E. J. BRASSEUR.

SHEET FEEDING APPARATUS.

APPLICATION FILED MAY 17, 1910

979,822.

Patented Dec. 27, 1910.

3 SHEETS—SHEET 1.

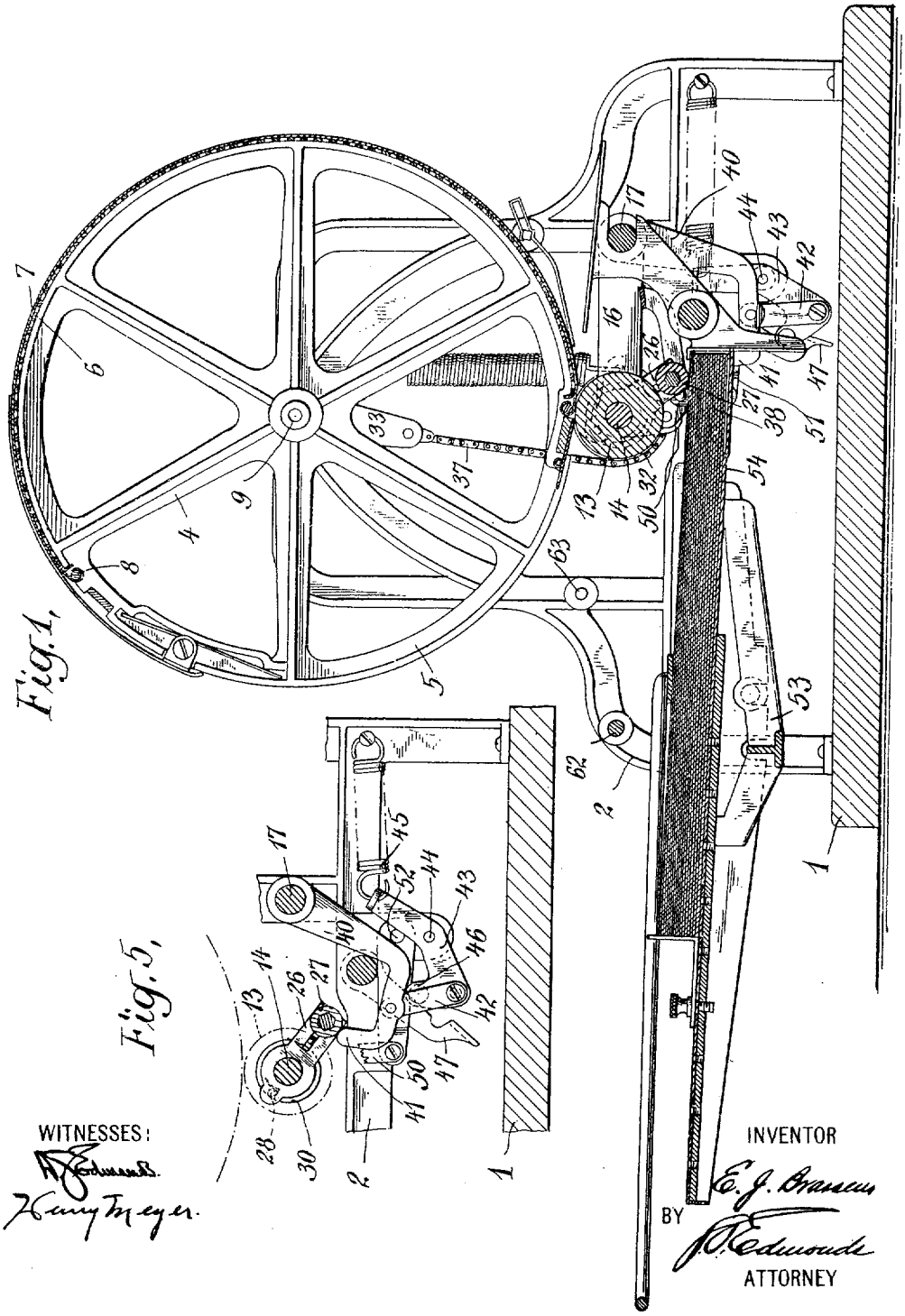

Fig. 1.

Fig. 5.

WITNESSES:

Henry Meyer.

INVENTOR

E. J. Brasseur

BY

J. Edmonds

ATTORNEY

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3 SHEETS—SHEET 2.

