D. S. DE LAVAUD.

ROTARY CASTING MACHINE.

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1,323,253. Patented Dec. 2, 1919.

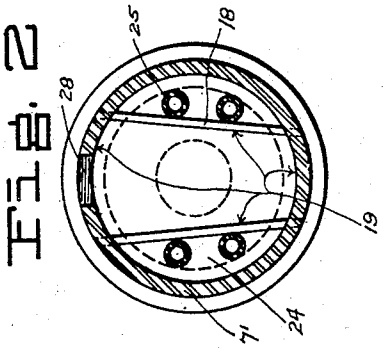


Fig. 2

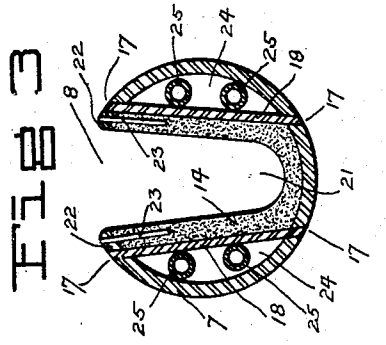


Fig. 3

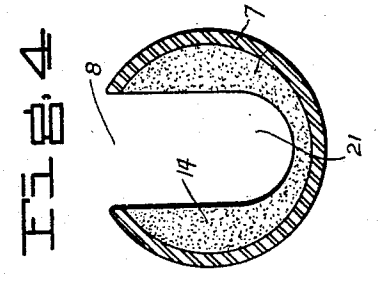


Fig. 4

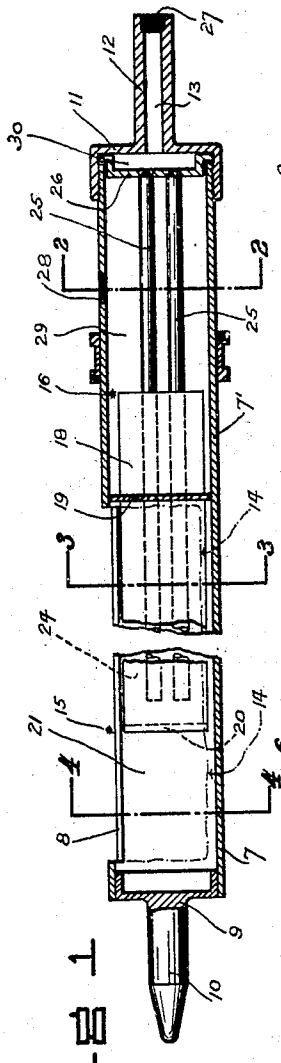


Fig. 1

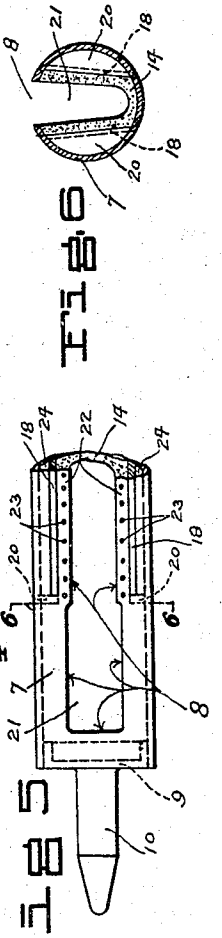


Fig. 5

Fig. 6

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ROTARY CASTING-MACHINE.

1,323,253. Specification of Letters Patent. Patented Dec. 2, 1919.

Application filed April 12, 1919. Serial No. 289,595.

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 Casting-Machines, of which the following is a specification.

This invention relates to rotary casting, and more particularly to the rotatable trough used in rotary casting machines.

The present invention is an improved construction of the water-cooled trough disclosed and claimed broadly in United States Letters Patent No. 1,276,038 issued to me. According to that patent, the trough is continuously cooled by a water circulation under pressure in all angular positions of the trough, by constructing the trough-shell of three concentric tubes or pipes spaced one within the other to provide two substantially annular water chambers, through one of which the admitted liquid flows in one direction and through the other of which the liquid, after leaving the first chamber, flows in the reverse direction. Such a construction is very satisfactory, but the mechanical difficulties of constructing the trough are considerable, and the fact that the trough is cooled at the bottom as well as at the sides, and is also cooled opposite the portion of the pouring slot of greater width at one end of the trough for taking care of the bell of a pipe to be cast, rather than merely opposite the length of the slot for making the main body of the pipe, holds the diameter of the trough larger than would otherwise be required. Of course the smaller the diameter of the trough, and the more nearly the external conformation of the trough approaches the cylindrical, the better, because a pipe cast of any external diameter cannot have an internal diameter smaller than the maximum lateral dimension of the trough.

