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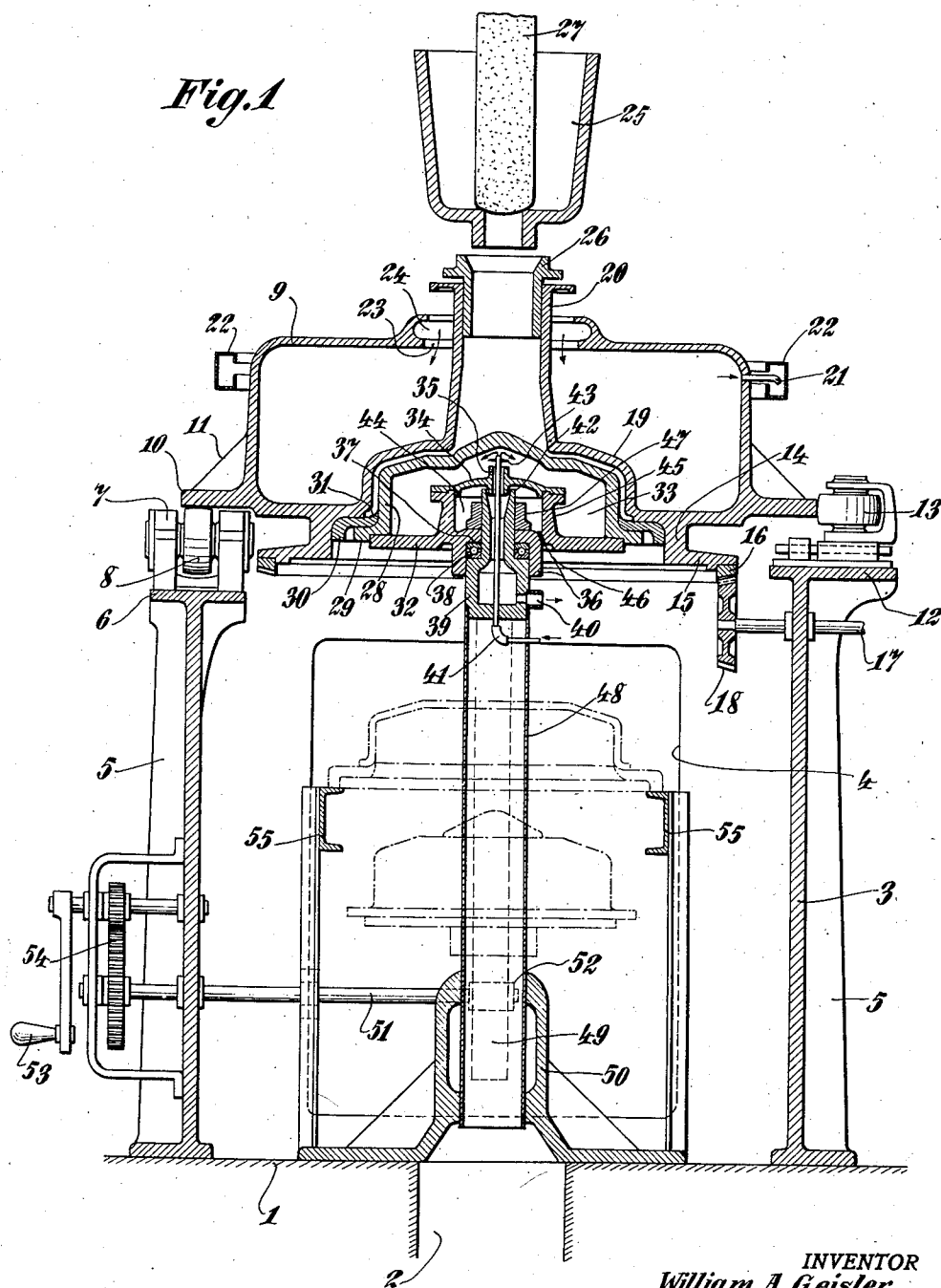
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CENTRIFUGAL MOLDING MACHINE

