

(No Model.)

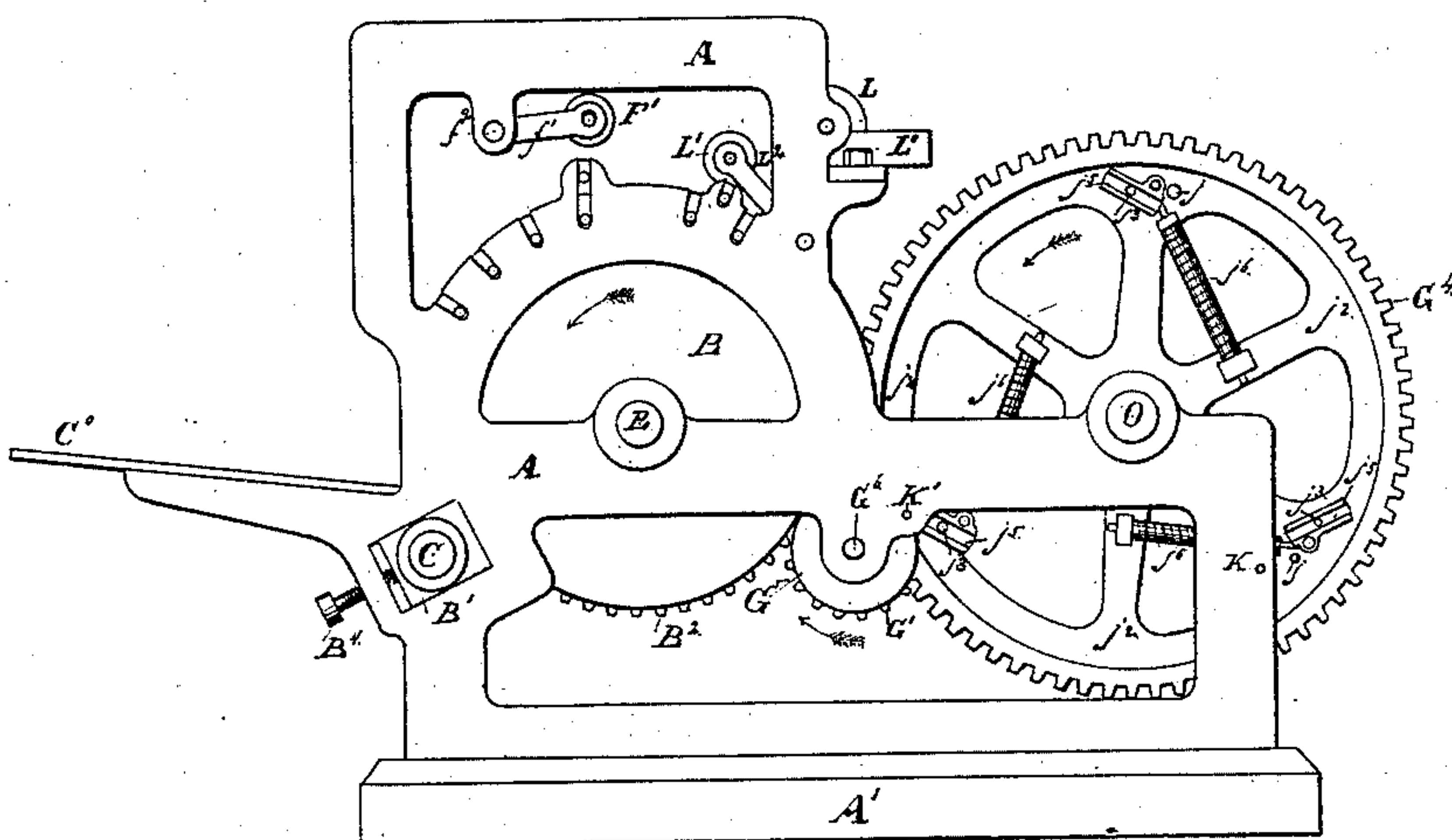
3 Sheets—Sheet 1.

