

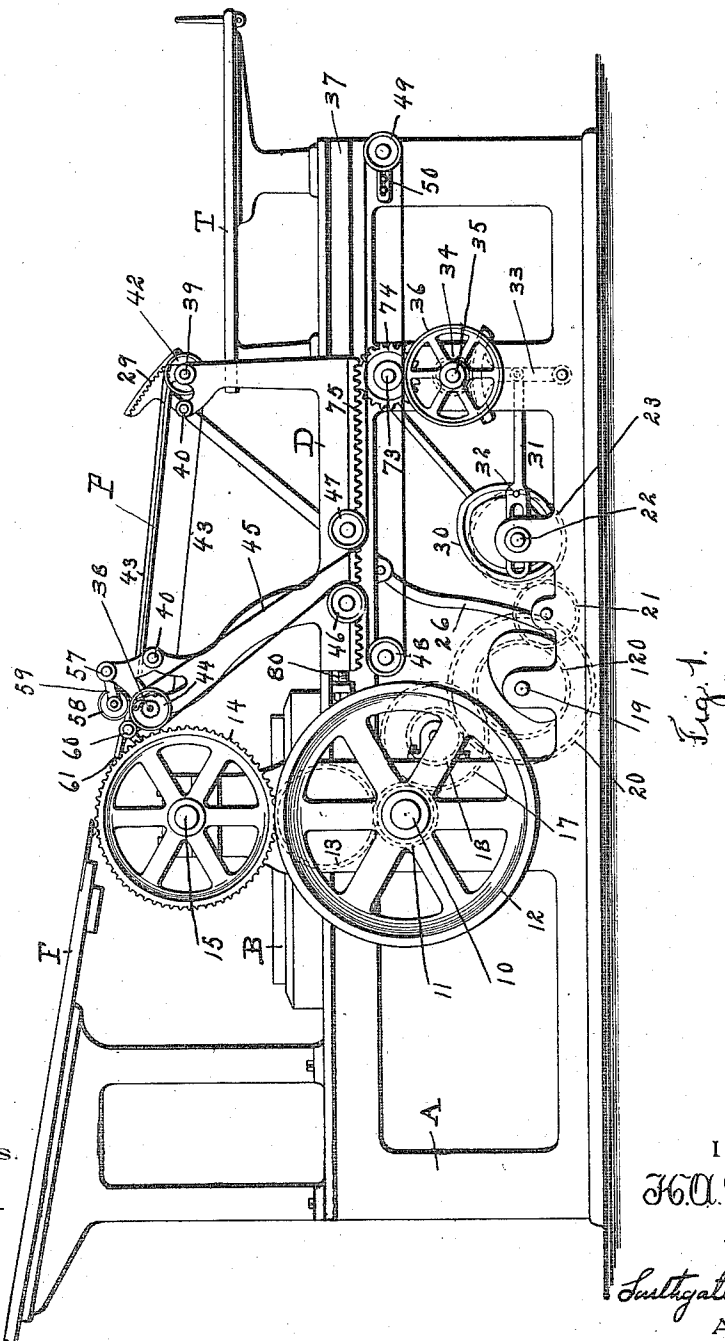
H. A. W. WOOD.
SHEET DELIVERY MECHANISM.

APPLICATION FILED APR. 23, 1897. RENEWED JAN. 6, 1906.

1,049,435.

Patented Jan. 7, 1913.

4 SHEETS—SHEET 1.



Witnesses.

