

(No Model.)

4 Sheets—Sheet 1.

T. BARTHOLOMEW.
PRINTING MACHINE.

No. 531,088.

Patented Dec. 18, 1894.

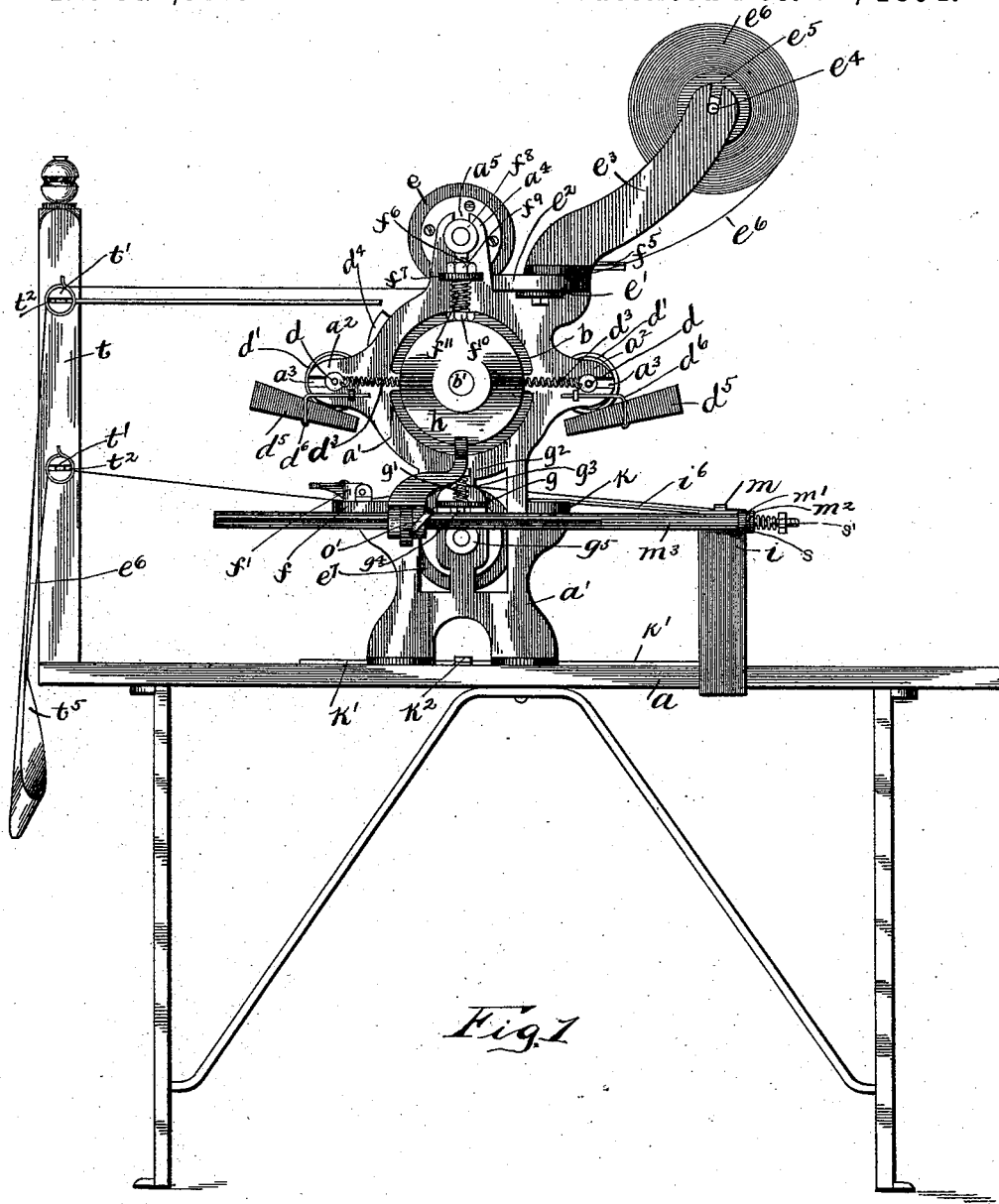


Fig. 1

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INVENTOR
Thomas Bartholomew

BY *Staley and Shepherd*
ATTORNEYS.

