J. E. LAFERRIERE.

APPARATUS FOR IMPARTING MECHANICAL IMPRESSIONS TO METAL OR OTHER SUBSTANCES.

APPLICATION FILED MAY 28, 1917.

1,245,599.

Patented Nov. 6, 1917.

3 SHEETS—SHEET 1.

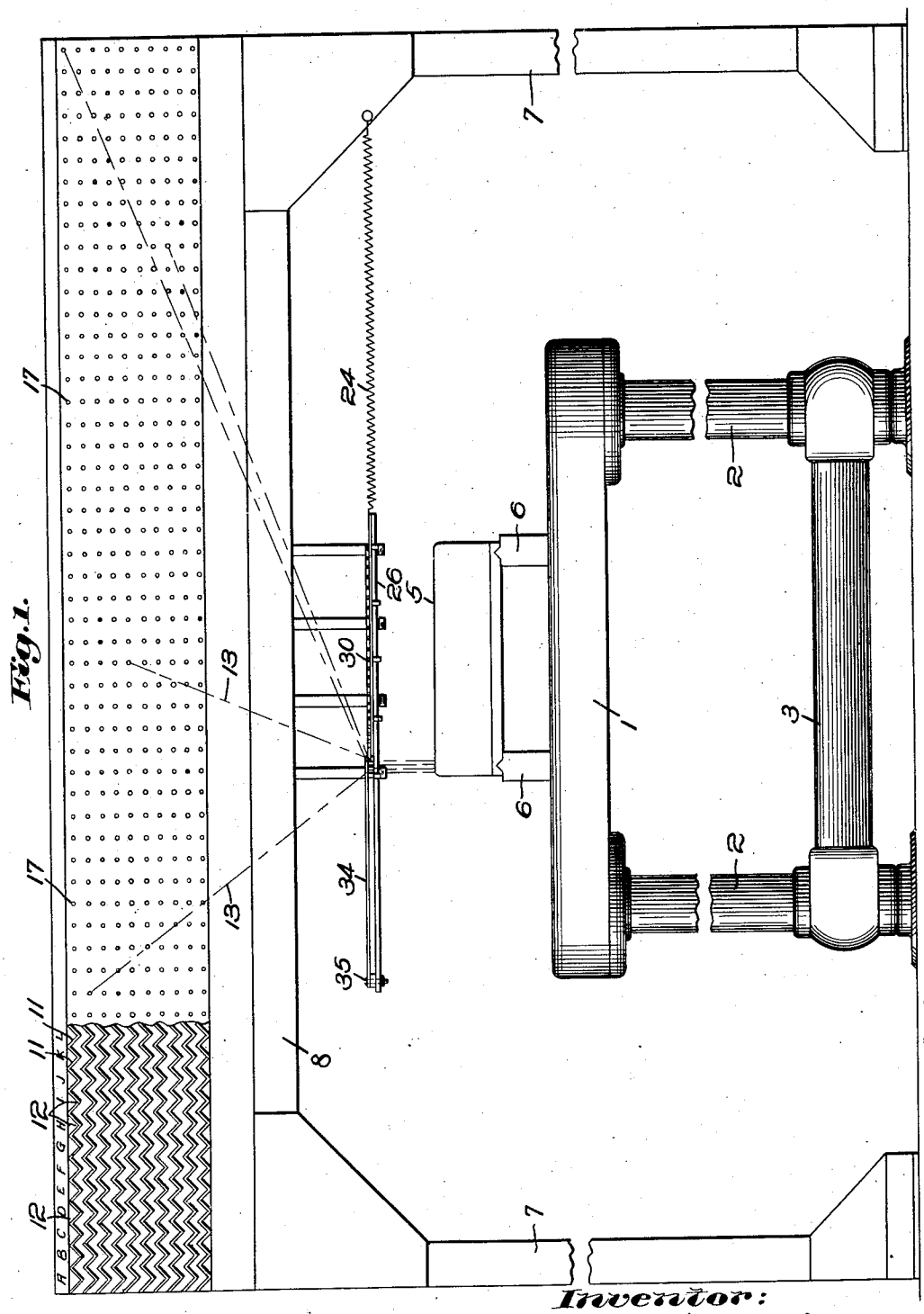



Fig. 1.

