Dec. 2, 1947. O. C. ROESEN ET AL 2,432,043

STEREOTYPE PLATE CASTING MACHINE

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FIG. 2.

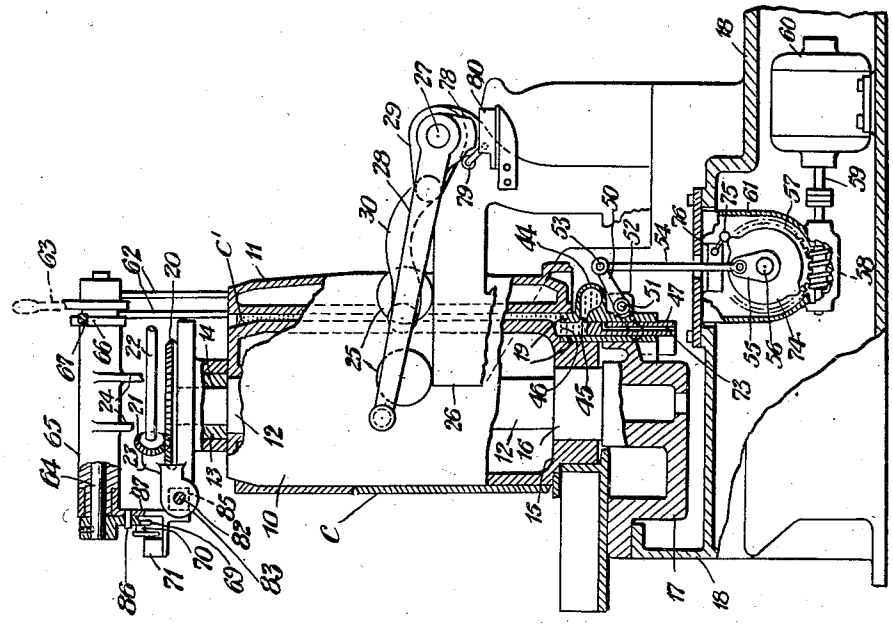
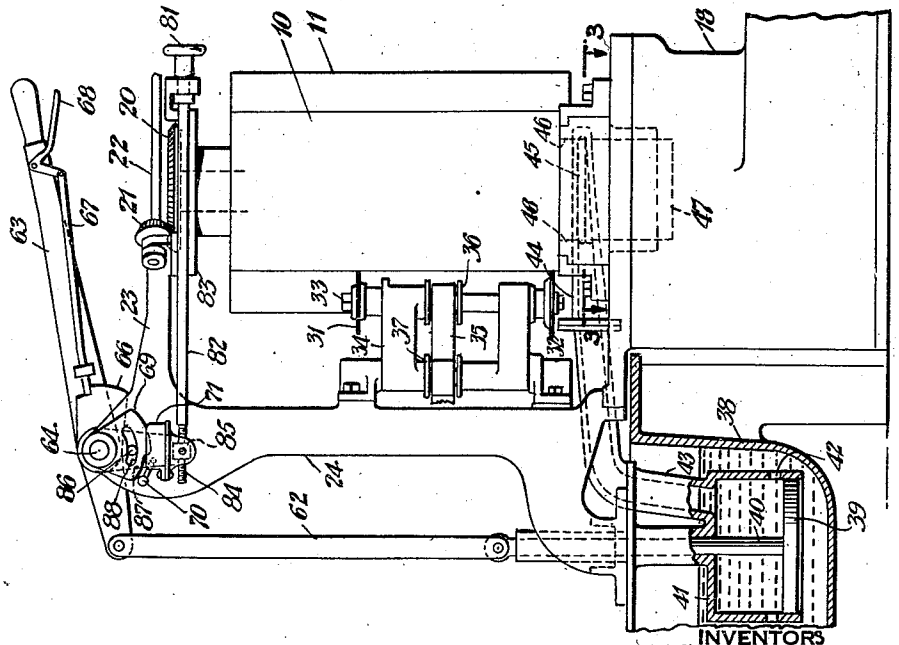


FIG. 1.



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FIG. 5.

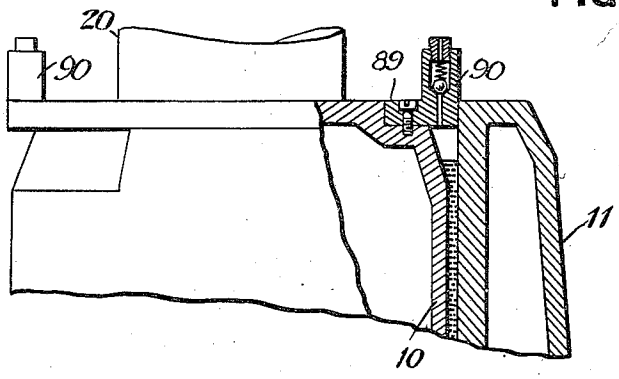


FIG. 3.

