

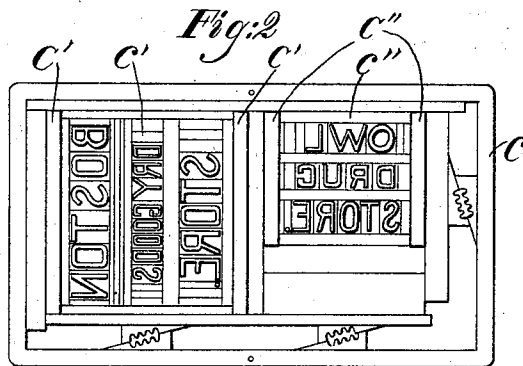
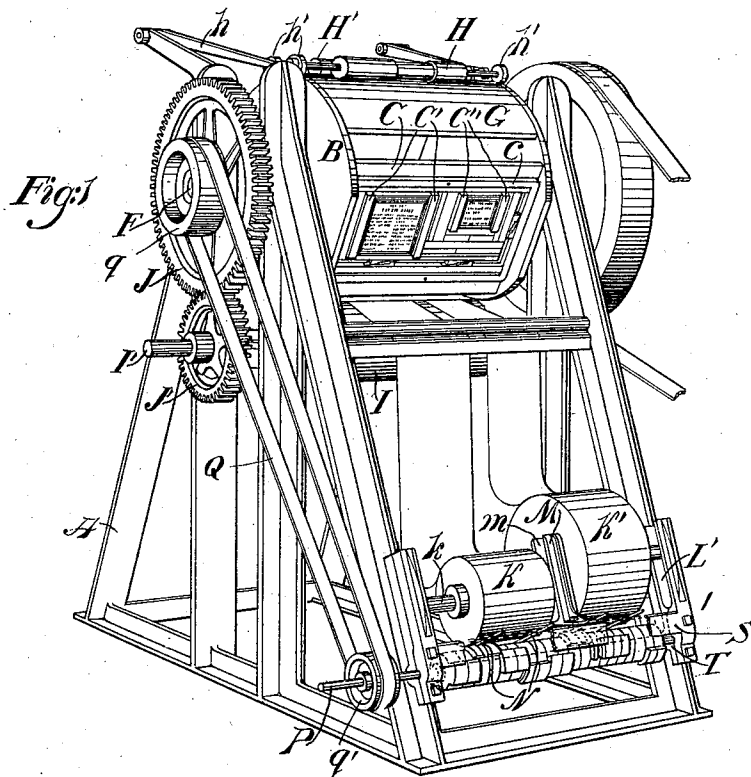
(No Model.)

2 Sheets—Sheet 1.

H. S. MERRILL.
FLAT FORM ROTARY PRINTING PRESS.

No. 588,231.

Patented Aug. 17, 1897.



Witnesses:

F. T. Johnson

Alfred J. Townsend

Inventor:

