

W. S. HUSON.
DELIVERY MECHANISM FOR PRINTING PRESSES.
APPLICATION FILED APR. 4, 1910.

986,172.

Patented Mar. 7, 1911

4 SHEETS—SHEET 1.

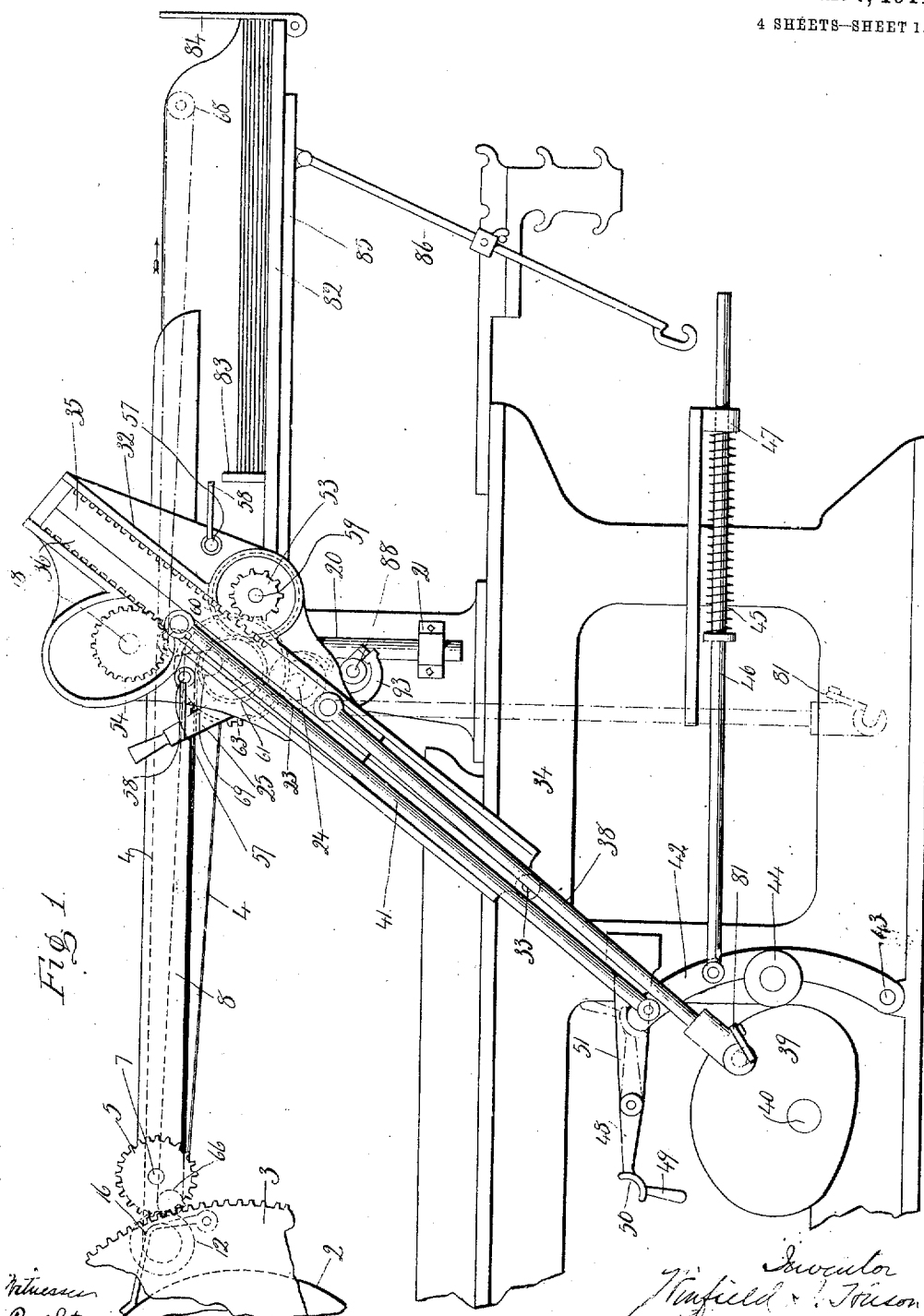


Fig. 1.

