

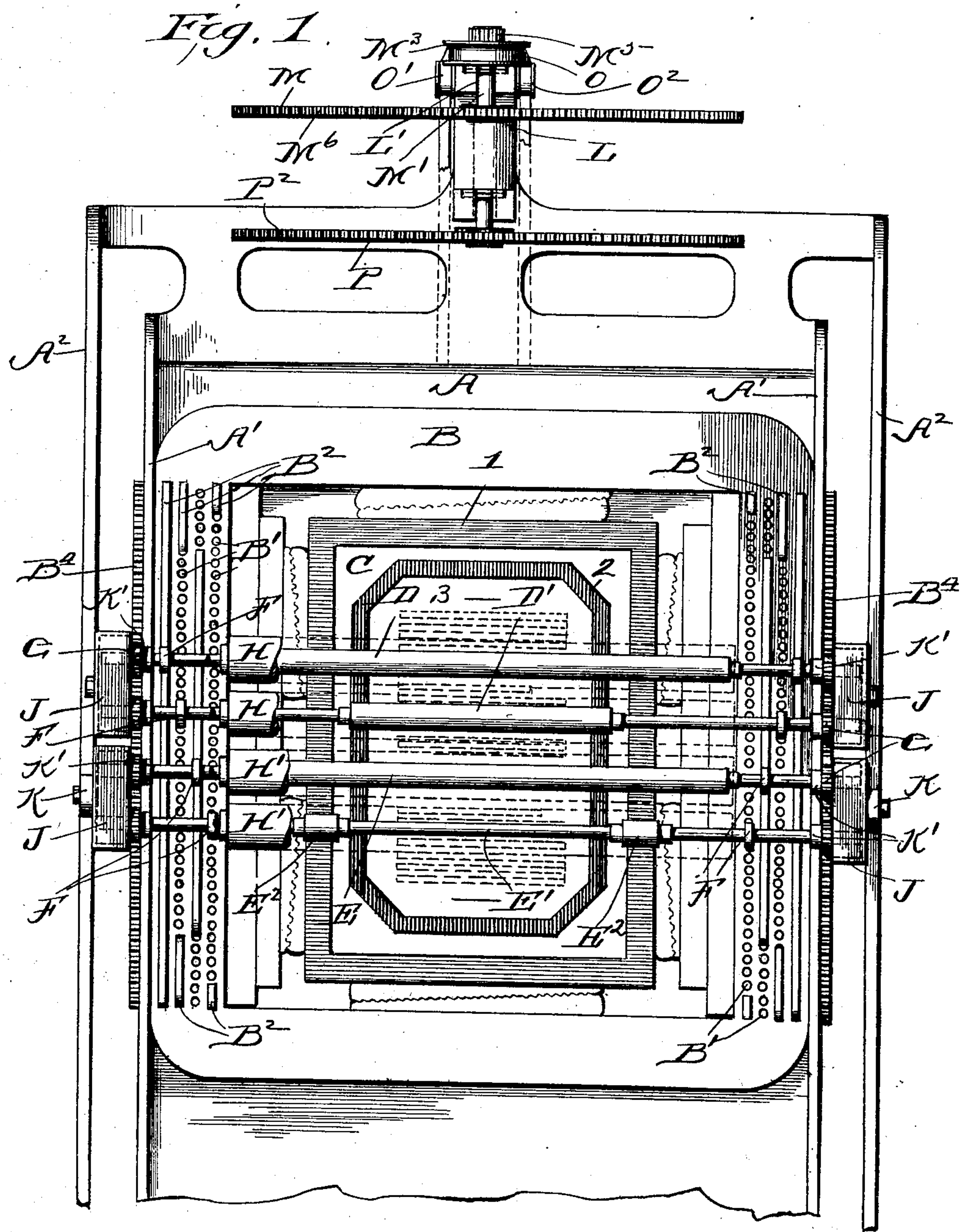
No. 891,392.

PATENTED JUNE 23, 1908.

H. A. AGRICOLA, JR.  
TWO COLOR PRINTING PRESS.

APPLICATION FILED NOV. 10, 1905.

