

Feb. 5, 1924.

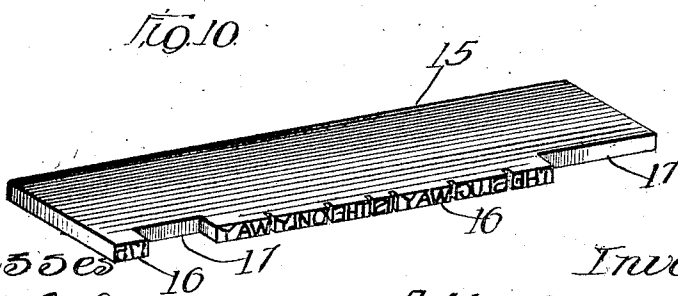
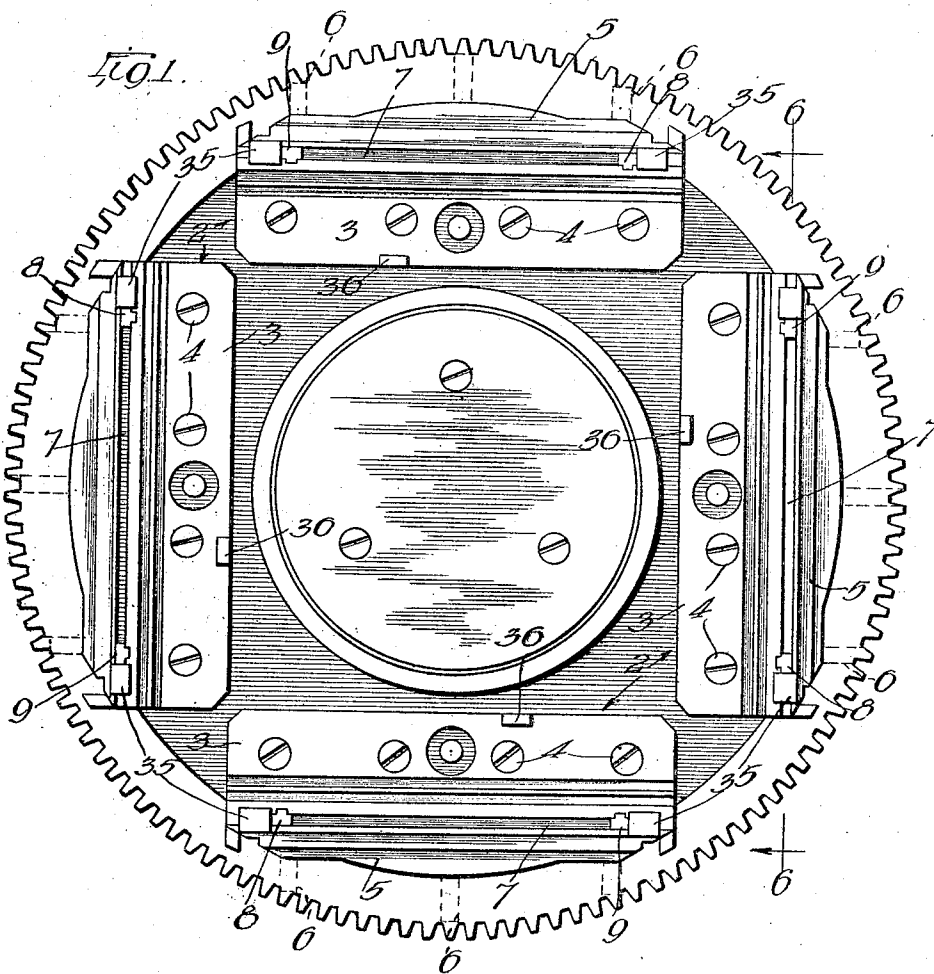
1,483,021

