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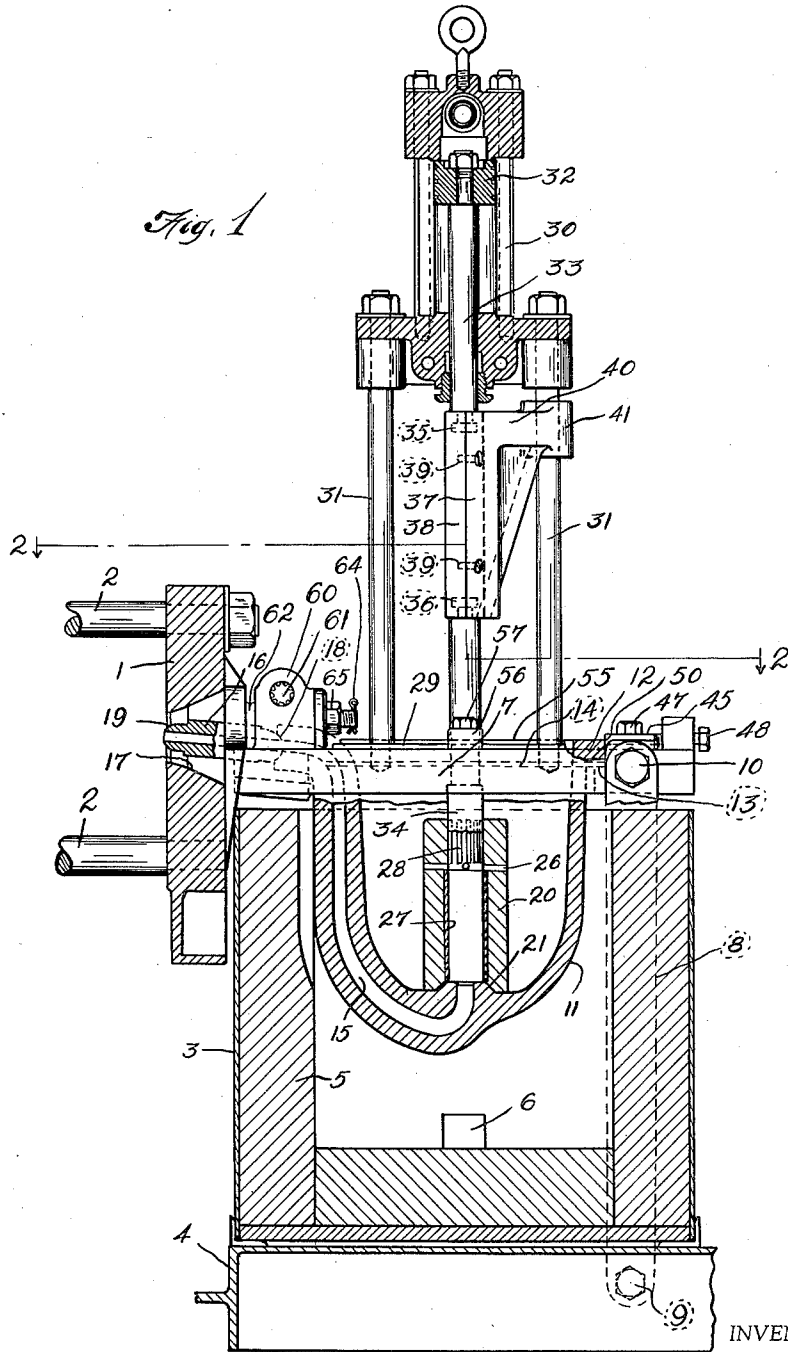
N. LESTER