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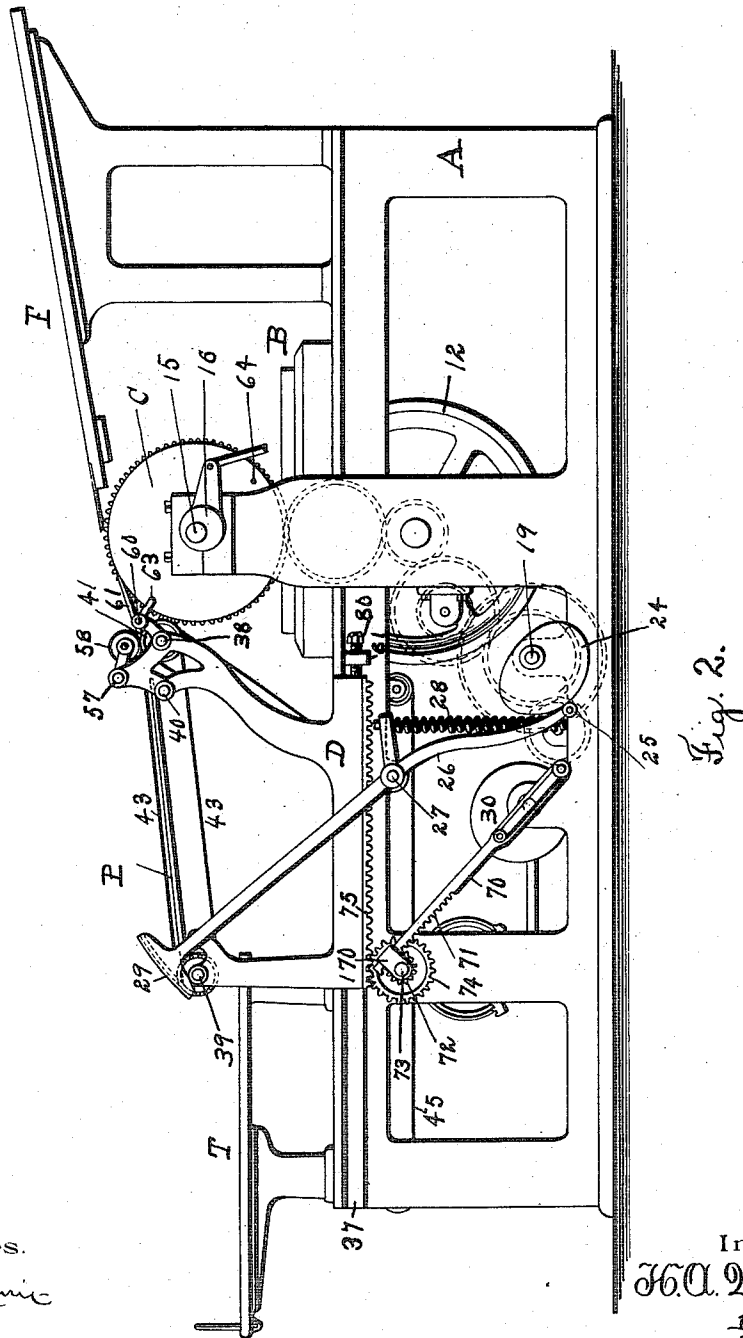


Fig. 2.

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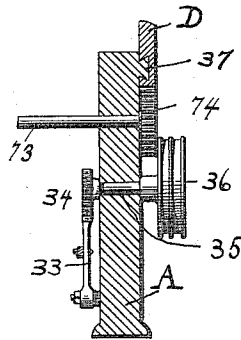


Fig. 3.

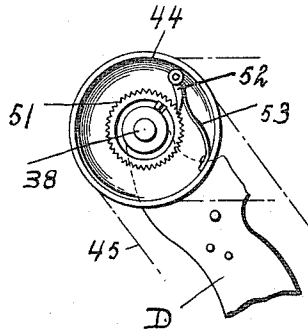


Fig. 4.

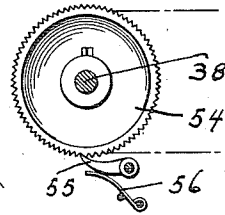


Fig. 5.

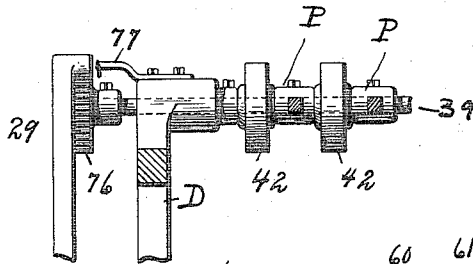


Fig. 6.

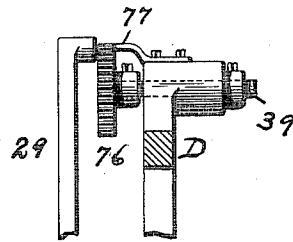


Fig. 7.

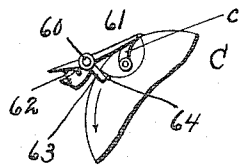


Fig. 9 1/2.

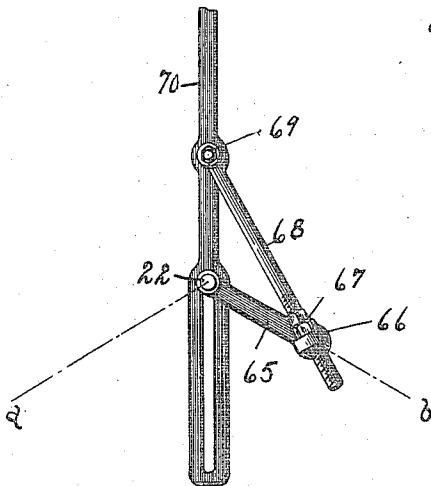


Fig. 8.