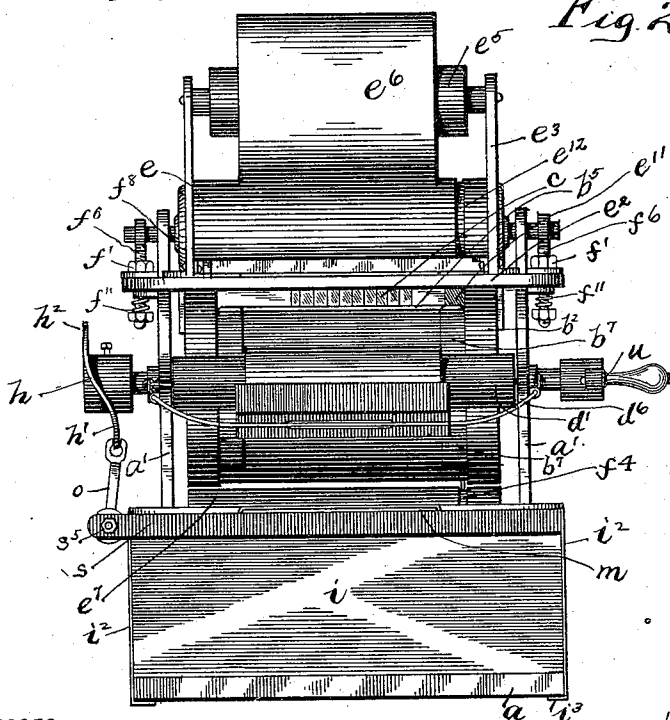
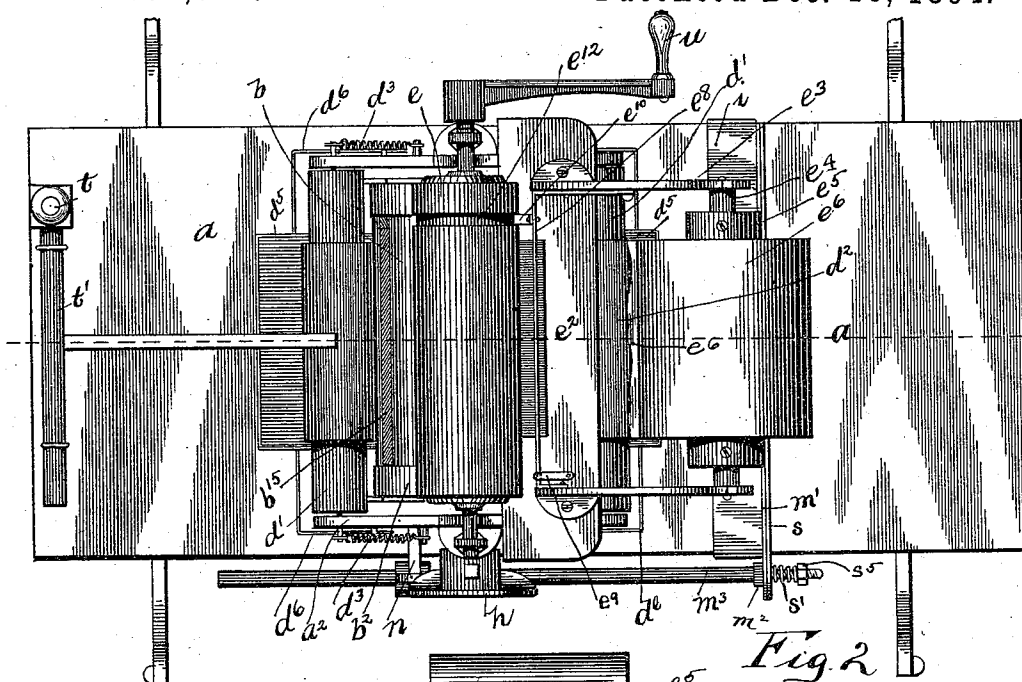
(No Model.)

