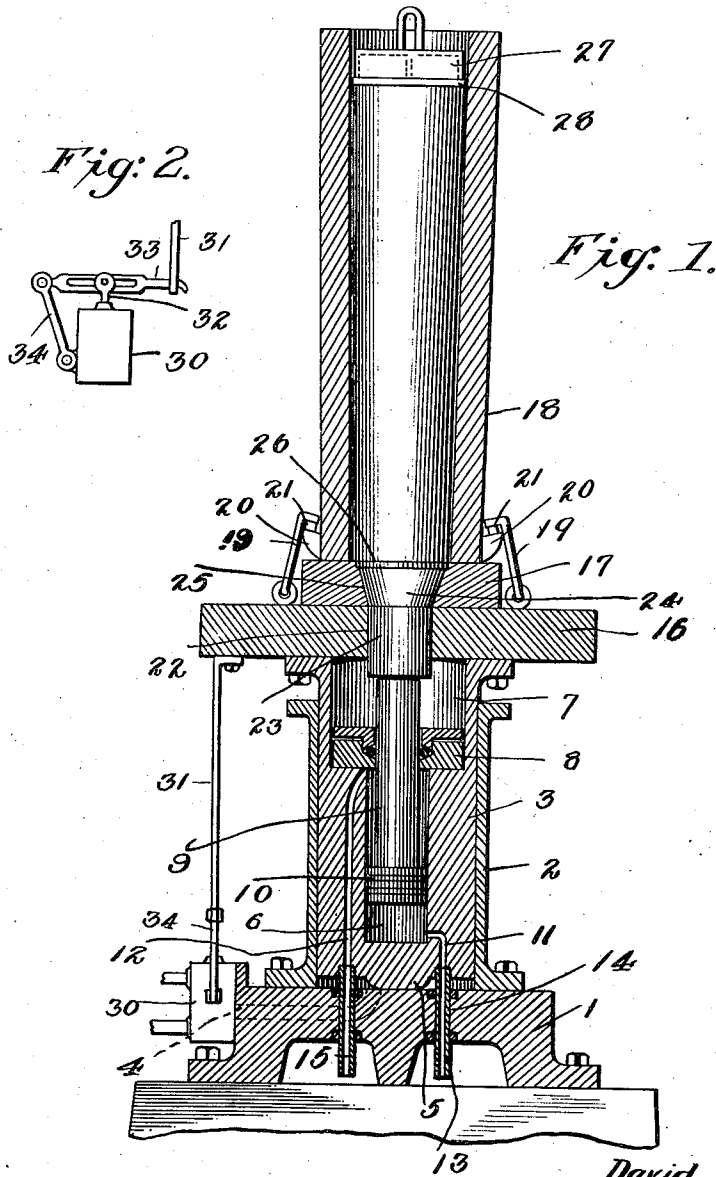


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 APPARATUS FOR TREATING CASTINGS.
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APPARATUS FOR TREATING CASTINGS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID MAXWELL, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Apparatus for Treating Castings, of which the following is a specification.

This invention relates to the art of casting, and while applicable to castings in general is particularly designed for use in the making of ingots, and has for its object to prevent piping and segregation and to enable the stripping of a casting upon one and the same apparatus.

With these and other objects in view, the present invention consists in the combination and arrangement of parts as will be hereinafter more fully described, shown in the accompanying drawings and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size and minor details may be made within the scope of the claims, without departing from the spirit of the present invention.

In the drawings, Figure 1 is a vertical central longitudinal sectional view of one embodiment of the invention. Fig. 2 is a diagrammatic view of means for varying the reciprocatory movement without stopping the apparatus.

In the drawing 1 designates a suitable base from which rises an open topped stationary cylinder 2 having a suitable cylinder 3 working therein. Fluid under pressure, preferably air, is admitted to the bottom of the stationary cylinder 2 through a port 4 for lifting the cylinder 3. A suitable boss or projection 5 is provided centrally upon the bottom of the cylinder 3, to contact with the base 1 and thereby support the bottom of the cylinder slightly above the base 1 in the lowermost position of the cylinder. The bore 6 of the cylinder 3 is enlarged in diameter at the top of the cylinder as shown at 7. A suitable gland 8 is provided in the upper larger bore portion of the cylinder 3, and through this gland works a plunger piston 9, the lower end of which is provided with a head 10, suitably packed and having a working fit in the lower bore portion 6.

A suitable port 11 is formed through the bottom of the cylinder 3 and leads into the bottom portion of the interior of the cylinder, while another port 12 extends longitudinally through the cylinder and communicates with the top of the bore portion 6. A tube or pipe 13 is carried by the bottom of the cylinder 3 in communication with the port 11 and works vertically through an opening 14 in the base 1, the ends of the opening 14 being provided with suitable glands to prevent leakage of fluid from the interior of the cylinder 2. A similar tube or pipe 15 is provided for the port 12. It will of course be understood that the tubes or pipes 13 and 15 have communication with a suitable source of fluid under pressure, preferably hydraulic, whereby water or oil may be admitted through one of the ports and exhausted through the other of the ports.

