

F. DE MINICO.
SHEET FEEDING MECHANISM.
APPLICATION FILED AUG. 30, 1921.

1,428,149.

Patented Sept. 5, 1922.

3 SHEETS—SHEET 1.

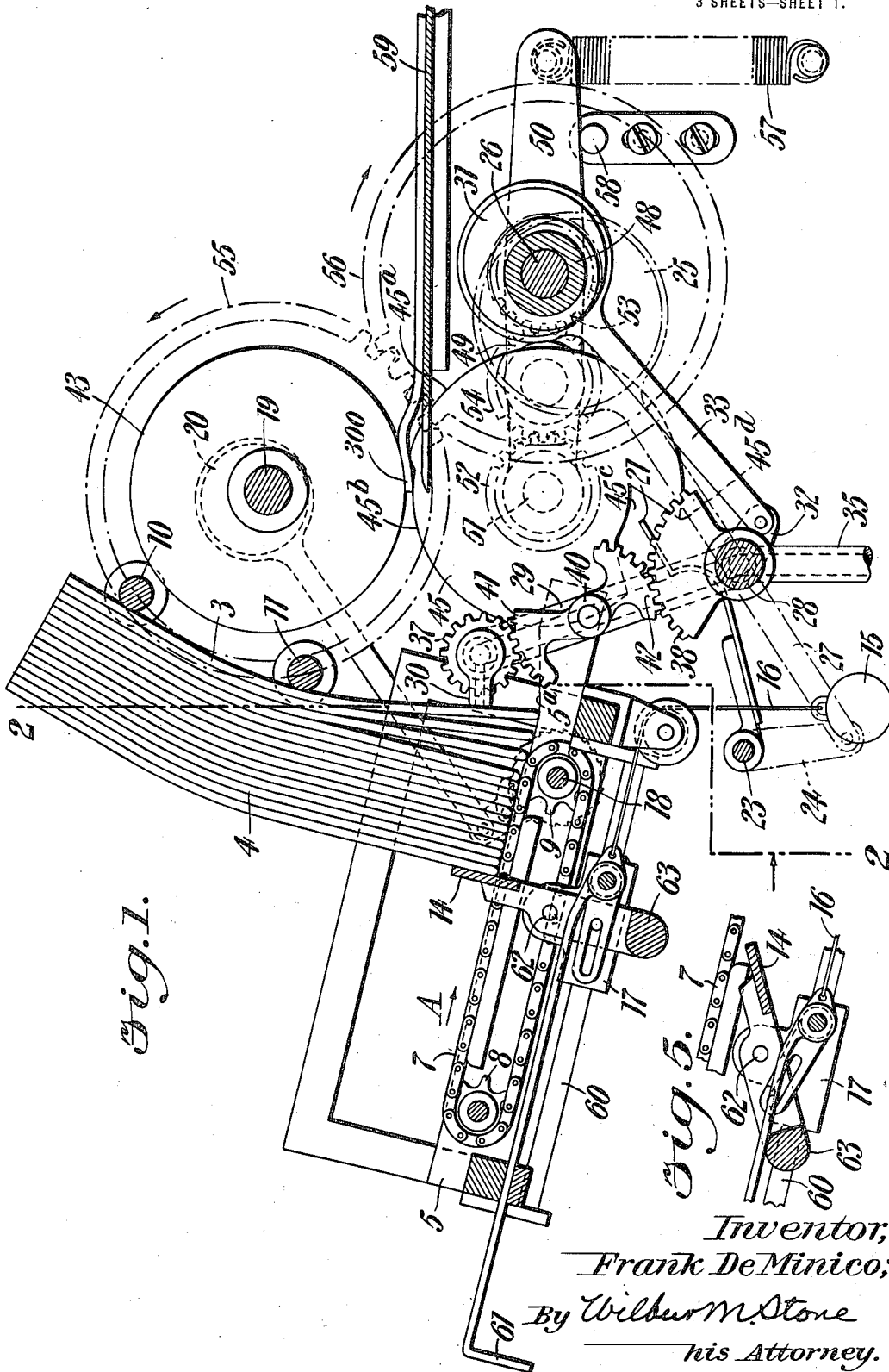


Fig. 1.

Fig. 5.

