April 18, 1939. G. C. COLEMAN ET AL 2,154,728

MATRIX STORAGE SYSTEM FOR TYPE MAKING MACHINES

Filed June 30, 1937 2 Sheets-Sheet 1

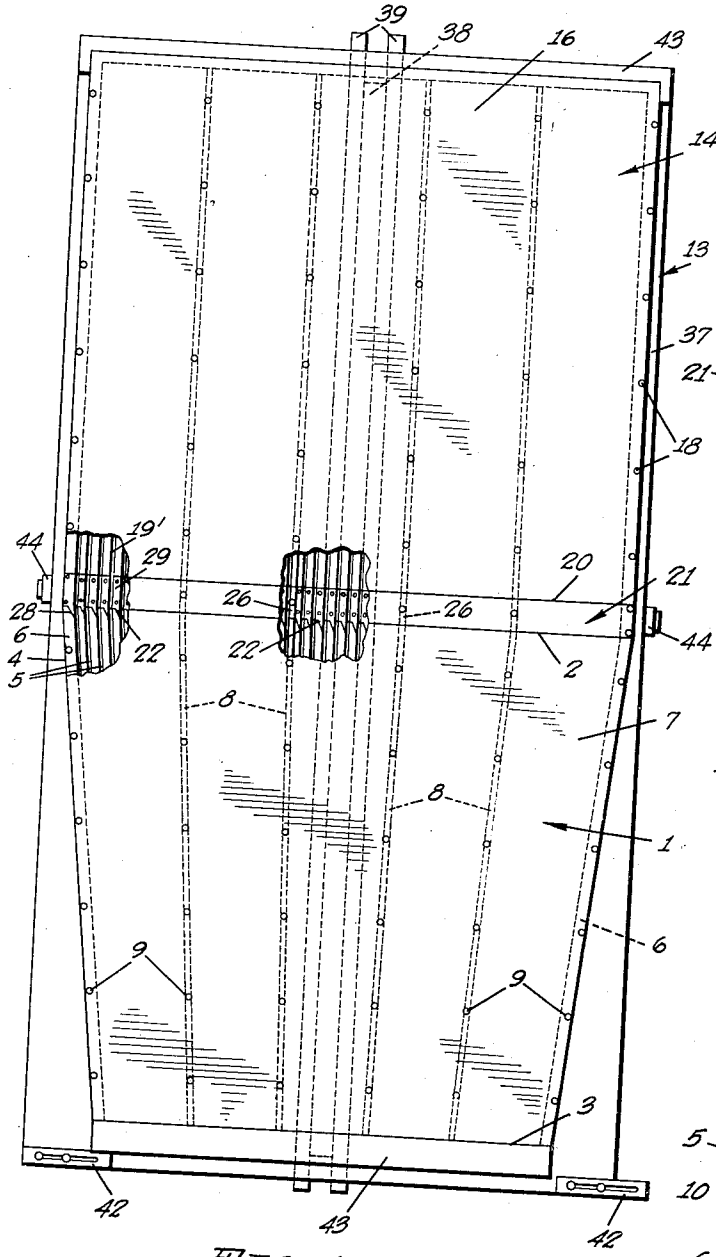


FIG. 1.

FIG. 2.

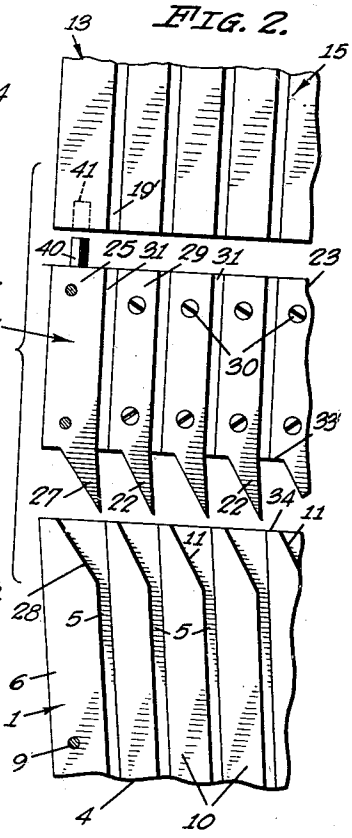
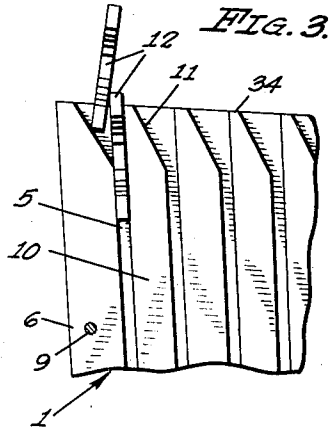


FIG. 3.



