

(No Model.)

2 Sheets—Sheet 1.

J. H. REYNOLDS.

SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

No. 417,884.

Patented Dec. 24, 1889.

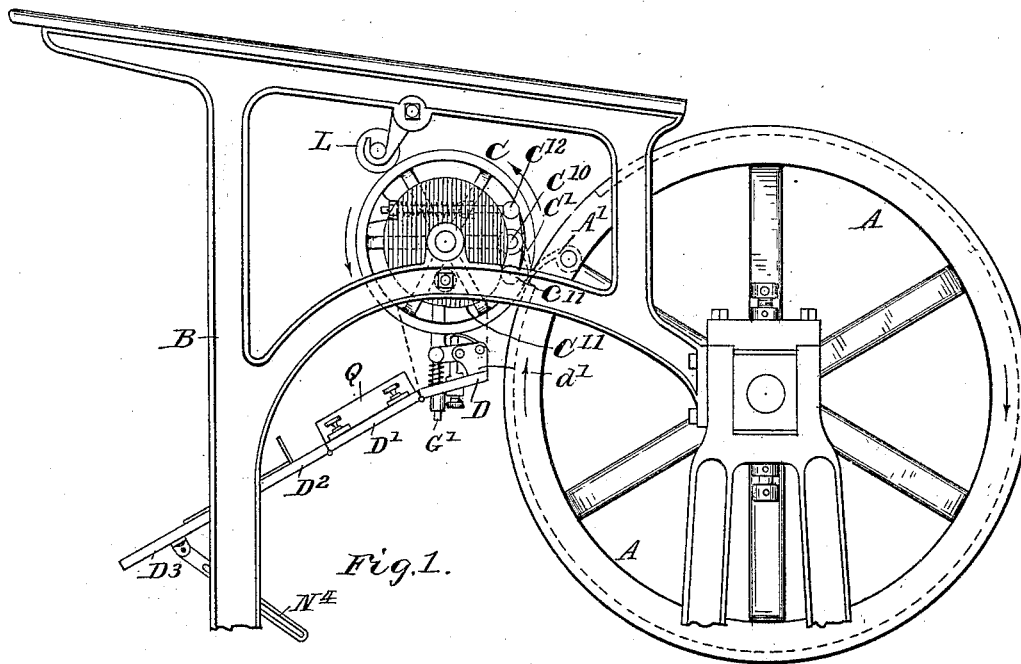


Fig. 1.

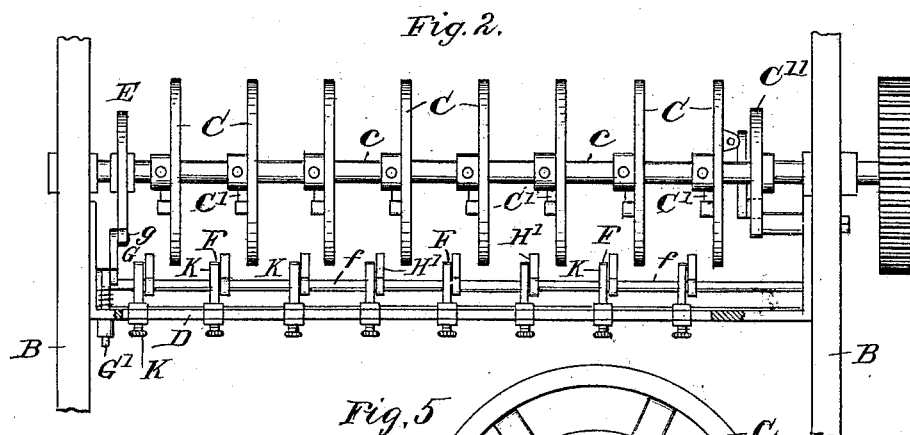
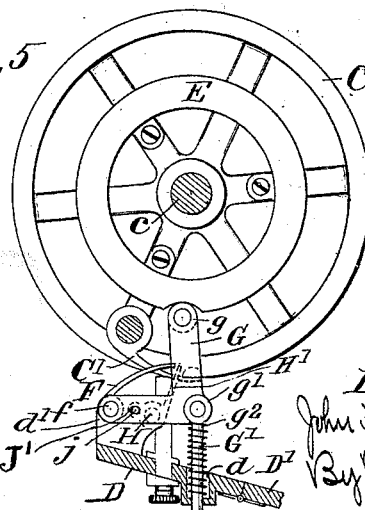


Fig. 2.

