

(No Model.)

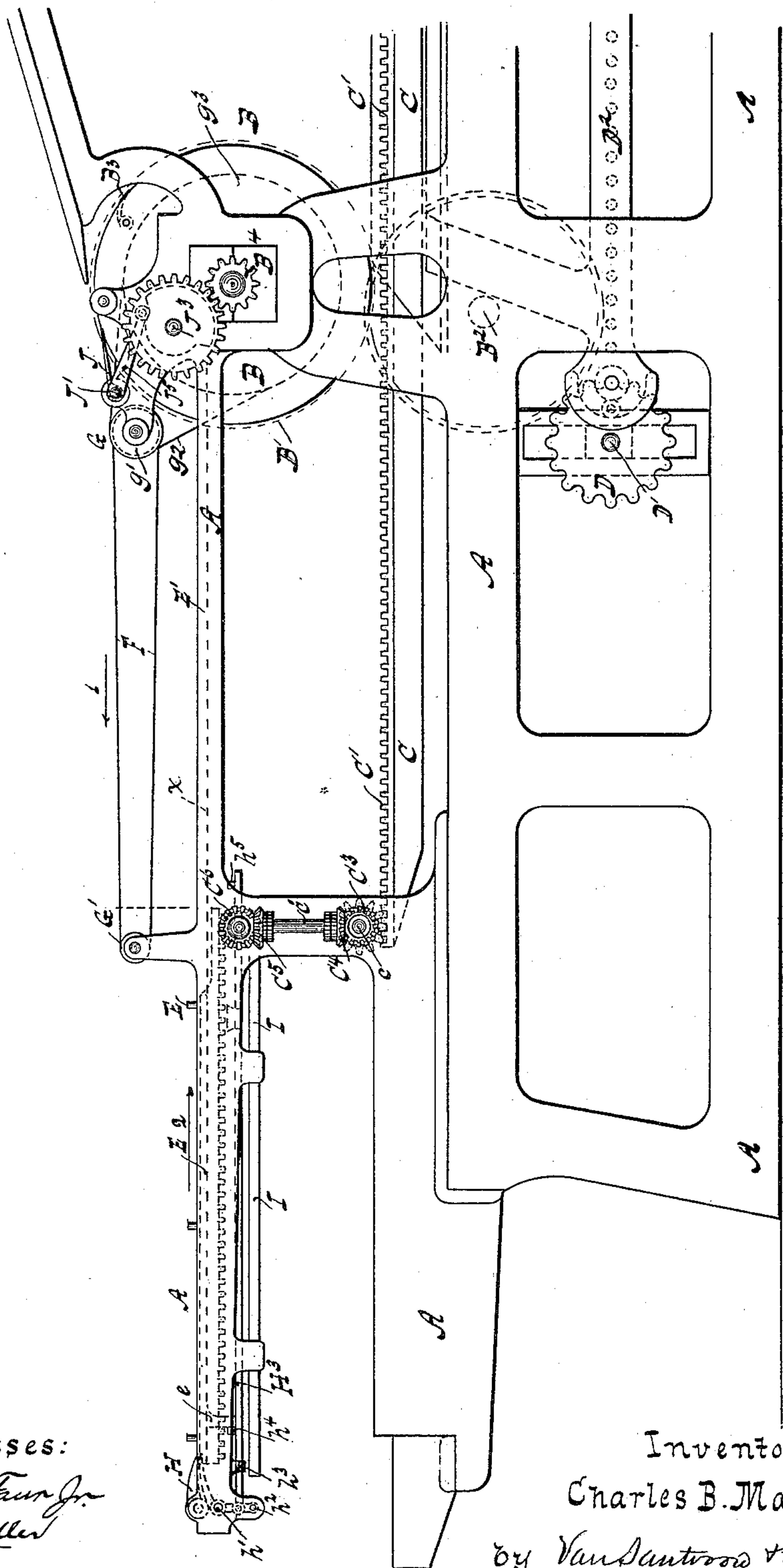
2 Sheets—Sheet 1.

C. B. MAXSON.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 405.582.

Patented June 18, 1889.



Witnesses:

Waher du Fair Jr.  
William Miller

Inventor:

Charles B. Maxson

by Van Santvoord & Hauff  
his Attorneys.

(No Model.)

2 Sheets—Sheet 2.

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FIG. 3.

