

(No Model.)

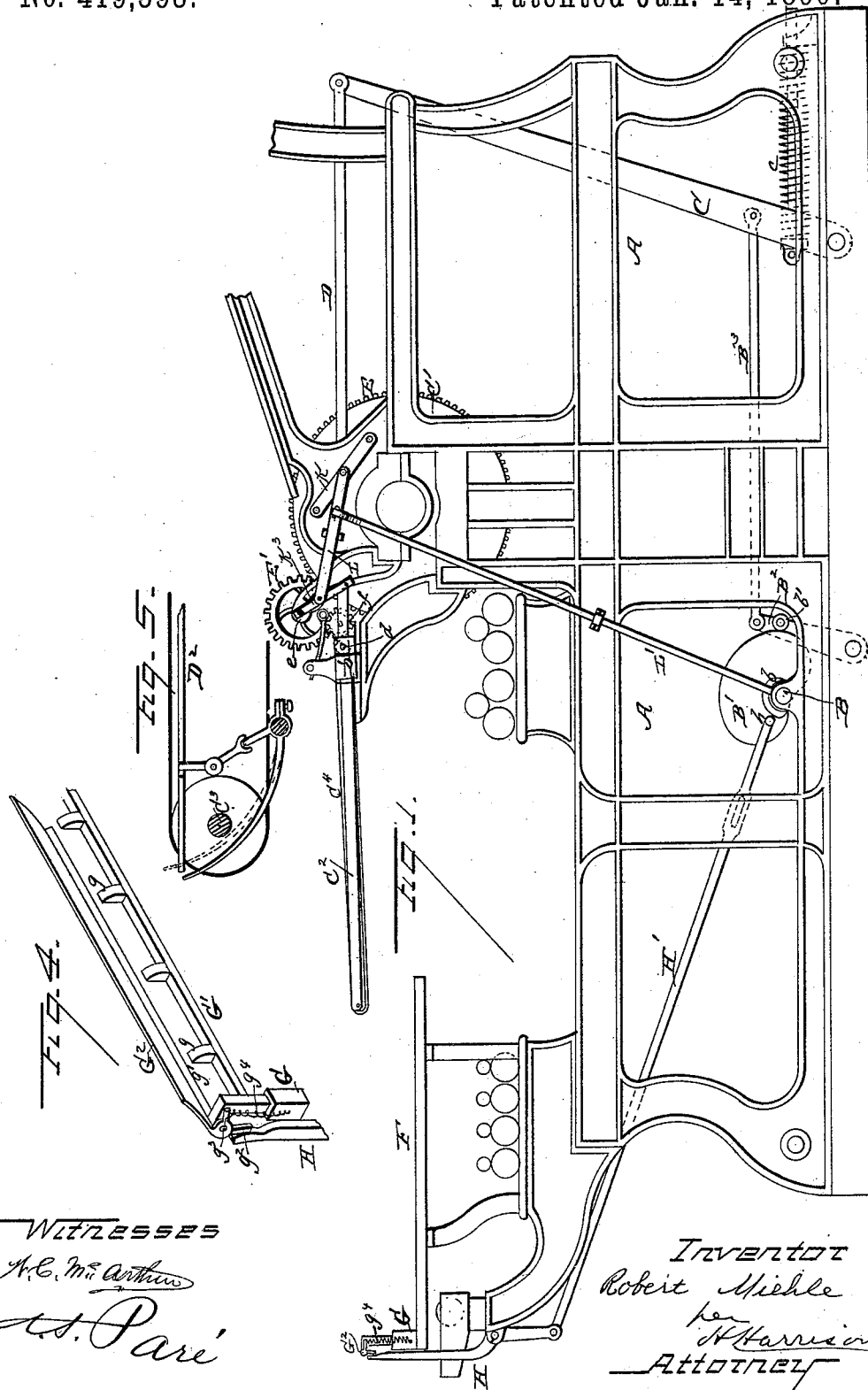
3 Sheets—Sheet 1.

R. MIEHLE.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 419,593.

Patented Jan. 14, 1890.



WITNESSES

A. C. McArthur

W. S. Paré

Inventor  
Robert Miehle  
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H. Harrison  
Attorney

(No Model.)

