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TYPOGRAPHICAL COMPOSING AND DISTRIBUTING MACHINE.

APPLICATION FILED JULY 15, 1907.

951,948. Patented Mar. 15, 1910.

4 SHEETS—SHEET 1.

Fig. 1.

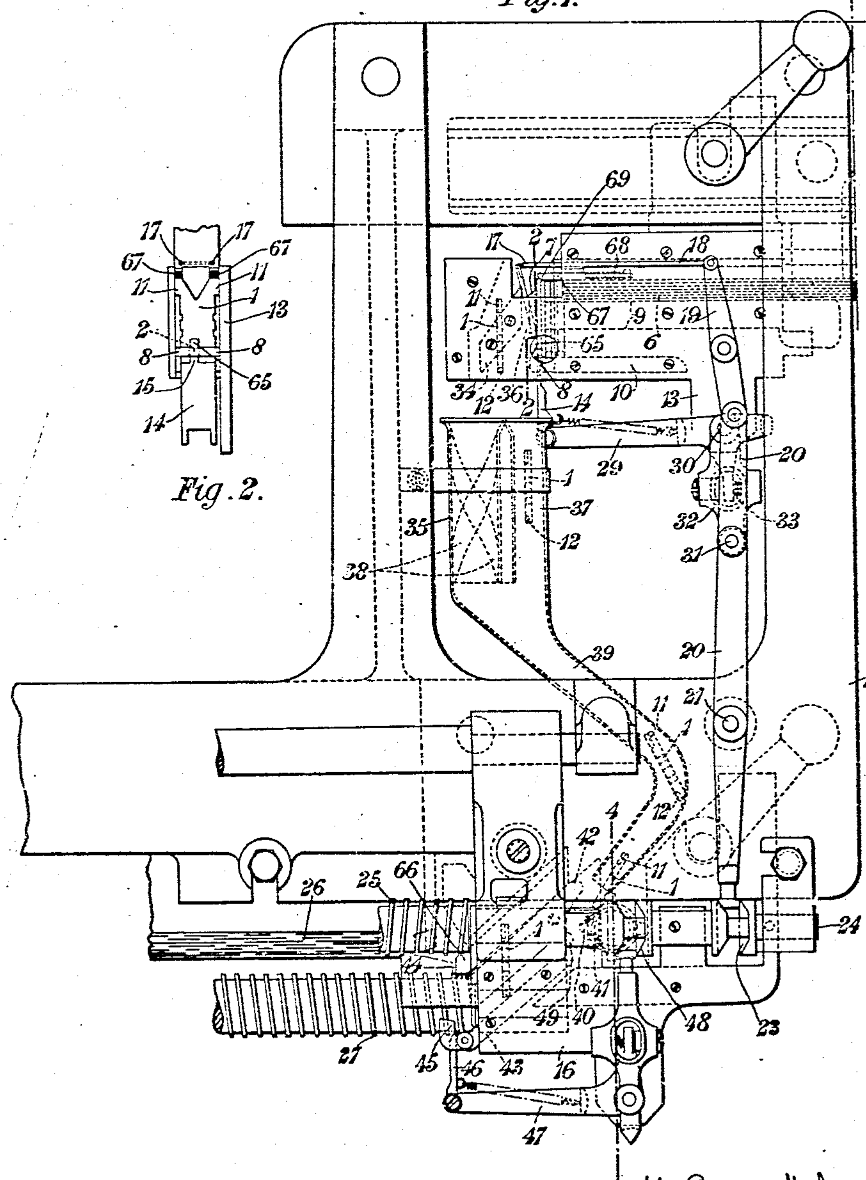

Fig. 2.

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4 SHEETS—SHEET 2.

