

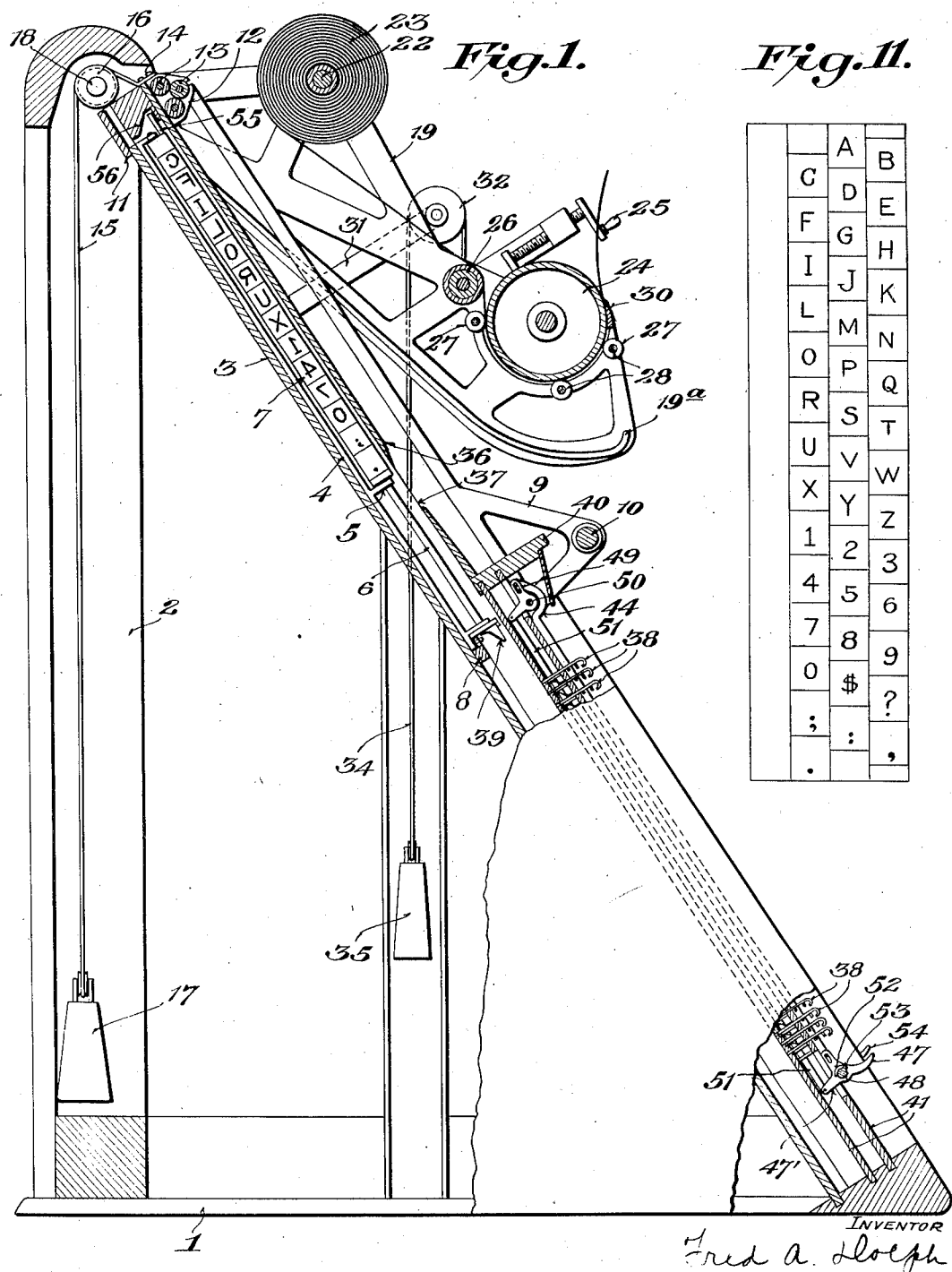
June 16, 1925.