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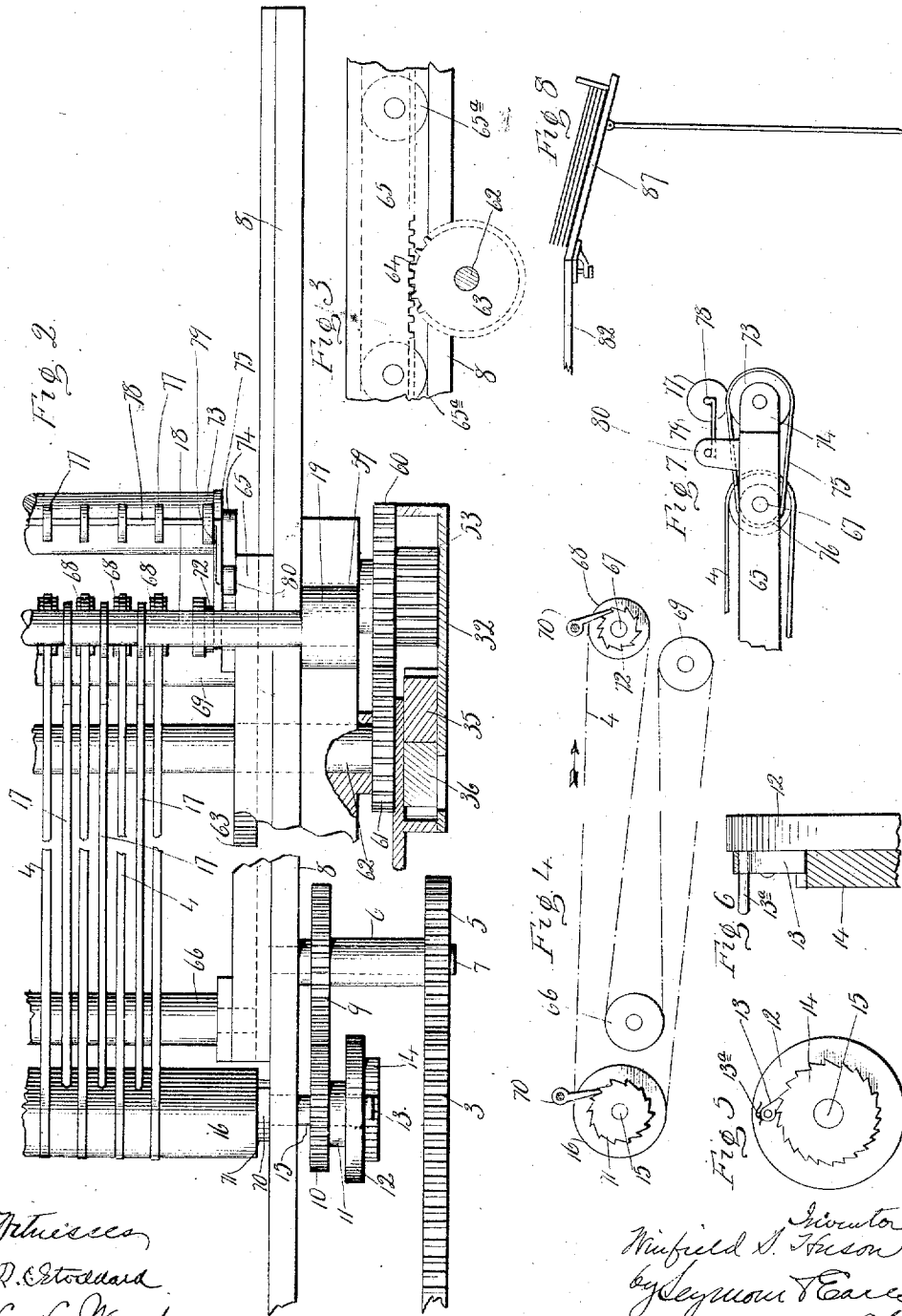
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4 SHEETS—SHEET 2.



