No. 720,355. PATENTED FEB. 10, 1903.

W. S. HUSON.

SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED AUG. 5, 1901.

NO MODEL. 4 SHEETS—SHEET 1.

Fig 1

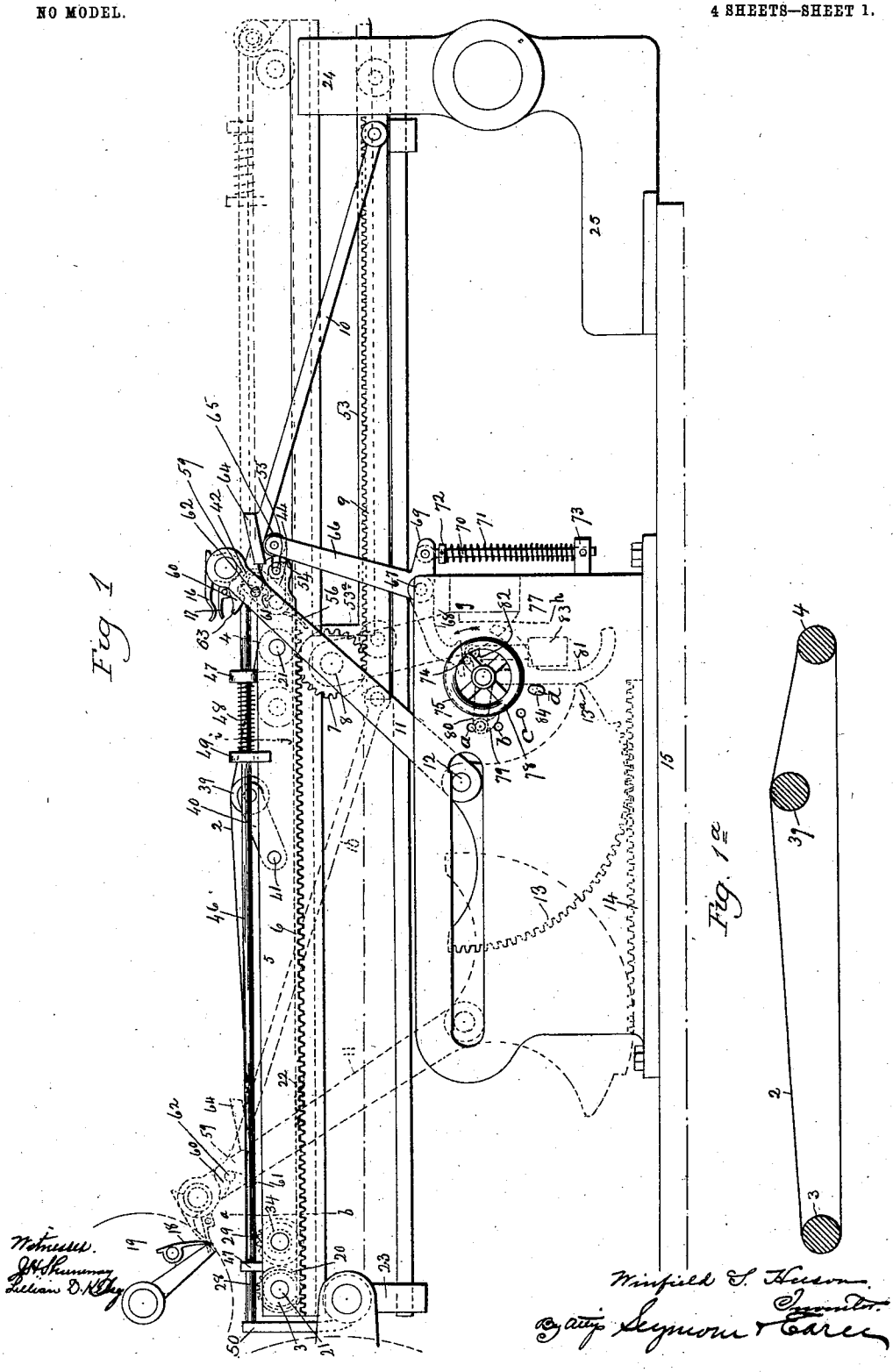

Fig. 1a

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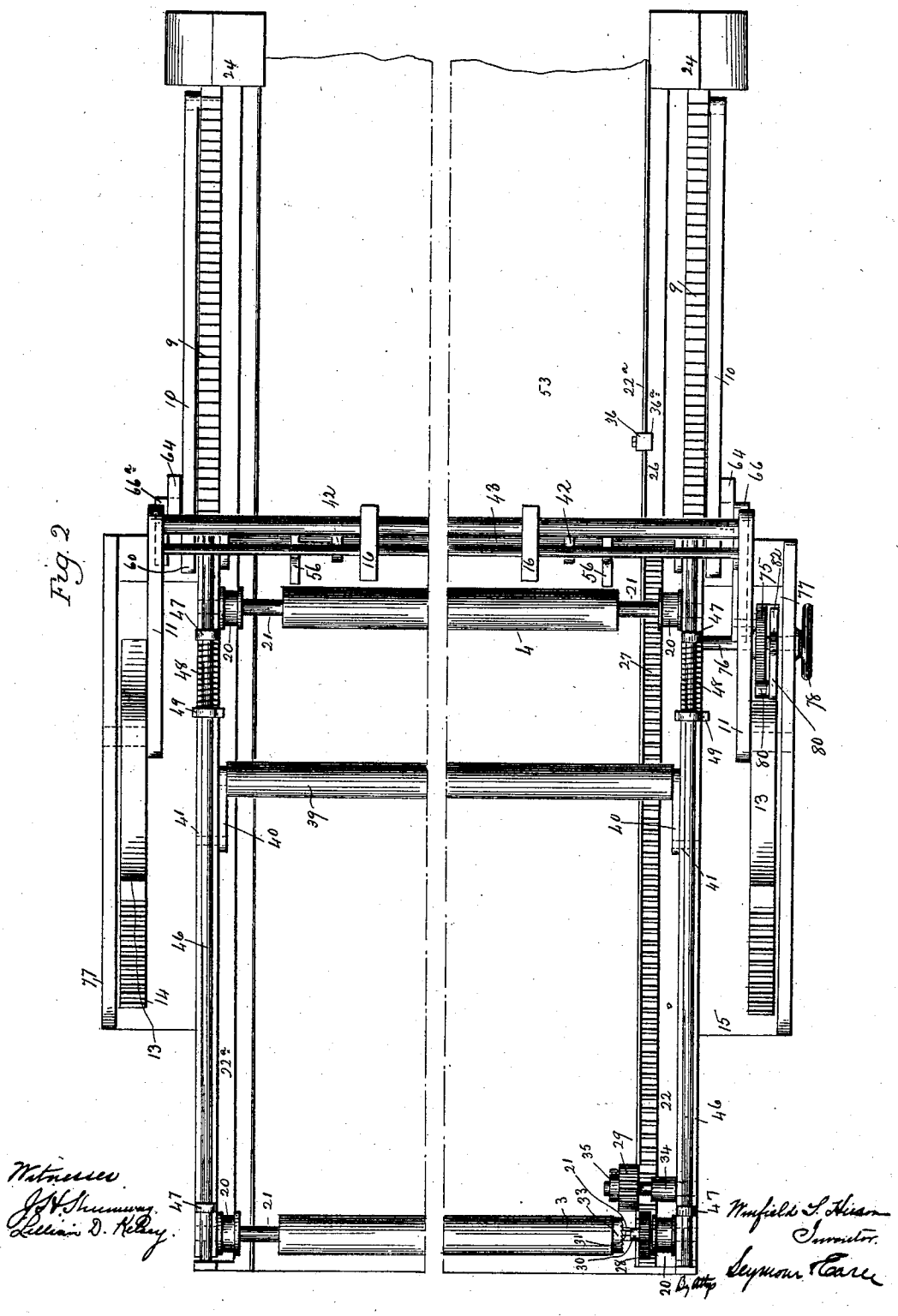
NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2



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SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

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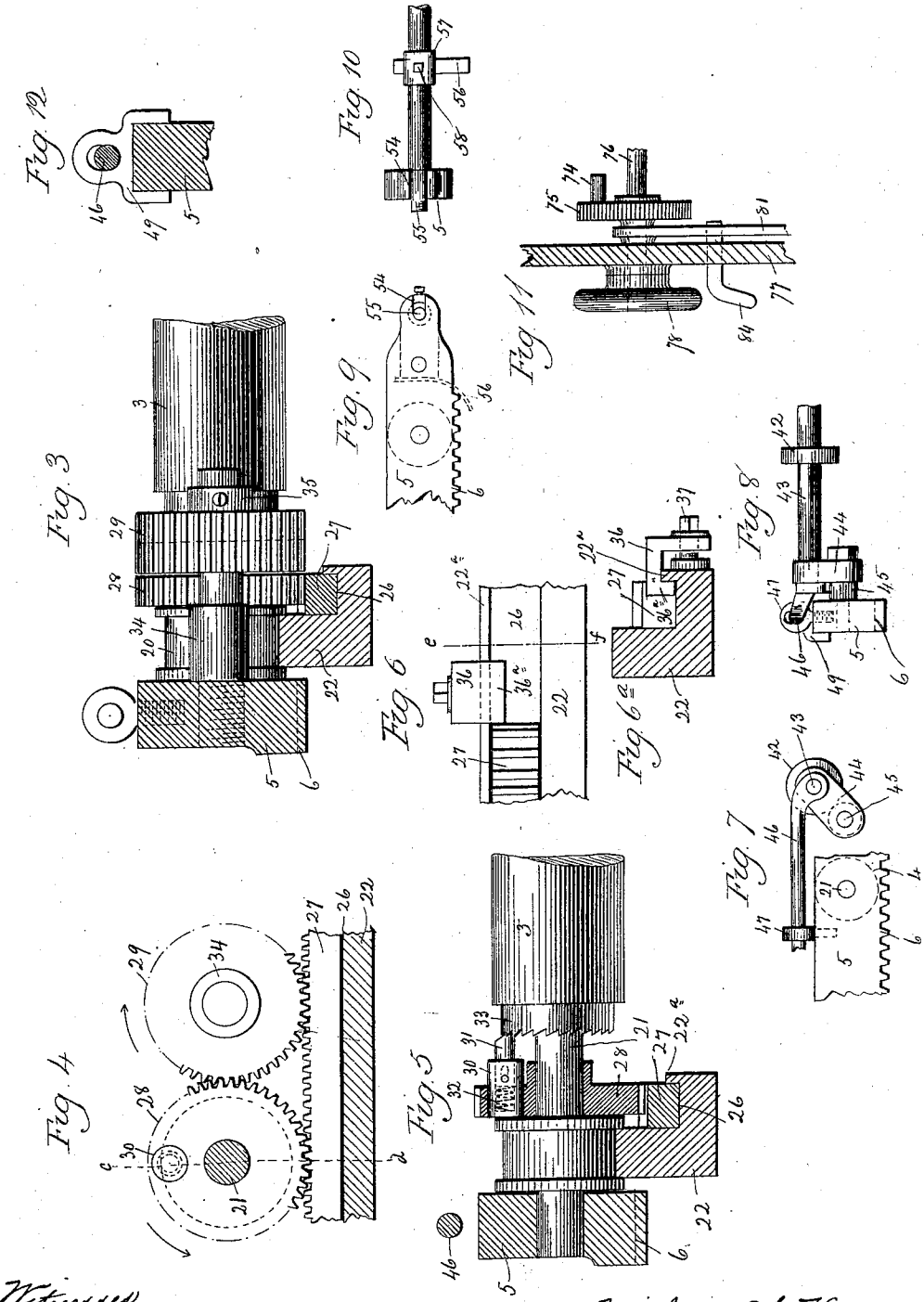
NO MODEL. 4 SHEETS—SHEET 3.



