylinder. When the cylinder reaches the bed C, the type supported thereby having been previously inked, the paper is rolled over the type, taking the impression, and is afterward carried forward to the foot of the machine, when the arm *l* strikes the finger *l'*, releasing the paper from the nippers. At the same time the cylinder G strikes the lever E, and through the medium of the rod F, connected therewith, swings the frames D D' in opposition to the tension of the spring or springs *e*, carrying the type downward out of the path of the cylinder. At the same time it swings the arm *j'* so as to bring the inking-roller *k'* into the path of the inking-rollers *d'*, permitting the inking-rollers *d'* to take the supply of ink requisite for one impression from the roller *k'* and carry it to the distributing-table L. When the cylinder G reaches the limit of its return-stroke, it strikes the upper end of the lever *i* and withdraws it from the ratchet-teeth *h* of the bar F, allowing the springs *e* to return the frames D D' to their vertical position and again bring the type into position for printing. The same operation, by swinging the arms *j'*, removes the ink-roller *k'* from the path of the ink-rollers *d'*, so that as the cylinder G is again moved forward the rollers *d'* will be carried along with it without touching the ink-rollers *k*.

Although my improved press is designed to be operated by hand by means of the handle *v*, I may arrange it for connection with suitable power.

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

1. In a printing-press, the combination, with the frame A A', the traveling cylinder G, and its automatically-operated nippers *k*, the bed C, the vertically-swinging frames D D', carrying said bed, the longitudinally-movable rod F, pivotally connected to said frames D D' beyond their pivotal points, and the lever E in the path of the cylinder and pivoted to the frame and to the said rod, substantially as set forth.

2. The combination, with a longitudinally-grooved printing-cylinder, G, of the nipper-shaft *j*, nippers *k*, carried thereby, the arm *l*, and spring *m*, attached to the end of the nipper-shaft, the handle *v*, lever *p*, and the rods *q s*, substantially as herein shown and described.

3. The combination, with the frame, the longitudinally-grooved printing-cylinder having a handle, *v*, of the nipper-shaft *j*, nippers *k*, carried thereby, the arm *l*, and spring *m*, attached to the end of the nipper-shaft, the le-

ver *p*, pivoted to the frame, the rods *q s*, pivoted to the opposite ends of said lever and extending into the paths of the arm *l* and handle *v*, respectively, and the projection *l'* on the opposite end of the frame in the path of the arm *l*, substantially as set forth.

4. The combination of a frame formed of side pieces, *A A'*, and cross-pieces connecting the same, racks *B B'*, secured to the sides of the frame, the cylinder *G*, provided on opposite ends with spur-wheels *H*, the bed *C*, supporting frames *D D'*, the spring *e*, rod *F*, provided with ratchet-teeth *h*, lever *E*, and the pawl-lever *i*, substantially as described.

5. The combination, in a printing-press, with the cylinder *G*, adapted to receive and carry paper for printing, of the movable bed *C*, the swinging frames *D D'*, the lever *E*, rod *F*, provided with the arm *i'*, the inking-table *L*, provided with the ratchet *f'*, the lever *h'*, the pawl *g'*, arranged to engage the ratchet *f'*, and the inking-rollers *d'*, arranged to be moved by the cylinder *G*, substantially as described.

6. The combination, with the lever *E*, rod *F*, inking-table *L*, and mechanism, substantially as described, for imparting motion from the rod *F* to the inking-table, of the ink-trough *M*, ink-roller *k'*, journaled in the ink-trough, arms *j'*, pivoted to the frame of the press and pivotally connected with the rod *F*, and the rollers *d'*, arranged to be moved over the inking-table and over the roller *k'*, as herein specified.

7. In a printing-press, the combination of the circumferentially-grooved cylinder *G*, the rings *w*, received in the grooves of the cylinder, the frame *J*, connected with the rings, the rollers *d' e'*, carried by the frame, and means for supplying the rollers with ink, substantially as herein shown and described.

JACOB CULLEN RAIRIGH.

Witnesses:

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W. C. PENTZ.