Aug. 17, 1965 E. J. WILLIAMSEN 3,200,452

DEVICE FOR CASTING BATTERY GRIDS

Filed April 16, 1962

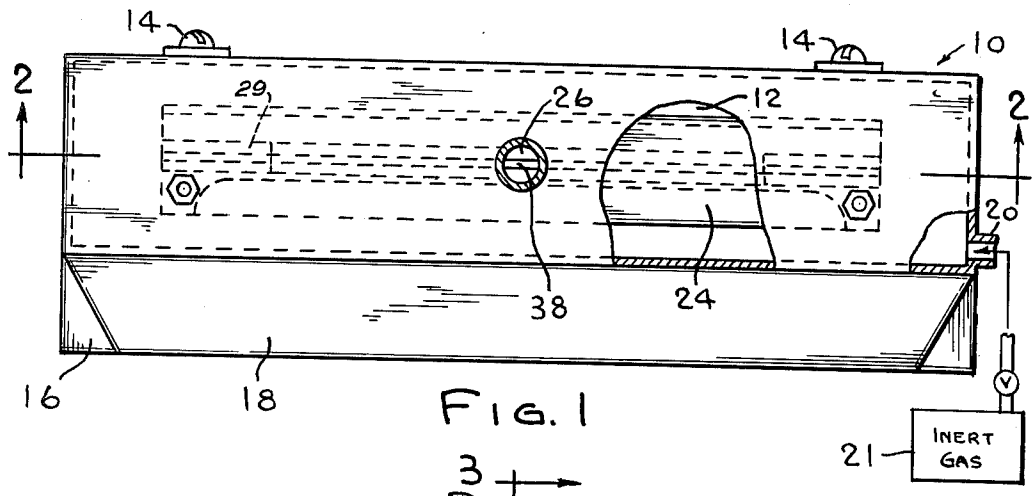

FIG. 1

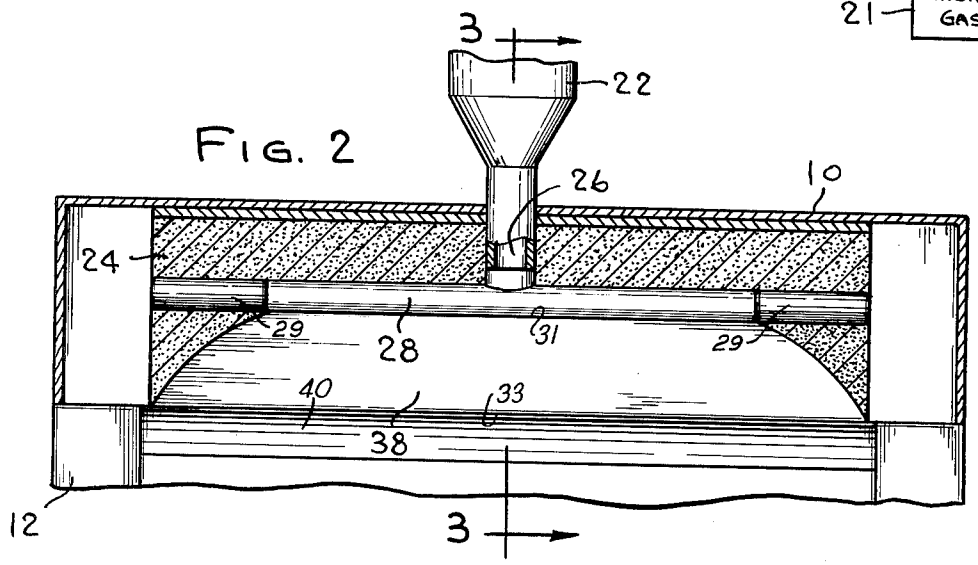

FIG. 2

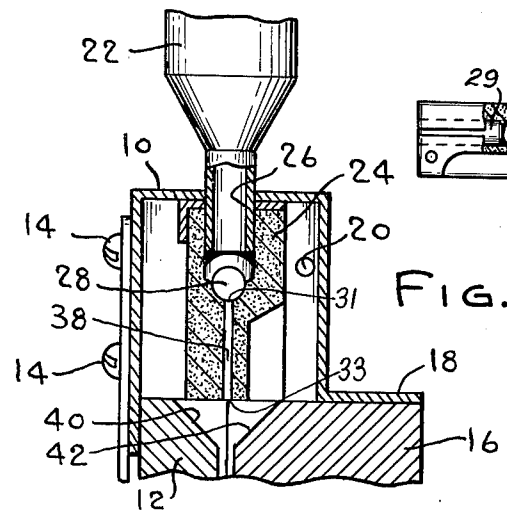

FIG. 3

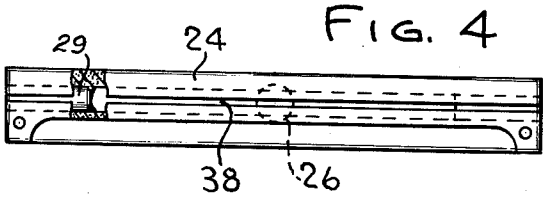

FIG. 4

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DEVICE FOR CASTING BATTERY GRIDS

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4 Claims. (Cl. 22—79)

This invention relates to an improved method and apparatus for casting battery grids.

Battery grids are generally cast in a two-piece mold which is closed automatically and a metered amount of molten lead poured into the mold. Grids cast in this manner have lead oxide inclusions chemically formed during pouring by the action of the oxygen on the lead as it is poured in the mold. The formation of the lead oxide is enhanced by the turbulence of the molten lead as it is poured onto the mold. These inclusions adversely effect the life of the grid through the relatively rapid breakdown of the grid at the inclusion areas.