3 SHEETS—SHEET 1.



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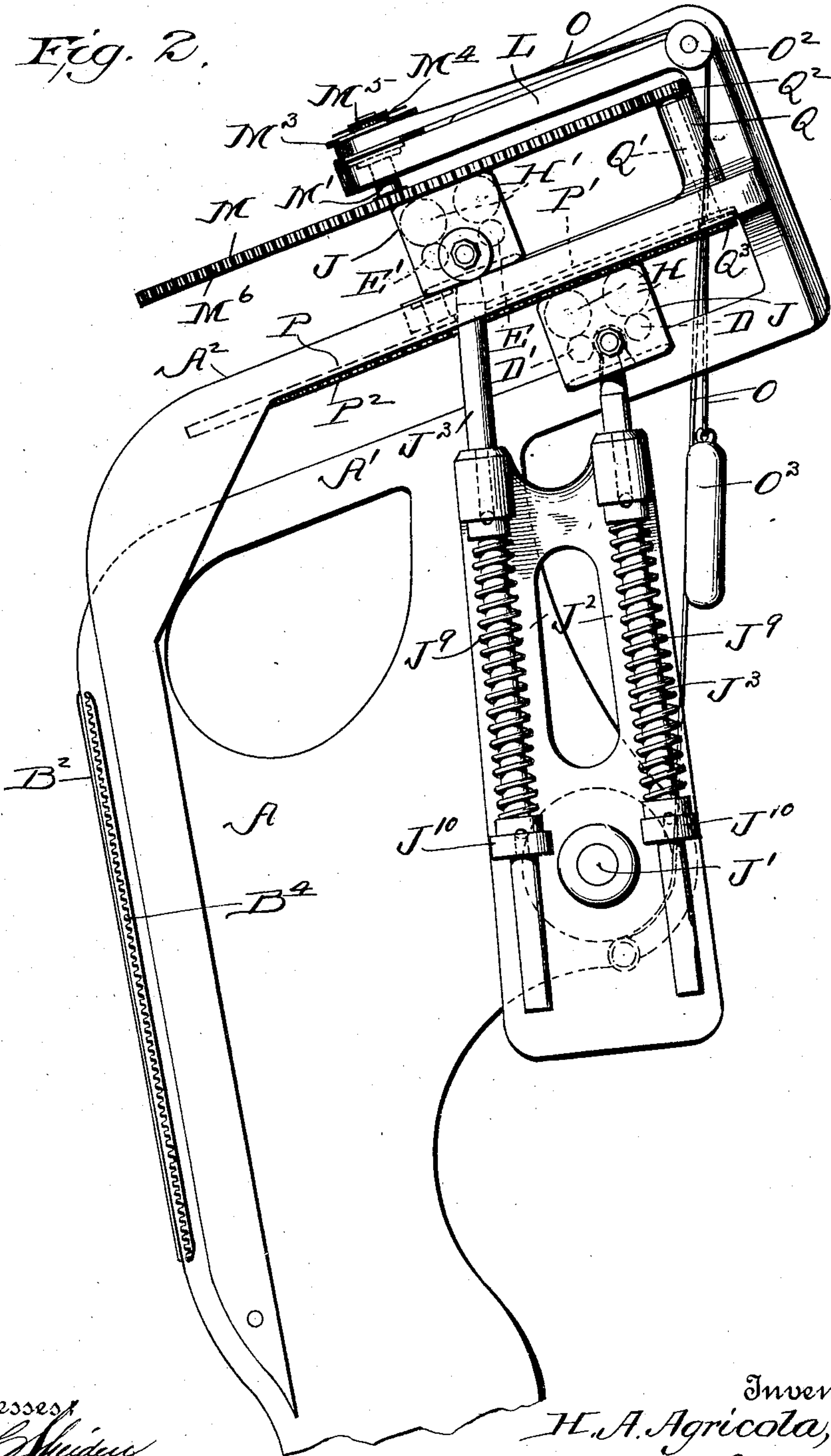
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

