Aug. 25, 1925. 1,551,277

A. YORK

APPARATUS FOR CASTING BEARINGS

Filed Feb. 13, 1924 2 Sheets-Sheet 1

FIG. 1.

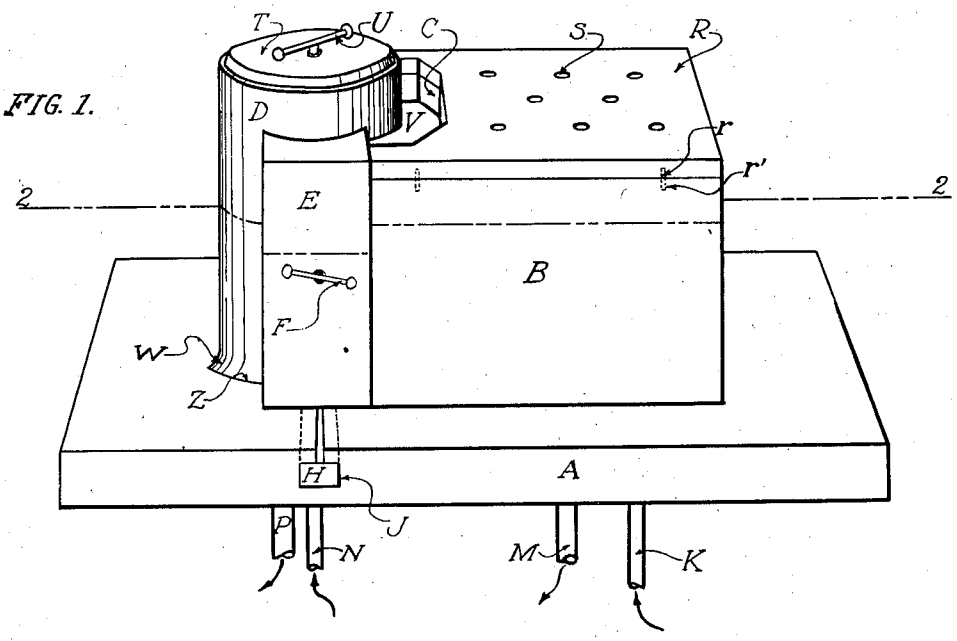
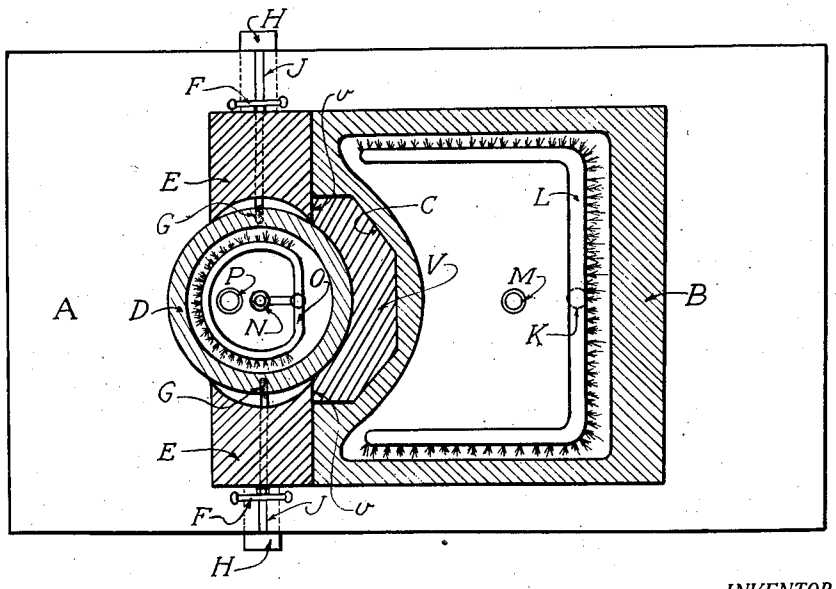


FIG. 2.



