

No. 895,290.

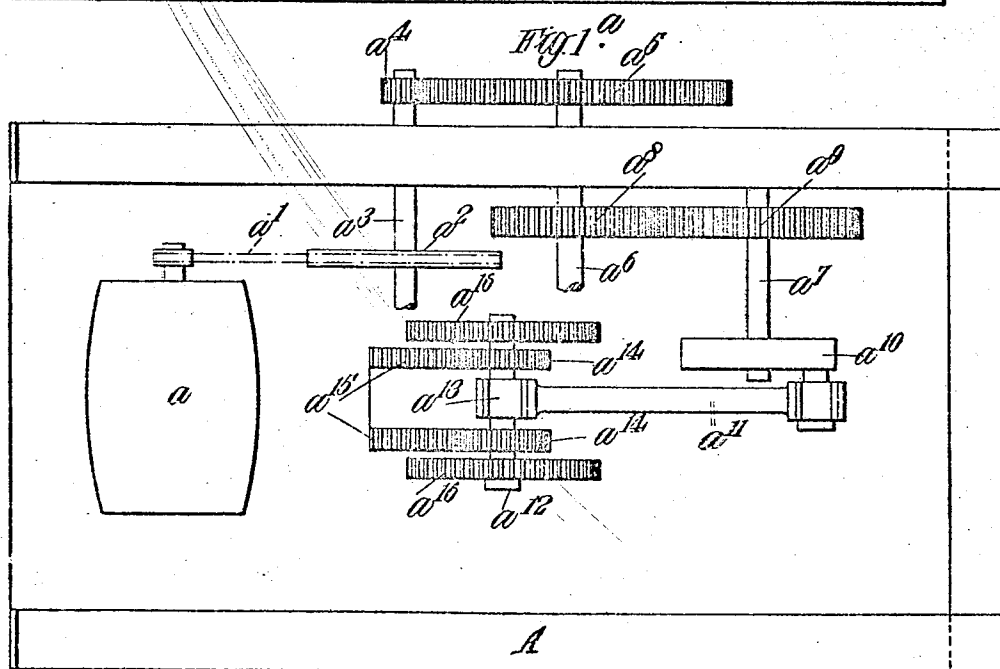
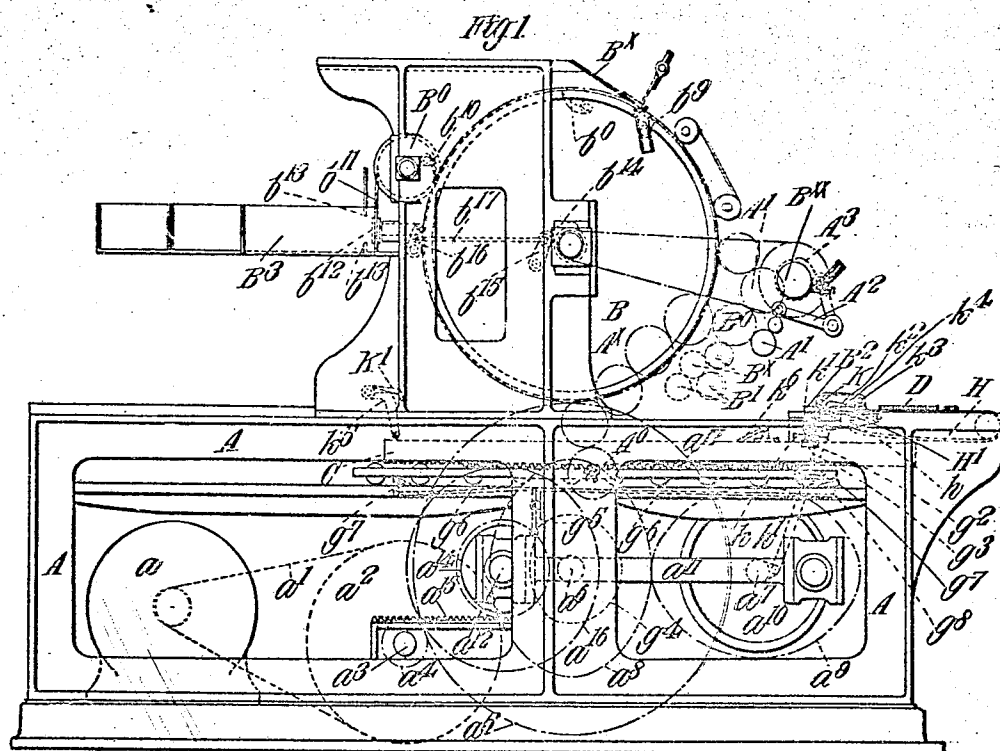
PATENTED AUG. 4, 1908.

