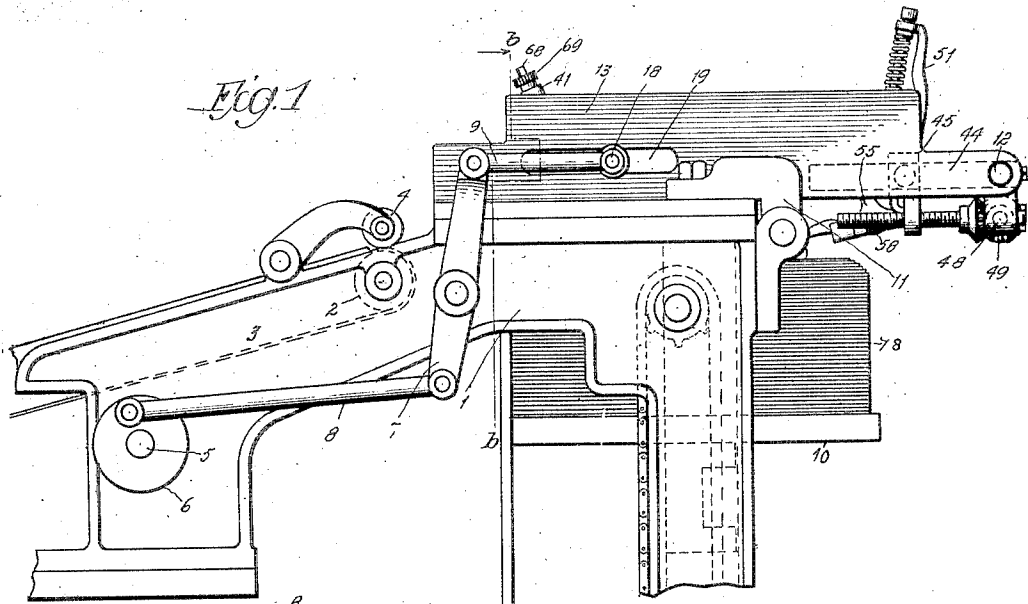
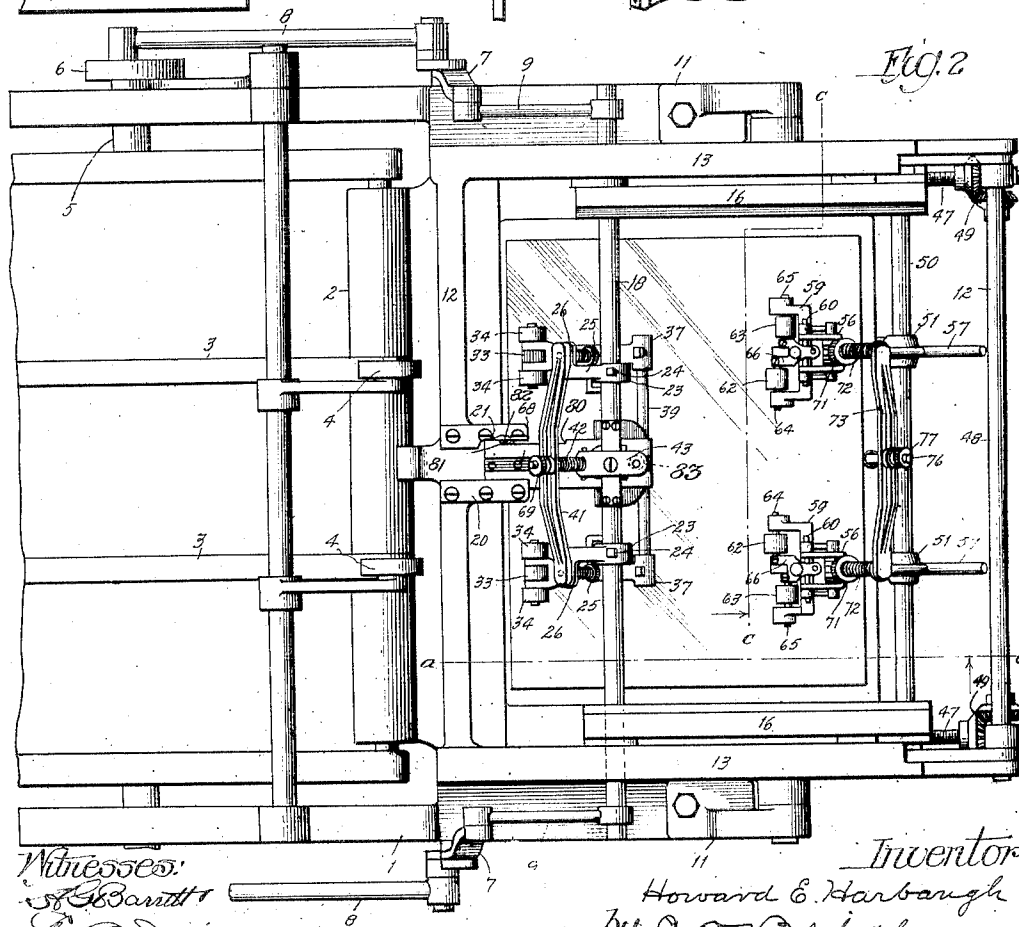


