July 8, 1958 H. HÖHNE 2,842,354

SMELTING FURNACE SYSTEM

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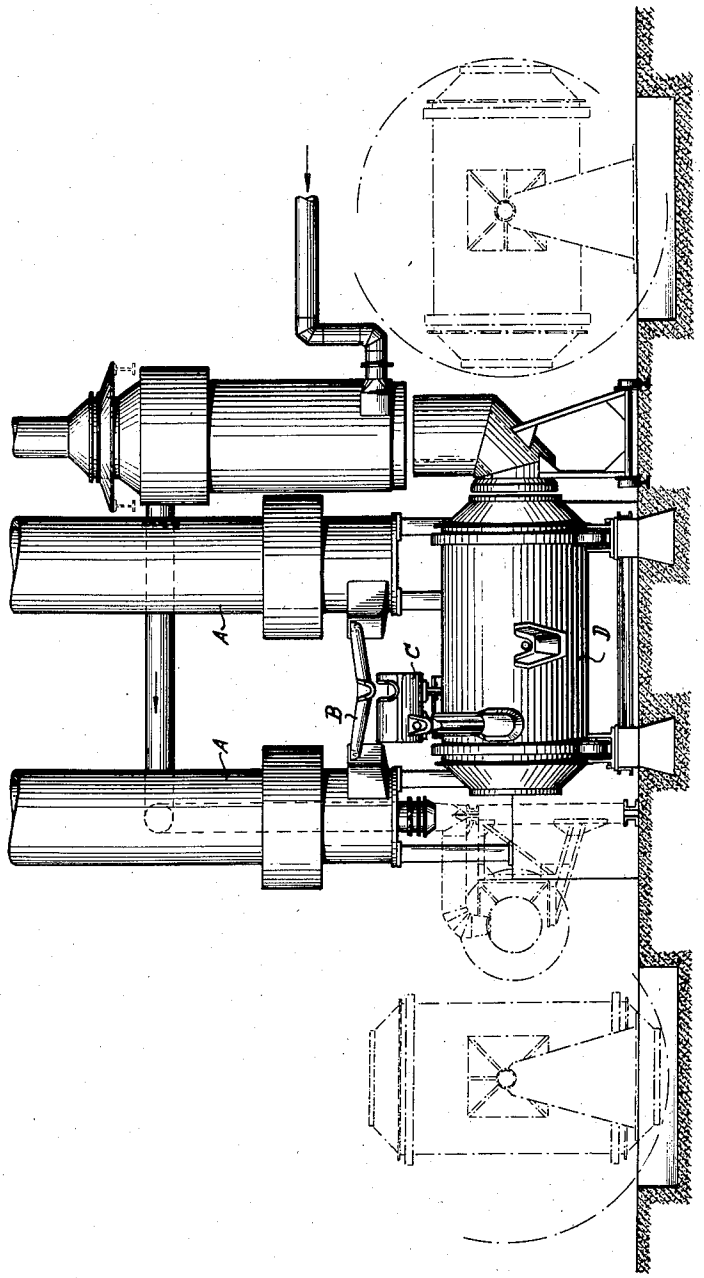


FIG. 1

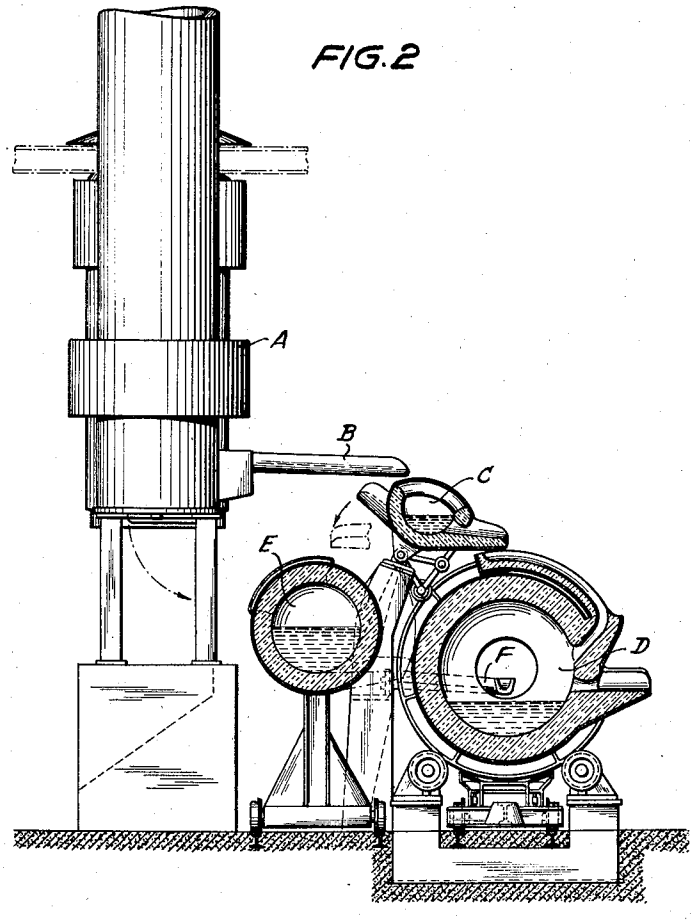
INVENTOR:
Heinrich Höhne
By:
Michael S. Striker
agt.