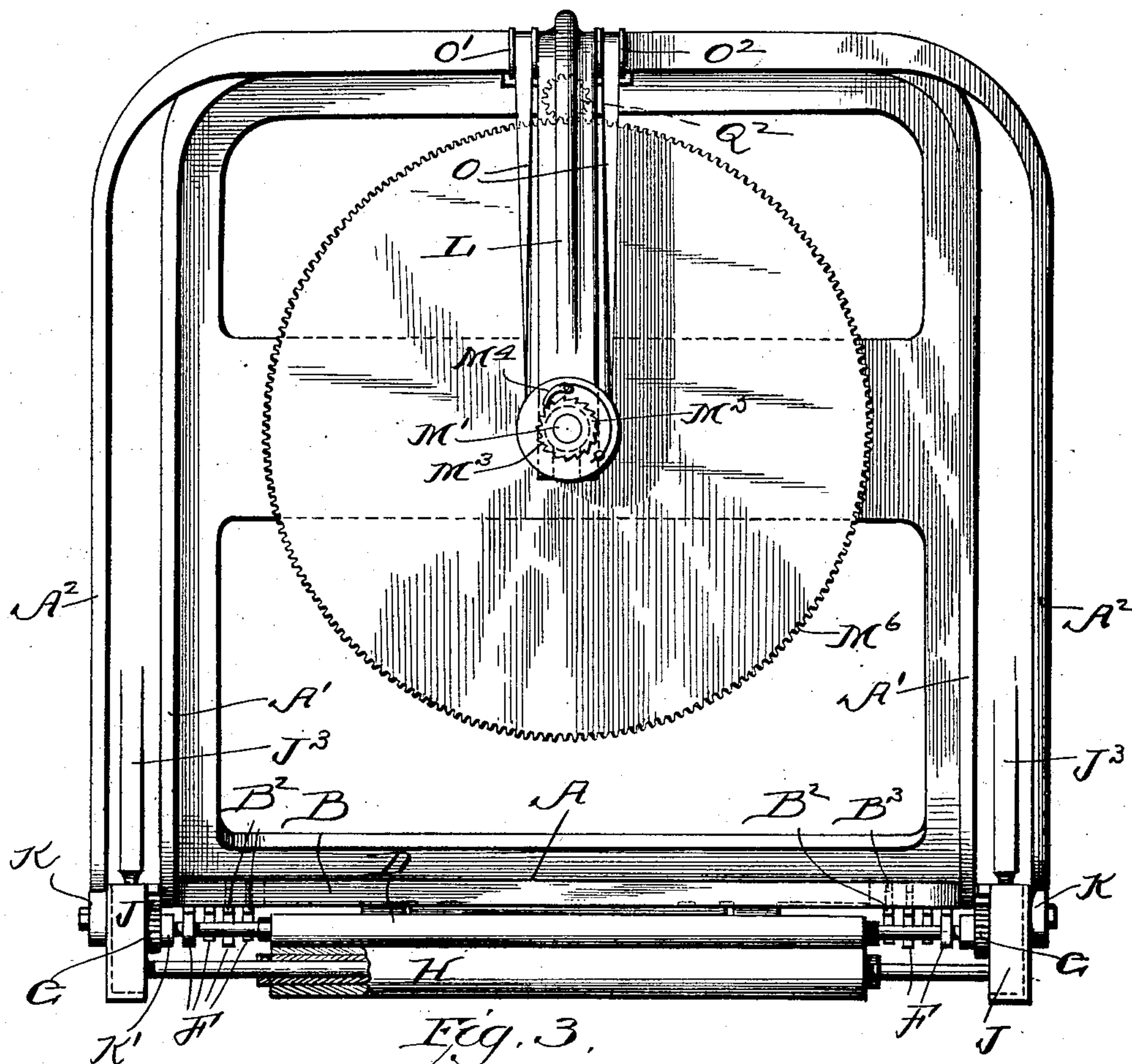


Fig. 3.

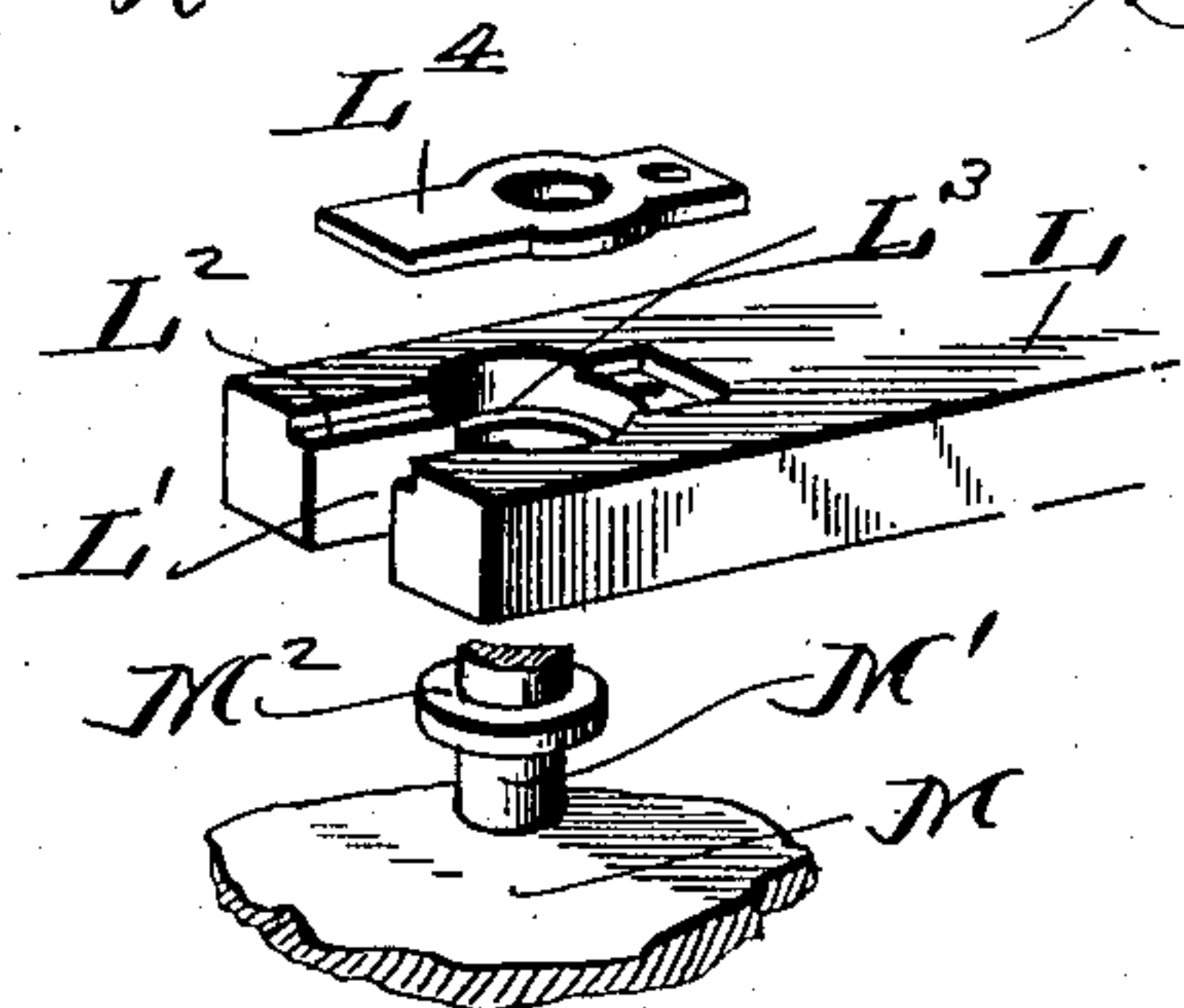


Fig. 4.

