Oct. 8, 1946. A. FRITSCHLE 2,409,121

DUMPING MECHANISM FOR MOLDS

Filed April 29, 1943 3 Sheets-Sheet 1

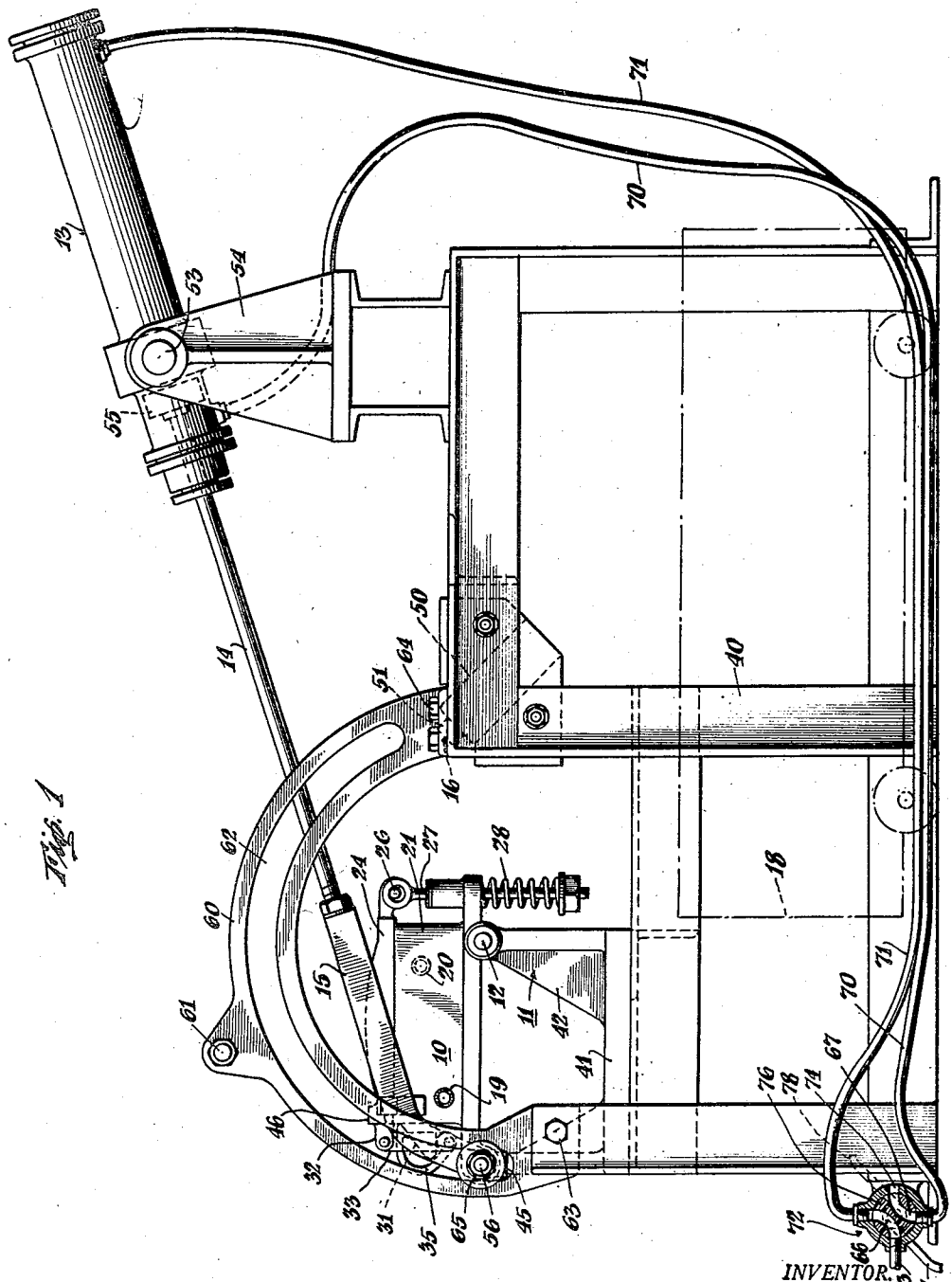


