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METHOD OF CASTING CURVED AND FLAT STEREOTYPE PLATES

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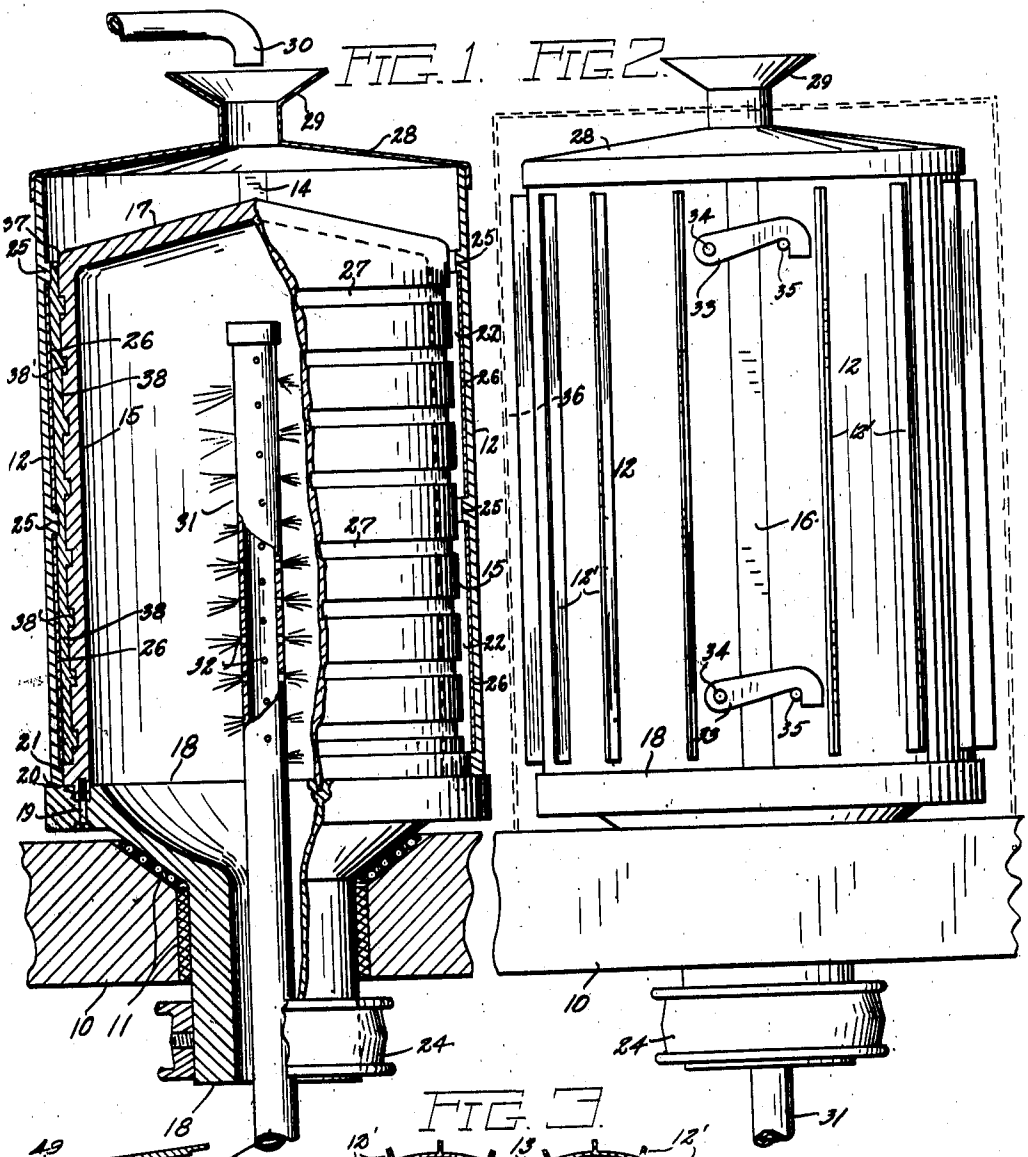


FIG. 1. FIG. 2.