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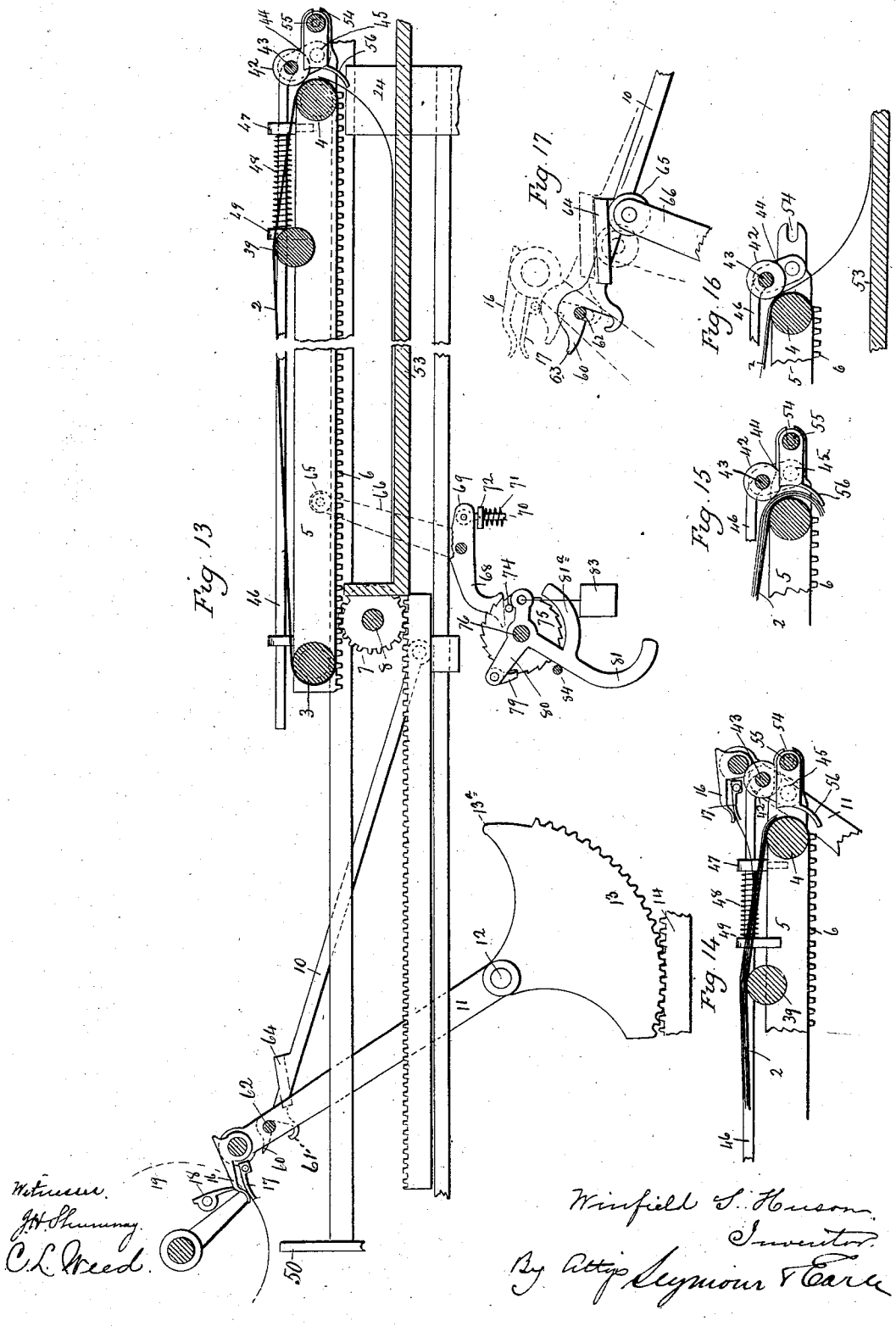
SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED AUG. 5, 1901.

NO MODEL. 4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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SHEET-DELIVERY MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 720,355, dated February 10, 1903.

Application filed August 5, 1901. Serial No. 70,869. (No model.)

To all whom it may concern:

Be it known that I, WINFIELD S. HUSON, of Derby, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Sheet-Delivery Mechanism for Printing-Presses; and I do hereby declare the following, when taken in connection with the accompanying drawings and the characters 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—

Figure 1, a view in side elevation of the delivery end of a printing-machine containing my improvements; Fig. 1ª, a view in the nature of a diagram showing the tape-rollers, the tape, and the tape-deflecting roller; Fig. 2, a plan view thereof; Fig. 3, an enlarged detail view, in vertical transverse section, on the line *a b* of Fig. 1, showing the method of arranging the tape-roller gears and the means for placing them in position to revolve the rollers in either direction; Fig. 4, a detail view, in side elevation, showing the tape-roller gears in their relation to the rack which drives them; Fig. 5, a broken detail view, partly in elevation and partly in section, on the line *c d* of Fig. 4, showing the ratchet and pawl through which motion is communicated to the tape-rollers from the gears; Fig. 6, a broken plan view showing the left-hand supporting-bars, the sliding rack, and the adjustable stop; Fig. 6ª, a detached view, in transverse section, on the line *e f* of Fig. 6, of one of the supporting-bars, showing the rack supported by it in end elevation and also showing the adjustable stop coacting with the rack; Fig. 7, a fragmentary elevation showing the means for bringing into contact with the sheets as they are laid upon the tape-rollers a series of friction-rollers, which are adapted to propel the sheets from off the tapes and rollers as the said rollers are turned by the pawl and ratchet and gears; Fig. 8, an end view of the parts shown in the preceding figure; Fig. 9, a broken view in elevation, showing the means for deflecting the sheet as it is run off the tape-rollers to deliver it with its printed face down; Fig. 10, an end view of the same mechanism; Fig. 11, a view, partly in elevation and partly in vertical section, on the line *g h* of Fig. 1 and showing the means employed for suspending the operation of the delivery of the sheets finally to the delivery-board until a predetermined accumulation is received upon the tapes and tape-rollers; Fig. 12, a view in vertical section on the line *i j* of Fig. 1, showing the forked head mounted on the rods employed for operating the friction-wheels; Fig. 13, a view of the machine in vertical central section, showing the carriage at the limit of its outward excursion and the grippers just taking a sheet from the delivery-reel and also showing portions of the automatic mechanism employed for suspending the operation of the carrier while sheets are being piled upon it *en masse*, this automatic mechanism being located in a plane in front of the plane of the remainder of the figure; Fig. 14, a broken sectional view showing the grippers of the delivery mechanism just ready to drop a printed sheet upon sheets previously laid upon the tapes of the carriage; Fig. 15, a broken sectional view showing one of the friction-rollers moving into position to grip several printed sheets and also showing a deflector for causing the sheets to be delivered with their printed sides down; Fig. 16, a corresponding view showing the deflectors removed for causing the delivery of the sheets with their printed sides up; Fig. 17, a broken view showing the automatic mechanism employed for suspending the operation of the carriage while sheets are being piled upon it *en masse*.