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SMELTING FURNACE SYSTEM

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FIG. 2



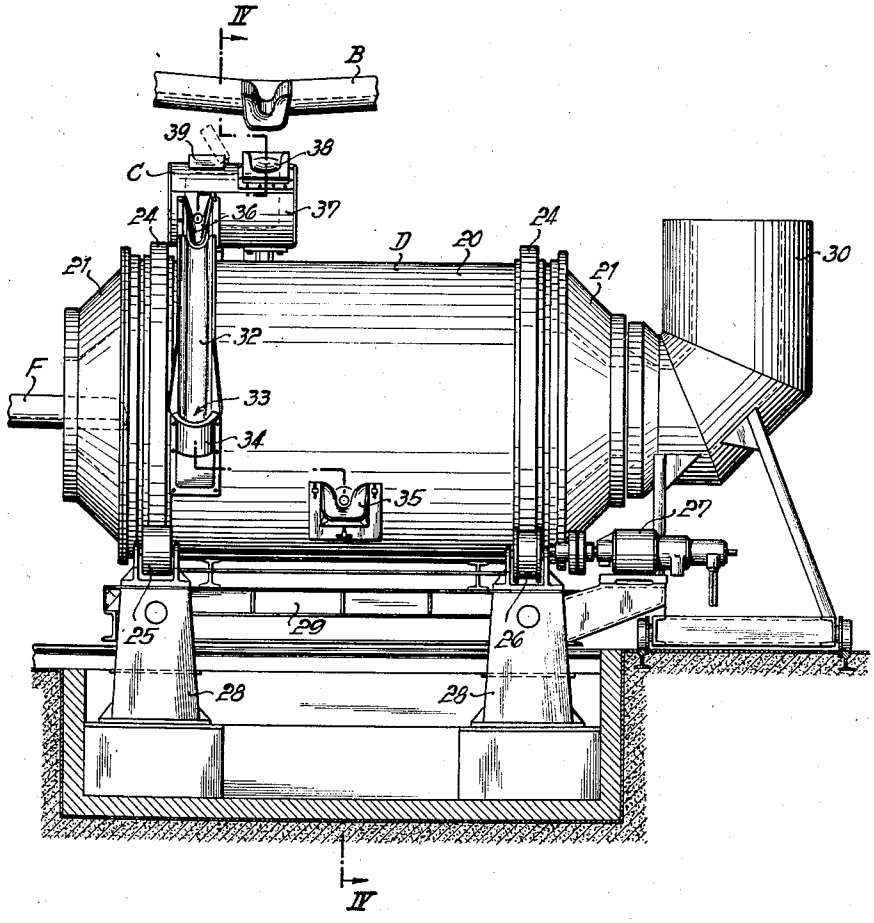
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Heinrich Höhne
By:
Michael S. Striker
agt.

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SMELTING FURNACE SYSTEM

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FIG. 3



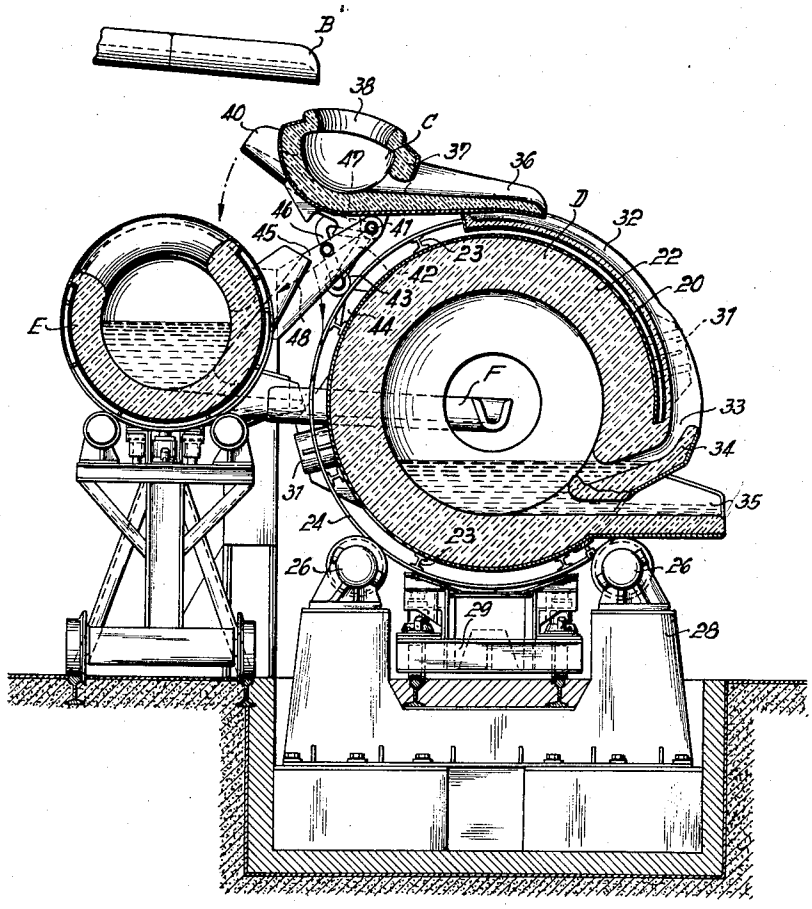
INVENTOR:
Heinrich Höhne
By:
Michael S. Striker
agt.

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SMELTING FURNACE SYSTEM

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FIG. 4



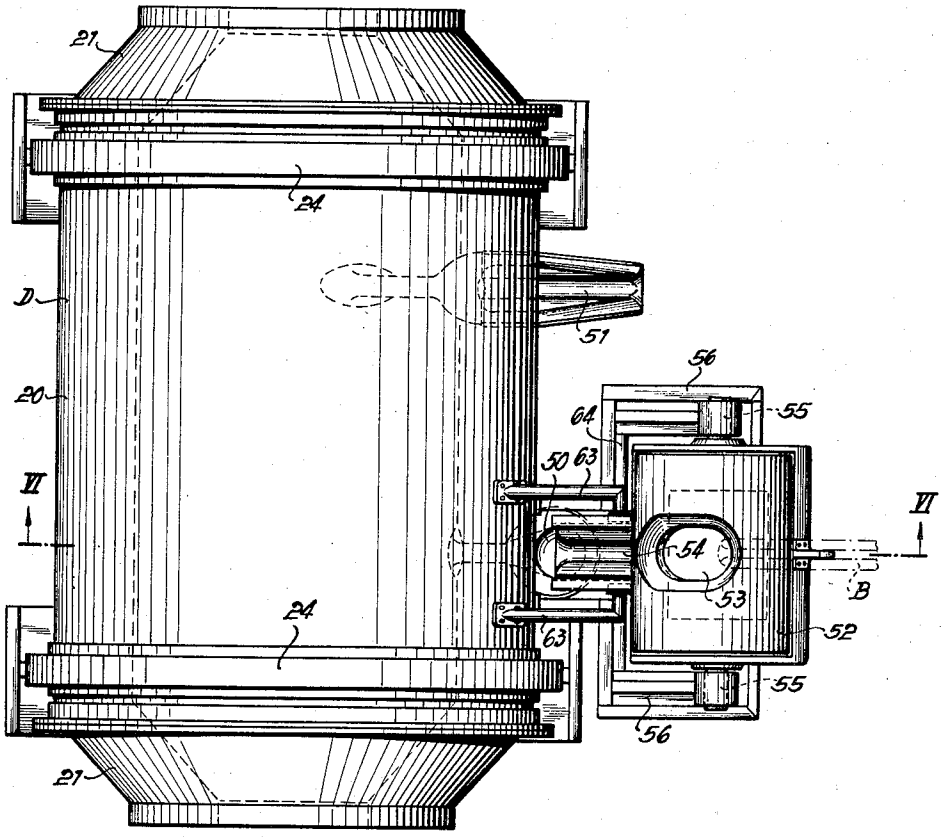
INVENTOR:
Heinrich Höhne
By:
Michael S. Striker
att.