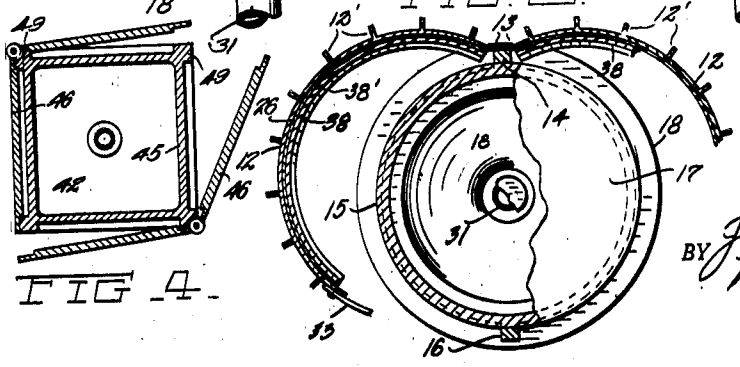


FIG. 3.

FIG. 4.

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UNITED STATES PATENT OFFICE.

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METHOD OF CASTING CURVED AND FLAT STEREOTYPE PLATES.

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This invention relates to curved or flat stereotype plates, and particularly to a method for casting the same.

It has for an object a simple method for casting curved or flat stereotype plates which will reduce the time required for producing a given number of round or flat plates over that required in the present method of casting, so, that, particularly in newspaper work, the presses may be held longer for later news.

It has also for an object the reduction of the cost of the plates, as the same number of men can produce more plates in a given time by my method, than with the method now generally employed, thus reducing the cost per plate, or the same number of plates may be produced with fewer men. This saving in the cost is material in newspaper work as well as in magazine work.

It has for a further object the production of a better and more uniform round or flat plate than is ordinarily produced by the present method employed.

With these and other objects in view, my method consists broadly of mounting one or more paper matrices in a substantially cylindrical mold facing inwardly, pouring or introducing molten metal into the mold and simultaneously rotating the mold and matrices at sufficient speed to force the molten metal into the depressions of the matrices and distribute it uniformly over the faces of the same under centrifugal action, and continuing such rotation until the metal has set.

For a better understanding of the invention, reference is had to the following description taken in connection with the accompanying drawing, in which—

Fig. 1 is a vertical section through a representation of one form of mold which may be used to carry out my method.

Fig. 2 is a side elevation thereof,

Fig. 3 is a top plan view, portions of the mold being shown in section, and Fig. 4 is a horizontal sectional view of a mold for casting flat plates.

A suitable support is represented at 10 provided with suitable bearings 11 for the mold comprising an outer casing, preferably made in two sections 12, hinged at 13 with a suitable support 14 connected to core 15, a similar element 16 being provided diametrically opposite the element 14. The core is preferably cylindrical and closed at one end by upwardly inclined end walls 17 and secured at its lower end to the supporting casting 18 by suitable means, such as bolts 19, the lower end of this core being preferably seated in an annular groove in the supporting casting, as shown. This core is preferably provided with an outwardly extending flange 21 against which the lower ends of the sections 12 rest when these sections are in closed position, and holds them suitably spaced from the side walls of the core to provide casting spaces 22. The supporting casting 18 is mounted to rotate in the support 10 in the bearings 11, indicated at 23, and has secured thereto a suitable pulley 24 which may be driven by a belt, gear or other suitable means, from any suitable source of power. The inner walls of the hinged sections 12 are provided with annular ribs 25 suitably spaced so that the matrices, in the usual method employed, may be mounted between them, which matrices are indicated at 26 and are secured in the mold by any suitable means facing inwardly, or toward the core 15, leaving a casting space 22 between the core and these matrices to receive the molten metal. The core is preferably provided with annular grooves 27 so that the finished casting will have ribs 38′ on the inner walls thereof. The upper end of the mold is closed by any suitable means, such as a head 28 provided with a funnel 29 over which is placed the discharge nozzle 30 of a melting furnace.

In order to quickly cool the mold and the casting, after it has been poured, I provide a stationary pipe 31 extending within the core 15 and having suitable openings 32 in the walls thereof. By forcing water or air through this pipe into the core and against the walls thereof, the core, and with it the casting, may be quickly cooled. This cooling may also be facilitated, if desired, by means of fins 12′ provided on the outside of the sections 12, which will conduct heat away from the casting, and which will be cooled by air passing over them as the mold rotates.

