

[54] SMOKE ELIMINATOR DUMP CHUTE DOOR	2,161,412	6/1939	Gregg et al.	110/18
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[75] Inventors: Robert H. Wieken , West St. Paul; Harland C. Potter , White Bear Lake, both of Minn.	3,111,098	11/1963	Peterson et al.	110/18
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[51] Int. Cl. **F23g 3/00**

[58] Field of Search **110/18 A, 18 R, 173 R, 110/179**

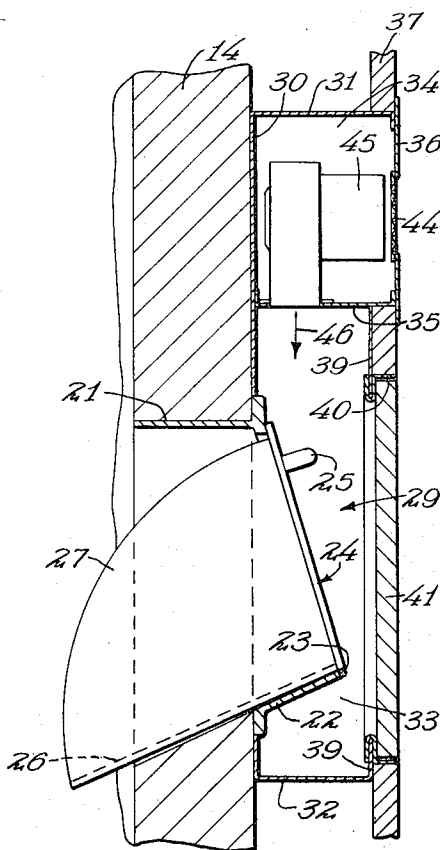
[57] **ABSTRACT**

An apparatus for preventing smoke leakage from chimneys provided with dump chute doors is provided. The device includes an enclosure encircling the dump chute door, and an access door in the enclosure providing access to the dump chute door. Means is provided for subjecting the interior of the enclosure to a slight positive pressure to overcome any position pressure experienced in the chimney.

