J. TOMLINSON.

PAPER FEEDING MECHANISM.

APPLICATION FILED APR. 15, 1916.

1,281,099.

Patented Oct. 8, 1918.

4 SHEETS—SHEET 1.

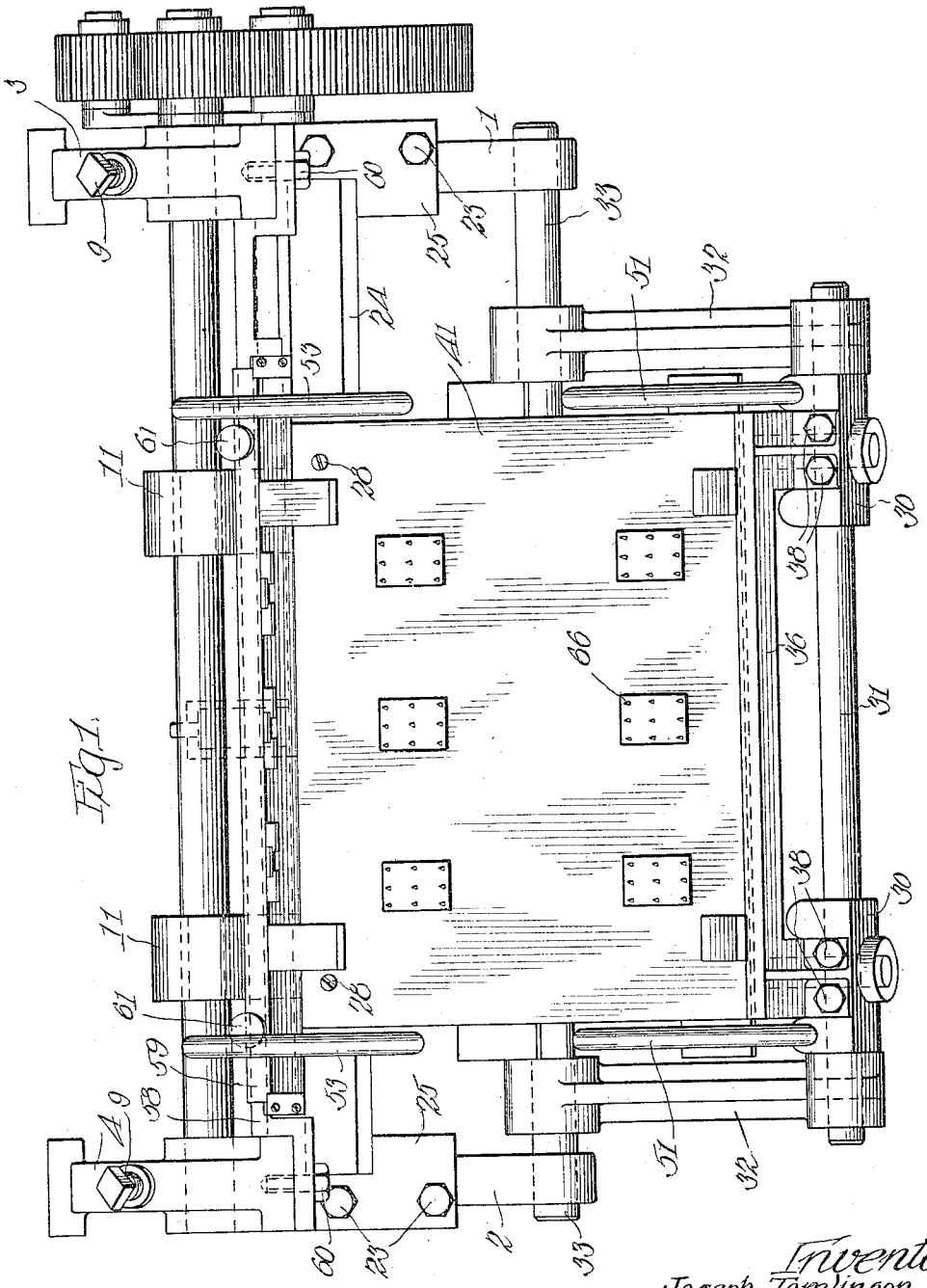


Fig. 1.

Witnesses:
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Inventor:
Joseph Tomlinson.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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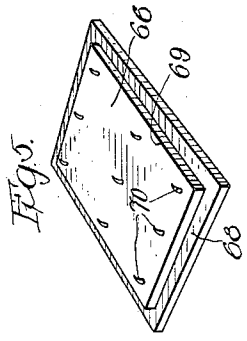


Fig. 5.

