

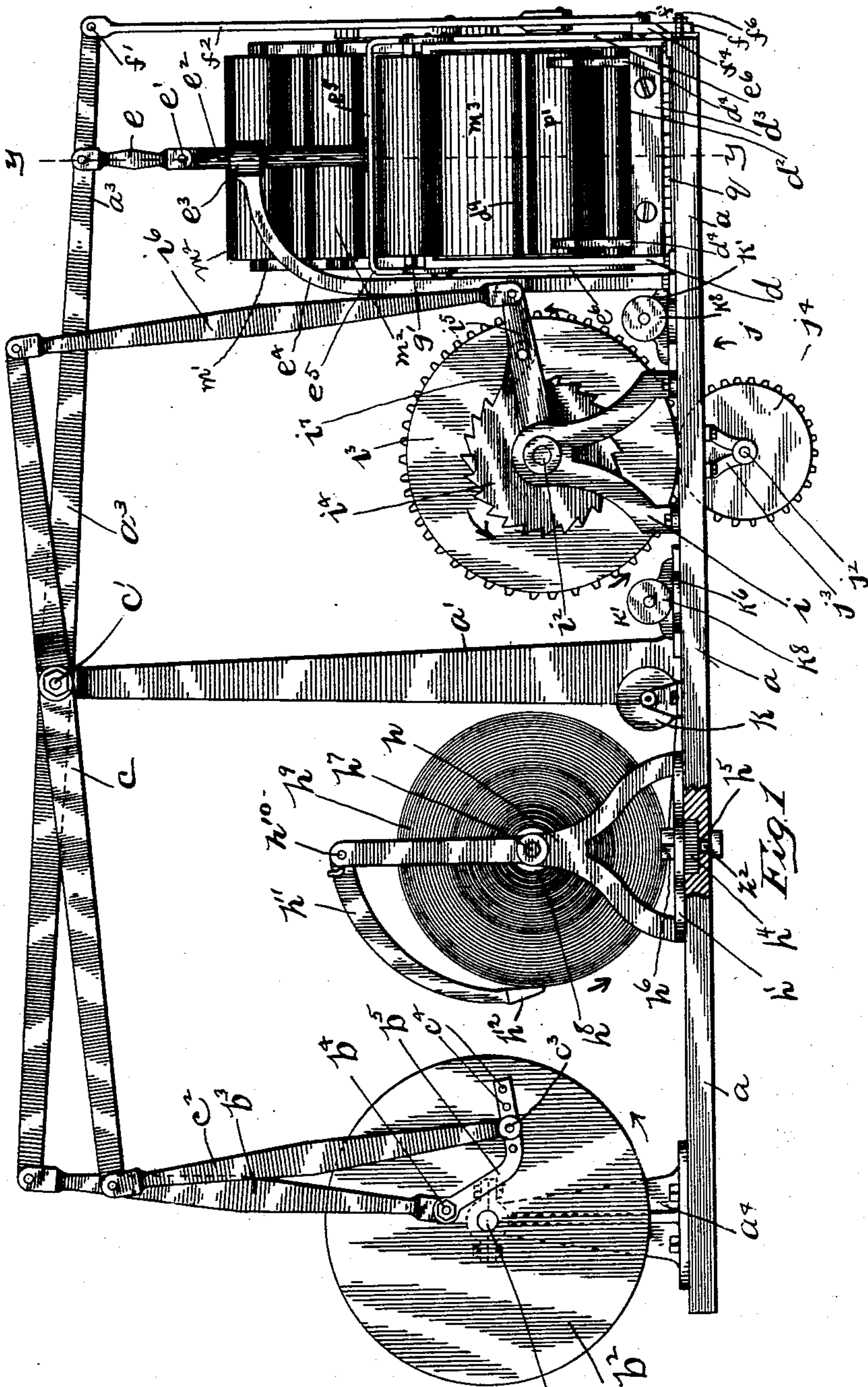
(No Model.)

3 Sheets—Sheet 1.

H. J. HEIMBERGER.
PRINTING MACHINE.

No. 568,904.

Patented Oct. 6, 1896.