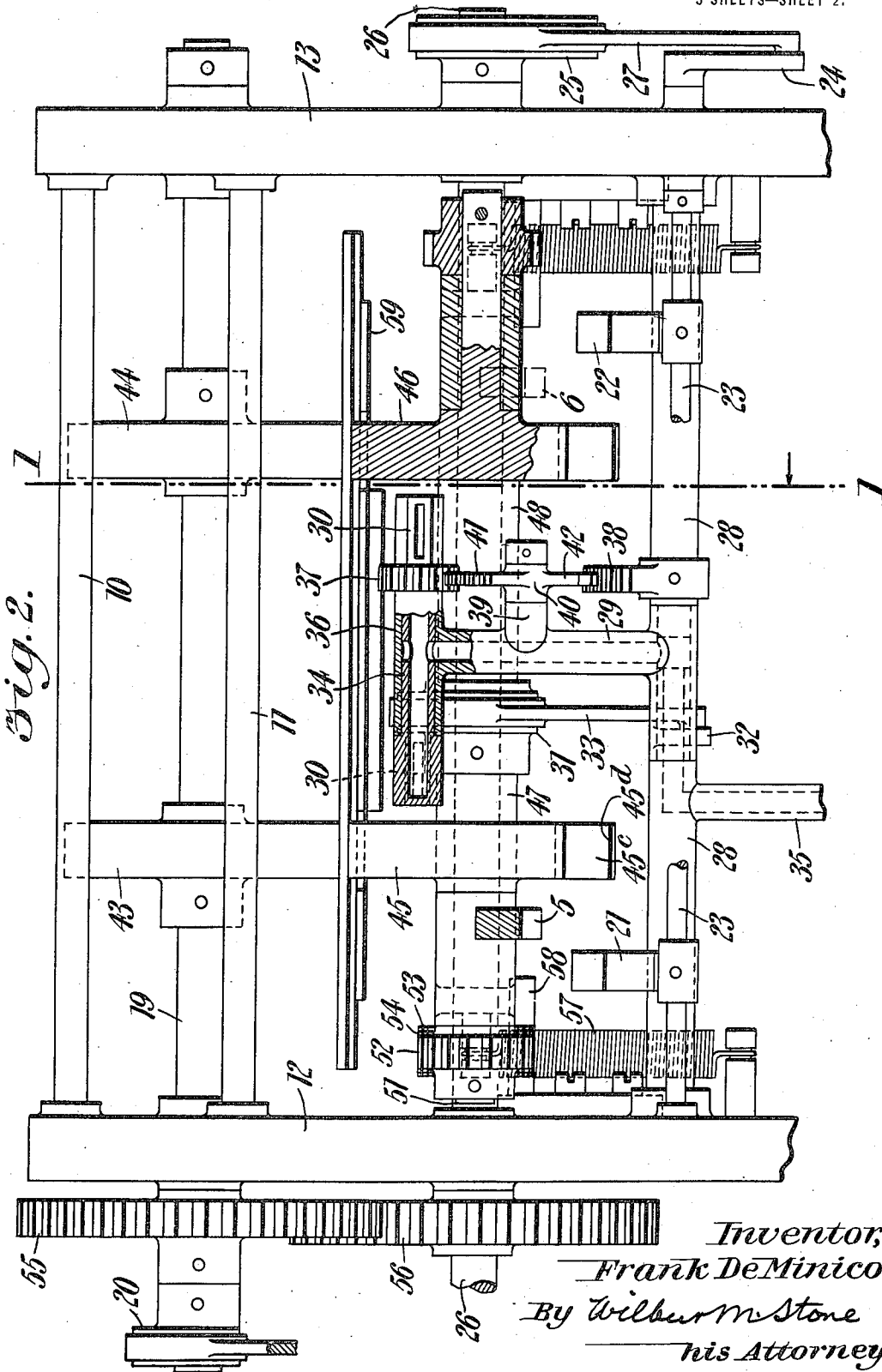
Inventor,
Frank DeMinico;
By Wilbur M. Stone
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