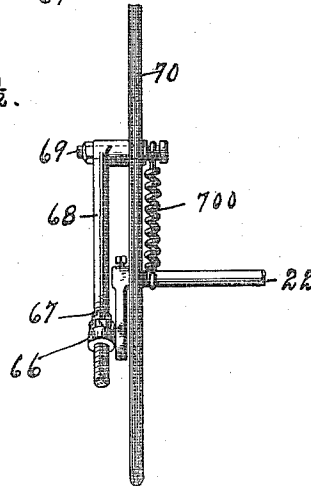


Fig. 9.

Witnesses.
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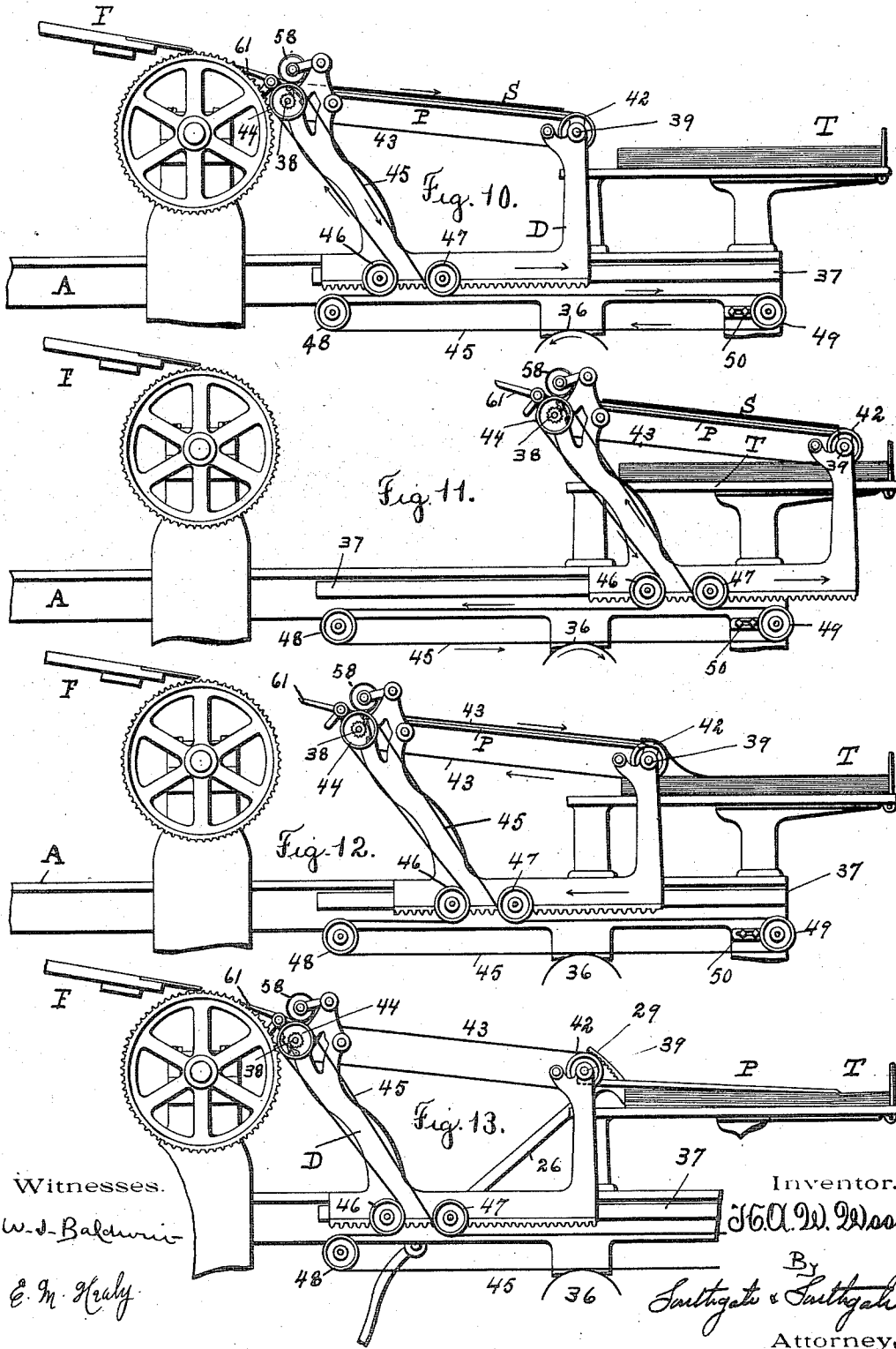
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE AUTOPLATE COMPANY OF AMERICA, OF JERSEY CITY, NEW JERSEY, A COR-
PORATION OF NEW JERSEY.

SHEET-DELIVERY MECHANISM.