H. E. HARBAUGH.
FEEDER FOR PRINTING PRESSES.
APPLICATION FILED APR. 15, 1912.

Patented Nov. 10, 1914.

3 SHEETS-SHEET 1.

1,116,587.



Witnesses:

St. Bantitt
Geo. D. Brown

Inventor:

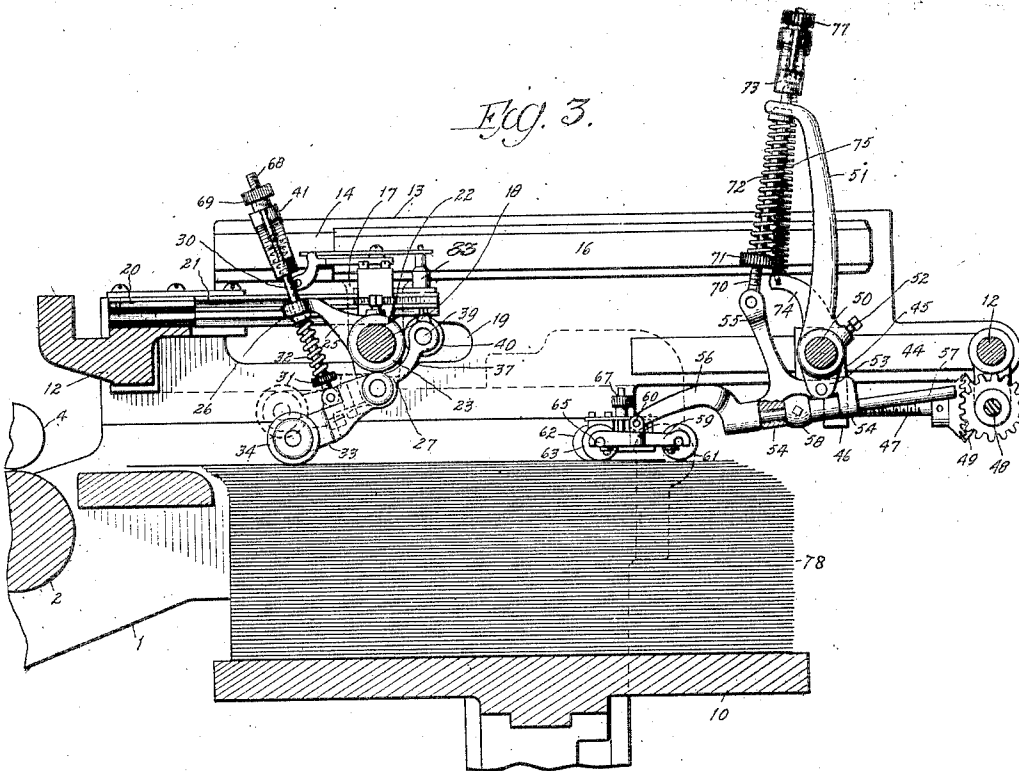
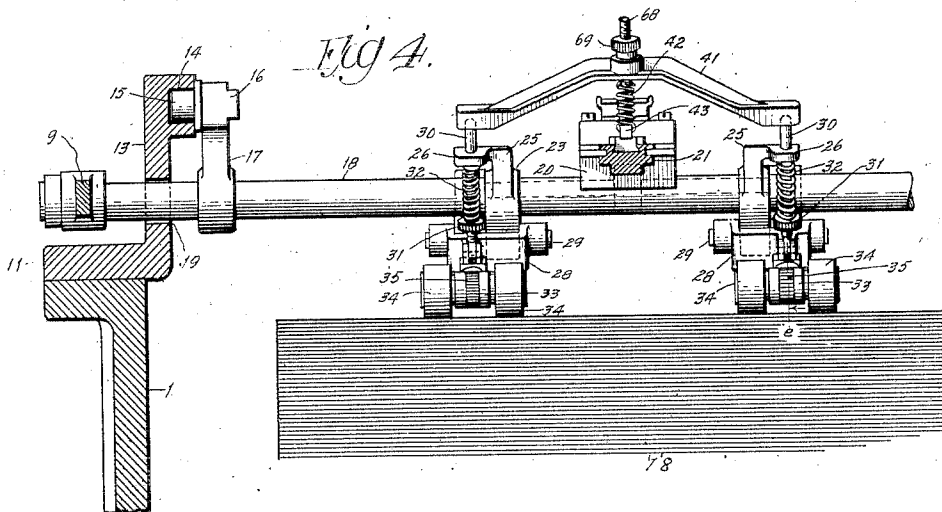
Howard E. Harbaugh
by A. O. Selig *Attor.*