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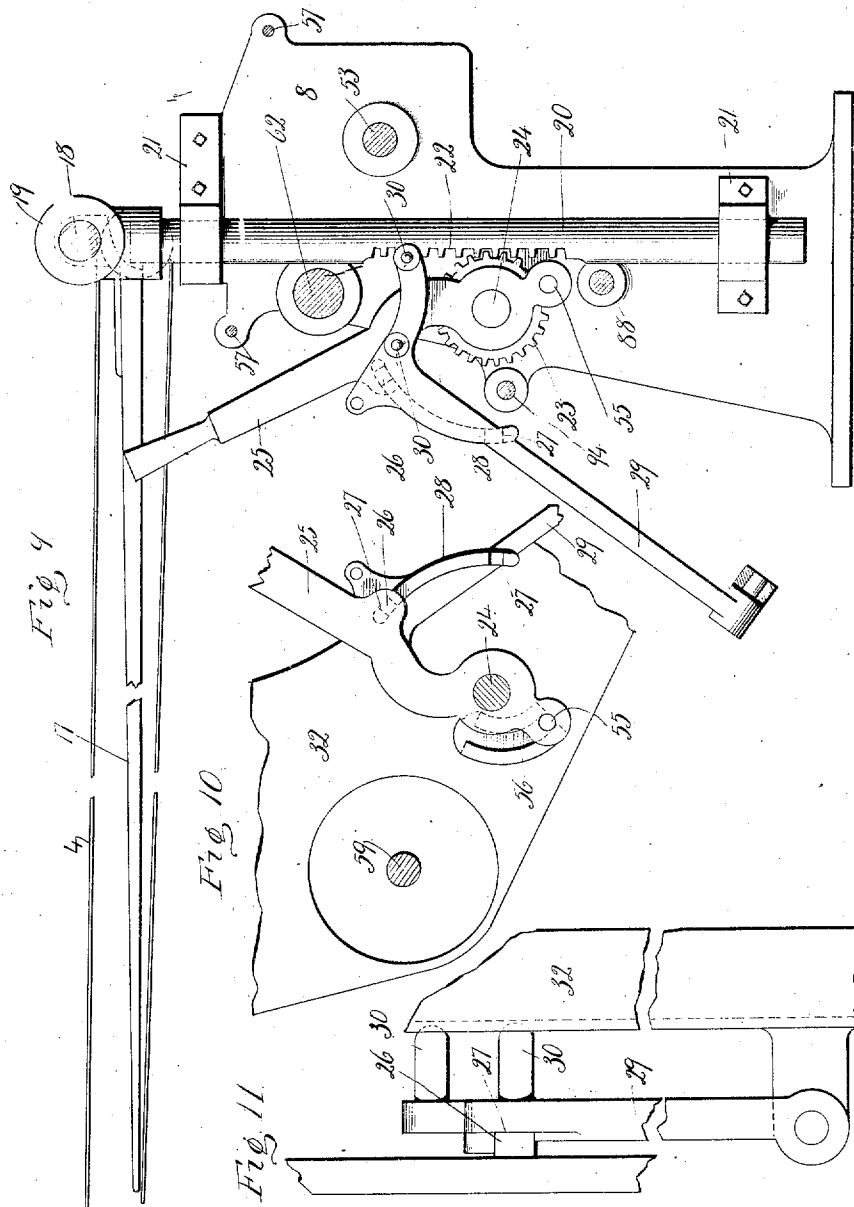
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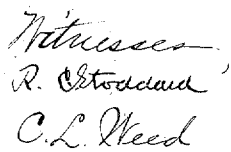


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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

WINFIELD S. HUSON, OF DERBY, CONNECTICUT, ASSIGNOR TO THE WHITLOCK PRINTING PRESS MFG. CO., OF DERBY, CONNECTICUT, A CORPORATION.

DELIVERY MECHANISM FOR PRINTING-PRESSES.

986,172.

Specification of Letters Patent.

Patented Mar. 7, 1911.

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To all whom it may concern:

Be it known that I, WINFIELD S. HUSON, a citizen of the United States, residing at Derby, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Delivery Mechanism for Printing-Presses; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

15 Figure 1 a broken view in side elevation of a printing-press delivery-mechanism constructed in accordance with my invention. Fig. 2 a broken view partly in plan and partly in horizontal section of the delivery-mechanism, showing the tape-roll slide at the limit of its inward excursion. Fig. 3 a broken view in inside elevation of the tape-roll slide, showing the mode of reciprocating it. Fig. 4 a view in the nature of a diagram, showing the relative positions of the tape-rolls and tape-wheels when the tape-roll slide is at the limit of its inward excursion. Fig. 5 a detached view in end elevation showing the pawl-carrying disk driven from the impression cylinder, and the ratchet-wheel mounted upon the shaft of the main tape-roll. Fig. 6 a broken edge view partly in elevation, and partly in section, of the parts shown by Fig. 5. Fig. 7 a broken view in side elevation, showing the means employed for reducing the speed of the sheet at the time of its delivery. Fig. 8 a broken view in side elevation of the auxiliary delivery-board. Fig. 9 a broken view in side elevation showing the means employed for converting the delivery-mechanism for delivering the sheets printed side up or printed side down. Fig. 10 a broken view in inside elevation of the pivotal rack-case showing the connection of the converting-lever with the same. Fig. 11 a broken edge view of the converting lever, the locking-lever and the rack-case. Fig. 12 a broken view in horizontal section showing the justifying-pins mounted in the locking-lever and entered into the justifying-recesses in the tape and fly racks. Fig. 13 a broken view in inside elevation of the tape and fly racks, showing the jogger-cams formed in their inner faces and the jogger-

levers. Fig. 14 a broken view partly in plan, and partly in section, on the line *a—b* of Fig. 13. Fig. 15 a detached view of the jogger-lever co-acting with the jogger-cam of the reciprocating tape-rack. Fig. 16 a broken detail view partly in side elevation, and partly in vertical section, showing the connection between the jogger-shaft 88 and the jogger-board 83, whereby the latter is vibrated.

My invention relates to an improved delivery-mechanism for cylinder printing presses of the type in which the printed sheet is delivered to the delivery-mechanism from a point toward the top and in front of the impression-cylinder, the object of my present invention being to provide simple, convenient and reliable delivery-mechanism convertible for delivering the sheets printed side up or printed side down, and for delivering the sheets printed side up from the tapes with the tape-roll slide in an extended position and the tapes continuously driven.

