

**No. 676,941.**

**Patented June 25, 1901.**

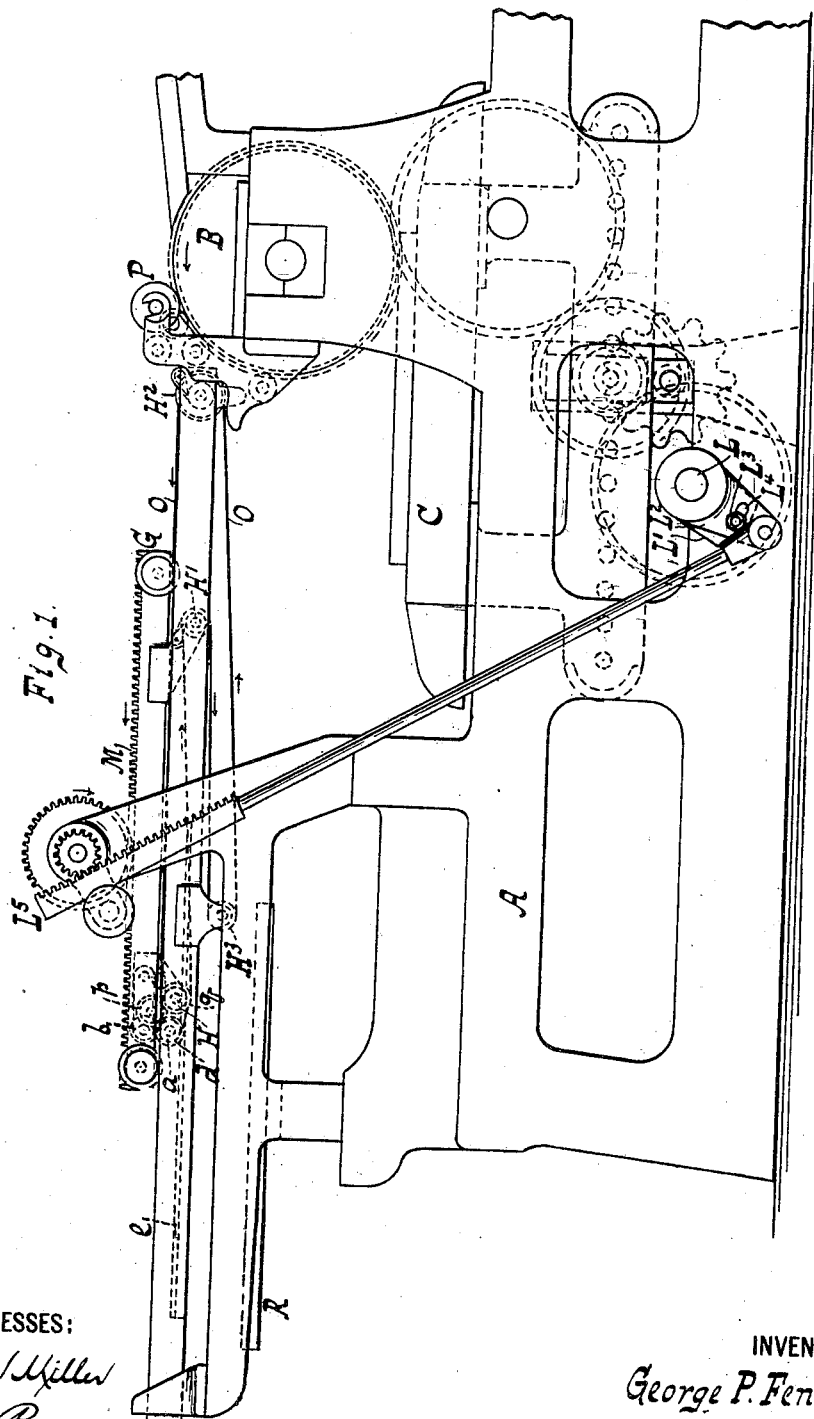
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**SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.**

(No Model.)

(Application filed Sept. 28, 1900.)

**3 Sheets—Sheet 1**



**WITNESSES:**

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C. E. Rogers.

