D. W. JONES.

CASTING OF CURVED STEREOTYPE PRINTING PLATES.

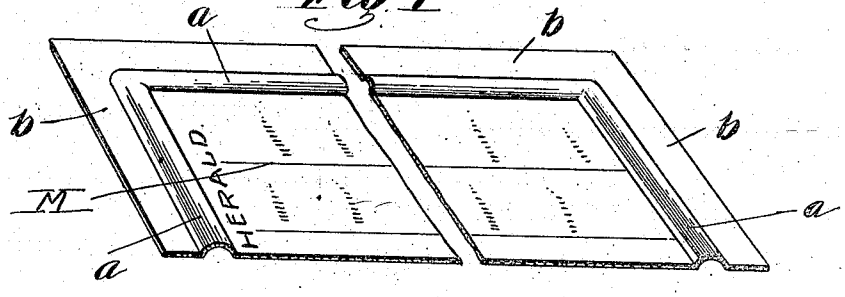
APPLICATION FILED APR. 18, 1906.

911,882.

Patented Feb. 9, 1909.

4 SHEETS—SHEET 1.

Fig. 1



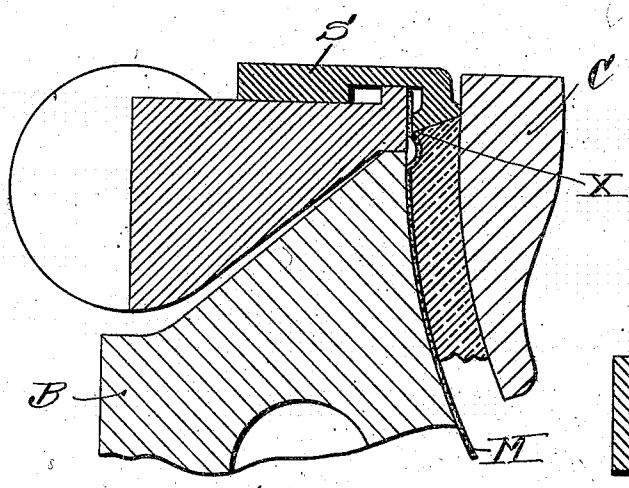


Fig. 2.

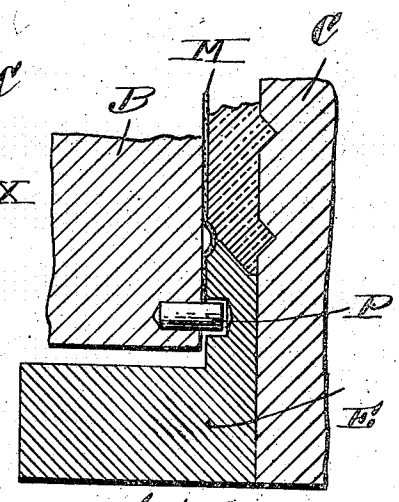


Fig. 4.

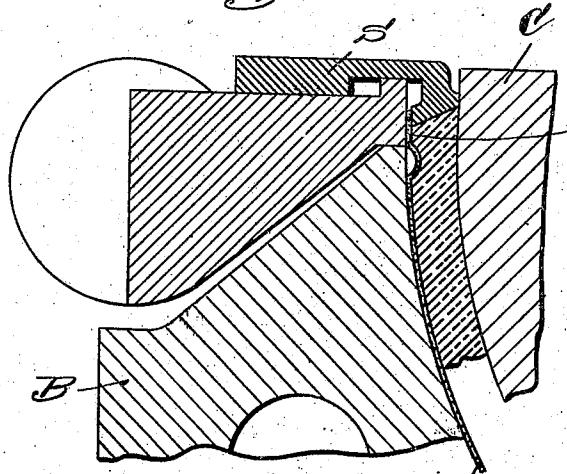


Fig. 3.

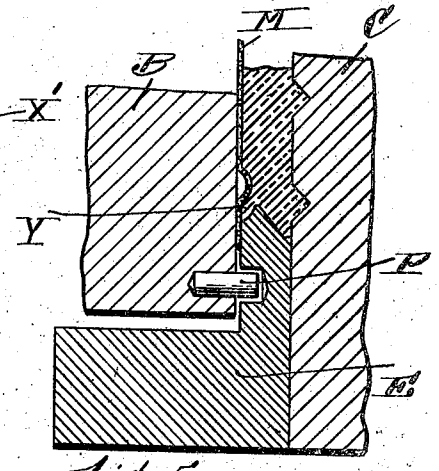


Fig. 5.

