

Dec. 4, 1928.

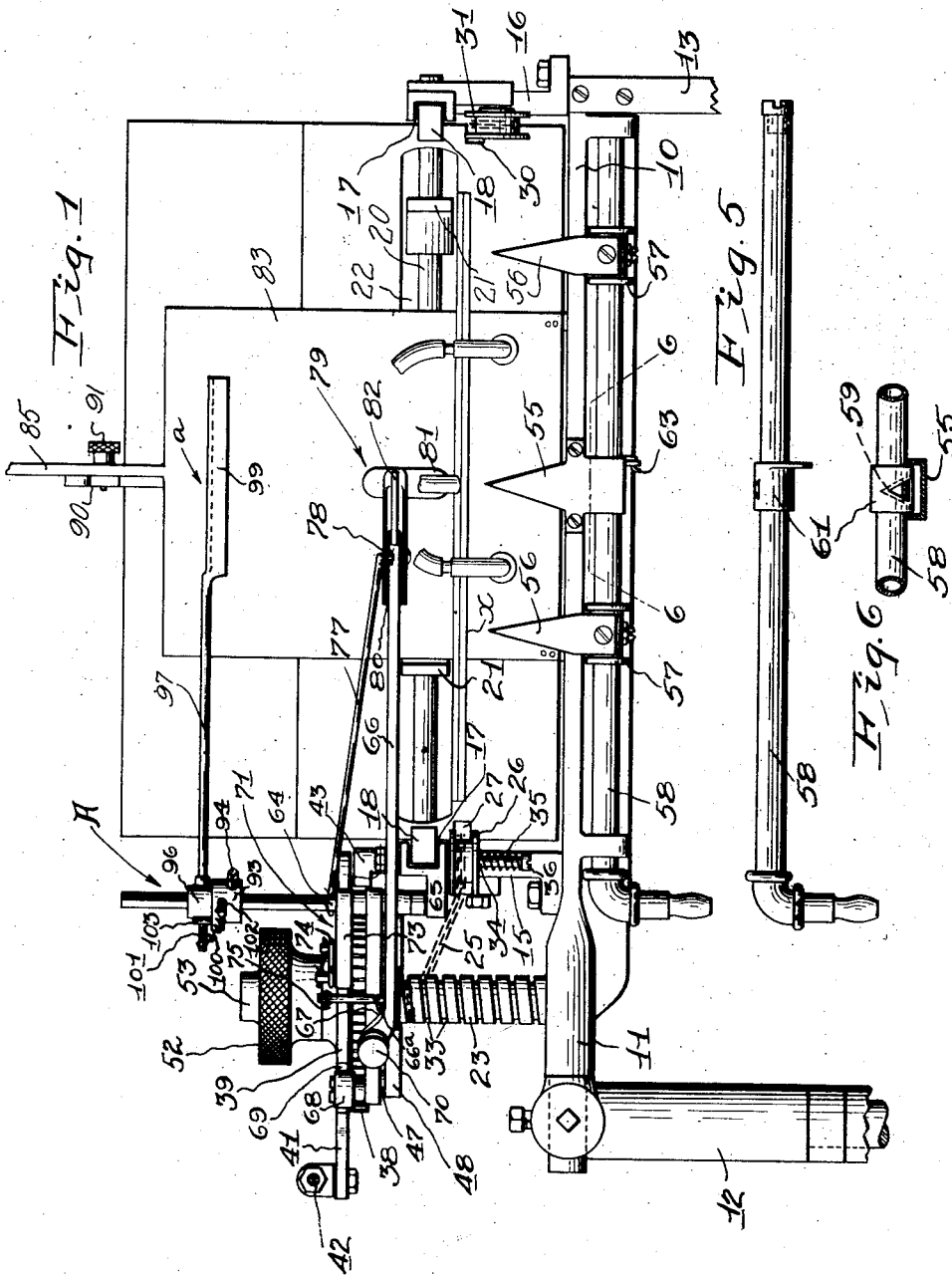
A. KLUGE ET AL

1,693,986

FEEDING MAGAZINE FOR PRINTING PRESSES

Original Filed Nov. 11, 1920

4 Sheets-Sheet 1



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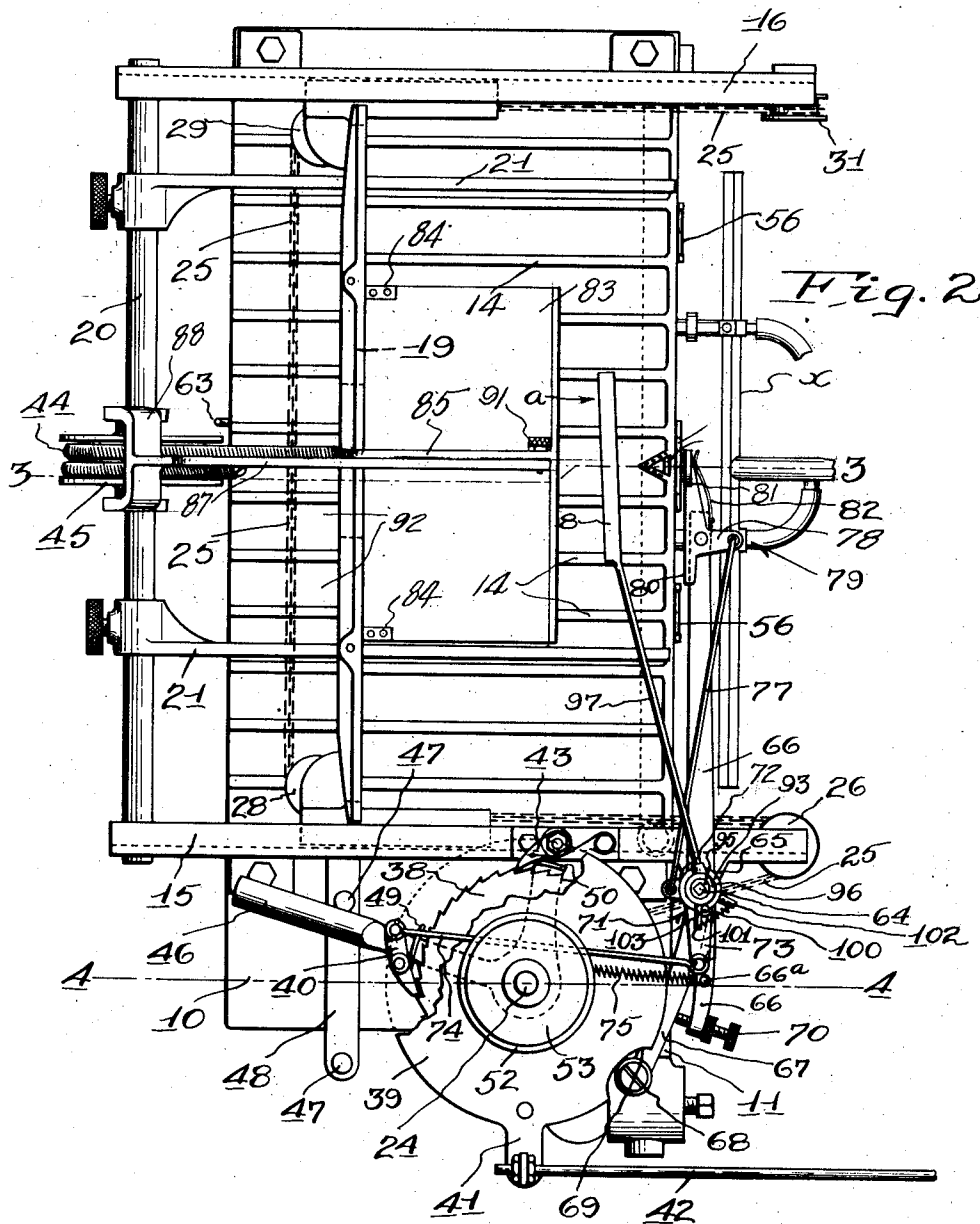
