Dec. 10, 1940. A. H. JUNG 2,224,514

MELTING POT

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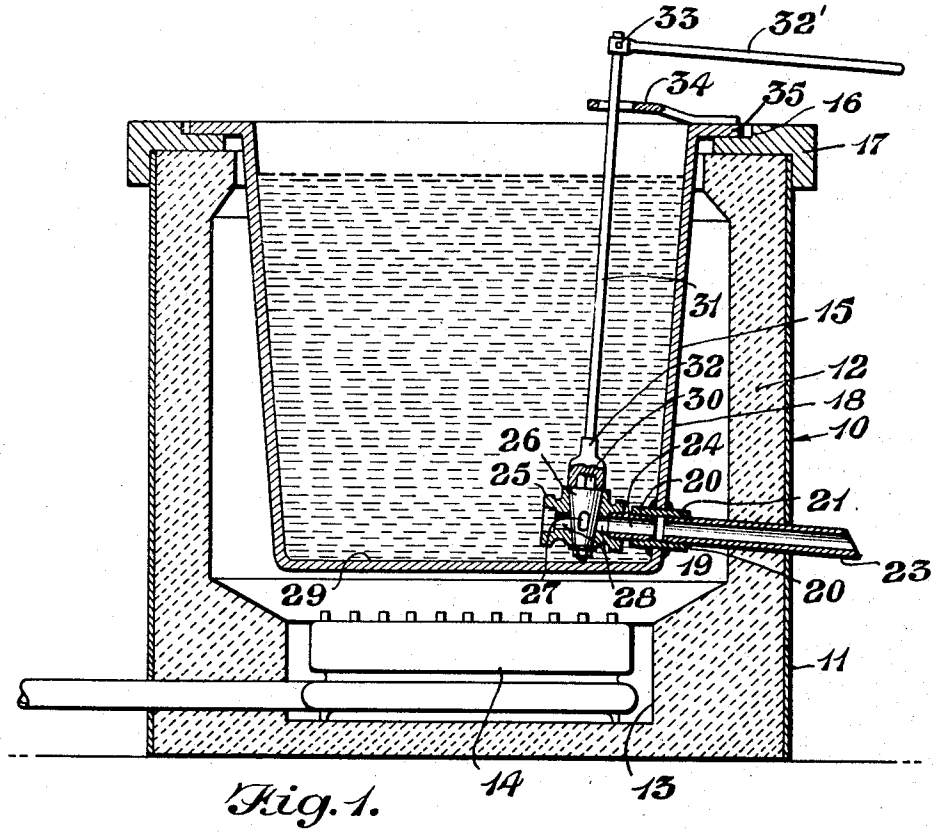


Fig. 1.

Fig. 2.

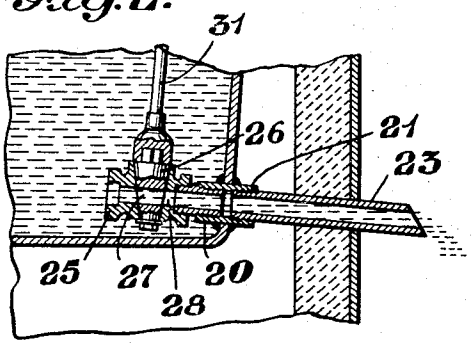


Fig. 3.

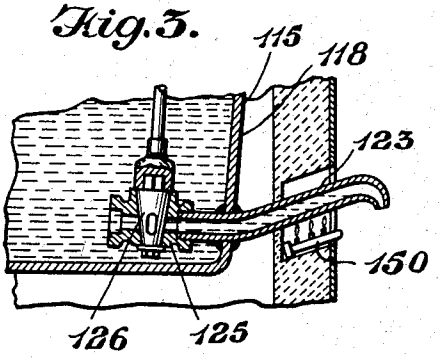
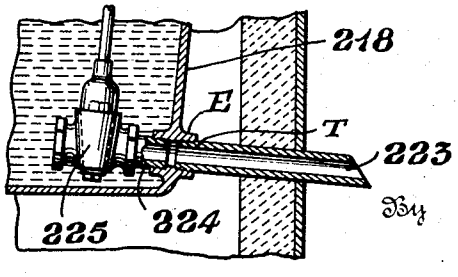


Fig. 4.



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MELTING POT

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Application April 28, 1939, Serial No. 270,633

1 Claim. (Cl. 266—33)

This invention relates to melting pots and more particularly to a bottom pouring pot and the control of the outlet thereof.

Prior to the instant invention melting pots have been provided with bottom pour outlets including valves in said outlet but such pots and their controls have been relatively unsatisfactory for they have been expensive to manufacture, easily injured, subject to undesirable leakage and freezing, and their design has been such as to promote the formation of oxidation or dross which is generally objectionable as it wastes metal and is unsightly.

It is an object of the instant invention to provide a melting pot having a bottom pour outlet and a control therefor which may be readily fabricated of simple and inexpensive elements, capable of accurate control, practically incapable of injury and substantially not subject to leakage.

It is a further object of the invention to provide a melting pot, including a bottom pour outlet, and a control therefor which generally inhibits the formation of dross on the surface of the discharged molten metal.

