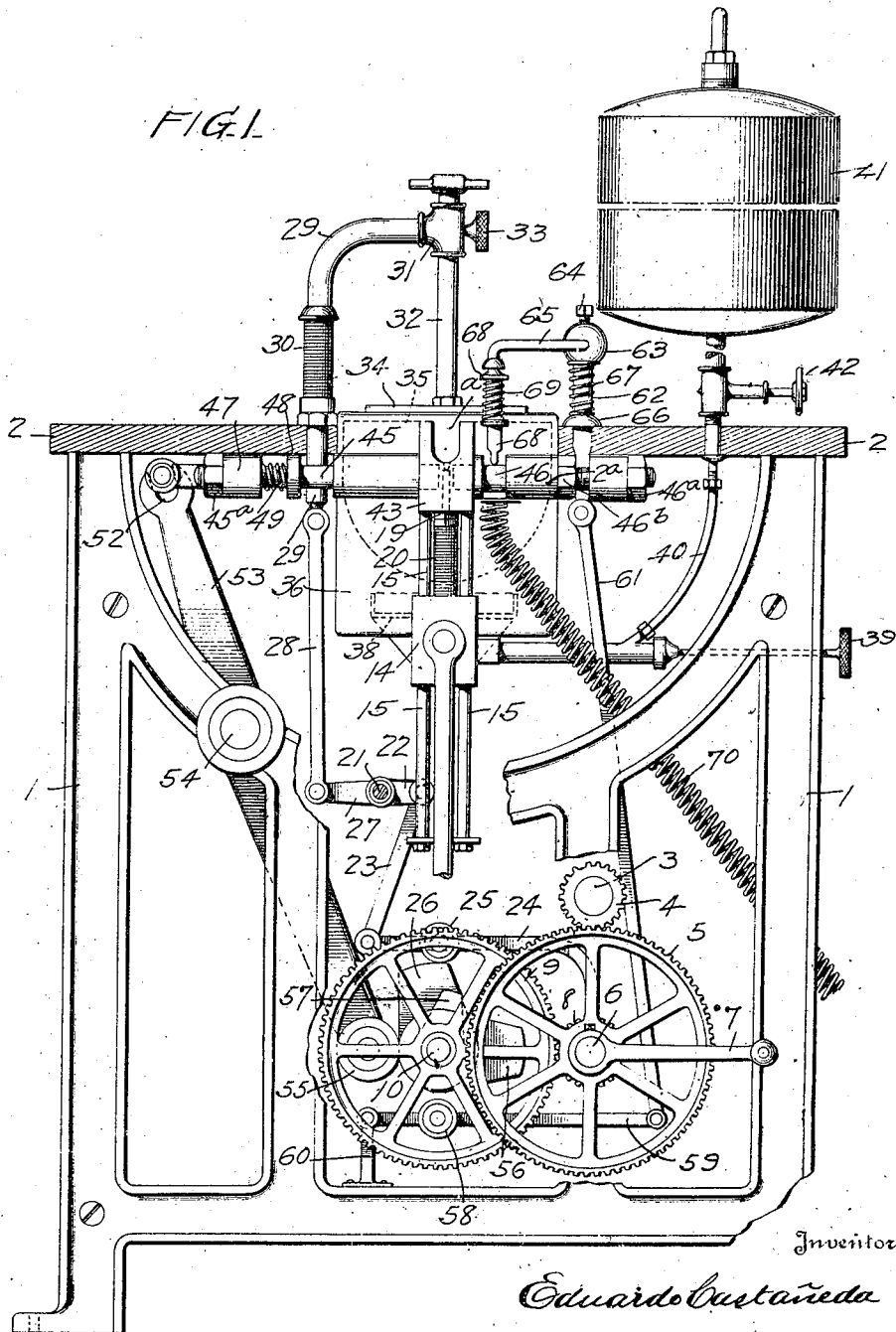


1,209,116.

E. CASTAÑEDA.
CASTING MACHINE.
APPLICATION FILED MAR. 9, 1916.

Patented Dec. 19, 1916.
3 SHEETS—SHEET 1.