WITNESSES:

H. B. Bradshaw
A. L. Phelps

INVENTOR

Harry J. Heimberger

BY

C. C. Shepherd

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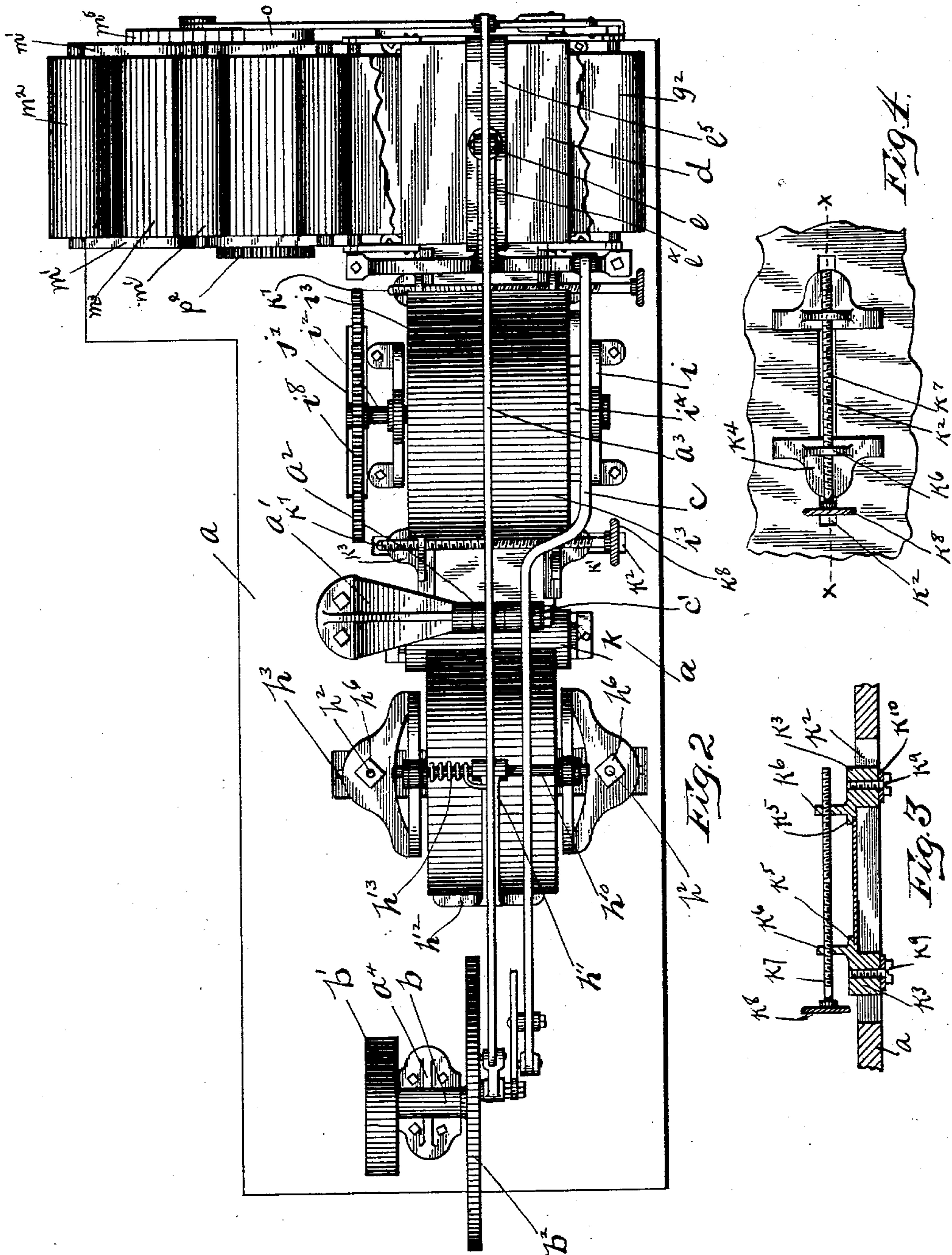
