H. A. W. WOOD.

STEREOTYPE PRINTING PLATE CASTING MECHANISM.

APPLICATION FILED FEB. 7, 1902. RENEWED FEB. 12, 1906.

977,248. Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.

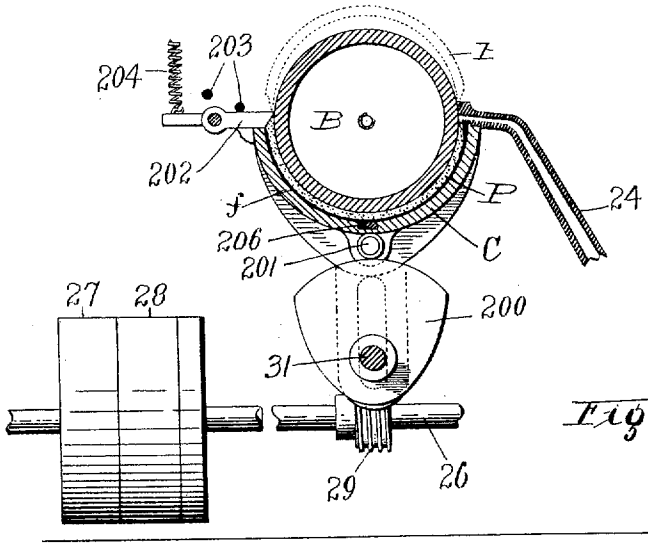

Fig. 1.

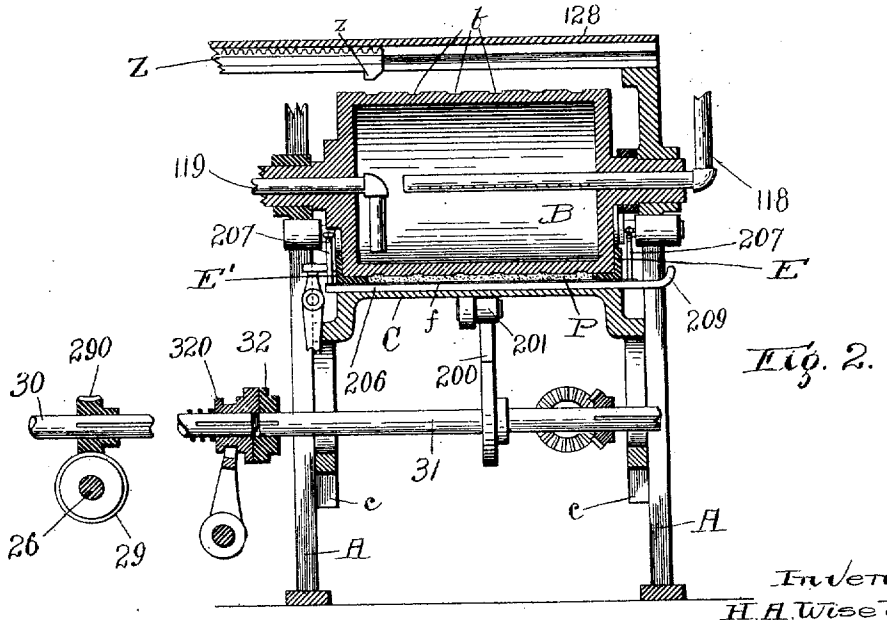

Fig. 2.