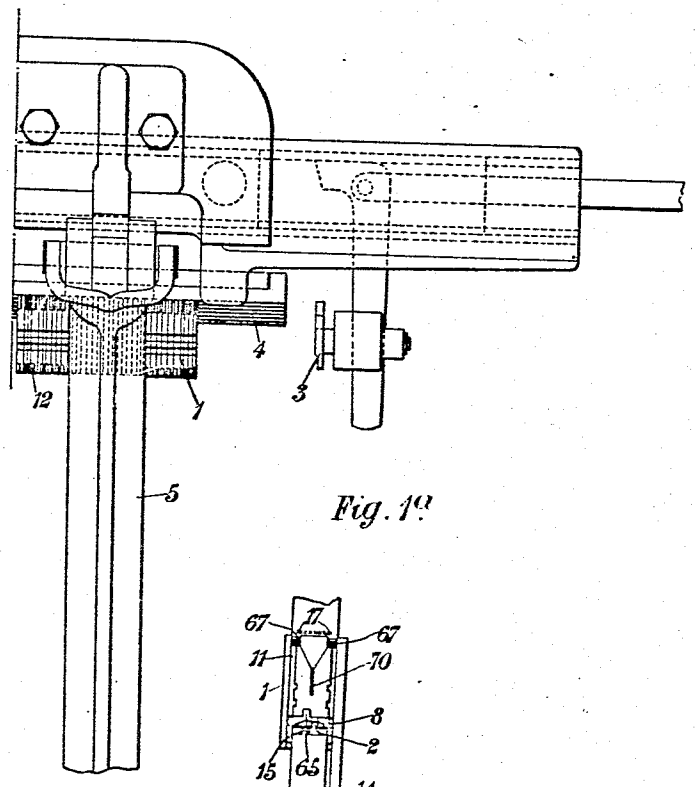

Fig. 1.

Fig. 3.

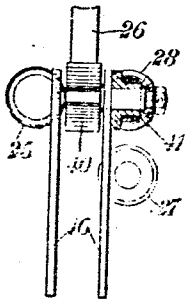

Fig. 4.

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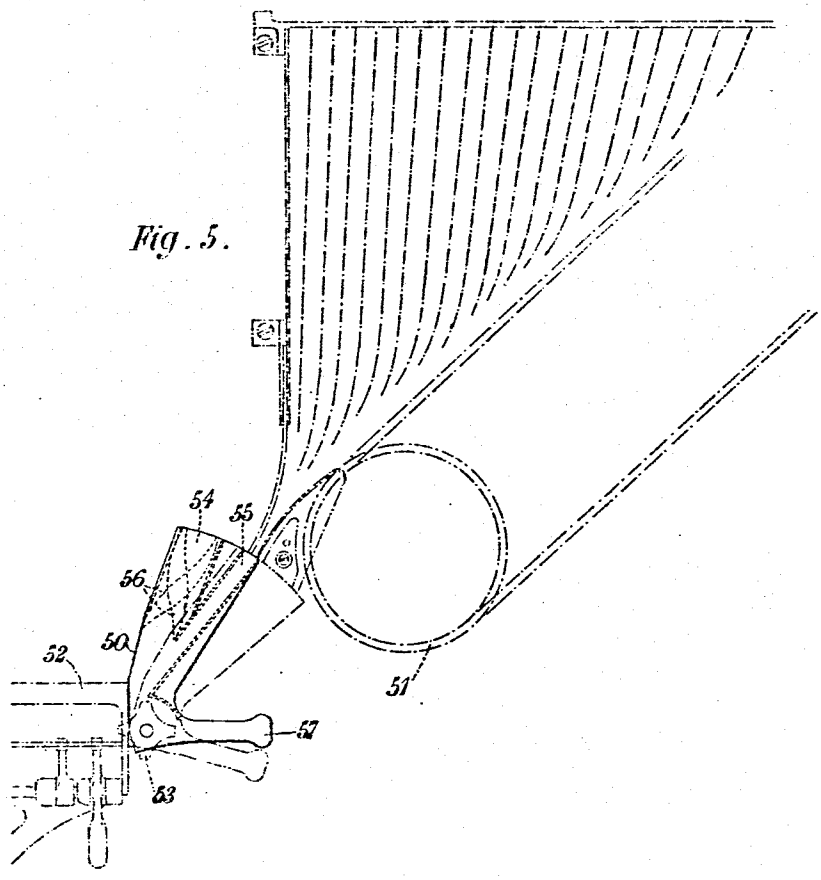
4 SHEETS—SHEET 3.

Fig. 5.



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4 SHEETS—SHEET 4.

Fig. 6.

