United States Patent [19]

Von Berlichingen

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[54] **AIR SUPPLY FOR PIT TYPE REFUSE INCINERATOR**

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[52] **U.S. Cl.** ..... **110/8 R,** 110/72 R, 110/75 R

[51] **Int. Cl.** **F23g 5/00**

[58] **Field of Search** ..... 110/7 R, 7 A, 18 R, 8 R, 110/72 R, 75 R

[56] **References Cited**

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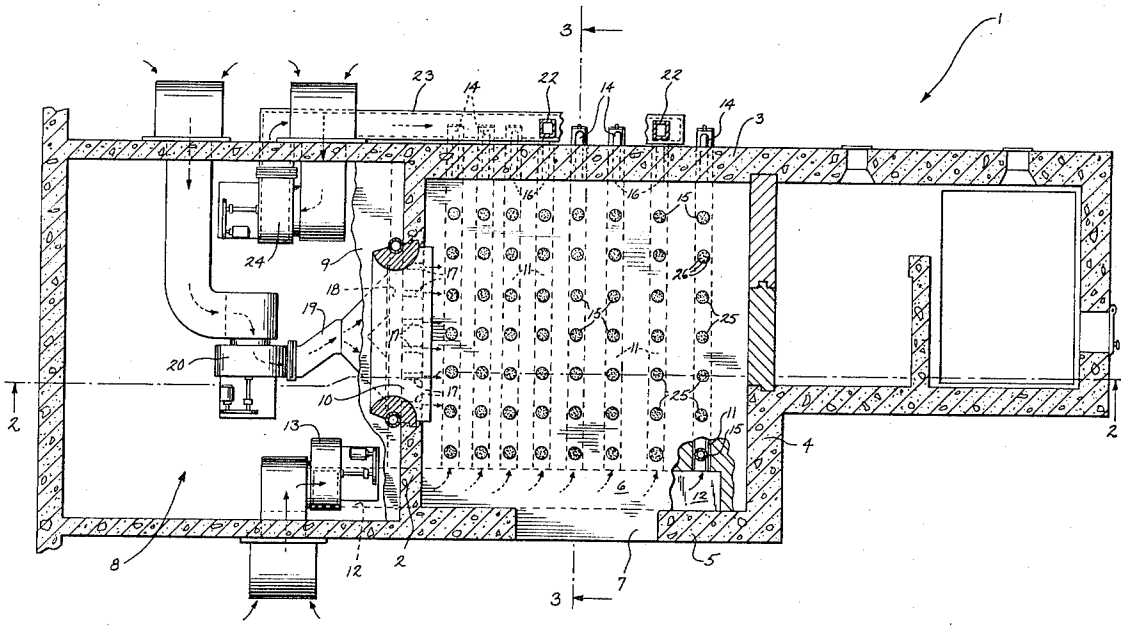
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[57] **ABSTRACT**

A pit type incinerator has a plurality of air ducts extending in parallel beneath the floor each supplying air through a plurality of under-fire ports in the floor. The ducts are supplied with air from suitable fan equipment adjacent the incinerator and discharging into one end of the ducts. One or more of the ducts connect with corresponding vertical ducts extending upwardly on the far side of the incinerator from the fans, and a plurality of over-fire jet ports supply air to the combustion chamber through the wall of the chamber from said vertical ducts.

