

S. P. ELLSWORTH.
CASTING MACHINE.

APPLICATION FILED AUG. 11, 1915.

Patented Mar. 14, 1916.

3 SHEETS—SHEET 1.

1,175,729.

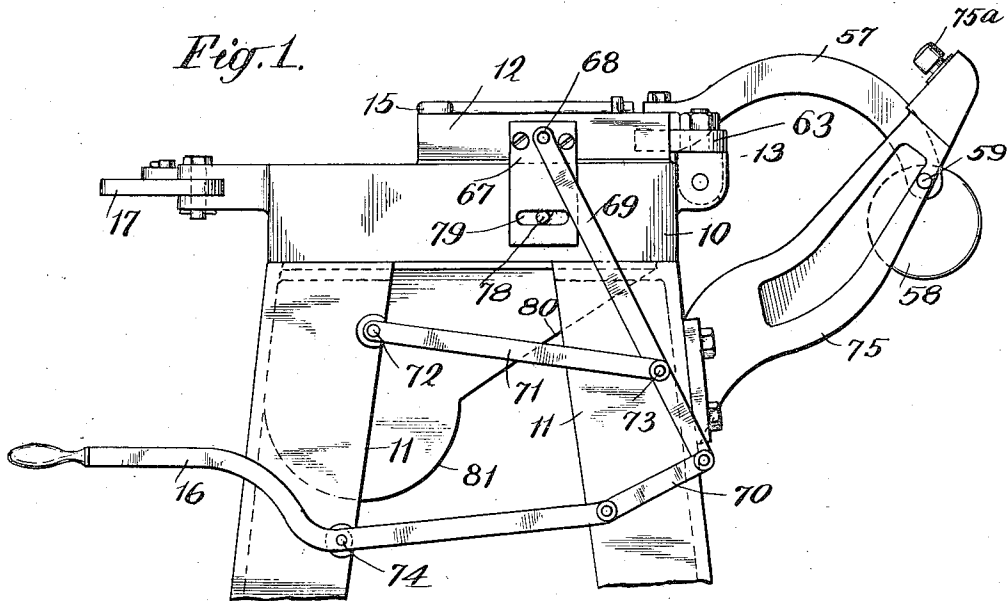
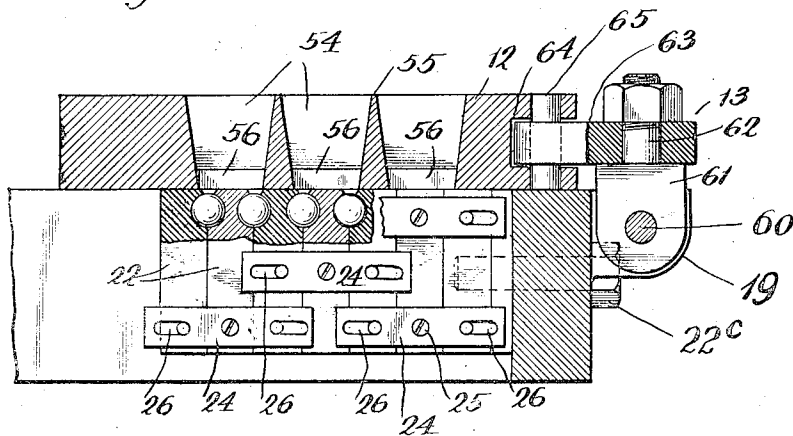


Fig. 2.



INVENTOR
Stephen P. Ellsworth
BY
E. W. Marshall
ATTORNEY

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Fig. 3.

