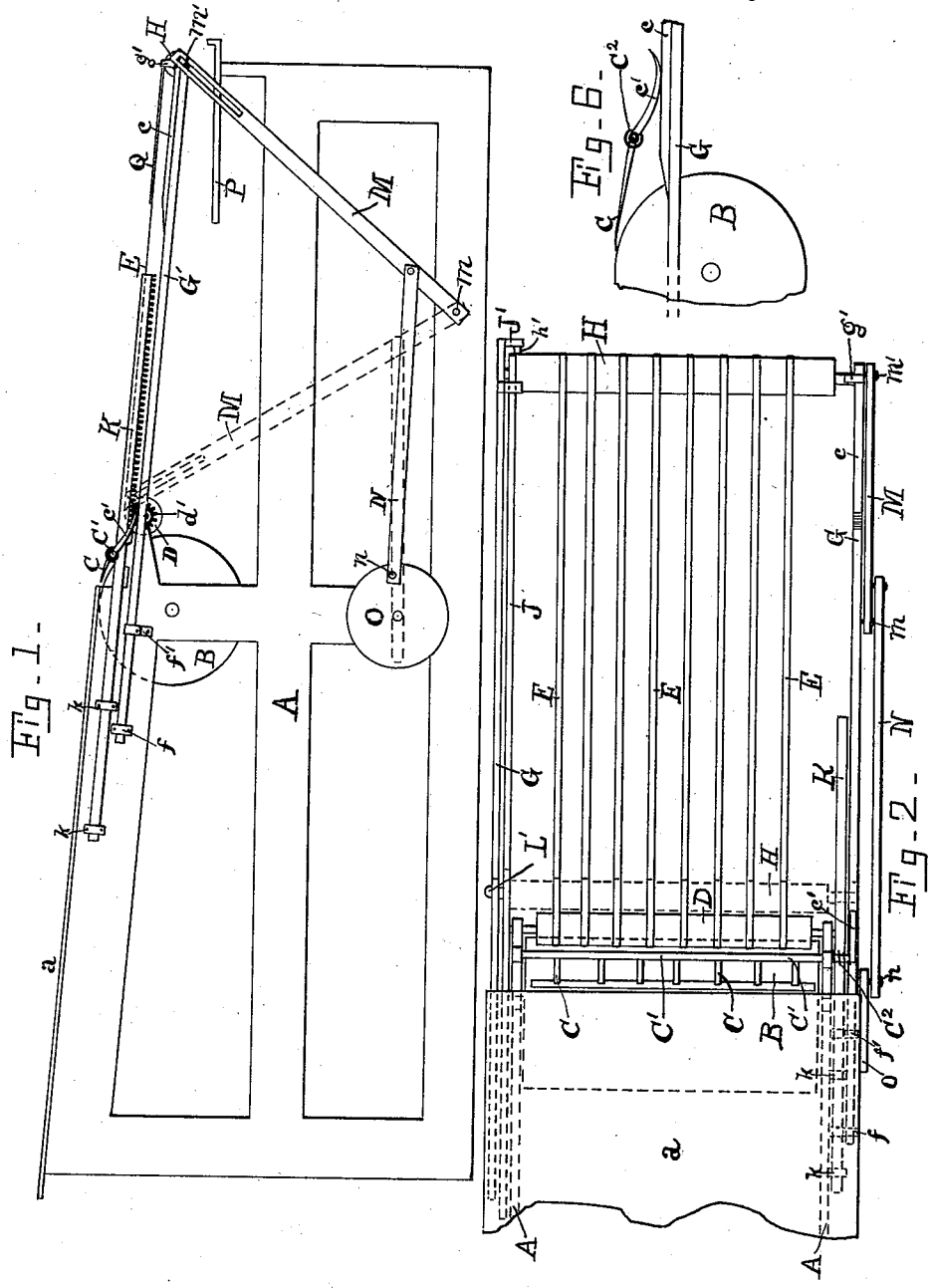
(No Model.) 2 Sheets—Sheet 1.

R. W. JAMIESON.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 563,967. Patented July 14, 1896.



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(No Model.) 2 Sheets—Sheet 2.

