H. C. LA BATT.

SHEET FEEDING MACHINE.

APPLICATION FILED JULY 17, 1906.

1,092,271.

Patented Apr. 7, 1914.

3 SHEETS—SHEET 1.

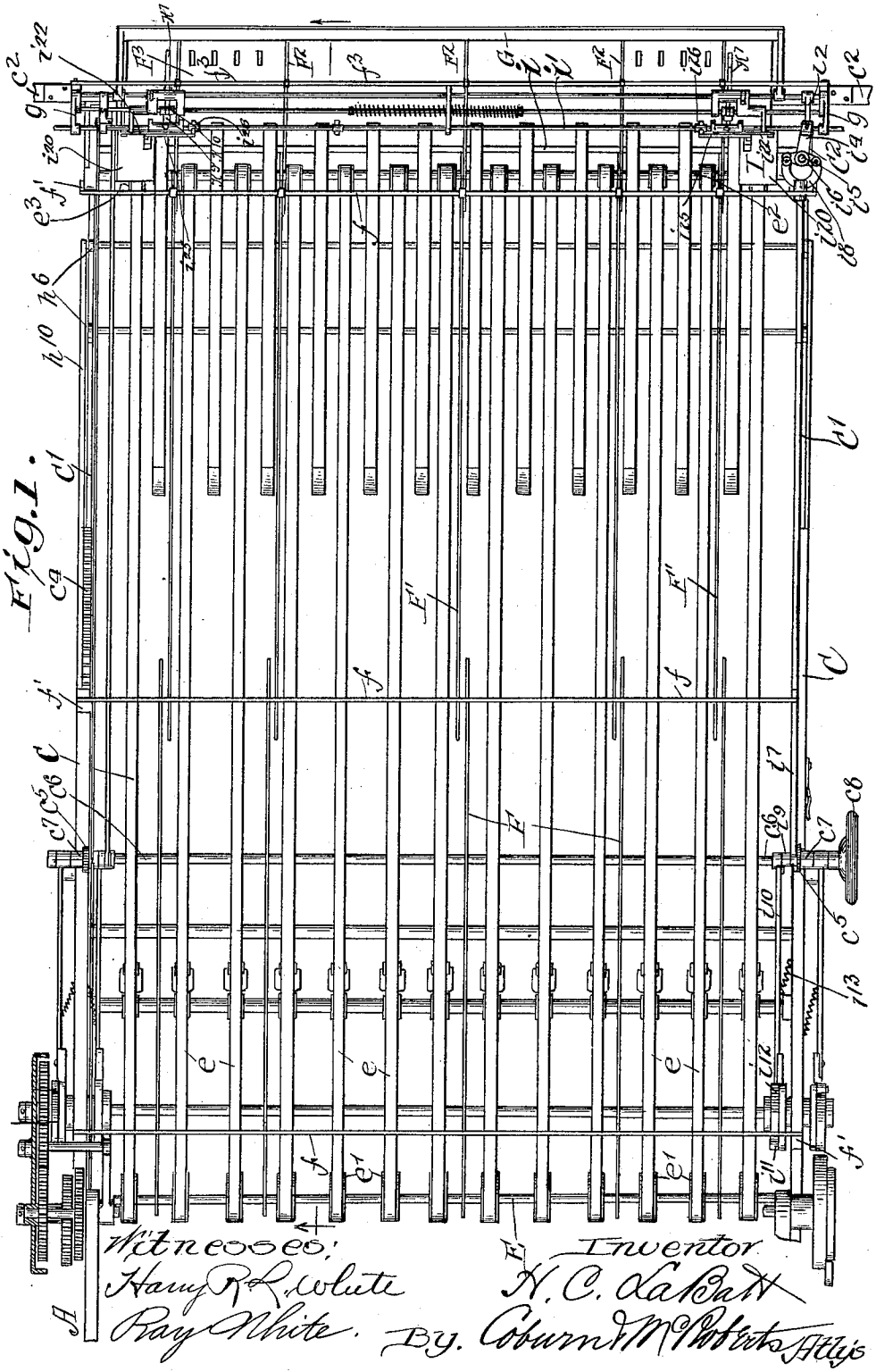


FIG. 1.