My invention relates to an improvement in sheet-delivery mechanism for printing-machines, the object being to provide simple, compact, reliable, and durable means for the final delivery upon a delivery-board of the sheets with their printed surfaces up or down at the will of the operator and also to provide simple and convenient means for securing an intermediary accumulation of printed sheets and then delivering them *en masse* with their printed surfaces up or down without stopping the machine in the same manner as a single sheet.

With these ends in view my invention consists in an apparatus having certain details

of construction and combinations of parts, as will be hereinafter described, and particularly pointed out in the claims.

For the illustration of my improvement I have chosen to embody it in a machine following the construction of that shown and described in United States Patent No. 544,075, granted August 6, 1895, to Sturges Whitlock for an improved printing-press; but of course it is to be understood that my invention is not limited in its application to the machine of that patent.

In carrying out my invention, as herein shown, I employ a number of tapes 2, running over tape-rollers 3 and 4, arranged transversely with respect to the length of the machine and having their ends provided with journals entering suitable journal-holes formed in two corresponding tape-roller-carrier bars 5, the lower edges of which are toothed to form racks 6, meshed into by pinions 7, located at the opposite ends of a transversely-arranged shaft 8, located about midway the length of the delivery end of the press. The pinions 7 in turn mesh into two corresponding sliding racks 9, the outer ends of which are connected by coupling-rods 10 with the respective gripper-arms 11, located on opposite sides of the press, mounted upon a rock-shaft 12, and rocking back and forth under the guidance of sector-shaped segments 13, traveling in racks 14, secured to the bed 15 of the machine. The reciprocation back and forth of the tapes 2, tape-rollers 3 and 4, and tape-roller-carrier bars 5 is therefore effected through power derived from the gripper-arms 11. These parts just mentioned together form a carriage or temporary support for the printed sheets, which are delivered upon it and fed from it either singly or in piles of predetermined numbers preparatory to final delivery. The said gripper-arms 11, as I may here state, are provided at their upper ends with grippers 16 and 17, coacting with grippers 18, mounted in the delivery-reel 19, which receives the printed sheets from the main impression-cylinder, which is not shown. These parts which form the delivery mechanism proper of the press do not, however, pertain directly to my present invention and need not be detailed. For a complete exposition of them it will be sufficient to refer to the patent already referred to by number and date. This delivery mechanism is in character a reciprocating delivery mechanism as distinguished from a rotatory delivery mechanism.

The carriage, comprising the tapes 2, the tape-rollers 3 and 4, the carrier-bars 5, and other associated parts, is supported by four small loose flanged wheels 20, mounted upon the journals 21 of the tape-rollers 3 and 4 and riding upon two supporting bars or frame-pieces 22 and 22^a, extending throughout the length of machine and mounted at their ends in brackets 23 and 24, secured to the machine-frame 25 at convenient points thereon. The inner portions of the bar 22 are cut away to form a groove or channel 26 for the reception of a sliding rack 27, which meshes into and drives one or the other of two gear-wheels 28 and 29, located at one end of the inner tape-roller 3, whereby the same is rotated in one direction or the other, as required, imparting corresponding movement to the tapes 2 and to the outer tape-roller 4. The gear-wheel 28 is loosely mounted upon one of the journals 21 of the roller 3 and carries a short sleeve 30, receiving a plunger 31, acted upon by a spring 32 and coacting with the said journal and placed against the adjacent end of the tape-roller 3. This gear-wheel 28 provides for the actuation of the tapes and tape-rollers during the outward excursion of the carriage for delivering the sheets from it with their printed surfaces downward, as will be described later on. The gear-wheel 29 is journaled upon a heavy inwardly-extending stud 34, mounted in the adjacent carrier-bar 5 and provided with a collar 35, by means of which the gear is held in place. When it is desired to deliver the sheets with their printed faces uppermost, the gear-wheel 28 is slid inwardly on the journal of the tape-roller 2 far enough to disengage its teeth from the rack 27, after which the gear-wheel 29 is slid outwardly on the stud 34 until its teeth have been brought into engagement with the said rack. In this way the gear-wheels 28 and 29 are shifted in position so as to bring one or the other into play for rotating the tape-rollers and driving the tapes. The gear-wheel 29 is wider than the gear-wheel 28, into which it meshes when it is engaged with the rack 27 and through which it communicates to the tape-rollers the power it takes from the said rack. In other words, when the gear-wheel 29 is in use the gear-wheel 28 becomes an intermediate wheel for reversing the direction in which the tape-rollers are rotated. Now during the outward excursion of the carriage the tapes and tape-rollers will remain at rest, for the reason that although both the wheel 28 and the wheel 29 are rotated the pawl 31, carried by the wheel 28, snaps over the teeth of the ratchet 33, so that during the outward excursion of the carriage the tape-rollers will not be rotated. However, during the succeeding inward excursion of the carriage the said pawl will not ride over the teeth of the ratchet-wheel 33, and consequently the tape-rollers will be actuated so as to propel the sheets and cause them to ride off onto the delivery-board 53 with their printed faces uppermost. The point at which the rotation of the tape-rollers and the movement of the tapes are begun during the outward excursion of the carriage when the sheets are being delivered printed side down is regulated by means of a clamp-like adjustable stop 36, having a clamping-screw 37 and a clamping-button 38 and adapted to be applied to the inner edge of the supporting-bar 22, which, as aforesaid, is formed with a groove 26 for the reception of the rack 27, the stop 36 having a hooked