Fig. 5



Witnesses:
C. W. Davenport
Jean Elliott

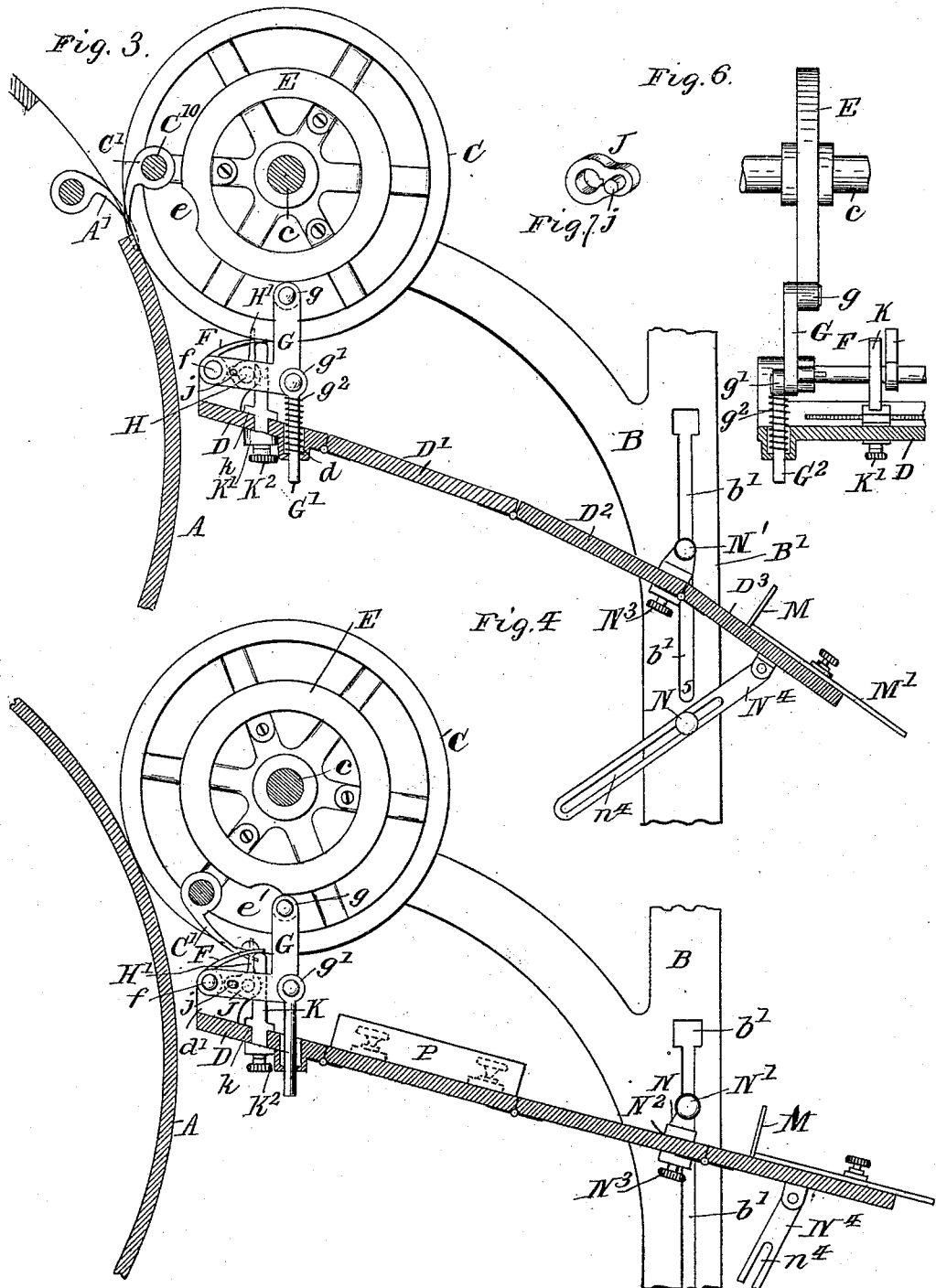
Inventor:
John H. Reynolds
By Burton B. Burton
his atty

J. H. REYNOLDS.

SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

No. 417,884.

Patented Dec. 24, 1889.



Witnesses:
C. W. Davenport
Jean Elliott

Inventor:
John H. Reynolds
By Burton & Burton
his attorneys

UNITED STATES PATENT OFFICE.