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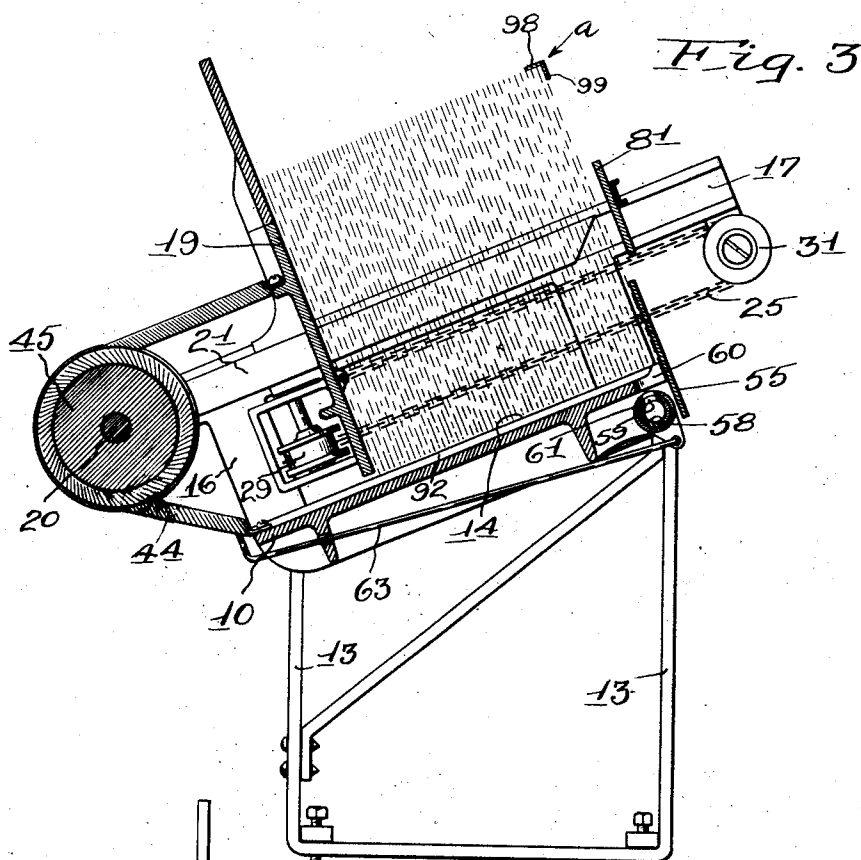
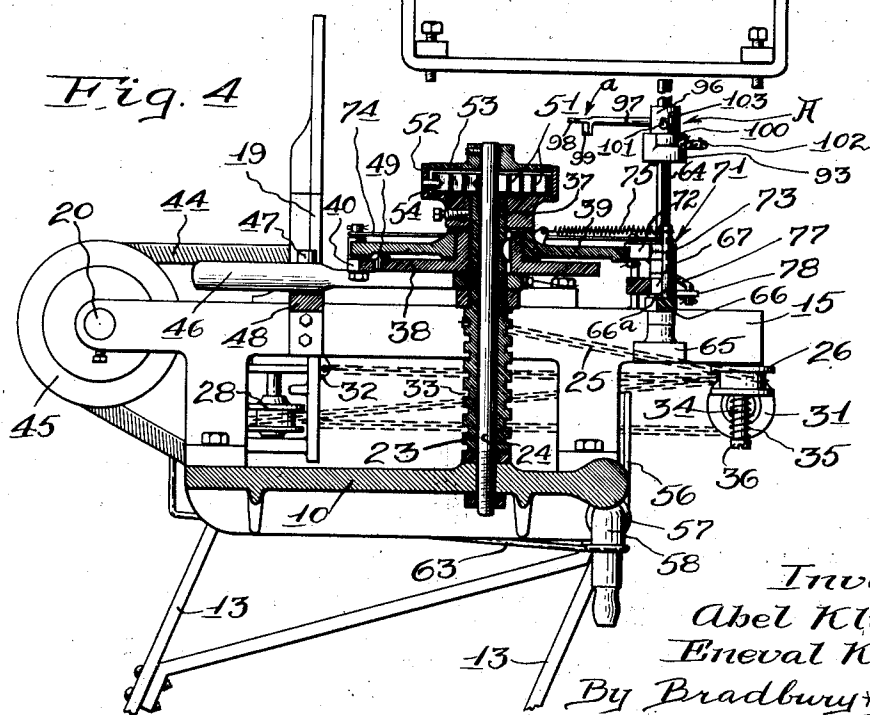
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4 Sheets-Sheet 3