INVENTOR

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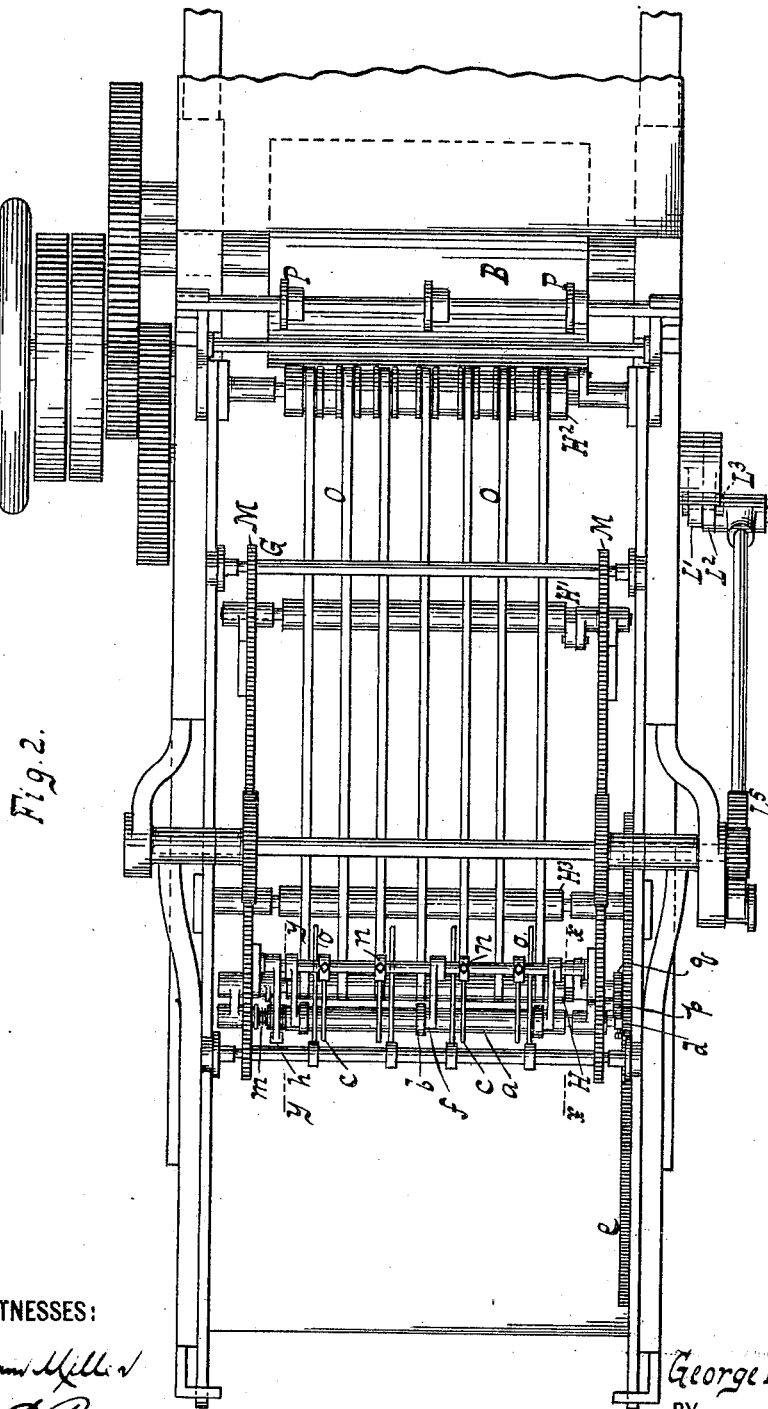


Fig. 2.

