

Aug. 28, 1962

L. M. LIPMAN ETAL

3,050,792

APPARATUS FOR CONTINUOUS METAL CASTING AND PARTS THEREOF

Filed Aug. 27, 1959

2 Sheets-Sheet 1

Fig. 1.

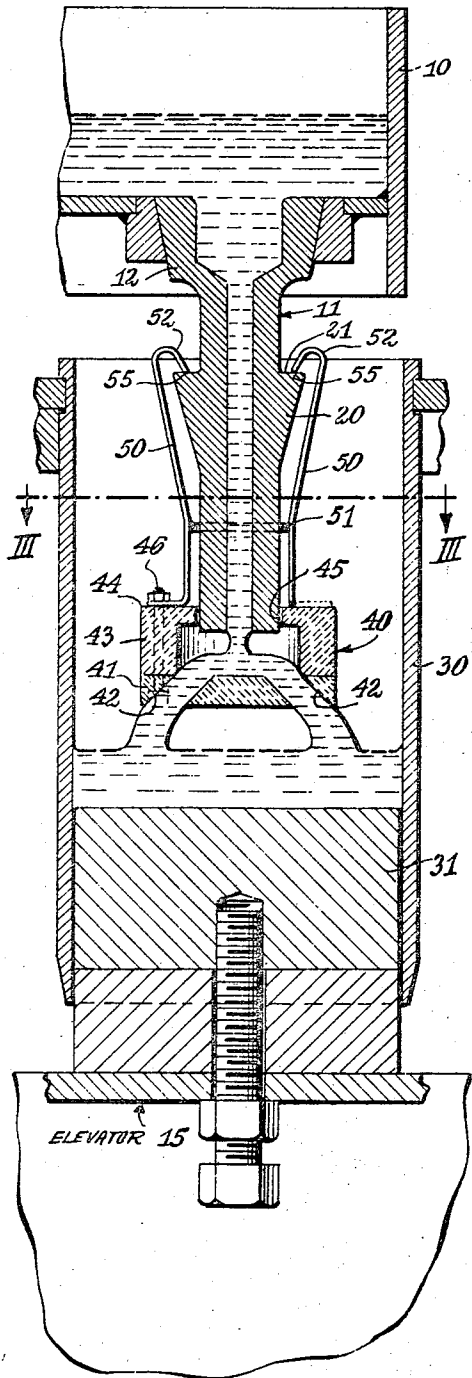
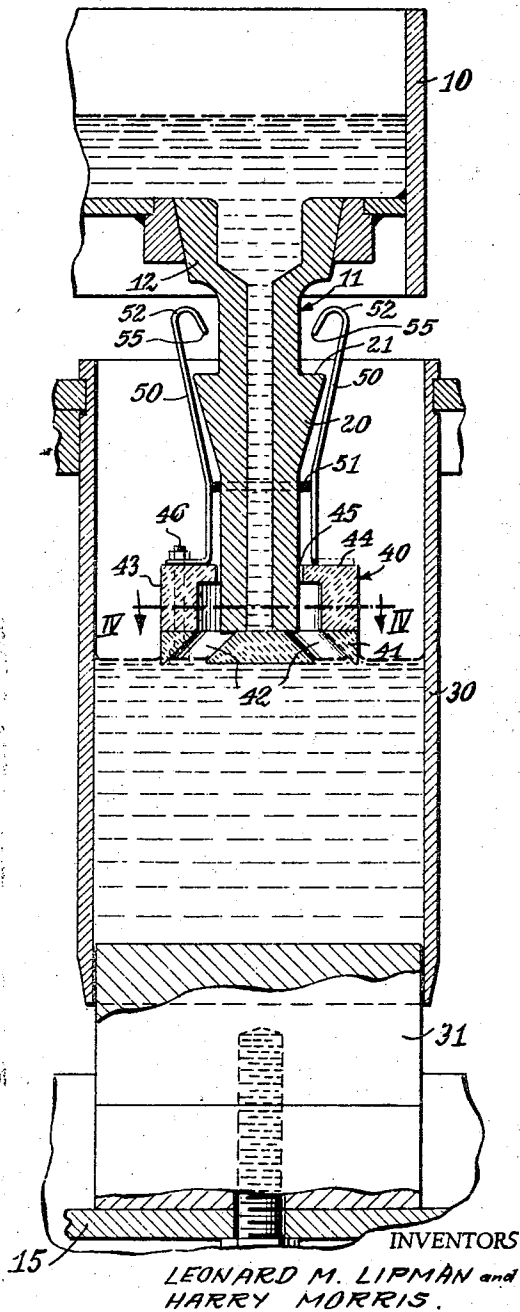


Fig. 2.