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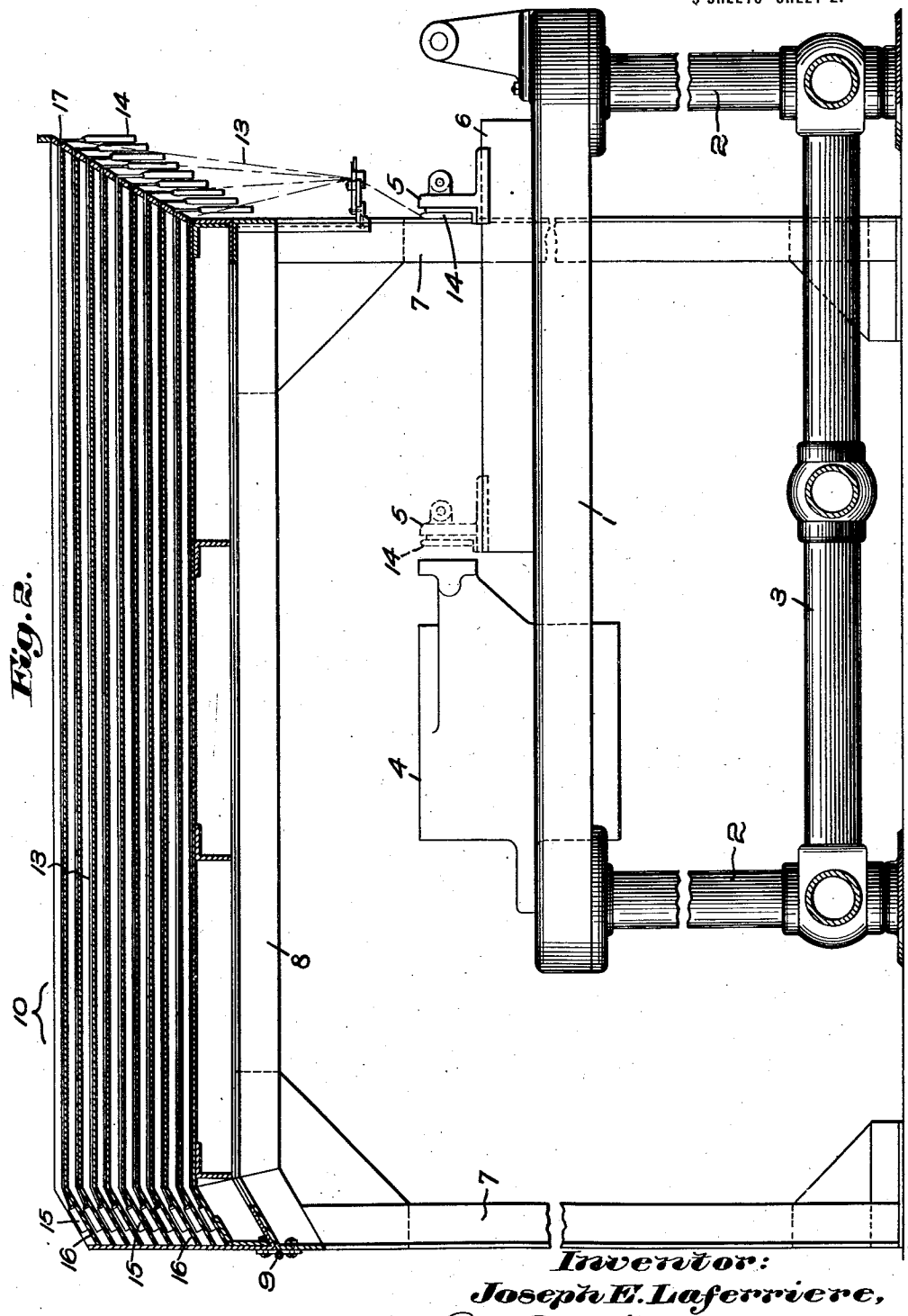



Fig. 2.