Inventor

Eduardo Castañeda

By

Henry Orth

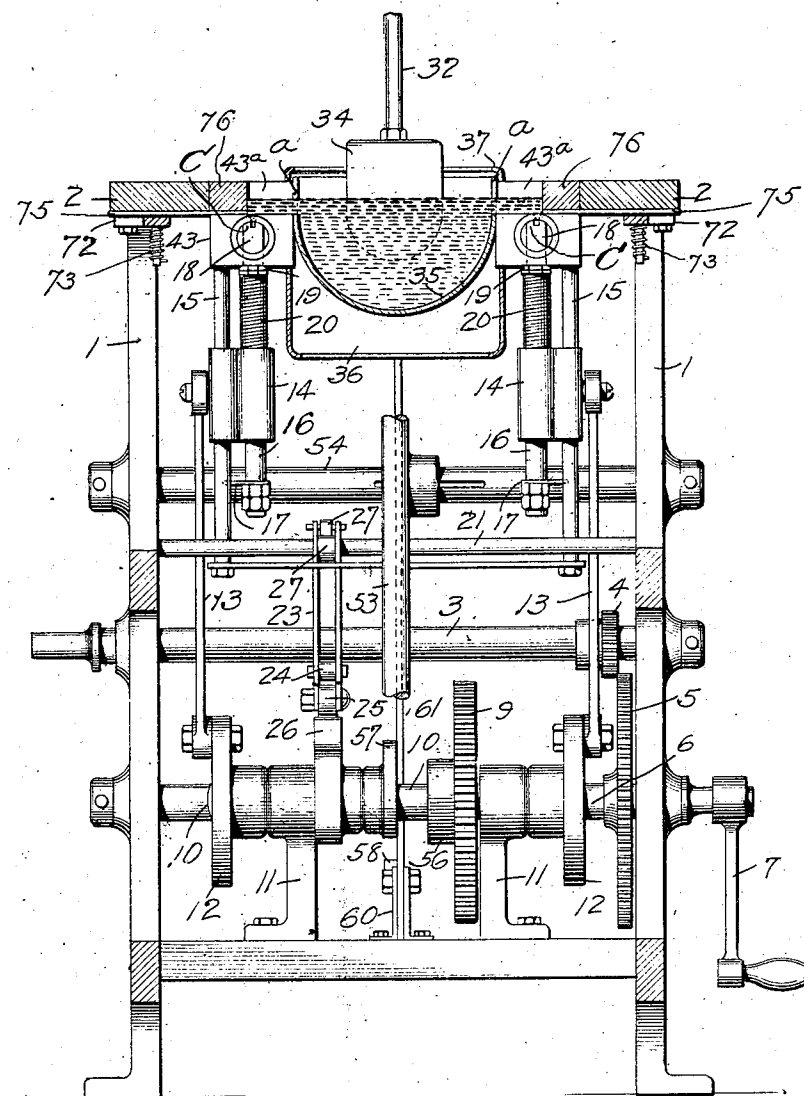
Attorney

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FIG. 2



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3 SHEETS—SHEET 3.

FIG. 3.

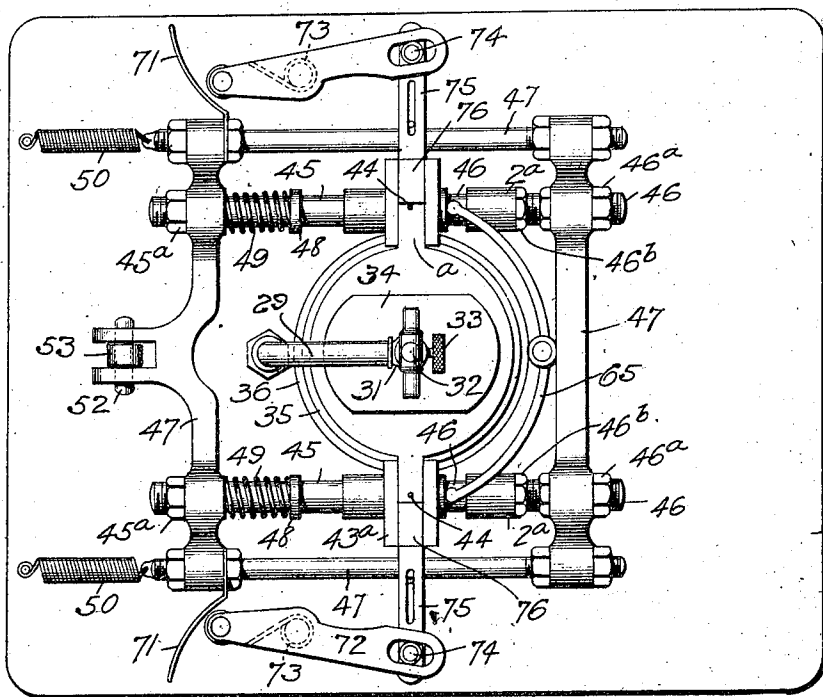
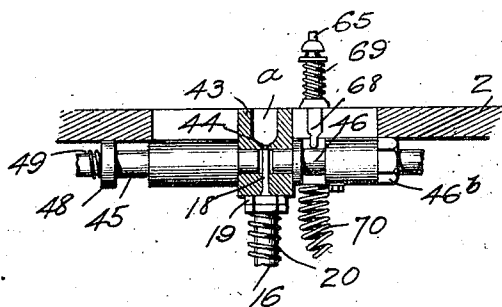


