No. 893,037. PATENTED JULY 14, 1908.

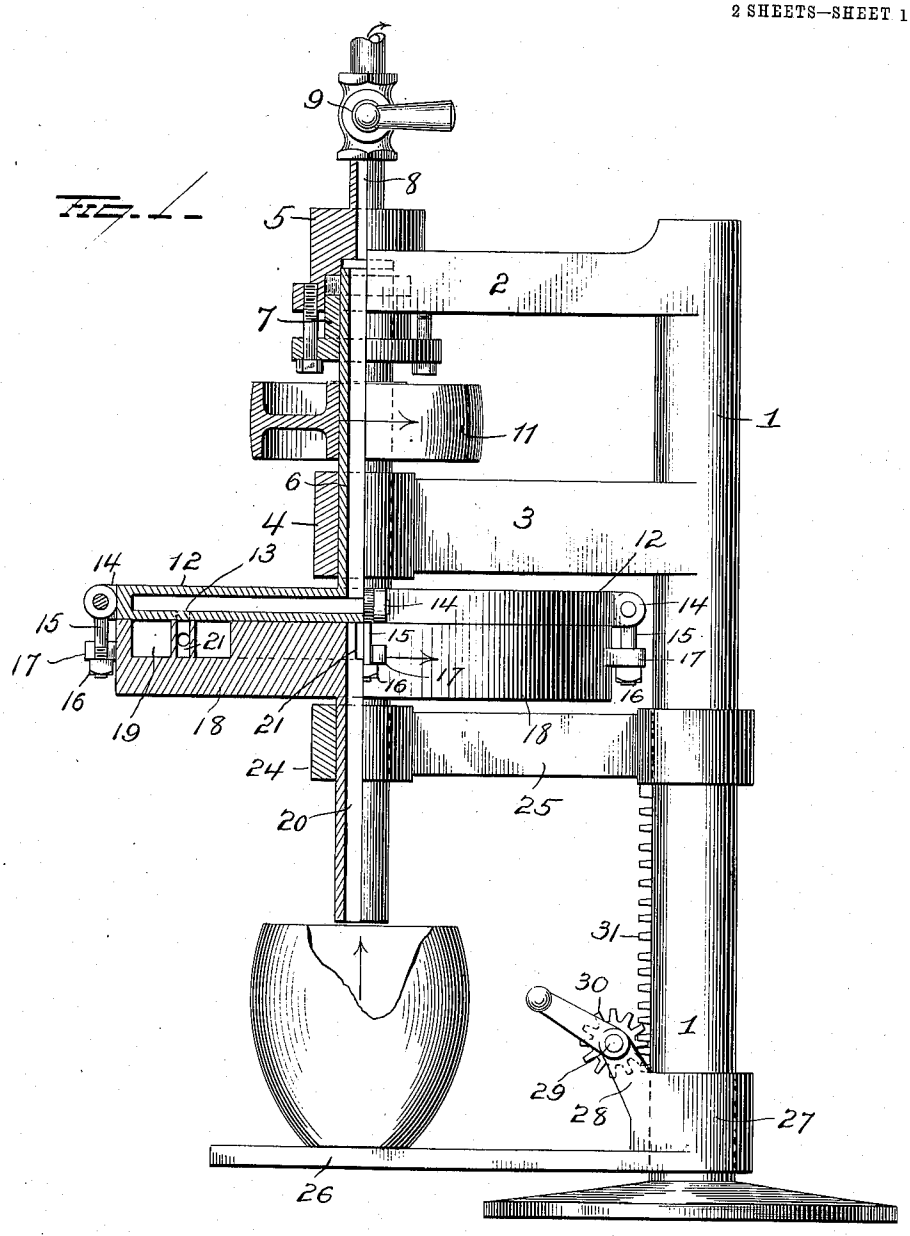
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CASTING APPARATUS.

APPLICATION FILED MAY 11, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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CASTING APPARATUS

APPLICATION FILED MAY 11, 190?

2 SHEETS—SHEET 2.

Fig. 2.