Filed Sept. 13, 1930

2 Sheets-Sheet 1



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Fig. 2

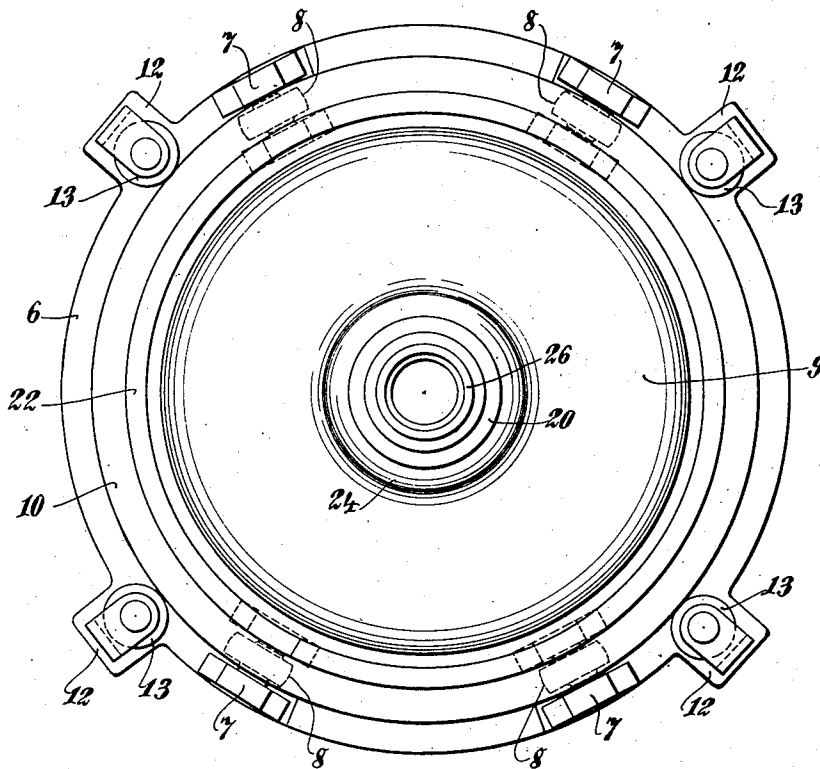
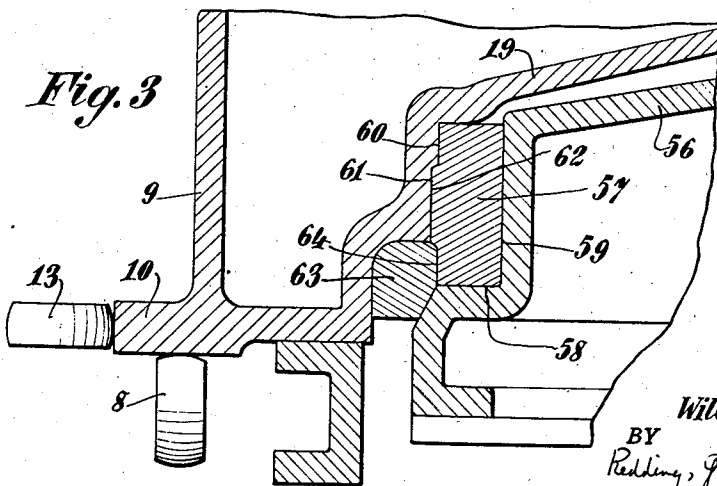


Fig. 3



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CENTRIFUGAL MOLDING MACHINE

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The present invention relates to centrifugal casting machines and embodies, more specifically, an improved device for casting articles centrifugally, the machine being so formed that the metal may be poured, the article cast, and its removal from the mold effected in a minimum time and amount of labor required. More particularly, the invention relates to casting machines by means of which articles may be readily cast in permanent rotating molds and removed from the molds quickly to permit the mold to be ready to receive a subsequent pouring in a minimum time.

The art of casting devices centrifugally is now developed to a stage in which the rotation imparted to the molten metal is utilized to cause the same to reach remote portions of a mold. In this connection, pipes and other cylindrical objects are now being cast in horizontal molds with considerable skill and efficacy. The present invention thus seeks to employ the known advantages of centrifugally cast metal and provide a machine by means of which articles may be so cast under methods affording quantity production.

An object of the invention, accordingly, is to provide a casting mechanism of the centrifugal type, such mechanism being provided with means for readily removing the casting from the mold and core in a minimum time.

A further object of the invention is to provide a device of the above character in which a portion of the mold is adapted to serve as a casting supporting device whereby such device, together with its casting, may be readily removed from the mold. A further object of the invention is to provide, in a mold of the above character, means whereby a portion of the molding surface serves as a casting supporting member, such portion being readily removable, together with its casting.

A further object of the invention is to provide a means for readily removing the core of a mold of the above character to permit the casting to be removed therefrom.

Further objects, not specifically enumerated above, will be apparent as the invention is described in greater detail in connection

with the accompanying drawings, wherein:

Figure 1 is a view in vertical section taken through a mold constructed in accordance with the present invention, showing the improved device embodied in the present invention.

Figure 2 is a plan view of the mold shown in Figure 1.

Figure 3 is a segmental view in section, showing a mold similar to the mold in Figure 1 and adapted to cast a different form of structure.

Referring to the above drawings, a suitable substructure is shown at 1, having a recess 2, within which a core supporting element is adapted to be received. Upon the substructure 1, a mold base 3 is mounted, this base being of any desired material conveniently formed and provided with openings 4 in the opposite sides thereof. Through these openings, the castings are adapted to be removed in a manner described hereinafter. Reinforcing webs 5 may be formed on the base and a plurality of lands 6 are formed at spaced intervals about the top of the base to mount spaced standards 7.