end 36ª, which grips the bar, as shown in Fig. 6. During the outward excursion of the carriage the rack 27 will slide along with the gear 28 until its outer end is brought into engagement with the said stop. The rack being thus brought to rest, the gear-wheel 28, engaged with it, will be revolved and the tape-rollers and tapes actuated so as to deliver the printed sheets printed face downward with their "heads" at a predetermined point on the delivery-board, that point being fixed by the suitable location of the said stop. When, on the other hand, it is desired to deliver the sheets with their printed faces uppermost, the stop is slid inwardly along the bar until it engages with the outer end of the rack 27, which will then be held against any sliding movement, so that the rotation of the tape-roller gears 28 and 29 will be begun just as soon as the outward excursion of the carriage begins, although the tape-rollers themselves will not be rotated until the beginning of the inward excursion of the carrier.

For deflecting the tapes 2, and hence the printed sheets, from a flat plane I employ a tape-deflecting roller 39, located between the tape-rollers 3 and 4, but nearer the roller 4 than the roller 3, and mounted at its ends in the upper ends of two rock-arms 40, the lower ends of which turn upon studs 41, projecting inward from the inner faces of the carrier-bars 5. By raising and lowering the arms 40 the deflection of the tapes 2, and hence the printed sheets, from a flat plane will be increased or decreased. The bending of the sheets by means of the roller 39 tends to give them lateral stiffness.

At the outer end of the carriage I locate a series of friction-rollers 42, mounted upon a transversely-arranged shaft 43, journaled in the upper ends of two rock-arms 44 44, swinging on studs 45, projecting inwardly from the carrier-bars 5, near the outer ends thereof. The ends of the said shaft 43 are connected with the rear ends of operating-rods 46 46, having bearing in screw-eye-like bearing-heads 47, mounted in the upper edges of the carrier-bars 5. Each rod has two of these heads 47, and the outer head of each pair has its opening elongated, so as to permit the rod to play up and down within narrow limits, as shown in Fig. 8. Each of these rods 44 is encircled by a spiral spring 48, impinged at its outer end against the outer bearing-head 47 and at its inner end against an adjustable collar 49, mounted upon the rod. These springs exert a constant effort to draw the rods 44 inwardly, with the effect of holding the friction-rollers 42 in position to grip the outer edge or head of the printed sheet between them and the outer face of the tape-roller 4, whereby the sheets are held during the major part of the outward excursion of the carrier. Just before the carrier reaches on its return the limit of its inward excursion the inner ends of the rods 44 engage with tappets 50, secured to the main frame of the machine, whereby the movement of the rods is stopped and the springs 48 placed under tension. Then as the carrier moves inward to complete its inward excursion the tape-roller 4 is moved with the carrier away from the friction-rollers 42, as shown in Fig. 7. A space is thus formed and kept between the friction-rollers 42 and the tape-roller 4 as long as the carrier remains at the limit of its inward excursion; but as soon as it starts on its outward excursion the springs 48 reassert themselves and the space between the wheels and roller is closed up, with the effect of gripping the outer edge or head of the printed sheet last deposited upon the tapes. During the inward and outward excursion of the carrier as soon as the tape-roller 3 is actuated in rotation, with the effect of moving the tapes 2 and rotating the tape-roller 4, the friction-wheels 42 will also be actuated in rotation through their frictional engagement with the tape-roller 4. The printed sheet upon the tapes will thus be propelled, as it were, in being delivered upon the delivery-board 53, so that the carrier will return empty for another sheet.

To provide for delivering the printed sheets on the delivery-board with their printed surfaces down, I form slots 54 in the outer ends of the carrier-bars 5 for the reception of a rod 55, upon which I mount a series of deflectors 56, held in heads 57, adjustably secured by set-screws 58 upon the rod. To bring these deflectors into play for delivering the sheets with their printed surfaces down, the gear 28 is engaged with the rack 27 and the gear 29 is disengaged from the said rack by being slid outward on the stud 34. Now during the outward excursion of the carrier the tapes and tape-rollers will remain at rest until the outer end of the rack engages with the adjustable stop 36, after which the tape-rollers are actuated and start the delivery of the sheets with their printed faces uppermost; but the heads are immediately impinged against the said deflectors 56, by which the sheets will be deflected, with the result of delivering the sheets printed side down upon the delivery-board 53, which is furnished with an adjustable back-stop 53ª, which will be engaged by the heads of the sheets as they are laid out upon the delivery-board. The deflectors 56 are removed from the machine except when it is desired to deliver the sheets with their printed sides down.

It is desirable, particularly when the machine is adjusted for delivering the printed sheets with their printed surfaces down, as described, to provide for delivering small sheets near the outer end of the delivery-board. For this purpose the stop 36 is made adjustable, as already described, and the rack 27 is made to slide in its channel 26 in the supporting-bar 22. Now in case it is desired to deliver small sheets near the outer end of the delivery-board the stop 36 is set upon the supporting-bar 22 some distance outward

from the outer end of the rack 27, which will then move outward with the carrier for some distance before engaging with the stop. When, however, that engagement takes place, the rack will be stopped, and from that moment the tapes and tape-rollers will begin to turn, and hence strip the printed sheet from off the tapes. In this way the adjustable stop 36 enables me to deliver sheets with their printed surfaces down at any predetermined point upon the delivery-board.