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4 SHEETS—SHEET 2.

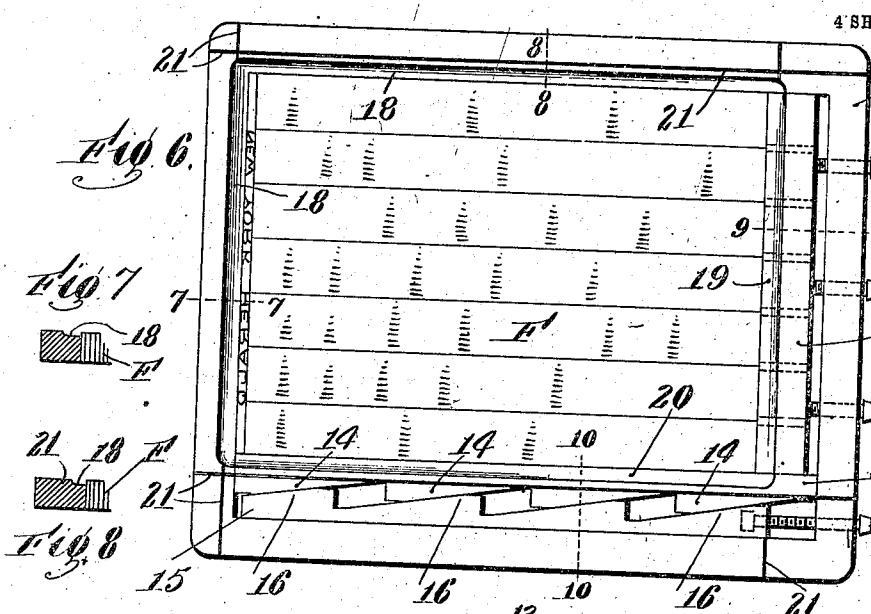

Fig. 6.

Fig. 7

Fig. 8

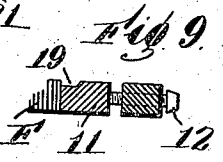

Fig. 9.

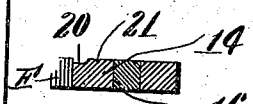

Fig. 10.

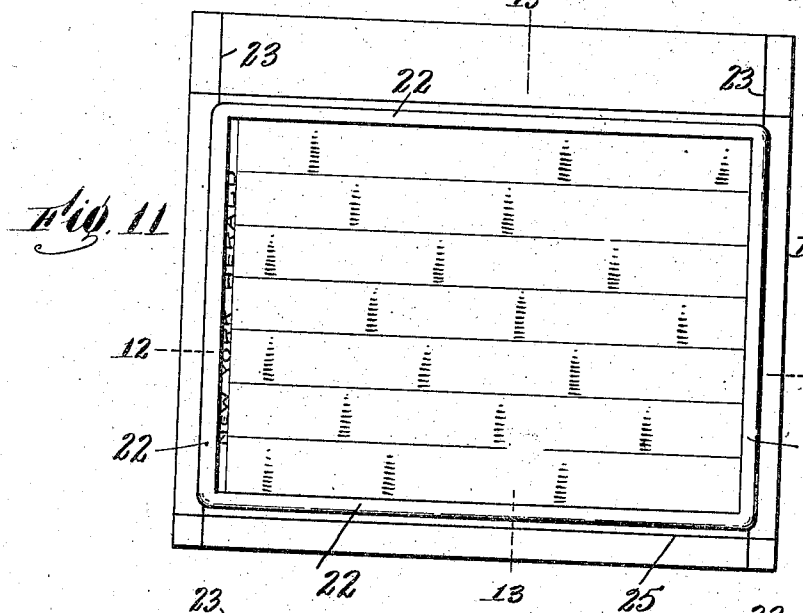

Fig. 11.

Fig. 12.

