

N. W. HARRISON.
DELIVERY MECHANISM.

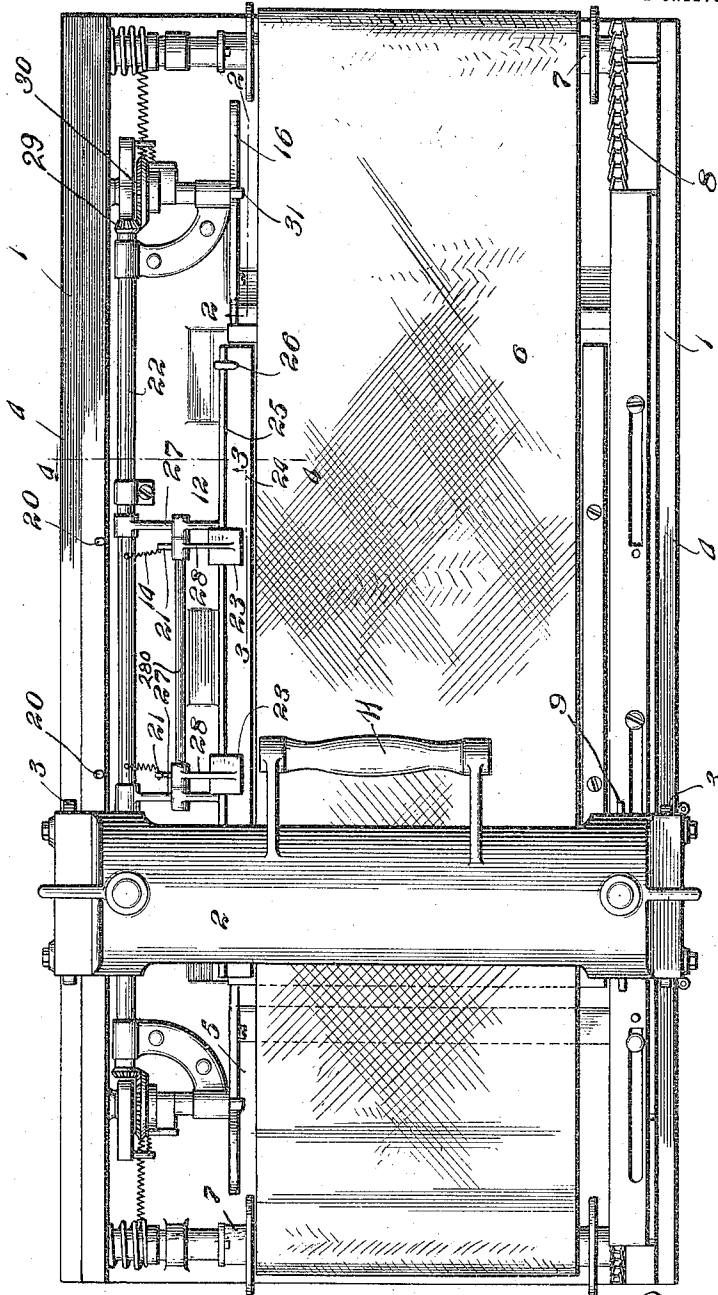
APPLICATION FILED FEB. 6, 1911. RENEWED SEPT. 20, 1913.

1,161,309.

Patented Nov. 23, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

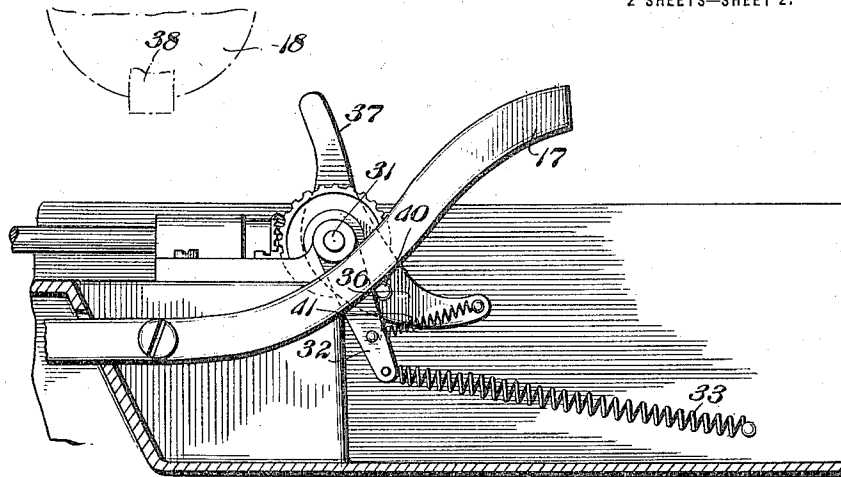


Fig. 2.