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3 SHEETS—SHEET 2.

1,116,587.



Witnesses:
Al Barrett
Geo. S. Larson

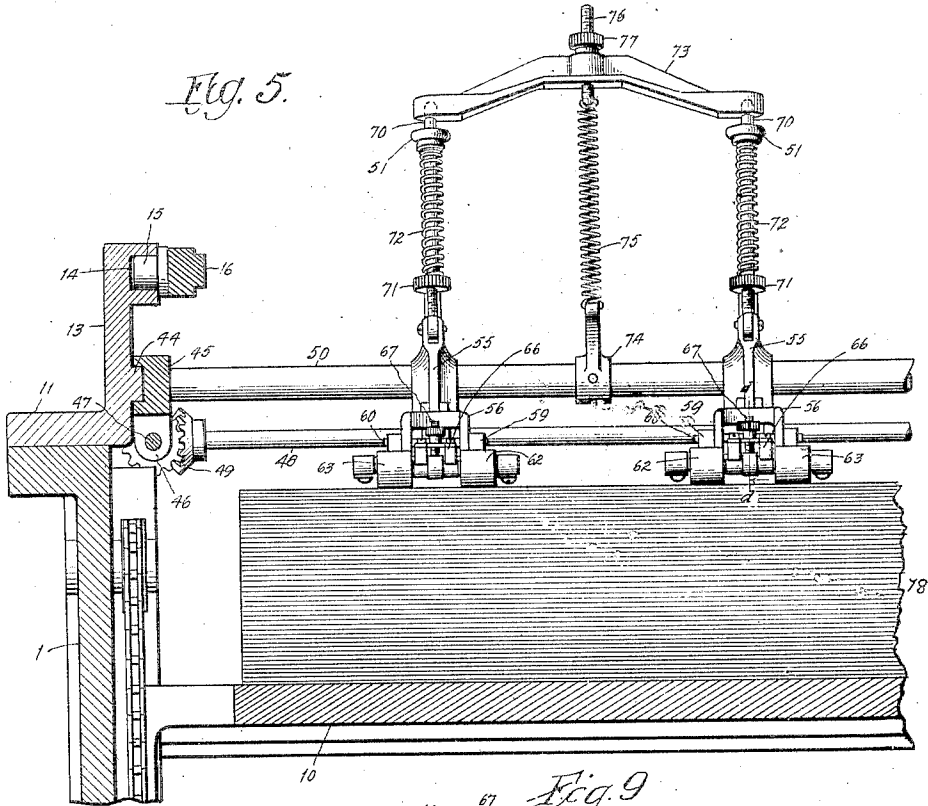
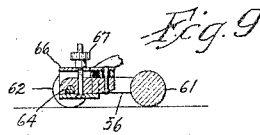
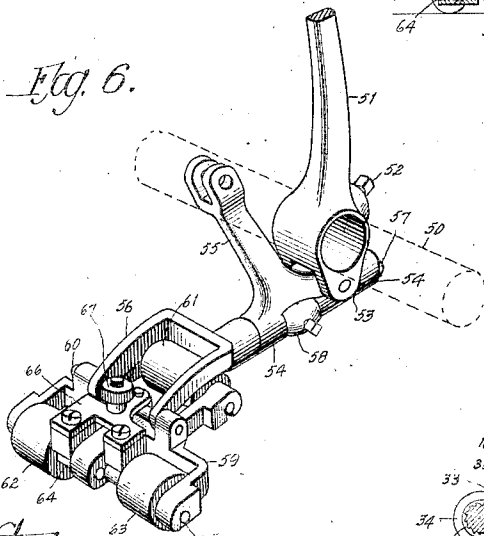
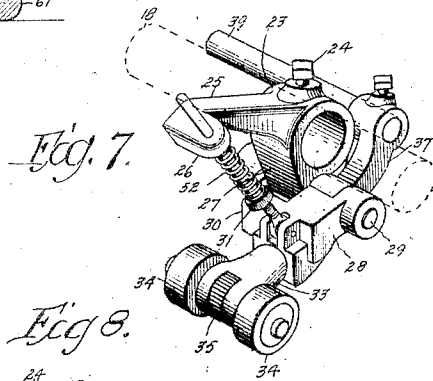
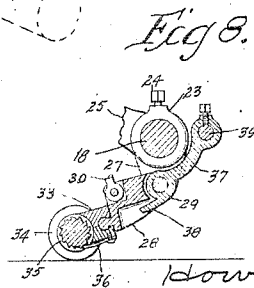
Inventor:
Howard E. Harbaugh
by A. O. Bellet
Atty.

