

Sept. 15, 1953

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2,651,822

MOLD SUPPORTING DEVICE

Filed April 17, 1951

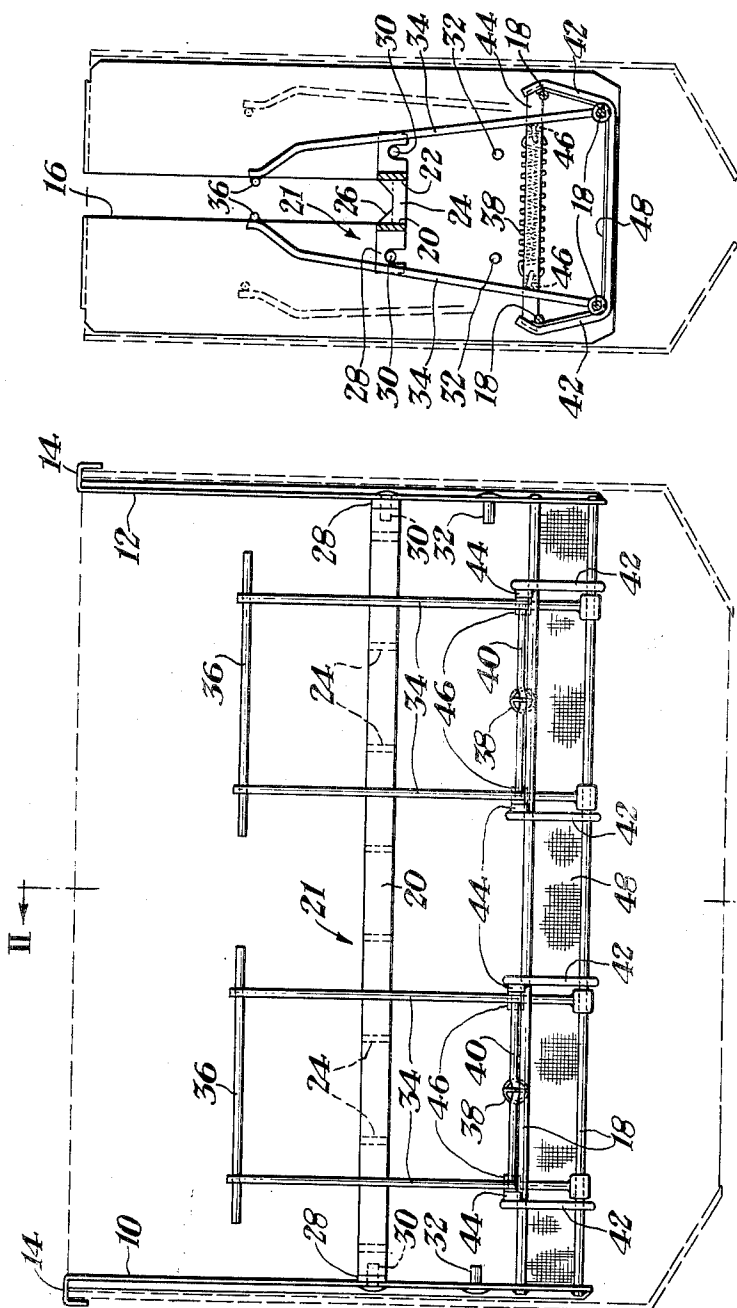


Fig. 2.

Fig. 1.

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2,651,822

MOLD SUPPORTING DEVICE

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Application April 17, 1951, Serial No. 221,423

5 Claims. (Cl. 22—90)

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This invention relates to casting apparatus and more particularly to supporting devices for shell-type molds.

Molds of the thin walled shell-type are comprised of a major portion of an inorganic molding material, such as sand, and a minor portion of an component serving to bind the inorganic material. The completed molds are in two or more matching parts having the form of hard, thin, shells of substantial strength. The inner faces of the matching parts are smooth and finished whereas the outer surfaces are left in a rough and irregular condition. Consequently, during the casting operation using such molds the common weighting methods for ordinary sand molds cannot be used with any degree of success.