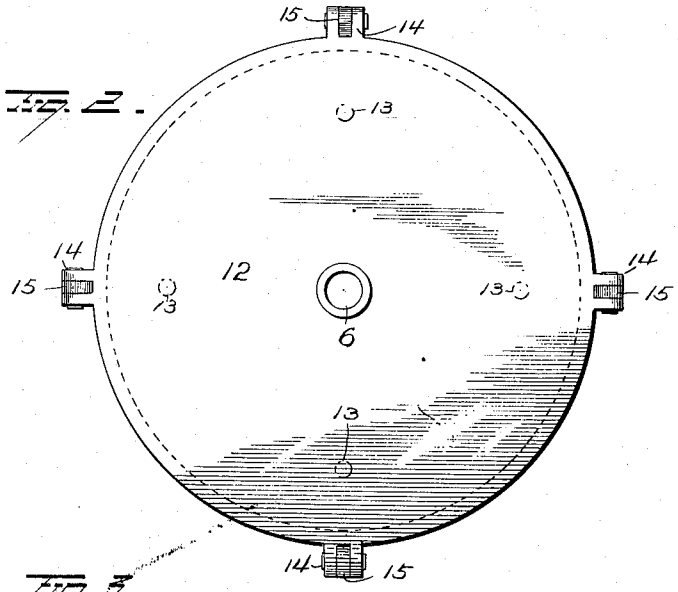


Fig. 3.

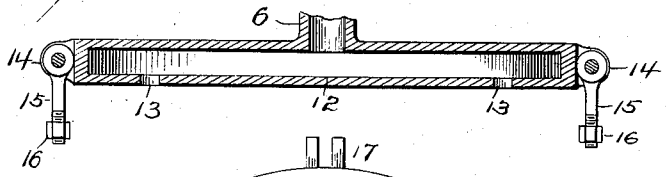


Fig. 4.

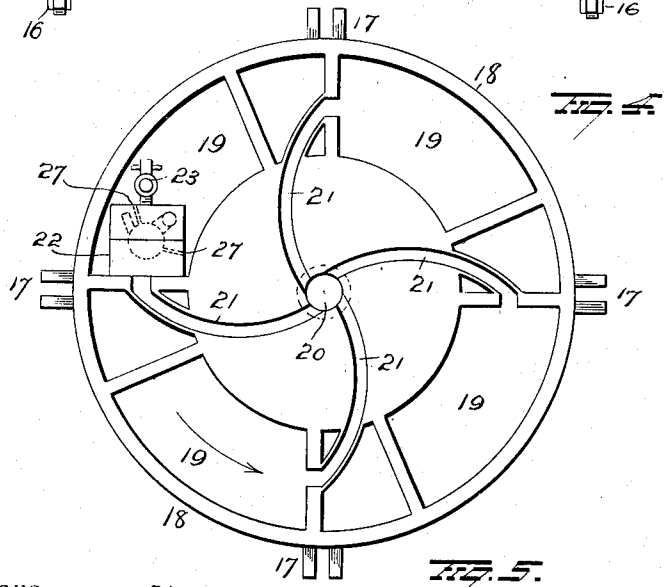
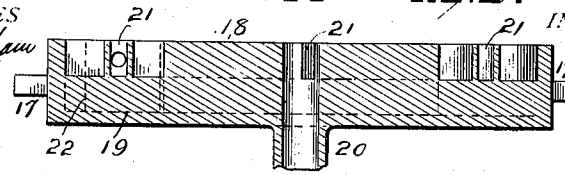


Fig. 5.



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UNITED STATES PATENT OFFICE.

HERBERT G. UNDERWOOD, OF BRIGHTON, NEW YORK, ASSIGNOR OF ONE-HALF TO WILLIAM S. BRIAN, OF MEMPHIS, TENNESSEE.

CASTING APPARATUS.

No. 893,037. Specification of Letters Patent. Patented July 14, 1908.

Application filed May 11, 1907. Serial No. 373,160.

To all whom it may concern:

Be it known that I, HERBERT G. UNDERWOOD, of Brighton, Staten Island, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Casting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in casting apparatus, the object being to obtain increased speed and convenience in operation; to prevent as far as possible any defects in the casting due to the presence of dross, and to supply fluid metal to a plurality of molds simultaneously, from a single source of supply.