A. G. STEVENSON

CASTING MACHINE

Filed Jan. 29, 1921

5 Sheets-Sheet 1



Witnesses
 Harry R. White
 W. A. Kilroy

Inventor
 Ashton G. Stevenson
 By Murray Lotz & Wilson
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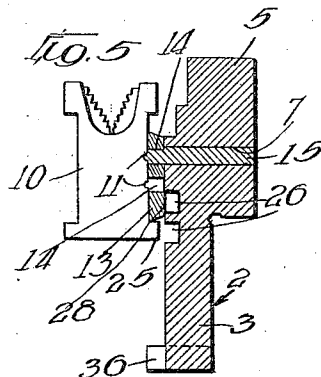
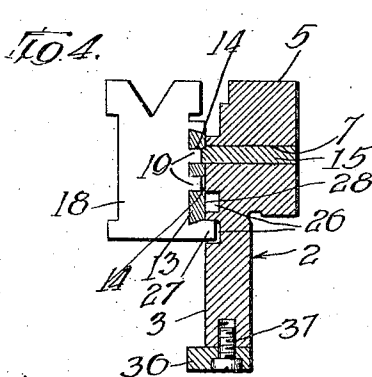
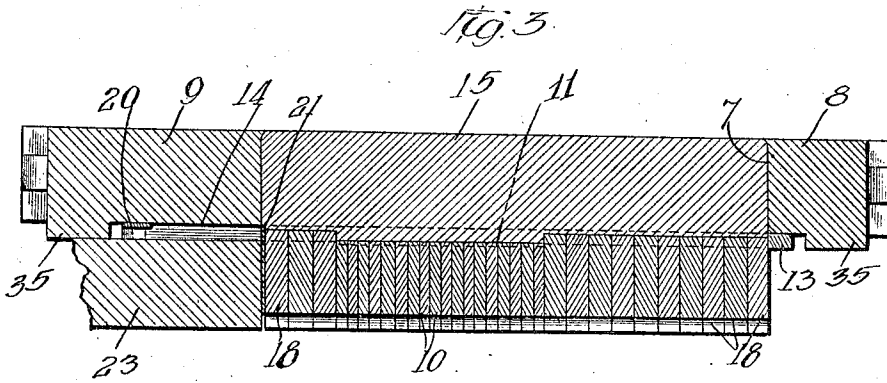
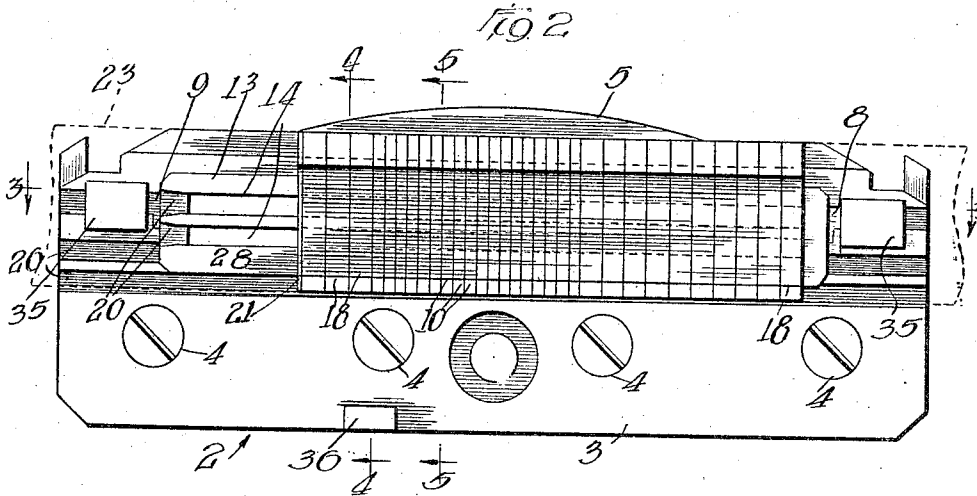
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5 Sheets-Sheet 2