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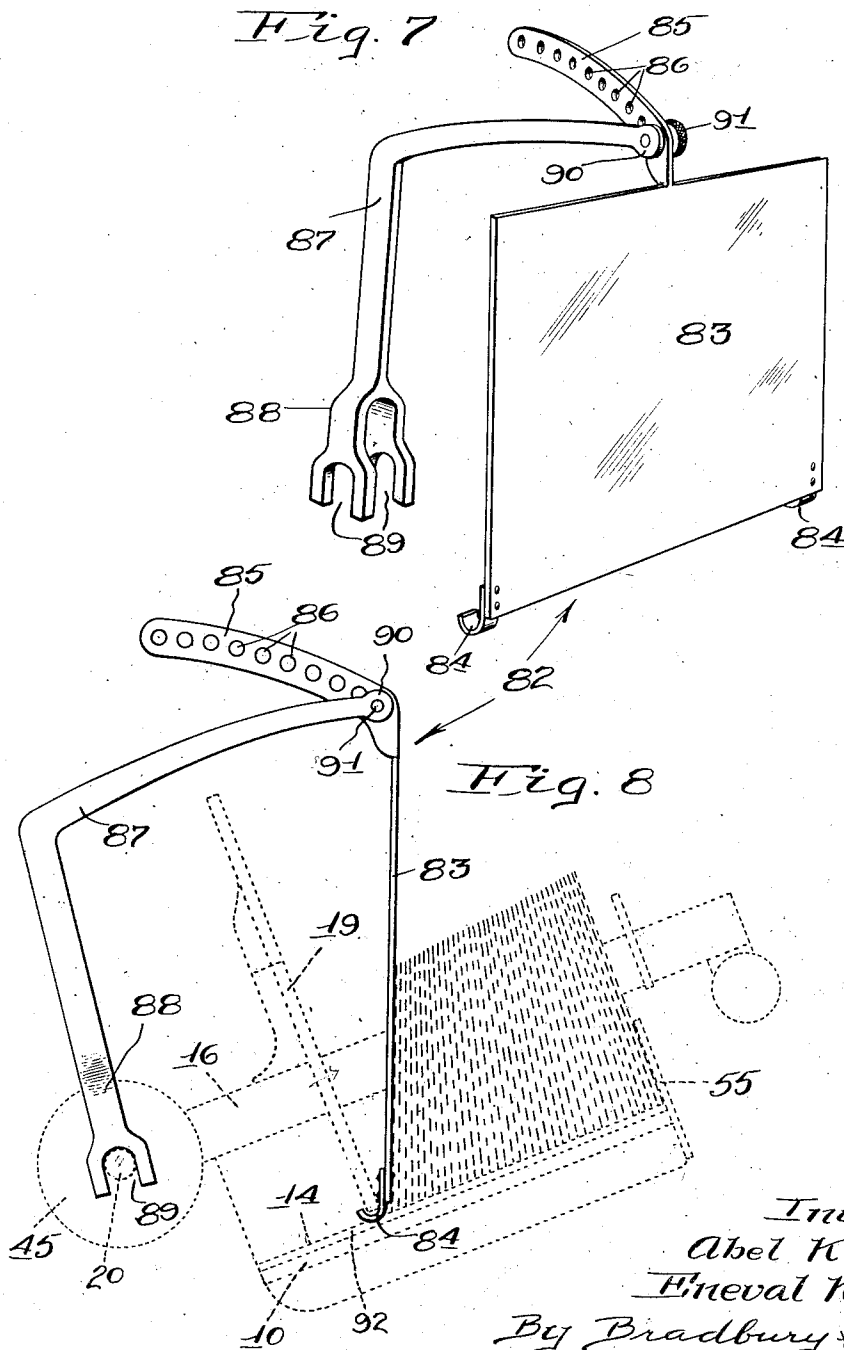
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

ABEL KLUGE AND ENEVAL KLUGE, OF ST. PAUL, MINNESOTA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO BRANDTJEN & KLUGE, INCORPORATED, OF ST. PAUL, MINNESOTA, A CORPORATION OF MINNESOTA.