1,542,223

F. A. DOLPH.
PRINTING MACHINE

Filed July 11, 1924

3 Sheets-Sheet 1



By *Maurice Cameron Lewis Berkam*
Attorneys

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3 Sheets-Sheet 2

Fig. 2.

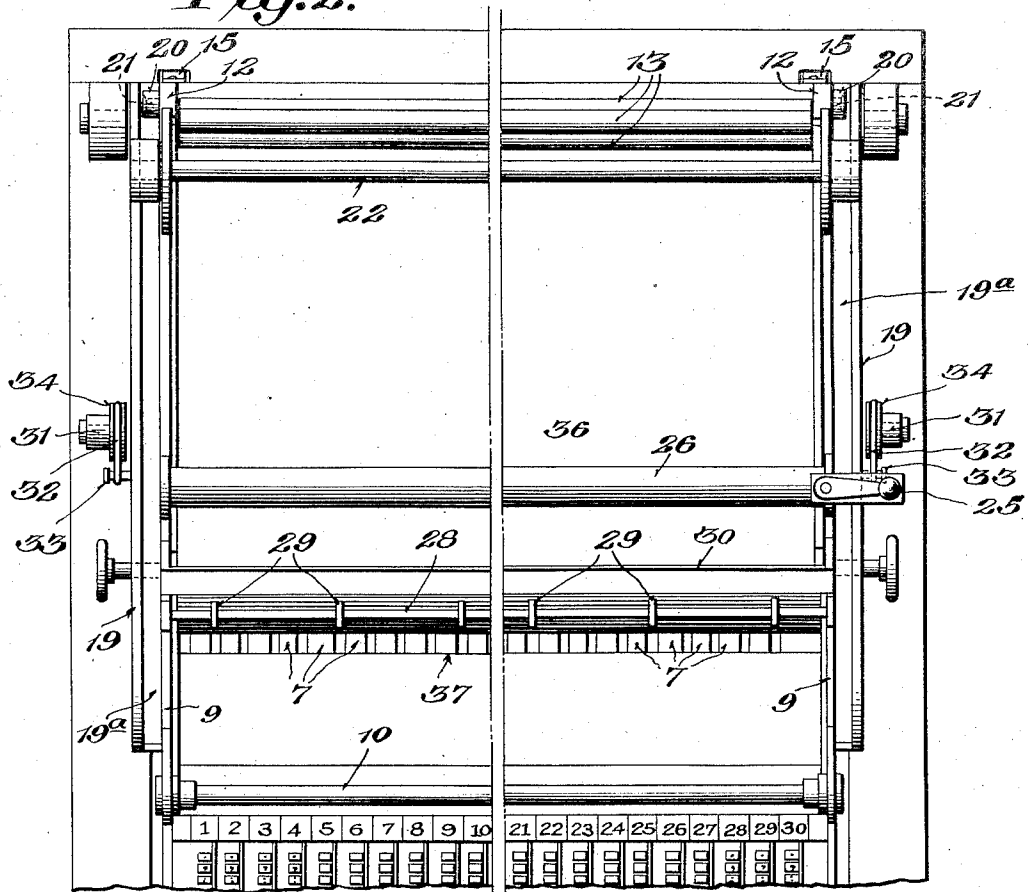
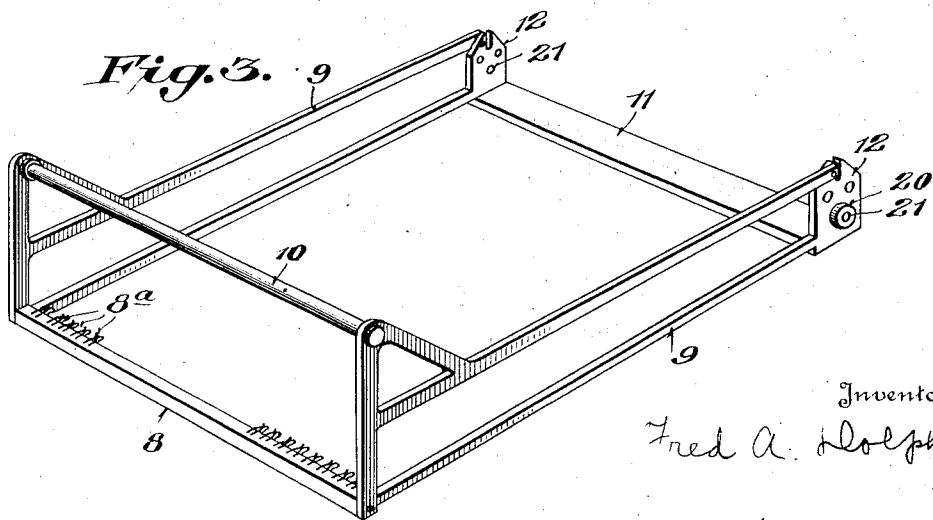