Rollers 8 are journaled in these standards and are adapted to receive the weight of a mold 9, provided with a horizontal flange 10. Suitable reinforcing webs 11 may be formed between the flange and mold to impart sufficient strength to the structure and the mold is thus rotatable upon base 3.

Also formed upon the base 3 are lands 12 which are adapted to mount horizontally adjustable rollers 13 which engage the periphery of the flange 10. In this fashion, lateral displacement of the mold 9 is prevented and vibration thereof effectively eliminated. The mold 9 is formed with a downwardly projecting shroud 14, having a horizontal flange 15, upon which an annular rack 16 is secured. A power shaft 17 is journaled in the base 1 and drives a bevel gear 18 which engages with the rack 16 to impart rotary motion to the mold 9.

The mold is formed with a molding surface 19, having an upwardly extending funnel portion 20. Between the molding surface and the outer wall of the mold, a cham-

ber is thus formed which is adapted to receive a cooling medium, the medium being discharged through pipes 21 into an annular channel 22. The cooling medium is introduced into the chamber through an annular space 23, between the outer wall of the mold and the funnel 20, as indicated by the arrows in Figure 1. To prevent the escape of the cooling medium from the mold, a circumferential groove 24 is formed adjacent the opening 23 to catch any fluid which attempts to escape from the chamber within the mold.

In pouring from a ladle 25, a fitting 26 is preferably inserted within the mouth of the funnel in accordance with past pouring practice, a stopper 27 of usual form being elevated to introduce the metal into the mold.

A core 28 of the mold is formed with a horizontal flange 29 which is adapted to support a ring 30. This ring is formed with a molding surface 31 which in effect serves as the bottom of the mold and supports the casting during its removal from the mold and the core. A bottom plate 32 supports the core 28 and forms a chamber 33, which is closed by a plate 34 having an axial hollow sleeve 35.

A downwardly extending sleeve 36 is formed on the plate 32 and provided with a shoulder 37 which is adapted to receive a bearing 38 to mount the core rotatably upon a supporting shaft 39. The supporting shaft is hollow and communicates with an outlet pipe 40, as clearly shown in Figure 1. Through the bottom of the supporting shaft, a pipe 41 extends, passing axially through the supporting shaft and a hollow extension 42 thereof. The pipe 41 likewise passes through the hollow sleeve 35 and is thus adapted to introduce a cooling fluid into the chamber 33. A flange 43 is preferably secured to the upper extremity of pipe 41 to prevent the fluid from flowing back through the hollow sleeve 35 before being introduced into the chamber 33.

It will thus be seen that the pipe 41, supporting shaft 39 and hollow extension 42 thereof, are stationary elements while the core 28 and mounting plate 32 rotate with respect thereto. Since the cooling fluid is present in the chamber 33, the connection between the rotatable elements and the stationary elements is rendered fluid-tight by providing the cover plate 34, which forms a sealing chamber 44 within the upwardly extending cylindrical flange 45, formed upon the base 32. A relief vent 46 may be provided to drain off fluid which may have collected in the chamber 44 and a sealing washer 47 is also provided to seal the joint between the hollow extension 42 and the base plate 32 effectively.

Formed as a continuation of the supporting shaft 39 is a sleeve 48, which is provided with a rack 49. The sleeve is slidably mount-

ed in a collar 50 which is preferably formed with the base 3 and mounted upon the sub-structure 1, a shaft 51 being journaled in the collar 50 and base 3 to move the sleeve 48 axially by means of a pinion 52 which engages with the rack 49. Rotary motion is imparted to the shaft 51 by means of a crank 53 and gears 54 or any other suitable device.

Extending between the opposite sides of the base 3 and secured to the sides of the openings 4 are parallel channels 55 which are so spaced as to engage the cylindrical portion of the ring 30. This is clearly shown in dot-and-dash lines in Figure 1. In this manner, after the metal has been poured and the casting formed, the core, together with the casting, is dropped until the ring engages the channels 55. Continued movement of the core and sleeve 48 frees the casting therefrom and enables the casting and ring to be removed by being slid along the channels 55. A fresh ring is then placed upon the channels and picked up by the core during its upward movement as it returns into the mold 9. It will thus be seen that the casting operation is greatly expedited and rapid pourings may be made in the mold by the operation outlined above.

With reference to the modification shown in Figure 3, the core 56 is formed with a different profile, adapting the same to cast a ring 57, the core being formed with a horizontal bottom casting surface 58 and a vertical surface 59. The mold is formed with a casting surface 60 within which an annular recess 61 is formed in order that the casting may have a circumferential rib 62, a ring 63 being formed with a complementary casting surface 64 to form a surface on the casting similar to the surface 60. In this manner the core may be dropped, as described in connection with the construction shown in Figure 1, and the ring 63, together with its casting 57, removed from the machine.

