Dec. 15, 1942. H. N. DURHAM 2,304,785

STEREOTYPE PLATE CASTING INSTRUMENTALITY

Original Filed Jan. 16, 1939

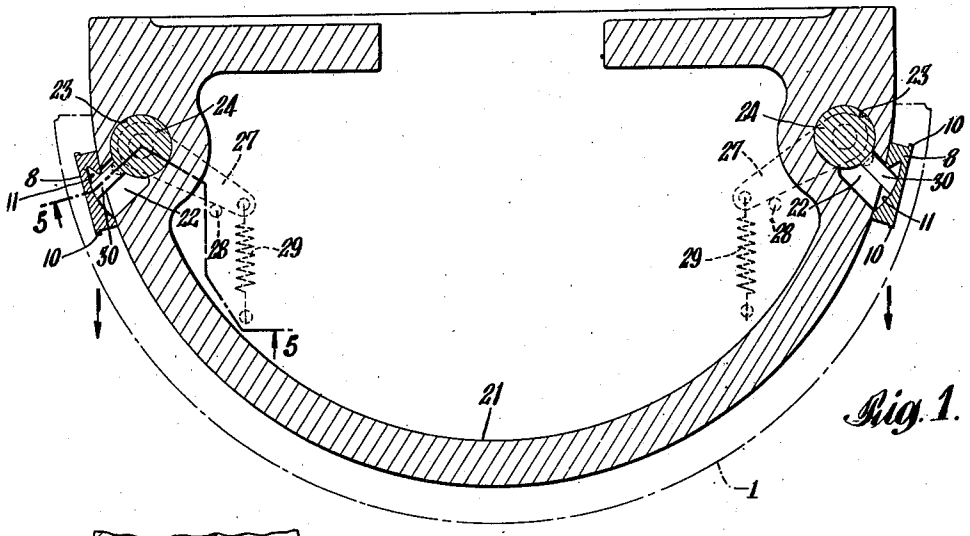


Fig. 1.

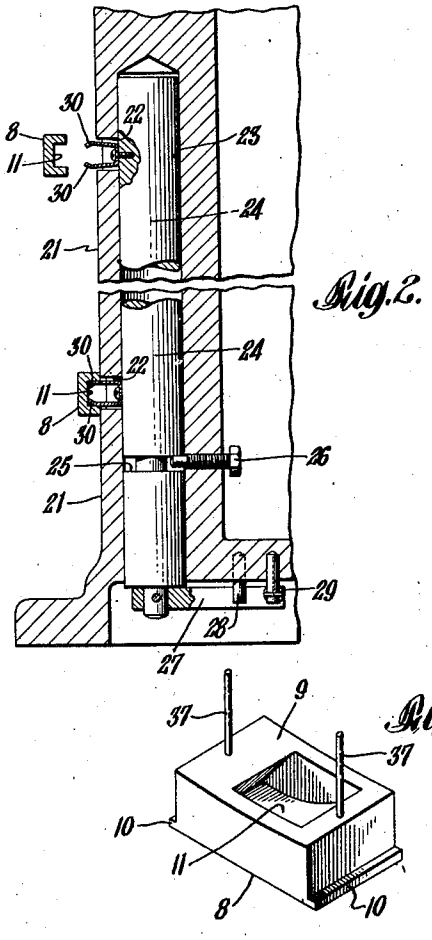


Fig. 2.

Fig. 3.

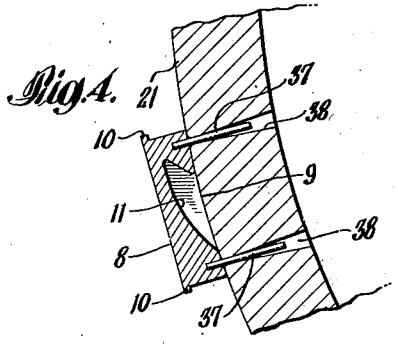


Fig. 4.