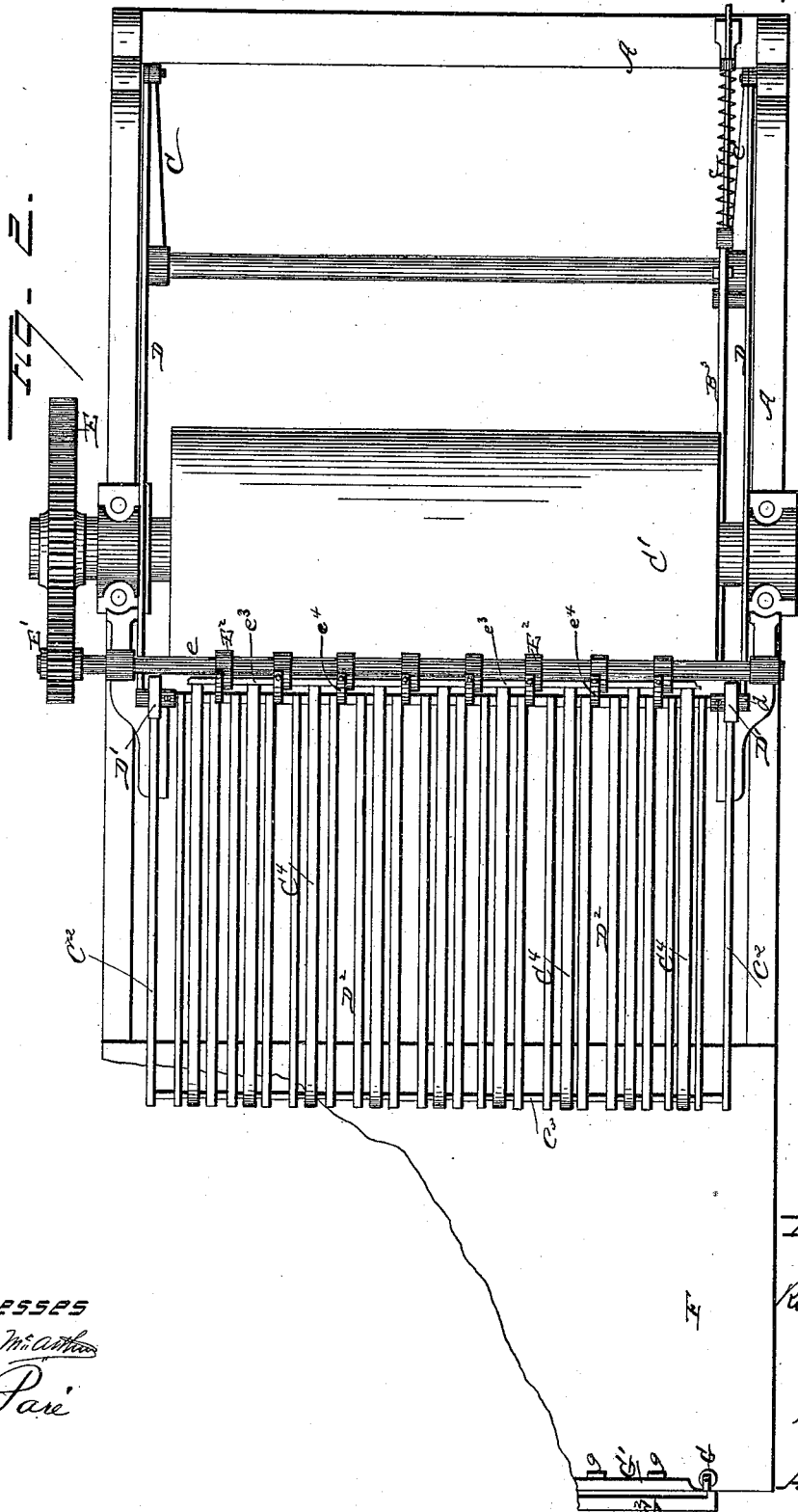
3 Sheets—Sheet 2.