With these ends in view my invention consists in a delivery-mechanism having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

I have chosen to illustrate my present improved delivery-mechanism as embodied in a flat-bed, cylinder press, but I would have it understood that my invention is equally well adapted for embodiment in a rotary press. Moreover, as flat-bed, cylinder presses are well known as to their construction and operation, it has seemed unnecessary for me at this time to illustrate or describe such a press in detail.

As herein shown, the impression-cylinder 2 is driven as usual by a large gear 3. For continuously driving the tapes 4 which receive the printed sheets from the said cylinder at a point toward the top thereof and in front thereof, I employ a pinion 5 meshing into the said gear 3 and located upon the outer end of a sleeve 6 turning upon a stud 7 mounted in the frame 8 of the delivery-mechanism. At its inner end the sleeve 6 carries a gear 9 meshing into a pinion 10 having a collar 11 to which is fastened a disk 12 carrying a pawl 13 having a handle 13^a and engaging with a ratchet-wheel 14 fixed to the outer end of the shaft 15 of the main tape-roll 16. One end of the shaft 15 pro-

jects through a portion of the frame 8 aforesaid, its opposite end being journaled in a corresponding parallel portion thereof. The main tape-roll 16 drives the tapes 4 which are spaced apart for the location between them of the fly-fingers 17 which are mounted upon an oscillating fly-shaft 18 the ends of which are entered into bearing-heads 19 mounted upon the upper ends of vertically movable rack-rods 20 supported in brackets 21 fastened to uprights of the frame 8. By raising and lowering the rack-rods 20, the fly-fingers 17 are bodily raised above and lowered below the plane of the said tapes 4 according as it may be desired to deliver the sheets printed side down or printed side up. For delivering the sheets printed side down, the fly-fingers 17 are lowered below the plane of the tapes and oscillated by rocking the shaft 18 aforesaid; while for delivering the sheet printed side up, the fly-fingers are raised above the plane of the tapes and allowed to remain at rest and so act as over-guides for the printed sheets.

The two rods 20 are formed with vertical racks 22 respectively meshed into by pinions 23 mounted on the ends of a rock-shaft 24 journaled in the frame 8 and provided at one end with a manual converting-lever 25 furnished with a locking-lug 26 entering one or the other of the locking-notches 27 located at the ends of a segmental rib 28 formed upon the inner face of a locking-lever 29, the lower end of which is pivotally connected with the case 32. When the converting lever 25 is in its elevated position, and its lug 26 is entered into the upper notch 27 of the locking-lever 29, the fly-fingers 17 will be positioned below the tapes for delivering the sheets printed side down. On the other hand, by depressing the lever 25 so as to enter its lug 26 into the lower notch 27, the rack rods 20 will be sufficiently elevated to carry the fly-fingers 17 above the tapes 4 for the delivery of the sheets printed side up.

Preparatory to moving the lever 25 from its elevated to its depressed position, and vice versa, the locking-lever 29 must be manually swung outward away from it so as to clear the locking-lug 26 from the notch 27 at the time entered by the said lug. Now to prevent the said lever 29 from being swung outward as described, except when the parts of the delivery-mechanism are properly positioned for their conversion from one mode of delivery to the other, the said lever is provided with two outwardly projecting justifying-pins (the term seems appropriate) 30 for entrance into justifying holes 31 formed in the flat inner face of a rack-case 32 fulcrumed at its lower end upon a stud 33 in the side frame 34 of the press and receiving the tape-rack 35 and the fly-rack 36, which are placed edge to edge in the

said case and reciprocated independently of each other, as will be described later on. The inner faces of these racks are formed with justifying recesses 37 located so that when brought into registration with the holes 31 and the pins 30, the several parts of the delivery mechanism are suitably positioned for its conversion for delivering the sheets printed side up or printed side down. Only when the justifying recesses 37 have been brought into registration with the pins 30 can the locking-lever 29 be swung outward so as to release the converting lever 25 and permit the same to be lowered or raised as may be required for delivering the sheets printed side up or printed side down. The pins 30 therefore confine the operation of the converting lever to the time when the conversion may properly be made. After the conversion of the mechanism has been effected, the lever 29 is swung inward whereby the pins 30 are cleared from the recesses 37 in the racks 35 and 36 and the locking-lug entered into one or the other of the two notches 27.

The tape-rack 35 is reciprocated in the rack-case 32 by means of a connecting-rod 38 having its upper end pivotally connected with the said rack near the lower end thereof, and having its lower end pivotally connected with the fly cam 39, so called, which is mounted upon the cam-shaft 40, the cam 39 forming what amounts to a crank connection between the rod 38 and the shaft 40.

The fly-rack 36 is reciprocated in the rack-case 32 by a connecting-rod 41 pivotally connected with it and having its lower end pivotally connected with the upper end of a curved fly-cam lever 42 fulcrumed upon a stud 43 and carrying a cam-roller 44 pressed against the edge of the fly-cam 39 by a spring 45 acting through a rod 46 pivotally connected with the said lever 42 and mounted in a bracket 47 attached to the side frame 34.