WITNESS:

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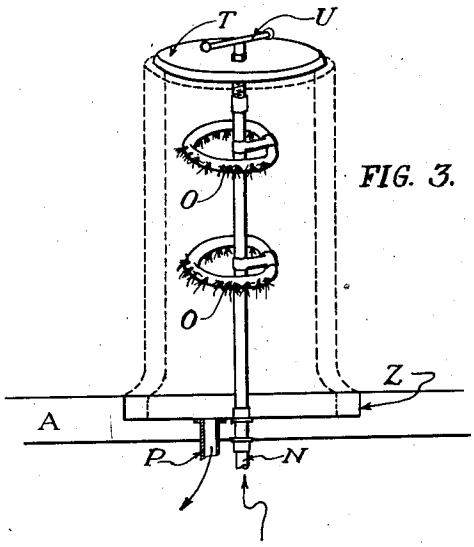

FIG. 3.

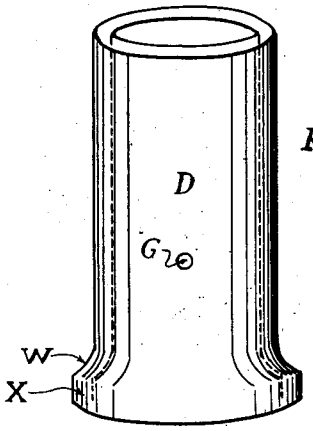

FIG. 4.

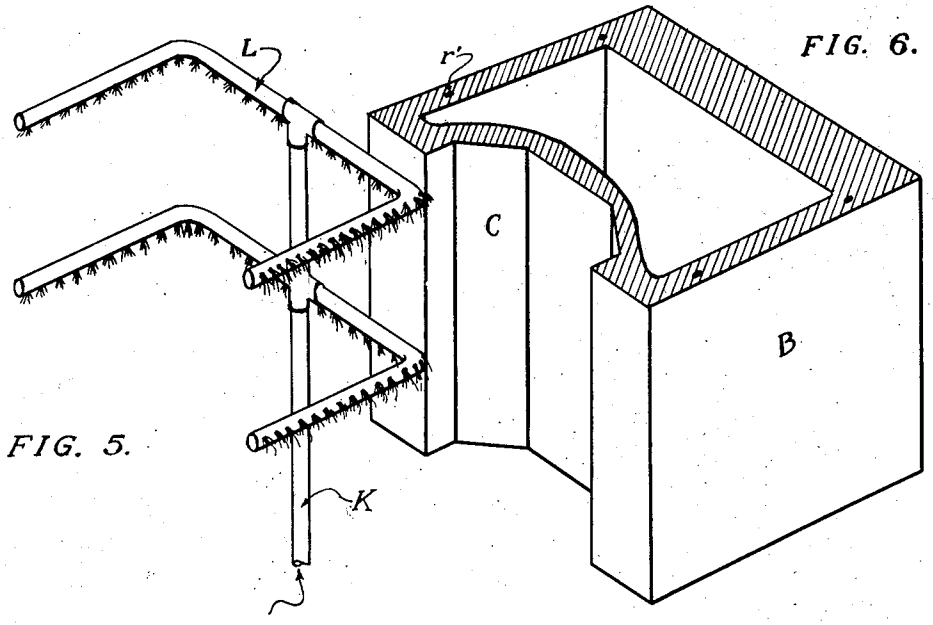

FIG. 5.

FIG. 6.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CASTING BEARINGS.

Application filed February 13, 1924. Serial No. 692,475.

To all whom it may concern:

Be it known that I, ARTHUR YORK, a citizen of the United States, residing in St. Louis, and State of Missouri, have invented a new and useful Improvement in Apparatus for Casting Bearings, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings which form a part thereof.

My invention relates to apparatus for casting bearings and more particularly to apparatus for casting brass bearings such as are ordinarily used in the axle boxes of railroad cars.