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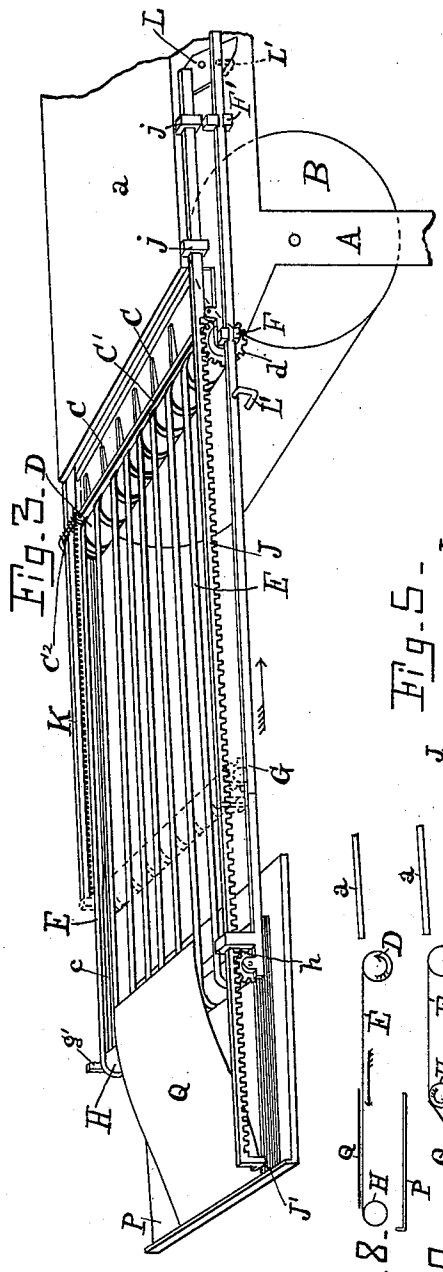

Fig. 3.

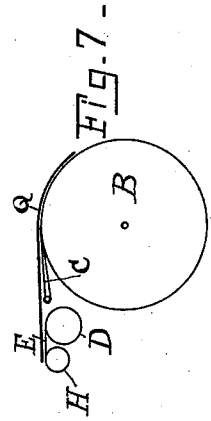

Fig. 7.

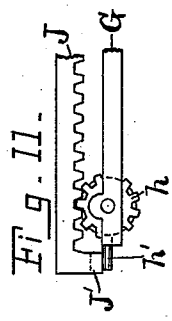

Fig. 11.

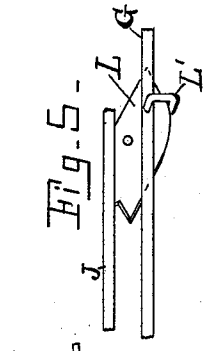

Fig. 5.

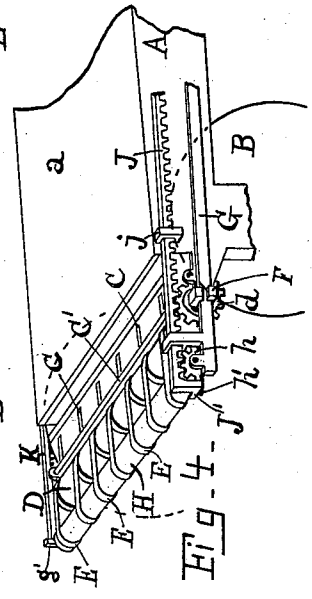

Fig. 4.

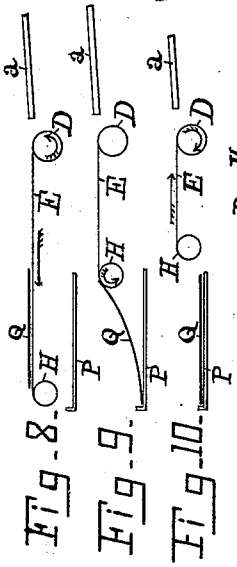

Fig. 8. Fig. 9. Fig. 10.

WITNESSES:

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ROBERT W. JAMIESON, OF ROCHESTER, NEW YORK.

SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 563,967, dated July 14, 1896.

Application filed January 21, 1896. Serial No. 576,346. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. JAMIESON, a citizen of the United States, and a resident of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Sheet-Delivery Apparatus for Printing-Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the frame of a printing-press having my apparatus applied thereto. Fig. 2 is a top plan view of the same. Fig. 3 is a perspective view of my apparatus with the traveler extended. Fig. 4 is a perspective view thereof with the traveler retracted. Fig. 5 is a view of the dog or catch for holding the winding-rack. Fig. 6 is a side elevation of the fingers for lifting the printed sheet from the impression-cylinder. Figs. 7, 8, 9, and 10 are diagrams illustrating the operation of my machine, and Fig. 11 is a detail view.