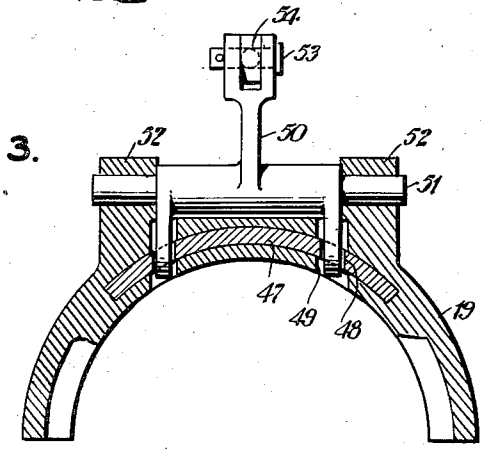
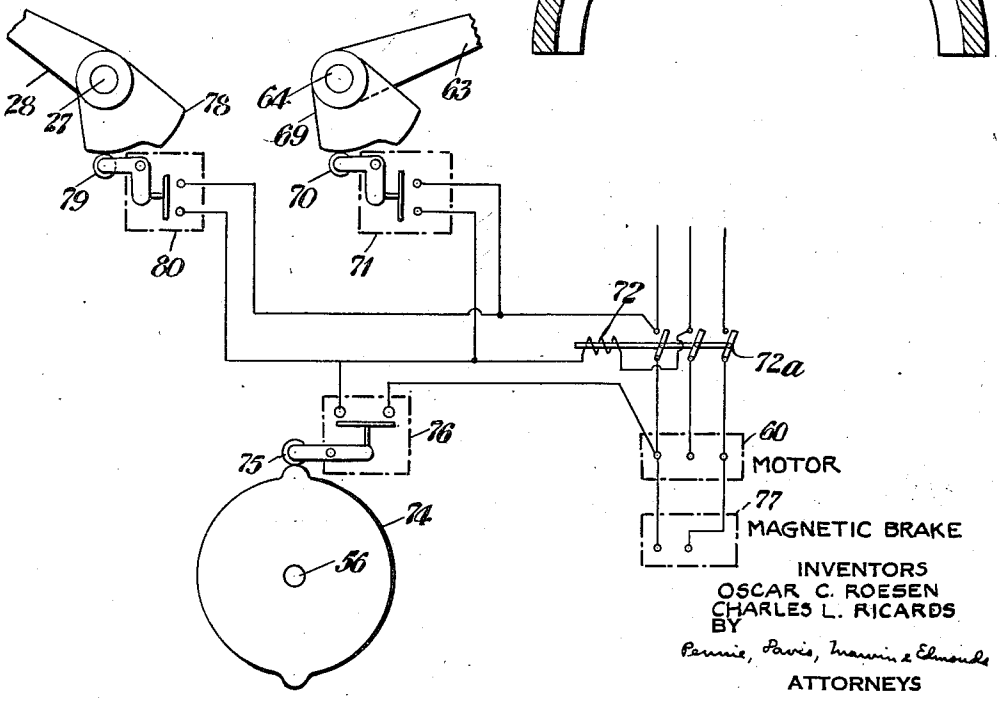


FIG. 4.



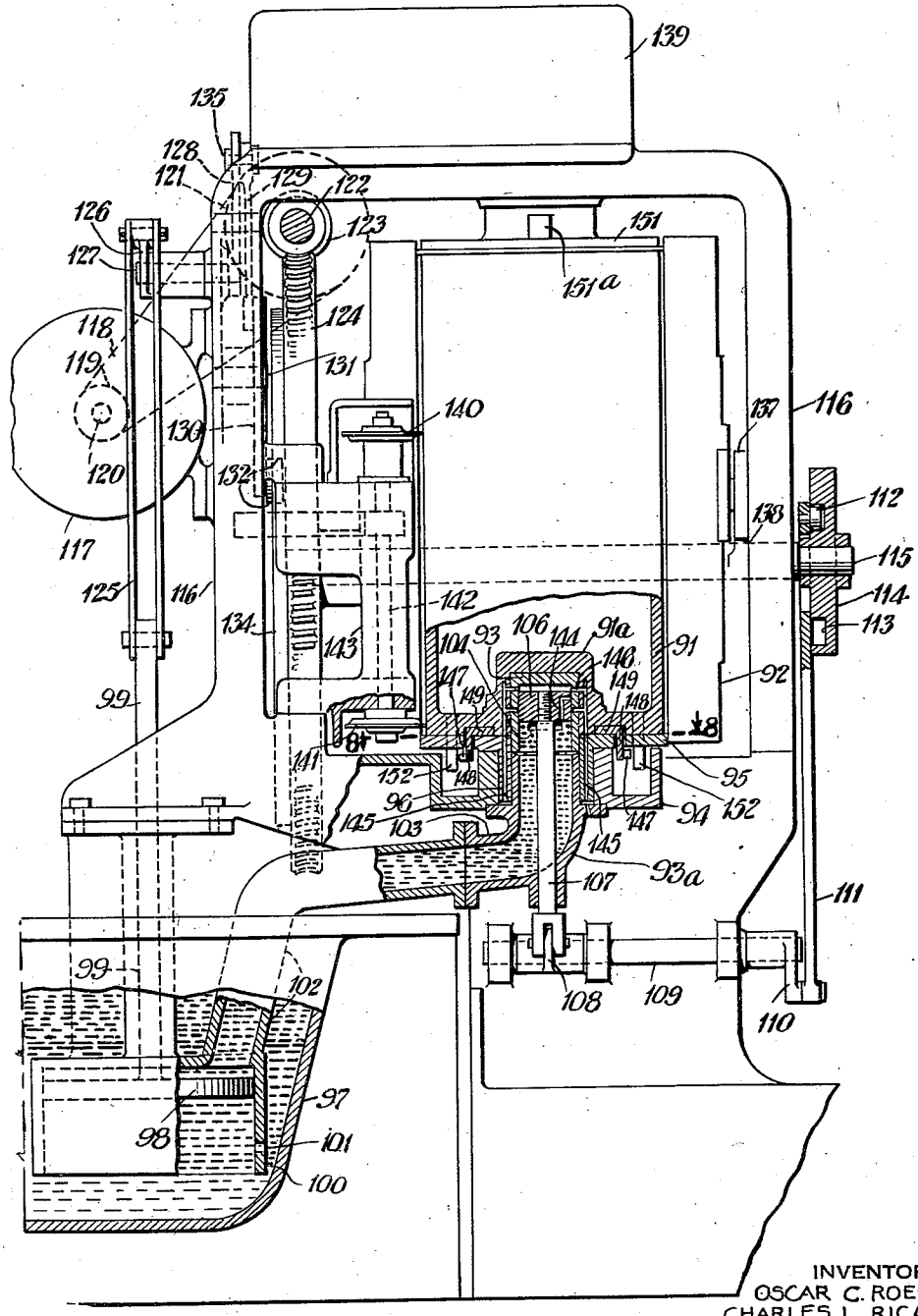
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STEREOTYPE PLATE CASTING MACHINE

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FIG. 6.