4 Sheets—Sheet 2.

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WITNESSES:

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Fig. 3

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T. BARTHOLOMEW.
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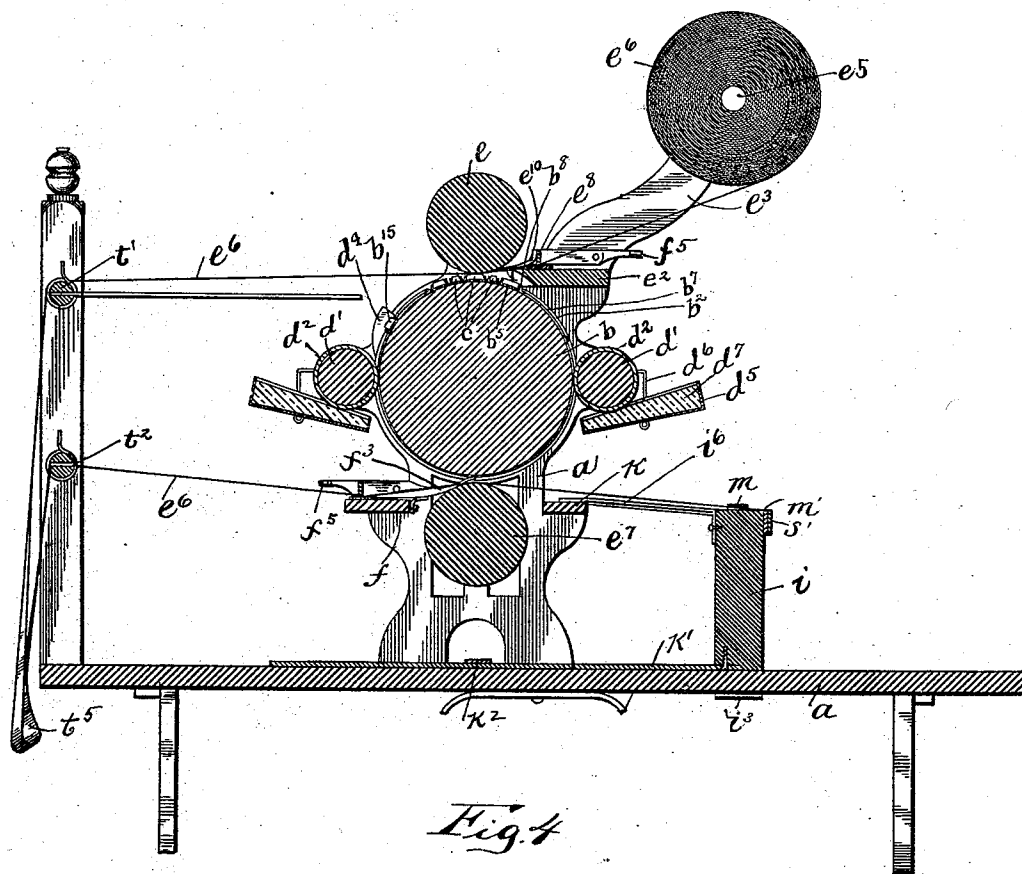


Fig. 4

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T. BARTHOLOMEW.
PRINTING MACHINE.

4 Sheets—Sheet 4.

No. 531,088.

Patented Dec. 18, 1894.