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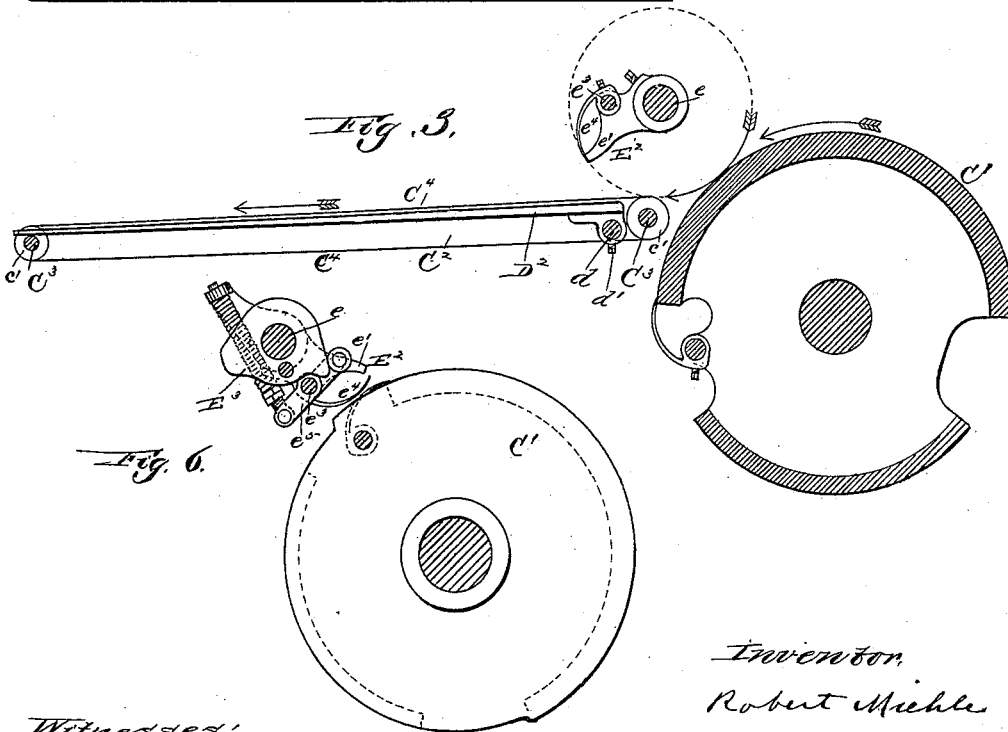
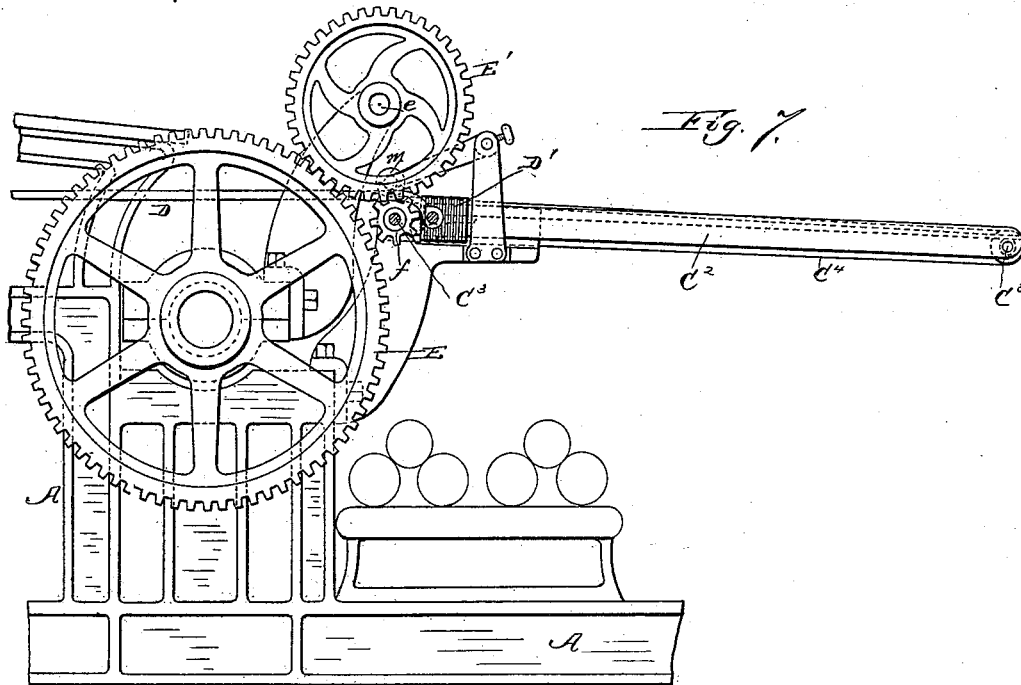
3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

ROBERT MIEHLE, OF CHICAGO, ILLINOIS.

## SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 419,593, dated January 14, 1890.

Application filed September 26, 1884. Serial No. 144,070. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT MIEHLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sheet-Delivery Apparatus for Printing-Machines, of which the following is a specification.

This invention relates to printing-machines; and it consists in certain novel points of the construction and arrangement of the same, whereby the sheets are delivered to the receiving-table with their freshly-printed surfaces upward and at no time in contact with the parts of the delivery mechanism or drawn across the sheets already printed and delivered. Heretofore in this class of presses the sheet has been deposited upon the delivery-table with the last-printed side down when the sheet was received from the cylinder with the clean or dry side to the fly-frame, which consists of a series of receiving-fingers. In practice this fly-frame has always been operated by a fulcrum, which in consequence turns the sheet with the last-printed side down upon the table when received as above stated. Now the object in view of the present invention is to deliver the sheet upon the delivery-table with the last-printed side up, which I accomplish by imparting a reciprocating movement to the fly-frame to and from the cylinder to the receiving-table, as hereinafter fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a side elevation of a press fitted with my improvements. Fig. 2 is a top plan view of the same, with the rollers *m* and their supports omitted therefrom. Fig. 3 is a detail view of the cylinder, delivery-tapes, and their accompanying devices. Fig. 4 is a perspective view of the sheet-holding device at end of press. Fig. 5 is a modification of a device for the same purpose—i. e., to clear the paper from the fly-frame as the latter is withdrawn. Fig. 6 is a detail view representing the cam which operates the carrying-nippers; and Fig. 7 is a side view of the press,

showing more clearly the driving of the delivery-tapes.

A represents a press-frame of any desired form suitable to the press in view, which is of that kind in which the sheets are taken from the upper front side of the cylinder and delivered to the tapes and thence to the receiving-table with the freshly-printed surface uppermost, and is provided with the usual ink-rollers, impression-cylinder, and other details which form the complete and operative machine and which are too well known to need a particular description at this time. At a suitable point in the lower part of the frame is journaled the driving-shaft B, carrying a cam B' and a smaller one *b*, which give motion to the sheet-delivery apparatus, presently explained.

In the main frame, near the shaft B, is journaled an arm B<sup>2</sup>, provided with an anti-friction roller *b'*, running upon the face of the large cam B', and the free end of this arm is by a rod B<sup>3</sup> connected to an arm C, also journaled on the frame and extending upward to its top. There are two of these arms C fixed upon a connecting rock-shaft, by which they are moved together, and they are moved in one direction by the cam B' and in the opposite direction by a spring *c*, fixed on the frame and bearing against the arm, as indicated in Figs. 1 and 2.

Upon the upper part of the main frame, extending in front of the impression-cylinder C', are two long arms C<sup>2</sup>, forming guides, each end of which is journaled a small transverse shaft C<sup>3</sup>, carrying any desired number of rollers *c'*, over which run the endless delivery-tapes C<sup>4</sup>, upon which the printed sheet is carried out from the cylinder, as herein after more fully explained.

The oscillating arms C are connected by rods D with sliding blocks D' on the guides C<sup>2</sup>, and these blocks carry a shaft *d* on which are adjustably secured, by means of a set-screw *d'*, the receiving-fingers, said parts forming the delivery-fly frame or receiving-frame which is reciprocated horizontally as the blocks D' slide back and forth on their guides, as will be at once seen.