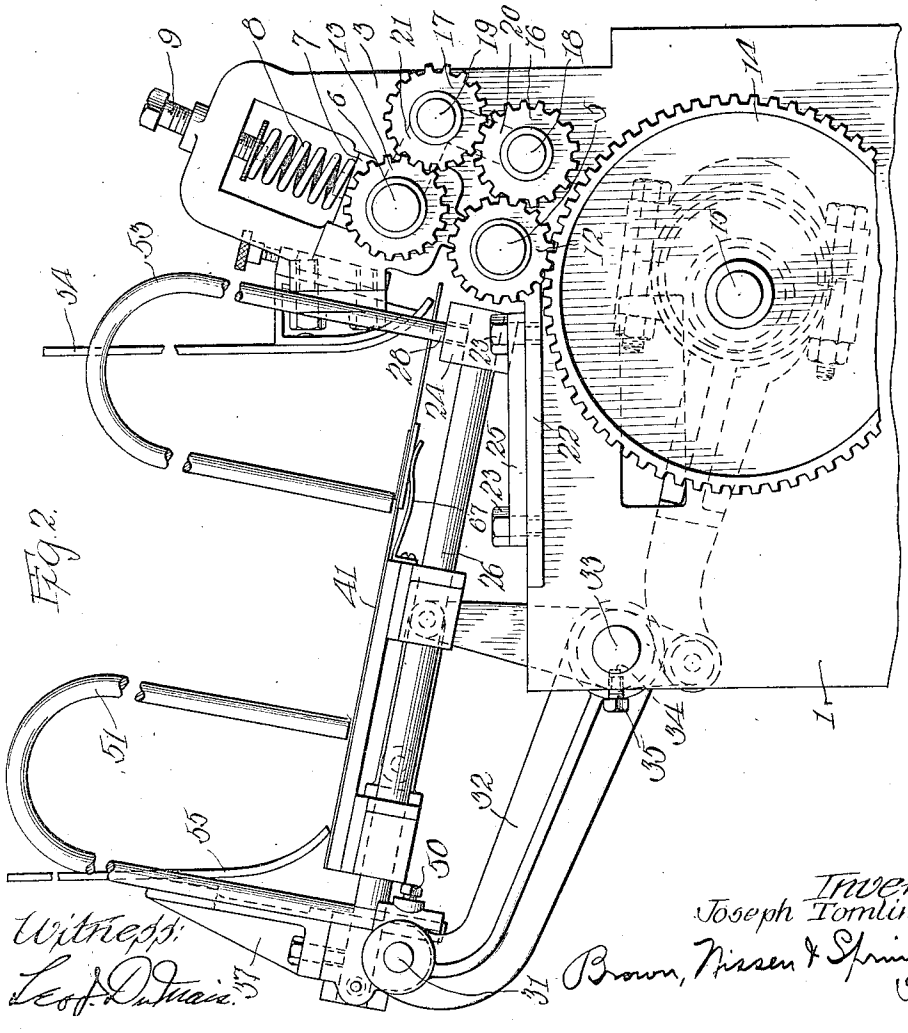


Fig. 2.