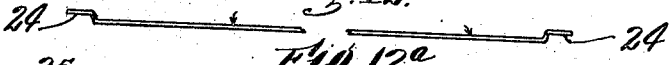

Fig. 12a

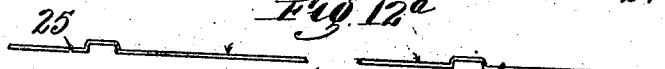

Fig. 13

Fig. 13a

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4 SHEETS—SHEET 3.

Fig. 14.

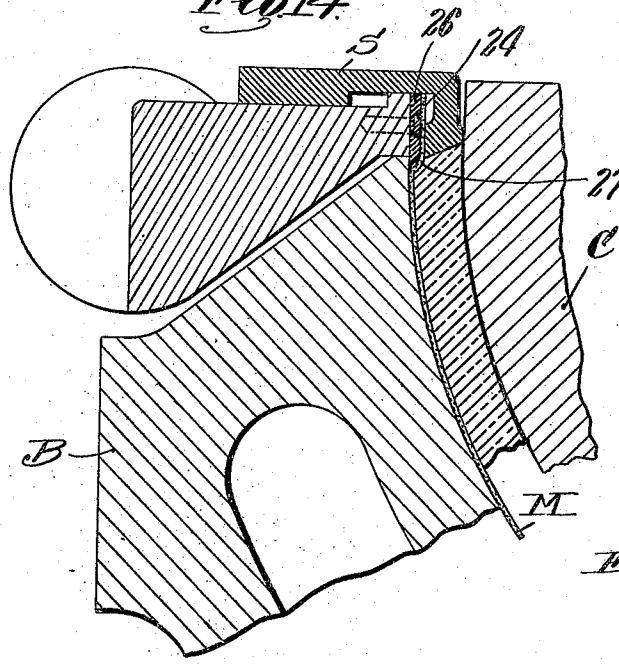

Fig. 16.

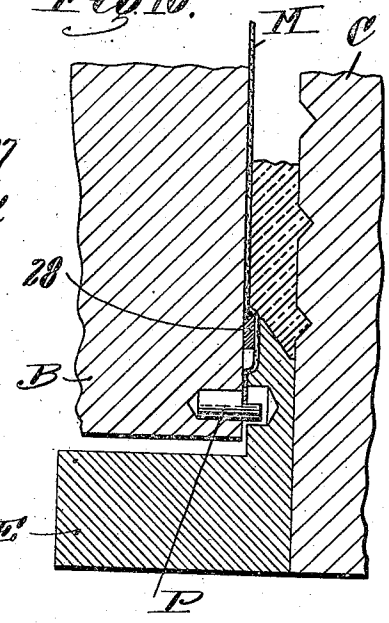

Fig. 15.

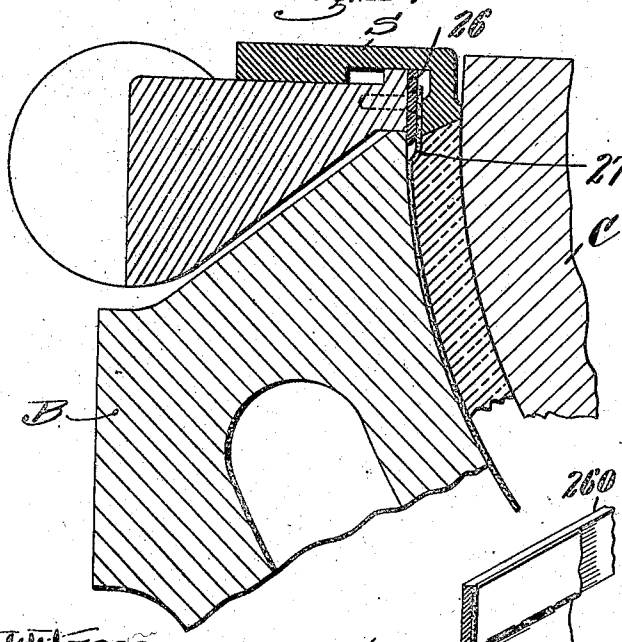

Fig. 17.