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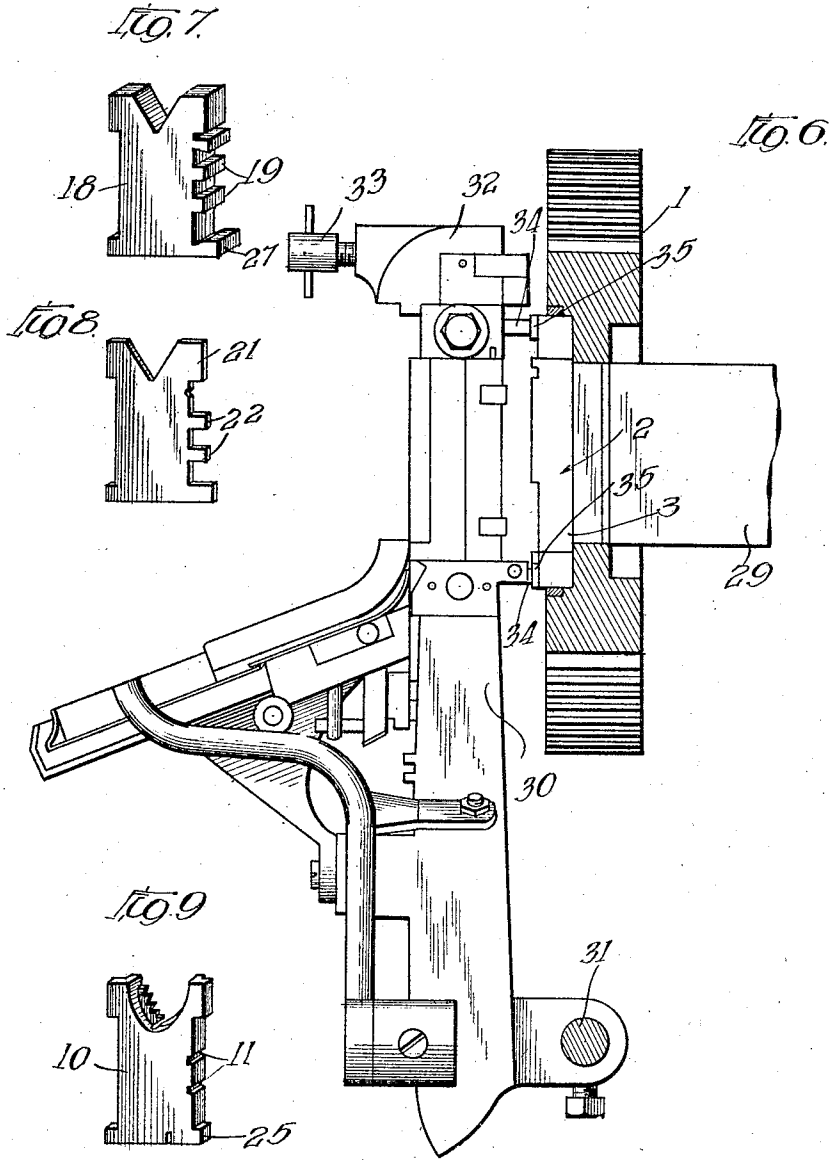
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CASTING MACHINE

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5 Sheets-Sheet 3



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5 Sheets-Sheet 4

FIG. 11.

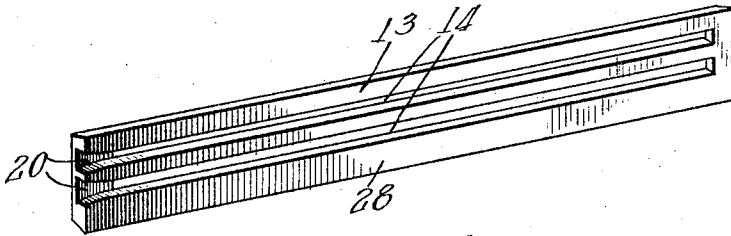


FIG. 12.

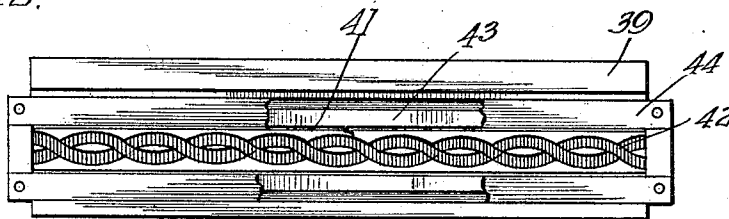


FIG. 13.

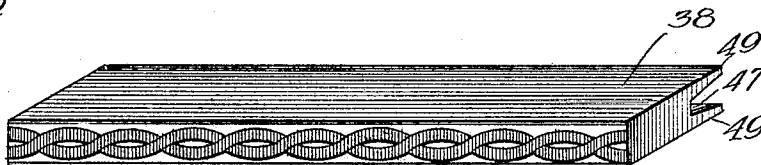


FIG. 14.