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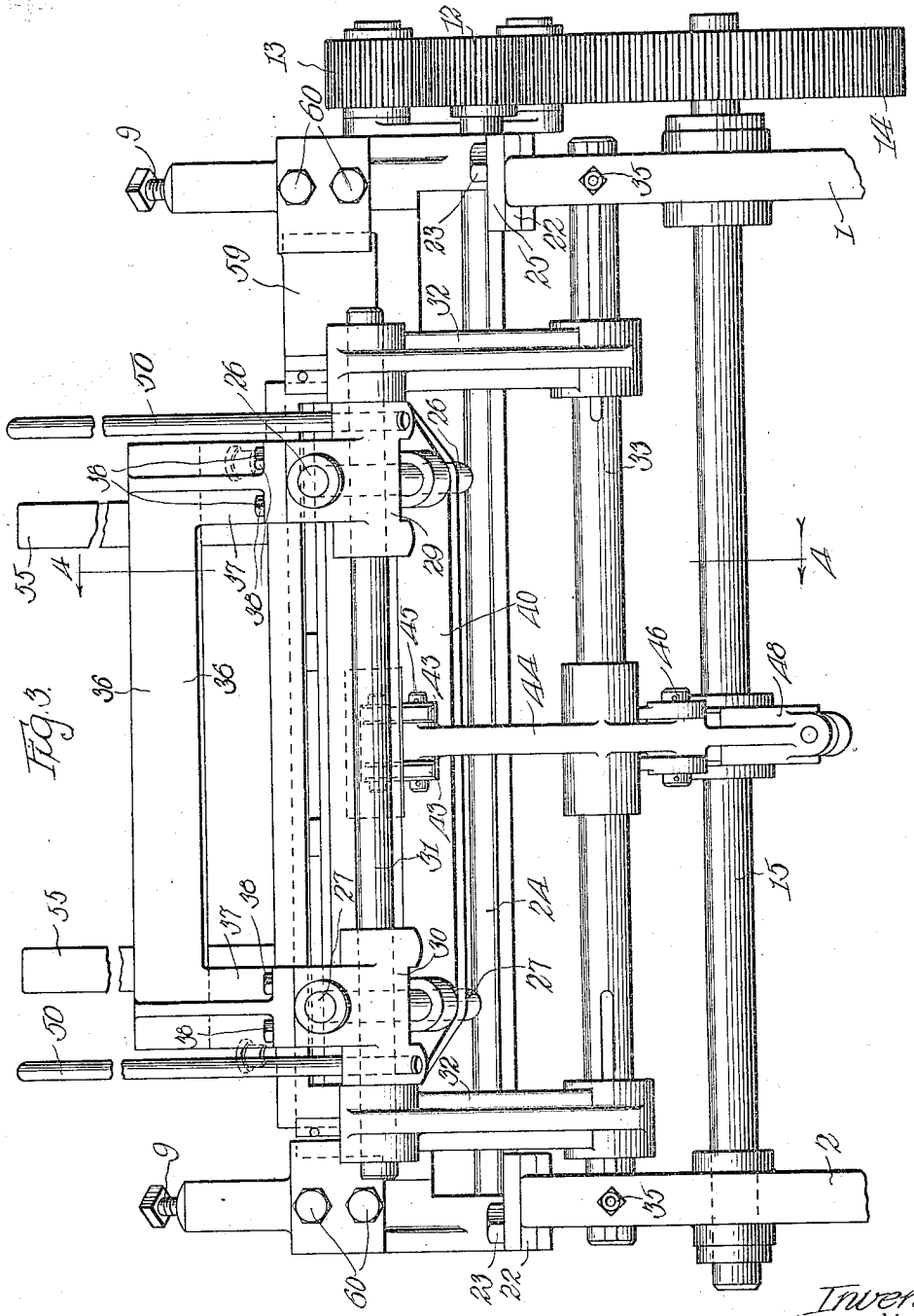


Fig. 3.

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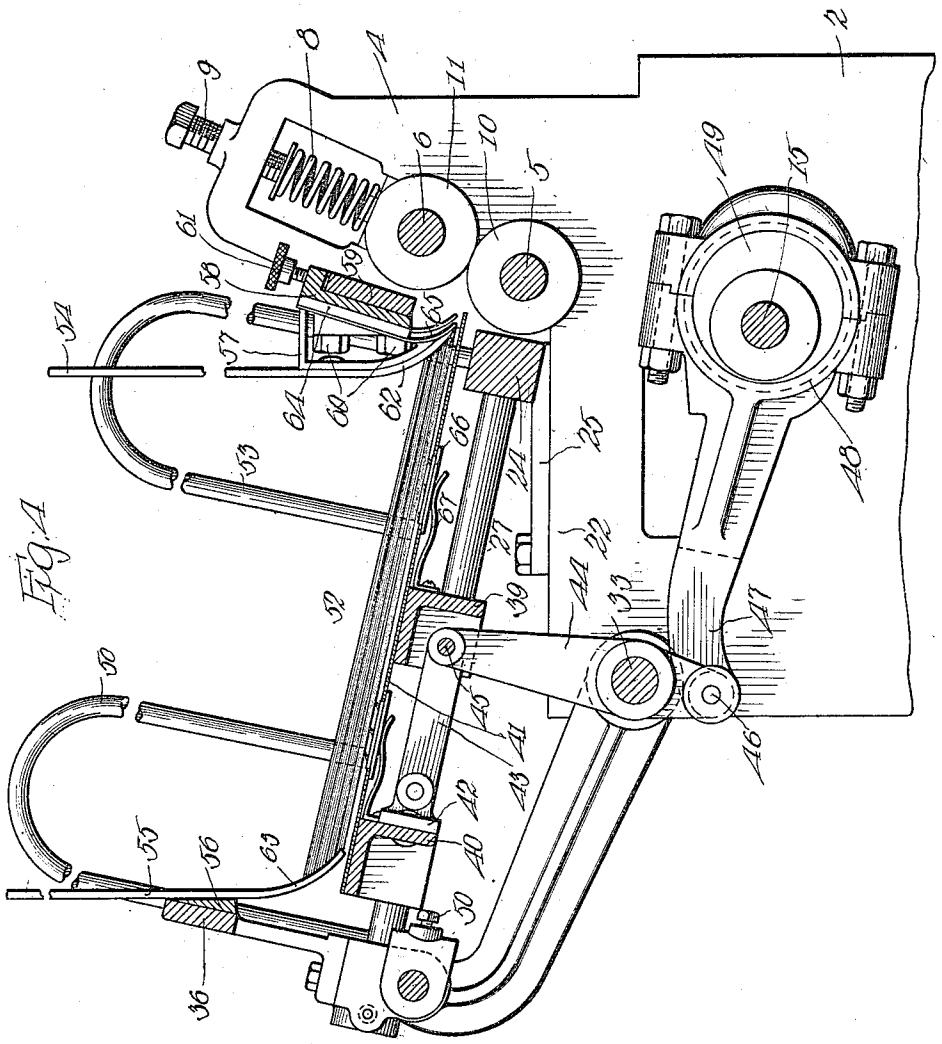


