

[54] INCINERATOR STOKER

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[58] Field of Search..... 110/7 R, 8 R, 18 R, 38; 126/175; 122/375

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[57]

ABSTRACT

An incinerator stoker has a stepped stationary hearth with alternate horizontal step surfaces and vertical walls or risers and has a plurality of movable hearths which are reciprocable by suitable driving means on the horizontal step surfaces through openings in the risers of the stationary hearth. Air for combustion is forced through vents in the risers and in vertical front wall portions of the movable hearths. There is no gap in the surface of the stoker other than the movable hearths openings and the vents, all of which are in vertical surfaces. The driving means can be arranged to reciprocate the movable hearths in groups and in any sequence desired to improve the agitating action and to further reduce the possibility of material being incinerated entering or clogging the openings or vents. One stoker construction disclosed comprises cast L-shaped and inverted channel shaped step members which are mounted alternately in side-by-side relation on suitable supporting structure across the width of each step with movable hearths being positioned within the inverted channel step members and being supported for in and out movement on the L-shaped step members of the next lower step.

15 Claims, 18 Drawing Figures

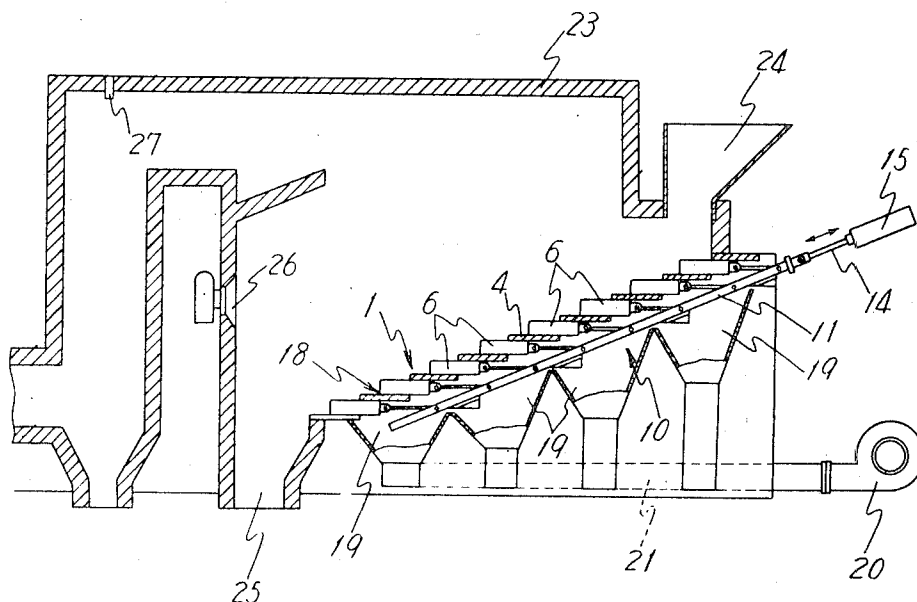


FIG 1

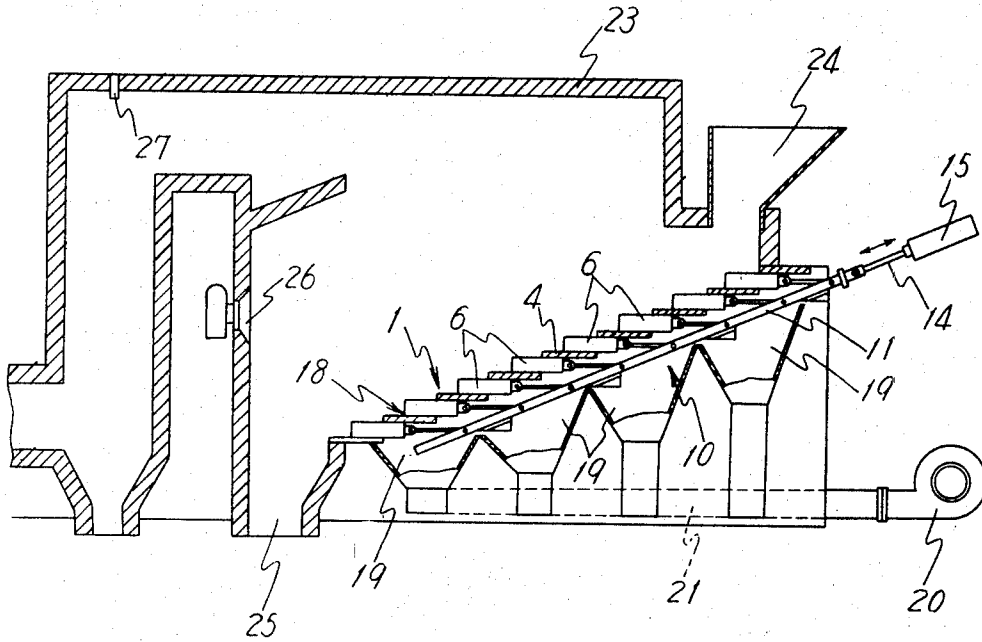


FIG 2

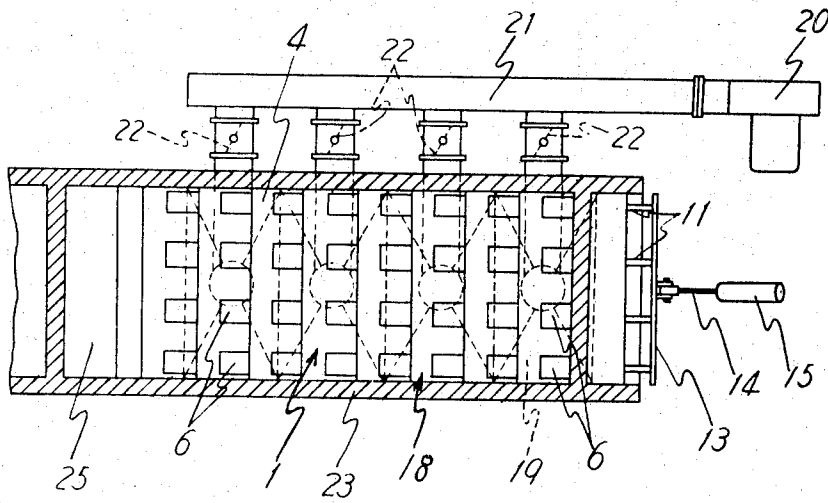


FIG 3

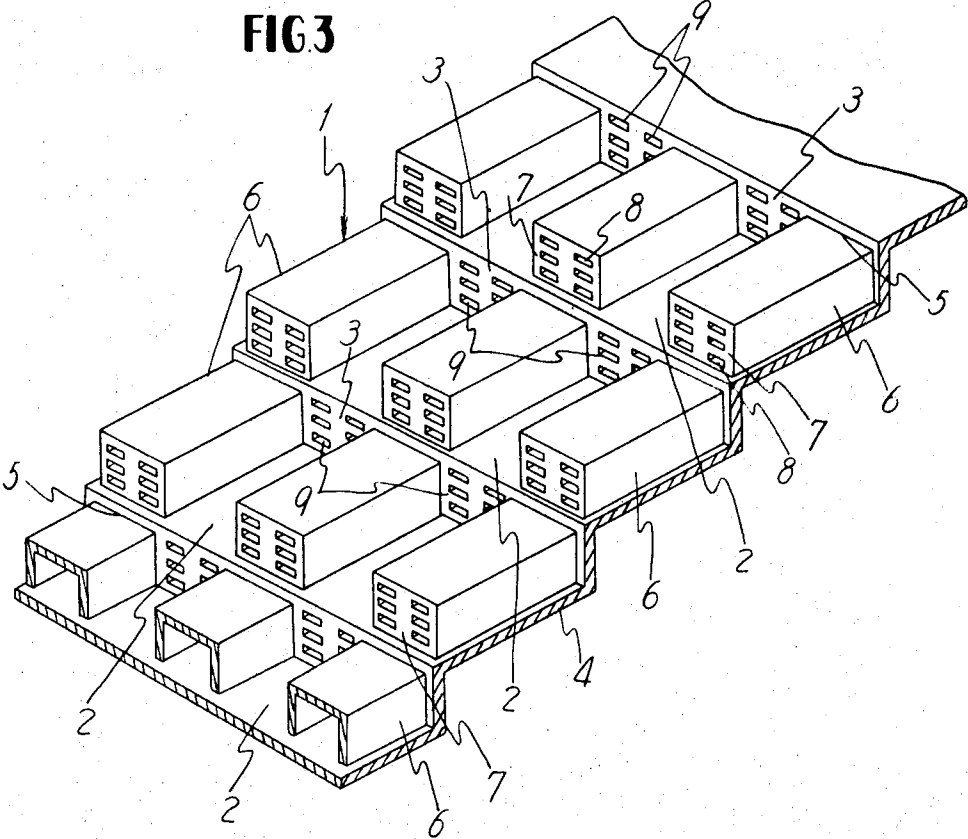
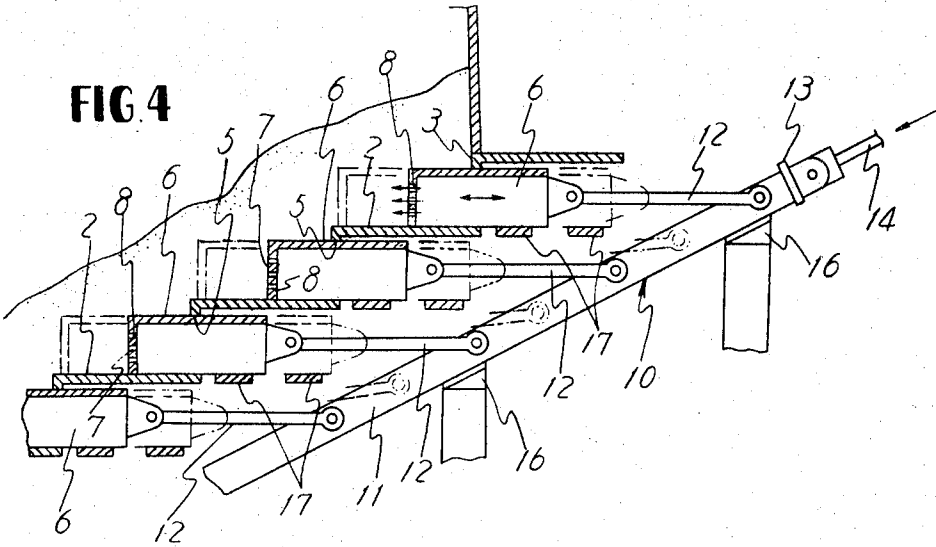


FIG 4



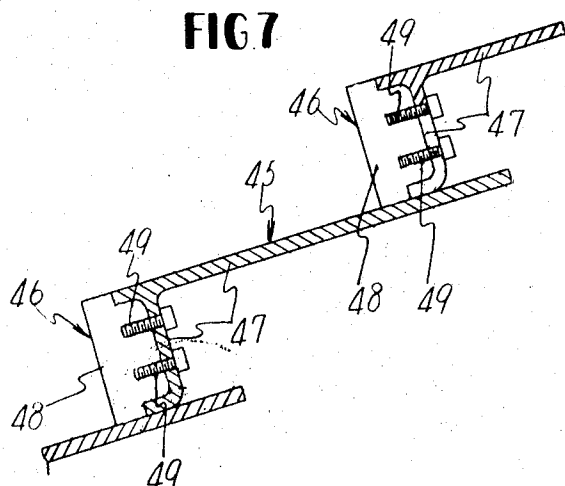
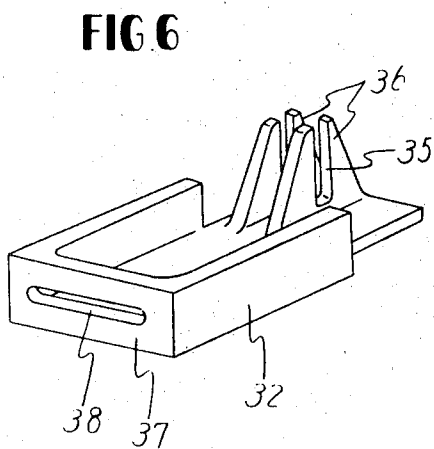
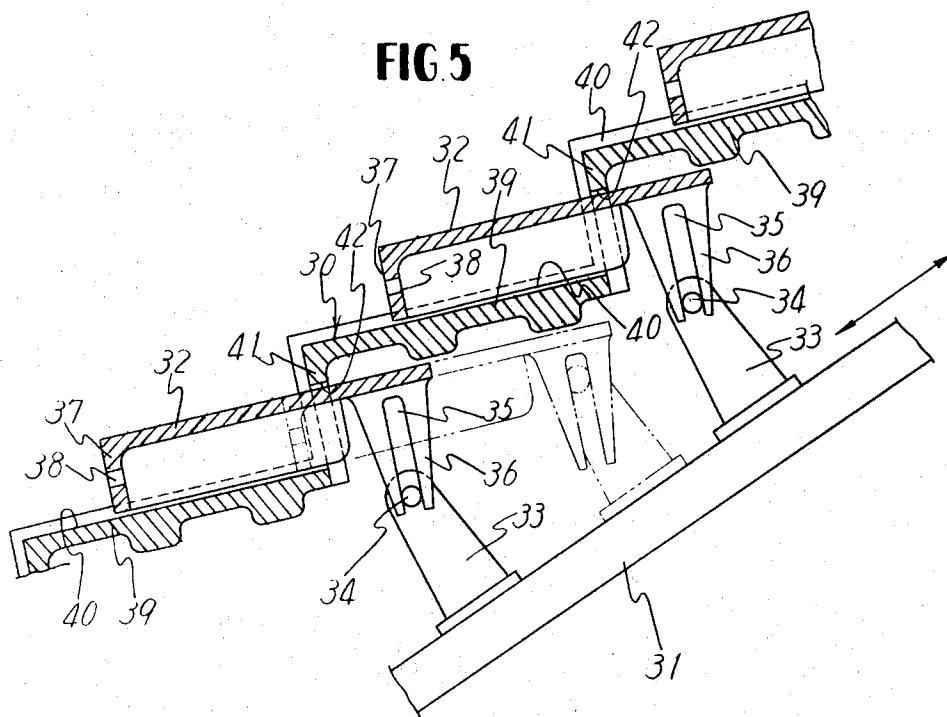


