

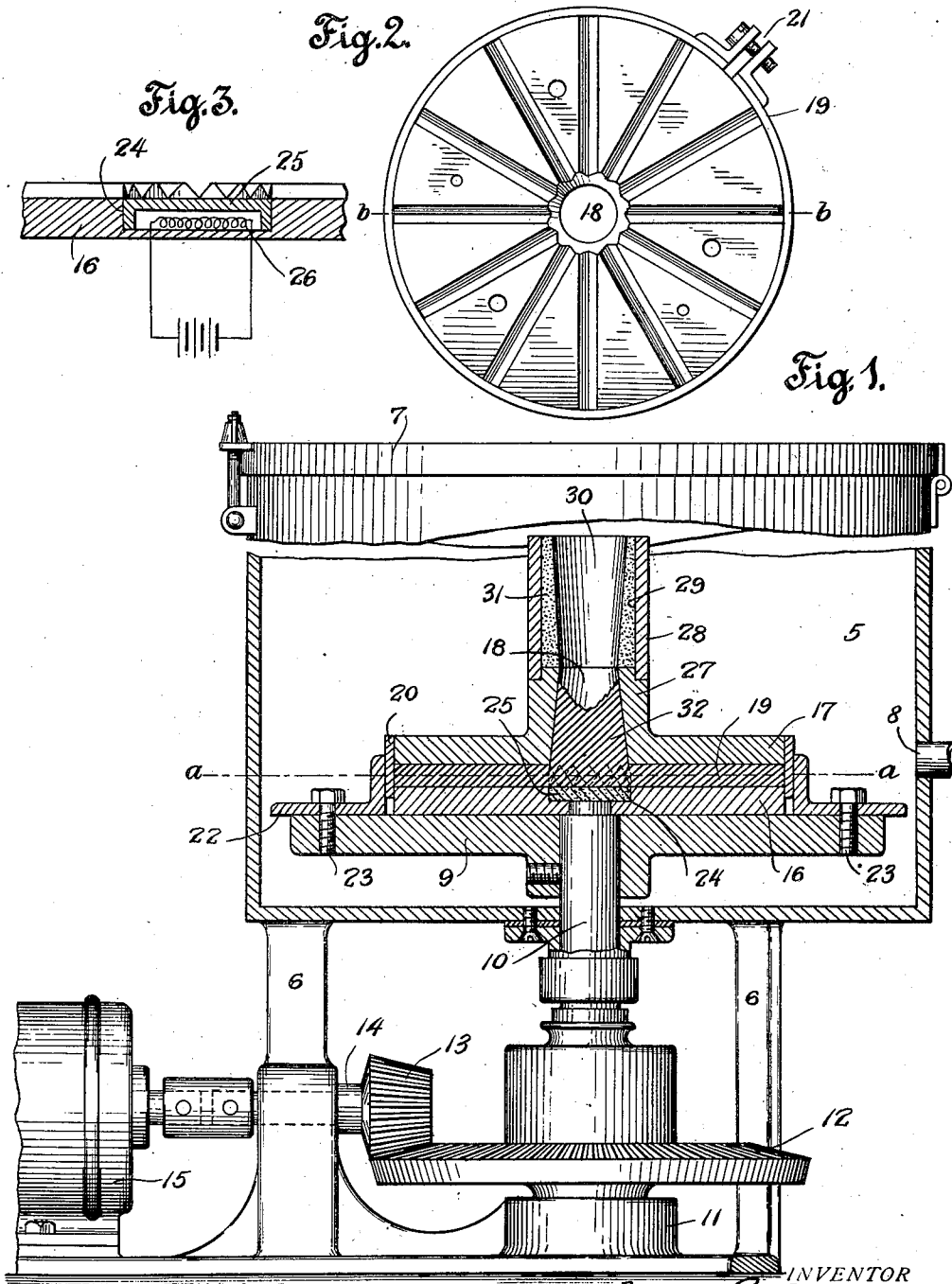
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MOLD

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MOLD.

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To all whom it may concern:

Be it known that I, ERNEST GRIDLEY SICARD, a citizen of the United States of America, residing at New York, county of New York, and State of New York (whose post-office address is 347 Fifth Avenue, New York, N. Y.), have invented certain new and useful Improvements in Molds, of which the following is a specification.

My invention relates to molds especially adapted for casting metals or alloys which chill rapidly in pouring. Casting high speed steel or alloys of the character of stellite has been practiced in a straight mold, a single piece at a time, for the reason that the fluid metal chills so rapidly that it cannot, for example, be made to flow from a gate into a number of radial passages. To overcome this difficulty I have made the mold which I will now proceed to describe:—

The accompanying drawing will serve to illustrate my invention, in which,

Fig. 1 is a vertical section of a mold with the top of the chamber and the mechanism for rotating the mold shown in elevation.

Fig. 2 is a plan view taken on the line *a-a* of Fig. 1.

Fig. 3 is a vertical section taken on the line *b-b* of Fig. 2 and showing modification.