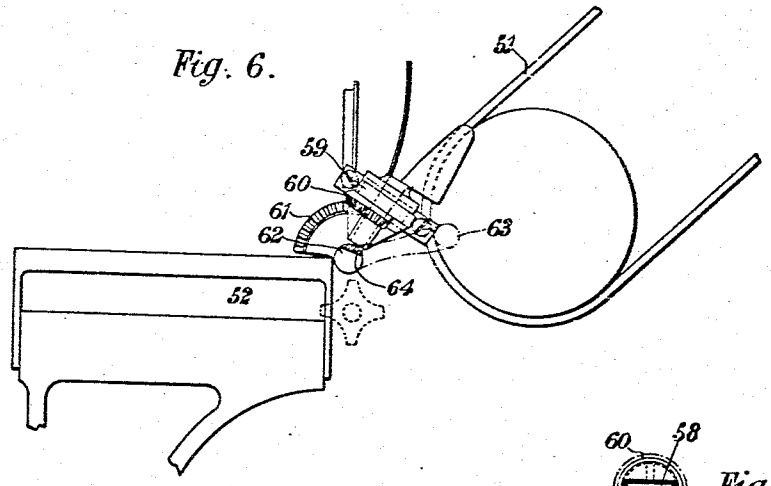
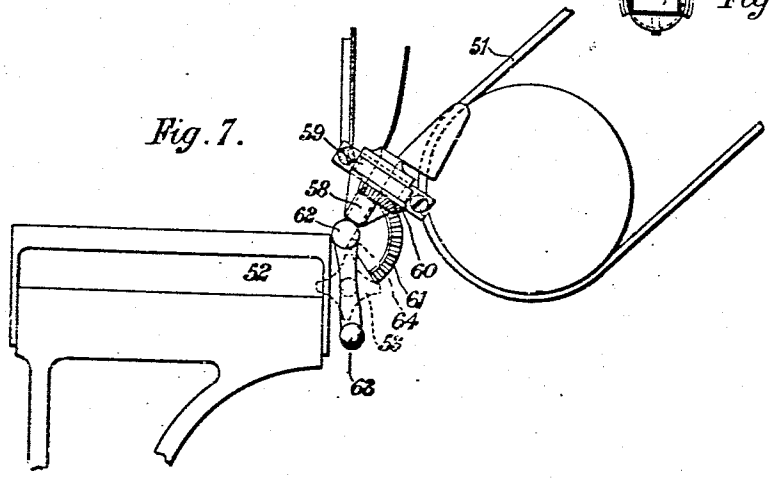


Fig. 8.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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TYPOGRAPHICAL COMPOSING AND DISTRIBUTING MACHINE.

951,948. Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed July 15, 1907. Serial No. 383,754.

To all whom it may concern:

Be it known that we, JOHN GLENNIE HOLBOURNS and HENRY ALEXANDER LONGHURST, subjects of the King of the United Kingdom of Great Britain and Ireland, and residing at 188 Fleet street, in the city of London, England, have invented new and useful Improvements in Typographical Composing and Distributing Machines, of which the following is a specification.

This invention relates to typographical composing and distributing machines of the class in which the type faces are cast in formative cavities provided each in a separate matrix, these matrices being normally stored in a magazine from which they are released to enable them to be assembled in the order of composition, and thereafter presented either collectively or individually to the nozzle through which the molten metal is discharged for producing the desired casting.

Of the different constructions of machine to which the present invention is applicable, those hereinafter referred to, are given merely as convenient examples and are not to be regarded as indications of the limits of applicability of the said invention.

The invention has for its object to provide novel means for endowing each machine of the above-named class with a capacity for producing, from a single set of matrices, bodies bearing printing faces of different fonts.

The matrices employed according to this invention are provided with one or more formative cavities of different characters or the same character in different fonts, and, in the application of the present improvements to type-casting machines of the well-known linotype class described in the specification of Letters Patent No. 436,532, these formative cavities are provided in each of the vertical edges of the said matrices.

The invention may be said to consist in providing devices whereby the abovenamed multiple font matrices can be turned edge for edge about their vertical axes first, at the will of the operator, during their passage from the magazine to the assembling position, and secondly, automatically, during their passage from the casting position to the magazine, this latter turning of the matrices restoring them to their respective normal positions.

In the accompanying drawings which are to be taken as part of this specification and read therewith, and in which, as an example, the invention is illustrated as applied to a linotype machine: Figure 1 is the left-hand part and Fig. 1ª the right-hand part of a rear elevation of portion of the distributer mechanism of the said linotype machine: Figs. 2 and 3 are vertical sections of Fig. 1 taken about on the line 2—2 of that figure, and showing different operations connected with the distribution of the matrices; Fig. 4 is a vertical section on about the line 4—4 of Fig. 1, as seen from the right hand side of that figure; Fig. 5 is a front elevation of part of the assembling mechanism of the machine; Figs. 6 and 7 are front elevations showing in two different positions of adjustment, an alternative arrangement of the mechanism shown in Fig. 5, and Fig. 8 is a plan of a detached portion of the apparatus shown in Figs. 6 and 7.

Throughout the several figures of the drawings like reference numerals are used to indicate like or corresponding parts of the apparatus.

