March 15, 1932. S. B. CLARK 1,849,072

RUNNER TROUGH FOR CENTRIFUGAL CASTING MACHINES

Filed June 3, 1930

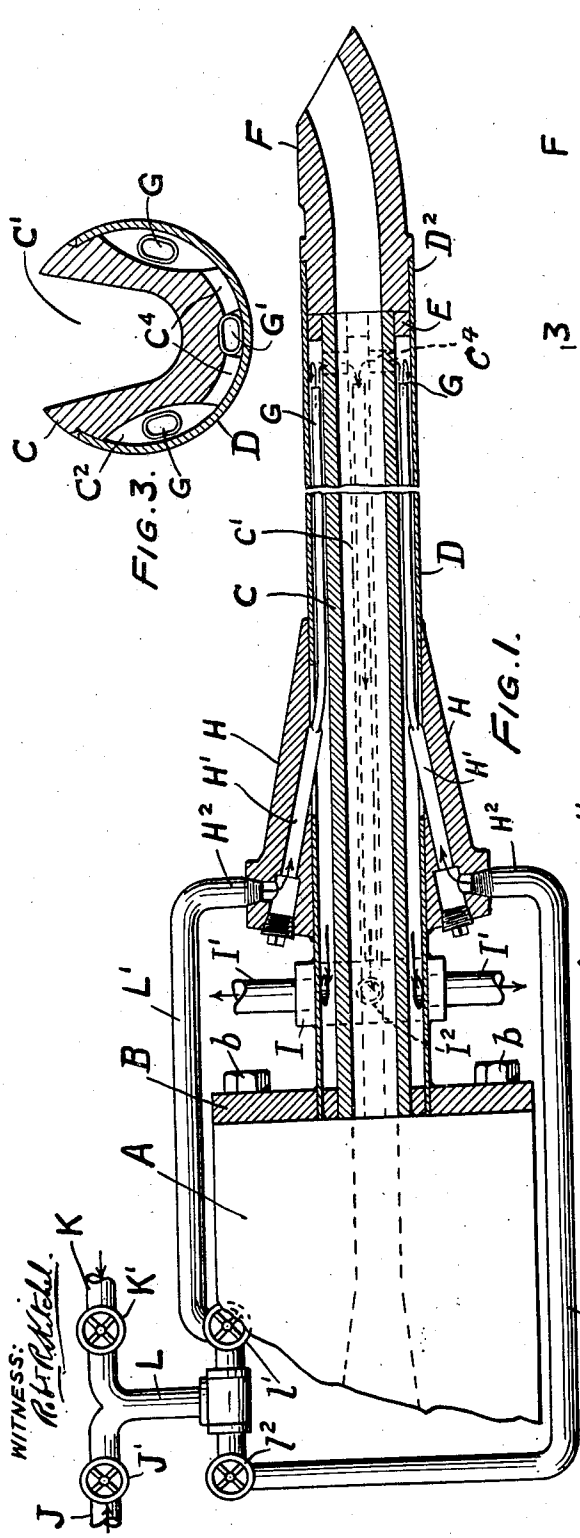


FIG. 1.

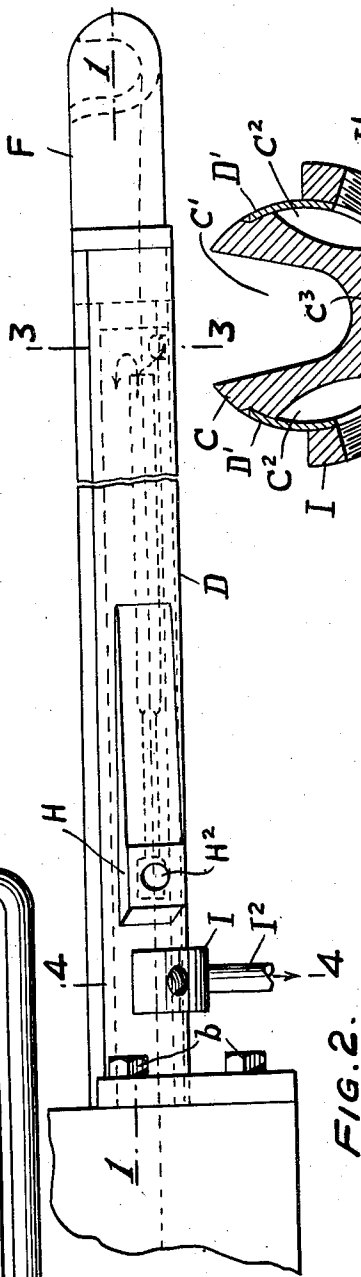


FIG. 2.

FIG. 3.

FIG. 4.

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'atented Mar. 15, 1932 1,849,072

UNITED STATES PATENT OFFICE

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RUNNER TROUGH FOR CENTRIFUGAL CASTING MACHINES

Application filed June 3, 1930. Serial No. 459,073.