Referring to the drawings, 5 is a containing chamber mounted upon the standards 6—6. The containing chamber is provided with a movable cover 7, and also with a pipe 8 which may be connected to an air pump or other means for exhausting air from the interior of the chamber, or conversely introducing a neutral gas. Situated within the chamber is a circular disc 9 secured to a shaft 10, which has its low bearing mounted in a support 11. Secured also to this shaft is a bevel gear 12 in mesh with the bevel pinion 13 mounted on the end of the shaft 14, connected to an electric motor 15, or to other means for imparting a rotating motion to the parts 14 and 10, and through the shaft to disc 9. Mounted on top of the disc 9 are plates 16 and 17. Formed in these plates is the central cylindrical opening 18 and radial space grooves 19. The opening 18 and grooves 19 in the plates 16 and 17 register with each other when the plates are in assembled position. Located around the circumference of the plates 16 and 17 is a ring 20 provided with

an adjustment and clamping screw 21. Arranged external to the ring 20 and secured to the plate 9, at an equal distance apart around the periphery of the plate 9 are small angleplates 22 connected to the plate 9 by screws 23. The purpose of the ring 20 is to close the outer ends of the radial slots 19, and the purpose of the angle plates 22 is to center the plates 16 and 17 and the ring 20 on the plate 9. Located in a centrally located recess 24 in the plate 16 at the bottom of opening 18 is a disc 25 made of material having a high fusing point and low conductivity for heat. In place of using such a disc 25 I may use the arrangement shown in Fig. 3 where the disc 25 is made of metal, and is provided in the interior with means for heating the disc 25, such as an electric heating coil 26. The plates 16 and 17 and disc 25 of Fig. 3 may be made of any suitable metal such as cast iron or steel. When, however, the disc of the form shown in Fig. 1 is used I prefer to construct it of a material having, as before stated, a high fusing point and low conductivity such, for instance, as carbon, magnesite or carborundum.

The purpose of using a disc with a high fusing point and low conductivity is to prevent the fused metal chilling as it strikes the disc, during the operation of pouring, which would be the case if the disc were made of the same material as the plates 16 and 17, that is, without the provision of means, such as disc 25, for preventing the chilling of the metal.

The plate 17 is provided with a central hollow hub 27 which supports a metal ring 28 above it. The ring is provided with an inner lining of refractory material 31.

The operation of my mold is as follows:—

The fused metal is poured in the opening 30 and passes downward strikes the disc 25, at which time the plate 9 and the parts supported by it are rotating. The rotary motion of the parts causes the metal, upon striking the disc 25, to flow into and fill the grooves 19. When the metal is sufficiently cooled the plates 16 and 17 are separated to remove the casting. The metal parts which have flowed into the groove 19 can then be separated from the gate 32, which occupies the opening 18. The separated portions of metal which have been cast in the grooves 19 are now ready for use in the condition

in which they are cast, or they may be subjected to subsequent heating treatment if desired.

I wish it understood that I do not limit myself to the details of the mechanism shown, as many modifications can be made therein without departing from my invention. The special feature of my improved mold consists in the provision of means adapted to prevent the chilling of the metal where it first strikes the mold, which in this case, is at the place where the radial slots communicate with the gate, and receive the melted metal. With some metals or alloys of metals, I find that it is not necessary to rotate the mold while pouring, while with other metals, especially those which chill easily, or where the melted metal is less fluid the rotation of the mold forces the metal by centrifugal force into the ends of the radial slots or grooves.

It will be observed that in the drawing the mold is shown as located within the chamber 5; the purpose of this is to prevent access of free air to the interior of the mold. The air in the interior of the chamber can be exhausted if desired at outlet 8, or conversely the interior of the chamber 5 can be filled with a neutral gas or a reducing gas. In practice when the chamber 5 is used and is to be exhausted, the cover 7 is removed, the pump being stopped and the metal is then poured into the mold. As soon as the gate is full the cover 7 is fastened down, and the air pump started in operation, exhausting the air, causing the metal to flow to all parts of the mold. Upon cooling the pump is stopped and air is permitted to fill the chamber 5 at atmospheric pressure, after which the cover 7 can be raised and the castings removed from the mold.

Having thus described my invention I claim:—

1. A mold comprising a central opening or gate, means situated at the bottom of the gate, made of material having a high fusing point and low conductivity, and a series of radial slots communicating with the bottom of the gate.

2. A mold having a central opening or gate, a disc situated at the point of impact of the fluid metal, said disc constructed to

prevent chilling of the metal when striking the disc, a series of radial slots communicating at one end with the gate, and means for rotating the mold as a whole.

3. A mold consisting of an enclosing chamber, a disc adapted to be rotated from without the chamber, and located within the chamber, a pair of plates mounted on the disc, having radial slots and a central opening, a body having a high fusing point and low conductivity located in the center of the lower disc, and a gate supported by the upper disc.

4. A mold comprising a central opening or gate, a carbon disc situated at the bottom of the gate, and a series of radial slots, communicating with the bottom of the gate.

5. A mold comprising a central opening, or gate, a disc of carbon situated at the point of impact of the fluid metal, and a series of radial slots, communicating at one end with the bottom of the gate.

6. A mold comprising a central opening or gate, a disc situated at the bottom of the gate, and having a fusing point and conductivity, corresponding to that of carbon, and a series of radial slots communicating with the bottom of the gate.

7. A mold adapted to impart a chill to a fluid metal introduced into the mold, said mold consisting of a central opening or gate, a body of refractory material of low conductivity, situated at the bottom of the gate, and a series of radial slots communicating at one end with the gate, together with means for rotating the mold as a whole.

8. A mold consisting of a body of metal adapted to impart a chill to a fluid metal introduced into it, said body having a vertically arranged central opening or gate, and a series of horizontally disposed radial slots communicating with said gate, together with means situated in the bottom of the gate, which will prevent chilling of the fluid metal when introduced into the mold.

In testimony whereof, I affix my signature, in the presence of two witnesses.

ERNEST GRIDLEY SICARD.

Witnesses:

HENRY PRICE BALL,
FLORENCE A. CHAPPLE.