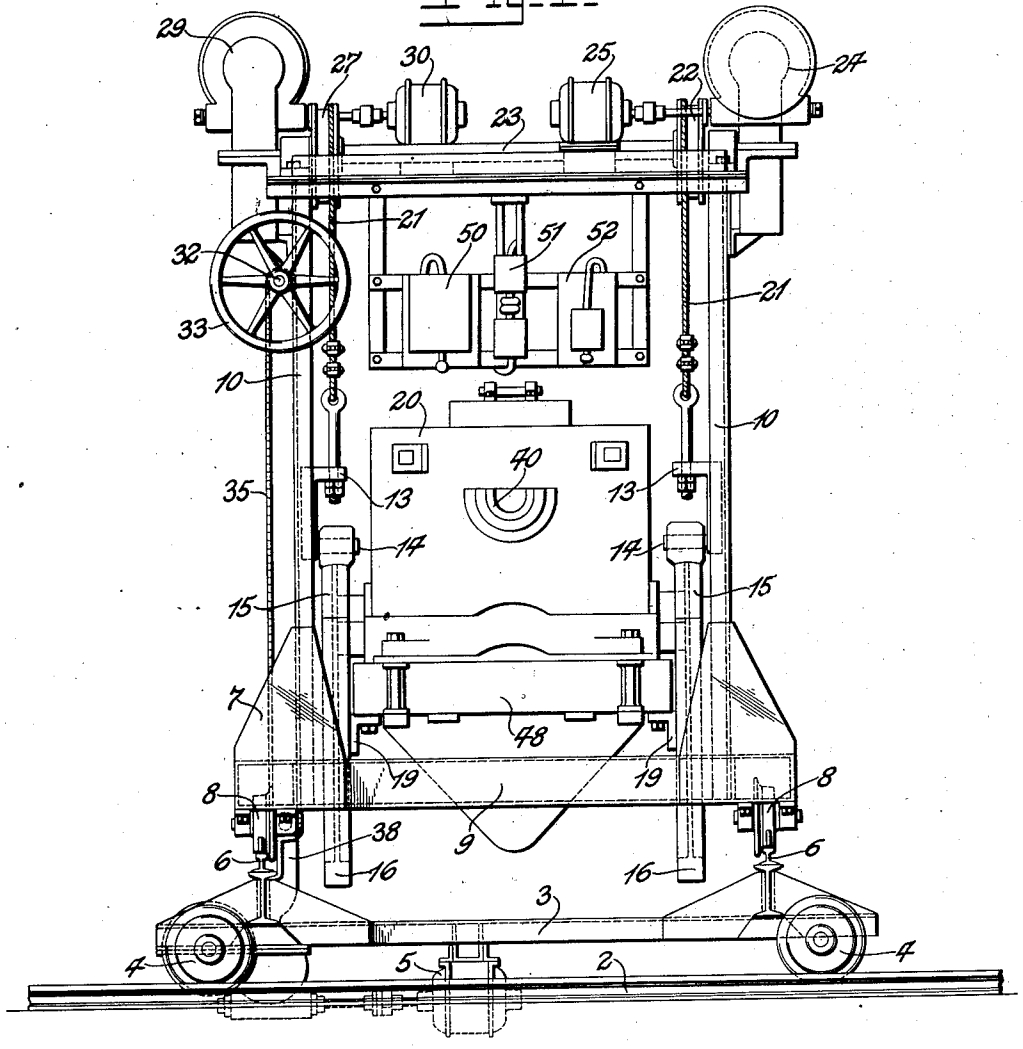
Nov. 30, 1926. **1,608,801**

T. MASEL ET AL

FURNACE CONTROLLING MECHANISM

Original Filed Sept. 21, 1922 2 Sheets-Sheet 1

Fig. 1.



Inventors.
Louise Masel, Executrix
Estate Theodore Masel,
Donald H. Fairfield,
by John N Brunnga.
Their Attorneys.

