(No Model.) 2 Sheets—Sheet 1.

B. HUBER.

DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 262,778. Patented Aug. 15, 1882.

Fig 1.

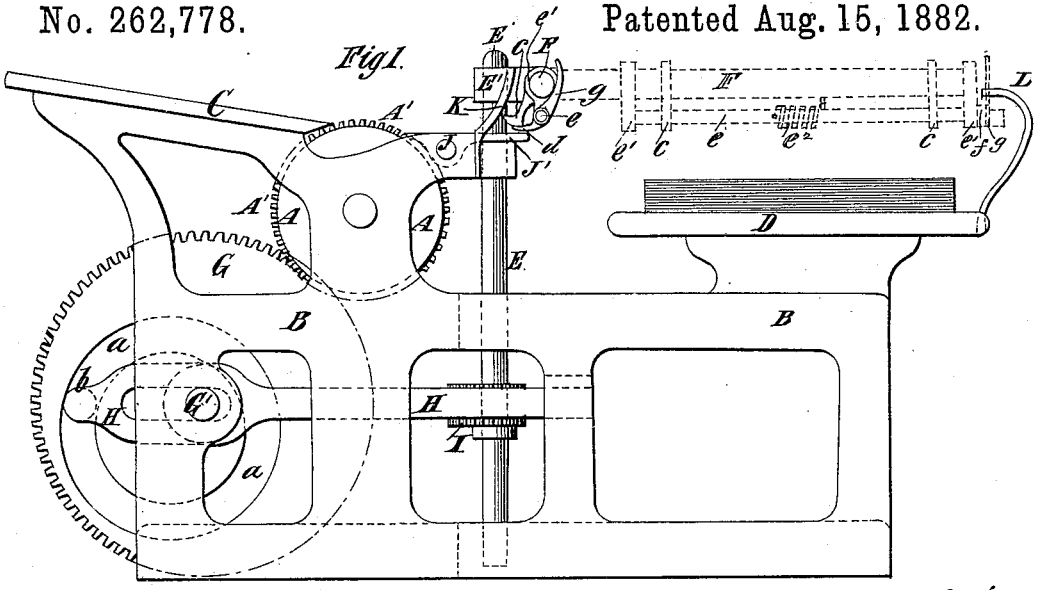
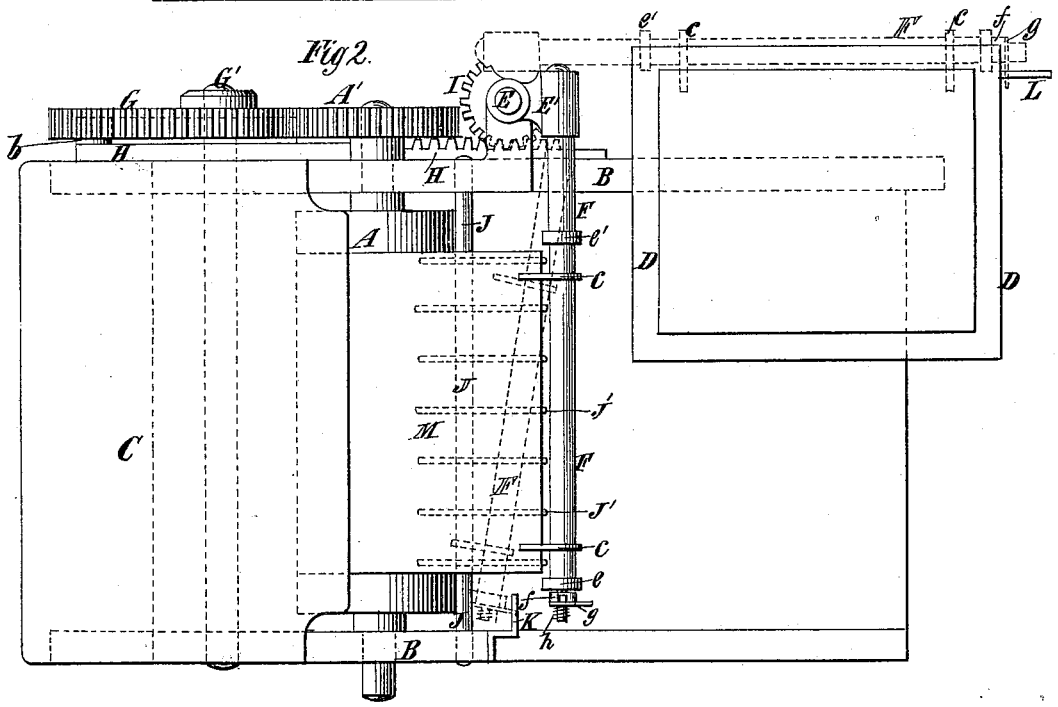


Fig 2.