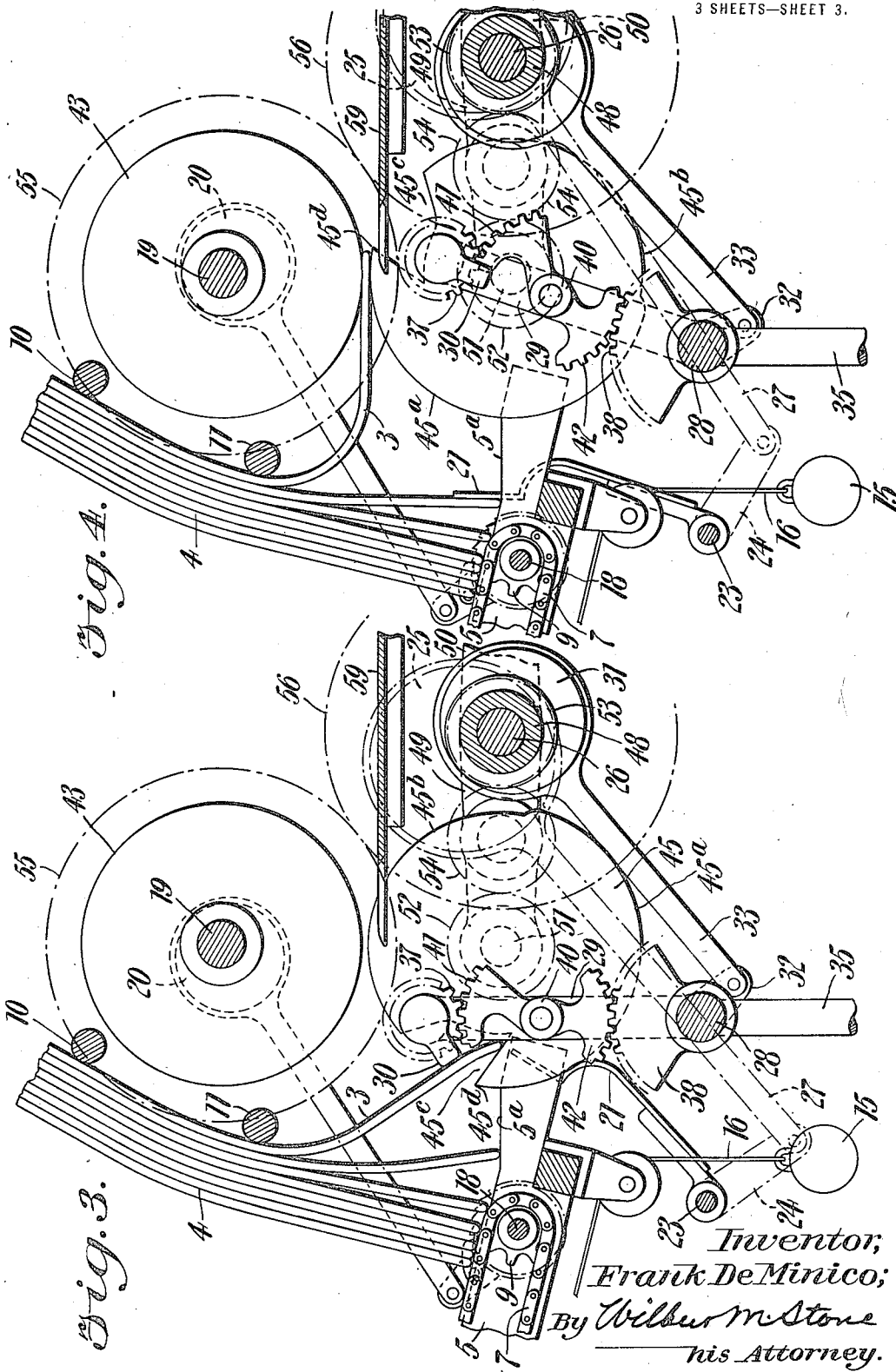
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

