Sept. 22, 1953 N. KATZ 2,652,772

SKIP-NUMBERING MECHANISM FOR PRINTING PRESSES OR THE LIKE

Filed May 27, 1950 3 Sheets-Sheet 1

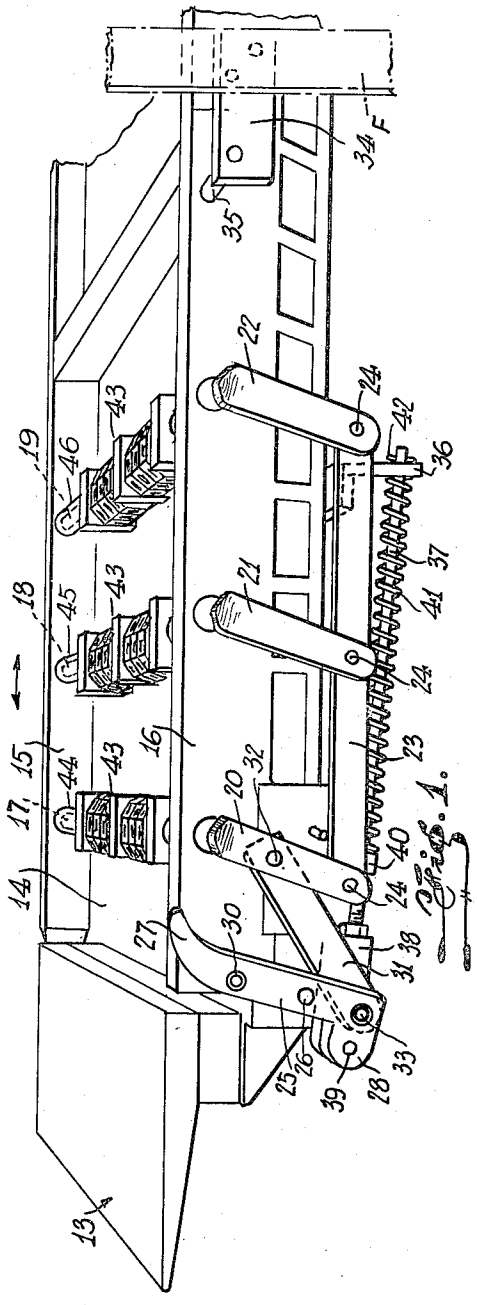


Fig. 1.

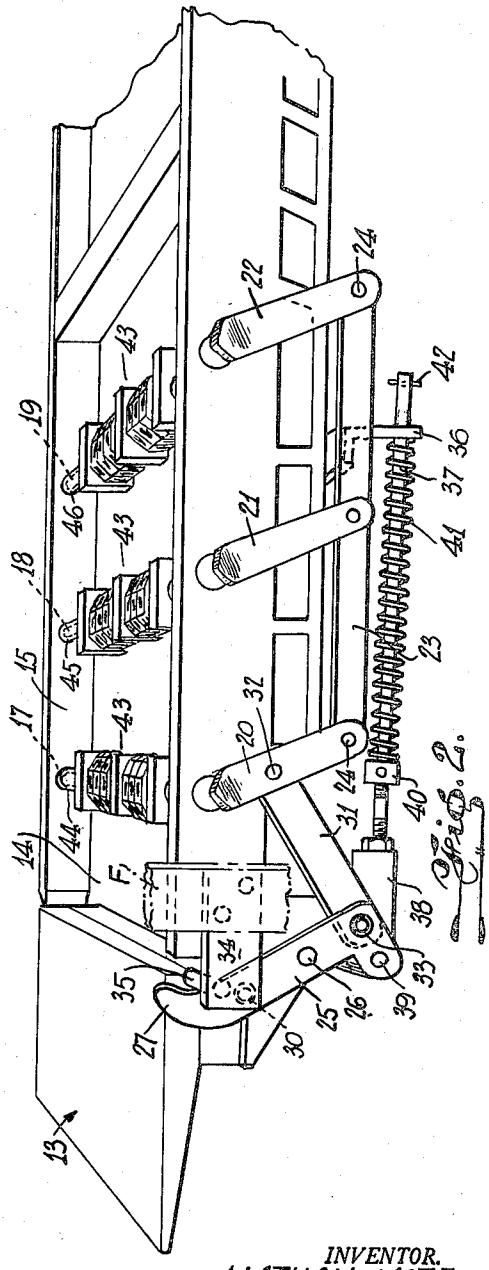


Fig. 2.

