

(No Model.)

3 Sheets—Sheet 1.

J. T. HAWKINS.

PRINTING MACHINE.

No. 305,076.

Patented Sept. 16, 1884.

Fig. 1.

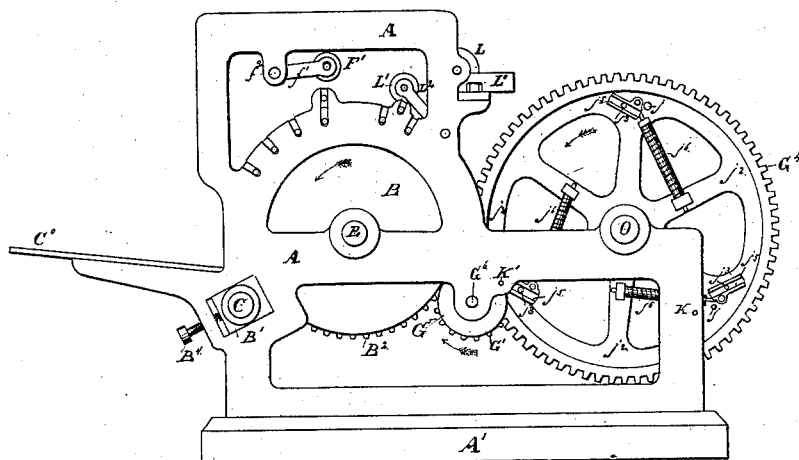
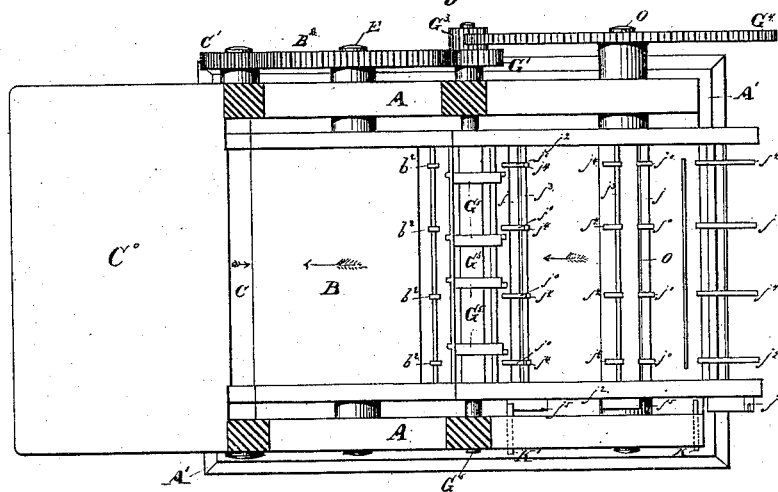


Fig. 2.



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(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

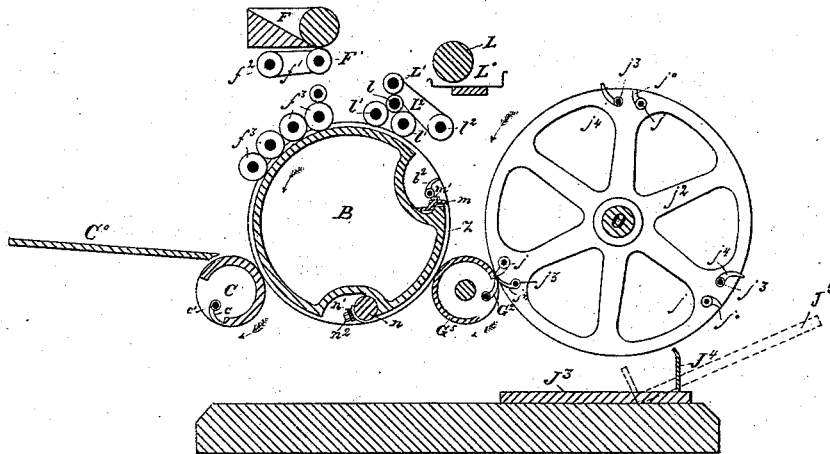
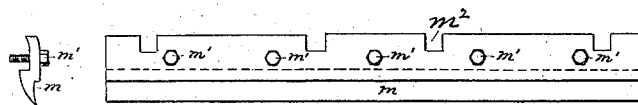


Fig. 4.