A. McPHERSON.

PRINTING MACHINE.

APPLICATION FILED MAR. 6, 1907.

2 SHEETS—SHEET 1.



Witnesses:  
H. J. Dietrich  
P. F. Hagle.

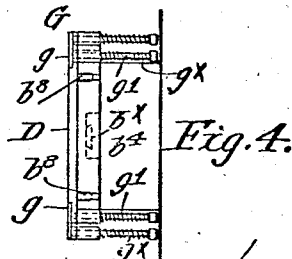
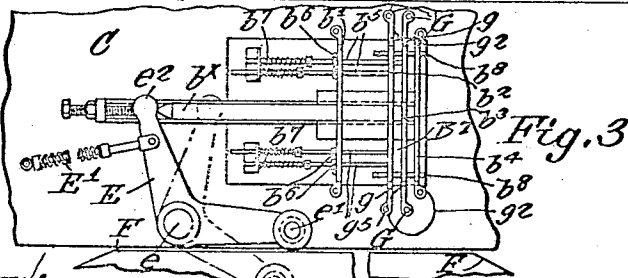
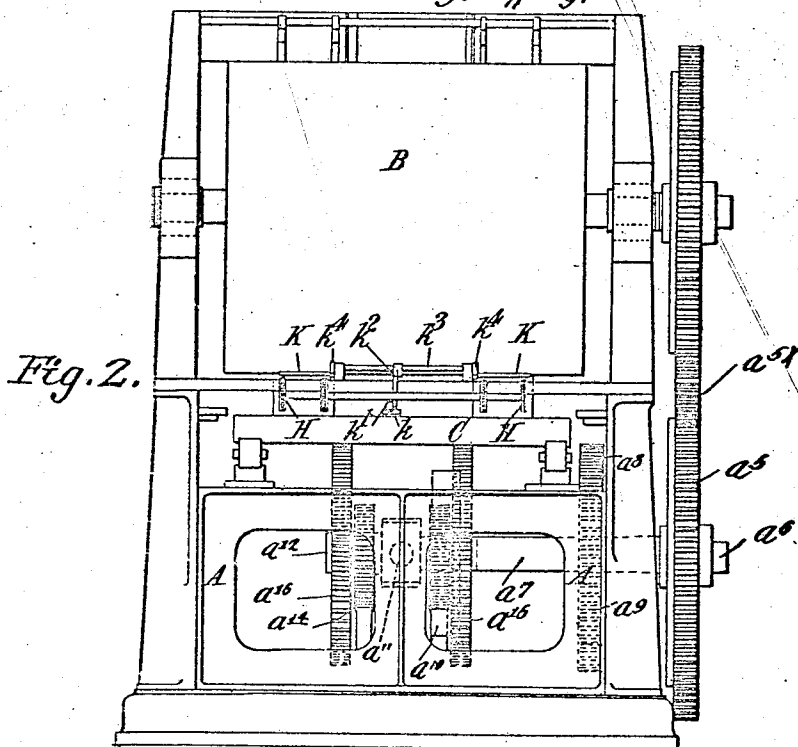
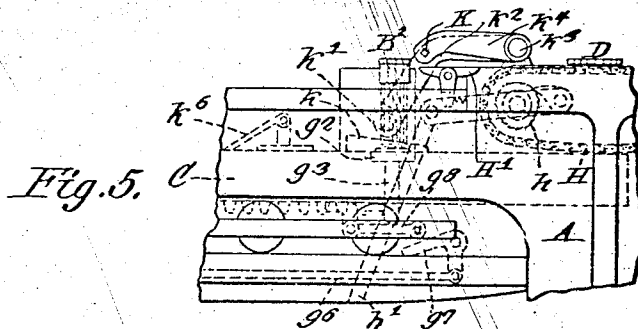
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2 SHEETS—SHEET 2.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