2,145,448

CASTING MACHINE

Filed March 2, 1936

2 Sheets-Sheet 1



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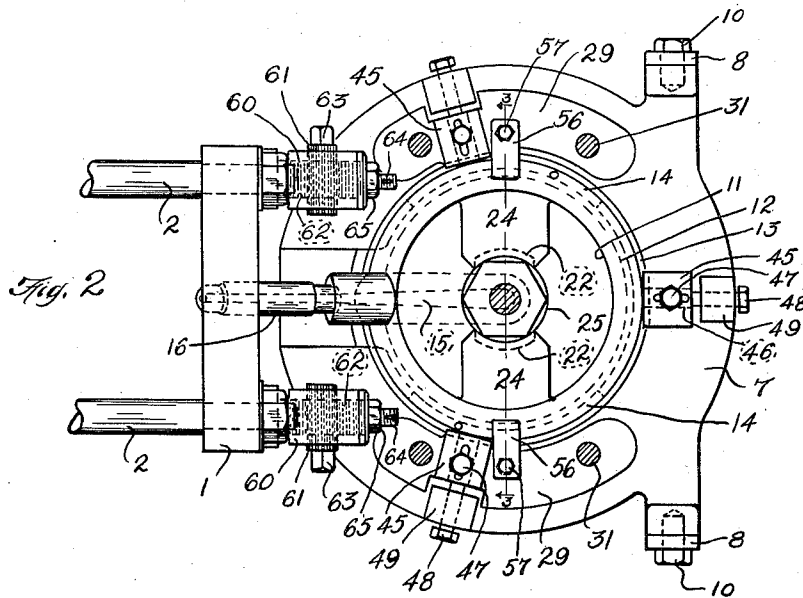
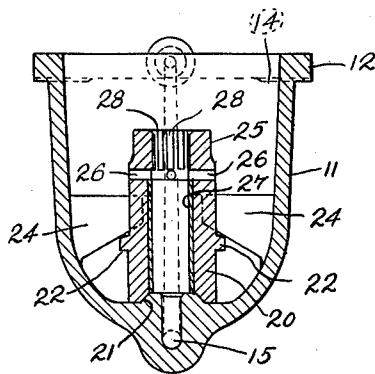
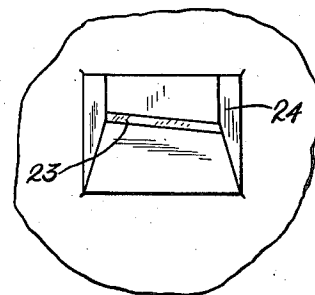


Fig. 3

Fig. 4

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2,145,448

CASTING MACHINE

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Application March 2, 1936, Serial No. 66,551

1 Claim. (Cl. 22—70)

The present invention relates to a machine for casting molten metal under pressure into a permanent mold or die cavity; and more particularly to a novel construction for that part of such a machine by means of which the molten metal is extracted from a reservoir or melting pot and delivered to the mold. The general object and nature of the invention is to provide a casting machine melting pot and a metal ejecting mechanism associated therewith whereby there is produced a construction of practical and efficient operation, and one in which the component parts such as the melting pot and the metal ejecting cylinder may be conveniently assembled, removed or replaced.

Briefly outlined, the invention comprises a heating furnace, a melting pot normally located therein and carried by means of a supporting frame which is independent and separate from the furnace. The supporting frame also carries a hydraulic pressure operating mechanism which is connected to a metal ejecting piston operable in a removable pressure casting cylinder in the interior of the melting pot. The melting pot is removably mounted upon the supporting frame and the latter is movably mounted and connected to the casting machine proper by an adjustable connection device whereby the position of the melting pot with respect to the casting machine may be adjustably located without disturbing the location or operation of appurtenant parts. Additional objects and advantages shall become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claim.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a sectional elevational view of a construction embodying the principle of the invention; Fig. 2 is a plan view of that part of Fig. 1 taken from the line 2—2 thereof; Fig. 3 is a detail, sectional view of the melting pot and taken substantially along line 3—3 of Fig. 2; Fig. 4 is an enlarged fragmentary view of a portion of the interior of the melting pot and particularly showing one of the inwardly projecting lugs therein adapted to effect removable engagement with the pressure casting cylinder.

Now referring more particularly to the drawings, there is shown therein a portion of the casting machine proper, consisting of the fixed die plate 1 supported by the tie bars 2. The remainder of the casting machine proper forms no part of the present invention, and hence is not shown or further described. A heating furnace 3 is located adjacent the die plate 1 and supported upon the base 4. The heating furnace 3 has a refractory, insulating lining 5 and also one or more tuyère openings, as shown at 6, for the admission of a heating gas flame.

An annular supporting frame 7 is positioned above the heating furnace 3 and supported at one end by the vertical bars 8 which are pivotally mounted at their lower end to the base 4 by means of the studs 9, and at their upper ends to the frame 7 by means of the studs 10. The melting pot 11 has an outwardly extending flange 12 adapted to seat in an annular shoulder 13 in the frame 7. Embossed portions 14 are located on the under surface of the flange 12 and serve as bearing faces contacting with the horizontal face of the shoulder 13.

An S-shaped or "goose-neck" passage 15 leads from the bottom of the melting pot 11 to a point adjacent the upper edge thereof. The mouth of the passage 15 contacts with a connector 16 which leads through the die plate 1 to the die block (not shown). The connector 16 has semi-spherical surfaces 18 and 19 at each end which are adapted to make contact connections with complementary, concave surfaces such as shown at 13 at the mouth of the passage 15.