J. T. HAWKINS.  
PRINTING MACHINE.

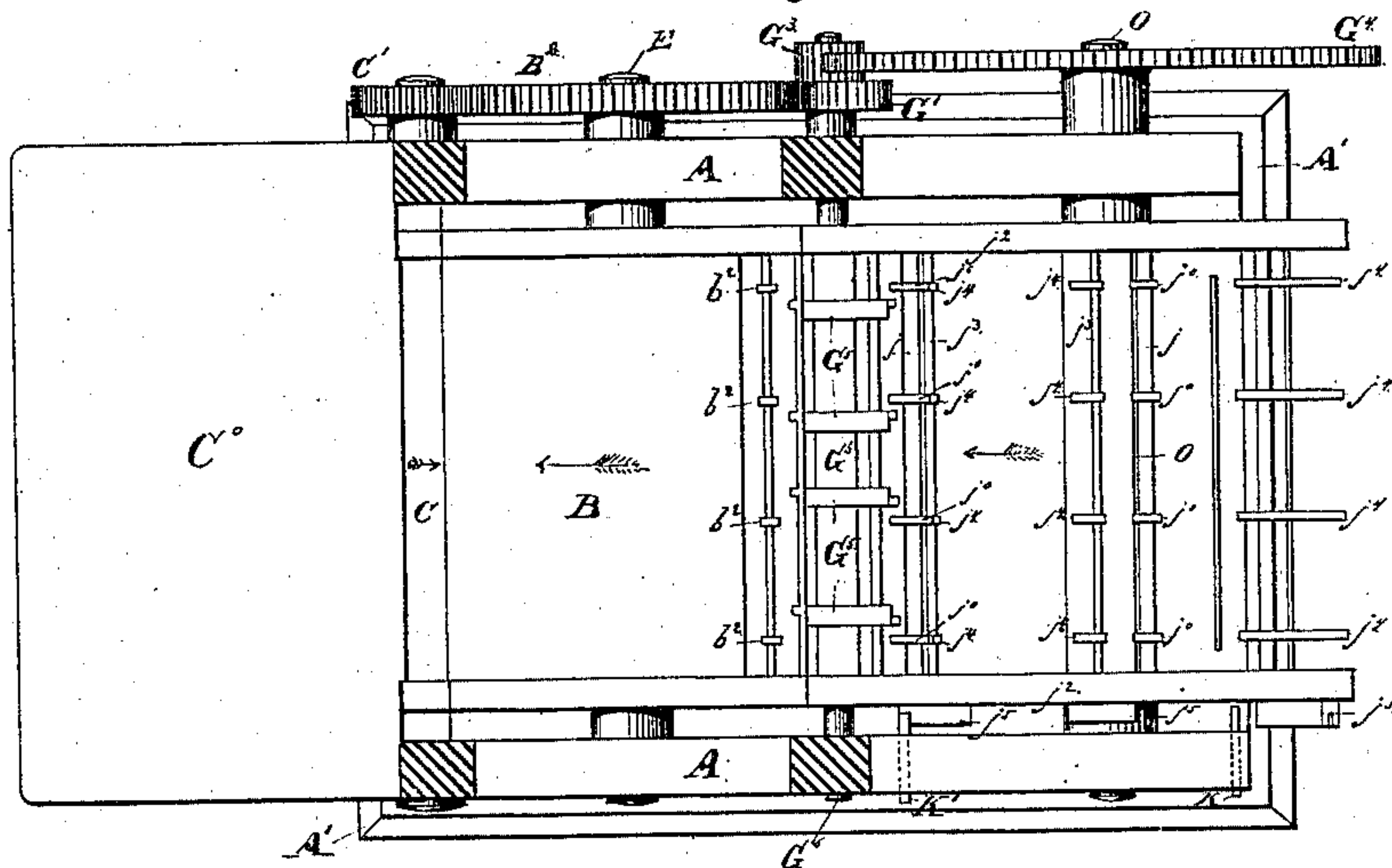
No. 305,076.

Patented Sept. 16, 1884.

*Fig. 1.*



*Fig. 2.*



WITNESSES:  
Francis Reilly  
Edward S. Berrall.

INVENTOR  
John T. Hawkins  
by Brodhead, King & Voorhes  
ATTORNEYS

(No Model.)

3 Sheets—Sheet 2.

J. T. HAWKINS.

PRINTING MACHINE.

No. 305,076.

Patented Sept. 16, 1884.

Fig. 3.