FIG. 4.

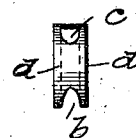


FIG. 5.

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UNITED STATES PATENT OFFICE.

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CASTING-MACHINE.

1,209,116.

Specification of Letters Patent.

Patented Dec. 19, 1916.

Application filed March 9, 1916. Serial No. 83,071.

To all whom it may concern:

Be it known that I, EDUARDO CASTAÑEDA, a citizen of Mexico, residing at Monterey, in the State of Nuevo Leon, in the Republic of Mexico, have invented certain new and useful Improvements in Casting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to casting machines, and has for its object to provide a simple machine of this character in which a molten metal, such as lead, Babbitt metal, tin alloy or the like, is caused to periodically enter molds under a natural head, and the casting automatically moved out of casting position to ejecting position, by which movement the casting is cut or sheared from the runner in the gate. At each operation of the machine the level of the molten metal is raised to such an extent by a displacing member, that the metal will flow into the mold or molds.

Referring to the drawings, in which like parts are similarly designated—Figure 1 is a side view, partly in section. Fig. 2 is a vertical section showing the parts of the mechanism in elevation; Fig. 3 is a plan view showing parts of the mechanism below the table. Fig. 4 is a section taken longitudinally of the mold plungers through the mold. Fig. 5 is an edge view of a casting.

The casting machine comprises a frame 1 on top of which is provided a table 2. Mounted in this frame is a power shaft 3 on which is a pinion 4 for engaging a gear wheel 5 on a driving shaft 6. The power shaft 3, which is driven by an electric motor or other suitable device, is, as shown in Fig. 2, moved to the left to cause the pinion 4 to be disengaged from the gear wheel 5, and the driving shaft 6 is provided with a crank 7, for manual operation.

The shaft 6 carries a pinion 8 that meshes with the gear wheel 9 fixed on an operating shaft 10 parallel to the shaft 6 and journaled in pedestals 11 within the main frame 1. At the ends of the shaft 10 are crank disks 12,

Fig. 2, connected by rods 13 to cross-heads 14. Each cross-head slides on a pair of rods 15 depending from the mold or the table 2. Slidable within each cross-head is a core rod 16, whose lower end below the cross-head is provided with a lug 17 held in place on the lower end of the rod by a nut and engaging between the pair of guide rods 15 to prevent the core rod 16 from rotating during its vertical reciprocation to and from the mold. At the upper end of this rod is a core 18 having a pair of lugs C that project through the casting, Fig. 5; below the core is a collar 19 secured to said rod 16, and included between this collar 19 and the cross-head 14 is a coil spring 20.

The core 18 is preferably, but not necessarily, detachably secured to the core rod 16 and the collar 19 is adjustable on the rod 16 and may be so adjusted that the core will enter into the mold cavity to a greater or less degree.

21 is a rock-shaft having a lever arm 22 connected by a link 23 to one end of a rod 24 whose other end is downwardly bent and fulcrumed on shaft 6. This rod 24 carries an anti-friction roller 25 acted on by a cam 26 on the shaft 10. Rock-shaft 21 is provided also with an arm 27 projecting in a direction opposite the arm 22, and is connected by a link 28 to the lower end of a vertically reciprocable rod 29 that passes through the table 2. This rod is urged upward by a coil spring 30 and its upper end is bent to project over a melting pot 35 and carries a head 31 in which is vertically adjustable a rod 32 held in its adjusted position by a clamping screw 33, or equivalent means.