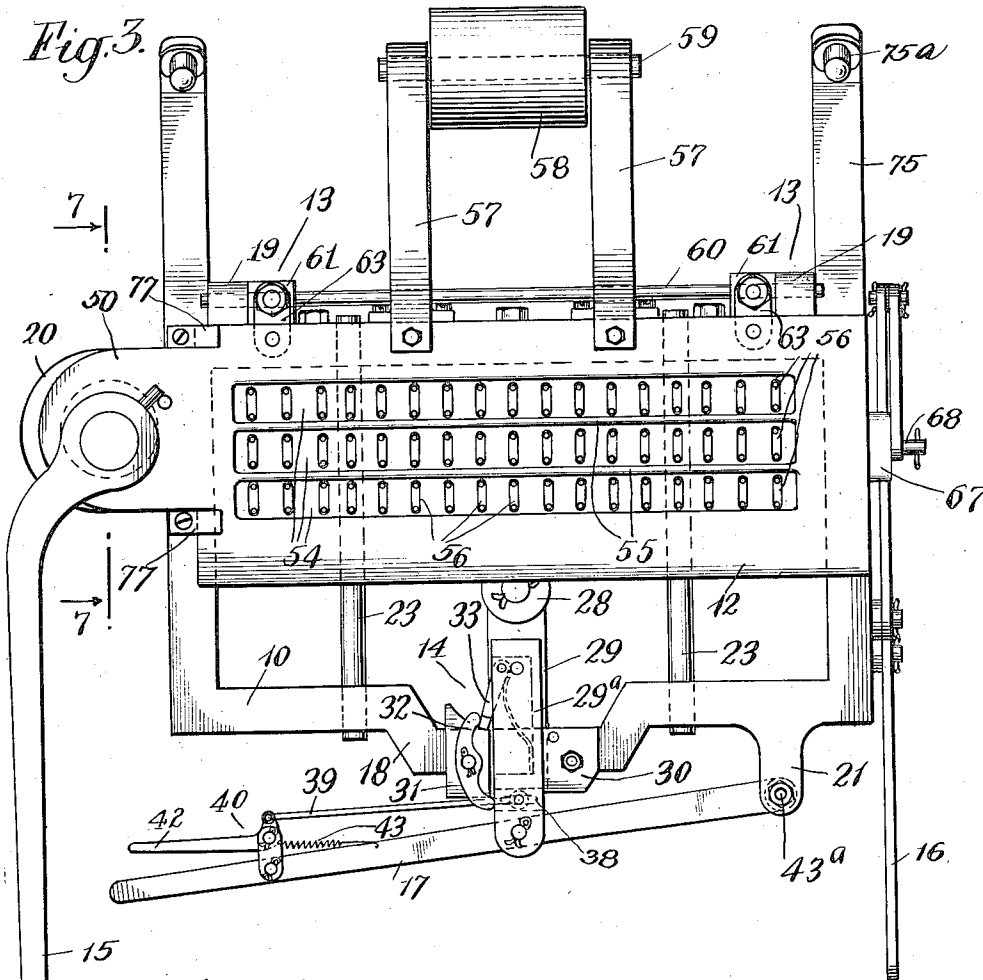
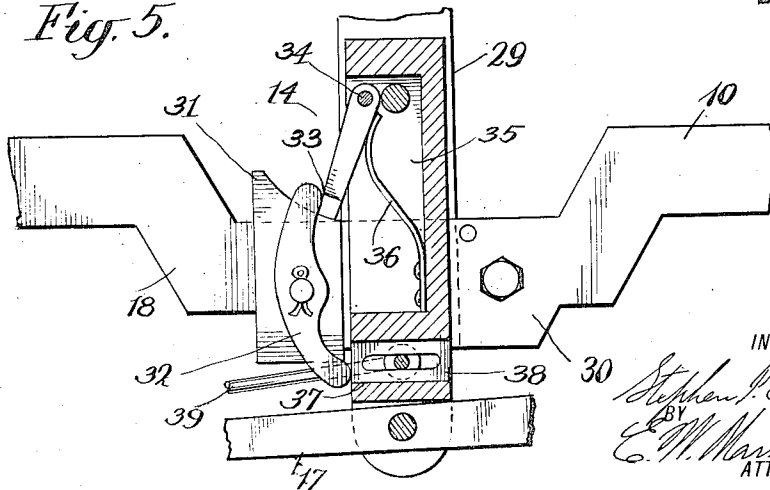


Fig. 5.