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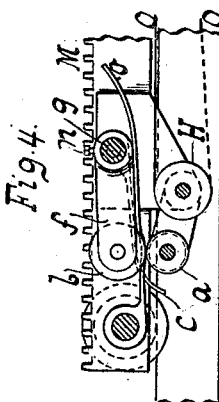
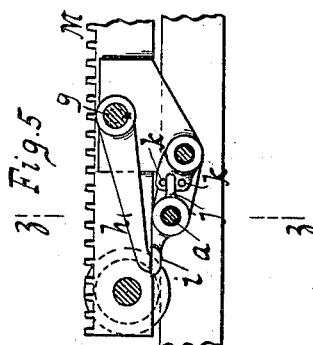
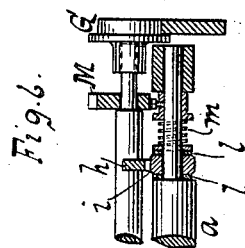
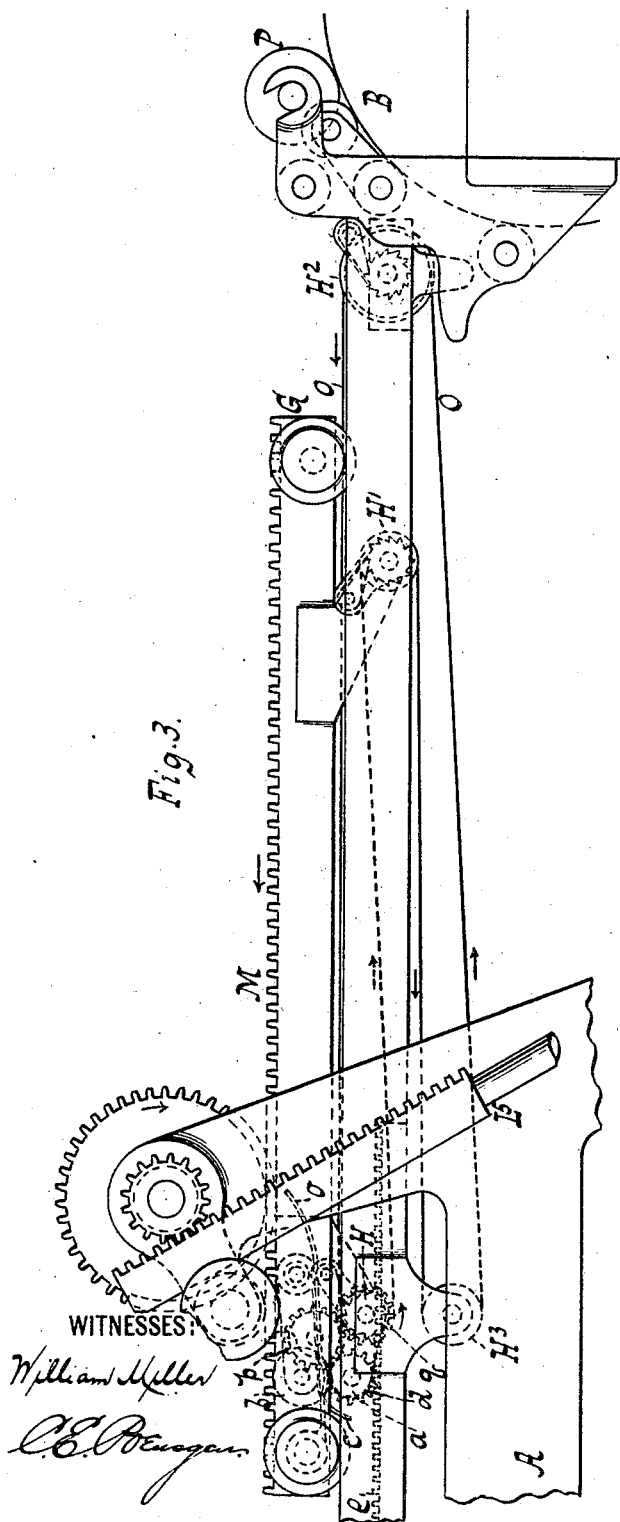
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SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

(Application filed Sept. 28, 1900.)

(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

GEORGE P. FENNER, OF NEW LONDON, CONNECTICUT.

## SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 676,941, dated June 25, 1901.

Application filed September 28, 1900. Serial No. 31,388. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE P. FENNER, a citizen of the United States, residing at New London, in the county of New London and State of Connecticut, have invented new and useful Improvements in Sheet-Delivery Apparatus for Printing-Machines, of which the following is a specification.

In United States Letters Patent No. 335,066, of January 26, 1886, is set forth a delivery apparatus by which a sheet is delivered printed face up. By a suitable arrangement or attachment the delivery can be made with the printed face of the sheet down.

The reversing attachment forming the subject of this invention is set forth in the following specification and claims and illustrated in the annexed drawings, in which—

Figure 1 is a side elevation of a delivery apparatus. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a detail view enlarged. Fig. 4 is a section along *x x*, Fig. 2. Fig. 5 is a section along *y y*, Fig. 2. Fig. 6 is a section along *z z*, Fig. 5.

In said patent is mentioned a printing-press frame A, with type-bed C and impression-cylinder B, as also the carriage G, with rollers H H' and the tapes O running about these rollers and about rollers H<sup>2</sup> H<sup>3</sup> on the frame.

