J. L. GERBER.

DIE CASTING APPARATUS.

APPLICATION FILED DEC. 27, 1919.

1,376,090.

Patented Apr. 26, 1921.

2 SHEETS—SHEET 1.

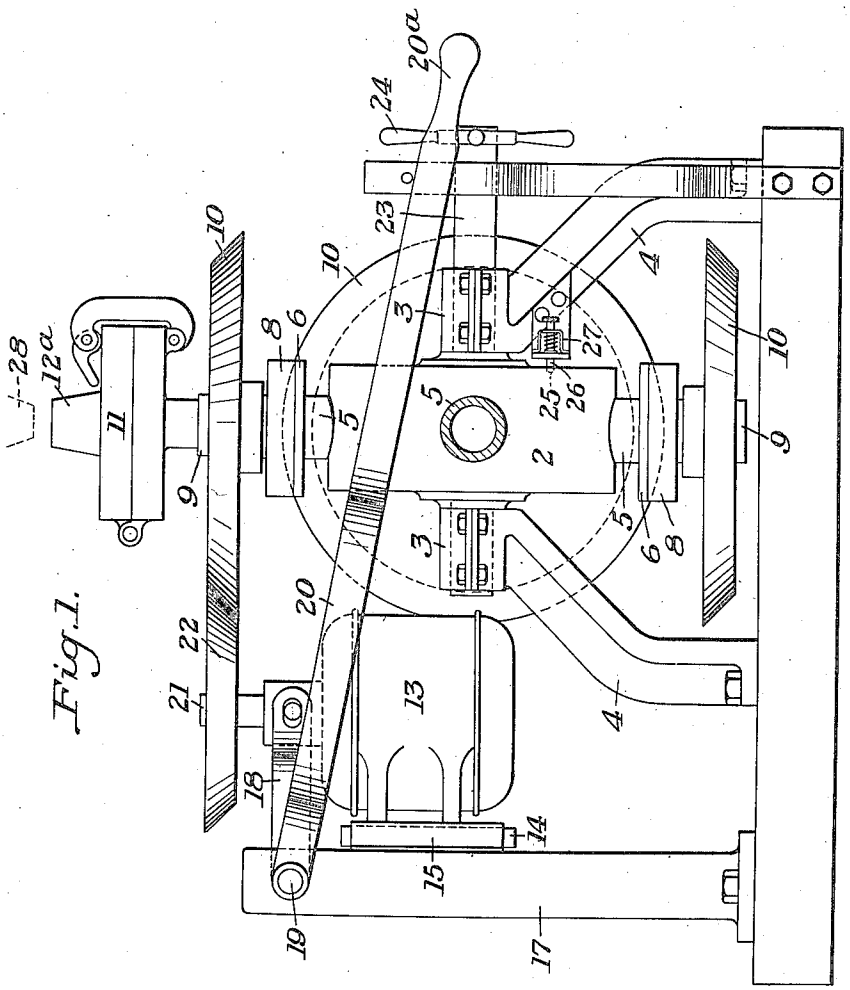


Fig. 1.

WITNESS

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2 SHEETS—SHEET 2.

Fig. 2.