FIG 8

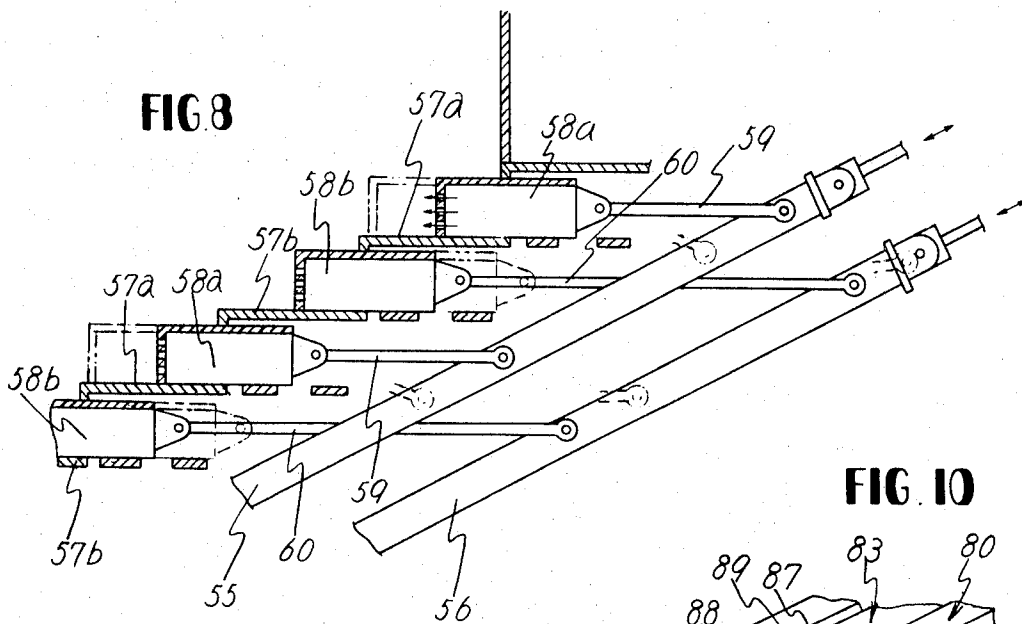


FIG 10

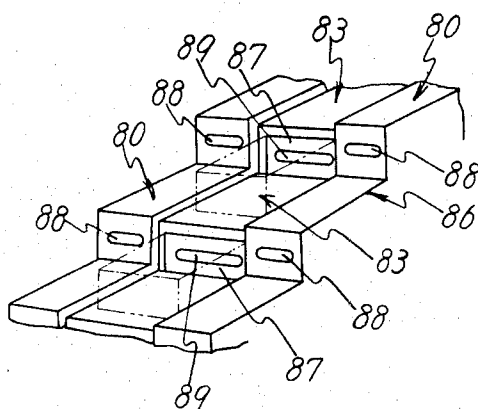
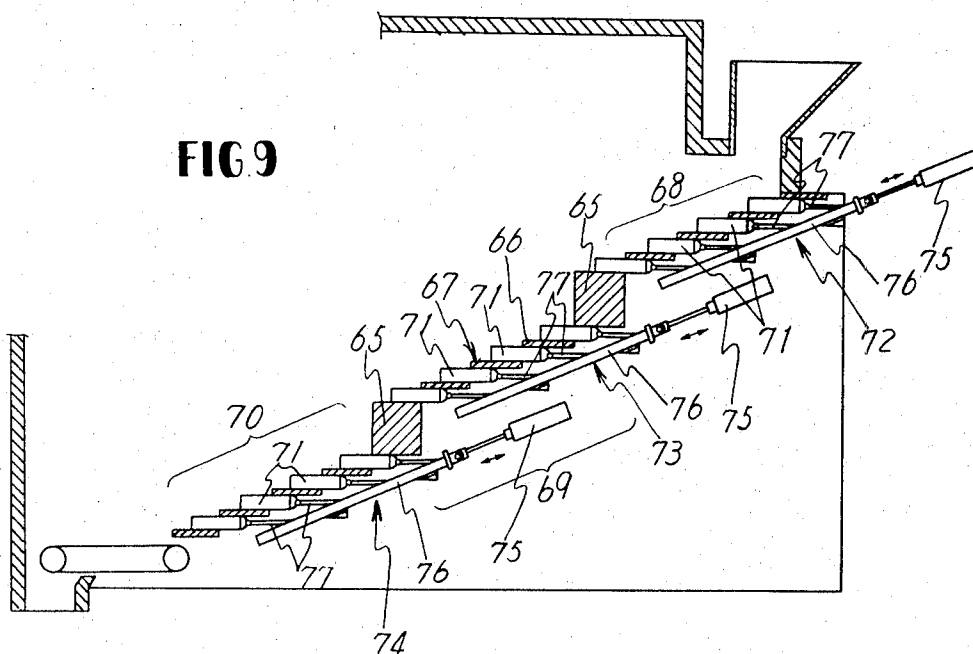