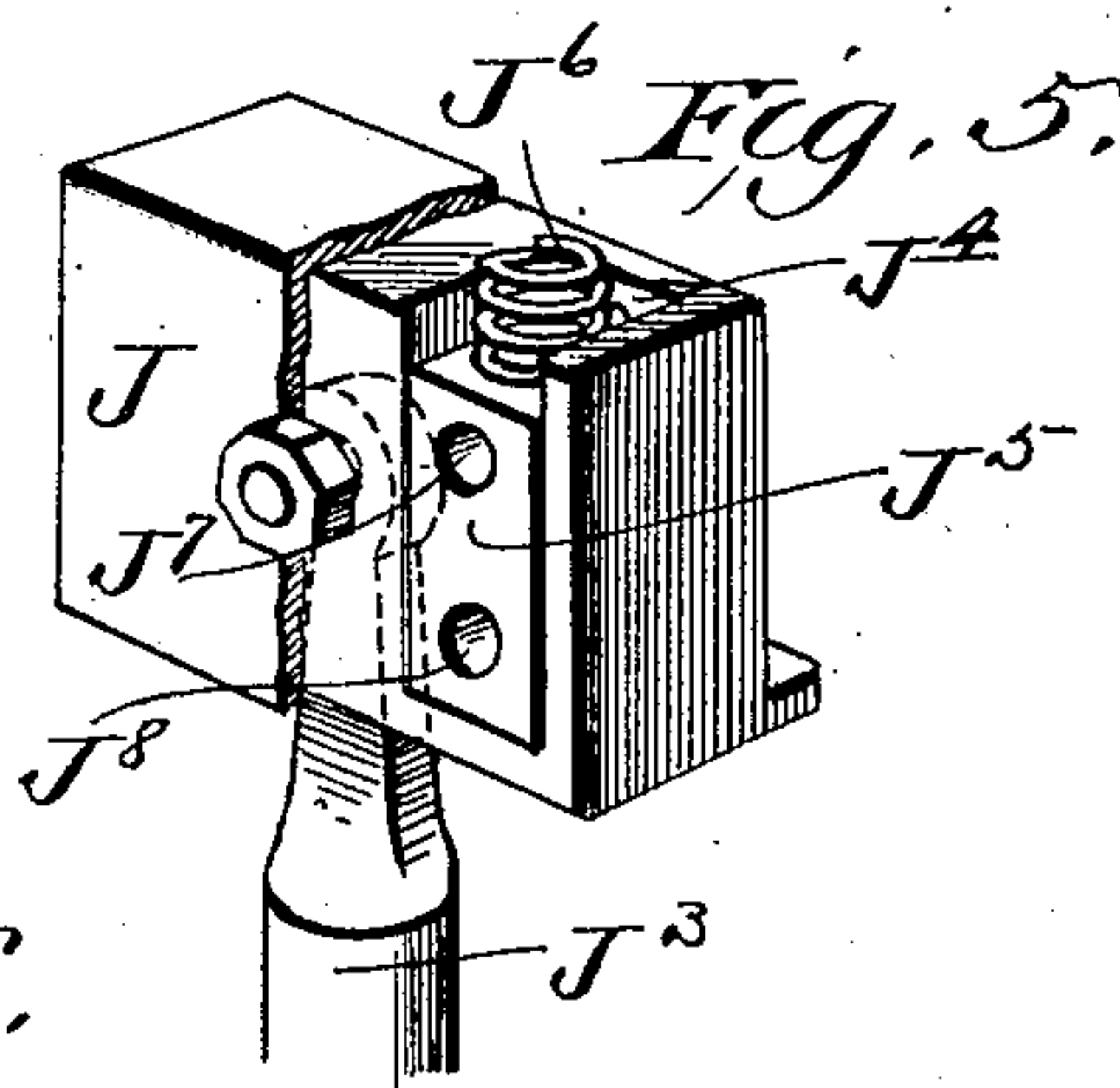
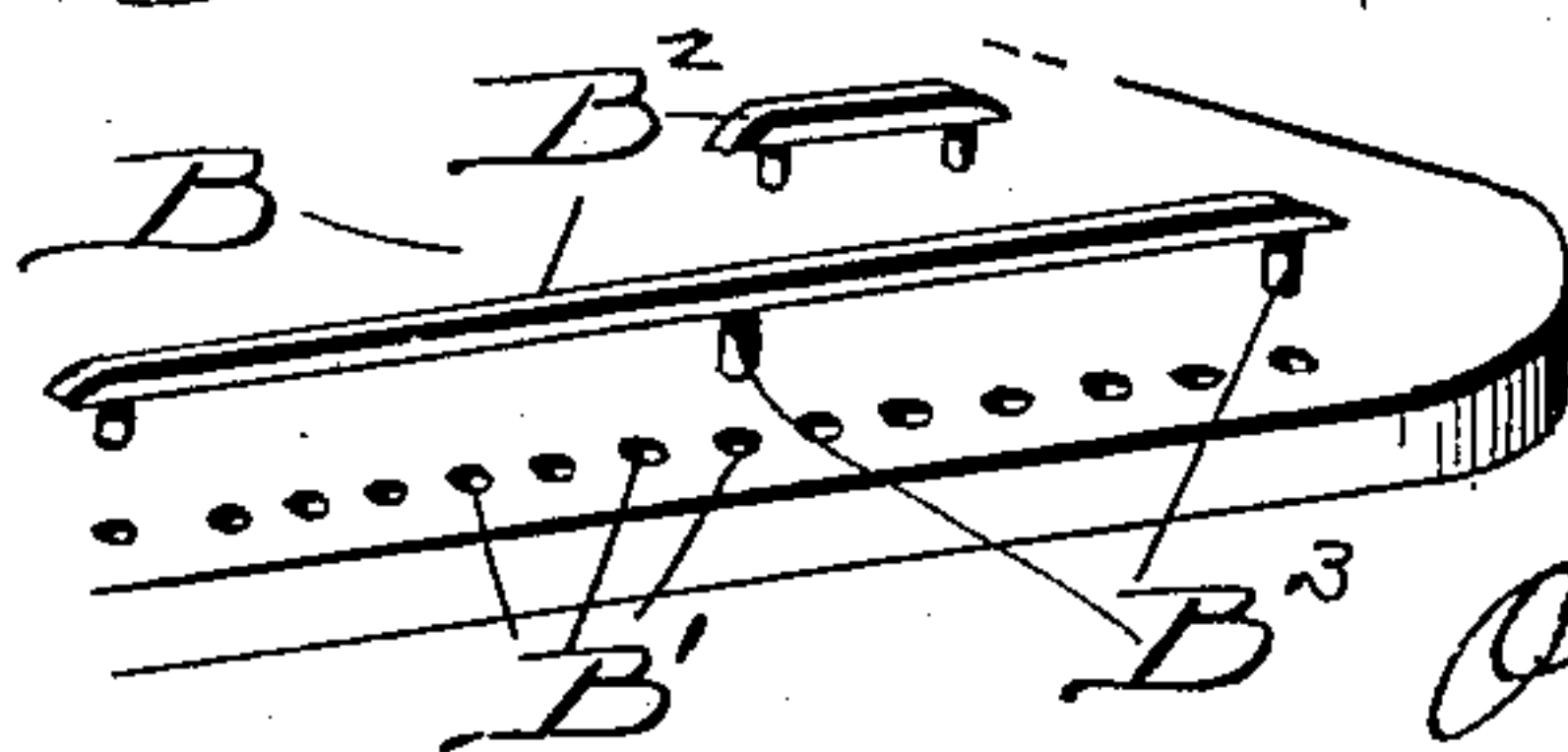