Witnesses.
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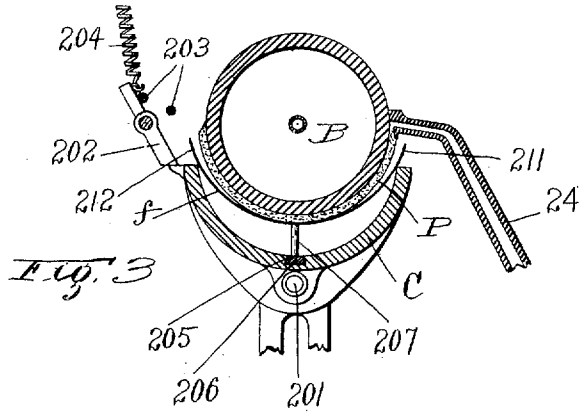

Fig. 3

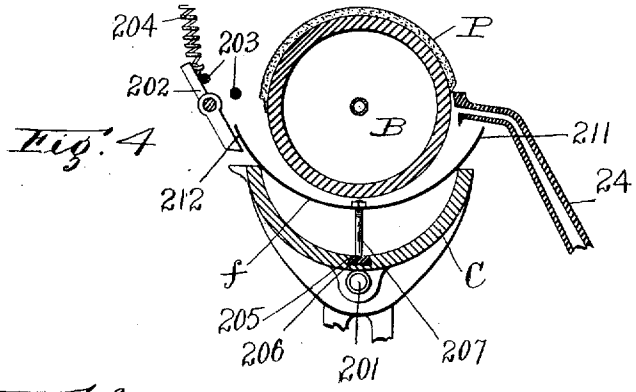

Fig. 4

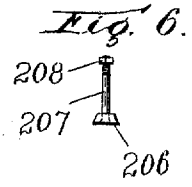

Fig. 6.

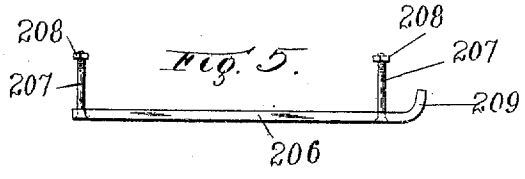

Fig. 5.

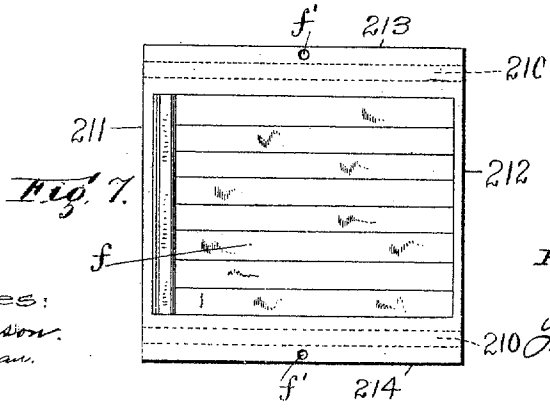

Fig. 7.

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

STEREOTYPE-PRINTING-PLATE-CASTING MECHANISM.

977,248. Specification of Letters Patent. **Patented Nov. 29, 1910.**

Application filed February 7, 1902, Serial No. 92,978. Renewed February 12, 1906. Serial No. 300,624.

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Stereotype-Printing-Plate-Casting Mechanism, of which the following is a specification.

In my patent dated Feb. 17, 1903, No. 721,117, I have shown, described and claimed an organized mechanism for casting and finishing curved stereotype printing plates.

The invention or improvements covered by this application for patent relate to an improved or modified form of stereotype printing plate casting mechanism adapted for use in the manner described in said patent or in the other or simpler forms of casting box.

The present invention relates to an improved or modified way of removing the flexible matrix from the surface of the cast plate.

By the present invention, the matrix is made resilient so that it is adapted to be bent to a curved shape in the casting box, and so that it will strip or spring from the surface of the cast plate by its own resiliency when the box is opened after the casting operation.

The parts further are arranged so that the said resilient matrix will be brought back to casting shape and position for the next cast, when the box is again closed.

The preferred way of guiding and manipulating this kind of a matrix consists in providing a holding device in the segmental back, which will hold the resilient matrix in position along its center line, so that its two ends will be free to spring from the surface of the cast plate as the box is opened, and so that the continued movement in opening the box will entirely free the matrix from the surface of the cast plate.

The invention further consists of certain details of construction hereinafter described and more particularly pointed out in the specific claims.