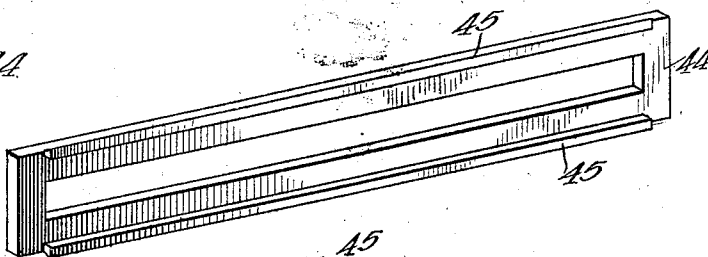
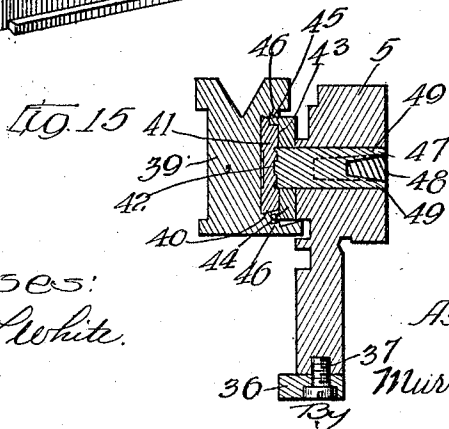


FIG. 15.



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CASTING MACHINE

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FIG. 16

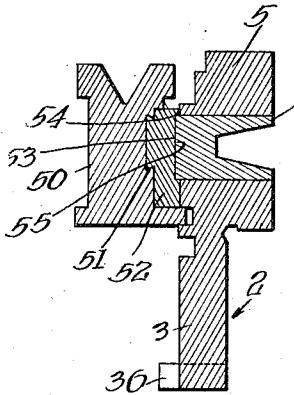


FIG. 17

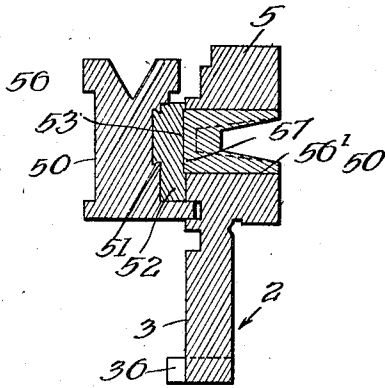


FIG. 18

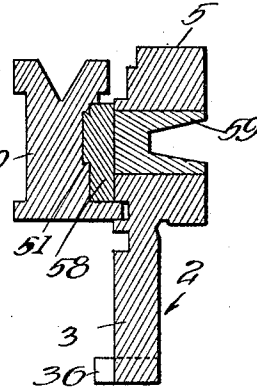
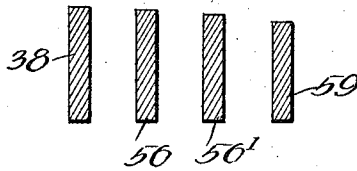


FIG. 19



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UNITED STATES PATENT OFFICE.

ASHTON G. STEVENSON, OF CHICAGO, ILLINOIS.

CASTING MACHINE.

Application filed January 29, 1921. Serial No. 441,077.

To all whom it may concern:

Be it known that I, ASHTON G. STEVENSON, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Casting Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in casting machines, and has especial reference to machines which are commonly known as "linotype" or line casting machines.

In a machine of this kind, as commonly constructed, there is a mold wheel which carries several molds in which the slugs are cast and which is adapted to be rotated to position the several molds in various positions for the several operations of casting, ejecting, etc. Associated with the mold wheel are means for supporting the usual matrices for casting printing slugs or what is known as a quad block slide holder for casting borders or line printing slugs, etc., or blanks.

The machines as constructed are adapted to cast slugs of full printing height, viz: .918 inch in height from the printing surface to the base of the slug. All but a very small part of this total height, viz: .043 of an inch, of it is cast within the mold and the balance of .043 of an inch is cast in the matrix. For casting a slug the matrices are clamped tightly upon or against the face of the mold, closing the forward side thereof and consequently the common surface of the several matrices thus held, where they are not provided with letter depressions form what is known as the quad or non-printing surface from which the type proper rise. As this general blank surface is only .043 of an inch below the printing surface the inking rollers sometimes deposit ink on these surfaces, especially when the slugs are used on the printing press and then the paper is apt to be depressed this slight distance and be inked or smudged.

