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CHARGING APPARATUS FOR CENTRIFUGAL CASTING MACHINES.

APPLICATION FILED NOV. 1, 1918.

1,307,823. Patented June 24, 1919.

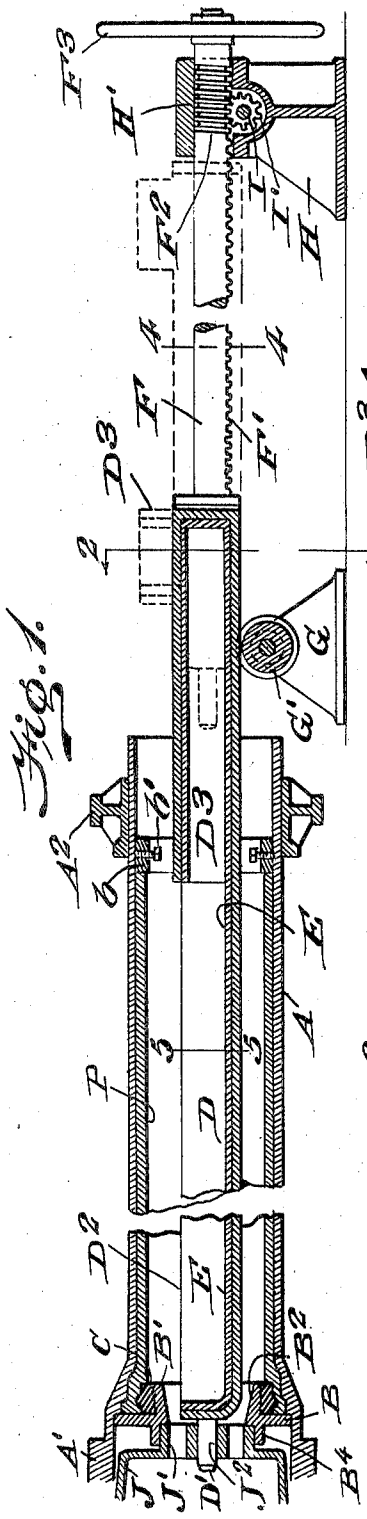


Fig. 1.

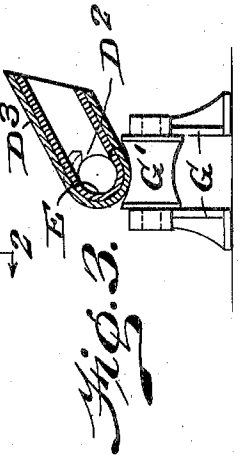


Fig. 3.



Fig. 5.

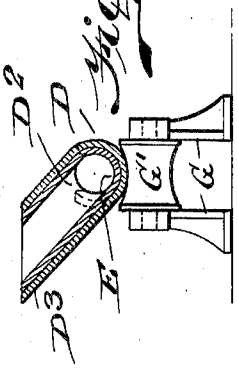


Fig. 2.



Fig. 4.

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CHARGING APPARATUS FOR CENTRIFUGAL CASTING-MACHINES.

1,307,823. Specification of Letters Patent. Patented June 24, 1919.

Application filed November 1, 1918. Serial No. 260,659.

To all whom it may concern:

Be it known that I, JAMES B. LADD, a citizen of the United States of America, and a resident of Ardmore, in the county of Montgomery, in the State of Pennsylvania, have invented certain new and useful Improvements in Charging Apparatus for Centrifugal Casting-Machines, of which the following is a true and exact description, reference being had to the accompanying drawing, which forms a part thereof.

My present invention relates to centrifugal casting machines and particularly to machines for casting relatively large cast iron pipes. The object of my invention is to provide improved means for supplying the molten casting forming metal to the rotating mold of the casting machine.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a portion of this specification. For a better understanding of the invention, however, and the advantages possessed by it reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described a preferred embodiment of my invention.

Of the drawings:

Figure 1 is an elevation, partly in section, of the mold of a centrifugal casting machine and the apparatus for charging the same.

Fig. 2 is a transverse section on the line 2—2 of Fig. 1.

Fig. 3 is a view taken similarly to Fig. 2 showing parts in different relative positions, and

Fig. 4 is a section on the line 4—4 of Fig. 1, and

Fig. 5 is a section on the line 5—5 of Fig. 1.

In the drawings, A represents the revolving mold of the casting machine. The mold A is shown as a tubular body of metal provided at its opposite ends with circumferential surfaces A′ and A², engaged by the mechanism, not shown, for supporting and rotating the mold during the casting operation. The mold shown is intended for casting a pipe with a bell end and the end of the mold at which the bell end of the pipe is formed is closed by an end member B which is detachably secured in the mold body A in any convenient way, as shown it has a rearwardly extending flange B⁴ which fits over a circular flange J′ of an end piece J in which is also formed a bearing J² for a trunnion D′ at the end of the filling trough. The end member B is provided with a hollow boss B′ extending into the mold cavity surrounded by a dried sand core collar C, which forms the inner surface of a short length of the pipe at the bell end. The inner surface B² of the boss B′ is conical with its largest diameter at its inner end. The end member B is provided with an axial socket J² to receive a trunnion D′ formed at the inner end of the mold charging trough. The spigot end of the mold body A is closed against the escape of molten metal by an annular member *b* fitting within the mold body A and adjustably secured therein as by means of the set screws *b*′. The position at which the member *b* is secured in place depends upon the length of the pipe P which it is desired to cast.