1,049,435.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed April 23, 1897, Serial No. 633,518. Renewed January 6, 1906. Serial No. 294,923.

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Sheet-Delivery Mechanism, of which the following is a specification.

The object of this invention is to provide a new and improved sheet delivery mechanism, especially adapted for use in connection with cylinder printing machines, which shall be simple, of few parts, and efficient to accomplish the many functions herein after described.

To this end, my invention consists in arranging a delivery mechanism with a reciprocating carriage, in mounting in said carriage a set of tapes, and in providing means for so controlling the tapes that the said tapes will advance or run to take the sheet thereon, will substantially stop as the carriage moves forward with the sheet, and will draw from under and thereby deliver the sheet as the carriage moves backward. I further preferably so actuate the carriage that the same will have a dwell in one extreme position as the sheet runs on to the set of tapes. I also mount in the reciprocating carriage a fly which may be connected or disconnected. When the fly is connected, the carriage is held stationary, and the fly is arranged to cooperate with said set of tapes to deliver the sheet in the ordinary way. By this arrangement, if the carriage is arranged on the front side of an ordinary cylinder printing machine, the sheets may be delivered printed side up by using the tapes, or may be delivered printed side down by using the fly.

Other features of my invention comprise a new and improved means for imparting the above described motions to the tapes, which consists of a driving belt so arranged that power will be imparted thereto and thereby to the tapes in the carriage at the proper time. I also preferably arrange a slider and a set of strippers in the carriage, so that when the carriage is moved to its extreme, away from the cylinder of the printing machine, said cylinder is very accessible for the purpose of making ready. A form of preferred driving mechanism that I use to reciprocate the carriage is a

crank mechanism provided with a relief to allow for the dwell heretofore mentioned.

The best understanding of the details of my invention will be had by referring to the accompanying four sheets of drawings forming part of this application, and which illustrate the best form now known to me for carrying out my invention.

Referring to said drawings and in detail, Figure 1 is a rear elevation of a printing machine with my improvement applied thereto, Fig. 2 is a similar elevation from the other or front side of the machine, Fig. 3 is a sectional view illustrating part of the driving mechanism for the belt which drives the tapes in the carriage, Figs. 4 and 5 are detail views of a ratchet mechanism used between the driving belt and the set of tapes, Figs. 6 and 7 are detail views of the shaft which carries the fly and the forward tape-pulleys, Figs. 8 and 9 are detail views of the crank mechanism which is used to reciprocate the carriage, Fig. 9½ is a detail view illustrating the action of the strippers mounted in the reciprocating carriage, and Figs. 10 to 13 inclusive are diagrammatic views illustrating the operation of my improved delivery mechanism.

In the drawings I have illustrated my invention as applied to act as a front delivery in connection with an ordinary two-revolution cylinder printing machine, although it is to be understood that my delivery mechanism can be applied to any kind of printing press or other machine.

Referring to the drawings and in detail, A, A are the usual side-frames.

B designates the usual reciprocating bed, which is driven by any of the usual bed movements, not necessary to show.

C designates the impression cylinder.

F designates the feed-board of the machine, and T designates the receiving table, upon which the printed sheets are to be delivered.

The driving shaft of the machine may be journaled in the frames in the usual manner, and may have mounted thereon any of the usual tight and loose pulleys or other power-imparting devices. Mounted on said shaft is a pinion 11, which, by means of intermediate 13 communicates motion to gear 14 mounted on the shaft 15 of the impression cylinder C, which shaft 15 is mounted

in eccentric bushings 16 journaled in each frame, which bushings are oscillated by any of the usual mechanisms to raise and lower the impression cylinder at the proper time.

6 The pinion 11 also meshes with a gear 17, turning with which is a pinion 18, which drives a shaft 19 by means of gear 20 mounted thereon. Also mounted on the shaft 19 is a gear 120, which, by means of intermediate 21, drives another shaft 22, by means of gear 23 mounted thereon, the shafts 19 and 22 in the particular instance illustrated making one turn for every two turns of the impression cylinder. Mounted on the front

10 side of the shaft 19 is a cam 24 which bears on a roller 25 mounted on a vibrating arm or lever 26, which is pivoted at 27 on the front side frame of the machine. A spring-pressed rod 28 connects to an arm projecting

15 from said lever 26 so as to keep the roller 25 spring-pressed against the cam 24. At the upper end of this pivoted lever 26 is formed an internal segment 29, which, as hereafter described, is arranged to operate the fly.

20 Arranged on the shaft 22 is a yoke 31, which carries a roller 32, which engages the groove in a face-cam 30. Said yoke connects to a pivoted segment 33, which segment engages a pinion 34 secured on the end of a shaft 35

25 journaled in the side frame, as shown. On the outer end of this shaft 35 is secured a belt-wheel 36, which, as hereafter described, operates the driving belt for the set of tapes.