To prevent this result, slugs which have much of this surface exposed, such for instance, as the slugs used at the heading of pages, have to be cut down by some means, usually upon a routing machine. This is a delaying and expensive operation, besides being an extra or added operation upon the

slugs, not to mention the annoyance of the chips from the routing tool.

So far as I am aware, no practical means have heretofore been provided by which a printing slug can be cast upon a standard linotype machine by the use of what are termed standard type producing matrices and which slugs shall have its non-printing or quad surfaces at a greater distance than .043 of an inch below the printing surface of the slug.

There are many thousands of what are termed standard linotyping machines in use and in each instance great quantities of fonts of standard linotype matrices are provided, but there has heretofore been no means provided by which these untold quantities of standard matrices could be used for producing the style of slugs above described, viz: having relatively low non-printing surfaces.

The only suggestion which has been made has been to provide molds lower than standard and provide matrices with deep notches in which the upper part of the slug shall be cast, the letter depressions being formed in the bottoms of these deep notches. There are two very serious objections to this plan which have prevented the general adoption or use thereof, viz: the impossibility of using the great quantity of standard matrices in stock and further it is now common practice to make standard two-letter matrices, that is, each matrix is provided with two letter depressions, one above the other, and means are provided for presenting one or the other of these letter depressions to the mold, but in the standard construction these two-letter depressions are arranged so close together than when the matrix is provided with two of the deep notches for use with the low mold, the tongue of metal remaining between these notches is too fragile for use and soon gives way and the matrix is useless.

I accomplish this result of producing printing slugs with extra low quad or non-printing surfaces in a very simple manner. I make a mold which is substantially an eighth of an inch lower or thinner than the standard mold and I use the standard matrices held in the usual vise arrangement commonly used in standard linotype machines. As thus arranged there would be a space of substantially an eighth of an inch between the edges of the matrices and the front face of the mold. To fill in this space and provide means for casting this part of

the slug, I provide what I term a mask which has a slot which is a forward continuation of the mold cavity and which in effect carries the mold cavity to the matrices. I then provide special quad matrices having projections on their forward or mold closing faces adapted to enter and substantially fill the slot in the mask at the part where it is desired to produce the low non-printing or quad surfaces. I am thus enabled to produce slugs of the character described by the use of the standard matrices, the only special matrices required being a comparatively few special blank matrices and the only change in the linotype machine being the change from the standard mold to a special mold substantially one eighth of an inch thinner than the standard.

Besides this fundamental advantageous feature of my invention there are many others which are of great utility, among which may be mentioned the following: In the printing art, different kinds of printing plates are made use of which owing to their method of manufacture have different thicknesses. For instance, stereotype plates are .159 of an inch in thickness; zinc plates are .065 of an inch thick. Having provided a mold which is substantially one eighth of an inch thinner than the standard mold, I am enabled to produce foundations for these various thicknesses of plates by providing matrix slides which are recessed more or less deeply on their mold faces, and furthermore I can, by providing a mask for a matrix slide similar to the mask which I use with the letter matrices, viz, one with a slot, for continuing the mold cavity forward, and associating this mask with a standard matrix slide for a border or the like, or printing slugs of other kinds of full height or printing height. Another feature of my invention relates to the production of what is known as printer's furniture, which consists of low non-printing members of slug form and of various thicknesses and the making of the thicker furniture hollow, having side walls on both sides extending down to the lower edge, and cored between these walls. This enables me to assemble such furniture with printing type and other slug members, as I provide continuous side walls or side contacting surfaces on all members. In the production of such furniture I make use of the thin mold, mounting within it a novel core member, and I provide a matrix slide thick enough so that when mounted on the matrix slide holder in its standard position the slide fills in the space provided by cutting back the mold, and the slug cast is of a height suitable for furniture.

Many other novel details of construction and operation enter into the practical and successful practice of my invention in

the production of the several forms of printer's slug material described, and all of which as well as many additional advantages will be understood from the following description, taken in connection with said accompanying drawings, in which:

Figure 1 is a face view of a linotype mold wheel showing four molds in place thereon;

Figure 2 is a face view of one of the molds showing a series of matrices in position in front of the same;

Figure 3 is a horizontal section on the line 3—3 of Figure 2;

Figures 4 and 5 are vertical sections on the lines 4—4 and 5—5 respectively of Figure 2;

Figure 6 is a vertical section of the mold on the line 6—6 of Figure 1 and showing associated parts of the machine.