FRANK DE MINICO, OF NEW YORK, N. Y., ASSIGNOR TO POLLARD-ALLING MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SHEET-FEEDING MECHANISM.

Application filed August 30, 1921. Serial No. 496,940.

To all whom it may concern:

Be it known that I, FRANK DE MINICO, a citizen of the United States, and a resident of New York, borough of Bronx, in the county of Bronx and State of New York, have invented certain new and useful Improvements in Sheet-Feeding Mechanisms, of which the following is a specification.

This invention relates to sheet feeding mechanisms and has for its object to provide a mechanism of the class specified, simple in construction and rapid and accurate in operation. With these objects in view my improvements comprise features illustrated in their preferred embodiment in the accompanying drawings, wherein:—

Figure 1 is a sectional side elevation on line 1—1 of Fig. 2, of so much of an organized sheet feeding machine as will suffice to illustrate my improvements. Fig. 2 is a rear elevation partly in section on line 2—2 of Fig. 1. Figs. 3 and 4 are side elevations, similar to a portion of what is shown in Fig. 1, and illustrate successive steps in the operation of my improved mechanism. Fig. 5 is a detail elevation of a portion of what is shown in Fig. 1 with the parts in different relative positions. All of the figures of the drawings are to the same scale.

The present invention is in the nature of improvements on the mechanism shown in Letters Patent of the United States No. 1,232,662, granted on my invention July 10, 1917, and to which reference may be had. In the mechanism therein set forth, the sheets are separated successively from the stack by means applied near their upper edges and those upper edges are turned abruptly downward about a small roll. In the present mechanism the sheets are separated successively from the stack by means applied near their bottom edges and those edges are turned upwardly in a large curve for engagement by subsequently acting members of the mechanism. While, with single sheets or thin periodicals, my earlier mechanism is highly successful, I have found that added facility and accuracy in handling thick periodicals is had with my present improved mechanism.

Directing attention now to the drawings, a stack of sheets or periodicals 4 is supported on a pair of spaced-apart rails 5, 6 between which are a pair of spaced-apart endless chains, as 7, supported on sprockets, as

8, 9. The upper runs of said chains travel in a plane slightly above the upper faces of rails 5, 6 so as to gently urge the lower edges of the periodicals forwardly toward the place of feeding, one at a time, to conveying mechanism. The upper portion of the foremost periodical 3 of stack 4 is supported by some convenient means, such as cross-rods 10, 11 reaching from side frame 12 to the opposite side frame 13. Rails 5, 6 and chains, as 7, have their sheet engaging portions inclined downwardly toward the place of feeding, whereby the force of gravity is efficient to maintain the stack against rods 10, 11. The delivery ends of rails 5, 6 are inclined upwardly, as at 5^a of rail 5, for supporting the periodical as its lower edge is bent forwardly by the suction feed. At its bottom, the rear end of stack 4 is engaged by pusher 14 which is urged forwardly by weight 15 attached by cord 16 to carriage 17 in which said pusher 14 is pivoted at 62. Said carriage slides on ways, as 60, and may be retracted by handle 61. When replenishing the stack, additional periodicals may be set up behind pusher 14, and then the pusher may be withdrawn to the left, Fig. 1, whereupon said pusher folds down (see Fig. 5) to below the upper runs of the chains, as 7, and when the pusher is sufficiently withdrawn to the rear of the added supply, its counterweight 63 will right it into operative position.

Shaft 18, to which chain sprockets as 9 are fixed, is rotated intermittently to advance the upper runs of said chains in the direction of arrow A by known means, such as a ratchet and pawl actuated from eccentric 20 fixed to shaft 19. For temporarily maintaining the front of stack 4, at the lower edge thereof, in suitable position for the engagement and removal of the foremost sheet, arms 21, 22 are fixed to shaft 23 mounted for oscillation below the place of feeding occupied by the lower end of sheet 3, Fig. 1. Said shaft 23 may be oscillated at suitable predetermined times, through arm 24 fixed thereto, by means of eccentric 25 fixed to shaft 26. Motion is communicated from eccentric 25 to arm 24 by means of the usual eccentric strap arm 27. Pivoted a short distance to the right of rockshaft 23, is fixed shaft 28, Fig. 1, at the midportion of which, Fig. 2, is oscillatably mounted arm 29. Said arm has oscillatably mounted

in its free upper end pickers comprising suction noses 30, 30 for engagement with the front face of the lower end of foremost periodical 3 of stack 4. Said arm may be oscillated from the position of Fig. 1, through that of Fig. 3, to the position of Fig. 4 and back again by means of eccentric 31 fixed to shaft 26. Motion is transmitted from said eccentric 31 to rockarm 32 projecting from the hub of arm 29 by the usual eccentric strap arm 33. Arm 29 and its transverse bearing 34 at its free end, are of tubular construction and such tubular construction extends through the hub of said arm to tube 35 depending from the left hand portion, Fig. 2, of shaft 28. Said tube 35 may be connected to some known source of suction, not shown. For oscillating suction noses 30, 30 for maintaining operative coaction with sheet 3 during the forward oscillation of arm 29, Fig. 1, the following means are provided: Said suction noses protrude from a common body 36 to which is fixed pinion 37. Fixed to the right hand portion of fixed shaft 28 is gear sector 38 and pivoted on hub 39 of arm 29 is oscillating member 40 having opposite gear sector portions 41, 42, the former meshing with pinion 37, the latter with gear sector 38.