Fig. 5.



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# UNITED STATES PATENT OFFICE.

HERMAN A. AGRICOLA, JR., OF ATLANTA, GEORGIA.

## TWO-COLOR-PRINTING PRESS.

No. 891,392.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed November 10, 1905. Serial No. 286,714.

*To all whom it may concern:*

Be it known that I, HERMAN A. AGRICOLA, Jr., a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Improvement in Two-Color-Printing Presses, of which the following is a specification.

This invention relates to an attachment for printing presses whereby two color work can be run off upon an ordinary press, as for example, upon the job press known as the "Gordon."

The object of the invention is an attachment of this kind comprising a number of co-acting devices which can be grouped together and put upon any jobbing press using form rollers and taking ink from one or more disks. At the same time, while I have shown the invention as applied to a press employing a flat surface inking disk, it will be obvious that presses having fountain roller ink feeds can also have the attachment connected thereto by attaching the ink feeding mechanism to them.

Another object of my invention is the printing of a form in two colors with a single impression or during one revolution of a "Gordon" press.

The invention is designed, for example, to print a form in solid black type with a border of red or any other suitable color surrounding the type portion.

The invention is also designed for the purpose of printing in black or any other desired color the body portion of a form, at the same time putting in one or more initial letters and a border of a contrasting color to that employed upon the body of the form.

The invention consists of a chase having a plurality of perforated tracks on opposite sides thereto, cam-bars of various lengths adapted to be fitted upon said tracks in engagement with the perforations, and a plurality of inking rollers movable over the chase, and over the form carried by the chase, the said rollers being provided with wheel portions traveling upon said tracks, whereby the roller is lifted away from the form when the wheels upon said roller come into engagement with the cam-bars, the roller traveling a distance up and down the form without inking the same, in proportion to the length of the cam-bars, engaged by the roller wheels.

The invention also consists in the novel

features of construction hereinafter set forth, pointed out in the claims and shown in the accompanying drawings in which

Figure 1, is a front elevation of a press supplied with my attachment. Fig. 2, is a vertical side elevation of the upper portion of a press having my invention applied thereto. Fig. 3, is a top plan view of Fig. 1. Fig. 4, is a detail perspective view illustrating the manner of journaling an inking disk in position. Fig. 5, is a detail perspective view of a journal box, the casing of the same being partly broken away. Fig. 6, is a detail perspective view of a portion of a chase, showing a perforated track, and two of the cam bars removed from the track.