Fig. 1

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Fig. 3

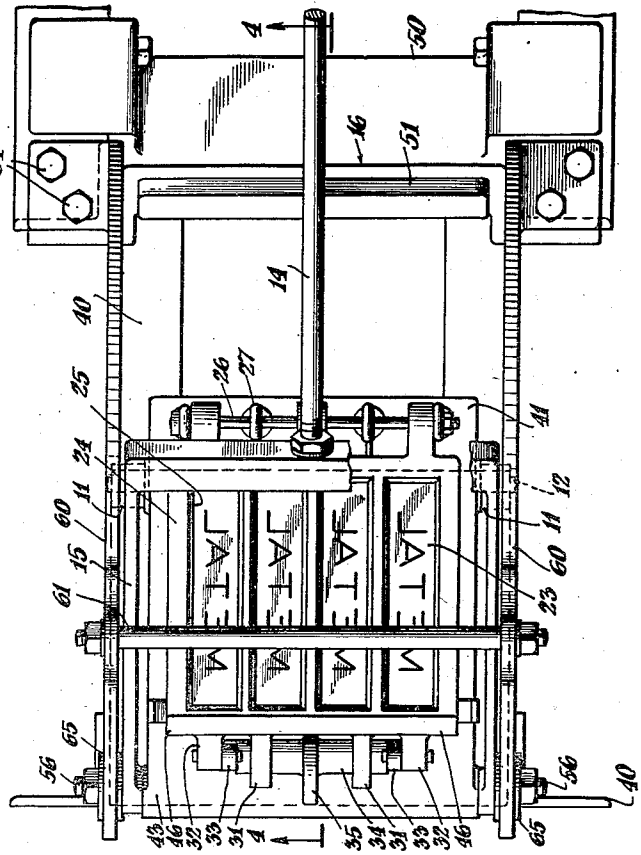
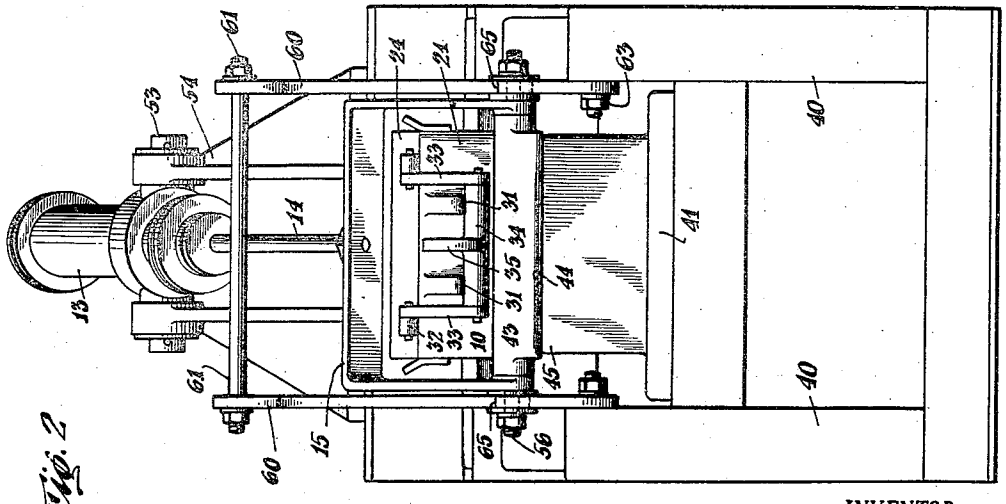