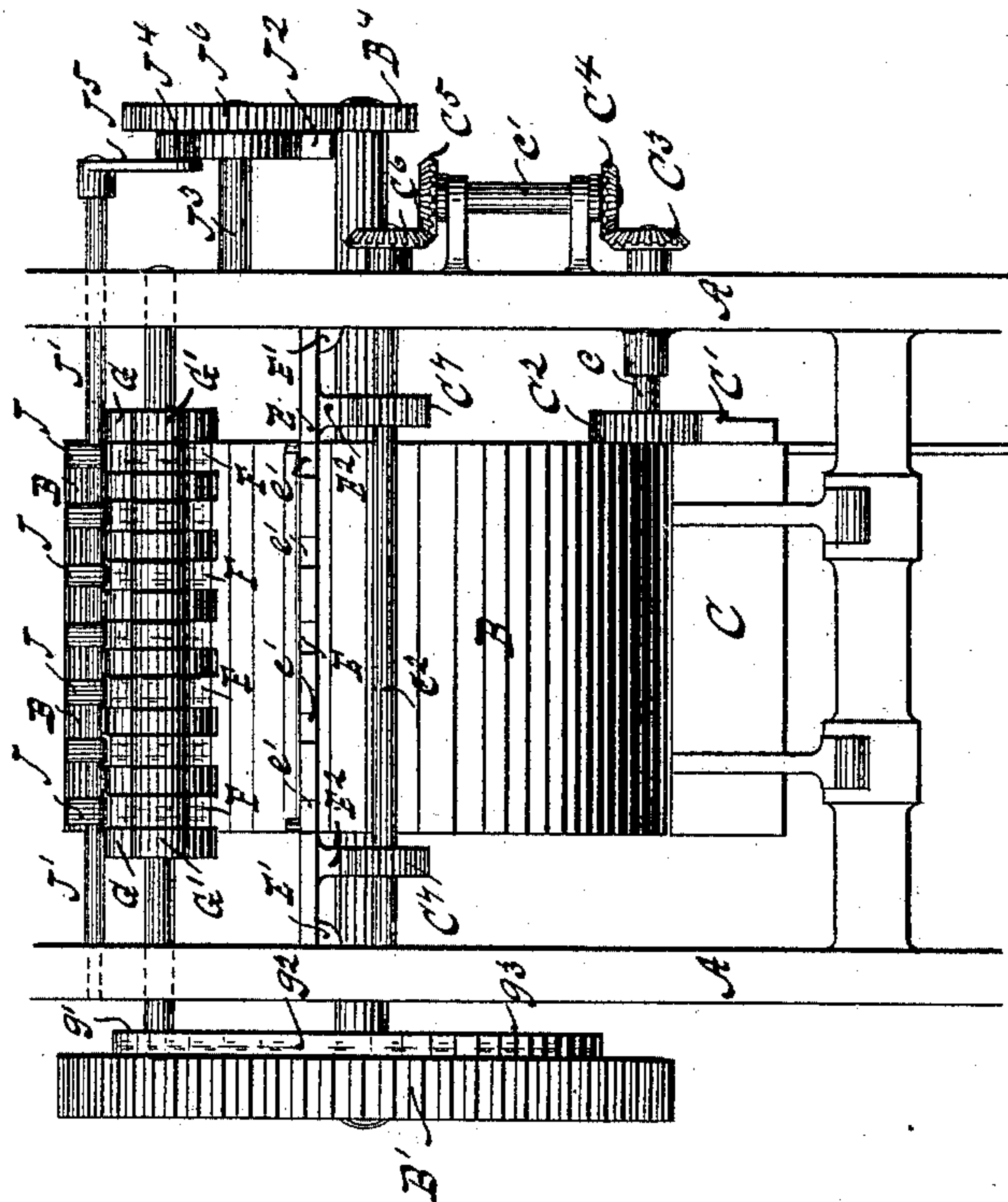


FIG. 2.