In these drawings A, represents the bed of the press upon which is arranged a chase B, and within the chase is locked a form C, the form being held in place in the usual manner. The chase B, has formed in its side walls a plurality of vertically extending rows of perforations B<sup>1</sup>. These rows have a length equal to that of the largest form which can be held in the chase, and have preferably four in number on each side of the chase, making a total of eight rows. It will be noticed that on each side of the chase, the adjacent rows of perforations are slightly staggered with respect to each other, alternate rows having the perforations in horizontal alinement. The perforations B<sup>1</sup>, which form the rows are preferably a pica distance apart, and by staggering the rows a distance of less than the pica size, type can be obtained in adjacent cam bars B<sup>2</sup>. These cam bars are made in various lengths from one pica size to a length equal to the length of the rows of perforations, and are provided with a plurality of pins or projections B<sup>3</sup>, varying in number according to the length of the cam bars, which pin fits snugly the perforations B<sup>1</sup>. A plurality of rollers, D, D<sup>1</sup>, E, and E<sup>1</sup>, extend transversely and horizontally across the chase and travel perpendicularly up and down the face of the form. These rollers are of small diameter and are provided with the usual printing composition to receive and deliver ink, the rollers consisting substantially of a small shaft forming a ground upon which the composition roller is mounted, and any desired means may be adapted to prevent the composition roller from slipping or turning upon its shaft. Upon each of the printing rollers thus formed, are arranged slidable



wheels F, which travel upon the trackways marked out by the rows of perforations or formed by the cam bars.

It will be obvious from the drawings, that the wheels F, of each roller travel upon the track of their own, the wheels being adjusted upon each roller out of vertical alinement with those of the other rollers. It will be plain that the wheels F, of one roller will be traveling upon the outer rows of perforations or upon what may be termed the outer tracks while the wheels of another roller will be traveling upon the innermost tracks and the wheels of the other two rollers upon the two intermediate tracks, the tracks and wheels being duplicated upon opposite sides of the chase.

An explanation of the parts already described will serve to more fully make clear the object of the parts to be hereafter described. In Fig. 1, I have shown a form in which it is assumed that the border 1, in red ink is to be printed and within which is a border 2, in black ink, with printed matter 3, within the last mentioned border. The rollers D, and D<sup>1</sup>, are assumed to be inked with black ink and the rollers E, and E<sup>1</sup>, with red ink. As the rollers are carried outwardly over the face of the form, the roller E<sup>1</sup>, being the lowermost roller, will pass first over the face of the form. This roller has secured upon it short collars or sleeves E<sup>2</sup>, formed of the inking composition, which sleeves are spaced apart and are of a length equal to the width of the red border on each side of the form. The wheels F, of the roller E<sup>1</sup>, are adjusted to travel upon the innermost track, and it will be noted that this track is free from cams in that portion of the track immediately opposite the vertical sides of the form C. As the roller E<sup>1</sup>, therefore passes over the form, the inking portion E<sup>2</sup>, of the said roller, will put in the vertical sides of the red border 1. The roller E, also receives red ink and its wheels F, travel upon the tracks adjacent those traveled upon by the wheels of the roller E<sup>1</sup>. As this roller comes down on the face of the form, it first inks in the upper horizontal side of the red border 1, and the wheels F, then immediately engage cams B<sup>2</sup>, which lift the roller sufficiently for it to clear the border 2, and the body portion 3. As the wheels of the roller D<sup>1</sup> strike the sides of the chase B, they ride first upon cams B<sup>2</sup>, which lift the said roller over the upper portion of the red border 1, but which stops short of the upper edge of the black border 2. This roller then prints in black until the border 2, and the body portion 3, has been entirely passed over and is then again lifted by cams B<sup>2</sup>, to clear the lower side of the red border 1. The roller D, having no work to perform in the example thus described, travels the entire length of the form upon cams B<sup>2</sup>, and no inking is done by this roller

on the form such as is shown for illustrative purposes in Fig. 1. The example in Fig. 1, therefore shows two rollers D<sup>1</sup>, and E<sup>1</sup>, inking simultaneously one form in two contrasting colors, one roller, D, carried across the form without inking in part of it and the roller E, inking in a red border only at the top and bottom of the form.

