

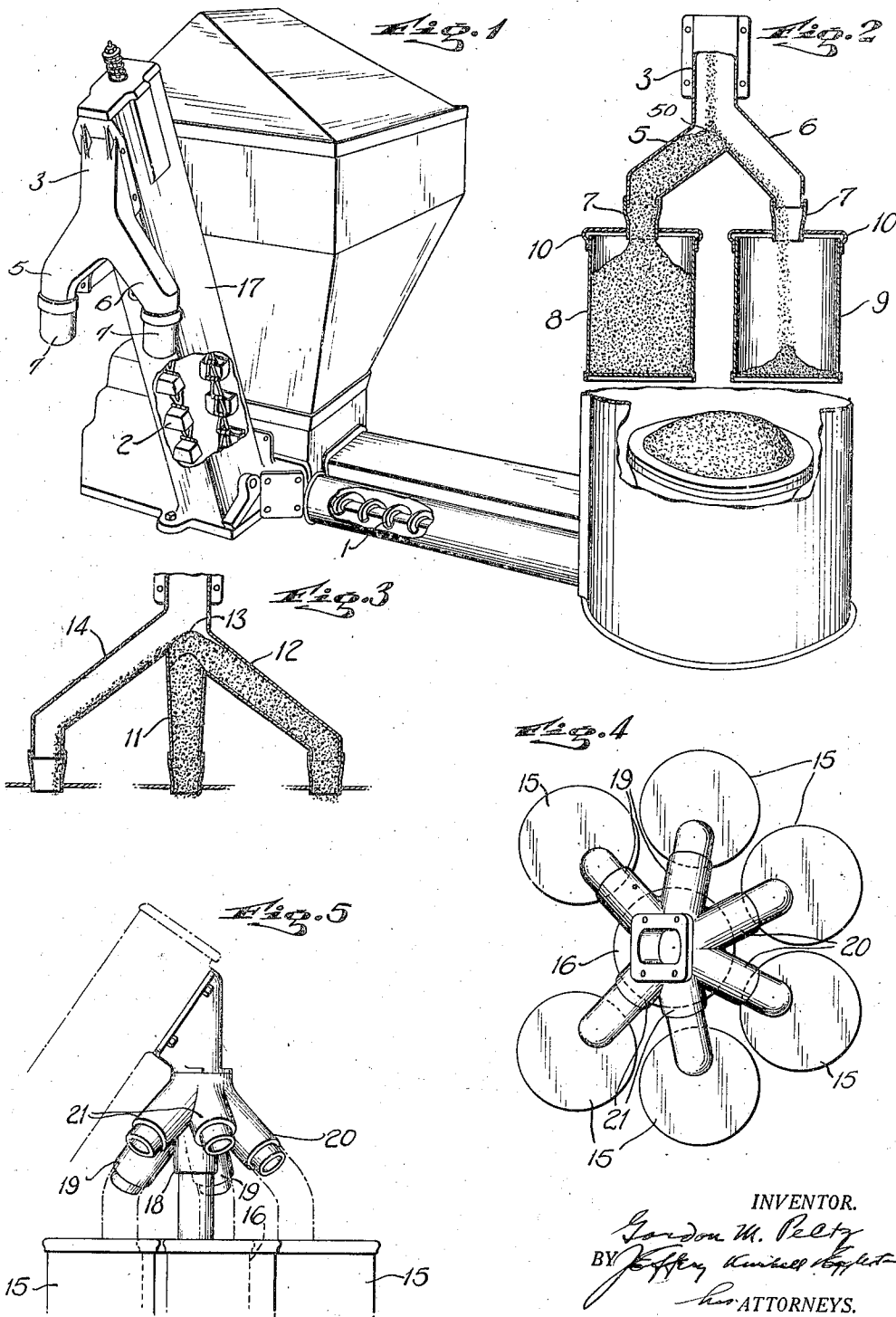
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ASH DISPOSAL MEANS