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H. J. HEIMBERGER.
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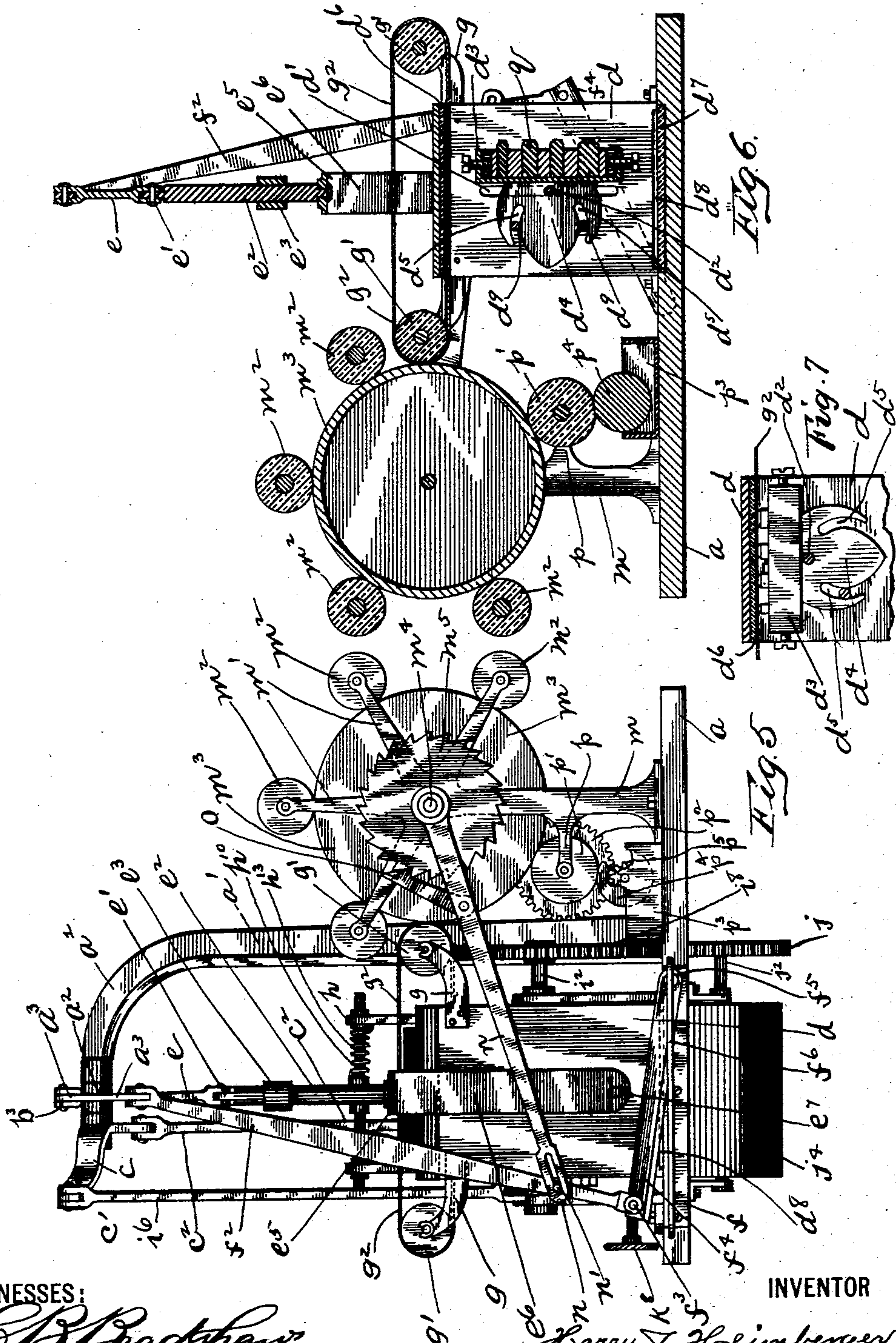
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INVENTOR

