

(No Model.)

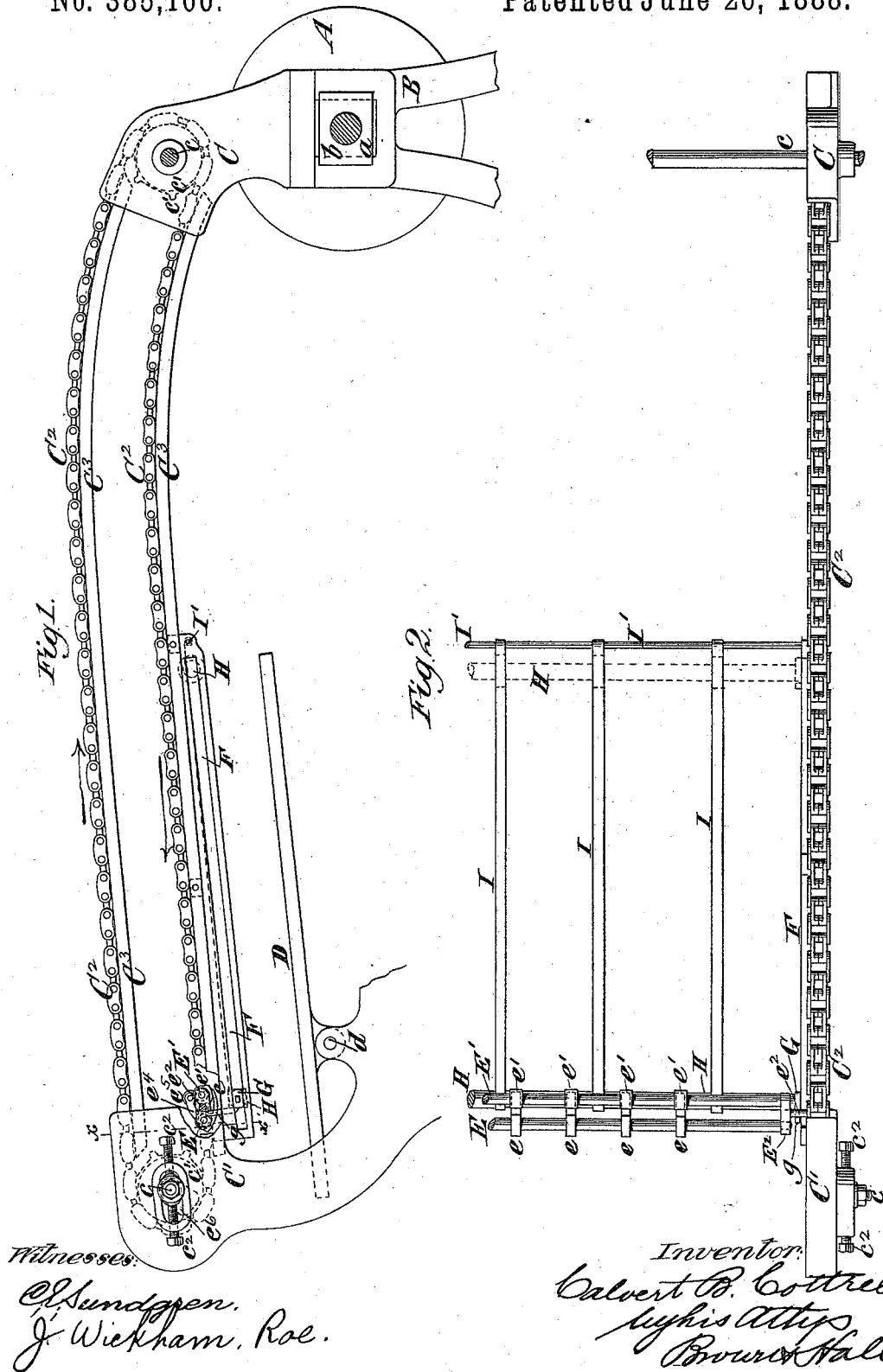
2 Sheets—Sheet 1.

C. B. COTTRELL.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 385,100.

Patented June 26, 1888.

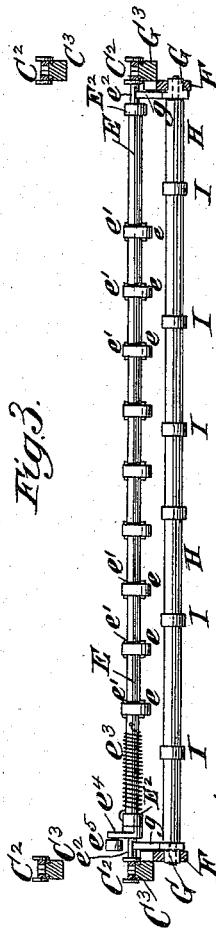


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No. 385,100.