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ASH DISPOSAL MEANS

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The general object of the invention is to provide for the disposal of the ashes from a furnace that produces ashes in such quantities that a single ash can is or may be inadequate. In brief, I employ a number of discharge ports, as it were, in the ash-removing system, to discharge successively, and with these at least one can which is arranged to receive ashes from the first discharge port to receive ashes; there may be as many ash cans as there are discharge ports. By thus providing an, say, extra discharge port or ports that is unused normally, the invention eliminates the possibility, existing with single-port single-ash-cans stokers, that failure to empty an ash can at the anticipated time may bring about damage to the stoker or extinguishment of the fire through an accumulation of ashes in the stoker, and by permitting the use of a number of ash cans that are filled successively, one after another, it provides an ash-disposal arrangement that is suitable for automatic furnaces and stokers that produce ashes in such quantities that a single ash can is not sufficient. The invention therefore is particularly useful in connection with household heating furnaces having large fuel hoppers or which are supplied with fuel automatically direct from the coal bin of the house, and especially in connection with the larger of such solid fuel stokers as are used for heating homes.

In stokers of this type, which are fully automatic, not only is the fuel fed mechanically to the furnace but usually the ashes are also mechanically removed and discharged into an ash can. To avoid frequent attention by the householder or furnace attendant, I provide preferably a number of such cans, rather than a single one, each supplied by an individual outlet or spout receiving ashes ejected from the stoker. These outlets are specially arranged with respect to the ash flow from the furnace so that after the first can has been filled another outlet becomes active and the corresponding can is filled, and so on, the cans filling successively. As a result, whenever it is desired to dispose of the ashes so collected, which may and is assumed to be after a considerable interval, there will always be one or more completely filled cans to be emptied and therefore no necessity or occasion to raise dust and scatter ashes in the neighborhood of the stoker by completely filling one or more of the cans from the others. In other words, if, in the interval between ash disposals, a quantity of ashes sufficient to fill only one can has been discharged from the stoker, all of such ashes will be in one can and not partially filling two or more of them.

The invention also contemplates an improved arrangement for connecting ash cans to ash-removing systems as appears hereinafter.

Illustrative embodiments of the invention are shown in the accompanying drawing, it being understood that the arrangement is subject to wide modification to suit the conditions in hand.

In the drawing, Fig. 1 is a perspective view of a well-known household type coal stoker having the invention applied to it, Fig. 2 a section of the receiving member with two cans arranged for successive filling by it, Fig. 3 a section, more or less diagrammatic, of a modification and Figs. 4 and 5 a plan and elevation, respectively, illustrating the invention applied to a large seven-can installation.

In a stoker of the kind illustrated, the ash removing means comprises a screw 1 and a bucket-type elevator 2, although any other suitable construction may be employed to deliver the ashes to preferably the down-spout or receiving member 3. As a matter of convenience where, as usual, the stoker is at or close to the floor level, the conveying means or elevator delivers at a sufficient height to permit of a gravity fall of the ashes through the member 3 to the cans, two of which are contemplated in the installation of Fig. 1.

The member 3 may be cast as a unit with two outlet spouts 5 and 6, having hose extensions 7 or otherwise arranged to discharge into the cans 8 and 9 respectively (Fig. 2), and each hose may desirably be passed through a hole in the dust-tight can covers 10. The single line of ash flow from within the furnace is continued or extended by the member 3 and whether the ash flow down through the upper part of member 3 is substantially along its center line or otherwise is of no moment to the invention, that being merely an incident of the elevator discharge arrangement, but in any event the outlets are variously, i. e. differently, placed with respect to the ash flow through such member so that initially all of the ashes discharge through one outlet. In the form shown, where the bucket elevator is symmetrically located with respect to the receiving member and discharges the ashes into it more or less centrally, the desired result is accomplished by placing the mouth of outlet 5 so as to be intersected by the axis of member 3, and the outlet 6 offset with respect to it.

With this construction it follows that all of the ashes first passing down through member 3 will discharge by way of outlet 5, into its can 8 and that this will continue until such can and its out-

let are filled substantially to the height indicated by the line 50 (Fig. 2), the accumulation being more or less conical in accordance with the angle of rest of the material. Thereafter, however, as the height of the cone tends to increase, the ashes delivered strike this accumulation and overflow as it were, through outlet 6 and into its can 9, which in turn is filled. Although each outlet is thus filled, as well as its can, I have found the ashes are so lightly packed that if each can is struck or shaken prior to its removal to be emptied, the ashes settle down and those in the adjacent outlet are easily accommodated in the respective cans provided the diameters of the outlets or spouts 5-7 and 6-7 are sufficiently smaller than the diameters of the cans and the discharge ends of these outlets or spouts are located at a suitable distance above the bottoms of the cans. It is preferred, but not altogether essential, that the downward slope of the bottom of each of the outlets be somewhat greater than the angle of rest of the material; with ashes, this angle is about 45°, which is the angle at which I usually slope the outlets; strictly speaking, it is only necessary that the outlets or conduits 5 and 6 provide passageways leading downwardly at an angle to the horizontal greater than the angle of rest of the ashes in the passageway.