7 Claims, 5 Drawing Figures



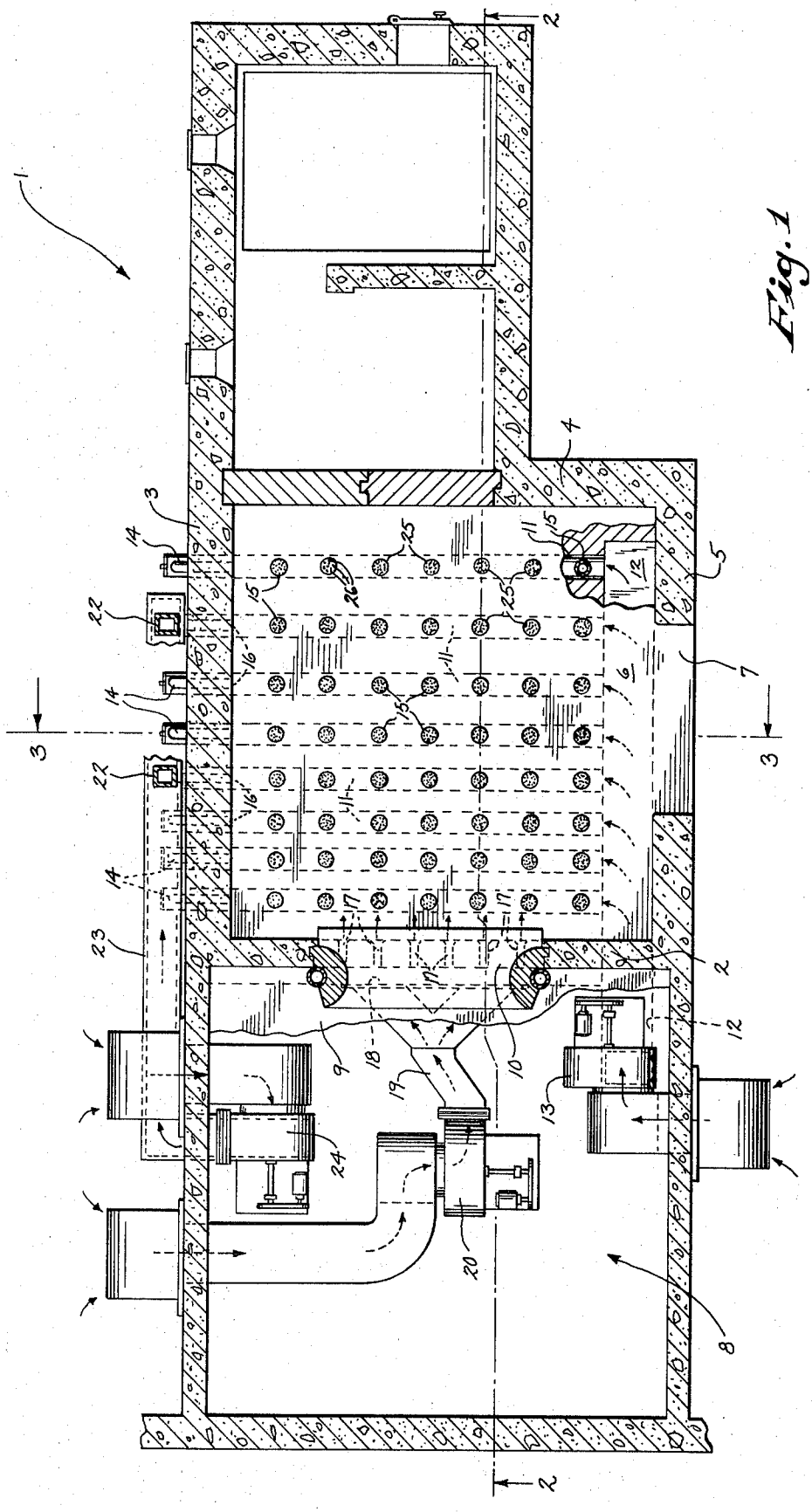


Fig. 1

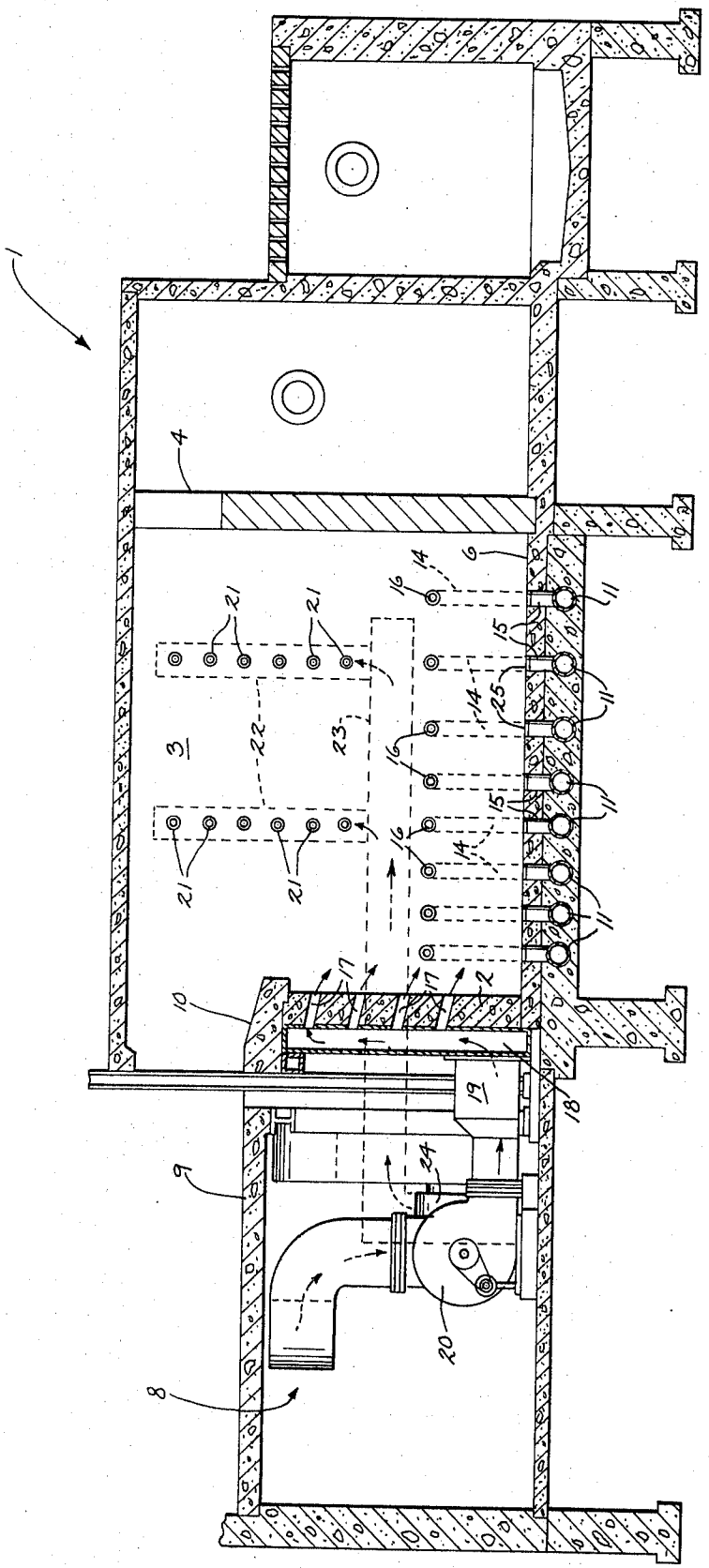


Fig. 2

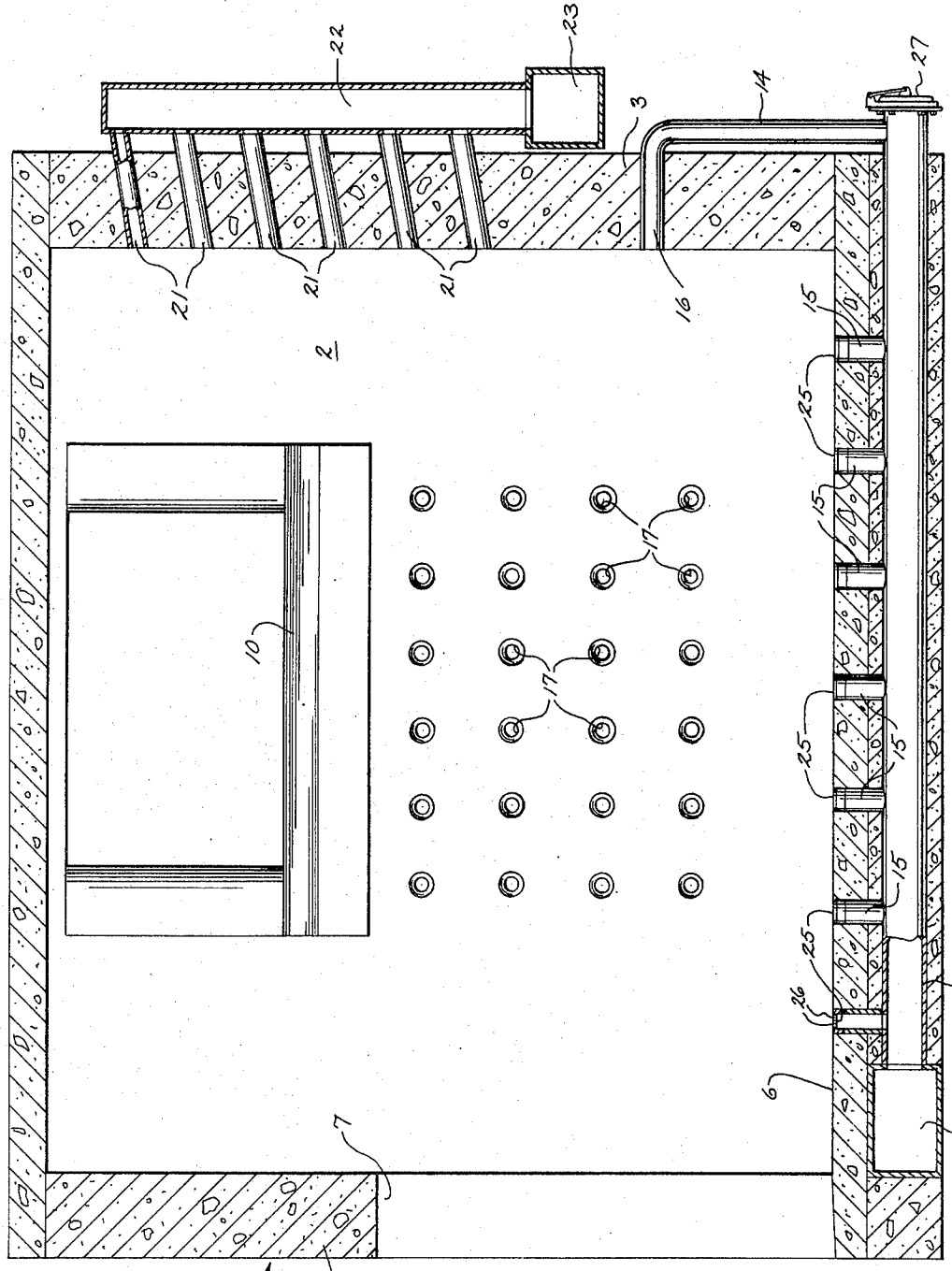


Fig. 3

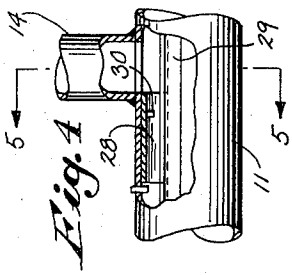


Fig. 4

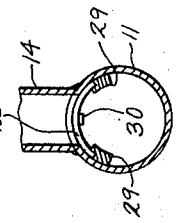


Fig. 5

AIR SUPPLY FOR PIT TYPE REFUSE INCINERATOR

BACKGROUND OF THE INVENTION

This invention relates to the air supply for a pit type refuse incinerator.

It has been the practice in constructing some pit type incinerators to provide air discharge jet ports in both the bottom and at least one side wall of the combustion chamber. Heretofore these ports have been supplied with air by ducts extending in parallel downwardly along the wall from a fan supplied header at the top, and then across beneath the bottom of the combustion chamber.

The resulting air supply to the combustion chamber was primarily through the over-fire ports in the side wall and secondarily through the under-fire ports in the floor.