Heretofore, usually in casting bearings of this kind an ordinary sand mold comprising a cope and a drag was used and necessarily the bronze or brass bearings cast in this way were rough and inaccurate and had to be rattled to remove irregularities and machined to the proper dimensions and finish. This machining broke the surface skin of the casting and made it more liable to wear in use. Also, when this method of casting bearings was used a new mold had to be made for each casting and this procedure involved a great deal of labor.

Molding apparatus using a hard composition or metal mold has been devised to obviate the necessity of using sand molds and to provide a bearing which was smooth; but such apparatus has been found inaccurate and with continued usage becomes hot because of contact with the molten metal until it becomes so hot as to be dangerous to the operator and so hot as to reduce the quality of the bearing cast.

The objects, therefore, of my invention are to provide apparatus for casting bearings whereby a bearing will be formed with accurate proportions and with a smooth finish, obviating the necessity of machining; to provide apparatus for casting bearings which includes permanent molds for forming the different integral parts of the bearing; to provide apparatus for casting bearings which will be readily adjustable to form bearings of different sizes; and to provide in apparatus for casting bearings means whereby the molding faces of such apparatus may be kept cool without being chilled.

A simple embodiment of my invention is shown in the accompanying drawings wherein similar letters are used to designate similar parts. Fig. 1 is a view showing the apparatus assembled; Fig. 2 is a view along the lines 2—2 in Fig. 1; Figs. 3 and 4 show details of construction of the mandrel and Figs. 5 and 6 show details of construction of the mold.

Referring to the figures the apparatus for casting bearings is mounted upon a base plate A and comprises the mold B, which is hollow with the inside walls, preferably, following some such contour as shown in Figs. 2 and 6; the hollow mandrel D; and the spacing blocks E which are arranged and adapted to hold the mandrel D in predetermined relation to the mold B, all arranged substantially as hereinafter set forth. The mold B has a molding surface C which follows the contour of the back of a bearing to be cast, and the mandrel D is adapted to give the proper shape to the face of a bearing. The parts of the apparatus and more especially the mold and the mandrel D are made of cast iron or some other durable material and the molding surface C and the surface of the mandrel with which molten metal contacts are highly polished and, preferably, oiled or dusted. The spacing blocks E, preferably, have their faces nearest the mandrel D arcuate in shape so as to press firmly against the mandrel. The blocks are held in position with respect to the mandrel by the hand bolts F which are adapted to screw into the threaded sockets G in the side walls of the mandrel, as shown in Fig. 2. The spacing blocks E are slidably mounted on the base plate A by means of the lugs H which are mounted in the grooves J, substantially as shown, and which allow free movement of the blocks away from or towards the mandrel when the bolts F are unscrewed but which prevent movement of the spacing blocks away from the mold B. The mandrel D has at its lower end the bevel W and the enlarged portion X which is adapted to fit into the depression Z in the base plate, thereby aiding the spacing blocks to maintain the mandrel in fixed position.

The mold B is provided with the water inlet pipe K entering the hollow interior portion of the mold through the base plate A, as shown. The water inlet pipe K is provided with the perforated branches L which are arranged to discharge water against the walls of the mold at the rear and two sides, but not against the wall having the molding surface. The discharge pipe

M is provided in the base plate so that the water discharged from the branches L will not collect in the hollow interior of the mold. Likewise, the mandrel D is provided with the water inlet pipe N which has the perforated branches O adapted to discharge water against the rear wall of the mandrel but not against the front wall of the mandrel with which molten metal comes into contact when a bearing is cast. The depression Z in which the mandrel rests is provided with the discharge pipe P, as is shown in the figures. The mold B may be provided with the cover R having the air vents S therein which is held in place by dowel pins r fitted in the holes r'. The mandrel D may be provided with the cover T which is held in place by a bolt threaded into a fitting arranged on the upper end of the water inlet pipe N, as shown in Fig. 3.