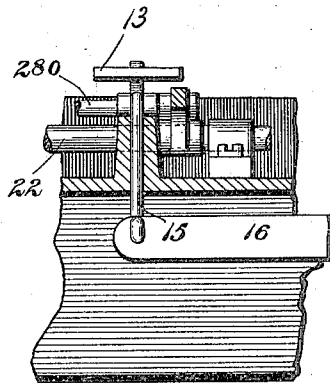


Fig. 3.

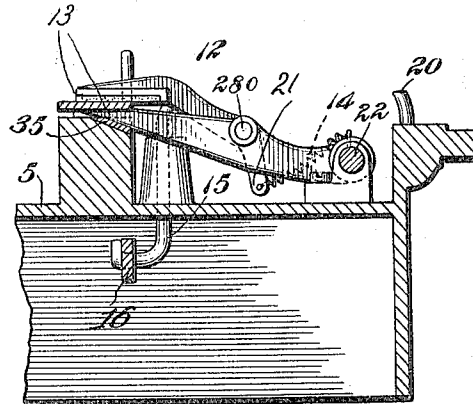


Fig. 4.

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UNITED STATES PATENT OFFICE.

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DELIVERY MECHANISM.

1,161,309.

Specification of Letters Patent.

Patented Nov. 23, 1915.

Application filed February 6, 1911, Serial No. 606,973. Renewed September 20, 1913. Serial No. 790,911.

To all whom it may concern:

Be it known that I, NATHANIEL WALDO HARRISON, citizen of the United States of America, residing at city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Delivery Mechanism, of which the following is a specification.

This invention relates to duplicating printing machines of the kind having a flat type bed, and particularly to a new and improved delivery mechanism for use with these machines.

The machine to which the device of my invention has been applied, embodies a printing or type surface, means for supplying printing medium, as ink, a presser roll, a presser roll carriage mounted to reciprocate and carry the roll back and forth over the printing surface, and delivery mechanism consisting of carriers mounted to swing laterally, and means for operating them.

In the preferred form of my invention, the delivery mechanism operates at each stroke of the carriage so that an impression or print may be made on both traverses or strokes, *i. e.*, the forward and the return stroke. To this end I place tripping means for the delivery mechanism at each end of the traverse in the path of the carriage. However, the delivery mechanism may be otherwise operated within the scope of my invention.

For the purpose of gripping the paper to remove it, I provide grippers on the carrier or jaw arms. These are normally placed with their opposed gripping surfaces substantially in the plane of the paper and printing surface, are opened to receive the paper when the carriage is at the extreme end of its traverse in each direction, and are closed to grip the paper before the roll reaches it. After the roll has passed over the paper, the grippers with their arms, referred to as the carriers, are swung laterally, and when near the termination of their swing, the jaws are opened and the paper dropped by the side of the machine. In this operation, several important functions are served. The paper which is positioned by means of suitable gages is gripped and held so that it cannot slip when engaged by the presser roll. Hence the characters being printed are accurately placed. This is of importance when letters are being repro-

duced by the machine on headed stationery and in similar work where blanks in the printed form, and other blanks in the duplicated matter must be filled in on a typewriter. In such cases, if the paper slips or is not accurately placed, the relation between the blanks in the original printed matter or letterhead, etc., and the blanks in the duplicated matter, will be varied, and neat or accurate work cannot be produced in filling in the blanks with the typewriter. The paper may be moved in the typewriter to compensate for such slip or inaccuracy, but this is inconvenient and expensive. This defect is wholly overcome by use of the gripping means, which is a part of my delivery mechanism, for the paper is held as presented and its initial position may be easily determined with accuracy by suitable gages. Another function of the device is that of turning the copies, which are printed from beneath, whereby they are delivered right side up with the printed matter in view of the operator so that he can observe the character of the work being done.

Other extremely important features of the delivery are its quickness of action and its operation at each traverse of the carriage so that a print may be produced both on the forward and on the return stroke.

So much of a duplicating printing machine, to which my device has been applied, as is necessary to a complete comprehension of the nature and operation of my invention, is illustrated in the accompanying drawings.