In carrying out my method the side sections 12 of the mold are swung outwardly away from the core about their supporting hinges and the matrices placed in position between the ribs 25 and 21, as indicated, there being preferably two in each section

12, one above the other, as shown, though I may, if desired, make the mold to hold one to six matrices or more.

The sections 12 are then moved to closed position and clamped therein by any suitable means, such as hooks 33 pivoted to one section at 34 and adapted to extend over pins 35 carried by the other section. When casting from curved matrices they are placed in sections 12 with the faces thereof on the concave side facing the core 15, and, after the sections 12 are closed, the head 28 is placed in position and a suitable guard, indicated in dotted lines at 36, may then be placed or drawn down around the mold so that, should it become ruptured or unlatched, or molten metal come out for any reason while being rotated, no one will be injured.

The mold and core are now rotated by means of the pulley 24 or other suitable means, and molten metal is fed into the upper end thereof from the discharge nozzle 30, the mold being rotated at sufficient speed to throw this metal against the faces of the matrices and force it into the depressions therein and uniformly distribute it over these faces by centrifugal action. This rotation is continued until the metal has set or congealed, which setting may be hastened by use of cooling fluid such as water or air fed through the pipe 31, sufficient metal being discharged into the mold to extend to about the top edge 37 of the core 15. Rotation of the mold is now stopped and the sections 12 opened, as shown in Fig. 3, allowing removal of the two sections of printing plates 38 therefrom and then the operation may be repeated until the desired number of plates or sections have been cast.

This method is not limited to casting curved plates or sections for cylindrical printing rolls, but may be used to cast flat plates by suitable modification of the construction of the mold, as desired. One way of using this method for casting flat plates is shown in Fig. 4 in which flat matrices 46 are arranged around the mold 42 and spaced from a polygonal core 45. After the sections are removed from the mold the two or more sections, which are cast in one piece, may be sawed apart, as is obvious. Provision may be made in machine, if desired, to cast so that sawing will not be necessary as by means of separating pieces 49 in Fig. 4. This method of casting these printing plates forces the molten metal into the recesses in the matrices so that they are all completely filled with this molten metal, properly reproducing the impressions on the matrices. These plates are also more uniform in structure than plates produced in the stationary mold in which the metal is denser at the lower end than at the upper, due to the weight of the metal in the mold, and in casting the stationary molds unless sufficient metal is fed into the mold to produce sufficient weight on the metal at the upper end thereof, it is liable not to be properly forced into the depressions or recesses in the matrices, and the entire printing surface of the plates is not properly formed. This extra amount of metal required also means there is more to be cut off from the ends of the plates to be remelted. Furthermore, as the force throughout the surface of the matrices is practically uniform in the applicant's method, the plates are practically of uniform density throughout and the whole printing surfaces are well and uniformly reproduced, insuring clearer printing when the plates are used in the press. In the stationary method, if metal is not hot enough to flow properly, the plate may not get sufficient metal throughout its entire surface, due to cooling of metal in the mold, and part of the plate will not be perfect. In my method, even if metal is not fully heated, the centrifugal force will tend to force the metal to flow to make a perfect plate.

Having thus described the nature of my invention, what I claim is:

1. The process of forming stereotype plates which consists in placing a matrix in a mold facing inwardly, introducing molten metal into the mold inwardly of the matrix, rotating the mold and matrix at sufficient speed to force the molten metal into the depressions in the matrix by centrifugal action, and continuing such rotation until the metal has set.

2. The process of forming stereotype plates which consists in placing a matrix in a mold, introducing molten metal into the mold and simultaneously rotating the mold and matrix at sufficient speed to force the molten metal into the depressions of the matrix by centrifugal action, and continuing such rotation until the metal has set.

3. The process of forming stereotype plates which consists in placing a matrix in a mold facing inwardly, introducing molten metal into the mold and simultaneously rotating the mold and matrix at sufficient speed to force the molten metal into the depressions of the matrix by centrifugal action, and continuing such rotation until the metal has set.