JOHN H. REYNOLDS, OF CHICAGO, ILLINOIS, ASSIGNOR TO HENRY P. HAMEL,
OF SAME PLACE.

SHEET-DELIVERY MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 417,884, dated December 24, 1889.

Application filed July 19, 1888. Serial No. 230,385. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. REYNOLDS, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Sheet-Delivering Mechanism for Printing-Presses, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

In the drawings, Figure 1 is a right side elevation showing the cylinder of a printing-press and portion of the frame in connection with my delivering mechanism. Fig. 2 is a front elevation of the reel and portion of the frame and gripping and discharging fingers of the delivering mechanism. Fig. 3 is a left side detail elevation of the delivering mechanism, with the delivery-table shown in section. Fig. 4 is a similar elevation showing the delivering mechanism at a different point of its action and the delivery-table adjusted to a different position. Fig. 5 is a detail of the table gripper and discharger in different position relatively to the roll from that shown in Fig. 4. Fig. 6 is a front elevation of the parts shown in Fig. 3, showing, however, only one of the gripping and discharging fingers, the remainder of the mechanism being broken away. Fig. 7 is a perspective of a lever-arm in the rock-shaft, which carries the lever-fingers.

A is the impression-cylinder; B, a portion of the frame comprising the feeding-table.

C is the delivering-reel, which is journaled on the frame in the usual manner and in the usual position with respect to the cylinder A.

D is a fixed portion of the delivery-table, containing supports for the delivering mechanism other than the reel. D', D², and D³ are further sections of the delivery-table hinged together, the first being hinged to the fixed section D.

A' represents the grippers on the cylinder, and C' the grippers on the reel, which cooperate in the usual manner, whereby the reel takes the paper from the cylinder, seizing it by means of the grippers C', which are fixed upon the rock-shaft C¹⁰ and are operated by the cam c¹¹, secured to the frame and encircling the reel-shaft c, said cam en-

gaging the roll c¹¹ at the end of the lever-arm C¹², and thereby rocking the shaft C¹⁰ at proper time to cause the grippers to engage and release the sheet, as hereinafter specifically explained.

At the opposite end of the shaft c from that at which is located the cam C¹¹ there is secured to the reel another cam E, which operates the delivering mechanism, which I will now describe. Upon the fixed section D of the delivery-table there are provided two brackets d', one at each side of the table, and in said brackets there is journaled the rock-shaft f, which is provided with grippers F, located at intervals throughout the length of the shaft, being preferably one for each ring of the reel C. To said rock-shaft at the end corresponding to that end of the shaft c at which is secured the cam E there is secured the angle-lever G, one portion of said lever extending horizontally in the direction of delivery and the other portion extending up from said angle vertically, and being provided at its upper end with a cam-roll g, which contacts with the cam E. At the angle of the lever there is connected the plunger-rod G', which extends downward through the section D of the receiving-table, in which there is formed a socket d, somewhat larger than the plunger G', so that there is room within it around said plunger for the coiled spring g², which is stopped at one end against the bottom of the socket and at the other end against the eye g', by which the plunger is connected to the lever G. In the brackets d' there is also journaled a rock-shaft H, which extends across the whole breadth of the delivery-table and is provided with the straight fingers H'. These fingers I will hereinafter refer to as the "delivery-fingers," as their purpose is to discharge the paper onto the delivery-table. To said rock-shaft H, just outside its bearing in the bracket at the end at which is located the cam E, there is secured the lever-arm J, which is keyed onto said shaft so that it projects close alongside of the lever G. It has the stud j projecting into the slot J', formed in the horizontal portion of said lever G, said slot extending horizontally for a very short distance only to allow for certain movement of the stud j therein. The

fixed section D of the delivery-table has a slot extending transversely across the width of the machine—*i. e.*, lengthwise of the section D—and in said slot are secured the gripping-posts K, which are provided with the shoulders *k* above the delivery-table and with the beveled washers K' below said table, and at their ends are screw-threaded and provided with the clamp-screws K², whereby they are adapted to be adjustably secured anywhere in the length of said slot. The grippers F are also adjustable longitudinally on the shaft *f*, and are designed to be adjusted so that their points will rest upon the upper ends of the gripping-posts K, respectively. The delivering-fingers H' are also adjustable on the shaft H, and are designed to be set thereon so that they shall open close alongside of the posts K, respectively, and play past them in the movement which they receive by means of the mechanism described.