In order that there may be a positive rotatory motion to the inking rollers above described, and which will be termed auxiliary rollers to distinguish them from inking rollers to be hereafter described, I secure upon the vertical sides of the chase B, suitable rack bars B<sup>4</sup>, and the rollers D, D<sup>1</sup>, E, and E<sup>1</sup>, carry gears G, which engage these rack bars, and any slipping or sliding of the rollers upon the form is prevented, and this not only insures a uniformity in the distribution of ink upon the form but also prevents any possible danger of the colors overlapping or being wrongly distributed. The rollers are held in suitable journal boxes J, two of these boxes being employed upon each side of the chase and for convenience of description the boxes will be referred to as upper and lower boxes. The upper boxes J, have journaled in them rollers E, and E<sup>1</sup>, and are termed the upper boxes for the reason that they travel to an upper inking disk from which the rollers E and E<sup>1</sup>, receive ink of the proper color, while the lower journal boxes J, in which are journaled rollers D and D<sup>1</sup>, travel to a lower inking disk which furnishes ink of a different color to the rollers D and D<sup>1</sup>. These inking disks will be described hereafter and it will be noted that when the inking rollers are passing over the form C, the upper journal boxes are really in a lower horizontal plane than the lower journal boxes, the upper boxes preceding the lower boxes in traveling down the face of the form. Upon opposite sides of the frame A, are arranged parallel tracks A<sup>1</sup>, and A<sup>2</sup>, these tracks being arranged in pairs and one pair being provided upon each side of the chase B. From Fig. 2, it will be noted that the tracks A<sup>1</sup>, lie within the tracks A<sup>2</sup>, and adjacent the bed of the press. The tracks A<sup>1</sup>, carry the rack bars B<sup>4</sup>, above referred to. Above the press bed, the tracks A<sup>1</sup>, curve upwardly and extend rearwardly. The tracks A<sup>2</sup>, are spaced some distance from the sides of the tracks A<sup>1</sup>, and extend upwardly above the tracks A<sup>1</sup>, and then curve rearwardly, and it will be noted that the straight portion of the tracks A<sup>2</sup>, are parallel to the straight portion of the tracks A<sup>1</sup>. The journal boxes J, are supported from the rock shaft J<sup>1</sup>, carried by the frame A, and upon each side of the frame, this shaft carries rocker arms J<sup>2</sup>. Any desired means may be employed for rocking the shaft J<sup>1</sup>. Loosely mounted upon the rocker arms J<sup>2</sup>, are parallel rods J<sup>3</sup>, which work through suitable sleeves and collars carried by the rocker arms.



Coil springs  $J^9$ , which encircle the rods  $J^3$ , and which are secured at their lower ends to collars  $J^{10}$ , draw downwardly or upwardly upon the said rods. At their outer ends, the rods  $J^3$ , are each pivotally connected to one of the journal boxes  $J$ . As shown in the detail view in Fig. 5, each journal box is formed in compartments, the outer casing being broken away in Fig. 5, to show one of said compartments at  $J^4$ . In each of these compartments is arranged a bearing block  $J^5$ , which is slightly smaller than the compartment  $J^4$ , and a spring  $J^6$ , is arranged upon each block and bears upon the inner face of the journal box  $J$ . These blocks  $J^5$ , have bearings  $J^7$ , and  $J^8$ , formed in them in vertical alinement and by means of the spring  $J^6$ , form adjustable bearings for the rollers journaled in the blocks  $J^5$ . In the bearings  $J^8$ , of the blocks are journaled the end portions of the auxiliary rollers  $D$ , and  $D^1$ ,  $E$  and  $E^1$ . In the bearings  $J^7$ , are journaled the end portions of inking rollers  $H$ , and  $H^1$ , arranged in pairs, the rollers  $H$ , being carried by the lower journal box  $J$ , and rotating in frictional contact with the rollers  $D$ , and  $D^1$ , and the rollers  $H^1$ , are carried by the upper journal box and rotate in frictional contact with the rollers  $E$ , and  $E^1$ , and it will be obvious that the auxiliary rollers receive their supply directly from the inking rollers  $H$ , and  $H^1$ , which rollers are of a much larger diameter than the auxiliary rollers.

The upper journal boxes  $J$ , are provided upon their outer faces with rollers  $K$ , which travel upon the tracks  $A^2$ , and it will be obvious from the drawings that the rocker arms  $J^2$ , move between the tracks  $A^1$ , and  $A^2$ , the journal boxes  $J$ , traveling also between the said tracks. The auxiliary rollers also carry small wheels  $K^1$ , which travel upon the tracks  $A^1$ . It will now be obvious when the rollers are in the position shown in Fig. 1, and are moving upwardly that as the lower journal box reaches the upper curved portion of the tracks  $A^1$ , the rollers  $K^1$ , upon the auxiliary rollers  $D$ , and  $D^1$ , will hug the curvature of the track  $A^1$ , by reason of the tension of the springs  $J^9$ , upon the rods  $J^2$ , pivotally connected to the lower journal boxes  $J$ , and this journal box will therefore travel rearwardly upon the tracks  $A^1$ . The upper journal box  $J$ , will, however, be held upon the tracks  $A^2$ , by the rollers  $K$ , and the wheels  $K^1$ , carried by the auxiliary inking rollers  $E$ , and  $E^1$ , will leave the track  $A$ , and the upper journal boxes  $J$ , will travel rearwardly upon the tracks  $A^2$ , the position of the two journal boxes as the rocker arms  $J^2$ , approach a perpendicular position being shown in Fig. 2. To support the inking disks which convey ink to the rollers  $H$ , and  $H^1$ , the upper rear portion of the arm  $A$ , carries a angled arm  $L$ , which is bifurcated at its free end as shown at  $L^1$ , in Fig. 4, and this bifurcation is pro-