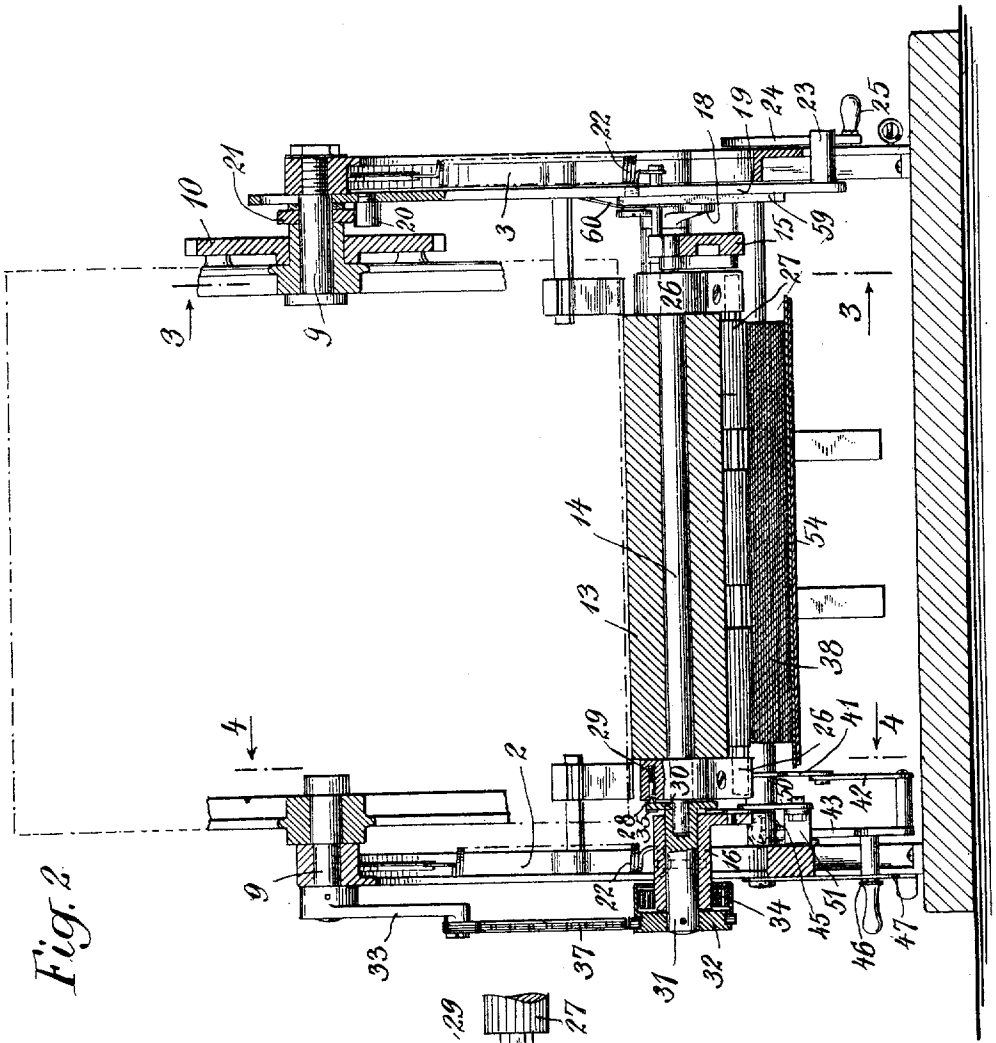

Fig. 2.

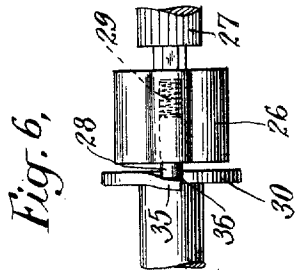

Fig. 6.

WITNESSES:

Henry Meyer

INVENTOR

E. J. Brasseur

BY

J. O. Edmunds

ATTORNEY

E. J. BRASSEUR.

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3 SHEETS—SHEET 3.

Fig. 4.