Where it is desired to use more cans, a three-way receiving member, such as illustrated in Fig. 3 may be employed. The principle of operation is the same. After the central outlet 11 has filled (following the filling of its adjacent can) the ashes flow through outlet 12, as before, and then, when the level rises to the line 13, they pass through outlet 14, which is at a higher level, to the can supplied thereby. In fact the number of outlets and cans is dictated solely by the requirements of the particular installation. For large installations, seven is a convenient number of cans to use since, as indicated in Fig. 4, they are capable of arrangement within a comparatively small compass, the six cans 15 being grouped closely around the central can 16 but usually slightly spaced on the stoker side to accommodate the elevator casing 17. A receiving member for supplying and successively filling such cans is illustrated in Figs. 4 and 5, there being a central outlet 18 and six lateral outlets variously placed around the wall of the member. To avoid increasing the height of the receiving member unduly to allow for outlets at six different levels, I prefer to arrange the lateral outlets in pairs, the ones marked 19 being at one level, 20 at another and 21 at still a third level, as indicated in Fig. 5; as between the two members of each pair, these may be placed in the manner illustrated in Fig. 2, or otherwise. As above described, the cans are filled successively but, after the first or central one, in pairs. In an installation of this capacity there may thus be, say, five completely filled cans to be emptied instead of that quantity of ashes distributed among all seven without filling any of them. In each case, as above mentioned with respect to the two-can assembly, the ashes filling up the outlets and the adjacent portion of the body member (as each outlet is filled and the next comes into action) are readily shaken down into the respective cans.

I claim:

1. The combination of at least one ash can, and means for burning solid fuel and delivering resulting ashes for said can in substantially a single line of flow, said means including means substantially surrounding said single line of ash flow,

characterized by the fact that the last mentioned means is provided with a plurality of ash exits differently located with respect to said line of flow so that as one exit is filled with ashes, ashes pass to another of said exits, and the first of said ash exits to receive ashes being an opening discharging to said ash can.

2. The combination of at least one ash can, and means for burning solid fuel and delivering resulting ashes for said can in substantially a single line of flow, said means including means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means is provided with a plurality of openings differently located with respect to said line of flow so that as one opening is filled ashes pass to another opening and spout means are provided at the first opening to receive ashes to lead ashes therefrom to said ash can.

3. The combination of at least one ash can, and means for burning solid fuel and delivering resulting ashes for said can, in substantially a single line of flow, said means including means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means is provided with a plurality of openings differently located with respect to said line of flow so that as one opening is filled ashes pass to another opening and the first opening to receive ashes discharging to said ash can.

4. The combination of a plurality of ash cans, and means for burning solid fuel and delivering the resulting ashes for a plurality of said ash cans, in substantially a single line of flow, said means including means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means is provided with a plurality of openings respectively discharging to said ash cans and differently located with respect to said line of flow so that as one opening is filled ashes pass to another opening.

5. The combination of a plurality of ash cans, and means for burning solid fuel and delivering the resulting ashes for a plurality of said ash cans, in substantially a single line of flow, said means including means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means includes a distributor distributing the ashes to a plurality of said cans successively.

6. The combination of a plurality of ash cans, and means for burning solid fuel including means for delivering resulting ashes, for a plurality of said ash cans, in substantially a single line of flow and means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means is provided with a plurality of openings differently located with respect to said line of flow so that as one opening is filled ashes pass to another opening, and conduit means connect said openings to different ones of said cans, each of said conduit means providing a passageway which, from the opening from which it leads to its discharge into an ash can, is at an angle to the horizontal greater than the angle of rest of the ashes therein.