Enough of a stereotype printing plate casting machine is shown in the accompanying two sheets of drawings to enable one skilled in the art to practice the invention.

Referring to said drawings, and in detail, Figure 1 is a cross-sectional view through the casting box, Fig. 2 is a longitudinal sectional view through the casting box, Figs. 3 and 4 are partial views similar to Fig. 1, showing the parts in different positions to illustrate the operation, Fig. 5 is a side view, Fig. 6 is an end view of the mechanism for holding the resilient matrix in position in the casting box, and Fig. 7 is a plan view of the resilient matrix.

In the drawings, I have shown enough of the mechanism described in said patent modified to practice the present improvement. The details of the gearing and various parts are not described and shown at length in this case, as they may be substantially the same as described and illustrated in said patent.

Referring to the drawings, and in detail, A designates the framing.

B designates the core or cylinder which is journaled by means of suitable projecting hubs in the frames A. The said cylinder is provided with small grooves *b*—*b*, so that the cast plate will have ribs on its inside or concave periphery. An inlet pipe 118 projects in through one hub of the core, and an outlet pipe 119 extends through the other hub of the core so that the plate can be cooled after the casting operation.

C designates the segmental back. The same is provided with guides *c*—*c* bearing on the frame A, so that said back is capable of a movement toward and away from the core B.

E designates an end rim carried by the frame A, which stops off the right-hand end of the casting chamber.

E′ designates a similar rim arranged to stop off the left-hand end of the casting chamber. These rims are arranged as described in said patent, and the left-hand rim E′ is preferably slightly eased off of the end of the cast plate after the casting operation by the mechanism described, so that the plate can be easily delivered from the chamber, as hereinafter described.

P designates the cast plate.

f designates the resilient matrix, which is made as hereinafter described. This matrix may be provided with holes *f*′—*f*′ near its two edges.

Z designates a conveyer having a tooth *z*.

This conveyer is arranged in a frame 128, and is actuated by suitable mechanism to reciprocate and to move the finished plate away from the top of the core.

24 designates a spout by which molten metal is directed into the casting cavity.

26 designates a power shaft which carries suitable tight and loose pulleys 27 and 28, by which power is applied to the machine. Arranged on the shaft 26 is a worm 29 which meshes with a worm-wheel 290 mounted on a shaft 30.

31 designates the shaft which is arranged to operate the casting mechanism. On the end of this shaft is arranged one member 32 of a clutch. The other member 320 of this clutch is keyed on the end of the shaft 30, and suitable mechanism is provided so that this clutch member can be moved back and forth to engage or disengage from the member 32, so that the casting mechanism can be thrown into and out of operation. Arranged on said shaft 31 is a cam 200, which bears on a roller 201 carried by the segmental back C.

A stopping-piece 202 for the front side of the casting chamber is pivoted on a shaft secured in the main frame. Pins 203 limit the motion of this stopping-piece. A spring 204 tends to normally pull the stopping-piece to the position shown in Figs. 3 and 4.

The back C is provided with a dove-tail groove 205 along its center line. A frame 206 is adapted to slide into this groove. Said frame is provided with projecting bolts 207, on which are arranged nuts 208. A handle 209 is arranged on the end of this frame.

The matrix used for this apparatus is made resilient or elastic. One way this kind of matrix can be made is as follows:—In two quarts of water, mix about two and one-half pounds of red gum, commercially so called used in making flongs. Soak for twenty-four hours; then put in a pot and bring to boiling point. In four quarts of water, place about sixteen ounces of starch, about twenty-two ounces of china clay and about twenty ounces of flour. Mix these with the gum; boil together with the gum; and use the paste thus formed in making the flong. The flong may consist of two or preferably more sheets of backing paper with four or more sheets of tissue on the face. These parts are secured together by the paste previously described. When a matrix is made in this way, it is sufficiently elastic for the purposes herein described. This recipe may be varied to suit the particular kind of paper used and the depth of the mold.