For cutting out the reciprocation of the fly-rack 36, I provide a latch 48 having a handle 49 and a throat 50, and pivotally mounted upon the end of a bracket 51 secured to the side frame 34. When this latch 48 is swung over into the position shown by broken lines in Fig. 1, its throat 50 engages with the upper end of the fly-cam lever 42 and holds the same from being operated by the fly-cam 39. The said tape-rack 35 has its lower face toothed for engagement with a tape-rack pinion 53, while the said fly-rack 36 has its upper face toothed for engagement with a fly-rack pinion 54, the rack 35 being intermeshed with the pinion 53, or the rack 36 being intermeshed with the pinion 54 according as the rack-case 32 is swung up or down on its stud 33 for which purpose the converting-lever 25 is provided, as

shown, at its extreme lower end with a stud 55, the opposite faces of which engage with the opposite walls of a segmental slot 56 formed in the rack-case 32 at a point close to, but eccentric with the shaft 24 upon which the said lever 25 turns as upon a center. When the lever 25 is in its elevated position, the press will be converted for delivering the sheets printed side down and the stud 55 will be located at the lower end of the segmental slot 56 as shown in Fig. 10. On the other hand, when the lever 25 is in its depressed position, the press will be converted for delivering the sheets printed side up and the stud 55 will be at the upper end of the slot 56. The rack-case 32 is firmly held in either one of its two positions by means of locking-bolts 57 having handles 58 and mounted in the frame 8 aforesaid as shown in Fig. 1.

The tape-rack pinion 53 aforesaid is mounted upon a stud 59 (Fig. 2) also carrying a wheel 60 which meshes into a wheel 61 mounted upon the outer end of a shaft 62 carrying two wheels 63 (Fig. 3) respectively engaging with horizontal racks 64 formed in the lower edges of horizontal slide bars 65 located upon opposite sides of the delivery mechanism, and provided with rollers 65a traveling upon portions of the frame 8 thereof. In the slide-bars 65 I journal the tape-roll 66 and a shaft 67 which latter carries a series of tape-wheels 68 employed in place of a roll to permit the fly-fingers 17 to be arranged between the tapes 4 which also pass over a fixed tape-roll 69 the ends of which are journaled in the frame 8. The side-bars 65 form the tape-roll slide which is moved back and forth for the extension and contraction of the tapes 4 in the well known manner, and which, when so operated, drives the tapes. When the tape-rack 35 moves downward, it moves the tape-roll slide outward, whereby the tape-roll 66 and the tape-wheels 68 are moved outward with the effect of virtually doubling the upper or sheet-receiving reaches of the tapes so as to provide room for the delivery of the printed sheets printed side up from the impression cylinder upon the tapes which by their own traveling motion at this time deliver the printed sheets for final delivery. On the other hand, when the tape-rack 35 moves upward, it moves the tape-roll slide inward, whereby the tape-roll 66 and the tape-wheels 68 are doubled, so to speak, on the tape-rolls 16 and 69, as shown in Fig. 4, and the length of the upper or sheet-receiving reaches of the tapes is virtually reduced by half.

When the press is converted for delivering the sheets printed side up by the propulsion of the tapes due to the reciprocation of the tape-roll slide, the pawl 13 is disengaged from the ratchet-wheel 14, thus cutting out the power of the impression cylinder 2 from

the tapes 4, and leaving them to be propelled by the reciprocation of the tape-roll slide.

In order that there may be no reverse rotation of the tapes 4 during the inward excursion of the tape-roll slide, I employ pawls 70 respectively engaging with a ratchet wheel 71 secured to one end of the tape-roll 16, and with a ratchet-wheel 72 secured to one end of the shaft 67 carrying the tape-wheels 68.

The propulsion of the tapes during the outward movement of the tape-roll slide, by the slide itself, may be explained as follows:—As the slide starts upon its outward excursion, the pawl 70 of the ratchet-wheel 72 engages with the same and prevents the rotation of the shaft 67 carrying the tape-wheels 68 which are thus held against rotation, while, on the other hand, the ratchet-wheel 71 is free to rotate under its pawl 70, thus leaving the main tape-roll 16 free to revolve. It follows from this that the endless tapes are virtually fastened to the tape-wheels 68 during the outward movement of the slide, whereby the tapes are drawn, as it were, over the freely running main tape-roll 16 and the roll 69. Therefore during the outward excursion of the tape-roll slide each tape is longitudinally propelled or drawn for a distance represented by about half of its entire length. On the other hand, at the beginning of the inward excursion of the slide, the situation with regard to the pawls and ratchet-wheels aforesaid is reversed, the ratchet-wheel 72 turning freely under its pawl 70, leaving the tape-wheels 68 free to run, while the ratchet-wheel 71 is engaged by the other pawl 70, whereby the main tape-roll 16 is held against rotation. This prevents the reverse propulsion of the tapes which are never permitted to move in the opposite direction from the arrow shown on Fig. 4. During the inward movement of the slide, the lower reaches of the tapes are doubled on themselves, so to speak, but there is no longitudinal movement of the upper reaches of the tapes. However, as the slide moves inward, the upper reaches of the tapes are virtually peeled from under the lower face of the printed sheet which is left free to drop when this "peeling from under" operation is completed.