FEEDING MAGAZINE FOR PRINTING PRESSES.

Application filed November 11, 1920, Serial No. 423,447. Renewed December 11, 1925.

Our invention relates to improvements in sheet feeding magazines for printing presses.

Its object is to provide a simple, durable and efficient device of this kind for printing presses employing automatic feeding mechanism adapted to receive sheets at a given receiving position.

A further object is to provide a feeding magazine, having an elevator and easily propelled mechanism for advancing the same; also means for quickly retracting said elevator.

Another object is to supply in a device of this nature, adjustable automatic means for regulating the lifting movement of the elevator, whereby the stock in the magazine is advanced in such manner as to prevent the feeding of the first sheet beyond a predetermined position.

A further object is to provide a magazine, as above, designed to advance a pack of uneven stock, such as pamphlets and the like, so that the first pamphlet of the pack will assume correct receiving position, regardless of the quantity or structure of said pamphlets in the pack.

With the foregoing and other objects in view, which will appear in the following description, the invention resides in the novel combination and arrangement of parts and in the details of construction hereinafter described and claimed.

In the drawings, Fig. 1 is a front elevation of our improved device; Fig. 2 is a plan view thereof; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; Fig. 4 is a similar view taken on the line 4—4 of Fig. 2; Fig. 5 is a detail elevation of the blower pipe and valve thereon; Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1, said view illustrating a section of said pipe and particularly the opening therein and valve therefor; Fig. 7 is a perspective view in detail of the auxiliary lifting-plate and supporting reach therefor and Fig. 8 is an elevation of the same as applied in use.

Our improvement includes an inclined table, an inclined lifter-plate slidable with respect to said table, mechanism for advancing the lifter-plate, means for retracting the same and mechanism for interrupting the operation of said lifter-plate advancing mechanism.

The table 10 is carried at one end by an

arm 11 pivoted horizontally on a post 12 adapted to be mounted upon the frame of a printing press. Legs 13 on the opposite end of the table 10 are provided to rest upon the press and support said end of said table, when the same is in operative position. The table 10 is supported at an angle substantially as shown in Fig. 3, ribs or slides 14 on the face of said table being designed to receive a pack of sheets upon edge and slidably support the same. Upright frame members 15 and 16 are secured upon the table near the ends thereof, said frames being formed with inner ways 17 to receive blocks 18, which are formed integrally with the elevator lifter-plate 19. Said plate is held substantially at right angles with respect to the table 10 and forms a sliding back rest for a pack of sheets. The rear extremities of the frame members 15 and 16 carry a shaft 20 upon which guides 21 are adjustably secured. Said guides extend forwardly of said shaft and pass through slots 22 in the lifter-plate 19. These guides are adjusted to suit the stock employed and are set to direct the sheets toward desired feeding position at the forward edge of the table 10.

The mechanism for advancing the lifter-plate 19 includes a drum 23 revolubly mounted upon a spindle 24 secured at its lower extremity to one end of the table 10. This drum is turned in reverse directions, as will soon appear, to wind in and pay out a chain 25, one end of which is secured to said drum 23 near its upper end. Said chain is passed forwardly from the drum 23 around a pulley 26 on the frame 10, thence rearwardly through an opening 27 in the lifter-plate 19 to and around a pulley 28 mounted at the rear and on the end of said lifter-plate adjacent to the frame 15, thence to a similar pulley 29 on the opposite end of the lifter-plate, thence around said pulley and forwardly through an opening 30 in the lifter-plate 19, thence forward to and over a pulley 31 at the forward end of the frame 16 and finally to the rear to an ear 32 on the face of the lifter-plate 19, where said chain is attached. The drum 23 is formed with a spiral groove 33 designed to direct the turns of the chain 25 spirally downward, when said chain is wound in upon the drum 23. The pulley 26 is journaled and slidable up and down on a pin 34 parallel with the drum 23. A spring 35 interposed

between the head 36 of said pin and the bottom of the pulley 26 yieldingly holds said pulley in elevated position, but contracts under downward resistance occasioned by the winding of the chain 25 toward the lower end of the drum 23. This floating pulley reduces the angular movement of the reach of the chain 25 between the pulley 26 and the drum 23, thus minimizing the loss of power by friction, between said chain and pulley.