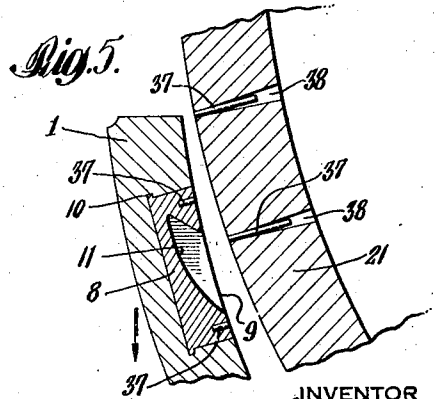


Fig. 5.

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Patented Dec. 15, 1942 2,304,785

UNITED STATES PATENT OFFICE

2,304,785

STEREOTYPE PLATE CASTING INSTRUMENTALITY

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Continuation of application Serial No. 251,210, January 16, 1939. This application August 28, 1941, Serial No. 408,661

3 Claims. (Cl. 22—2)

This invention relates to new and useful improvements in the art of stereotyping and more particularly to such improvements in casting curved stereotype plates which are held on the press cylinder by peripheral tension exerted on the head and tail of the plate and to a casting box adapted to cast such improved plates.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawing, referred to herein and constituting a part hereof, illustrates one embodiment of the invention, and together with the description, serves to explain the principles of the invention.

Fig. 1 is a transverse section through the core of a casting box, showing a mechanism for, and the method of casting the hook-holding insets in stereotype plates;

Fig. 2 is a fragmentary, detail section taken on line 5—5 of Fig. 1;

Fig. 3 is a perspective detail of one form of the hook-engaging units having shearing pins;

Fig. 4 is a fragmentary detail of a hook-engaging unit like Fig. 3 inserted in the core of the casting machine preparatory to casting; and

Fig. 5 shows the method of drawing off the cast plate with the hook-engaging insets cast into the plate, the holding pins being sheared to release the insets from the core.

This application is a continuation of my prior application, Serial No. 251,210, filed January 16, 1938, which was a division of my application, Serial No. 204,270, filed April 26, 1938.

The invention provides an improved cylindrical stereotype plate especially adapted for successful and satisfactory use when held upon the plate cylinder of the press by peripheral tension applied to the head and tail ends of the plate, with or without other holding means being applied to the plate, and to this end a plate is provided having embedded therein a plurality of hook-engaging devices, of block-like form, spaced apart along its straight edges, said devices being of relatively hard metal, having a higher melting point and a lower specific gravity than stereotype metal. Resiliently impelled hooks, mounted on the press cylinder, engage with these devices and strongly hold and tension the plate about the cylinder. A plate equipped with these insets may be subjected to very great peripheral tension without danger of breakage, deformation or strain, as often occurs when the tension is placed directly on the stereotype metal. The blocks are of hard metal able to withstand the pull of the hooks without breaking or deformation, and distribute the strain over a relatively large area of the plate, and particularly distribute the strain over a large extent lineally along the straight head and tail of the plate. The invention includes casting box structure in which the hook-engaging insets having the capacities and characteristics described, are positioned and temporarily attached to the core and within the casting chamber, and then are cast permanently into the plate as the stereotype metal is poured and cools. These holding blocks are usable over and over, being recovered from the molten plate metal, and again used in the casting chamber in the manner described. These are usually formed with the male member on the press cylinder and the female member in the plate. The invention also provides a novel method of casting curved stereotype plates having the hook-engaging devices of my invention embedded in the plates, whereby the devices are preliminarily detachably positioned along the straight edges of the core. The plates may be cast by the usual pouring and cooling process, during which process the hook-engaging devices are cast into, and made integral with, the plate, and when the casting box is opened by the recession of the drag with the plate in it these engaging devices embedded in the plate are detached from the casting box core by this usual opening movement of the drag. By this method, these devices are integrated with the head and tail portions of the plate to constitute a continuous reenforcement to take the pull on the head and tail of the plate.