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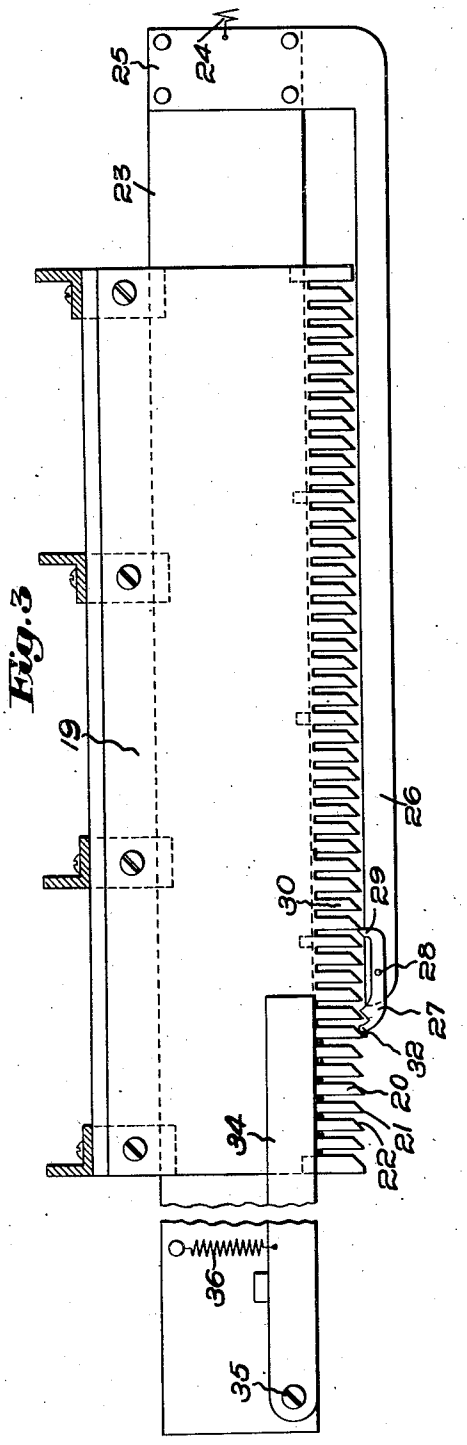
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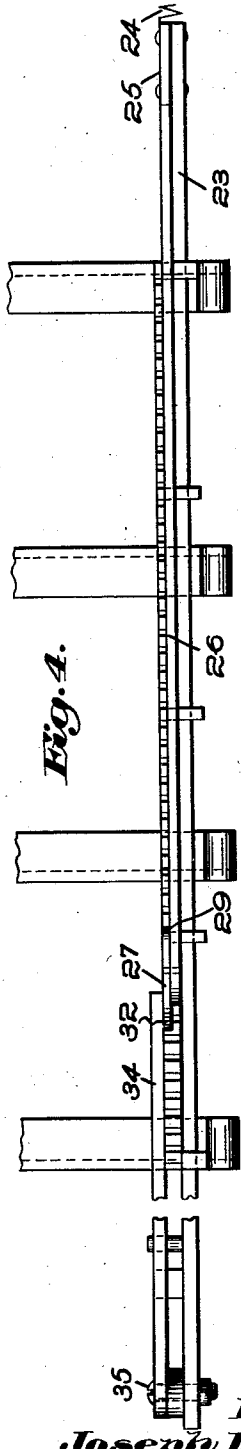
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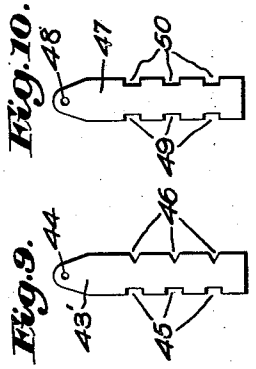
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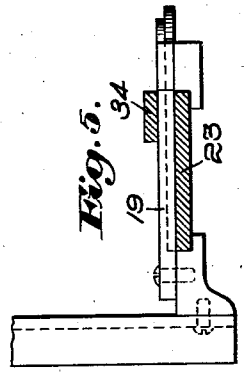


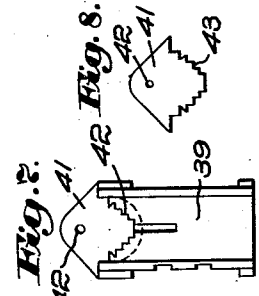





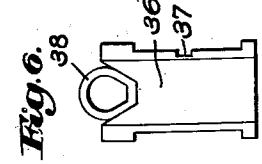











Inventor:
Joseph E. Laferriere.
by Emery, Booth, Janney and Varney.
Attys.

# UNITED STATES PATENT OFFICE.

JOSEPH E. LAFERRIERE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO SPRAY ENGINEERING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## APPARATUS FOR IMPARTING MECHANICAL IMPRESSIONS TO METAL OR OTHER SUBSTANCES.

1,245,599. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed May 28, 1917. Serial No. 171,400.

*To all whom it may concern:*

Be it known that I, JOSEPH E. LAFERRIERE, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Apparatus for Imparting Mechanical Impressions to Metal or other Substances, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to apparatus for imparting mechanical impressions to metallic or other substances. More particularly it relates to metal casting machines adapted for use in many different relations, and specifically it relates to the manufacture of type and type bars for use in printing.

In order that the principle of my invention may be readily understood, I have disclosed a single embodiment thereof in the accompanying drawings, wherein—

Figure 1 is a front elevation, partly broken away;

Fig. 2 is a view partially in side elevation and partially in vertical section of the apparatus shown in Fig. 1;

Fig. 3 is a view, partially in plan and partially in transverse section, of the separator preferably employed in the practice of my invention;

Fig. 4 is a view in front elevation of the separator shown in Fig. 3;

Fig. 5 is a vertical section of the said separator; and

Figs. 6 to 10 inclusive are front elevations of various forms of matrices that may be employed in the practice of my invention.

In my Patent No. 1,191,085, dated July 11, 1916, I have disclosed a metal casting machine, and in my patent application Serial No. 170,855, filed May 25, 1917, I have disclosed a metal casting machine to both of which my invention may be applied. My invention, however, is adapted for use in many different relations and may be used with metal casting machines of widely different character than those shown in my said patent and application.