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Witnesses:

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# UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF STONINGTON, CONNECTICUT.

## SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 385,100, dated June 26, 1888.

Application filed October 31, 1887. Serial No. 253,834. (No model.)

*To all whom it may concern:*

Be it known that I, CALVERT B. COTTRELL, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Sheet-Delivery Apparatus for Printing-Machines, of which the following is a specification.

My invention relates to those printing-machines which have a front delivery consisting of an endless carrier provided with delivery-grippers and adapted for continuous travel along guides which extend from the impression-cylinder forward to the receiving-table at the front end of the machine. Examples of a delivery apparatus of this character are shown in my Letters Patent No. 305,798, granted September 30, 1884, and in my Letters Patent No. 319,460, granted June 9, 1885, both for sheet-delivery apparatus for printing-machines. In machines of this character the carriers for the delivery-grippers commonly consist of endless chains, which travel in the manner described, at opposite sides of the machine, in suitable guides and between which extend two rods or bars closely adjacent to each other, and one of which carries at intervals in its length a series of gripper-fingers or grippers closing upon correspondingly-spaced gripper-rests upon the other rod or bar. The printed sheet is grasped by the grippers at its forward edge, and is floated over the form and to the receiving-table at the farther end of the machine, where the delivery-grippers let go and allow the sheet to fall upon the table. With such an apparatus the sheet sometimes has a tendency to fall or droop at its rear edge; and the object of my invention is to provide, in connection with a delivery apparatus of the kind above described, a spring-roller and a tape-support for the sheet, which will be drawn forward to extend the tapes by the delivery apparatus and will be released from the delivery apparatus a little time before the grippers release the sheet, so that the spring-roller may roll back under the sheet and clear of the sheet at the instant the sheet is released and without smudging or smearing it.

The invention consists in the combination, in a printing-machine, with a cylinder and a receiving-table at the farther end of the ma-

chine and beyond the form, and guides extending between them, of an endless delivery gripper-carrier traversing said guides continually in one direction, a spring-roller and tapes extending between the guides, guides for the said roller, and a tappet-connection between the gripper-carrier and spring-roller, whereby soon after leaving the cylinder the gripper-carrier will take up and move forward the spring-roller under the sheet, and when released by the carrier the spring-roller will roll back from under the sheet and wind up the tapes which have been extended by its forward movement.

In the accompanying drawings, Figure 1 is a side view of the impression cylinder and delivery apparatus of a printing-machine embodying my invention, including the receiving-table at the farther end of the press or machine. Fig. 2 is a plan of one side portion of the delivery apparatus, showing the carrier as having moved the spring-roller to about its farthest point, and having extended the tapes beneath the sheet; and Fig. 3 is a transverse section of the guides for the gripper-carrier and the spring-roller and showing the gripper bars or rods and the spring-roller extending between their guides, the section being taken upon about the plane of the dotted line *x x*, Fig. 1.

Similar letters of reference designate corresponding parts in the several figures.

A designates the impression-cylinder, and B a part of the cylinder-frames, wherein are fitted the boxes *b*, receiving the journals *a* of the cylinder. Upon these cylinder-frames are erected standards or housings C, in which is journaled a shaft, *c*, carrying upon it chain-wheels *c'*, and in similar housings, C', at the farther end of the machine, is journaled a shaft, *c*, carrying chain-wheels *c'*, and which may be adjusted in position by set-screws *c''*. It will be understood that there is a pair of chain-wheels, *c'*, at each side of the machine, and around the wheels of each pair passes an endless metallic chain, C<sup>2</sup>, which travels along guides C<sup>2</sup>, extending between the housings or frames C C'. These chains C<sup>2</sup> may be maintained taut by adjusting the set-screws *c''* so as to move the adjustable shaft *c* away from the shaft *c* over the impression-cylinder A.

D designates the receiving-table, which is, as here represented, pivoted at  $d$ , so that it may be swung into about a parallel position with the portions of the chains  $C^2$  which pass above it, and upon which the printed sheets are deposited, as I shall soon describe. The chains  $C^2$  are traversed along the guides  $C^3$  in the direction indicated by the arrows in Fig. 1, and may have connected one or a number of sets of delivery-grippers, and in case more than one set of grippers are employed they should, of course, be connected with the chains at equidistant points in the length of the chains. I have here represented but a single set of grippers, the construction of which will be best seen from Figs. 2 and 3.