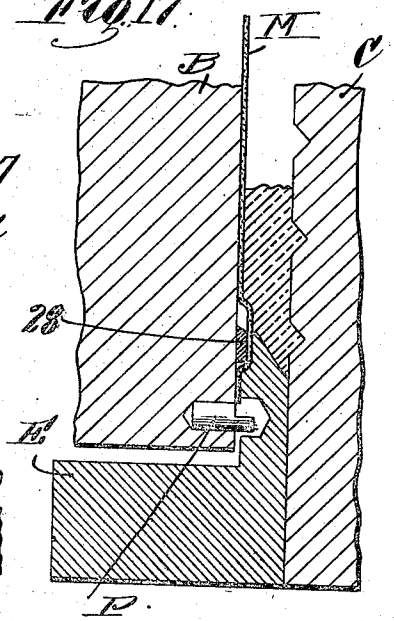

Fig. 18.

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4 SHEETS—SHEET 4

Fig. 19.

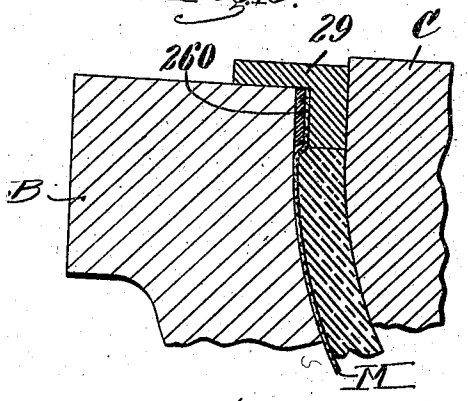


Fig. 20.

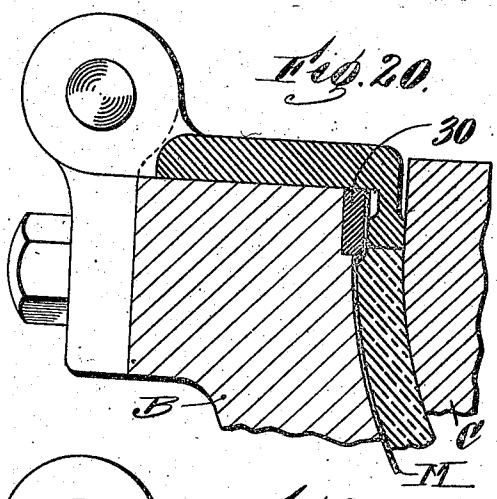


Fig. 21.

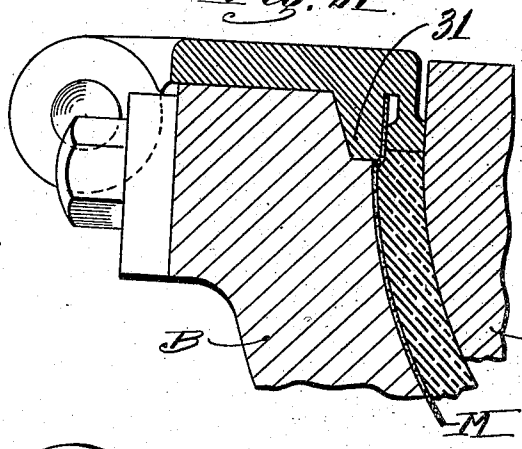


Fig. 22.

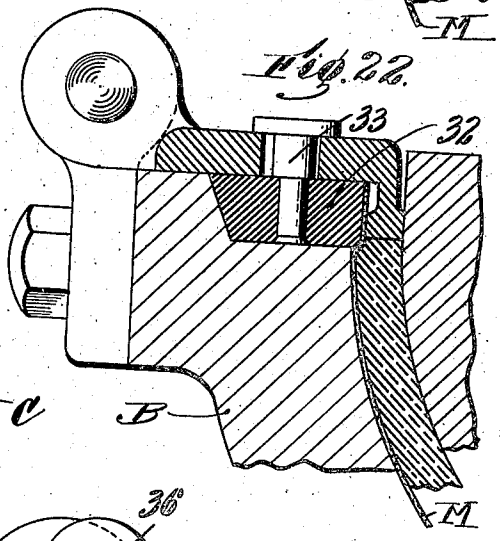


Fig. 23.