H. E. HARBAUGH.
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APPLICATION FILED APR. 16, 1912.

Patented Nov. 10, 1914.

3 SHEETS—SHEET 3.

1,116,587.



Witnesses:
J. B. Barnett
Geo. C. Green

Inventor:
Howard E. Harbaugh
by A. O. Deibel
Att'y

UNITED STATES PATENT OFFICE.

HOWARD E. HARBAUGH, OF KENOSHA, WISCONSIN.

FEEDER FOR PRINTING-PRESSES.

1,116,587.

Specification of Letters Patent.

Patented Nov. 10, 1914.

Application filed April 15, 1912. Serial No. 691,058.

To all whom it may concern:

Be it known that I, HOWARD E. HARBAUGH, a citizen of the United States, residing at Kenosha, in the county of Kenosha and State of Wisconsin, have invented certain new and useful Improvements in Feeders for Printing-Presses, of which the following is a specification.

One of the objects of this invention is to construct a feeder for printing presses in which the two sets of rollers for feeding the paper to the main feeding roller of the press are independently vertically self adjustable in order that each set of rollers may accommodate itself to the unevenness of the thickness of the stack of sheets being fed to the press.

A further object of this invention is to provide two sets of rollers which are independently adjustable for holding back the top sheets of the stack in order that the top sheet may be drawn free of the other sheets and passed to the press.

In feeders for printing presses, various means have been employed to separate the top sheet from the stack and carry it to the press, but so far as known to me the means employed to carry a sheet from the stack to the press comprises two sets of rollers located transverse to the movement of the paper and connected so as to move vertically in unison. In such a construction should one edge of the stack of sheets be higher than the other edge, the two sets of rollers would contact with the paper with varying pressure which would cause the paper to move diagonally sidewise, with the result that it would not be presented squarely to the feed roll of the press. My improvements aim to overcome this difficulty.

In the accompanying drawings, Figure 1 is a side elevation of the feed end of a printing press to which I have applied my improvements. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a section on line *a a* Fig. 2. Fig. 4 is a section on line *b b* Fig. 1. Fig. 5 is a section on line *c c* Fig. 2. Fig. 6 is a perspective view of one of the sets of rollers for holding back the sheets of paper. Fig. 7 is a perspective view of one of the sets of rollers for feeding a sheet of paper to the feed rolls of a printing press. Fig. 8 is a

section on line *e* Fig. 4. Fig. 9 is a section on line *d d* Fig. 5.

My improvements are applied to a printing press which is provided with a magazine holding a stack of sheets of paper to be printed, and in the drawings I have only shown such portions of the press as are necessary to an understanding of my improvements.

The main frame comprises the side bars 1 which support a roller 2 which is rotated by the endless belts 3. Presser rolls 4 are located over the belts 3 and in contact therewith. A shaft 5 is supported by the side bars and it supports two crank heads 6. This shaft is rotated in any suitable manner. To the side bars 1 are pivoted two rocking bars 7, one end of each is connected to a link 8, and their other ends are connected with the crank heads 6. The other ends of these rocking bars are pivotally connected to the links 9. The side bars of the main frame support a vertically movable magazine 10 which is automatically raised in any suitable manner. I lay no claim to the magazine or means for operating it, only in the operation of my improvements some construction of automatically operated magazine is necessary.