Fig. 2



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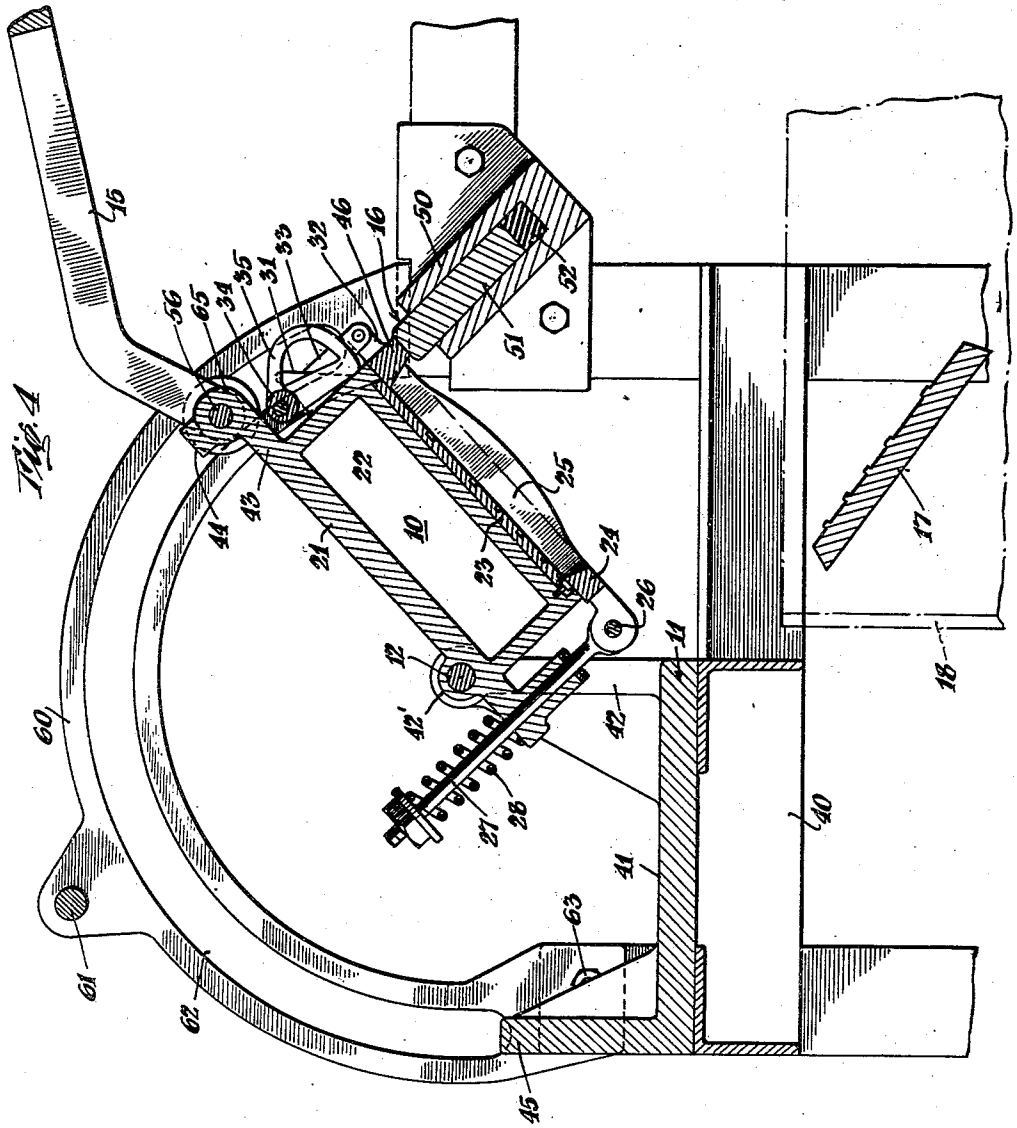


Fig. 4

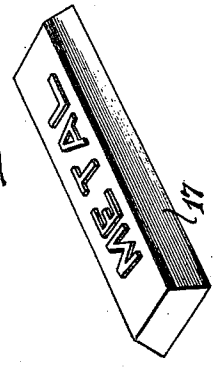


Fig. 5

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DUMPING MECHANISM FOR MOLDS

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Application April 29, 1943, Serial No. 484,968

5 Claims. (Cl. 22—91)

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The invention relates in general to the art of molding and more particularly to mechanism for dumping the castings from the molds.