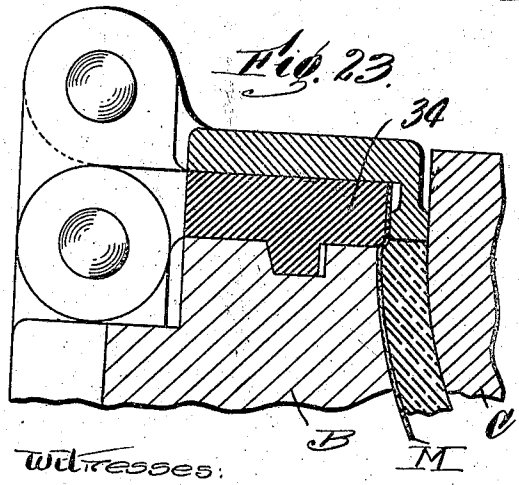
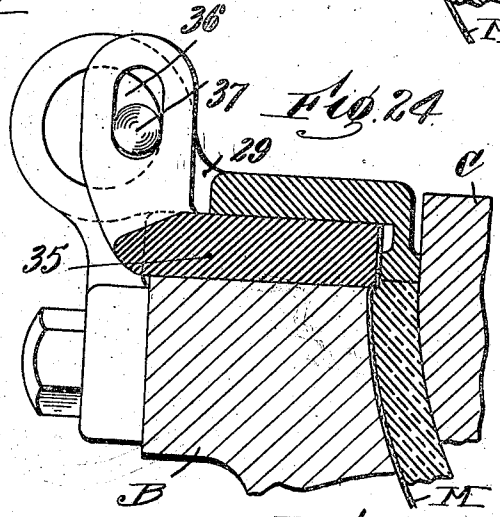


Fig. 24.



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Inventor:
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By Regan & Lustgarten
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UNITED STATES PATENT OFFICE.

DAVID W. JONES, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CASTING OF CURVED STEREOTYPE PRINTING-PLATES.

No. 911,882. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed April 18, 1906. Serial No. 312,420.

To all whom it may concern:

Be it known that I, DAVID W. JONES, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented new and useful Improvements Relating to the Casting of Curved Stereotype Printing-Plates, of which the following is a specification.

This invention relates to improvements in casting stereotype plates, particularly the semi-cylindrical plates, which are used upon rotary printing presses. As is well known, such plates are cast from a matrix which is prepared from a form of type and which matrix is fixed into semi-cylindrical shape and placed in a curved casting box to form one wall thereof, each cast being made so that its convex face will be formed from said matrix, whereby said face will be a replica of the flat form of type in semi-cylindrical shape.

After the cylindrical plate or cast has been made, it is necessary to finish the same up accurately so that the plate can be applied to the cylinder of the rotary printing press. The plate is finished by cutting off from its curved end the long riser or piece which is usually left at the top of the mold so as to obtain a hydrostatic pressure in the mold as the cast solidifies. The convex surface or back of the plate is finished by being cut out or scraped out by a revolving knife so as to be truly cylindrical. Where the plate or cast is made in an ordinary hand-box, it is not customary to machine-up the two straight edges of the plate, these edges being usually finished up by the stereotyper by using a plane or other tools.

When the plate is cast in an automatic machine, such as the well-known "auto-plate", it is customary to saw or finish the straight edges of the plate. In using hand-boxes, this planing or finishing down of the straight edges of the plate is objectionable as it consumes much valuable time and in the automatic casting machines it has been found difficult to saw or trim off the straight edges of the plate so that hand finishing or touching up is not requisite. It would be an extremely advantageous operation if the plate could be cast so that finishing along its straight edges would not be required or in other words, if the plate could be cast sufficiently accurate along its straight edges so as to dispense with hand finishing.

The plate is usually clamped onto the cylinder along its curved edges so that absolute accuracy is not required on the straight edges of the plate. But, nevertheless, it has been impossible previous to this invention, to cast a plate so that its straight edges would not have to be finished up or touched up by hand.