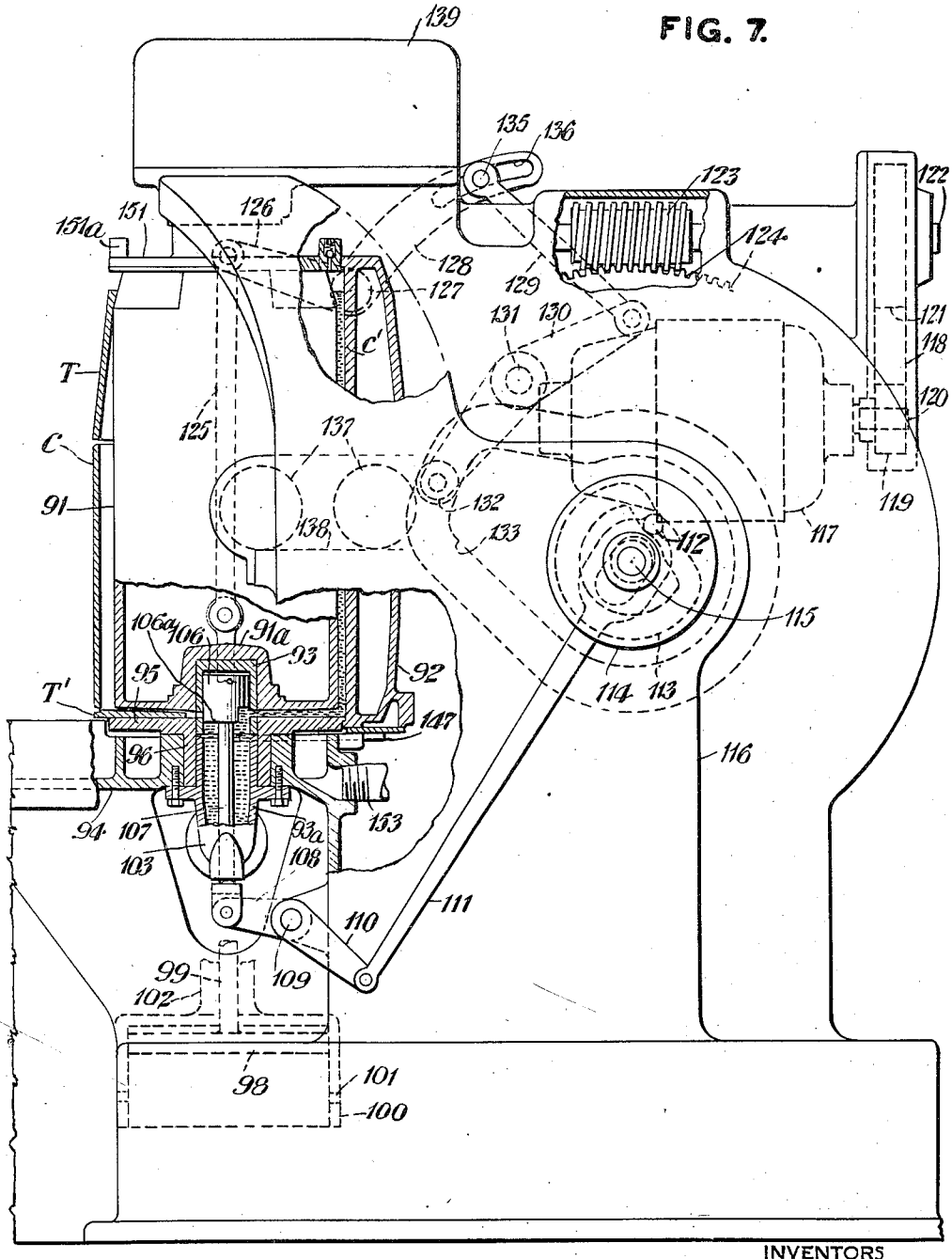
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STEREOTYPE PLATE CASTING MACHINE

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FIG. 7.



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STEREOTYPE PLATE CASTING MACHINE

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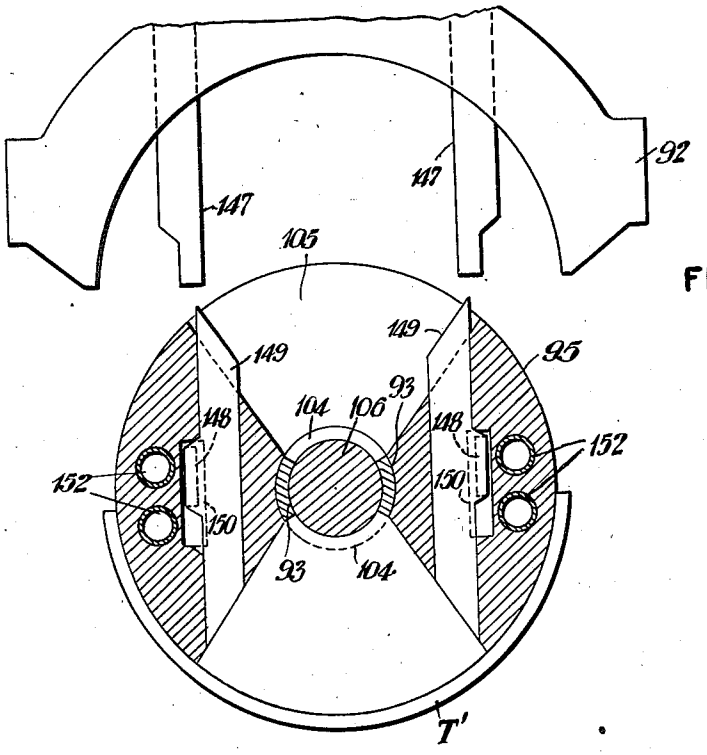


FIG. 8.