A removable cylinder 20 is mounted in the interior of the melting pot 11. The lower end of the cylinder 20 fits over the inner end of the passage 15 and makes a tight fit with the frusto-conical portion 21 of the wall of the melting pot 11. A pair of spaced projecting lugs 22 extend laterally from the outer walls of the cylinder 20 and engage with the inclined surfaces 23 on the under side of the spaced projections 24 extending from the inner wall of the melting pot 11. As best shown in Figs 2, 3 and 4, the projections 22 and 24 are in practical effect fragmentary thread portions by means of which the cylinder 20 may be inserted and removed from the melting pot 11. Engagement of the faces of the projections 22 with the surfaces 23, by means of the rotation of the cylinder 20, is of a wedging or thread-like nature and serves to firmly secure the cylinder 20 in position. A hexagonal portion 25 is provided on the upper, outside wall of the cylinder

20 for the reception of a suitable manipulating tool or wrench.

Fluid or molten metal inlet ports 26 are provided in the wall of the cylinder 20, in the upper portion thereof. A lining insert 27 which is preferably composed of a hot formed steel-vanadium alloy having a nitrided surface, is press fitted into the interior of the cylinder 20 and forms the inner wall thereof. The melting pot 11, the cylinder 20 and the remaining parts which come in contact with the molten metal are fabricated from a strong, heat resistant material such as Grade A Meanite or a nickel alloy steel. A series of axially parallel grooves 28 are located on the inner wall of the cylinder 20 and extend from the inlet portion 26 to the upper end of the cylinder 20. The grooves 28 are for the purpose of not only reducing the amount of the bearing surface between the walls of the cylinder 20 and the piston 34 which operates therein, at a point where a liquid seal is not required, but also for the purpose of providing clearance spaces for the insertion of a punch-out tool when it is desired to remove the lining insert 27 from the interior of the cylinder 20.

A hydraulic pressure cylinder 30 is carried by means of the frame 7 of the vertical supporting bars 31. Embossed portions 29, whose upper faces are machine finished, are located on the frame 7 around the points of attachment of the supporting bars 31. The embossed portions 29 serve as means for reinforcing the frame 7.

A piston 32 is mounted in the cylinder 30 and its piston rod 33 is separably connected to the metal ejecting piston 34 mounted in the casting cylinder 20. The hydraulic piston rod 33 and the metal ejecting piston 34 are separably connected by means of the T-heads 35 and 36 respectively engaged by the split coupling 37. A cap member 38 forms one-half of the split coupling 37, and is removably secured thereto by means of suitable fasteners 39. A bracket 40 extends laterally from the coupling 37 and carries a guide collar 41 which slidably engages with one of the vertical supporting bars 31.

Three centering plates 45 are mounted in the slots 46 at equi-angular distances around the annular supporting frame 7. Fastening studs 47 extend through elongated slots in the plates 45 and hold the latter in position. Adjusting bolts 48 threadably engage with the bosses 49 and their inner ends abut against the ends of the plates 45. As will be seen in Fig. 1, a downwardly extending lip 50 on the inner end of the plate 45 bears against the outer edge of the flange 12 on the melting pot 11. Thus, by adjustment of the bolts 48 and the centering plates 45, it is possible to locate the position of the melting pot 11 with respect to the supporting frame 7 and

to properly align the cylinder 20 and piston 34 with the hydraulic pressure piston rod 33.

The melting pot 11 is secured in position by means of the clamping plates 56, bolted to the frame 7 with the studs 57, and contacting with the upper edge 55 of the melting pot 11.

The supporting frame 7 is adjustably connected to the fixed die plate 1 of the casting machine by means of a rack and gear mechanism. This latter mechanism comprises a pair of housings 60 on the supporting frame 7 in which the gears 61 are journaled. The gears 61 engage with the gear racks 60 carried by the die plate 1. The outer ends of the gear 61 are squared as at 63 for the reception of a suitable manipulating crank. The outer ends of the gear rack 62 terminate in threaded portions 64 engaged by the nuts 65, whereby the supporting frame 7 may be tightly drawn towards and held in position against the die plate 1.

From the foregoing description, it will be readily seen that in order to remove the casting cylinder 20 for the purpose of inspection or substitution, it is merely necessary to unfasten the coupling 37, and then unscrew the cylinder 20. In order to remove or substitute the melting pot 11, the coupling 37 is unfastened, and the centering plates 45 moved back slightly, whereupon the melting pot can be lifted out of the assembly. In this manner, those parts of the metal casting mechanism, which most frequently require inspection, removal and repair, can be very quickly and conveniently assembled and disassembled without disturbing or dismantling the remainder of the component elements.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by the following claim or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

In a casting machine, the combination of a heating furnace positioned adjacent the fixed die plate of said machine, a horizontally movable supporting frame independent of and positioned above said furnace, a melting pot carried by said frame, a rack and gear connection between said frame and said die plate whereby said frame and said melting pot are adjustably movable with respect to said die plate, a metal ejecting cylinder separably mounted in said melting pot, a piston operable in said cylinder, a hydraulic cylinder and piston carried by said frame, means for separably connecting said metal ejecting piston to said hydraulic piston, and means for adjustably locating said melting pot with respect to said frame.

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