FIG 9



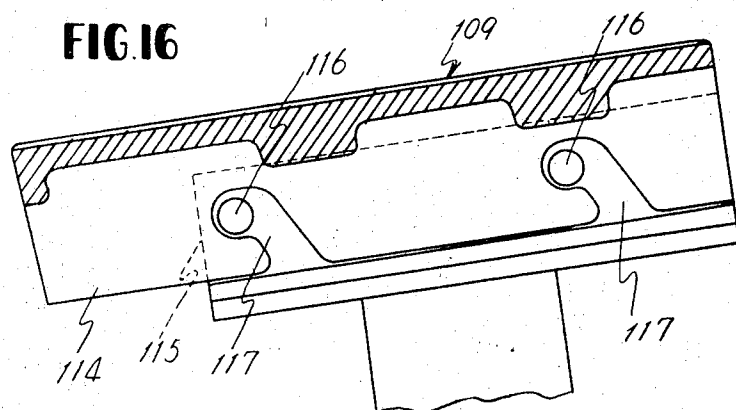
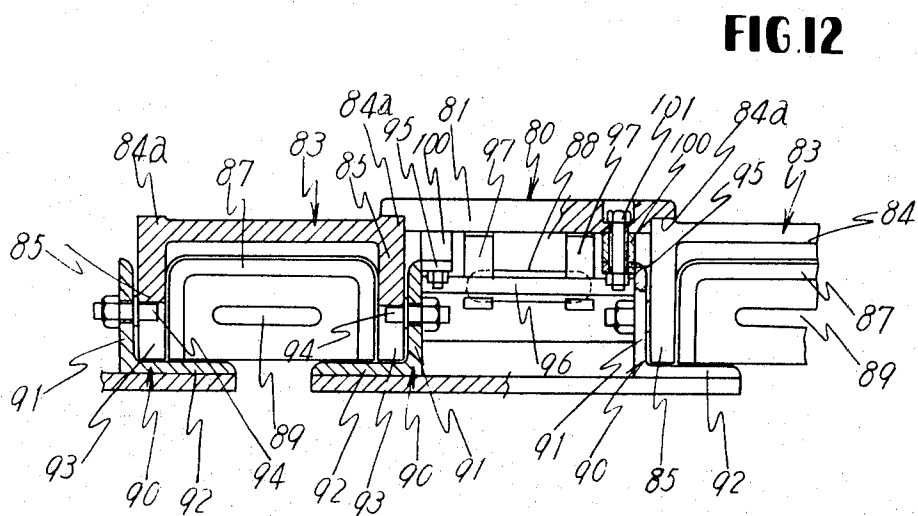
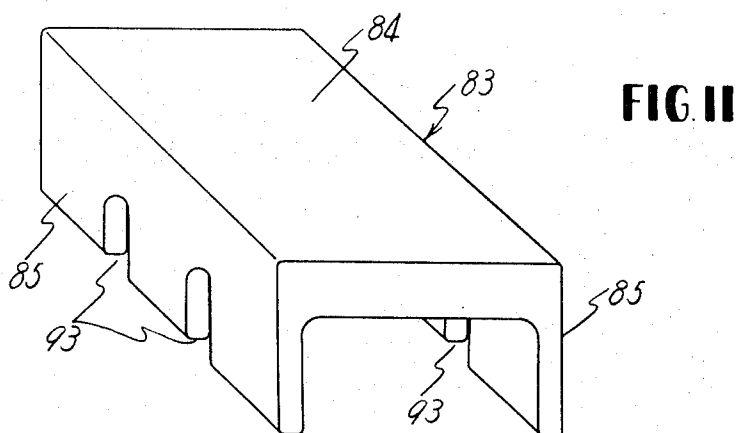
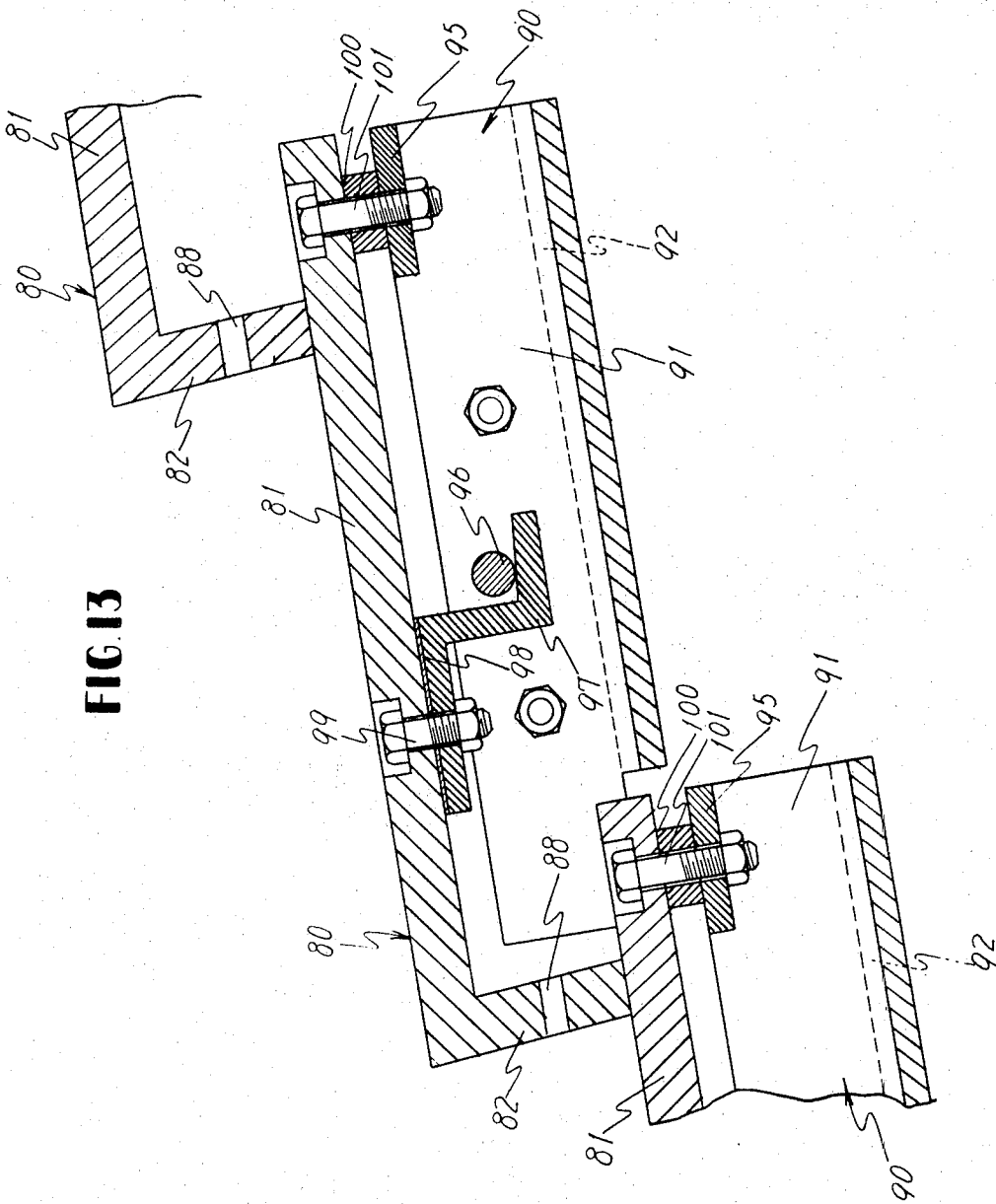


