Dec. 23, 1924. 1,520,083

W. C. REDFIELD

POT CHARGING MECHANISM

Filed Jan. 30, 1923 2 Sheets-Sheet 1

Fig. 1.

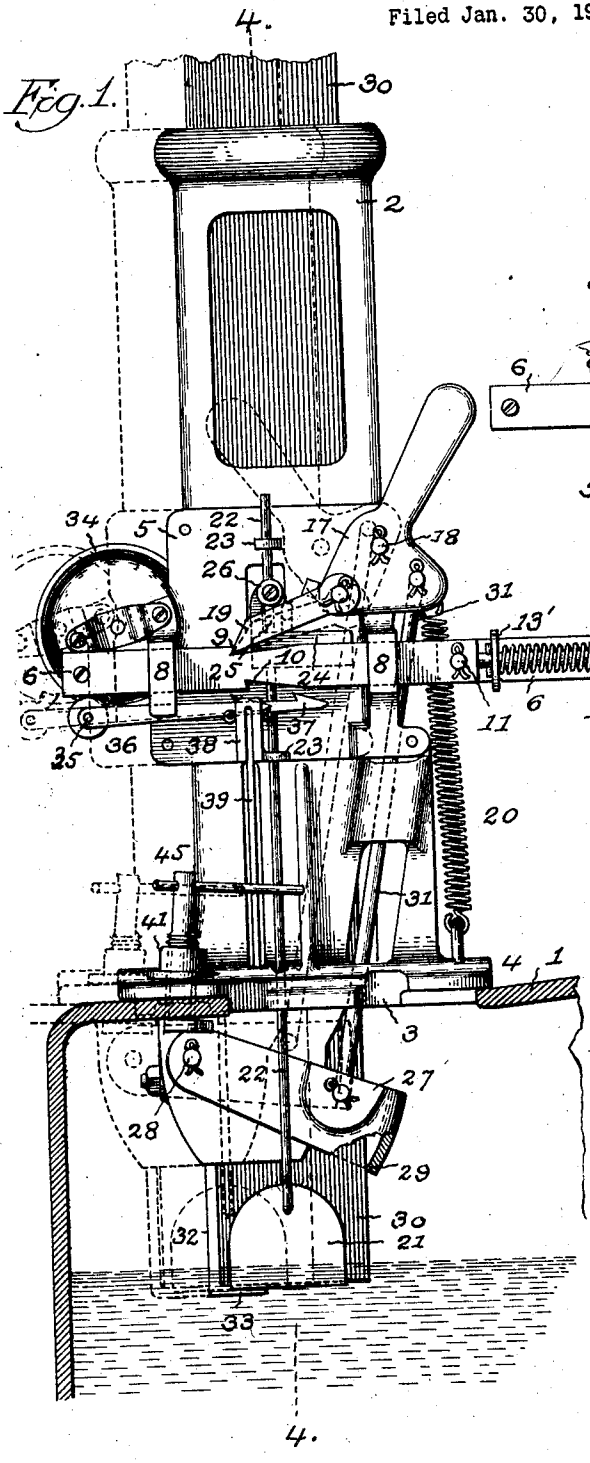
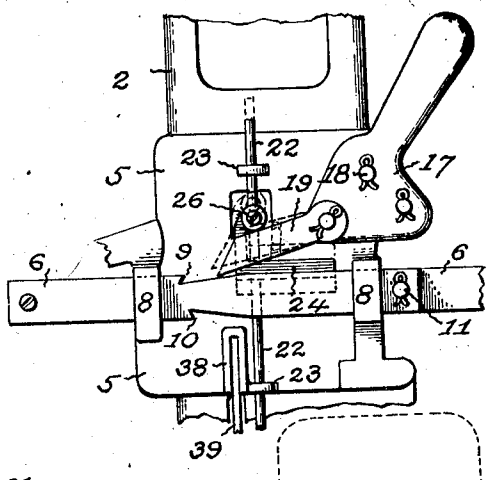


Fig. 2.