In carrying out this invention I provide a horizontally rotating mold carrier with a series of compartments each adapted to carry a mold, a vacuum chamber communicating with the mold chambers, means for exhausting air in the vacuum chamber and communicating mold compartments, and a pipe or conduit communicating with the several molds and leading to the fluid metal receptacle, whereby when the vacuum chamber and mold carrier are rapidly rotated in a horizontal plane, the fluid metal will be drawn up by the suction above, and by centrifugal action and be simultaneously discharged into the several molds.

My invention therefore consists in the parts above referred to and in the combinations of parts hereinafter referred to and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of my apparatus assembled. Fig. 2 is a bottom plan view of the vacuum chamber. Fig. 3 is a view in section of same. Fig. 4 is a top plan view of the mold carrier, and Fig. 5 is a view in transverse vertical section of same.

1 represents an upright standard provided with the parallel horizontal arms 2 and 3, which terminate at their free ends in alined bearings 4 and 5 for the hollow shaft 6. This shaft 6 is mounted directly in bearing 4 and in a stuffing box or gland 7 secured in bearing 5. The upper face of the bearing, and the hollow shaft 6 are in communication with pipe 8 having a valve 9, the pipe being secured to the bearing 5 and leading to a vacuum pump or other apparatus (not shown) for exhausting the air from the interior of the mechanism. The shaft 6 carries the belt wheel 11, by which the shaft, and parts connected thereto, are revolved in the direction indicated by the arrow, and has secured to its lower end, the vacuum chamber 12, which as shown, is in direct communication with the hollow shaft 6. This vacuum chamber 12 is in the form of a hollow disk connected centrally to the lower end of the hollow shaft 6, with its interior or chamber in direct communication with the opening through the shaft, and is provided in its lower wall with a plurality of openings 13, one for each mold chamber in the mold carrier. This vacuum chamber 12 is provided on its periphery with a plurality of pairs of lugs 14 in which the swinging clamping bolts 15 are pivotally secured. Nuts 16 carried by these bolts engage the under side of slotted lugs 17 on the mold carrier 18, and firmly lock and clamp the latter to the underside of the vacuum chamber 12, with the mold chambers 19 communicating with the vacuum chamber through the openings 13 in the lower wall of the latter.

The mold carrier 18 carries the centrally disposed depending hollow shaft 20, which communicates directly with the interior of the mold carrier, and the latter is provided with a series (in the present instance four) of mold chambers 19 disposed adjacent to the periphery of the mold carrier, a curved port 21 connecting each mold chamber 19 with the hollow shaft 20, as clearly shown in Figs. 4 and 5.

The molds 22 may be of any suitable construction, and are secured by clamps 23 within the chamber 19, with their ingates communicating with the outer ends of the ports 21, so that the molten metal drawn up by suction and forced outwardly by combined suction and centrifugal action, will pass directly into the molds. The hollow shaft 20 passes through the bearing 24 in arm 25, which latter is mounted to turn or swing on standard 1, and forms a support for the mold carrier when the latter is disconnected from the vacuum chamber.

26 is a platform having a sleeve 27 embracing the standard 1 and having a bearing 28 in which is mounted a shaft 29 carrying a pinion 30. This pinion meshes with rack 31 on standard 1 and when turned oper-

ates to raise or lower table 26. Shaft 20 terminates some distance above the lowest position of the table 26, and the latter is designed to support a crucible or other vessel containing the fluid metal.

With the parts thus arranged the apparatus is ready for operation. By now imparting rotary motion to shaft 6, and opening valve 9, the suction in pipe 8 causes a rush of air through pipe 20, through ports 21 in the carrier, through the molds 22, out of the latter through the openings 27ª, and into the mold chambers and from thence through openings 13 into the vacuum chamber and from thence out through shaft 6 and pipe 8. After the apparatus has been thus started the table 26 carrying the vessel containing the fluid metal, is raised until the lower end of pipe 21 is submerged. As soon as the latter enters the molten metal, the vacuum thus created above, causes the metal to rise in pipe 20 and into ports 21; as the metal reaches the ports, the vacuum assisted by centrifugal force carries the metal outwardly through the ports and into the molds, the air in advance of the metal escaping from the molds through the vent openings 27.