The object of my invention is to provide a sheet-delivery apparatus for printing-presses which shall be, among other things, certain in action, simple in construction, easily adapted and attached to a press, and which is movable out of the way of the pressman when he desires to reach the interior of the press.

My invention consists in the mechanisms, combinations, and arrangements thereof hereinafter described and claimed.

In the drawings, A is the frame of the press, ordinarily having a feeding-table *a*.

B is the impression-cylinder, provided with the usual attachments, including the ordinary grippers for grasping the forward edge of the sheet.

C are a series of lifting-fingers attached to a shaft C′. This shaft is normally acted upon by a spring C^2, Figs. 2 and 6, which is attached to a stationary part of the machine and to said shaft, and tends to lift the ends of the fingers from the impression-cylinder B; but after the sheet is printed and must be removed from the impression-cylinder the grippers on the cylinder are automatically released in the ordinary manner, and the fingers C are pressed upon the surface of the cylinder and strip the leading edge of the sheet from the cylinder for delivery of the sheet, with the printed side up, to the delivery apparatus. The fingers C are therefore a means for detaching the printed sheet from the impression-cylinder, and act also as guides to support the sheet in passage from the cylinder to the delivery mechanism proper.

Adjacent to the cylinder and near the upper portion thereof a roller is journaled in fixed bearings, with its axis parallel to the axis of the cylinder. On each end of the roller or of its axle is a gear-wheel *d*, Figs. 3 and 4, and *d′*, Fig. 1. On opposite sides of the press-frame, and arranged in lines passing through or adjacent to the axis of the roller D, are the guides F F′, Fig. 3, and *f f′*, Fig. 1. In these guides slide reciprocating rods G G′. To the ends of these rods there is journaled a roller H having an axis parallel to the axis of the roller D, and having on one end of its axle a gear-wheel *h*, and of substantially the same diameter on its pitch-line as the roller H.

One end of each of a series of parallel discontinuous tapes E E is fastened to the roller D and the other end of each tape is fastened to the roller H. The tapes constitute a traveler for supporting the printed sheet which is operated by the traveler-rolls D and H. The rods G G′ and the roller H constitute a carriage for the traveler.

On the side of the press-frame and in the same plane as the gear-wheels *d* and *h* are guides *j j*, wherein there slides a rod J provided with a rack through the greater portion of its length, which rack meshes with the gear-wheels *d* and *h*. The gear-wheel *h* is smaller than the gear-wheel *d*, in order that the former, when rolling on the rack J, may operate rather slowly and the latter may move said rack rapidly when the roller D is operated by the rack K, as hereinafter described. The rod J reciprocates in a line parallel to the rod G. On the end of the rod J is a finger J′, which, when the end of the rod is close to the gear-wheel *h*, comes in contact with a pin *h′* on the roller H, Fig. 4, and prevents the revolution of the roller H as long as the pin and the finger are in contact, as shown in Fig. 11. On the other side of the press-frame from the rod J is another rod K, sliding in guides *k k* and

provided with a rack meshing with the gear-wheel d' on the axle of the cylinder D. Upon the rod G' is a lug g', which, when the rod is retracted in its guides $f f'$ to the desired degree, strikes the end of the rod K, and by moving it revolves the gear-wheel d', and thereby the cylinder D. Upon the rod G' is also a cam c, Figs. 1 and 6, which, when the rod G' is retracted, elevates a lever c' attached to the shaft C' and depresses the points of the fingers C.

On the same side of the press with the rods G and J is a pivoted dog or catch L, which, when the rod J is extended to its most extreme position, catches said rod and holds it in such extreme position, as shown in Fig. 3. Upon the rod G is a lug L', Figs. 3 and 5, which, when said rod has been retracted in the direction of the arrow in Fig. 3 to a proper extent, strikes the tail of the pawl L and disengages the same from the rod J.