Fig. 4

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UNITED STATES PATENT OFFICE.

JOSEPH TOMLINSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO COX MULTI-MAILER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

PAPER-FEEDING MECHANISM.

1,281,099. Specification of Letters Patent. Patented Oct. 8, 1918.

Application filed April 15, 1916. Serial No. 91,272.

To all whom it may concern:

Be it known that I, JOSEPH TOMLINSON, 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 Paper-Feeding Mechanism, of which the following is a specification.

This invention relates to mechanism for feeding papers, books, pamphlets and similar articles, and has for its object the provision of a device of the character named which shall be of improved construction and more efficient in operation than devices of this character previously constructed. The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawings and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawings; Figure 1 is a top plan view of a feeding device embodying the present invention; Fig. 2 is a side elevation of the device shown in Fig. 1; Fig. 3 is a front elevation of the device; Fig. 4 is a vertical sectional view on line 4—4 of Fig. 3, and Fig. 5 is a detail perspective view of a contact pad forming a part of the mechanism.

In the figures of the drawings the numerals 1 and 2 represent supporting webs or plates which constitute the frame work on which the operating mechanism is mounted. The supports 1 and 2 are provided at the discharge end of the machine with upstanding projections or bearing members 3 and 4 respectively, in which are mounted for rotation a pair of shafts 5 and 6. The shaft 5 is carried in fixed journals while the shaft 6 is provided with sliding journal boxes 7 yieldingly pressed toward the shaft 5 by springs 8 and adjusting screws 9. The shafts 5 and 6 carry feed rolls 10 and 11 respectively, which are arranged to receive papers fed to them and to move the papers forwardly into the mechanism with which the feeding device is connected. This mechanism may be either an addressing machine, a wrapping machine or any other machine to which it is desirable to feed papers of various kinds one at a time. The shafts 5 and 6 are provided with pinions 12 and 13. The pinion 12 is driven by a gear 14 secured to a main drive shaft 15. A pair of idler pinions 16 and 17 mounted on stud shafts 18 and 19 respectively, constitute a gear train for transmitting motion from the pinion 12 to the pinion 13. A link 20 connects the stud shafts 18 and 19 to retain the gears 16 and 17 in mesh, and a similar link 21 connects the stud shaft 19 with the shaft 6 to maintain the gears 13 and 17 in driving relation with one another. The shaft 18 is held in fixed position on the frame 1 but the stud shaft 19 is free to move, being held in place only by the links 20 and 21. By this arrangement mechanism is provided which will permit movement of the shaft 6 relatively to the shaft 5 to accommodate different thicknesses of paper fed between the rolls 10 and 11 without breaking the driving connection between the two shafts. The bearing members 3 and 4 are detachably supported upon the frame members 1 and 2 and are held in place by plates 22 and lag screws 23.