The manner in which the tapes deliver sheets on receiving-board R is set forth in said patent and need not be here detailed. The carriage can be reciprocated by suitable means, as shown in said patent or in United States

Patent No. 506,990, of October 17, 1893. The carriage is provided with a sheet-feeding roller *a*, Fig. 4, and with pressure-rollers *b*, and a sheet fed out between these rollers and bent or reversed by the curler or conductor-fingers

*c* will be turned or delivered face down. To the shaft of roller *a* is secured or feathered a gear *d*, which when pushed or set to outward position, as in Fig. 2, will run on rack *e*, fixed to frame A. When the carriage runs forward or away from cylinder B, the roller *a*

has its top or sheet-supporting portion also rotating forward, but at increased speed compared to the speed of the carriage. During such forward stroke the pressure rollers or disks *b* rest on roller *a*, so that a sheet grasped between these rollers is fed to guide *c*. Dur-

ing the return of the carriage the pressure-wheels *b* are lifted off the roller *a*, so that the latter, which now rotates in the reverse direction, does not grip a sheet which may pass or lap thereon.

The lifting and dropping of wheels *b* are effected as follows: These wheels *b* are mounted on arms *f*, Fig. 4, which are fixed to the rock-shaft *g*, having an arm *h*, Fig. 5, resting on a nose *i*, whose hub is mounted on roller *a* or on a gudgeon forming part of this roller. This nose *i*, with its hub and its tail *j*, can be cast in one piece, and in the example shown might be compared in the manner of mounting to a lever of the first class. The tail *j* extends between two fixed and suitably-spaced pins or stops *k*. When the tail *j* swings to contact with lower stop *k*, the nose *i*, with arm *h*, and wheels *b* are raised to clear or be out of touch with roller *a*. On nose *i* dropping or tail *j* resting against upper stop *k* the wheels *b* fall to engagement with roller *a*. The pins *k* thus form stops limiting the swing of tail *j* and nose *i* to the required degree. The hub of nose *i* is of such size or its opening of such diameter as to sit loosely about the gudgeon of roller *a*, but said hub is seated between two friction or clutch pads or cheeks *l*, Fig. 6, which feather, or at least one of which feathers or slides, on the roller-gudgeon, so as to rotate with the roller, and a spring *m* tends to press these clutch-cheeks toward one another to grip the interposed nose *i*. As the carriage travels forward the corresponding forward rotation of roller *a* and clutch-pieces *l* swings nose *i* downward until tail *j* is arrested by upper stop-pin *k*. The clutch *l* thus keeps rotating and rubbing against the nose-hub, while such nose stands still, being in sufficiently low position for wheels *b* to have dropped to active position. On the return of the carriage and the backward rotation of roller *a* to lift nose *i* until arrested by lower stop *k* the rollers *b* are raised or in idle position.

It has also been found practical or simple to mount the sheet-reversing guides on shaft *g*. In such case it is true the guides *c* rise somewhat on the return of the carriage and drop somewhat on the forward travel of the carriage; but this has not been found to in-

terfere with the desired working or reversing action of the attachment. The hubs of guides *c* being slipped onto shaft *g*, such guides can be set or adjusted to the required dip or angle, and thus fixed on the shaft by screws or fastenings *n*, and it can here also be noted that if the guides *c* are to be left idle the screws *n* have only to be loosened and the free ends of the guides swung up sufficiently high and there fixed by retightening the screws, so that these guides do not touch a sheet leaving the carriage or tapes. The attachment can thus be readily set for delivering a sheet either reversed or unreversed, as desired. While this mounting of the guides is simple and practical, it is of course self-evident that the invention is not limited to the exact construction shown. The arrangement set forth, however, possesses certain advantages. It can be attached to carriages or deliveries being made for the market or even to those which are already in use, if such attachment should be called for, and if to be dispensed with such attachment can be readily left off or dismantled or set out of action.

The shaft *L*, Fig. 1, is shown with an arm *L'* fixed thereto. The crank-arm *L*<sup>2</sup> is not keyed or fixed to shaft *L*, but is adjustable or has a pin-and-slot connection *L*<sup>3</sup> *L*<sup>4</sup> with arm *L'*. This crank *L*<sup>2</sup>, by rack *L*<sup>5</sup>, actuates the driving-gear engaging rack *M* on top of reciprocating carriage *G*. By the adjustment *L*<sup>3</sup> the crank and rack *L*<sup>5</sup> can be set so that, for example, the leading edge of a sheet coming from cylinder *B* can reach conductor or guide *c* at different moments in the travel of the carriage. Say the crank *L*<sup>2</sup> is set so that the carriage does not start forward until the sheet has had its leading edge fed forward some distance from between cylinder *B* and wheel or roller *P*. The sheet will thus, as it might be expressed, have a certain "start" over the carriage.