ALFRED McPHERSON, OF STOKE NEWINGTON, ENGLAND.

## PRINTING-MACHINE.

No. 895,290.

Specification of Letters Patent.

Patented Aug. 4, 1908.

Application filed March 6, 1907. Serial No. 360,933.

*To all whom it may concern:*

Be it known that I, ALFRED McPHERSON, a subject of the King of Great Britain, residing at 44 Fountayne road, Stoke Newington, in the county of Middlesex, England, printer, have invented certain new and useful Improvements Relating to Printing-Machines, of which the following is a specification.

This invention relates to printing machines and has particular reference to those of the kind that are employed for addressing envelops and the like and in which the matter to be printed is arranged on numerous loose and independent type bars or slips which are fed to the machine and taken by a reciprocating table in, say, groups of four lying one against the other, and carried beneath an impression cylinder to effect the printing, after which they are conveyed away from the machine to a suitable receptacle.

The chief object of this invention is to enable the said bars or slips to be separated from each other so as to be correctly spaced prior to the printing operation for which purpose the chase, which supports the aforesaid type bars or slips and which is carried by the reciprocating table, is composed of several portions adapted, while moving towards the impression cylinder carrying the paper envelop or other article to be printed upon, to be separated or spaced to the requisite degree, so that the various lines of printed matter impressed on the envelop or the like are at the required distance apart, the said portions, after the printing operation, closing together again prior to their removal from the machine.

The invention also embodies other features which will be hereinafter described.

In order that the said invention may be clearly understood and readily carried into effect, I will describe the same more fully with reference to the accompanying drawings in which:—

Figure 1 is a side elevation of one form of printing machine constructed according to this invention. Fig. 1<sup>a</sup> is a plan of the gearing for reciprocating the table of the machine. Fig. 2 is a front elevation of the machine shown in Fig. 1. Fig. 3 is an enlarged plan of the chase bars showing them in their spread or separated position. Fig. 4 is an end elevation of the arrangement shown in Fig. 3. Fig. 5 is an enlarged sectional eleva-

tion of the means for feeding the type bars onto the chase.

A is a frame work of the machine; B is the impression cylinder.

B<sup>1</sup> B<sup>1</sup> are the inking rollers and C is the reciprocating table that carries the chase B<sup>2</sup>.

The means for driving the reciprocating table comprise in the construction shown in Figs. 1 and 1<sup>a</sup> a motor *a* connected by a chain or belt *a*<sup>1</sup> to the wheel *a*<sup>2</sup> on the shaft *a*<sup>3</sup> on which is also fixed the gear wheel *a*<sup>4</sup> meshing with the gear wheel *a*<sup>5</sup> on the shaft *a*<sup>6</sup>. The gear wheel *a*<sup>5</sup> meshes with gear wheel *a*<sup>5x</sup> (Fig. 2) which is fixed on the shaft of the impression cylinder and thus drives the latter. On the shaft *a*<sup>6</sup> and the parallel shaft *a*<sup>7</sup> are mounted two intermeshing elliptical wheels *a*<sup>8</sup>, *a*<sup>9</sup>, respectively, through which the power is transmitted at variable speed to the shaft *a*<sup>7</sup> and thus to the disk-crank *a*<sup>10</sup> which drives the connecting rod *a*<sup>11</sup>. A short shaft *a*<sup>12</sup> passes through the cross head *a*<sup>13</sup> of the connecting rod *a*<sup>11</sup> and has mounted thereon two pairs of gear wheels, one pair *a*<sup>14</sup> *a*<sup>14</sup> gearing with the fixed racks *a*<sup>15</sup> *a*<sup>15</sup> and the other pair *a*<sup>16</sup> *a*<sup>16</sup> gearing with racks *a*<sup>17</sup> (Fig. 1) on the underside of the reciprocating table. It will therefore be understood that the motor *a* by means of the intermediate gearing causes the short shaft *a*<sup>12</sup> to be reciprocated, and the reciprocating table driven to and fro by means of the gear wheels *a*<sup>16</sup> *a*<sup>16</sup>, and racks *a*<sup>17</sup>.