The charging trough D is tubular and is formed with a discharge slot D² extending along the portion of the length of the trough received in the mold cavity in the mold charging operation. At its outer end the trough D is formed with a lateral tubular extension D³ forming the trough filling inlet. The charging trough D is formed of metal and is provided with a refractory lining E. The trough D is manipulated by means of a bar or operating rod F rigidly secured to the outer end of the trough D. The trough is supported on a grooved roller G′ mounted in a stationary pedestal G adjacent the mold, and the bar F passes through a guide sleeve H′ formed in a stationary pedestal H, which is more remote from the mold than the pedestal G. The bar F is in the form of a rod circular in cross section (see Fig. 4) except that at one side it is flattened and provided with gear teeth F′, so that the bar F is essentially a rack bar. The portion of the outer end of the bar F, received in the sleeve H′, when the trough is in the mold charging position shown in Fig. 1, is provided with circular ribs F² separated by circumferential grooves, the pitch or spacing of the ribs F² being the same as the pitch of the rack teeth F′. A shaft I, journaled in the pedestal H, carries a spur gear I′ to mesh with the ribs F² and the rack teeth F′. By rotating the spur gear I, the trough D may be axially

withdrawn from the mold and returned to the latter end of one charging operation and preparatory to a subsequent charging operation. With the trough inserted in the mold, as shown in Fig. 1, its molten metal contents may be discharged into the mold by rotating the bar F and thereby the trough D. For this purpose a hand wheel F^3 is provided at the outer end of the bar F. When the trough is thus being rotated its axial displacement is prevented by the gear I′ in mesh with the circular ribs F^2. To prevent molten metal from spilling out of the trough through the inlet opening D^3, when the trough is turned from the position shown in Figs. 1 and 2 to the position shown in Fig. 3, the tubular inlet D^3 is extended radially outward from the periphery of the body of the trough, and is so set and angularly disposed that when the trough is in the trough filling position with the discharge slot D^2 at the top of the trough, as shown in Figs. 1 and 2, the lateral projection D^3 is inclined away from one side of the vertical plane through the trough axis at an angle of about 45°, and when the trough is turned into the discharge position shown in Fig. 3, the projection D^3 is inclined to the opposite side of that vertical plane at an angle of about 45°.

To provide the necessary metal at the bell end of the pipe to fill the portion of the mold surrounding the core C I have extended the trough D into the hollow boss B′, so that a portion of the metal poured out of the trough will fall directly on the conical inner surface B^2 of the boss B′. The metal falling against this surface B^2 is carried by centrifugal action to the inner end of the surface, and thence flows into the portion of the mold cavity for which it is intended.

The mold charging apparatus disclosed is simple in construction and reliable in operation, and because of the manner in which it is formed and its relatively small bulk is comparatively easy to manipulate. While in accordance with the provisions of the statutes I have illustrated and described the best form of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention as set forth in the appended claims, and that some features of my invention may sometimes be used to advantage without a corresponding use of other features.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In centrifugal casting apparatus, the combination with a rotatable mold, of a charging trough and means for moving it axially of the mold into and out of the latter comprising a stationary support adjacent the mold and a roller journaled thereon on which the trough rests, and a second stationary support more remote from the mold, and coöperating gear members carried by the trough and said second support for moving said trough axially of the mold.

2. In centrifugal casting apparatus, the combination with a rotatable mold, of a mold charging trough and means for supporting said trough comprising a pair of stationary supports one adjacent and the other more remote from the mold, of a roller journaled in the support adjacent the mold on which the trough rests, a rack bar secured to the trough and having a sliding bearing in the more remote support and a spur gear journaled in the more remote support and in mesh with said rack bar.

3. In centrifugal casting apparatus, the combination with a rotatable mold, of a rotatable charging trough axially movable into and out of the mold, and means for supporting and moving said trough comprising a pair of stationary supports located one adjacent to, and one more remote from the end of the mold, a roller journaled in the first mentioned support on which the trough rests, the second of said supports being provided with a sleeve, a rack bar secured to one end of the trough and sliding in said sleeve, a spur gear journaled in second support and in mesh with said rack bar, said rack bar having a cylindrical portion provided with circumferential ribs adapted to mesh with the spur gear when the trough is in the mold charging position, and means for rotating said trough and rack bar when the trough is in the mold charging position.

4. In a centrifugal pipe casting machine the combination with a rotatable mold enlarged at one end to form a bell end pipe and provided with an end member at its enlarged end having a tubular portion extending into the mold cavity and formed with a conical inner surface the base of which is at the inner end of said mold, and mold charging means adapted to supply molten metal along the length of the mold and against said conical surface.

5. In a centrifugal pipe casting machine, the combination with a rotatable mold enlarged at one end to form a bell end pipe and provided with an end member at its enlarged end having a tubular portion extending into the mold cavity and formed with a conical inner surface the base of which is at the inner end of said tubular portion, and a rotatable mold charging trough longitudinally disposed in the mold and extending into said tubular mold end portion.

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