INVENTOR

Stephen P. Ellsworth
BY
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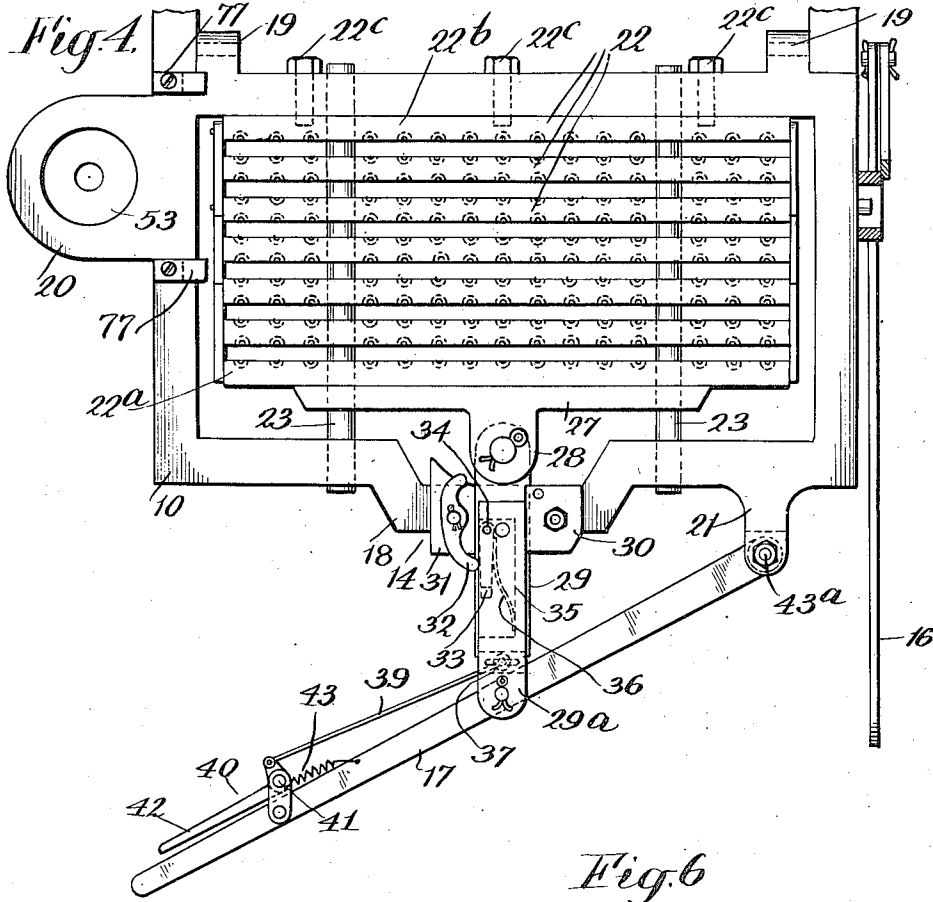


Fig. 6

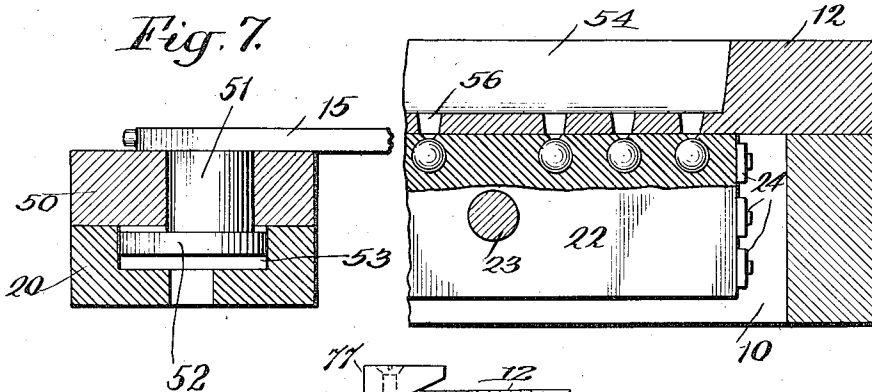
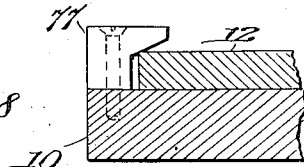


Fig. 8



INVENTOR
Stephen P. Ellsworth
BY
E. W. Marshall
ATTORNEY

UNITED STATES PATENT OFFICE.