Dealing first with the reversing devices appertaining to the distributer mechanism, which devices are represented in Fig. 1, it will facilitate the understanding of the invention if it is here explained that most of this occupies a position above that occupied by the distributer mechanism in the commercial linotype machine, and that the second elevator of the improved machine is adapted to raise the matrices up to this higher level. It will also be well here to explain that each matrix 1, as shown clearly in Figs. 2 and 3, is provided with a recess or notch 2 in its foot, conveniently of rectangular form, the notches being of the same size, shape and position throughout all the matrices of the same set or font. The preferred position of the notch 2 in each matrix is to one side of the vertical axis of such matrix, by a distance not less than the width of a notch, so that when a matrix which has been turned from its normal position, is juxtaposed with one that has not been so turned, the notches 2 of the two matrices

will not register with, or overlap each other, as will be well understood by reference to Figs. 2 and 3.

When the line of matrices 1 is raised to the before mentioned higher level—it is shown in that position in Fig. 1a—it is, in the ordinary well-known manner, pushed by a reciprocating pusher 3, off the toothed bar 4 of the second elevator 5 on to a stationary toothed bar 6 shown in dotted lines in Fig. 1. The teeth of this bar 6, in the ordinary well-known manner, support the matrices 1, in their passage toward two sets of stops or gates 7, 8, respectively formed or provided at the ends of two sets of stationary rails 9, 10, the teeth of the bar 6 terminating at a point short of the vertical plane containing the gates 7, 8, so as to allow the matrices to be supported by the said rails 9, 10 on which their top lugs 11 and bottom lugs 12 are then respectively caused to bear. All this is substantially the same as that which happens in commercial linotype machines of ordinary construction. The toothed bar 6 and rails 9, 10 form part of what is known as a "lift box" hereinafter referred to as the lift box 13, which lift box is provided with a vertically reciprocating lifter 14, adapted to successively lift each matrix as it, in turn, is moved up to the stops or gates 7, 8.

The lifter 14, unlike that of the commercial linotype machine, is provided, at its upper or lifting edge, with a projection 15, Figs. 2 and 3, adapted, as shown in Fig. 2, to enter the recess 2 in the foot of each matrix 1 which is presented to it in normal direction, that is to say, the direction in which the usual casting or rear edge of the matrix is, as ordinarily, presented toward the rear of the machine. When the lifter 14 operates upon any matrix which has been turned 180 degrees from its normal position, as shown in Fig. 3, the lifter projection 15 engages with the lowest edge of that matrix and lifts it higher than it does a matrix presented to it in normal or un-turned position, the difference in this lift being equal to the depth of the recess 2 or length of the projection 15, as will be well understood by comparing Figs. 2 and 3 with each other.

For convenience of description the matrices which are in their normal or un-turned position, and those which have been turned through 180 degrees from such normal position are, when it is desired to refer to them, in those respective positions, hereinafter referred to as "normal matrices" and "reversed matrices" respectively.

The lift box 13 is hereinafter referred to as the "upper lift box" (because there is another one below it, later referred to as the "lower lift box 16") and at its upper part it is provided with a horizontally reciprocated forked pusher 17 adapted by its forked end, to engage with the upper part of each of the reversed matrices when, as shown in Fig. 1, the said matrix is raised by the lifter 14; the normal matrices are not affected by the pusher 17 because the lifter 14 does not raise them sufficiently to bring them into the path of such pusher. The pusher 17, by its stem 18 (which is situated at the outside of the rear wall of the upper lift box 13) is pivoted to the upper end of a lever 19 pivoted to the rear wall of the lift box, and which, at its lower end, is pivoted to the upper end of a lever 20 pivoted at 21 to the fixed frame 22. At its lower end, the lever 20 is in permanent engagement with a cam 23 fast to the shaft 24 of the distributer screw 25 which is one of the three ordinary screws by which the matrices are caused to traverse the permuted bar 26; of these three distributing screws only portions of two are represented in Fig. 1, viz., the before-mentioned screw 25 which is situated at the rear of the permuted bar 26, and the screw 27 which is situated at a lower level, all as in the ordinary commercial linotype machine. The third distributer screw 28 is situated immediately in front of the permuted bar 26 and is represented only in Fig. 4, being obscured from view in Fig. 1, by the said bar.

The lower end of the lifter 14 is pivoted to a bell-crank lever 29 which, at 30, is pivoted to the frame 22 and at 31 is pivotally connected, through its flexibly attached arm 32, to the lever 20. The arm 32 is the equivalent of those which are found in existing linotype machines, and, like those is held up to its work by a buffer or spring 33 (shown in the dotted lines in Fig. 1) which, in the event of any obstacle being present to interfere with the raising of a matrix by the lifter 14, yields, and thereby prevents damage being done to the matrix or machine.