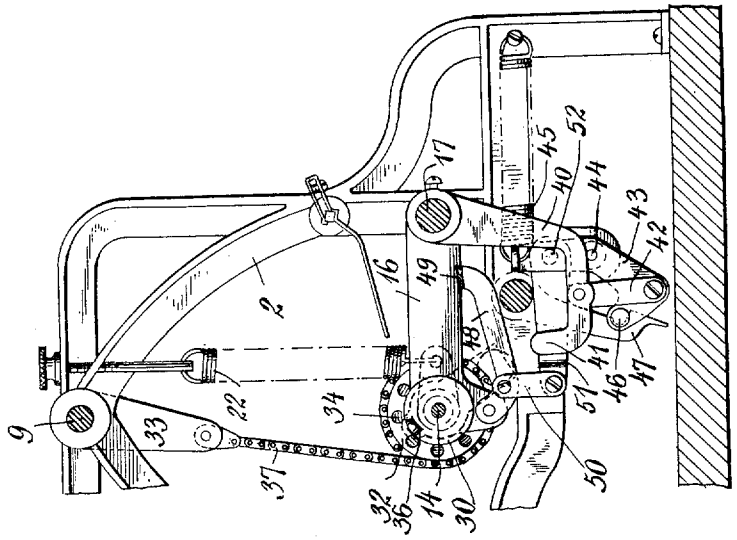
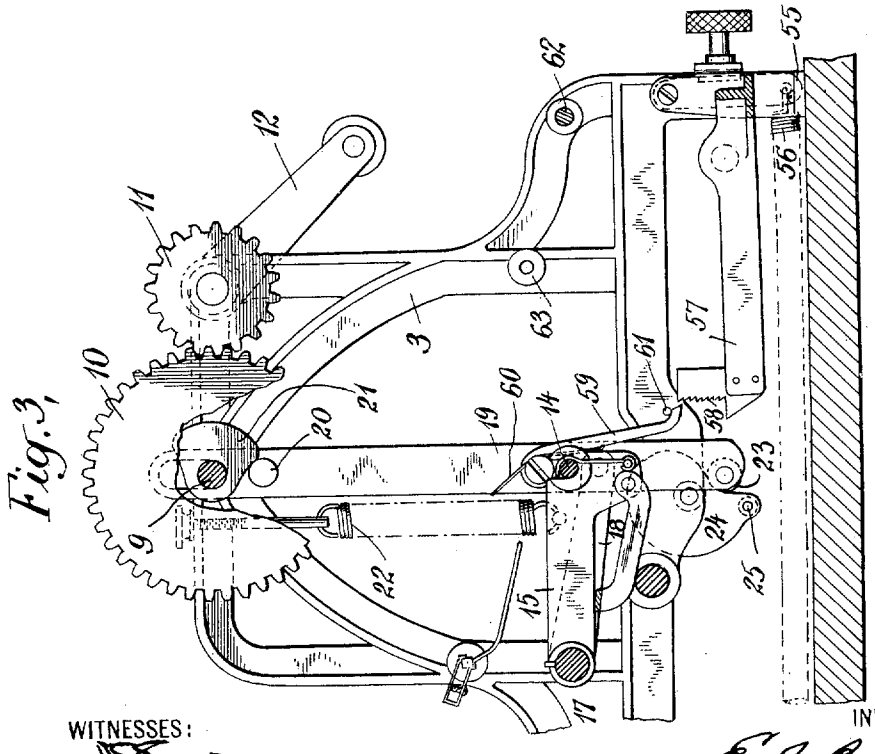


Fig. 3.



WITNESSES:

Henry Smeyer.

INVENTOR

E. J. Brasseur

BY

J. P. Edmonds

ATTORNEY

UNITED STATES PATENT OFFICE.

ERNEST J. BRASSEUR, OF CHICAGO, ILLINOIS, ASSIGNOR TO A. B. DICK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SHEET-FEEDING APPARATUS.

979,822. Specification of Letters Patent. **Patented Dec. 27, 1910.**

Application filed May 17, 1910. Serial No. 561,802.

To all whom it may concern:

Be it known that I, ERNEST J. BRASSEUR, a subject of the King of Belgium, residing in the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Sheet-Feeding Apparatus, of which the following is a specification.

This invention is directed to the provision of an improved form of sheet-feeding apparatus and especially an apparatus of this character adapted for use in connection with stencil-duplicating apparatus.

More particularly, the invention relates to an improved form of sheet-feeding apparatus of the type disclosed in Patent No. 960,514 dated June 7, 1910.

The object of this invention is to simplify the construction of a sheet-feeding apparatus of this character so that it can be manufactured at low cost and to provide a sheet-feeding apparatus which is reliable and efficient in operation.

The preferred embodiment of the invention is illustrated in the accompanying drawings in which—

Figure 1 is a central section of the machine, Fig. 2 is a transverse section of the same, Fig. 3 is a sectional detail view on line 3—3 of Fig. 2, Fig. 4 is a sectional detail view on line 4—4 of Fig. 2, Fig. 5 is a detail view of certain of the parts shown in Fig. 4 illustrating the other position of these parts and Fig. 6 is a detail view of the clutch.