The operation of this mechanism is as follows: The sheet carried by the cylinder A and engaged at the end by the grippers A' is seized by the grippers C' on the reel in the manner which is well known, the cam C¹¹ on the reel-shaft engaging the cam-roll on the end of the lever-arm C¹², attached to the shaft of the grippers C' in proper time to cause said grippers to open to receive the paper, and said cam being so formed as to allow them to close also and grip the paper at the proper instant to take it from the cylinder. This action is performed precisely as in well-known delivering devices for printing-presses and forms no part of my invention, except in so far as the cam C¹¹ is slightly changed in form, its raised portion not being extended so far as in the ordinary construction, in order to adapt it to co-operate with my delivering mechanism. The paper, being thus seized by the grippers of the reel, is carried around on the reel until the several parts of the mechanism reach the position shown in Fig. 5. The position illustrated in this figure is that at which the depression *e* in the cam E has reached the cam-roll on the end of the lever G and permitted the spring *g*² to force said lever upward to the extent of said depression. This movement of the lever rocks the shaft *f* and throws back the points of the grippers F, lifting them off from the ends of the gripping-posts K, respectively. At the same time the said lever G, by its slot J' engaging the stud *j*, rocks the shaft H, causing the discharging-fingers H' to tip forward past the posts K, the position of the parts being, therefore, as shown in said figure. As the reel continues its revolution and commences to force the cam-roll on the end of the lever G out of the depression *e*, the movement of the grippers F and discharging-fingers H' is reversed, the discharge-fingers receding past the post K and the grippers descending toward the ends of the posts. While this movement is occurring, however, the reel by its revolution is causing its grippers to carry the edge of the

paper still in their clasp in against the receding discharge-fingers H' and under the descending grippers F, and the cam C¹¹ has the commencement of the center part so located with respect to the lever G that just as the grippers F come into contact with the ends of the posts and grip the paper thereon the grippers C' are lifted and release the paper from their grasp, leaving it, therefore, stopped against the discharge-fingers H' and grasped in the grippers F upon the posts K. The roll L upon the side of the reel has up to this time been holding the paper on the reel. As the reel now continues to revolve, the end of the paper no longer being carried by it, but held on the posts K by the grippers F, the other end of the paper is rolled off by the reel from under the roller L and falls down upon the delivery-table D D' D² D³, and when the reel, having completed another revolution, brings the notch *e* of the cam E again around to the cam-roll upon the end of the lever G, the movement of the parts actuated by said lever being repeated precisely as above described, the outward movement of the discharge-fingers H', which in its first occurrence above described effected no result, now discharges the paper free of the posts K and causes the end which has been grasped thereon to fall onto the delivery-table. Thus two complete revolutions of the reel effect the complete discharge of the paper on the table. It will be observed that the eccentric portion of the cam C¹¹, by means of which the movement of the grippers C' is produced, must be located at such point in the circumference of the cam that it will cause the grippers C' to release the paper at the point where it should be seized by the grippers F. This point is so near the point at which the grippers C' would necessarily be opened in order that they might be closed upon the paper to take it from the cylinder that the same enlargement serves both purposes by being slightly extended.

In order that the paper falling from the reel onto the delivery-table may not double up or collapse, instead of falling out at full length, I construct said table so that its inclination may be varied to increase the distance that the end of the paper will fall before it reaches the table to correspond somewhat with the length of the sheet and the flexibility of the paper. Thus, if the sheet is a short one, the table may be set up as nearly horizontally as it is ever desirable, the inclination of the fixed section D being designed to show about the nearest approach to a horizontal position which is desirable. If the sheet is long, and especially if it is light and very flexible, I drop the outer end of the table, so that the sheet, however light, will unroll its full length, and if it were necessary the table might be dropped almost to a vertical position at the outer end, so that the end of the sheet could not fail to fall out over it. The best result in respect to this movement

of the paper, especially with large sheets, is attained by having the table set at different inclinations at different parts of its length, the inclination increasing—that is, the table becoming steeper—toward the farther or outer side, and for this purpose I construct the delivery-table in the several sections $D D' D^2 D^3$, said sections being hinged together, so that their inclination may be successively increased.