STEPHEN P. ELLSWORTH, OF RICHMOND HILL, NEW YORK, ASSIGNOR TO JAMES V. V. COLWELL, OF NEW YORK, N. Y.

CASTING-MACHINE.

1,175,729.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, STEPHEN P. ELLSWORTH, a citizen of the United States of America, and a resident of Richmond Hill, Queens county, and State of New York, have invented certain new and useful Improvements in Casting-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to molds or machines for casting metals and has special reference to such as are adapted for making small metal casting in large quantities.

One object of my invention is to provide a machine of this character that shall be simple and durable in construction and easy and reliable in operation.

Another object is to provide a casting machine embodying means for quickly and readily shearing off the gates when the castings are complete, then removing the surplus metal from the trough, and releasing the casting from the mold.

Another object of my invention is to provide a relatively simple and compact means for locking the sections of the molds together in position to receive the molten metal.

Other objects and advantages of my invention will be set forth hereinafter, and in order that my invention may be thoroughly understood, I will proceed to describe the same in the following specification and then point out the novel features thereof in appended claims.

Referring to the drawings: Figure 1 is an end elevation of a machine arranged and constructed in accordance with my invention. A transverse sectional view of the same machine is shown on a larger scale in Fig. 2. Fig. 3 is a plan view of the same machine with the trough in its closed position ready for the metal to be poured. Fig. 4 corresponds to Fig. 3 but shows the frame with the trough removed. Fig. 5 is a partially sectional plan view of the latching and releasing mechanism of Fig. 3, drawn to a larger scale. Fig. 6 is a sectional detail of the trough and one of the mold bars. Fig. 7 is a sectional detail of the cam shown in Fig. 3. Fig. 8 shows one of the clamping blocks of Figs. 3 and 4 in detail.

The machine comprises in general a frame

10, which may be supported in any suitable manner, as for example, upon legs 11; a trough 12, which is connected to the frame by oscillating hinges 13, a latch mechanism 14 and a plurality of operating levers 15, 16 and 17.

Frame.—The frame 10 is substantially rectangular in form, but has an offset section 18, in the center of the front side. It has lug projections 19 which form parts of the oscillating hinges 13, an end projection 20 and a projection 21 near one of its front corners. A plurality of mold sections 22, which have the form of rectangular bars, are supported in the frame 10 on the transverse rods 23. These rods are removable so that the mold sections may be removed and replaced for the purpose of adapting a machine to produce castings of various kinds. The mold sections 22 do not completely fill the frame 10 and are adapted to be separated within the frame for the purpose of permitting the casting to drop out when completed. Consequently as shown in Fig. 2, the sections 22 are interconnected by links 24, the arrangement of the parts being such that when a section 22^a at the front end of the group is pulled toward the adjacent side of the frame, as hereinafter explained, the sections are spaced apart. In order to make the operation of this portion of the device perfectly clear, the details of the interconnection between sections will now be set forth.

Each of the links 24 is secured to an intermediate mold section or bar by a pin 25 and is connected to the adjacent sections or bars on either side, by slot and pin connections 26. Another group of sections or bars is similarly connected with links 24 and another of the links 24 is then utilized, as clearly shown in Fig. 2, for interconnecting the two groups. One of the strips or sections designated 22^b in Fig. 4 is secured to the adjacent side of the frame by bolts 22^c and the strip or section at the opposite end of the group, designated 22^a in Fig. 4, is provided with a bracket 27, having a projection 28 to which an extension 29 is connected. The extension projects through a slot or notch in the adjacent section 18 of the frame and is guided by blocks 30 and 31. A pawl 32 is mounted on the block 31 and is adapted to release the latch 33. This

latch is pivotally mounted at 34 in a recess 35 in the extension 29 and is pressed outwardly by a spring 36.