INVENTOR.
NATHAN KATZ.

BY

ATTORNEY.

Sept. 22, 1953 N. KATZ 2,652,772

SKIP-NUMBERING MECHANISM FOR PRINTING PRESSES OR THE LIKE

Filed May 27, 1950 3 Sheets-Sheet 2

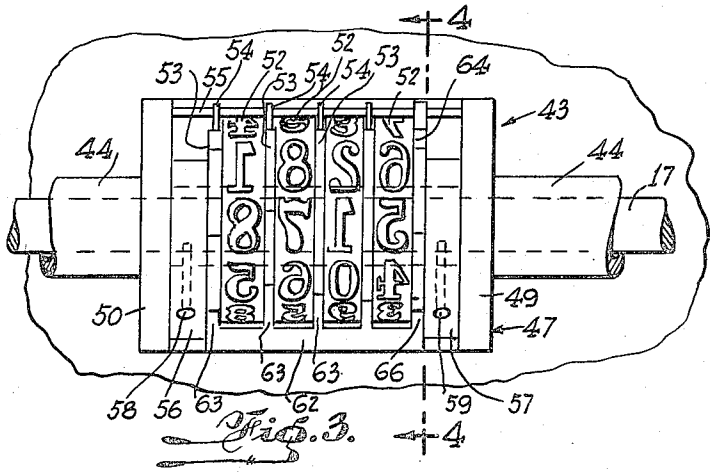


Fig. 3.

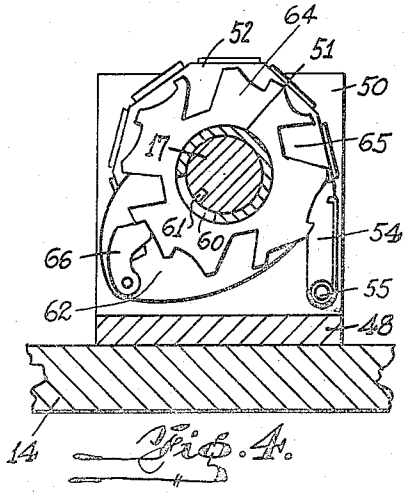


Fig. 4.

INVENTOR.
NATHAN KATZ.