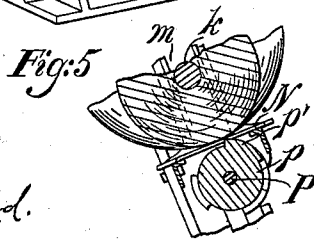
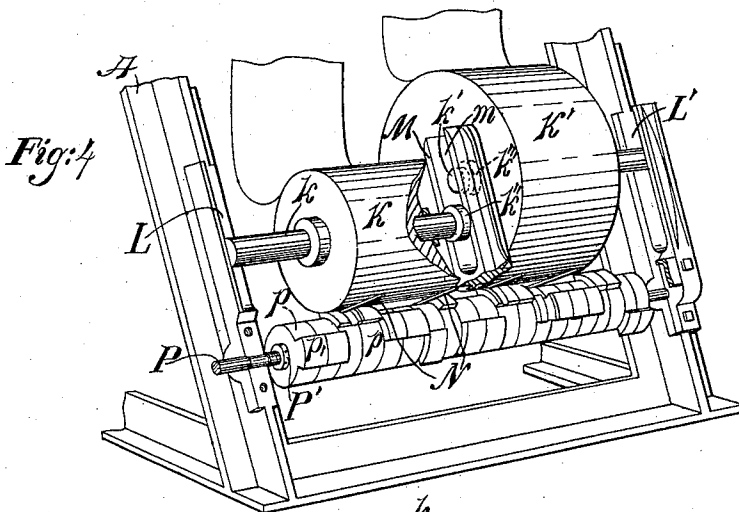
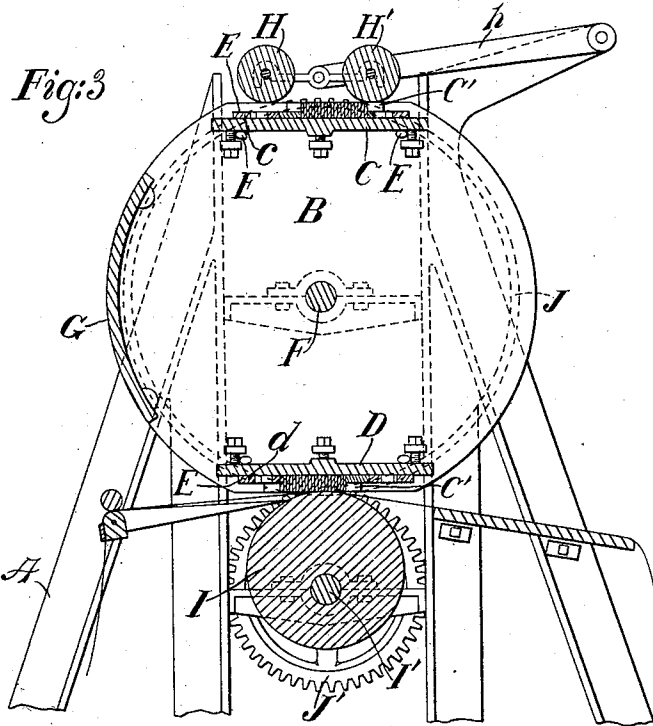
Harry S. Merrill

by
Hazard & Townsend
his attys

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UNITED STATES PATENT OFFICE.

HARRY S. MERRILL, OF LOS ANGELES, CALIFORNIA.

FLAT-FORM ROTARY PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 588,231, dated August 17, 1897.

Application filed August 3, 1896. Serial No. 601,503. (No model.)

To all whom it may concern:

Be it known that I, HARRY S. MERRILL, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Flat-Form Rotary Printing-Press, of which the following is a specification.

My invention relates to those presses in which a flat form of type is arranged to have an impression thereof taken by means of a rotary impression-cylinder.

One object of my invention is to provide a printing-press of this character which will be very simple in construction, easy to manufacture, and not liable to become broken or to get out of order and one in which greater speed can be obtained than with any press of this class heretofore in use.

One especial object of my invention is to provide a press of this kind which will have no cam-shaped gears and no elliptical impression-rollers, whereby I am enabled to avoid the great expense which is necessary to provide gears and rollers of other than the ordinary cylindrical shape, also at the same time to provide for the positive action of the type-carrying cylinder and impression-cylinder and to mount both in fixed bearings, so that when under high speed there will be an absence of friction and the consequent wear and strain upon the press which are present where the type-cylinder is carried toward and from the impression-cylinder by means of cam-shaped guideways.

My invention is especially designed for use in job-printing and is adapted to be operated either with a cutter which will sever the web into sheets of proper size after the impression is taken, or the web may be rerolled in case it is desired to print advertisements upon rolls of paper used by merchants.

My invention comprises the various features of construction and combinations of parts whereby I secure cheapness and effectiveness of the machine and am enabled to accomplish the objects hereinbefore set forth.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective front elevation of a machine embodying my invention. Fig. 2 is a top view of a chase having two forms locked in position therein ready to be secured

upon the rotary carrier of the press. Fig. 3 is a vertical mid-section of the machine shown in Fig. 1. Fig. 4 is a fragmental perspective view illustrating the device which I employ for unwinding the web from the paper-roll, and Fig. 5 is a fragmental section of the same.

In the drawings, A represents the frame of my improved press, and B represents a rotary carrier which is provided upon opposite sides with type-beds C and D, respectively, to receive thereupon chases *c* and *d*, respectively, containing flat forms of type. These chases holding the forms are secured upon the type-bed by means of thumb-screws E in the ordinary manner.