Referring to these drawings, 1 designates the base of the machine upon which are supported the side-frames 2 and 3, in which is journaled the drum 4 comprising the heads 5 and a stencil-carrier 6 of foraminated material adapted to support an ink-pad 7 held in position by bars 8 and over which pad is placed a stencil of waxed paper or other material. The heads 5 of the drum are secured to stub-shafts 9 which are received in bearings formed in the side-frames 2, 3. Loosely mounted on one of the stub-shafts 9 is a gear 10 secured to the adjacent head 5. The gear 10 meshes with the pinion 11 carried by a stub-shaft which is mounted for rotation in a bearing formed in the side-frame 3 and carrying means for rotating the shaft and with it the drum 4, as for instance, a crank and handle 12.

The pressure-roller which coacts with the drum 4 is shown at 13. This roller is loose upon a shaft 14 the ends of which are rotatable in bearings formed in the free ends of arms 15 and 16 which are secured to a rock-shaft 17 mounted in bearings formed in the side-frames of the machine. Also secured to the rock-shaft 17 is an arm 18 the free end of which is pivotally connected to a reciprocating bar 19. This bar is guided in its vertical movement by one of the stub-shafts 9 (Fig. 3) which passes through an elongated slot in the bar. On the bar is a stud or roller 20 adapted to coact with a cam 21 which is secured to gear 10. The cam 21 coacting with the roller 20 serves to move bar 19 and the parts to which it is connected downwardly and when the cam passes beyond the roller, bar 19 and its connected parts are returned to their former positions by springs 22 connected at one end to the arms 15, 16 and at their other ends to the side-frames. The bar 19 lies adjacent to the inner side of the side-frame 3 and at its lower end carries a roller 23. On the outer side of the side-frame 3 is pivotally mounted an arm 24 adapted to coact with the roller 23 when turned by a handle 25 mounted thereon, so that by turning the arm 24 the bar 19 may be moved downwardly so as to carry the pressure-roller 13 away from the drum and hold it in inoperative position.

Loosely mounted upon the shaft 14 are two brackets 26 in the outer ends of which are secured the ends of a feeder 27; this feeder consists of a rod, portions of which are covered with rubber having a corrugated or roughened surface. In the bracket 26 adjacent to the side-frame 2 is an opening extending parallel to the axis of shaft 14 and this opening receives a pin 28. Between the inner end of this pin and the end of the opening in the bracket is a spiral spring 29 normally tending to force pin 28 outwardly so as to press its outer end into engagement with a clutch-member 30. This clutch-member is formed on or secured to a stub-shaft 31 in the inner end of which is a bore to receive the end of the shaft 14. This stub-shaft extends through a bore formed in the free end of the arm 16. On the outer end of the stub-shaft 31 is secured a disk 32 having a circumferential groove formed therein. One end of a flexible connector such as a sprocket chain 37 is secured to the disk 32 at a point in the groove therein and extends upwardly from this disk, its upper end be-

ing connected to a crank 33 secured to the stub-shaft 9 which is pivotally mounted in the side-frame 2. At one side the disk 32 is hollow and in the chamber thus formed is a spiral spring 34 one end of which is secured to disk 32, the other end being secured to the arm 16.

The construction of the clutch-member 30 is best shown in Fig. 6. It consists of a disk having a portion thereof at the periphery cut to permit of bending it slightly out of the plane of the disk, as shown at 35, so as to form a shoulder 36 and a cam surface leading to this shoulder.

I will now describe the operation of the machine when feeding sheets into printing position automatically.