While the invention has been described with specific reference to the constructions shown in the accompanying drawings, it is not to be limited, save as defined in the appended claims.

I claim as my invention:

1. A molding machine comprising a permanent mold mounted on a vertical axis, a cooling chamber on the mold, means to supply a cooling medium to the chamber, a permanent core, a supporting plate secured to the core to form a cooling chamber thereon, means to journal the plate on a vertical axis, means to supply a cooling medium to the chamber, and means to rotate the mold and core.

2. A molding machine comprising a permanent mold mounted on a vertical axis, a cooling chamber on the mold, means to supply a cooling medium to the chamber, a permanent core, a supporting plate secured to

the core to form a cooling chamber thereon, a pedestal, means to journal the plate on the pedestal, means to supply a cooling medium to the chamber, and means to rotate the mold

5 and core.

3. A molding machine comprising a permanent mold mounted on a vertical axis, a cooling chamber on the mold, means to supply a cooling medium to the chamber, a permanent core, a supporting plate secured to the core to form a cooling chamber thereon, a pedestal, means to move the pedestal axially, means to journal the plate on the pedestal, means to supply a cooling medium to the

15 chamber, and means to rotate the mold and core.

4. A molding machine comprising a permanent mold mounted on a vertical axis, a cooling chamber on the mold, means to supply a cooling medium to the chamber, a permanent core, a supporting plate secured to the core to form a cooling chamber thereon, a cylindrical flange formed on the plate and extending into the chamber, a cover plate

25 over the flange to form a sealing chamber, means to journal the first plate on a vertical axis, means to supply a cooling medium to the last named chamber, and means to rotate the mold and core.

5. A molding machine comprising a permanent mold mounted on a vertical axis, a cooling chamber on the mold, means to supply a cooling medium to the chamber, a permanent core, a supporting plate secured to the core to form a cooling chamber thereon, a cylindrical flange formed on the plate and extending into the chamber, a cover plate over the flange to form a sealing chamber, a mounting head journaling the first plate for rotation about a vertical axis, means to supply a cooling medium to the last named chamber through the head, and means to rotate the mold and core.

6. A molding machine comprising a permanent mold mounted on a vertical axis, a cooling chamber on the mold, means to supply a cooling medium to the chamber, a permanent core, a supporting plate secured to the core to form a cooling chamber thereon, a cylindrical flange formed on the plate and extending into the chamber, a cover plate over the flange to form a sealing chamber, a mounting head journaling the first plate for rotation about a vertical axis, means to supply a cooling medium to the last named chamber through the head, means to rotate the mold and core, and means to move the mounting head axially.

7. A molding machine comprising a permanent mold mounted on a vertical axis, a cooling chamber on the mold, means to supply a cooling medium to the chamber, a permanent core, a supporting plate secured to the core to form a cooling chamber thereon, a cylindrical flange formed on the plate and extend-

ing into the chamber, a cover plate over the flange to form a sealing chamber, a mounting head journaling the first plate for rotation about a vertical axis, means to supply a cooling medium to the last named chamber through the head, means to discharge the cooling medium from the chamber through the head, means to rotate the mold and core, and means to move the mounting head.

8. A molding machine comprising a permanent mold mounted for rotation about its own vertical axis, a permanent core cooperating therewith and rotatable about the said axis, means to drop the core from the mold, and means to remove the casting from the core during the movement of the core from the mold.

9. A molding machine comprising a permanent mold mounted for rotation about a vertical axis, a permanent core cooperating therewith and rotatable about the said axis, means to drop the core from the mold, a ring on the core engaging the casting, and means to engage the ring during the movement of the core from the mold.

10. A molding machine comprising a permanent mold mounted for rotation about a vertical axis, a permanent core cooperating therewith and rotatable about the said axis, means to drop the core from the mold, a ring on the core and forming a molding surface, and means to engage the ring during the movement of the core from the mold.

11. A molding machine comprising a permanent mold mounted for rotation about a vertical axis, a permanent core cooperating therewith and rotatable about the said axis, means to drop the core from the mold, a ring on the core forming a molding surface and projecting radially beyond the core, and spaced members to engage the ring upon the opposite sides thereof when the core is moved from the mold.

12. A molding machine comprising a permanent mold mounted for rotation about a vertical axis, a permanent core cooperating therewith and rotatable about the said axis, means to drop the core from the mold, a ring on the core forming a molding surface at an angle to the vertical and projecting radially beyond the core, and spaced members to engage the ring upon the opposite sides thereof when the core is moved from the mold.

This specification signed this 3 day of September A. D. 1930.

WILLIAM A. GEISLER.