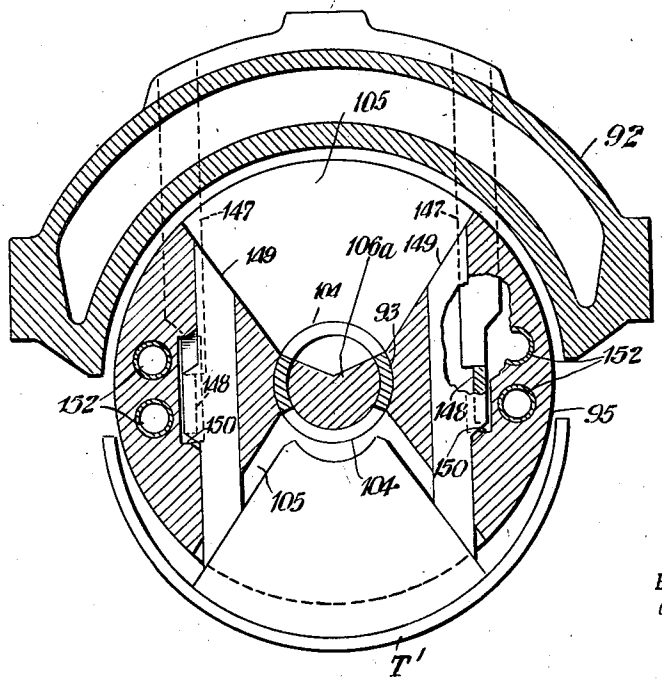


FIG. 9.

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Patented Dec. 2, 1947 2,432,043

UNITED STATES PATENT OFFICE

2,432,043

STEREOTYPE PLATE CASTING MACHINE

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Application December 2, 1944, Serial No. 566,328

16 Claims. (Cl. 22—2)

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This invention relates to an improved machine for casting stereotype plates.

Stereotype plates for use in printing newspapers and the like are made by casting molten metal in a mold in which a stereotype matrix, also known as a flong or mat, has been placed. The molten metal is solidified by cooling, and the resulting cast plate is separated from the matrix and finished.

The conventional mold consists essentially of a core and a casting box separated slightly from each other to provide the space in which the plate is cast, this mold space usually being arranged in a vertical position. In accordance with customary practice, the requisite amount of molten metal to form the desired cast plate is poured from the top of the mold into the space between the core and the casting box, the matrix having previously been placed therein. Such procedure, however, results in the production of a porous cast plate even though certain precautions are taken in the pouring of the molten metal, which appears to trap at least a portion of the air initially in such space in the form of bubbles. The air can only escape by being forced around and through the descending molten metal; and the cooling of the molten metal, which is solidified as quickly as possible since speed of operation is important, apparently does not permit all of the air to escape.

The present invention is directed to an improved stereotype plate-casting machine that avoids this operating difficulty. This improved machine is designed for the introduction of the molten metal into the bottom of the mold space so that the molten metal displaces the air upwardly substantially as a single mass as it rises as a pool within such space and does not trap any air as it solidifies. In this manner, intermingling of the molten metal being introduced into the mold space and of the air being displaced therefrom and the resulting porosity otherwise encountered are substantially avoided.

Our improved plate-casting apparatus includes a vertically arranged mold comprising a core and a casting box positioned at a slight elevation with respect to a metal-melting pot, the mold and the melting pot being interconnected by a suitable conduit for the introduction of the molten metal into the mold space at substantially the lowest point thereof. The introduction of the molten metal in this manner is controlled by a valve which is designed and operated so that the formation of a sprue on the cast plate by the metal in the connecting conduit is avoided

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and so that the molten metal in the connecting conduit is returned to the melting pot and any possible solidification of the molten metal in such conduit is thereby avoided. A particular feature of the invention resides in the coordination of the operation of this valve with the operation of the pump means for supplying the molten metal from the melting pot to the mold space whereby the production of cast plates can be automatically or semiautomatically carried on without interruption. The improved machine may also be provided with means to enclose the top of the mold space, ordinarily left open, so that the air, as it is displaced upwardly in the mold space, is confined and exerts an increased pressure on the molten metal as it cools and solidifies whereby a close grain plate with finer detail is obtained. In this latter arrangement the mold space-enclosing means is advantageously provided with a release valve for the escape of the air confined in the mold space in accordance with any predetermined operating conditions.

Other features and advantages of the invention will be apparent from the following description of certain preferred forms thereof taken in connection with the accompanying drawings, in which:

Fig. 1 is an end elevation with parts in section and with certain parts omitted of a manually operated plate-casting machine provided with one form of the improved apparatus.

Fig. 2 is a side elevation with parts in section of the manually operated machine shown in Fig. 1, the machine being shown in this figure with the mold space filled with molten metal.

Fig. 3 is a detail view of a part of the machine taken along the line 3—3 of Fig. 1.

Fig. 4 is a diagram of the electric circuit for operating certain parts of the machine shown in Fig. 1.

Fig. 5 is a fragmentary side elevation, partially in section, showing the machine of Fig. 2 provided with a modified construction.

Fig. 6 is an end elevation with parts in section of an automatically operated plate-casting machine provided with another form of the improved apparatus.

Fig. 7 is a side elevation with parts in section of the machine shown in Fig. 6.

Figs. 8 and 9 are detail views taken along the line 8—8 of Fig. 6, the two figures showing the machine in successive operating positions.

The manually operated plate-casting machine shown in Figs. 1 and 2 includes the core 10 and

the casting box 11, which together form the mold in which the plates C and C' are cast. This machine is so designed that, after the plate C has been cast, the casting box 11 is retracted and the core 10 is rotated through 180°, during which rotation the top and the bottom of the plate are trimmed. The casting box 11 is then returned to its closed position, the plate C being simultaneously dislodged from the core 10, and the plate C' is then cast in the mold space formed by the core and the casting box. These operations are cyclically repeated until the desired number of plates has been cast.