To a suitable point on the press-frame a rock-lever M is pivoted, as at m. The other end of this lever is slotted for engagement with a pin m' upon one of the rods G or G', so that the vibration of the lever will extend the carriage, consisting of both rods G and G' and the roller H, toward the receiving-table P. The rock-lever M may be operated by a link N, Fig. 1, attached to a crank-pin n, upon a crank-plate O actuated by or from any suitable driving mechanism for the press, but so connected therewith as to operate in time, as hereinafter described, with the action of the printing mechanism.

P is the usual receiving-table for the printed sheets, and Q is a printed sheet.

The operation of the mechanism is as follows: While the sheet is being printed upon the impression-cylinder B, the usual grippers on the cylinder grasp the leading edge thereof, and when said edge is brought around near to the point where the fingers C may come in contact with said edge the grippers are released in the usual manner, and said fingers, being brought against the surface of the cylinder B by the cam c, strip the sheet from the cylinder; and by the further revolution of the cylinder the sheet is forced over the fingers and upon the traveler or tapes E. At this time the parts are in the position shown in Figs. 4 and 7. As soon as the leading edge of the sheet is stripped from the cylinder and begins to lie upon the tapes or traveler, the lever M is operated, moving the rods G and J in their guides and extending the tapes. Inasmuch as the finger J' upon the end of the rod J is in contact with the pin h' of the roller H and the pull upon the traveler or tapes tends to turn the roller so that the pin presses against the finger, the roller H is prevented from turning and the tapes or traveler will be unrolled from the roller D and will carry the printed sheet with the printed side upward on the tapes, as shown in Fig. 8. The whole carrying mechanism is extensible so far as to carry the roller H about over the farthest end of the receiving-table P, and when the roller has reached this position the catch L engages the end of the rod J to prevent its retraction. The rock-lever M now begins its return path from the position shown in the full lines in Fig. 1 to the position of the dotted lines thereof in the same figure, thus beginning to return the roller H toward the roller D. The rod J, with its rack, being held stationary, will cause the gear-wheel h to revolve rather slowly in the direction shown by the arrow in Fig. 9, and the gear-wheel rolls along the rack on the rod J, winding the now stationary tapes upon it, withdrawing the roller H from under the sheet, feeding the sheet from the tapes, and delivering the sheet, as shown in Figs. 3 and 9, upon the receiving-table P with the printed side up. When the roller H has been retracted by the rod G, and after the sheet is fully delivered to the table, the lug L' releases the dog L from the end of the rod J and at or about the same time the lug g' comes in contact with the end of the rack-rod K and causes the roller D to revolve, and this winds the tapes or traveler rapidly off the roller H and on the roller D, as shown in Fig. 10. At first, while the roller D is revolving, as indicated in Fig. 10, the roller H is revolved in the same circular direction by the pull of the tapes until the tapes are fully wound off the roller H and the pin h' strikes its stop, whereupon the roller H moves with the rack J without further revolution. The positions of the parts when the dog L is about to be released are shown in dotted lines in Fig. 1. The racks are of such length and are so adjusted that when the tapes are fully wound upon the roller D they are wound off the roller H and the various parts are brought back to the positions shown in Fig. 4, with the pin h' in contact with the finger J'.

It is obvious that the tapes E E constitute a traveler for supporting and conveying the sheet Q and that a wide belt would, among other devices, be an equivalent for the set of tapes. It is also obvious that the rollers D and H, or either of them, may, when tapes are used, be replaced by a series of narrow pulleys on the shafts of the rollers D and H, one pulley on each shaft being provided for each tape. These instances indicate that I do not confine the scope of my claims to the constructions shown herein, but that the claims are to be construed as broadly as the state of the art may permit.

What I claim is—

1. The combination of an impression-cylinder, a receiving-table, a pair of parallel rollers, a discontinuous traveler, means for winding the traveler alternately from one roller to the other, and means for reciprocating one of said rollers to and from the receiving-table and from and to the other roller.

2. The combination of an impression-cylinder, a receiving-table, a pair of parallel roll-

ers, one of which has fixed bearings and the other of which is movable to and from the receiving-table, a discontinuous traveler connected to each roller, means for winding the traveler off and on the roller having fixed bearings, and means for winding said traveler off and on the other roller.

3. The combination of an impression-cylinder, a receiving-table, a carriage movable between the impression-cylinder and the receiving-table, a roller journaled in said carriage, a stationary roller adjacent to said cylinder and provided with fixed bearings, a discontinuous traveler connected to each roller, means for winding said traveler off and on the stationary roller, means for winding said traveler off and on the roller journaled in the carriage, and means for preventing the rotation of said last-mentioned roller during movement of the carriage toward the receiving-table.