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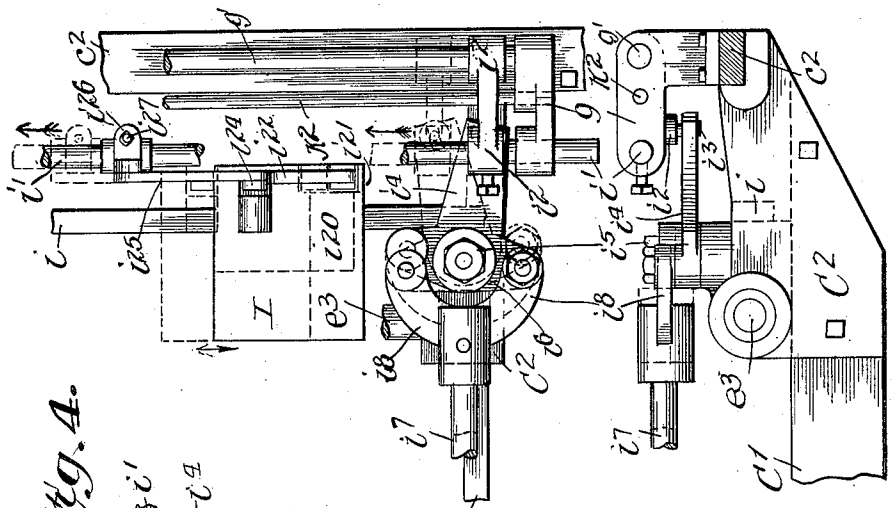
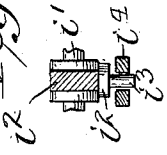


Fig. 4.



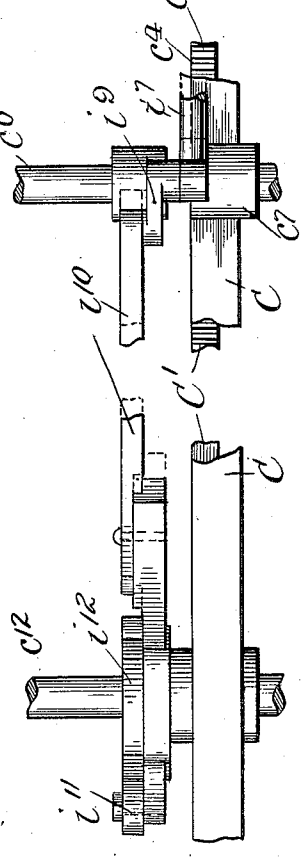


Fig. 2.

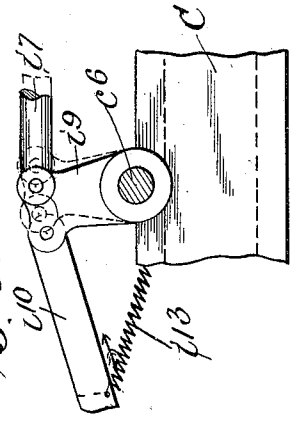
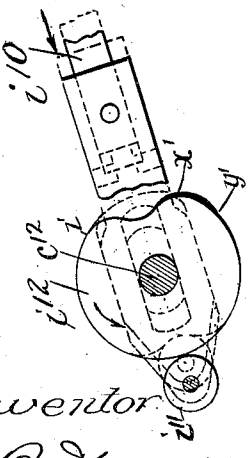


Fig. 3.