On the lower end of the rod 32 is a displacing member 34 of fire-brick or the like, the arrangement being such that at each rotation of the operating shaft, the cam 26 acts on the roller 25 to rock shaft 21, thereby pulling down the link 28 and rod 29 against the tension of spring 30, and causing the displacing member 34 to be momentarily lowered into the metal contained in the melting pot 35. This melting pot 35 is provided with an external shield 36 surrounding it which projects slightly above the table and has its upper edge turned slightly inward, as shown at 37. Within that por-

tion of the shield 36 which extends below the bottom of the pot 35 is a burner 38, of any suitable type, preferably for gasoline. This burner is controlled by a regulating screw or needle-valve 39, as is customary, and is fed by a pipe 40 from a tank 41 having a cut-off valve 42 above the table.

At its opposite sides the pot 35 and the shield 36 are provided with cutaway portions or notches *a* to which is fitted the stationary portion of the mold 43, which in this particular instance is designed for the casting of railway car seals, shown in edge view in Fig. 5. As is customary, these car seals are cylindrical soft metal disks provided with a passage *b* divided at one end by a partition *c* formed by the lugs C on the core 18.

The notch *a* in the pot extends to the mold member 43 between parallel sides 43^a forming a runner for the molten metal, which runner is provided with a conical hole or gate 44 at its bottom directly over the chamber to be filled with metal. On each side of the gate and forming the circular sides of the mold cavity are spaced plungers 45 and 46 in alinement and mounted in a reciprocating frame 47 suitably mounted and guided beneath the table. The frame 47 and plungers 45 and 46 move in a direction perpendicular to the trough or runway formed between the sides 43^a of the mold member 43.

The plunger 45 is provided with a collar 48 between which and the frame 47 is a coil spring 49. This plunger is slidable in the frame 47 and is adjusted by a nut 45^a to cause the plunger to enter to a greater or less extent into the flask member 43. The plunger 46 is held rigid in the frame 47 by nuts 46^a.

The frame 47 is held retracted by two coil springs 50, one end of each being secured to said frame and the other end to the underface of the table. The movement of the frame and plungers to the left, Fig. 3, is limited by suitable adjustable stops, here shown as nuts 46^b that stop against lugs 2^a projecting beneath the table 2, and in which the plungers 46 are guided. Said frame 47 is acted upon at 52 by the forked end of a rock lever 53 mounted on a rock shaft 54, and carrying at its lower end a roller 55. This roller is acted upon by a cam 56 on the operating shaft 10 directly adjacent the gear wheel 9, so that upon each revolution of the shaft 10 the frame 47 receives a reciprocation.

Between the two cams 26 and 56 is a cam 57 that acts upon a roller 58 mounted on a rod 59 below shaft 10. One end of this rod is pivoted in a standard 60 and the other end is connected by link 61 to a vertical rod 62 passing through the top of the table. This rod has a head 63 in which is adjustably

held by means of a screw 64 ejector actuating arms 65.

Between the head 63 and a collar 66 on the table 2 is a coil spring 67 which normally holds the head 63 and arms 65 raised. These arms diverge to opposite sides of the table and there engage ejector pins 68 held retracted by springs 69. These ejector pins 68 pass through the table 2 and are in line with the mold plungers 45 and 46, so that when the cam 57 comes into operation rod 59 is moved downward, pulls rod 61 and moves vertical rod 62 downward against the action of spring 67, thereby causing the arms 65 to give a short downward movement to the ejector pins 68 to eject the article into the discharge spouts 70.

The frame 47 carries at each side a cam 71, (Fig. 3), and as this frame moves to the right each cam acts on a pivoted lever 72 held retracted by a spring 73. Pivotaly connected to each lever 72 at 74 is an arm 75 of a slide 76, which slide has a cross section corresponding to the notch *a* and to the upper part of the flask member 43, and slides between the sides 43^a.