To maintain the reversed matrices in operative contact with the lifter 14 sufficiently long to enable the latter to lift the said matrices into the path of the pusher 17, the lift box 13 is provided with an additional stop or gate 65 extending upward to a higher level than do the gates 7, 8 and in such position, as shown in Figs. 2 and 3, as to be in line with solid or un-recessed parts of the reversed matrices and in line with the recesses 2 of the normal matrices, the length and width of the said gate being slightly less than the depth and width of the recesses 2. By this arrangement the release of the normal matrices from the stops or gates 7, 8 is in no way interfered with, the recesses 2 of these matrices being pushed over the gate 65 immediately the respective lugs 11, 12 of the said matrices are raised above the gates 7, 8; with the reversed matrices however, the provision of the gate 65, necessitates these matrices being lifted by the lifter 14 high enough to enable their feet to

pass over the said gate (the recesses 2 of these reversed matrices being out of line with the gate). It is this increased lift of the reversed matrices which insures their upper parts being brought into the path of the pusher 17.

In the lift boxes of existing linotype machines means are provided for preventing any but the foremost of the matrices in such boxes from being lifted by the lifter, those means generally consisting of a blade projecting from the end of the appropriate stationary toothed bar to such distance therefrom as will admit of only the thinnest of the matrices being raised between it and the stops or gates of the lift box, all matrices other than those thinnest ones being vertically grooved as at 70 Fig. 3, so as to reduce their thickness, at the part at which the blade is caused to act, to about the thickness of the thinnest matrices. Such an arrangement as that just mentioned is shown in connection with the lower lift box 16 represented in Fig. 1 wherein the matrix separating blade is indicated by the numeral 66 and fulfils its function in the ordinary way. As the line or column of matrices when received in the lift box 13 is, as previously described, made up of normal and reversed matrices, it is obvious that a blade such as that before described cannot be used for preventing a second matrix from being lifted by the lifter along with the foremost one, because the matrices cannot be grooved on both sides.

As a means of effecting a like result to that resulting from the use of the above-named blade, there is provided a forked rod 67, the stem of which is encircled by a coiled compression spring 68, Fig. 1, which tends always to move the rod 67 toward the right of the machine. The ends of the prongs of the forked rod 67 are inclined, or cam-shaped as at 69, Fig. 1, and are normally situated in the upward path of the matrices raised by the lifter so that, while any matrix which is positively raised by the lifter will by its upper end acting on the curved ends 69, force the rod leftward without practical result on such matrix, any matrix which previously may have been adhering to the said positively lifted one, will be brushed off by the action of the rod 67 and will fall into its proper position at the front of the column so as to be raised by the lifter 14 at its next ascent.

At a short distance away from the right-hand side of the before described stops or gates 7, the upper lift box 13 is provided with a pair of downwardly inclined rails 34 (of which only one is shown in the drawings, and that in dotted lines in Fig. 1) the lower ends of which terminate immediately over a special chute 35 into which the reversed matrices drop on leaving the said inclined rails. The space 36 between the stops 7 and the inclined rails 34 is sufficient to allow clearance for the normal matrices to drop through, and this space is directly over a chute 37 which directs these matrices toward the lower lift box 16. The special chute 35 is rifled, as for example by the twisted or spiral blades 38, shown in dotted lines in Fig. 1, or otherwise suitably formed for giving to the previously reversed matrices, during their descent through such chute, a turning motion of 180 degrees about their vertical axes, so that the vertical edges which were presented rearward on entering the chute 35, are presented toward the front when the matrices leave the said chute. The chutes 35 and 37 both deliver the matrices 1 into the same common chute or channel 39 by which they are guided to the same destination, viz.:—the lower lift box 16, the said channel delivering them, if desired, on to, or just to the right of, a rotating star wheel 40 which is similar to those at present employed in the assembly box of the commercial linotype machine. In the present arrangement the star wheel 40, as shown in Figs. 1 and 4 is driven through a pair of miter wheels 41 from the shaft of the distributer screw 28.

In the lower lift box 16, the matrices 1 (which are therein all presented in the normal direction), travel along downwardly inclined rails 42, 43, the upper and lower lugs 11, 12 of the matrices respectively sliding over the said rails, until they abut against the stops or gates 44, 45 adjacent to the receiving ends of the distributer screws 25, 27, 28. The matrices, as each in turn is moved up to the gates 44, 45, are, by a vertically reciprocating lifter 46, successively raised into engagement with the distributer screws 25, 27, 28 in the ordinary well-known manner, the foremost of the column of matrices descending down the rails 42, 43 being moved up to the stops by the weight of the following matrices. The lifter 46 is pivoted to a bell-crank lever 47 which, as in existing linotype machines, is operated by a cam 48 fast on the shaft 24 of the distributer screw 25.