To the side bars 1 of the main frame are connected the side bars 11 of the feeder frame, which are connected by end bars 12. These side bars 11 are each provided with a vertical edge 13 which is formed with a guide-way 14 in which are located rollers 15 connected to bars 16. From the bars 16 depend bearings 17 which are connected by a rod 18 which extends through openings in the edges 13 and their projecting ends are connected to the links 9. As the crank heads 6 rotate, the bars 16 will be reciprocated in guide-ways 14 through the rocking-bars 7 carrying the rod 18 with them. To the end bar 12 of the supplemental frame is secured a guide-way 20 within which is located a guide 21, which has formed in one side, a key-way having the shoulders 80 and 81. A key 82 fixedly secured in the guide-way 20, limits the forward and backward movement of the guide 21. The guide 21 is moved thus, by the frictional engagement of the spring-pressed finger 83 which contacts said

guide, the frictional engagement being just sufficient to grip said guide and reciprocate it, and allow said guide to slide freely thereunder when the shoulders 80 and 81 contact the key 82. The underside of the guide is provided with a cam surface 22. The rod 18 has two brackets 23 connected to it by set screws 24 and each bracket has an overhanging arm 25 with an offset perforated end 26. These brackets 23 have a perforated depending projection 27 to which is pivoted a yoke 28 by the pin 29. To the yoke 28 is pivoted a screw 30 which extends through the perforation of the offset 26 of the overhanging arm 25. A nut 31 is turned on the screw 30, and a spring 32 surrounds the screw between the nut and the offset end 26. To the yoke 28 is swiveled a T bar 33 carrying two rollers 34. Between the rollers 34 and connected therewith is located a ratchet wheel 35, with which a flat spring 36 engages. The pin 29 supports an arm 37 which has a finger 38 which contacts with the underface of the yoke 28, Fig. 8. The two arms 37 are connected by a rod 39, and this rod supports a roller 40, Fig. 3.

A bar 41 has its ends formed with cavities which receive the upper ends of the screws 30. A spring 42 has one end connected to the plate 43 movable with the rod 18, and the other end of this spring is connected to a screw 68 passing through the bar 41 and receiving a thumb nut 69 on its projecting end.

The side bars 13 are formed with guide-ways 44 which support guides 45 from which depend a bearing 46 for a screw 47. These screws 47 are connected by a rod 48 and miter gears 49. By turning one of the screws 47 the other screw will be rotated which will move the guides back and forth carrying the rod 50 with them. To the rod 50 are connected two sheet separating devices each comprising an arm 51 connected to the rod by the set screw 52. From the arm 51 depends two ears 53 between which is pivoted a bracket having depending perforated ears 54, and an uprising arm 55.

A yoke 56 has a shank 57 located in the ears 54, and is adjustable longitudinally by the collar 58. To the yoke 56 is pivoted a frame 59 on the pin 60, and a central roller 61 is pivoted to this frame. Two rollers 62 and 63 are connected to the forward section of the frame 59 on the two rods 64 and 65 respectively. A brake 66 is supported by the yoke 56 and contacts with the rods 64 and 65, and by means of the screw and adjusting nut 67, the friction applied to the rods can be varied.

To the uprising arm 55 is pivoted a screw-threaded rod 70 which passes through the upper end of the arm 51. A nut 71 is located on the screw 70 and a spring 72 is lo-

cated between the nut 71 and the arm 51. A bar 73 is formed with a recess in each end which receives the rod 70. An arm 74 is secured to the rod 50 and a spring 75 has one end connected to this arm. The other end of the spring 75 is connected to a screw 76 which extends through the bar 73 and receives a nut 77 on its projecting end.

In use, the rollers 61; 62 and 63 are adjusted bodily with respect to the paper 78 supported by the magazine 10 so as to hold back the sheets of paper and permit the top sheet to be drawn forward by the feeding rollers located in advance of the holding rollers. The feeding rollers 34 being supported by the rod 18 will be moved back and forth as the rod is moved by its connection with the crank heads 6. These rollers rest in contact with the paper during its movement toward the press and the springs 36 engage the ratchet wheels 35 will hold the wheels from rotating so that the rollers act as fingers and carry a sheet of paper forward to be engaged between the rollers 2 and 4 which will carry the sheet to the cylinder of the press. It will be noticed that should the transverse contour of the paper drop slightly to one side, that with a roller 34 on the high side of such slope of the paper, the other roller 34, through the brackets 33 and 38 would be allowed to move vertically downward independently of the former roller to follow said depression in the contour of the paper. Just before the rollers finish their forward movements, the roller 40 will contact with the cam face 22 which will depress the roller, and the rod 39 supporting it. The arms 27 will be moved downward which will bring the lug 38 against the underface of the yoke 28 thereby raising the rollers free of the paper. At the end of the forward movement of the bar 18, the shoulder 80 will be in contact with the key 82, and in the rear movement of the bar 18 the rollers will be carried elevated free of the paper until the shoulder 81 contacts the key 82, when the guide 20 will stop, and the roller 40 will leave the cam surface 22, just as the bar 18 reaches the end of its movement. I do not claim the invention of these feeding rollers or means for positively moving them bodily back and forth, or for carrying them elevated in their returning movement, but I claim the independent oscillatory movement to the two sets of rollers so that they will conform to the lateral conformation of the stack of paper, also the independent vertical movement of the two sets of rollers so that they will independently conform to the longitudinal undulations of the upper sheet of paper.