From the foregoing it will be seen that by my invention a printed sheet may be finally delivered with its printed surface down or its printed surface up through the instrumentality of a reciprocating carrier adapted to receive the sheet and to deliver it to the delivery-board.

It is customary in some classes of work to deliver printed sheets upon a frame, generally made of wood and called a "rack," which is placed upon the delivery-board and which after it has received several sheets is removed and another rack substituted for it. If the press is being run rapidly, it must be stopped to permit the filled rack to be removed and an empty rack to be substituted for it. To avoid the objection of stopping the machine for the substitution of the racks and to secure the various advantages pertaining to the multiple-sheet method of delivery as distinguished from the single-sheet method, I have provided means for automatically suspending the reciprocation of the carrier and for automatically cutting out the means employed for operating the tapes and tape-rollers when the carrier is at the limit of its inward excursion, where it will be allowed to remain at rest and receive a predetermined number of printed sheets, after which it will be automatically cut into operation and moved to the limit of its outward excursion, during which time the accumulated sheets will be delivered *en masse* upon the delivery-board in the same way that one sheet is delivered. In carrying out this feature of my invention I provide the inner ends of the connecting-rods 10 with open heads 59, each having a hook 60 and a hook-like fender 61, located directly opposite to the said hook, which is adapted to engage with a pin 62, mounted in the gripper-arm 11. The hook 60 is also furnished with a projecting nose 63. Normally the hooks 60 are engaged with the pins 62, whereby the rods 10 are coupled with the gripper-arms 11, for the constant actuation of the carrier back and forth in carrying out the principle of the single delivery of each printed sheet from the carriage to the delivery-board. For automatically disconnecting or unlocking the rods 10 from the gripper-arms 11 I provide each of the rods with a cut-out incline 64, located near its head 59 and coacting with an anti-friction-roller 65, mounted in the upper ends of two cut-out levers 66 and 66ª, both secured to a shaft 67. The lever 66 on the left-hand or "gear" side of the machine is provided with an operating-arm 68 and an arm 69, extending in the opposite direction and having pivotally connected with it a rod 70, encircled by a spiral spring 71 and provided near its upper end with a collar 72, against which the upper end of the spring impinges, the lower end of the rod passing through a bracket 73, upon which the lower end of the spring impinges. The said spring 71 exerts a constant effort to swing the levers 66 and 66ª inward, and thus bring their rollers 65 into position to be engaged with the cut-out inclines 64, which when they ride up on the said rollers disconnect the hooks 60 from the pins 62 in the gripper-arms 11. Normally the levers 66 and 66ª are held in their retired positions by the engagement of a toe at the end of the arm 68 of the lever 66 by a pin 74, projecting inwardly from a ratchet-wheel 75, mounted upon a shaft 76, journaled in a bracket 77, located on the left-hand or gear side of the machine. The said shaft is provided at its outer end with a hand-wheel 78. The said ratchet-wheel is actuated in rotation by means of a pawl 79, pivotally hung in the outer end of an arm 80, formed at the upper end of an actuating or pawl lever 81, hung concentric with the shaft 76, and also provided with an arm 82, from which a weight 83 is suspended for the restoration of the lever 81 to its perpendicular position, in which it is engaged by a toe 13ª, formed upon the sector 13 of the gripper-arm 11 on the left-hand or gear end of the machine. As shown by broken lines in Fig. 1 of the drawings, the connecting-rod 10 is engaged with the left-hand gripper-arm 11 for the single delivery of the sheets; but as shown in full lines the said rod 10 is disconnected from the said left-hand gripper-arm 11 by the riding of the cut-out inclines 64 upon the rollers 65 in the upper ends of the cut-out levers 66 and 66ª. The bracket 77 aforesaid is formed, as shown, with four holes *a*, *b*, *c*, and *d*, arranged concentrically with the ratchet-wheel 75 and the hand-wheel 78 for the reception of a stop-pin 84, which limits the swinging movement of the actuating or pawl lever 81 under the influence of its weight 83, and therefore determines the number of teeth covered by the pawl at each swinging movement of the said lever. For the purposes of description it may be assumed that the ratchet-wheel 75 has twenty-four teeth in it. Now if the stop-pin 84 is inserted into the hole *d* the pawl-lever 81 will swing under the action of the weight 83 far enough to cause the pawl to cover six teeth of the ratchet-wheel 75, so that four actuations of the pawl-lever 81 by the sector 13 of the gripper 11 will be required to effect one complete revolution of the ratchet-wheel 75. In other words, the gripper-arms 11 will deliver four sheets during one revolution of the said ratchet-wheel, during which time the carrier will be cut out of reciprocation and allowed to rest at the limit of its