The extension has a transverse slot 37, in which an actuator 38 slides. This actuator is connected by a link 39 to a bell crank releasing lever 40. The releasing lever is pivotally mounted at 41, and its long arm 42 is adjacent to the end of the handle lever 17 in position to be gripped by the hand of the operator and to be moved in opposition to a spring 43. The lever 17 is pivotally mounted at 43^a on the projection 21 of the frame and is connected, at an intermediate point in its length, by a link 29^a to the extension 29.

Trough.—The trough 12 has a projection 50 which corresponds in its general location to the projection 20 of the frame and constitutes a bearing for the eccentric hub 51 of the lever 15. The hub extends at right angles to the plane of the lever and, on the under side of the trough projection 50 supports a bearing plate 52. This plate is so located when the lever is in the position shown in Fig. 3, as to enter a recess 53, with which the projection 20 is provided. The arrangement is such that when the lever 15 is pushed inwardly the eccentric hub 51 is turned with the result that the trough is oscillated longitudinally relative to the frame, and the gates, as hereinafter explained are sheared off.

The trough is provided with a plurality of longitudinal slots 54 forming spacing bars 55. Between these bars the slots are provided with holes 56 which are formed and located to constitute gates and cooperate with the molds which are provided in the frame 10. Each of the gates has beveled edges to cause the excess metal in the gate to rise as it is sheared off. A pair of curved bracket arms 57 are secured to the trough and extend backwardly therefrom. They constitute supports for a counterweight 58 mounted on a rod 59 between them.

An oscillating hinge pin or rod 60 is supported by the lugs 19 of the frame and studs 61 are pivotally mounted on the rod 60 adjacent to the lugs. Each of the studs 61 has an upwardly extending projection 62 and is connected by a link 63 to the trough 12. As clearly shown in Fig. 2, the trough is provided with slot 64 into which the links 63 extend, pins 65 being provided for securing the links to the trough and at the same time permitting the longitudinal oscillatory movement of the trough relative to the frame. The trough is provided with a block 67, from which a pin 68 extends. This pin constitutes a pivot for one end of a lever 69 which is connected at its opposite end by a link 70 to the lever 16. A link 71, which is pivoted at a stationary point 72, is connected to an intermediate point 73 in the lever 69,

the lever 16 being pivoted at an intermediate stationary point 74. The arrangement of links and levers is such as to constitute a compound toggle for throwing the trough open. The pin 68 is of sufficient length, or there is otherwise provided sufficient play in the toggle connection to permit the trough to be moved longitudinally by the eccentric as already explained.

The frame is preferably provided with a stationary bracket or brackets 75 having spring stops 75^a and constituting a buffer against which the trough may rest when it is open. The frame is provided with overhanging lugs 77 which are adapted to engage the trough and hold it securely in place when in casting position, the engaging surfaces being tapered to secure a clamping action. At the opposite end of the frame is a pin 78 which is adapted to engage a hole 79 in the block 67 at the same time and to cooperate with the lugs 77 in clamping the trough in place.

When the lever 15 is pushed in, to shear the gates as hereinafter explained, the trough is released from the lugs 77 and the block 67 is released from the pin 78 so that the trough is free to be swung open.

The shape of the gate may be varied dependent upon the size or shape of the casting to be produced—for example the gates may be D shape, V shaped or circular.

The neck of the casting instead of being at the surface of the mold sections, is below the surface to avoid making the walls of the mold itself, at the edge of the aperture, too thin and frail. Above the neck the opening is enlarged so that in the shearing process the metal above the neck remains with the excess and the metal parts at the neck.