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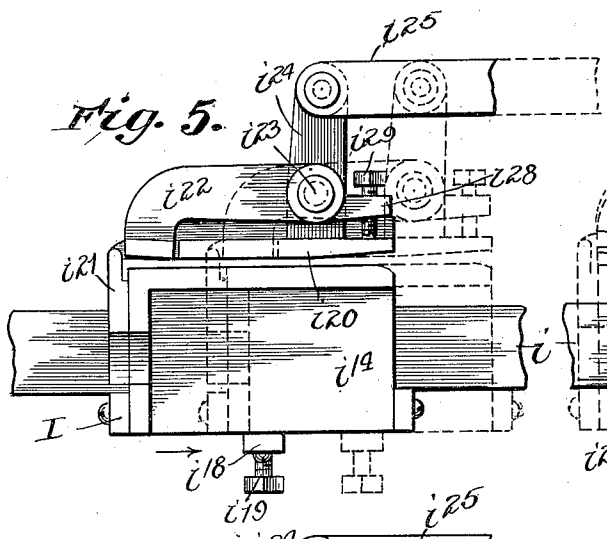
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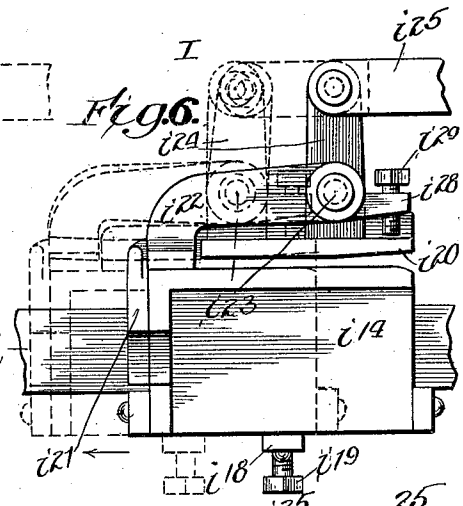
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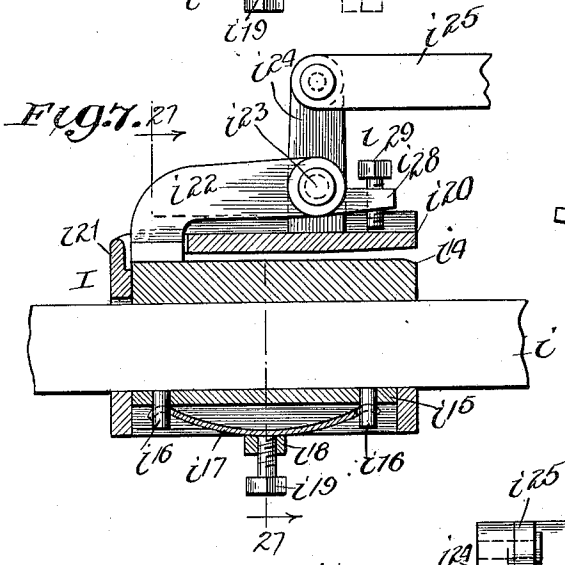
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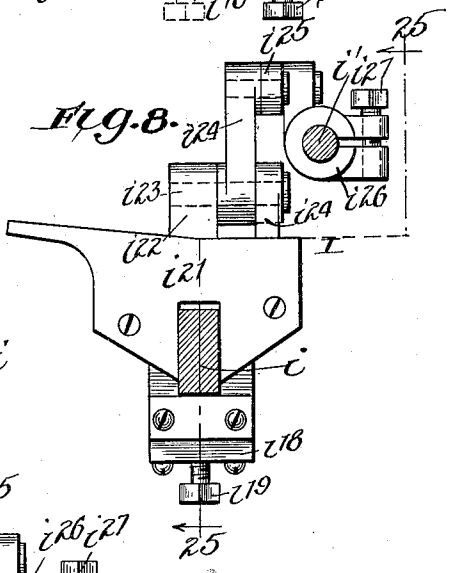
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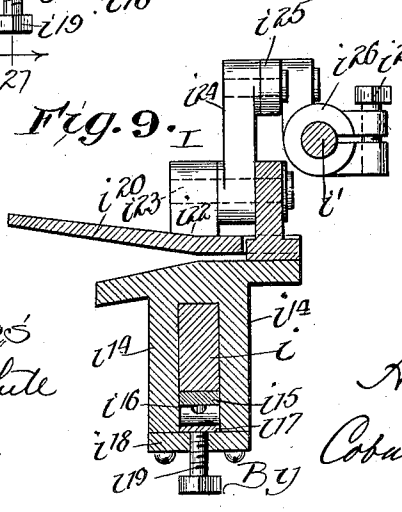
3 SHEETS—SHEET 3.