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FIG. 4.

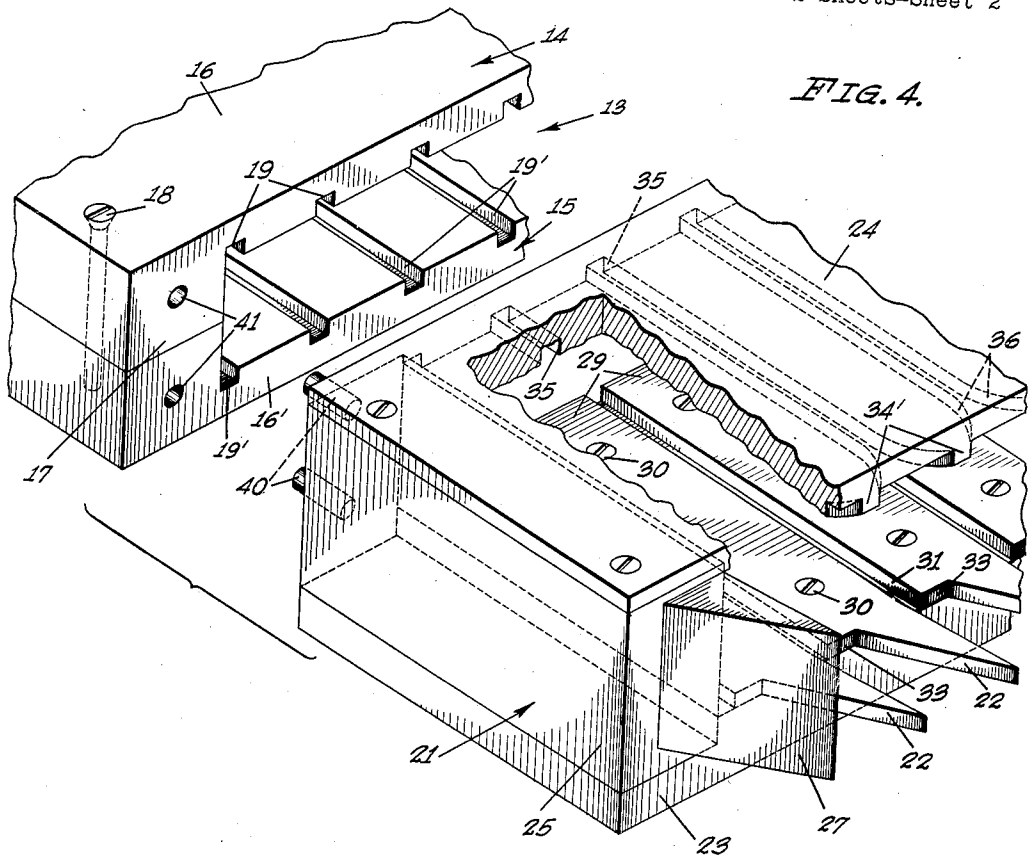
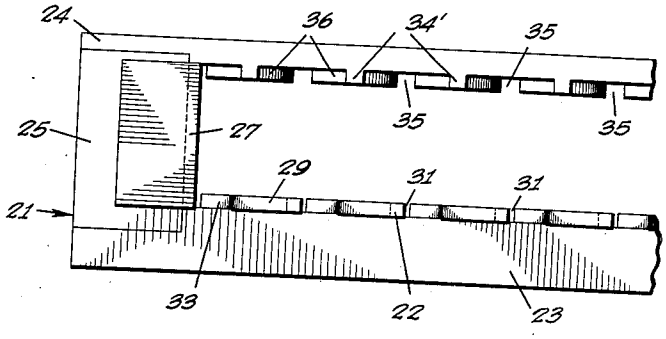


FIG. 5.