Fig. 3.



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Fig. 4.

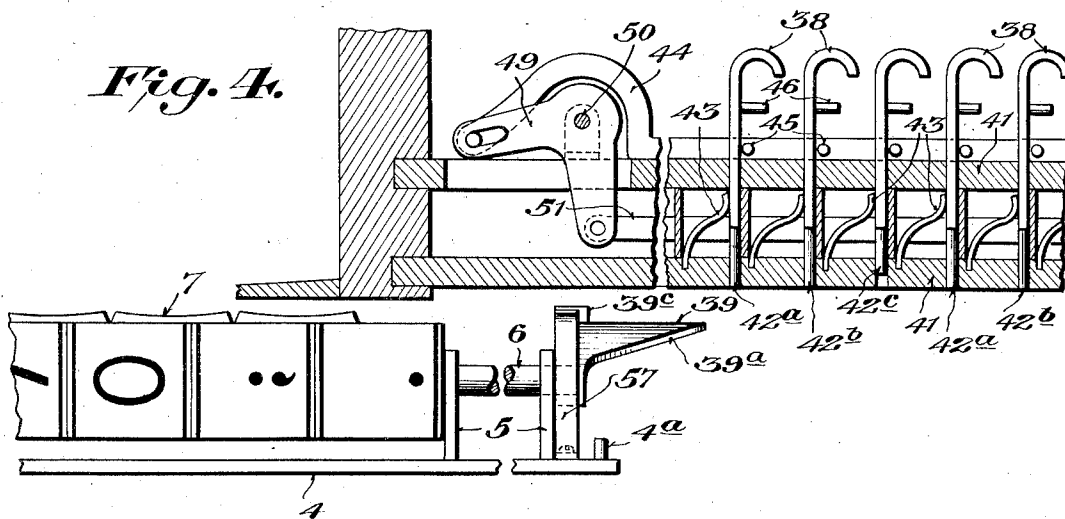


Fig. 5.

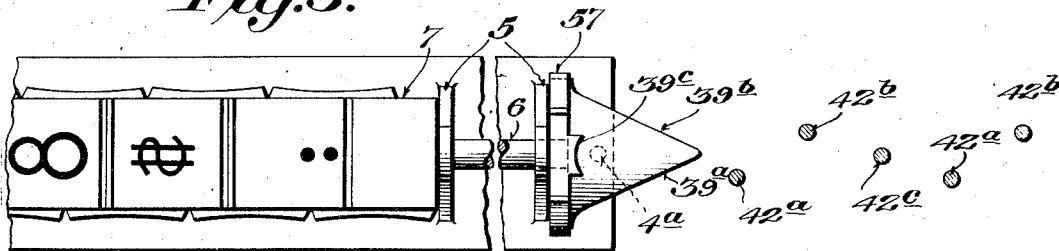


Fig. 6.