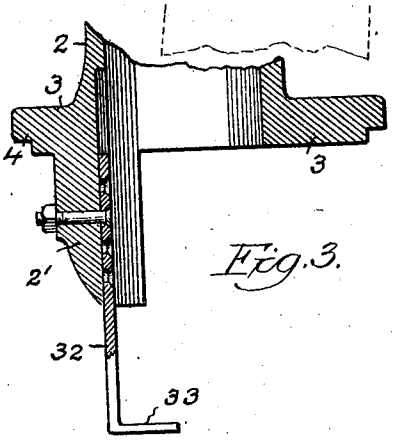


Fig. 3.

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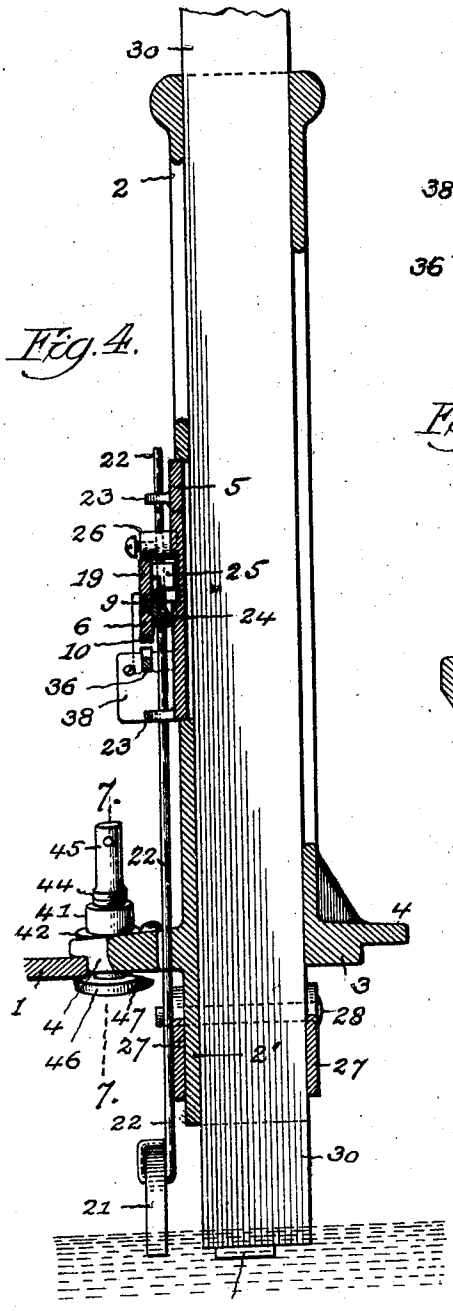


Fig. 4.

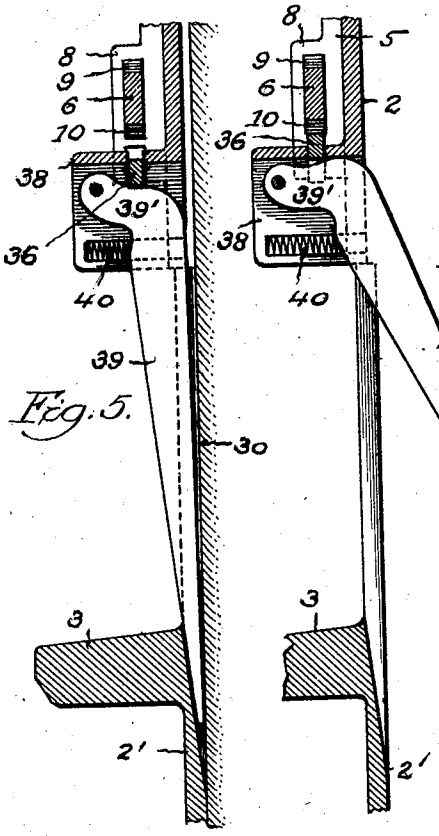


Fig. 5.

Fig. 6.

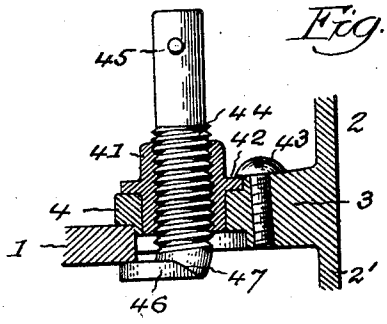


Fig. 7.