Upon the shaft of the cylinder is a large gear E, with which meshes a smaller gear E<sup>2</sup>.

upon a transverse shaft *e*, journaled in brackets above the cylinder, and upon which are a series of guide-grippers *E*<sup>2</sup>. These are formed by a series of short arms *e'*, having lugs *e*<sup>2</sup>, through which run a rod *e*<sup>3</sup>, carrying a series of fingers *e*<sup>4</sup>, clasping over the ends of the arms *e'* to grasp the paper. These are kept normally closed by a spring bearing on an arm *e*<sup>5</sup> of the rod *e*<sup>3</sup>, and opened at proper intervals by a cam *E*<sup>3</sup> on the frame, contacting with a second arm on this rod, as fully seen in Fig. 6. The gear *E'* engages a small pinion *f* on the tape-shaft *C*<sup>3</sup>, to give motion to the tapes.

Upon the forward end of the main frame is the table *F*, for the reception of the printed sheets; and in suitable standards *G* upon this table, or upon the frame beside it, is supported a cross-bar *G'*, upon which are a series of beveled or rounded lugs *g*, as in Fig. 4. Upon the standards *G* is hinged a cross-bar or clamp *G*<sup>2</sup>, having a flange *g'* on its rear edge; and at one end this clamp is provided with two arms *g*<sup>2</sup> *g*<sup>3</sup>, the latter of which is connected by a spring *g*<sup>4</sup> with the standard or main frame, and is thus at the proper time drawn down to seize and hold the sheet. The other arm *g*<sup>2</sup> is engaged by a lever *H*, fulcrumed on the frame, and its opposite end connected to a rod or bar *H'*, sliding on the main frame, and carrying a small friction-roller *h*, running upon the face of the small cam *b* on the main shaft. When the sheet has been printed and arrives at the upper forward side of the cylinder, the grippers release it, and at the same time its edge is seized by the guide-grippers *E*<sup>2</sup> and lifted off the cylinder upon the rear end of the tapes, when it is again released and runs out upon these tapes with its freshly-printed side uppermost, where it is not liable to come in contact with any of the apparatus, and cannot therefore be in any way blurred or injured. The fly-frame or receiving-frame *D*<sup>3</sup> has its fingers lying between the tapes, with its outer ends slightly lower than the inner, and as the tapes at their outer ends are also slightly dropped, while the guide-bars *C*<sup>2</sup>, upon which the fly-frame slides, is horizontal, or nearly so, it will be evident that as the fly-frame moves out on said guides it will lift the paper above the tapes and carry it out to the receiving-table; and it will also be noticed that the inclination given to the fly-fingers is just sufficient to cause the air to retain the paper on and against said fingers as they move outward. At this point the cam *B'* releases the arm *B*<sup>2</sup>, and the spring *c* moves the rack forward in a direct line at the same speed as the tapes, and carries the sheet forward till its extreme edge lies upon the beveled lugs beneath the clamp-bar *G*<sup>2</sup>. At this time the passage of the cam *b* frees the rod *H'* and lever *H*, and the spring *g*<sup>4</sup> throws down the clamp to clasp the edge of the sheet. The cam *B'*, now engaging the arm *B*<sup>2</sup>, draws back the fly-frame, and, the cam *b* again lifting the clamp-bar, the sheet falls

flat upon the table in its proper position, and its freshly-printed side is not touched by any portion of the devices. It is obvious that, if 70  
desired, the bar *G'* may be turned over with its lugs on the under side and the clamp *G*<sup>2</sup> reversed to suit this arrangement, and the operation will be the same as that just described. 75

The press, as herein described, performs its functions properly and accurately, and it will be seen that when the sheet-bearer or fly-frame is drawn back the sheet settles upon the table before it is released by the clamp, 80  
and thus it cannot slip or slide on the pile and mar the one beneath.

By reference to the drawings it will be seen that the outer tape-carrying shaft is journaled below the center of the guide-arms *C*<sup>2</sup>, 85  
and thus when the fly-frame advances it gradually rises above the outer ends of the tapes and lifts the sheet from them without disturbing its position by twisting it in any way. The peculiar shape of the cam *B'* is 90  
such that the first portion of the movement of this fly-frame or receiving-fingers is rapid and at the same or nearly the same speed as the tapes; but the latter part of the stroke is slower, thus diminishing the speed after the 95  
paper is lifted from the tapes.

The clamp *G*<sup>2</sup> may, if desired, be made stationary and the lugs on the bar *G'* advanced toward it to clutch the paper.