Witnesses
J. H. Keane
James A. Bowen.

Inventor
Berthold Huber
By his Atty
Edwin H. Brown.

(No Model.) 2 Sheets—Sheet 2.

B. HUBER.

DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 262,778. Patented Aug. 15, 1882.

Fig 3.

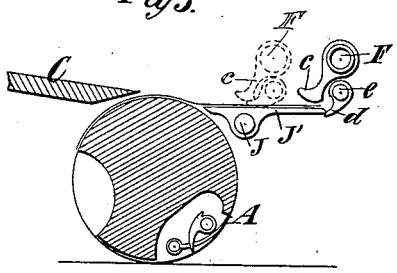


Fig 4.

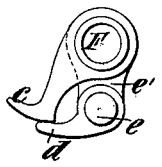


Fig 5.

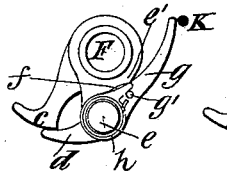


Fig 6.

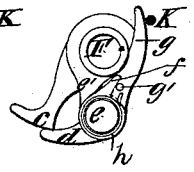


Fig 7.

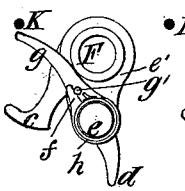


Fig 8.

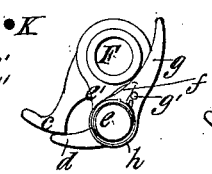


Fig 9.

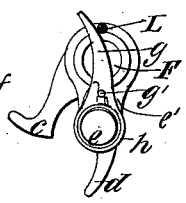


Fig 10.

Fig 11.

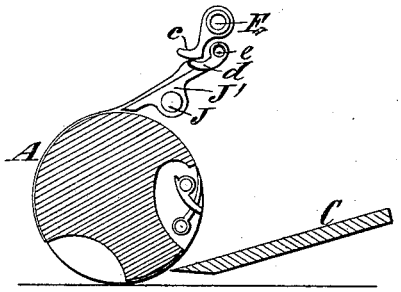
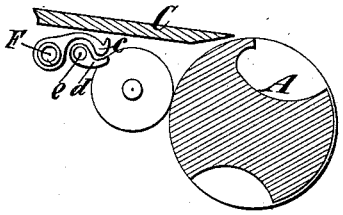


Fig 12.



Witnesses
J. J. Keane
James R. Bowen.

Inventor
Berthold Huber
By his atty.
Edwin H. Brown

UNITED STATES PATENT OFFICE.

BERTHOLD HUBER, OF TAUNTON, MASSACHUSETTS.

DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 262,778, dated August 15, 1882.

Application filed February 13, 1882. (No model.)

To all whom it may concern:

Be it known that I, BERTHOLD HUBER, of Taunton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Delivery Apparatus for Printing-Machines, of which the following is a specification.

One feature of my invention is applicable to all cylinder printing-presses in which the cylinder and sheet are moving at the time the sheet is gripped by the delivery-grippers, and in which the said grippers are carried away from the cylinder in the same direction as the sheet and cylinder are moving to draw the sheet from the cylinder; and it consists in the combination, with the cylinder, of delivery-grippers which are adapted to move toward and from the cylinder in a horizontal plane parallel with the axis of the cylinder, and which in their movement toward the cylinder are carried past the position at which they take the sheet, and which are started in their movement in the direction requisite for carrying off the sheet before they arrive at the position in which they take the sheet, and which are consequently in motion when they take the sheet.

Another feature of my invention is applicable to cylinder-presses generally; and it consists in the combination, with the cylinder, of a bar carrying delivery-grippers and fulcrumed at one side of the press, and mechanism for swinging said bar from a position approximately parallel with the cylinder into a position transverse thereto, whereby I provide a very simple and effective delivery apparatus and enable the bed of the press to be readily reached for adjusting or securing the form or for other purposes.

The gripper-carrying bar is fulcrumed upon an upright shaft; and the invention also consists in the mechanism employed for oscillating said shaft to impart the necessary swinging motion to said bar, and in a novel means for opening the grippers.

In the accompanying drawings, Figure 1 represents a side view of such parts of a press as are necessary to illustrate my invention. Fig. 2 represents a plan thereof; and Fig. 3 represents a transverse section of the cylinder, feed-board, and delivery apparatus. Fig. 4 represents a transverse section of a gripper-carrying bar and appurtenances upon a larger scale. Figs. 5 to 9, inclusive, represent end views of the gripper-carrying bar and grippers upon the same scale as Fig. 4, illustrating them in different positions. Fig. 10 represents a detail view of one of the parts of the delivery apparatus. Fig. 11 represents a section of a cylinder and feed-board arranged under the same with my delivery apparatus adapted thereto; and Fig. 12 represents a transverse section of the cylinder and feed-board of a press having my delivery apparatus arranged under the feed-board.