33

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Patented Dec. 23, 1924. 1,520,083

UNITED STATES PATENT OFFICE.

WILLIAM C. REDFIELD, OF CHICAGO, ILLINOIS.

POT-CHARGING MECHANISM.

Application filed January 30, 1923. Serial No. 615,811.

To all whom it may concern:

Be it known that I, WILLIAM C. REDFIELD, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pot-Charging Mechanisms, of which the following is a specification.

This invention relates to that class of pot feeding mechanisms for linotype casting machines and the like, in which an ingot of metal is contained in an upright holding chute, with the automatic lowering of the ingot into the melting pot controlled by a float resting on the surface of the molten metal in said pot. The present improvement has for its various objects:

To provide a simple and substantial formation and combination of parts and mechanisms, whereby the feeding of a metal ingot into the melting pot is automatically attained and controlled in an effective and positive manner.

To provide in connection with the automatic mechanism by which the lowering of the metal ingot into the melting pot is controlled, a safety means, which when said automatic mechanism becomes inoperative due to accident thereto, will yield under the stress of the operating mechanism of the melting pot, to permit the normal operation of the apparatus without breakage or damage in said automatic ingot control mechanism.

To provide means coacting with said ingot control mechanism, whereby an alarm is set up when the holding chute of the metal ingot is in an empty condition, all as will hereinafter more fully appear.

In the accompanying drawings:—

Fig. 1, is a side elevation of a pot feeding mechanism embodying the present invention, in place upon the melting pot of a linotype machine, with the upper portion of the pot in section and with the two positions of the mechanisms shown in full and in dotted lines.

Fig. 2, is a detail side elevation of the controlling means of the catch pawl of the mechanism, in the dormant and active positions of said pawl and associated parts.

Fig. 3, is a fragmentary section of the lower end of the ingot chute, illustrating an adjustable ingot stop associated with the lower end of the chute.

Fig. 4, is a detail transverse section on line 4.—4. Fig. 1.

Figs. 5 and 6, are companion detail transverse sections, showing the operating finger of the alarm mechanism in its two positions.

Fig. 7, is a detail vertical section on line 7.—7. Fig. 4, of the latch mechanism for securing the base of the ingot chute to the open top wall of the melting pot.

Like reference numerals indicate like parts in the several views.

Referring to the drawings: 1, designates the metal melting pot of an ordinary Mergenthaler linotype machine or the like, provided with the usual delivery throat or spout and enclosing the usual pump by which the molten metal is forced through said throat into the molds of the machine. The pot 1 is arranged to have limited reciprocation in a horizontal plane to bring the outlet end of said throat in close relation to said molds, in one step in the operation of the machine, and to move said outlet end away from the molds in another step of the machine operation, as usual in the type of machines above mentioned.

2, designates an upright chute adapted to contain ingots of type metal above the pot 1 ready to be fed downwardly into said pot. The chute 2 is provided with a base plate 3 forming a closure for the open top wall of the melting pot 1 and is provided with a marginal supporting flange 4 adapted to rest upon the margin of the pot opening, such base being provided with a latch mechanism hereinafter described in detail, for securing the chute 2 and base 3 in proper operative position.

In the preferred construction shown, the chute 2 has a skirt or extension 2′ open at one side, and extending down into adjacent relation to the normal level of the molten metal in the pot 1, with said open side permitting the proper operation of the ingot control device hereinafter described.

5, designates a vertically arranged plate formed as a fixture on the chute 2 at its

mid-height, and adapted to provide a support and a guide for the different elements of the automatic control mechanism by which the descent of a type metal ingot 30 into the pot 1 is governed; such automatic mechanism comprising parts and mechanisms as follows:—

6, designates an operating bar, which in the present construction is arranged horizontally, and fixedly attached at one end to a portion 7 of the supporting frame of the machine, so as to have a stationary relation to the chute 2 and the automatic mechanism mounted thereon, in the reciprocation thereof, along with the melting pot 1 of the machine. At its mid-length the bar 6 has guiding engagement in guide lugs 8 on the plate 5 aforesaid, and between said lugs the bar 6 is formed with upper and lower detents or teeth 9 and 10 for purposes hereinafter stated.

