April 7, 1925. 1,532,690

P. J. FLAHERTY

METHOD AND APPARATUS FOR MAKING CENTRIFUGAL CASTINGS

Filed Nov. 22, 1922 2 Sheets-Sheet 1

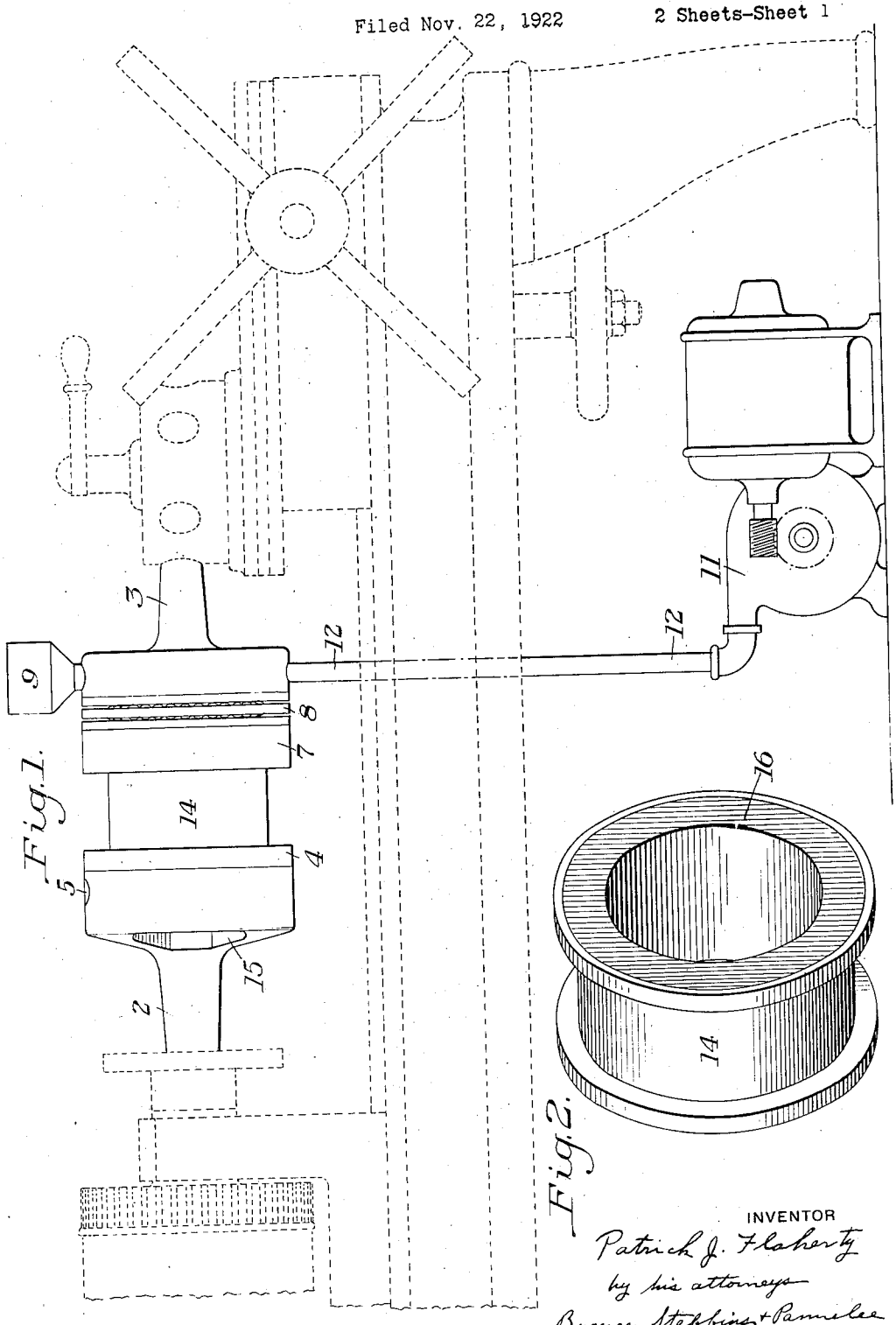


Fig. 1.

Fig. 2.