The star wheel 40 is provided for the purpose of securing, conjointly with projections 49 adapted to temporarily engage the lower lugs 12 of the descending matrices, the upending of the matrices and the jerking of their upper lugs 11 on to the inclined rails 42, but in practice, it may be found that the descending matrices acquire sufficient momentum of their own to attain this result without extraneous assistance, in which case the star wheel 40 would not be provided.

The matrices, as previously explained, being stored in their magazine with their respective front and rear edges all presented in normal direction, and it being required,

according to variation of font desired, that some of these matrices should be assembled in the assembly box with their respective edges reversed, it becomes necessary to provide means for effecting this reversal. In one arrangement for effecting this reversal of the matrices, viz.:—the arrangement represented in Fig. 5, the matrices will, in succession, be automatically reversed after a single preliminary adjustment. This arrangement comprises a chute 50 interposed between the lower part of the assembler belt 51 and the entrance to the assembly box 52, and it is adapted to pivot conveniently about the axis of the ordinary star wheel 53. This chute 50 is provided with, or divided into, two separate channels 54, 55, of which, the former is rifled, as for example by spiral blades 56, or otherwise adapted to turn the descending matrices through 180 degrees about their respective vertical axes for effecting the above-named reversal, as when a variant font is required; the other channel 55 is non-rifled or plain to allow the matrices 1 to descend therethrough without reversal, as when the normal font is required. According to whether a matrix is required for the production of a letter of variant or normal font so will the chute be adjusted to bring respectively into operative position its rifled channel 54, as shown in dot and dash lines in Fig. 5, or its non-rifled channel 55 as shown in full lines in that figure. The chute 50 is preferably provided with a handle or lever 57 for facilitating its adjustment, and a catch or detent—not represented in the drawings—may be provided for retaining it in either of its two adjusted positions until the operator next requires to adjust it for obtaining a change of font. This arrangement necessitates some slight variation in the positioning of the parts of the machine as compared with the positions occupied by corresponding parts in existing machines, for instance the assembler belt and its coöperating pulleys will require to be moved farther toward the right of the machine and possibly also raised so as to make room for the pivoted chute 50 between the lower part of the assembler belt 51 and the entrance to the assembly box 52.

In the arrangement shown in Figs. 6 and 7, a short inclined chute 58 is interposed between the lower part of the assembler belt 51 and the entrance to the assembly box 52, and is so mounted in a fixed bearing 59 as to be capable of being turned about its longitudinal axis through 180 degrees. On this chute 58 is provided a conical toothed segment 60 gearing with a toothed segment 61 fast to a horizontal shaft 62 free to be turned in suitable bearings (not shown in the drawings) and having secured to it a handle 63 by which it may be turned for partially rotating the chute 58. The shaft 62 passes beneath the lower end of the adjustable chute 58 and is cut away or otherwise so arranged that when it is in one of its two positions of adjustment, it presents no obstacle to the descent of the matrices through the chute 58, indeed when the shaft is in this position the straight face of the segmental portion 64 which is left at the otherwise cut away part of the shaft virtually constitutes a continuation of one side of the chute 58, as shown in Fig. 7; when a variant font is required, the operator before releasing the matrix from the magazine, turns the shaft 62 into the position in which it is shown in Fig. 6, so that the outer or curved side of the segment 64 is presented toward the chute 58, and the said segment for the time-being, effectively closes the outlet from the chute, against the egress therefrom of any matrix allowed to enter it. The act of turning the shaft 62 as last described, also effects the turning of the chute 58 through 180 degrees and when therefore, the shaft is next turned in the opposite direction to withdraw the segment 64 from beneath the chute (as it must be before the matrix can be released from the chute) the said chute is turned back through the 180 degrees, thereby reversing the matrix which, by the same operation, is released from the chute. With this last described arrangement, when the normal font is required, the shaft 62 is turned so as to leave the outlet from the chute 58 unobstructed, as shown in Fig. 7, the matrices then dropping through the latter and over the shaft 62 without any interruption; when a variant font is required, the shaft 62 is turned so as to obstruct the outlet from the chute 58, as shown in Fig. 6, so that each matrix dropping into it, has its descent arrested by the segment 64, and it cannot be released, until, by the operator turning the shaft 62, the said matrix, as above described, has been turned through 180 degrees and therefore in the position necessary for obtaining the desired variant font, the same operation releasing the temporarily arrested matrix and thereby allowing it to take its place in the assembly box 52.

