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M. STERN

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METHOD AND APPARATUS FOR DIE CASTING

Filed Oct. 20, 1923

Fig. 1.

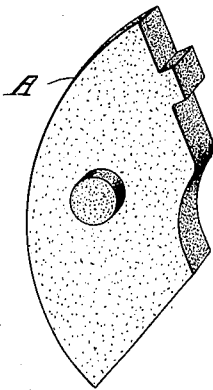


Fig. 2.

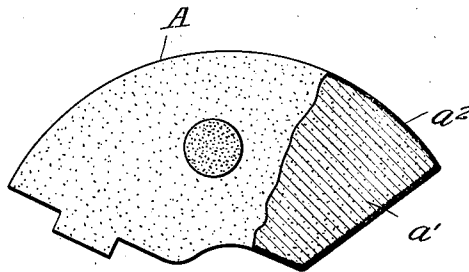
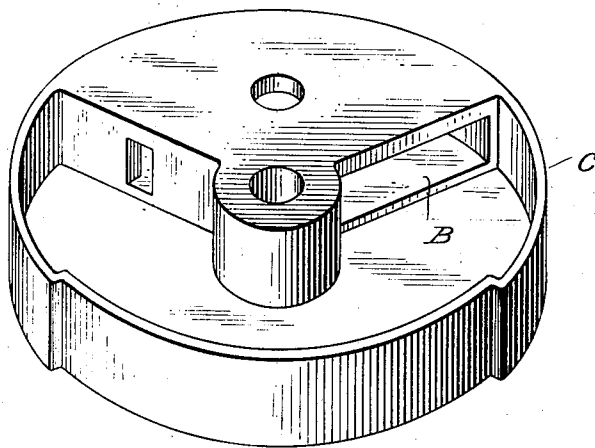


Fig. 3.



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A CORPORATION OF NEW YORK.

METHOD AND APPARATUS FOR DIE CASTING.

Application filed October 20, 1923. Serial No. 669,719.

To all whom it may concern:

Be it known that I, MARC STERN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Methods and Apparatus for Die Casting, of which the following is a full, clear, and exact description.

My invention relates to the art of die casting and has particular reference to the casting of undercuts of such a character that the core cannot be drawn from the casting and where it is not possible to use a collapsible core. One of the expedients heretofore suggested for such castings is the use of metallic cores having a lower fusing point than that of the casting metal, and subsequently fusing out the core. While that method is very satisfactory for many types of castings, it is relatively expensive, inasmuch as the cores themselves generally have to be die cast, and furthermore many castings will be injured by subjecting them to the heat necessary to fuse out the core.

In accordance with my invention I employ a core the cost of which is slight as compared with that of the fusible metallic cores, and which may be readily removed without the application of heat to the casting. More specifically the core embodying my invention is readily disintegratable but is made sufficiently rigid to withstand the force of the molten metal as the casting is poured, by giving it a suitable protective coating.

For example the core may be composed of comminuted material such as sand, sawdust, paper pulp, or many other substances which will readily suggest themselves for the purpose, joined by a suitable binder and molded and then baked until firm. The coating is then put on in such a way that the surface of the core is not caused to crumble thereby. If molten metal is applied for the coating, for instance, I have found that it can to best advantage be sprayed on, as with a scoop gun. When put on in this finely divided state its heat is sufficiently dissipated to avoid injury to the molded surface. Certain metallic paints in which the metal is carried in suspension in small particles are also satisfactory for the purpose, although the spraying process has more universal application. Obviously other ma-

terials than metal may be employed for the protective coating, the only requirements being that they be susceptible of practical application and will themselves stand the heat of the molten metal for the casting and will sufficiently reinforce the material of the core against crumbling under the high pressure of the inflowing metal characteristic of die casting.

Material for the coating will generally be selected having a fusing point preferably slightly above that of the casting metal. For example, if the coating be metal, a brass coating will be employed in casting aluminum, and an aluminum coating will be employed in casting zinc. This is not always necessary, however, especially with metal coatings, and in many cases metal may be employed having a fusing point the same as or even somewhat lower than that of the casting metal.

In the drawings I have illustrated one practical application of my invention, Figure 1 being a perspective view from the lower side of a core, Figure 2 being a plan of the same partially in section, and Figure 3 being a perspective view of a die casting having a recessed or undercut part made with the core shown in Figures 1 and 2.

The illustrated core A is of the proper shape to form the undercut recess B in the casting C. The core may be made of sand a' and any suitable binder such as commonly employed, for example, in making sand cores for sand castings. The sand with the binder is molded to the desired shape and the molded form is then placed in an oven and baked until hard. The protective coating a^2 is then applied to the molded form, either by spraying molten metal thereon, as above suggested, or in any other suitable way. It is apparent that such cores may be made in quantities very cheaply and rapidly. The core is then placed in the die, being anchored therein in any way most convenient, as by the two round bosses on the opposite sides of the core which may seat in recesses in opposite faces of the die cavity. The metal is then delivered under pressure through the gate opening and flows around the core and fills the mold cavity. Following the ejection of the casting the core may readily be disintegrated with any suitable tool, and thus removed.

I claim:

1. The method of die-casting consisting in forming a core of readily disintegratable material, applying thereto a protective coating of metal, casting metal under pressure about the coated core, and then disintegrating and removing the core.
2. The method of die-casting consisting in forming a core of readily disintegratable material, applying thereto a protective coating of metal in a finely divided state, casting metal under pressure about the coated core, and then disintegrating and removing the core.
3. The method of die-casting consisting in forming a core of readily disintegratable material, coating the same with a material having a higher fusing point than the metal to be cast, casting metal under pressure about the coated core, and then disintegrating and removing the core.
4. The method of die-casting consisting in forming a core of readily disintegratable material, spraying thereon a coating of molten metal, casting metal under pressure about the coated core, and then disintegrating and removing the core.
5. The method of die-casting consisting in forming a core of readily disintegratable material, spraying thereon a coating of molten metal having a higher fusing point than the metal to be cast, casting metal under pressure about the coated core, and then disintegrating and removing the core.
6. The method of die-casting consisting in molding a core of sand and a suitable binder therefor, treating the molded core with heat until rigid, applying thereto a protective coating of metal, casting metal under pressure about the coated core, and then disintegrating and removing the core.
7. The method of die-casting consisting in molding a core of sand and a suitable binder therefor, treating the molded core with heat until rigid, applying thereto a protective coating of metal having a higher fusing point than the metal to be cast, casting metal under pressure about the coated core, and then disintegrating and removing the core.
8. The method of die-casting consisting in molding a core of sand and a suitable binder therefor, treating the molded core with heat until rigid, spraying thereon a coating of molten metal having a higher fusing point than the metal to be cast, casting metal under pressure about the coated core, and then disintegrating and removing the core.

In witness whereof, I hereunto subscribe my signature.

MARC STERN.