In casting operations using shell-type molds it has been customary to imbed the mold parts in a loose, relatively coarse, granular material with the intention of enabling the mold to withstand the static pressure of the molten metal. Refractory materials, such as steel shot, sand and gravel have been proposed as suitable bedding material to be contained in the pouring box. It is difficult, however, to support the two halves of the mold in proper position within the casting box while the refractory material is loaded therearound.

An object of this invention is to support shell-type molds during the loading operation so that the operator is free to conduct the loading operation.

Another object of the invention is to support the mold in casting position in a manner which will not fracture or otherwise destroy the mold being supported.

Another object of the invention is to permit removal of the supporting device from the casting box in an expeditious manner after the casting operation.

Another object of the invention is to retain broken mold parts and other debris remaining from the casting operation within the supporting device for removal therewith from the casting box and thus avoid contamination of the loading material.

The supporting device for accomplishing these and other objects and advantages of the invention comprises a generally rectangular casing having opposite side walls defining an opening adapted to receive the mold. Mold support means extend across the casing between the side walls thereof and may be arranged for adjustment to two or more operative positions. A plurality of pivotally mounted retaining members are positioned in the casing and adapted for engagement

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with opposite sides of the mold for holding the same in position on the support. The retaining members are disposed in opposite pairs on either side of the mold for independent movement. Yieldable means is operable between each of the opposite pairs for rotating the free ends of the retaining members toward each other and relative to the mold positioned therebetween for retaining the same in position on the support means.

The side walls of the supporting device are provided with hooked ends which provide for demountable attachment from a casting box of suitable type. Such a casting box is fully disclosed and claimed in my copending application, Serial No. 183,363, filed September 6, 1950. A screen is positioned in the bottom of the supporting device for retaining broken molds and other debris within the supporting device for removal therewith from the casting box following the casting operation.

In the accompanying drawings:

Fig. 1 is a side elevation of the supporting device,

Fig. 2 is a cross-section taken on the line II—II of Fig. 1.

Referring more particularly to the drawing, a pair of oppositely disposed side-wall members 10, 12 are provided with hooked ends 14 for demountable attachment to a casting box as shown in broken lines. The median portion of each of the side-wall members 10, 12 at one end thereof is slotted, as at 16, to jointly receive the opposite ends of the shell-type mold. A plurality, in this instance four, connecting members in the form of tie rods 18 are positioned at the opposite end of the side-wall portions 10, 12 for securing the same in spaced relation. The arrangement of the side-wall portions 10, 12 and tie rods 18 forms a generally rectangular casing having opposite side walls defining an opening and provided with the slotted portions 16 and the hooked ends 14. The casing so formed is of sufficient size to receive the shell-type mold and also fit loosely within the casting box when supported therein by the hooked ends 14. It will be understood that the mold is spaced from the opposite side-walls of the casting box sufficiently to provide for loading the refractory material therearound as previously explained. However, the mold having its ends positioned in the slotted portions 16 is adapted to be supported at other points during the loading operation.

To this end, support means 21 for the mold bottom take the form of a pair of longitudinal bars

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20, 22 secured together in spaced relation by means of a plurality of cross-bar portions 24 which are suitably notched, as at 26, to provide guide means for the lower edges of the mold halves. The support bars 20, 22 and cross-bars 24 extend between and are supported in the side-walls 10, 12 by head portions 28 secured at either end to the support bars 20, 22 and which are suitably notched for engagement with a pair of projecting studs 30 carried by each of the side walls 10, 12 respectively. In order to provide for adjustment of the support means 21 relative to the side walls 10, 12, an additional pair of studs 32 project from each of the side-walls 10, 12 respectively in spaced relation to the studs 30. It will be apparent that more than these two positions may be provided, if desired, by the use of additional studs appropriately located on the side-walls 10, 12.