In the preferred construction shown in Fig. 1, the operating bar 6 is formed in two aligned sections or members connected together by a pivot pin 11, so as to afford flexibility to the bar in a vertical movement of the part of the same which is movable with the melting pot in relation to the part which is attached to the stationary supporting frames. Another purpose of said pivotal formation of the bar 6 is that the section remote from the guide lugs 8 may be folded compactly against the chute 2 for convenience in shipment and storage of the mechanism when not in use. The remote section of the operating bar 6 will have a detail construction as follows:

12, designates a lateral lug on the outer end of the remote section adapted in an assembled condition of the mechanism to have bearing abutment against the aforesaid stationary portion 7 of the machine frame. In addition the lateral lug 12 is formed with a guide eye for an attaching rod and an abutment for a spring associated with said rod and having the following detail arrangement.

13, designates a rod moving in the guide eye of the lug 12 and having a hook 14 at one end adapted to hook around the aforesaid frame portion 7, at the side opposite to that with which the lug 12 has resting abutment.

15, designates a loop or lateral extension on the rod 13 adjacent to the hook 14 for convenient manual operation of the parts in applying and removing the rod 13 from the frame portion 7 aforesaid.

16, designates a compression spring associated with the rod 13, one end of the spring has bearing against the aforesaid lug 12, while the other end has bearing against a fixed collar 13′ on said rod 13, with a normal tendency to draw the hook 14 of said rod into holding engagement with the frame part 7. Another and material feature of the described arrangement is that the spring 16 will yield and permit a movement of the chute 2 and its associated parts upon the bar 6, in the normal reciprocation of said chute, when from any accidental cause the automatic ingot control mechanism becomes clogged up and inoperative, thus avoiding breakage of parts in such mechanism.

17 designates a handled rocker plate, preferably of a triangular shape, pivoted near its apex on a pivot pin 18 on the supporting plate 5 aforesaid.

19 designates a pawl pivoted to a lower end of the rocker plate 17, with its free end adapted for engagement with the aforesaid upper detent or tooth 9 of the operating bar 6, so that in a horizontal movement of the chute 2 carrying the rocker plate 17, the pawl 19 will be held stationary and impart a rocking motion to said rocker plate. The automatic engagement and disengagement of the pawl 19 with the operating bar 6 is attained by an associated float mechanism hereinafter described.

20, designates a spring connected to the rocker plate 17, with a resilient tendency to return the rocker plate to its normal position after an operation in an opposite direction by the pawl 19 and bar 6 above described. Said spring also acts to force the gripping yoke, hereinafter described into holding engagement with the metal ingot 30 in the chute 2.

21, designates a float of any usual construction, resting on the surface of the molten metal in the pot 1, and having a vertical stem 22 moving in guide ears 23 on the supporting plate 5 aforesaid.

24, designates a lifting lug, of a length greater than the horizontal stroke of the chute 2 and associated parts, and preferably of an inclined shape in cross section, secured to the float stem 22, as shown in Figs. 1, 2 and 4 and adapted to have lifting engagement beneath a lateral hook shaped lug 25 on the rear face of the pawl 19 to hold said pawl in its raised and unengaged position with a normal level of the molten metal in the melting pot 1. The described formation of the lugs 24 and 25 is adapted to prevent any tendency to lateral disengagement between the same in actual use.

26, designates a fixed collar on the float stem 22, adapted to impose the weight of the float 21 upon the upper face of the pawl 19 when a lowered level of the molten metal in the pot 1 prevails, thus aiding an operative engagement between the pawl 19 and operating bar 6.

27, designates a gripping yoke, attached at one end to the aforesaid depending chute portion 2′ by a pivot pin 28, and extend

ing in an oblique direction across said chute portion, with its edge 29 adapted for holding engagement with a metal ingot 30 in the chute 2 to normally hold said ingot from downward movement through said chute into the melting pot 1, as usual in the present class of mechanisms.