The operation is as follows: It being supposed that molten lead, Babbitt metal, or tin alloy is contained within the pot 35 and is kept molten by means of a flame from the burner 38. The metal displacing element 34 is then adjusted by means of screw 33 in the head 31, so that its lower surface is about at the level of the metal in the pot or slightly dips thereinto, so that after adjustment the level of the metal will be below the notch *a*. If power is to be applied for driving the machine, then shaft 3 is shifted to the right to cause pinion 4 to engage with gear wheel 5. If the machine is to be operated manually, shaft 3 is left in the position shown in Fig. 2, and the handle 7 manipulated, thereby rotating shaft 6 and pinion 8 to rotate the gear wheel 9 and shaft 10 lying parallel with shaft 6. During the first part of the rotation, of shaft 10, each crank disk 12 causes its connecting rod 13 to move the cross head 14 and core rod 16 upward so that the core 18 projects into the mold. The spring 20 between the cross-head 14 and adjustable collar 19 causes the core to move in unison with the cross-head until it is stopped in its upward movement by the collar 19. A continued rotation of the crank disk compresses spring 20 on the core bar 16, allows the cross-head 14 to move idly to its uppermost position, during which time cam 26 comes into operation, rocks shaft 21 and causes the rod 29 carrying the displacing member 34 to move down into the molten metal. This causes the level of the molten metal to rise above the bottom of the notch *a* and allows it to overflow through this notch into the gate 44 and fill the mold, after which the cam 26 rides past its roller

25 and allows the displacing member 34 to be lifted by its spring 30, so that the molten metal will fall to its normal level below the bottom of the notch *a*. The crank disk 12 then withdraws the core 18 from the flask. The cam 56 now comes into operation to rock the arm 53 to move the frame 47 beneath the plate to the right, Fig. 3, carrying the two alined plungers 45 and 46 with it, so that the casting contained between their ends is bodily forced to the right and is cut off from the metal remaining in the runway and in the gate 44.

The frame 47 moves to the right until the castings contained between the plungers 45 and 46 are carried beneath the ejector pins 68. After the alined plungers 45 and 46 have moved to the right sufficiently to cut the castings from the metal contained in the runways, cams 71 come into operation and act on levers 72 and cause the slides 76 to push the hardened metal, yet very hot and contained in the gates and notches *a* back into the pot where it is immediately remelted.

Just before the plungers have reached the position for ejecting the casting, collar 48 strikes the left hand side of the mold and arrests the movement of the plunger 45, which yields by reason of spring 49, while the other plunger 46 continues its movement for a fraction of an inch, thus separating the plungers and effectually releasing the article held between them. Ordinarily this releasing will be sufficient to discharge the castings, but in order to insure their discharge should they accidentally stick, I provide ejector pins 68, Fig. 1.

The ejector pins are actuated when the frame 47 has moved the plungers 45 and 46 into ejecting position, that is to say, when cam 56 engages roller 55, cam 57 will come into operation on its roller 58, force down rod 59, link 61 and ejector head 63, and the arms 65 resting on top of the ejector pins give these ejectors a sudden impulse, thereby ejecting the castings into the spiral wire discharge tubes 70. After this the parts return to initial position for repeating the cycle of operations.

By means of nuts 45^a the plungers 45 may be adjusted to enter to a greater or less extent into the mold members, and by means of nuts 46^a and 46^b the plungers 46 can be similarly adjusted so that one or both side walls *d* of the casting, Fig. 5, may be made thicker or thinner, as desired.

The spiral wire discharge tubes have the advantage of rapidly cooling the discharged hot casting by providing a free circulation of air through these tubes and around the casting as it passes through the tubes, so that by the time the casting has reached the end of the tube the metal has sufficiently hardened to prevent injury to the casting

when dropping therefrom into a suitable receptacle.

I claim—

1. In a casting machine, a pot for molten metal, a molten metal displacing member to raise and lower the liquid level in said pot, a mold member adjacent the pot, means to move the displacing member into the metal to cause it to flow into said mold member, and means to return the surplus metal to the pot.

2. In a casting machine, a pot for molten metal, a member for displacing the metal in the pot, a mold member communicating with the pot and above the normal level of the metal therein, and automatically operated means to actuate the displacing member periodically to raise and lower the level of the metal in the pot to cause the metal to overflow periodically from the pot into the mold member when the level of the whole body of metal is raised.

3. In a casting machine, a pot for molten metal, a displacing member, a mold member communicating with the pot and above the normal level of the metal therein, means to periodically move the displacing member to cause the molten metal to overflow into the mold member, and means to return the surplus metal to the pot.

4. In a casting machine, a pot for molten metal, a displacing member, a mold member having a runner and a gate above the normal level of the metal in the pot, means to move the displacing member into the molten metal to cause it to overflow through said runner and gate, and means to return the surplus metal in said runner and gate to the pot after the metal level has been lowered.

5. In a casting machine, a mold member having a gate, a pair of spaced plungers movable in said member, means to move the plungers with the casting between them past the gate to sever the casting from the gate metal.