F is an axle or shaft upon which the carrier is mounted, and G represents an ink-distributing surface arranged upon the carrier.

H H' are ink-rollers, which are secured to arms *h*, which are pivotally secured to the frame of the press. The ink-rollers are each provided with supporting-wheels *h'*, which travel upon the ends or heads of the carrier and are arranged in sections to ink the forms only and to receive the ink from the ink-distributing surface as the carrier carries the forms and the ink-distributing surface beneath the ink-rollers.

I is an impression-cylinder, which is made cylindrical in form and is mounted eccentrically upon a shaft I'. Suitable gears J and J' connect the rotary carrier and the impression-cylinder with each other, so that they operate simultaneously.

The gearing shown is so arranged that the impression-cylinder makes two revolutions to one revolution of the form-carrier, thus at each revolution of the carrier to take the impression of the forms upon both of the type-beds, if desired.

By making the impression-roller cylindrical in cross-section it can be easily and accurately turned without great expense. I am also enabled to make the gear-wheels J and J', which connect the carrier and the cylinder with each other, of the usual circular shape, thus also avoiding expense of construction and the friction and wear which are caused by irregular gears meshing with each other. The expense of making a round impression-roller is less than one-half that of making an impression-roller of elliptical or oval shape, and, further-

more, by my improved construction I avoid the necessity of providing cam-guides, which have heretofore been necessary to guide the carrier in its reciprocation toward and from the impression-cylinder.

By referring to Fig. 3 it will be seen that the cylindrical impression-roller by reason of its eccentric shaft compensates for the unequal rate of speed at which the flat face of the rotating type-form travels. As the carrier rotates the extreme front edge of the type-form first contacts with the impression-cylinder, and as the form travels the cylinder travels and the point of contact between the form and the impression-cylinder first advances toward the axis of the carrier until the center line of the form is reached, after which it recedes until the rear edge of the form leaves the cylinder.

In Fig. 2 of the drawings I have shown two forms of type c' and c'' , arranged side by side upon the same type-bed. One of these forms is arranged to require, say, for instance, three inches of its respective web to take the impression and allow for a suitable margin. The other form, for instance, requires six inches of web for the impression of its form and a margin.

K and K' represent two independent rolls of paper which are supported upon independent shafts k and k' , the outer ends of which respectively slide in substantially vertical but slightly-inclined grooves L and L', provided in the frame of the machine, and the inner ends of which slide in a guide-groove m , which is provided in an adjustable division-bracket M and corresponds in inclination to the guide-grooves L and L'. The bracket may be rendered adjustable by bolts, thumb-screws, clamps, or any of the many well-known expedients employed for such purposes, and detailed description and illustration of such means herein are unnecessary to the complete understanding of my invention.

The shafts k and k' are each provided with a collar k'' and k''' , respectively, which engage with the sides of the partition and prevent the ends of the shafts from engaging with each other.

N represents a series of supporting-fingers upon which the rolls of paper rest when the rolls are not being rotated to unwind the paper therefrom.

By supporting the roll of paper upon fingers and lifting the roll from such fingers to unroll the quantity of paper required the device is rendered very simple, in that the feeding devices remain always in the same position, and the paper-roll is by the force of its own weight advanced into proper position to be operated upon. I thus avoid using mechanical devices which are necessary to maintain the feed-disks in proper position to operate upon the paper-roll when the feeding-disks are supported above the paper-roll, as has heretofore been proposed. Furthermore, the contact of the roll with the fingers after

each partial rotation acts as an efficient brake which prevents more paper being unwound from the roll than is required.

P represents a feed-shaft, upon which are arranged a series of independent feed-disks p , the main body of each disk being small enough to allow the body of the disk to revolve beneath the paper-roll without being carried into contact therewith, but upon the periphery of each disk is provided a segmental bearing p' , which enlarges the diameter of the disk at such point sufficiently to bring the bearing into contact with a roll of paper and to lift such roll from the fingers N and to rotate the roll while the disk-bearing is in engagement therewith.