[56] **References Cited**
UNITED STATES PATENTS

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8 Claims, 3 Drawing Figures



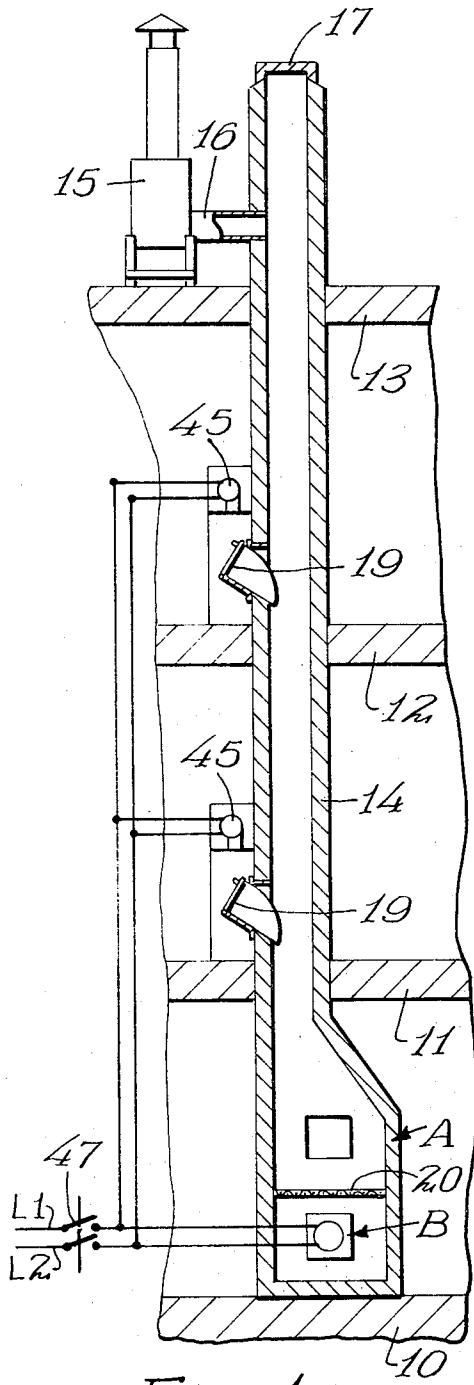


FIG. 1

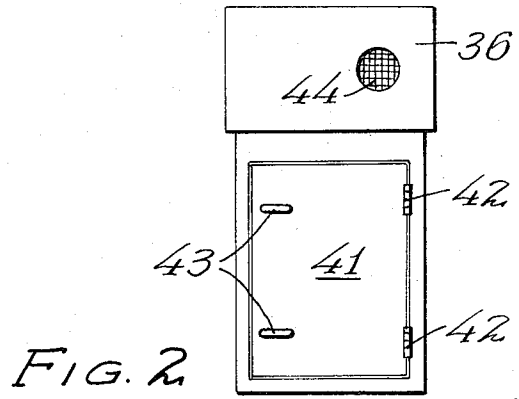


FIG. 2

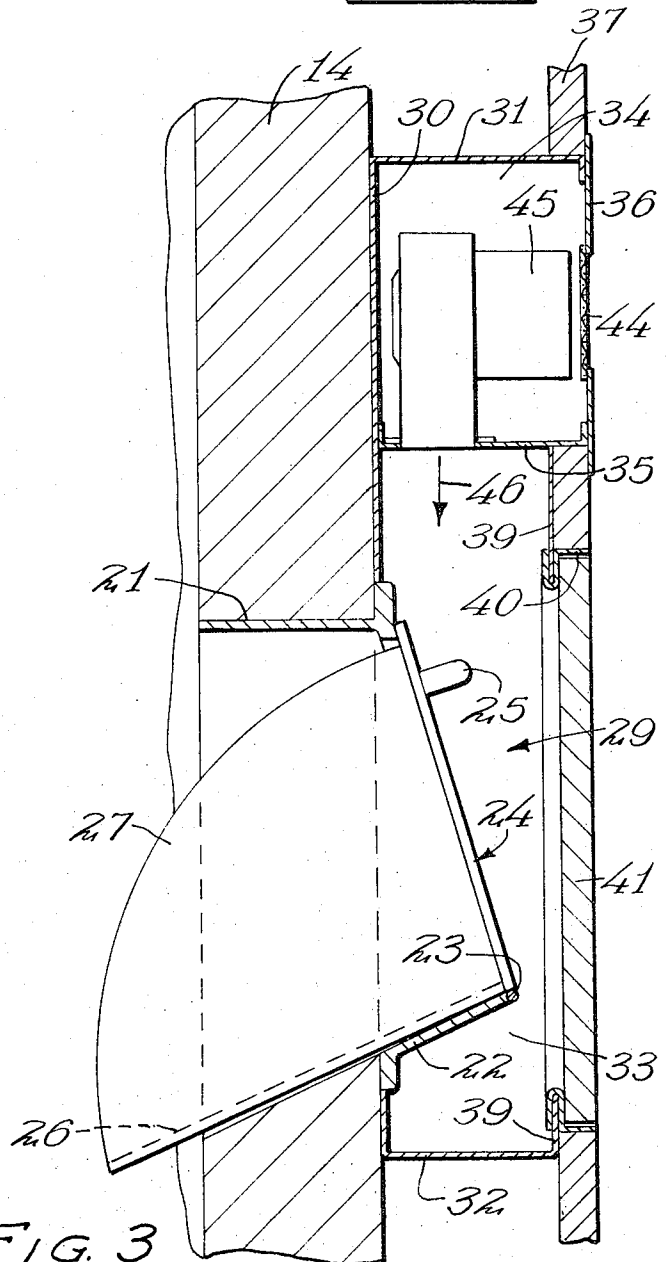


FIG. 3

SMOKE ELIMINATOR DUMP CHUTE DOOR

This invention relates to an improvement in smoke eliminator dump chute door enclosures and deals particularly with a device for preventing the escape of gases from an incinerator chimney.

BACKGROUND OF THE INVENTION

Apartments and similar dwelling houses are usually equipped with an incinerator in the boiler room or other basement area of the building provided with a chimney extending upwardly through the various floors to the roof of the building. This chimney is usually provided with a dump chute door on each floor into which garbage, trash and the like may be deposited. At predetermined intervals, the incinerator, which is usually fired by a gas burner or the like, is ignited burning the material which has been dumped into the incinerator. In view of the fact that the chimney extends above the roof of the building, sufficient draft is normally created to permit the gases to be expelled from the chimney.