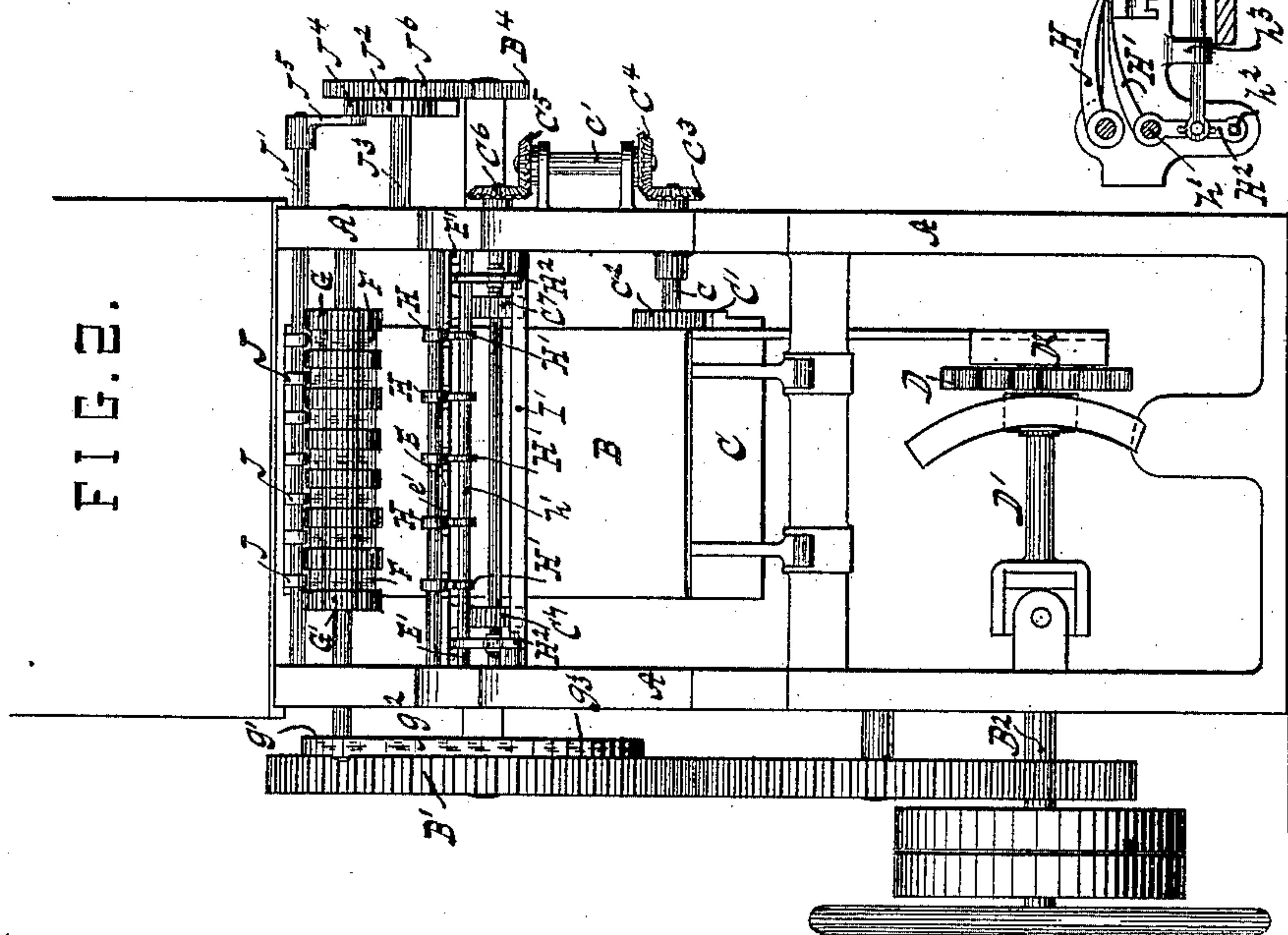
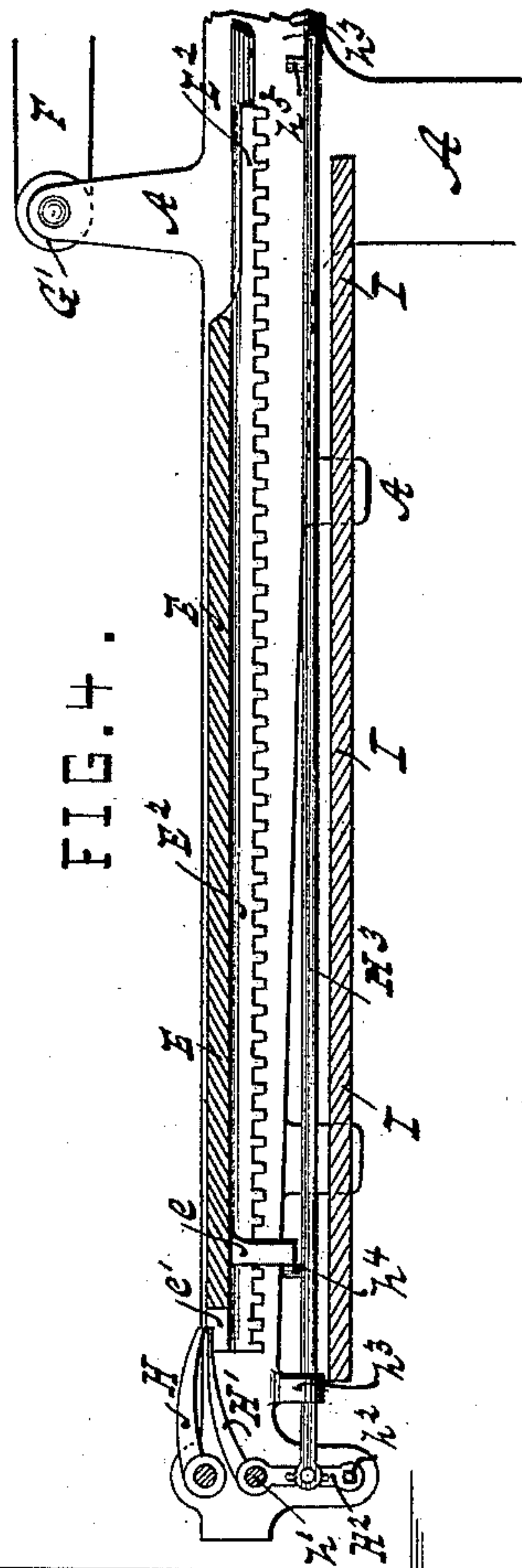