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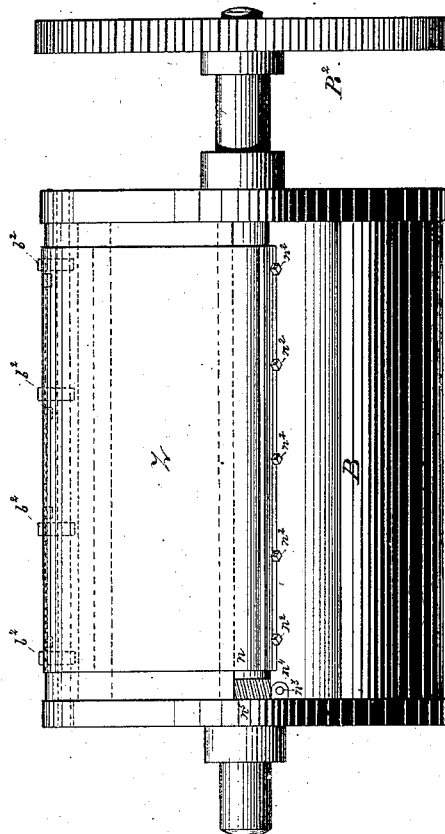
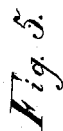
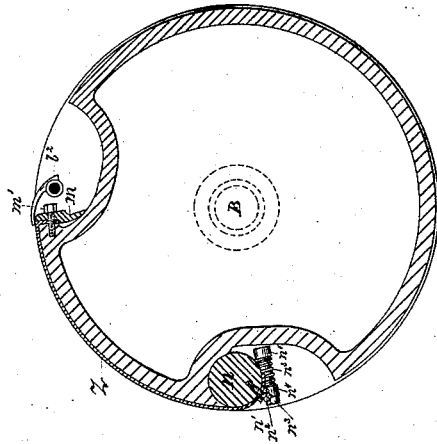
(No Model.)

3 Sheets—Sheet 3.

J. T. HAWKINS.
PRINTING MACHINE.

No. 305,076.

Patented Sept. 16, 1884.



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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 electrotype 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 B⁴.

C⁰ indicates the feed-board from which the separate sheets are fed to the machine. A series of delivery-wheels, G⁵, on a shaft, G⁶, are journaled in the frames A. The delivery-wheels G⁵ each carry a gripper, G². Said grippers G², being secured to a rock-shaft journaled in the wheels G⁵, 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, J², are three or any suitable number of gripper-shafts, J³, each carrying grippers J⁴. In the wheels J² are secured a similar number of rods parallel and near to the gripper-shafts J³, each rod having secured to it a series of rests, J⁰, upon the ends of which the grippers J⁴ close. On the receiving-board J³ the printed sheets are delivered.

J⁴ indicates a stop, against which the delivered sheets strike at their leading or head end when released by the grippers J⁴.

J⁵ in dotted lines shows the position with the stop J⁴ 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 J⁴ at a higher point than when J³ is used, as shown in full lines. The wheels J² are carried on the shaft O, journaled in the frames A. The grippers J⁴ are operated to open and close by the tumbler-cam J⁵. 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, B², secured to the shaft E of the plate or form-cylinder B, and the spur-gear B² engages a spur-gear, G', secured to the shaft G⁰ of the delivery-wheels G⁵. Upon the small shaft G⁶ is secured a smaller spur-gear, G³, which in turn engages a spur-gear, G⁴, secured to the shaft O of the wheels J². The gears G', G³, and G⁴ are so proportioned as to make the peripheral velocity of the wheels J² less than that of the delivery-wheels G⁵. This construction is, however, arbitrary, and the spur-gear G⁴ 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, f². The ink form-rollers f³ are lowered to the distributing-surface and raised to the plate-surface of the plate-cylinder as each roller respectively passes them. Similarly L⁰ indicates a water-fountain; L, a water-fountain roller; L', a water doctor-roller carried in arms L², secured to the rock-shaft I². 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'' . 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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