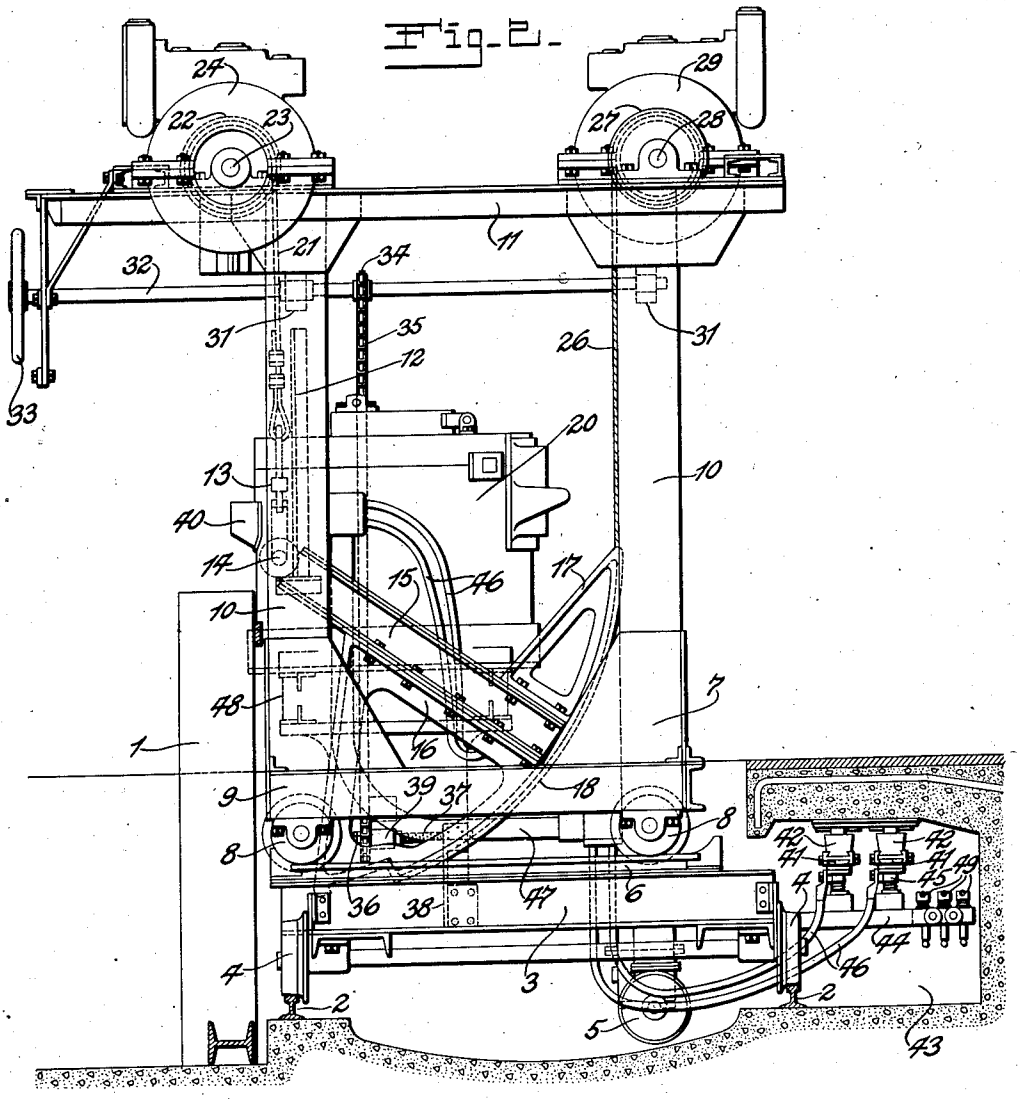
Nov. 30, 1926. **1,608,801**

T. MASEL ET AL

FURNACE CONTROLLING MECHANISM

Original Filed Sept. 21, 1922 2 Sheets-Sheet 2

Fig. 2.



Inventors.
Louise Masel, Executrix
Estate Theodore Masel,
Donald H. Fairfield,
by John N. Brunnga
Their Attorneys.

Patented Nov. 30, 1926. 1,608,801

UNITED STATES PATENT OFFICE.

THEODORE MASEL, DECEASED, OF EAST ALTON, ILLINOIS, BY LOUISE MASEL, EXECUTRIX, OF EAST ALTON, ILLINOIS, AND DONALD H. FAIRFIELD, OF KENOSHA, WISCONSIN, ASSIGNORS TO WESTERN CARTRIDGE COMPANY, OF EAST ALTON, ILLINOIS, A CORPORATION OF DELAWARE.

FURNACE-CONTROLLING MECHANISM.

Continuation of application Serial No. 590,545, filed September 21, 1922. This application filed April 16, 1923. Serial No. 632,465.

This invention relates to furnaces, and more particularly to such furnaces as may be used for melting brass and other metals and pouring the same into molds.