Another method of preparing a resilient matrix is to insert strips of flexible metal, stiff paper, or other similarly acting material in the matrix along its curved edges, as indicated at 210 in Fig. 7. If this is done, the matrix can be made up in the ordinary way with such strips embedded therein or fast to its inner edges.

The matrix thus prepared and having the holes f'—f' punched therein is placed in the frame 206. This is done by unscrewing the nuts 208, slipping the bolts through the holes f'—f', and then screwing the nuts on the ends of the bolts. The framing with the resilient matrix is then slid into position in the casting chamber. When the parts of the box are in open position, as shown in Fig. 4, the casting mechanism is then started in operation. The back will move up to the core to close the box. This will force the matrix against the end rims E'—E', so that said rims will hold and position the resilient matrix in proper casting position when the box is closed. The molten metal is then forced or poured into the casting chamber. When the plate is sufficiently cooled, the back C drops from the core. As the back moves away from the core, the bolts 207 will move down through the holes f'—f' in the matrix, leaving the same free, so that the two straight ends thereof will spring away from the cast plate, as shown in Fig. 3. The continued downward movement of the back will cause the nuts 208 to engage the matrix and entirely remove the same from the plate, as shown in Fig. 4, if it has not previously cleared itself. As the back drops down away from the core, the stopping-piece 202 will move to the position shown in Fig. 3. The core is then given a half turn by the mechanism described in my previous patent. This will deliver the cast plate from the casting chamber. As the back again rises to close the box, the stopping-piece 202 will strike under the edge of the cast plate and free the same from the surface of the core, as indicated in dotted lines in Fig. 1. The conveyer Z will then move the plate from over the casting mechanism for further manipulation.

While the invention is herein shown and described as applied for use in connection with an automatically operating casting mechanism, it is obvious, of course, that the same can be applied and used in connection with any of the simpler forms of casting box which are opened and closed by hand. It is also obvious that the bolts 207 can be rigidly secured in the segmental back to serve their purpose when the box is opened. These bolts perform two functions, one, that of guiding the matrix into position before each cast, and the other, that of serving to free it along its center line after each cast.

Other mechanisms may be devised for controlling and guiding the resilient matrix so that the same will free itself from the surface of the cast plate when the box is opened

and so that the matrix will be brought to proper casting position for the succeeding cast when the box is closed.

As I believe I am the first to devise a matrix sufficiently resilient to free itself from a plate when the casting box is opened, and as I believe I am also the first to provide means for guiding and controlling a resilient matrix, I do not wish to be limited to the details of construction herein shown and described, as I am aware and fully understand that the substance of this present invention can be worked out and applied to any of the ordinary or improved forms of stereotype printing plate casting box without departing from the scope of my invention as expressed in the claims.

As I use the term "straight ends" in referring to the matrix, I mean the ends 211 and 212 thereof, which ends remain straight and are not curved as the matrix is brought into casting position. On the other hand, the edges 213 and 214 are brought to substantially semi-cylindrical shape as the matrix is brought to casting position.

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

1. A resilient matrix for casting a plurality of curved stereotype printing plates, which can be bent to curved shape in the casting box, and which will spring from the surface of the cast plates by its own resiliency when the box is opened after each casting operation.

2. A resilient matrix for casting a plurality of curved stereotype printing plates having resilient means embodied therein, whereby the matrix can be bent to curved shape in the casting box, whereby the resilient means will tend to free the matrix from the surface of the cast plate when the box is opened, and whereby the matrix can be restored to curved shape for the next cast.

3. A resilient matrix for casting a plurality of curved stereotype printing plates having resilient means embodied therein along two of its edges, whereby the matrix can be bent to curved shape in the casting box, whereby the same will tend to free itself from the surface of the cast plate when the box is opened, and whereby the same can be restored to curved shape in the casting box for the next cast.