The core 10 is journaled on the vertical shaft 12, the upper end of the core being formed into a hub 13 which engages the upper bearing 14 of the shaft 12 and the lower end of the core being formed with the internal hub 15 which is fitted on the lower bearing 16 of the shaft 12. This shaft is provided at its lower end with the integrally formed, outwardly extending flange 17 secured to the base 18. The core rests on and is supported by the semicircular ring support 19, which is also suitably secured to the base of the machine. Rotation of the core is accomplished through the bevel gear 20 secured to the upper hub 13 of the core and driven by the bevel pinion 21 mounted on the shaft 22, which is supported at one end by the bracket 23 carried by the frame member 24 affixed to the base 18 and which is driven from any suitable power source (not shown).

The casting box 11 is provided on each side with the rollers 25, which are adapted to roll along the tops of the frame members 26 also secured to the base of the machine. Journaled in these frame members is the shaft 27, on one end of which is fixed the handle 28. This shaft also carries the cranks 29, each of which is pivotally connected to one end of an arm 30 in turn pivotally fastened at its other end to one side of the casting box. Upward movement of the handle 28 from the position shown in Fig. 2 effects a retraction of the casing box 11 from its closed position, and movement of this handle to the position shown effects the closing of the casting box.

The tail of the cast plate is trimmed and the lower edge thereof is also trimmed, as the core 10 is rotated, by means of the upper and lower saws 31 and 32, respectively, carried on the shaft 33 journaled in the bracket 34 pivotally mounted on the frame member 24. These saws are operated by means of the belt 35 passing around the pulley 36 on the shaft 33 and over the guide pulley 37 and driven by any suitable means (not shown). The operation of the machine is such that the bracket 34 is swung into operative position only when the casting box 11 is retracted, the details of such mechanism being shown in the patent to Wood, No. 1,009,272. Reference is also made to this patent and to the Wood Patent No. 1,009,367, for other details of construction and operation of the casting box and core.

In accordance with the present invention, the metal-melting pot 38 is positioned below the core and the casting box and may be formed as a unit therewith. This pot is provided with the molten-metal pump comprising the piston 39, the piston rod 40, and the piston cylinder 41, which has the inlet openings 42 and the upwardly extending discharge spout 43 that is fastened to a manifold 44 desirably formed integrally with the ring support 19. This manifold directs

the molten metal through an opening 45 into the arcuate passage 46 that communicates with the mold space in which the cast plate is formed.

Adapted to slide within this arcuate passage 46 is the similarly shaped gate valve 47 (Fig. 3), which controls the flow of the molten metal into the mold space. This valve and the ring support 19 are respectively provided with the slots 48 and 49, in which is fitted the bifurcated end of the lever 50 pivotally mounted on the shaft 51 journaled in the extensions 52 of the ring support. The other end of the lever 50 is pivotally connected by the pin 53 to one end of the arm 54, which in turn pivotally secured at its other end to the crank 55 mounted on the crankshaft 56. Also mounted on this latter shaft is the worm gear 57 driven by the worm 58 secured to the drive shaft 59 of the motor 60. As indicated in Fig. 2, this motor is fastened to the base of the machine, and the shafts 56 and 59 are journaled in suitable bearings in the housing 61 also secured to the base 18.

The piston rod 40 of the molten-metal pump is pivotally attached to one end of the link 62, the other end of which is in turn pivotally secured to the pump handle 63 mounted on the shaft 64 rotatably journaled in the bracket 65 carried by the frame member 24. Attached to this bracket 65 is the stop 66 which engages one end of the latch rod 67 connected at its other end to the latch handle 68 associated with the pump handle 63 in order to maintain the pump piston 39 in the position shown in Fig. 1 when the pump is not in use.

In the operation of this plate-casting machine, when the core and the casting box have been brought together and the valve 47 has been opened as shown in Fig. 2, the latch rod 67 is disengaged from the stop 66, the pump handle 63 is depressed, and the desired amount of molten metal is forced through the discharge spout 43 and the manifold 44 into the mold space. As the pump handle 63 reaches the bottom of its stroke, the cam 69 mounted on the shaft 64 trips the arm 70 of the limit switch 71 mounted on the bracket 87 pivotally journaled on the shaft 64 whereby an electric circuit is closed through energization of the operating solenoid 72 of the switch 72a and the motor 60 is started (Fig. 4). The valve 47 is thereby pushed upwardly within the arcuate passage 46 and closes the opening 45 in the ring support 19, the molten metal being forced out of the passage 46 so that no sprue is formed on the cast plate to interfere with the subsequent rotation of the core 12. The pump handle 63 is now raised, and the molten metal remaining in the spout 43 and the manifold 44 is returned to the melting pot 38 by gravity. The valve 47 is provided with the internal vent line 73 open to the external atmosphere and communicating with the manifold 44 when the valve is closed. This arrangement prevents the formation of a vacuum pocket in the spout 43 after the valve has been closed and so permits the immediate return of molten metal to the melting pot 38.

Closing of the valve 47 is accomplished by rotation of the shaft 56 through half a revolution. As the valve reaches its closed position, the cam 74 mounted on this shaft trips the arm 75 of the limit switch 76 secured in the housing 61 whereby the motor-energizing circuit is broken through de-energization of the solenoid 72 and the motor 60 is stopped. A magnetic brake 77 of known construction serves to stop the motor as soon as

the circuit is broken. Although the limit switch 71 is opened when the pump handle 63 is raised, the motor circuit remains closed until the valve 47 reaches its closed position since the limit switch 76 closes as soon as the motor starts.

As soon as the cast plate has been sufficiently cooled, the casting box 11 is retracted by operation of the handle 28, and the core 10 is rotated through half a revolution for trimming of the cast plate and removal thereof for finishing. As the handle 28 is moved, the cam 78 fixed to the shaft 27 trips the arm 79 of the limit switch 80 mounted on one of the frame members 26 whereby the motor-energizing circuit is again closed through re-energization of the solenoid 72 of the switch 72a and the motor 60 is again started. The valve 47 is thereby moved to its open position as shown in Fig. 2 through rotation of the shaft 56 again through half a revolution. As the valve reaches its open position, the cam 74 again trips the arm 75 of the limit switch 76 whereby the circuit is again broken through de-energization of the solenoid 72 and the motor 60 is brought to a stop. The apparatus is then ready for the casting of another plate.

