(No Model.) 3 Sheets—Sheet 1.

W. G. TREVETTE.

SHEET SEPARATING AND FEEDING MACHINE.

No. 562,866. Patented June 30, 1896.

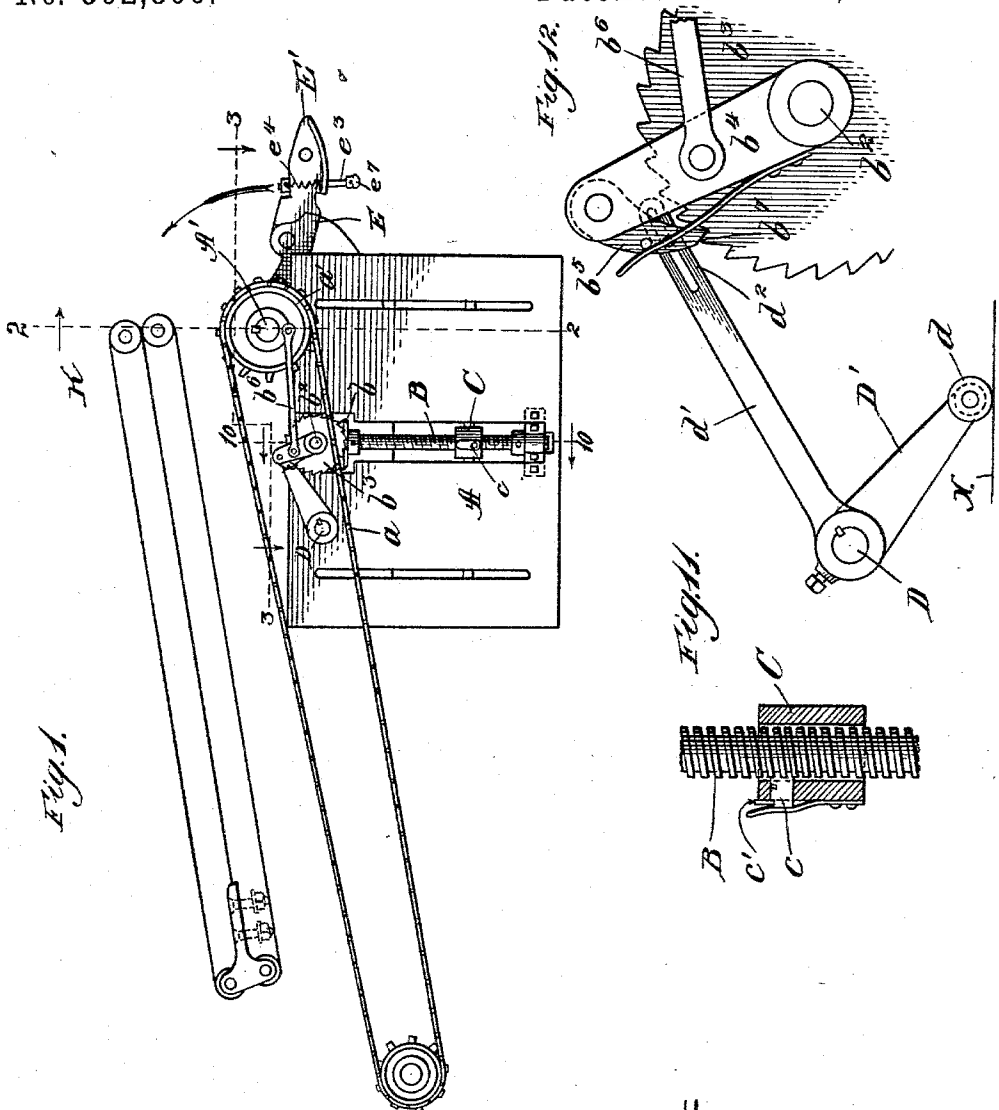

Fig. 1.

Fig. 12.

Fig. 11.

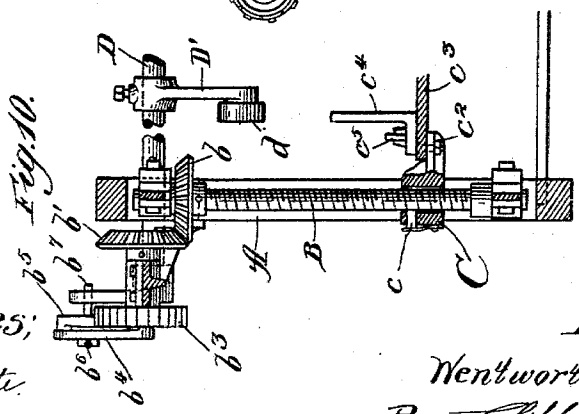

Fig. 10.