The drum 23 is formed with an upper reduced end or sleeve 37, upon which a ratchet wheel 38 is keyed. A disc 39 revoluble on the hub of said ratchet wheel carries a pawl 40 on the lower margin thereof in position to engage the teeth of the ratchet wheel 38. An arm 41 on the disc 39 is attached to a rod 42, which is reciprocated by any suitable means in synchronism with the movement of an associated sheet feeding element such, for example, as shown at X in Figs. 1 and 2. The rocking of the disc 39 by said rod 42 normally results in a step by step movement of the ratchet wheel 38 by the pawl 40, an anti-backing pawl 43 being mounted on the frame 15 and arranged to normally engage and lock said ratchet wheel against backward rotation. This step by step forward movement (counter clock-wise, Fig. 2) of the ratchet wheel 38 causes the drum 23 to rotate and the chain 25 to be wound thereon. The winding in of this chain on said drum carries the lifter-plate 19 forward and advances a pack of sheets leaning thereagainst. To retract the lifter-plate 19 for any reason, the usual object being to replenish the magazine, we supply the following mechanism: This mechanism includes a spiral spring 44 turned twice upon a drum 45 freely revoluble upon the shaft 20. One end of this spring is attached to the rear of the lifter-plate 19 and the other end thereof is secured to the table 10. Forward movement of the lifter-plate 19 is had against the tension of this spring throughout its entire length. We release the pawls 40 and 43 from the ratchet wheel 38 by means of a trip lever 46. This lever swings on the sleeve 37 of the drum 23 between stop pins 47 on a bracket 48 carried by the frame 15, said lever 46 being fitted with two lifter-slides 49 and 50, one for each of the pawls 40 and 43. With said pawls removed from engagement with the ratchet wheel 38, the spring 44 is free to operate and draws the lifter-plate 19 rearwardly upon the table 10 to such extent as is permitted by the length of the chain 25. We supply means for unwinding the drum 23 to pay out the chain 25 and thereby relieve the spiral spring 44 of such work, when the ratchet wheel 38 is released. A coiled spring 51, housed within a knob 52 fixed to the sleeve 37 of the drum 23, is secured at its inner end to the spindle 24 and at its outer end to said knob 42. Rotation of the drum 23 to wind in

the chain 25 winds up the coiled spring 51, said spring being of sufficient strength to unwind said drum, when the ratchet wheel 38 is released. A cap 53 secured to the spindle 24 and covering the spring compartment 54 in the knob 52 retains the spring 51 in said compartment. Said knob 52 serves also to turn the drum 23, by hand, in a direction to wind in the chain and advance the lifter-plate. Such provision is advantageous since it permits of quick and easy adjustment of a pack to position, wherein the front sheet thereof rests closely adjacent to front guides 55 and 56 at the forward edge of the feeding table 10. Said feeding table is placed for use so that the first sheet of a pack resting adjacent to said front guides 55 and 56 will stand in desired receiving position for a sheet feeding element. The guide 55 is permanently fixed to the forward edge of the table 10, midway between the ends thereof, while the guides 56 are mounted upon slides 57 adjustably secured upon a blow-pipe 58 carried beneath the forward margin of the table 10. Said blow-pipe is formed with an opening 59 in the upper side thereof, which opening registers with an opening 60 in the table 10. A valve 61 comprising an apertured collar 62 on said pipe 58 is set by a thrust rod 63 and controls the escape of air from the opening 59 in the pipe. Air, admitted under pressure to the pipe 58 from any suitable source, may be permitted to escape upwardly beneath the first few sheets of a pack in such quantities as is necessary to separate said sheets.

Our pack lifting mechanism is designed to advance sheets of different stock to continuously supply the ordinary feeding mechanism, interrupting means being employed to discontinue the action of said lifting mechanism and thereby avoid advancing the pack too rapidly. A post 64 on a bracket 65 integral with the frame member 15 supplies a pivotal support for a lever 66, one end thereof passing in front of a pack of sheets on the feeding table 10, while the other end terminates in front of the disc 39. An auxiliary lever 67, pivoted at one end upon said post 64, is supplied at its free end with a roller 68 arranged to ride against a depressed cam surface 69 on the periphery of the disc 39. A set screw 70, threaded in the lever 66 and bearing against said auxiliary lever 67, provides for adjusting the inner end of said lever 66 forward and backward. A spring 75 stretched between a pin 66^a on the arm 66 and an anchoring lug 76 near the center of the disc 39 operates through the screw 70 and lever 67 to yieldingly hold the roller 68 against the cam surface 69. A bell crank 71 is also pivoted on the post 64, common to said levers 66 and 67, and has a short arm 72 and a long arm 73. Said latter arm 73 is connected with the pawl 40 on the disc 39 by means of a link 74.