Extending transversely of the machine and supported on the upper edges of the frame members 1 and 2 is a rectangular bar 24 which is provided with brackets 25 at each end, the brackets 25 being secured to the frame members 1 and 2 by the lag screws 23 which hold the plates 22 in place. The bar 24 is bored to receive a pair of guide shafts 26 and 27, which shafts have their ends rigidly held in the openings in the bar 24 by means of set screws 28 threaded into the bar and bearing against the ends of the shafts. The ends of the shafts 26 and 27 opposite the bar 24 are carried in castings 29 and 30 respectively. These castings are supported on a stationary shaft 31 which passes through openings in the ends of brace members 32. The lower ends of the brace members 32 are carried on a shaft 33 to which they are secured by keys 34. The shaft 33 is supported near the upper portions of the frame members 1 and 2 and is held in place by set screws 35. A cross brace 36 is supported by brackets 37 on the upper portions of the castings 29 and 30 to which it is secured by means of lag screws 38. By this construction the guide shafts 26 are rigidly held in position with their ends adjacent the feed rolls 10 and 11 and preferably inclined downwardly toward the rolls, as shown in the drawings.

Mounted to slide on the guide rods 27 is a pair of bars 39 and 40 which constitute a cross head on which a plate 41 is mounted

for supporting and feeding the papers in a manner to be described. Pivotally secured to the bar 40 by means of a bracket 42 is a pair of links 43 which have their opposite ends pivotally secured to a lever 44 by means of a pin 45. The lever 44 is pivotally mounted on the shaft 33 and has its lower end connected by a pivot pin 46 to the end of an eccentric arm 47. The arm 47 is connected to an eccentric strap 48 which is driven by an eccentric 49 on the shaft 15. By this mechanism the cross head bars 39 and 40 and the paper supporting plate 41 will be given a reciprocatory movement on the supporting rods 26 and 27 whenever the shaft 15 is rotated. Adjustably secured to the castings 29 and 30 by means of set screws 50 is a pair of U-shaped guard rods 51. These rods 51 have their free ends arranged to extend in an upright position adjacent the side edges of the supporting plate 41 in position to hold the papers 52 supported on the plate 41 from movement sidewise on the plate. A pair of similar rods 53 are supported at the end of the machine adjacent the feed rolls by means of the cross bar 24. Upright guide bars 54 and 55 are supported in position to guide the front and rear edges of the papers as they move downwardly into position to be fed to the rolls 10 and 11. The guides 55 are secured to the cross bar 26, a filler 56 being employed to hold the guide bars in substantially vertical position. The bars 54 are supported on bracket 57 secured to a plate 58 adjustably carried on a gate bar 59 which has its ends secured to the bearing members 3 and 4 by means of lag screws 60. Thumb screws 61 are provided for adjusting the plate 58 vertically relative to the cross bar 59. The guide bars 54 have their lower ends curved, as shown at 62, thus forming a curved stop against which the forward edges of the papers 52 are held. By this arrangement the lowermost papers in a stack supported on the plate 41 are held in position with each paper a little farther advanced than the paper resting immediately thereon. The guide bars 55 are similarly curved at 63 to guide the rear edges of the papers in the same way in which the forward edges are guided. Spaced along the plate 58 is a double row of stop fingers 64 which have resilient lower ends 65 curved in the same direction as the curvature of the bars 54. The ends of the stop fingers 64 are preferably extended a slight distance below the ends of the guide bar 62 and are spaced above the upper surface of the supporting plate 41 an amount sufficient to permit the passage of a single paper at a time beneath the ends of the stop bars. The space between the supporting plate 41 and the lower ends of the bars 54 and finger 65 may be adjusted by means of the thumb screw 61 for the purpose of setting the device to accommodate papers and pamphlets of different thicknesses. The resilient curved ends of the fingers 64 press together the front edges of the papers being fed, thus insuring greater accuracy in feeding papers one at a time as the papers are all pressed to their normal thickness. This is especially advantageous in feeding the folded edges of newspapers which have a tendency to expand and spring upwardly at the edge where they are folded.

To insure forward movement of the lowermost paper 52 at each reciprocation of the feed plate 41, the plate is provided with a plurality of pads or contact plates 66. These are arranged to register with rectangular openings through the plate 41 and are resiliently held in position in the openings by leaf springs 67 which bear against the under surface of the pads. The pads are provided, as shown in Fig. 5, with a flange 68 extending entirely around the periphery of each pad. The central portions 69 of the pad 66 project upwardly through the openings in the plate 41 and are of sufficient thickness to extend slightly above the upper surface of the plate when the flanges 68 are in contact with the lower surface of the plate. The upper surface of the central portions 69 of the pad 66 is provided with a plurality of small forwardly curved points or teeth 70 which engage the lower surface of the papers being fed and cause the papers to move forwardly with the forward movement of the plate 41. The inclination of the teeth 70 permits the return movement of the plate 41 without disturbing the position of the papers 52 relative to one another.