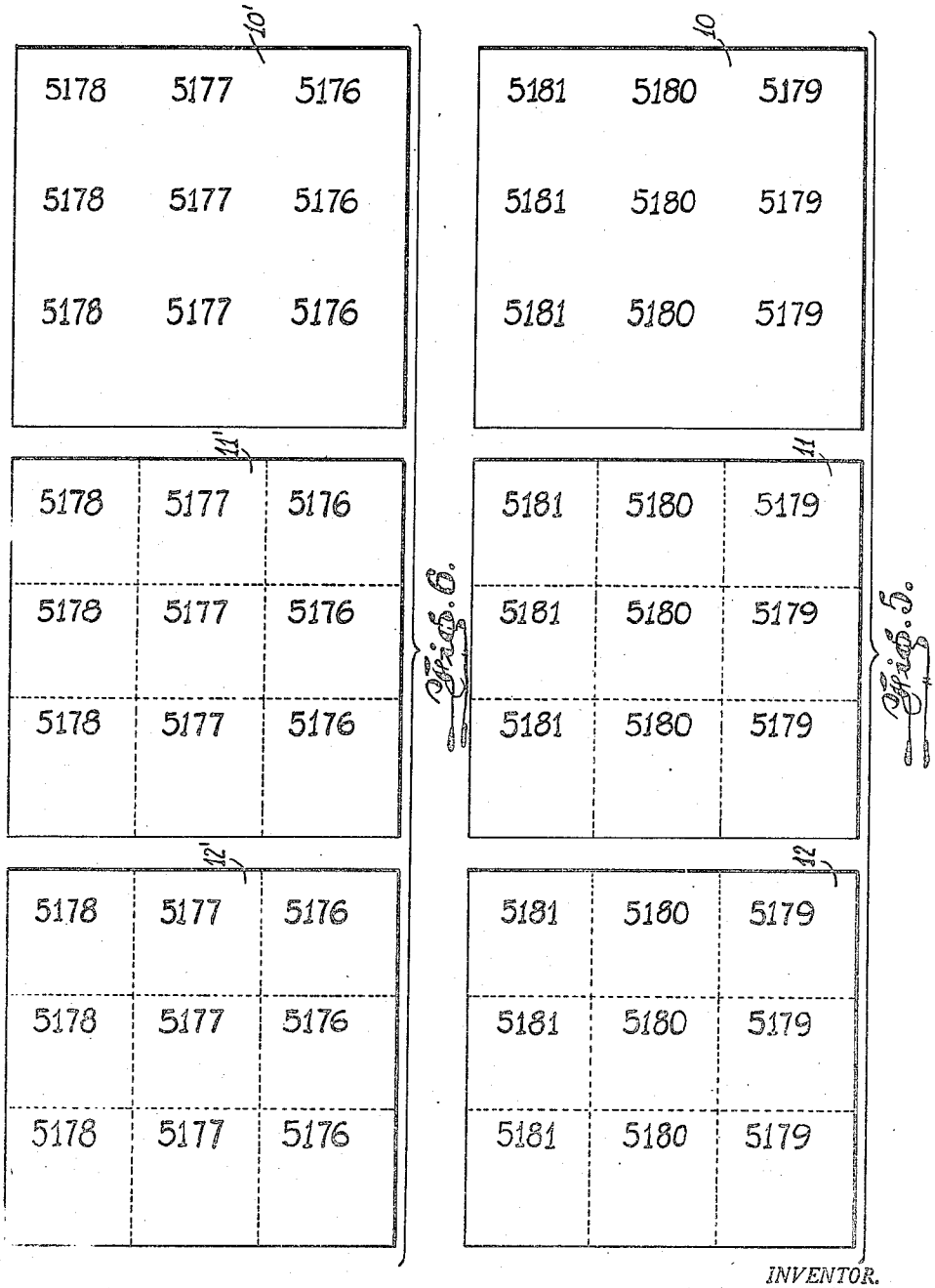
BY
Maxwell E. Pearson

ATTORNEY.

Sept. 22, 1953 N. KATZ 2,652,772

SKIP-NUMBERING MECHANISM FOR PRINTING PRESSES OR THE LIKE

Filed May 27, 1950 3 Sheets-Sheet 3



INVENTOR.
NATHAN KATZ.

BY
Edward E. Dann

ATTORNEY.

Patented Sept. 22, 1953

2,652,772

UNITED STATES PATENT OFFICE

2,652,772

SKIP-NUMBERING MECHANISM FOR PRINTING PRESSES OR THE LIKE

Nathan Katz, New York, N. Y.

Application May 27, 1950, Serial No. 164,802

9 Claims. (Cl. 101—72)

1

This invention relates generally to numbering machines used in conjunction with cylinder type printing presses, and more particularly to an actuating device for the numbering machines which are operated by the to and fro movement of the bed of the printing press.

According to this invention a plurality of center drive numbering machines are mounted upon the reciprocating bed of a cylinder type printing press, and the actuating shafts of such numbering machines are extended to one side of the bed and terminate in radially extending crank arms which are connected by a suitable rod. An operating lever is pivoted on the side of the bed and is pivotally connected by a link to the closest of the crank arms. The operating lever is spring urged to the limit of its movement in one direction and is moved in the opposite direction for rotating the actuating shafts by contact with a suitable stop fixed on the frame of the press and disposed in the path of travel of the operating lever as the bed reaches the end of its travel during the printing of a sheet.

An object of this invention is to provide actuating means for numbering machines of the type having a central drive shaft which will effectively advance the numeral wheels of the numbering machine in conjunction with the motion of the bed of the printing press.