I have discovered that perfectly practical operation may be obtained with a trough which is only water-cooled at the sides, and not at the bottom of the trough, and further, that the trough need not be water-cooled at all opposite the portion of the slot of greater width. And I have devised a construction for taking advantage of these discoveries, as will now be described.

The construction is preferably embodied as shown in the appended drawing, which, however, is merely illustrative of the invention.

The ends sought by the present invention result from novel structural combinations, and therefore, before structurally describing the embodiment shown in the drawing, such structural combinations will not be generally referred to; attention being directed to the appended claims in the latter particular.

In the accompanying drawing,

Figure 1 is an axial sectional view, the trough being shown broken away intermediate its ends to condense the length of the latter;

Figs. 2, 3 and 4 are, respectively, transverse sections, on an enlarged scale, taken on lines 2—2, 3—3 and 4—4 of Fig. 1;

Fig. 5 is a top plan view of the left hand end of the trough; and

Fig. 6 is a transverse section, taken on line 6—6 of Fig. 5.

The trough includes a shell 7, which may be a length of pipe of suitable diameter. The trough proper is the length of such pipe in which is cut an elongated slot 8, to act as the pouring slot of the trough. The trough also includes a tubular portion for journaling the trough proper, such tubular portion here being a prolongation of pipe 7 as indicated at 7'.

At the free end of the trough proper an end closure 9 is suitably secured in place, as by welding, and carries, axially of the trough, a pivot pin 10.

The opposite end of the entire trough, that is, of the tubular portion to be journaled to rotatably mount the trough, is closed by a cap 11 threaded thereon and having an offset central extension 12 bored from end to end at 13.

In order to establish walls, which, while allowing for the first and second water-cooling compartments below described, will permit a refractory lining 14 to be conveniently set in place as shown in the drawing, the following parts are provided. The trough is equipped with these parts, in connection with the formation of the pouring slot 8, preferably in the following order.

The trough-shell 7 is longitudinally slotted along four parallel lines, between the points 15 and 16 of Fig. 1, the lines being spaced circumferentially of the shell as indicated at 17 in Fig. 3. Two partitions 18

are set in the slots and there welded, as shown in Figs. 1 and 3. Next the pouring slot 8 is cut out of the shell wall. Then the transverse partitions 19 and 20, 20 are inserted and welded in place.

The plate 19 has the shape shown in Fig. 2, and is edge-welded all around to the inside of the shell and to the inner sides of the partitions 18.

Each of the plates 20 is segment-shaped as shown in Figs. 3 and 6, and each plate 20 is welded along its straight edge over the front edge of a partition 18, and edge-welded at its circular edge to the inside of the shell.

It will be seen that the refractory lining 14 provides, below the pouring slot 8, a molten-metal receiving pocket 21; this pocket being of substantially U-shape in cross-section below the portion of the pouring slot of greater width and being of substantially V-shape in cross-section below the remaining portion of the slot.

It will also be seen that the locations of the two upper slots 17, relative to the narrower portion of the pouring slot 8 opposite which the partitions 18 are disposed, are such that overhanging eaves 22 are provided. Along these eaves at spaced intervals depending pins 23 are set at their upper ends, these pins performing a very important function in that they facilitate lining the trough with the refractory material opposite the partitions 18 and protect the lining against crumbling or chipping away near the side edges of the pouring slot 8 during prolonged operation of the casting machine.

The side portions of the trough shell, the partitions 18 and the transverse partitions 20 provide what will be termed the first water-cooling compartments 24, which, it will be observed, are at the sides of the trough only, and do not extend so far to the left as to lie opposite the portion of the pouring slot 8 of greater width.

Two vertically spaced pipes 25 in each first compartment 24, each of which pipes may be termed a second water-cooling compartment, are provided, having open left ends. At their right threads, these pipes are also open, but carry external screw threads, as shown most clearly in Fig. 1, whereby they may be screwed into tapped transverse openings in a laterally disposed circular fixture 26 to be rigidly clamped or otherwise suitably fixedly held in place between the extreme right-hand end edge of the trough-shell and the inner face of cap 11. In turn, consequently, the pipes 25 are rigidly held in the locations illustrated.

The reference characters 27 and 28 in Fig. 1 represent the inlet and outlet openings for the cooling water (or other suitable liquid). Assuming the water enters at 27, preferably under considerable pressure, it flows through the bore 13, thence into an equalizing compartment 30 (Fig. 1), thence into the pipes 25 or second compartments, flowing therethrough to the left, thence into the first compartments 24, flowing therethrough to the right, thence into a preliminary discharge compartment 29 established between the fixture 26, the pipes 25, the transverse partition 19, the right-hand ends of compartments 24 and the trough-shell 7, and thence to the discharge outlet 28.