INVENTORS
LEONARD M. LIPMAN and
HARRY MORRIS.

BY *Angelo M. Pisarra*

ATTORNEY

Aug. 28, 1962

L. M. LIPMAN ETAL

3,050,792

APPARATUS FOR CONTINUOUS METAL CASTING AND PARTS THEREOF

Filed Aug. 27, 1959

2 Sheets-Sheet 2

Fig. 3.

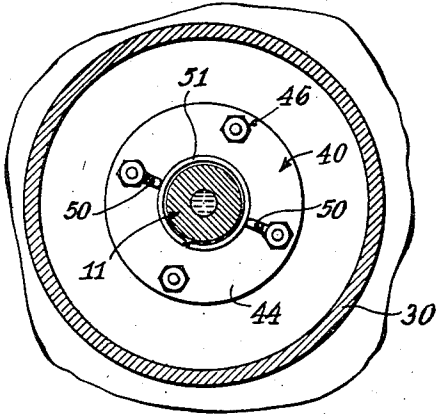


Fig. 4.

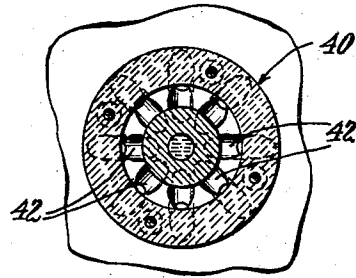


Fig. 5.

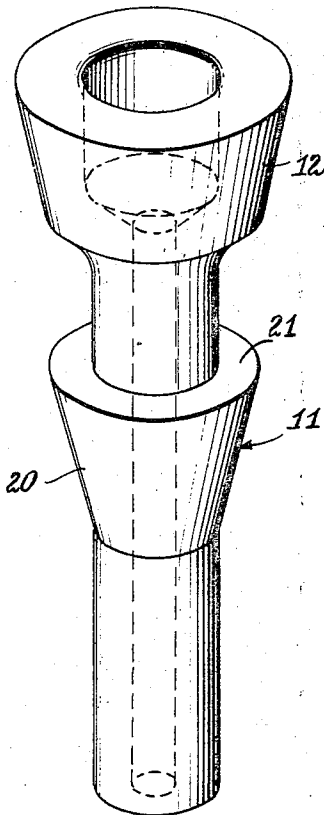
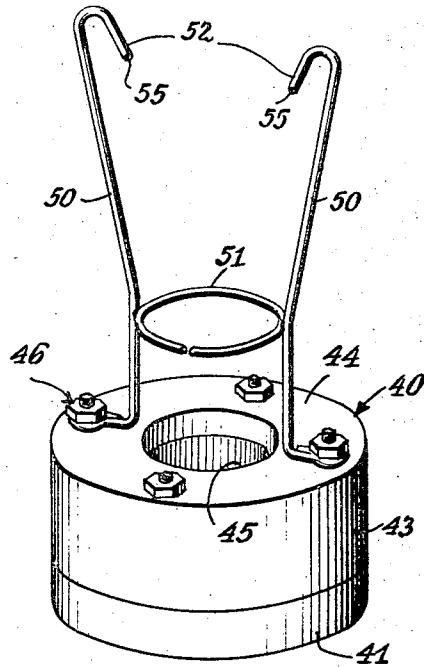


Fig. 6.



INVENTORS

LEONARD M. LIPMAN and
HARRY MORRIS.