By reason of this construction the force of the air being discharged upwardly through the floor ports was insufficient to maintain the ports free of ash.

SUMMARY OF THE INVENTION

According to the present invention the fan system supplies air to the free ends of the horizontal ducts beneath the floor and the upper ends of the vertical portion of the ducts are closed, whereby the primary discharge is through the underfire ports in the floor and the secondary discharge is through the over-fire ports in the wall of the combustion chamber.

The construction locates the fan room beneath the loading platform and additional ducts are provided leading to wall ports upon that side of the combustion chamber opposite the first named over-fire ports.

By reason of the invention a greater air flow is provided in the under-fire floor ports to maintain them more free of ash for a longer time in a cycle of operation of the incinerator.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawing illustrates the preferred embodiment constituting the best mode presently contemplated by the inventor for carrying out the invention.

In the drawing:

FIG. 1 is a horizontal section looking downwardly of the combustion chamber and adjacent fan room;

FIG. 2 is a vertical section taken generally on line 2—2 of FIG. 1;

FIG. 3 is a vertical section taken on line 3—3 of FIG. 1 with parts broken away as indicated;

FIG. 4 is an enlarged detail section of the closure for the overfire air duct; and

FIG. 5 is a section taken on line 5—5 of FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, the incinerator 1 is of the pit type and is preferably rectangular with side walls 2, 3, 4 and 5 and with a flat floor 6 which may slant downwardly at a slight angle toward the clean-out doors 7 in wall 5.