As the reciprocating table carries the chase and type bars towards the impression cylinder the type bars pass under the inking rollers B<sup>1</sup> B<sup>1</sup>. These rollers are driven by the distributing drum B<sup>0</sup> by means of the intermediate friction rollers B<sup>x</sup>. The distributing drum B<sup>0</sup> is driven through a chain of wheels A<sup>x</sup> from the pinion A<sup>0</sup> gearing with the rack *a*<sup>17</sup> on the underside of the reciprocating table A. Ink is supplied to the distributing drum from the drum B<sup>xx</sup> through the intermediate drums or riders A<sup>1</sup> and vibrator A<sup>2</sup>; the drum B<sup>xx</sup> is driven from the shaft of the impression cylinder B and carries upon its axle the cam A<sup>3</sup> which imparts the vibratory movement to the vibrator A<sup>2</sup>.

The chase B<sup>2</sup> comprises several portions or bars of which in the example shown there are four namely *b*<sup>1</sup> *b*<sup>2</sup> *b*<sup>3</sup> *b*<sup>4</sup> so arranged that they normally lie in contact with each other, at the feeding end of the machine, so that the type bars or slips D fed into the machine will arrive thereon in their closed positions. As

the reciprocating table C conveys the chase B<sup>2</sup> beneath the impression cylinder the several chase bars b<sup>1</sup> b<sup>2</sup> b<sup>3</sup> b<sup>4</sup> automatically separate to the required distance, so that the printed matter upon the envelopes will be spaced correctly, that is to say, the bar b<sup>1</sup> will print a registration number at the left hand corner of the envelop, the bar b<sup>2</sup> will print the name of the person to whom the envelop is to be sent, and the bars b<sup>3</sup> b<sup>4</sup> the address of such person. The said chase bars, after the printing operations, then close together again at the opposite or delivery end of the machine as the stroke or travel of the table C is being completed, and the type bars or slips are finally removed from the several chase bars and conveyed away or otherwise disposed of as desired.

The above described movements of the chase bars may be effected by means of a bell crank lever E (Fig. 3) pivoted at e to the reciprocating table C. The said lever E is adapted to engage at one end e<sup>1</sup> with a cam groove or cam surface such as F on a fixed part of the machine, and at the other end e<sup>2</sup> with a sliding bar b<sup>x</sup> that is connected with the innermost one of the said chase bars so that movement will be imparted to this chase bar b<sup>1</sup> in accordance with the extent of movement that the bell crank lever receives from the aforesaid cam surface F. The next succeeding portion or bar b<sup>2</sup> and the one adjacent to it b<sup>3</sup> are each furnished with a pair of rods b<sup>5</sup> having adjustable collars or stop pieces b<sup>6</sup> and are subjected to the action of springs b<sup>7</sup> that normally tend to keep the said chase bars pressed one against the other and both of them against the outermost one b<sup>4</sup> which is fixed. The position of the said collars or stops b<sup>6</sup> is such that when the innermost chase bar b<sup>1</sup> is shifted by the aforesaid bell crank lever E, it acts in succession upon the stops and thereby separates the intermediate chase bars b<sup>2</sup> b<sup>3</sup> from the outermost one b<sup>4</sup> and from each other, as shown in Fig. 3, to an extent depending on the position of the stop pieces b<sup>6</sup>. The chase bars are thus placed into the required position for spacing the type bars they carry, being retained in their position by the bell crank lever E until it reaches the opposite end of the said cam surface F, whereupon said bell crank lever is moved under the influence of the compression spring E<sup>1</sup> into a position to permit the chase bars to come together again. b<sup>3</sup> b<sup>5</sup> are guide pieces for the said chase bars. The said type bars D are held in place upon the chase bars by means of clip pieces such as G, which comprise fingers g having stems g<sup>1</sup> controlled by springs g<sup>x</sup>, said clip pieces being moved into their disengaging position at the proper times by suitable means such as hereinafter described for permitting the said fingers g to become lifted from engagement with the ends of the type bars so that the latter can