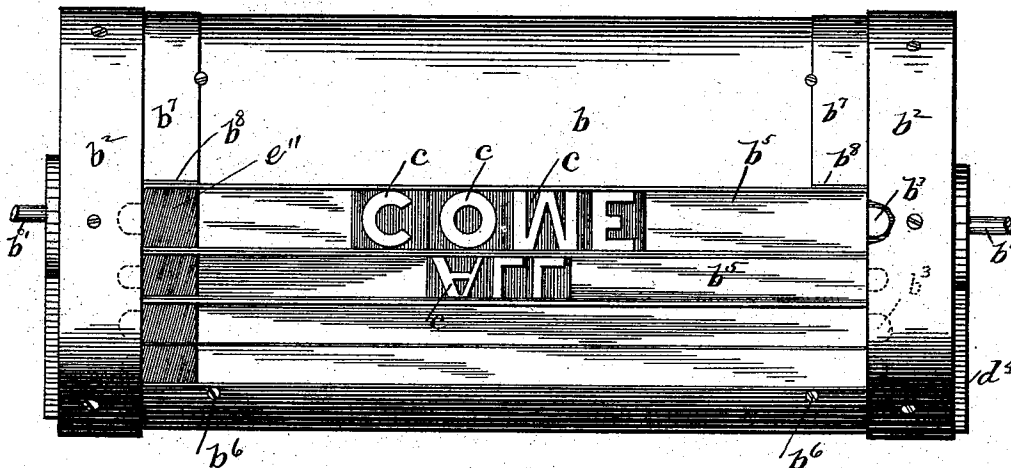


Fig. 5

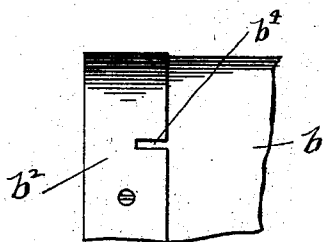


Fig. 6

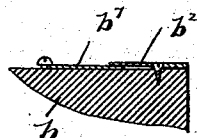


Fig. 7

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UNITED STATES PATENT OFFICE.

THOMAS BARTHOLOMEW, OF NEWARK, OHIO.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,088, dated December 18, 1894.

Application filed December 12, 1892. Serial No. 454,969. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BARTHOLOMEW, a citizen of the United States, residing at Newark, in the county of Licking and State of Ohio, have invented a certain new and useful Improvement in Printing-Machines, of which the following is a specification.

My invention relates to the improvement of printing machines and has particular relation to machines or devices for printing dodgers, hand bills, &c.

The objects of my invention are to provide a superior machine of this class of improved construction and arrangement of parts; to so construct said machine as to provide simple and reliable means for printing on one or both sides of a continuous sheet of paper and cut the same into the desired lengths when so printed; to construct my machine in a reliable and inexpensive manner and produce other improvements which will be more specifically pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a plan view thereof with the paper withdrawn from the rolls. Fig. 3 is an end view. Fig. 4 is a central section on line *xx* of Fig. 1. Fig. 5 is a face view of the type or printing roller. Fig. 6 is a view of a portion of one end of said roller and Fig. 7 is a sectional view through a portion of one end of the roller.

Similar letters refer to similar parts throughout the several views.

a represents a suitable oblong stand or base from which rise on opposite sides and at opposite points metallic frames or supporting standards *a'*. The upper and enlarged end portion of each of these standards has formed therewith oppositely located bearing lugs *a²* which project forwardly and rearwardly as shown. Each of these lugs is provided with an open ended slot or horizontal recess *a³*. *a⁴* represents a similar bearing lug which forms an upward extension of each of the standards *a'* said lug *a⁴* having a vertical bearing seat *a⁵* therein.

b represents a type carrying roller, the smaller end spindles *b'* of which are journaled in the centers of the upper portions of the standards *a'*. Surrounding the periphery of

the roller *b* at each end thereof is a band *b²*, said band having its inner portion raised slightly from the roller surface to provide a circular socket or recess between the roller and band. These bands are provided at opposite points with incisions *b⁴* in their inner edges, said incisions being adapted to receive the tongue ends *b³* of horizontal type holding plates *b⁵* and admitting of the latter being forced to the desired position on the roller and being retained thereon by said bands.

In order to limit the movement of the type holding plates on the roller, I provide suitable projections *b⁶* on the periphery of said roller against which the type plates may lodge. As a further means of retaining the type plates in position, I provide stop strips *b⁷*, the latter having their outer edges retained beneath the inner portions of the bands *b²* and having their flanged or shouldered ends *b⁸* bearing against the last inserted type plate *b⁵*.

The body of each of the insertible type plates is preferably of the channel shape shown and each of said plates is adapted to retain between its flanges raised faced type or printing blocks of rubber or similar material as indicated at *c*. At a distance from the group of type plates I provide on the roller *b* a spacing bar or projection *b¹⁵* preferably of a yielding material which is equal in height to the type above mentioned.