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SMELTING FURNACE SYSTEM

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FIG. 5



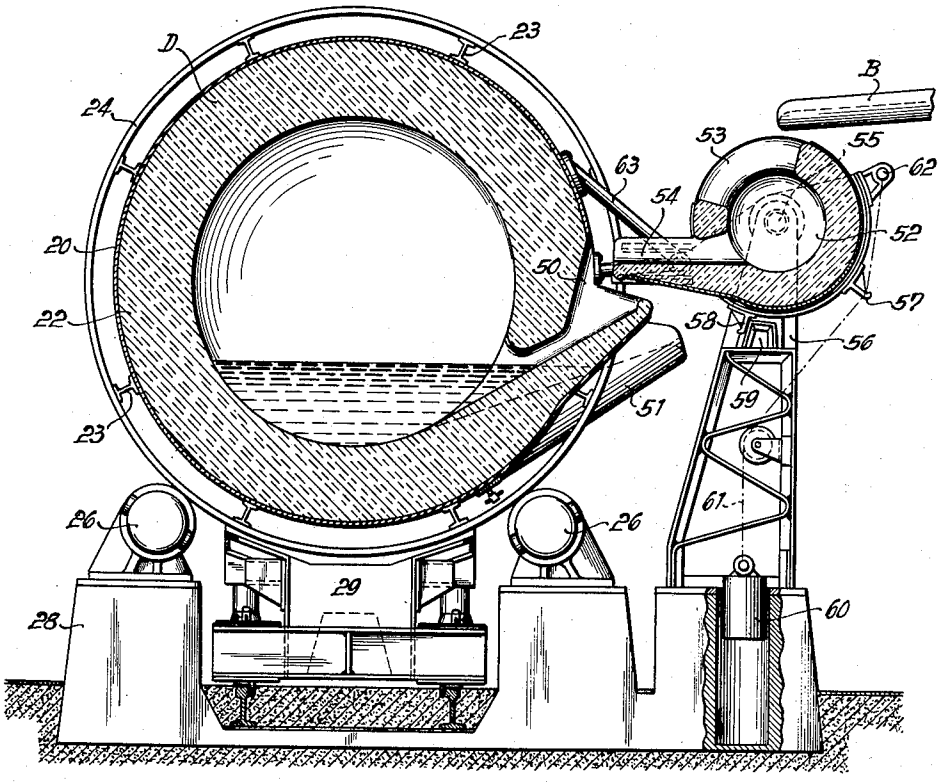
INVENTOR.
Heinrich Höhne
By:
Michael S. Striker
Agt

July 8, 1958 H. HÖHNE 2,842,354

SMELTING FURNACE SYSTEM

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FIG. 6



INVENTOR:
Heinrich Höhne
By:
Michael S. Striker
agt.

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SMELTING FURNACE SYSTEM

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FIG. 7

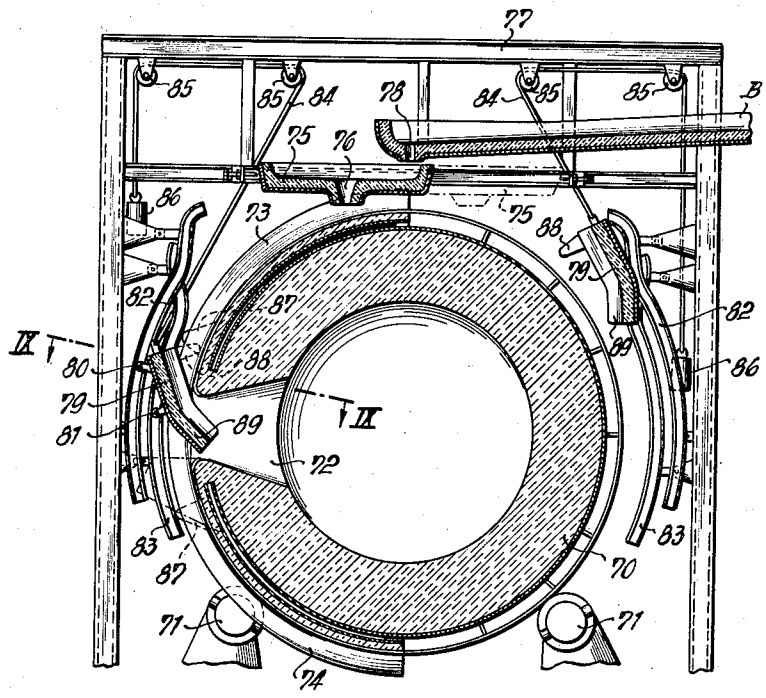


FIG. 8

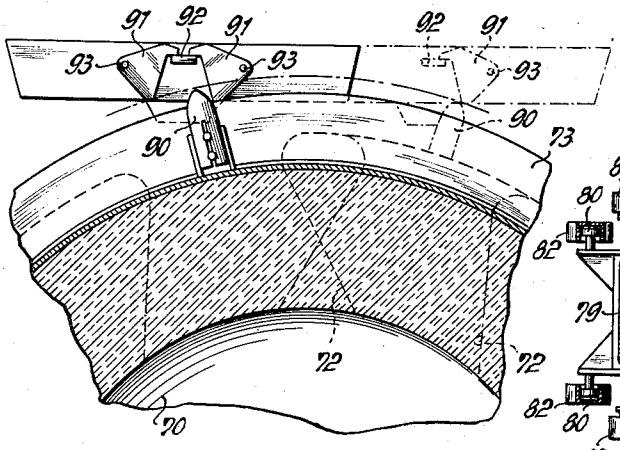
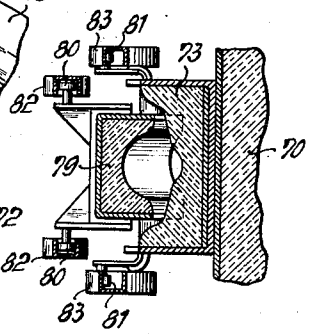


FIG. 9



INVENTOR:
Heinrich Höhne
By:
Michael S. Striker
agt.