This application is a continuation of application Serial Number 590,545, filed September 21, 1922.

In the service for which this device is intended, it is usually required, after properly melting the metal in the crucible, to pour the same into molds. These molds are usually placed in a row or circle, and the metal poured into them in succession, the crucible being moved from one to another. In performing the operation of pouring, it is necessary to control the stream of metal in such a way that not only will the rate of pouring be such as will be best adapted to the size and nature of the mold, but the stream must be properly controlled so that it will flow into the mold directly and not be spilled over the sides. As the form of the stream of metal changes during the pouring on account of changes in the position of the crucible and on account of change in the head of metal over the pouring spout as the amount of metal in the crucible decreases, it is desirable that the operator shall have such complete control of the tipping of the crucible that he can control both the rate of pouring and also the position of the stream with respect to the mold.

One of the objects of this invention, therefore, is to provide means for handling the crucible, such that the operator will have complete control of the tipping movement thereof and of its position with respect to the mold.

Another object of this invention is to provide such means which will enable the operator to control the tipping of the crucible and also its elevation at the same time.

Another object of this invention is to provide such means whereby the operator may control such tipping and elevating movements of the crucible, either independently or simultaneously, and in either direction.

Another object of this invention is to provide an electrically heated crucible and a mounting for the same, whereby it may be moved from mold to mold and the pouring operation controlled at each mold.

Further objects will appear from the detail description taken in connection with the accompanying drawings, in which:

Figure 1 represents a front elevation of a furnace embodying this invention; and

Figure 2 represents a side elevation of the same.

Referring to the accompanying drawings, 1 designates a mold which may be of any form, such as an ingot mold for casting steel billets or the like. A series of these molds may be arranged along a track 2 which may be laid on the foundry floor or in a trench or pit prepared for that purpose. A carriage 3 provided with wheels 4 is arranged to run along the track 2, a motor 5 being provided to drive the same along the track.

The carriage 3 is provided with a pair of cross-rails 6 upon which a frame 7 provided with suitable wheels 8 is adapted to move. The rails 6 need be only long enough to provide a limited movement of the frame 7 for adjustment of the position of the pouring spout with respect to the mold in a lateral direction. The frame 7 comprises a sub-structure 9 mounted on the wheels 8 and uprights 10 properly framed together at the top by cross-braces 11 so as to provide a strong and rigid structure. One pair of uprights 10 is provided with guide-ways 12 within which cross-heads 13 are adapted to move up and down. These cross heads are provided with journals 14 upon which are pivoted brackets 15. Bolted to each of the brackets 15 are sub-brackets 16 and 17 which together are adapted to provide a sector 18 for a purpose which will be hereinafter described.

The sector 18 is provided with brackets 19 by means of which the crucible 20 may be mounted upon the sector so as to be carried thereby.

The cross-heads 13 are suspended from the frame 7 by means of cables 21 passing over drums 22, both of which are mounted on a shaft 23 journalled to the frame 7. The shaft 23 is connected through proper reduction gearing 24 to a motor 25, so that by

operating the motor 25, the cross-heads 13 may be raised and lowered. A second pair of cables 26 is provided which are attached to the sectors 18, and after passing around the circumference of said sectors, pass up over a pair of drums 27 mounted on a shaft 28 which is also journalled on the frame 7. The shaft 28 is connected through reduction gearing 29 to a motor 30 by means of which the drums 27 may be operated so as to take up or pay out the cables 26 for the purpose of tipping the crucible 20. It will be apparent that by operating the drums 22 and 27, the cables 21 and 26 may be raised and lowered. Raising or lowering the cables 21 will correspondingly move the pivots 14 so as to raise or lower the crucible 20. Raising or lowering the cables 26 will tip the crucible in one direction or another. Operating both pairs of drums 22 and 27 simultaneously will raise the crucible bodily without tipping it, while operating the cables 26 alone will simply tip the crucible in one direction or another.

Mounted in bearings 31 on the frame 7 is a shaft 32 provided with a hand wheel 33 for turning the same. Fixed to the shaft 32 is a sprocket 34 which drives a sprocket chain 35, running over a sprocket 36 on a screw shaft 37. The screw shaft 37 is threaded into a bracket 38 mounted on the carriage 3. The screw shaft 37 is itself mounted in a bearing 39 on the sub-structure 9 of the frame 7. By turning the handle 33, the screw 37 may be operated to move the frame 8 backward or forward along the track 6 so as to adjust the position of the pouring spout 40 of the crucible 20 to proper relation with the mold 1.