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UNITED STATES PATENT OFFICE.

HARRY J. HEIMBERGER, OF COLUMBUS, OHIO.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,904, dated October 6, 1896.

Application filed July 1, 1895. Serial No. 554,556. (No model.)

To all whom it may concern:

Be it known that I, HARRY J. HEIMBERGER, a citizen of the United States, residing at Columbus, in the county of Franklin 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 the objects of my invention are to provide a power printing-machine of improved construction and arrangement of parts which will be particularly adapted for the printing of cards, small circulars, and similar work, which is ordinarily accomplished by hand-fed presses; to provide means for automatically feeding the paper into position for receiving the impression, and to provide in conjunction therewith improved means for cutting the paper into desirable lengths; to provide improved guides for the paper, and to produce other improvements the details of construction and operation of which will be more fully 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 printing-machine. Fig. 2 is a plan view. Fig. 3 is a central longitudinal section taken on line xx of Fig. 4. Fig. 4 is a detail plan view of one of the paper-guides. Fig. 5 is an end elevation of the machine. Fig. 6 is a vertical section taken on line yy of Fig. 1; and Fig. 7 is a detail view of the type-chase, showing the same in position for inking the type.

Similar letters refer to similar parts throughout the several views.

In carrying out my invention I employ a suitable base, preferably of the oblong form shown at a . a' represents a standard which rises, as shown in the drawings, from the base a , near the center of the length of the latter and on one side of the center of the width thereof. This standard has its upper end portion extending substantially at right angles with its vertical body, and the upper arm portion of said standard has fulcrumed thereto, as indicated at a^2 , the central portion of a walking-beam a^3 , the latter extending in the direction of the length of the base a . From the upper side of the rear portion of the base a extends upward a bearing-

standard a^4 , and journaled in a boxing at the head of said standard a^4 is a power-shaft b , said power-shaft carrying on one of its ends a belt-wheel b' and on its remaining end a larger driving-disk b^2 .

b^3 represents a connecting-arm, the upper end of which is jointedly connected with the rear end of the walking-beam a^3 at a point above the disk b^2 , and the lower end of which is secured on a pin b^4 , which projects eccentrically from the face of the disk b^2 . The pin b^4 also has secured thereto one end of a crank-arm b^5 .

c represents a walking-beam of less length than the beam a^3 , said beam c being fulcrumed at a point in its forward half, as indicated at c' , to the outer end of the upper arm of the standard a' . As indicated in the drawings, the forward portion of the beam c is bent out of alinement with its remaining portion, said outwardly-projecting beam portion being parallel with the line of extension of the rear portion thereof. The rear end of the beam c is by means of a connecting-bar c^2 jointedly connected with the outer arm of the arm b^5 , as indicated at c^3 . This outer arm of said arm is provided, as indicated in the drawings, with a number of pivot-pin openings c^4 , thus admitting of the connection of the bar c^2 being made with said arm at different points.

Supported on the forward end portion of the base a is a vertical housing or casing d , the sides of which are open, as indicated. The vertical sides of the casing or frame d are provided with oppositely-located central vertical slots or mortises d' , which form guides for opposite end portions of a transverse pin d^2 , which project therethrough.

d^3 represents a type-holding chase which is substantially of the cup shape shown and from opposite ends of the back of which project cam-plates d^4 . As indicated in the drawings, each of these cam-plates d^4 is substantially of an acorn shape and has its outer end portion on opposite sides of the center of its width provided with inwardly-extending and inwardly-curved recesses d^5 . Each of the cam-plates d^4 thus formed has its inner portion at a point adjacent to the back of the chase d^3 mounted centrally on the pin d^2 , which extends through said casing or frame d .

d^9 represents two horizontal pins which are arranged one above the other and which extend between the end plates of the casing d , said pins being adapted, as shown, to pass loosely through the guide-recesses d^5 of the cams d^4 when the type are in the inking position hereinafter described.

Against the under surface of the upper side of the casing d I provide a suitable pliable pad or facing d^6 , and in the base a beneath said casing d I provide a pad d^7 , the upper surface of which is flush with said base a .

As indicated at d^8 , the under side of each of the vertical end plates of the casing d is slightly cut away or recessed to form, as hereinafter shown, guideways for a paper strip.

To the walking-beam a^3 , at a point over the casing d , is pivoted the upper end of a connecting-bar e , the lower end thereof having, as shown at e^1 , a pivotal connection with the upper end of a vertical plunger-rod e^2 , said plunger-rod extending downwardly through a keeper or guide e^3 on the upper end of a standard e^4 , which rises from the base a . The lower end of this plunger e^2 is secured to the upper horizontal arm of a yoke e^5 , the downwardly-extending parallel arms e^6 of the latter embracing, as shown, the forward and rear sides of the casing d . The lower ends of these yoke-arms e^6 are, as indicated at e^7 , connected with the outwardly-projecting ends of the cam-supporting pins d^2 .

f represents a stationary knife-bar which, as shown in the drawings, is secured to the forward end of the base a and has its upper beveled and sharpened edge projecting in front of the forward guide-opening d^8 of the casing d .

To the extreme forward end of the walking-beam a^3 is pivoted at f^1 the upper end of a knife-operating bar or arm f^2 . This bar f^2 , which extends downward, is inclined slightly outward and has its lower end pivoted at a point f^3 to one end of a knife-blade f^4 , the remaining end of said knife-blade being pivotally connected at f^5 to the outer face of one end of the knife-bar f . The lower edge of the blade f^4 is sharpened and adapted, when moved upward and downward on its pivot-points, to shear against the sharpened upper edge of the fixed bar f . The knife parts thus formed are loosely embraced by a forwardly-projecting keeper-rod f^6 .