For receiving and advancing the periodicals one at a time, when delivered thereto by suction noses 30, 30 the following means are provided: Fixed to upper shaft 19 and spaced-apart thereon are feed discs 43, 44, and therebelow for coaction therewith, respectively, are discs 45, 46. These latter discs have mutilated peripheries which will be described more in detail hereinafter. Also said discs 45, 46 are peculiarly mounted as follows: Turning freely on shaft 26 are opposite sleeves 47, 48. As these and the mechanisms carried thereby are substantially the same, a description of one will suffice for both. Sleeve 47 has projecting to the left therefrom arm 49 and to the right arm 50, Fig. 1. Arm 49 carries on its free end, pivotally mounted for rotation, disc 45, and fixed to shaft 51 of said disc is pinion 52. Fixed to shaft 26 is pinion 53 and pivotally mounted on arm 49 is intermediate gear 54, between and meshing with pinions 52 and 53. Shafts 19 and 26 are geared together by equal gears 55, 56. Arm 50 is constantly urged downwardly by spring 57 and its downward movement is limited by adjustable stop 58. By this organization it will be observed that, between discs 45 and 46, Fig. 2, an open space is provided in which arm 29 swings for moving each successive periodical into the paths of discs 45, 46, respectively.

Discs 45 and 46 each have a maximum radius equal to the radius of its coacting disc above on shaft 19. Said discs 45 and 46 are alike, and directing attention par-

ticularly to disc 45, it will be noted that about half of its periphery 45^a, is of one maximum radius, and that an adjoining portion 45^b, of about three eighths of the periphery, has a slightly less radius, and that between said portions is pocket 45^c whereby peripheral portion 45^a is provided with hook 45^d at its leading end.

To the right of discs 43 to 46, Fig. 1, and slightly below their plane of coaction is table 59. Said table extends to the left a short distance into the paths of discs 45, 46 and is suitably notched to give room for said discs.

The operation of my improved mechanism is as follows: A stack of sheets, pamphlets or periodicals 4, having been erected on rails 5, 6 with the upper portion of the right hand sheet 3 resting against rods 10, 11 and with pusher 14 urged by weight 15 against the lower rear portion of the stack, shaft 26, which may be considered the main shaft, is started in rotation in clockwise direction, Fig. 1. For the moment disregarding the position of sheet 3, the positions of the parts in Fig. 4, may be considered the initial position in the operation of the mechanism, and therein arms 21, 22 are shown in sustaining relation to the lower front portion of the stack. The slight separation of the bottom portions of some of the sheets of the stack will thereupon be more or less closed up by the incremental advance of the feed chains, as 7. Arm 29 then oscillates from the position of Fig. 4 to that of Fig. 1, suction noses 30, 30 swinging upwardly to present their operative mouths against the leading sheet 3, Fig. 1. At the same time arms 21, 22 swing away from engagement with the lower front portion of the stack, Fig. 1, thus leaving pickers 30, 30 free to move the lower portion of sheet 3 forwardly to the right over the upwardly inclined ends 5^a of rails 5, 6, and into the path of hooks 45^d of discs 45, 46, Fig. 3. Arm 29, continues its oscillation to the right, pickers 30, 30 release their hold of sheet 3 and hooks 45^d lift the leading end of the sheet into engagement with the lower portions of the peripheries of upper discs 43, 44, and maximum radius portions 45^a of discs 45, 46 thereupon coact with the respective upper discs to grip and feed sheet 3 forwardly to the right therebetween, Fig. 4. In the meantime arms 21, 22 swing back to sustain the lower forward portion of stack 4. The several feeding discs continuing their respective rotations, low portions as 45^b of lower discs 45, 46 release the following end 300 of the delivered sheet, and which sheet may then be advanced freely by means not shown to other operations of printing or otherwise as desired.

I claim:

1. In sheet feeding mechanism the com-

5 combination of a pair of rails for supporting a stack of sheets on edge, the delivery ends of said rails being inclined upwardly for sustaining each sheet as delivered, oscillating means for intermittently supporting the lower front portion of said stack, a pusher slidably mounted for engagement with the lower portion of the rear of the stack, and means for urging said pusher to engage said stack, said pusher being pivotally mounted for folding to below said rails.