FIG. 4.



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# UNITED STATES PATENT OFFICE.

CHARLES B. MAXSON, OF WESTERLY, RHODE ISLAND.

## SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 405,582, dated June 18, 1889.

Application filed September 20, 1888. Serial No. 285,896. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES B. MAXSON, a citizen of the United States, residing at Westerly, in the county of Washington and State of Rhode Island, have invented new and useful Improvements in Sheet-Delivery Apparatus for Printing-Machines, of which the following is a specification.

My invention relates to improvements in sheet-delivery apparatus for printing-presses; and it has for its object to provide novel mechanism for preventing the printed faces of the sheets from coming in contact with parts of the apparatus during their delivery to the receiving-table, and to deliver the sheets printed face uppermost.

The object of my invention I accomplish in the manner and by the combination of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a printing-press provided with my improved sheet-delivery apparatus. Fig. 2 is an end elevation of the same as seen from the left-hand side of the sheet. Fig. 3 is an end elevation, on a larger scale than the preceding figures, of the tapes and the delivery-table in their proper position on the press. Fig. 4 is a vertical longitudinal section on the same scale as Fig. 3, showing the mechanism which retains the printed sheet and which delivers the same to the receiving-table.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates the frame of a printing-press, which frame is constructed to support the rotating impression-cylinder B and the reciprocating type-bed C in their proper relative positions. In the example shown in the drawings, Figs. 1 and 2, the reciprocating motion is imparted to the type-bed C by means of an ordinary rack and knuckle shaft, consisting of a spur-wheel D, arranged on a shaft D' in a proper position to engage with a horizontal row of pins on a rack-bar D<sup>2</sup>, pendent from the type-bed C. However, other known means may be employed for the specified purpose.

Upon the shaft of the impression-cylinder B is mounted a cog-wheel B', which is properly connected by intermediate gears to a gear

arranged upon the driving-shaft B<sup>2</sup> of the press, whereby the rotary motion is imparted to the impression-cylinder. In a suitable cavity of the cylinder B are arranged the usual grippers B<sup>3</sup>, Fig. 1, for holding the sheet to be printed upon the cylinder, these grippers being operated by trip-pins, (not shown in the drawings,) which are actuated by a cam and levers in the usual manner. The impression-cylinder makes two revolutions during a complete traverse of the bed in both directions, the whole constituting a two-revolution press of well-known construction; but my sheet-delivery apparatus may be applied to other presses in a similar manner.

In the upper part of the frame A are formed longitudinal guideways E', which are intended to support and guide a table, which I shall hereinafter term the "delivery-table" E, and this table is adapted to reciprocate so as to lie at stated intervals below tapes F, which extend around a pair of tape-rollers G G', having suitable bearings in the frame, and these tapes are in a position to receive the printed sheet from the impression-cylinder. One of these tape-rollers G is situated in close proximity to the impression-cylinder B, while the second roller G' is placed at such a distance from roller G that the length of the receiving-surface formed by the tapes F, extending around the said rollers, will be fully as great, or preferably somewhat greater, than the length of the sheet to be printed.