The shorter arm 72 is joined through a link 77 with an arm 78 on a gauge 79, said gauge being pivoted on the inner end of the lever 66. A stop 80 on said gauge limits the rearward throw of the gauge paddle 81 and a bar spring 82, fixed to the lever 66 and bearing against said paddle, yieldingly holds said stop 80 in engagement with said lever 66. The rocking of the disc 39 normally causes the rotation of the ratchet wheel 38 through the pawl 40 and the consequent winding of the drum 23. This rocking of the disc 39, further, causes the inner end of the lever 66 to swing forwardly from a pack on the table, then rearwardly toward said pack. The forward throw of said lever, being timed with respect to the movement of the sheet feeding element, avoids interference of the gauge-paddle 81 with a sheet in the course of removal from the table 10 and the rearward throw of said lever replaces the gauge-paddle, locating the same in sheet engaging position. The forward limit of the foremost sheet of a pack is varied with respect to the sheet receiving position of the feeding element to accord with the stock to be fed, the different limits being attained through the adjustment of the screw 70 in the lever 66. When, through the operation of the pack lifting mechanism, the first sheet of a pack reaches its predetermined forward limit, said sheet abuts against the paddle 81, upon the rearward throw of the lever 66, and results in the tilting of the gauge, which action is transmitted through the link 77, bell crank 71 and link 74 to the pawl 40, said pawl being thereby disengaged from the ratchet wheel 38. By thus disengaging the pawl 40 from the ratchet wheel 38, the rotation of the drum 23 is arrested and the advance of the lifter-plate 19 thereby interrupted. The reduction of the pack by the feeding mechanism again permits the return of the gauge-paddle 81 to normal position at the end of its rearward throw and thereby permits the re-engagement of the pawl 40 with the ratchet wheel 38 and the consequent resumption of operation of the pack lifting mechanism. Aside from its operation in interrupting the action of the pack advancing mechanism, the gauge-paddle 81 tends to separate the first sheet from the second sheet of a pack. Upon the rearward throw of the lever 66, preparatory to the taking of the first sheet, the gauge-paddle engages said sheet and, swinging in an arc, has a tendency to slide said first sheet upon and separate the same from the second sheet.

In feeding folded sheets, we supplement our lifter-plate 19 with an auxiliary lifter 82 (Figs. 7 and 8). This lifter includes a plate 83 having hooks 84 at its lower corners and a curved arm 85 extending upwardly and rearwardly from a medial point on the upper margin of said plate, said arm being formed with a series of apertures 86 therein. A support

for said plate comprises a curved reach 87, having a yoke 88 at its lower end, the branches of said yoke being notched to fit, as at 89, over the shaft 20. The upper end of said reach 87 is formed with an ear 90 having a threaded bore therein. A knobbed pin 91 having its end threaded to fit said bore is adapted to pass through any one of the apertures 86 in the arm 85 and pivotally join said arm with the reach 87. The yoke 88 straddles the pulley 45 and tilts upon the shaft 20. The hooks 84 are caught beneath the lower edge of the lifter-plate 19 and ride in grooves 92 between the ribs 14 on the table 10. The connection between the reach 87 and arm 85 is made to obtain the desired inclination of the auxiliary plate 83, whereby upon its forward sweep, caused by the advance of the lifter-plate 19, the folded sheets, about to be received by the feeding mechanism, will assume proper receiving position.

In feeding light stock in high speed machines, the second sheet of a pack has a tendency to cling to the first sheet. In the absence of preventative devices, this second sheet, at times, is lifted slightly and then clings to the third sheet in elevated position as the first sheet is carried from the table. Said second sheet, at other times, is removed from the table together with the first sheet. We have supplied our feeding magazine with a sheet holder *a* to cause the first sheet of a pack, in the act of removal, to be effectually freed from the second sheet and to prevent such displacement and removal of said second sheet. This holder employs as a support, the upper end of the post 64, which is square in cross section, as will be observed in Figs. 1, 2 and 4. A block 93, slidable vertically on said post and adjustably secured thereon by means of a set screw 94, is formed at its upper end with a journal 95. A collar 96, fitted to turn on said journal, carries an arm 97 reaching over the table 10 above its forward margin. A guide *a*, formed at the extremity of said arm, has an upper flange 98 and a forward depending flange 99. The block 93 is adjusted so that the guide *a* will embrace the upper forward edge of a pack of sheets (Fig. 3), the flange 98 resting above the first few sheets of the pack and the flange 99 resting in front of the first sheet. A spring 100, stretched between a pin 101 on the collar 96 and a pin 102 on the block 93, operates to yieldingly hold the flange 99 against the face of a pack of sheets. A stop pin 103 in the block 93, in the path of the pin 101 on the collar 96, limits the movement of the arm 97 by the spring 100, so that said arm will not interfere with the replenishing of the magazine. Our holder functions best with the use of a feeding mechanism adapted to first grasp the lower margin of the first sheet in a pack, then lift the same slightly before the commencement of its throw toward the printing couple. In

such an operation as this, the flange 98 of the guide *a* prevents the vertical displacement of the second sheet, thus insuring its subsequent proper engagement with the grips of the feeding mechanism and its consequent proper placement on the receiving member of the printing couple. Said flange 98 also acts as a stop for the upper edge of the first sheet and causes said first sheet to buckle, as its lower margin is raised, preparatory to the removal of said sheet from the magazine. This buckling of the first sheet effectually frees it from the second sheet, a substantial air space being formed between the two sheets. The guide *a* yields forwardly and compensates for different feeding positions of the first sheets and may be raised or lowered to suit sheets of different width by the adjustment of the block 93 on the post 64.

Changes in the specific form of our invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of our invention.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. The combination with a sheet feeding element adapted to receive and take sheets from a given receiving position, of a support for a pack of sheets, a plate for advancing the pack on said support, mechanism for moving the plate and tripping means, operative during the intervals between the taking of sheets from the support, said tripping means being actuated by the pack for interrupting the action of said mechanism.

2. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined support adapted to receive a pack of sheets on edge, a lifter-plate for advancing the pack on said support, ratchet driven mechanism for moving the lifter-plate, an intermittently operative, yielding gauge connected with said mechanism and adapted to render the same inoperative, said gauge being located so as to be actuated by the first sheet of the pack, in case that the operation of said mechanism advances said sheet beyond a predetermined position.

3. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined support adapted to receive a pack of sheets on edge, a lifter-plate for the pack, mechanism for advancing the lifter-plate step by step, a gauge, a support for the gauge, said gauge being adapted to be shifted by the pack to limit the advancement thereof, said gauge being connected with said mechanism and designed to render the same inoperative, and means for swinging the support to withdraw the gauge from the pack when said feeding element is in receiving position.

4. The combination with a sheet feeding

element adapted to receive sheets at a given receiving position, of an inclined table for carrying a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack, a rocker member, a revoluble element to which movement is imparted by said rocker member, connecting means between said revoluble element and lifter-plate for advancing the latter and means for retracting said lifter-plate.

5. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of a pack advancer designed to shift a pack of sheets so that the first sheet thereof is placed adjacent to said given receiving position, an oscillatory support, a yielding gauge carried thereon, said gauge being adapted to touch the center of the foremost sheet of a pack nearing receiving position and to be shifted upon its support by a sheet approximating such position, driving mechanism actuated in synchronism with said sheet feeding element and designed to shift the pack advancer, also to swing said gauge support toward and from the pack, the removing throw of said support permitting of the removal of a sheet from the pack by said feeding member, and connecting means between said gauge and mechanism for interrupting the operation of the latter when said gauge is shifted by the pack upon said support.

6. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined table for carrying a pack of sheets on edge, a sliding back rest for the pack designed to assume various angular positions to suit the inclination of folded sheets of different stock and means for advancing the back rest to shift the pack and place the first unit thereof in receiving position, said back rest being adapted to approach parallelism with the given sheet receiving position in its forward movement upon the table.

7. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack and adapted to advance the first sheet of the pack toward receiving position, a rocker member, a revoluble element including a ratchet wheel fixed thereon, a chain connecting the revoluble element with the lifter-plate and adapted to advance the former when wound in upon the latter, a pawl on the rocker member for driving the ratchet wheel, an anti-backing pawl also engaging said ratchet wheel, a tripping device for simultaneously disengaging said pawls from said ratchet wheels, a coiled spring connected with the revoluble element and energized by the rotation thereof in advancing the lifter-plate, said spring being

adapted to turn said revoluble element in a direction to pay out the chain and a spring interposed between the table and lifter-plate for retracting the latter.

8. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack and adapted to advance the first sheet of the pack toward receiving position, a rocker member, a revoluble element including a ratchet wheel fixed thereon, connecting means between said revoluble element and lifter-plate for shifting the latter, a pawl on the rocker member for driving the ratchet wheel, an anti-backing pawl also engaging said ratchet wheel, a tripping device for simultaneously disengaging said pawls from said ratchet wheels and a coiled spring connected with the revoluble element and energized by the rotation thereof in advancing the lifter-plate, said spring being adapted to turn said revoluble element in a direction permitting the retraction of the lifter-plate.

9. The combination with a sheet feeding element, adapted to receive sheets at a given receiving position, of an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack and adapted to advance the first sheet of the pack toward receiving position, a drum, a chain attached near one end of the drum and joining the same with the lifter-plate, pulleys to guide said chain, means for turning the drum in one direction to wind the chain thereon and advance said lifter-plate, the pulley adjacent said drum being floatable upon an axis parallel with the axis of the drum, a spring to turn said drum in a direction to pay out said chain, said spring being arranged to be tightened when the drum is rotated to wind in said chain.

10. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack and adapted to advance the first sheet of the pack toward receiving position, a drum, a chain joining the drum and lifter-plate, pulleys to guide said chain, means for turning the drum in one direction to wind the chain thereon and advance said lifter-plate, a spring to turn said drum in the reverse direction to pay out said chain, said spring being arranged to be tightened when the drum is rotated to wind in said chain, and a spring interposed between the lifter-plate and table for retracting the former.

11. The combination with a sheet feeding element adapted to receive sheets at a given

receiving position, of an inclined table for carrying a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack, a rocker member, a revoluble element to which movement is imparted by said rocker member, connecting means between said revoluble element and lifter-plate for advancing the latter, an auxiliary plate detachably connected with said lifter-plate and adapted to be swept forward and backward on the table by the movement of said plate, an upwardly and rearwardly extending arm on the auxiliary plate, a reach having a pivotal support at its lower end on the table and an adjustable pivotal connection at its upper end with the arm on the auxiliary plate, said auxiliary plate being adapted to swing from greater or less angles with respect to the lifter-plate toward position parallel with said lifter-plate during its forward movement.

12. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack and adapted to advance the first sheet of the pack toward receiving position, a drum, a chain joining the drum and lifter-plate, pulleys to guide said chain, means for turning the drum in one direction to wind the chain thereon and advance said lifter-plate, and a spring to turn said drum in the reverse direction to pay out said chain, said spring being arranged to be tightened when the drum is rotated to wind in said chain.

13. In a device of the class described, an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate having slots therein, said lifter-plate supplying a slidable back rest for said pack, guides adjustably mounted at the rear of the table and passing forwardly through the slots in said lifter plate, means for advancing the lifter-plate, a freely revoluble pulley at the rear of the table, a spiral spring attached at one end to the lifter-plate and at its other end to the table, said spring being passed around said pulley and adapted to retract said lifter-plate.