10 2. In sheet feeding mechanism the combination of two upper feed discs spaced apart, two lower feed discs similarly spaced apart for coaction with said upper discs respectively, said lower discs being movable toward and from said upper discs, means for urging said lower discs toward said upper discs respectively, said lower discs being oppositely supported and actuated whereby an open space is provided therebetween, each of said lower discs having a portion of its periphery of maximum radius for coaction with its respective upper disc for advancing the sheets one by one and another portion of its periphery of less radius for freeing said sheet while still sustaining the sheet, each of said discs having a portion thereof cut away between said peripheral portions whereby the leading end of the portion of maximum radius is provided with a hook for engaging and lifting the sheet into engagement with its respective upper disc, and means located within said open space for delivering the lower portion of said sheets one at a time into the path of said lower discs.

3. In sheet feeding mechanism the combination of means for advancing a stack of sheets on edge, two upper feed discs spaced apart, two lower feed discs similarly spaced apart for coaction with said upper discs respectively, said lower discs being independently movable toward and from said upper discs respectively, means for urging said lower discs toward said upper discs respectively, said lower discs being oppositely supported and actuated whereby an open space is provided therebetween, each of said lower discs having a portion of its periphery of maximum radius for coaction with its respective upper disc for advancing the sheets one by one and another portion of its periphery of less radius for freeing said sheet while still sustaining the sheet, each of said discs having a portion thereof cut away between said peripheral portions whereby the leading end of the portion of maximum radius is provided with a hook for engaging and lifting the sheet into engagement with its respective upper disc, and an oscillating picker mounted for movement within said open space adapted and actuated for engaging the lower portion of the foremost sheet of the stack and for moving

said lower portion into the path of said lower discs.

4. In sheet feeding mechanism the combination of means for advancing a stack of sheets on edge, two upper feed discs spaced apart, two lower feed discs similarly spaced apart for coaction with said upper discs respectively, said lower discs being movable toward and from said upper discs, means for urging said lower discs toward said upper discs respectively, said lower discs being oppositely supported and actuated whereby an open space is provided therebetween, and means located within said open space for delivering the lower portions of said sheets one at a time into the path of said lower discs.

5. In sheet feeding mechanism the combination of means for advancing a stack of sheets on edge, two upper feed discs spaced apart, two lower feed discs similarly spaced apart for coaction with said upper discs respectively, said lower discs being movable toward and from said upper discs, means for urging said lower discs toward said upper discs respectively, said lower discs being oppositely supported and actuated whereby an open space is provided therebetween, and an oscillating picker mounted for movement within said open space and adapted and actuated for engaging the lower portion of the foremost sheet of the stack and for moving said lower portion into the path of said lower discs.

6. In sheet feeding mechanism the combination of means for advancing a stack of sheets on edge, two upper feed discs spaced apart, two lower feed discs similarly spaced apart for coaction with said upper discs respectively, said lower discs being movable toward and from said upper discs, means for urging said lower discs toward said upper discs respectively, each of said lower discs having a portion of its periphery of maximum radius for coaction with its respective upper disc for advancing the sheets one by one and another portion of its periphery of less radius for freeing said sheet while still sustaining the sheet, each of said discs having a portion thereof cut away between said peripheral portions whereby the leading end of the portion of maximum radius is provided with a hook for engaging and lifting the sheet into engagement with its respective upper disc, and means for delivering sheets one at a time from the stack advancing means into the path of said lower discs.

7. In sheet feeding mechanism the combination of means for advancing a stack of sheets on edge, two upper feed discs spaced apart, two lower feed discs similarly spaced apart for coaction with said upper discs respectively, said lower discs being independently movable toward and from said upper

discs respectively, means for urging said lower discs toward said upper discs respectively, each of said lower discs having a portion of its periphery of maximum radius for coaction with its respective upper disc for advancing the sheets one by one and another portion of its periphery of less radius for freeing said sheet while still sustaining the sheet, each of said discs having a portion thereof cut away between said peripheral portions whereby the leading end of the portion of maximum radius is provided with a hook for engaging and lifting the sheet into engagement with its respective disc, and means for delivering sheets one at a time from the stack advancing means into the path of said lower discs.

In witness whereof, I hereby affix my signature this 26th day of August, 1921.
FRANK DE MINICO.