D. S. DE LAVAUD.

ROTARY CASTING.

APPLICATION FILED AUG. 27, 1920.

1,377,406. Patented May 10, 1921.

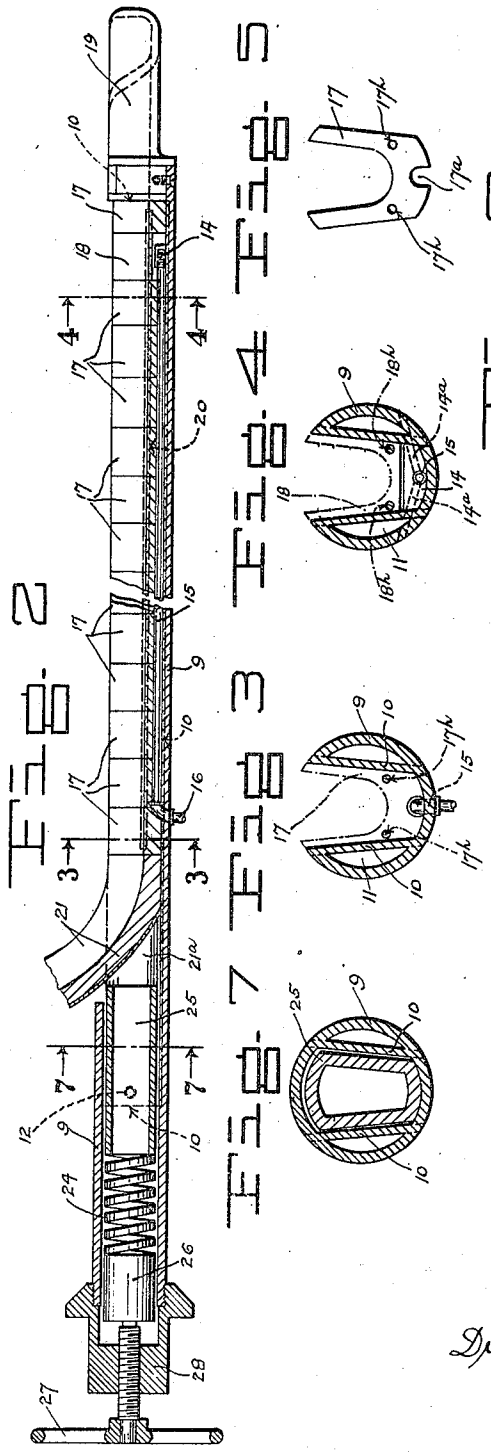


Fig. 2

Fig. 4

Fig. 3

Fig. 7

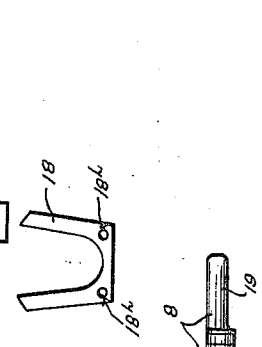


Fig. 5

Fig. 6

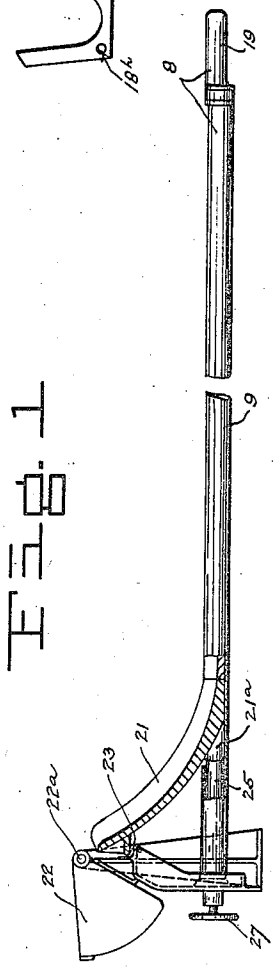


Fig. 1

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ROTARY CASTING.

1,377,406. Specification of Letters Patent. Patented May 10, 1921.

Application filed August 27, 1920. Serial No. 406,440.

To all whom it may concern:

Be it known that I, DIMITRI SENSAUD DE LAVAUD, a citizen of the United States of Brazil, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Rotary Castings, of which the following is a specification.

This invention relates to rotary casting, and more particularly aims to provide an improved type of distributer for supplying the molten metal to the rotary mold.