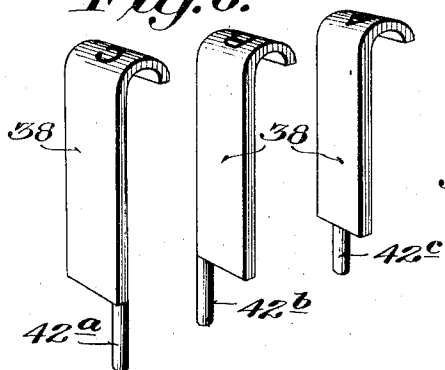


Fig. 7.

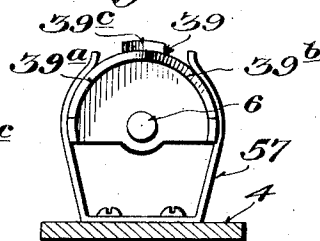


Fig. 8.

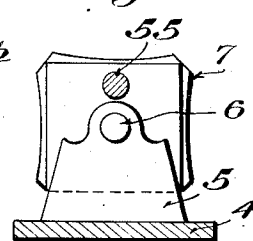


Fig. 9.

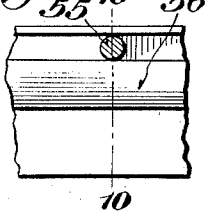
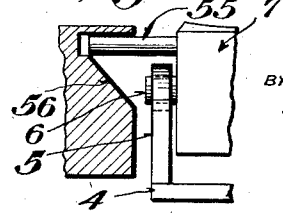


Fig. 10.



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UNITED STATES PATENT OFFICE.

FRED A. DOLPH, OF WASHINGTON, DISTRICT OF COLUMBIA.

PRINTING MACHINE.

Application filed July 11, 1924. Serial No. 725,509.

To all whom it may concern:

Be it known that I, FRED A. DOLPH, a citizen of the United States of America, and a resident of Washington, District of Columbia, have invented new and useful Improvements in Printing Machines, which invention is fully set forth in the following specification.

This invention relates to a printing machine of the type disclosed in my Patent No. 1,232,246, dated July 3, 1917, and more particularly to a machine that is adapted for printing or typing newspaper bulletins, show cards, and other matter requiring the use of large size type.

So far as I am aware no machine has heretofore been available for printing newspaper bulletins without the necessity of setting up individual type characters by hand, assembling these characters in a form, locking them in a chase, together with all the other steps of printing that are necessary when a cylinder or platen press is used. This method of printing large size characters is extremely expensive because of the fact that usually not more than one or two copies of the matter are required. Frequent changes must be made in the wording of the bulletins or cards, and these changes must be quickly made.

An object of the present invention is to provide a machine for printing bulletins, display cards, and other advertising matter requiring the use of large size type with the same facility and speed that results from the use of an ordinary typewriter.

It is frequently necessary in work of this character to employ type of almost any size up to two inches and even more. A minimum number of at least forty characters is required, it being assumed that it is unnecessary to have both capital and small letters. In order to enable type of this size to be used in a machine which may be manually operable, it is necessary to provide a different form of type bar from that disclosed in my patent referred to above. An object of the present invention therefore is to provide a rotatably mounted type bar which has the large type characters formed on two or more sides thereof.

Another object of this invention is to provide means whereby the type bar may be rotated and its longitudinal movement con-

trolled in such a manner as to bring a selected character into printing position. A further object of the invention is to provide means for automatically returning a type bar that has been rotated, to its normal position after a line has been printed. A further object of the invention is to provide a platen mechanism and a mounting therefor which is readily adapted for use in a machine of this character. A further object of the invention is to provide a plurality of letter keys which may be silently operated and which are so formed as to control the rotation of the type bars.