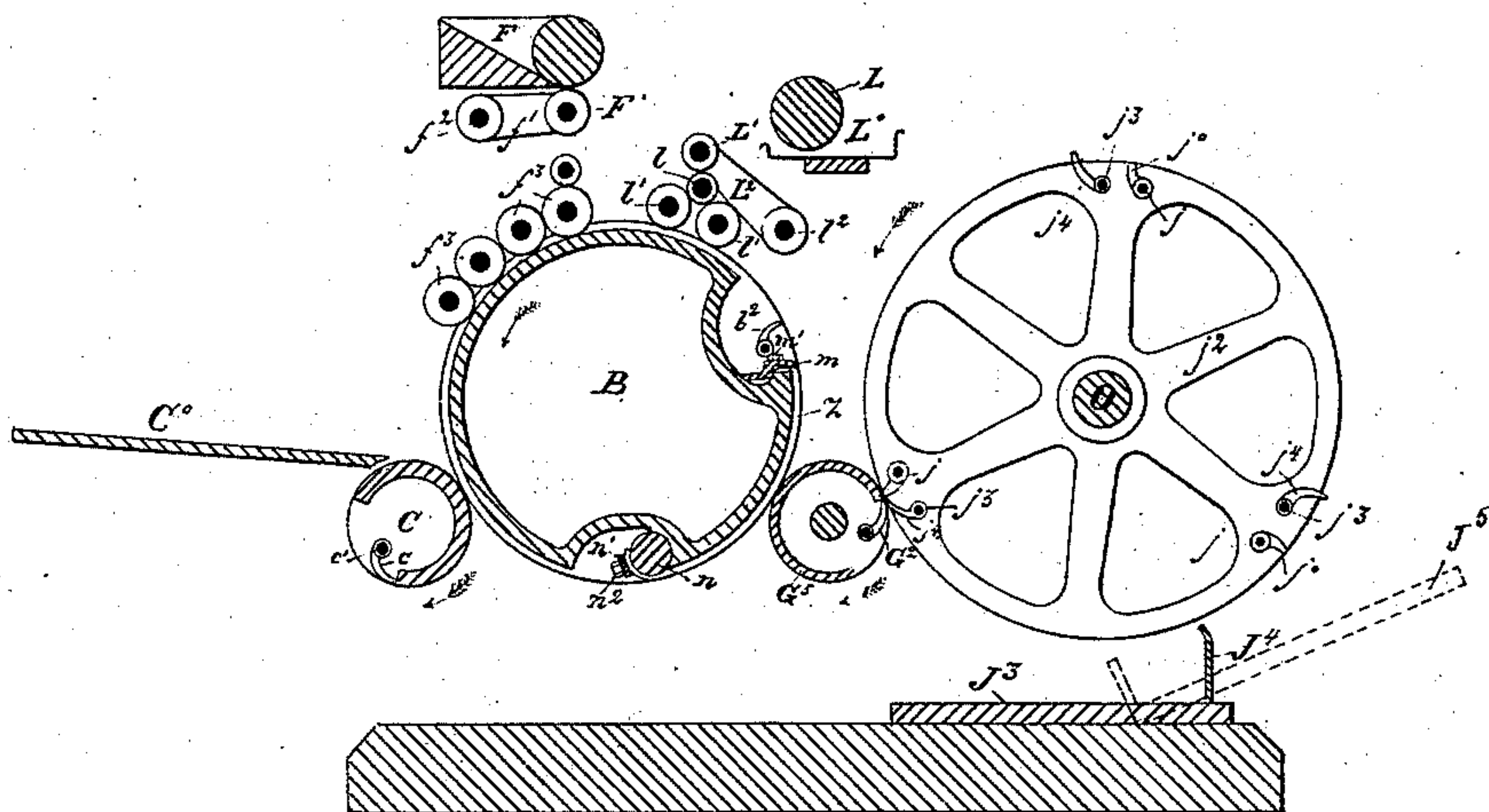
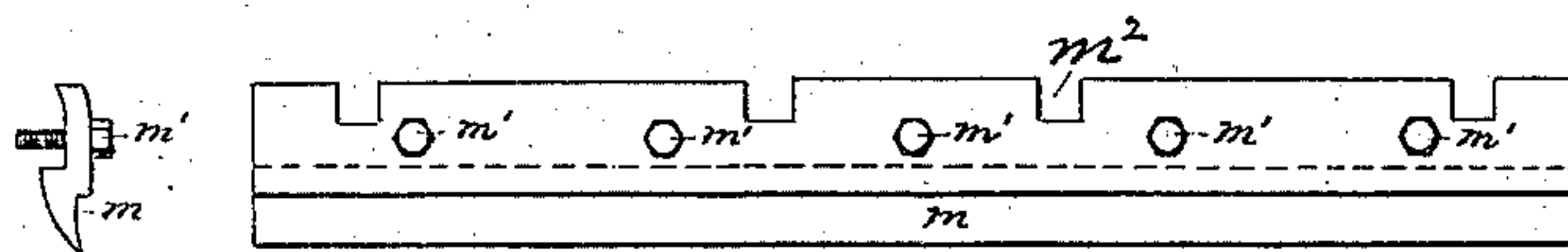


Fig. 4.