30 D, D represent two frames which constitute a carriage, and which frames are gibbed or fitted to slide on suitable ways 37 formed on or secured to the side-frames. Journaled in the side-frames D, D are two shafts 38 and 39, and suitable tie-rods as 40—40 may

35 be arranged between the two side-frames D, D, to tie the same together so that the entire carriage will move as one piece. Rigidly mounted on the shaft 38 is a tape-roller or set of tape-pulleys 41, and loosely mounted

40 on the shaft 39 are a number of tape-pulleys 42. Arranged between the tape-roller 41 and the tape-pulleys 42 is a set of tapes 43.

45 For some purposes, where it is not desired to use the fly, as hereinafter described, a wide belt or apron may be arranged between the two shafts 38 and 39 in the usual manner, and such device is the equivalent of the set of tapes, as I use that term in the

50 claims. Loosely mounted on one end of the shaft 38 is a pulley 44, around which is passed a driving-belt 45. Journaled on studs fitted in the rear frame D are pulleys 46 and 47. Journaled on a stud secured to

55 the rear side-frame A is a pulley 48, and adjustably secured to the front of said side frame A is another pulley 49, which is mounted in an adjustable arm 50. The belt 45 passes around the pulley 47, then around

60 the pulley 49, and is then wrapped around

and secured to the driving-wheel 36. The other end of the belt passes around the pulley 46, around the pulley 48, and has the end thereof also wrapped around and secured to said driving-wheel 36. The driving-wheel 36 preferably has two faces, as shown in Fig. 3, so that the two ends of the belt 45 can be nicely turned around the same in opposite directions, and secured to said driving pulley. The loose pulleys 46 and 47 are arranged so as to have their lowest point substantially in line with the top points of the fixed pulleys 48 and 49. By this construction, as the driving-wheel 36 is turned in one direction or the other, the belt 45 will be run in one direction or the other. Also by this construction, that portion of the belt extending from pulley 46 around pulley 44 back to pulley 47 may be said to constitute a traveling wave in said belt; that is, as the reciprocating carriage moves backward and forward, this wave of the belt will move backward and forward between the pulleys 48 and 49 without affecting the position of said belt on the driving-wheel 36, or without affecting the tension of the driving belt. By this means, the shaft 38 can be controlled, as hereafter described.

In some instances, where the peculiar construction and arrangement of the tape-pulleys 42 and fly-fingers hereafter described is not used, the belt 45 may be carried around a driving pulley mounted on the shaft which carries the forward tape-pulleys. The tension of the belt can be adjusted by the adjustable pulley 49. The pulley 44 is so arranged on the shaft 38 that only a movement in one direction of the belt 45 will be transmitted to the shaft 38; that is, the pulley 44 is loosely mounted on the shaft 38 between the frame D and a ratchet-wheel 51, which is rigidly secured upon said shaft 38. A pawl 52 is pivoted to said pulley 44, and is pressed into engagement with the ratchet-wheel 51 by means of spring 53. By this arrangement, only the motion of the pulley 44 in Fig. 4, corresponding to the movement of the hands of a watch, will be imparted to the shaft 38. The movement of the pulley 44 in the opposite direction will simply cause the pawl 52 to travel backward around the ratchet-wheel 51. I preferably provide another ratchet-wheel 54 on the inside and on the shaft 38, next to said frame D, and I arrange a pawl 55 on the frame D, with a spring 56, which pawl is adapted to prevent the shaft 38 turning backward when the pawl 52 travels around its ratchet-wheel. By this arrangement, when the driving-belt 45 is moved in one direction, the shaft 38 will be turned; but when the driving-belt 45 turns in the other direction, the shaft 38 will not be affected. This is desirable for effecting the operation hereinafter described. Also mounted between the frames D, D is a

shaft 57, on which is mounted an adjustable arm 59, which carries a slit 58, which may be set in the proper position to cooperate with the tape-roller 41. Also journaled in said frames D, D is a shaft 60, which carries a set of stripper-fingers 61, which are laterally so arranged as to fit in between the grippers *c* in the impression cylinder C, as indicated in Fig. 9½. Said stripper-fingers may be held normally in one position by means of a spring 62, and may be operated by any suitable means from the impression cylinder, as by means of an arm 63 mounted on the shaft 60, which is fitted to engage a pin or cam 64 mounted on the front face of the impression cylinder C.