4. The combination of a stereotype printing plate casting apparatus made up of a core and segmental-back, the annular space between the two forming a curved casting chamber, and a resilient matrix from which a plurality of plates can be cast arranged in said box so as to free itself from the surface of each cast plate when the core and back are separated.

5. The combination of a stereotype printing plate casting apparatus made up of a core and segmental back, the annular space between the two forming a curved casting chamber, and means for holding a resilient matrix in said chamber so that the same will assume the proper curved shape for casting and so that the same will strip itself by its own resiliency from the surface of the cast plate without disconnection from the holding means when the core and segmental back are separated.

6. The combination in a stereotype printing plate casting apparatus, of a core and segmental-back, the annular space between the two forming a curved casting chamber, and means for holding a resilient matrix from which a plurality of casts can be made so that as the core and segmental back are separated after each casting operation the matrix will free itself by its own resiliency from the surface of the cast plate and so that the matrix will be brought back to casting shape and position for the next cast.

7. The combination in a stereotype printing plate casting apparatus, of a core and segmental back, the annular space between the two forming a curved casting chamber, and means for holding a resilient matrix in position therein so that it will strip itself by its own resiliency at its two straight ends from the surface of the cast plate when the core and back are separated and so that it will be restored to casting position when the chamber is closed.

8. The combination in a stereotype printing plate casting apparatus, of a core and segmental back, the annular space between the two forming a curved casting chamber, and means for holding a resilient matrix in position therein along a line intermediate its two straight ends so that said straight ends will be free when the chamber is opened.

9. A stereotype printing plate casting apparatus made up of a core, segmental-back and end rings, and means for holding a resilient matrix in position so that said end rings will bring the matrix to casting shape and so that the matrix will strip from the cast plate by its own resiliency.

10. A stereotype printing plate casting box made up of a core, segmental-back and end rings, and means for holding a resilient matrix in position in said box so that said rings will bring the resilient matrix to casting position when the box is closed, so that the matrix will strip or unwind by its own resiliency from the surface of the cast plate when the box is opened, and so that said end rings will restore the matrix to casting position when the box is closed again.

11. A stereotype printing plate casting box made up of a core, segmental-back and end rings, and means carried by the segmental back whereby a resilient matrix is

loosely secured thereto with its straight ends free so that the matrix will free itself at its two straight ends from the surface of the cast plate and will then be moved bodily away from the surface of the cast plate as the box is opened and so that as the box is closed said end rings will bring the resilient matrix back to casting shape.

12. A stereotype printing plate casting box made up of a core, segmental-back and end rings, means for moving the segmental-back toward and away from the core to close and open the casting box, a resilient matrix and means carried by the segmental back for controlling the resilient-matrix so that the same will be positioned by the end rings when the box is closed and so that said matrix will free itself by its straight ends from the surface of the cast plate and move away therefrom with the back.

13. A stereotype printing plate casting box made up of a core, segmental back and end rings, and a matrix holding device having means for holding a matrix along a line between two straight edges, and means for attachment to the box.

14. A stereotype printing plate casting box made up of a core, segmental-back and end rings, and a matrix holding device having means for holding a matrix along a line between its two straight ends and means for attachment to said back.

15. A stereotype printing plate casting box made up of a core, segmental-back and end rings, a groove cut in said back, and a matrix-carrying-frame adapted to fit said groove.

16. A stereotype printing plate casting box made up of a core, segmental-back and end rings, a groove cut in said back, and a matrix guiding frame adapted to fit said groove and having means for loosely carrying a matrix along a line between its straight ends.

17. A stereotype printing plate casting box made up of a core, segmental-back and end rings, a groove cut in said back, and a matrix guiding frame adapted to fit said groove carrying bolts with nuts for controlling a resilient matrix.

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

H. A. WISE WOOD.

Witnesses:
SEYMOUR CONOVER,
JAS. H. CRAFT.