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(No Model.)

3 Sheets—Sheet 3.

J. T. HAWKINS.  
PRINTING MACHINE.

No. 305,076.

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Fig. 6.

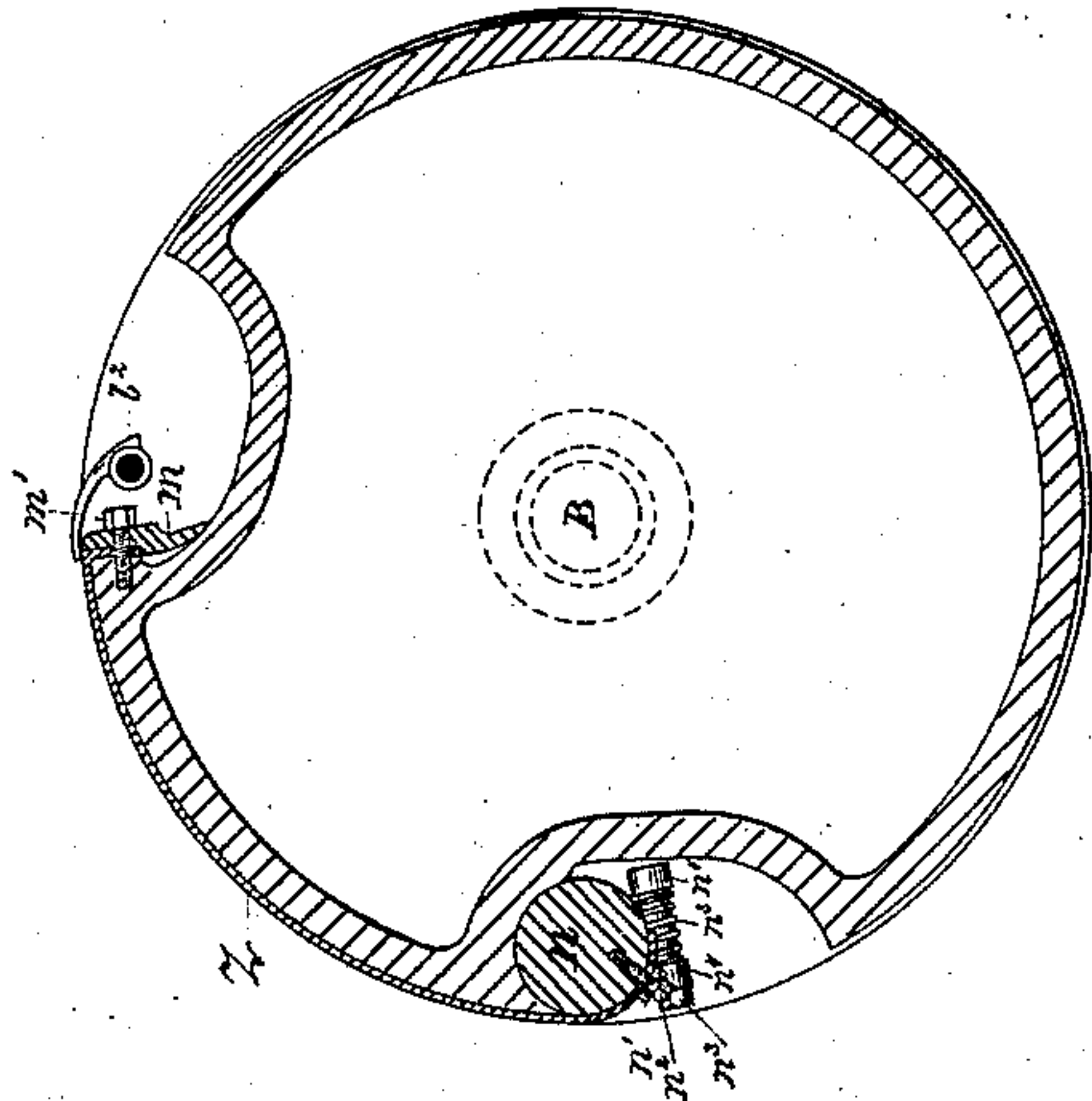