With this apparatus a plurality of molds may be quickly and simultaneously filled, and as the end of pipe 20 should be submerged none of the dross which floats on the top will be carried up into the mold. Again by employing a vacumm for drawing up the metal into the mold, all the air will be expelled from the molds, and more perfect castings will be secured, as the tendency will be for the exhaust to draw the metal into the vent openings and thus completely fill the molds. After the molds have been filled, the table 26 is lowered and the mold carrier disconnected from the vacuum chamber, thus leaving the arm 25 free to be turned and carry the mold carrier from under the vacuum chamber. After the castings have been removed and the molds replaced the carrier should be returned to its operative position and the operation repeated.

It is evident that changes in the construction and relative arrangement of the several parts might be made without avoiding my invention and hence I would have it understood that I do not restrict myself to the particular construction and arrangement of parts shown and described, but,—

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is,—

1. In a casting apparatus, the combination of a mold carrier, of a fluid metal supply pipe projecting from the bottom of the mold carrier to conduct metal to a mold therein, and air exhausting means communicating with the carrier for exhausting air from a mold therein and raising metal to said mold.

2. In a casting apparatus, the combination with a rotary carrier having a series of mold compartments and ports or ducts radiating from the center of said carrier to the several mold compartments therein, a depending pipe for fluid metal communicating with the inner ends of the several ports or ducts and air-exhaust means communicating with the outer ends of the several ports or ducts.

3. In a casting apparatus, the combination of a carrier for molds having a series of ports or ducts radiating from its center, means for rotating the carrier, air-exhausting means communicating with the outer ends of the ports or ducts in the carrier, and a depending liquid metal supply pipe communicating with the inner ends of said ducts.

4. In a casting apparatus the combination with a rotating carrier having a series of mold compartments and a curved port leading from the center of the carrier to each mold compartment, and means for exhausting the air from the several compartments, of a depending supply pipe communicating with all of said ports.

5. In a casting apparatus the combination with a cylindrical carrier mounted to rotate on a vertical axis and having a series of chambers arranged adjacent to its periphery, and a port leading from the center of the carrier to each chamber, and means for exhausting the air from said chambers, of a centrally disposed supply pipe depending from the carrier, and communicating at its upper end with all of said ports.

6. In a casting apparatus, the combination with a vertical rotating shaft, a vacuum chamber secured to the lower end thereof and a mold carrier secured to said chamber and in communication therewith, of a supply pipe depending centrally from the mold carrier and ports in the latter leading from the supply pipe to the ingates of the several molds.

7. In a casting apparatus, the combination with a cylindrical rotating carrier having a series of mold compartments arranged adjacent to its periphery and means for exhausting the air from said compartments, of a centrally disposed supply pipe depending from the carrier, ports within said carrier and connecting the supply pipe and ingates of the several molds and a vertically movable table located under the carrier.

8. In a casting apparatus, the combination of a hollow rotating shaft, a vacuum chamber carried thereby and communicating with the bore of the shaft, means for exhausting the air from said chamber, a mold carrier having a series of mold compartments, the said compartments communicating with the vacuum chamber, a supply pipe depending from the carrier and ports

leading from the supply pipe to the several mold compartments.

9. In a casting apparatus, the combination with a rotating hollow shaft, a vacuum chamber carried thereby and communicating with the bore thereof, and means for exhausting the air in said chamber, of a supply pipe, a mold carrier secured to the upper end thereof, means for securing the mold carrier to the vacuum chamber and ports leading from the upper end of the supply pipe to the several mold compartments in the carrier.

10. The combination with a vertical standard having parallel horizontal arms, a vertical hollow shaft mounted in said arms, a vacuum chamber on the lower end of said shaft and means for exhausting the air from said shaft and chamber, of a mold carrier having a series of mold compartments, a supply pipe depending from said carrier, a swinging arm on said standard having a bearing through which said supply pipe passes, ports in the carrier connecting the supply pipe and the several compartments, and means for locking the carrier to the vacuum chamber, the latter forming a closure for the top of the carrier.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

H. G. UNDERWOOD.

Witnesses:
PHILIP F. MULLIGAN,
THOS. A. CONNERY.