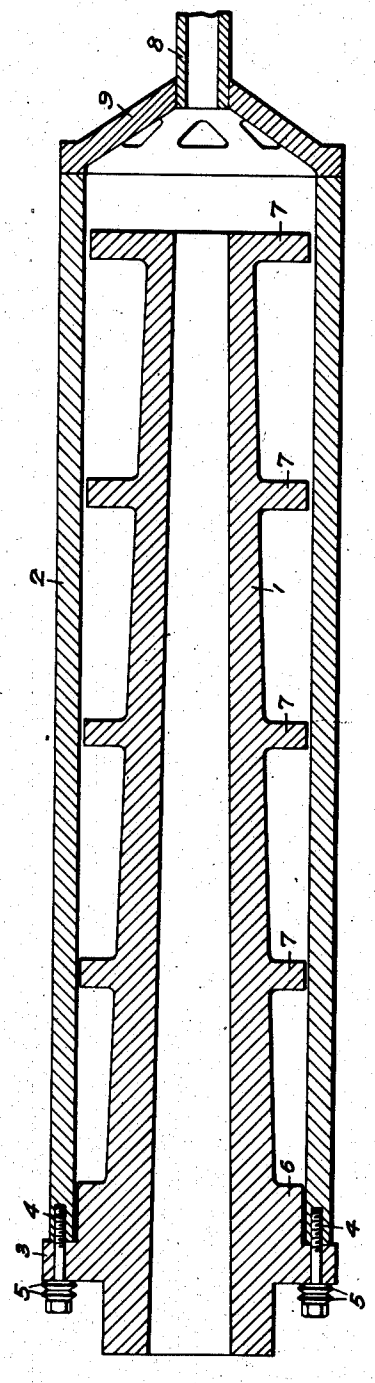
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CENTRIFUGAL CASTING MOLD

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Inventors
Walter G. Donald
James L. Martin
By G. Kessenich & J. H. Church
Attorneys

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CENTRIFUGAL CASTING MOLD

Walter G. Donald, United States Army, Philadelphia, Pa., and James L. Martin, Lowell, Mass.

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3 Claims. (Cl. 22—65)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This invention relates to a mold for centrifugal casting.

A common expedient in centrifugal casting is to employ a chill mold received in and fixed to a sleeve rotor for rotation therewith. The mold in such cases is spaced from the sleeve rotor by circumferential ribs, and various sized molds may be employed in a single size of rotor. The mold is fixed to the end of the rotor remote from the driving end thereof by means of a flange, and a clearance is provided between the ribs and the rotor to allow for radial expansion when the mold is heated by the molten metal.

It has been found that if the ribs freeze to the rotor prior to the attainment of maximum longitudinal expansion the mold is likely to be damaged by warping or cracking. This freezing is prevented, in part, by providing clearance between the ribs and rotor, but such clearance is limited by consideration of stability of the centrifugal action.

According to the invention, longitudinal expansion is permitted after freezing of a rib to the rotor by providing a progressively increasing clearance between the ribs and the rotor.

It is therefore, an object of this invention to provide a centrifugal casting device in which the danger of cracking or warping due to restrained longitudinal expansion is greatly reduced.

To these and other ends, the invention consists in the construction, arrangement and combination of elements described hereinafter and pointed out in the claims forming a part of this specification.

A practical embodiment of the invention is illustrated in the accompanying drawing wherein:

The single figure shows a longitudinal section of a chill mold and rotor.

Referring to the drawing by characters of reference, there is shown a chill mold 1 received in a rotor 2 and having a flange 3 abutting the end of said rotor and fixed thereto by stud bolts 4 carrying spring washers 5. A reduced flange 6 serves as a bearing. The mold 1 is provided with flanges 7 which, together with flange 6, have been provided with a clearance from the walls of the rotor 2 which clearance, for example, could be of the order of 0.005 in. but which may vary for instance with the size and material of the mold, and the maximum temperature of the run.

The drive is communicated to the rotor from a shaft 8 through a spider 9 which provides an exit for gases.

The heat is poured into the mold at the bolted end and both radial and longitudinal expansion commence, the point of maximum activity coinciding with the region of highest temperature, determined by the point of pour contact and the dimensions of the mold. Ordinarily this will occur between the flange 6 and the next succeeding flange 7. At the first exertion of the expansive forces the mold 1 will progress into the rotor 2. After the hottest of the flanges 7 contacts the rotor 2 inward extension of that portion of the mold up to such flange is inhibited. For this portion the expansion is then outward against the pressure of the spring washers 5 while the balance of the mold continues to expand inwardly until all flanges are in contact with the rotor 2.

In order to further provide for free expansion into the rotor without warping or fracture the flanges 7 are provided with a progressively increasing clearance in the order of their position in the mold from the pouring end toward the driving end. Thus, while the earlier engaged flanges may be engaging the rotor under conditions of high stress, yet the engagement in each case does not take place until the mold portion preceding it has attained a safe measure of longitudinal expansion.

In one example used, the clearance between flange and rotor increased by 0.010 in. progressively for each flange from the pouring end toward the driving end. The mold expanded 0.25 in. against the spring washers until the bearing 6 at this end expanded tight. Since other flanges were still free, the mold moved longitudinally inward of the mold, each flange expanding tight in turn. If clearance is properly established to suit given conditions, the mold will be permitted its full amount of expansion. By the method of this invention the expansion obtained was very close to the calculated expansion for a cast iron mold 200 in. long at 800° F.

The function of the spring washers is merely additive and they may be omitted, if desired.

We claim:

1. In a centrifugal casting machine including a hollow driving rotor and a chill mold received therein, a driving connection supporting one end of the mold in the rotor, and circumferential ribs longitudinally spaced and integral with the

mold, the inner wall of the rotor and the peripheral face of each rib having a clearance therebetween, said clearance progressively increasing with each rib in the direction of the free end of the mold.

2. A centrifugal casting machine comprising a driving rotor and a chill mold received therein, spaced external circumferential ribs integral with the mold and spacing it from the rotor, and a driving connection between the rotor and the mold, the inner surface of the rotor and the peripheral face of each rib having a clearance therebetween, said clearance progressively decreasing along the longitudinal extent of the mold in the direction of the driving connection.

3. In a centrifugal casting machine including a hollow driving rotor and a chill mold received therein, a driving connection supporting the pouring end of the mold in the rotor, and circumferential ribs longitudinally spaced and integral with the mold, the inner wall of the rotor and the peripheral face of each rib having a clearance therebetween, said clearance progressively decreasing with each rib in the direction of the pouring end of the mold.

WALTER G. DONALD.
JAMES L. MARTIN.