inward excursion by the unhooking of the rods 10 from the gripper-arms 11, as shown in broken lines in Fig. 1. Assuming, with reference to this figure, that three sheets have already been delivered upon the tapes 2, the pin 74 in the ratchet-wheel 75 will have been brought into engagement with the toe of the arm 68 of the lever 66. Now the next time the gripper-arms 11 are rocked outward the pawl-lever 81 will be actuated and the wheel 75 turned through a quarter-revolution, whereby the pin 74 will be raised against the toe of the arm 68 of the cut-out lever 66, whereby the said lever, the shaft 67, and the cut-out lever 66^a are rocked outward against the pressure of the spring 71, whereby the rods 10 will be allowed to automatically recouple themselves with the gripper-arms 11, so that as the same swing outward again the carrier will be actuated in its outward excursion and the four sheets upon it will be stripped off upon the delivery-board. On the other hand, if the pin 84 is inserted into the hole *c* of the bracket 77 the swinging movement of the pawl-lever 81 will cover only four teeth, which will necessitate six separate actuations of the ratchet-wheel 75 for one complete revolution of it. Therefore six sheets would be accumulated upon the carrier before the same was automatically cut into operation again for delivering those sheets *en masse* upon the delivery-board. If the pin 84 is inserted in the hole *b* of the bracket 77, the swinging movement of the lever covers only two teeth of the ratchet-wheel 75, so that twelve actuations of the same would be necessary to one complete revolution of it, whereby twelve sheets would be accumulated upon the carrier before the same were automatically cut into operation again for the delivery *en masse* of those sheets upon the delivery-board. If, however, the pin 84 is placed in the hole *a* of the bracket 77, the pawl-lever will be prevented from swinging at all under the action of the weight 83. Now by turning the hand-wheel 78 upon the shaft 76 in the direction of the arrow 3 in Fig. 1, so as to engage the pin 74 with the toe of the arm 68, the cut-out levers 66 and 66^a will be depressed against the tension of the spring 71 into such a position that they will not coact with the cut-out inclines 64, whereby the connecting-rods 10 will remain connected with the gripper-arms 11 and the carrier caused to reciprocate synchronously with the rocking movement of the gripper-arms. When the machine is adjusted in this way, the sheets will be delivered single. If while the machine is adjusted for the single delivery of the sheets it becomes desirable for any reason to suspend their delivery onto the delivery-board, the hand-wheel 78 is turned until the pin 74 is disengaged from the toe of the arm 68 of the cut-out lever 66, at which time the spring 71 will assert itself to lift the levers 66 and 66^a into position to have their rollers 65 engaged by the cut-out inclines 64, whereby the connecting-rods 10 will be disengaged from the pins 62 of the gripper-arms 11. Now when it is desired to begin the delivery of the sheets from the tapes to the delivery-board it is only necessary to turn the hand-wheel sufficiently to cause the pin 74, carried by it, to lift against the toe of the arm 68 of the lever 66, and so throw the levers 66 and 66^a back into their retired positions. The inclines 64 are constructed and arranged so that as they ride over the rollers 65 they will gradually release and lift the hooks 60 of the rods 10 away from the coupling-pins 62.

The pawl-lever 81 is formed with a segmental guard 81^a, extending in the opposite direction from the series of holes *a*, *b*, *c*, and *d* in the bracket 77, and is of sufficient length to cover all of them and prevents the stop-pin 84 from being put into one of the holes *a b c* on the outside of the lever 81, where it would be sheared off by the action of the left-hand sector 13 upon the lever.

It is obvious that the ratchet-wheel 75 and the stroke of the pawl 79 can be modified to permit the accumulation of any desired number of sheets upon the tapes; but the construction shown and described will sufficiently illustrate my improvement.

In view of the modifications suggested and of others which may obviously be made I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such alterations as will fairly fall within the spirit and scope of my invention.

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

1. In a sheet-delivery mechanism for printing-machines, the combination with reciprocating delivery mechanism, of a delivery-board, a flat or substantially flat temporary sheet-support upon which the sheets are deposited and allowed to come to rest, and means whereby the delivery of the sheets from the said temporary support to the delivery-board may be suspended without stopping the machine.

2. In a sheet-delivery mechanism for printing-machines, the combination with reciprocating delivery mechanism, of a flat or substantially flat temporary sheet-support upon which the sheets are temporarily deposited and allowed to come to rest, and means whereby the sheets may be finally delivered from the said temporary support either as units or *en masse*.

3. In a sheet-delivery mechanism for printing-machines, the combination with reciprocating delivery mechanism, of a flat or substantially flat temporary sheet-support upon which the sheets are temporarily deposited and allowed to come to rest, and means whereby the sheets may be delivered from the said support either as units or *en masse* with their printed sides uppermost.

4. In a sheet-delivery mechanism for print-

ing-machines, the combination with reciprocating delivery mechanism, of a flat or substantially flat temporary sheet-support upon which the sheets are temporarily deposited by the said mechanism and allowed to come to rest, and means whereby the sheets may be delivered from the said support either as units or *en masse* with their printed sides down.

5. In a sheet-delivery mechanism for printing-machines, the combination with a carrier forming a sheet-support and comprising carrier-bars, and tape-rollers, of mechanical means for breaking the upper plane of the carrier without disturbing the said carrier-bars so that the printed sheets will not lie out flat thereupon.

6. In a sheet-delivery mechanism for printing-machines, the combination with a delivery mechanism, of a delivery-board, a carrier forming a sheet-support upon which the sheets are laid by the delivery mechanism, and from which they are transferred to the said board, and means consisting of a roller and rock-arms, connected with the carrier for breaking the plane thereof.

7. In a sheet-delivery mechanism for printing-machines, the combination with the delivery mechanism thereof, of a reciprocating carrier forming a support for the sheets which are delivered upon it by the said mechanism and allowed to come to rest upon it, and connections between the said delivery mechanism and the said carrier, whereby the latter is reciprocated synchronously with the former.

8. In a sheet-delivery mechanism for printing-machines, the combination with the delivery mechanism thereof, of a carrier forming a support for the sheets which are delivered upon it by the said mechanism, connections between the said delivery mechanism and the said carrier, whereby the latter is operated synchronously with the former, and means for automatically disconnecting the carrier from the delivery mechanism, whereby the delivery of the sheets from the carrier is suspended so as to cause the sheets to be piled thereupon.

9. In a sheet-delivery mechanism for printing-machines, the combination with a delivery mechanism, of a carrier forming a support upon which the sheets are deposited by the delivery mechanism, connections between the delivery mechanism and carrier, and mechanism for breaking and reëstablishing those connections whereby the sheets may be delivered from the carrier singly or in piles of any desired number.

10. In a sheet-delivery mechanism for printing-machines, the combination with a delivery mechanism comprising two gripper-arms, of a carrier forming a temporary support upon which the sheets are deposited by the delivery mechanism, and connections between the carrier and gripper-arms comprising hooks and cut-out inclines.