The amount of molten metal delivered to the mold space may be varied as desired by adjustment of the knob 81 on one end of the rod 82 journaled in the extension 83 of the bracket 23. The other end of this rod is threaded as shown at 84 and engages the threaded boss 85 to the bracket 87 carrying the limit switch 71. Such adjustment of the rod 82 changes the position of the pin 86 fixed in the limit-switch bracket 87 with respect to a slot 88 in the cam 69 so that the degree to which the pump handle 63 can be depressed is accordingly limited. The limit switch 71 is fixed in relation to the pin 86 and is similarly adjusted when the knob 81 is turned so that the valve 47 is closed at the proper time regardless of the particular amount of molten metal delivered to the mold space.

In Fig. 5 there is shown a modified form of casting apparatus, in which the core 10 is provided with the annular sealing ring 89 suitably secured to its upper edge. This ring fits tightly against the casting box 11 and serves to confine the air initially within the mold space as the molten metal is introduced into the lower portion thereof. In this manner the hydrostatic pressure on the molten metal during the casting and cooling thereof is increased whereby a close grain plate with finer detail is obtained. In certain cases it may be possible, through such confinement and compression of the air within the mold space, to reduce the size of the tail customarily formed along the upper edge of the cast plate to provide the necessary hydrostatic pressure. Each half of this sealing ring 89 is equipped with an adjustable spring-loaded air-release valve 90 so that the degree of air compression within the mold space can be regulated.

The automatically operated plate-casting machine shown in Figs. 6 and 7 includes a cylindrical core 91 and a casting box 92. The cycle of operation of this machine is identical with that of the manually operated machine already described except that each operation is automatically carried out and, in accordance with the invention, the sequence of operations is automatically coordinated.

The lower portion of the core 91 is formed with a reentrant boss 91a, in which is suitably secured the vertically disposed valve chamber 93 adapted to ride on the seat formed by the elbow-shaped

conduit 93a fastened to the base 94 of the machine. Secured to the lower portion of the core is the ring 95, which corresponds to the ring support 19 of the manually operated machine and is provided with the vertical annular flange 96 surrounding the conduit 93a. The core is rotated as a unit with the ring 95, which may be formed integrally therewith, and with the valve chamber 93 about this conduit 93a, which acts as a guide therefor.

As in the manually operated machine, the metal-melting pot 97 is disposed below the core and the casting box and is provided with the molten-metal pump comprising the piston 98, the piston rod 99, and the piston cylinder 100, which has the inlet openings 101 and the upwardly extending discharge spout 102 that is fastened to the extension 103 of the conduit 93a. The molten metal is forced up through the valve chamber 93, out through one of its two oppositely positioned ports 104 into the respective communicating cavity 105 (Fig. 8) formed between the core 91 and the ring 95, and into the mold space between the core and the casting box.

Adapted to slide within the valve chamber 93 is a valve piston 106 attached to the valve piston rod 107. This valve piston is provided, as shown in Fig. 7, with the depending arcuate boss 106a, which closes off the port 104 not in communication with the mold space so that the molten metal is directed only into such space.

The outer end of the rod 107 is pivotally fastened to one end of a rocker arm 108 secured at its other end to a shaft 109 journaled in suitable bearings in the base of the machine. Also secured to this shaft 109 is the lever 110 pivotally secured at its outer end to one end of the link 111, the other end of which is bifurcated as shown in Fig. 7 and is provided with the roller 112 adapted to slide in the cam groove 113 of the cam plate 114 mounted on the shaft 115 journaled in the frame members 116. This shaft 115 is driven by the motor 117 through the sprocket chain 118 engaging the sprocket 119 mounted on the motor shaft 120 and the sprocket 121 mounted on the shaft 122. The shaft 122 is suitably journaled in one of the frame members 116 and carries a worm 123 that drives a worm wheel 124 mounted on the shaft 115. The motor 117 is suitably supported from one of the frame members 116.

The piston rod 99 of the molten metal-pump is pivotally attached to one end of the link 125, the other end of which is in turn pivotally attached to the crank 126 fixed to a stud 127 suitably journaled in the frame member 116. Also fixed to this stud 127 is a throw lever 128 pivotally attached to one end of the arm 129 which is in turn pivotally secured at its other end to one arm of the bell crank lever 130 mounted on the stud 131 also journaled in the frame member 116. The other arm of this bell crank has a roller 132 adapted to slide in the cam groove 133 in the cam plate 134 mounted on the shaft 115. Adjustment of the amount of molten metal delivered to the mold space for the production of a cast plate can be obtained by varying the position of the arm 129 with respect to the throw lever 128, the pin 135 in the arm 129 engaging the slotted portion 136 of the throw lever 128 in the known manner.

The casting box 92 is provided on each side with the rollers 137 adapted to roll on the track members 138 secured to the respective frame members 116 during movement of the casting box to and from its closed position. The mecha-

nism (not shown in the interest of clarity) for so moving the casting box is also driven from the shaft 115 by means of a cam arrangement, and reference is made to the patent to Wood, No. 1,848,592, for the details of the construction and operation thereof. The mechanism for rotating the core, which is enclosed within the housing 139, is also driven by the motor 117 in a coordinated manner with the other moving elements and is described in detail in this Wood patent. Reference is also made to this patent for details of the upper and lower tail-trimming saws 140 and 141 mounted on the shaft 142 journaled in the bracket 143 hingedly secured to one of the frame members 116, such saws likewise being driven from the motor 117 in timed relation with the rotation of the core, and for other known details not shown in the drawings.