vided with guideways  $L^2$ , which intersect the perforations provided with an annular shoulder  $L^3$ , which shoulder is counter sunk with respect to the slideways  $L^2$ . An upper inking disk  $M$ , is provided with a shaft  $M^1$ , which carries a collar  $M^2$ . This shaft  $M^1$ , slides in the bifurcated portion of the arm  $L$ , the collar  $M^2$ , traveling in the slideways  $L^2$ , and dropping into the perforations and resting upon the countersunk shoulder  $L^3$ . The disk is then secured in place by means of a flat locking plate  $L^4$ , perforated to fit over the shaft  $M^2$ , and which rests in the slideway, the said plate being held in position by a suitable screw. It will be obvious that in order to remove the inking disk  $M$ , for purpose of cleaning, it is only necessary to remove the locking plate  $L^4$ , and lift the disk upwardly so as to raise the collar  $M^2$ , out of its seat upon the shoulder  $L^3$ , and then draw the disk forwardly until the shaft  $M^1$ , has cleared the bifurcation  $L^1$ . Upon the upper end portion of the shaft  $M^1$ , is loosely mounted a pulley  $M^3$ , and upon the pulley is pivoted a spring-pressed pawl  $M^4$ , which engages the ratchet  $M^5$ , fixed upon the upper end of the shaft  $M^1$ , when the pulley is rotated in one direction, the pulley slipping upon the ratchet when the pulley is rotated in the opposite direction. The inking disk  $M$ , is also formed with gear teeth  $M^6$ , upon its periphery.

A belt  $O$ , is connected at one end of the rock shaft  $J^1$ , and passes upwardly over the pulley  $O^1$ , carried at the angle of the arm  $L$ , and the belt then passes around the pulley  $M^3$ , and back over the pulley  $O^2$ , carried by the arm  $L$ , on the side opposite the pulley  $O^1$ . The free end of the belt has a weight  $O^3$ , attached thereto. A lower inking disk  $P$ , is suitably journaled upon an arm  $P^1$ , which extends over the arm  $L$ , upwardly to the disk  $M$ . As the disk  $P$ , and its bearings are substantially duplicates of the upper inking disk  $M$ , no detailed description of them is thought necessary. In order to rotate the lower printing disk  $P$ , a sleeve  $Q$ , is formed upon the rear end portion of the arm  $P^1$ , and at right angles thereto and in the face of the sleeve is journaled a shaft  $Q^1$ , which carries at its ends pinions  $Q^2$ , and  $Q^3$ , the pinions  $Q^2$ , meshing with the teeth  $M^6$ , of the inking disk  $M$ , and the pinion  $Q^3$ , meshing with similar teeth  $P^2$ , formed on the disk  $P$ .

As the operation of the main part of the device has already been referred to in detail, a brief summary of the operation as a whole will give a clear understanding of the operation of the device. Assuming that the colors to be printed are black and red, the disk  $M$ , will be a red inking disk and the lower disk  $P$ , will carry the black ink. As the rocker arms  $J^1$ , swing into a perpendicular position, the rollers  $H$ , carried by the lower journal boxes  $J$ , will roll across the end face of the disk  $P$ . At the same time the rollers  $H^1$ , will



travel over the end face of the inking disk M. During this operation the weight  $O^3$ , will be ascending as the pulley  $M^4$ , will be slipping upon the ratchet  $M^5$ , there will be no rotation of the inking disks. But as the rock shaft  $J^1$ , has its directions of rotation reversed, and the rocker arms  $J^2$ , swing forward bringing the rollers H, and  $H^1$ , again across the face of their respective inking disks, the weight  $O^3$ , will descend thus reversing the direction of the loose pulley  $M^3$ , and the pawl  $M^4$ , will engage the teeth of the fixed ratchet  $M^5$ , and the disk M, will be rotated. This rotation of the upper disk M, will be transmitted to the lower disk P, through the shaft  $Q^1$ , and the pinions  $Q^2$ , and  $Q^3$ . The rollers H, and  $H^1$ , will therefore be thoroughly inked, the rollers H, receiving a supply of black ink and the rollers  $H^1$ , a supply of red ink, and this ink will be distributed by these rollers to the auxiliary rollers with which they are in contact. By employing the rollers H, and  $H^1$ , to receive the inks direct from the inking disks instead of passing the auxiliary rollers themselves directly over the faces of the said inking disks, I am enabled to employ printing rollers, that is, rollers which come into actual contact with the form C, of a much smaller diameter than would be otherwise possible. By having the rollers H, and  $H^1$ , of a comparative larger diameter an abundant supply of ink is received from the inking rollers and spread over a considerable surface, and by employing rollers of comparatively smaller diameter for actual work upon the form I am able to more nicely adjust the delivery of ink of different colors to the said form.

Having thus fully described my invention,

what I claim as new and desire to secure by Letters Patent, is:—

1. A device of the kind described comprising upper and lower inking disks, a plurality of journal boxes, inking rollers journaled in said boxes and adapted to receive ink from the inking disks, and auxiliary rollers of less diameter than the first mentioned rollers, said auxiliary rollers being journaled in the said boxes, each auxiliary roller being in frictional contact with one of the first mentioned rollers and adapted to receive ink from same and to deliver it to a form, and means for bringing a portion of the first mentioned rollers into contact with one of said inking disks, and the remainder of the first mentioned rollers into contact with the other disk.

2. A device of the kind described comprising a chase, a plurality of track-ways formed on said chase, cam bars adapted to be secured on said track-ways, a plurality of journal boxes upon each side of the chase, the plurality of inking rollers journaled in said boxes and adapted to travel upon said track-ways and cam bars, a plurality of rollers of larger diameter than those first mentioned also journaled in the said boxes and in frictional contact with the rollers first mentioned, a plurality of inking disks equal in number to the number of journal boxes upon one side of the chase, and means for bringing the last mentioned rollers, into contact with said inking disks, the rollers of each pair of journal boxes engaging one disk.

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