Upon the top of the cylinder 3 is a head or table 16, upon which is a casting block 17 supporting any ordinary or preferred form of mold 18, the form shown in the drawing being that of a cylindrical ingot mold in inverted position, that is to say, with its larger end uppermost. The mold is held in position by means of hooks 19, hinged or loosely carried by the head or table 16 and swung over into engagement with the ears 20 upon the mold, a suitable wedge 21 being driven in between each ear and the adjacent hook to insure a tight holding of the mold. The head or table 16 is provided with a central opening 22 in which works a reciprocating ejecting member 23, the upper end of which is enlarged as at 24 and works in a similarly shaped opening 25 formed in the casting block. A plate 26 rests loosely in a socket in the top of the casting block 17 in position to be raised by the ejecting member 23.

Within the top of the mold there is a floating cover 27, which is in the nature of a hollow spidered disk containing a packing 28 of some suitable refractory or infusible material, which material forms a facing for the bottom of the cover. By the use of this cover oxidation of the upper surface of the molten metal is materially prevented and the metal is maintained in a molten condition for a relatively long period.

In practice the cover 27 is removed and the mold poured through its top in the usual manner. When a suitable amount of molten metal is accumulated in the mold, impacts are applied thereto by lifting and dropping the mold. This is accomplished by admitting fluid pressure through the port 4 so as to lift the cylinder 3 and consequently the mold and its contents. After the mold has been lifted a suitable distance fluid pressure is permitted to escape through the port 4, so as to drop the cylinder 3 together with the mold and its contents. When the cylinder 3 strikes the base 1, an impact will be applied to the contents of the mold. This operation is repeated throughout the filling of the mold, the initial impacts being relatively slight, and thereafter increasing in power throughout the remainder of the treatment of the metal. After the mold has been filled, the cover 27 is replaced and floats upon the top of the molten metal. The impact treatment is continued with the cover floating upon the metal.

After the impacting operation has been completed and the metal has become solidified sufficiently for removal, fluid under pressure, preferably hydraulic, is admitted through the port 11 so as to lift the piston 9 and force the stripper 24 against the bottom of the casting and thereby strip or force the latter upwardly until it projects through the open top of the mold sufficiently to admit of the casting being pulled out of the mold by means of a crane or other device. After the casting has thus been stripped the mold may be immediately repoured and the impacting operation carried out.

Any suitable means may be employed for admitting fluid pressure through the port 4 for lifting the mold support 16 and thereafter permitting escape of the fluid pressure through the port 4 to permit gravitation of the mold support. For instance, a valve chest 30 may be employed in communication with the port 4, the valve in the chest being actuated by a connecting rod 31 secured to some movable part of the apparatus, for instance the table or mold support 16. For the purpose of varying the movement of the cylinder or plunger 3 to change the character of the impacts, the position of the slide valve in the chest is of course changed. This can be accomplished in any suitable manner, as for instance by the means illustrated in Fig. 2, wherein the valve stem 32 of the valve in the chest 30 may be slidably connected with a horizontal lever 33, one end of which is fulcrumed upon an upstanding link 34 hinged upon the chest 30, the other end of the lever being connected to the rod 31 which is carried by and moved with the reciprocating table. By adjustably swinging the link 34 upon its hinge, the distance between the fulcrum of

the lever 33 and its connection with the valve stem 32 may be varied, whereby the throw of the valve will be changed and the admission and exhaust of the fluid pressure through the port 4 may be properly regulated.

What is claimed is:—

1. An apparatus for applying impacts to and stripping castings including a reciprocatory mold support, means for lifting and dropping the support, and means for pushing the casting out of its mold.

2. An apparatus for applying impacts to and stripping castings, including a reciprocatory mold support, means for lifting and dropping the support, means for varying the lifting and dropping movement of the support, and means for pushing the casting out of its mold.

3. An apparatus for applying impacts to and stripping castings including a reciprocatory mold support, means for lifting and dropping the support, and means for pushing the casting upwardly out of its mold.

4. An apparatus for applying impacts to and stripping castings including a reciprocatory mold support, means for lifting and dropping the support, and a stripping device telescoping within the lifting and dropping means.

5. An apparatus for making castings including a mold support having an opening, means to lift and drop the support, an endwise movable stripper element carried by the support, working in the opening therein, and forming a closure for the open bottom of a mold, and means to effect relative movement between the support and the stripper element to strip a casting.

6. An apparatus for applying impacts to and stripping castings including a reciprocatory mold support, a fluid actuated impact plunger for lifting and dropping the support, and a fluid actuated stripping plunger telescoping in the impacting plunger.

7. An apparatus for applying impacts to and stripping castings including a cylinder, an impacting plunger working in the cylinder, a mold support carried by the plunger, and a stripping plunger working in the impacting plunger.

8. An apparatus for applying impacts to and stripping castings including a cylinder, an impacting plunger working therein, a mold support carried by the plunger and provided with an opening, and a stripping plunger working in the impacting plunger and having access through the opening in the mold support to strip a casting from its mold.

9. An apparatus for applying impacts to and stripping castings including a cylinder, an impacting plunger working therein, a mold support carried by the plunger and having an opening therethrough, means to

hold a mold upon the support with its open
end in communication with the opening in
the support, an endwise movable stripper
element in the opening in the support, and
5 a stripping plunger working in the impact-
ing plunger in coöperative relation with the
stripping element.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

DAVID MAXWELL.

Witnesses:

WALTER S. WHEELER,
BEATRICE D. VERNON.