FIG. 13



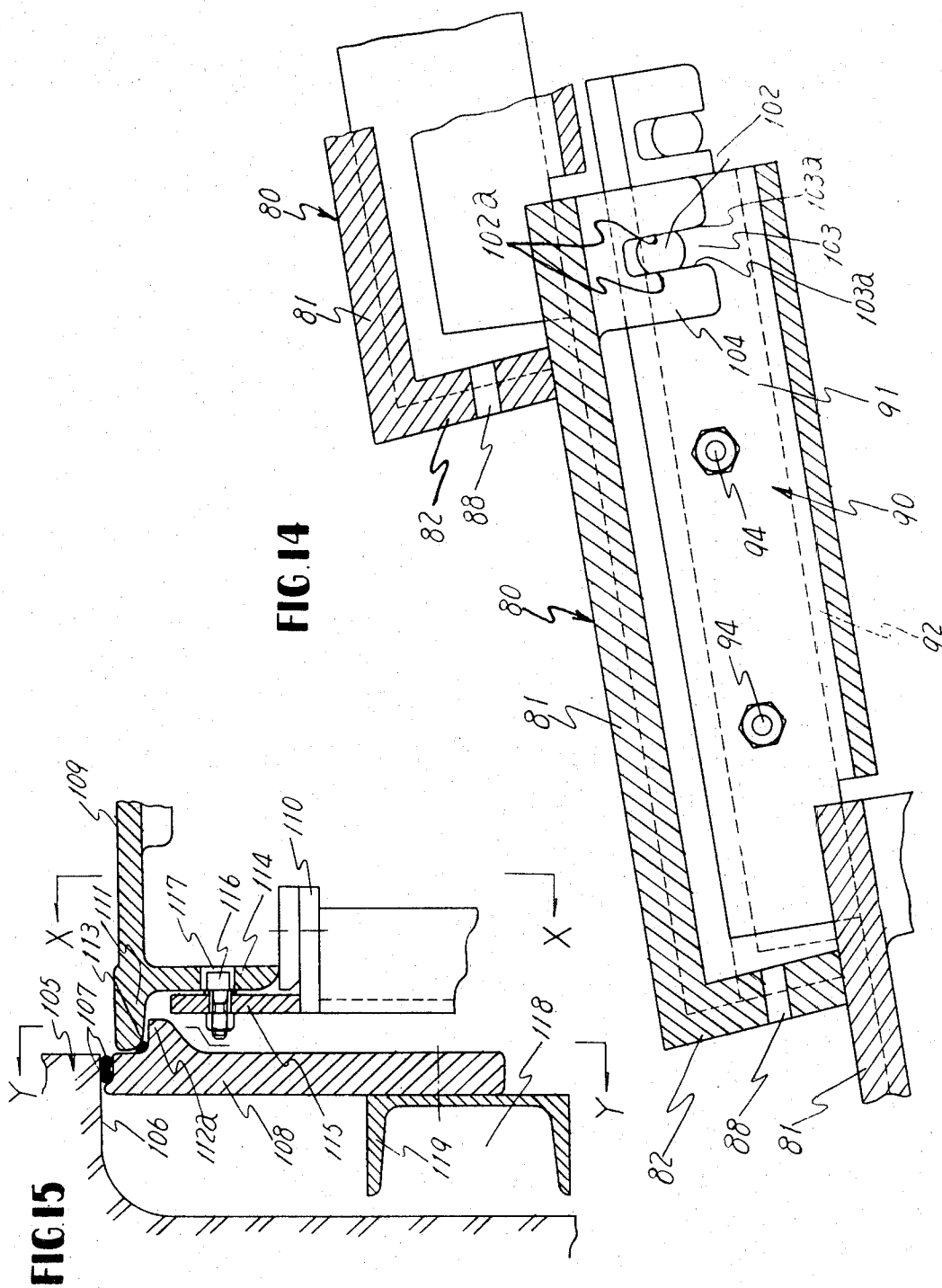


FIG. 17

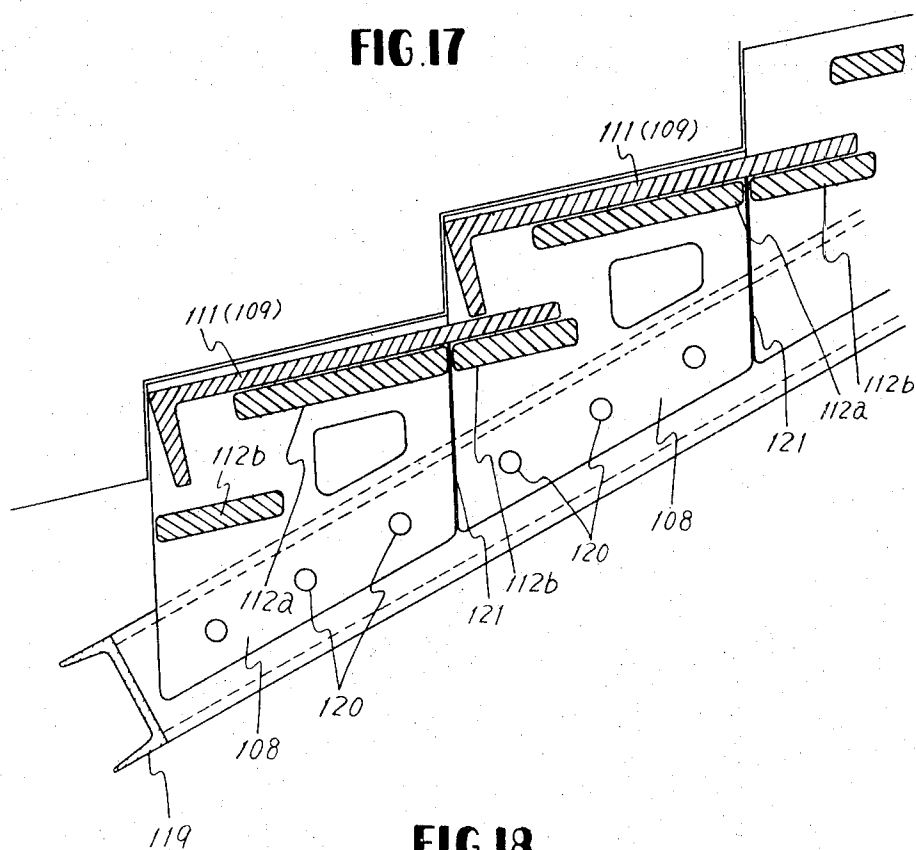
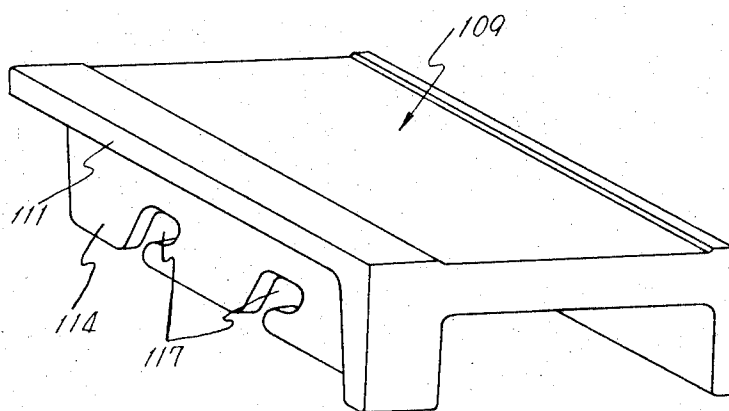


FIG. 18



INCINERATOR STOKER

BACKGROUND OF THE INVENTION

The present invention relates to an incinerator stoker for burning up industrial refuse, particularly solid wastes containing a large amount of plastics.

Heretofore, in a stoker of this type, groups of movable hearths and stationary hearths are disposed alternately in a direction perpendicular to the direction of feeding material to be incinerated, are arranged in steps and the material to be incinerated is placed on each step and conveyed down step by step by reciprocating each movable hearth between the stationary hearths in the direction of the steps. With this construction, however, there is a problem described subsequently. Because the movable hearths are reciprocated longitudinally between the stationary hearths with the movable hearths and stationary hearths juxtaposed laterally, regardless of how closely both hearths may be abutted against each other, it can not be avoided that ashes or melted plastics or the like produced by burning penetrate between both hearths. On the other hand, in an existing stoker, a gap is formed positively between both hearths to effect the supply of air through the gap. But, it is very difficult to set the dimension of the gap. When the gap is too narrow, there is brought about a problem in that the melted plastic chokes the gap and thereby the sliding motion of the movable hearth with respect to the stationary hearth and the flow of air for combustion are deteriorated, and when the gap is too large, material not burned completely falls down through the gap. Melted plastic flowing down through said gap below the stoker is undesirable because the melted material is tar-like and troublesome to dispose of and accordingly a stoker without said gap is desirable.

SUMMARY OF THE INVENTION

The principal object of the present invention is to provide an incinerator stoker feasibly to satisfy the requirement as mentioned above.

An incinerator stoker according to the present invention includes a hearth assembly comprising stepped stationary hearths having alternate horizontal step surfaces and vertical wall portions, movable hearths adapted to be moved in and out on each of the horizontal step surfaces through openings provided in each of the vertical wall portions at suitable intervals in a direction width-wise of the stationary hearth, air holes provided in the front vertical portion of each of said movable hearths and in the vertical wall portions of the stationary hearth between the movable hearths and driving means for moving said movable hearths in and out.

With an incinerator stoker of such a construction, material to be incinerated such as solid waste containing a large amount of plastics is burned up while being pushed down onto a next lower step successively on the stepped stationary hearths and being stirred up by the movement of each of the movable hearths. Since the air holes provided in the vertical portions have less possibility of being covered with melted plastics or other cinders, the supply of air for combustion is carried out satisfactorily at all times and thereby combustion efficiency may be increased. And, as there is no gap in the whole floor of the hearth assembly hardly any cinders flow down below the stoker compared to the construc-

tion mentioned above, and the object expected may be accomplished.

Several other features and effects of the present invention will be understood readily from the explanation to follow of some preferred embodiments illustrated in the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional elevation of an incinerator stoker according to a first embodiment of the invention;

FIG. 2 is a plan view thereof;

FIG. 3 is an enlarged perspective view of a portion of the stoker of FIG. 1;

FIG. 4 is an enlarged partial side elevation showing driving means for the stoker of FIG. 1;

FIG. 5 is an enlarged partial elevation showing an alternate form of driving means;

FIG. 6 is a perspective view of a movable hearth member, shown in inverted position;

FIG. 7 is a partial side elevation of a modified construction in which refractory material is used as part of the stationary hearth;

FIG. 8 is a partial side elevation showing an alternate form of driving means;

FIG. 9 is a longitudinal side elevation of a modified stoker construction provided with steps especially large height;

FIG. 10 is a perspective view of a portion of a stoker of concrete construction;

FIG. 11 is a perspective view of a reverse channel member used in the construction of FIG. 10;

FIG. 12 is a transverse sectional elevation showing the rear of the construction of FIG. 10;

FIG. 13 is an enlarged longitudinal sectional view of the construction of FIG. 10;