From each of the vertical end plates of the casing d , adjoining the upper end of the latter, project oppositely-located bracket-arms g , in the outer ends of each pair of which are journaled the end spindles of a roller g' , and these rollers g' carry, as shown in the drawings, an endless ink-belt g^2 , the lower line of the latter passing through the upper end portion of the casing d in contact with or adjacent to the under side of the pad d^6 . Rising from the base-plate a , at a point in front of the driving-disk b^2 , are two oppositely-located standards h . Each of these standards is provided with a horizontal foot portion h' , through

which is adapted to pass a bolt h^2 , said bolt passing downward through a block h^4 , which is formed with the under side of the foot, and which is adapted to slide in a transverse way h^3 , formed in the base a , said base being also provided with a transverse slotted opening h^5 beneath said block through which the bolts h^2 are adapted to project, as shown in Fig. 1 of the drawings. These bolts are adapted to receive nuts h^6 in the usual manner. In the standards h are adapted to be detachably journaled the spindle ends h^7 of a roller h^8 , on which is adapted to be mounted a roll of paper h^9 . The upper ends of the standards h above the paper roll are connected by a transverse shaft h^{10} , and on the center of said shaft is loosely mounted the upper end of a tension-arm h^{11} , the latter curving downwardly and having a transverse foot portion h^{12} , which is adapted to bear against the surface of the paper-roll h^9 . The foot of the tension-arm is caused to exert the desired degree of pressure against the paper-roll surface through the influence of a spring h^{13} , which has one end secured to and which is coiled upon the shaft h^{10} , and which has its remaining end bearing on the upper side of the arm h^{11} .

From the upper side of the base a , at a point adjacent to the rear side of the casing d , I provide two upwardly-projecting oppositely-located standards i , in which are journaled the end portions of a transverse shaft i^2 . This shaft i^2 carries between said standards a comparatively large feed-roll i^3 . The shaft i^2 also carries adjacent to one end of said feed-roll a ratchet-wheel i^4 , and pivoted on said shaft on the outer side of said ratchet-wheel is one end of a forwardly-extending arm i^5 , the outer end of the latter being jointedly connected with the forward end of the walking-beam c by a connecting-bar i^6 . To the inner side of the arm i^5 is pivoted a pawl i^7 , which is adapted to engage with the teeth of the ratchet i^4 , as shown more clearly in Fig. 1 of the drawings. The opposite end portion of the shaft i^2 projects beyond the bracket in which it bears and carries, as indicated at i^8 , a gear-wheel, the latter engaging with the teeth of a gear-wheel j , the upper portion of which projects upward through a slotted opening j^1 in the base a . The gear-wheel j is mounted on a transverse shaft j^2 , which is journaled in brackets j^3 , which depend from the under side of the base a . This shaft j^2 also carries a transverse roll j^4 , the upper side of which projects through the base a and is normally in frictional contact with the roll i^3 .

In front of the paper roll is journaled in suitable short brackets, which rise from the base-plate a , a small feed-roll k , and on opposite sides of the roll i^3 I support on said base-plate adjustable paper-guides k' . In constructing each of these paper-guides I provide a transverse mortise k^2 in the base a , and into this mortise are inserted two guide-blocks k^3 , the latter being provided with

flanged upper sides, as indicated at k^4 , adapted to span the mortise k^2 . These guide-blocks have their upper sides provided with inturned flanges k^5 , from which rise lugs k^6 , each of the latter having a threaded opening there-through. The lugs k^6 are adjustably connected by means of a horizontal adjusting-screw k^7 , having a suitable thumb-piece k^8 on its outer end. This adjusting-screw is provided for one half of its length with a right-hand screw-thread and in its remaining half with a left-hand screw-thread, as indicated more clearly in Figs. 2, 3, and 4 of the drawings. The under side of each of the blocks k^2 has secured thereto by means of a screw k^9 a washer or cross-piece k^{10} of greater width than the width of the slotted opening k^2 .