Another object is to provide actuating means for central drive numbering machines mounted on the bed of a cylinder type printing press which is simple in structure, relatively inexpensive, sure in its operation and easily adapted to the various cylinder type presses now in existence.

A further object is to provide actuating means for central drive numbering machines which is operative in response to the movement of the bed, and which is adapted to rotate the actuating shafts of the numbering machines in either of two opposed directions.

Still another object of this invention is to provide numbering machines mounted on the bed of a cylinder type printing press and actuating means therefor which operate to advance the numeral wheels in response to selected ones of the horizontal movements of the press bed, so that a plurality of sheets will be printed bearing identical numerals before the numbering machines are actuated to change the printed numerals.

Other objects, features and advantages of the invention will appear in the following detailed description of a preferred embodiment thereof,

2

and in the accompanying drawings illustrating the described embodiment.

In the drawings:

Figure 1 is a perspective view of the bed of a cylinder type sheet fed printing press having center drive numbering machines thereon and showing an actuating device for such numbering machines constructed according to this invention;

Figure 2 is a perspective view, similar to that of Figure 1, illustrating the position of the parts during movement of the actuating device in response to displacement of the printing press bed;

Figure 3 is a detailed top plan view, on an enlarged scale, of one of the numbering machines;

Figure 4 is a transverse sectional view of one of the numbering machines taken along line 4—4 of Figure 3; and

Figures 5 and 6 are each plan views of a plurality of sheets printed by a cylinder type printing press having numbering machines and actuators therefor according to this invention, and showing the change in the printed numerals effected by movement of the actuating device.

Referring to the drawings, and initially to Figures 5 and 6 thereof, groupings of sheets are there illustrated, upon which the printed numerals have been formed by an apparatus constructed in accordance with this invention. In Figure 5, three sheets 10, 11 and 12, are illustrated, each having identical numerals placed thereon. It is desirable to print sheets such as illustrated in Figure 5 for the purpose of binding them into a book of receipts or the like, so that when such receipt books are in use sheet 12 may be detached and given to the customer, as his receipt, sheet 11 may be secured to the article identified by the numeral, and sheet 10 may be retained in the book as a permanent record of the transaction. In Figure 6 a second grouping of sheets 10', 11', and 12' is illustrated, and it will be noted, that the numerals placed on these sheets while being identical with each other, are each three numerals lower than those appearing in the respective columns of sheets 10, 11 and 12. Sheets 10', 11' and 12' will form the leaf of the receipt book disposed above that leaf formed by sheets 10, 11 and 12. The apparatus to be described hereinafter is provided for automatically printing numerals upon sheets such as those shown in Figures 5 and 6. That is, the apparatus forming an attachment for a cylinder type sheet fed printing press, will print identical numerals upon three successive sheets fed through the

printing press, and then will automatically actuate the numbering machine containing the numeral dies, in order to change the numerals by a desired amount for the next three successive sheets.

In Figures 1 and 2, a type bed 13 of a cylinder type sheet fed printing press is illustrated. The bed 13 is reciprocated in a horizontal plane by mechanism forming a part of the printing press itself, which mechanism is not illustrated since it is well known in the art, and of itself forms no part of this invention. Bed 13 is provided with a flat bottom 14, and upstanding walls 15 and 16 extending along the opposite side edges thereof. Parallel spaced apart shafts 17, 18 and 19 extend transversely across the bed 13, at right angles to the direction of the reciprocation of the latter, and are rotatably journalled, at their opposite ends, in the side walls 15 and 16. Crank arms 20, 21 and 22 are fixed upon the ends of the shafts 17, 18 and 19, respectively, which extend through side walls 16 of the bed 13. An elongated connecting rod 23 is pivotally connected, by pin 24, to the free ends of each of the crank arms, 20, 21 and 22, so that these crank arms and the respective shafts will rock together. An operating lever 25 is pivoted intermediate its ends upon pivot member 26 which is fixedly carried by side walls 16 of the bed adjacent one end of the latter. Operating lever 25 is formed with a hooked portion 27 on one end, and with a laterally extending foot 28 on the other end. Bushings 30 are fixed within lever 25 on opposite sides of its pivot 26. A connecting link 31 is pivoted at one end to crank arm 20 by pin 32, and is pivoted at its other end to lever 25, by pin 33 extending into bushing 29.