7. The combination of a plurality of ash cans, and means for burning solid fuel including means for delivering resulting ashes, for a plurality of said ash cans, in substantially a single line of flow and means substantially surrounding said single line of ash flow characterized by the fact that the last mentioned means is provided with a plurality of openings one of which lies in said line of flow and another of which is at one side of said

line of flow, and conduit means connect said two openings to different ones of said cans, each of said conduit means providing a passageway which, from the opening from which it leads to its discharge into an ash can, is at an angle to the horizontal greater than the angle of rest of the ashes therein.

8. The combination of a plurality of ash cans, and means for burning solid fuel including means for delivering resulting ashes, for a plurality of said ash cans, in substantially a single line of flow and means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means is provided with a plurality of openings located at different heights so that as one opening is filled ashes pass to another opening, and conduit means connect said openings to different ones of said cans, each of said conduit means providing a passageway which, from the opening from which it leads to its discharge into the ash can, is at an angle to the horizontal greater than the angle of rest of the ashes therein.

9. The combination of a plurality of ash cans, and means for burning solid fuel including means for delivering resulting ashes, for a plurality of said ash cans, in substantially a single line of flow and means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means is provided with an opening in said line of flow and a plurality of openings located at different heights, so that as one opening is filled ashes pass to another opening, and conduit means connect said openings to different ones of said cans, each of said conduit means providing a passageway which, from the opening from which it leads to its discharge into an ash can, is at an angle to the horizontal greater than the angle of rest of the ashes therein.

10. The combination of a plurality of ash cans, and means for burning solid fuel including means for delivering resulting ashes, for a plurality of said ash cans, in substantially a single line of flow and means substantially surrounding said single line of ash flow, characterized by the fact that the last mentioned means is provided with a plurality of openings located at different heights so that as one opening is filled, ashes pass to another opening, and a conduit means connect each of said openings to different ones of said ash cans and at least one of said conduit means connects one of said openings to a plurality of said ash cans, said conduit means providing passageways which, from the opening from which the conduit means leads to its discharge into an ash can, are respectively at an angle to the horizontal greater than the angle of rest of the ashes therein.

11. The combination of a plurality of ash cans, means for burning solid fuel including means for delivering the ashes resulting therefrom, and a receiving member receiving the ashes from the

last mentioned means, characterized by the fact that said receiving member is a branched member through which the ashes flow by gravity, one branch thereof leading from the line of flow of ashes through the entrance end of said receiving member, and another branch leading from a point beside said line of flow and each of said branches leading to adjacent one of said ash cans and providing a passageway for ashes which is at an angle to the horizontal greater than the angle of rest of the ashes in the respective branch.

12. The combination of a plurality of ash cans, and a solid fuel stoker including means for withdrawing the ashes and elevating the ashes to a point above said ash can in substantially a single line of flow and means through which said single line of ash flow passes, characterized by the fact that the last mentioned means is provided with a plurality of openings differently located with respect to said line of flow so that as one opening is filled, ashes pass to another opening, and conduit means connect said openings to different ones of said cans, each of said conduit means providing a passageway which, from the opening from which it leads to its discharge into an ash can, is at an angle to the horizontal greater than the angle of rest of the ashes therein.

13. In means for receiving the ashes from means for burning solid fuel including means for delivering resulting ashes, for a plurality of ash cans, in a single line of flow, the combination of a plurality of ash cans, means through which said single line of flow of the ashes passes providing a plurality of openings differently located with respect to said line of flow so that as one opening is filled ashes pass to another opening, and conduit means connecting said openings to different ones of said cans, each of said conduit means providing a passageway which, from the opening from which it leads to its discharge into an ash can, is at an angle to the horizontal greater than the angle of rest of the ashes therein, and each of said conduit means having its discharge end located at such a distance above the bottom of the ash can into which it discharges, that by shaking the can both the ashes in the can and the ashes filling the respective passageway can be accommodated in the can.

14. In combination, an ash can, a cover to close the top of the can, said cover being provided with an aperture therethrough, a relatively rigid member for delivering ashes to a point higher than said cover, and a flexible hose connected to said rigid member and adapted to be inserted into and withdrawn from said aperture to form a passageway for ashes from said rigid member to the interior of the ash can, the diameter of said hose being so much smaller than the diameter of the can that by shaking the can both the ashes in the can and ashes filling the hose can be accommodated in the can.

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