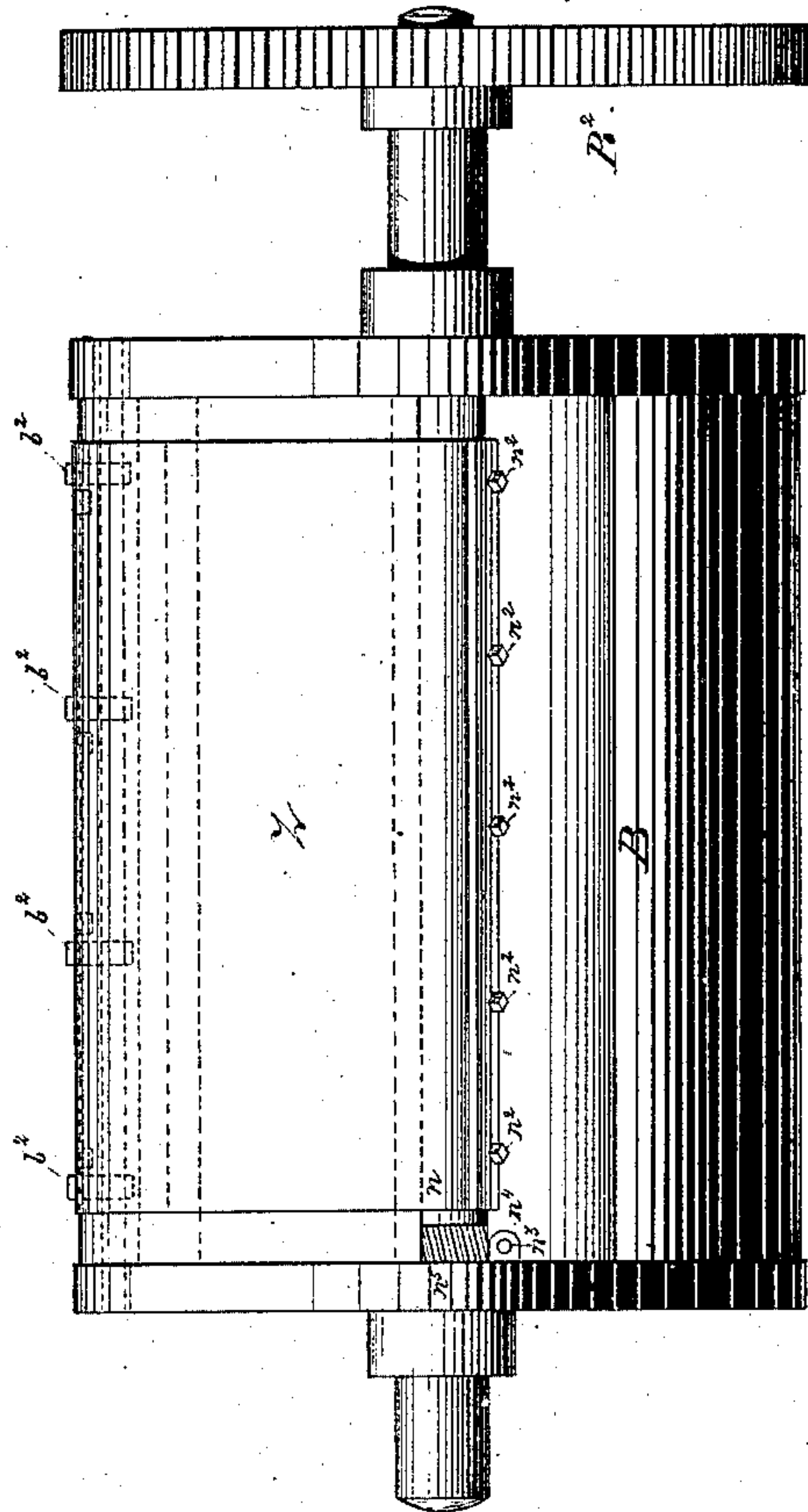


Fig. 5.



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# UNITED STATES PATENT OFFICE.

JOHN T. HAWKINS, OF TAUNTON, MASSACHUSETTS.

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 305,076, dated September 16, 1884.