FIG. 14 is an enlarged longitudinal sectional view showing an alternate construction of the structure of FIG. 10;

FIG. 15 is a partial cross section showing the sealing construction between a stationary hearth member and adjacent brick furnace wall;

FIG. 16 is a partial side elevation taken along the line X—X of FIG. 15;

FIG. 17 is a partial side elevation taken along the line Y—Y of FIG. 15; and,

FIG. 18 is a perspective view of a channel member adapted for the sealing construction of FIG. 15.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the embodiment of the present invention shown in FIGS. 1 to 4, 1 is a hearth assembly, and includes stepped stationary hearths 4 having alternate horizontal step surfaces 2 and vertical wall portions 3. A number of movable hearths 6 are adapted to be moved in and out on the horizontal step surfaces 2 through rectangular openings 5 provided in each of the vertical wall portions 3 at suitable intervals in a direction widthwise of the stationary hearth i.e., a direction horizontally perpendicular to the direction of inclination of the steps. The movable hearths 6, —each a hollow square column shape laid horizontally, having no bottom wall contacting the horizontal step surface 2 and no rear end wall, —are arranged to form a plurality of straight rows in the direction of the inclination of the steps. In the front vertical portion 7 of each said movable

hearths 6 are provided air holes 8 passing therethrough, and in the vertical wall portion 3 of the stationary hearth located between adjacent movable hearths 6 are also provided air holes 9 passing therethrough. Driving means 10 for moving said movable hearths in and out, include a plurality of reciprocating bars 11 disposed to be moved up and down parallel to the direction of the inclination of the steps of the stationary hearths 4 below the hearth assembly 1, intermediate links connecting the rear end of each of the movable hearths 6 of a row corresponding to each of the reciprocating bars 11, a connecting bar 13 connecting integrally the upper end of each of the bars 11 and a fluid pressure cylinder device 15 having a piston stem 14 connected with the bar 13. Bar supporting seats 16 slidably support each bar 11, and bearing plates 17 support the movable hearths 6 when retracted through the openings 5 in the vertical wall portions 3.

At the underside of the hearth assembly constructed as above mentioned are arranged a plurality of air ducts 19. The opening of each duct 19 is constructed to face one of a plurality of sections into which the hearth assembly 1 is divided, and thereby supplies air all over the facing section which includes a plurality of movable hearths 6. An air blower 20 supplies air to each duct 19 through a main duct 21, an air flow regulating damper 22 is provided in each duct 19.

In FIGS. 1 and 2, 23 is the furnace wall of the incinerator equipped with the stepped stoker 18 constructed as above mentioned, 24 is a hopper for supplying material to be incinerated onto the uppermost step of the stepped stoker 18, 25 is a cinder pit located adjacent the lowermost step of the stepped stoker, 26 is an incinerating burner and 27 is a water spray nozzle disposed above a flue gas duct.

In the structure mentioned above, by reciprocating the piston stem 14 of the fluid pressure cylinder device 15, each reciprocating bar 11 is reciprocated and thereby all the movable hearths are moved in and out on the horizontal step surfaces 2 of the stationary hearths 4 with respect to the vertical wall portions 3 thereof. It is preferable to reciprocate the movable hearths 6 so that they do not move completely out of the rectangular openings with a stroke length substantially equal to the width of the horizontal step surface 2 in the direction of the step. When air for combustion and for simultaneously cooling the hearth assembly 1 is sent forth upward from below the hearth assembly through each air duct 19 by operating the air blower 20, the air for combustion is discharged laterally above the hearth assembly 1 through the air holes 9 in the vertical wall portions 3 of the stationary hearths and the air holes 8 in the vertical portions 7 at the front ends of the movable hearths.

When material to be incinerated is supplied properly onto the uppermost step of the stepped stoker 18, this material is pushed down successively onto a next lower step of the horizontal step surfaces 2 by the movement of the movable hearths 6. Accordingly, by firing the material to be incinerated with the burner 26 for incineration, the material being conveyed toward the cinder pit 25 is burned up very briskly under favor of the stirring action effected when the material falls down the steps and with the air for combustion supplied through each of the air holes 8 and 9. The cinder is then thrown into the pit 25.

As mentioned above, when a stoker according to the present invention is used, not only may a better combustion efficiency be obtained, but also, even when plastics are mixed in the material to be incinerated, since there is no gap or no opening in the bottom face of the whole hearth assembly, melted plastics never flow down below the stoker and there is no fear of impeding the supply of air for combustion due to the melted material.

As shown in this embodiment, when the hearth assembly is divided into a plurality of sections and an air duct is disposed for every one of the sections, a deviation of air flow such that the amount of air in a portion of the hearth assembly is less than that in the other portions thereof may be eliminated, and imperfect combustion or damage to the hearth may be prevented. When the hearth assembly 1 is divided from the uppermost end thereof into sections such as a drying section, a main combustion and an auxiliary combustion section, and an air duct is disposed for every one of the sections, it is possible to supply a suitable amount of air to each of the sections, so that perfect combustion of material to be incinerated and desirable incinerating action may be maintained and the disposing ability of the hearth assembly may be considerably upgraded.

The movable hearth 6 mentioned above may be constructed with porcelainous matter. Since porcelainous matter is superior to metal in corrosion resistance and in the range of temperature usable, perfect combustion of material to be incinerated under a high critical temperature may be carried out while the damage due to corrosion may be reduced to the least; and further, as porcelain is high in hardness, the damage due to wear may be improved and perfect incinerating work may be held for a long time.

Moreover, when the stationary hearth 4 is also prepared with porcelain, the effect mentioned above may be demonstrated more distinctly.

FIGS. 5 and 6 show a modified embodiment of the movable hearth and the driving means thereof. The driving means in this embodiment includes a reciprocating bar 31 disposed under a stationary hearth 30 and movable up and down substantially parallel to the direction of inclination of the steps thereof, a pin 34 protruding laterally from a bracket 33, projecting from the bar 31 toward the movable hearth 32, and a bifurcated member 36 projecting downward from the rear end of a movable hearth 32 and having a vertical slot 35 fitting loosely with said pin 34. The bar 31 may be reciprocated with a cylinder device or the like as shown in FIG. 1. The movable hearth 32 including said bifurcated member 36 is formed integrally with porcelainous matter and in the front end vertical portion 37 is provided with an air hole 38 as shown in FIG. 6. And, as shown in FIG. 5, in the horizontal step surface 39 of the stationary hearth 30 there is provided a shallow groove 40 in which the movable hearth 32 is slidably fitted.

In this embodiment, the reciprocating motion of the reciprocating bar 31 is transmitted to each of the movable hearths 32 through the pins 34, the slots 35 and the bifurcated members 36. Each movable hearth 32 is moved in and out on the horizontal step surface 39 through the opening provided in the vertical wall portion 41 of the stationary hearth 30 accompanied by relative up-and-down motion between the pin 34 and the slot 35.

FIG. 7 shows an embodiment wherein the surface of the vertical wall portion 46 of the stationary hearth 45 is constructed with a refractory block 48, such as porcelain or the like, attached to a metal body by bolts 49. Said refractory blocks 48 may be fitted all over the surfaces of the vertical wall portions 46 of the stationary hearth or only between the openings through which the movable hearths pass.

The surface of the vertical wall portions of the stationary hearth is not likely to be covered with cinders, and is thereby particularly more liable to be exposed to an atmosphere of high temperature than other portions and to be corroded. Accordingly, when such portion is constructed with a refractory such as porcelain or the like as mentioned above, said vertical wall portion may be protected fully and thereby perfect combustion of material to be incinerated under a high critical temperature may be made possible and simultaneously damage due to corrosion may be reduced to the least. When the present invention is embodied in a combination of this embodiment and the embodiment wherein the movable hearth is constructed with porcelainous matter, the present invention will be more effective.