Figure 7 is a perspective view of one of my special low quad producing matrices;

Figure 8 is a perspective view of a thin cut-off matrix which I use to produce short slugs;

Figure 9 is a perspective view of a standard two-letter matrix;

Figure 10 is a perspective view of the form of slug which is one of the objects and the result of my invention;

Figure 11 is a perspective view of the two slot mask suitable for use with standard two-letter matrices.

Figure 12 is a front elevation of a slide block carrying a border slide and a mask for use with same, the mask being partly broken away;

Figure 13 is a perspective view of a cored border slug such as is produced by the use of my invention;

Figure 14 is a perspective view of a single slot mask for use with borders and adapted to be mounted on a slide block in conjunction with a border slide;

Figure 15 is a section similar to Figures 4 and 5 and showing a mold equipped with a core for casting a cored border slug;

Figures 16 to 18, inclusive, are sectional views similar to Figure 15 and showing various forms or slides for producing foundations for cuts, etc.; and

Figure 19 is a diagrammatic view illustrating the related height of the several slugs produced.

In the so-called linotype machine a mold wheel 1 is provided, usually carrying four molds 2 on its face, said molds being equally circumferentially spaced thereon. Each mold consists of a base 3 rigidly secured to the web of the wheel usually by screws 4 and a removable cap 5 held in position by screws 6 projecting through the outer part of rim of the mold wheel. The cap is adjustable from and toward the base for providing a mold slot 7 between the base

and cap of different heights or thicknesses for producing slugs of different thicknesses. The cap is spaced from the base by liners 8 and 9 at the ends of the slot 7. The liner 9 may be of different lengths to make the molds of various lengths depending upon the length of slug desired. Usually the liner 8 which is at the right hand end of the mold is not changed in length.

Matrices of the general form as that shown at 10, Figure 9, are assembled side by side and in the operation of casting are held, as shown in Figures 2 and 3 with their die cut edges 11 to the face of the mold, being held by the machine tightly against the mold and the molten metal is forced into the mold from the rear, filling the mold and entering the depressions in the matrices and reproducing the depressions in the matrices on what becomes the printing face of the slugs.

As ordinarily arranged, the faces 11 of standard matrices would be positioned against the front face of the mold, that is against both the cap and the base thus closing the mold slot. I purposely make the mold 2 of less depth from front to back than the standard mold and consequently when standard matrices are arranged in a standard linotype machine and held in casting position there is a space between the die faces 11 of the matrices and the adjacent front face of the mold by the amount which I have removed from the face of the mold, preferably about one eighth of an inch. As in the linotype machine the mold wheel is pressed forward into contact with the matrices and other mold closing devices, with great pressure, this one eighth of an inch would disappear and the resulting slug would not be standard height. I prevent this result and make use of this space which I have produced by arranging between the matrices 10 and the mold a mask or mold forming member 13 having either one or two longitudinal slots 14 positioned therein in accordance with the vertical spacing of the die depressions in the standard two-letter matrices. When the matrices, mask and mold are assembled as shown in Figures 4 and 5, one of these slots 14 provides a forward continuation of the mold slot 7, and the resultant slug 15 is cast of full printing height at the point where the standard matrices are arranged, as shown at 16 in Figure 10.

For producing the low quad surfaces 17 on the slug where the printing characters do not appear, I provide special blank matrices 18 having projections 19 on their edges presented to the mold and which are adapted to project into the slot 14 nearly through same and thus produce a low top surface on the slug. These projections are not quite as long as the mask is deep, as

I desire to connect the several longitudinal bars which form the mask and which define the slots 14 at one end of the mask. I connect these bars by the thin transverse connecting parts 20, Figure 11, and the projections 19 are just short enough to pass these connecting parts when they are moved into place along the mask from said end. As best shown in Figure 4 the projections 19, which as above explained are not the full depth or thickness of the mask, do not reach to the face of the mold or the face of the liner which fills the mold at the end, and consequently there is a space left through which the molten metal might escape when a slug is cast. To stop off this opening I provide a thin blank matrix 21 having a similar projection 22 which is as long from the edge of the body of the matrix as the depth or thickness of the mask, and I use one of these thinner matrices at the end of a line of matrices as shown in Figures 2 and 3 just within the left hand vise block 23.