be placed on and removed from the chase bars.

The feeding of the type bars or strips D on to the chase bars from the feed table of the machine may be performed by means of a rising and traveling platform which may comprise a pair of rotary shafts carrying arms connected together at their free ends by a plate or bar, so that the latter imparts a slight forward movement to the type bars at each revolution of the shafts. I prefer however to effect the feeding by a traveling platform H and a hinged guide or bridge piece H<sup>1</sup> the said traveling platform being actuated intermittently by a pawl and ratchet device h receiving its motion from a crank and connecting rod h<sup>1</sup>.

A hinged piece or fence K is provided at the feeding end of the machine for regulating the extent to which the type bars D are fed on to the chase B<sup>2</sup>. In the example shown two such fences are illustrated so that two sets of type bars can be operated upon simultaneously.

The actuation of each fence K is effected by means of an incline k secured to the reciprocating table C and adapted, upon the return stroke of the latter, to engage a roller k<sup>1</sup> mounted on the end of a bent arm k<sup>2</sup> which is fixed to a shaft k<sup>3</sup>. The roller k<sup>1</sup> is then raised, the shaft k<sup>3</sup> partially turned, and the fence K lifted, the latter being carried by an arm k<sup>4</sup> fixed to the shaft k<sup>3</sup>. The clip pieces G are formed with stems g<sup>1</sup>, the lower extremities of which bear upon a plate g<sup>2</sup> mounted on a rod g<sup>3</sup>, the lower end of which is supported on a bar g<sup>4</sup> pivoted at one end to the reciprocating table and having at the other or free end a roller which engages with tilting levers g<sup>7</sup> at each end of the machine, said tilting levers being actuated through connecting rods g<sup>6</sup>, rocking lever g<sup>5</sup>, and rotating cam g<sup>4</sup>. As the reciprocating table completes its return stroke to the feeding end of the machine, the fence K is raised as above described, and the clip pieces G are also raised by reason of the pivoted bar g<sup>4</sup> engaging with the tilting lever g<sup>7</sup>. The continued movement of the reciprocating table carries the chase B<sup>2</sup> beyond the fence to an extent corresponding to the width of four type bars and said chase passes under the first four of the type bars that are waiting on the bridge piece H<sup>1</sup>. The table then commences to start moving in the reverse direction, that is to say towards the impression cylinder, and the chase B<sup>2</sup> carries the four type bars away with it; the clip pieces G then descend and hold the type bars upon the chase while the reciprocating table travels under the impression cylinder. Meanwhile the fence K has also descended and the type-feeding mechanism again becomes operative, feeding more type bars forward until they fill up the gaps on the bridge piece H<sup>1</sup> and abut against the

fence K, after which any further movement of the feeding mechanism merely results in the slipping of the traveling platform H under the type bars.