Other objects and the nature and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a vertical view of a furnace incorporating a bottom pour melting pot and a valved control therefor in accordance with the invention;

Fig. 2 is a fragmentary sectional view illustrating the control for the kettle with the valve in open position;

Fig. 3 is a view similar to Fig. 2 with the valve closed but illustrating a modified form of pouring spout;

Figure 4 is a view similar to Figs. 2 and 3 and illustrates a cast iron pot with the means for holding the pouring spout and valve assembly cast integral with the pot.

Referring to the drawing, a furnace 10 comprising a casing 11 lined with the refractory material 12 having a bottom well 13 in which a burner 14 is located directly below the bottom of a melting pot 15 suspended at its upper outer margin from the shoulder 16 of the cap 17 which covers the top edges of the casing 11 and the refractory lining 12.

Formed within a lower portion of the vertical wall 13 of the melting pot 15 is an opening 19 to which is welded a nipple 20 having internal screw threads 21 which cooperate with the inner end of the pour spout 23 and the externally threaded connector 24 which secures the valve body 25 to the assembly. In cooperating relation with said valve body is the frusto-conical rotary valve element 26 having an opening 27 therethrough which is adapted to register with the openings 28 within the valve body 25 which in turn cooperates with the interior of the connector 24 and the passage through the pouring spout 23. The pouring spout 23 is pitched at a slight angle from the horizontal whereby gravitational forces will ensure the emptying thereof of molten metal. The valve 26 being spaced from the bottom wall 29 of the pot 15, there will always be sufficient hot metal within pot 15 to prevent freezing of the valve. This valve 26 and the interior of the valve body 25 with which the valve cooperates need not be accurately machined but may be simply of a relatively lower standard usually associated with cast iron valves of this type. The upper portion of the valve 26 may be formed with a projection 30 of square horizontal section whereby the operation of the valve may be readily effected by an operating rod 31 formed at its lower end with a socket 32 having an interior which cooperates with the projection 30.

The stem 31 need not be accurate nor is it necessary that it be formed with screw threads as is found on conventional valve stems associated with bottom pour melting pots. Rotation of the valve stem 31 may be effected by the relatively long handle 32' which is secured to the upper portion of the valve stem 31 by the screw 33. The handle 32' may be of a length which extends over the upper outer edge of the melting pot 15 and the furnace cap 17 whereby the operator's hand need never be subject to the hot ambient directly above the melting pot.

When the handle 32' is rotated to bring the valve 26 to its open position as illustrated in Fig. 2, the molten metal will flow directly through the valve body 25, the opening 27 within the valve 26, through the exterior of the connector 24, and through the discharged spout 23 with substantially no formation of dross as the hot metal does not fall through an air space as in conventional bottom pouring melting pots with which the formation of dross is associated.

As the function of the stem 31 is simply to effect rotation of the socket end 32 which in turn causes rotation of the valve 26 the accuracy with which the said valve stem is fabricated is relatively unimportant and accordingly the assembly may be made very inexpensively. Though

the parts described and illustrated are relatively simple, yet accurate control is effected by the operator by turning the handle 32' an amount to give the required discharge. When the valve 26 is in the position illustrated in Fig. 1 no leakage occurs as the frusto-conical valve 26 effects a double seal and further the frusto-conical shape tends to prevent leakage when associated with a melting pot as described, despite relative inaccuracy of parts as compared with other valves of the needle or plug type. A guide 34 may be associated with the upper portion of the stem 31 and secured to the upper flange 35 extending from the vertical wall 18 of the melting pot 15.

In order to minimize the formation of dross, it is essential that the molten metal not fall through an air space and accordingly the upwardly bent spout 123 illustrated in Fig. 3 is associated with the wall 118 of the melting pot 115. The inner end of the spout 123 is associated with the valve body 125 and is controlled by a rotary frusto-conical valve 126. As the spout 123 is of such configuration that it does not empty itself, in order to prevent freezing of metal therein, the heating element 150 is located in alignment therewith and keeps the metal therein in a static molten state until the valve 126 is rotated to its open position and additional metal discharged from the pot 115. In the embodiment of the invention illustrated in Fig. 3, as in that illustrated in Figs. 1 and 2, the valve 126 and valve body 125 are always in thermal contact with hot molten metal and the freezing thereof is prevented.

It is to be understood that it is within the scope of the invention to cast the pot 218, see Fig. 4, with an enlarged portion E which may be tapped to receive the correspondingly threaded end T of the spout 223, and the connector 224 which serves to hold the valve body 225 in operative relation with the interior of the pot. In this embodiment of the invention the valve assembly may be precisely that illustrated in Figs. 1, 2 and 3 and described above. This construction eliminates the necessity for additional nipples such as utilized in the embodiment illustrated in Fig. 1.

Accordingly, it will be understood that the melting pots described may be simply and readily fabricated of inexpensive components and at the same time the device will be rugged, practically incapable of injury by contact with solid objects within the pot such as ingots, inhibits the formation of dross, does not freeze or stick and will not leak.

It will be obvious to those skilled in the art that various changes may be made in this device without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawing and described in the specification but only as indicated in the appended claim.

What is claimed is:

A melting pot having a generally vertical wall and a bottom wall, a generally horizontal pouring spout and a rotary valve having a generally vertical turning axis, said valve controlling communication from said pot through said spout, said valve having contacting surfaces located within said melting pot and spaced from said bottom wall whereby the said surfaces are in direct thermal contact with molten metal on all sides, said valve and pouring spout being so associated with each other that when said valve is open, the openings through the valve and said pouring spout are in alignment.

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