The invention provides a distributer lining for the hollow part of the distributer within which the metal is temporarily confined preparatory to casting an annular object, as a pipe, or through which the molten metal steadily flows during the casting of such a pipe. The tilting trough, as an example of the former type of distributer, is well known in the art; and an example of the latter type of distributer is a spout such as disclosed in United States Letters Patent No. 1,329,295 issued to the undersigned.

The lining of the new invention includes a plurality of substantially U-shaped lining members arranged end to end in a substantially straight line along a length of the distributer, thereby to provide a chamber for holding molten metal, located within and over the line of members, in combination with means for yieldingly maintaining such members in end-to-end contact. Such chamber, in the case of a trough distributer, is a pocket, and such chamber, in the case of a spout distributer, is a channel or gutter leading to the discharge end of the spout, or rather, to what may be called the spout proper. The material of which the members are constructed, in the case of the trough type of distributer, is preferably of some clay-like, graphitic or other suitable refractory material to which the molten iron will not readily freeze; but in the case of a spout distributer, practice has proved that the members may safely be made of cast iron or other suitable metal, due to the fact that in casting according to the spout method the metal is never quiescent but always flowing through the distributer, and so the tendency of prematurely cooled parts of the metal to adhere to any particular point inside the distributer is minimized if not wholly defeated.

The new lining is made up of such plurality of yieldingly held members as described, in order that when the lining becomes injured or worn, the entire lining need not be replaced, but, instead, a particularly broken or injured member may be removed and a new one substituted, and in order, further, and this is probably the most important advantage, that heat expansions of the lining may take place without causing a bending or arching of the entire distributer along its length.

The prime object of the invention is to provide a construction for attaining the ends just indicated.

Among its lesser objects, the invention also involves the provision of an illustrated embodiment constituting a compact, readily accessible, preferably adjustable means for yieldingly holding the lining members in line as described. Preferably said means is housed in a part of the casting apparatus not calculated to interfere with the small size, simplicity, low cost of construction, and ease of operation otherwise characteristic of such a casting apparatus, especially when said means is utilized in a spout type of distributer. In the latter case, described in detail hereinbelow, said means preferably is located at one side of the foot of the now-familiar supply chute, and a terminal lining member is located at the other side of the foot of the chute with such spout distributer of the type wherein the part of the distributer surrounding the lining is, as is at present preferable, constructed of a tubular, generally cylindrical outer metal casing which interiorly carries, beyond the outer surfaces of the lining members, a plurality of the water-cooling compartments one of which is preferably a water-feeding pipe extending under the line of lining members.

That the various objects above enumerated are attained will be seen from the accompanying drawing disclosing a preferred embodiment of the invention, illustratively applied to a spout type of distributer.

In this drawing,

Figure 1 is a side elevation, partially broken away and partially in section, showing a spout distributer, its chute for supplying the molten metal to the supply end of the distributer, and a tilting reservoir

or ladle for delivering the predetermined charge of molten metal gradually and uniformly to the upper end of the chute;

Fig. 2 is a vertical axial section through such distributer, and through the lower end of the chute, showing the plurality of lining members and a yieldable, in the present case resilient, lining-maintainer, pursuant to the present invention;

Fig. 3 is a transverse section taken on line 3—3 of Fig. 2, with the lower part of the chute omitted and with one of the lining members indicated in dot-and-dash;

Fig. 4 is a transverse section taken on line 4—4 of Fig. 2, with another one of the lining members indicated in dot-and-dash;

Fig. 5 is an end elevation of one type of lining member used in part to make up the line of such members in the distributer—this being the type of member indicated in Fig. 3;

Fig. 6 is an end elevation of the other type of lining member used also in making up said line of such members—this being the type of member indicated in Fig. 4; and

Fig. 7 is a transverse section taken on line 7—7 of Fig. 2.

Similar reference characters refer to similar parts throughout the several views of the drawing.

The distributer, marked 8 in Fig. 1, includes, as shown best in Figs. 2, 3, 4 and 7, a tubular outer metal casing 9, slotted at the top for a part of its length as indicated, and carrying at its discharge end a spout-piece 19.

(This casing has side partitions 10, establishing water-cooling compartments as indicated at 11 in Figs. 3, 4 and 7,—the continuously circulating water in these compartments discharging through suitable outlets as indicated at 12 in Fig. 2, such water being continuously admitted to these compartments through the ducts 14^a in a block 14 as shown in Figs. 4 and 2, from a third center bottom water-compartment constituted by a pipe 15 having a water inlet at 16; these parts being provided preferably to water-cool the trough, and hence help in preventing heat distortions thereof, pursuant to some of the principles disclosed in United States Letters Patent No. 1,323,253 issued to the undersigned.)