Other objects and advantages of the invention will appear from the following description taken in connection with the drawings, which form a part of this specification, and in which,

Fig. 1 is a side elevation partly in section of my improved printing machine;

Fig. 2 is a top plan view, with the parts broken away, of the device illustrated in Fig. 1;

Fig. 3 is a perspective view of the universal type carriage frame;

Fig. 4 is an enlarged detail sectional view illustrating a portion of the mounting for the rotatable type bar and the letter keys;

Fig. 5 is a top plan view of a portion of the rotatable type bar and its supporting frame;

Fig. 6 is a perspective view illustrating a series of three letter keys;

Fig. 7 is an end view, partly in section, of one type of means that may be employed for preventing accidental rotation of the type bars;

Fig. 8 is a view, partly in section, illustrating the upper end of the type bar;

Figs. 9 and 10 are detail views, with parts broken away, illustrating the means that may be employed for returning a rotated type bar to its normal position; and,

Fig. 11 is a diagrammatic view illustrating the arrangement of the type characters on the three sides of the type bar.

Referring to the drawings wherein like reference numerals refer to like parts throughout the several views, the elements of the machine are illustrated as being mounted on a frame that comprises a base 1, upright supporting members 2, and an inclined bed plate 3. Slidably mounted on

the upper surface of plate 3 are a plurality of type bar frames 4 which are provided with ears 5 which project upwardly at right angles from the frames and which constitute a support for a rotatably mounted rod 6 that projects from the opposite ends of the type bar 7. Preferably thirty type bars are provided. The type bar frames 4 are normally in engagement at their lower ends with the transverse member 8 of a universal type carriage or frame (Fig. 3) that comprises side members 9, an operating rod 10 and an upper transverse member 11 which passes underneath plate 3 and which terminates at its ends in brackets 12 which extend upwardly through slots formed in plate 3 and which support a plurality of inking rollers 13. Attached to the upper edges of brackets 12, as at 14, are flexible bands or cables 15 which pass over pulleys 16 that are rotatably mounted adjacent the top of the frame. Bands 15 carry, at their lower ends, weights 17. Secured to the opposite ends of rod 18, which supports the loosely mounted pulleys 16, are frame members 19 which are provided adjacent their lower inner edges with a curved rib or track 19^a that is engaged by rollers 20 mounted on stub axles 21 projecting from the outer faces of brackets 12. Journalled at suitable points in frame members 19 is a spool 22 for supporting a roll of paper 23, and a platen mechanism 24, of any suitable type, provided with a threaded lever 25 for regulating the throw of the platen ratchet mechanism. The paper on spool 22 is guided in its travel around the platen by means of a guide roller 26 and retaining rollers 27. The latter preferably comprise a rod 28 provided at suitable intervals with rubber disks 29 which insure that the paper will be maintained at all times in contact with the platen roller but which are so spaced along rod 28 that they will not cause smearing of the printed characters. A knife 30 is mounted on frame members 19 in close proximity to platen 24 in order that the operator may tear off a printed section of the paper. Extending outwardly from the upper surface of plate 3 are a pair of brackets 31 which carry at their outer ends a rotatably mounted pulley 32. Secured at one end to a pin 33, projecting from the side of frame member 19, is a flexible cable 34 which passes over pulley 32 and which carries at its lower end a weight 35. An ink plate 36, provided adjacent its lower portion with a transverse opening 37, is secured to the main frame above the type bars 7.

Means are provided for bringing selected type characters on the type bars into alignment in the center of the ink plate opening 37. As illustrated, this means comprises a plurality of letter keys 38, which are mounted in a keyboard frame posi-