An electric furnace of the induction type is shown in the drawings, although the invention may be used with any other type of furnace. In order to provide current for the operation of the furnace, a pair of feeders in the shape of contact rails 41 is provided. These may be mounted upon insulators 42 suitably mounted in a covered trench 43 in a well known manner. Mounted on a bracket 44 on the carriage 3 is a pair of collecting shoes 45 adapted to engage the rails 41 to collect the current therefrom. The collecting shoes 45 are connected through flexible cables 46 passing through a suitable conduit 47 to the heating element 48 of the furnace. The cables 46 are made flexible in order to accommodate the tipping of the crucible. A supply of current for the motors 5, 25 and 30 may be collected from feeders 49 in a similar manner.

In the operation of this device, a suitable charge of metal having been melted in the crucible, it may be poured into the mold 1 by first adjusting the frame 7 along the track 2 to proper relation with the mold. This may be done by controlling the motor 5. The operator may then adjust the position of the spout 40 to the desired relation with the mold 1. The motors 25 and 30 will then be operated either simultaneously or independent of one another, so as to first raise or lower the spout 40 to the desired position with respect to the mold and then to tip the crucible so as to pour the metal into the mold. It will be apparent that absolute control of the stream of metal is provided by the motors 25 and 30. By operating these motors the crucible may be raised, lowered or tipped in any desired manner so that the position and volume of the stream of metal may be controlled to a nicety. The operator may thus fill the mold without loss of metal by spilling and at the proper rate of flow. The change from one mold to another is rapidly and conveniently made by mere manipulation of the controllers 50, 51 and 52 which control the motors.

It is obvious that various changes may be made in details of construction without departing from the spirit of this invention; it is, therefore, to be understood that this invention is not to be limited to the specific details described and shown.

Having thus described the invention, what is claimed is:

1. An apparatus of the class described, comprising a truck adapted to run on a ground track, a superstructure mounted for lateral adjustment on said truck, a crucible having a pouring spout and means for suspending said crucible from said superstructure adapted to permit tipping said crucible for pouring.

2. An apparatus of the class described, comprising, a truck adapted to run on a ground track, a superstructure mounted for lateral adjustment on said truck, a crucible having a pouring spout, and means for pivotally suspending said crucible from said superstructure adapted for independent vertical adjustment thereof.

3. An apparatus of the class described, comprising, a truck adapted to run on a ground track, a superstructure mounted for lateral adjustment on said truck, a crucible having a pouring spout, and means for tipping said crucible.

4. An apparatus of the class described, comprising, a truck adapted to run on a ground track, a superstructure mounted for adjustment on said truck, a crucible having a pouring spout, a guide on said superstructure, a pivot for said crucible suspended from said superstructure and engaging said guide, and means for adjusting said pivot along said guide.

5. An apparatus of the character described, comprising a truck adapted to run on a ground track and having rails thereon, a superstructure mounted for movement on on said rails, a crucible having a pouring

spout, and means for adjustably suspending said crucible from said superstructure adapted to permit tipping said crucible for pouring.

6. An apparatus of the character described, comprising a truck adapted to run on a ground track and having rails thereon, a superstructure mounted for transverse movement on said rails, a crucible having a pouring spout, and means for adjustably suspending said crucible from said superstructure, whereby said crucible may be adjusted longitudinally, transversely and vertically and tipped for pouring.

7. An apparatus of the character described, comprising, a truck adapted to run on a ground track and having rails thereon, a superstructure mounted for a movement on said rails, a crucible having a pouring spout, a guide on said superstructure, a pivot for said crucible suspended from said superstructure and engaging said guide, and means for adjusting said pivot along said guide.

8. An apparatus of the character described, comprising, a truck adapted to run on a ground track and having rails thereon, a superstructure mounted for a movement on said rails, a crucible having a pouring spout, electrical heating means for said crucible mounted on said superstructure, a current-collecting trolley on said truck and connected with said heating means, and adjustable means for suspending said crucible from said superstructure adapted to permit tipping said crucible for pouring.

9. An apparatus of the character described, comprising, a truck adapted to run on a ground track and having rails thereon, a superstructure mounted for a movement on said rails, a crucible having a pouring spout, electrical heating means for said crucible mounted on said superstructure, a current-collecting trolley on said truck and connected with said heating means, a guide on said superstructure, a pivot for said crucible suspended from said guide, and means for adjusting said pivot along said guide.