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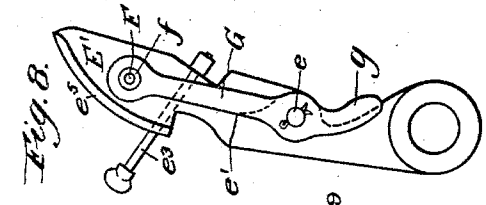
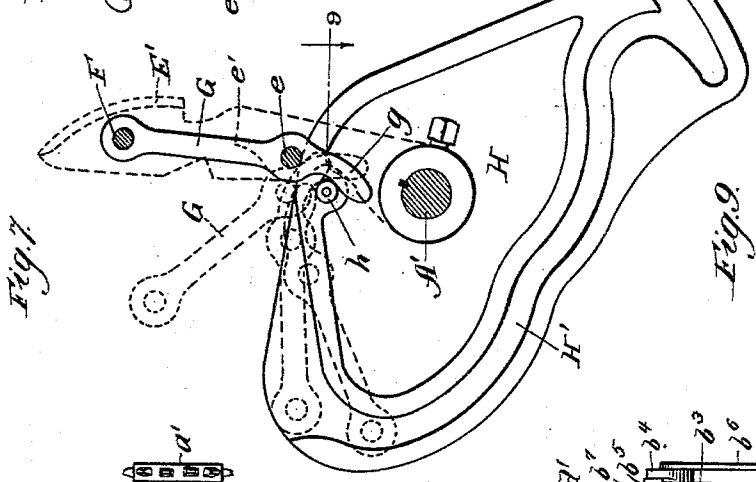
(No Model.) 3 Sheets—Sheet 2.

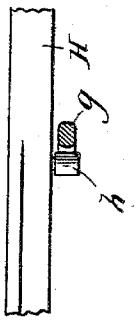
W. G. TREVETTE.

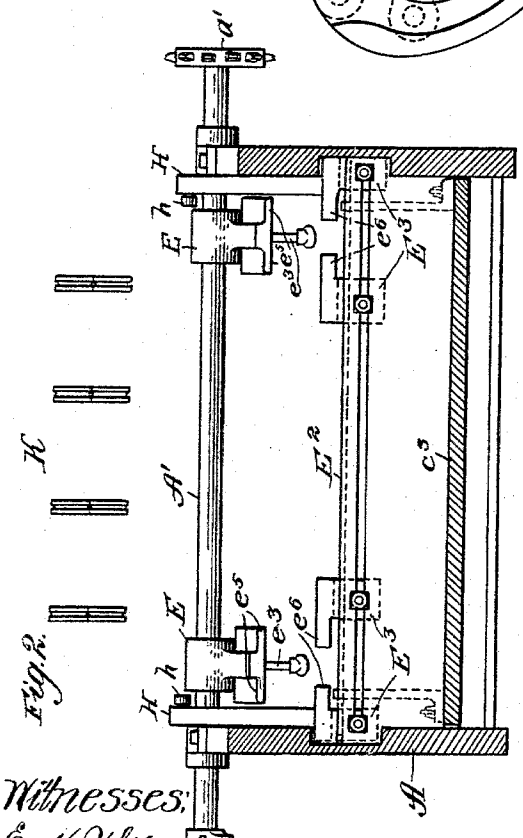
SHEET SEPARATING AND FEEDING MACHINE.

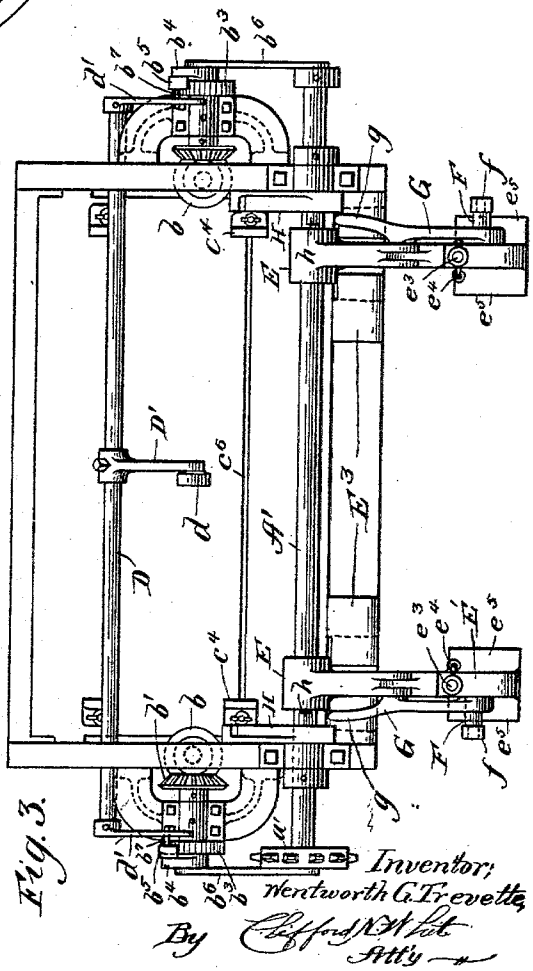
No. 562,866. Patented June 30, 1896.











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(No Model.) 3 Sheets—Sheet 3.

W. G. TREVETTE.

SHEET SEPARATING AND FEEDING MACHINE.

No. 562,866. Patented June 30, 1896.

Fig. 4.