The object of this invention is to overcome this difficulty and to arrange the parts so that one plate or a plurality of plates can be cast from the same matrix and have the straight edges thereof sufficiently accurate so as to require no hand finishing or practically no hand finishing. This desirable object has been impossible with all previous methods of clamping and holding the matrix with which I am familiar. This difficulty can best be understood by referring to the first sheet of drawings forming part of this application for patent in which,—

Figure 1 is a fragmentary view of part of an ordinary flexible matrix. Fig. 2 is a sectional view through one of the clamping or holding means for the straight edge of the matrix, showing the matrix in place; Fig. 2 being on larger scale than Fig. 1. Fig. 3 is a view showing how the difficulty increases as succeeding plates are cast. Fig. 4 is a sectional view through the bottom of the casting box illustrating how a similar difficulty is encountered at the curved edge of the plate, and Fig. 5 is a similar view illustrating how the difficulty increases as succeeding plates are cast.

Referring to this sheet of the drawings and in detail, M designates an ordinary flexible matrix. It is customary and the practice, at the present time, to form a semi-cylindrical ridge or bolster *a* around the printing face of the matrix so that a depression will be formed in the surface of the curved cast, around the type face of the plate. The clamping surfaces *b* of the matrix come outside of this bolster. These clamping surfaces are always type-high or in other words are always formed in the same plane with the type face of the matrix. This bolster is provided so that the type face of the cast plate

will have a sharp edge so as to prevent the accumulation of ink on the edge of the printing face of the type. The depression is particularly needed along the straight edges of the curved cast plate.

In the customary practice, the straight edge of the matrix is held in the clamp or by a side strip S, as indicated in Fig. 2, wherein the clamp employed in the auto-plate is shown. The matrix when in position, lies between the core or cylinder C and the semi-cylindrical back B of the casting box. The matrix is clamped along its clamping surface usually close up to the bolster, as indicated. Then when the plate is cast, a small fin or ridge X is left along the plate, which fin is nearly type-high. This fin X is what has to be planed down or finished up to make the straight edges of the plate ready for use. As successive casts are made from the same matrix, the matrix shrinks from the great heat. It is now customary, where the matrix is clamped in the casting box, to hold the matrix somewhat yieldingly along one or both of its straight edges so that this shrinkage will not tear or fracture the matrix, but as this shrinkage takes place, as successive casts are made, the fin X will become larger and thicker, as indicated at X′ in Fig. 3, so that more and more hand finishing along the straight edges of the cast plate is required. The curved edge of the matrix is set up to pins P and the curved edge of the matrix comes between an end ring E and the back B, as shown in Fig. 4. When the matrix shrinks as succeeding casts are made, a fin Y will be left on the lower curved edge of the plate. While this fin is not so objectionable as the fins X, as the curved edges of the plate are finished in preparing the plate for the cylinder, it still is objectionable as it makes more work for the finishing tool which finishes the lower curved edge of the plate. This finishing tool is usually merely a revolving scraper.

The hand finishing of the curved cast plate along its straight edges, which is a necessary incident of the present practice, is objectionable as above stated on account of the time required to dress up the plate. I have discovered that this objection can be obviated by forming the matrix with its clamping surfaces in a plane off-set from the type face of the matrix and by making these off-set clamping surfaces form the bolster. In other words, I make a bolster which has a flat surface above the plane of the type face of the matrix, which surfaces are additionally utilized for clamping surfaces. By doing this and by backing up the off-set clamping surfaces in the mold, no fins will be cast no matter how much the matrix shrinks in the casting of successive plates.

The invention will be understood by referring to the accompanying drawings forming part of this application for patent. In said drawings, Figs. 1 to 5, inclusive, have already been described.

Fig. 6 is a plan view of a chase with a form of type locked therein, the chase being modified or constructed to embody my invention. Figs. 7, 8, 9 and 10, inclusive, are sectional views taken along the lines 7—7, 8—8, 9—9 and 10—10 of Fig. 6, illustrating the construction of the sides of the chase. Fig. 11 is a face view of a matrix prepared on the chase and form of type illustrated in Fig. 6. Fig. 12 is a sectional view taken on the line 12—12 of Fig. 11, on double the scale of said Fig. 11. Fig. 12ª is a view similar to Fig. 12 illustrating the matrix after it has been trimmed. Fig. 13 is a sectional view through the matrix taken on the line 13—13 of Fig. 11, of double scale relatively to Fig. 11. Fig. 13ª is a view similar to Fig. 13 of the matrix after the same has been trimmed. Fig. 14 is a view similar to Fig. 2, illustrating the way my improved form of matrix is placed in the casting box and the improved means for holding the same therein. Fig. 15 is a view similar to Fig. 14 illustrating the position of the parts after the matrix shrinks. Fig. 16 is a view similar to Fig. 4, illustrating the way my improved matrix is held at its curved lower edge. Fig. 17 is a similar view illustrating what happens after the matrix shrinks. Fig. 18 is a perspective view illustrating a modified form of matrix which is made to embody my improvement, and Figs. 19 to 24, inclusive, are views similar to Fig. 14 illustrating modifications.