The entire mechanism is secured to a machine to which papers are to be fed in such a position that papers passing from the rolls 10 and 11 will be directed into proper position on the machine to be fed. A stack of papers may be placed in the magazine formed by the guide bars 50, 53, 54 and 55 and the mechanism will then be in condition for operation. All that is necessary is to rotate the shaft 15 which will drive the feed rolls 10 and reciprocate the feed plate 41. As the papers move downwardly in the magazine the lowermost papers will be partially separated by the curved lower ends of the guide bars 62 and 63 and the forward edge of the lowermost paper will then be directed into the opening beneath the stop finger 65. The papers above the lowermost one will be prevented from entering the opening by striking against the rear faces of the stop fingers. As the feed plate 41 is reciprocated it will slide freely beneath the papers 52 on its rearward movement because of the inclination of the contact teeth 70. On the forward movement of the plate, however, the contact teeth of the pad 66 will engage the lower surface of the lowermost paper and move the paper forwardly through

the opening beneath the stop finger 65, the amount of movement being sufficient to bring the forward edge of the paper into contact with the feed rolls 10 and 11. These rolls will seize the forward edge of the paper and continue to move it forwardly, drawing it from the magazine and depositing it in position upon the machine being fed. It should be noted that the feed pads 62 are fitted loosely in their openings in the plate 41 and are thus free to automatically adjust themselves to properly contact with the lower surface of the paper being fed.

By the mechanism described, papers or magazines of various thicknesses may be fed by the same machine, it being, of course, obvious that the guide bars constituting the magazine may be adjusted to fit various sizes of papers, and the opening beneath the stop finger 65 may also be adjusted to accommodate papers of all thicknesses. The mechanism is especially useful in feeding comparatively thin papers and magazines, such as newspapers. This is due to the fact that it is not necessary to feed the papers by force exerted against the rear edges as has been done by feeding machines heretofore in use. It has been found impossible to use previously designed machines to feed thin folders because of the fact that such folders do not have sufficient rigidity to allow feeding by pressure against the rear edges. This is also true of folders and newspapers that do not have the rear edges trimmed to constitute an even contact surface. By use of the contact pads which engage the lower surface of the paper being fed at points distributed over a considerable area the feeding action does not depend upon the stiffness of the folder nor upon contact with the rear edge thereof. The device, therefore, is especially useful in feeding thin folders, but is also adapted to feeding magazines and pamphlets of greater thickness.

I claim:—

1. In a device for feeding flat articles, a magazine for supporting a plurality of said articles in recumbent position one upon another to form a stack, and means for positioning the lower articles in said stack with the edges of said articles at one side of said stack in offset position relative to one another, said means comprising a double row of curved fingers having their lower ends spaced substantially equal distances from the floor of said magazine and beneath which said articles are fed from said stack.

2. In a device for feeding flat articles, a magazine for supporting a plurality of said articles in recumbent position one upon another to form a stack, means for positioning the lower articles of said stack with the edges of said articles at one side of said stack in offset position relative to one another, and a reciprocatory bottom plate for said magazine on which said articles rest and which carries spring pressed pads for engaging the lower surface of the lowermost article of said stack at a plurality of points distributed over said surface to feed said article from said stack.

3. In paper feeding mechanism, a magazine for supporting a stack of papers to be fed, having one of its upright walls curved outwardly at the lower portion thereof to cause the papers in the lower portion of said magazine to be offset relative to one another and supplementary outwardly curved fingers coöperating with said wall to regulate the movement of paper out of said magazine.

4. In a paper feeding device, a magazine having one of the walls thereof curved at its lower portion to cause the papers in the lower portion of said magazine to be offset relative to one another, an opening adjacent the lower portion of the curved portion of said wall, means for feeding the lowermost paper in said magazine through said opening and supplementary forwardly and downwardly curved spring fingers for regulating the movement of paper through said opening.

5. In a paper feeding device, a magazine having opposite walls thereof curved at their lower portion, the curvature of said walls being in the same direction and arranged to hold the lower papers in said magazine in progressively offset position relative to the magazine, a support for the papers in said magazine, said support being spaced from one of said curved walls to form an opening at the bottom of said wall through which papers may be fed, means for reciprocating said support to cause said support to feed said papers through said opening and supplementary curved fingers for regulating the movement of papers through said opening.