Application filed November 15, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. HAWKINS, of Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Printing-Machines, which improvement or invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of the invention is to provide a machine to print separate sheets from cylindrically-surfaced type-forms, stereotype or electrotpe plates, or zincographic plates in a rapid and correct manner, delivering each printed sheet without contact of its printed side with any part of the mechanism, while at the same time providing a secure, quick, and correct method of straining and holding a zincographic plate or sheet upon the form or plate cylinder. Said latter method, however, is not herein claimed, the same forming the subject of a claim in an application now pending for other Letters Patent.

The novel features of the invention are clearly set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a plan with the inking and dampening apparatus removed. Fig. 3 is a longitudinal vertical section, in general outline, showing the positions and functions of the principal parts. Fig. 4 shows two views, enlarged, of the clamp for securing a zinc plate to the form-cylinder at its gripper-edge. Fig. 5 is an elevation, and Fig. 6 a transverse section, of the plate or form cylinder.

In the above figures, the letters A A indicate the main frames, in which the principal parts are journaled and supported.

B indicates the type or plate cylinder, journaled in the frames A at E; C, the impression-cylinder, carried in journal-boxes B', sliding in proper rectangular openings in the frames A, to allow of adjusting the impression by means of the set-screws B<sup>4</sup>.

C<sup>0</sup> indicates the feed-board from which the separate sheets are fed to the machine. A series of delivery-wheels, G<sup>5</sup>, on a shaft, G<sup>6</sup>, are journaled in the frames A. The delivery-wheels G<sup>5</sup> each carry a gripper, G<sup>2</sup>. Said grippers G<sup>2</sup>, being secured to a rock-shaft journaled in the wheels G<sup>5</sup>, are operated to

close upon and release the sheet at the proper time by any of the well-known means. (Not shown.) Journaled in a pair of wheels, j<sup>2</sup>, are three or any suitable number of gripper-shafts, j<sup>3</sup>, each carrying grippers j<sup>4</sup>. In the wheels j<sup>2</sup> are secured a similar number of rods parallel and near to the gripper-shafts j<sup>3</sup>, each rod having secured to it a series of rests, j<sup>0</sup>, upon the ends of which the grippers j<sup>4</sup> close. On the receiving-board J<sup>3</sup> the printed sheets are delivered.

J<sup>4</sup> indicates a stop, against which the delivered sheets strike at their leading or head end when released by the grippers j<sup>4</sup>.

J<sup>5</sup> in dotted lines shows the position with the stop J<sup>4</sup> reversed, in which the receiving-board may be placed for the reception of certain kinds of thin paper, the sheet dropping back to the stop after being released by the grippers j<sup>4</sup> at a higher point than when J<sup>3</sup> is used, as shown in full lines. The wheels j<sup>2</sup> are carried on the shaft O, journaled in the frames A. The grippers j<sup>4</sup> are operated to open and close by the tumbler-cam j<sup>5</sup>. The impression-cylinder C has upon its axis a spur-gear, C', to which the power is applied in any well-known way. The spur-gear C' engages a spur-gear, B<sup>2</sup>, secured to the shaft E of the plate or form-cylinder B, and the spur-gear B<sup>2</sup> engages a spur-gear, G', secured to the shaft G<sup>6</sup> of the delivery-wheels G<sup>5</sup>. Upon the small shaft G<sup>6</sup> is secured a smaller spur-gear, G<sup>3</sup>, which in turn engages a spur-gear, G<sup>4</sup>, secured to the shaft O of the wheels j<sup>2</sup>. The gears G', G<sup>3</sup>, and G<sup>4</sup> are so proportioned as to make the peripheral velocity of the wheels j<sup>2</sup> less than that of the delivery-wheels G<sup>5</sup>. This construction is, however, arbitrary, and the spur-gear G<sup>4</sup> may be made to directly engage the gear G', thus giving equal peripheral velocities to all the rotary members above described.

F indicates an ink-fountain; F', a doctor-roller carried in vibrating arms f', secured to a rock-shaft, f<sup>2</sup>. The ink form-rollers f<sup>3</sup> are lowered to the distributing-surface and raised to the plate-surface of the plate-cylinder as each roller respectively passes them. Similarly L<sup>0</sup> indicates a water-fountain; L, a water-fountain roller; L', a water doctor-roller carried in arms L<sup>2</sup>, secured to the rock-shaft I<sup>2</sup>. The water form-rollers I' are also raised and



lowered to the respective levels of the plate or form distributing surface.