The method of using my improved apparatus to cast a bearing is as follows: The mandrel D of the proper size to form the desired face of the bearing to be cast is positioned with its enlarged portion in the depression Z. The spacing blocks E are moved to bear against the sides of the mandrel and bolts F are screwed into the sockets G in the mandrel to hold the mandrel firmly in place. The hollow space between the face C of the mold, the face of the mandrel, and portions of the sides of the blocks E conforms to the shape of the bearing to be cast. The molten metal of which the bearing is to be cast is poured to fill the space described and then is allowed to set in the usual way before the bearing V is removed. The back of the bearing V being formed by the face C, the face of the bearing being formed by a portion of the mandrel D, and the edges v of the bearing adjacent to the face thereof being formed by portions of the spacing blocks E. A bevel is usually desired at the lower marginal edge of the face of the bearing and this bevel is formed by the bevel W at the lower edge of the mandrel. When the metal has set the blocks E are loosened, the mandrel taken from the depression and the bearing removed. A top for the molding space may be provided having the usual gate therein, through which the metal is poured, if desired.

When the apparatus is in use to form a number of bearings one after the other the mold B and the mandrel D are maintained at a constant predetermined temperature during the casting of the bearings by means of the water which is allowed to flow from the perforated branches L and O, as set forth above. Since it is usually desirable not to chill the bearings being cast no water is allowed to be discharged upon the wall of either the mold or the mandrel with which the molten metal comes in contact, but only against those walls which are not in contact with the metal. In this way, the parts are kept at a desired coolness but the bearing metal is not chilled.

My device may be used to cast other articles which present the same problems presented in casting bearings, and in casting some of these devices it may be desirable to have a chill with which the molten metal contacts. In this event water may be allowed to be discharged against the walls of the mold and mandrel which contact with the metal being cast. I do not desire to limit myself to the exact embodiment of the invention shown in the drawings, since for the sake of convenience, I have shown my invention in one of its simplest forms. It may be readily seen that the shape of the different parts and particularly of the mold B, the face C and the size and exact shape of the mandrel D may be necessarily varied within wide limits without deviating from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent, is:—

1. In apparatus for casting bearings, a vertical mold adapted to form the back of a bearing, a vertical mandrel adapted to form the face of a bearing, and adjustable spacing blocks arranged to hold said mandrel in predetermined fixed relation to said mold.

2. In apparatus for casting bearings, a mold adapted to form the back of a bearing, a mandrel adapted to form the face of a bearing, and spacing blocks arranged to hold said mandrel in predetermined fixed relation to said mold and adapted to form the edges of said bearing adjacent said face, said spacing blocks being slidably mounted so as to be movable from or towards said mandrel.

3. In apparatus for casting bearings, a hollow metal mold adapted to form the back of a bearing, a hollow metal mandrel adapted to form the face of a bearing, adjustable means for holding said mold and said mandrel in predetermined fixed relation, and means within said mold and said mandrel for cooling said mold and said mandrel.

4. In apparatus for casting bearings, a hollow mold adapted to form the back of a bearing, a hollow mandrel adapted to form the face of a bearing, means for holding said mold and said mandrel in predetermined fixed relation, means for cooling said mold and said mandrel and said cooling means being constructed and arranged so that the cooling medium thereof does not meet the parts of the walls of said mold and said mandrel which contact with the metal of which the bearing is cast.

5. In apparatus for casting bearings, a hollow mold adapted to form the back of a bearing, a hollow mandrel adapted to form the face of a bearing, means for holding

said mold and said mandrel in predetermined fixed relation, and means for discharging water upon those parts of the walls of said mold and said mandrel which do not contact with the molten metal when a bearing is cast.

6. In apparatus for casting bearings, a hollow metal mold adapted to form the back of a bearing, a hollow metal mandrel adapted to form the face of a bearing, adjustable spacing blocks arranged to hold said mandrel in predetermined fixed relation to said mold and adapted to form the edges of said bearing adjacent said face, means for discharging water against the inner sides of those parts of the walls of said mold and said mandrel which do not contact with the molten metal when a bearing is cast whereby said mold and said mandrel are cooled, and discharge openings in the lower ends of said mold and said mandrel whereby the water discharged against the walls thereof is prevented from collecting therein.

In witness whereof I have signed my name to this specification.

ARTHUR YORK.