6. In a paper feeding device, a magazine for holding a stack of papers to be fed, a support positioned at the bottom of said magazine and spaced from one of the walls thereof to form an opening through which papers may be fed, and movable outwardly and downwardly curved supplementary fingers for adjusting the size of said opening to adapt said feeding device to papers of different thicknesses.

7. In paper feeding mechanism, a magazine containing papers to be fed, said magazine having one wall thereof curved outwardly at its lower end, and having a double row of outwardly curved fingers adjacent the curved portion of said wall and forming in effect a part thereof, means for supporting a stack of papers in said magazine, said supporting means being spaced from the lower portion of said curved wall to form an opening through which papers may be fed, and means for adjusting said

wall relative to said support to vary the size of said opening.

8. In a paper feeding device, a magazine for holding papers to be fed, said magazine having the forward and rear walls thereof curved at their lower portions in the same direction, means for supporting the papers in said magazine, said supporting means being spaced from the lower edge of one of said curved walls to form an opening through which papers may be fed, a curved stop device for regulating the number of papers that may be fed through said opening at a single time, and means for adjusting said stop device to vary the size of said opening.

9. In a paper feeding device, a magazine having front and rear walls thereof curved at their lower portions in the direction in which papers are fed from said magazine, a plate for supporting papers in said magazine, said plate being spaced from the lower edge of said front wall to form an opening through which papers may be fed, one at a time, an adjustable guard for regulating the size of said opening to accommodate papers of various thicknesses, and means for reciprocating said supporting plate to feed papers through said opening, one at a time.

10. In a paper feeding device, a magazine having an upright wall curved outwardly at its lower edge, a bottom plate for said magazine inclined downwardly toward said curved wall and spaced from the lower edge of said wall to form an opening through which papers may be fed, and means for reciprocating said base plate to feed papers through said opening.

11. In a paper feeding device, a magazine having one wall thereof curved outwardly at its lower edge, a bottom plate for said magazine inclined downwardly toward said curved wall and spaced from the lower edge of said wall to form an opening through which papers may be fed, means for adjusting the size of said opening, and means for reciprocating said plate to feed papers, one at a time, through said opening.

12. In a paper feeding device, a magazine having upright front, rear and side guide members, said front guide member being curved outwardly at its lower edge and said rear guide member being curved inwardly at its lower edge, adjacent the position of the lowermost papers in said magazine, and a bottom plate for said magazine spaced from the lower edge of said front guide member to form an opening through which papers may be fed.

13. In a paper feeding device, a magazine having upright front, rear and side guide members for retaining papers in a recumbent position in said magazine, said front guide members being curved outwardly at their lower ends and said rear guide members being curved inwardly to conform to the outward curvature of said front guide members, a base plate for supporting papers in said magazine inclined downwardly toward the lower ends of said front guide members and spaced therefrom to form an opening through which papers may be fed, adjustable stop fingers for regulating the size of said opening, and means for reciprocating said base plate to feed papers through said opening, one at a time.

14. In a paper feeding device, a magazine for supporting a stack of papers placed one upon another in recumbent positions, an inclined bottom plate for said magazine and a plurality of spring supported members having inclined teeth thereon, carried by said bottom plate, for contacting with the lower surface of the lowermost one of said papers to feed said lowermost paper forwardly.

15. In a paper feeding device, a magazine for holding a stack of papers piled one upon another in flatwise position, said magazine having one wall thereof curved outwardly at its lower edge, a base plate for supporting the papers in said magazine, said base plate being spaced from the lower edge of said curved wall to form an opening through which papers may be fed and inclined downwardly toward said opening, and frictional means carried by said base plate for feeding papers from said magazine through said opening.

16. In a paper feeding device, a magazine for holding a stack of papers piled one upon another in flatwise position, said magazine having one wall thereof curved outwardly at its lower end, a base plate for supporting the papers in said magazine, said base plate being spaced from the lower edge of said curved wall to form an opening through which papers may be passed and being inclined downwardly toward said opening, and a plurality of teeth carried by said base plate and inclined toward said opening.

17. In a paper feeding device, a magazine for supporting a plurality of papers piled one upon another in flatwise position to form a stack, said magazine having one wall thereof curved outwardly at its lower edge, a base plate for supporting the papers in said magazine, said base plate being spaced from the lower edge of said curved wall to form an opening through which papers may be fed, one at a time, and being inclined downwardly toward said opening, a plurality of pointed teeth carried by said base plate and positioned thereon in spaced relation with one another, and means for reciprocating said base plate to feed said papers through said opening.