As usually made, standard matrices have forwardly extending projections or toes 25 at their lower ends which enter a horizontal guide slot in the face of the lower part of the mold for causing the letter dies to register with the mold slots. These projections 25 are less than one eighth of an inch in length and consequently when I remove an eighth of an inch from the face of the mold then these projections do not reach the mold. Usually there are two of these guide slots in the face of the mold parallel with each other and spaced vertically the same as the spacing of the letter depressions on two-letter matrices. I reproduce these two guide slots as shown at 26, Figure 4, and I make my blank matrices 18 with extended or long projecting toes 27 at their lower ends, so that they will project beneath the mask 13 and enter the slots 26. The lower bar 28 of the mask is wide enough so that when the toes 27 rest in the slot 26 and the mask 13 rests on the toes 27 one of the slots 14 in the mask is registered as to height with the mold slot; that is the lower edge of the slot registering with the bottom of the mold slot.

The mold at the right hand side of Figure 1 is in the ejecting position. In this position, as shown in Figure 6, an ejector blade 29 is pushed into the mold from the rear to force the cast slug forward out of the mold. It takes considerable pressure to push out the slug and to prevent damage to the mold wheel and its related parts. The machine is provided with means for receiving this thrust, comprising a strong vertical frame 30 mounted at its lower end upon a cross bar 31 forming part of the machine and braced or held at its upper end by a cross bar 32 clamped to the frame of the

machine by screws 33. This frame 30 carries stops 34 arranged to contact with the face of the mold at the ends of the mold slots when in ejecting position. As I have cut away the face of the mold one eighth of an inch below the standard position, these stops do not reach the mold and to make up this difference I provide plates or projecting parts 35 on the liners 8 and 9, which parts are substantially one-sixth of an inch thick and build up these two portions of the mold to the original position. These two plates are in the proper position to contact with the stops 34 and take the pressure off of the mold wheel due to the action of the ejector blade 29.

The inner edge of the lower part 3 of the standard mold operates upon a suitable stop mechanism to regulate the amount of the rotation of the mold wheel and to cause it to stop at certain predetermined points. In reducing the thickness of the mold for permitting the use of the mask this co-operation of the mold edge with the stop mechanism is eliminated and in order to reproduce this action I provide a forwardly extending projection 36 which is secured to the under edge of the mold part 3 by the screw 37. This part projects forward from the reduced face of the mold the amount the mold has been reduced and reproduces the original lower edge for a short distance so that it properly co-operates with the standard stop mechanism.

Besides the production of the form of slug shown in Figure 10, my invention is also useful in producing slugs of several other forms; namely, full height printing slugs 38, Figure 13, for printing borders, etc., and slugs of less than type height for use in making foundations for different thicknesses of plates and in different processes of reproduction of pictures, etc.

In Figure 15, I have shown a sectional view of what is known as a quad block 39, which is an elongated block having the cross sectional shape of a standard matrix and which is adapted to be placed in a standard machine in the place of a line of assembled matrices, and is used for casting borders and such like printing elements. The block is provided with a dovetailed groove 40 on its face, which is presented to the linotype mold and in which a member 41 is positioned and held. This member 41 has on its face which is presented to the mold, a die 42 for casting a border or some similar design, the face 43 which carries the border, that is, in the standard devices of this character, is positioned in the same plane as the type dies in the standard matrices. By placing a mask 44 over the border slide similar to the mask 13, I can cast the border and similar printing elements by the use of my low or thin mold, as best

shown in Figure 15. In said figure the casting of the border 38 is shown. The mask or frame 44 is provided with dove-tail ribs 45 on its back which fits into a second pair of dove-tail grooves 46 which I provide in the body of the quad block 39 and in such relation to the grooves 40 that when the block is held in clamped position against the face of the mold the adjacent faces of the mask and border slots make a tight joint between the two to prevent the escape of metal during the operation of forcing the metal into the mold to make a casting.