The invention relates to mechanism for dumping ingot molds of the types described and claimed in application Serial No. 443,274, filed May 16, 1942, entitled "Multiple-bar, self-dumping mold," and which issued as Patent No. 2,330,277 on September 23, 1943, although it is not limited to such use.

The prior application relates to a multiple ingot, separable two-section mold, the lower section comprising a water bosh having a flat surface constituting a chill plate. A removable name plate is secured with a cavity in the chill plate surface. The upper section is in the form of a perforate plate-like skeleton member having a plurality of mold cavities extending entirely through the section. A hinge arrangement connects the two sections along one edge and a disengageable hand clamping arrangement connects the sections along the opposite edge. After the metal is cast, the clamping arrangement is disengaged and the upper section is raised and swung around its hinge to dump the metal bars from the mold.

According to a preferred form of the present invention, instead of unclamping the two sections for dumping the mold, the entire mold is hingedly mounted on a suitable framework about which the mold is swung to substantially invert the mold and dump the bars from the mold cavities. A suitable anvil arrangement takes the shock of dumping the mold and the framework is provided with clearance to receive a suitable dump car into which the metal bars may directly fall. Power mechanism for dumping the mold comprises a pivoted air cylinder mounted on the framework, the piston rod having a bail connected to the front of the mold and straddling the mold so as not to interfere with pouring. Suitable air valve control means is provided for operating the cylinder, both to move the mold to dumping position and to return the mold to pouring position. If desired, suitable guides may be provided in the form of semi-circular slotted ways in which rollers attached to the mold run to guide the mold and to take some of the weight off the main dumping hinge.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part hereof, in which

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Fig. 1 is a vertical side elevation of the mold dumping mechanism;

Fig. 2 is a front elevation;

Fig. 3 is a top plan view of that part of the mechanism supporting the mold;

Fig. 4 is an enlarged vertical section taken on the line 4—4 of Fig. 3, showing the mold in dumping position; and

Fig. 5 is one of the metal ingots produced by the mold.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

Referring now to the drawings, the mechanism comprises essentially the mold 10, frame 11, supporting the mold by hinge 12, an operating cylinder 13 having a rod 14 connected to a bail 15 straddling the mold 10 and connected to the front thereof by pivot 56. The mold rests upon a front ledge 45 for pouring and contacts a back anvil 16 for dumping, the cast bars 17 falling into car 18. The slotted guides 60 are arranged, one on each side, and extend from the front to the back of the apparatus, concentric with the dumping hinge 12, rollers 65 mounted on shaft 56 operating in the guideways.

The mold proper 10 comprises a water bosh 21 having a water chamber 22 and having one or more name plates 23 removably mounted in the top surface of the water bosh to constitute a chill plate. The water bosh 21 has a water inlet 19 on one side and a water outlet 20 on the other side connected by flexible hoses (not shown) to a suitable water circulatory system for keeping the mold cool.

Secured to the water bosh 21 is a skeleton top plate 24 divided into mold cavities 25 and connected to the water bosh by hinge devices 26 including rods 27 slidable in bosses attached to the water bosh 21 and having springs 28 acting to resiliently hold the two mold sections 21 and 24 together.

At the front end of the mold is a clamp whereby the mold sections may be easily separated. The clamp includes lugs 31 secured to the water bosh 21 and lugs 32 secured to the top plate 24.