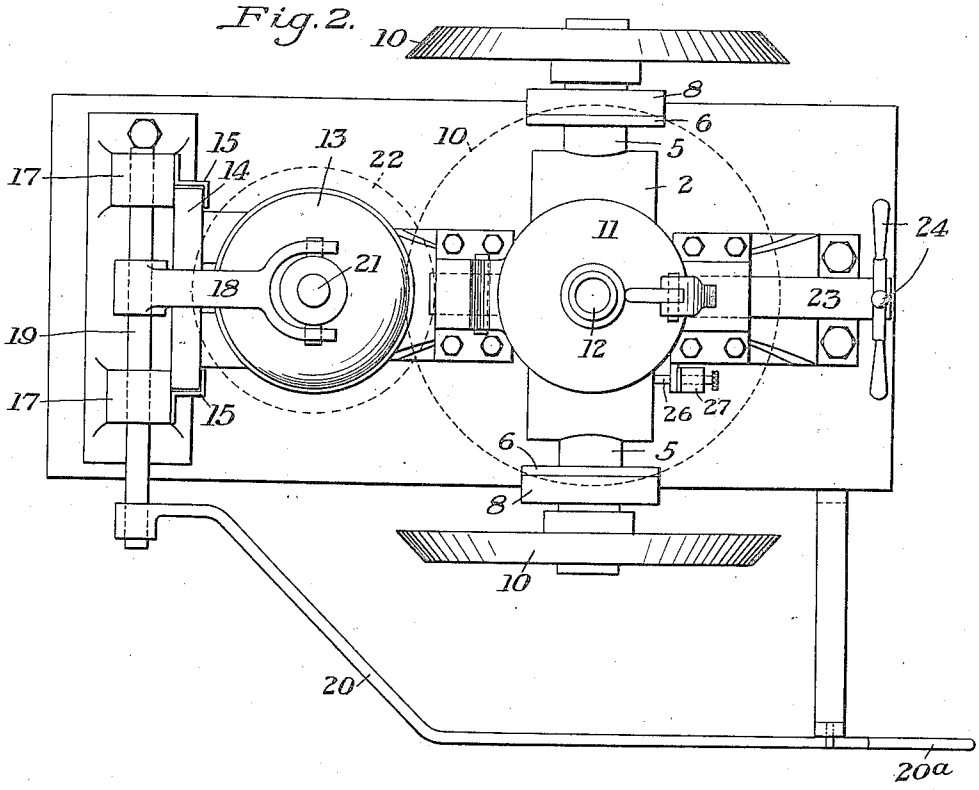
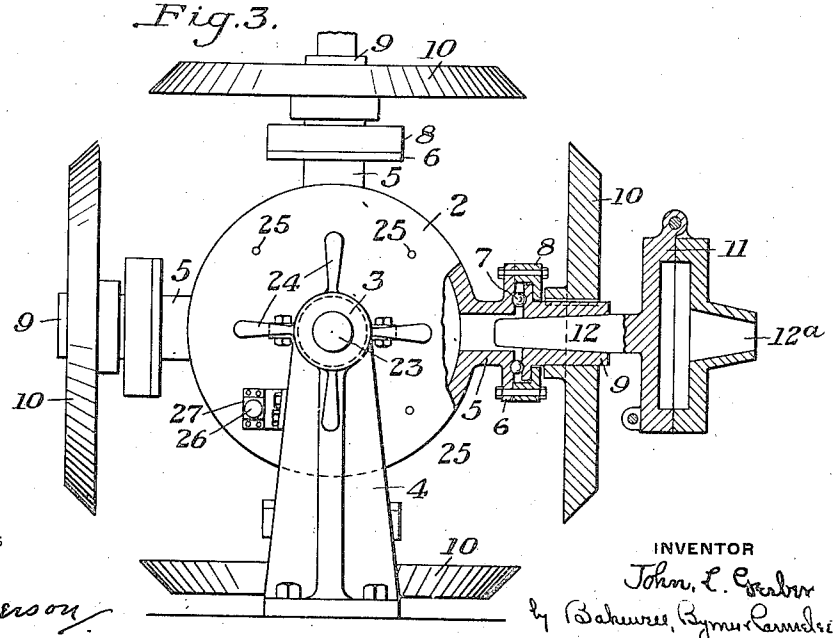


Fig. 3.



WITNESS

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UNITED STATES PATENT OFFICE.

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DIE-CASTING APPARATUS.

1,376,090. Specification of Letters Patent. Patented Apr. 26, 1921.

Application filed December 27, 1919. Serial No. 347,792.

To all whom it may concern:

Be it known that I, JOHN L. GERBER, a resident of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Die-Casting Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation with certain parts cut away of apparatus embodying my invention;

Fig. 2 is a plan view of the same certain of the parts being shown in dotted outline; and

Fig. 3 is a view partly in end elevation and partly in vertical section.

My invention has relation to die-casting apparatus, and is designed to provide apparatus of this character, by means of which die castings may be made which are substantially free from blow holes, gas holes and shrinkage cavities.

A further object of this invention is to provide apparatus of this character which is so constructed and arranged as to permit the casting operations to be rapidly performed in sequence in a plurality of die molds.