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SMELTING FURNACE SYSTEM

Heinrich Höhne, Gevelsberg, Westphalia, Germany, assignor to Stockey & Schmitz, Gevelsberg, Westphalia, Germany, a firm

Application October 19, 1955, Serial No. 541,451

Claims priority, application Germany October 22, 1954

28 Claims. (Cl. 266—40)

The invention relates to smelting furnaces, and more particularly to a smelting furnace system in which a preferably heatable forehearth movable during the charging operation is connected up to a smelting furnace or the like. As a rule operationally moved forehearths serving for collecting and improving the fused mass obtained from the smelting furnace are charged with the aid of ladles transportable by crane arrangements, the forehearth being brought to a standstill during the introduction of the fused mass. It is also known to feed the melt directly to the movable forehearth in a continuous operation. For this purpose gutter arrangements are provided which conduct the melt into a pear-shaped forehearth through a hollow trunnion bearing. These constructions have not provided satisfactory in practice. It is likewise known to provide in the jacket of a drum-shaped rotatable forehearth a charging opening extending over a considerable portion of the periphery, through which opening the melting charge enters independently of the movement of the forehearth. These constructions have also not achieved any practical importance because, due to the large expanse of the charging opening, the angle of oscillation of the forehearth is necessarily restricted within narrow limits. Consequently, economical utilization of the quantity of heat applied for heating the forehearth is not possible because a great portion of this heat merely heats the portion of the lining of the forehearth which always remains above the level of the melt and good thermal efficiency is only obtained when the portion of the lining located above the melt runs regularly under the melt in order to give up to the melting charge the heat which it has accumulated.

The object of the present invention is to create a smelting furnace system of the type above described which allows automatic charging independently of the operational movement of a heatable rotatably mounted drum-shaped forehearth and ensuring particularly good thermal efficiency.

According to the present invention there is provided a smelting furnace system comprising in combination at least one smelting furnace, a heatable rotatable mounted drum-shaped forehearth connected up to said smelting furnace, a charging opening in the forehearth, said forehearth being oscillatable during a charging operation, an arrangement for guiding a melting charge to said rotatably mounted drum-shaped forehearth, and means for automatically moving said guiding arrangement in rhythm with the movement of the forehearth.

The guiding of the melting charge to the forehearth can be attained in a number of ways in that a gutter, or a part thereof, conducting the melting charge is automatically moved in rhythm with the movement of the forehearth. The melting charge can be fed continuously to the moving forehearth, or the arrangement may be such that the melting charge enters intermittently in rhythm with the oscillating movements of the forehearth. Both forms of construction allow the forehearth to be charged practically automatically, and at the same time

a particularly good thermal efficiency to be attained because the charging opening of the forehearth, owing to the movability of the arrangement feeding the melting charge, may be only of small dimensions which in practice do not reduce the greatest possible range of oscillation determined and necessitated by the tap which, as a rule, is permanently open. The small dimensions of the charging opening likewise reduce to a great extent the possible entry of fresh air and thermal losses. This results in high-grade smeltings in addition to saving expenses. Other details of the invention will be apparent from the following description of different forms of construction and the claims.

Several preferred embodiments of the invention are illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is an elevational view of a smelting furnace system;

Fig. 2 is a side elevation of Fig. 1, wherein the parts of the arrangement affecting the invention are shown in section;

Fig. 3 is an elevation on a larger scale, showing the parts affecting the invention illustrated in Figs. 1 and 2;

Fig. 4 is a section taken on line IV—IV of Fig. 3;

Fig. 5 is a top plan view of a rotatable forehearth and a guiding arrangement according to a modified form of construction of the invention;

Fig. 6 is a section on line VI—VI of Fig. 5;

Fig. 7 is a sectional view of another form of construction of a rotatable forehearth with automatic guiding arrangement;

Fig. 8 is a detail of the arrangement shown in Fig. 7, and

Fig. 9 is a section on line IX—IX of Fig. 7.

A smelting furnace system illustrated in Figs. 1 and 2 consists substantially of two smelting furnaces A, preferably cupola furnaces, arranged side by side, from which the melting charge obtained flows into a feed gutter B bifurcated at one end which conducts it to a receiving member C from which the melting charge enters an operationally movable forehearth D in the form of a rotatable drum or, if desired, with an appropriate displacement of the receiving member C, to a transportable collecting vessel E, from which it can, if desired, be returned to the rotatable forehearth D by a gutter F shown in dotted lines in Fig. 2. The arrangement might also have only one smelting furnace. Moreover, it is pointed out that the melting charge need not necessarily be obtained directly from a smelting furnace but might also flow, preferably continuously, from a large collecting vessel. The arrangement of the smelting furnaces A has practically no unusual features so that it is not necessary to describe it in detail.

According to Figs. 3 and 4, showing particularly the forehearth arrangement, the rotatable forehearth D consists of a substantially cylindrical, drum-shaped body **20** with conical end walls **21** and a refractory lining **22**. In known manner, such rotatable drum-shaped forehearths are provided with raceways **24** carried by supporting bars **23** with the aid of which raceways they rest on pairs of rollers **25** and **26**, the pair of rollers **26** being driven in alternating directions of rotation by electric motors **27** or the like in such a manner that the forehearth D carries out continuous oscillating movements which can extend through an angle of about 180° to 200°. During these movements the lining of the rotatable forehearth runs under the melt located therein in rhythm with the oscillating movements so that the heat accumulated in the lining in the intervals is utilized for heating up the melting charge. The pairs of rollers **25** and **26** are mounted on bearing blocks **28**. Between these blocks **28** a lifting platform truck **29** can be run in known man-

ner for lifting the rotatable forehearth D off the rollers 25 and 26 for the purpose of exchange or repair. Co-ordinated to central apertures, provided in the end walls 21, are a burner, not shown in the drawings, at one end and a flue 30 at the other end. In order to make the rotatable forehearth D easily movable for the purpose of maintenance, sockets 31 are provided in known manner on opposite sides of the jacket within the range of the centroidal axis for receiving trunnions with the aid of which the forehearth can be mounted on supporting blocks in such a manner that it can be swung with little effort. To this extent rotatable forehearths are known.