I claim,

1. In a trough construction for rotary casting machines, the combination of an elongated shell having an elongated pouring slot in its top, partitions in the shell at opposite sides of the pouring slot for forming a first elongated compartment within the shell at each side of a molten-metal receiving pocket in the shell below the pouring slot, a second elongated compartment within each of the first compartments, and means for admitting cooling liquid to one end of each second compartment, the opposite end of each second compartment being open to admit such liquid to the first compartment from the second compartment to cause the liquid to flow in the first compartment longitudinally of the shell in a direction opposite to the direction of flow of the liquid through the second compartment.

2. The trough construction defined in claim 1, wherein means are provided for discharging the cooling liquid from the interior of the shell, such means including a discharge opening at the end of each first compartment opposite to the end thereof whereat the liquid enters the first compartment from the second compartment.

3. The trough construction defined in claim 1, wherein each second compartment is a length of pipe of substantially circular cross-section.

4. The trough construction defined in claim 1, wherein such shell is a hollow member of substantially circular cross-section and wherein each of said partitions is formed at least in part of a sheet-like plate arranged with its flat portion substantially vertical.

5. The trough construction defined in claim 1, wherein said partitions are downwardly converged toward the center of the trough below the pouring slot.

6. The trough construction defined in claim 4, wherein two of such second compartments are in each of the first compartments, one second compartment spaced above the other in each first compartment.

7. The trough construction defined in claim 6, wherein each of said second compartments is a length of pipe of substantially circular cross-section.

8. The trough construction defined in claim 1, wherein the pouring slot has a portion of greater width at one end, and wherein each first compartment is closed at one end opposite the last mentioned portion of the pouring slot, each first compartment being located alongside the portion of the pouring slot in prolongation of said portion of greater width.

9. The trough construction defined in claim 7, wherein such shell carries a tubular portion to be journaled for permitting rotation of the trough, and wherein a fixture is seated and fixed in said tubular portion, transversely of the trough, such fixture having the four second compartments rigidly mounted thereon.

10. The trough construction defined in claim 9, wherein said fixture is a transverse partition in said tubular portion, having four transverse openings therethrough, each in connection with the interior of one of the second compartments, and wherein the means for admitting cooling fluid also includes means for admitting such fluid in the interior of said tubular portion at the side of said transverse partition opposite to the side thereof from which the four second compartments project.

11. The trough construction defined in claim 1, wherein such partitions are set in the shell with the top edges of the partitions substantially parallel to but spaced a distance from the side edges of the pouring slot, to provide eaves overhanging the top of the pocket at opposite sides of the pouring slot, and pins are set at their upper ends in said eaves to depend substantially parallelly with the partitions and spaced therefrom at intervals along the length of the slot.

12. The trough construction defined in claim 1, wherein such shell is a hollow member of substantially circular cross-section, and wherein the partitions are arranged in substantial parallelism but downwardly converging below the slot, the shell having elongated slots cut therein and the upper and lower edge portions of the partitions being set in such slots and there welded in place.

13. The trough construction defined in claim 12, wherein shaped transverse plates, each having a circular edge and a straight edge are secured in place to close the end of each first compartment intermediate the length of the pouring slot.

14. The trough construction defined in claim 13, wherein the circular edge of a shaped plate is welded at such edge to the inside of the shell and a marginal strip of said plate alongside its straight edge is welded to the end edge of the partition.

15. The trough construction defined in claim 1, wherein near one end of the trough the pouring slot is of greater width and wherein the constructions defined for liquid-cooling the trough extend from near the other end of the trough only to the beginning of such portion of greater width.

16. The trough construction defined in claim 15, wherein a refractory lining is provided in the trough which opposite the slot portion of greater width is of substantially U-shape in cross-section and which opposite the remaining slot portion is of substantially V-shape in cross-section.

17. In a trough construction for rotary casting machines, the combination of an elongated shell having an elongated pouring slot in its top, and longitudinal partitions in the shell at opposite sides of the slot forming liquid-cooling compartments at the sides only of the shell to establish a pocket for receiving molten metal below the pouring slot and between the partitions and the bottom of the shell.

18. The trough defined in claim 17, wherein there is provided a refractory lining in the shell overlying the sides and bottom of the pocket.

Signed at New York in the county of New York and State of New York this 10 day of April A. D. 1919.

DIMITRI SENSAUD DE LAVAUD.