By reason of each disk being provided with a bearing forming only a segment of a circle by adjusting the disks upon the shaft the various segments may be arranged in line with each other, so that they will feed from the roll paper only equal in length to the length of the bearing-face of one segment, or the segments may be arranged out of line with each other to form a bearing-face partially or entirely encircling the shaft, so as to feed from the roll the exact amount of paper necessary to take the impression of its particular form. These feed-disks are separate from each other and are held in place by means of a nut P', which screws upon the screw-threaded end of the shaft and clamps the disks firmly together. Thus the bearings can be adjusted so as to intermittently support and rotate each roll of paper or to rotate the roll continuously if the form requires that much paper to take the impression.

Each type-form is provided with a suitable bearing C' C'', one arranged upon each side of each form to engage with the web of paper and to press it firmly against the impression-cylinder and to thereby carry the web forward before the type of the form is brought into contact with the web. These bearings are of sufficient length to carry the required length of paper through the machine to give sufficient margin for each impression. The bearings can be regulated to suit each form, and the feed-rollers can be regulated to supply from each roll of paper just that which is required to provide sufficient loose paper, so that while the web is being drawn into the machine while the impression of the form is being taken there will be no danger of the web tearing by reason of having to unwind the web from an inert roll.

In Fig. 1 the cross-bar S, which supports the outer ends of the fingers N and the end of the partition-bracket M, is broken away, only a fragment of each end thereof being shown. In Fig. 4 this cross-bar and one member of the box T of the feed-shaft are both removed, exposing the shaft K in its slot.

A belt Q and suitable pulleys q q' connect the feed-shaft with the rotary carrier, so that the carrier and the feed-shaft rotate in unison.

It will be understood that only one form

may be used, if desired, or four forms may be used in the press shown in the drawings.

My invention is not limited by the number of forms printed from, since the principle is the same whether one or many forms are used.

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

1. In a printing-press, the combination set forth of a rotary carrier provided with a type-bed; a form on said bed; an ink-distributing surface arranged upon said carrier; suitable inking-rollers; a rotating cylindrical impression-roller mounted eccentrically upon a shaft; suitable means for feeding a web between the impression-cylinder and the form; and suitable means for rotating the carrier and the impression-cylinder.

2. A printing-press comprising a rotating frame carrying a flat form and an ink-distributing surface; rollers adapted to ink the form; a rotating cylindrical impression-roller mounted eccentrically upon a shaft, and adapted to carry the web against the form; suitable means for intermittently feeding a web between the impression-cylinder and the form; and means for rotating the frame and the impression-cylinder in reverse directions so that the opposing faces of the form and the impression-cylinder will travel in the same direction and at the same rate of speed.

3. In a printing-press, a rotary carrier provided on one side with a type-bed, and on another side with an ink-distributing surface; an impression-cylinder mounted eccentrically upon a supporting-shaft; gears connecting such shaft with the carrier; ink-rollers adapted to ink a form secured upon the type-bed,

and to be inked by the ink-distributing surface; such form, mounted upon the type-bed; a roll of paper mounted upon a vertically-movable shaft and supported by fingers; and a rotating feed-roller adapted during a portion of its rotation to engage with the roll, to lift it from the fingers and rotate it.

4. In a rotary printing-press, the combination set forth of a frame provided with substantially vertical slots; a paper-roll mounted on a shaft having its ends arranged to slide in such slots; means arranged to support the roll; and means adapted to intermittently lift the roll from its support and to partially rotate it while thus lifted.

5. In an intermittent feed for rotary presses, the combination of a paper-roll; suitable supports for supporting such roll; and suitable means adapted to intermittently engage the roll, lift it from the supports and partially rotate it while lifted.

6. In an intermittent feed for rotary presses, the combination of a paper-roll; suitable means for supporting such roll; and a feed-roller having adjustable bearing-faces adapted to intermittently engage the roll, lift it from its support and partially rotate it.

7. In combination, two paper-rolls, each mounted upon an independent shaft; suitable supports arranged to support each roll; and a feed-shaft, provided with adjustable bearing-faces adapted to engage both rolls, lift them from their supports and partially rotate them while so lifted.

HARRY S. MERRILL.

Witnesses:

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