Figure 1 is a plan of the machine. Fig. 2 is a fragmentary section on the line 2, 2, Fig. 1. Fig. 3 is a fragmentary section on the line 3, 3, Fig. 1. Fig. 4 is a fragmentary transverse section on the line 4, 4, the same figure.

The machine consists of a frame 1, a presser roll carriage 2 mounted to reciprocate thereon and provided with suitable means shown in the form of rollers 3 to engage track 4 on the frame. The frame is provided with a bed 5 to receive a flat form or chase of type. Over the type face runs an ink ribbon 6, but it is within the scope of my invention to supply ink or other printing medium in any suitable manner. The ribbon is carried by rollers 7 which may be driven in any convenient manner as by chains 8 actuated by suitable means as pawls 9 on the carriage. The operator

grasps the handle 11 of the carriage and reciprocates it along the frame, moving the presser roll back and forth over the printing surface.

5 In the preferred form of my device, a sheet of paper is presented at each traverse of the carriage so that a print is made on both the forward and the return stroke. To accomplish this, with the machine running
10 regularly and continuously, it is necessary to remove the prints each time the carriage makes a change of direction.

To perform this and other functions referred to herein, I provide the delivery
15 mechanism indicated in a general way by reference character 12. This delivery mechanism has grippers or jaws 13 mounted on arms 27 and 28, pivoted to swing laterally with and upon a shaft 22. Springs 14 tend
20 to maintain the jaws closed. Sliding rods 15 and intermediately pivoted levers 16 at each end of the machine, each connected at one end to a rod 15 and having the other end 17 in the path of a roller 18 on the carriage,
25 serve to open the jaws for an instant to receive the paper. Stationary pins 20 each in the path of the tail 21 of the arm 28 of one jaw of each pair, open the jaws at the end
30 of their outward swing to deliver the paper. The jaws, as shown, consist of two upper jaw members 23 and a single lower jaw member 24. The latter extends longitudinally of the machine along the edge of the ribbon, and is given an L-shaped cross-section
35 to provide a side gage 25 and a horizontal jaw surface. A movable end gage 26 may also be provided. The jaw 24 is mounted on arms 27 secured to the longitudinal shaft 22, and pivotally mounted on these
40 arms are the arms 28 carrying the upper jaw members 23. The jaw arms 28 are secured to the shaft 280 which forms the pivot referred to. The side gage 25 is notched to permit the upper jaws 23 to
45 move downward so as to bring their gripping surfaces into engagement with the horizontal surface of the jaw member 24. To rotate the shaft 22 as the carriage 2 approaches each end of its traverse, I provide
50 miter gears 29 and 30, one secured to the shaft 22, the other on a transverse shaft 31. To the gear 30 on the transverse shaft 31 is secured an arm 32 connected by a spring 33 with a fixed member on the machine
55 frame. The spring 33 tends to rotate the transverse shaft left-handed as seen in Fig. 2, whereby the shaft 22 is also given a left-handed rotation, and the lower jaw or gripper is pressed against any
60 suitable stop or positioning surface 35 on the machine frame. The jaws are closed in this position and the gripping surfaces of the jaws are near the plane of the paper when on the ribbon. Loosely mounted
65 on the transverse shaft 31, to rotate

freely thereon, is an escapement lever 36. This is provided with an upright arm 37
extending upward into the path of the carriage, or more properly, into the path
of the abutment or dog 38 thereon. Below
70 its center, or below the center of the shaft 31, is a pin 40 to engage the arm 32 and impart to it right-handed rotation. In this connection it is to be understood that the
75 operation of the actuating mechanism, at the opposite end of the machine, is the reverse of the action being described. A tension spring 41 is connected to the lower
extremity of the lever 36 and to the arm 32 so that the pin 40 is normally main-
80 tained in contact with the arm 32. On each outward movement of the carriage near the end of its traverse, the stop or abutment 38 encounters the upright arm 37, and rotates
85 the lever 36 about the shaft 31, and the pin 40 acting on the arm 32, imparts rotation to it, and thereby to the miter gear 30. This gear which meshes with the gear 29 on the
90 shaft 22, rotates that shaft, and swings the gripper jaws 13 laterally from their receiving to their delivering position. By this action the tension spring 33 is expanded, and when the arm 37 is released by the pas-
95 sage of the carriage over and beyond it, the gripper jaws return to their normal position, the spring 33 contracting, swings the arm 32 left-handed, rotating the miter gear 30 and the shaft 22. On the return of the carriage when the arm 37 is engaged by
100 the dog 38, the lever 36 rotates freely in left-handed phase about the shaft 31, the spring 41 yielding to permit this action. When the carriage has passed the escape-
ment lever, actuated by the spring 41, re-
105 turns to normal position, the pin 40 pressing against the arm 32.