11. In a sheet-delivery mechanism for printing-machines, the combination with a delivery mechanism comprising gripper-arms, of a delivery-board upon which the printed sheets are finally delivered, a sheet-support consisting of a carrier comprising tape-rollers and carrier-bars, the lower faces of which latter are provided with racks, sliding racks, connecting-rods between the said sliding racks and gripper-arms, and means for transmitting the movement of the sliding racks to the racks of the carrier, whereby the same is actuated synchronously with the gripper-arms.

12. In a sheet-delivery mechanism for printing-machines, the combination with tape-rollers, of bars in which the same are journaled, two gear-wheels, and a rack engaging with one or the other of the said gear-wheels which are movable into and out of engagement with the rack according to the direction in which it is desired to rotate the said rollers, one of the gear-wheels being adapted to be coupled with one of the rollers, and the other gear-wheel being adapted to be meshed into the other gear-wheel at the same time it is engaged with the said rack.

13. In a sheet-delivery mechanism for printing-machines, the combination with a carrier provided with tape-rollers, and with one or more gear-wheels through which power is transmitted to the tape-rollers for the actuation thereof, a rack engaging with one of the said gear-wheels, and a stop adapted to be set at a predetermined point and coacting with the rack for starting the actuation of the tape-rollers.

14. In a sheet-delivery mechanism for printing-machines, the combination with tape-rollers provided with journals, of carrier-bars receiving the said journals, flanged wheels mounted upon the journals, supporting-bars upon which the flanged wheels rest, gear-wheels connected with one of the rollers for actuating the same in either direction, a rack mounted upon one of the said supporting-bars, and coacting with the said gear-wheels, and a stop secured to the said supporting-bar and coacting with the said rack to start the rollers in rotation at any predetermined time during the outward excursion of the rollers.

15. In a sheet-delivery mechanism for printing-machines, the combination with a delivery-board, of a carrier upon which the printed sheets are supported preparatory to their being delivered upon the said delivery-board, a series of friction-rollers located adjacent to the outer end of the carrier, and engaging with the "heads" of the printed sheets so as to hold them against displacement on the said carrier, a transversely-arranged shaft on which the said friction-rollers are mounted, rock-arms in which the ends of the said shaft are mounted, springs for normally maintaining the said rollers in their gripping positions, and operating-rods connected with the said arms, having slight vertical movement to permit the rocking movement thereof, and at their rear ends impinging against fixed tappets so

as to rock the arms and lift the rollers just before the carrier reaches its receiving position, against the tension of the said springs which themselves restore the rollers to their gripping positions as the carrier moves outward and clears the ends of the rods from the tappets.

16. In a sheet-delivery mechanism for printing-machines, the combination with reciprocating delivery mechanism, of a carrier forming a support for the printed sheets which it receives directly from the said reciprocating delivery mechanism, and provided with tape-rollers and with tapes therefor, means for actuating the said rollers in rotation, and deflectors mounted in the outer end of the carrier and adapted to turn the sheets inward when the carrier makes its outward excursion.

17. In a sheet-delivery mechanism for printing-machines, the combination with delivery mechanism, of a carrier forming a temporary support for the sheets which are delivered to it by the said delivery mechanism, the said carrier including tape-rollers, a rack for imparting movement to the said rollers, and an adjustable stop coacting with the said rack to start the rollers in motion at any predetermined time during the outward excursion of the carrier.

18. In a sheet-delivery mechanism for printing-machines, the combination with delivery mechanism of a delivery-board, a carrier forming a temporary support for the sheets which are fed from it to the delivery-board, connections between the delivery mechanism and the carrier, including connecting-rods each provided at one end with a head containing a hook, and mechanism for automatically unhooking the rods from the delivery mechanism and rehooking them thereto, whereby the connection between the delivery mechanism and carrier is automatically broken and automatically reëstablished without stopping the machine.

19. In a sheet-delivery mechanism for printing-machines, the combination with delivery mechanism including gripper-arms, of a carrier forming a temporary sheet-support, sliding racks for actuating the carrier, connecting-rods connecting the said racks to the said gripper-arms, hooks located upon the said rods for hooking them to and unhooking them from the said arms, cut-out inclines mounted upon the rods, and automatic mechanism coacting with the said cut-out inclines for unhooking and hooking the rods from or to the arms.

20. In a sheet-delivery mechanism for printing-machines, the combination with delivery mechanism including gripper-arms, of a carrier forming a sheet-support, sliding racks for actuating the carrier, connecting-rods connecting the said racks to the said gripper-arms, hooks located upon the said rods for hooking them to and unhooking them from the said arms, cut-out inclines mounted upon the rods, and automatic mechanism coacting with the said cut-out inclines for unhooking and hooking the rods from or to the arms, including a cut-out lever coacting with one of the inclines, a ratchet-wheel provided with a pin and coacting with the said lever to move it into its retired position and to hold it there, a pawl coacting with the said wheel, and means operating synchronously with the gripper-arms for actuating the pawl.

21. In a sheet-delivery mechanism for printing-machines, the combination with delivery mechanism including gripper-arms, of a carrier forming a sheet-support, sliding racks for actuating the carrier, connecting-rods connecting the said racks to the said gripper-arms, hooks located upon the said rods for hooking them to and unhooking them from the arms, cut-out inclines mounted upon the rods, and automatic mechanism including a cut-out lever coacting with one of the inclines, a ratchet-wheel provided with a pin coacting with the said lever to move it into its retired position and hold it there, a pawl-lever, a pawl carried thereby, and means for adjusting the swinging movement of the pawl-lever, and hence the movement of the ratchet-wheel, the said pawl-lever being adapted to be operated synchronously with the said arms.

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

WINFIELD S. HUSON.

Witnesses:
JULIUS G. DAY,
WALTER RANDALL.