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Filed Nov. 22, 1922 2 Sheets-Sheet 2

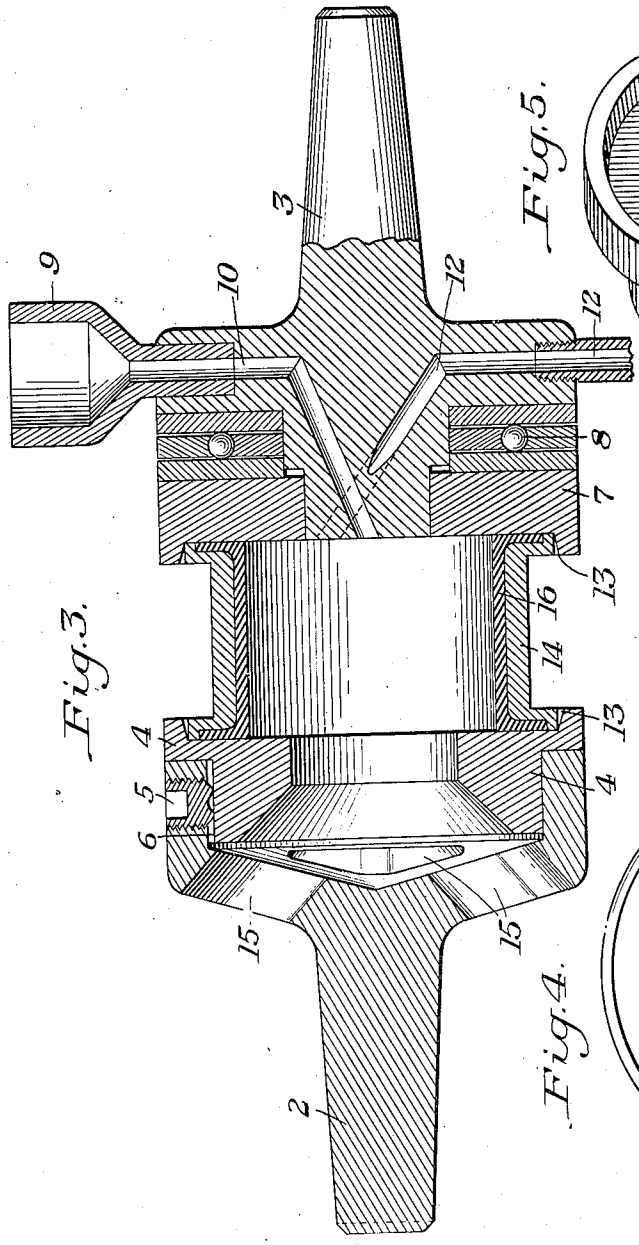


Fig. 3.

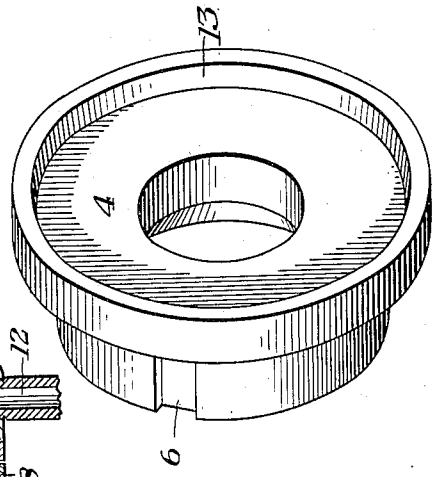


Fig. 5.

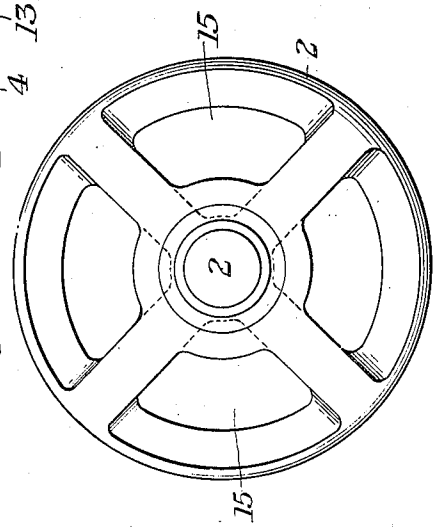


Fig. 4.

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UNITED STATES PATENT OFFICE.

PATRICK J. FLAHERTY, OF NEW CASTLE, PENNSYLVANIA, ASSIGNOR TO THE JOHNSON BRONZE COMPANY, OF NEW CASTLE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

METHOD AND APPARATUS FOR MAKING CENTRIFUGAL CASTINGS.

Application filed November 22, 1922. Serial No. 602,527.

To all whom it may concern:

Be it known that I, PATRICK J. FLAHERTY, a citizen of the United States, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented a new and useful Improvement in Methods and Apparatus for Making Centrifugal Castings, of which the following is a full, clear, and exact description.

This invention relates to method and apparatus for making centrifugal castings, and is particularly adapted for making lined bearings. In the manufacture of such bearings, a shell of bronze or other suitable material is cleaned and given a preliminary "wash" of tin to insure adhesion, and then lined with bearing metal, such as babbitt, by the centrifugal casting process.