When the dog 38 has passed the escapement arm 37, and is near the extremity of its traverse, the roller 18 engages the lever 17 and elevates the sliding rod 15, whereby
110 the upper jaws 23, against one of which each of the rods 15 bears, are raised so that the grippers 13 are opened to receive the paper. As the carriage starts back the lever 17 is released, the springs 14 close the jaws
115 and the paper is gripped. When the carriage approaches the opposite end of its traverse after the roll has passed over the paper, the dog 38 encounters the arm 37, and the grippers still holding the paper, are
120 swung laterally. In extreme position the tails 21 of the arms 28 carrying the jaws 23 encounter the fixed stops 20 on the machine, the grippers are opened and the paper delivered.
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I have thus described in specific terms a single embodiment of my invention in order that its construction and operation may be clearly understood. However, the specific terms herein are used in their descriptive
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rather than in their limiting sense, and the scope of my invention is defined in the claims:

1. In a duplicating, printing machine, a printing surface, means for supplying printing medium, a presser roll carriage mounted to move back and forth across the printing surface, swinging delivery mechanism pivoted at the side of the printing surface, and means acting to operate the same at each change of direction of the carriage to engage the paper and deliver it printed side up.

2. In a duplicating printing machine, a type surface, means for supplying printing medium, a presser roll carriage mounted to carry the roll back and forth across the type surface, swinging delivery mechanism, and means acting to operate the same once for each change of direction of the carriage to engage the paper, turn it over and deliver it at the side of the machine.

3. In a duplicating printing machine, in combination a printing surface, ink supplying means, a presser roll carriage mounted to reciprocate back and forth across the printing surface, delivery mechanism, including paper grippers, means for closing the grippers, and means for opening them near the end of the traverse of the carriage to receive the paper and grip it before entering upon the printed stroke, and means for moving the grippers toward and from the printing surface to engage and deliver the paper.

4. In a duplicating printing machine, a printing surface, means for supplying printing medium, a presser roll carriage mounted to move back and forth across the printing surface, delivery mechanism, including paper engaging members mounted to swing transversely of the machine, and means in the path of the carriage at each end of its traverse for operating the delivery mechanism once for each change of direction of the carriage.

5. In a duplicating machine in combination a printing surface, means for supplying printing medium, a roll carriage mounted to reciprocate and move back and forth over the printing surface, and a delivery mechanism consisting of gripper jaws mounted at the side of the printing surface to swing at right angles to the traverse of the carriage, means for closing the jaws, means acting at the end of the traverse of the carriage to open the jaws for an instant to receive the paper, means for swinging the jaws laterally, and means for opening them to deliver the printed sheet.

6. In a duplicating machine in combination a printing surface, means for supplying printing medium, a roll carriage mounted to reciprocate and move back and forth over the printing surface, a delivery mechanism

consisting of gripper jaws mounted at the side of the printing surface to swing at right angles to the traverse of the carriage, means for closing the jaws, means acting at each end of the traverse of the carriage to open the jaws for an instant to receive the paper, including a member in the path of the carriage at each end of its traverse for operating said means, means for swinging the jaws laterally, including a member at each end of the traverse in the path of the carriage for actuating said means, and means for opening the jaws at the end of their lateral swing to deliver the sheet.

7. In a duplicating printing machine, a printing surface, means for supplying printing medium thereto, a presser roll, carriage mounted to reciprocate and move back and forth over the printing surface, delivery mechanism including paper grippers, swinging transversely of the machine, means tending to maintain them closed, and means operating at each end of the traverse, to open them an instant to receive the paper, and means for operating the delivery mechanism.

8. In a duplicating printing machine in combination a printing surface, means for supplying ink, a roll carriage mounted to reciprocate and move back and forth over the printing surface, delivery mechanism consisting of gripper jaws at the side of the printing surface, one jaw having a side gage, means for closing the jaws, means for swinging them laterally, and means in the path of their lateral swing for opening them.