Supported on the base a at one side of the casing d are two oppositely-located vertical standards m , the upper end portion of each of which terminates in two or more radially-arranged arms m' . These arms m' of the two standards m , being oppositely located, form bearings, as shown, for the end spindles of ink-distributing rollers m^2 , the latter being in frictional contact with a large ink-roller m^3 , mounted upon a shaft m^4 , which is journaled in the standards m . This shaft m^4 also carries on the outer side of the arms m' a ratchet-wheel m^5 .

n represents a lever-bar, one end of which is fulcrumed on the shaft m^4 and the remaining and slotted end of which receives a pin n' , which projects from the arm f^2 at a point near the lower end thereof. The lever-bar n has pivoted thereto a pawl o , the free end of which is adapted to engage with the teeth of the ratchet m^5 . The lower portions of the standards m are provided with oppositely-located arms p , between which is journaled an ink-roll p' , one end of which carries a gear-wheel p^2 . Beneath the ink-roll p' is supported on the base a an ink reservoir or box p^3 , within which is journaled an ink-roller p^4 , said ink-roller carrying on the outer end of its shaft a pinion-wheel p^5 , which gears with the wheel p^2 . As indicated, the peripheries of the rolls p^4 and p' are in frictional contact. It will be observed that the endless inking-belt g^2 is, while passing over one of the rolls g' , in frictional contact with the large inking-roll m^3 .

The operation of my improved printing-machine is substantially as follows: The type q are set and secured in the chase d^3 , the printing-faces of said type projecting beyond said chase. The end of the paper roll is carried downward beneath the roll k , threaded through the rear guide k' , between the blocks k and beneath the flanges k^5 thereof, and then carried between the rolls j^4 and i^3 . From these rolls said paper strip is passed between the guide-blocks of the forward guide k' and thence through the oppositely-located openings d^8 of the printing-case d , from which said strip leads out over the fixed knife-bar f and keeper f^6 . Through the medium of a suitable engine-belt motion is imparted to the

wheel b' , which through its shaft b imparts a rotary motion to the driving-disk b^2 . The rotation of this disk results, as is evident, from the connections therewith heretofore described of the bars b^3 and c^2 , in an alternate rocking action of the walking-beams a^3 and c . As the walking-beam bar i^6 executes its up-stroke it is evident that the engagement of the pawl i^7 with the ratchet i^4 will result in said ratchet being turned in the direction indicated by the arrow adjacent thereto a sufficient distance to allow said pawl to drop into engagement with the next succeeding tooth of the ratchet. This movement of said ratchet results in a corresponding rotation of the feed-roll i^3 , and through the engagement of the gear-wheels j and i^8 motion is imparted to the roll j^4 . In this manner the paper strip which leads from the roll h^9 is fed forward through the casing d a distance equal to the width or length of the card or other paper to be produced. While the paper-feeding rolls thus described are at rest during the downward movement of the bar i^6 the forward end of the walking-beam a^3 descends and through its descent the connections of the knife-operating bar f^2 , lever-bar n , and engagement of the pawl o with the ratchet m^5 a partial rotation of the large inking-roll m^3 is attained. Through the frictional contact of the ink-rolls m^3 , p' , and p^4 and the gear connection of the wheels p^2 and p^5 rotary motion is imparted to said rolls p' and p^4 and the ink, which is taken up by the roll p^4 from the reservoir p^3 , in which it travels, is conveyed to the roll p' and thence to the larger roll m^3 , where it is equally distributed from the frictional contact with the rolls m^2 . As indicated, the gears p^2 and p^5 are preferably of different sizes to impart increased distribution of ink. The frictional contact of the continuous inking-belt g^2 with the surface of the roll m^3 results in not only supplying said belt g^2 with ink, but in imparting a traveling motion to said belt over its rollers g' . In addition to the operation above described the downward movement of the forward portion of the walking-beam a^3 results in a downward movement of the plunger e^2 and in a consequent downward movement of the arms e^6 of the chase-operating yoke e^5 . When the yoke is in its elevated position, it is evident that, owing to the connection of the pins d^2 with the cams d^4 , the chase will be supported horizontally in the upper portion of the casing d , with the type-faces in contact with the inking-belt g^2 , and that the lower guide-pins d^9 will be disengaged from one of the cam-recesses d^5 , while the upper guide-pin d^9 will be at the inner ends of the remaining cam-recesses d^5 . The downward movement of the yoke hereinbefore described must however result, through the engagement of said upper pin d^9 with the recesses of the cam-plates, in turning the chase to the half-inverted position indicated in Fig. 6 of the drawings, in the engagement of the lower