By connecting the two sets of feeding rollers with the bar 41, and a center spring

connection between this bar and a fixed part the force of this spring will be equalized between the two sets of rollers sufficient to carry the top sheet of paper forward, but additional spring force can be given to either of the sets of rollers independently by the nuts 31 compressing the spring 32 against the arm 26. In a stack of paper, the two edges vary in thickness, and in order to feed the top sheet it is necessary that the two sets of rollers be independently vertically movable, and owing to the lateral unevenness of the stack of paper it is necessary that the two rollers of each set oscillate on a horizontal pivot.

The frame supporting the holding rollers 61, 62 and 63 has an oscillatory movement so that they can conform to the lateral contour of the stack of papers similar to the oscillatory movement of the feeding rollers. By the spring 72 exerting a downward force on the arm 55, the rollers 61, 62 and 63 will be held in contact with the paper, and the pressure can be varied independently by the adjusting nut 71. The action of the bar 73 and the spring 75 is the same as the bar 41 and spring 42 above described. By this arrangement of feeder, the top sheet is fed squarely to the rollers 2 and 4 and by them carried to the cylinder. The rollers 62 and 63 are elastic so that they will cling more closely to the paper and prevent more than one sheet being fed at a time.

As the paper varies in thickness and a feed for the magazine cannot operate to hold the upper surface of the stack of paper at a uniform height, it is necessary that the pressure of the holding rollers on the paper should be as nearly uniform as possible. I have therefore arranged the arm 55 and the rod 70 with relation to the pivot of the bracket supporting the arm, and the guide for the rod, so that, as the spring force increases the leverage will be decreased.

I claim as my invention:

1. A sheet feeding mechanism for printing presses comprising a reciprocating feed-frame, two brackets fixedly secured thereto, roller-supporting brackets pivoted to each of said fixed brackets, rollers carried by the roller-supporting brackets, an equalizing-arm having a connection with each of said roller-supporting brackets and adapted to yieldably depress the roller-supporting brackets, and means connecting and adapted to raise and lower said roller-supporting brackets.

2. A sheet feeding mechanism for printing presses comprising a reciprocating feed-frame, two brackets fixedly secured thereto and each having an outstanding arm, roller-supporting brackets pivoted to

each of said fixed brackets, rollers carried by the roller brackets, an equalizing-arm, a connection passing through each of said outstanding arms and connecting each roller-supporting bracket with the equalizing-arm, yieldable means mounted on each of said connections between the outstanding arm and the roller-supporting bracket and adapted to yieldably depress said roller-supporting brackets independently, and means for yieldably depressing said equalizing-arm.

3. A sheet feeding mechanism for printing presses comprising a supporting-frame, two brackets carried thereby and capable of vertical movement, a bracket having a vertical transverse movement and secured to each of said vertically movable brackets, a roller-supporting frame pivotally attached to each of said transversely movable brackets, and rollers supported by said roller-supporting frames at the front and rear of their pivotal support.

4. A sheet feeding mechanism for printing presses comprising a supporting-frame, a bracket carried thereby and capable of a vertical movement, a bracket having a vertical transverse pivotal movement and secured to said vertically movable bracket, a roller-supporting frame pivotally attached to said transversely pivotal bracket, and rollers carried by said roller-supporting frame at the front and rear of their pivotal support.

5. A sheet feeding mechanism for printing presses comprising a supporting-frame, two brackets pivotally secured to said frame and capable of independent vertical movement, a vertical transversely pivotal bracket carried by each of said vertically pivotal brackets, a frame pivotally secured to each of said transversely pivotal brackets, rollers carried by said frames, and an equalizing-arm having connection with and adapted to yieldably depress said vertically pivotal brackets.

6. A sheet feeding mechanism for printing presses comprising a supporting-frame capable of adjustment as to the length of the sheets being fed, two brackets pivotally secured to said frame and capable of independent vertical movement, a vertical transversely pivotal bracket carried by each of said vertically pivotal brackets, a frame pivotally secured to each of said transversely pivotal brackets, rollers carried by said pivotal frames, and an equalizing-arm having connection with and adapted to yieldably depress said vertically pivotal brackets.