4. The process of forming stereotype plates which consists in placing a matrix in a mold having a core with the matrix facing the core and spaced therefrom, introducing molten metal into the space between the matrix and core and simultaneously rotating the mold, core and matrix at sufficient speed to force the molten metal into the depressions in the matrix by centrifugal action, and continuing such rotation until the metal has set.

5. The process of forming curved stereotype plates which consists in mounting a

curved matrix in a mold having a curved core with the face of the matrix toward the core and spaced therefrom, introducing molten metal into the space between the core and matrix and simultaneously rotating the mold, core and matrix at sufficient speed to force the molten metal into the depressions in the matrix by centrifugal action, and continuing said rotation until the metal has set.

6. The process of forming curved stereotype plates which consists in mounting a curved matrix in a mold having a curved core with the face of the matrix toward the core and spaced therefrom, pouring molten metal into the space betwen the core and matrix and simultaneously rotating the mold and matrix at sufficient speed to force the molten metal into the depressions in the matrix by centrifugal action, projecting cooling fluid into the core, and continuing said rotation until the metal has set.

7. The process of forming curved stereotype plates which consists in mounting curved matrices in a mold having a cylindrical core with the matrices placed around the core facing the same and spaced therefrom, pouring molten metal into the space between the matrices and core and simultaneously rotating the mold and matrices at sufficient speed to force the molten metal into intimate contact with the matrices under centrifugal action, and continuing said rotation until the metal has set.

8. The process of forming curved stereotype plates which consists in mounting curved matrices in a mold having a cylindrical core with the matrices placed around the core facing the same and spaced therefrom, pouring molten metal into the space between the matrices and core and simultaneously rotating the mold and matrices at sufficient speed to force the molten metal into intimate contact with the matrices under centrifugal action, introducing cooling fluid into the core, and continuing said rotation until the metal has set.

9. The process of forming curved stereotype plates which consists in mounting a curved matrix in a substantially vertically extending mold having a curved core with the matrix facing the core and spaced therefrom, pouring molten metal into the space between the matrix and core at the upper end thereof and simultaneously rotating the mold and matrix about a substantially vertical axis with sufficient speed to force the molten metal into the depressions in the matrix under centrifugal action, and continuing said rotation until the metal has set.

10. The process of forming curved stereotype plates which consists in mounting curved matrices in a substantially vertically extending mold having a cylindrical core with the matrices placed around the core facing the same and spaced therefrom, pouring molten metal into the space between the matrices and core at the upper end thereof and simultaneously rotating the mold and matrices about a substantially vertical axis at sufficient speed to force the molten metal into the depressions in the matrices under centrifugal action, and continuing said rotation until the metal has set.

11. The process of forming curved stereotype plates which consists in mounting curved matrices in a substantially vertically extending mold having a cylindrical core with the matrices placed around the core facing the same and spaced therefrom, pouring molten metal into the space between the matrices and core at the upper end thereof and simultaneously rotating the mold and matrices about a substantially vertical axis at sufficient speed to force the molten metal into the depressions in the matrices under centrifugal action, introducing cooling fluid into the core, and continuing said rotation until the metal has set.

12. The process of simultaneously forming a plurality of stereotype printing plates which consists in mounting a plurality of curved independent matrices in a circular casting chamber, all said matrices being located substantially at the same distance from the end of the casting chamber and at equal distances from the center thereof and pouring metal in the casting chamber.

13. The process of simultaneously forming a plurality of stereotype printing plates which consists in mounting a plurality of independent matrices in a casting chamber, all said matrices being located substantially at the same distance from the end of the casting chamber and pouring metal in the casting chamber.

14. The process of simultaneously forming two printing plates which consists in placing two matrices opposite each other in a cylindrical mold having a core and simultaneously casting metal betwen the core and both matrices.

15. In a stereotype casting device, the combination with a circular back and a plurality of independent matrices located against the inner surface thereof at substantially equal distances from the end of the mold, and a common core equally spaced from the matrices to provide a plurality of spaces for the casting of a corresponding number of plates against the matrices.

In testimony whereof I affix my signature.

JOSEPH P. CATLIN.