A plurality of pairs, in this instance four pairs, of retaining members in the form of rod members 34 are pivotally mounted at one end on two opposite tie bolts 18 to extend perpendicularly thereof toward the open end of the casing with the free ends extending beyond the support means 21. The rod members 34 are disposed in opposite pairs on each of the two tie bolts 18 for operative engagement on either side of the mold and for independent movement. The free ends of each of the pairs of rod members 34 are connected by a cross-bar 36 for unitary movement of each pair.

Yieldable means in the form of a pair of tension springs 38 is operable respectively between the opposite pairs of rod members 34 for biasing the cross-bars 36 on opposite sides of the mold toward each other. Each spring 38 has its opposite ends engaged with a pair of spring retainer bars 40 each of which is secured at opposite ends to the pairs of rod members 34 but preferably at the pivoted end thereof opposite the cross-bar 36. The coil springs 38 are chosen to cause the cross-bars 36 to exert sufficient pressure on the mold halves to retain the same in position on the support means 21, but insufficiently to crush the mold so supported.

Stop means are employed for limiting movement of the rod members 34 against the bias of the springs 38 and take the form of a plurality of angular shaped support rods 42, four in this instance, one of which is positioned on either side respectively of the rod members 34 and extending around each of the four tie bars 18. The support rods 42 may be secured by welding or other suitable means to the two opposite tie rods 18 not carrying the pivoted ends of the rod members 34. A pair of tension bars 44 are employed for connecting the opposite ends of each pair of support rods 42 respectively and extend substantially parallel with the springs 38 on either side thereof. Secured to each support bar 42 is a pair of stop plates 46 which project transversely therefrom adjacent each of the rod members 34 to limit movement thereof under bias of the springs 38. Thus, the free ends of the rod members 34 carrying the cross-bars 36 are maintained in spaced relation for ready separation to insert the mold. The support bars 42 provide convenient support for a screen 48 for retaining broken molds and other debris from entering the casting box to which the supporting device is applied.

The operation of the device will be apparent from the foregoing description. The device is applied to a suitable casting box by the hooked

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ends 14. The cross-bars 36 at the free ends of the rod members 34 may readily be separated from each other as described to insert a mold with its opposite edges within the slotted portions 16 of the side-walls 10, 12. The mold rests on the support means 21 which, as stated, is suitably notched at 26 for its reception. The cross-bars 36 and rod members 34 are then released to engage the mold and retain it in position during the shot loading operation.

After the casting operation, the mold is usually disintegrated and the pieces will fall on the screen 48 without entering the casting box. The support of this invention may be removed at any time from the casting box and emptied of debris as will be apparent. Many changes may be made in the details of construction and arrangement of parts within the scope of the appended claims.

I claim:

1. A supporting device for a shell-type mold, comprising a pair of oppositely disposed side-wall members, a plurality of connecting members extending between said side-wall members and being connected thereto for retaining the same in spaced relation, support means carried by said side-wall members, said support means extending between said side wall members and being adapted to engage the lower edge of a mold to support the same, and means for preventing lateral displacement of a mold on said support means including at least two oppositely disposed members pivotally mounted on said connecting members, yieldable means for biasing said pivoted members toward each other for engagement with the mold on said support means, and stop means for limiting said pivotal movement under said bias to maintain a spaced relation between said pivoted members in the biased position thereof.

2. A mold supporting device as claimed in claim 1 wherein said yieldable means comprises a spring acting between said pivoted members to bias the same toward said stop means.

3. A mold supporting device as claimed in claim 1 wherein said side wall members are slotted at the median portion thereof to receive the ends of the mold and prevent lateral displacement thereof.

4. A mold supporting device as claimed in claim 3 wherein said support means include a bar having guide means extending longitudinally between said slotted portions and supported by said side wall members.

5. A mold supporting device as claimed in claim 3 wherein said side wall members are provided with hooked ends adapted for demountable attachment on a casting box, and screening means beneath said support means for retaining debris for removal with the supporting device from the casting box.

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