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MATRIX STORAGE SYSTEM FOR TYPE MAKING MACHINES

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10 Claims. (Cl. 276—44)

Our invention relates to a system for storing matrices for type making machines, adapted to cast a line of type from matrices selected by operation of a keyboard, arranged in a desired line and passed to casting apparatus which molds or casts the complete line of type, and has particular reference to a storage magazine and a system for transferring matrices from a standard line casting machine magazine to a storage magazine.

In line casting machines the various matrices for a given font of type are contained within a magazine which is disposed upon a type making machine above the keyboard and from which matrices are released upon the operation of the keys of the machine. The standard magazines employed upon the machines are usually considerably wider at their upper end than at the lower end thereof, each of the magazines being provided with a plurality of slots, one for each of the different letters, numbers or other symbols of the particular font of type contained therein, these slots or grooves tapering toward each other from top to bottom of the magazine in conformity with the difference in width of the top and bottom of the magazine. Since this standard magazine includes a portion of the mechanism for selectively releasing the matrices, upon the operation of the keys, it is essential that each of the slots or grooves be accurately machined so that the magazine which is used as a standard part of the equipment of the machine is relatively expensive.

Whenever a different font of type is to be used on one of these machines, it is necessary to remove the previously used magazine and insert a new magazine containing the different font of type, making it necessary for the operator of the machine to have on hand a separate and distinct standard machine magazine for each different font of type he proposes to use in the machine or making it necessary for the operator of the machine to remove one by one each of the matrices in the machine and to store them in a separate container and then when these matrices are again to be used they must be fed into the distributor of the machine and redistributed into the standard machine magazine on the machine.

The provision of a separate standard machine magazine for each different font of type requires tremendous investment on the part of the establishment operating the machines while the separate and individual removing of the matrices from the machine requires laborious effort on the part of the operator of the machine since he is required to operate the keys of the machine once for each matrix contained in the magazine and then, when the matrices are to be restored to the magazine, the operator must wait for the distributor to completely distribute a thousand or more of these matrices back into the magazine.

It is an object of our invention, therefore, to provide a storage magazine for receiving and storing matrices from the standard magazine and which will hold the matrices in the same relation to each other as the matrices were held or contained within the standard magazine.

Another object of our invention is to provide a storage magazine of the character set forth which may be constructed relatively inexpensively, requiring greatly reduced investment in storage magazines for each different font of type as compared with the investment required for a standard storage magazine for each different font of type.

Another object of our invention is to provide a system for transferring matrices from the standard machine magazine to a storage magazine or to transfer the matrices from the storage magazine to a standard machine magazine which requires the mere end to end assembly of the storage and standard magazines with a transfer member interposed therebetween, which accurately guides the matrices from their slots in the standard magazine to corresponding slots in the storage magazine and vice versa.

Another object of our invention is to provide a transfer member for use in the system defined in the preceding paragraph in which the transfer member includes means for forming with the slots or grooves of the standard storage magazine a uniform width groove or slot extending from the standard machine magazine to the storage magazine to prevent the binding, overlapping or piling up of the matrices during the transfer from one to the other of the magazines.

Other objects and advantages of our invention will be apparent from a study of the following specifications, read in connection with the accompanying drawings, wherein

Fig. 1 is a plan view of an assembly of storage magazine, standard machine magazine and transfer member upon a suitable supporting table, preferably tiltable to allow the matrices to pass by gravity from one to the other of the magazines, a portion of the top plate of the magazines and transfer member being broken away to illustrate the fingers employed to form uniform width grooves for the transfer of the matrices from one magazine to the other.

Fig. 2 is an exploded view of a portion of each

of the storage magazine, standard magazine and transfer member, each having their upper or top plates removed to disclose the bottom slots in each of these members and the manner of assembly of the members;

Fig. 3 is a detail fragmentary view of the bottom plate and groove defining members of a standard machine magazine illustrating the flaring or tapering of the upper ends of the slots and the manner in which matrices bind as they pass into or out of the slots in the magazine;

Fig. 4 is a fragmentary exploded perspective view of a portion of the storage magazine constructed in accordance with our invention and a portion of the transfer member employed in the practice of our system; and

Fig. 5 is a fragmentary end view of a portion of the transfer member employed in the practice of our invention.