The handle 12 is turned to cause rotation of drum 4, thus turning the crank 33. When the crank moves upwardly it operates through the chain 37 to turn disk 32, shaft 31 and clutch-member 30 against the tension of spring 34 and as clutch-member 30 turns thus the shoulder 36 thereon engages the pin 28 and causes the brackets 26 and the feeder 27 to turn with it, from the position in which the feeder is shown in Fig. 1 in a clock-wise direction looking at that figure, until, near the end of one revolution, the feeder moves by gravity ahead of the shoulder 36 on the clutch-member due to the weight of the feeder until the latter again rests upon the top of the sheet-pile 38. In doing this the feeder loosens the top sheet of the pile 38 and moves the forward edge of that sheet over the pressure-roller 13. By this time the crank 33 will have been moved upwardly to the vertical position and it will then commence to move downwardly. During such downward movement of the crank, the chain 37 permits the spring 34 to turn disk 32 and clutch-member 30 in the reverse direction until at the end of the downward movement of the crank the shoulder 36 will have passed beyond the pin 28 so that on the next forward movement of the clutch-member it will pick up the pin 28 and the feeder 27 again. The feeder 27 is thus caused to make one revolution about the pressure-roller 13 and to feed the top sheet of the pile into printing position during each complete revolution of the drum 4. But this movement of the feeder is not a continuous movement; the movement is discontinuous, the feeder making one revolution and then resting in the position in which it is shown in Fig. 1 until about the time when the open side of the drum comes over the pressure-roller again whereupon another revolution of the feeder is made. This movement of the feeder is effected by a clutch-member, in this instance the clutch-member 30, having a reciprocating rotary movement transmitted thereto from the drum of the machine, this clutch-member picking up the feeder, causing rotation of the feeder and then moving backward to its initial position so that it can again pick up the feeder and cause another rotation thereof. Most of this movement of the feeder takes place while the open side of the drum is passing over the pressure-roller, so that when the closed portion of the drum comes around again a sheet will be gripped between it and the roller and will be imprinted upon and delivered. The slight upward and downward movement of the pressure-roller as the drum is rotated has no material effect upon the sheet-feeding devices.

In machines of this character it is usually desirable to provide means whereby the sheets can be fed to a printing position manually or automatically at will; I have therefore provided means whereby the operation of the feeder 27 can be discontinued to permit of manual operation when desired and in combination with such means I provide a paper-stop operable when the manual feed is employed and inoperative when the automatic feed is employed. Loosely mounted upon the rock-shaft 17 is an arm 40 having an upwardly turned end 41 and a link 42 is pivotally connected at one end to arm 40 and at the other end to a lever 43 pivotally mounted at 44 upon the side-frame 2; the upper end of this lever has a spring 45 connected thereto the other end of which is connected to the side-frame 2. The opposite end of lever 43 has a pin 46 thereon which is adapted to be received in a notch formed in a latch 47 pivotally mounted upon the side-frame 2. The arms 15 and 16 carrying the pressure-roller are each provided with a depending ear to which is pivotally connected one end of an arm 48 and the free ends of these two arms carry a paper-stop 49 extending across the machine. The arm 48 adjacent to the side-frame 2 is pivotally connected by a link 50 to an arm 51 which is pivotally mounted at 52 upon the side-frame 2.

Fig. 4 shows the parts above described in the positions which they occupy when the automatic feed of the sheets is being used. In this position pin 46 is in the slot in the latch 47 so that lever 43 is held in the position in which it is shown against the tension of spring 45 and the upwardly extending end 41 of the arm 40 is out of the path of the adjacent bracket 26 carrying the feeder. Furthermore, the pin 46 is a substantial distance below the arm 51. When the arms 15 and 16 and the pressure-roller are depressed, as they will be during each rotation of the drum by the cam 21, the parts 48, 50 and 51 will be depressed with them, so that the paper-stop 49 will remain in substantially the same position in which it is shown in Fig. 4, that is the inopera-

tive position, throughout the downward and upward movement of these parts. If it should be desired to discontinue the automatic feed of the sheets and feed the sheets in manually, the latch 47 is moved so as to release the pin 46 whereupon the spring 45 will operate to move lever 43 and the parts connected thereto to the positions in which they are shown in Fig. 5. This movement carries the upwardly turned end 41 of arm 40 into the path of the adjacent bracket 26 for the feeder 27 and carries pin 46 upwardly so that it lies directly under the arm 51. When the feeder 27 makes its next revolution it will be arrested by the end 41 of arm 40 in a position substantially above that in which it is shown in Fig. 1, and when in this position the backward movement of the clutch-member 30 will not be sufficient to permit the pin 28 to drop over the shoulder 36 on the clutch-member; therefore, when the clutch-member makes its next forward movement it will not pick up the feeder and carry the latter with it, but the feeder will remain in the position in which it is shown in Fig. 5 until arm 40 is again lowered; also, the pin 46, being directly under the arm 51, will preclude downward movement of that arm and therefore when the arms 15 and 16 and the pressure-roller carried thereby move downwardly, actuated by cam 21, the arm 51 and link 50 will cause the arms 48 to turn about their pivotal connections to the arms 15 and 16 so as to move the paper-stop 49 in the arc of a circle until it lies directly over the pressure-roller 13 in which position it will serve as a paper-stop to arrest the movement of a sheet when the latter is moved manually into printing position.