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UNITED STATES PATENT OFFICE.

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SHEET-FEEDING MACHINE.

1,092,271. Specification of Letters Patent. **Patented Apr. 7, 1914.**

Application filed July 17, 1906. Serial No. 326,538.

To all whom it may concern:

Be it known that I, HOMER C. LA BATT, 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 Sheet-Feeding Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in machines for feeding or delivering sheets of paper to a printing press, folding machine, ruling machine, or other machine employing or acting on sheets of paper.

The object of my invention is to provide means for alining or registering the sheets with reference to the coöperating parts of the associated machine in order to produce uniform results on the sheets, such for example as uniform margins or lines of print.

Other objects will be apparent from the disclosure and claims.

The invention consists in the arrangements and organizations of parts hereinafter described and pointed out in the claims.

In the accompanying drawings, which illustrate one embodiment of my invention Figure 1 is a plan view of a sheet feeding machine exemplifying features of my invention; Fig. 2 is a plan view showing the side register and certain of its coöperating parts, the connections between the three groups of parts being broken away for convenience of illustration; Fig. 3 is a view in side elevation of the parts of Fig. 2; Fig. 4 is a detail sectional view; Fig. 5 is a view in rear elevation of the side register, showing different positions of the parts in full and dotted lines; Fig. 6 is a view similar to Fig. 5; Fig. 7 is a view partly in side elevation and partly in section on the line 25—25 of Fig. 8; Fig. 8 is a view in end elevation of the side register with the supporting bar in section; Fig. 9 is a sectional view on the line 27—27 of Fig. 7.

The sheet feeding machine is especially adapted for transmitting or delivering sheets of paper from a sheet-separating machine to a printing press, folding machine, ruling machine, or other machine employing or acting upon sheets of paper, and usually is supported or mounted between a sheet-separating machine and a printing press having a cylinder.

The frame of the sheet-feeding machine comprises a pair of side rails C which in the form shown are carried by brackets secured to a cross-shaft of the sheet-separating machine, the forward ends of the rails being supported by brackets fastened to the frame of the printing press. The side rails C are so disposed that their forward ends extend under the rear end of the feed-board or table of the printing press, where they serve to support the extensible or movable section, which in the present embodiment of the invention comprises a pair of opposite side bars C′ having suitable end brackets or blocks C^2 at their front ends connected by a transverse brace rod or bar c^2. The side rails C are provided upon their inner faces with inwardly extending guides or ways upon which the side bars C′ are movably supported. Any suitable means may be provided for advancing and retracting the extensible section of the sheet-feeding machine, and in order to provide for this purpose the side bars C′ may be made in the form of rack bars having teeth c^4 with which suitable pinions c^5 mesh. The pinions c^5 are preferably fixed upon a cross-shaft c^6, journaled in bearings c^7 arranged upon the opposite side rails C, as clearly shown in Figs. 1 and 2. A hand wheel c^8 is keyed to the shaft c^6, and by turning this wheel the bars C′ may be advanced or retracted.

A transverse rotating shaft c^{12} is mounted near the front on the side rails C, and is driven from any suitable source of power, preferably from the power shaft of the press. As it is preferable to employ a sheet-separating machine I use mechanism by which power is transmitted from the press drive shaft to both the sheet-separating and sheet-feeding machines.