In the manufacture of lined bearings, it is important to have the shell properly centered and alined in order to get a uniform thickness of bearing metal inside. Where a large number of sizes are to be made this becomes expensive on account of the large number of machines necessary to accommodate shells of various sizes. I provide two heads for supporting the mold or shell, and a series of removable adapters for the heads, by which it is possible to accommodate different sized molds or shells on the same machine by using suitable adapters.

I also provide for directing a cooling blast of air through the shell in order to more quickly freeze the lining metal.

In the accompanying drawings illustrating the preferred embodiment of my invention,—

Figure 1 is a side elevation of my invention as applied to a conventional lathe, shown in dotted lines, to make a centrifugal casting machine;

Figure 2 is a perspective view of a bearing produced by my method;

Figure 3 is a sectional view through the apparatus shown in full lines in Figure 1;

Figure 4 is an end elevation of the live head; and

Figure 5 is a perspective view of an adapter.

In the illustrated embodiment of my invention, there is provided a live head or spindle 2 and a dead head or spindle 3 which may be carried by the head and tail stocks, respectively, of an ordinary lathe. These heads may take various forms, and while they are shown as spindles, are not limited thereto. The live head 2 is bored out to receive an adapter 4, which is held in place by a set screw 5 engaging a slot 6.

The other head is provided with an adapter 7, behind which is a ball bearing 8. The adapter 7 is free to rotate on the dead head 3. A cup 9 and a passage 10 in the dead head are provided for the introduction of the molten metal to be cast, while cooling air is supplied from a blower 11 through a passage 12.

In operation, the heads are separated by backing off the tail-stock of the lathe, and a tinned shell 14 is placed between the adapters. The tail-stock is then moved up and clamped. The working faces of the adapters are provided with tapering circular recesses 13 which receive the ends of the shell 14, thus insuring proper centering.

The lathe is started up and a measured quantity of molten metal is poured into the cup 9, from which it passes to the interior of the spinning mold by the passage 10. This passage is at an angle to the axis of the mold, and therefore serves to direct the metal toward the interior surface of the shell 14.

Cooling air enters through the passage 12, which also terminates at an angle, and sweeps over the freshly cast surface for the length of the casting and out through openings 15 in the live head. The openings 15 are preferably as large as possible to allow free egress of the cooling air.

The cast metal 16 quickly sets, and the bearing may then be removed for subsequent finishing operations by backing off the tail-stock.

I provide for the economical production of various sizes of bearings by a single casting machine, since the adapters make it possible to change from one size of shell to another. I also provide simple and dependable means for air cooling the centrifugal casting, by directing the cooling air against the surface to be cooled.

While I have shown the preferred embodiment of my invention, it will be understood that it is not limited to the illustrated form, but may be embodied in other con-

structions within the scope of the following claims.

I claim:

1. In apparatus for centrifugal casting, a mold, a live head adapted to rotate the mold and to support one end thereof, and a dead head adapted to support the other end thereof, the dead head having an opening for the molten material to be cast and a second opening for the introduction of a cooling medium, substantially as described.

2. In apparatus for centrifugal casting, a mold, a live head adapted to rotate the mold, a removable adapter for the live head rotatable therewith, a dead head, and a removable rotatable adapter thereupon, said adapters being adapted to accommodate the ends of the mold for centering and supporting the same, substantially as described.

3. In apparatus for centrifugal casting, a mold, a live head adapted to rotate the mold, a removable adapter for the live head rotatable therewith, a dead head, a removable rotatable adapter thereupon, and means for introducing the molten material to be cast through the dead head, substantially as described.

4. In apparatus for centrifugal casting, a mold, a head for supporting the mold, means for introducing a cooling medium to the interior of the mold, the head having an opening to permit egress of the cooling medium from the mold, and a removable adapter for the head for accommodating molds of different sizes, the adapter having an opening permitting free passage of the cooling medium from the mold to the opening in the head, substantially as described.

5. In apparatus for centrifugal casting, a mold, relatively rotatable heads for supporting the mold, a removable adapter for each head, said adapters being adapted to accommodate the ends of the mold for centering and supporting the same, and means whereby the molten material to be cast may be introduced through one of said heads, substantially as described.

6. In apparatus for centrifugal casting, a mold, a live head adapted to rotate the mold, a removable adapter for the live head rotatable therewith, a dead head, and a removable adapter for the dead head rotatable thereupon, said dead head having separate passages therethrough for the introduction of the molten material and a cooling medium to the mold and the live head and its adapter having openings therethrough for the egress of the cooling medium, substantially as described.

In testimony whereof I have hereunto set my hand.

PATRICK J. FLAHERTY.