Within the slots *a³* of the lugs *a²* bear the spindles *d* of ink rollers *d'*, the latter having a suitable covering of pliable composition or material *d²*. The ends of both these ink-roller spindles are as shown at *d³* connected with the frame work of the standards at inner points by means of contractile coiled springs. *d⁴* represents cams which project from the ends of the roller *b* past the periphery of the latter at points opposite the spacing bar. The curved outwardly projecting portions of these cams are as hereinafter shown adapted to come into contact with the ends of the ink rollers and prevent the latter coming into contact with the spacing bar. *d⁵* represent ink pad boxes or plates which are supported preferably upon spring wires or rods *d⁶* the latter extending from one standard *a'* to the other and serving to press the inking pads or material *d'*, contained in the boxes, into contact with the ink rollers.

e represents an upper and smaller roller, the latter having its end spindles mounted in the slots *a*⁵ of the lugs *a*⁴ said roller *e* having its periphery in close proximity to the roller *b*.

Supported upon rearwardly projecting shoulders *e'* of the standards *a'*, are the ends of a transverse feed-board *e*², from the end portions of which rise rearwardly inclined bracket arms *e*³. In the upper ends of these bracket arms are journaled the spindles *e*⁴ of a roller *e*⁵, the latter having normally wound thereon a coil or roll of paper *e*⁶.

*e*⁷ represents a lower roller corresponding in size with the upper roller *e*, said lower roller being journaled in the lower portions of the standards *a'*, as shown.

*e*⁸ represents a binding bar having its rearwardly turned end portions pivotally connected with the innersides of the brackets *e*³ or other suitable framework. This pivoted bar is, by means of a suitable spring *e*⁹, one end of which is secured to the feed board and the remaining end of which bears on the bar *e*⁸, made to press normally against the upper side of the feed board. *e*¹⁰ represents a spring finger which projects from the bar *e*⁸ near one end thereof and extends between the rollers *e* and *b*. This spring finger normally presses downward and when the type plates are passing beneath the upper roller through the rotation of the roller *b*, said spring finger is brought into contact with suitable filling blocks or pieces *e*¹¹ in the corresponding ends of said type plates *b*⁵. The result of this contact is that said spring finger is temporarily raised upward within a peripheral groove *e*¹² in the roller *e*.

Supported from the forward sides of the standards *a'* opposite the upper portion of the lower roller *e*⁷ is a paper feed board *f* and upon said feed board is pivotally supported or journaled a spring actuated binding bar *f'* which corresponds with the upper binding bar *e*⁸. This lower binding bar is also provided with a spring tongue projection *f*³ which, as shown, projects between the rollers *b* and *e*⁷ and which is adapted by contact with the elevating blocks *e*¹¹ of the type plates to be pressed into a groove *f*⁴ in the lower roller *e*⁷. As shown at *f*⁵, I provide the bars *e*⁸ and *f'* with outwardly projecting handle pieces.

*f*⁶ represents tension screws one of which, as shown passes through an ear *f*⁷ which projects outwardly from the lug *a*⁴ on each side of the machine. This tension screw has rigidly connected with its upper end a head *f*⁸ in which the outer end of the spindle of the upper roller *e* is journaled. Upon each of the screws *f*⁶ beneath the head *f*⁸ and bearing upon the ear or shoulder *f*⁷ is an adjusting nut *f*⁹. Upon the lower end of each of the screws *f*⁶ is a nut *f*¹⁰ and between the latter and the under side of the ear *f*⁷ said screw is surrounded by coil spring *f*¹¹.