To reduce the speed at which the sheet is finally delivered by the tape 4, I employ a speed-reducing roll 73 mounted in brackets 74 secured to and projecting beyond the outer ends of the slide-bars 65, the roll 73 being driven by a belt 75 running over a pulley 76 located at one end of the shaft 67, whereby the speed-reducing roll 73 travels at a slower rate than the tapes 4. A series of wheels 77 mounted upon a shaft 78 press the sheets down upon the said roll 73, the shaft 78 being mounted in the outer end of arms 79 hung in brackets 80 extending up-

ward from the outer ends of the side-bars 65 as shown in Fig. 3. When the fly-rack 36 is reciprocated in engagement with the fly-pinion 54, the shaft 18 carrying the fly-fingers is oscillated as required for swinging the same back and forth through their required sweep. At this time the tapes 4 are continuously driven at the speed of the impression cylinder 2 for which purpose the pawl 13 carried by the disk 12 is thrown by its handle 13^a into engagement with the ratchet-wheel 14 mounted on the shaft 15 of the tape-roll 16, whereby the tape-roll 16 partakes of the continuous movement imparted to the disk 12 through the gears 5, 9 and 10, the former meshing into the cylinder gear 3.

In case it is desired to operate the press for the delivery of the sheets printed side up, without the reciprocation of the tape-roll slide, but with the same in any desired position within the limits of its reciprocation, the press is "turned over", so to speak, until the tape-roll slide has been brought into the required position. The connecting rod 38 is then disconnected with the fly-cam 39 by the operation of the locking-slide 81 at the lower end of the said rod 38 which then swings down into the position in which it is shown in broken lines in Fig. 1. The pawl 13 is now thrown into engagement with the ratchet 14, thus providing for the continuous movement of the tapes 4 at the speed of the impression cylinder 2.

As shown, the press is furnished with a delivery-board 82 having the usual jogger-board 83 and front stops 84, this board 82 being supported upon a batten 85 in turn supported by a rod 86 of usual form.

In case it is desired to deliver the printed matter into or upon a receptacle 87 (Fig. 8) beyond the delivery-board 82, the tape-roll slide will be moved to the limit of its outward excursion after which the rod 38 will be disconnected from the cam 39 as just explained. The pawl 13 will then be thrown into the ratchet 14 so that the tapes 4 will be continuously driven. The printed matter will then be delivered into the receptacle 87 from the tapes.

For vibrating the jogger-board 83, I connect the same by a strap 100, with an arm 102 mounted upon a jogger-shaft 88 provided at one end with a jogger-head 89 carrying set-screws 90 and 91 respectively engaged by the ends of jogger-levers 92 and 93 loosely hung upon a stud 94. The said lever 92 has a downwardly extending arm 95 carrying a roller 96 entering a cam-slot 97 in the fly-rack 36, while the lever 93 has an upwardly extending arm 98 carrying a roller 99 entering a cam-slot 100 in the tape-rack 35. As the said racks 35 and 36 are reciprocated, the inclined walls of the cam-slots 97 and 100 turn the levers 92 and 93

upon the stud 44, and this movement is transmitted through the jogger-head 89 to the jogger-shaft 88, and thence to the jogger-board 83. The above mechanism moves the jogger-board 83 in the direction of the arrow on Fig. 16, the jogger-board being moved in the opposite direction by means of a spring 103 located below the delivery-board 82 and connected with the lower edge of the jogger-board so as to act in line with the movement thereof.

I claim:—

1. In a delivery mechanism for printing presses, the combination with a main tape-roll journaled in immovable bearings, of a tape-roll slide carrying tape-rolls, endless extensible tapes passing over the said main tape-roll and the tape-rolls mounted in the said slide, slide-reciprocating means for reciprocating the slide and thus doubling and undoubling and driving the said extensible tapes for the tape-delivery of sheets printed side up, the said means including a reciprocating rack, a cam-shaft, and a rod connecting the said rack and shaft and detachably connected with the latter to permit the slide to be used at rest in any position within the limits of its reciprocating movement; and means for positively and continuously driving the said main tape-roll and hence the said tapes, for the tape-delivery of sheets printed side up when the slide is at rest and the said tapes are more or less doubled, dependent upon the position in which the said slide is set when disconnected from the said slide-reciprocating means, the said tape-driving means being disconnected from the main tape-roll when the slide is being reciprocated.