In Figures 13 and 15 I have illustrated the cast border 38 as being quite thick and provided with a hollow space 47, whereby the border is lighter in weight than if made solid. This space or hollow 47 is produced by means of a core 48 which I mount in the mold space. This core has forwardly tapered parts 49 which core the body of the border and which are relatively easy from which to withdraw the border when cast.

In Figures 16 and 18 inclusive, I have illustrated still another advantageous feature of my invention.

In these figures, instead of providing a border slide or the like mounted on a quad block, I have provided in each instance a single slide mounted by means of dove-tails on the quad block and in each instance the body of the slide is thick enough so that when in casting position the rear face of the slide contacts with the adjacent face of the mold and makes the joint at this point.

In Figure 16 I have shown a quad block 50 provided with a dove-tailed groove 51 in which is mounted a slide 52 provided with a relatively deep recess 53. The rear face 54 of the slide contacts with the adjacent face of the mold and the recess is less than one eighth of an inch deep, consequently the bottom 55 of the recess produces a top surface on the article 56 which is cast, which is lower than full printing height. In Figure 17, which illustrates a similar slide, the recess 57 is more shallow consequently the article 56' produced will not be as high as the article shown in Figure 16.

Figure 18 illustrates the fact that I can use my device for producing low quads as I provide a slide 58 which has no recess and consequently the whole of the article 59 is cast within the shallow mold and consequently is one eighth of an inch lower than the full printing height.

It is thus made plain that I can produce type furniture for mounting cuts or borders by use of the molds which are thinner than standard molds and by the use of the various filling slides, etc., which I have provided.

Figure 19 illustrates the relative height of printing slugs, cut foundations and low

quads which are produced by the use of my devices, 38 being a printing slug or border 56 a foundation for zinc plate cuts 56' a foundation for stereotype plates, and 59 a 5 low quad.

As it is obvious that many modifications of my invention will readily be suggested, I do not limit or confine my invention to the specific structures herein shown and described. 10

I claim:

1. In a machine of the character described, a slug mold lower than the standard mold, closure means for forming the upper 15 face of the slug, positioned in front of the mold, and spaced therefrom equal to the reduction in the height of the mold, a mask positioned between the face of the mold and said closing means for carrying the mold 20 slot forward from the face of the mold to said closing means and causing the production of a full height slug, the mold having a guide groove in its face, other slot closing means associated with said closing means 25 and formed for engagement with the mask and for entering said guide groove to cause the proper registration of the three parts of the slug forming cavity.

2. In a machine of the kind described, 30 a slug mold which is lower than the standard mold, an assembled line of standard matrices shorter than full mold length arranged in front of the mold in casting position and at a distance from the face of the mold equal 35 to the reduction in the height of the mold below standard, a mask arranged between the matrices and the mold face having a slot for extending the slug cavity forward to the matrices and other matrices associated with 40 the letter matrices having projections on their edges adapted to enter the slot in the mask and produce a low non-printing space on a slug cast in the mold.

3. In a machine of the kind described, a mold in which to cast a slug, standard mat- 45 rices arranged in front of the mold and spaced therefrom a predetermined distance, a mask for closing the space between the matrices and the face of the mold having a slot for carrying the mold cavity forward 50 to the matrices, other matrices having projections adapted to enter the slot in the mask for producing a low non-printing surface on the slug cast, said other matrices having 55 projections extending towards the mold beneath the mask for entering a guide slot provided in the face of the mold, the standard matrices having projections extending beneath the mask and adapted to be positioned thereby. 60

4. In a machine of the kind described, a mold lower than the standard mold, standard matrices positioned in their standard position in relation to the mold and having 65 their mold closing edges spaced from the face of the mold a distance equal to the reduction in height of the mold below standard, other matrices associated with the standard matrices and adapted to be 70 clamped in the usual vise and provided with extension toes at their lower ends for engaging in guide slots in the face of the low mold, a mask for filling in between the face of the mold and the matrices, the toes on the 75 standard matrices engaging with the lower edge of the mask as they are brought to casting position in front of the mold slot, said other matrices having projections on 80 their mold closing edges entering the slot in the mask and whereby the mask is held in position and low non-printing surfaces are produced on the slug cast.

In witness whereof I hereunto subscribe my name this 11th day of January, 1921.

ASHTON G. STEVENSON.