18. In a paper feeding device, a magazine, a base plate for supporting papers in said magazine, contact pads each having a plurality of points thereon and loosely held in

openings in said base plate to move with said base plate, and means for moving said base plate to cause said contact pads to feed sheets from said magazine.

19. In a paper feeding device, a magazine having a base plate for supporting papers in said magazine, an opening through said base plate, and a device positioned in said opening for contacting with the papers in said magazine and supported therein entirely by a resilient member.

20. In a paper feeding device, a magazine for supporting papers to be fed, a base plate for supporting the papers in said magazine, an opening through said base plate, a contact pad positioned to project through said opening, stops for limiting the movement of said pad upwardly through said opening, and resilient means for loosely holding said contact pad in said opening.

21. In a paper feeding device, a magazine, a base plate for supporting papers in said magazine, a contact pad loosely held by said base plate, and pointed teeth carried by said contact pad for engaging the papers in said magazine.

22. In a paper feeding device, a magazine for holding papers to be fed, a base plate for supporting the papers in said magazine, means for reciprocating said base plate to feed papers, one at a time, from said magazine, said base plate having an opening therein, a contact pad loosely supported in said opening, a spring for holding said contact pad in said opening, and pointed teeth carried by said contact pad for engaging the surface of papers in said magazine.

23. In a paper feeding device, a magazine for holding a stack of papers, a base plate for supporting said papers, means for reciprocating said base plate to feed said papers from said magazine, said base plate having a plurality of openings therein in spaced relation to one another, contact pads loosely mounted in said openings, resilient means for holding said contact pads in position in said openings, and pointed teeth carried by said contact pads for engaging with the paper in said magazine.

24. In a paper feeding device, a magazine having its front wall curved outwardly thereof at its lower edge, a base plate for supporting said papers in said magazine, said base plate being spaced from the lower edge of said curved wall to form an opening through which papers may be fed, means for adjusting the size of said opening, contact pads loosely carried in spaced relation to one another by said base plate, pointed teeth carried by said contact pads and inclined toward said opening, means for reciprocating said base plate, and contact pads to feed papers, one at a time, through said opening.

25. In a paper feeding device, a magazine for holding a stack of papers piled one upon another in flatwise position, an inclined base plate for supporting the papers in said magazine and having its lowermost edge spaced from the bottom edge of the front wall of said magazine to form an opening through which papers may be fed and extending forwardly therefrom, means for reciprocating said base plate to feed papers, one at a time, through said opening, and a pair of rollers for receiving the papers so fed to withdraw said papers from said magazine.

26. In a paper feeding device, a magazine for containing a stack of papers piled one upon another in flatwise position, said magazine having its front wall curved outwardly at the lower edge thereof and its rear wall curved inwardly to conform to the curvature of said front wall, a base plate for supporting the papers in said magazine, said base plate being spaced downwardly from the lower edge of said front wall to form an opening through which papers may be fed, one at a time, means for adjusting the width of said opening to accommodate papers of different thicknesses, said base plate having a plurality of openings therethrough arranged in spaced relation to one another, friction pads loosely mounted in said openings, resilient means for forcing said pads upwardly in said openings, pointed teeth carried by said pads and inclined toward the opening beneath said front wall, means for reciprocating said base plate to feed said papers, one at a time, from said magazine, and feed rollers for contacting with said papers to assist in said feeding operation.

27. In combination, a magazine for holding a stack of papers to be fed one at a time, said magazine having an opening at its lower portion, a bottom plate having a flat upper surface extending beneath said opening and an outwardly curved flat spring finger for limiting the size of said opening and arranged to compress papers passing through said opening.

28. In combination, a magazine for holding a stack of papers and having an opening through which papers are fed from said magazine, a bottom plate having a flat upper surface extending beneath said opening, means for reciprocating said plate for feeding papers through said opening, and an adjustable gate having spring fingers arranged to control the size of said opening and to exert pressure on papers fed through said opening to compress said papers to normal thickness.

29. In combination, a magazine for holding a stack of papers piled flatwise one upon another, guides for said papers at one side of said magazine and curved outwardly from said magazine at their lower ends, means for feeding papers from said magazine beneath said guides and in the direction

of the curvature thereof, and resilient guard fingers positioned adjacent the lower ends of said guides and curved in the direction of curvature thereof and arranged to exert compression force on papers as they are fed from said magazine.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 3d day of April, A. D. 1916.

JOSEPH TOMLINSON.

Witnesses:
A. J. CRANE,
CHARLES H. SEEM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."