Passing through an ear *g* projecting from the lower portion of each of the standards *a'* in vertical alignment with the ear *f*⁷, is an ad-

justing screw *g'* which as prescribed for said screw *f*⁶ is provided with an end nut *g*², a coil spring *g*³ and an adjusting nut *g*⁴, and a head *g*⁵, the latter forming a journal bearing for the outer end of the lower roller spindle. Upon one of the outer projecting ends of the central roll spindle *b'* is mounted as shown at *h*, a cam-disk, said cam-disk having an inwardly and outwardly approaching portion *h'* *h*².

i represents a transverse cutting block which is supported upon the face or table *a* at a point in rear of the standards *a'* as shown. This cutting block is as indicated at *i*² provided with end plates, the lower extremities of which are bent inward to form lips *i*³, which project beneath the table top edges, as shown. Said lips serve to perform the office of guides when said block is moved forward or backward for the purpose hereinafter described. The block *i* has its central portion provided near its upper side with a suitable paper delivery plate *i*⁴, the latter having its free end resting upon a transverse delivery bar *k* which connects the standards *a'* in rear of the upper portion of the lower roller.

k' represents a sliding bar which is arranged centrally in suitable keepers *k*² and upon the upper side of the table top and which is adapted to slide longitudinally thereon. One end of this bar is connected, as shown, with the cutting block *i*.

Upon the upper side of the cutting block and extending in the direction of the length of the latter and adjacent to the outer side thereof is a raised bar or elongated keeper *m*.

m' represents a metallic blade or bar which is secured to the outer face of the cutting block adjacent to the upper side thereof, said blade or bar having one of its ends projecting outwardly, as shown at *m*². This outwardly projecting end of the blade *m'* forms a journal bearing for a horizontal knife rod *m*³, the latter having its forward portion journaled in a suitable bracket arm *n* which projects outwardly from one of the standards *a'*.

o represents an operating finger, one end of which is adjustably secured by means of a set screw *o'* upon the knife rod *m*³. The upper end of the finger *o'* is notched or bifurcated to embrace the edges of the cam disk *h*, as shown.

Upon the rear end of the knife rod *m*³ is mounted a knife blade or cutter-bar *s*, the latter being adapted to shear against the outer side of the fixed blade *m'*. The knife blade is yieldingly retained against the blade *m'* by means of a coiled spring *s'* which surrounds the outer projecting end of the knife blade and the outer end of which bears against an adjusting nut *s*⁵ on said rod extension.

Rising from the forward end of the table or machine base is a frame consisting of a vertical standard *t* from which project outward, and at right angles therewith across the end of the table, arms *t'* the latter being preferably provided with longitudinal slots *t*².

The method of utilizing my improved printing machine and the means of operating the

same, are as follows: It being desired to print and produce dodgers, circulars or other similar printed papers, the paper from which the same are to be formed is first wound upon the roller or spool e^5 . From this roller e^5 the paper strip so wound is threaded or inserted between the upper roller e and the larger and central roller b , as shown in the drawings. After passing between these rollers the strip is continued outwardly over or through the slot in the upper frame arm t' , from which point it is dropped downward below the lower frame arm t' where it is turned to form a twisted loop indicated at t^5 . From this loop the paper strip is passed through the slot of the lower frame arm t' , thence between the lower and central rollers over the plate i^6 , beneath the keeper m of the cutting block and over the blade m' .

The rotation of the roller b by the turning of a suitable crank handle u upon the spindle, must result as will readily be seen in the rotation of the cam disk h . When the roller b has been sufficiently turned to bring the faces of the rubber type in contact with the paper strip above said roller, it will be seen that the close proximity of said central and upper roller will result in the yielding type faces pressing the paper against the upper roller—which must result in the rotation of the latter by the friction or contact thus caused. In this manner it will be seen that the type faces which have previously been inked through their contact with the spring actuated ink rollers, will produce the desired printed impression upon the under side of the upper portion of the paper strip. During this printing operation the paper is freed from the binding action of the upper binding bar e^8 owing to the fact that the spring finger e^{10} of said bar is pressed upward into the groove e^{12} of the upper roller, in the manner hereinbefore described. It will thus be seen that when the type have passed the printing point, said spring finger will resume its normal position, allowing the binding bar to drop downward upon the paper and press the latter against the board e^2 . The further rotation of the roller b will result in the spacing bar or projection b^{15} coming into contact with the paper strip between the central and lower rollers, and in said spacing strip by the frictional contact thus produced, imparting a partial rotation to the lower roller and causing the paper to feed a short distance between the rollers. Owing to the fact that the cam projections d^4 of the roller b are arranged opposite the spacing bar, it will be seen that the contact of the outer curved surfaces of these cams with the inking rollers will result in said inking rollers being forced outward in their bearings sufficiently to prevent their contact with the spacing bar, thus preventing the inking of said spacing bar as the latter passes the ink rollers. The group of type however having produced the impression on the underside of the upper portion of the paper