It will be observed that the present invention provides a ready means of doubling the capacity of a linotype machine, and that if it be applied, as it is shown applied in Figs. 1, 1*, 2 and 3, to what is known as the double-letter linotype machine, that is to say, a machine employing double-letter matrices such as those described in the specification of Letters Patent No. 547,633, it endows that machine with a capacity of casting from a single set of matrices, linotypes having at the option of the operator any one of four different fonts of printing faces.

In a type-casting machine such as that described in the specification of Letters Patent No. 675,827 each of the character

matrices has its formative cavity formed in one of its two faces (as distinguished from the edge thereof as in the linotype machine), and a notch in one of its edges, the depth of which latter bears a definite relationship to the set-way dimension of the type cast from the said formative cavity, the formative cavities being formed midway between the vertical edges of the matrices. In the application of the present invention to a machine of the last mentioned construction each matrix is provided with a formative cavity in each of its two faces, and one of the above-named notches in each of its vertical edges. If the thickness of the thinnest matrix of the set or font be sufficient for the purpose, the formative cavities formed in the respectively opposite faces of each such matrix may be directly in line with each other, if, however, the said thickness be insufficient for that purpose, then the formative cavity on each face would be formed nearer to one vertical edge than to the other, but each formative cavity of the series would occupy the same relative position in its respective matrix face.

In the last-named arrangement the machine would be suitably adjusted or modified to admit of it dealing with the matrices having the non-central formative cavities instead of as heretofore, central cavities, and in connection with this application of the present invention it will be observed that by suitably modifying the necessary parts to adapt them to the altered conditions the improvements described in the before-mentioned specification of Letters Patent No. 547,633 may be applied with like advantages to machines employing matrices of any of the before-described constructions.

If desired, one of the before described manually adjustable matrix reversers may be applied to or used in connection with, any single magazine channel or to a group of channels so as to admit of matrices released from that channel or group of channels being reversed, while those from the other channels would be assembled in their normal or unreversed position, this reverser being used either conjointly with, or independently of, the first described manually adjusted one, which, as before explained, is adapted to operate on the entire set of matrices.

It will, of course, be understood that the reference to turning the matrices about their vertical axes is descriptive simply of the particular mechanism shown and described by way of illustration, and therefore the invention is not to be strictly limited thereto. More generically the matrices may be described as turning about their longitudinal axes, or again, as turning about axes extending in the direction of the height of the characters. The matrix may also be defined as reversible, in that, in turning upon its described axis, the character-bearing edges will have been reversed.

We claim,

1. In a typographical machine, the combination with a magazine adapted to contain a supply of matrices having one or more formative cavities in each edge thereof, an assembler device adapted to receive the matrices from the magazine, and devices adapted to conduct the matrices in their passage from the magazine to the assembler device, and vice versa, of devices adapted to turn the matrices 180 degrees about their vertical axes during their passage from and to the magazine.

2. In a typographical machine, the combination with a magazine adapted to contain a supply of matrices having one or more formative cavities in each edge thereof, an assembler device adapted to receive the matrices from the magazine, and devices adapted to conduct the matrices in their passage from the magazine to the assembler device, of a device adapted to turn the matrices 180 degrees about their vertical axes during their passage from the magazine to the assembler device.

3. In a typographical machine, the combination with a magazine adapted to contain a supply of matrices having one or more formative cavities in each edge thereof, an assembler device adapted to receive the matrices from the magazine and from which they are returned to the magazine, of a device adapted to turn the matrices 180 degrees about their vertical axes during their return passage to the magazine.

4. In a typographical machine, the combination with a magazine adapted to contain a supply of matrices having one or more formative cavities in each edge thereof, and distributer mechanism adapted to distribute the matrices into the respective channels of the magazine, of a device adapted to turn each matrix individually through 180 degrees about its vertical axis during its passage from the casting position to the distributer.

5. In a typographical machine, the combination with a magazine adapted to contain a supply of matrices, distributer screws adapted to move the matrices to their respective magazine channels and a lift box wherein the matrices are lifted into engagement with the said screws, of a second lift box situated at a higher level than the other one, and a device adapted to turn the matrices 180 degrees about their vertical axes during their passage from one to the other of such lift boxes.

6. In a typographical machine the combination with a magazine adapted to contain a supply of matrices, distributer screws adapted to move the matrices to their re-

spective magazine channels, and a lift box wherein the matrices are lifted into engagement with the said screws, of a second lift box situated at a higher level than the other one, and two chutes adapted to conduct the matrices from one to the other of such lift boxes, one of these chutes being adapted to turn the matrices 180 degrees about their vertical axes.

7. In a typographical machine, the combination with matrices having recesses or notches in their feet of a matrix lifter having a projection corresponding with said notches, the relative disposition of said notches and projection being such that the projection enters the notches of those of the matrices which are turned or face in one direction and engages the feet of the matrices which are turned or face in the opposite direction, and means adapted to vertically reciprocate the said matrix lifter.