By mounting the slit 58 and the strippers 61 in the traveling carriage, it will be seen that very free access is given to the front of the impression cylinder, for the purpose of making ready, as indicated in Fig. 11. On the front end of the shaft 22 is arranged a crank-arm 65, loosely pivoted in the end of which is an eye bolt or crank-pin 66, loosely fitted in which is a pitman 68, the lower end of which is screw-threaded, and which has nuts 67 mounted thereon. The pitman 68 connects by bolt 69 to a yoke 70, which is fitted to slide on the shaft 22. The upper end of the yoke 70 has rack-teeth 71, and the same fits into a frame 170 pivoted on a shaft 73, which shaft 73 is journaled in the side-frames A, A. Secured upon the shaft 73 is a pinion 72, which engages the rack-teeth 71. Fitted on the ends of the shaft 73 are gears 74, which engage with and drive racks 75 secured to the lower sides of each of the frames D, D. By this mechanism, the traveling carriage will be reciprocated.

Screws 80 are tapped through lugs 81 secured to each side-frame, as shown, to limit and adjust the movement of the frames D, D toward the impression cylinder. The movement thus imparted to the traveling carriage is substantially crank-actuated, except that the peculiar arrangement of the crank with the relief, as before described, allows the carriage to dwell in its position nearest the impression cylinder; that is, as the carriage moves to the right, Fig. 2 the yoke 70 will strike on the shaft 22, or the frames D, D will come against the adjusting screws 80, when the crank is substantially in the position indicated by the dotted line *a* in Fig. 8. Then, as the crank moves from this position, to the position indicated by dotted lines *b*, the eye bolt will run down and up on the pitman 68, without imparting any movement to the rod 70, so that, during the time of the crank between the dotted lines *a* and *b*, the carriage will dwell in its extreme right-hand position.

After the crank passes the dotted line *b*, the eye bolt 66 will push up on the adjust-

able nuts 67, and between the dotted lines *b* and *a*, the rod 70 will be pushed up and down, a spring 700 being arranged between the bolt 69 and the shaft 22 or a stationary point, to keep the nuts 67 in engagement with the eye bolt 66. By adjusting the nuts 67, the time of the dwell of the carriage can be adjusted. By disconnecting the nut on the end of the bolt 69, the pitman 68 can be removed, and withdrawn from the eye bolt, and the crank 65 thus rendered inoperative, and thereby the carriage can be held in its extreme position nearest the impression cylinder, so that the sheets can be delivered by the fly, as hereafter described. While I prefer to use this crank mechanism provided with a relief, of course a cam could be arranged on the end of the shaft 22, to accomplish the same purpose.

Keyed or otherwise fitted on the front end of the shaft 39 is a pinion 76, which, when drawn to its outer-most position, as shown in Fig. 6, will engage with the segment 29, but which, when pushed in near to the side-frame D, as indicated in Fig. 7, will clear the said segment. A catch 77 is provided on top of the frame D, so that, when the pinion 76 is pushed in, as shown in Fig. 7, the same will be held in its inner-most position, and the shaft 39 from turning, so that the pulleys 42 can nicely turn on the shaft. Arranged on the shaft 39, between the tape-pulleys 42, are a set of fly-fingers P, P, which intermesh with the tape-pulleys 42, as indicated in Fig. 6. When the pinion 76 is pulled out to engage the segment 29, the shaft 39 will be oscillated, so that the fly-fingers will be swung around on an arc to take the sheet up from the tapes 43, and deliver the same. When the pinion 76 is disconnected from its segment, the fly-fingers will remain down in an inoperative position, below the tapes. As the tape-pulleys 42 are loosely fitted on the shaft 39, so that they can freely turn thereon, this arrangement enables me to greatly simplify the parts.

Referring now to the diagram, I will explain the operation of my device.

In Fig. 10, the carriage is shown as dwelling in its left-hand extreme position. The driving-wheel 36 is turning in the direction indicated by the arrow, and therefore the belt 45 is running in the direction indicated by the arrows, turning the pulley 44, thereby the shaft 38, and thereby the tapes 43 so that the sheet S is being carried from the impression cylinder down on to said tapes, the cam 30 being properly proportioned to nicely accomplish this result. So soon as the sheet is nicely on the tapes 43, the belt 45 stops running in the direction before indicated. Then the carriage moves forward, the tapes being held stationary, and, by this movement, the sheet is nicely carried