The primary object of this invention is to improve the operating life of battery grids.

Another object of this invention is to provide an improved means for casting battery grids which reduces lead oxide formations to a minimum.

Another object of the present invention is to provide a means for evenly distributing the molten lead throughout a battery grid mold.

These objects are accomplished by purging the mold with a purging gas prior to pouring the molten lead into the mold. A hood is placed on the top of the mold and purging gas blown into the hood under pressure. The purging gas will be forced into the grid pattern of the mold so that no oxygen will be present in the mold when the molten lead is poured. The molten lead is distributed to the mold through a distributor head mounted within the hood and connected to the end of the pouring spout. The distributor head is designed to progressively change the molten lead flow path from a passage to a narrow slit-type passage which overlies and extends across the entire width of the mold. The lead will then be evenly distributed across the width of the mold in a thin flat stream that will flow readily into the mold. Battery grids cast in this manner have been found to have less lead oxide inclusions which has resulted in longer operating life for the grids.

Other objects and advantages will be pointed out in or be apparent from the specification, as will obvious modifications of the embodiment shown in the drawing, in which:

FIG. 1 is a top view partly broken away of the hood for a battery grid mold;

FIG. 2 is taken on line 2—2 of FIG. 1 showing the distributor hood;

FIG. 3 is taken on line 3—3 of FIG. 2 showing a side view of the distributor head; and

FIG. 4 is a bottom view of the distributor head.

Referring more particularly to the drawings, hood 10 is shown mounted on one section 12 of a battery grid mold by bolts 14. The other section 16 of the mold is brought into contact with the first half section of the mold with lip 18 on the hood seated on the top of the second half section of the mold. A positive flow of inert gas, nitrogen, is maintained in the hood through inlet 20. The gas purges the hood and mold of any oxygen entrapped therein from a source 21 of gas under pressure. The hood and two sections of the mold are held together but are not sealed with a gas tight seal so that thereby the purging gas can force the oxygen out of the mold through the seam between the two sections.

After the mold has been purged of oxygen a metered amount of molten lead, sufficient to fill the mold to the proper level, is poured into reservoir 22 secured to the top of the hood. The molten lead will flow by gravity into distributor head 24 through inlet passage 26. The distributor head is made of a material to which lead will not adhere. A passage 28 is provided in the head and is transverse to and intersects passage 26 and is of a smaller diameter. The molten lead will flow into the transverse passage and out of the head through slit 38 cut into the bottom of the distributor head along the lower side of passage 28. The outlet passage or slit 38 is of smaller width than the width dimension of the transverse passage 28 and of the inlet passage 26 so that the resistance to flow therethrough will cause molten metal to distribute throughout the length of the transverse passage and provide all parts of the slit with a supply of molten metal. The elongated passage 28 is defined at its ends by pins 29. This construction is a manufacturing expedient in that it permits the drilling of a hole through the entire head and the subsequent insertion of the pins at both ends of the hole to thereby provide the passage 28. The slit flares outwardly from its entrance 31 to its exit 33 to allow the lead to spread out the full length of the mold. A thin flat stream of lead will flow out of the slit and into a groove formed in the top of the mold by sloping surfaces 40 and 42 which guide the lead into the mold.

This arrangement of the hood and distributor head provides a simple and inexpensive means for purging a mold of oxygen immediately prior to casting grids and reduces the formation of lead oxide in the grids during the pour operation to a minimum. The distribution of the molten lead over the entire width of the mold has also been found to hasten the flow of the lead into the mold and has made it possible to reduce the initial operating temperature of the lead.

Although but one embodiment of the present invention has been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. A distributor head for a battery grid casting mold having an elongated top mold opening, comprising:

a member having a generally vertically extending inlet passage;

a transverse passage connected to said inlet passage and extending generally horizontally and transverse to said inlet passage, said inlet passage having a smaller transverse dimension than the length of the transverse passage; and

a slit passage having an entrance which is connected along its length to said transverse passage, said slit passage extending downwardly and having an exit which is adapted to overlie the mold opening, the width dimension of said slit passage being smaller than the width dimension of said inlet passage and smaller than the width dimension of said transverse passage to thereby cause molten metal which is introduced to the head at said inlet passage to be conveyed in a uniform manner over the length of the elongated top mold opening.

2. A distributor head according to claim 1 wherein the length dimension of the entrance to said slit passage is smaller than the length dimension of the exit of said slit passage, and wherein said slit passage flares lengthwise outwardly between said entrance and exit.

3. An apparatus for pouring battery grids comprising:

two associated mold sections assembled so that they may be brought together to form a mold cavity with an elongated top opening and so that they may be separated to facilitate removal of a cast grid;

a hood overlying the top faces of said mold and communicating with said opening when said sections are brought together;

a distributor head positioned in said hood and located above said mold sections, said distributor head having a generally vertically extending inlet passage in communication with the atmosphere outside of said hood and with a slit passage in said head, said slit passage having an exit overlying said elongated top opening and serving to convey molten metal to said mold cavity in a uniform manner over the length of said elongated opening; and

an inlet in said hood for admitting purging gas to said hood, and the fit between the mold sections being such that air can be forced out by the purging gas through the seams formed by said mold sections.

4. An apparatus according to claim 3 wherein said vertically extending inlet passage is connected to a generally horizontally extending transverse passage which in turn

is connected to said slit passage, said inlet passage having a smaller transverse dimension than the length of said transverse passage, and the width dimension of said slit passage being smaller than the width dimension of said inlet passage and smaller than the width dimension of said transverse passage.

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