The reciprocating motion is imparted to the delivery-table E, in the example shown in the drawings, by means of a suitable gear-connection with a rack C' on the type-bed C. This connection consists of a gear-wheel C<sup>2</sup>, mounted on a shaft c, which has bearings in the press-frame and carries on its other end a bevel-gear C<sup>3</sup>, which meshes into a bevel-gear C<sup>4</sup>, secured to a shaft c', which also has bearings in the press-frame, and on the end of this shaft c' is a similar bevel-gear C<sup>5</sup>, which engages a bevel-gear C<sup>6</sup> on the driving-shaft c<sup>2</sup> of the delivery-table. Upon this shaft are a pair of gear-wheels C<sup>7</sup>, which are properly arranged to engage with racks E<sup>2</sup> E<sup>2</sup> on the bottom of the delivery-table.

A continuous linear motion in the direction indicated by arrow 1 in Fig. 1 is imparted to



the top tape F by rotating the tape-roller G in the proper direction. As shown in the drawings, this rotation of the tape-roller G is accomplished by arranging a pulley  $g'$  upon the shaft  $g$  of the said roller G, which pulley is connected, by means of a belt  $g^2$ , with a pulley  $g^3$ , arranged in a proper position on the shaft of the impression-cylinder B; or the said pulley  $g^3$  may be formed integral with the gear  $B'$ . The connections of the tapes F and the reciprocating delivery-table E with their respective drivers are so designed that the linear velocity of the said tapes and table will be the same, this equality of speeds being necessary to secure the proper transfer of the sheet to the delivery-table E, since the said sheet is delivered to the said table during its forward stroke from under the tapes.

It is evident that the tapes F and the reciprocating table E would form a working combination, since the printed sheets would be deposited upon the said table E and by the tapes F, and could be allowed to remain on the table until a sufficient number had accumulated, whence they could be removed by the person in attendance; but I have found it desirable to remove each individual sheet from the delivery-table as soon as it is deposited thereon. To accomplish this purpose, I have arranged a set of grippers at the end of the frame in a proper position to retain the sheet while the delivery table moves away from the grippers and to release the sheets at the proper time. The specific construction and arrangement of this mechanism are as follows: At the extreme end of the frame are arranged on a suitable rod a set of stationary fingers H, Figs. 2 and 3, the ends of which are on a level slightly above that of the top of the table, so that the sheet can pass under the said fingers. Directly below these fingers H are a series of grippers  $H'$ , which are secured to and can turn with a gripper-shaft  $h'$ , having bearings in the frame. To the ends of this gripper-shaft  $h'$  are secured levers  $H^2$ , which are fulcrumed at  $h^2$  to the press-frame, and from each of these levers extends a rod  $H^3$ , Figs. 1 and 4, having bearings  $h^3$  in the press-frame, and said rods are provided with dogs  $h^4$   $h^5$ , which are adapted to be engaged at certain intervals by projecting downward from the delivery-table E. The dogs  $h^4$   $h^5$  upon the rods are placed at such a distance apart and in such position upon the rods  $H^3$  that shortly before the delivery-table stops in its travel toward the impression-cylinder the post  $e$  on the said table engages the dogs  $h^5$  on the rod  $H^3$  and opens the grippers H. On the return motion of the receiving-table toward the grippers, and directly after the forward end of the sheet projects into the grippers, the post  $e$  engages the dogs  $h^4$  and the grippers close upon the sheet, and on the return motion of the delivery-table they are again opened, as before described, and release the sheet, which then falls upon a receiving-table I, situated in a proper position to re-

ceive the said sheet. To allow the grippers to obtain a hold on the sheet without the necessity of having the latter projecting beyond the delivery-table, I cut slots  $e'$  in the proper end of the table, into which slots the grippers project.

To facilitate the delivery of the sheet from the impression-cylinder B upon the tapes F, I employ sheet-guides J, which are arranged upon a shaft  $J'$ , extending between the said cylinders and the tape-roller G, and which sheet-guides are actuated by a cam  $J^2$  on a shaft  $J^3$ , which cam engages with a roller-stud  $J^4$ , arranged on the end of a lever  $J^5$ , secured to the sheet-guide shaft. A rotary motion is imparted to cam-shaft  $J^3$  by means of a gear  $J^6$ , which meshes into a gear  $B^4$  on the slot-shaft of the impression-cylinder B.