The feeder is provided with suitable means for delivering the sheets to the press cylinder, and in the present instance a series of endless bands or tapes are employed. In the present embodiment a cross-shaft E suitably journaled in bearings on the frame of the feeder, or upon the frame of the separator if desired, when the latter is used, is employed to drive the tapes *e* which convey the sheets to the discharge end of the feeder. The shaft E may be provided with a drum or with rollers *e′* suitably spaced apart, and the speed of the shaft is such that the tapes move at the same speed as the feeding-off members of

the separator. The shaft E in the present embodiment is driven from the shaft of the separator by a suitable train of gears, and the tapes pass to rollers e^2 on a cross-shaft e^3 journaled in bearings on the blocks or brackets at the outer end of the movable section of the frame. The tapes pass back from the rollers e^3 to the rollers e' over suitable tighteners.

Fenders F F′ are mounted between the tapes, and are composed of steel rods arranged a suitable distance above the line of the tapes to allow for the passage of the sheets but prevent them from buckling or turning up. The fenders are sectional and are carried by cross-rods f, the sections F having upwardly curved re-bent portions at their ends passing through cross-rods f mounted on upright brackets f' on the side rails C, and the sections F′ having similar upwardly curved re-bent portions at one end passing through one of the cross-rods and being straight at the other ends where they are carried by fingers depending from the rear cross-rod f.

The fenders F′ are only four or five in number as many are not required in the body of the machine where the sheets travel at uniform speed on the tapes, but at the point of delivery of the sheet to the blade G it is desirable to increase the number of fenders as the sheets are more liable to buckle at the exit. For this purpose I provide a series of auxiliary fenders F^2 which extend from the terminals of the fenders F′ to the vicinity of the blade G. As shown in Fig. 1 a cross-rod f^3 is supported upon the brackets C^2, and the supplemental fenders are supported thereon at intervals by suitable brackets f^4 adjustably secured to the rod by set screws and provided with openings in which the upwardly projecting arm of each fender F^2 is adjustably held by a set screw. By this means the supplemental fenders may be adjusted to any position across the machine without disturbing the long fenders, and at the same time they may be also vertically adjusted with reference to the path of the sheet. The forward edges of the sheets pass from the tapes to a delivery plate F^3, which when the extensible section is in its operative position, occupies the position shown in Fig. 1. It is obvious that the plate may be made sectional or in the form of a series of fingers.

A registering or alining device adapted to square or aline the front edges of the sheets is carried at the rear end of the feeder, and while this device may be of any suitable construction adapted to accomplish this function, in the present form it consists of a blade G which is periodically and automatically lowered into the path of the sheets and is then raised to permit the sheets to move forward to the press gages.

A registering device is carried by the feeder at its rear end and is designed to aline the sheets in predetermined position with reference to the coöperating part of the associated machine, such as the form of a printing press for example, in order to produce uniform margins or lines of print. This side register is shown in detail in the drawing, and comprises, generally speaking, a gripping device adapted to engage the side edge of the sheets and move the same laterally to adjust them to predetermined position.

The side register I is supported upon a rod or cross-bar i, and reciprocates back and forth thereon by means of a connection with a reciprocating rod i' which is slidably mounted in the overhanging ends of the brackets g. In order to reciprocate the rod i' it is provided with a block i^2 fixed thereto by any suitable means, such as a set screw, and which is provided at its lower side with a pin i^3. A double bell-crank lever i^4 is pivoted, as at i^5, upon one of the end brackets or blocks C^2, as shown in Figs. 2 and 3, and its forward end is provided with a fork which engages the pin i^3. The lateral arms i^6 of the bell-crank lever are adapted to be alternately connected to a reciprocating rod i^7 by any suitable means, and for this purpose the adjacent end of the rod is provided with a yoke i^8, the arms of which may be alternately connected with the associated lateral arms of the bell-crank lever. The rod i^7 extends rearwardly to a rocker-arm i^9 pivotally mounted on the cross-shaft c^6 and connected by means of an arm i^{10} to the stem of a yoke or fork which is provided with an elongated slot adapted to the shaft c^{12} and with a roller i^{11} adapted to coöperate with a cam i^{12} on the shaft c^{12}. The arm i^{10} is provided with a spring i^{13} which is connected thereto at one end and to the frame of the machine at its opposite end so as to draw the roller i^{11} into engagement with its cam. As the shaft c^{12} rotates the cam causes the rod i^7 to travel in the direction of the arrows shown in Fig. 3 and to move the rod i' to the right, while the spring i^{13} acts to move the rod i' in the opposite direction, the relative direction of movement caused by these parts being, however, reversed in the event the other end or arm of the bell-crank lever i^4 be connected to its associated arm of the yoke i^8.