strip as above described are by the continued rotation of the roller b brought into contact with the inking roller and thus supplied with ink. When this group of type reaches a point immediately above the lower roller b^7 it is evident that the upper side of the lower portion of the paper strip will be printed upon, and that the binding of the type between the central and lower rollers will result in the paper being fed toward the rear during said printing operation. During the time that the group of type is between the central and lower rollers, it will be seen that the spring finger f^3 of the lower binding bar will as prescribed for the upper spring finger be pressed into the groove f^4 of the lower roller and the pressure of said lower binding bar upon the paper will be thus released temporarily.

From the above described method of printing, it will be observed that the spacing bar acts after each impression of the type thus resulting in a separation of said impressions on the paper strip; and it will also be seen that the impressions produced as above described may be thus made in opposite places on said strip.

The above described rotation of the cam disk h will result through the connection therewith of the operating finger o in said operating finger being alternately rocked inward and outward, and in said rocking motion being contributed to the knife rod. As a result of this motion being contributed to the knife rod it will be seen that the knife blade s will have imparted thereto an upward and downward movement which movement will result in the lower sharpened edge of said blade acting with the blade m' cutting the rearwardly fed printed strips into uniform lengths. In order to increase or decrease the distance between the upper roller and the printing roller for the purpose of increasing or decreasing the pressure upon the type, or for the purpose of equalizing said pressure, the nuts f^9 may be turned upward or downward thus drawing said rollers closer together or increasing the distance between them.

For the purpose of producing a like adjustment between the central and lower rollers it is evident that the nuts g^4 may be turned. By the above described adjustment of the rollers it will be seen that the closer the rollers are arranged, the more complete will be the binding action between the rollers and type, thus resulting in slightly increasing the space between the impressions through the additional pull upon said rollers and paper.

For the purpose of printing circulars, posters or sheets where but one impression is desired, I may remove the paper roll to the forward end of the machine loosely mounting the same upon one of the paper guide arms t' and threading the paper between the middle and lower rollers. In this manner it will be seen that but one impression will be im-

parted on the paper. It is also evident that I may construct my machine for the purpose of producing but one impression on the paper and in this case it is obvious that the upper roller might be omitted.

By releasing the setscrew o' , sliding the cutting block backward or forward, and locking it with the keeper k^2 , it will be seen that the distance between said cutting block and rollers may be increased or decreased as desired.

From the construction herein shown and described it will be seen that a simple, reliable and inexpensive device is provided for producing printed impressions on one or both sides of the paper strip and cutting the same into lengths. It will also be seen that the means herein shown of supporting the type in the printing position upon the central roller are such as to admit of the manipulation of said type by persons who are unskilled in the art of printing.

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

1. In a printing machine the combination with the frame work, a printing roller journaled therein, and pliable type detachably supported on said roller periphery, of two or more impression rollers supported adjacent to said printing roller two or more inking rollers journaled adjacent to said printing roller and adapted to come into contact with the type faces when said printing roller is rotated, a paper roll journaled in bearings in the framework, independent tensions for the strip of paper adjacent the impression rollers, an upright standard carried by the framework, and two horizontal arms projecting therefrom and having slots through which the strip passes and between which it is given a twist, substantially as and for the purpose specified.