Referring to the drawings, we have illustrated a standard machine magazine 1 which, as hereinbefore described, usually tapers from its upper end 2 toward its lower end 3, that is, the upper end 2 of the magazine through which matrices enter the magazine from the distributors of the machine is usually of greater width than the lower end of the magazine from which the matrices pass as the keys of the type making machine are operated. While the precise construction of the standard magazines 1 may vary with different forms or brands of manufacture thereof, it is substantially standard in all of these magazines to provide a bottom plate 4 upon which is formed or cut a plurality of uniform width grooves 5, one groove being provided for each different letter or number or symbol to be set up by the machine, the grooves 5 extending from the upper end 2 of the magazine 1 to the lower end thereof and constituting passageways engaging the matrices to hold them in alignment one above the other. In view of the fact that it is essential that these grooves accurately conform with the matrix releasing mechanism of the machine, the grooves must be machined in the standard magazine with extreme accuracy and, in view of the tapering of the magazine from top to bottom, the grooves 5 must taper relative to each other, requiring accurate and careful machining thereof. The side walls 6 of the standard magazine are formed as strips extending between the bottom plate 4 and the top plate 7 which, as will be understood by those skilled in the art, is likewise provided with slots similar to slots 5 conforming with the lower slots to guide the opposite side edges of the matrices contained within the slots 5. A plurality of partitions 8 are usually provided extending between the top and bottom plates 4 and 7 to act as supports holding these plates in proper spaced relation, the plates, partitions and side walls being interconnected by suitable screws, bolts or other securing devices 9.

By referring particularly to Figs. 1, 2 and 3, it will be observed that the material 10 between the slots 5 is cut away or tapered outwardly at the upper ends of the grooves, as indicated at 11, to form a flared entrance opening into the grooves 5 to assist in the guiding of the matrices 12 into the grooves as they are dropped with more or less accuracy by the distributor of the machine. It follows therefore that should any attempt be made to empty the matrices from the grooves of the standard magazine by merely inverting the standard magazine and allowing the matrices to slide out of their grooves, a condition of overlapping or binding of the matrices will occur, such as that shown in Fig. 3, wherein one of the matrices 12 has arrived at the flared or tapered entrance 11 and the next adjacent matrix 12 has likewise arrived with its upper end at the flared or tapered entrance 11. The first matrix being free from the confines of the groove 5 has moved slightly to one side, allowing the end of the succeeding matrix to overlap into a jamming or binding relation relative thereto.

Various attempts have been made to provide storage magazines for receiving the matrices from the standard magazine and into which the matrices may be emptied by merely inverting the standard magazine. Such attempts have, however, been unsuccessful primarily because the magazines and the methods of handling the same have not provided for an avoidance of the binding or overlapping relation of the matrices as they pass the flared or tapered entrance ends of the grooves 5.

In Fig. 1 we have illustrated a storage magazine 13 which may be readily and inexpensively constructed as shown particularly in Fig. 4 as a pair of complementary members 14 and 15, each of which may be milled or similarly formed with a relatively flat wall 16 having edge flanges 17 extending perpendicularly thereto so that when the two complementary members 14 and 15 are assembled together and are secured together by means of screws 18 they form a frame including spaced walls 16 and 16', each of which may be provided with a plurality of longitudinally extending spaced grooves 19 in the upper wall and a corresponding set of screws 19' in the lower wall, capable of receiving between them the matrices passed from the standard storage magazine. The spacing of the grooves 19 and 19' relative to each other is identical with the spacing of the upper ends of the grooves 5 in the standard storage magazine so that by abutting the entrance end 20 (see Fig. 1) of the storage magazine 13 with the upper end 2 of the standard magazine 1, the matrices from any one groove 5 may pass into the storage magazine in the same order and the same relation as these matrices were contained within the standard magazine.