BY

Angelo M. Pisana

ATTORNEY

1

3,050,792

APPARATUS FOR CONTINUOUS METAL CASTING AND PARTS THEREOF

Leonard M. Lipman, Hillside, and Harry Morris, Oradell, N.J., assignors to Warner Mfg. Corp., Bloomfield, N.J., a corporation of New Jersey

Filed Aug. 27, 1959, Ser. No. 836,392

2 Claims. (Cl. 22-57.2)

This invention relates to novel apparatus and to novel parts thereof. More specifically this invention is directed to novel apparatus employed in the pouring or casting of aluminum and also to novel parts thereof.

The primary object of this invention is to provide novel spouts and also means in combination with a float and adapted to cooperate with said novel spout to cut-off and also permit the flow of molten aluminum in the casting of aluminum. The object of this invention has been achieved by making simple, yet significant modifications in both the spouts and such means of the prior art.

The foregoing, as well as other objects and advantages of the present invention will be readily apparent, to those skilled in the art of casting, from the following description taken in conjunction with the appended drawings, wherein:

FIG. 1 is a fragmentary vertical cross sectional view of a portion of novel apparatus employed in the pouring or casting of aluminum, and shows the relative positions of the parts while the molten metal travels from the novel spout through the float and into the mold.

FIG. 2 is a view similar to FIG. 1 and shows the change in position of the stool and also of the float with the latter due to the change in the level of the molten metal in the mold whereby the float is in cut-off position to prevent the flow of metal from the spout and into the mold at that stage.

FIG. 3 is a cross-sectional view taken on line III—III of FIG. 1 in the direction of the arrows.

FIG. 4 is a cross-sectional view taken on line IV—IV of FIG. 2 in the direction of the arrows.

FIG. 5 is a perspective view of the novel spout, shown in FIGS. 1 and 2.

FIG. 6 is a perspective view of float and novel hanging means, shown in FIGS. 1 and 2.

As shown, there is a portion of a circular pouring pan 10 for receiving molten aluminum. Secured to said pan 10 are a plurality of depending spouts 11, only one of which is shown to illustrate the invention. Each spout 11 may be composed of grey iron or other appropriate material, has a head 12 secured to the pan 10 and depending therefrom, and has a central opening extending lengthwise thereof and communicating with said pan 10.

According to this invention that portion of the spout 11 below pan 10, which is otherwise cylindrical, is enlarged at an appreciable and material distance above the lower extremity thereof, with said enlargement being preferably in the shape of an inverted frusto-cone 20 to provide an annular shoulder 21 whose diameter is materially greater than that of the cylindrical portion of the spout 11 therebelow and thereabove.

The lower end of said novel spouts 11 extends into and is disposed in the upper part of a mold 30, and below the lower end of each spout 11 is a stool 31 extending into and disposed in the lower end of mold 30 and is adapted to travel away from the lower end of spout 11 due to downward travel of elevator 15 at a predetermined rate in the course of continuous casting operation.

Located in each mold 30 and disposed at the lower end of each spout 11 is an intermittent cut-off asbestos or heat resistant float 40. Each float 40, in general consists of a bottom portion 41 having a plurality of angularly disposed openings 42 therethrough at the outer

2

marginal portion thereof, a short cylindrical portion 43 extending upwardly from the bottom portion 41 and having a top portion 44 with central opening 45 whose diameter is slightly larger than the lower cylindrical portion of spout 11. The portions 41, 43, and 44 are all secured to each other by the locking nuts and bolts 46.

Also according to this invention, a plurality and as shown a pair of diametrically disposed supporting wires or rods 50 are secured to the float 40 through a pair of said diametrically disposed nuts and bolts 46 and extend upwardly therefrom. A ring 51 whose internal diameter is approximately that of the opening 45 in the float is disposed above the float, is welded to the rods 51 and is substantially concentric with respect to opening 45. This ring 51, which may be continuous or split as shown, serves to lock wires or rods 50 in position and maintain them in substantially fixed relation with respect to each other and also serves as a guide for the lower end of spout 11 coupled therewith. The portions of rods or wires 50 extending upwardly from the float 40 to said ring 51 are approximately parallel to each other. The portion of each rod or wire 50, above ring 51, which may be flexed by hand, is bent outwardly and the ends 53 thereof are bent inwardly towards each other and preferably inwardly and downwardly as shown in FIGS. 1, 2, and 5. The distance between the extremities or the bearing portions 55 of the rods or wires 50 and the upper face of the top portion 44 of the float is less than the distance between the supporting shoulder 21 of spout 11 and the lowermost face thereof.