7. A sheet feeding mechanism for printing presses comprising a supporting-frame, two brackets pivotally secured to said frame and capable of independent vertical move-

ment, a vertical transversely pivotal bracket carried by each of said vertically pivotal brackets, a frame pivotally secured to each of said transversely pivotal brackets, an equalizing-arm having connection with and adapted to yieldably depress said vertically pivotal brackets, and means carried by said pivotal frames for contacting the paper.

8. A sheet feeding mechanism for printing presses comprising a supporting-frame capable of adjustment as to the length of the sheets being fed, two brackets pivotally secured to said frame and capable of independent vertical movement, a vertical transversely pivotal bracket carried by each of said vertically pivotal brackets, a frame pivotally secured to each of said transversely pivotal brackets, rollers carried by said pivotal frames, an equalizing-arm having a connection with and adapted to yieldably depress said vertically pivotal brackets, and adjustable means carried by the equalizing arm and adapted to vary the pressure of said arm.

9. A sheet feeding mechanism for printing presses comprising a supporting-frame capable of adjustment as to the length of the sheets being fed, two brackets pivotally secured to said frame and capable of independent vertical movement, a vertical transversely pivotal bracket carried by each of said vertically pivotal brackets, a frame pivotally secured to each of said transversely pivotal brackets, rollers carried by said pivotal frames, an equalizing-arm, a connection between each vertically pivotal bracket and the equalizing-arm, yieldable means mounted on said connections and adapted to independently depress said vertically pivotal brackets, and means for yieldably depressing the equalizing-arm.

10. A sheet feeding mechanism for printing presses comprising a supporting-frame capable of adjustment as to the length of the sheets being fed, two brackets pivotally secured to said frame and capable of independent vertical movement, a vertical transversely pivotal bracket carried by each of said vertically pivotal brackets, a frame pivotally secured to each of said transversely pivotal brackets, rollers carried by said pivotal frames, an equalizing-arm, a connection between each vertically pivotal bracket and the equalizing-arm, yieldable means mounted on said connections and adapted to independently depress said vertically pivotal brackets, adjustable means on said connections and adapted to vary the pressure of said yieldable means, and means for yieldably depressing said equalizing-arm.

11. A sheet feeding mechanism for printing presses comprising a supporting-frame capable of adjustment as to the length of the sheets being fed, two brackets secured to

said frame and capable of independent vertical movement, a transversely pivotal bracket carried by each of said vertically movable brackets, a frame pivotally secured to each of said transversely pivotal brackets, an equalizing-arm having connection with and adapted to yieldably depress said vertically movable brackets, and means carried by said pivotal frames for contacting the paper.

12. A sheet feeding mechanism for printing presses comprising a supporting-frame, two vertically movable brackets attached thereto, a transversely pivotal bracket carried by each of said vertically movable brackets and capable of longitudinal adjustment, a frame pivotally secured to each of said transversely pivotal brackets, rollers carried by said pivotal frames, and an equalizing-arm having connection with and adapted to yieldably depress said vertically movable brackets.

13. A sheet feeding mechanism for printing presses comprising a supporting-frame, two vertically movable brackets attached thereto, a transversely pivotal bracket carried by each of said vertically movable brackets and capable of longitudinal adjustment, a frame pivotally secured to each of said transversely pivotal brackets, rollers carried by said pivotal frames, an equalizing-arm, a connection between each vertically movable bracket and the equalizing-arm, yieldable means mounted on said connections and adapted to independently depress said vertically movable brackets, and means for yieldably depressing said equalizing-arm.

14. A sheet feeding mechanism for printing presses comprising a supporting-frame, a vertically pivotal bracket carried thereby, paper contacting means carried by said bracket, an arm rigidly carried by said bracket, and yieldable means having a connection with said arm and adapted to decrease its tension as the downward leverage of the pivotal bracket increases.

15. A sheet feeding mechanism for printing presses comprising a supporting-frame, a vertically pivotal bracket carried thereby, paper contacting means carried by said bracket, an arm rigidly carried by said bracket adjacent the pivotal support thereof and extending above said pivotal point, and means having a connection with the free end of said arm and adapted to yieldably depress the arm.

16. A sheet feeding mechanism for printing presses comprising a supporting-frame, two brackets carried thereby and capable of a vertical movement, a roller-support pivotally carried on a horizontally disposed axis parallel with the direction of feed of the sheets by each of said vertically movable

brackets and movable vertically from said axis independent of the movement of said brackets, rollers carried by the support spaced apart transverse to the direction of feed of the sheets at each side of the pivotal point of said support, and means for yieldingly depressing said rollers.