However, in order to avoid the binding or overlapping relation of the successive matrices in any one groove as they pass the flared or tapered portion 11 of the groove 5, we prefer to employ a transfer member designated generally by the reference character 21, which includes a plurality of fingers 22 adapted to be received in and fill the flared portion 11 of the grooves 5 of the standard magazine to thereby form a uniform width groove extending completely from the standard magazine to the grooves of the storage magazine.

By referring particularly to Fig. 4, it will be seen that the transfer member 21 comprises a bottom plate 23 and a top plate 24 held by end members 25 and, if desired, a plurality of partition members 26 (see Fig. 1) may be provided conforming in dimensions and spacing with the partitions 8 of the standard magazine. The end member 25 is provided with an outwardly extending tongue 27, preferably tapered and conforming in shape with the taper at the extreme upper end 28 of the side wall member 6 of the standard magazine so that by pressing the tongue 27 into the space between the upper and lower plates of the standard magazine the engagement of the tapered tongue 26 with the wall 6 of the standard magazine will accurately align the transfer member with the standard magazine.

The lower plate 23 of the transfer member is provided with a plurality of groove defining members 29 which may be formed integrally with the lower plate 23 or may be constructed as separate individual plates secured to the lower plate 23 in spaced relation by means of screws or other securing devices 30. The plates 29 are preferably of uniform width throughout the major portion of their length so as to define between them transfer grooves 31 of uniform width and conforming in width and spacing with the width and spacing of the grooves 5 of the standard magazine. However, the forward ends of each of the plates 29 is provided with a projection or projecting finger 22 having a taper conforming with the angle of the flare or taper 11 of the upper ends of the grooves 5 of the standard magazine so that when the transfer member 21 is pressed snugly against the upper end of the standard magazine 1, the fingers will extend into and fill the flared portion of the upper ends of the grooves 5 and will cooperate with the material 10 to define a continuation of the groove 5 of the same width as the major portion of the groove 5, thus preventing the sidewise motion of any of the matrices 12 and preventing the piling up or binding of these matrices one upon the other as they pass out of or into the upper ends of the groove 5.

As will be understood by those skilled in the art, the spacing of the grooves 5 relative to each other across the standard magazine varies considerably and the plates 29 should therefore be varied in width and spacing to conform with the spacing of the grooves 5, each of the plates being preferably formed with a straight edge shoulder 33 conforming in width with the straight edge 34 of the extreme upper end of the material 10, against which it abuts. (See Fig. 2.)

The thickness of the plates 29 may conform with the thickness of the material 10 so as not to extend into the space between the upper and lower plates of the standard magazine and interfere with the free passage of the matrices into and out of the magazine. As will be understood by those skilled in the art, the change in direction of the grooves 5 from those lying on one side of the standard magazine to those lying on the opposite side is a gradual change and the angle at which the fingers 22 extend must vary as these fingers are disposed across the length of the transfer member 21. This is illustrated particularly in Fig. 1 wherein the fingers 22 at the extreme left-hand side of the transfer member, as viewed in Fig. 1, extend inwardly at a considerable angle while those disposed centrally of the storage member 21 extend in substantially straight alignment with the grooves of the storage magazine 13.

It will be noted from an inspection of Fig. 4 that the upper plate 24 of the transfer member 21 may be provided with groove-refining members 34', either formed integrally with or as separate members attached to the upper plate 24 to define grooves 35 for guiding the upper edges of the matrices. In view of the fact, however, that the projecting fingers 22 prevent the overlapping or binding relation of the matrices 12, it is unnecessary to provide projecting fingers upon the members 34', it being necessary only to curve or flare these members as indicated at 36 to provide a substantially funnel-like throat conforming with the flared portions 11 of the matrix guiding grooves in the upper plate of the standard magazine.