2. In a delivery mechanism for printing presses, the combination with an impression cylinder, of a main tape-roll journaled in immovable bearings, a tape-roll slide carrying tape-rolls, slide-reciprocating means adapted to be disconnected from the slide to permit the same to be used at rest in any position within the limits of its reciprocating movement, endless extensible tapes passing over the said main tape-roll and the said tape-rolls mounted in the said slide and doubled and undoubled and driven by the reciprocation of the slide for the tape-delivery of sheets printed side up, gearing between the said impression cylinder and main tape-roll for positively driving the same and hence the tapes, when the slide is at rest and when the said tapes are more or less doubled, dependent upon the position in which the said slide is set when disconnected from the said slide-reciprocating means for the tape-delivery of sheets printed side up; and means for disconnecting the said gearing from the main tape-roll when the slide is being reciprocated.

3. In a delivery mechanism for printing

presses, the combination with a main tape-roll, of a slide carrying tape-rolls, slide-reciprocating means adapted to be disconnected from the slide to permit the same to be used at rest, endless tapes passing over the said rolls and doubled and undoubled and driven by the reciprocation of the slide for the tape-delivery of sheets printed side up, a series of fly-fingers arranged between the said tapes, means for bodily moving the fly-fingers above and below the plane of the tapes for converting the press from a fly-delivery to a tape-delivery, and vice versa, and means connected with the said main tape-roll for positively and continuously driving the same and hence the tapes when the slide is at rest and the fly-fingers are positioned above the tapes for the tape-delivery of sheets printed side up, the said tape-driving means being disconnected from the main tape-roll when the slide is being reciprocated.

4. In a delivery mechanism for printing presses, the combination with a main tape-roll journaled in fixed bearings, of a slide carrying tape-roll, slide-reciprocating means adapted to be disconnected from the slide to permit the same to be used at rest, endless tapes doubled and undoubled and driven by the reciprocation of the slide for the tape-delivery of sheets printed side up, a series of fly-fingers arranged between the said tapes, means for oscillating the said fly-fingers, a converting lever, connection between the said lever and fly-fingers, whereby the latter may be bodily moved above and below the plane of the tapes for converting the mechanism from a fly-delivery to a tape-delivery and vice versa, and tape-driving means for positively and continuously driving the tapes through the main tape-roll for the tape-delivery of sheets printed side down when the slide is at rest and the fly-fingers are positioned below the tapes and are oscillated.

5. In a delivery mechanism for printing presses, the combination with a main tape-roll, of a slide carrying tape-rolls, endless tapes doubled and undoubled and driven by the reciprocation of the slide for the tape-delivery of sheets printed side up, fly-fingers arranged between the tapes, means for bodily raising and lowering the said fly-fingers with respect to the tapes, a tape-rack connected with the slide for the reciprocation thereof, the said rack being adapted to be disconnected from the power, a fly-rack connected with the fly-fingers for oscillating the same, a pivotal rack-case for the said tape and fly-racks, and means for swinging the rack-case as required to bring one or the other of the said racks into position for the operation of the slide or fly-fingers as the case may be.

6. In a delivery mechanism for printing

presses, the combination with the tapes thereof, of means for operating the same, a series of fly-fingers arranged between the tapes, a fly-finger shaft, means for oscillating the same, vertically movable rack-rods carrying the said shaft, pinions meshing into the racks of the said rods, a shaft on which the said pinions are mounted, and a converting lever applied to the said shaft for turning the same to raise and lower the rack-rods, and hence the fly-fingers, with respect to the tapes.

7. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers located between the tapes, a tape-rack and a fly-rack respectively connected with the tapes and fly-fingers for operating the same, a converting lever for raising and lowering the fly-fingers with respect to the tapes, and means for bringing the said racks into predetermined positions preparatory to the operation of the said converting lever.

8. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers respectively arranged between the tapes, a fly rack and a tape-rack respectively connected with the tapes and fly-fingers for operating the same, a converting lever for bodily raising and lowering the fly-fingers with respect to the tapes for converting the mechanism from a fly delivery to a tape-delivery and vice versa, and a locking-lever coacting with the said converting lever and provided with justifying pins coacting with the said racks to prevent the converting-lever from being operated except when the racks are in predetermined positions.

9. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers located between the same, a tape rack and a fly-rack respectively connected with the tapes and fly-fingers for operating the same, a converting-lever connected with the fly-fingers for bodily raising and lowering the same with respect to the tapes, a locking-lug carried by the said lever, a locking-lever provided with notches for the reception of the said lug for holding the converting-lever in its elevated and depressed positions, and justifying-pins carried by the locking-lever and coacting with the said racks to prevent the converting-lever from being shifted except when the racks are in predetermined positions.