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

Referring first to Figs. 1 to 10, inclusive, which represent a two-revolution press with the delivery apparatus in front of the cylinder, A designates the cylinder, which is mounted in suitable bearings in the side frames, B, of the press, and which may receive its rotary motion in any suitable manner. The bed may be arranged to work in guides in the side frames, B, below the cylinder, and may be reciprocated by any suitable devices; but as neither the bed nor its operating mechanism forms any part of my invention I have not illustrated them.

C designates the feed-board, arranged behind and above the cylinder A, and D designates the delivery board or table, arranged in front of the cylinder and at one side of the press, as is clearly shown in Fig. 2.

E designates an upright shaft arranged at the side of the press on which is the delivery-table D, and F designates a gripper-carrying bar extending horizontally from the upright shaft E, and connected therewith by a piece, E′, comprising two eyes, into which the said shaft and bar are fixed, and which are at right angles to each other. The shaft E forms a fulcrum for the bar F to swing upon, and by turning the shaft about a quarter of a turn alternately in opposite directions the bar F may be swung from a position approximately parallel with the cylinder into a position transverse thereto and approximately parallel with the side of the press on which is the delivery-table D.

Any suitable mechanism may be employed

for imparting the necessary oscillating motion to the shaft E. In the present example of my invention the cylinder A has fixed upon it a spur-wheel, A′, which engages with a spur-wheel, G, of double the size of the spur-wheel A′. In the side of the wheel G is a cam-groove, *a*, (shown clearly in Fig. 1;) and H designates a rack-bar which straddles the shaft G′ of the cam-wheel G, and carries a roller, *b*, engaging with the groove *a*. The rack-bar H drives a pinion or sector, I, on the shaft E, and at each two revolutions of the cylinder the cam-wheel G makes one revolution and the shaft E is turned forward and back, thereby swinging the gripper-carrying bar F from the cylinder to the delivery-table and return.

The cylinder A is provided with the ordinary grippers and lifting-fingers, as shown in Fig. 3, and they may be operated in any suitable manner. The operating mechanism of these grippers and fingers is not shown, as it forms no part of my invention.

I will now describe more particularly the gripper mechanism carried by the bar F, which is preferably hollow to make it as light as possible.

Upon the bar F are two fixed grippers, *c*, and *d* designates the movable grippers which operate in conjunction therewith, and are secured to a shaft, *e*, suspended by hangers *e′* from the bar F. The shaft *e* is capable of being turned in its hangers *e′*, and when turned the movable grippers *d* are opened or closed relatively to the fixed grippers *c*. When the shaft *e* is not otherwise actuated it is turned to close the grippers *d* on the fixed grippers *c* by means of a spring, e^2, applied as shown in dotted lines in Fig. 1.

Upon the free or outer end of the shaft *e* is fixed a toe, *f*, of the form shown in Fig. 10, and *g* designates a lever loosely fitting on the shaft *e*, adjacent to the toe *f*, and carrying a pin, *g′*, which is adapted to operate on said toe to turn the shaft *e* and open the grippers *d*. The lever *g* is acted upon by a spring, *h*, to hold the pin *g′* in contact with the toe *f*, and when moved away from said toe it is returned automatically by said spring.

Between the cylinder A and the bar F is arranged a shaft, J, carrying bridge-fingers or stripping-fingers J′, as clearly shown in Figs. 2 and 3.

Attached to the frame B, adjacent to the cylinder A, is a stop, K, and L designates a similar stationary stop adjacent to the delivery-table D, the purpose of which will be hereinafter described.

At the time the front edge of the printed sheet M is raised by the lifting-fingers in the cylinder over the stripping-fingers J′ the gripper-carrying bar F is returning from the delivery-table D, and in its return movement toward the cylinder the said bar passes the position at which its grippers take the sheet and moves into the position shown in dotted outline in Figs. 2 and 3. The front edge of the printed sheet M is just then passing over the stripping-fingers J′, and as the bar F commences its motion away from the cylinder the sheet, the cylinder, and the bar are all moving in the same direction and at about a uniform speed.

It will be observed that the gripper-carrying bar F moves toward and from the cylinder in a horizontal plane parallel with the axis of the cylinder.