In Figure 1 bed 13 is shown in its extreme position of movement to the left, while in Figure 2, bed 13 is shown in its extreme right hand position. A block 34 is fixed to a portion F, shown in broken lines in Figures 1 and 2, of the frame of the printing press. A laterally extending pin 35 is fixedly carried by block 34, and extends into the path of travel of the hooked portion 27 of lever 25, when the latter is moved horizontally with bed 13. An apertured hanger 36 depends from the bottom of bed 13, and a rod 37 has one of its ends extending slidably through hanger 36. The other end of rod 37 is threaded into block 38 which is pivoted upon foot 28 of lever 25 by a pin 39. A collar 40 is threaded upon rod 37, and a coiled spring 41 is disposed about rod 37 and has its opposite ends abutting against collar 40 and hanger 36. A cotter pin 42 extends through the end of rod 37, and prevents removal of the rod from hanger 36. From the drawing, it is apparent that spring 41 constantly urges rod 37, and block 38 to the left, as viewed in Figures 1 and 2, to thereby constantly urge lever 25 to rotate in a clock-wise direction to the position shown in Figure 1.

When bed 13 approaches the limit of its movement in the right hand direction, pin 35 will engage hook portion 27 of lever 25, and the final movement of the bed 13 towards the right will effect rotation of lever 25 in a counter-clockwise direction against the force of spring 41 and to the position illustrated in Figure 2. Such rotation of operating lever 25 will effect similar rocking of crank arm 20, 21 and 22 by reason of the connection afforded by connecting link 31 and connecting rod 23. Shafts 17, 18 and 19 will then be caused to rock, or oscillate, in response to each reciprocation of bed 13. If it is desired to reverse the direction of rocking of shafts 17, 18 and 19, in response to engagement of pin 35 with hook portion 27 of layer 25, the end of connecting link 31 may be pivotally connected to the lever 25 on the opposite side of its pivot 26 by extending the pivot pin 33, carried by connecting link 31 through bushing 30, rather than through bushing 29.

A plurality of center drive numbering machines, generally indicated by numeral 43, and being of well known construction, are disposed upon each of shafts 17, 18 and 19, and the respective numbering machines 43 are positioned along the associated shafts by cylindrical spacers 44, 45 and 46.

Referring now to Figures 3 and 4, the details of the connection between the shafts 17, 18 and 19 and the numbering machines mounted thereon are illustrated. In these views the details of the connection of one of the numbering machines 43 are shown, and it is to be understood that each of the other numbering machines are similarly associated with their respective shafts. Each numbering machine 43 is formed of a substantially U-shaped frame member 47 having a base 48 and opposite upstanding side walls 49 and 50. A tubular member 51 is fixed between side walls 49 and 50 of the frame, and rotatably receives shaft 17. The base 48 of the frame rests upon bottom 14 of the bed 13, and prevents rotation of frame 47 with shaft 17. A plurality of numeral bearing wheels 52 are rotatable upon tubular member 51, and a ratchet wheel 53 is fixed to each of the numeral bearing wheels 52. The numeral bearing wheels 52 are rotatable independently of each other. Spaced apart spring urged pawls 54 are pivoted upon transverse pin 55, and engage against ratchet wheels 53 to prevent reverse rotation of the numeral bearing wheels, and to retain the wheels in their set position. Radially extending arms 56 and 57 disposed inwardly of the side walls 50 and 49 respectively, are pivoted upon tubular member 51. Set screws 58 and 59, carried by radial arms 56 and 57, respectively, extend through radial slots 60 formed in tubular member 51, and engage in the longitudinal keyway 61 formed in shaft 17, so that arms 56 and 57 will swing with the oscillations of shaft 17. A member 62 is pivoted between the outer ends of arms 56 and 57, and is formed with dogs 63 adapted to extend between the numeral bearing wheels 52 for engagement with the ratchet wheels 53. When the dogs 63 engage their respective ratchet wheels 53, and shaft 17 is oscillated, then the numeral bearing wheels will be selectively displaced. As is common in numbering machines, the dogs engaging the several ratchet wheels 53 are of varying lengths, so that certain of the dogs may only engage the associated ratchet wheel when the other of the ratchet wheels are in a predetermined position. That is, the dogs 63 are so arranged that the wheel printing the last numeral, of the number being printed, will turn through a full rotation, before the second wheel will be rotated a single numeral.