In the operation of the described machine, when the core and the casting box have been brought together and the valve piston is in the open position as shown in Fig. 6, the molten-metal pump forces molten metal through the valve chamber 93 and one of the cavities 105 into the bottom of the mold space wherein it rises as a pool. As soon as the predetermined amount of molten metal has been forced into the mold space, the valve piston 106 is automatically moved downwardly, thereby closing off the cavity 105 from the valve chamber 93; and the pump piston 98 is then depressed, whereupon the molten metal remaining in the spout 102 and the conduit 93a is returned to the pot 97 by gravity. To prevent the formation of a vacuum pocket in the valve chamber, the valve piston 106 is provided with the internal air vent duct 144 which matches with one of the air vent ducts 145 in the valve chamber 93, the core 91, and the ring 95 when the valve piston is in its closed position, the vent ducts 145 being open to the external atmosphere. Each vent duct 145 is also provided with the extension 146 opening into the space above the valve piston 106.

When the valve piston 106 has been closed, during which time the cast plate is being cooled to solidify the molten metal, the casting box 92 is automatically retracted the core 91 is rotated through 180°, and the saws 140 and 141 trim the upper and lower tails T and T', respectively, from the cast plate as the core is rotated. The casting box is then returned to its closed position whereupon the cast plate C and its upper tail T are broken away from the core and removed. The lower tail T' is removed by means of the fingers 147, which are attached to the lower portion of the casting box and which contact the projections 148 of the ejector bars 149 sliding in corresponding grooves in the lower part of the core 91, such projections extending downwardly through the slot-like openings 150 in the ring 95 (Figs. 8 and 9). In this manner the ejector bars contact the lower tail T' and dislodge it from the cavity 105 so that it can be removed from the machine. Fig. 8 shows the tail T' ready to be ejected, and Fig. 9 shows this tail in ejected position. In the meantime the valve piston 106 is again moved to its open position as shown, and the machine is ready to form another cast plate. As already indicated, the several operations are all automatically coordinated by means of the several cam plates and related mechanisms, which are so designed that each operation is performed in timed sequence in relation to the others.

As in the case of the manually operated machine, this automatic machine may also be provided with the sealing ring 151 secured to the upper edge of the score 91. Spring locked adjustable air-release valves 151a, similar to the valves 90 of the manually operated machine, may be provided on the ring 151 to control the pressure to which air is compressed in the mold space. Provision (not shown) is, of course, made for the introduction of the requisite cooling water, which is removed from the core through the nipples 152 and the drain pipe 153.

Although the present invention has been described in detail in connection with the above types of plate-casting machines, it is applicable to other types of such machines and also to the production of other types of plates such as flat plates.

We claim:

1. In combination with a stereotype plate-casting machine including a vertical mold comprising a core and a casting box forming a vertical mold space therebetween, a metal-melting pot below the bottom of the mold, a conduit connecting the melting pot with the bottom of the mold space, a cut-off valve interposed between the head of the conduit and the bottom of the mold space for blocking the passage from the conduit to the mold space, and means operated by the valve to vent the head of the conduit below the valve when the valve is closed and to close such vent when the valve is open.

2. In combination with a stereotype plate-casting machine including a vertical mold comprising a cylindrical core and a semicyclindrical casting box forming a vertically extending mold space therebetween, a metal-melting pot below the lower end of the mold, an arcuate member for supporting the core, a manifold carried by the arcuate member and communicating with the bottom of the mold space, a conduit connecting the melting pot and the manifold, a valve interposed between the melting pot and the mold space for controlling the flow of molten metal through the conduit into such space and means operated by said valve for venting said conduit to atmosphere only when said valve is closed.

3. In combination with a stereotype plate-casting machine including a vertical mold comprising a cylindrical core and a semicylindrical casting box forming a vertically extending mold space therebetween, a metal-melting pot below the bottom of said mold, an arcuate member for supporting the core, said arcuate member having a vertical arcuate passage in alinement peripherally with the bottom of the mold space, a manifold carried by the arcuate member and communicating with the arcuate passage, a conduit connecting the melting pot and the manifeld, and a valve slidable in the arcuate passage to control the flow of molten metal into the mold space.

4. In combination with a stereotype plate-casting machine including a vertical mold comprising a cylindrical core and a semicyclindrical casting box forming a vertically extending mold space therebetween, a metal-melting pot below the bottom of said mold, a vertical chamber positioned below the core and arranged axially with respect thereto, said core being formed to provide a passage between the chamber and the bottom of the mold space, a conduit connecting the melting pot and the chamber, and a valve interposed between the melting pot and the mold space for controlling the flow of molten metal into such space.

5. In combination with a stereotype plate-

casting machine including a vertical mold comprising a cylindrical core and a semicylindrical casting box forming a vertically extending mold space therebetween, a metal-melting pot disposed below the bottom of the mold, a vertical valve chamber associated with the bottom of the core and arranged axially with respect thereto, said core being formed to provide a passage between the valve chamber and the bottom of the mold space, a conduit connecting the melting pot and the valve chamber, and a valve movable in said valve chamber for controlling the flow of molten metal into the mold space.

6. In combination with a stereotype plate-casting machine including a vertical mold comprising a cylindrical core rotatable about a vertical axis and an arcuate casting box adjacent a part of the cylindrical surface of the core and forming therewith a vertically extending mold space, a metal-melting pot below the mold, a valve chamber secured to the bottom of the core and arranged axially with respect thereto, said core being formed to provide oppositely disposed passages alternately connecting the chamber with the bottom of the mold space when the core is rotated, a conduit connecting the melting pot and the chamber, said chamber having oppositely disposed openings each communicating with one of the core passages, and a valve movable in the chamber for controlling the flow of molten metal from said chamber and into the mold space through the one of said core passages connecting said chamber to the mold space.

7. In combination with a stereotype plate-casting machine including a vertical mold comprising a core and a casting box forming a vertically extending mold space therebetween, a conduit communicating with the bottom of the mold space, means to introduce molten metal through the conduit into the mold space, a cut-off valve interposed between the conduit and mold space for blocking the passage therethrough, a sealing member for closing the top of the mold space to confine air therein under compression as the molten metal rises within such space, and a loaded air-release valve positioned across a passage through the sealing member for releasing confined air in said space.