forward over the receiving table T, the forward movement of the same being indicated in Fig. 11. During this forward movement of the carriage, the driving wheel 36 is turned back to its first position, but the movement thus imparted to the belt 45 does not affect the shaft 38, neither does the run of the belt 45 around the pulley 44, due to the forward motion of the carriage D, as both these motions turn the pulley 44 in position to the movement of the hands of a watch, and therefore, do not affect the shaft 38 or the tapes 43. After the carriage has reached its extreme position to the right, the same starts backward toward the impression cylinder. During this backward movement of the carriage, the driving belt 45 is held stationary. Thus, as the carriage moves toward the cylinder, the driving belt 45 will run around the pulley 44 in the same direction as the hands of a watch move, and exactly at the same time and speed at which the carriage moves backward. This will cause the lower portion of the tapes 43 to withdraw from under the sheet, and the upper portion of the tapes 43 to stand stationary relatively to a fixed point, so that the tapes will be bodily withdrawn from under the sheet, and the sheet nicely deposited upon the delivery table T, as the pulley 44 is substantially the same diameter as the tape-pulleys or roller 41. When the carriage reaches its left-hand extreme, the stripper fingers 61 actuate to start a second sheet down on the tapes 43, and the action before described is repeated.

The mechanism before described for reciprocating the carriage is a desirable one, in that it starts the carriage quickly on its forward movement after the sheet has run thereon, brings the same to an easy stop in the extreme right-hand position, and starts slowly backward; in other words, imparts a crank reverse to the carriage at its right-hand extreme.

In Fig. 13 I have indicated how my device is used when it is desired to fly the sheets instead of delivering the same by the tapes. In this arrangement, the pitman 68 is disconnected, as before described, so that the carriage remains all the time in its position next the impression cylinder. The pinion 76 is slid out to engage the segment 29. The tapes are left to run, as before described. Then, when a sheet has been run down on said tapes, the fly picks the same up off the tapes, and turns the same over, and delivers the same on the table T.

By the constructions thus described, a very simple and complete delivery mechanism is provided, which can be used to deliver the sheet in a variety of manners, as before described.

The details and gearing and relative arrangements of the parts may be drawn out,

proportioned and designed by a skilled mechanic in very many ways, without varying from the principles of my invention, as herein claimed.

Having thus described my invention so that those skilled in the art will appreciate the arrangement and advantages thereof, what I desire to claim and secure by Letters-Patent is:—

1. The combination in a delivery mechanism of a reciprocating carriage carrying delivery devices and a fly, and connections whereby the sheet may be delivered by either said delivery devices or the fly.

2. The combination in a delivery mechanism of a reciprocating carriage, a set of tapes and a fly mounted thereon, and means whereby sheets may be delivered by reciprocating the carriage and using the tapes, the fly remaining inoperative, or whereby the carriage may be stopped and the fly used to deliver the sheets.

3. The combination in a delivery mechanism of a reciprocating carriage, a set of delivery tapes arranged therein, a shaft having tape pulleys loosely journaled thereon, and a fly rigidly secured thereto, and means whereby said carriage may be held stationary and said shaft operated, so that sheets will be delivered by the fly.

4. The combination in a delivery mechanism, of a reciprocating carriage, a set of tapes mounted in said carriage, a driving pulley arranged to turn said set of tapes, a driving belt mounted on the frame-work of the machine, and looped around said pulley, and means for operating said driving belt, so that the tapes can take a sheet, carry the same forward, and withdraw from under the sheet to deliver the same.

5. The combination in a delivery mechanism of a reciprocating carriage carrying a set of tapes, a driving pulley arranged to turn said tapes, loose pulleys as 46, 47 arranged in said carriage, a driving belt passing around said loose pulleys and the pulley which drives said tapes, and means for controlling the driving belt, so that the tapes will carry a sheet forward over and deposit the same upon a delivery table.

6. The combination in a delivery mechanism of a traveling carriage carrying a set of tapes, a pulley arranged to turn said set of tapes, loose pulleys as 46 and 47 mounted on said carriage, fixed pulleys as 48 and 49, a driving belt passing around said pulleys as described, and means for controlling the said driving belt, so that the tapes will carry a sheet over and deposit the same upon a delivery table.

7. The combination in a delivery mechanism of a reciprocating carriage, a set of tapes mounted therein, a driving pulley for said tapes, loose pulleys as 46, 47 mounted on said carriage, fixed pulleys as 48, 49, a

driving-wheel 36, a driving belt 45 passing around said pulleys and secured to said wheel, as described, and means for imparting movement to said driving-wheel.

5 8. The combination in a delivery mechanism of a reciprocating carriage, a set of tapes arranged therein, a pulley arranged to turn said set of tapes, a ratchet between said pulley and the tape-roller or pulleys, loose
10 pulleys 46—47 mounted on said carriage, a driving-belt, and means for controlling said driving belt, so that the tapes will carry a sheet over and deposit the same upon a delivery table.

15 9. The combination in a delivery mechanism of a reciprocating carriage, a set of tapes arranged therein, a pulley arranged to drive said tapes through a ratchet, loose
20 pulleys 46—47 mounted on said carriage, fixed pulleys 48—49, a driving-wheel 36, a driving belt 45 passing around said pulleys and secured to said driving wheel 36, and means for turning said driving wheel 36
25 arranged so that the tapes will run forward when the carriage is at one extreme, remain stationary as the carriage advances, and will withdraw from under the sheet as the carriage retreats.