In the form of construction illustrated particularly in Figs. 3 and 4 a guide gutter or channel 32 lined with refractory material is arranged on the jacket of the rotatable forehearth D in the peripheral direction thereof and extends through an angle of about 100°. This guide gutter 32 is closed at its free end and terminates at its other end in a charging opening 33 of the forehearth, in front of which charging opening 33 a guide member 34, rigidly connected to the jacket of the forehearth, is mounted in such a manner that the melting charge flowing through the guide gutter or channel 32 enters the charging opening 33 reliably and without loss even when this opening 33 is located below the horizontal middle plane of the rotatable forehearth. A tap spout 35 slightly displaced relatively to the charging opening 33 in the peripheral direction is arranged in a radial plane displaced relatively to the guide gutter 32. The range of oscillation of the rotatable forehearth must consequently be so chosen that the melting charge does not normally flow out of the tap spout 35 or the charging opening 33. In Figs. 3 and 4 the rotatable forehearth is shown in a position in which the tap spout 35 is in the pouring position. The melting charge continually flowing through the above mentioned feed gutter B is conducted into the guide gutter 32 by means of the receiving member C which, in the construction illustrated, consists of a substantially closed container 37 provided with a channel-shaped pouring spout 36 and lined with refractory material. The melting charge continually flowing from the gutter B enters the container 37 through a slot-shaped charging aperture 38. Beside this aperture an aperture, preferably closable by a flap 39, is provided which serves for introducing fluxes or admixtures for improving or refining the melt. This presents advantages in many respects over the direct introduction of such fluxes or admixtures into the forehearth. Thus, a damaging of the lining 22 of the forehearth is reliably prevented. Furthermore, with the manner of operation according to the invention—that is when introducing fluxes or admixtures into the receiving member C—unfavorable changes in temperature of the melting charge are avoided, so that the continuity of the working process is improved. Moreover, as shown in dotted lines in Fig. 4, a pouring spout 40 can also be provided on the receiving member C, extending in the opposite direction to the pouring spout 36, and can be used, if required, for conducting the melting charge to the collecting vessel E instead of to the forehearth D when this melting charge is needed at another place or the forehearth D is filled to the permissible limit. The two pouring spouts 36 and 40 of the receiving member C are inclined at different angles to the horizontal plane, these angles being so chosen that one of the spouts comes selectively into operation, whereas the other remains empty. The receiving member C is oscillatable about an axle 41 extending transversely to the longitudinal direction of the pouring spout 36 and located outside the center of gravity of the receiving member C in such a manner that this member is always subjected to a moment of rotation in counter-clockwise direction determined by weight. This is taken up by a supporting arm 42 carrying at its extremity a control roller 43. This control roller 43 runs on a cam race 44 which extends over a portion of the periphery of the forehearth D in such a manner that the pouring spout 36 of the receiving member C is inclined for a direct pouring of the melting charge as long as a portion of the guide gutter 32 is located under its mouth. If, however, during the swinging movement of the forehearth D, which first takes place in counter-clockwise direction based on the position shown in Fig. 4, the charging opening 33 passes the mouth of the pouring spout 36, the receiving member C in the state of disequilibrium is swung about the axle 41 in counter-clockwise direction by means of the cam race 44 and the arm and roller 42, 43, so that the outflow of the melting charge continually entering the receiving member C is interrupted. This interruption continues until, as the forehearth D swings back, the charging opening 33 has passed the mouth of the pouring spout 36, so that a portion of the guide gutter 32 is again located thereunder. In the intervals between the pouring into the guide gutter 32 the receiving member C serves as a collector.

The tipping movements of the receiving member C occurring during the operations are so timed that when the pouring spout 36 is swung upwards the pouring spout 40, if provided, has not yet become operative. The introduction of the melting charge into the collecting vessel E through the intermediary of the pouring spout 40 requires a further tipping of the receiving member C in counter-clockwise direction. This is rendered possible by a link system 45, 46 composed of two members connected like a toggle lever and extending between the supporting arm 42 and the receiving member C, which system guides the arm 42 carrying the control roller 43, whereby a buckling of the link system 45, 46 causes the receiving member C to swing about its axle 41 in opposition to the support by the arm 42. The buckling of the link system composed of the parts 45 and 46 can be effected by means of an adjusting rod gear indicated by an arrow 48. So as to prevent the movements of the receiving member C occurring during the normal charging of the forehearth D from being influenced by such a link system, it is advisable to construct the part 46 as one arm of a bell-crank lever another arm 47 of which extends to within the range of the fulcrum or axle 41. The adjusting rod gear indicated by the arrow 48 is also connected coaxially with the fulcrum or axle 41. By the coaxial arrangement of the engagement point of the adjusting rod gear 48 with the axle 41 displacements of the toggle-lever or link system 45, 46 do not take place during the normal movements of the receiving member C.

The modified form of construction of a drum-shaped forehearth and of the guiding arrangement for the melting charge illustrated in Figs. 5 and 6 can be applied in a similar manner to the arrangements shown in Figs. 1 and 2. Also in this form of construction the rotatable forehearth D consists of a drum-shaped housing which is lined with refractory material. The mounting of the forehearth corresponds to that shown in Figs. 3 and 4 so that explanations in this respect are not necessary. The forehearth D is, as can be seen from Fig. 6, provided with a charging aperture 50 to which, contrary to the construction shown in Figs. 1 to 4, no gutter or the like is co-ordinated. The charging aperture 50 is, as in the construction illustrated in Figs. 3 and 4, located slightly displaced in the peripheral direction relatively to a spout 51 which is moreover arranged in a different radial plane. For feeding the melting charge preferably flowing continuously through the feed gutter B, a receiving member 52 is provided in the form of a drum having a charging aperture 53 at the top and a spout 54. The receiving member 52 is oscillatable in bearings in a carrier frame 56 with the aid of trunnions 55 or a suitable cradle, the range of oscillation being limited by abutments 57 and 58 on the drum jacket, which abutments co-operate respectively with a counter-abutment 59 on the carrier frame 56. The movements of the receiving member 52

which are operationally necessary are effected on the one hand by a counterweight **60** which is connected to a bracket **62** on the receiving member **52** or cradle by a rope **61** guided over pulleys and tends to swing the spout **54** upwards. The lowering of the spout **54** necessary for intermittently charging the forehearth D, is effected by arms **63** extending outwardly from the jacket of the forehearth D and having inwardly bent ends which, when the forehearth reaches the position suitable for commencing the charging operation, come into contact with counter-abutment surfaces **64** on the receiving member **52** and turn the latter about the trunnions **55** in counter-clockwise direction, so that the weight **60** constituting a work accumulator is raised through the intermediary of the rope **61**. As the spout **54** is lowered, the melting charge accumulated in the meantime in the receiving member **52** flows off into the charging aperture **50** of the forehearth D. When the latter has reversed its direction of movement the counterweight **60**, through the intermediary of the rope **61**, turns the receiving member **52** in clockwise direction in rhythm with the return swing of the arms **63** on the forehearth, so that the spout **54** swings upwards and interrupts the outflow of the melt. As the melt is fed continuously along the feed gutter B, the receiving member **52** acts as collector during the greater part of each swinging movement of the forehearth D. The arrangement is such that the receiving member **52** is only tipped for effecting the outflow of the melting charge when the charging aperture **50** of the rotatable forehearth D is underneath the mouth of the spout **54**. The abutment arrangement **57** to **59** may also be provided with electric switch elements, not shown in the drawings, which interrupt the movement of the rotatable forehearth in the event of irregularities in the movement of the receiving member **52**. For this purpose the abutment **58** must be so arranged that it does not normally come into contact with the stationary counter-abutment **59**, whereas the abutment **57** limits the lifting of the spout **54** by cooperation with the stationary counter-abutment **59**.