By employing our storage magazine 13 and our transfer member 21, the ready and rapid transfer of the matrices from the standard magazine to the storage magazine or from the storage magazine to the standard magazine with each of these matrices maintained in the same relation relative to each other as in the standard magazine may be readily accomplished by placing a storage magazine 13 upon a suitable supporting table 37, the storage magazine being provided upon its lower surface with a central guide bar 38 receivable between a pair of rails 39 on the table 37 so as to hold the storage magazine in a predetermined centralized relation on the table. The transfer member 21 is then placed in abutting relation with the entrance end 20 of the storage magazine 13 and accurately aligned therewith as by inserting suitable dowel pins 40 at the rear end of the transfer member 21 into dowel-receiving holes 41 in the edge flanges 17 of the storage magazine 13. Then the standard machine magazine may be placed upon the table 37 in abutting relation with the transfer member 21, with the tongue 27 and fingers 22 received in the open upper end 2 of the standard magazine as hereinbefore described. The storage magazine, transfer member and standard magazine may be held on the table 37 in the described abutting relation by providing suitable latch members 42 on the table adapted to engage the lower end 3 of the standard magazine while the opposite end of the storage magazine may be placed against a guide flange 43 formed upon the end of the table 37. The storage magazines are usually provided with a central guide bar 43 which may be received between the rails 39 to assist in centralizing the standard magazine upon a table 37. The table 37 may then be lifted so as to raise the end 3 of the standard magazine and to depress the opposite end of the storage magazine 13 and the matrices will pass by gravity from the standard magazine to the storage magazine. The table 37 may be mounted upon suitable bearings 44 by which the table may be tilted when it is desired to run the matrices from one of the magazines to the other. Likewise if it is desired to fill the standard magazine from the storage magazine, the same assembly of the magazines and the transfer member may be made and the table tilted in the opposite direction.

It will therefore be observed that we have provided a relatively simple and inexpensive storage magazine which will hold matrices in the same relation as these matrices must be held in the standard machine magazine and into which and from which the matrices may be transferred by a simple "pouring" of the matrices from one magazine to the other, employing our transfer member to define continuous uniform width grooves between the standard magazine and storage magazine.

While we have shown and described the preferred embodiment of our invention, we do not desire to be limited to any of the details of construction shown or described herein, except as defined in the appended claims.

We claim:

1. In a system for transferring type matrices to and from a standard type making machine magazine, a standard magazine having a plurality of grooves for guiding and holding matrices, said grooves being flared outwardly at their entrance ends, a storage magazine having a plurality of matrix receiving grooves alignable with the grooves of said standard magazine, a trans-

fer member disposed between the entrance ends of both said magazines and having means defining a plurality of matrix guiding grooves alignable with the grooves of both said magazines, and a plurality of fingers on said transfer means extending into the flared ends of said standard magazine grooves to form therewith continuous substantially uniform width grooves between said transfer member and said standard magazine.

2. In a system for transferreing type matrices to and from a standard type making machine magazine, a standard magazine having a plurality of grooves for guiding and holding matrices, said grooves being flared outwardly at their entrance ends, a storage magazine having a plurality of matrix receiving grooves alignable with the grooves of said standard magazine, a transfer member disposed between the entrance ends of both said magazines and having means defining a plurality of matrix guiding grooves alignable with the grooves of both said magazines, and a plurality of tapered fingers on said transfer member projecting into said standard magazine, the taper of said fingers conforming with the flare of said standard magazine grooves to define therewith continuous substantially uniform width grooves between said transfer member and said standard magazine.

3. In a system for transferring type matrices to and from a standard type making machine magazine, a standard magazine having upper and lower plates, each provided with a set of a plurality of grooves for receiving and holding opposite edges of matrices, said grooves being flared outwardly at their entrance ends, a storage magazine having upper and lower plates each provided with a set of a plurality of matrix receiving grooves alignable respectively with the grooves of the upper and lower plates of said standard magazine, a transfer member disposed between the entrance ends of both said magazines and having means for defining a plurality of upper and lower matrix guiding grooves alignable respectively with the upper and lower grooves of both said magazines, and means on said transfer member cooperating with the flared ends of one of said sets of grooves of said standard magazine to define a set of continuous uniform width grooves between said transfer member and said standard magazine.

4. In a system for transferring matrices to and from a standard type making machine magazine, a standard magazine having a plurality of grooves for guiding and holding matrices, said grooves being flared outwardly at their entrance ends, a storage magazine having a plurality of matrix receiving grooves alignable with the grooves of said standard magazine, and a transfer member disposed between the entrance ends of both said magazines and having means thereon projecting into said standard magazine to form with the flared ends of the grooves therein continuous substantially uniform width grooves between said transfer member and said standard magazine.