When the lever *g* strikes the stop K as the bar F is moving toward the cylinder it is simply deflected, so as to carry the pin *g′* away from the toe *f*; but as the bar moves away from the cylinder the said lever strikes the opposite side of the stop K, and its pin *g′* acts upon the toe *f* and opens the grippers *d* to receive the front edge of the printed sheet M, and as soon as the lever *g* passes the stop K the grippers are closed upon the sheet by the action of the spring e^2, and said sheet is then securely held by the grippers. In Fig. 1, and in bold outline in Figs. 2 and 3, the grippers are represented as having just grasped the sheet, and as the bar F swings outward it takes the sheet from the cylinder as fast as delivered and swings it off to one side of the press. As the bar F reaches the end of its movement the lever *g* strikes the stop L and the grippers *d* are opened to release the printed sheet and allow it to fall upon the delivery-table D. In Fig. 5 the lever *g* is represented as just approaching the stop K. In Fig. 6 the said lever is being acted on by the said stop. In Fig. 7 the stop has moved the lever sufficiently to open the grippers. In Fig. 8 the lever has escaped from the stop K and the grippers are closed upon the printed sheet, and in Fig. 9 the lever is being acted on by the stop L to open the grippers and deliver the printed sheet upon the delivery-table D.

When the cylinder and sheet are both moving together at the time the sheet is taken by the delivery-grippers the movement of the delivery-grippers past the position at which they take the sheet is very desirable, as then the delivery-grippers commence their movement away from the cylinder and acquire a speed nearly uniform with the speed at which the sheet moves before they take the sheet. This manner of operating the delivery-grippers is advantageous whether they are carried by a swinging bar, as here shown, or are carried by devices which move them directly away from the cylinder in a straight path, as in many front-delivery presses.

During the first movement of the gripper-carrying bar F away from the cylinder the sheet will be delivered onto the stripping-fingers J′ faster than the bar will remove it, at least on the side nearest the fulcrum of the bar, and the sheet may wrinkle up on that side; but this is of no importance, as the newly-printed side of the paper, which is uppermost, cannot touch anything to smear or blot it.

This form of delivery apparatus is simple

and effective, and is also advantageous, because it delivers the sheet head first and printed side up from the cylinder and on the pile on the delivery-table, and because it delivers the sheet on the side of the press and affords free access to the bed and form-rollers.

If the horizontal gripper-carrying bar be used on a press where the sheet comes to a standstill and may be taken at leisure by the delivery-grippers—as, for instance, on a stop-cylinder or oscillating-cylinder press—then the gripper-carrying bar need only move from where its grippers take the sheet to where they deliver it.

If the dotted position of the gripper carrying bar F (shown in Fig. 3) were omitted, said figure would represent an arrangement suitable for an oscillating-cylinder press, for in such a press said bar need not move back of the position at which it takes the sheet.

In Fig. 11 I have represented the swinging gripper-carrying bar and its grippers arranged to suit a press in which the feed-board C is under the cylinder, and this arrangement would be equally good whether the press be a continuous rotating cylinder, an oscillating cylinder, or a stop-cylinder.

In Fig. 12 I have represented the swinging gripper-carrying bar and its grippers arranged to suit a press in which the feed-board C is above the cylinder A, and has the delivery on the back of the cylinder and under the feed-board. This arrangement would be advantageous with a stop-cylinder or oscillating-cylinder press, and, with but slight variations, with a continuous-rotating-cylinder press.

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

1. The combination, with the cylinder of a printing-press adapted to rotate at the time the sheet is taken by the delivery apparatus, of delivery-grippers which are adapted to move toward and from the cylinder in a horizontal plane parallel with the axis of the cylinder, and which in their movement toward the cylinder are carried past the position at which they take the sheet, and which are started in their movement in the direction requisite for carrying off the sheet before they arrive in the position at which they take the sheet, substantially as specified.

2. The combination, with the cylinder of a printing-press, of a horizontal bar carrying delivery-grippers and fulcrumed at one side of the press, and mechanism, substantially such as described, for swinging said bar from a position approximately parallel with said cylinder outward to the side of the press where the sheet is delivered, substantially as specified.

3. The combination, with the cylinder of a printing-press, of a horizontal bar carrying delivery-grippers and fulcrumed at one side of the press, and mechanism, substantially such as described, for swinging said bar toward the cylinder, past the position at which it takes the printed sheet, and for swinging said bar away from the cylinder to deliver the printed sheet at the side of the press, substantially as and for the purpose specified.

4. The combination, with the cylinder A and the delivery-table D at the side of the press, of the upright shaft E and the horizontally-swinging gripper-carrying bar fulcrumed on said shaft, substantially as specified.

5. The combination, with the cylinder A, of the upright shaft E, the swinging gripper-carrying bar F, the sector or pinion I on the shaft E, and the cam-wheel G and rack-bar H for oscillating said shaft, substantially as specified.

6. The combination of the bar F, with fixed grippers *c*, the movable shaft *e*, with grippers *d*, the spring e^2, the toe *f*, the loose lever *g*, and the stationary stops K and L, substantially as specified.

BERTHOLD HUBER.

Witnesses:
WM. S. BRIGGS,
W. R. CROSSMAN.