The necessary mechanism for operating the doctor-rollers, for raising and lowering the form-rollers and rotating the fountain-rollers, is omitted, as these operations may be performed in any of the well-known ways.

Z indicates the zinc plate or sheet, secured to part of the periphery of the cylinder B by means of the clamp  $m$  and bolts  $m'$  at the head or gripper end of the form, and also by means of the roller  $n$ , to which it is clamped by the clamps  $n'$  and bolts  $n^2$ . The roller  $n$  is journaled in the cylinder at its ends, and is embedded for a part of its circumference throughout its whole length in the cylinder B, to prevent its springing when under strain.

To the roller  $n$  at one end is secured the worm-wheel  $n^5$ , into which meshes the endless screw  $n^3$ , carried in lugs or bearings  $n^4$ . The roller  $n$  is rotated by means of the endless screw  $n^3$ , by which means the plate or sheet of zinc is strained securely in contact with the surface of the cylinder B. The clamp  $m$  has slots  $m^2$  cut in its outer edge, (which edge forms a short continuation of the cylindrical surface of the plate or sheet of zinc Z,) corresponding in lateral position with the grippers of the cylinder C and of the delivery-wheels  $G'$ , so that either of the latter in opening or closing pass through the slots  $m^2$ , while the zinc plate Z is not cut for their passage. The sheets are clamped by their leading unprinted margins upon the top of the clamp  $m$  by the grippers  $b^2$  of the cylinder B at points between the slots  $m^2$ .

The operation of the machine is as follows: The sheets, fed from the feed-board  $C^0$  in the usual way, are taken by the grippers of the cylinder C at each third revolution, and then taken by the grippers  $b^2$  of the cylinder B and held by them in contact with the plate or form after the impression is made until released to the grippers  $G^2$  of the delivery-wheels  $G^5$ . The grippers  $G^2$  convey the head of the sheet over until met by the more slowly-moving grippers  $j^4$  of the rotating delivery-frame  $j^2$ , and the sheet is finally released by the grippers  $j^4$ , to fall successively by its own weight, as arrested by the sheet-stops  $J^4$  upon the receiving-board  $J^3$ , printed side up, and in an even pile. The speed of the delivery-frame  $j^2$  and of its grippers  $j^4$  is so proportioned that they shall travel much slower than

the grippers  $G^2$  of the delivery-wheels  $G^5$ , the latter overtaking the former until the grippers  $j^4$  have closed upon and the grippers  $G^2$  have released the sheet, at which point the speed of the sheet is much reduced, and it will from that point have its following end delivered from between the form-cylinder B and the delivery-wheels  $G^5$  faster than its head is removed by the grippers  $j^4$  of the delivery-frame  $j^2$ , thus looping itself upward until the tail end has passed entirely off the form by being stripped therefrom by the grippers  $j^4$  of the delivery-frame  $j^2$ . This feature of the construction renders it unnecessary that the delivery-wheels  $G^5$  should be of sufficiently large diameters to strip the sheet completely from the form before releasing it. This construction also gives the sheet a slow motion through the air when released by the grippers  $j^4$  of the delivery-frame  $j^2$  to fall upon the receiving-table  $J^3$ .

Having thus fully described my said improvements as of my invention, I claim—

1. In a rotary printing-machine, the combination of a plate or form cylinder, an impression-cylinder, and a delivery cylinder or wheels, each of said cylinders carrying a series of grippers for the successive transfer of the sheet from one to the other, substantially as set forth.

2. In a rotary printing-machine, the combination of a plate or form cylinder, an impression-cylinder, a delivery cylinder or wheels, and a rotary delivery-frame, said frame and each of said cylinders carrying a series of grippers for the successive transfer of the sheet from one to the other, substantially as set forth.

3. In a printing-machine for printing from a form or plate cylinder, a rotary delivery device consisting of a cylinder or a series of wheels provided with grippers taking the sheet upward from the grippers of the plate or form cylinder, and a rotary gripper-frame carrying one or more series of grippers taking the sheet downward from the grippers of said cylinder or wheels and depositing it, printed side up, upon a receiving-board placed beneath said gripper-frame without contact of the printed side with any part of the mechanism, substantially as set forth.

JOHN T. HAWKINS.

Witnesses:

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EDWARD I. BERRALL.