8. In a typographical machine, the combination with matrices having non-central recesses or notches in their feet of a matrix-lifter having a projection adapted to enter the notches of those of the matrices which are turned or face in one direction and to engage the feet of the matrices which are turned or face in the opposite direction, and means adapted to vertically reciprocate the said matrix-lifter.

9. In a typographical machine, the combination with matrices having recesses or notches in their feet, a matrix-lifter having a projection adapted to enter the said notches when the matrix-lifter is moved for raising some of the matrices, and to engage the feet of other of such matrices, of a matrix-pusher adapted to engage those of the matrices whose feet are engaged by the lifter projection and two chutes of which one receives the matrices which have been engaged by the pusher and the other receives the matrices which have not been engaged by the pusher.

10. In a typographical machine, the combination of matrices having recesses or notches in their feet, a matrix-lifter having a projection adapted to enter the said notches when the matrix-lifter is moved for raising some of the matrices and to engage the feet of other of such matrices, a matrix-pusher adapted to engage those of the matrices whose feet are engaged by the lifter projection and two chutes of which one receives the matrices which have been engaged by the pusher and the other receives the matrices which have not been engaged by the pusher, one of the said chutes being adapted to turn the matrices 180 degrees about their vertical axes.

11. In a typographical machine, the combination of matrices having recesses or notches in their feet, a lift box, a matrix-lifter having a projection adapted to enter the said notches when the matrix-lifter is moved for raising some of the matrices in the lift-box, and to engage the feet of other of such matrices, a matrix-pusher adapted to engage those of the matrices whose feet are engaged by the lifter projection, inclined rails in the lift box for guiding the matrices last referred to, and two chutes of which one receives the matrices from the inclined rails and the other receives the matrices which have not been engaged by the pusher, one of the said chutes being adapted to turn the matrices 180 degrees about their vertical axes.

12. In a typographic machine, the combination with separately movable matrices, a lift box and a matrix-lifter adapted to raise the foremost of the matrices in their lift box, of a cam-ended rod adapted to move horizontally, and a spring acting on this rod so as to hold the cam normally over the said foremost matrix, while allowing it to move horizontally when a matrix is pressed against the said cam.

13. In a typographical machine containing circulating matrices having uninverted characters in their opposite edges, the combination of means for assembling the matrices in line, and means for delivering matrices successively thereto, which delivering means comprise an intermediate matrix guiding device, adjustable at will, to turn the matrices about their longitudinal axes.

14. In a typographical machine, matrices having characters in opposite edges, and means for guiding said matrices in succession, said means adjustable at will to turn the passing matrices on their longitudinal axes, side for side, or to deliver them without the turning action.

15. In a typographical machine, reversible matrices formed with characters in the opposite edges in uninverted position with reference to each other, in combination with means for assembling them successively in line, and controllable means for delivering the matrices either side forward at will.

16. In a typographical machine, reversible matrices having characters in two edges in uninverted position with reference to each other, in combination with assembling mechanism, and controllable means acting on the matrices to determine at will which character of each matrix shall appear in operative position in the assembled line.

17. In a typographical machine, the combination of matrices having characters in opposite edges in corresponding and uninverted position with reference to each other, a distributer, a magazine to receive the matrices therefrom, and assembling mechanism to receive the matrices successively from the magazine, controllable means for delivering the matrices to the assembler in their normal or in reversed positions at will, and means

for delivering all the matrices to the distributer in their original or normal positions.

18. In a typographical machine, matrices having characters in opposite edges, in combination with an assembling mechanism, a guide having a straight passage and a rifled passage, and means to cause the delivery of the matrices through either passage at will, whereby each matrix may be delivered into the line with one or the other of its characters in operative position at will.

19. The combination with reversible matrices having characters in opposite edges and in uninverted position with reference to each other, means for assembling the matrices, and means for controlling the assemblage by turning the desired matrix or not to cause one or the other edge, as desired, to face in the active direction.

20. The combination with reversible matrices having characters in opposite edges in uninverted position with reference to each other, means for assembling the matrices, and means for turning a matrix or not to cause either edge as desired to face in the active direction.

21. The combination with reversible matrices having characters in uninverted position with reference to each other, means for assembling the matrices, and means for turning the desired matrix or not as it is being assembled to present either character.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

JOHN GLENNIE HOLBOURNS.
HENRY ALEXANDER LONGHURST.

Witnesses:
WARWICK HY. WILLIAMS,
WM. SUTHERLAND ROBINSON.