I shall proceed to describe that specific form of my invention herein illustrated and shall set forth merely the application thereof to a type casting machine, but such description is not to be taken as indicating in any way a limitation of the scope of the invention or of the application thereof.

Referring first to Figs. 1 and 2, I have therein indicated a table 1 supported by uprights 2 having suitable cross braces 3. Upon said table 1 I support a type or type bar casting machine indicated merely in outline at 4, and which may be of the general character shown in my said patent, or of that shown in my said application, or may be of any other suitable character.

Preferably it includes a melting pot or other suitable means by which molten metal may be provided and conveyed into contact with the matrices or like articles. The said matrices are adapted to be assembled in a suitable support or stick 5, which is herein represented as supported for sliding movement upon uprights 6—6 whereon it is suitably guided. In the practice of this form of my invention, the matrices are adapted to be positioned in the stick when the latter is in the full line position in Fig. 2 and then to be moved into operative or impression conveying position indicated in dotted lines in said figure.

My invention particularly relates to means for supporting a series of matrices in non-impression imparting position, means for supporting said matrices in impression-imparting position, and connections of suitable character, and the preferred form of which is hereinafter set forth, permitting movement of said matrices preferably individually from the first of said positions to the other and their return to the first. While I herein refer to matrices, it is evident that within the broader aspect and scope of my invention, I may and do provide a series of elements each having a characteristic impression to be imparted to material contacting therewith, said elements having connections permitting movement thereof preferably individually from inactive to active position and their return to the inactive position.

In that specific form of my invention herein shown, I provide uprights or standards 7—7, whereon at 9 I movably mount and preferably pivot a structure 10 constituting in effect a series of receptacles or

compartments, each having a channel or passage leading therefrom or communicating therewith and wherein or adjacent whereto the matrices and their connections are adapted to be positioned. Herein, as shown most clearly in Fig. 1, I have represented a series of horizontally positioned plates 11, each being of a general zigzag form, thus providing a series of channels 12 wherein I position flexible connections 13, preferably of a strand like character, to one or each of which I attach a matrix 14 and to the other end of each of which I attach a suitable substantially counterbalancing weight 15. Preferably the end of the channels, wherein the weights are supported during periods of inactivity of the matrices, are downwardly inclined as indicated at 16. The strand-like connections 13, which are preferably cords, are of any suitable length, but herein I have represented them as extending through openings or holes 17 in the front wall 18 of the structure 10. Preferably said front wall 18 slopes forwardly as clearly indicated in Fig. 2, so that the matrices 14, when in inactive position, depend therefrom out of contact with each other, as clearly shown in said figure, and so as to be readily accessible.

In assembling the matrices in the stick 5, the operator grasps one after another the desired matrices when inactively positioned in Fig. 2, and places them one by one in the stick 5, where they are secured in any suitable manner, as by tightening a set screw or other device usually provided for that purpose, and one form of which is shown in my said patent.

Each of the matrices, when in assembled operative position, still remains connected to its cord 13, each weight 15 being merely drawn along the proper groove or channel 12. The assembled matrices are then slid into active position as indicated in dotted lines in Fig. 2, and after use the stick 5 is returned to the full line position shown in said figure. In order to return the said matrices to their inactive position, the screw or other holding means is released and the structure 10 is then sufficiently tilted about the pivot 9 to cause the weights 15 to draw upon the matrices 14 and to return them to the position shown in full line in Fig. 2.

Instead of employing weights 15, I may employ springs or any other suitable means, and in other forms of my invention other instrumentalities may be employed, it being broadly new so far as I am aware to provide connections for matrices to be transferred by being drawn manually or otherwise from an inactive position to an active position where they are alined, and then by relative movement of such alined matrices and molten metal casting means are brought into casting position with provisions to effect their return to their inactive position.

Preferably I provide means to prevent tangling of the strands or cords of those matrices that are assembled in the stick 5. Any suitable means may be provided for this purpose. In Figs. 3, 4 and 5, I have represented a separator and have in Figs. 1 and 2 shown the same in position between the structure 10 and the stick 5. In that form of separator herein shown, I have provided a plate 19 suitably secured to one of the uprights 7 and at the outer edge thereof have provided a series of teeth 20 suitably spaced, and each having a point 21 and an inclined edge 22 extending rearwardly therefrom. As each of the matrices is grasped by the operator and positioned in the stick 5, its cord or strand is positioned by the operator between two of the teeth 20, said cords being successively positioned between said teeth beginning at the left hand end thereof viewing Figs. 3 and 4.