30 10. The combination in a delivery mechanism of a reciprocating carriage arranged to have a dwell in one extreme position, a set of tapes mounted in said carriage, a pulley arranged to drive said tapes through a ratchet connection, loose pulleys mounted on
35 said carriage, fixed pulleys, a driving wheel, a driving belt passing around said pulleys and secured to the driving wheel, as described, and means as a cam for operating said driving wheel, the whole so arranged
40 that the tapes will run forward to take the sheet while the carriage dwells, will stand stationary as the carriage advances, and will withdraw from under the sheet to deliver the same as the carriage moves backward.

45 11. The combination with a cylinder printing press, of a reciprocating carriage carrying delivery devices, and stripper fingers arranged in said carriage so as to be movable away from the impression cylinder
50 to permit free access to the front of the impression cylinder while the impression cylinder is being made ready.

55 12. The combination with a cylinder printing press, of a reciprocating carriage, stripper fingers mounted in the carriage and movable therewith to leave free access to the impression cylinder while the same is being made ready, and means for operating the
60 stripper fingers when in their position adjacent to the impression cylinder.

13. The combination with a cylinder printing press, of a reciprocating carriage, stripper fingers arranged in said carriage and movable therewith to leave free access
65 to the impression cylinder for making the

same ready, operating connections actuating the stripper fingers when in position adjacent to the impression cylinder, and a slitter arranged in said carriage.

14. The combination with a cylinder 70 printing press, of a reciprocating carriage movable with respect to the impression cylinder and carrying delivery mechanism, stripper fingers arranged in said carriage, and means whereby the stripper fingers will
75 be operated from the impression cylinder when the carriage is in its position nearest the impression cylinder.

15. The combination in a delivery mechanism of a reciprocating carriage, a set of 80 delivery tapes arranged therein, a fly arranged in said carriage to lie in an inoperative position below the top of said tapes, and means whereby said carriage may be held stationary and the fly operated. 85

16. The combination in a delivery mechanism of a reciprocating carriage, a set of 90 delivery tapes arranged therein, a shaft carrying tape pulleys and a fly, a pinion arranged on the end of said shaft, an operating segment for said pinion, and means whereby said carriage may be held stationary and said pinion moved to engage said segment and the fly thereby brought into operation. 95

17. The combination in a delivery mechanism of a reciprocating carriage, a set of delivery tapes arranged therein, and a fly also arranged in said carriage, the arms of which
100 intermesh with said tapes, and connections whereby the fly may be rendered inoperative and sheets delivered by reciprocating the carriage and using the tapes, or the carriage held stationary and the fly used to deliver the sheets. 105

18. The combination in a delivery mechanism of a reciprocating carriage, two shafts arranged therein, tape-pulleys or rollers mounted on said shafts, the tape-pulleys being loosely journaled on the forward shaft, 110 a set of fly-fingers also mounted on the forward shaft, and means whereby said carriage may be held stationary and said forward shaft connected to an operating mechanism so that the fly can be used. 115

19. The combination with a cylinder printing press, a reciprocating carriage, and actuating connections for the carriage for giving the same a full crank reverse at the end of its travel remote from the impression 120 cylinder, permitting the same to dwell in its position adjacent to the impression cylinder, and having quick motion for starting the same away therefrom.

20. The combination in a delivery mechanism of a carriage carrying a set of tapes, means for operating said tapes, racks mounted on said carriage, gears engaging said racks, a pinion for turning said gears, a sliding-rack engaging said pinion, a crank pro- 125 130

vided with a relief connected to reciprocate said rack, and a spring arranged between said rack and a stationary part.

- 5 ing machine of a reciprocating carriage arranged in front of the impression cylinder, delivery devices arranged in said reciprocating carriage so that the sheet can be taken from the impression cylinder and delivered
10 printed side uppermost, a fly also arranged in said carriage, and connections whereby the carriage may be stopped from reciprocation and the fly brought into operation so that the same will deliver the sheets printed
15 side down.

22. The combination in a cylinder print-

ing machine of a reciprocating carriage arranged in front of the impression cylinder, a set of tapes and a fly arranged in said carriage, and means whereby the fly may be rendered inoperative and the sheets delivered printed side up by said reciprocating carriage and set of tapes, or can be brought into operation and the carriage stopped and the sheets delivered printed side down. 20 25

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

H. A. WISE WOOD.

Witnesses:

HENRY W. COZZENS, Jr.,

LOUISE PECKHAM.