The body i^{14} of the side register is provided in its lower portion with a vertically extending groove or slot adapted to receive the bar i. The body is adjustably mounted on the bar to provide for adjustment according to the position of the form on the press or to accommodate sheets of different sizes, but in order to prevent its accidental displacement in operation as hereinafter described it is provided with a friction de-

vice, which, as shown in Figs. 7 and 9, consists of a wear plate or shoe i^{15} resting within the slot of the body and provided at its ends with depending lugs i^{16} adapted to receive the forked ends of a leaf spring i^{17}, which is bent downwardly at its center and rests upon a cross-plate i^{18} secured to the body along the lower edges of the slot and having a set screw i^{19} by means of which the tension of the spring may be adjusted. The body is provided with a cap plate i^{20}, which is provided at one end with a downwardly bent web i^{21} against which the sheets seat when the register moves and through which suitable screws pass to connect the body and cap together, as shown in Fig. 8. The cap and body are spaced apart, as clearly shown in Figs. 5 to 9, in order to provide a way or passage for the sheet, and the body and cap are oppositely flared in the direction of the rear of the machine, as shown in Fig. 9, to provide a bell shape mouth or entrance on the receiving edge of the register; a gripper in the form of a bell-crank lever i^{22} is pivotally mounted as at i^{23} between ears i^{24} on the upper portion of the cap plate and at or near its forward edge. The gripper is provided at one end with a downwardly projecting hammer which passes through a recess or opening in the cap plate at or near its outer corner, and its opposite upwardly projecting end i^{24} is provided with a connecting rod i^{25} lying parallel with and connected at its opposite end to the reciprocating rod i'. As shown in Figs. 2, 8 and 9, the connecting rod i^{25} is pivoted to an upright lug upon a clamp i^{26} preferably in the form of a split collar with a suitable screw i^{27} for drawing the two parts together and clamping the same upon the rod i'. The gripper is provided with a rearwardly projecting lug i^{28} having a stop screw i^{29}, by which the upward stroke of the hammer may be adjusted.