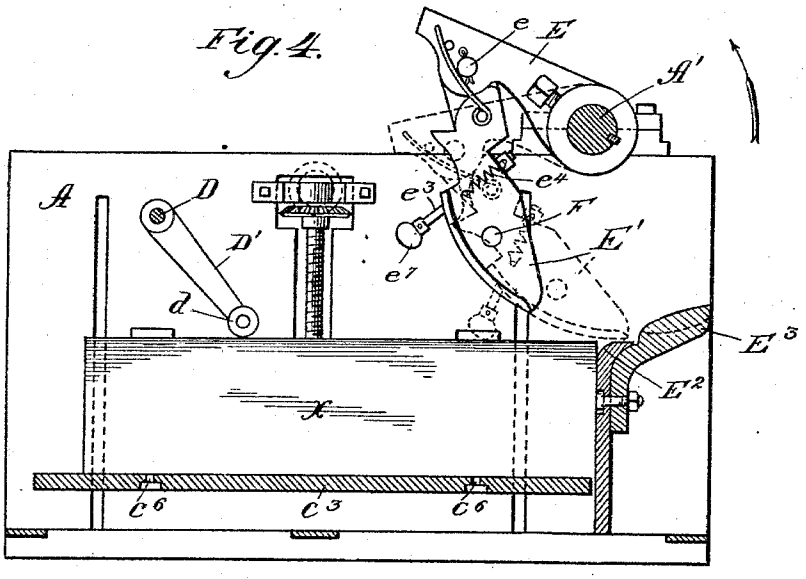


Fig. 5.

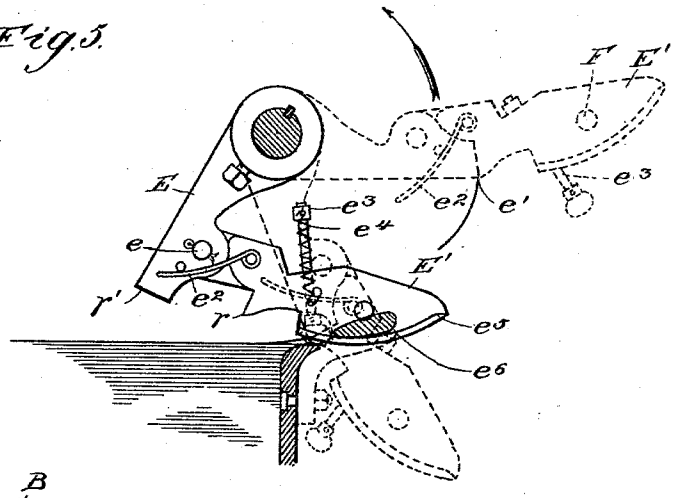
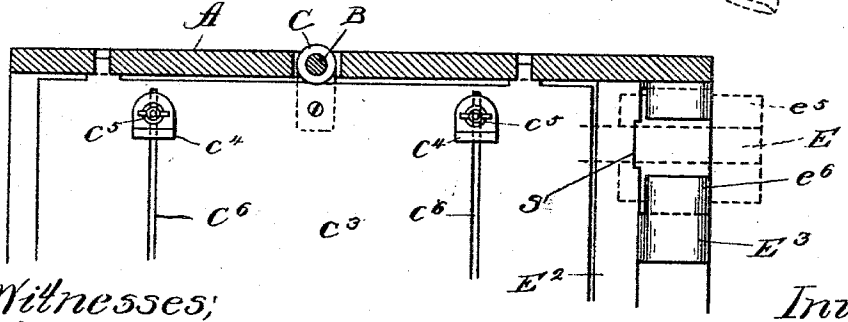


Fig. 6.



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UNITED STATES PATENT OFFICE.

WENTWORTH G. TREVETTE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO LUCIUS W. WINCHESTER, OF SAME PLACE.

SHEET SEPARATING AND FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 562,866, dated June 30, 1896.

Application filed February 4, 1895. Serial No. 537,316. (No model.)

To all whom it may concern:

Be it known that I, WENTWORTH G. TREVETTE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mechanism for Separating and Distributing Paper; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in mechanism for separating and distributing paper when in the form of a pile of sheets, and is especially applicable for use in connection with printing-presses.

The prime object of this invention is to automatically separate the topmost sheet from those below, grip the same and carry it to the point of delivery, such as the carrying-tapes of a printing-press, and deliver the same at such point.

Another object is to perform the above-mentioned functions in a continuous operation of the same mechanism during each cycle of its operation.

A further object is to automatically maintain the top of the pile at a substantially uniform predetermined elevation, whereby the top sheet to be operated upon by the feed mechanism will be always maintained in proper position.

A still further object is to automatically arrest the elevation of the pile, whenever it is raised more rapidly than the feed reduces the pile, whereby the mechanism is adapted for operating upon sheets of paper varying materially in thickness.

Other objects are to insure the separation of the top sheet from those below before the sheet is gripped, and to have the grippers so operate upon the top sheet as to destroy the vacuum between it and the next sheet below, whereby is avoided the danger of crumpling the lower sheet or drawing off more than one sheet at each operation, and to provide for returning the table carrying the pile of sheets to its starting position when empty without the disconnection or reverse rotation of any of the parts.