A fan room 8 is disposed adjacent wall 2 which is beneath the loading platform 9 and inlet chute 10.

A plurality of parallel air ducts 11 extend beneath floor 6 from adjacent wall 5 to beyond wall 3.

Air is supplied to ducts 11 by a header 12 in fan room 8, and which receives air from fan 13 in the fan room and extends along wall 5.

The far ends of ducts 11 connect with corresponding vertical ducts 14 extending upwardly along wall 3 and which are suitably closed at the top.

The ducts 11 constitute manifolds feeding air to a plurality of spaced ports 15 in the floor 6, and each vertical duct 14 terminates in a port 16 in wall 3.

Additional spaced ports 17 may be provided in wall 2 beneath chute 10, and may be supplied by a separate duct 18 and header 19 from fan 20 in the fan room 8.

Also additional spaced ports 21 are provided in wall 3 by a series of vertical manifold ducts 22 above ports 16 and which are supplied by a header 23 from fan 24 in fan room 8.

In the construction illustrated the air supplied to ducts 11 is primarily forced upwardly through the underfire ports 15 in floor 6 at such a velocity as to maintain the ports generally free of ash for the major portion of a cycle of operation.

For this purpose each port 15 is covered by a plate 25 which has a plurality of smaller jet openings 26 therein to provide a jet force to the air as it discharges therethrough.

The overfire wall ports 16 provide secondary air to the combustion chamber generally above any ash accumulation.

Should ports 15 become gradually clogged with ash the air continues to be supplied through the ports 16 in the same total volume to support combustion until a cycle of operation is complete.

The additional air discharge ports 17 in wall 2 tend to balance the ports 16 and 21 to maintain combustion centered in the combustion chamber and prevent a tendency for products of combustion to move directly through the chute 10 above.

Each duct 11 has a clean-out door 27 at the end beneath duct 14 to enable removal of ashes tending to fall into the duct.

Behind clean-out door 27 is an air shut-off valve for duct 14 in the form of an arcuate plate 28 fitting the upper portion of duct 11 at the mouth of duct 14 to close the latter.

Plate 28 is supported at its opposite side edges to slide in a corresponding channel member or track 29 secured to the inner side wall of duct 11.

A depending projection 30 centrally of plate 28 serves to facilitate manual sliding of the plate longitudinally of duct 11 to uncover the mouth of duct 14 and permit air to flow to and through port 16 when the underfire ports 15 become clogged with ashes.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. In an incinerator of the class described having a floor and surrounding walls defining a substantially rectangular combustion chamber with a clean-out opening in one side wall extending to the floor of the chamber and a charging opening in a wall at right angles to said first wall and disposed near the top of the chamber, a plurality of horizontal air ducts extending in parallel beneath the floor of the combustion chamber, an air supply header connected to one end of each duct near said first wall of the combustion chamber, a

plurality of vertically disposed ducts connected individually to the opposite end of each of said first named ducts and extending upwardly along and on the outside of the corresponding wall opposite said first wall of the combustion chamber with the upper end of each duct closed, a plurality of underfire jet ports in the floor of the combustion chamber connected to each said horizontal duct to receive air therefrom, an overfire port leading through the last named wall of said combustion chamber from each of said vertical ducts, whereby said horizontal ducts constitute manifolds supplying primary air through the floor to the combustion chamber and said vertical ducts supply secondary air through the wall to the combustion chamber, a blower room adjacent said combustion chamber and separated therefrom by said second named wall, a blower in said blower room connected to deliver air to said air supply header, and a charging platform closing the top of said blower room and communicating with said charging opening.

2. The construction of claim **1** and additional overfire air discharge means in said second named wall beneath

said discharge opening, and blower means in said blower room connected to said last named means to supply air thereto.

3. The construction of claim **1** in which each floor port is capped by a plate having smaller jet openings therethrough to more effectively prevent clogging by ash.

4. The construction of claim **1**, and a plurality of overfire discharge means in the wall above said first named wall ports with separate means to supply air therethrough.

5. The construction of claim **1**, and a clean-out door closing the end of each horizontal duct opposite said air supply header.

6. The construction of claim **1**, and a separate valve means to close each said vertical duct.

7. The construction of claim **6** in which said valve means are disposed in said horizontal ducts at the juncture of said vertical ducts therewith and closing the end of each horizontal duct opposite said air supply header and providing access to the corresponding valve means.

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