To insure the sheet following the tapes outward properly when delivering from the cylinder, I provide a series of small rollers *m*, 100  
lying on said tapes at their rear ends, such as are commonly used in similar positions on presses, and these rollers may be made to cut 105  
the sheet in the usual manner, if desired.

In Fig. 5 is shown a modification of the device for holding the sheet while the bearer is drawn back, consisting of a rock-shaft carrying a series of fingers, which are thrown up 110  
behind the paper after it is fed out over the table, and thrown down again when another sheet is to be fed forward by means of a jointed arm on the shaft and stops on the fly-frame, as indicated. 115

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a printing-press, the combination, with an impression-cylinder and sheet-lifters, of 120  
the fly-frame *D*<sup>2</sup>, having a reciprocating movement imparted to the same to and from the cylinder to the receiving-table for delivering the printed sheets with the last-printed side uppermost, substantially as described. 125

2. In a printing-press, the combination, with an impression-cylinder and sheet-lifters, of the fly-frame *D*<sup>2</sup>, having a reciprocating movement imparted to the same to and from the cylinder to the receiving-table, and means, 130  
substantially as described, for sliding or drawing the sheet off from the said fly-frame while the same is withdrawn, whereby the sheet is delivered upon the delivery-table

with the freshly-printed side uppermost, as set forth.

3. In a printing-press, the combination, with the impression-cylinder, of the fly-frame D<sup>2</sup> and the revolving sheet lifters or grippers for removing the sheet from the cylinder with the non-printed or dry side to the said fly-frame, substantially as described.

4. In a printing-press, the combination of the impression-cylinder, delivery-tapes, the reciprocating fly-frame D<sup>2</sup>, and the revolving sheet lifters or grippers for removing the sheet from the cylinder to the delivery-tapes, substantially as described.

5. In a printing-press, the combination of the impression-cylinder, delivery-tapes, the reciprocating fly-frame D<sup>2</sup>, the revolving sheet lifters or grippers, and the clamping or holding device, substantially as described, for holding the forward end of the sheet while the fly-frame is withdrawn, as set forth.

6. In a printing-press, the combination of the impression-cylinder, delivery-tapes, and rollers *m*, fly-frame D<sup>2</sup>, the revolving sheet lifters, and the clamping or holding device, substantially as described.

7. In a printing-press, the combination of the cylinder, the reciprocating fly-frame D<sup>2</sup>, and the revolving sheet-lifters for removing the sheet from the cylinder with the non-printed or dry side to the said reciprocating fly-frame, substantially as described, and for the purpose set forth.

8. In a printing-press, the combination of an impression-cylinder and sheet-lifters, the delivery-tapes, reciprocating fly-frame D<sup>2</sup>, and the clamping or holding device, substantially as described, and for the purpose set forth.

9. In a printing-press, the combination, with the impression-cylinder, of a series of delivery-tapes above and in front of the same and

a series of revolving sheet-lifters for seizing the edge of the printed sheet and delivering it from the cylinder to the tapes with the last-printed side uppermost, substantially as described.

10. In a printing-press, the combination, with the impression-cylinder, of the revolving sheet lifters or grippers journaled in stationary bearings located at the front or top of the cylinder, to seize the edge of the printed sheet and start it away from the cylinder with the non-printed or dry side to the delivery mechanism, substantially as described.

11. In a printing-press, the combination of the impression-cylinder, the reciprocating fly-frame, and the supporting guide-arms C<sup>2</sup> for supporting and guiding the fly-frame on its movement to and from the cylinder to the receiving-table, substantially as described.

12. In a printing-press, the combination, with the impression-cylinder and the reciprocating fly-frame D<sup>2</sup>, of the supporting guide-arms C<sup>2</sup>, being raised slightly at their outer ends from a line with the tapes, and fly-frame D<sup>2</sup> to raise the same above the tapes while moving away from the cylinder to the receiving-table, substantially as described, and for the purpose set forth.

13. In a printing-press, the combination, with the impression-cylinder and the reciprocating fly-frame, of an operating-arm pivoted on the frame and connected to said fly-frame to reciprocate it endwise from the cylinder to the receiving-table, substantially as described, and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT MIEHLE.

Witnesses:

W. C. MCARTHUR,  
CHAS. KRESSMANN.