In order to prevent changing of the printed numerals with each oscillation of shaft 17, so that three sheets may be printed with the same number before a change in the numbering machine is effected, a ratchet wheel 64 is rotatably carried by tubular member 51 adjacent radial arm 57. As seen in Figure 4, ratchet wheel 64 is provided with a plurality of outwardly opening relatively deep recesses 65, which are spaced

uniformly about its circumference. Pivoted member **62** carries a dog **66** at one end for engagement with the periphery of ratchet wheel **64**, and when dog **66** is engaged with the normal notches in the periphery of that wheel, the other dogs **63** are moved out of engagement with their respective ratchet wheels **53**. Only when dog **66** is received by one of the notches or recesses **65**, are the dogs **63** permitted to move into engagement with their respective ratchet wheels. Therefore, the dogs **63** will be inoperative to effect rotation of the numeral bearing wheels **52** for two successive oscillations of shaft **17**, and only on the third oscillation of the shaft will this movement be imparted to the numeral bearing wheels.

From the foregoing detail description of a preferred embodiment of this invention, it is apparent that I have provided an attachment for a cylinder type sheet fed printing press which is capable of printing numerals upon sheets for forming receipt books or the like, which sheets conform to those shown in Figures 5 and 6.

Having thus described and illustrated a detailed embodiment of this invention, it is to be understood that changes and modifications thereof, obvious to one skilled in the art, may be effected without departing from the scope of the invention as defined by the appended claims.

What I claim is:

1. In combination with a cylinder type sheet fed printing press having a frame and a horizontally reciprocated type bed; at least one center drive numbering machine fixed on said bed with its axis extending transversely relative to the direction of movement of said bed, a transversely extending shaft operatively connected to said numbering machine and rockably extending through a side wall of said bed, a crank arm fixed on said shaft at the outside of said side wall of said bed, an operating lever pivoted intermediate its ends to said side wall of said bed and swinging in a vertical plane parallel to the direction of movement of said bed, an operating link pivotally connected at its opposite ends to one end of said lever and to said crank arm, and an actuating pin fixed on said frame in the path of travel of the other end of said lever and engaging against said other end of said lever when said bed approaches the limit of its movement in one direction for rocking said lever relative to said bed during the final movement of the latter in said one direction whereby said shaft is rocked to effect rotation of the numbering wheels of said numbering machine.

2. The combination set forth in claim 1, including resilient means connected to said operating lever constantly urging the latter to rock in the direction opposite to the rocking effected by engagement of said pin with said other end of said lever whereby said shaft will be oscillated through a full cycle during each oscillation of said bed.

3. The combination set forth in claim 2, wherein said numbering machine includes a pair of spaced radial arms fixed to said shaft, a plurality of independently rotatable numeral wheels disposed between said arms, a ratchet wheel fixed to each of said numeral wheels, a member pivoted between said arms and formed with a plurality of dogs adapted to engage said ratchet wheels, a rotatable ratchet wheel formed with a plurality of angularly spaced outwardly opening recesses, and a dog on said member engaging the last mentioned ratchet wheel for rotating the latter in response to rocking of said shaft and normally holding said first mentioned dogs out of engagement with said ratchet wheels on said numeral wheels, said first mentioned dogs moving inwardly for engagement with said ratchet wheels on said numeral wheels when said last mentioned dog engages in one of said recesses in said last mentioned ratchet wheel whereby said numeral wheels will be actuated during selected movements of said bed.