14. In a device of the class described, an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate, said lifter-plate supplying a slidable back rest for said pack, means for advancing the lifter-plate, a freely revoluble pulley at the rear of the table, a spiral spring attached at one end to the lifter-plate and at its other end to the table, said spring being passed around said pulley and adapted to retract said lifter plate.

15. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined table designed to slidably support a pack of sheets on

edge, an inclined lifter-plate supplying a slidable back rest for said pack and adapted to thrust the first sheet of the pack toward receiving position, a rocker member, a revoluble element to which movement is imparted in one direction by said rocker member, a flexible connecting medium between said revoluble element and lifter-plate and pulleys to guide said flexible medium so that the winding of the same upon said revoluble element advances said lifter-plate.

16. The combination with a sheet feeding element adapted to receive sheets at given sheet receiving position, of an inclined support adapted to receive a pack of sheets on edge, a lifter-plate for advancing the pack on said support, and a yielding, oscillatory stop carried above the upper edge of the first and adjacent sheets of the pack, said stop serving to prevent the vertical displacement of said sheets by said sheet feeding element.

17. A pack advancing support and a yielding guide for embracing one of the forward edges of a pack on said support, said guide being adjustable to suit sheets of different widths and adapted to prevent edgewise displacement of the first and adjacent sheets of a pack, when the former is removed from the pack in feeding.

18. A sheet feeding magazine including a tiltable pack rest and means for advancing the rest, said means serving also to progressively adjust the rest angularly to suit diminishing packs of folded sheets and to present the uppermost unit of a pack in given feeding position.

19. A sheet feeding magazine including a pack rest and means for advancing the rest, said rest being initially angularly adjustable to suit a given pack of folded sheets, said rest advancing means serving automatically to progressively adjust said rest angularly to present the uppermost unit of a diminishing pack in given feeding position.

20. A sheet feeding magazine comprising an inclined table for carrying a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack, means for advancing the lifter-plate, a blow pipe opening beneath the forward margin of the table and adjustable front guides slidably mounted on said blow pipe.

21. In a device of the class described, a pack advancer, mechanism for moving the pack advancer, a gauge associated with said mechanism and actuated by the pack to render said mechanism inoperative, and means to swing the gauge into and out of operative position, the movement of said gauge during the engagement thereof with said pack serving to slide the first sheet upon and separate the same from the second sheet.

22. In a device of the class described, a rest for advancing a pack of sheets, a rocker member, a revoluble element, means for en-

gaging said member with said element on one throw of the former, connecting means between said revoluble element and rest for advancing the latter and tripping means actuated by the foremost sheet of the pack for rendering said engaging means inoperative, the position of said tripping means being controlled by said rocker member, whereby upon the return throw thereof the foremost sheet may be freely taken from the pack.

23. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of an inclined table designed to slidably support a pack of sheets on edge, an inclined lifter-plate supplying a slidable back rest for said pack and adapted to thrust the first sheet of the pack toward receiving position, a rocker member, a revoluble element to which movement is imparted in one direction by said rocker member, and a flexible connecting medium between said revoluble element and lifter-plate, said medium being adapted to be wound in by said revoluble element to advance the lifter-plate.

24. The combination with a sheet feeding element adapted to receive sheets at a given position, of a movable member for advancing a pack of sheets, said member being designed to assume various angular positions to suit the inclination of folded sheets of different stock, and means for advancing said member to shift the pack and place the first unit thereof in receiving position, said member being adapted to tilt, in moving forward, and swing toward parallelism with said given sheet receiving position.

25. The combination with a sheet feeding element adapted to receive sheets at a given receiving position, of a movable member for advancing a pack of sheets to present the first sheet thereof in such receiving position, a rocker-member, a revoluble element to which movement is imparted in one direction by said rocker-member, means countering the movement of said element in a reverse direction, a medium connecting said member with said revoluble element adapted to be wound in on the latter for advancing the former, and a device for rendering said countering means inoperative to permit of the unwinding of said medium from the revoluble element and the retraction of said pack advancing member.

26. In combination, an inclined table adapted to slidably support a pack of sheets on edge, an inclined lifter-plate supplying a slidable back-rest for said pack, said back-rest having a horizontal slot therein, a support at the rear of the back-rest, and a side-guide for the pack movable through said slot and adjustably mounted on said support.

27. In combination, an inclined bottom rest and an inclined back-rest for supporting a pack of sheets on edge, the back-rest being movable, a side-guide for the pack and means

at the rear of the back-rest for supporting the side-guide in various positions of adjustment horizontally of the bottom rest, said back-rest being formed to accommodate the side-guide and permit of such adjustment thereof. 15

28. The combination with a sheet feeding element adapted to receive sheets at and take the same one at a time from a given receiving position, of an inclined bottom rest for movably supporting a pack of sheets on edge, an inclined movable back-rest for the pack, mechanism for advancing the pack, step by

step, to present the foremost sheet thereof at said given sheet receiving position, and tripping means, operative during the intervals between the taking of sheets from the support, said tripping means being actuated by the foremost sheet of the pack for interrupting the action of said mechanism.

In testimony whereof, we have signed our names to this specification. 20

ABEL KLUGE.
ENEVAL KLUGE.