9. In a duplicating printing machine, in combination a printing surface, means for supplying printing medium, a roll carriage mounted to reciprocate and move back and forth over the printing surface, delivery mechanism consisting of laterally swinging jaws, means tending to maintain them closed, means for opening them at the end of the carriage traverse to receive and grip the paper, means in the path of their lateral swing for opening them to deliver the paper, and means at each end of the traverse in the path of the carriage for actuating the delivery and swinging the jaws laterally.

10. In a duplicating printing machine in combination a printing surface, means for supplying printing medium, a roll carriage mounted to reciprocate and move back and forth over the printing surface, delivery mechanism consisting of laterally swinging jaws, means to maintain them closed, means for opening them at each end of the carriage traverse including a member in the path of the carriage for actuating said means and means for swinging the jaws laterally.

11. In a duplicating printing machine, a

printing surface, means for supplying printing medium, a roll carriage mounted to reciprocate and move back and forth over the printing surface, delivery mechanism in the form of jaws, a longitudinal shaft on which they are mounted to swing laterally, one jaw being pivoted on the other jaw arm, and an escapement having an arm in the path of the carriage for rotating the shaft to swing the jaws laterally.

12. In a duplicating printing machine in combination a printing surface, means for supplying printing medium, a roll carriage mounted to reciprocate and move back and forth over the printing surface, delivery mechanism in the form of jaws, a longitudinal shaft on which they are mounted to swing laterally, one jaw being pivoted on the other, means tending to maintain the jaws closed, an escapement having an arm in the path of the carriage for rotating the shaft to swing the jaws laterally, means for opening them for an instant at each end of the traverse of the carriage to receive and grip the paper, including a member in the path of the carriage for actuating said means, and means for opening the jaws at the end of the lateral swing.

13. In a duplicating printing machine, a delivery mechanism consisting of a shaft extending along the side of the printing surface, a pair of gripper jaws and gripper arms mounted thereon, one arm being rigid with the shaft, a pair of meshing miter gears, one on the shaft, an arm secured to the other gear, an escapement lever coöperating with the arm, an abutment on the carriage to engage the lever, and means for returning the lever to normal position.

14. In a duplicating printing machine having a reciprocating presser roll carriage, delivery mechanism consisting of an arm carrying a jaw and pivoted on a fixed axis parallel to the direction of traverse of the carriage, an arm carrying a coöperating jaw pivoted on the first jaw arm, means swinging about an axis transverse to the motion of the carriage, and connected with the first mentioned arm to swing it through an arc in a transverse plane, means in the path of the carriage for actuating the first swinging means, means tending to maintain the jaws closed, means actuated by the carriage

near the end of its traverse for opening the jaws to receive the paper, and means in the path of the coöperating jaw member to open it to deliver the paper.

15. In a duplicating machine, a reciprocating carriage, a printing surface, a shaft extending in the direction of traverse of the carriage, and carrying gripper arms and jaws, a member pivoted to swing about an axis at right angles to the shaft and connected thereto to rotate it, an escapement lever normally in the path of the carriage, to be actuated thereby to operate said member, an abutment on the carriage to engage said lever, means actuated by the carriage when in its extreme position for opening the jaws to receive the paper, means for opening the jaws to discharge the paper, and means tending to maintain the jaws closed.

16. In a printing machine having a reciprocating presser roll carriage delivery mechanism consisting of jaws pivoted to swing laterally, means for maintaining them normally in receiving position, means tending to close the jaws, means actuated by the carriage as it approaches the end of its traverse for opening the jaws for an instant to receive the paper, means for swinging them in a plane transverse to the motion of the carriage, and means engaging the jaws as they swing away from the printing surface to open them.

17. In a duplicating printing machine having a flat type bed and reciprocating presser roll carriage, a delivery mechanism consisting of gripper jaws, arms carrying the same, the arm of one jaw being pivoted to swing laterally, the arm of the other jaw being intermediately pivoted on the first jaw arm, means for swinging the first jaw arm laterally about its pivot moving the jaws toward and from the type bed, means for opening the jaws to receive the paper, and means in the path of the tail of the second jaw arm for engaging it to open the jaws and deliver the paper.

Signed by me at city of Baltimore, State of Maryland, this 6th day of January, 1911.

NATHANIEL WALDO HARRISON.

Witnesses:

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EDWIN F. SAMUELS.