Figs. 7 to 9 show another possible form of construction for a system of a rotatable forehearth and guiding arrangement to be incorporated in an arrangement according to Figs. 1 and 2. A rotatable forehearth **70**, lined with a refractory material, is oscillatably mounted on pairs of rollers **71** in the manner already described. Contrary to the constructions above described, guide gutter sections **73** and **74** extend from a charging aperture **72** of the rotatable forehearth **70** in opposite peripheral directions and are lined with refractory material. The melting charge is fed alternately to the charging aperture **72** of the rotatable forehearth **70** by the guide gutter sections **73** and **74**. As it is advisable for obtaining a perfect outflow of the melting charge to have it impinge upon a sloped part of the gutter arrangement, a receiving member **75** automatically movable in rhythm with the forehearth is introduced between the feed gutter B and the guide gutter sections **73**, **74**. This receiving member **75** is in the construction illustrated formed as a gullet or pan lined with refractory material and has a centrally arranged discharge nozzle **6** serving as pouring aperture. The receiving member **75** is mounted in a carrier frame **77** so that it is shiftable in substantially horizontal direction and for this purpose can be movable on rail-like guides preferably with the aid of rollers not shown in the drawings. The range of movement of the receiving member **75** is such that even in its end positions a portion of the channel or pan of the receiving member **75** is always located under a pouring aperture **78** provided in the feed gutter B. The drive of the receiving member **75** is dependent upon the movement of the forehearth **70** and will be hereinafter described in detail.

To ensure that the melting charge flowing along one of the guide gutter sections **73** or **74**, respectively, actually reaches the charging aperture **72** when this is in or below the horizontal central plane of the rotatable forehearth, special guide members are provided in the form of construction shown in Figs. 7 to 9. In the construction illustrated, these consist of substantially spade-shaped guide members **79** which are each shiftable with the aid of two pairs of guide rollers **80** and **81** running in pairs of guide rails **82** and **83** mounted on the uprights of the frame **77**. The pairs of guide rails **82**, **83** extend on a considerable lower portion of their lengths in a curve the center of which coincides with the axis of rotation of the forehearth **70**. The upper reaches of the pairs of the guide rails **82**, **83** differ so that the guide members **79** on attaining these reaches are so swung that their mouths cannot discharge into the charging aperture **72**. The guide members **79** should only be operative over a limited range of the movement of the forehearth so as to ensure that the melting charge enters the charging aperture **72** without loss. The guide members **79** are driven by entrainment means acting against dead loads. For this purpose a rope tackle **84** is attached at one end to each guide member **79**, guided over pulleys **85** on the carrier frame **77** and carries at its other end a counterweight **86**. The arrangement is such that the counterweight tends to raise the guide member **79**, that is to bring it into its inoperative position. A guide member in this position is shown on the right of Fig. 7. When the charging aperture **72** of the rotatable forehearth **70** comes within the range of this guide member **79**, an abutment **87** fixed on the rotatable forehearth and projecting from the periphery thereof, comes into contact with a projection **88** on the guide member and carries this along with it against the action of the counterweight. Owing to the different curvature of the path of the pairs of guide rails **82**, **83** in the first phase of this movement, a mouth end **89** provided on the guide member **79** swings into the charging opening **72** of the rotatable forehearth **70**. The guide member is carried along in this position until the reversal point is reached. During the following swinging movement of the rotatable forehearth **70** in the opposite direction, the guide member **79**, under the action of the counterweight, follows the movement of the rotatable forehearth **70** until it arrives in the differently curved portion of its guide rails when it is brought into an inoperative position. It is possible with the aid of the guide members **79** to obtain a perfect charging also in those reaches of the forehearth oscillation path in which satisfactory charging of the melt into the charging opening **72** from a gutter section **73** or **74** could otherwise not be ensured.

The necessary operative movement of the receiving member **75** is also controlled with the aid of abutments. The arrangement employed for this purpose is separately illustrated in Fig. 8. The surface of the jacket of the rotatable forehearth **70** carries a substantially radially projecting abutment finger **90** which is preferably adjustable in length. On the slidably mounted receiving member **75** abutments **91** in the form of double levers are provided which are arranged in opposite directions and co-operate with an abutment **92**. The abutments or double levers **91** are oscillatable about pins **93** and allow the abutment which is not actually required to yield so that a proper entrainment of the receiving member **75** from one end position into the other is possible without it being necessary to work to very fine tolerances in the production.

The form of construction illustrated in Figs. 7 to 9 provides for the division of the melting charge feed into three phases. In the end regions of the movement of the rotatable forehearth **70** shown in Fig. 7 the melting charge flows out of the feed gutter B through the receiving member **75**, the guide gutter section **73**, and the guide member **79** into the charging aperture **72** of the forehearth **70**. When the guide member **79** has become inoperative, that is as soon as the charging aperture **72** of the forehearth **70** has moved through an angle of about 60° out of its vertical middle position, the melting charge

passes from the feed gutter B through the receiving member **75** and the guide gutter section **73** directly into the charging aperture **72**. As soon as, during the further movement of the rotatable forehearth **70**, the charging aperture **72** comes directly below the discharge nozzle **76** of the receiving member **75** a gutter section is no longer required because the melting charge can enter the charging aperture **72** directly from the discharge nozzle **76** of the receiving member **75**. This direct charging takes place until a position beyond the upper dead-center point is reached, whereby the receiving member **75** follows the charging aperture **72** owing to the co-operation of the abutment **90** of the rotatable forehearth **70** and the abutment **91** of the receiving member **75**. Following this phase the guide gutter section **74** and finally in addition thereto a guide member **79** become operative.