4. The combination of an impression-cylinder, a receiving-table, a carriage reciprocating between the impression-cylinder and the receiving-table, a roller journaled in said carriage, a stationary roller adjacent to said cylinder, and having fixed bearings, a discontinuous traveler attached to each roller, means for winding said traveler off and on the stationary roller having fixed bearings, means for preventing the rotation of the movable roller during movement toward the receiving-table, and means for rotating the movable roller on its return motion toward the cylinder.

5. The combination of the impression-cylinder, a receiving-table, a carriage reciprocating between the impression-cylinder and the receiving-table, a roller journaled in said carriage, a stationary roller adjacent to said cylinder and having fixed bearings, a gear-wheel attached to said stationary roller, a discontinuous traveler attached to each roller, a rack moving with the carriage during its motion toward the receiving-table and meshing with the gear-wheel of the stationary roller for winding said traveler off said roller, means for winding said traveler on said stationary roller, means for preventing the rotation of the movable roller during movement of the carriage toward the receiving-table and means for rotating the movable roller on its return motion toward the cylinder.

6. The combination of an impression-cylinder, a receiving-table, a carriage reciprocating between the impression-cylinder and the receiving-table, a roller journaled in said carriage and a gear-wheel attached thereto, a stationary roller adjacent to said cylinder and having fixed bearings, a discontinuous traveler attached to each roller, means for winding said traveler off and on the stationary roller, a rack meshing with said gear-wheel on the movable roller, a catch for holding the rack at the end of the movement of the carriage toward the receiving-table, a lug on said carriage for releasing said catch after delivery of the sheet from said traveler, and means for preventing the rotation of the movable roller during movement toward the receiving-table.

7. The combination of an impression-cylinder, a receiving-table, a carriage reciprocating between the impression-cylinder and the receiving-table, a roller journaled in said carriage and a gear-wheel attached thereto, a stationary roller adjacent to said cylinder and having fixed bearings, a gear-wheel attached to said stationary roller, a discontinuous traveler attached to each roller, a rack moving with the carriage during motion toward the receiving-table and meshing with the gear-wheel of the stationary roller for winding said traveler off said roller, said rack moving with the carriage during motion toward the receiving-table and meshing with the gear-wheel on the movable roller for rotating the movable roller on its return motion toward the cylinder, a catch for holding the rack which meshes with the gear-wheel of the movable roller at the end of the movement of the roller toward the receiving-table, a lug on the carriage for releasing said catch, means for winding said traveler on the stationary roller and means for preventing the rotation of the movable roller during movement toward the receiving-table.

8. The combination of an impression-cylinder, a receiving-table, a carriage reciprocating between the impression-cylinder and the receiving-table, a roller journaled in said carriage and a gear-wheel attached thereto, a stationary roller adjacent to said cylinder and having fixed bearings, two gear-wheels attached to said stationary roller, a discontinuous traveler attached to each roller, a rack moving with the carriage during motion toward the receiving-table and meshing with the first gear-wheel of the stationary roller for winding said traveler off said roller, a rack meshing with the second gear-wheel of the stationary roller for winding the traveler on said stationary roller, said first rack moving with the carriage during motion toward the receiving-table and meshing with the gear-wheel on the movable roller for rotating said roller on its return toward the cylinder, a catch for holding the last-mentioned rack at the end of movement of the roller toward the receiving-table, a lug on said carriage for releasing said catch after delivery of the sheet, a lug on said carriage for moving the rack meshing with the second gear-wheel of the stationary roller and means for preventing the rotation of the movable roller during movement toward the receiving-table.

9. The combination of an impression-cylinder, a receiving-table, a movable roller, a stationary roller, a discontinuous traveler attached to the rollers and normally wound on the stationary roller, means for moving the movable roller to and from the receiving-table

but without rotation thereof when moving from said table, devices for winding the traveler upon the movable roller during a part of its return movement, whereby the sheet is delivered, mechanism for preventing the rotation of the stationary roller during said delivery, and means for winding the traveler on the stationary roller and off the movable roller after said delivery.

ROBERT W. JAMIESON.

Witnesses:
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GEO. HERBERT SMITH.