Referring to Fig. 6, 10 designates an ordinary rectangular chase modified for the practicing of my improvement. The same is provided with a foot-stick 11 which is adjustable by screws 12. 13 designates the side stick which has wedge-shaped projections 14 formed along one side thereof. 15 designates the adjustable strip which is formed with wedges 16 coöperating with the wedges 14. The adjusting strip 15 can be slid in the chase by the usual adjusting screw 17. The form of type F is placed in the chase and the screws 12 and 17 are adjusted so that the form of type will be locked tightly therein. As shown in the drawings, the upper and left-hand sides of the chase are provided along their inner edges with a depression 18, which depression is of a width equal to the width of the desired clamping surface and the bottom of which depression is flat, as indicated in Figs. 7 and 8. In other words, these sides of the chase are formed with a depressed inner flat surface standing on a plane below the plane of the face of the type or the type plane. The foot-stick 11 is provided with a similar depression 19, as shown in Fig. 9. The side stick 13 is also provided with a similar depression 20, as shown in Fig. 10. Small grooves 21 are

usually cut around the sides of the chase, as indicated, so as to form cutting lines for trimming up the matrix.

The matrix M is taken and beaten onto the type form and chase in the usual manner and dried in contact therewith. The matrix is then removed and the same will have the appearance indicated in Fig. 11; that is to say, the same will have a ridge 22 running around the type or printing face of the matrix and the lower surface of this ridge will thus form a practically plane rectangular strip or surface below the type face of the matrix. The matrix is then trimmed along the lines 23—23 which are formed therein by the grooves 21 in the sides of the chase. This will leave the matrix with plane clamping surfaces or strips 24 along its head and foot or along what is commonly termed the straight edges of the matrix. The matrix is then trimmed along one of the lines 25 formed by one of the grooves 21 in one of the long sides of the chase, so as to have the longitudinal section shown in Fig. 13ª. The other end of the matrix is left untrimmed so as to come under the ring or protecting piece which is used at the top or pouring end of the mold. The matrix can be placed on the form and chase so that either the upper or lower side thereof, as indicated in Fig. 11, may contain the long strip which lays under the pouring ring of the box or under the riser which is cast on the plate. This will make a new form of matrix which, as hereinafter described, will cast a plate without any of the objectionable fins. If the matrix is to be used in the side clamps shown in Fig. 4, the side clamps are modified by adding a metallic face or packing 26 to the stationary jaw thereof and by cutting away the movable jaw as indicated in Fig. 14. By this arrangement, it will be seen that the corner 27 of the matrix between the clamping surface 24 and the type surface thereof will practically form a bolster which will make a small depression in the plate so that the edge of the type face of the plate will be sharp. It will also be noticed that the clamping plane or surface of the matrix thus comes above the type face of the plate or is off-set from the inside of the back towards the center of the box. As the matrix shrinks with successive casts, as indicated in Fig. 15, the connecting surface 27 will simply pull away from the metallic face 26 and the clamping surface 24 will move down in the clamp thus making the depression in the plate at its type edge somewhat deeper but still never leaving the fin. This action is illustrated in Fig. 15. The bottom of the mold or the edge thereof against which the lower curved edge of the matrix is to rest is also provided with a small semi-cylindrical packing 28, as indicated in Fig. 16. This packing fits in the clamping surface which is formed at the lower edge of the plate. As the matrix shrinks, as shown in Fig. 17, no fin will be cast on the lower edge of the plate as the lower curved clamping edge of the matrix will merely pull up on the packing 28. Thus, a plate can be cast without fins and the straight edges of the plate can be cast sufficiently accurate to do away practically with all planing or hand finishing. In some cases the packing 260 may be placed directly on the off-set clamping surface 24 of the matrix as indicated at 260 in Fig. 18. This packing may be formed of a piece of paste-board cut to the proper shape and pasted to the matrix if desired. When this is used, the metallic face 26 is not employed in the clamps. The above improved form of matrix may also be advantageously employed in hand boxes; that is, in boxes which are formed simply with side bars and in which the matrix is not held by clamps along its straight edges.