These and such other objects as may hereinafter appear are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my improved mechanism. Fig. 2 is a sectional view on the line 2 2 of Fig. 1, viewed in the direction indicated by the arrow. Fig. 3 is a plan view on the line 3 3 of Fig. 1, viewed in the direction indicated. Fig. 4 is a detail view of the gripper-lever, the full lines being one position it assumes as it approaches the material to be operated upon and the dotted lines its position just as the pusher-finger comes in contact with the said material. Fig. 5 is a similar view showing in full lines the lever just before the pusher-finger leaves the surface of the material, the first dotted outline the position showing it after the jaw thereof has gripped a sheet of the material, and the second dotted outline the position as it is traveling in its revolution with the sheet in its jaw. Fig. 6 is a detail plan view of the receptacle for holding the material; Fig. 7, a detail of the gripper-cam adapted to guide the gripper during a part of its revolution and also the trip-lever for opening the jaw when it has reached the point of discharge. Fig. 8 is a detached view of the gripper with the trip-lever in position thereon. Fig. 9 is a detail in plan of the cam, taken on the line 9, Fig. 7. Fig. 10 is a sectional view on line 10 of Fig. 1, showing a construction adapted to raise the material as it is carried off by the gripper and keep the said material at approximately the same level. Figs. 11 and 12 are detail views of the same mechanism.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A represents the frame of a receptacle for the material to be operated upon, in which frame is mounted a shaft A′, which is driven preferably by a sprocket-chain *a*, trained over a sprocket-wheel *a′*, mounted thereon.

On either side of the receptacle A, and in a

proper position, is journaled a vertical screw-threaded shaft B, having mounted at a convenient point thereon a miter gear-wheel b, meshing with a corresponding miter gear-wheel b' on a cross-shaft b^2. Mounted rigidly on the outer end of this cross-shaft b^2 is a ratchet-wheel b^3. Loosely mounted upon the shaft b^2 is a rocker-arm b^4, which carries a spring-dog b^5, meshing with the ratchet-wheel b^3. Secured to this arm b^4 is a connecting-rod b^6, connecting the said arm to the sprocket-wheel a' on the shaft A'.

Traveling loosely upon the threaded shaft B is a collar C, provided with one or more spring-dogs c, adapted to travel in the thread of the shaft B, so as to raise the said collar as the shaft revolves and also to allow the collar to be lowered without turning the shaft by springing the said dogs c out of mesh with the thread of the shaft B. These dogs may be provided with a button or other similar device c' to hold them in or out of mesh when desired. On the inner side of the collar C is a supporting lug or arm c^2, to which is secured a table or platform c^3, on which the paper or other material is placed. Guides c^4 are adapted to be adjusted crosswise or transversely of the table by means of a thumb-screw c^5, sliding in a slot c^6 in said table to the width of the material to be operated upon.

Mounted at a predetermined point in the framework A is a shaft D, which has mounted thereon a radially-adjustable arm D', carrying a small roller d, which rests upon the surface of the material and is adapted to turn the shaft D to a certain degree as the paper is raised or lowered. On either end of the said shaft D and approximately in a line with the spring-dog b^5 on the rocker-arm b^4 is an arm d', having at its outer end a slot d^2, in which rests a pin b^7, projecting from the spring-dog b^5. Thus it will be seen that the arm D' can be adjusted to such a position that if the material be raised above a certain point, it will, through the medium of the arm d', slot d^2, and pin b^7, raise the dog b^5 out of engagement with the ratchet-wheel b^3, thereby preventing the turning of the threaded shaft B and the raising of the table c^3, on which the material is placed, until enough material has been taken off to allow the said dog to again come in mesh with the ratchet-wheel.

On the shaft A' are mounted, preferably two, adjustable gripper-arms E, the construction and operation of which being identical, only one will be described. These gripper-arms may be adjusted laterally on the shaft A' and secured rigidly in position thereon by set-screws W. These arms are made in two sections, hinged together at e, and adapted to form in its joint a jaw e', and are provided with a spring e^2, which has a tendency to close the jaw. The outer section E' of the arm E is provided at a predetermined point with a pusher-finger e^3, having a spring or similar device e^4, tending to throw it out toward the material. The arm E is preferably provided, on the face which comes toward the material in its revolution, with a broad, slightly-curved portion e^5, which starts at the outer end of the section E' and terminates at a point slightly in the rear of the pusher-finger e^3.

The side of the receptacle from which the material is taken has its surface at the upper edge preferably curved or rounded outwardly, as at E^2, Fig. 4, so as to allow the upper sheets in the pack to be advanced slightly beyond those immediately below. It is also provided with adjustable guide-blocks E^3, having lips e^6, projecting toward each other and over the path of the enlarged portion e^5 of the gripper-lever E. The purposes of the said projections e^6 are to form guides for the enlarged portion e^5 on the lever E and prevent more than one sheet being advanced to the guide-block E^3 by the pusher-finger e^3 at one time.

It will be readily seen that when the lateral flanges on the enlarged portion e^5 of the section E' pass under the lips e^6 on the guide-blocks E^3 the lower curved surface of this enlarged portion e^5 opposes the rounded or curved edge E^2 of the side of the receptacle, and forms a tapering and gradually-contracted throat between such enlarged portion and the curved edge E^2, into which the upper sheet of paper is forced and through which it must pass to the guide-block E^3, which serves as a stop for the sheet, and such contracted or tapering throat is of such dimensions as to admit of the passage of but one sheet of paper at a time.

At a predetermined point on the section E' is a stud or projection F, having at its outer end a small friction-roller f, adapted to travel in the camway for guiding and operating the gripper-lever E. Fulcrumed, preferably on the hinge-pin e, is a lever G, one end of which is secured to the stud F on the section E' of the gripper-lever E, the opposite end g terminating toward the shaft A'.