My invention relates to runner troughs for centrifugal casting machines of the type in which the metal flowing through the trough is delivered from a spout at its end in a continuous stream and the object of my invention is to provide a runner of this kind which can be used without the usual liners in the trough and in which the trough through which the metal runs will be of increased capacity as compared with the outer dimensions of the trough, a further object of my invention being to provide a structure which is more easily controlled with regard to deflections of the trough than is the case with troughs or runners as previously constructed. The essential novel feature of my construction is the make-up of the runner trough of a massive steel inner member of approximately cylindrical shape in the upper portion of which is formed the trough or channel through which the metal flows, in the lateral sides of which are formed open faced longitudinal chambers and in the bottom of which is preferably formed another open faced longitudinal chamber. The sides and bottom of this inner member are enclosed in a segmental outer member forming a closure for the lateral and bottom chambers and my structure further involves the provision of some convenient means for creating a flow of cooling or heating fluid through the lateral chambers and preferably also through the bottom chamber, with preferably means for regulating the flow of such fluid so as to control the heating or cooling of the runner trough and thereby prevent undesirable bending of the trough. My construction will be best understood as shown in the drawings, which illustrate a trough of my improved construction and in which

Figure 1 is a horizontal section through my improved trough taken as on the line 1—1 of Fig. 2, this view also showing the pipe connections through which steam or cooling water is introduced into the lateral chambers of the runner.

Figure 2 is a side elevation of my improved trough.

Figure 3 is a cross sectional view on the line 3—3 of Fig. 2, and

Figure 4 a cross sectional view on the line 4—4 of Fig. 2.

A indicates a structure, ordinarily a part of the ladle supporting frame, to which the runner trough is attached by a supporting flange indicated at B and nuts as indicated at *b*. C indicates the inner member of my improved trough, which is a massive steel structure of approximately cylindrical form, provided with a trough C^1 on its upper side for the passage of the molten metal, with lateral open faced chambers C^2 C^2 and with preferably a bottom open faced chamber indicated C^3 connected to the lateral chambers at or near their ends by channels C^4; the sides and bottom of this inner member are enclosed in a segmental outer member D, which forms a closure for the lateral and bottom chambers formed in the member C, being attached to the inner member as by walls indicated at D^1 D^1, etc. Near the outer end of the runner the lateral and bottom channels or chambers are closed in any convenient way as by blocks E, indicated in Fig. 1. As shown, an end D^2 of the outer member projects beyond the member C and forms a retaining seat for the delivery spout of the runner indicated at F. G, G are pipes located in the lateral chambers C^2 and opening near the outer ends of these chambers and G^1 indicates a similar pipe located in the lower chamber C^3 and forming as shown a contact with the sides of this chamber. This pipe may be omitted in the general organization shown and the flow of water backward through the chamber C_7 comes directly in contact with its sides. H is a saddle piece secured on the outside of the runner trough and formed with channels indicated at H^1 H^1, the outer ends of which are connected through an opening in the outer member D with the ends of the pipes G, G. H^2 H^2 indicate the openings by which fluid conveying pipes are connected with the channels H^1. I indicates another saddle secured to the jacket, having openings I^1 I^1 communicating through perforations in the member D with the channel C^2 C^2 and an opening I^2 similarly connected with the bottom channel C^3. J and K indicate respectively water and steam pipes each

provided with a control valve indicated at J^1 and K^1, these pipes communicating with a common pipe L, having branches L^1 and L^2 each provided with a regulating valve l^1 and l^2 the openings H^2 H^2.

The means for delivering metal to the runner trough may be of any usual approved construction and are not shown in the drawings.

Preparatory to pouring metal through the runner trough and into the centrifugal mold, not shown, the runner trough is heated by turning on steam through the pipe J which will pass through the pipes L, L^1 and L^2 into the passages H^1 and pipes G, G escaping at the end of these pipes into the lateral chambers C^2 C^2 and flowing back through these chambers and through the passages C^4 and bottom chamber C^3 to the outlet openings described. When the trough has been sufficiently heated the steam is cut off, the metal admitted to the trough and water turned on from the pipe K which will circulate in the same manner described as to the steam, with the effect of cooling the trough to an extent which can be regulated by regulating the flow of water by means of the valves l^1 and l^2.

There is nothing essentially new in my described apparatus for the control of steam and cooling water except the use of such appliances in connection with a trough having the structural make-up which I have described and which I believe to be entirely new with me.

It might be explained that it is advisable to coat the open trough C^1 with a thin refractory coating which can be applied as a wash at frequent intervals during the periods when the metal is not flowing through the trough.

Experience has demonstrated that a trough having my construction does not require to be provided with the usual lining blocks of cast iron or refractory material and can be made therefore of smaller diameter than that required by the usual structures and also that my special construction secures under conditions of use the necessary rigidity of the runner trough and provides for the ready correction of any deflections which may occur in it by a regulation of the application of the cooling fluid.

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

1. A runner for delivering molten metal to a centrifugal pipe casting machine consisting of an inner massive steel member of approximately cylindrical form having formed in it a trough or gutter for the molten metal and lateral longitudinally extending open faced chambers in combination with an outer jacket member secured to the inner steel member and forming a closure for the lateral chambers and means for directing a cooling fluid through said lateral chambers.

2. A runner having the constructive features of claim 1 in which the inner steel member is further provided with a bottom longitudinal open faced chamber connected to the outer ends of the lateral chambers and closed by the outer member.

STUART B. CLARK.