The device has been found to work well, as follows: The leading edge of the sheet having been run forward some distance (say two or three inches, for example) of tape-carrying roller *H*<sup>2</sup>, and the carriage then starting forward with the sheet - supporting or top stretch of the tapes, then on the return of the carriage the sheet standing still will come to lap with its leading part somewhat over onto roller *a*. The carriage now again starts forward and the wheels *b* having dropped onto roller *a* such overlapping sheet is run forward between such wheels and roller and reversed by guide *c* onto the receiving-board.

As seen in Fig. 4, rearwardly - extended guides *o*, applied to prevent the leading edge of the sheet rising up or running elsewhere than under guide or conductor *c* or wheels *b*, are useful.

When the roller *a* is not to be in engagement with rack *e*, its gear *d*, Fig. 2, can be slid inward to mesh with intermediate gear *p*, which engages a gear *q*, Fig. 3, on tape-roller

*H*. As this tape-roller *H* now rotates or stands still, the roller *a* does likewise.

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

1. In a delivery apparatus for printing-machines, the combination of a reciprocating carriage, tape-rollers mounted thereon, tapes carried by said rollers, delivery feed-rollers mounted on the carriage and operating to grasp and deliver the sheets fed thereto by the tapes, and reversing-guides carried by the carriage and arranged to intercept the sheets as they are fed from the delivery feed-rollers and turn them face down, substantially as described.

2. A delivery apparatus comprising a reciprocating tape-carriage and tape-rollers, sheet-feeding rollers or wheels on the carriage, and reversing-guides in the path of a sheet moved by said feeding-rollers substantially as described.

3. In a delivery apparatus for printing-machines, the combination of a reciprocating carriage, tape-rollers mounted thereon, tapes carried by said rollers, delivery feed-rollers mounted on the carriage and operating to grasp and deliver the sheets fed thereto by the tapes, and a shiftable gear mounted on one of said feed-rollers and arranged to be thrown at will into gear either with one of the tape-rollers or with means for imparting to said feed-roller a rotary motion alternately in opposite directions, substantially as described.

4. In a delivery apparatus for printing-machines, the combination of a reciprocating carriage, tape-rollers mounted thereon, tapes carried by said rollers, delivery feed-rollers mounted on the carriage and operating to grasp and deliver the sheets fed thereto by the tapes, a fixed rack, and a shiftable gear mounted on one of said feed-rollers and arranged to be thrown at will into gear with the rack or with one of the tape-rollers, substantially as described.

5. In a delivery apparatus for printing-machines, the combination with a reciprocating carriage, tape-rollers carried thereby and tapes mounted on the tape-rollers, of a sheet-feeding roller, a vertically-movable roller arranged to rest on the feed-roller during the forward movement of the carriage, and means operated by said feed-roller for lifting the movable roller out of contact with the feed-roller during the backward or return movement of the carriage, substantially as described.

6. A tape-carriage having a feeding-roller and pressure-wheels, a rock-shaft for the wheels, an actuating-arm for the shaft, a nose for the arm, and a friction-clutch on the feeding-roller for moving the nose back and forth substantially as described.

7. A tape-carriage, a feeding-roller and pressure-wheels, combined with a rock-shaft for the wheels, an actuating-arm for the shaft, a nose having a tailpiece, stops for the tail-

piece, and a friction-clutch for moving the tailpiece between the stops for causing the nose to reciprocate for the rock-shaft to swing the pressure-wheels into and out of action substantially as described.

8. A tape-carriage provided with a feeding-roller and pressure-wheels, supporting-arms and a rock-shaft for the wheels, a gear secured to the feeding-roller, a rack for the gear fixed alongside the carriage, an actuating-arm for the rock-shaft, a nose for the arm, and a friction-clutch for the nose made to travel with and to be rotated by said feeding-roller to reciprocate the rock-shaft so as to cause the pressure-wheels to be in action on the delivery, and out of action on the return stroke of the carriage substantially as described.

9. In a delivery apparatus for printing-machines, the combination with a reciprocating tape-carriage, of a feed-roller and pressure-

wheels carried thereby, of a sheet-reversing guide arranged between the pressure-wheels and above the feed-roller, and a guide for directing the sheets from the tapes to the reversing-guide, substantially as described.

10. A tape-carriage having tape-rollers and a sheet-feeding roller, a rack fixed alongside the carriage, and gears on the carriage actuated by the tape-roller, said feeding-roller having a gear adapted to be shifted to engage the rack or the tape-roller-actuated gear substantially as described.

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

GEORGE P. FENNER.

Witnesses:

WILLIAM W. IRISH,  
NATHAN BABCOCK.