Opposing the side of the gripper-lever which carries the trip-lever G and friction-roller f is a camway H, secured to a stationary portion of the machine. At a predetermined point on the cam-plate is a pin carrying a friction-roller h, which lies in the path of the end g of the trip-lever G. It will thus be seen that as the gripper-lever revolves with the shaft A' the end g of the trip-lever comes in contact with the friction-roller h, near the fulcrum e, and that the further movement of the shaft will cause the trip-lever to turn on its fulcrum e, and as the point of connection F between the said trip-lever and section E' of the gripper-lever is more remote from the fulcrum than is the point of contact with the stationary friction-roller h, it will cause the jaw of the gripper-lever to suddenly open, thus leaving the sheet of material held in the jaw free to be carried off by the tapes.

K is a series of tape-pulleys mounted in a suitable manner upon the machine with which it is desired to have the invention operate,

but in a manner to allow the free revolution of the gripper-lever and still be in such a position that as the gripper-lever revolves after having secured a sheet of material, they, one gripper-lever on each side of the material, will draw the said material directly between the tape-pulleys before the trip-lever opens the jaw. The tapes then convey it to the desired point.

The operation of this mechanism is as follows: Power being applied to the shaft A′, through the medium of the chain *a*, it is revolved in the direction of the arrows shown in Figs. 1, 4, and 5. To begin, we will suppose the gripper arm or lever E to be in an upright position, as shown in dotted lines in Fig. 7. The lower end *g* of the trip-lever G has just come in contact with the stationary friction-roller *h*, and as the shaft continues to revolve the trip-lever turns upon its fulcrum *e*, and carries with it the outer section E′ of the gripper-lever, thus opening the jaw *e′*. As the point of connection F is more or less farther removed from the fulcrum *e* than is the trip-roller *h*, it will be seen that as the shaft revolves the tendency is to open the jaw of the gripper-lever more or less quickly. The shaft continuing to revolve throws the stud F, which carries the friction-roller *f*, in the course shown by dotted lines, Fig. 7, and before the end *g* has left the stationary roller *h* the roller *f* has entered the camway H′, which is made of the required form to carry the gripper-lever during a predetermined part of its revolution, and in the course of its revolution the gripper-lever assumes the positions shown in Figs. 4 and 5. When it comes to the point shown by dotted lines, Fig. 4, the pusher-finger e^3 has come in contact with the surface of the material X, which is the material to be operated upon. This finger may, if necessary, be provided with a friction-cap e^7, made of leather, rubber, or other suitable material. The continued revolution of the gripper-lever draws the said pusher-finger over a portion of the surface, and as there is more or less pressure applied during its travel by any suitable means, as by the spring e^4, it will be seen that the tendency is to push the upper sheets in the direction of its travel, and the sheets assume the shape shown in Fig. 5, with the upper sheets slightly in advance of those below. When the pusher-finger has come in contact with the surface of the material, the flanges of the shoe e^5 are about to enter the guide formed therefor by the projections e^6 on the guide-blocks E^3 and have formed, in conjunction with the curved or rounded upper edge of the receptacle, a contracted or tapering throat, which allows but one sheet to advance to the guide-blocks E^3. The pusher-finger will usually advance more than one sheet against the rounded edge of the receptacle, but, by reason of the fact that the curved portion e^5 of the gripper-arm, moving forward at the same time as the pusher-finger, presses the upper sheet against the rounded edge of the receptacle for a limited time, the sheets below the upper sheet are thereby prevented from being advanced as far as the upper sheet, because the edges of the under sheets will engage the rounded edge of the receptacle, while the upper sheet is moved forward until it strikes the guide-blocks E^3. At or about this time the curved portion of the gripper is automatically disengaged from its pressing action on the upper sheet and drops down, as shown in dotted lines in Fig. 5, the paper remaining for a very brief interval in this free position until the jaws of the gripper are engaged therewith. The curved portion of the gripper therefore forms a narrow throat with the rounded upper edge of the receptacle at the time the upper sheet is being advanced beyond the under sheets, which may have been more or less advanced themselves, and, in this way, I am able to effectively separate the upper sheet in every instance from those below it and from the pile. The material is steadied in its forward movement by the weight upon the roller *d*. It has been found that the material must be steadied for the reason that as the pusher-finger leaves the surface suddenly it would, if the material were not steadied, have a tendency to throw the upper sheet back so it could not be taken up by the gripper-lever. When the finger has left the surface of the paper, the gripper-lever begins to assume a straight, or its normal, position, and as the roller *f* travels in the camway it causes the section E′ of the lever to retreat from its forward movement, throwing the nose *r* of the section E′, which forms one-half of the jaw when closed in under the ledge of the portion E^2, and before the jaw has completely closed the said nose *r* travels over the said ledge and under the sheet a certain distance before it meets the other portion of the jaw *r′*. It will be seen that the sheet is raised slightly as it is gripped by the jaw, allowing air to enter between the sheets, which destroys the vacuum therebetween and permits the upper sheet to be drawn out without disturbing those below it. The ledge of the portion E^2 may be slightly cut away, as at *s*, Fig. 6, to more readily facilitate the gripping of the sheet by the jaws. As the gripper has now assumed its normal or straight position, it travels in a true radius from the shaft A′, carrying the material with it, and just before it has reached the position shown in dotted lines, Fig. 7, the one which was taken for our starting position, it has drawn the sheet between the traveling tapes, which, as soon as the jaw is opened by the trip-lever G in the manner above described, convey it to the desired point. It is preferable to have one of these grippers on each side of the sheet adapted to travel in unison during the revolution of the shaft, as they tend to keep the material straight, as must be done if it be a large or thin sheet, and also to draw it more accurately between the tapes. The number, how-

ever, is not essential to the spirit of my invention.