The stereotype plates are supplied with the embedded and integrated hook-engaging devices whereby the plate is placed under tension peripherally about the plate cylinder with powerful resilient pressure exerted on the head and tail ends of the plate. The hook-engaging blocks for taking the resilient peripheral tension on the plate are adapted to cooperate with the plate holding and stretching means shown and claimed in Patent No. 2,047,357, dated July 14, 1936, to C. S. Crafts. In that patent the projecting hooks or holding members are mounted in the cylinder, and the hook-engaging recesses are formed in

the plate, and that is considered to be the more advantageous form for these devices, and the present invention is applied in like manner. In said patent, a plurality of spaced-apart hooks 7 are mounted in a straight line along an element of the plate cylinder 2, near the head of the stereotype plate, and are under-cut on their lead or forward sides so as to engage within recesses formed in like relation within and along the straight lead edge of the plate, to hold the plate in position upon the cylinder. In my parent application Serial No. 204,270, aforesaid, cooperating with these hooks 7 are a series of hook-engaging devices 8 of block-like form, which are embedded and integrated in the stereotype plate during the plate-casting operation. These members 8 have the same curvature as the core and plate, are of less height than the thickness of the casting chamber (i. e., of the plate) and have lateral projections located inwardly from the inner surface of the plate, so that when the plate metal cools the members 8 are securely embedded, integrated and interlocked in the plate. These devices are of relatively hard metal to give them strength and durability, as they are capable of being used over and over in successive stereotype plates. These devices are made of metal which has a higher melting point and a lower specific gravity than stereotype metal. Thus when the used plates are thrown back into the melting pot or stereotype metal reservoir, the devices will not melt, and will also float on the molten stereotype metal and are thus recovered for further use.

In the embodied form shown and described in said parent application, these devices 8 have their inner curved faces 9 flush with the inner cylindrical face of the stereotype plate, and the body of the device, which is embedded in the plate, has portions, preferably lateral projections, for firmly holding the device in the plate, and as shown these are in the form of lips or beads 10 projecting outwardly from inner edges of the body of the device. The devices are recessed on their inner surfaces, as shown at 11, to engage with and fit over the hooks of said Crafts Patent No. 2,047,357 and in said parent application, to hold the head edge of the plate in position on the plate cylinder. A plurality of similar spaced-apart hook-engaging devices 8 are cast into the straight tail edge portion of the plate 1, and these engage with a series of tension-exerting hooks such as are shown in said Crafts patent and said parent application. In a plate of this type exceedingly powerful peripheral tension may be placed on the stereotype plates without danger of breakage or deformation or other failure due to the nature of the stereotype metal.

Referring now to the exemplarily illustrated form of casting box and cooperating means whereby the two series of plate-engaging devices may be embedded in the stereotype plates during the plate-casting operation, the cylindrical core 21 of a stereotype casting box is shown in Fig. 1, with the cast plate 1 shown in dot and dash lines in position upon the core just previously to the opening of the drag, whereby the plate is carried away from the core, usually by a backward swinging or rocking movement of the drag, in the direction indicated by the arrows. The drag is not shown in the drawing, but may be of any known or suitable form. In Figs. 1 and 2 one form of means is shown for detachably positioning a plurality of the hook-engaging devices 8 in two spaced-apart lines, upon the core 21, adjacent the straight side walls of the casting chamber, preparatory to pouring the metal, so that the devices will be embedded and integrated in the cast plate near the straight edges of the plate when cast. Said form of positioning means comprises a plurality of apertures 22 formed in spaced-apart relationship along elements of the core, the holders for the devices 8 projecting through these openings, as later described. Mounted in a longitudinally-extending recess 23, formed within the wall of core 21, is a shaft 24, which is free to rotate, but is held against longitudinal movement by means of an annular undercut collar 25 formed in the shaft, into which projects the end of a screw 26, which is threaded into the wall of the core 21. Fixed to a projecting outer end of the shaft 24 is an arm 27, which is spring-held against a stop 28 by a tension spring 29. Fixed to shaft 24 and extending outwardly therefrom through the apertures 22 and protruding therefrom into the casting chamber, are pairs of spring fingers 30, which are shaped and dimensioned so that they will pass into the apertures 11 of the devices 8, will hold them frictionally, but will snap out of them when the plate is drawn away. Thus the hook-engaging devices 8 may be snapped over the holding clips 30, and are thereby positioned upon and along the core preparatory to casting the plate. When the drag is opened in the direction of the arrows in Fig. 1, the devices 8, now embedded in the plate, move in the same direction, at which time the holding clips 30 swing inwardly into the recesses 22 in the core and at the same time move out of the recesses 11 in the devices 8, as springs 29 yield to permit the necessary rotary movement of shaft 24. After the plate is clear, springs 29 restore the mechanism to the position shown in Figs. 1 and 2.