6. In a casting machine, a mold member having a gate, a pair of spaced plungers movable in said member, means to move the plungers with the casting between them past the gate to discharging position and to simultaneously sever the casting from the gate metal, and means to arrest one of said plungers in advance of the other to separate the plungers to release the casting.

7. In a casting machine, a mold member having a gate, a pair of spaced plungers movable in said member, means to move the plungers to sever the casting between them from the gate metal, and means to eject the gate metal.

8. In a casting machine, a pot, a mold member above the normal metal level in the pot and having a gate, a pair of spaced plungers movable in said member, means to cause the metal to overflow into said member

through said gate, means to move the plungers with the casting to discharging position and simultaneously sever said casting from the gate metal, and means to eject the gate metal into the pot to be remelted.

9. In a casting machine a spiral wire discharge tube.

10. In a casting machine, a pot, a mold member above the normal metal level therein and having a gate, a pair of spaced plungers movable beneath the gate, a core movable into and out of said member between said plungers, means to cause the metal level to momentarily rise and overflow through said gate to fill the mold cavity between the plungers, means to move the plungers after the withdrawal of the core to sever the casting from the gate metal, means to cause the separation of the plungers and means to eject the casting from between said plungers.

11. In a casting machine, a table, a pot mounted therein, a mold member connected to the pot, a reciprocable frame beneath the table, a pair of aligned plungers mounted in said frame spaced apart at their proximate ends, and movable in said member, means to yieldingly hold one of the plungers in said frame, means to arrest said yielding plunger, and means to reciprocate the frame.

12. In a casting machine, a pot for molten metal, a vertically reciprocable rod having a portion overhanging the pot, and a metal displacing member vertically adjustable in the overhanging portion, and means to cause said rod to reciprocate to raise and lower the molten metal level in the pot.

13. In a casting machine, a pot, a mold member having a runner and a gate above the normal metal level in said pot, means to cause the level of the metal in said pot to rise and overflow through said runner and gate to fill the mold cavity, means to sever the casting from the gate metal and means to eject the runner and gate metal into the pot after the metal level therein has dropped.

14. In a casting machine, a mold, a reciprocating cross head, a core rod yieldingly mounted in said head, a core on the end of said rod arranged to enter the mold, and means on the rod to arrest the movement of the core.

15. In a casting machine, a mold, means for supplying molten metal thereto through its top, a core movable into the mold through its bottom, a cross head movable to and from said mold, a rod carrying the core slidable in the cross head, an abutment on the rod, and a spring interposed between the

abutment and cross head, for the purpose specified.

16. In a casting machine, a pot, a mold having a gate above the normal metal level in the pot, a runner connecting the gate and pot, means to cause the level of the metal in the pot to overflow through said runner and gate to fill the mold cavity, a reciprocating frame, means on the latter to sever the casting from the gate metal, slides movable into the runners, and means actuated by the movement of the frame to move the slides through the runners to eject the metal therefrom.

17. In a casting machine, a pot, a mold having a gate above the normal metal level in the pot, a runner connecting the gate and pot, means to cause the level of the metal in the pot to overflow through said runner and gate to fill the mold cavity, a reciprocating frame, means on the latter to sever the casting from the gate metal, slides movable into the runners, and means actuated by the movement of the frame to move the slides through the runners simultaneously with the severing of the casting from the gate metal to eject the latter from the runners.

18. In a casting machine, a pot, a mold having a gate above the normal metal level in the pot, a runner connecting the gate and pot, means to cause the level of the metal in the pot to overflow through said runner and gate to fill the mold cavity, a reciprocating frame, plungers carried by the latter to remove the casting from the mold, slides in the runners, pivoted levers connected to the slides, and cams on the frame adapted to actuate the levers to move the slides through the runners.

19. In a casting machine, a pot, a mold having a gate above the normal metal level in the pot, a runner connecting the gate and pot, means to cause the level of the metal in the pot to overflow through said runner and gate to fill the mold cavity, a reciprocating frame, plungers carried by the latter to remove the casting from the mold, slides in the runners, pivoted levers connected to the slides, and cams on the frame adapted to actuate the levers to move the slides through the runners simultaneously with the movement of the plungers.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EDUARDO CASTAÑEDA.

Witnesses:

J. BELDEN,
HENRY ORTH, Jr.