- 5 If five lines of type were required, the chase would of course consist of five chase bars, and the fence K would be situated further from the shaft  $k^3$  by an amount equal to the width of the additional chase bar.
- 10 The removal of the type bars at the delivery end of the machine is effected by means of a hinged piece or fence  $K^1$  which is raised by movement of a bent arm  $k^5$  when a pivoted inclined plate  $k^6$  on the reciprocating table
- 15 comes against a laterally mounted roller on said bent arm  $k^5$  during the rearward travel of the table thus raising the fence  $K^1$  so as to allow the chase and type bars to pass beyond the same. As the said table completes its
- 20 rearward movement the pivoted inclined plate  $k^6$  passes beyond the bent arm  $k^5$  and thus permits the fence  $K^1$  to fall in front of the type bars. When the table again advances, the fence  $K^1$  remains closed owing to
- 25 the pivoted inclined plate  $k^6$  giving way to the laterally mounted roller on the bent arm  $k^5$ , said roller lifting the aforesaid plate  $k^6$  and passing under it; the fence  $K^1$  therefore removes the type bars from the chase, and
- 30 retains them at the opposite or delivery end of the machine, it being understood that the clip pieces G are at this time raised by the tilting lever  $g^7$  as hereinbefore described.

As the envelop to be printed is being carried along by the impression cylinder B from the feed table  $B^x$  a gripping finger  $b^9$  or equivalent device engages with and holds down the rear portion of the said envelop so as to maintain the whole of its area in close

40 proximity to the surface of the cylinder and not merely its forward portion, which is held by a gripping device  $b^9$  in the usual manner.

As the impression cylinder revolves, it carries the envelop downward to the printing

45 position to which the type bars have also been carried by the reciprocating table C. The printing having been effected the impression cylinder conveys the printed envelop into a position from which it is transferred to an auxiliary cylinder  $B^9$  by means

50 of fingers  $b^{10}$  in the usual way. From this auxiliary cylinder the envelop is delivered to the mouth of the box or receptacle  $B^3$  by means of stripping fingers  $b^{11}$ , whereupon a

55 plunger  $b^{12}$  advances and pushes the envelop past suitable stop pieces  $b^{13}$  into said box or receptacle, the said stop pieces being of such a character that the envelops will pass them by slightly bending.

60 The movement of the plunger  $b^{12}$  may be derived from a rotary cam  $b^{14}$ , rocking arms  $b^{15}$ ,  $b^{16}$  and link  $b^{17}$ .

What I claim and desire to secure by Letters Patent of the United States is:—

- 65 1. In a printing machine, the combination

with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of means for laterally separating said type bars during the movement of the table, for the purpose specified.

2. In a printing machine, the combination 70 with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, and means for spacing said chase bars during the movement of the table, for the purpose specified. 75

3. In a printing machine, the combination 80 with the impression cylinder, the reciprocating table and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for spacing said chase bars during the movement of the table, and means 85 for feeding the type bars towards the chase bars intermittently, for the purpose specified.

4. In a printing machine, the combination 90 with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for spacing said chase bars during the movement of the table, an endless traveling platform for conveying the 95 type bars, and pawl and ratchet mechanism for intermittently moving said platform, for the purpose specified.

5. In a printing machine, the combination 100 with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, a bell-crank lever operatively connected with said chase bars, and a cam surface for actuating said lever during the movement of the said table, substantially as and 105 for the purpose specified.

6. In a printing machine, the combination 110 with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a fixed outer chase bar, a movable inner chase bar, intermediate chase bars, means whereby the movement of said inner chase bar is imparted to the intermediate chase bars to varying extents, and means for imparting said movement to the inner chase bar during the movement of the table, substantially as and for the purpose specified. 115

7. In a printing machine, the combination 120 with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a fixed outer chase bar, a movable inner chase bar, intermediate chase bars, rods on said intermediate chase bars, adjustable stop-pieces on said rods for engaging 125 with said inner chase bar, and means for imparting movement to the latter during the movement of the table, substantially as and for the purpose specified. 130

8. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a fixed outer chase bar, a movable inner chase bar, a sliding bar connected with said inner chase bar, intermediate chase bars, rods on said intermediate chase bars, adjustable stop-pieces on said rods for engaging with said inner chase bar, a bell-crank lever whereof one arm engages with said sliding bar, and a stationary cam surface for engaging with the other arm of said lever, substantially as and for the purpose specified.

9. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a fixed outer chase bar, a movable inner chase bar, a sliding bar connected with said inner chase bar, intermediate chase bars, rods on said intermediate chase bars, adjustable stop pieces on said rods for engaging with said inner chase bar, springs for controlling said rods, a bell-crank lever whereof one arm engages with said sliding bar, a stationary cam surface for engaging with the other arm of said lever, and a spring for controlling said lever, substantially as and for the purpose specified.

10. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for spacing said chase bars during the movement of the table, and means for temporarily retaining said type bars on the chase bars, for the purpose specified.

11. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for spacing said chase bars during the movement of the table, and spring controlled clip pieces for temporarily retaining said type bars on the chase bars, for the purpose specified.

12. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for spacing said chase bars during the movement of the table, means for temporarily retaining said type bars on the chase bars, and means for moving said retaining means into a position to liberate the type bars as the reciprocating table completes its movement to the delivery end of the machine and begins to return, substantially as and for the purpose specified.

13. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent

type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for spacing said chase bars during the movement of the table, spring controlled clip-pieces for retaining said type bars on the chase bars, stems on said clip-pieces, a movable plate for engaging with said stems, tilting levers for operating said plate, and cam and lever mechanism for actuating said tilting levers, as the reciprocating table completes its to-and-fro movements substantially as and for the purpose specified.

14. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for feeding said type bars onto the chase bars, means for temporarily retaining said type bars upon the chase bars, means for spacing said chase bars during the movement of the table, and means for obstructing the feeding of the type bars except when the table completes its return stroke, substantially as and for the purpose specified.

15. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for spacing said chase bars during the movement of the table, means for temporarily retaining said type bars upon the chase bars, a hinged fence for obstructing the feeding of the type bars onto the chase, and an incline on the reciprocating table for raising said fence as the table completes its return stroke, substantially as and for the purpose specified.

16. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for feeding said type bars onto the chase bars, means for temporarily retaining said type bars upon the chase bars, means for spacing said chase bars during the movement of the table, a hinged fence for obstructing the feeding of the type bars onto the chase bars, and an incline on the reciprocating table for raising said fence as the table completes its return stroke, substantially as and for the purpose specified.

17. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for feeding said type bars onto the chase bars, means for temporarily retaining said type bars upon

the chase bars, means for spacing said chase bars during the movement of the table, means for obstructing the feeding of the type bars except when the table completes its return stroke, and means for retaining the type bars carried by the chase bars at the delivery end of the machine, substantially as and for the purpose specified.

18. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for feeding said type bars onto the chase bars, means for temporarily retaining said type bars upon the chase bars, means for spacing said chase bars during the movement of the table, means for moving said retaining means into a position to liberate the type bars as the table completes its movement to the delivery end of the machine and begins to return, and means for obstructing the feeding of the type bars except when the table completes its return stroke, substantially as and for the purpose specified.

19. In a printing machine, the combination with the impression cylinder, the reciprocating table, and a plurality of independent type bars, of a plurality of chase bars carried by the reciprocating table for supporting said type bars, means for feeding said type bars onto the chase bars, means for temporarily retaining said type bars upon the chase bars, means for spacing said chase bars during the movement of the table, means for moving said retaining means into a position to liberate the type bars as the table completes its movement to the delivery end of the machine and begins to return, means for retaining the type bars carried by the chase bars at the delivery end of the machine, and means for obstructing the feeding of the type bars except when the table completes its return stroke, substantially as and for the purpose specified.

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

ALFRED McPHERSON.

Witnesses:

T. SELBY WARDLE,  
WALTER J. S. MERTEN.