In the embodiment shown in FIG. 1, all the movable hearth move in and out in the same direction. Consequently the material to be incinerated that is pushed down by the movable hearth on an upper step falls onto the movable hearth on the next lower step similarly being moved in and out, and initially when the movable hearth on the next lower step is being retracted, the material to be incinerated falls onto the horizontal step surface of the stationary hearth of the said lower step. In this case, it is noticed that a part of the material on the movable hearth being retracted may be dragged into the gap between the opening in the vertical wall portion of the stationary hearth through which the movable hearth passes and impede the smooth movement of the movable hearth. Accordingly, it is preferable to use driving means for reciprocating as one group the movable hearths disposed on every other step and for reciprocating the remaining movable hearths as another group so that the direction of the movement of both groups of the movable hearths may be opposite to each other.

When using such driving means, the material to be incinerated resting on the lower step of a movable hearth being moved backward is subjected continuously to the pushing action of the movable hearth being moved forward on the next step above. The material to be incinerated is hardly dragged into the gap between the opening and the movable hearth moving there-through in comparison to the case mentioned above.

When a driving means is used which moves alternately the groups of the movable hearths disposed on every other step so that while each of the group of the movable hearths on each of the horizontal step surfaces located at every other step is stopped in the most retracted position thereof, the movable hearths on each of the remaining horizontal step surfaces may be moved in and out, further more desirable effects may be obtained.

An example of driving means feasible to carry out a driving system as mentioned above will be explained referring to FIG. 8. In this embodiment, a first reciprocating bar 55 and a second reciprocating bar 56 are provided, both similar to the bar 11 in the driving means shown in FIG. 4. The first reciprocating bar 55

is connected through intermediate links 59 with the rear ends of the movable hearths 58a on the horizontal step surfaces 57a of the stationary hearths located on every other step, and the second reciprocating bar 56 is connected through intermediate links 60 with the rear ends of the movable hearths 58b on the remaining horizontal step surfaces 57b. Said first reciprocating bar 55 and the second reciprocating bar 56 are each driven separately with a driving device such as a cylinder device. Consequently, by controlling properly the driving device driving the first reciprocating bar 55 and the driving device driving the second reciprocating bar 56, a driving system as mentioned above may be obtained.

Dividing the driving means into a first driving means and a second driving means as above mentioned, may be applied to an embodiment using no intermediate link such as that shown in FIG. 5. With the two driving means, the number of reciprocating motions per unit time of the two groups may also be made different from each other.

In the embodiment shown in FIG. 9 a stationary hearth 65 having vertical wall portions larger in height to increase particularly the fall is used after each plurality of vertical wall portions. In the example illustrated, the hearth assembly is divided into an upper section 68, a middle section 69 and a lower section 70 with the two dividing vertical wall portions 65 larger in height, and driving means 72, 73 and 74 are provided respectively for each of the sections to drive the movable hearths 71 therein. Each driving means comprises a reciprocating bar 76 driven by a cylinder device 75 and intermediate links 77 connecting each of the movable hearths 71 and the reciprocating bar 76.

By adopting the vertical wall portion 65 larger in height as above mentioned, the material to be incinerated in falling along the vertical wall portion 65 is turned over and stirred up very satisfactorily, so that for the incinerator as a whole the combustion efficiency thereof may be increased, and moreover, the incinerator per se may be constructed with a lower height than when all the vertical wall portions are made larger in height.

In the embodiment shown in FIGS. 10 to 13, 80 is an L-shaped step member (FIG. 13) including a ceiling plate portion 81 and a vertical wall plate 82 extending downward from the front end of the ceiling plate portion 81; 83 (FIG. 11) is a reversed channel step member including a ceiling plate portion 84 and vertical side plates 85 extending downward from both sides of the ceiling plate portion 84. In the horizontally lateral direction said step members 80 and 83 are disposed alternately and with the ceiling plate portion 84 of the reversed channel member 83 located slightly lower, and the stationary hearth 86 is constructed by arranging the same members in stepped formation in the direction of the inclination of the steps. A movable hearth 87 is adapted to be moved in and out from the inside of the reversed channel member 83 on the ceiling plate portion 84 of the reversed channel member 84 of the next lower step. An air hole 88 is provided in the vertical wall plate 82 of the L-shaped member 80 and 89 is an air hole provided in the front vertical portion of the movable hearth 87.

Supporting means for said step members include attaching bases 90 of L-shape in section (FIG. 12) which are arranged in pairs to face each other with their verti-

cal plate portions 91 positioned at both sides of said reversed channel member 83, and with their horizontal plate portions 92 positioned under the reversed channel member 83. Recessed portions 93 (FIG. 11) are formed in the member 83 by cutting in two positions front and rear on each of both vertical side plates 85 from the lower edge thereof. Reversed channel member propping pins 94 protrude inwardly from the facing vertical plate portions 91 on each pair of the attaching bases and are fitted in each of the recessed portions 93.

The horizontal plate portions 92 of a pair of the attaching bases 90 holding said reversed channel member 83 therebetween serve also as the supporting guide for the movable hearth 87 located within the reversed channel member 83.

When constructed as above mentioned, the part of the stationary hearth that is the reversed channel member is positioned only by the engagement of the pins 94 in the recessed portions 93, so that the attaching or detaching thereof is extremely easy. Consequently, labor or time required for maintenance work such as inspection, repair and replacement of the reversed channel member, or of the movable hearth which is liable to be worn rapidly, may be reduced widely.

The attaching structure for the L-shaped step member 80 will be explained, referring to FIGS. 12 and 13. On the pair of the attaching bases 90 positioned below both sides of the ceiling plate portion 81 of each step member 80 are supporting brackets 95 projecting inwardly respectively from the upper portion of each of the rear ends of the facing vertical plate portions 91. A latching bar 96 is mounted between the facing vertical plate portions 91 in a position near the middle lengthwise thereof. On the underside of the ceiling plate portion 81 of each step member 80 are attached with bolts and nuts 99 through liners 98, L-shaped latching pieces 97 engageable with said latching bar 96 from the underside thereof. Both side edges at the rear end of the ceiling plate portion 81 are adapted to be attached to said brackets 95 with bolts and nuts 101 through spacers 100.

When an L-shaped step member 80 is to be attached, it is secured to the brackets 95 with the bolts and nuts 101 after sliding the step member 80 rearward and upward on the lower step of the stationary hearth 86 to engage the latching pieces 97 to the latching bar 96. Similarly, the members 80 of the upper steps may be attached successively to cover the exposed heads of the bolts and nuts 101.

With the structure above mentioned, the bolts and nuts for attaching the L-shaped step member are covered by the L-shaped step member of the next upper step and are not exposed in the surface of the stepped stationary hearth, so that in attaching and detaching of the bolts, difficulties due to corrosion of a bolt head, or clogging of a bolt hole may be avoided.

When the L-shaped latching piece 97 is attached as mentioned above, the latching piece may be adjusted for tight engagement to the latching bar 96. Also the L-shaped latching piece 97 may be formed integrally with the ceiling plate portion 81 of the step member 80.

As illustrated in FIG. 12, when both side edges of the ceiling plate portion 81 of the L-shaped step member 80 are overlapped respectively on the raised portions 84a at the side edges of the ceiling plate portions of the adjacent reversed channel members 83 and, when the back surfaces near the sides of the vertical wall plate 82

at the front end of the L-shaped step member 80 are contacted with the front surfaces of the vertical side plates 85 of the reversed channel step member 83, cinders, particularly melted plastics may be prevented from flowing down below the hearth.