pins d^9 with the remaining recesses of the cam-plates d^4 , and, finally, in a complete inversion of said chase. In this position it is evident that the faces of the type which have been inked by contact with the belt g^2 will be pressed into contact with the paper strip, which is temporarily at rest beneath the chase on the pad d^7 . A further result of the downward action of the forward end of the walking-beam c^3 is the downward shearing movement of the knife-blade f^4 against the side of the knife-bar f , with the result that that portion of the paper strip on which a previous impression has been made and which, by means of the feeding mechanism hereinbefore described has been fed through the forward guide-opening d^8 , is cut off and dropped from the machine. The succeeding upward movement of the forward portion of the beam a^3 must, as will readily be seen, return the type-chase to its upper or inking position, lift the knife-blade f^4 , and raise the pawl o into engagement with another tooth of the ratchet m^5 , thus placing said parts again in position for operation on the downstroke of said walking-beam.

From the operation described it will be seen that the feeding of the paper from the roll and inking of the inking-rolls and type is accomplished simultaneously and that the printing and cutting operations are alternate therewith.

Owing to the use of the spring-actuated tension-arm h^{11} the paper on the roll h^8 is held against too rapid removal. In case it is desired to vary the width of paper used, it is evident that by turning the right and left hand threaded screws k^7 of the guides k' one of the guide-blocks may be rigidly connected with the base-plate by turning upward one of the screws k^9 until its washer k^{10} is clamped firmly against the under side of the bed-plate, after which the remaining guide-block may be forced toward or from the other, as may be desired, resulting in the formation of a space between said blocks equal to the width of the paper to be passed therethrough. By varying the point of connection of the bar c^2 with the outer arm of the arm b^5 it is evident that the extent of rotation of the feed-rolls will be varied and that the lengths into which the printed paper strip is cut may thus be regulated.

From the manner hereinbefore described of securing the paper-roll standards on the base a it is evident that by loosening the bolts h^2 the block extensions h^4 of said standard-feet may be moved inward or outward in the guideway h^3 , thus providing for the support of paper rolls of varying widths.

From the construction and operation which I have described it will be seen that simple, reliable, and effective means are provided

not only for producing rapid and regular printed impressions, but for automatically feeding the paper through the printing-case and cutting the same into desired lengths.

It is evident that a printing-machine such as herein shown and described will be of great utility in the printing of cards, small circulars, &c., which ordinarily are produced on hand-fed machines or presses.

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 a base a , having a mortise k^2 therein, a paper-roll-carrying reel mounted on said base, a spring-actuated tension-arm pivotally connected with the roll-supporting frame and adapted to bear against the roll, coaxing feed-rolls journaled in front of said paper roll between which the paper strip from said paper roll is adapted to pass and means for imparting an intermittent rotary motion to said feed-rolls, of guide-blocks k^3 movably supported in said base-mortise k^2 between said paper and feed rolls, an adjusting-screw k^7 connecting said guide-blocks, said screw having a right-hand threaded engagement with one of said blocks and a left-hand threaded engagement with the other, means for producing a temporary rigid connection of one of said guide-blocks with the base, and a printing mechanism in line with the feed-rolls, substantially as and for the purpose specified.

2. In a printing-machine the combination with a base, a casing or frame d supported thereon, oppositely-located slotted openings in said case, cross-pins d^9 in said case, oppositely-located inlet and outlet openings d^8 in the base of said case, a fixed knife-bar f secured to said base adjacent to said outlet-opening d^8 and a knife-blade f^4 pivoted at one end to one end of said knife-bar f , of a type-holding chase d^3 within the casing d , substantially acorn-shaped cam-plates projecting therefrom, inwardly extending and curved recesses d^5 formed as described in said cam-plates and adapted to receive loosely the pins d^9 , a transverse pin d^2 extending through said slotted openings d^7 and supporting said cam-plates as described, an ink-carrying belt passing through said case d , a yoke e^5 embracing opposite sides of said case and connected with the ends of said pin d^2 , a plunger e^2 extending upward from said yoke, a connecting-bar between said plunger and knife-blade and means for imparting a vertical reciprocating motion to said plunger, substantially as and for the purpose specified.

HARRY J. HEIMBERGER.

In presence of—

A. L. PHELPS,
C. M. VOORHEES.