The means for mounting and moving the feed-board upon which the sheet-pile 38 is mounted is substantially the same as that disclosed in the patent above referred to. Extending between the side-frames of the machine and mounted for rotation in bearings formed therein is a rocking frame 53 on which the feed-board 54 rests. To this frame is secured an arm 55 and a long spiral spring 56 has one end secured to the free end of arm 55 and the other secured to the frame of the machine so that it tends to rock the frame 53 so as to carry the inner end of the sheet-pile upwardly. To frame 53 is secured an arm 57 having a ratchet 58 at its forward end adapted to be engaged by a pawl 59, mounted upon the bar 19 and actuated by a spring 60 to carry its free end into engagement with the ratchet 58. When bar 19 moves upwardly pawl 59 engages a pin 61 on the side-frame 3 so as to be disengaged from the rack 58 and thus allow the spring 56 to move the feed-board until the top sheet of the pile thereon is pressed yieldingly against the feeder. This is the position of the feed-board when the automatic feed of the sheets is employed but when the sheets are to be moved manually the feed-board is removed from the supporting frame 53 and is mounted upon a rod 62 extending between the side-frames, with portions of the support extending under studs 63 on the side-frames so that a sheet moved manually over the top of the pile will have its forward end projected over the pressure-roller and into engagement with the paper-stop.

Having described my invention, what I claim as new therein and desire to secure by Letters Patent of the United States is:

1. The combination of a rotatable drum, means for rotating the same, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a member concentric with said roller and actuated by said drum, and automatically actuated means for connecting said member in driving relation to the feeder during a portion of each revolution of the drum and disconnecting it therefrom, substantially as set forth.

2. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a member mounted on said shaft, means actuated as said drum is rotated for giving said member a reciprocatory rotary movement, and automatic devices for connecting said member in driving relation to said feeder when the member is moving in one direction and disconnecting it from the feeder when the member is moving in the opposite direction, substantially as set forth.

3. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a member, means for giving said member a reciprocatory movement as said drum is rotated, and means for causing said member to actuate the feeder when moving in one direction, substantially as set forth.

4. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a member connected to said drum and having reciprocating rotary movement as said drum is rotated, and a clutch between said member and feeder, substantially as set forth.

5. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a crank secured to said drum, a member connected to said crank

and reciprocated thereby, and means connecting said member to said feeder, substantially as set forth.

6. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a crank secured to said drum, a member connected to said crank and reciprocated thereby, and a clutch connecting said member to the feeder when the member is moving in one direction, substantially as set forth.

7. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a member movable in one direction as the drum is rotated, a spring for moving said member in the other direction, and means for connecting said member to the feeder, substantially as set forth.

8. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a member rotated in one direction as said drum is rotated, a spring for rotating the member in the opposite direction, and a clutch for connecting the member to the feeder when the member is moving in one direction, substantially as set forth.

9. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a crank rotatable with the drum, a member connected thereto and rotated thereby in one direction, a spring for moving the member in one direction, and an automatic clutch for connecting the member to the feeder when it is moving in one direction and disconnecting it therefrom when it is moving in the opposite direction, substantially as set forth.

10. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, means actuated by the rotation of said drum for automatically rotating the feeder intermittently, and a movable device adapted to be moved into or out of position for arresting the movement of the feeder, substantially as set forth.

11. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a clutch actuated when the drum is rotated for automatically rotating the feeder intermittently, and a movable device adapted to be moved into and out of position for arresting movement of the feeder and rendering said clutch inoperative, substantially as set forth.

12. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, a clutch--member, a connection from the drum to said member causing rotation of the drum to transmit reciprocatory rotary movement to the clutch-member, means for automatically connecting said member to the feeder when moving in one direction and disconnecting it therefrom when moving in the other direction, and a member movable into position for rendering the clutch-member ineffective to move the feeder, substantially as set forth.

13. The combination of a rotatable drum, a shaft, a roller on said shaft coacting with said drum, a feeder mounted on said shaft, a feed-board for supporting a sheet-pile adjacent to said feeder, means actuated when the drum is rotated for automatically rotating the feeder intermittently, a paper-stop, means for moving the same, and means for rendering the stop moving means operative or inoperative, substantially as set forth.

This specification signed and witnessed this 13th day of May, 1910.

ERNEST J. BRASSEUR.

Witnesses:
R. R. HARRINGTON,
M. H. BURKART.