In the normal position of the parts, as shown in full lines in Fig. 5, the side register is so located that the right hand edges of the sheets, when looking at the machine from the left end of Fig. 1, enter the flaring mouth in such position as to go through the passage and pass beneath the hammer more or less which at this time is raised, it being of course understood that the side register may be adjusted along its supporting rod or cross-bar so as to aline it with edges of sheets of different widths or sizes, it being so positioned upon the bar or rod that when it is drawn to its outward position toward the side of the machine it will cause the sheets to properly aline with relation to parts of the coöperating machine, such as the form of a printing press, so that the margin of all sheets will be uniform. After the fingers h^8 have moved the sheet to position against the press gages or grippers, the rod i' is moved in the direction of the feathered arrows in Fig. 2 by means of the spring i^{13}, and through the connecting arm i^{25} draws the side register inwardly toward the center of the machine a sufficient distance to cause the edge of the sheet to seat against the web i^{21} of the cap, this movement being permitted by the roller i^{11} entering the depression in the cam i^{12}. The inward movement of the register is sufficient to cause the sheet to buckle slightly, the position of the register at this time and the relation of its parts being shown by the dotted lines in Fig. 5. When the roller i^{11} passes out of the depression of the cam, the rod i' is drawn in the opposite direction by the cam, and the initial movement of the connecting arm i^{25} causes the hammer to drop upon the sheet, thereby locking the sheet to the register, the position of the parts at this time being indicated by full lines of Fig. 6, and as the cam revolves in the direction of the featherless arrow of Fig. 3, the portion x' causes the rod i' to continue in its reverse reciprocation and to draw the register and the locked sheet to the position shown by dotted lines in Fig. 6 and in full lines in Fig. 5, which represent the registered position of the sheet. When the sheet has thus been drawn toward the right hand side of the machine in order to aline with the associated part, such as the form of the press, the further movement of the cam i^{12} in the direction of the featherless arrow of Fig. 4 brings its reduced portion or drop-off y' into coöperation with the roller i^{11}, so that the spring i^{13} may retract the rod i' in the direction of the arrows of Fig. 2 just sufficient to release the hammer from contact with the sheet, but not far enough to move the register bodily which is then held against displacement by its friction device above described, the position of the parts then being indicated by the full lines in Fig. 5. The continued revolution of the cam then maintains the register in its registering position as the portion of the cam between the points y' and x' keeps the parts in the position shown in full lines in Fig. 2.

It will be observed that the side register, as illustrated in Fig. 2, is located upon the right hand side of the machine, so that the line of print is registered with respect to the right hand margin of the sheet being printed upon, and it is obvious that a single register may bring the impressions upon both sides of the sheets into registration or alinement to produce uniform margins, or that a second register may be employed upon the opposite side of the machine so as to register the sheets from the same side edge for the reverse impressions. The left hand side register in construction is substantially a duplicate of the register just described, but operates to draw the sheets toward the

left hand side of the machine. For this purpose I provide the reciprocating rod i' with a second clamp i^{26} which may be located at any desired point along the left hand side of the machine and which may be suitably connected to the associated connecting rod i^{25} in the manner heretofore described in order to operate the left hand register. As these registers are designed to be operated interchangeably, the yoke i^8 is adapted to be alternately engaged or connected with the opposite arms of the double bell-crank lever i^4 (see Fig. 2). Assuming that the sheets are to be alined or registered at the right hand edge in making the impressions on one side, the yoke and bell-crank are connected as shown in Fig. 2, and when the sheets have been through the press they are turned over so that the same side edges are adjacent the left hand side of the machine in position to be operated upon by the other register, for which purpose the connection between the yoke and bell-crank lever is shifted so that the sheets will be registered from the same edges for the impressions upon both faces.

Having described my invention what I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a mechanism of the class described, the combination with a pair of oppositely disposed side registers each of which is provided with a gripper, of a reciprocating rod, a link associated with each register and adapted to detachably connect the gripper thereof to the rod, a lever for reciprocating the rod and having a pair of lateral arms, and an operating rod having an arm associated with each of the said lateral arms and adapted to be detachably connected thereto.

2. In a sheet feeding machine, in combination with a frame provided with carrying tapes, a cross-bar carried by the frame, a pair of oppositely disposed registering devices adjustably mounted on the bar and each of which comprises a reciprocating carrier and a gripper pivotally mounted thereon, a reciprocating rod, a collar associated with each register and adjustably carried on the rod, a link for detachably connecting each collar with the associated register, and detachable means to oppositely move the rod.

3. In a sheet feeding machine, a frame provided with a cross-bar, a pair of oppositely disposed independently adjustable registering devices mounted on the bar and each of which comprises a reciprocating body and a hammer mounted thereon, a reciprocating rod provided with a pair of adjustable collars detachably carried thereon, a link for operating each registering device and adapted to engage the collar associated therewith, a lever having opposite arms adapted to be detachably connected to the rod, and means to move the lever.

In testimony whereof I affix my signature in presence of two witnesses.

HOMER C. LA BATT.

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