In Figs. 3, 4 and 5 are shown a different form of means for positioning and detachably holding the hook-engaging devices 8 within the casting chamber. In this form, long pins 37 are fixed in the inner curved surface 9 of the engaging device 8, and these pins pass into apertures 38 formed in the core 21, and thereby the hook-engaging devices 8 are arranged in two spaced-apart rows, adjacent to either straight wall of the casting chamber, as shown in Fig. 4, preparatory to casting the plate. After the plate has been cast and cooled, as the drag moves away from the core, carrying the plate 1, in the direction indicated by the arrows in Fig. 5, the pins 37 will be sheared off in the apertures 38, leaving the devices 8 embedded in the cast plate 1. The severed or sheared pins 37 are then pushed out of the apertures 38 preparatory to setting devices 8 for the casting of the next plate.

The mechanisms and devices just described are well adapted for carrying out the method of embedding in stereotype plates hook-engaging devices, of strong metal, having a higher melting point and a lower specific gravity than stereotype metal. As described, a plurality of the hook-engaging devices having these characteristics are detachably positioned in spaced-apart relationship near both straight edges of the core and within and near the straight side wall of the casting chamber. The stereotype metal is then poured in the usual manner and allowed to cool, and the holding devices will be embedded in the cooled plate. On opening the drag, which may be in the usual manner, the hook-engaging devices, now embedded in the core, and the positioning means which are positioned in the core, are separated from each other

by this opening movement, and the cast plate is delivered with the two rows of spaced-apart hook-engaging devices embedded near the straight edges of the plate.

The foregoing is a disclosure of my present preferred form of the invention, as to the novel devices, mechanism and method of my invention, and also of the present preferred form of practicing the invention, but it will be understood that departures may be made from said disclosure without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. As a plate casting instrumentality, in combination a stereotype casting box having a drag and a cylindrical core constituting a part of the casting chamber, said core having a plurality of spaced-apart orifices arranged adjacent to and along a straight wall of the casting chamber to be covered by a plurality of hook-engaging insets of less height than the thickness of the casting chamber, the insets having lateral projections and an internal hook-receiving recess on their inner faces, a plurality of holding and positioning members mounted within said apertures and extending therefrom to engage within said hook-receiving recesses to position the insets preparatory to casting a plate with which the insets are to be integrated, a shaft on which a plurality of said holding and positioning members are mounted, and a spring acting on said shaft, the movement of the drag away from casting position to open position causing said shaft to rotate against its spring and said holding and positioning members to rotate out of engagement with the hook-receiving recesses of said insets, the insets being embedded in the concave side of the plate but not extending through to the convex side.

2. As a plate casting instrumentality, in combination a stereotype casting box having a drag and a cylindrical core constituting a part of the casting chamber, said core having a plurality of spaced-apart orifices arranged adjacent to and along a straight wall of the casting chamber to be covered by a plurality of hook-engaging insets of less height than the thickness of the casting chamber, the insets having lateral projections and an internal hook-receiving recess on their inner faces, a plurality of holding and positioning members mounted within said apertures and extending therefrom to engage within said hook-receiving recesses to position the insets preparatory to casting a plate with which the insets are to be integrated, resilient means on which said members are mounted, whereby the movement of the drag away from casting position to open position causes the insets to be released from said members with the insets embedded in the concave side of the plate but not extending through to the convex side.

3. As a plate casting instrumentality, in combination a stereotype casting box having a drag and a cylindrical core constituting a part of the casting chamber, said core having a plurality of spaced-apart orifices arranged adjacent to and along a straight wall of the casting chamber to be covered by a plurality of hook-engaging insets of less height than the thickness of the casting chamber, the insets having lateral projections and an internal hook-receiving recess on their inner faces, a plurality of holding and positioning members mounted within said apertures and extending therefrom to engage within said hook-receiving recesses to position the insets preparatory to casting a plate with which the insets are to be integrated, rotary supports adjacent the orifices on which the members are mounted said rotary supports being rotatable to retract the members within the orifices to release the insets as the drag is moved from casting to open position.

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