I will now describe the mechanism for keeping the paper at the required level. The connecting-rod b^6, (see Figs. 1 and 12,) being connected at one end eccentrically to the shaft A′, and at the other end to the rocker-arm b^4, mounted loosely upon the shaft b^2, it will be seen that the rotating of said shaft A′ will cause the rocker-arm b^4 to reciprocate. The spring-dog b^5 on the said arm b^4 is normally in mesh with a ratchet-wheel b^3, mounted rigidly upon the shaft b^2. Also mounted rigidly upon the shaft b^2 is a miter-wheel b', meshing with a corresponding miter-wheel b upon the vertical screw-threaded shaft B. This shaft B is mounted in bearings adapted to allow its rotation and has traveling on the screw-threaded portion thereof a loose collar C, provided with dogs c, adapted to mesh, when desired, with the thread on the shaft, and also supporting a table c^3, on which the material is placed. This table is provided with adjustable guides c^4, adapted to be set by means of the thumb-screw c^5, according to the width of the material. Thus it will be seen as the rocker-arm b^4 is reciprocated the spring-dog b^5, meshing with the ratchet-wheel b^3, rotates the shaft b^2, which rotation, through the medium of the beveled gears b' and b, transmits a similar rotation to the threaded shaft B, and as the dogs c of the collar C are in mesh with the thread on said shaft B, it will, as the shaft rotates, raise the collar supporting the table c^3. This mechanism should be so timed that the raising of the table c^3 will correspond to the number and thickness of the sheets taken off by the gripper-levers; but to prevent its rising too high, I provide on a suitably-mounted cross-shaft D an arm D′, carrying a roller d, which rests upon the surface of the material near the center. It is preferable to have this near the center for the reason that it will rest more nearly upon the true level of the material than if it were at either end. At the outer ends of this shaft are mounted arms d', which project toward and near to the spring-dog b^5. The said dog has secured at the proper point thereto a pin b^7, which projects through a slot d^2 in the arm d'. Thus if the material rises above the desired point it raises the roller d, resting thereon, turning the shaft D, raising the arm d', which, through the medium of the pin connection with the dog, holds the said dog out of engagement with the ratchet-wheel, allowing the rocker-arm and dog to reciprocate without turning the ratchet until enough material has been removed to allow the dog to again come in mesh with the said ratchet.

While I have herein shown and described specific details of my improved mechanism, I do not however wish to limit myself to the exact construction shown, as the parts may obviously be changed and reversed, or their mechanical equivalents substituted therefor, without departing from the spirit of my invention.

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

1. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotatable arm constructed to advance, grip and carry a sheet of paper from said pile to a predetermined point of delivery, in the course of its revolution and means for actuating said arm, substantially as described.

2. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a jointed rotatable arm adapted in the course of its revolution to advance, grip and carry a sheet of paper from said pile to a predetermined point of delivery, and means for actuating said arm, substantially as described.

3. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotatable arm adapted to advance, grip and carry a sheet of paper from said pile, means for guiding the arm in its proper course, and means for operating said arm, substantially as described.

4. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotatable gripper-arm normally arranged above the paper and adapted in the course of its revolution to pass over and below the edge of a sheet of paper and to grip and raise the same and means for actuating said arm, substantially as described.

5. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a jointed rotatable gripper-arm normally arranged above said pile and adapted in the course of its revolution to pass over and below the edge of a sheet of paper and to grip and raise the same and means for actuating said arm, substantially as described.

6. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotatable arm adapted in the course of its revolution to advance a sheet of paper on said pile beyond the lower sheets, pass over and below the edge of the sheet so advanced, and to raise and grip the same and means for actuating said arm, substantially as described.

7. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a jointed rotatable arm adapted in the course of its revolution to advance a sheet of paper from said pile beyond the lower sheets, to pass over and below the edge of the

sheet so advanced, and to raise and grip the same and means for actuating said arm, substantially as described.

8. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of an arm adapted to rotate and comprising a pusher-finger arranged to bear and rub upon the surface of the paper, thus advancing the upper sheet beyond the lower ones, and a jaw adapted to grip and carry the sheet so advanced, substantially as described.

9. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of an arm adapted to rotate and comprising a pusher-finger arranged to bear and rub upon the surface of the paper, a presser foot or shoe, means coöperating with said presser foot or shoe to prevent more than one sheet being advanced at one time, and a jaw adapted to grip the sheet so advanced, substantially as described.

10. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotating arm adapted to advance and grip a sheet of paper, means for actuating said arm, means for steadying the paper and preventing more than one sheet being advanced at a time in position to be gripped, and means for guiding said arm in the desired course, substantially as described.

11. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotating jointed arm adapted to advance, grip and carry a sheet of paper, means for actuating said arm, and means for breaking said joint at a predetermined point in the rotation of said arm, substantially as described.

12. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotating arm adapted to advance and grip a sheet of paper and deliver the same at a predetermined point in the revolution of said arm, means for actuating said arm, the gripper-jaws on the arm, and means for opening the gripper-jaws of said arm at the point of delivery, substantially as described.

13. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a jointed rotating arm comprising a finger adapted to bear and rub upon the surface of the paper, and advance a sheet, and jaws adapted to grip the sheet so advanced, and means engaged by the arm for opening the jaws to release the sheet from said jaws, substantially as described.

14. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a jointed rotating arm having a finger adapted to advance the sheets in said pile, means for increasing the friction of said finger upon the said sheet, a jaw adapted to grip the sheet so advanced and carry it to a predetermined point, and means for discharging said sheet from said jaws, substantially as described.

15. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, and means for advancing said sheets, of a rotating arm composed of two sections hinged together, gripper-jaws on said sections, respectively, and means for yieldingly maintaining said sections in normal relation to each other, substantially as described.

16. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, and means for advancing said sheets, of a rotating arm composed of two sections hinged together, gripper-jaws on said sections, respectively, means for yieldingly maintaining said sections in normal relation to each other, and means for breaking the joint in said arm, substantially as described.

17. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotating arm composed of two sections hinged together, one of said sections having a finger adapted to bear upon and advance the sheets from said pile as the arm revolves, means for yieldingly maintaining said sections in normal relation to each other, and gripper-jaws carried by said sections, substantially as described.

18. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, and means for advancing said sheets, of a rotating gripper-arm composed of two sections hinged together, means for yieldingly maintaining said sections in their normal relative positions, gripper-jaws on said sections respectively adapted to grip and carry the sheets from the receptacle to a predetermined point of delivery, and a cam adapted to guide said arm during its revolution, substantially as described.

19. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotating arm composed of two sections hinged together, one of said sections being provided with a movable finger adapted to bear and rub upon the sheets in said pile and successively advance the same, means for maintaining said sections in their normal relative positions, gripper-jaws on said arms respectively adapted to grip and carry the sheets from the receptacle to a predetermined point of delivery, and a cam adapted to guide said arm during its revolution, substantially as described.

20. In a machine for separating and distributing paper, the combination with a recepta-

cle containing sheets of paper arranged in a pile, of a gripper-arm composed of two sections hinged together, one of said sections being provided with a movable finger adapted to bear and rub upon the said sheets and successively advance the same, means for yieldingly maintaining said sections in their normal relative positions, gripper-jaws on said sections respectively, a cam engaged by the outer section during a portion of its revolution, and an arm on said outer section adapted to come in contact with a stationary obstruction while said arm is disengaged from the cam, substantially as described.

21. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a gripper-arm composed of two sections hinged together, one of said sections being provided with a movable finger adapted to bear and rub upon the said sheets and successively advance the same, means for yieldingly maintaining said sections in their normal relative positions, gripper-jaws on said sections respectively, a cam engaged by the outer section during a portion of its revolution, and an arm on said outer section adapted to come in contact with a stationary obstruction while said arm is disengaged from the cam, and thereby collapse said gripper-arm to discharge the sheet from the jaws, and means for conveying said sheet so discharged to any desired point, substantially as described.

22. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a gripper-arm composed of two sections hinged together, one of said sections being provided with a movable finger adapted to bear and rub upon the said sheets and successively advance the same, means for yieldingly maintaining said sections in their normal relative positions, gripper-jaws on said sections respectively, a cam engaged by the outer section during a portion of its revolution, a lever fulcrumed to said outer section adapted to come in contact with a stationary obstruction and collapse said gripper-arm to discharge the sheet from said jaws, substantially as described.

23. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a flat pile, of a rotating arm adapted during its revolution to advance, grip and carry a sheet of paper, substantially as described, mechanism for advancing said arm, and means for automatically maintaining the top of said pile of sheets in approximately the same horizontal plane and in a flat position, substantially as described.

24. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotating arm adapted to advance, grip and carry a sheet of paper from said pile, mechanism for actuating said arm, means for guiding said arm during its revolution, means for discharging said sheet at a predetermined point in the revolution of said arm, and means for maintaining the top of said pile of sheets in approximately the same plane, substantially as described.

25. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a flat pile, of a rotatable gripper-arm adapted to advance, grip and carry sheets from said pile, mechanism for actuating said arm, and means for preventing more than one sheet advancing at one time to the point of gripping, substantially as described.

26. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a flat pile, of a rotatable gripper-arm adapted to advance, grip and carry sheets from said pile, mechanism for actuating said arm, means for preventing more than one sheet advancing at one time to the point of gripping, and means for maintaining the top of the pile in approximately the same horizontal plane, substantially as described.

27. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotatable gripper-arm composed of two sections, the outer section adapted to be guided by a cam in the desired course, means carried by said arm for advancing the sheets in said receptacle, the top one beyond the rest, and gripping said sheet when so advanced, and means for preventing more than one sheet advancing at one time to the point of gripping, substantially as described.

28. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of a rotatable gripper-arm composed of two sections, the outer section adapted to be guided by a cam in the desired course, means carried by said arm for advancing the sheets in said receptacle, the top one beyond the rest, and gripping said sheet when so advanced, means for preventing more than one sheet advancing at one time to the point of gripping, and means for automatically maintaining the top of the pile of sheets in approximately the same plane, substantially as described.

29. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of an adjustable rotating gripper composed of two sections hinged together and adapted to advance the upper sheet beyond the lower sheets, to grip said sheet when so advanced and carry it to a predetermined point in its revolution, means for actuating said gripper, a trip-lever attached to said gripper and adapted to be tripped at a predetermined point and open the jaws of said gripper, means for conveying said sheet from the

point of discharge to any other desired point, substantially as described.

30. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of an adjustable rotating gripper composed of two sections adapted to advance the upper sheet beyond the lower sheets, to grip said sheet when so advanced and carry it to a predetermined point in its revolution, means for actuating said gripper, a trip-lever attached thereto and arranged to be tripped at such predetermined point and open the jaws of said gripper, means for conveying said sheet from the point of discharge to any other desired point, and means for keeping the top of the pile in said receptacle at approximately the same plane, substantially as described.

31. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, of an adjustable rotating gripper composed of two sections hinged together and adapted to advance the upper sheet beyond the lower, to grip said sheet when so advanced and carry it to a predetermined point in its revolution, means for actuating said gripper, a trip-lever attached thereto and arranged to be tripped at such predetermined point and open the jaws of said gripper, means for conveying the said sheet from the point of discharge to any other desired point, means for maintaining the top of the pile in said receptacle at approximately a uniform plane, and means for preventing the material rising above such predetermined plane, substantially as described.

32. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, and rotating arms carrying means for advancing the upper sheet of said pile, of means adapted to temporarily form, with the side of the receptacle, a contracted throat closed at one end to permit the passage of said upper sheet therein and thereby prevent any of the under sheets which may have been more or less advanced from reaching the point where the sheet to be separated is grasped, substantially as described.

33. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, the upper edge of one side of said receptacle being rounded outwardly, of means for advancing the upper sheet of said pile and gripping means adapted to press the same for a limited time against said rounded edge of the side of the receptacle before the sheet is carried away thereby, substantially as described.

34. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, the upper edge of one side of said receptacle being rounded outwardly, of means for advancing a number of sheets against said rounded edge and means for pressing the upper sheet for a limited time against said rounded edge of the side of the receptacle in advance of the other sheets, substantially as described.

35. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, the upper edge of one side of said receptacle being rounded outwardly, of means adapted to advance the upper sheet of said pile a limited distance, means for pressing the same against the edge of said receptacle, and mechanism for automatically and momentarily releasing said pressing means from its pressing action on said upper sheet and then cause the same to grasp and remove said sheet from the pile, substantially as described.

36. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, the upper edge of one side of said receptacle being rounded outwardly, of means for temporarily forming in conjunction with the rounded edge of the receptacle a gradually-contracted throat, means for advancing the upper sheet into said throat, and means for momentarily arresting the advance of said sheet, substantially as described.

37. In a machine for separating and distributing paper, the combination with a receptacle containing a number of sheets of paper arranged in a pile, of a rounded edge in front of the upper sheets on said pile, means for advancing the top sheet of said pile over said rounded edge, means for temporarily arresting the advance of said sheet and gripping means adapted to grasp the sheet so advanced and carry it away, substantially as described.

38. In a machine for separating and distributing paper, the combination with a receptacle containing a number of sheets of paper arranged in a pile, of a rounded edge in front of the upper sheets on said pile, advancing means arranged above the pile and adapted to be brought down in contact therewith and moved forward to advance the top sheet on said pile, means for temporarily arresting the advance of said sheet, and means adapted to form a narrow throat above the said rounded edge to prevent more than a single sheet being advanced to the gripping mechanism at a time, substantially as described.

39. In a machine for separating and distributing paper, the combination with a receptacle containing a number of sheets of paper arranged in a pile, a rounded edge in front of and adjacent to said pile, means for advancing the upper sheet of said pile, means for temporarily arresting the advance of said sheet and means for forming a narrow throat above the said rounded edge to receive said upper sheet, substantially as described.

40. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, the upper edge of one side of said recep-

tacle being rounded outwardly, of adjustable guide-blocks arranged on one side of said receptacle and having lips projecting toward each other, and a gripper adapted to operate between said lips, substantially as described.

41. In a machine for separating and distributing paper, the combination with a receptacle containing sheets of paper arranged in a pile, the upper edge of one side of said receptacle being rounded outwardly, of adjustable guide-blocks arranged on said side of the receptacle and having lips projecting toward each other, and a gripper adapted to operate between said lips and having enlarged portions on each side thereof arranged to operate beneath said lips, substantially as described.

42. The combination with a receptacle containing sheets of paper arranged in a pile, of means for advancing and separating a single sheet from the pile comprising a pusher-finger adapted to engage the pile of paper and advance one or more sheets, a presser foot or shoe adapted to engage the top sheet, and means coöperating with said presser foot or shoe to prevent more than a single sheet of paper from being completely advanced to the point at which the sheet is gripped and separated from the pile, substantially as described.

43. The combination with a receptacle containing sheets of paper arranged in a pile, of a rotating gripper-arm carrying means for temporarily forming with the upper edge of the side of said receptacle a narrow throat to receive a single sheet of paper, and a pusher-finger carried by said arm adapted to engage the upper sheet of paper and move it forward and into said throat, substantially as described.

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Witnesses:

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