A matrix provided with the improved bolster or clamping surfaces previously described, if the matrix is to carry its own packing along the bolster, may be used in any ordinary hand casting boxes provided the side bars of the box are cut out so that they will go around the bolster, as shown in Fig. 19. In this arrangement, is shown the old-fashioned side bar 29 which lifts out. If, however, a packing for the bolster is used which is part of the casting chamber instead of a part of the matrix itself, this packing can be fastened to the parts of the casting chamber unless the plate is to be slid out axially of the casting box. When this arrangement is desired and when it is desired to remove the plate in the ordinary way, the packing 30 for the bolster is left loose as indicated in Fig. 20, in which figure is shown a partial sectional view of a hand box employing hinged side bars.

To overcome the objection of using a loose packing piece 30, as shown in Fig. 20, the packing may be made part of the hinged side bar, as indicated at 31 in Fig. 21. In this modification, the packing 31 formed integrally with the side bar is tapered where it fits the ends of the back so that the parts can easily turn on the pivot.

In Fig. 22 a packing 32 is shown as loosely connected to the pivoted side bar by pins 33 which fit in slots in the side bar. In this modification, when the side bar is turned out, the packing will move on the side bar to release the matrix.

In Fig. 23 a packing 34 is shown as made in the form of a supplemental side bar independently pivoted to the back.

In Fig. 24 a packing 35 is employed which is arranged to slide on the edge of the box. The packing piece is provided with a slot 36 engaging which is a pin 37 eccentrically set in the side bar 29 so that as the side bar is lifted, the packing will be moved away clear of the plate.

Many other forms of mechanism may be devised for clamping or holding a matrix made to embody my improvement in a casting box, without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters-Patent is:—

1. A flexible curved matrix having a clamping strip or surface along its curved edge, the elements of which surface are offset from corresponding parallel elements in the printing surface.

2. A flexible curved matrix having clamping strips or surfaces along its straight and curved edges, the elements of which surface are offset from corresponding parallel elements in the printing surface.

3. A matrix having a clamping strip or surface along its straight and curved edges offset from the printing surface, the connecting surface between the clamping surface and the type surface of the matrix forming a bolster.

4. A flexible curved matrix having clamping strips or surfaces along its straight and curved edges, the elements of which surfaces are offset from and above the corresponding parallel elements in the printing surface, the connecting surface between the clamping surface and the type surface of the matrix forming a curved bolster.

5. The combination with a matrix having a clamping strip or surface in a plane above the printing plane, of a packing for making up the difference of level.

6. A matrix having a clamping strip or surface along its straight edge in a plane above the printing plane, and a casting box for receiving said matrix, having a side bar arranged to engage the clamping strip or surface of the matrix to hold the same in proper position in the casting box.

7. The combination with a matrix having a clamping strip or surface in a plane above the type surface to form a bolster, and a casting box having a side bar, of packing for holding the bolster.

8. The combination with a matrix having a clamping strip or surface in a plane above the type surface, and a casting box having a removable side bar, of packing for holding the matrix by the clamping strip or surface.

9. The combination with a matrix having a clamping strip or surface in a plane above the type surface, and a casting box having a side bar, of packing for holding the matrix in the casting box, the side bar and packing being relatively movable.

10. A curved stereotype casting box comprising a core, a semi-cylindrical back and a clamping device or side strip for holding the straight edge of a matrix along a surface offset from the inside of the back in towards the center of the box.

11. A curved stereotype casting box comprising a core, a semi-cylindrical back and a side strip and packing for holding the straight edge of a matrix along a surface offset from the inside of the back in towards the center of the box.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

DAVID W. JONES.

Witnesses:
C. J. ROBERTSON,
ROBERT M. OTIS.