In our co-pending application for patent for "Smoke Eliminator," we have described an apparatus for removing virtually all of the impurities from the gases passing through the chimney. During the past few years, the problem of air pollution has been recognized to a greater and greater extent. Many state governments and municipalities have appointed committees for the purpose of regulating the amount of pollution which may be expelled from heating plants, boilers and the like. In many cases it has been found that incinerators cause a relatively high degree of pollution in the form of fly ash and unburned particles which act to pollute the air in the area of the chimney. The above mentioned co-pending application describes an apparatus for use in removing most of the foreign particles in the emitted gases. This device is connected to the upper portion of the chimney to receive the gases therefrom, and the chimney itself is capped.

In some instances, this device acts to somewhat reduce the draft normally created in the chimney. Obviously, if a positive or above atmospheric pressure is experienced in the chimney, there is a tendency for the dump chute doors to swing outwardly to the extent necessary to permit some of the gases to escape, producing smoke in the areas of the floors of the building where the incinerator chimney is located. Furthermore, the doors are often improperly sealed, allowing the gases to escape. It is a purpose of the present invention to prevent the dump chute doors from leaking or emitting smoke while the incinerator is in operation.

SUMMARY OF THE INVENTION

An object of the present invention resides in the provision of a compartment outwardly of the dump chute door having an auxiliary door which may be opened to provide access to the dump chute door. This compartment is closed except when someone is in the operation of dumping material into the chimney. Means are provided for subjecting this compartment to positive pressure when the incinerator is in operation, thus preventing the slight pressure within the chimney from causing smoke leakage, or opening the dump chute door and preventing leakage of the smoke.

It is recognized that if the dump chute doors fit tightly in their frames, and if means were provided for locking these doors in closed position when they were

not in use, the smoke could not leak from the chimney. Unfortunately, however, doors of this type do not always fit tightly. Locks which would keep these doors from leaking or swinging partly open are often disregarded by the building tenants, and are of little effect if the door itself does not seal tightly. Accordingly, the present construction is relatively foolproof and prevents the leakage of smoke whether the dump chute door itself leaks or is subjected to internal positive pressure from the flue gases.

A feature of the preferred form of the invention resides in the provision of a compartment enclosing the dump chute door and which is usually formed between the chimney and the interior wall. An access door is provided in the compartment which may be opened when the dump chute door is to be used. A fan is provided in the wall of the compartment for blowing air from the hallway in which the access door is located to the interior of the compartment. This fan creates a slightly positive pressure within the compartment capable of offsetting any positive pressure within the chimney. As a result, smoke will not leak from the chimney even though the dump chute door is not completely sealed.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic view showing the relationship of the incinerator, the smoke eliminator, and the dump chute doors.

FIG. 2 is a front elevational view of the dump chute door compartment.

FIG. 3 is a vertical sectional view through the dump chute door and enclosing compartment indicated in FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The general arrangement of the apparatus is indicated in FIG. 1 of the drawings. FIG. 1 illustrates an incinerator A usually supported on the basement floor 10. A first floor is indicated by the numeral 11, and a second floor is indicated by the numeral 12. The roof is indicated by the numeral 13. The incinerator A is connected to a chimney 14 which extends through the roof 13, and is either connected to atmosphere, or else is connected to a smoke eliminator 15 mounted on the roof 13. The smoke eliminator 15 is shown as being connected by a breeching 16 to the chimney, and the chimney itself is in this case capped as indicated at 17. The eliminator 15 may be electrically driven or controlled by an electrically actuated valve.

Garbage, trash, and other waste material is dumped in the chimney through dump chute doors 19 mounted at the various floor levels. The material to be burned is thus dumped directly onto the grate 20 of the incinerator. At suitable intervals, the garbage and other trash such collected is burned in the incinerator by suitable means such as a power gas blower and burner generally indicated by the letter B. In instances where the chimney leads directly to atmosphere, there is usually sufficient draft to provide a pressure in the chimney which is less than atmospheric pressure, so that no problem is experienced in smoke leakage on the various floors through or about the dump chute doors. However,

where smoke eliminator means are provided such as the member 15, it is sometimes possible that the normal draft of the chimney is somewhat of impeded, making it possible for the smoke to escape either through or around the dump chute doors.