Links 33 are pivoted to lugs 32 and carry a rotatable eccentric drum 34 having a finger loop or handle 35. Thus, to separate top plate 24 from water bosh 21, finger loop 35 is merely pulled outwardly to release the snubbing engagement between eccentric drum 34 and lugs 31. This permits swinging the links 33 away from the mold so that the top plate 24 may be separated from water bosh 21 about the hinge 26.

It will be understood that the manner of removably mounting the name plates 23, the construction of the water space 22 and the cooling arrangement, the details of the hinge construction 26 and of the clamping arrangement 34, 35, are disclosed in detail and claimed in the prior application and form no part of the present invention except as associated with the dumping apparatus.

The dumping mechanism comprises generally the frame 11 including a structural framework 40 on which is mounted a support or base 41. The base 41 has spaced rear columns 42 webbed or gusseted for strength through which a rod 12 passes, the rod also passing through an enlarged knuckle 42' on the bottom of water bosh 21 to form the main dumping hinge. The front of the water bosh 21 has a flange 43 and a depending boss 44 adapted to rest upon a front ledge 45 to locate the mold in pouring position.

To take the shock of dumping the mold, to help jar the cast bars or ingots 17 loose, an anvil 16 extending entirely across the frame is provided. The anvil 16 comprises a holder 50 having an anvil bar 51 slidably movable therein. Suitable cushioning material 52 is located between the anvil bar 51 and the bottom of holder 50. A raised lug 46 is provided along the front edge of top plate 24 to contact the anvil bar 51.

The operating mechanism for moving the mold 10 between pouring and dumping positions comprises an air cylinder 13 having trunnions 53 located in bearings 54 supported by the framework 40. The cylinder 13 has a piston 55 to which piston rod 14 is connected. Rod 14 is connected to bail 15 whose forked ends straddle the mold 10 and receive a shaft 56 which also passes through the flange 43 on the water bosh.

To help guide the mold and take part of the weight, semi-circular roller guides 60 are provided, concentric with the pintle 12 of the dumping hinge. The guides 60 have slots 62 and have lugs connected by a bracing and spacing rod 61. The front ends of the roller guides are bolted to the frame by bolts 63 and their rear ends by bolts 64. Rollers 65 mounted upon the ends of shaft 56 ride in the slots 62.

For operating the piston 55, flexible air lines 70 and 71 are connected to opposite ends of cylinder 13, these lines being connected to a valve 72 to which is also connected compressed air supply pipe 73. The valve 72 has an exhaust port 74 and a rotatable plug 76 having passages 66 and 67. Pedals 77 and 78 are mounted upon the same shaft as rotatable plug 76.

The operation of the device is as follows:

Assuming the mold 10 to be in the pouring position shown in Fig. 1, the molten metal is poured into the top mold cavities 25. After the metal solidifies, the operator depresses the pedal 78 which connects compressed air source 73 with pipe 70 causing the piston 55 to move to the right in Fig. 1, rotating the mold 10 about dumping hinge 12 causing the abutment 46 to engage the anvil bar 51 with a shock. This jars loose the metal ingots 17 which fall into the waiting car 18. To return the mold to pouring position, the pedal 77 is depressed, returning it to the position shown in Fig. 1. This connects pipe 71 to compressed air source 73 and pipe 70 to exhaust port 74, causing the piston 55 to return to the position shown in Fig. 1, and causing the knee 44 on mold 10 to abut the rest 45 whereupon the mold is in readiness for pouring the next set of ingots.

It will be understood that the guide slots 62 are longer than the corresponding movement of the mold so as not to interfere with the engagement of abutment 46 and anvil bar 51 in dumping position or with the engagement of knee 44 with rest 45 in pouring position. The rollers 65 in the slots 62 assist in guiding the mold in its movement between positions, and in relieving the load on the dumping hinge 12. The bail 15 straddling the mold does not interfere with the pouring of the molten metal in any way. Nor does the dumping operation interfere with the flexible hose connected to water connections 19 and 20. The dumping and returning operation is accomplished wholly by power, eliminating all manual exertion and the necessity for separating the top plate 25 from the water bosh 21 for dumping the ingots. It is only necessary to disengage top plate 25 from water bosh 21 when it is desired to change or renew the name plates 23.