31, designates a connecting rod extending from the yoke 27 to the lower end of the rocker plate 17, opposite to the attachment of the pawl 19, and adapted in the rocking movement of said plate above described, to move the yoke 27 out of holding engagement with the metal ingot 30 and permit a descent of said ingot into the melting pot 1. In such descent of the metal ingot 30, the same may move down until stopped by the bottom of the melting pot 1. Where a less degree of descent is desired, provision as follows is made.

32, designates a stop stirrup attached in a vertically adjustable manner to the chute portion 2' and provided with a lower lateral ledge 33 forming a stop or abutment for the lower end of the metal ingot 30.

34, designates an alarm bell carried on a side of the chute 2, and having an operating arm 35 provided with operative connections as follows.

36, designates a horizontally arranged catch bar, pivotally secured at one end to the bell arm 35 and formed at its other end with a hook 37 adapted for operative engagement with the lower detent or tooth 10 of the operating bar 6 aforesaid.

38, designates a hollow lateral shell formed on the supporting frame 5 and having guiding engagement with the mid-length of the catch bar 36. In addition the shell 38 provides support for the operating lever now to be described.

39, designates a lever of an angular form having an upper short arm 39' pivoted at one end in the shell 38, with its mid-length in supporting engagement beneath the catch bar 36 as shown in Figs. 1, 5 and 6, so that in its movements it will lift and lower the hook 37 of the catch bar 36 into and out of engagement with the operating bar 6 aforesaid. The other and long arm of the lever 39 extends downwardly and has movement in a vertical slot in a side wall of the chute 2. With a metal ingot 30 in said chute, the long arm of the lever 39 is held out of the chute as shown in Fig. 5, while in the absence of a metal ingot from the chute, said long arm of the lever 39, under the influence of a spring 40, moves into the interior of the chute and effects a lifting of the catch bar 36 into operative engagement with the operating bar 6 to sound an alarm upon each normal reciprocation of the associated melting pot and chute.

41, designates a screw bushing or nut fitting an orifice in the marginal portion of the chute base 3 and held in place by a holding screw 42 screwed into said base with its headed portion engaging over a bearing flange 43 of the bushing, as shown in Fig. 7.

44, designates a screw threaded spindle having operative engagement in the screw threaded bore of the bushing 42, with its upper portion formed into a handled stem 45 for manual rotation. The lower end of the spindle 44 carries a lateral lug 46 the top surface of which is formed with an inclined or cam end 47 adapted to ride beneath the margin of the top wall of the melting pot 1, to effect a firm and substantial attachment of the chute base 3 to the pot top, with a manual rotation of the spindle 44.

By a preliminary turning of the bushing 41, with the spindle 44 held stationary, an initial adjustment of said spindle can be effected, to suit different thickness in the top walls of melting pots with which connection is to be made.

The operation of the apparatus is as follows:

With the apparatus in practical use, the melting pot 1, with the main portion of the mechanism of the present improvement mounted thereon, has the usual reciprocating movement in a horizontal plane, with the exception of the operating bar 6, which is held stationary by connection to a fixed part of the supporting frame of the apparatus, as usual in the present type of pot chargers.

With a predetermined drop in the level of the molten metal in the pot 1, a corresponding drop or descent of the float 21 takes place, and through the operative connections between said float and the pawl 19, said pawl is lowered into the path of the detent 9 of the operating bar 6. With said lowered condition of the pawl 19 and on each reciprocation of the melting pot 1, the rocker plate 17 (reciprocating with the melting pot) receives a positive rocking movement, and in turn transmits the same to the gripping yoke 27 by which a metal ingot is normally held from downward movement into the melting pot, to attain a release movement of said yoke from the ingot so that it may descend into the melting pot. The descent of the ingot raises the level of the molten metal in the pot 1, with a corresponding rise of the float 21, and a lifting of the pawl 19 into the normal inoperative position above described. With the present feeding mechanism, the descent of the ingot is of a retarded or step by step nature, and ordinarily will require a plurality of rocking impulses of the parts in attaining the required descent of the ingot in a gradual manner, with an avoidance of a too rapid or plunging descent of the ingot.