According to this invention, each float 40 is coupled with a spout 11, by inserting the lower end of the spout through ring 51 and into the chamber of the float 40 and in the course of this procedure, the extremities 55 of the ends 52 bear against 20 whereby the diverging portions of rods or wires 50 are flexed outwardly until the extremities 55 are positioned immediately above the annular shoulder 21 whereupon said diverging portions of the rods or wires 50 automatically flex-back and return to their original positions and the extremities 55 of the ends 52 bear against the shoulder 21 to support or free-hang the float 40 in position as shown in FIG. 1. In this position the lower end of spout 11 supporting the freely hanging float 40, is spaced from the upper face of the bottom portion 41 of float 40 and molten metal from the pan 10 may pass from said pan through spout 11 into the chamber of float 40 through its openings 42 and into the mold 30 closed by stool 31, as shown in FIG. 1.

In the course of continuous casting, the level of the molten metal in each of the molds sometimes tends to rise above a predetermined level notwithstanding predetermined rate of movement of each stool 31 away from the lower end of each spout 11, as said stools are moved downwardly by travel of elevator 15 to which they are coupled. In the event the level of the molten metal in any of the molds rises above said predetermined level as shown in FIG. 2, the float 40 in that particular mold is automatically lifted by said metal to force the upper face of the lower portion thereof against the lowermost extremity of spout 11 coupled therewith thereby to shut-off the flow of molten metal into that particular mold as shown in FIG. 2. This shut-off is maintained in only that mold until the metal in said mold is withdrawn to such degree by subsequent movement of stool 31 that the upper level of the metal in the mold is lowered whereupon the float 40 and hangers 50 automatically drop to their original position and flow of metal into the mold is resumed as shown in FIG. 1.

While the invention has been described in detail, it is not to be limited to the exact constructions shown and described which are given merely by way of example

3

and illustrate a preferred embodiment thereof. It is understood that various changes and modifications may be made without departing from the spirit of the invention.

We claim:

1. In an apparatus for continuous casting and including a pour pan, a spout depending therefrom, a mold, a movable stool, and a float, the improvement comprising in combination therewith a shoulder on an inverted frustro-conical portion of said spout, and means for hanging said float on said shoulder whereby said float is movable up and down in response to the level of metal in said mold to automatically prevent and permit the flow of metal from said pan into and through said spout and float into said mold, with said means comprising a plurality of elements secured to said float and extending upwardly therefrom, with the free ends of said elements extending inwardly from said upwardly extending portions thereof and adapted to rest on said shoulder to support said float in its lowermost position, said elements being resiliently flexible thereby capable of being deformed outwardly when slid over said frustro-conical portion and then returned inwardly to dispose said ends on said shoulder.

2. In an apparatus for continuous casting and including a pour pan, a mold, a spout depending therefrom and extending into the upper end of said mold, movable stool extending into the lower end of said mold and movable away from said spout in the course of continuous casting, and a float having an opening therethrough for

4

the passage of molten metal, said float located in said mold, with a portion thereof disposed between said spout and said stool, the improvement comprising in combination therewith a shoulder on an inverted frustro-conical portion of said spout, and means for hanging said float on said shoulder whereby said float is movable up and down in response to the level of metal in said mold to automatically shut-off and permit the flow of metal from said spout, said means comprising a plurality of elements having the lower ends thereof secured to said float and extending upwardly therefrom, means secured to the lower portion of said elements to maintain said portions in substantially fixed relationship with respect to each other, and adapted to accommodate the lower end of said spout for extension therethrough, the upper free ends of said elements extending inwardly towards each other and adapted to rest on said shoulder to maintain said float in its lowermost position, said elements being resiliently flexible thereby capable of being deformed outwardly when slid over said frustro-conical portion and then returned inwardly to dispose said ends on said shoulder.

References Cited in the file of this patent

UNITED STATES PATENTS

1,139,887 Mellen ----- May 18, 1915
2,891,291 Schnacke ----- June 23, 1959

FOREIGN PATENTS

256,026 Switzerland ----- Feb. 16, 1949