I have provided in face to face relation with the plate 19 a slide 23 shown most clearly in Figs. 3 and 4, and attached to which is a coil spring 24 tending to draw the same toward the right, viewing Figs. 1 and 3. Secured to said slide 23 is a right angle bar 25, the member 26 of which extends along in front of the teeth 20 at a slight distance therefrom, as clearly indicated in Fig. 3. Upon the forward end of said member 26 is an escapement device 27 preferably pivoted thereto at 28 and having a rear tooth 29 adapted to successively engage the longer wall 30 of each tooth 20. The opposite end of said escapement device 27 is notched as indicated at 31 and is provided with a curved end 32.

At the commencement of the operation, the slide with its escapement device 27 is moved to the left so that the curved end 32 of the escapement 27 lies in front of the space between the first and second teeth 20 at the left hand end of the plate 19. In such position, the tooth 29 at the other end of the escapement device 27 engages the longer wall of one of the teeth 20. The operator selects and draws down the first matrix, and in so doing presses the cord 13 against the curved end 32 of the escapement which yields and permits the cord to enter between the first two teeth. In yielding, the tooth 29 of the escapement moves outwardly away from the tooth 20 with which it is engaged, and spring 24 at once acts to draw the slide 25, 26 to the right, viewing Fig. 3. This movement brings the tooth 29 of the escapement against the next tooth 20 with the result that the tooth 29 is moved inward and engages the next tooth 20 of the separator. The spring 24 is therefore permitted to draw the slide 23 to the right view-

ing Fig. 3, to the extent only of one tooth of the separator 3. This action is repeated with each successive matrix, and the slide 23 is gradually moved from left to right from one end of the separator to the other.

I preferably provide means to release the cords from the separator 19. While for this purpose any suitable means may be provided I have herein represented a releasing bar 34 pivoted at 35 upon the slide 23, a coil spring 36 being preferably provided to hold the releasing bar 34 inwardly beyond the teeth 20. In Figs. 3 and 4, the releasing bar is shown as broken away, but it is of sufficient length to extend along the whole series of teeth 20. When it is desired to release the cords 13 from between the teeth 20, the slide 23, 26 for this purpose being moved sufficiently far to the right, the bar 34 is swung outwardly by hand about its pivot 35, thus pressing outwardly and releasing from between the teeth all the cords 13. It will be observed that in this action the cord of the last positioned matrix is first released, and that the remaining matrices are released in the reverse order in which they have been drawn into action. This avoids any tendency to tangling of the cords 13.

It is, of course, obvious that I may provide many other forms of means for returning the matrices having the cords 13 attached thereto. For example, each matrix may be provided with a weight or spring so that immediately upon its release, it is drawn or snapped back into inactive position without resorting to a pivoted or movable structure 10 for the purpose.

Any suitable means may be provided for attaching the cords 13 or other flexible connections to the matrices, and any suitable type of matrices may be provided. In Figs. 6 to 10 inclusive, I have represented various forms or types of matrices having provisions for attaching the cords or flexible connections 13 thereto. I contemplate the use of any suitable matrices, and to that end may use matrices now upon the market, but provide or equip them with means for effecting such attachment of the cords thereto.

To that end, in Fig. 6, I have represented a matrix 36 having impression 37 thereon. To the upper end of said matrix, I have soldered or otherwise secured a preferably metallic looped wire ring or other device 38. This permits me to use an otherwise old and well known form of matrix 36.

In Fig. 7, I have represented another old and well known form of matrix 39 which, as purchased upon the open market, is provided with selection notches 40. Such notches being unnecessary for the purpose of my invention and the matrix being normally unprovided with means for securing a cord thereto, I solder or otherwise secure to said matrix a filling member or piece 41 having therein a hole 42 for the attachment of the cord 13. As indicated in Fig. 8, such piece 41 will be provided with complementary notches 43.

It will, of course, be understood that the matrix may be fashioned in one piece or otherwise specially made for use with the apparatus herein disclosed. To that end, in Fig. 9, I have represented a one-piece matrix 43′ having in its upper end an opening 44 for the insertion or attachment of the cord 13. In this form of matrix, I have represented a plurality of impressions 45, any one of which may be employed. A proper impression is utilized according to the indication of the respective notches 46. In Fig. 10, I have represented still another form of matrix 47 provided with a cord receiving opening 48 and have shown the same as provided on each of its edges with a series of impressions 49, 50 respectively, any one of which may be employed at any time when the matrix is selected. In connection with each of the impressions 49, I may employ a notch, groove or other formation to control the selection or use of that impression.

It will be clear from the foregoing description that I have provided a metal casting machine, and more specifically an apparatus for the manufacture of type and type bars in printing, wherein a series of matrices or like elements are employed having preferably flexible connections permitting movement thereof from a non-impression imparting position to an impression imparting position with means for effecting ready return to the former position.

Having thus described one illustrative embodiment of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

Claims:

1. Apparatus for imparting mechanical impressions comprising in combination, a series of matrices, a holder for said matrices in idle position, a support for assembled matrices and having means to support said matrices in alined position and ready for casting, casting means spaced from said support, and connections attached to each of said matrices and permitting the movement thereof from said holder to said support and their assemblage and alinement therein ready for casting, and the subsequent movement of said support with the assembled alined matrices to casting position.