FIG. 3 of the drawings indicates somewhat diagrammatically the manner in which the usual dump chute door is formed. The chimney 14 is provided with a suitable aperture 21 which supports a dump chute door frame 22. The frame 22 is pivotally connected at 23 to the door 24 which is provided with a suitable handle 25 by means of which the door may be pivoted. Attached to the inner surface of the door is often an angularly inclined panel 26 connected to the door 24 by suitable side plates 27. FIG. 3 illustrates the door in closed position. However, when the door panel 24 is swung forwardly, a compartment of generally triangular shape is exposed, the panel 26 swinging against the top of the aperture 21 or against the frame to limit its swinging movement. The garbage or other trash is placed on the door panel 24, and the door is swung into closed position, permitting the deposited material to slide into the chimney and to drop into the incinerator A.

While the doors are usually formed of cast aluminum or similar material, they do not always close tightly so that leakage of smoke is always possible. When the chimney 14 has suitable draft, this is not likely to cause difficulty. On the other hand, if the interior of the chimney is subjected to above atmospheric pressure, smoke may either leak out around the doors, or may even open the door slightly so as to permit the escape of fumes on the various floors of the building.

In order to prevent this escape of smoke, a compartment 29 is provided completely encircling the area of the dump chute door and enclosing it. In the particular arrangement illustrated, the compartment 29 includes a rear wall 30 designed to be secured to the chimney 14, a top wall 31, a bottom wall 32, and connecting side walls 33. The upper portion of the compartment 29 includes a separate enclosure 34 divided from the remainder of the compartment 29 by a partition wall 35. The lower portion of the compartment 29 is arranged forwardly of the dump chute door which has been described.

The upper portion 34 of the compartment 29 is closed by a front wall 36 mounted on the surface of a plaster wall 37 in the particular arrangement illustrated. The plaster wall 37 is only employed where the compartment is fitted into such a wall, and where such a wall is provided in spaced relation to the chimney. The lower portion of the compartment 29 is shown as including a front wall 39 which supports a door frame 40. The door frame 40 supports an access door 41 which is shown in FIG. 2 as being hingedly connected at 42 to the frame 40. Handles such as 43 are provided on the door by means of which it may be opened to provide access to the dump chute door.

The front wall 36 of the upper portion of the compartment is provided with a screened inlet opening 44 through which air may enter the compartment. A fan or blower 45 is mounted upon the partition wall 35 and has its outlet extending through the partition wall 35 as indicated by the arrow 46. The blower 45 is designed

to provide a slight positive pressure within the compartment 29 when it is in operation. Under normal circumstances, the blower 45 is actuated by a circuit connected to the incinerator A so that the blower is only in operation when the incinerator is in operation. An example is indicated in FIG. 1, where line wires L1 and L2 form a supply source extend to the incinerator burner B as well as to the blowers 45 through a control switch 47. The burner may be motor driven or controlled by an electrically actuated valve.

The operation of the apparatus is believed obvious from the foregoing description. When the incinerator burner B is started to burn up the trash and other material deposited in it, each blower 45 is actuated to create a slight positive pressure within each compartment 29. This positive pressure is arranged to be slightly above the maximum pressure experienced in the chimney 14. As a result, there is no smoke leakage either through the dump chute door or around it.

In accordance with the Patent Statutes, I have described the principles of construction and operation of my improvement in Dump Chute Doors and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my invention.

We claim:

1. An apparatus for preventing the escape of chimney gases through dump chute doors extending through chimney apertures, the apparatus including:

an enclosure encircling the dump chute door on the outside of the chimney and sealed relative to the chimney,

an access door in said enclosure providing access to the dump chute door, means providing a slightly above atmospheric pressure within said enclosure.

2. The structure of claim 1 and in which said means providing an above atmospheric pressure comprises a fan.

3. The structure of claim 1 and including an incinerator at the base of the chimney.

4. The structure of claim 3 and including a burner in said incinerator.

5. The structure of claim 3 and including an electrically actuated burner, and in which the means providing a slightly above atmospheric pressure is electrically actuated simultaneously with said burner.

6. The structure of claim 1 and in which said enclosure is divided into two compartment portions, one of which includes an inlet an outlet to the other compartment portion, and a blower therebetween forming the means for producing a slightly elevated pressure, and the other compartment portion including the access door.

7. The structure of claim 6 and in which the said one compartment portion is positioned above the said one compartment portion is positioned above the said other compartment portion.

8. The structure of claim 6 and in which the two compartment portions are separated by a partition.

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