tioned at the lower end of plate 3 and above the plane of the upper surface of type bars 7, together with a rotating head or cone 39 secured to the lower end of rod 6 of each of the type bars. The keyboard frame comprises a transverse member 40 and a pair of plates 41 which are mounted parallel to bed plate 3 and which are provided with a plurality of series of registering openings. Extending through these openings are the letter keys 38 that are preferably formed of a metal plate that is curved at the top and provided at its lower end with a downwardly projecting spindle or lug 42. As illustrated in Fig. 6 the spindles are arranged in series of three, the first spindle of the series, 42^a, being formed at one side of the key, the second spindle, 42^b, being arranged at the opposite side of the next adjacent key and spindle 42^c being formed in the center of the lower edge of the third key of each series. The spindle 42^c is shorter in length than the spindles 42^a and 42^b, which latter are of equal length and are adapted to be engaged by the inclined edges 39^a, 39^b of rotating head 39. Spindle 42^c is adapted to engage a curved projection 39^c formed at a convenient point on the upper surface of head 39. Normally, the letter keys are maintained in raised position by means of a plurality of curved springs 43 which are secured at their lower ends to the lower plate 41 and which bear at their upper ends against the upper surface of keys 38. As illustrated in Fig. 2, the letter keys are arranged in vertical rows, a row being provided for each type bar 7. The number of keys in each row corresponds to the number of type characters formed on the type bars.

Any suitable means may be provided for returning keys 38 to normal position after they have been depressed. In the embodiment shown this means comprises a shift bar 44 provided with a plurality of laterally projecting pins 45 which are adapted to engage pins 46 formed on the lower face of the letter keys. Bar 44 is pivoted at its lower end to a column release key 47 mounted on a transversely extending rod 48. The upper end of bar 44 is connected by a pin and slot connection to a bell crank lever 49 pivoted to the frame as at 50. If desired, a bar 51 may be pivoted at one end to the lower arm of bell crank lever 49 and at its opposite end to a downwardly projecting arm 47' of shift key 47. One shift bar 44 is provided for each vertical column of keys and in order that these bars may be individually actuated shift key 47 is provided with an arcuate slot 52 into which extends a rib 53 formed on rod 48. A universal shift key 54 mounted on the end of shaft 48 provides means for actuating all of the bars

44 simultaneously. Automatic means may be provided for returning all of the letter keys that have been depressed to normal raised position as is disclosed in my co-pending application Serial Number 696,890, filed March 4, 1924, wherein a lever is pivotally secured to a transverse rod corresponding to rod 48 and a lug is provided on the side of the carriage for actuating this lever.

Projecting from the upper end of each of the type bars 7 is a pin 55 which, in the normal position of the type bars, extends into a beveled groove 56 (Figs. 9 and 10) formed in the frame adjacent the upper end of bed plate 3. If desired, a leaf spring 57 may be secured to each of the type bar frames 4 in a position to engage rotating head 39 to prevent accidental rotation of the type bar.

While the type bars 7 and type bar frames 4 are moved down the upper surface of plate 3 by the force of gravity when the carriage frame is moved downwardly, means are preferably provided for positively moving the type bars downwardly. As illustrated, this means comprises a pin 4^a which projects upwardly from the upper surface of the lower end of type bar frame 4, and a plurality of spring clips 8^a which are secured in any desired manner to the transverse member 8 of the carriage frame. When the type bars are in their normal position adjacent the upper end of the bed plate 3, spring clips 8^a have resilient engagement with pins 4^a and positively move the type bars downwardly when the carriage frame is actuated, as is fully described in my co-pending application referred to above.

The operation of the device is as follows:—

The parts being in the position illustrated in Fig. 1 and it being desired to print the following line, for example, "News Bulletin Number 1," the letter keys 38 corresponding to the letters in the word "News" are depressed in the four left hand vertical columns of keys, the downward movement of the keys being limited by engagement of pins 46 with the pins 45. The next vertical column of keys is skipped and the remaining keys are depressed in such a manner as to form the other words of the line. Any mistake that is made in striking the keys may be corrected by actuating shift key 47 for the particular column wherein the mistake was made. The keys for the line being set, the operator pulls rod 10 downwardly whereupon the type carriage moves downwardly and releases the type bars 7, together with their frame members 4, which move down the bed plate 3 under the force of gravity until the rotating heads 39 encounter one of the downwardly