The lining members, placed end to end within the slotted part of casing 9, are of two different kinds, as to their bottom conformations, as indicated at 17 and 18 in Figs. 2 to 6; that is to say, a single one of such members 18 is used to overlie the block 14, a single one of the members 17 is used to the right of the member 18 in Fig. 2, and the remainder of the line of members, to the left of said member 18, is made up of members 17. In the case of these last mentioned members 17, the undercut-slots with which they are formed at the bottom, as indicated most clearly in the case of the member 17 shown in Fig. 5, such slot being there given the reference numeral 17^a, are provided for straddling the pipe 15.

These lining members 17 and 18, being preferably of cast iron as aforesaid, may depend merely on gravity to hold them in line within the bottom of casing 9; although, if desired, the members may be provided with registering holes, as indicated at 17^h and 18^h in Figs. 5 and 6, so that rods 20 may be passed therethrough.

The supply chute for the distributer so far referred to is preferably a chute 21, to the top of which molten metal is delivered by means of a reservoir or ladle 22 forming a permanent part of the casting apparatus and caused to tilt at a uniform rate on a horizontal axis 22^a during a casting operation, all as described in the aforesaid United States Letters Patent No. 1,329,295. According to that patent, however, the chute is disclosed as being rigidly anchored at its upper end; whereas here, in order to permit a slight backward and forward movement of the foot of the chute against the line of lining members 17 and 18, the chute is swingingly mounted at its upper end as indicated at 23 in Fig. 1.

The purpose of this swing-mounting of the chute is to permit the means for yieldingly holding the lining members in end-to-end contact, which means is constituted by an expansile coil spring 24 (Fig. 2), to exert its yielding pressure against the line of members 17 and 18, not only through a sliding spring follower 25 (Figs. 1, 2 and 7), but also through a boss 21^a (Figs. 1 and 2) formed on the heel of the swingingly mounted chute 21.

As a result of this construction, a very compact, simple, reliable and accessible construction is provided, with the spring 24 and the follower 25 both arranged in line with the lining members 17 and 18 and in the rear of the foot of chute 21; such parts 24 and 25 being housed in a rear unslotted extension of the metal casing 9 of the distributer.

In order to permit the spring 24 to be set to any desired expansile adjustment, a cylindrical thrust-block 26 is also housed in the rear extension of the casing 9, as shown in Fig. 2, directly in back of the spring, and this block may be moved to the right or allowed to move to the left pursuant to the spiral adjustment of a hand-wheel 27 having its shaft threaded into a cap 28 mounted on the rear end of casing 9.

Operation.

Before or during the employment of the distributer for delivering metal to the interior of a rotary mold, while carrying out

one or more casting operations, handwheel 27 is turned to compress spring 24, to cause such spring, acting through its follower 25 and the boss 21ª at the heel of the swingingly mounted supply chute, to hold the lining members 17 and 18 in close end-to-end contact. By thus operating the hand-wheel, the spring is given precisely the compression to insure that lining members 17 and 18 will be pressed closely together, to form a smooth, even gutter or channel, and to prevent the passage of any thin films of molten metal between them, and yet as thus pressed together they will be free to move slightly, longitudinally of the distributer, to allow for heat expansions.

I claim:

1. In a molten metal distributer for rotary molds, the combination of a multi-part lining for the distributer, including a plurality of substantially U-shaped members arranged end to end in a substantially straight line along a length of the distributer, thereby to provide a chamber for holding the molten metal and located within and over the line of members, and means for resiliently holding such members in end-to-end contact.

2. In a molten metal distributer for rotary molds, the combination of a multi-part lining for the distributer, including a plurality of substantially U-shaped members arranged end to end in a substantially straight line along a length of the distributer, thereby to provide a chamber for holding the molten metal and located within and over the line of members, and means for acting on one of the members at one end of the line of members to hold the members yieldingly in end-to-end contact.

3. The distributer defined in claim 2, wherein said means includes an expansile coil spring, there also being provided an adjustable member for controlling the tension of said spring.

4. The distributer defined in claim 2, wherein said means includes an expansile spring and a movable block interposed between the spring and the last mentioned lining member and contacting the latter.

5. The distributer defined in claim 4, wherein a chute is provided for delivering molten metal to the distributer and said block is carried by said chute, the chute being swingingly mounted to permit the block to have slight movement.

Signed at New York in the county of New York and State of New York this 30th day of July A. D. 1920.

DIMITRI SENSAUD DE LAVAUD.