4. The combination set forth in claim 1, including an apertured hanger depending from said bed, a rod pivoted at one end to said one end of said operating lever, the other end of said rod extending slidably through said apertured hanger, a collar threaded on said rod, and a coil spring on said rod abutting at its opposite ends against said collar and said hanger and resiliently urging said lever to rock in the direction opposite to the rocking effected by engagement of said pin with said other end of said lever.

5. In combination with a cylinder type sheet fed printing press including a frame and a linearly reciprocated type bed carried by said frame; at least one transversely extending shaft rockably carried by said bed and extending through a sidewall of the latter; a crank arm fixed to said shaft at the outside of said bed; an operating lever pivoted intermediate its ends on said one side of said bed; an operating link pivotally connected at its opposite ends to one end of said lever and to said crank arm; resilient means constantly urging said lever to rotate in one direction; an actuating pin fixed on said frame in the path of travel of the other end of said lever and engaging against said other end of said lever when said bed approaches the limit of its movement in one direction and rocking said lever in the direction opposed to the urging of said resilient means during the final movement of said bed in said one direction of the latter; at least one center drive numbering machine on said bed axially receiving said shaft; said numbering machine including a plurality of independently rotatable numeral wheels and operating means operatively connected to said shaft for selectively advancing said wheels; and means actuated by said shaft rendering said operating means inoperative during predetermined oscillations of said shaft whereby said numeral wheels will be advanced in response to selected reciprocations of said bed.

6. In combination with a cylinder type sheet fed printing press including a frame and a linearly reciprocated type bed carried by said frame; a plurality of transversely extending parallel spaced apart shafts rockably carried by said bed and extending through a side wall of the latter; a crank arm fixed to each of said shafts at the outside of said bed; an operating lever pivoted intermediate its ends on the side wall of said bed through which said shafts extend; a connecting rod pivotally connected to the free ends of said crank arms; an operating link pivotally connected at its opposite ends to one end of said lever and to the crank arm on the adjacent end of one of said shafts; resilient means constantly urging said lever to rotate in one direction; an actuating pin fixed on said frame in the path of travel of the other end of said lever and engaging against said other end when said bed approaches the limit of its movement in one direction and rocking said lever in the direction opposed to the urging of said resilient means during the final movement of said bed in said one

direction of the latter; a plurality of numbering machines axially receiving each of said shafts; each of said numbering machines including a plurality of independently rotatable numeral wheels and operating means operatively connected to the associated shaft for selectively advancing said wheels, and means actuated by the associated shaft rendering said operating means inoperative during predetermined oscillations of the shaft whereby said numeral wheels are advanced only in response to predetermined reciprocations of said bed.

7. The combination set forth in claim 6, wherein said resilient means includes an apertured hanger depending from said bed, a rod pivoted at one end to said one end of said operating lever, the other end of said rod extending slidably through said hanger, a collar threaded on said rod, and a coil spring on said rod abutting at its opposite ends against said collar and said hanger.

8. The combination as set forth in claim 6, wherein said operating means includes a pair of radial arms fixed to the associated shaft, a ratchet wheel fixed on each of said numeral wheels, and a member pivoted between said pair of radial arms having dogs thereon spring urged toward said ratchet wheels for selectively rotating said numeral wheels in response to oscillation of said shaft.

9. The combination as set forth in claim 8,

wherein said means actuated by the associated shaft rendering said operating means inoperative during predetermined oscillations of the shaft includes a ratchet member rotatable concentrically to said shaft, a dog on said pivoted member engaging the periphery of said last mentioned ratchet member and normally holding said first mentioned dogs away from said ratchet wheels on said numeral wheels, and outwardly opening recesses formed in said last mentioned ratchet member intermittently receiving said last mentioned dog to thereby permit inward movement of said pivoted member for engagement of the dogs thereon with the ratchet wheels on said numeral wheels.

NATHAN KATZ.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
216,046	Macdonough	June 3, 1879
350,640	Reinhardt	Oct. 12, 1886
708,295	Bartusch	Sept. 2, 1902
741,311	Culley	Oct. 13, 1903
871,923	Galwey	Nov. 26, 1907
1,497,458	Mayer	June 10, 1924

FOREIGN PATENTS

Number	Country	Date
478,382	Great Britain	Jan. 18, 1938