10. In an apparatus of the character described, a ground track, a feeder along said track, a truck adapted to run on said track and having rails thereon, a superstructure mounted for movement on said rails, a crucible having a pouring spout, electrical heating means for said crucible mounted on said superstructure, a current-collecting trolley on said truck cooperating with said feeder and connected with said heating means, and adjustable means for suspending said crucible from said superstructure adapted to permit tipping said crucible for pouring.

11. An apparatus of the class described, comprising, a tramway truck adapted for movement on rails and having rails thereon, a frame mounted on and above said truck and adapted for movement on the rails thereon, a crucible mounted on said frame, an electrical heating element incorporated therewith for heating the material therein, a trolley on said truck for supplying current to said element, means for elevating said crucible, and means for tipping said crucible.

12. An apparatus of the class described, comprising, a tramway truck adapted for movement on rails and having cross rails thereon, a frame mounted on and above said truck and adapted for movement on the rails thereon, a crucible mounted on said frame, an electrical heating lement incorpated therewith for heating the material therein, a trolley on said truck for supplying current to said element, means for elevating said crucible, and means for tipping said crucible.

13. An apparatus of the class describer, comprising, a tramway truck adapted for movement on rails and having cross rails thereon, a frame suspended on and above said truck and adapted for movement on the rails thereon, a crucible mounted on said frame, an electrical heating element incorporated therewith for heating the material therein, a trolley on said truck for supplying current to said element, means for elevating said crucible, and means for tipping said crucible.

14. An apparatus of the class described, comprising, a tramway truck adapted for movement on rails and having rails thereon, a frame mounted on and above said truck and adapted for movement on the rails thereon, a crucible mounted on said frame, an electrical heating element incorporated therewith for heating the material therein, motor driven means for elevating said crucible, motor driven means for tipping said crucible, and a current collecting trolley on said truck.

15. An apparatus of the class described, comprising, a frame, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, flexible electrical connections to said heating element adapted to permit free movement of said crucible on said frame, a motor connected to elevate said crucible, and a motor connected to tip said crucible for pouring.

16. An apparatus of the class described, comprising, a frame, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for independent vertical and tipping movement on said frame, flexible eletrical connections to said heating element adapted to permit free movement of said

crucible on said frame, means for moving said crucible forwardly, and a motor connected to tip said crucible for pouring.

17. An apparatus of the class described, comprising, a frame, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, flexible electrical connections to said heating element adapted to permit free movement of said crucible on said frame, a motor connected to elevate said crucible, means for moving said crucible forwardly, and a motor connected to tip said crucible for pouring.
scriibed, comprising, a track and having aa

18. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said frame, and a motor on said frame connected to tip said crucible.

19. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said frame, a motor connected to elevate said crucible, and a motor connected to tip said crucible.

20. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said frame, a motor supplied from said collectors and connected to move said frame, and a motor supplied from said collectors and connected to tip said crucible.

21. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said frame, a motor connected to move said frame, a motor connected to elevate said crucible, and a motor connected to tip said crucible.

22. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said frame, a motor connected to move said frame along said track, a motor connected to elevate said crucible, and a motor connected to tip said crucible.

23. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, means for mounting said crucible for movement on said frame, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said frame, means for moving said crucible forwardly, a motor connected to move said frame along said track, a motor connected to elevate said crucible, and a motor connected to tip said crucible.

24. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a crucible having a pouring spout and an electrical heating element incorporated therewith for heating the material therein, journals for mounting said crucible for independent vertical and tipping movement on said frame above said track, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said frame, and a motor connected to tip said crucible.

25. An apparatus of the class described, comprising, a track, a frame mounted to move along said track, a carriage mounted on said frame above said track to move transversely thereon, a crucible having a

pouring spout and an electrical heating element incorporated therewith for heating the material therein, journals for mounting said crucible for independent vertical and tipping movement on said carriage above said track, feeders connected with a source of current, collectors on said frame and engaging said feeders, flexible connections from said collectors to said heating element adapted to permit free movement of said crucible on said carriage, and a motor connected to tip said crucible.

In testimony whereof I affix my signatures this 25th day of January, 1923.

LOUISE MASEL,
Executrix Under the Last Will and Testament of Theodore Masel, Deceased.

In testimony whereof I have affixed my ture this 25th day of January, 1923.

DONALD H. FAIRFIELD.