17. A sheet feeding mechanism for printing presses comprising a reciprocable frame, two roller-supports carried thereby pivotally on horizontally disposed axes parallel with the direction of feed of sheets and capable of independent vertical movement from said axes, each roller-support carrying two rollers spaced apart on an axis transverse to the movement of said frame, said roller axes being movable independent of the roller supports to approximately follow the vertical contour of the sheets being fed, and means for yieldingly depressing the rollers.

18. A sheet feeding mechanism comprising a reciprocable frame, a feed bracket carried thereby and capable of vertical movement, a roller support carried by the bracket on an axis disposed parallel with the feed direction and capable of vertical movement from said axis independent of said bracket, rollers carried by the roller support, spaced apart transverse to the direction of feed of the sheets, and each roller capable of independent vertical movement through the movement of said roller support, and means for depressing the rollers.

19. In a sheet feeding mechanism, the combination of two frames capable of independent vertical movements, a roller supported by each frame, and a spring actuated equalizing bar supported by the frames and movable vertically in conformity with the independent vertical movement of said frames.

20. In a sheet feeding mechanism for printing presses, the combination of sheet feeding means, sheet hold-back means including a stationarily mounted rotatable roller having a yieldable periphery, said roller being positioned to engage with an underlying sheet as the topmost sheet is being withdrawn and serving by frictional contact of its periphery with said underlying sheet to hold said sheet and separate the same from the sheet being fed and means for frictionally retarding the rotation of said roller.

21. A sheet feeding mechanism for printing presses comprising a supporting frame, two feed roller-supports having connection therewith, capable of independent vertical movement and spaced apart transverse to the direction of feed of the sheets, rollers for the roller-supports, an equalizing-bar having a connection with each of said roller-supports and movable vertically in conformity

with said independent vertical movement of either of said roller-supports, and means for yieldingly depressing the equalizing-bar.

22. A sheet feeding mechanism comprising a supporting frame, two roller-supports having connection therewith and located adjacent a common end of sheets being fed, capable of independent vertical movement and spaced apart transverse to the direction of feed of the sheets, a roller for each roller-support, an equalizing-bar supported and movable in conformity with the independent vertical movement of either of said roller-supports by and having a movable connection with each of said roller supports, and means for yieldingly depressing the equalizing-bar.

23. A sheet feeding mechanism comprising a supporting frame, two roller-supports having connection therewith, capable of vertical movement and spaced apart transverse to the direction of feed of the sheets, a roller for each roller-support, an equalizing-bar having a movable connection with each of the roller-supports and movable vertically through said vertical movement of said roller-supports, and means having connection with the equalizing-bar at a point thereon intermediate said spaced roller-supports for yieldingly depressing the equalizing-bar.

24. A sheet feeding mechanism comprising a supporting frame, paper contacting means having connection therewith and located at a common end of sheets being fed, spaced apart transverse to the direction of feed of the paper and capable of independent vertical movement, an equalizing-bar disposed between said paper contacting means having connection therewith and capable of vertical movement in conformity with said independent movement of the paper contacting means, and means for yieldingly depressing the equalizing-bar at a point approximately centrally between said paper contacting means.

25. A sheet feeding mechanism comprising a supporting frame, a plurality of roller-supports carried thereby at a common end of sheets being fed, spaced apart transversely to the direction of feed of the paper and each roller-support capable of independent vertical movement, a roller for each roller-support, a movable connection between each two adjacent roller-supports so as to form connected pairs, these connections being vertically movable in conformity with the independent movement of roller-supports, and means for yieldingly depressing said connections whereby an approximately equal depression of each roller on the paper is obtained.

26. A sheet feeding mechanism comprising a supporting frame, a plurality of roller-supports carried thereby spaced trans-

verse to the direction of feed of the sheets
and each roller-support capable of independent vertical movement, a roller for each
roller-support, vertically movable equalizing
5 means having connection with each roller-support for yieldingly depressing the roller-supports at approximately an equal degree of pressure, means carried by each
roller-support for yieldingly depressing its
10 roller, and an adjustment for each of said

yieldable means to vary the independent depression of the roller carried by each roller-support.

In testimony whereof I have hereunto set my hand in presence of two subscribing
witnesses. 15

HOWARD E. HARBAUGH.

Witnesses:

LOUIS HANSMANN,
A. O. BEHEL.