10. In a delivery mechanism for printing presses, the combination with a main tape-roll journaled in fixed bearings, of a slide carrying tape-rolls, a series of endless tapes doubled and undoubled and driven by the reciprocation of the slide for the tape-delivery of sheets printed side up, a series of fly-fingers located between the tapes, means for bodily raising and lowering the fly-fingers

gers with respect to the tapes, a tape-rack and a fly-rack, connection between the slide and the tape-rack, and the fly-fingers and the fly-rack respectively, the said connection including pinions; a pivotal rack-case located between the said pinions, means for swinging the said rack-case upon its pivot, whereby the said racks are swung between the said pinions for the engagement of one rack or the other with its appropriate pinion, and means for positively driving the tapes when the slide is used at rest by disconnecting the tape-rack from the power.

11. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers arranged between the tapes, means for bodily raising and lowering the fly-fingers with respect to the tapes including a converting-lever, a tape-rack and a fly-rack respectively connected with the tapes and fly-fingers for operating the same, a pivotal rack-case in which the said racks are located, and connection between the said lever and rack-case, whereby the lever when operated swings the rack-case upon its pivot to bring one rack or the other into operation and simultaneously cut the other rack out of operation.

12. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers located between the tapes, means for bodily raising and lowering the said fly-fingers to convert the machine from a fly-delivery to a tape-delivery and vice versa, the said means including a converting lever provided with an operating-pin located below its fulcrum, a tape-rack and a fly-rack for operating the tapes and fly-fingers respectively, and a pivotal case for the said racks, the said case being provided with an eccentric slot located adjacent to the fulcrum of the said converting-lever and receiving the said pin, whereby the rack-case is swung in one direction or the other to bring one of the two racks into operative position and to cut the other rack out of operative position.

13. In a delivery mechanism for printing presses, the combination with a main tape-roll journaled in fixed bearings, of a slide carrying tape-rolls, endless tapes doubled and undoubled and driven by the reciprocation of the slide for the tape-delivery of sheets printed side up, a series of fly-fingers located between the tapes, means for bodily raising and lowering the fly-fingers above and below the plane of the tapes, a tape-rack for driving the slide, a fly-rack for oscillating the fly-fingers when the same are positioned below the tapes, a cam-shaft, connection between the fly-rack and the cam-shaft, a fly-cam, a fly-cam lever operated thereby, and connection between the fly-rack and the fly-cam lever, the said fly-rack and fly-fingers and connected parts being used

when the slide is at rest, and means for positively driving the tapes when the slide is used at rest.

14. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers arranged between the tapes, a tape-roll slide, a fly-rack and a tape-rack, connection between the fly-rack and the fly-fingers, connection between the tape-rack and the said tape-roll slide, a cam-shaft, a fly-cam mounted thereupon, a fly-cam lever operated by the said cam, connection between the fly-cam lever and the fly-rack, and detachable connection between the tape-rack and the cam-shaft, whereby the power may be cut off from the tape-roll slide and the same positioned at any point within the range of its movement; and means for continuously driving the tapes with the slide so positioned.

15. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers, a reciprocating tape-rack for operating the tapes, a reciprocating fly-rack for operating the fly-fingers, a jogger-board, a jogger-shaft, and two jogger-levers respectively operated by the said racks and connected with the jogger-shaft which they oscillate.

16. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a series of fly-fingers located between the tapes, a tape-rack having a jogger-cam, a fly-rack having a jogger-cam, a jogger-board, a jogger-shaft, and two jogger-levers connected with the jogger-shaft and respectively coacting with said cams, whereby they are operated by the reciprocation of the racks.

17. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a tape-roll slide, means for reciprocating the said slide including means for cutting off the power to permit the slide to be positioned at any predetermined point within the range of its movement, means for continuously driving the tapes when the slide is so positioned, a speed-reducing roll carried by the slide at its outer end, and means for driving the said speed-reducing roll, whereby the headway of the printed sheet is checked.

18. In a delivery mechanism for printing presses, the combination with the tapes thereof, of a tape-roll slide, means for reciprocating the said slide and for disconnecting the same from the power, whereby the slide may be allowed to rest in an extended adjustment of the tapes, an auxiliary receptacle for the printed matter, a speed-reducing roll for delivering the printed matter from the tapes as extended to the said receptacle, and means for driving the said roll.

19. In a delivery mechanism for printing

presses, the combination with an impression cylinder, of a main tape-roll, a slide, tape-rolls carried thereby, slide-reciprocating means adapted to be disconnected from the power to permit the use of the slide at rest, endless tapes doubled and undoubled and driven by the reciprocation of the slide for the tape-delivery of sheets printed side up, a main tape-roll shaft, a ratchet-wheel carried thereby, a gear mounted upon the impression cylinder, a pawl-carrying disk, a pawl carried thereby and adapted to coast with the said ratchet-wheel, and gearing between the said impression-cylinder gear, and

pawl-carrying disk for driving the latter, 15 whereby the said main tape-roll and hence the tapes may be positively driven from the impression gear for the tape-delivery of sheets printed side down by throwing the said pawl into engagement with the said 20 ratchet-wheel.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WINFIELD S. HUSON

Witnesses:

CLARA L. WEED,
GEORGE DUDLEY SEYM