As shown in FIG. 14, the hearth assembly also may be constructed to support the L-shaped step member 80 in a prescribed position by providing a latching bar 102, corresponding to the latching bar 96 shown in FIG. 13, between a pair of the attaching bases 90 near the rear end of the L-shaped member 80. One or more bifurcated plates 104 each having an opening 103 engageable with the latching bar 102, extend downwardly from the underside of the ceiling plate portion 81 of the step member 80 near the rear end thereof. Thus, the step member 80 may be dropped into place to fit together the notched opening 103 of the bifurcated plate 104 and the latching bar 102. When parallel side surfaces 102a are formed on the latching bar 102 and are abutted by the parallel inner side surfaces 103a of said opening 103, the L-shaped member 80 may be prevented from rotating about the latching bar 102. Alternatively, the L-shaped member 80 may be permitted to rotate about the latching bar 102 to make the contacting portion of the L-shaped member 80 fit evenly with the reversed channel member 83 adjacent thereto.

The embodiment shown in FIGS. 15 to 18 relates to sealing structure between the stepped stationary hearth and the brick furnace wall and is characterized by a side wall sealing plate 108 installed with refractory packing 107 interposed between the side wall sealing plate 108 and the inner face of the brick side wall portion of the incinerator. A reversed channel member 109, located inside of the side wall sealing plate 108, is installed detachably on an attaching base 110, and a protruding side portion 111 of the reversed channel member 109 rests on protrusions 112a and 112b projecting from the inside of the side wall sealing plate 108.

The reversed channel members 109 correspond to the reversed channel members 83 of the embodiment shown in FIGS. 10 to 12, and similarly are arranged in a stepped manner and are equipped with movable hearths. Similarly to said reversed channel member 83, the reversed channel member 109 may be set in a prescribed position in one operation by fitting notched openings 117 in the side plates 114 thereof on pins 116 protruding from the upright plate portion 115 of the attaching base 110.

The side wall sealing plates 108 are attached with bolts 120 to a supporting metal channel section 119 providing within the recessed portion 118 of the side wall brick work 105 as shown in FIGS. 15 and 17. Asbestos tape 121 is interposed between the vertical edges of the side wall sealing plates 108. The side wall sealing plates 108 contact the upper surface of the recessed portion 118 of the side wall brick work with the packing 107 interposed therebetween. Further, each side wall sealing plate 108 has upper and lower protrusions 112a and 112b with the upper protrusion 112a of a sealing plate 108 and the lower protrusion 112b of an adjacent sealing plate 108 forming a combined protrusion 112a, 112b in a straight line to support the refractory packing 113 against the extended plate portion 111 of a reversed channel member 109.

The packings 107, 113, for example, may comprise refractory rope (asbestos), and the side wall brick work 105 may be constructed with fire bricks.

When constructed as described above, the following effects may be obtained.

1. The upper side of the stationary hearth and the air chamber under the hearth are separated completely by said packings 107, 113 so that when burning dusts or refuse containing a high percentage of plastics, for example, melted plastics are prevented from flowing down below the hearth between the hearth and the furnace wall.

2. The sealing effect obtained by means of the side wall sealing plate and the packing allows the attaching or detaching of the hearth plates to be carried out readily on the supporting base in comparison to the case of sealing obtained by means of sealing filler (the sealing filler is liable to stick to the hearth plate).

The attaching bases 90, 110 shown in FIGS. 12 to 16 may be attached respectively on the rest of the structure disposed below them (not shown) and extending parallel to the direction of the inclination of the stepped stationary hearth.

We claim:

1. An incinerator stoker comprising a plurality of stepped stationary hearths having alternate horizontal step surfaces and vertical wall portions, openings provided in the vertical wall portions at suitable intervals widthwise of the stationary hearths, movable hearths having front end vertical portions and adapted to be moved in and out on the horizontal step surfaces through said openings, air holes provided in the front end vertical portions of said movable hearths and in the vertical wall portions of the stationary hearths between the movable hearths, and driving means for moving said movable hearths in and out.

2. An incinerator stoker according to claim 1, including a vertical wall portion of greater height separating groups of vertical wall portions of lesser height in said stationary hearths.

3. An incinerator stoker according to claim 1, wherein said driving means are arranged to drive as one group the movable hearths on alternate horizontal step surfaces and to reversely drive as another group the movable hearths on the remaining horizontal step surfaces.

4. An incinerator stoker according to claim 3, wherein said driving means comprises a separate driving device for each group of movable hearths.

5. An incinerator stoker according to claim 1 wherein said driving means comprises bars reciprocable underneath the stationary hearths, intermediate links connecting the bars to the rear end portions of the movable hearths and a driving device adapted to reciprocate said bars.

6. An incinerator stoker according to claim 1, wherein said driving means comprises bars reciprocable underneath the stationary hearths, brackets extending from said bars toward the movable hearths and pins protruding from said brackets, bifurcated members extending generally downward from the rear end portions of the movable hearths, said members loosely engaging said pins, and a driving device adapted to reciprocate said bars.

7. An incinerator stoker according to claim 1, including a plurality of air blast ducts having openings disposed below the hearths, the opening of each duct di-

viding the hearths into one of a plurality of sections with each section including a plurality of movable hearths, each of said ducts separately supplying air to each section.

8. An incinerator stoker according to claim 1, wherein at least one of said stationary hearths and movable hearths is constructed with porcelainous material.

9. An incinerator stoker according to claim 1, wherein the surface of the vertical wall portions of said stationary hearths comprises a metal supporting body and a refractory material fixed thereto.

10. An incinerator stoker according to claim 1, wherein said stationary hearths include L-shaped step members each comprising a ceiling plate portion and a vertical wall plate extending downward from the front end thereof, reversed channel step members each comprising a ceiling plate portions and vertical side plates extending downward from both side edges thereof; supporting means on which said step members are disposed laterally alternately to form each step; and, wherein said movable hearths are installed within said reversed channel step members and are movable in and out on the ceiling plate portions of the reversed channel step members on the next lower step.

11. An incinerator stoker according to claim 10, wherein said reversed channel step members each include recessed portions extending upwardly from the lower edges of said vertical side plates, and wherein said supporting means include pairs of attaching bases having vertical portions and pins extending from said vertical portions, said pins facing each other and adapted to be engaged by said recessed portions thereby allowing upward detachment of the reversed channel step members.

12. An incinerator stoker according to claim 10, wherein said L-shaped step members include L-shaped latching pieces facing rearwardly on the undersides thereof and the rear ends of the L-shaped step members are attached detachably by connections to said supporting means, said connections being protectively covered by the L-shaped members of the next step above, and wherein said supporting means include latching bars engageable by said L-shaped latching pieces.

13. An incinerator stoker according to claim 10 wherein said L-shaped step members each include a downwardly extending bifurcated plate located on the underside of the ceiling plate thereof and wherein said supporting means include latching bars engageable by said bifurcated plates.

14. An incinerator stoker according to claim 10, including side walls, sealing plates parallel to said side walls and refractory packing interposed between said sealing plates and said side walls, and wherein said reversed channel step members adjacent to said sealing plates include side protrusions, said sealing plates include protrusions, and refractory packing is interposed between said sealing plate protrusions and said channel step member protrusions.

15. An incinerator stoker according to claim 10 wherein said supporting means include pairs of attaching bases, each of said pairs including laterally spaced vertical portions disposed below one of said L-shaped step members and adjacent to the vertical side plates of reversed channel step members on either side of said one L-shaped step member, and connecting means for the step members carried by said vertical portions of the attaching bases.

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