In order to support the table in any position to which it may be adjusted, I provide in the outer upright edge of the legs B' of the frame B a vertical slot b' , in which the supporting link or clip N is made to slide, said clip being adapted to be secured at any desired position therein by the clamp-screw N' . This clip may also be set at an angle with respect to the slot, being turned on the clamp-screw. The lower end of the clip has the slot N^2 , in which the edge of the section D^2 of the delivery-table is received, and a clamp-screw N^3 is provided to fasten the clip to the edge of said section D^2 . The section D^3 is hinged to the section D^2 beyond the clip N and extends beyond the legs B' , and is provided with the link N^4 , pivoted to the under side of it, and having a slot n^4 , which runs on the clamp-screw N^3 , which is screwed into the leg, so that the section D^3 can be raised and lowered, swinging on the hinge which joins it to the section D^2 . Thus each of the sections of the delivery-table may have a different inclination increasing from the inner to the outer, or they may all or any two consecutive sections have the same inclination.

In order to cause the sheets to be delivered in a uniform pile notwithstanding the slope of the table and the fact that they fall freely thereonto, I provide the stop-gage M , which is secured to the outer section D^3 and adjustable toward and from the delivery mechanism according to the length of the sheets, and in case of sheets too short to be delivered with their outer edge so far out as the section D^3 , the two sections $D^2 D^3$ being set at the same inclination, the gage may be adjusted inward toward the delivery mechanism and located thereby on the section D^2 , the arm M' of said gage being long enough to permit it to be thus located while still secured on the section D^3 . The paper falling freely in the manner described would be liable to move sidewise, floating on the arm as it falls, and to prevent irregular delivery in respect to the said edges of the sheets, I provide the side gages P and Q , one at each side, which are adjustable laterally in any convenient manner and are designed to be set so that the sheets can fall freely between them, but without any considerable play, whereby the pile of sheets as delivered will be substantially uniform on all its edges.

In operating with short sheets, especially of stiff paper or card, the grippers F are not always necessary, and all the mechanism con-

nected with the levers G may in that case be dispensed with, except that a stop such as is afforded by the fingers H' might be provided.

I claim—

1. In a printing-press, in combination with the delivering-reel and the grippers thereon, the gripper-opening cam located in position to open the grippers while they are on the under side of the reel, and the delivery-table commencing under and receiving the sheet directly from the reel and inclined downward therefrom, substantially as set forth.

2. In combination with the reel, the cam E thereon, the receiving-table, and the gripper-shaft f , having its bearings fixed with respect to the table, said shaft having the lever-arm G and the grippers F , suitable fixed counter-parts, as the posts K , to co-operate with the grippers to hold the paper, the shaft H , journaled on the table and having the discharging-fingers H' , and the lever-arm J , which is engaged by the lever G , whereby the discharging-fingers are tipped forward to discharge the paper when the table-grippers are opened to release it, substantially as set forth.

3. In a printing-press, in combination with the reel, the delivery-table extending under the reel, the grippers and dischargers, both having their shafts journaled in bearings fixed with respect to the table, and a cam on the reel, which operates them to open the grippers and tip forward the discharge-fingers simultaneously, substantially as set forth.

4. In combination, substantially as set forth, the table-grippers and the discharging-fingers, and the mechanism, substantially as set forth, which operates them simultaneously to open and close the grippers by immediately successive movements and tip the dischargers forward and then backward by movements respectively simultaneous with the movements of the grippers, whereby the grippers seize the paper if presented to them during such movements, and at the next repetition of such movements the dischargers eject it without change in the movement for the two purposes.

5. In a printing-press, in combination with the delivering-reel, a table located partly thereunder and inclined downward therefrom, such table being formed in successive sections whose inclination is adjustable separately, whereby said sections may be set at steeper inclinations successively from the receiving to the discharge side, substantially as set forth.

6. In a printing-press, in combination with the delivering-reel and the delivery-table located partly thereunder and inclined downward therefrom, said table being formed in successive sections hinged together, the clip N , adjustable vertically on the frame and provided with means for clamping it to the edge of the third section of the table, and adjustable also in an arc about the point of its connection to the frame, whereby it serves to ad-

just the inclination of the second and third sections, substantially as set forth.

7. In a printing-press, in combination with the delivering-reel, the delivery-table secured
5 thereunder and inclined downward therefrom, the side gages P and Q extending parallel with the plane of rotation of the reel and adjustable laterally in the direction of the axis of the reel, substantially as set forth.

In testimony whereof I have set my hand, in the presence of two witnesses, at Chicago, this 2d day of July, 1888.

JOHN H. REYNOLDS.

Witnesses:

E. F. BURTON,
CHAS. S. BURTON.