2. In a printing machine, the combination with the standards, a type carrying printing roller journaled therein, impression rollers journaled above and below said printing roller, a tension device in advance of each impression roller, means for releasing the tension during the passage of the type between these rollers, a type-high spacing strip on the printing roller in advance of the type, and cam projections opposite said spacing strip on the ends of the printing roller; of the spring-actuated inking rollers journaled at opposite sides adjacent said printing roller, said inking rollers being normally supported in the path of the cams and adapted to be forced outward by contact with the latter, and means for passing a paper strip between the printing roller and the upper impression roller, then around the inking roller, and finally between the printing roller and the lower impression roller, said strip being controlled by the tension devices adjacent both impression rollers, substantially as and for the purpose set forth.

3. In a printing machine the combination of standards, a printing roller journaled therein, channeled type holding strips b^5 having

end tongues as described, end bands b^2 on said printing roller beneath which said type strip tongues are adapted to fit and slide, mouths b^4 as described in said bands and following strips b^7 having end shoulders b^8 said following strips adapted to fit and slide beneath said bands b^2 , and means for rotating said printing roller and inking the face of the type contained in said type holding strips substantially as and for the purpose specified.

4. In a printing machine the combination with a printing roller b , type holding strips detachably secured thereon, pliable type supported in said strips, end blocks e^{11} in said type strips as described, an impression roller journaled in said standards adjacent to said printing roller, a peripheral groove e^{12} in said impression roller, a feed board e^2 supported as described adjacent to the upper portion of said printing roller, a paper reel supported from said feed board, a spring actuated pressure or retaining bar pivoted to the frame work and adapted to bear on said feed board and a spring finger e^{10} extending from said pressure bar to a point beneath the roller groove e^{12} the end of said spring finger being normally supported in the path of said blocks e^{11} when said printing roller is rotated substantially as and for the purpose specified.

5. In a printing machine the combination with the standards, a type carrying roller journaled therein, and one or more impression rollers e e^7 journaled adjacent to said printing roller, a type high spacing strip on said printing roller and the cam projections d^4 opposite said spacing strip on the ends of said printing roller, of the spring actuated inking rollers journaled at opposite points and adjacent to said printing roller said inking rollers normally supported in the path of said cams and adapted to be forced outward by contact with the latter when the printing roller is rotated substantially as and for the purpose specified.

6. In a printing machine, the combination with a printing roller b , type detachably secured thereon, end blocks also carried thereon as described, an impression roller adjacent said printing roller, a peripheral groove e^{12} in said impression roller, a feed board e^2 supported as described adjacent to the upper portion of said printing roller, a paper reel, a spring-actuated pressure or retaining bar pivoted to the framework and adapted to bear on said feed board, a spring finger e^{10} extending from said pressure bar to a point beneath the roller groove e^{12} , the end of said spring finger being normally supported in the path of said blocks e^{11} when said printing roller is rotated, a type high spacing strip on said printing roller, the cam projections d^4 opposite said spacing strip on the ends of said printing roller, and spring-actuated inking rollers journaled at opposite points and adjacent to said printing roller, said inking rollers normally supported in the path of said cams and adapted to be forced outward by

contact with the latter when the printing roller is rotated, as and for the purpose specified.

7. In a printing machine the combination of the base and standards thereon, a type carrying printing roller having its end spindles journaled in said standards, an outturned and inturned cam disk carried on one of said spindles, one or more impression rollers journaled adjacent to said printing roller, a cutting block adjustably supported on said base, a knife rod journaled in said cutting block and in one of said standards, an operating finger *o* adjustably supported on said knife rod, said finger being notched to receive the edge of said cam disk and a cutting blade yieldingly held on said rod and adapted to shear as described against the outer side of said cutting block substantially as and for the purpose specified.

8. In a printing machine, the combination of the standards, a printing roller journaled therein, pliable type supported on said roller periphery, impression rollers *e* and *e'* journaled above and below said printing roller, a paper roll journaled in the machine framework, means for passing the paper strip between said rollers as described, and for giving the strip a twist after the first and before the second impression, inking rollers journaled as described in the side of said standards, and independent tension bars adapted to restrain the movement of said strip of paper when said type are not between the rollers, substantially as and for the purpose specified.

THOMAS BARTHOLOMEW.

In presence of—

EMANUEL KROMER,
JONATHAN REES.