8. In combination with a stereotype plate-casting machine including a vertical mold comprising a cylindrically shaped core and a semicylindrical casting box forming a vertically extending mold space therebetween, a conduit communicating with the bottom of the mold space, means to introduce molten metal through the conduit into the mold space, a cut-off valve interposed between the conduit and mold space for blocking the passage therethrough, an annular sealing ring for closing the top of the mold space to confine air therein under compression as the molten metal rises within such space, said sealing ring being attached to the upper peripheral edge of the core, and a loaded air-release valve positioned across a passage through the sealing ring for permitting the escape of such confined air.

9. In combination with a stereotype plate-casting machine including a vertical mold comprising a cylindrical core and a casting box forming a vertically extending mold space therebetween, said core being rotatable about its vertical axis and said casting box being retractible from its closed position with respect to the core, a vertical chamber positioned below the core and arranged axially with respect thereto, the lower portion of said core being formed to provide a passage between the chamber and the bottom of the mold space, means to introduce molten metal into the mold space through the chamber and the passage, a valve to control the flow of molten metal into the mold space, the molten metal forming in said passage a tail on the plate cast in the mold space, means to trim the tail from the cast plate during rotation thereof with the core, and means operable by movement of the casting box for dislodging the severed tail from the passage.

10. In combination with a stereotype plate-casting machine including a vertical mold comprising a core and a casting box forming a vertically extending mold space therebetween, said core being rotatable about its vertical axis and said casting box being retractible from its closed position with respect to the core, a vertical chamber positioned below the core and arranged axially with respect thereto, the lower portion of said core being formed to provide a passage between the chamber and the bottom of the mold space, means to introduce molten metal into the mold space through the chamber and the passage, a valve to control the flow of molten metal into the mold space, the molten metal forming in said passage a tail on the plate cast in the mold space, means to trim the tail from the cast plate, ejector means associated with the core and adapted to engage the severed tail, and inwardly projecting means on the casting box for engaging said ejector means upon closing of the casting box from its retracted position and causing the ejector means to engage the severed tail for dislodgement thereof from the passage.

11. In combination with a stereotype plate-casting machine including a vertical mold comprising a core and a casting box forming a vertically extending mold space therebetween, a conduit communicating with the bottom of the mold space, a pump for introducing a plate forming charge of molten metal through the conduit into the mold space in one discharge stroke, means for operating the pump, a cut-off valve interposed between the conduit and the bottom of the mold space for blocking the passage therethrough, and means positively operated by the pump operating means at the end of the pump discharge stroke for closing the valve.

12. In combination with a stereotype plate-casting machine including a vertical mold comprising a core and a casting box forming a vertically extending mold space therebetween, said casting box being retractible from its closed position with respect to the core, a conduit communicating with the bottom of the mold space, means to introduce a plate forming charge of molten metal through the conduit into the mold space, a cut-off valve interposed between the conduit and the bottom of the mold space for blocking the passage therethrough, means positively operated by the molten metal-introducing means for closing the valve immediately after the plate forming charge of molten metal has been introduced into the mold space, means to retract the casting box, and means positively operated by the casting box in its retracted position for opening the valve.

13. In combination with a stereotype plate-casting machine including a vertical mold comprising a core and a casting box forming a vertically extending mold space therebetween, said casting box being retractible from its closed position with respect to the core, a conduit communicating with the bottom of the mold space, a pump

for introducing a plate forming charge of molten metal through the conduit into the mold space in one discharge stroke, a cut-off valve interposed between the conduit and the bottom of the mold space for blocking the passage therethrough, a motor for operating the valve, means operable by the pump at the end of its discharge stroke for immediately energizing the motor to close the valve, means operable by the motor for de-energizing itself when the valve is closed, means to retract the casting box, means operable by movement of the casting box to its retracted position for re-energizing the motor to open the valve, and means operable by the motor to de-energize itself when the valve is opened.

14. In combination with a stereotype plate-casting machine including a vertical mold comprising a core and a casting box forming a vertically extending mold space therebetween, a conduit communicating with the bottom of the mold space, means to introduce molten metal through the conduit into the mold place, a cut-off valve interposed between the conduit and the bottom of the mold space for blocking the passage therethrough, a driving means, and means operable by said driving means positively for operating the molten metal-introducing means, immediately closing the valve, and positively opening the valve in timed sequence.

15. The combination with a stereotype plate casting machine including a vertically extending mold comprising a core and a casting box forming a vertically extending mold space therebetween, a metal melting pot below the bottom of the mold, a conduit connecting the melting pot with the bottom of the mold space, a cut-off valve interposed between the conduit and the bottom of the mold space for blocking the passage therethrough and including a movable valve element, and a vent including a passage in said valve element for venting the conduit below said valve to the atmosphere only when said valve is closed.

16. The combination with a stereotype plate

casting machine including a vertically extending mold comprising a core and a casting box forming a vertically extending mold space therebetween, a metal melting pot below the bottom of the mold, a conduit connecting the melting pot with the bottom of the mold space and forming an upwardly extending path to conduct metal from the melting pot to the mold space, a cut-off valve interposed between the conduit and the bottom of the mold space for blocking the passage therethrough and to permit the immediate return flow of molten metal from the conduit below the valve to the melting pot, and a vent for venting the conduit below said valve to the atmosphere only when said valve is closed.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
782,299	Wich	Feb. 14, 1905
838,741	North	Dec. 18, 1906
902,941	Case	Nov. 3, 1908
969,539	Kitchen	Sept. 6, 1910
980,419	Hopkins	Jan. 3, 1911
1,112,694	Grey	Oct. 6, 1914
1,448,529	Fleming	Mar. 13, 1923
1,570,480	Goulding	Jan. 19, 1926
1,848,592	Wood	Mar. 8, 1932
1,922,514	Wilson	Aug. 15, 1933
2,012,189	Fritz	Aug. 20, 1935
2,069,248	Huck	Feb. 2, 1937
2,136,383	Huck	Nov. 15, 1938
2,236,212	Huck	Mar. 25, 1941

FOREIGN PATENTS

Number	Country	Date
2,772	Great Britain	Oct. 12, 1911
103,229	Switzerland	Feb. 1, 1924