2. Apparatus for imparting mechanical impressions comprising in combination, a holder for a series of matrices in idle position, a flexible member attached to each of said matrices, a support for a series of mat-

rices and having means to support said matrices in alined position and ready for casting, and casting means spaced from said support, the relation of said parts being such that the matrices may be interchangeably moved from the holder to the support and when in assembled alined position therein ready for casting may then be moved with the support to casting position.

3. Apparatus for imparting mechanical impressions comprising in combination, a holder 10 having a series of matrices 14 carried thereby, flexible members attached to said matrices 14, a matrix support 5 in which the matrices are adapted to be assembled and alined with the flexible members still attached thereto, and a casting instrumentality 4 spaced from said support 5 when the matrices are assembled and alined in the latter, said support 5 being movable to casting position with its assembled alined matrices.

4. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of matrices mounted therein and each having a cord attached thereto, flexible in all directions including a direction lengthwise said cords, said matrices being idly supported in position to be grasped manually, a support 5 into which an interchangeable series of said matrices may be placed having their cords attached thereto, molten metal casting means and guiding means 6 along which said support with the assembled matrices may be moved to casting position.

5. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of matrices, each having a flexible member attached thereto and supported in idle position by said holder, a support for assembled matrices into which said matrices may be assembled with the flexible members still attached thereto, and a separator between said support and the idle position of the matrices to receive and separate said flexible members, but permitting movement of the matrices while their flexible members are so separated.

6. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of matrices each having a flexible member attached thereto and supported by said holder, a support having an interchangeable series of assembled matrices, casting means spaced from said support, and to which the support with the assembled matrices are adapted to be moved while said flexible members are still connected to said matrices, and a separator to receive said flexible members and permitting movement of the matrices while still receiving said flexible members.

7. Apparatus for imparting mechanical impressions comprising in combination, a holder having a series of channels, a series of flexible elements positioned in said channels, matrices attached to said elements, means co-acting with said elements to restore them to idle position, a support below the idle position of the matrices, and wherein the matrices may be assembled while still attached to said elements, and a separator between said support and the idle position of said matrices to engage said elements, but permitting movement of said matrices.

8. Apparatus for imparting mechanical impressions comprising in combination, a holder having a series of channels, a series of flexible elements positioned in said channels, matrices attached to said elements, means co-acting with said elements to restore them to idle position, a support below the idle position of the matrices, and wherein the matrices may be assembled while still attached to said elements, and having means to support said matrices in alined position and ready for casting, molten metal casting means, and means along which said support may be moved to carry the assembled alined matrices to casting position.

9. Apparatus for imparting mechanical impressions comprising in combination, a holder having a series of substantially horizontal channels, a series of cords in said channels, matrices attached thereto, return means attached to said cords to restore said matrices, and a matrix support or stick below the idle position of the matrices, and wherein the latter may be interchangeably assembled and alined while still attached to said cords and casting means spaced from the assembling alining position of said matrix support or stick, the latter being movable to the casting means after the matrices have been assembled and alined therein.

10. Apparatus for imparting mechanical impressions comprising in combination, a holder having a series of substantially horizontal channels, a series of cords in said channels, matrices attached to said cords, return means attached to said cords to restore matrices attached to said cords, a matrix support or stick below the idle position of the matrices, and wherein the latter may be interchangeably assembled while still attached to said cords and casting means spaced from said support and toward which said support is adapted to be moved with the assembled matrices therein.

11. Apparatus for imparting mechanical impressions comprising in combination, a series of matrices each having a single impression thereon, flexible members connected to said matrices and adapted to permit movement of the latter without detachment, a separator to receive and separate said flexible members but permitting move-

ment of the matrices while their flexible members are so separated, and means wherein said matrices may be interchangeably assembled while still attached.

12. Apparatus for imparting mechanical impressions comprising in combination, a series of matrices each having a single impression thereon, flexible members connected to said matrices and adapted to permit movement of the latter without detachment, means wherein said matrices may be interchangeably assembled while still attached, and having means to support said matrices in alined position ready for casting but spaced from such casting position, casting means spaced from said means when in matrix assembling and alining position, and a base whereon said means may be moved with the assembled alined matrices to casting position.

13. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of single impression matrices supported by said holder, a series of flexible members attached to said matrices, a matrix support in which said matrices may be interchangeably assembled while still attached to said member, molten metal casting means, and means whereby said matrix support may be moved into casting position.

14. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of cords therein and having returning means, said cords being flexible in all directions including a direction lengthwise said cords, a series of single impression matrices attached to said cords, a matrix support below the idle position of said matrices and wherein the latter may be assembled while still attached to said cords, and type casting means spaced from said support and toward which the latter may be moved with the assembled matrices.

15. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of cords therein and having returning means, a series of single impression matrices attached to said cords, a matrix support below the idle position of said matrices and wherein the latter may be assembled while still attached to said cords, and a separator between the idle position of the matrices and said support and adapted to engage singly said cords and permitting movement of the attached matrices.

16. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of cords positioned therein, said cords being flexible in all directions including a direction lengthwise said cords, return means for said cords, a series of matrices attached to the ends of said cords and suspended therefrom and movable in all directions when grasped and drawn upon, and molten metal casting means, and means whereby the assembled matrices and the molten metal casting means may be relatively moved to bring said parts into casting relation.

17. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements supported thereby, matrices attached to said elements and adapted to be drawn from said holder when grasped, a separator to receive said flexible elements but permitting freedom of movement of said matrices and from which separator said flexible elements may be released in the reverse order of the positioning of the matrices.

18. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements supported thereby, matrices attached to said elements and adapted to be drawn from said holder when grasped, a separator to receive said flexible elements but permitting freedom of movement of said matrices and from which separator said flexible elements may be released in the reverse order of the positioning of the matrices, and a matrix support wherein the matrices may be interchangeably assembled.

19. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements carried thereby, matrices respectively attached to said flexible elements, molten metal casting means, a support for assembled matrices, and having means to support said matrices in alined position and ready for casting, the construction and arrangement of parts being such that the matrices are adapted to be brought interchangeably to the same position in said support with respect to the base of the latter, and means whereby said casting means and said support may be relatively moved to bring them into casting relation.

20. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements carried thereby, matrices respectively attached to said flexible elements, casting means, a support for assembled matrices, and having means to support said matrices in alined position and ready for casting, the construction and arrangement of parts being such that the matrices are adapted to be brought interchangeably to the same position in said support with respect to the base of the latter, and means whereby said support with its assembled matrices attached to said flexible elements may be moved into casting relation to said casting means.

21. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements supported thereby, matrices respectively at-

tached to said flexible elements, molten metal casting means, a matrix support below said holder, and having means to support said matrices in alined position and ready for casting, and the construction and arrangement being such that the matrices may be interchangeably moved downward from their idle position until their bases are in the same horizontal plane in said support, and means whereby said casting means and said support may be relatively moved to bring them into casting relation.

22. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements supported thereby, matrices respectively attached to said flexible elements, molten metal casting means, a matrix support below said holder, and having means to support said matrices in alined position and ready for casting, the construction and arrangement being such that the matrices may be interchangeably moved downward from their idle position until their bases are in the same horizontal plane in said support, and means whereby said casting means and said matrix support may be relatively moved, thereby to bring them into casting relation.

23. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements supported thereby, matrices respectively attached to said flexible elements, a matrix support below said holder, the construction and arrangement being such that the matrices may be interchangeably moved downward from their idle position until their bases are in the same horizontal plane in said support, casting means spaced from said support and into casting relation with which said support and the attached matrices may be moved, and a separator between the idle position of the matrices and the support to engage the flexible elements only and permitting movement of the assembled matrices.

24. Apparatus for imparting mechanical impressions comprising in combination, a holder, cords positioned in said holder and having return means, molten metal casting means and a series of matrices attached to said cords, said matrices having three positions, namely, an idle position at said holder, an assembled alined position whereat an interchangeable group of matrices may be assembled and alined while attached to said cords, and a casting position spaced from the assembled alined position to which the assembled alined matrices may be moved while still attached to said cords.

25. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements therein and having return means, a series of matrices respectively attached to said flexible elements, a support wherein an interchangeable series of matrices may be assembled and assembled ready for casting while attached to said elements, casting means horizontally spaced from said support, and means whereby said support with its assembled alined attached matrices may be moved horizontally into casting position.

26. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements therein and having return means, a series of matrices respectively attached to said flexible elements, a support wherein an interchangeable series of matrices may be assembled and alined ready for casting while attached to said elements, casting means horizontally spaced from said support, and means whereby said support with its assembled alined attached matrices may be slid into casting position.

27. Apparatus for imparting mechanical impressions comprising in combination, a holder having a series of cords therein, said cords being flexible in all directions including a direction lengthwise said cords, return means for said cords, a series of matrices respectively attached to said cords, a support to which the attached matrices may be moved manually, molten metal casting means and means whereby said support with its attached assembled matrices may manually be moved to casting position.

28. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements positioned therein, return means for said elements, a series of matrices respectively attached to said elements, a separator through which the flexible elements may be manually passed, a support wherein an interchangeable series of attached matrices may be manually positioned.

29. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements positioned therein, return means for said elements, a series of matrices respectively attached to said elements, a separator through which the flexible elements may be manually passed, a support wherein an interchangeable series of attached matrices may be manually positioned, and means whereby said support with its series of attached matrices may be manually moved to casting position.

30. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements positioned therein, return means for said elements, a series of matrices respectively attached to said elements, a separator through which the flexible elements may be manually passed, a support wherein an interchange-

able series of attached matrices may be manually positioned, means whereby said support with its series of attached matrices may be manually moved to casting position, and means for releasing the flexible elements from said separator, whereby the matrices may be returned to idle position with respect to said holder.

31. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of matrices mounted therein and each having a cord attached thereto flexible in all directions including a direction lengthwise said cords, said matrices being idly supported in position to be grasped manually, a support for assembled matrices having means to support them in alined position and ready for casting, molten metal casting means and guiding means along which said support with the assembled matrices may be moved to casting position.

32. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements positioned therein and having return means, a series of matrices respectively attached to said elements, a support in which said matrices may be assembled and alined in interchangeable order without detachment from said elements and casting means spaced from the assembling alining position of the matrices in said support, said support being manually movable toward and from said casting means.

33. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible elements positioned therein and having return means, a series of matrices respectively attached to said elements, a support in which said matrices may be assembled and alined ready for casting in interchangeable order without detachment from said elements, and casting means spaced from said support and toward which the latter is adapted to be moved with its assembled attached matrices.

34. In a mechanism having matrices with means connected thereto, a separator for a matrix controlling mechanism having a series of teeth to receive between them the connecting means attached to the matrices, and means coöperating with said separator and acted on successively by said connecting means to permit the insertion of said connections between said teeth.

35. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of cords positioned therein, return means attached to said cords to restore the matrices attached to the cords, and a matrix support or stick below the idle position of the matrices and wherein the latter may be interchangeably assembled and alined while still attached to said cords, and casting means spaced from the assembling alining position of said matrix support or stick, the latter being movable to the casting means after the matrices have been assembled and alined therein.

36. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of cords in said holder, matrices attached to said cords, return means attached to said cords to restore matrices attached to said cords, a matrix support or stick below the idle position of the matrices, and wherein the latter may be interchangeably assembled while still attached to said cords, and casting means spaced from said support and toward which said support is adapted to be moved with the assembled matrices therein.

37. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of cords therein and having return means, said cords being flexible in all directions including a direction lengthwise said cords, a series of single impression matrices attached to said cords, a support for assembled matrices and having means to support said matrices in alined position and ready for casting, and type casting means spaced from said matrix support and toward which the latter may be moved with the assembled matrices.

38. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of cords therein and having returning means, a series of matrices attached to said cords, a matrix support below the idle position of said matrices and wherein the latter may be assembled while still attached to said cords, and a separator between the idle position of the matrices and said support and adapted to engage singly said cords and permitting movement of the attached matrices.

39. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of flexible connections in said holder and having returning means, a series of matrices attached to said flexible connections, a matrix support below the idle position of said matrices and wherein the latter may be assembled while still attached to said flexible connections, and a separator between the idle position of the matrices and said support and adapted to engage singly said flexible connections and permitting movement of the attached matrices.

40. Apparatus for imparting mechanical connections comprising in combination, a holder, flexible members positioned in said holder and having return means, molten metal casting means and a series of matrices attached to said flexible connections, said matrices having three positions, namely, an idle position in said holder, an assembled alined position whereat an interchangeable group of matrices may be assembled and

alined while attached to said flexible members, and a casting position spaced from the assembled alined position and to which the assembled alined matrices may be moved while still attached to said flexible members.

41. Apparatus for imparting mechanical impressions comprising a holder, cords positioned in said holder and having return means, a series of matrices attached to said cords, and a separator to receive said cords but permitting freedom of movement of said matrices, said matrices having three positions, namely, an idle position at said holder, an assembling alined position whereat an interchangeable group of matrices may be assembled and alined while attached to said cords, and a casting position spaced from the assembled alined position and to which the assembled alined matrices may be moved while still attached to said cords.

42. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of impression matrices supported by said holder, a series of flexible members attached to said matrices, a matrix support in which said matrices may be interchangeably assembled while still attached to said members, molten metal casting means, and means whereby said molten metal casting means and said matrix support with its assembled matrices may be relatively moved to bring said parts into casting relation.

43. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of matrices supported by said holder, a series of flexible members attached to said matrices, a matrix support in which said matrices may be interchangeably assembled while still attached to said members, molten metal casting means, and means whereby said matrix support may be moved into casting position.

44. Apparatus for imparting mechanical impressions comprising in combination, a holder, a series of matrices supported by said holder, a series of flexible members attached to said matrices, a matrix support in which said matrices may be interchangeably assembled while still attached to said members, molten metal casting means spaced from the matrix support, and means whereby said molten metal casting means and said matrix support may be relatively moved to bring said parts into casting relation.

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