Operation.—The operation of the machine is as follows: Assuming that the parts occupy the positions in which they are shown in Figs. 2 and 3, the machine is in condition to receive the molten metal which is poured into the slots 54 in the trough and flows into the gates 56. When the metal has set, the operator first actuates the lever 15 which operates the eccentric and moves the trough for a short distance with reference to the frame. This motion on account of the links 63 is oscillatory and is particularly effective in shearing off the gates. This motion also releases the trough which was clamped to the frame as already explained. The lever 16 is next pushed downwardly, thereby throwing the trough from its closed position to its open position where it is caught by the buffers 75^a of the brackets 75. The excess metal which was raised by the shearing process, drops out of the trough at this time and does not have to be removed. The operator then grasps the handle of the lever 17 and first actuates the bell crank 40, to pull outwardly on the lug 39 and move the ac-

tuator 38. This small sliding member, as shown in Fig. 3, is in position to actuate the pawl 32, which in turn releases the latch 33 and permits the lever 17 to be pulled outwardly into the position shown in Fig. 4. The mold sections or bars which were close together, as shown in Fig. 2, are by this action spread apart, as shown in Fig. 4, so that the castings drop out of the molds. Below the frame is a deflector plate 80 which guides the castings into a chute 81 from which they are discharged into any suitable receptacle (not shown). After the castings have thus been removed the lever 17 is returned to its original position, the latch 33 when released is pushed outwardly by the spring and thus serves to hold the mold sections close together. The lever 16 is raised to close the trough, then lever 15 is drawn out and set, clamping the trough to the frame. The machine is now in condition to have the casting operation repeated.

It is evident that castings of various kinds and shapes may be produced and that the details of the construction of the machine may be varied within the spirit and scope of my invention, I therefore intend that only such limitations be imposed as are intended in the appended claims.

What I claim is:

1. A casting machine comprising a mold frame having a projection provided with a recess, a trough, hinge connected to the frame to permit it to be swung in a plane at right angles to the plane of the frame and having means adapted to cooperate with the recess in the frame projection when the trough and frame are superposed and to adjust the trough in the plane of the frame.

2. A casting machine comprising a mold frame having a recessed projection, a trough, hinge connected to the frame and having a correspondingly located projection, an eccentric rotatively supported in the trough projection and having a bearing member adapted to engage the recess of the frame projection and means for actuating the eccentric to adjust the trough.

3. A casting machine comprising a mold frame having a recessed projection, a trough, hinge connected to the frame and having a correspondingly located projection, an eccentric rotatively supported in the trough projection and having a circular disk bearing member adapted to engage the recess of the frame projection, and a lever secured to the eccentric and adapted to actuate the same.

4. A casting machine comprising a mold frame, a trough, hinge connected thereto, a lever and interposed toggle links between the trough and the lever, whereby the lever is adapted to swing the trough on its hinges.

5. A casting machine comprising a mold frame having a plurality of mold sections

slidably mounted within the frame, means for locking the sections together, a trough, oscillating hinges connecting the trough and the frame, said trough being adapted to be oscillated in the plane of the frame to shear the gates.

6. A casting machine comprising a mold frame having a plurality of mold sections slidably mounted within the frame, means for locking the sections together, a gate trough hinge connected to the frame, means for adjusting the trough to shear the gates and means for clamping the trough to the frame when the trough is adjusted to casting position.

7. A casting machine comprising a mold frame having a plurality of mold sections slidably mounted within the frame, means for locking the sections together, a trough, hinge connected to the frame, a lever and interposed gearing whereby the lever is adapted to swing the trough on its hinges, and means mounted on the trough for adjusting the trough relative to the frame.

8. A casting machine comprising a mold frame having a plurality of mold sections slidably mounted within the frame, means for locking the sections together, a trough hinge connected to the frame, means for clamping the trough to the frame, means for adjusting the trough to shear the gates and release the clamping means, a lever and interposed toggle links between the trough and the lever.

9. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on said rods within the frame, means for locking the sections together, means for releasing the lock and spreading the sections, a trough, oscillating hinges connecting the trough to the frame, said trough being adapted to be moved in the plane of the frame to shear the gates and means for swinging the trough on its hinges in a plane at right angles to the plane of the frame.

10. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on said rods within the frame, means for locking the sections together, means for releasing the lock and spreading the sections, a gate trough, oscillating hinges connecting the trough to the frame and means for adjusting the trough to shear the gates and means for swinging the trough on its hinges in a plane at right angles to the plane of the frame.

11. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on said rods within the frame, means for locking the sections together, means for releasing the lock and spreading the sections, a trough hinge connected to the frame, a lever and interposed toggle links whereby the lever is

adapted to swing the trough on its hinges in a plane at right angles to the plane of the frame.

12. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on said rods within the frame, means for locking the sections together, means for releasing the lock and spreading the sections, a recessed projection from the frame, a trough, oscillating hinges connecting the trough to the frame and means mounted in the trough adapted to cooperate with the recess in the frame projection, for adjusting the trough in the plane of the frame and means for swinging the trough back on its hinges.

13. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on said rods within the frame, means for locking the sections together, means for releasing the lock and spreading the sections, a recessed projection from the frame, a trough, oscillating hinges connecting the trough to the frame and means mounted in the trough and adapted to cooperate with the recess in the frame projection, for adjusting the trough in the plane of the frame, a lever and interposed toggle links between the trough and the lever whereby the lever is adapted to swing the trough on its oscillating hinges.

14. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on the rods within the frame, a plurality of slotted links for interconnecting the sections to permit a limited spacing thereof, means for locking the sections together and means for releasing the lock and spreading the sections.

15. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on the rods within the frame, a plurality of slotted links for interconnecting the sections to permit a limited spacing thereof, an extension from one of the sections, means on the frame for guiding the extension, a spring pressed latch on the extension adapted to lock the sections together, a pawl for releasing the latch, a lever connected to said extension adapted to spread the sections and having means adapted to actuate the pawl to release the latch.

16. A casting machine comprising a mold frame having removable rods, a plurality of mold sections slidably mounted on the rods within the frame, a plurality of slotted links for interconnecting the sections to permit the spacing thereof, an extension from one of the sections, means on the frame for guiding the extension, a spring pressed latch

on the extension adapted to lock the sections together, a pawl for releasing the latch, a lever connected to said extension adapted to spread the sections, a bell crank grip lever adapted to actuate the pawl to release the latch and permit the lever to spread the sections.

17. A casting machine comprising a mold frame having a plurality of separable mold sections, registering mold cavities materially below the common top surface of the sections, and a gate section with beveled edges opening through a small neck into the mold cavity, a gate trough adapted to be moved in the plane of the top surfaces of the sections to cause the excess metal to part from the casting at the small neck of the mold cavity.

18. A casting machine comprising a mold frame having removable transverse rods, a plurality of separable mold sections or bars slidably mounted on said rods, registering mold cavities materially below the common top surface of the sections in their engaging surfaces, gate sections with beveled edges opening through small necks into the mold cavities, and a gate trough adapted to be moved in the plane of the top surfaces of the sections to cause the excess metal to part from the casting at the small neck of the mold cavity.

19. A casting machine comprising a mold frame having removable transverse rods, a plurality of separable mold sections or bars slidably mounted on said rods, registering mold cavities materially below the common top surface of the sections in their engaging surfaces, gate sections with beveled edges opening through small necks into the mold cavities, a gate trough, oscillating hinges connecting the trough to the frame, and means for oscillating the trough in the plane of the top surface of the sections to cause the excess metal to part from the casting at the small necks of the mold cavities.

20. A casting machine comprising cooperating mold members having a common plane surface, registering cavities at a short distance from the plane surface, and a small frusto-conical passage from the surface to each of the cavities; and a trough having a plane surface cooperating with the surface of the mold members and adapted to guide the casting material into the mold cavities and to be moved in the plane of said surfaces to shear the gates by wedging the metal in the frusto-conical passages, upward until it breaks at the casting.

In witness whereof I have hereunto set my hand this 3rd day of August, 1915.

STEPHEN P. ELLSWORTH.