Between the chains  $C^2$ , at opposite sides of the machine, extends a gripper rod or bar, E, and a rest rod or bar, E', and upon the gripper rod or bar E are placed, at suitable intervals apart, delivery-grippers  $e$ , while upon the bar or rod E' are corresponding gripper-rests  $e'$ . The gripper rod or bar E is journaled at the ends in cheek-pieces E<sup>2</sup>, which are connected by a short rod or spindle,  $e^2$ , with the chain  $C^2$ , as clearly shown in Fig. 2, and to the gripper-rod E is applied a spring,  $e^3$ , (shown in Fig. 3,) so as to turn said rod or bar in the direction to close the gripper-fingers  $e$  upon the rests  $e'$ . Upon the end of the bar or rod E, as shown in Fig. 3, is an arm,  $e^4$ , carrying a roller,  $e^5$ , and as the gripper-chains  $C^2$  move forward the roller  $e^5$  comes in contact with a cam,  $e^6$ , (shown in Fig. 1,) and the arm  $e^4$  is tripped to turn the shaft or rod E in a direction to open the grippers and release the front end of the sheet which they have drawn forward from the cylinder.

Referring now to the parts which more particularly relate to my present invention, it will be observed that beneath those parts of the guide  $C^3$  which are over the receiving-table D are attached guides F, in which are fitted sliding blocks G, in which the ends of a spring-roller, H, are journaled. This roller may be constructed like a spring curtain-roller, and to it are attached a desired number of tapes, I, having their opposite ends attached to a rod, I', which extends across between the guides  $C^3$ , and is secured thereto so that it is immovable. The slides G, which carry the spring-roller H, have a tappet-connection with the gripper-carrier  $C^2$ , and, as here represented, the sliding block G is provided with an upwardly-extending tooth,  $g$ , in contact with which the shaft or stud  $e^2$  of the gripper-carrier comes as said carrier is moved along past the rod I'. It will be observed that the slideway F diverges downward from the track of the chain  $C^2$  from the right to the left hand of Fig. 1, and consequently, as the grippers and their rod E move from the right to the left hand end of the slideway F the shaft or spindle  $e^2$  is gradually withdrawing from the tappet  $g$ , and as the sliding block G, carrying the roller H, reaches the left-hand end of its slide-

way F the shaft or stud  $e^2$  escapes over the top of the tappet  $g$ , and the spring-roller H, by the action of its internal spring, is thrown instantly toward the right hand of Figs. 1 and 2, rotating as it moves, and winding up the tapes I, until it reaches the position shown by dotted lines in Figs. 1 and 2, close to the rod I'. Thus it will be seen that when the press is at rest the spring-roller H is close to the rod I', with the tapes I wound upon it; but as the set of delivery-grippers reaches this roller the shafts or studs  $e^2$  at opposite ends thereof strike the tapes  $g$  and carry the spring-roller H forward, thereby drawing off from said roller the tapes I, so that they serve to support the sheet and prevent it from dropping downward, until finally the shafts or studs  $e^2$  of the gripper-carrier escape from the tappets  $g$ , and then the spring within the roller instantly tends to turn it in a reverse direction, and thereby winds up the tapes I and draws the roller back from under the sheet instantly to a position adjacent to the rod I', as shown by dotted lines in Fig. 2. While the roller is thus being withdrawn from beneath the printed sheet it rolls back upon the printed sheet or beneath it, and thus the tapes and roller move simply by a rolling action and without smudging or smearing the sheet, and by the time the roller H has thus been withdrawn from beneath the sheet the gripper-arm  $e^4$  and its roller  $e^5$  have come to the cam, and the grippers are opened to release the sheet, which settles down at once upon the board D. When this arrangement of the spring-roller and tape is employed for the sheet-support, it will be obvious that it is not necessary to carry the chain-guides  $C^3$  to any great distance above the receiving-table D and the form, because as soon as the sheet is free from the cylinder A it comes behind the tapes I, which are extended to receive it, and which are unwound and left under the sheet at the same speed that the sheet progresses.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, in a printing-machine, with the cylinder, a receiving-table at the farther end of the machine, and guides extending between them, of an endless delivery gripper-carrier traversing said guides, a spring-roller and tapes extending therefrom and secured to a bar extending between the guides, guides for the said roller, and a tappet-connection between the gripper-carrier and spring-roller, whereby soon after leaving the cylinder the gripper-carrier will take up and move forward the spring-roller under the sheet, and when released by the carrier the spring-roller will roll back and wind up the tapes, substantially as herein described.

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