With an empty condition of the feeding chute 2, the angle lever 39 moves into the interior of said chute, and in so doing raises

the catch bar 36 into operative engagement with the detent 10 of the operating bar 6, to sound the alarm bell 34, at each reciprocation of the melting pot and the mechanism moving therewith, and until a fresh metal ingot is introduced into the chute 2, to effect a return of the angle lever 39 to its normal position.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute mounted on the pot, a horizontal operating bar adapted for attachment to a fixed part of the pot supporting frame and having guide engagement with said chute, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate pivotally mounted on said chute, and operatively connected to said yoke, a pawl pivoted on the rocker plate and adapted for engagement with a tooth on said operating bar, a float arranged in the melting pot, and having a vertical stem the upper end of which is adapted to engage and swing said pawl into and out of the path of the tooth of the operating bar.

2. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute mounted on said pot, a horizontal operating bar comprising two spring connected sections, adapted for holding engagement with a fixed part of the pot supporting frame and having guide engagement with said chute, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate pivotally mounted on said chute and operatively connected to said yoke, a pawl pivoted on the rocker plate and adapted for engagement with a tooth on said operating bar, a float arranged in the melting pot and having a vertical stem the upper end of which is adapted to engage and swing said pawl into and out of the path of the tooth of the operating bar.

3. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute mounted on the pot, a horizontal operating bar adapted for attachment to a fixed part of the pot supporting frame and having guide engagement with said chute, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate pivotally mounted on said chute and operatively connected to said yoke, a pawl pivoted on the rocker plate and adapted for engagement with a tooth on said operating bar, a float arranged in the melting pot and having a vertical stem the upper end of which is adapted to engage and swing said pawl into and out of the path of the tooth of the operating bar, said operating bar comprising two spring connected sections one of which has a hook end for engagement with a fixed part of the pot supporting frame and the other portion having a lateral lug adapted to bear against an opposite side of said fixed part of the pot supporting frame.

4. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute mounted on the pot, a horizontal operating bar adapted for attachment to a fixed part of the pot supporting frame and having guide engagement with said chute, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate pivotally mounted on said chute, and operatively connected to said yoke, a pawl pivoted on the rocker plate and adapted for engagement with a tooth on said operating bar, a float arranged in the melting pot and having a vertical stem the upper end of which is adapted to engage and swing said pawl into and out of the path of the tooth of the operating bar, said operating bar having a hinged formation affording flexibility in the relative vertical movement between the melting pot and its supporting frame.

5. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute carried by said pot, a supporting plate forming a fixed part of said chute and provided with guide ears, a horizontal operating bar having guiding engagement in said ears and adapted for fixed attachment to a part of the pot supporting frame, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate of a triangular form pivoted on said supporting plate, a connecting rod between said rocker plate and yoke, a pawl pivoted on said rocker plate and adapted for engagement with a tooth on said operating bar, a float arranged in the melting pot and having a vertical stem the upper end of which is adapted to engage and swing said pawl into and out of the path of the tooth of the operating bar.

6. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute carried by said pot, a supporting plate forming a fixed part of said chute and provided with guide ears, a horizontal operating bar having guiding engagement in said ears and adapted for fixed attachment to a part of the pot supporting frame, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate of a triangular form pivoted on said supporting plate, a connecting rod between said rocker plate and yoke, a pawl pivoted on said rocker plate and adapted for engagement with a tooth on said operating bar, said pawl having a lateral lug, a float arranged in the melting pot and having a vertical stem moving in guides on the aforesaid supporting plate, and an operating lug

on said stem adapted for lifting engagement with said lateral lug of the pawl.

7. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute carried by said pot, a supporting plate forming a fixed part of said chute and provided with guide ears, a horizontal operating bar having guiding engagement in said ears and adapted for fixed attachment to a part of the pot supporting frame, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate of a triangular form pivoted on said supporting plate, a connecting rod between said rocker plate and yoke, a pawl pivoted on said rocker plate and adapted for engagement with a tooth on said operating bar, said pawl having a lateral lug, a float arranged in the melting pot and having a vertical stem moving in guides on the aforesaid supporting plate and an operating lug on said stem adapted for lifting engagement with said lateral pawl lug and having a bearing surface for said lug longer than the stroke of the melting pot.

8. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute carried by said pot, a supporting plate forming a fixed part of said chute and provided with guide ears, a horizontal operating bar having guiding engagement in said ears and adapted for fixed attachment to a part of the pot supporting frame, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate, of a triangular form pivoted on said supporting plate, a connecting rod between said plate and yoke, a pawl pivoted on said rocker plate and adapted for engagement with a tooth on said operating bar, said pawl carrying a hook shape lateral lug, a float arranged in the melting pot and having a vertical stem moving in guides on the supporting plate aforesaid, and an operating lug on said stem having a beveled upper surface adapted for lifting engagement with the aforesaid lug of the pawl.

9. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute carried by said pot, a supporting plate forming a fixed part of said chute and provided with guide ears, a horizontal operating bar having guiding engagement in said ears and adapted for fixed attachment to a part of the pot supporting frame, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate of a triangular form pivoted on said supporting plate, a connecting rod between said rocker plate and yoke, a pawl pivoted on said rocker plate and adapted for engagement with a tooth on said operating bar, a float arranged in the melting pot and having a vertical stem the upper end of which is adapted to engage and swing said pawl into and out of the path of the tooth of the operating bar, and a spring tending to return the rocker plate to its normal position.

10. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute carried by said pot, a supporting plate forming a fixed part of said chute and provided with guide ears, a horizontal operating bar having guiding engagement in said ears and adapted for fixed attachment to a part of the pot supporting frame, an ingot engaging yoke pivoted at the lower end of said chute, a rocker plate of a triangular form pivoted on said supporting plate, a connecting rod between said rocker plate and yoke, a pawl pivoted on said rocker plate and adapted for engagement with a tooth on said operating bar, said pawl having a lateral lug, a float arranged in the melting pot and having a vertical stem moving in guides on the aforesaid supporting plate, an operating lug on said stem adapted for lifting engagement beneath said lateral lug of the pawl, and a collar on said stem adapted to contact with the upper face of said pawl to aid in the movement of the same to an engaged position.

11. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute mounted on the pot, a horizontal operating bar adapted for attachment to a fixed part of the pot supporting frame and having guiding engagement with said chute, automatic means operatively connected with said operating bar for controlling the descent of a metal ingot in said chute, an alarm bell moving with said chute and provided with an operating arm, a catch bar pivoted to said arm and having a hook end adapted for engagement with a tooth on said operating bar, and an angle lever pivoted on said chute and having a short arm adapted for operative engagement with said catch bar and a long arm adapted for movement into and out of the interior of said chute.

12. In a charging mechanism for reciprocating melting pots, the combination of an upright ingot chute mounted on the pot, a horizontal operating bar adapted for attachment to a fixed part of the pot supporting frame and having guiding engagement with said chute, automatic means operatively connected with said operating bar for controlling the descent of a metal ingot in said chute, an alarm bell moving with said chute and provided with an operating arm, a catch bar pivoted to said arm and having a hook end adapted for engagement with a tooth on said operating bar, an angle lever pivoted on said chute and having a short arm adapted for operative engagement with said catch bar and a long arm adapted for movement into and out of the interior of

said chute, and resilient means tending to move the long arm of said lever into the interior of said chute.

13. The combination of an open top melting pot, an upright ingot chute having a base plate for supporting engagement with the top of the pot, a screw threaded bushing mounted in an orifice in said chute base, a screw threaded spindle engaging the orifice of said bushing and having at one end a handled operating stem and at the other end a lateral lug formed with an upper cam surface.

14. The combination of an open top melting pot, an upright ingot chute having a base plate for supporting engagement with the top of the pot, a screw threaded bushing revolubly mounted in an orifice in said chute base, a clamping screw adapted to hold said bushing from rotation, a screw threaded spindle engaging the orifice of said bushing and having at one end a handled operating stem and at the other end a lateral lug formed with an upper cam surface.

Signed at Chicago, Illinois, this 29th day of January, 1923.

WILLIAM C. REDFIELD.