5. In a transfer member for transferring matrices from a standard magazine of a type making machine while holding the matrices in alignment with each other, means defining a pair of spaced sets of grooves for receiving respectively the opposed side edges of the matrices, said groove defining means including a plurality of fingers projectable into a standard magazine to define with the grooves thereof continuous substantially uniform width grooves between said standard magazine and the transfer member.

6. In a transfer member for guiding matrices from a standard type making machine magazine, a pair of plates, means disposing said plates in spaced relation to each other, means on each of said plates for defining a set of a plurality of matrix receiving grooves for engaging and guiding the side edges of said matrices, one of said plates having a plurality of fingers formed thereon and projecting therefrom receivable in one end of a standard magazine to prevent displacement of said matrices as they pass into and out of said standard magazine.

7. In a device for transferring matrices into and out of a standard type making machine magazine, said magazine having an upper and lower wall each provided with a plurality of grooves for receiving and holding matrices and having outwardly tapering entrance passageways leading to said grooves, a transfer member including an upper and lower wall each provided with a plurality of grooves alignable with the entrance ends of the grooves in said standard magazine, one of said walls being provided with a plurality of outwardly projecting fingers one for each of said grooves on said wall receivable in the tapered entrance ends of said standard magazine grooves, each of said fingers having a taper conforming with the taper of said entrance ends of said magazine grooves to define therewith a continuous substantially uniform width groove extending from said magazine into and through said transfer member.

8. In a device for transferring matrices into and out of a standard type making machine magazine, said magazine having an upper and lower wall each provided with a plurality of grooves for receiving and holding matrices and having outwardly tapering entrance passageways leading to said grooves, a transfer member including an upper and lower wall, means on one of said walls for defining a plurality of grooves alignable with the grooves of a standard magazine, said groove defining means comprising a plurality of plates secured to said wall of said transfer member and each having a tapered finger projecting therefrom, one edge of said finger forming a continuous line with the groove defined by said member, the opposite edge of said finger tapering to conform with the taper of the entrance end of the groove of said standard magazine, said fingers projecting into said standard magazine and forming with the tapered ends of said magazine grooves a continuous substantially uniform width groove extending from said magazine into and through said transfer means.

9. In a device for transferring matrices into and out of a standard type making machine magazine, said magazine having an upper and lower wall each provided with a plurality of grooves for receiving and holding matrices and having outwardly tapering entrance passageways leading to said grooves, a transfer member including an upper and lower wall, means on one of said walls for defining a plurality of grooves alignable with the grooves of a standard magazine, said groove defining means comprising a plurality of plates secured to said wall of said transfer member and each having a tapered finger projecting therefrom, one edge of said finger forming a continuous line with the groove defined by said member, the opposite edge of said finger tapering to conform with the taper of the entrance end of the groove of said standard magazine, said fingers projecting into said standard magazine and forming with the tapered ends of said magazine

grooves a continuous substantially uniform width groove extending from said magazine into and through said transfer means, the other wall of said transfer member being provided with a plurality of grooves conforming with and alignable with the respective grooves in the upper wall of a standard magazine, said grooves in the upper wall of the transfer member being flared outwardly to align with the tapered entrance ends of the grooves in the upper wall of said magazine.

10. In a device for transferring matrices into and out of a standard type making machine magazine, said magazine having an upper and lower wall each provided with a plurality of grooves for receiving and holding matrices and having outwardly tapering entrance passageways leading to said grooves, a transfer member including an upper and lower wall each provided with grooves conforming with and alignable with the grooves in said standard magazine, an end member for each end of said transfer member interposed between said walls thereof and including an upwardly projecting tongue receivable between the upper and lower walls of said standard magazine to align the grooves of said transfer member with the grooves of said standard magazine, and means on said standard magazine projectible into the tapered entrance passageways of said standard magazine and cooperating with the grooves therein to define substantially continuous uniform width grooves leading from said magazine into and through said transfer member.

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