The dumping mechanism is particularly useful with molds for casting various light metals and alloys, as, for example, type metal, solder, antimonial lead, babbitt, etc., although, of course, it is not limited to such use.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the substance of the invention.

What is claimed is:

1. In a self-dumping mold, a frame, an open-top ingot mold adapted to rest on said frame in pouring position, hinge means connecting the rear of said mold and said frame, an anvil in back of said mold to engage the mold when it is swung to dumping position, operating mechanism for moving said mold between pouring and dumping positions, a shaft passing through the front of said mold, semi-circular slotted roller guides concentric with said dumping hinge, and rollers in said guides disposed on said shaft.

2. In a self-dumping mold, a frame, an open-top ingot mold adapted to rest on said frame in pouring position, hinge means connecting the rear of said mold and said frame, an anvil in back of said mold to engage the mold when it is swung to dumping position, operating mechanism for moving said mold between pouring and dumping positions comprising bearings on said frame, a cylinder having trunnions in said bearings, a piston in said cylinder, a rod connected to said piston, a bail connected to said piston rod and straddling the mold, a shaft passing through the front of said mold and the ends of said bail, semi-circular slotted roller guides concentric with said dumping hinge, and rollers in said guides disposed on said shaft.

3. In a self-dumping mold, a frame including a mold support having a front ledge and back standards, an open-top ingot mold having a lower rear knuckle portion, a shaft passing through said rear standards and said knuckle portion forming a dumping hinge, said mold having at its front end a depending boss adapted to engage said front ledge to hold the mold in pouring position, said mold having a raised lug extending

across the mold, an anvil carried by said frame comprising a holder, a slidable bar in said holder, a cushion between said bar and the bottom of the holder, said raised lug engaging said bar to dump ingots from the mold, and operating mechanism for moving the mold between pouring and dumping positions comprising bearings on said frame, a cylinder having trunnions in said bearings, a piston in said cylinder, a rod connected to said piston, a bail connected to said piston rod straddling the mold, and a shaft passing through the front of said mold and the ends of said bail.

4. In a self-dumping mold, a frame including a mold support having a front ledge and back standards, an ingot mold made up of a lower water bosh and a flat top plate providing mold cavities, said water bosh having a lower rear knuckle portion, a shaft passing through said rear standards and said knuckle portion forming a dumping hinge, said water bosh having a depending front boss adapted to engage said front ledge to hold the mold in pouring position, the front of said top plate having a raised lug extending across the mold, an anvil carried by said frame comprising a holder, a slidable bar in said holder, a cushion between said bar and the bottom of the holder, said raised lug engaging said bar to dump ingots from the mold, operating

mechanism for moving the mold between pouring and dumping positions comprising bearings on said frame, a cylinder having trunnions in said bearings, a piston in said cylinder, a rod connected to said piston, a bail connected to said piston rod straddling the mold, a shaft passing through the front of said water bosh and the ends of said bail, semi-circular slotted roller guides concentric with said dumping hinge secured to said frame, and rollers in said guides disposed on said shaft.

5. Metal casting and dumping apparatus comprising: a frame, an open-top mold hinged at one end to said frame with its other end resting on the frame when the mold is in pouring position, an anvil carried on said frame to engage the said other end of the mold at its top when the mold is in its dumping position, fluid pressure means for inversive movement of the mold in an arc defined by the pivot axis of the hinged mounting of the mold aforesaid, and a bail member straddling said mold, said bail being pivotally attached to the free end of said mold and also connected to said fluid pressure means whereby upon actuation of the latter the mold may be moved from pouring position to dumping position and vice versa in the path of the arc aforesaid.

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