The nature of my invention will be best understood by reference to the accompanying drawings in which I have shown the preferred embodiment thereof and which will now be described, it being premised, however, that various changes can be made in the details of construction, arrangement and combination of the various parts without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates a rotary head or turret which is journaled to rotate about a horizontal axis in suitable bearings 3, carried by the supporting stands 4. This head or turret is provided with a plurality of equally spaced radial projections 5, shown in the present case as being four in number, and each of which is provided at its outer end with a flange 6, which forms a seating for ball bearings 7, and also a bolting flange for a cap plate 8. Secured to each of these projections by means of this cap plate is a hollow or socketed shaft member 9, mounted to rotate on the ball bearing 7, and to which is rigidly secured a driving wheel 10, which is preferably a beveled friction wheel. Each of the die molds 11 is provided with a tapered stem 12, adapted for removable insertion in one of the hollow shaft members 9, to have a driving connection therewith. In general, these die molds may be of any suitable character having a pouring nozzle or orifice 12^a. It is, however, important that this nozzle or orifice shall be arranged so as to come at the top of the mold when the mold is in pouring position; and that the axis of the orifice shall be substantially coincident with the axis of rotation of the mold. Furthermore, it is important that the nozzle containing this orifice shall be extended vertically so as to form a head or riser for the castings. In the operation of machines of this character, it is manifestly difficult and more or less impracticable to exactly measure the quantity of metal which is poured into each mold for a casting operation. By providing for a head or riser any excess metal is fully taken care of without its being thrown promiscuously about the casting room by the force of rotation. I also prefer to make the orifice of the inwardly tapering form shown at the right hand side of Fig. 3, so as to insure free flow of metal into the interior of the mold.

13 designates an electric motor which is secured to a base 14, mounted for vertical movement in suitable guides 15, mounted on the boss or support 17. The motor is suspended by a lever arm 18, carried by a shaft 19, to which is connected a bent lever 20. The armature shaft 21 of this motor carries a beveled friction wheel 22, which is adapted to be moved into and out of driving engagement with any one of the friction wheels 10, by the manipulation of the lever 20.

One of the shafts or trunnions of the head or turret 2 is extended through its bearing, as shown at 23, and carries a hand-actuated wheel 24, on the end portion of such extension. The head or turret is also provided with a plurality of pin holes 25, any one of which may be engaged by a pin 26, inserted through a plate or bracket 27, secured to one of the posts 4. The lever 20 is so shaped that its handle portion 20^a is adjacent to the handle lever 24. The operation is as follows:

One of the die molds having been prepared for a casting, its stem is inserted in

one of the hollow shaft members 9, and the head or turret 2 is turned to bring said mold into the upper vertical position. The electric motor 13 is then lowered by means of the lever 20, bringing the friction driving wheel 22 into engagement with the friction wheel 10. The die mold now commences to rotate and during its rotation is filled by means of any suitable pouring device, such as the spout or nozzle indicated at 28 in Fig. 1. Preferably the speed of rotation should be in the neighborhood of one thousand revolutions per minute, while the mold is being filled. This rapid rotation of the mold acts centrifugally not only to densely pack the molten metal in the mold, but it also causes the forcing out of all gases from the inside of the molds. The result is a solid homogeneous casting practically free from blow holes, gas holes and shrinkage cavities. After the mold has been filled, the motor 13 is raised to disengage the friction gears, and the head is rotated 90°, bringing a new mold which has been prepared in the meantime into casting position and bringing the filled mold to a position where it can be removed fram the machine.

In this manner, the operations can be carried out very rapidly by the use of a series of die molds which are successively placed in the apparatus and poured and then removed.

The advantages of my invention will be apparent to those familiar with the art, since it provides a machine which is extremely simple in its construction and mode of operation and by means of which die castings may be rapidly and accurately made. The invention is particularly useful in connection with the manufacture of die castings of relatively small sizes, although it may be used in making larger castings.

I claim:

1. Die-casting apparatus, comprising a head or turret mounted for rotation about a horizontal axis, a plurality of mold carriers on said head or turret, each of said carriers having means whereby it may be rotated and also having a socket member, and a plurality of molds, each of said molds having a projecting portion or stem adapted for removable rotative engagement with one of said socket members, substantially as described.

2. Die-casting apparatus comprising a rotatable head or turret, a plurality of rotatable shaft members carried by the head or turret, and a die mold hving a stem portion adapted for rotative engagement with any one of said shaft members, substantially as described.

3. Die casting apparatus, comprising a head or turret mounted for rotation about a horizontal axis, a plurality of mold carriers mounted on said head or turret, each of said carriers having means whereby it may be rotated and also having a socket member, and a plurality of molds, each of which is adapted for rotative engagement with said socket member, each of said molds having a pouring opening whose center substantially coincides with the axis of rotation of the mold and carrier, said orifice being extended externally of the mold to provide for a head or riser, substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN L. GERBER.