projecting spindles 42. Since the letter "N," as illustrated in Fig. 11 which shows the development of the type bar, is on the right hand side of the bar, the spindle 42 for the letter key "N" is on the right hand side of the key in a position corresponding to the spindle 42^b illustrated in Fig. 6. This spindle strikes the inclined edge 39^b of rotating head 39 and rotates type bar 7 to bring the right hand side of the bar on top. Spindle 42 also stops the downward movement of the type bar at such a point as to bring the letter "N" directly in the center of the opening 37 of the ink plate 36. The letter "E" is also on the right hand side of the type bar as is "W" and these two type bars are rotated in a similar manner. The letter "S," however, is positioned on the upper surface of the bar and the stem of the letter key "S" is located in the central plane of the key as illustrated at 42^c in Fig. 6. The fourth type bar from the left accordingly moves downwardly until the curved projection 39^c of rotating head 39 encounters the stem 42^c of the letter key "S." When a letter key is depressed corresponding to a character formed on the left hand side of the type bar such as "U," the corresponding type bar is rotated to the right by the engagement of spindle 42^a with the inclined edge 39^a of the rotating head.

As the letter characters are brought into alignment in the center of opening 37 ink rollers 13 pass over these characters and continue downwardly to the lower portion of the ink plate 36. Simultaneously with these movements rollers 20, carried by the brackets 12, move along the curved track 19^a forcing the platen 24 into engagement with the aligned characters and the line is printed.

When the rod 10 is released weights 17 and 35 return the parts to normal position. As the type bars are forced back into their normal position at the upper end of bed plate 3 by the transverse member 8 of the type carriage frame, pins 55, projecting from the upper end of each type bar, engage the inclined surface 56, if the bar has been rotated, and rotate the bars in the opposite direction to return them to normal position. Letter keys 38 must now be returned to their normal raised position and this operation is performed by pressing universal shift key 54 downwardly which rotates shaft 48 and causes rib 53 to rotate the column release levers 47 thereby simultaneously raising all of the bars 44 and keys 38. If the automatic key shift mechanism is provided the keys will be automatically returned to their normal position as the carriage frame moves upwardly to the upper end of the plate 3. When the bulletin has been printed the paper may be cut to the desired length by the use of knife 30. If it is desired to print adver-

tising cards or show cards it will be understood that these may be fed into the platen individually and need not be carried on the paper spool 22. Type characters formed on the bars 7 are illustrated as being concave in order that they may conform to the curvature of platen 24 thus insuring a clean impression.

While only one embodiment of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto but is capable of a variety of mechanical expressions within the limits of the appended claims.

15 What is claimed is:

1. In a printing machine, the combination of a frame, type bars mounted for rotation and reciprocation in said frame, means for reciprocating said type bars, and a keyboard including a plurality of letter keys, each of said keys being adapted to control the rotation and the longitudinal movement of one of said bars.

2. A machine of the class described comprising a frame, a plurality of rotatable type bars having type characters formed on two or more sides thereof, means for reciprocating said bars, and means for controlling the rotation and reciprocation of said bars including a plurality of depressible keys and a rotating cone rigidly secured to each of said bars.

3. A machine of the class described comprising a frame, a bed plate carried by said frame, a type bar carrier slidably mounted on said bed plate, a type bar rotatably mounted on said carrier, means for reciprocating said bars, and means for controlling the reciprocation and rotation of said bars.

4. A type bar comprising a rectangular member, a plurality of concave type characters formed on two or more sides of said member, and a rotating head having a pair of oppositely inclined surfaces secured to said member.

5. A machine of the class described comprising a frame, platen mechanism pivoted thereto, a type carriage slidably mounted on said frame, means mounted on said carriage and having engagement with said platen mechanism for actuating the latter, a plurality of rotatable type bars slidably mounted on said frame, and means for selectively rotating and limiting the longitudinal movement of said type bars.