The constructions illustrated are, as already mentioned, only preferred examples of how the invention may be put into effect. However, the invention is not restricted thereto and many other forms of construction are possible. In particular, the constructional details of the forms of construction illustrated can be modified in many ways. Moreover, details of the embodiments shown can be applied to other forms of construction. Instead of a direct drive for the movable parts of the guiding arrangements, individual drives can be used which are controlled in rhythm with the movement of the rotatable forehearth. Regarding the form of construction shown in Figs. 5 and 8 modifications can be introduced in that the receiving member **52** could be arranged at some other point within the swinging range of the charging aperture of the forehearth, for example, in the region of the middle position, that is vertically above the forehearth.

I claim:

1. A melting furnace arrangement comprising, in combination, at least one smelting furnace; a guiding arrangement located adjacent said smelting furnace for receiving molten metal, said guiding arrangement being movable between a collecting position and a discharging position and having an outlet for discharging metal in said discharging position; a forehearth located underneath said guiding arrangement and being oscillatable about a horizontal axis between a discharging position, and a heating end position, said forehearth having a discharge opening for discharge in said discharging position and a circumferentially extending charging opening located underneath said outlet in at least one intermediate position of said forehearth; and means for oscillating said forehearth between said discharging position and said end position for bringing the molten metal therein into contact with different inner surface portions thereof, and for simultaneously moving said guiding arrangement to and from said discharging position in a selected sequence with the movement of said forehearth so that said guiding arrangement is in collecting position when said forehearth oscillates.

2. A smelting furnace system as set forth in claim 1, wherein the arrangement for guiding the melting charge to the forehearth incorporates a guide gutter with means for automatically changing its position in accordance with the movement of the forehearth.

3. A smelting furnace system as set forth in claim 1, wherein the arrangement for guiding the melting charge to the forehearth comprises a guide gutter and the forehearth has a jacket on which the guide gutter extends in the peripheral direction thereof and terminates in the charging opening in the forehearth.

4. A smelting furnace system as set forth in claim 1, wherein the arrangement for guiding the melting charge to the forehearth comprises a guide gutter and the forehearth has a jacket on which the guide gutter extends substantially over a quarter in the peripheral direction thereof, a feed gutter feeding the melting charge from the smelting furnace to the forehearth, and a receiving member arranged at the delivery end of said feed gutter and being automatically tiltable according to the movement of the forehearth to conduct the melting charge directly to the guide gutter during a portion of each oscillating movement of the forehearth and to collect the melting charge, continuously flowing from the feed gutter, during the remaining portion of each oscillating movement of the forehearth.

5. A smelting furnace system as set forth in claim 1, comprising a feed gutter feeding the melting charge from the smelting furnace to the forehearth, a tiltable receiving member at the delivery end of said feed gutter, a guide gutter on the periphery of the forehearth leading to the charging opening thereof, a pouring spout on said receiving member and means for swinging said receiving member about an axle extending transversely to said spout to periodically deliver the melting charge into said guide gutter in dependency upon the movement of said forehearth.

6. A smelting furnace system as set forth in claim 1, wherein the drum-shaped forehearth has on its periphery two guide gutter sections extending in opposite directions from the charging opening thereof.

7. A smelting furnace system as set forth in claim 1, wherein the drum-shaped forehearth has on its periphery two guide gutter sections extending in opposite directions from the charging opening thereof, and a receiving member is arranged at the delivery end of a feed gutter leading the melting charge from the smelting furnace, means being provided for adjusting said receiving member according to the position of said forehearth for alternately discharging the melting charge to each of said two guide gutter sections.

8. A smelting furnace system as set forth in claim 1, wherein the drum-shaped forehearth has on its periphery two guide gutter sections extending in opposite directions from the charging opening thereof, and a receiving member, consisting of a gullet, is shiftable in synchronism with the movement of the forehearth to supply the melting charge alternately to each of the two guide gutter sections.

9. A smelting furnace system as set forth in claim 1, wherein the drum-shaped forehearth has on its periphery two guide gutter sections extending in opposite directions from the charging opening thereof and a receiving member in the form of a gullet receives the melting charge from the smelting furnace and has abutments which co-operate with abutment fingers on the forehearth to shift said receiving member in synchronism with the movement of the forehearth for supplying the melting charge alternately to each of the two guide gutter sections.

10. A smelting furnace system as set forth in claim 1, wherein the guiding arrangement incorporates a guide gutter arranged in peripheral direction on the forehearth and leading to the charging opening thereof and a guide member is arranged at the side of the forehearth separate therefrom in the plane of the charging opening to deflect the melting charge being fed in the direction of the charging opening during a portion of the movement of the forehearth.

11. A smelting furnace system as set forth in claim 1, wherein the guiding arrangement incorporates a guide gutter arranged in peripheral direction on the forehearth and leading to the charging opening thereof and a guide member is arranged at the side of the forthhearth to guide the onflowing melting charge towards the charging opening, said guide member being movable and provided with means for swinging its mouth end into inoperative position as the charging opening of the forehearth passes through the upper range of its movement.

12. A smelting furnace system as set forth in claim 1,

wherein the guiding arrangement incorporates a guide gutter arranged in peripheral direction on the forehearth and leading to the charging opening thereof and a guide member is arranged at the side of the forehearth to guide the onflowing melting charge towards the charging opening, said guide member being movable in guide rails the lower portions of which are curved coaxially with the axis of rotation of the forehearth whereas the upper portions of these rails spread apart so that the guide member carried along by the forehearth is swung out of the charging opening thereof.

13. A smelting furnace system as set forth in claim 1, wherein the guiding arrangement incorporates a guide gutter arranged in peripheral direction on the forehearth and terminating in the charging opening thereof and a guide member is arranged at the side of the forehearth to guide the onflowing melting charge in the direction of the charging opening, said guide member being movable and provided with a projection which cooperates with an abutment on the forehearth to constitute an automatic drive dependent upon the movement of the forehearth.

14. A smelting furnace system as set forth in claim 1, wherein the guiding arrangement incorporates a guide gutter arranged in the peripheral direction on the forehearth and terminating in the charging opening thereof and a guide member is arranged as the side of the forehearth to guide the onflowing melting charge in the direction of the charging opening, said guide member being movable and carrying a projection cooperating with an abutment on the forehearth to swing the guide member into its operative position, and a work-accumulating device is provided in the form of a counterweight loading said guide member in the sense of a movement into inoperative position and force-locking said abutment and counter-abutment.