In the position shown in the drawings the press has just finished printing a sheet. The type-bed is on its back-center, and the delivery-table E is in extreme forward position toward the grippers H, and a printed sheet on the said table is under the said grippers, while the front edge of the sheet just printed is under the grippers of the impression-cylinder B. The operation of the sheet-delivery apparatus is now as follows: When the type-bed starts on its return toward the impression-cylinder, the delivery-table E participates in its motion in the same direction, and when the type-bed is at the other end of its stroke the delivery-table will have advanced to the end of its course and will be in the position shown by the single dotted line  $x$  in Fig. 1—that is to say, will be directly under the tape F. During the time thus elapsing the printed sheet will have been advanced outward upon the tapes, and by the time the type-bed reverses and starts toward the forward end of the press the sheet will lie with its advanced edge directly in a vertical line about the edge of the table, facing the grippers H. Now, when the type-bed continues in its motion toward the forward end of the press, the delivery-table travels in the same direction and the printed sheet is fed upon the said table from the tapes. During the previously-described motion of the delivery-table in the direction toward the impression-cylinder the same has engaged with the lever-rod  $H^3$  and opened the gripper H, and the same remains open until it is closed by the table acting on dogs  $h^4$ , whence it closes upon the sheet and retains the same while the table moves in the direction of the arrow 2, marked thereon, until the free end of the sheet clears the delivery-table, whence the grippers are opened by the action of the table upon dogs  $h^5$ , whereupon the grippers open and release the paper, which then falls upon the table printed side up. This completes the operations, and the sheet is delivered without having its printed face brought into contact with any part of the apparatus.

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



1. The combination, with the impression-cylinder of a printing-press, of the traveling tapes F, receiving the printed sheet from the cylinder, the delivery-table E, reciprocating independently of and back and forth below the tapes, and on its forward movement receiving the printed sheet from the forward portion of the tapes, and a receiving-table I, for receiving the sheet from the delivery-table, substantially as described.

2. The combination, with the impression-cylinder of a printing-press, of the traveling tapes receiving the printed sheet from the cylinder, and the delivery-table E, reciprocating independently of and back and forth below the tapes and moving at the same speed as the tapes to receive the printed sheet therefrom as said table moves forward from beneath the tapes, substantially as described.

3. The combination, with the traveling tapes F and stationary receiving-table I, of a delivery-table E, reciprocating independently of and back and forth below the tapes, and on its forward movement receiving the sheet from the tapes, and means, substantially as described, for retaining the sheet and delivering it to the receiving-table when the delivery-table moves backward below the tapes, substantially as described.

4. The combination, with the traveling tapes F and receiving-table I, of a delivery-table E, reciprocating back and forth below and independent of the tapes and receiving the sheet therefrom, and gripper-fingers, one of which is opened and closed positively by the movement of the table, substantially as described.

5. The combination, with the traveling tapes F, of a delivery-table E, reciprocating

independently of the tapes and grippers H H', one of which is swung to a closed position by the table when at or near the end of its forward movement and to an open position by said table when at or near the end of its backward movement, substantially as described.

6. The combination, with the reciprocating delivery-table E, of the stationary gripper H, the movable gripper H', the lever H<sup>2</sup>, the rod H<sup>3</sup>, secured thereto, and the dogs h<sup>4</sup> h<sup>5</sup> thereof, adapted to be engaged by the delivery-table, substantially as shown and described.

7. The combination, with the impression-cylinder and type-bed, of the tape-rollers G G', one rotated by a gear-connection with the cylinder, the tapes F, extending around and moved by the rollers, the delivery-table E, reciprocated back and forth independently of the tape and tape-rollers, and grippers H H', one of which is swung to both its open and closed positions by the action of the delivery-table, substantially as described.

8. The combination, with the impression-cylinder and reciprocating type-bed of a printing-press, of traveling tapes driven by gear-connection with the cylinder, a delivery-table reciprocating below and independent of the tapes and operated by a gear-connection with the type-bed, a receiving-table, and grippers for retaining the sheet as the table moves backward, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

CHARLES B. MAXSON. [L. S.]

Witnesses:

GEO. P. FENNER,  
GEORGE COLFAX.