6. A machine of the class described comprising a frame, a platen mechanism pivoted thereto, a type carriage slidably mounted on said frame, means mounted on said carriage and having engagement with said platen mechanism for actuating the latter, a plurality of rotatable type bars slidably mounted on said frame, a plurality of keys for selectively rotating and limiting the longitudinal movement of said type bars, said keys being

provided with downwardly projecting stems, means for resiliently maintaining said keys in raised position, and means for returning said keys from depressed position to raised position.

7. In a printing machine, the combination of a frame, type bars mounted for rotation and reciprocation on said frame, means including a type carriage frame controlling the rotation and reciprocation of said bars, and means for returning bars that have been selectively rotated to normal position.

8. In a printing machine, the combination of a frame, type bars mounted for rotation and reciprocation on said frame, means for controlling the rotation and reciprocation of said bars, and means energized by the actuation of said first named means for returning the bars to normal position.

9. In a printing machine, the combination of a frame, a plurality of type bars mounted for rotation and reciprocation on said frame, means normally preventing movement of said bars, and for returning said bars to normal position, a platen mechanism operatively connected to said means, and means for controlling the rotation and reciprocation of said bars comprising a plurality of letter keys and a rotating head secured to each of said bars.

10. In a printing machine, the combination of a frame, a plurality of type bars mounted for rotation and reciprocation on said frame, means normally preventing movement of said bars, and for returning said bars to normal position, a platen mechanism operatively connected to said means, and means for controlling the rotation and reciprocation of said bars comprising a plurality of letter keys provided with spindles and a rotating head secured to each of said bars.

11. In a printing machine, the combination of a frame, a plurality of type bars mounted for rotation and reciprocation on said frame, means normally preventing movement of said bars, and for returning said bars to normal position, a platen mechanism operatively connected to said means, and means for controlling the rotation and reciprocation of said bars comprising a plurality of letter keys arranged in vertical columns, the keys in each column being arranged in series of three, and a rotating head secured to each of said bars.

12. A device of the character described comprising a frame, type bars mounted for reciprocation and rotation in said frame, a platen pivoted to said frame, and common means for moving said platen and type bars into printing engagement.

13. A device of the class described comprising a frame, a bed plate carried by the frame, a plurality of type bars slidably mounted on said plate, platen mechanism

pivoted to said frame including a curved rib, and means including a roller having engagement with said rib for moving the type bars and platen to printing position.

5 14. In combination, a frame, a plurality of type bars carried by said frame, a platen pivotally connected to said frame, means for moving said platen and type bars, means including a plurality of depressible keys and
10 cones secured to the type bars for rotating the latter, and means for returning the type bars and platen to normal position.

15 15. In combination, a frame, a bed plate carried by the frame, a plurality of type bars slidably mounted on said bed plate, a plurality of concave type characters formed on two or more sides of said bars, the characters on one side of said bar being arranged in overlapping position relative to the characters on the adjacent side of said bar, a platen
20 mechanism movably secured to said frame, a plurality of letter keys adapted to be moved into engagement with said bars for rotating the latter, and means for simul-

taneously returning each of said keys to 25 normal position.

16. A device of the character described comprising a frame, type bars mounted for reciprocation and rotation in said frame, a platen pivoted to said frame, manually oper- 30 able means for controlling the rotation and reciprocation of said bars, and common means for moving said platen and bars into printing engagement.

17. A device of the character described 35 comprising a main frame, type bars mounted for reciprocation and rotation in said frame an auxiliary frame pivoted to said main frame, a platen carried by said auxiliary frame, means for controlling the rotation 40 and reciprocation of said type bars, and means for simultaneously imparting longitudinal movement to said bars and pivotal movement to said auxiliary frame.

In testimony whereof I have signed this 45 specification.

FRED A. DOLPH.