15. A smelting furnace system as set forth in claim 1, wherein the guiding arrangement automatically movable in dependence upon the movement of the forehearth for initiating a continuous flow of melting charge into the operationally moved forehearth is formed by a stationary receiving member at the discharge end of a feed gutter for automatically emptying the melt into the forehearth in rhythm with the passage of the charging opening of the forehearth and collecting the melting charge during the intervals.

16. A smelting furnace system as set forth in claim 1, wherein the guiding arrangement automatically movable in dependence upon the movement of the forehearth for initiating a continuous flow of melting charge into the operationally moved forehearth consists of a drum-shaped receiving member having a pouring spout which is automatically raised and lowered in rhythm with the passage of the charging opening of the forehearth.

17. A smelting furnace system as set forth in claim 1, wherein the guiding arrangement automatically movable in dependence upon the movement of the forehearth for initiating a continuous flow of melting charge into the operationally moved forehearth consists of a drum-shaped receiving member having a pouring spout oscillatable in front of the mouth of the feed gutter about an axis extending transversely to the pouring spout.

18. A smelting furnace system as set forth in claim 1, wherein a receiving member for collecting the melting charge delivered by a feed gutter from the smelting furnace has a pouring spout coordinated to the forehearth and a second pouring spout cooperating optionally with a collecting vessel for the melting charge independent of the forehearth.

19. A smelting furnace system as set forth in claim 1, wherein a receiving member for collecting the melting charge delivered by a feed gutter from the smelting furnace has a pouring spout coordinated to the forehearth and a second pouring spout coordinated to a collecting vessel independent of the forehearth, said receiving member carrying a control roller which cooperates with a cam race on the forehearth.

20. A smelting furnace system as set forth in claim 1, wherein a receiving member for collecting the melting charge delivered by a feed gutter from the smelting furnace carries a control roller which cooperates with a cam race on the forehearth and is pivotable about an axle located outside its center of gravity so that the said control roller is maintained in positive contact with the cam race.

21. A smelting furnace system as set forth in claim 1, wherein a receiving member for collecting the melting charge delivered by a feed gutter from the smelting furnace is oscillated by means of a control roller cooperating with a cam race on the forehearth, the control roller being carried by a supporting arm oscillatable to produce a movement of the receiving member independently of the cam race on the forehearth.

22. A smelting furnace system as set forth in claim 1, wherein a receiving member is provided for collecting the melting charge delivered by a feed gutter from the smelting furnace and oscillated by means of a control roller cooperating with a cam race on the forehearth, said control roller being carried by an oscillatable supporting arm guided by a link system composed of two parts forming a toggle lever.

23. A smelting furnace system as set forth in claim 1, wherein a receiving member is provided for collecting the melting charge delivered by a feed gutter from the smelting furnace and oscillated by means of a control roller cooperating with a cam race on the forehearth, the control roller being carried by an oscillatable supporting arm guided by a two-part link system, the part of the link system adjacent the receiving member being formed by one arm of a bell-crank lever the other arm of which is engaged by an adjusting rod gear coaxial with the pivot axis of the receiving member.

24. A smelting furnace system as set forth in claim 1, wherein a receiving member operatively automatically movable in dependence upon the movement of the forehearth is equipped with means for the optional introduction of admixtures for improving and refining the melt.

25. A smelting furnace system as set forth in claim 1, wherein a receiving member is provided for receiving the melting charge delivered from the smelting furnace and operatively automatically movable in dependence upon the movement of the forehearth, said receiving member having a charging aperture coordinated to a feed gutter delivering the melting charge from the smelting furnace, and a second closable charging aperture for introducing flux materials for improving and refining the melt.

26. A smelting furnace arrangement comprising, in combination, at least one smelting furnace; a guiding arrangement located adjacent said smelting furnace for receiving molten metal, said guiding arrangement being movable between a collecting position and a discharging position and having an outlet for discharging metal in said discharging position; a forehearth located underneath said guiding arrangement and being oscillatable about a horizontal axis between a discharging position, a plurality of intermediate heating positions and a heating end position, said forehearth having a discharge opening for discharge in said discharging position and a circumferentially extending elongated charging opening located underneath said outlet during oscillation of said forehearth between said discharging position and said intermediate position, and being located spaced from said outlet in said end position; and means for oscillating said forehearth between said discharging position and said end position for bringing the molten metal therein into contact with different inner surface portions thereof, and

for simultaneously moving said guiding arrangement to and from said discharging position in a selected sequence with the movement of said forehearth so that said guiding arrangement is in said discharging position when said forehearth is in said discharging position and in said intermediate heating positions and is in said collecting position when said forehearth is in said heating end position.

27. A smelting furnace arrangement comprising, in combination, at least one smelting furnace; a guiding arrangement located adjacent said smelting furnace for receiving molten metal, said guiding arrangement being movable between a collecting position and a discharging position and having an outlet for discharging metal in said discharging position; a forehearth located underneath said guiding arrangement and being oscillatable about a horizontal axis between a discharging position, a plurality of intermediate heating positions and a heating end position, said forehearth having a discharge opening for discharge in said discharging position and a circumferentially extending elongated charging opening located underneath said outlet during oscillation of said forehearth between said discharging position and said intermediate position, and being located spaced from said outlet in said end position; and means for continuously oscillating said forehearth about said horizontal axis between said intermediate heating positions and said heating end position whereby molten metal is brought into contact with different surface portions of said inner chamber for being heated by heat stored in the entire forehearth, and for selectively turning said forehearth into said discharging position, and for simultaneously moving said guiding arrangement so that said guiding arrangement is in said discharging position when said forehearth is in said discharging position and in said intermediate heating positions and is in said collecting position when said forehearth is in said heating end position.

28. A smelting furnace arrangement comprising, in combination, at least one smelting furnace; a guiding arrangement located adjacent said smelting furnace for receiving molten metal, said guiding arrangement being movable between a plurality of positions and having an outlet for discharging metal; a forehearth located underneath said guiding arrangement and being oscillatable about a horizontal axis, said forehearth having at least one circumferentially extending elongated charging opening located underneath said outlet during oscillation of said forehearth, said forehearth being turnable into a discharge position and having a discharge opening for discharging in said discharge position; and means for oscillating said forehearth and said guiding arrangement in a timed sequence so that said charging opening is located to receive molten metal from said outlet of said guiding arrangement during the oscillating movement of said forehearth.

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