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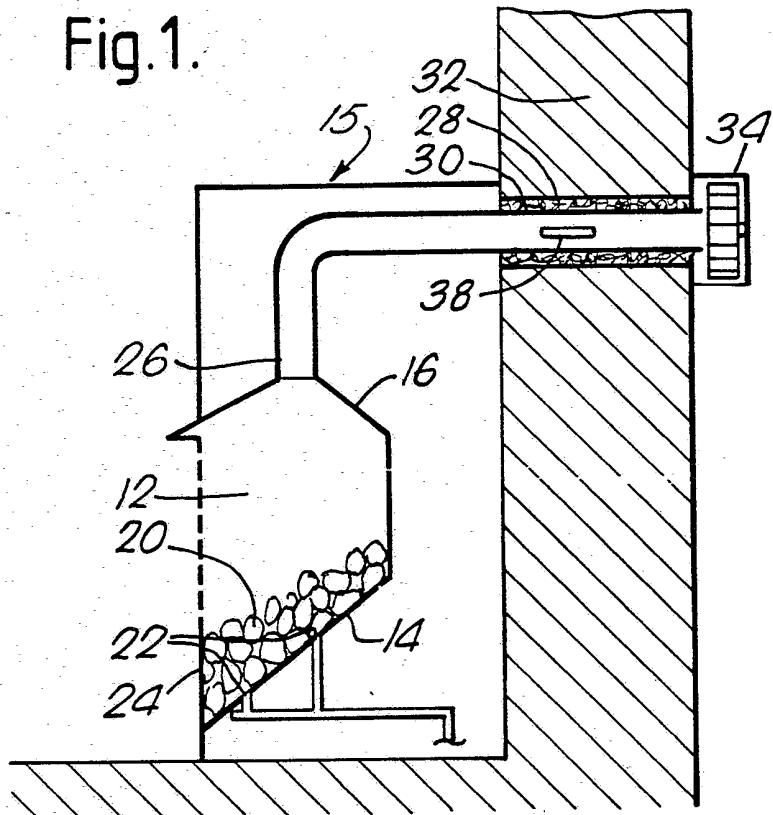
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(54) Extraction system for a gas fire or other appliance

(57) An extraction system for a gas fire includes a flue pipe 30 extending from the fire through an exterior wall of the building in which the fire is located and an extraction fan 34 mounted at the outlet of the flue pipe to provide positive extraction of combustion products. A flow detector 38 in the flue pipe is arranged to close a valve and cut off the supply of gas to the fire in the event that the flow rate through the flue pipe 30 falls below a value adequate for safe extraction of combustion products. The flue pipe may comprise telescopically adjustable stub pipes 42, 46 (Fig 2, not shown) and a silencer 44, which may be removable.

Fig.1.



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Fig.1.

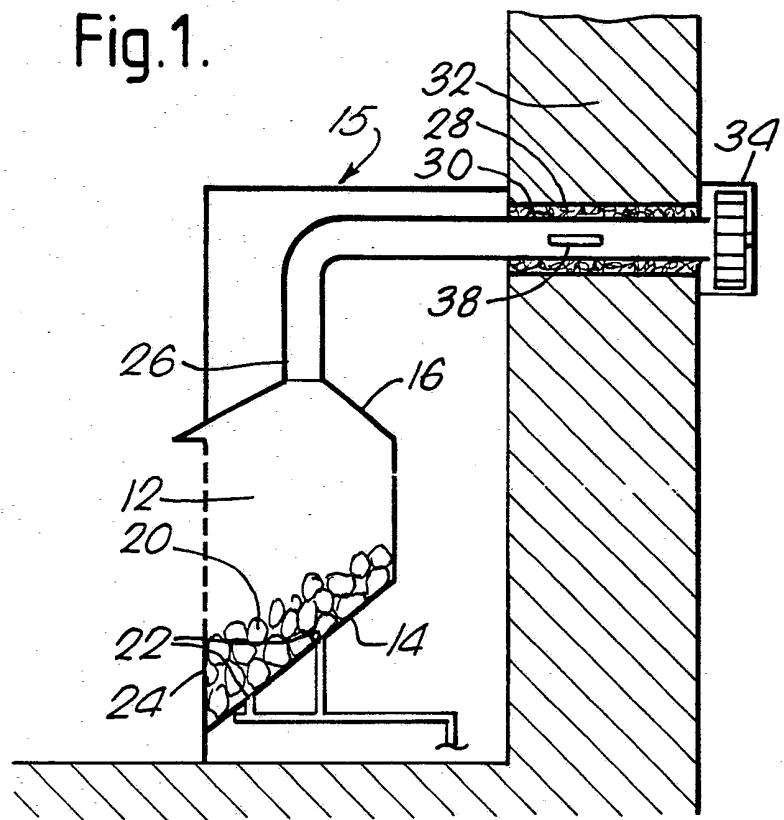


Fig.3.

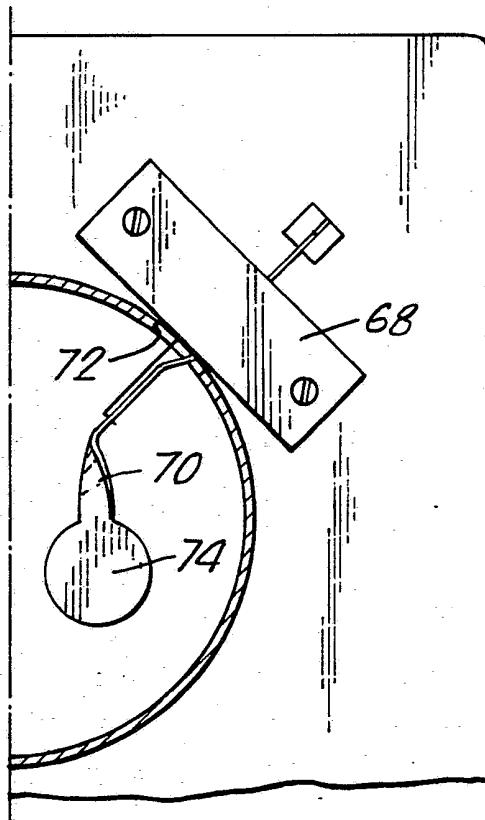
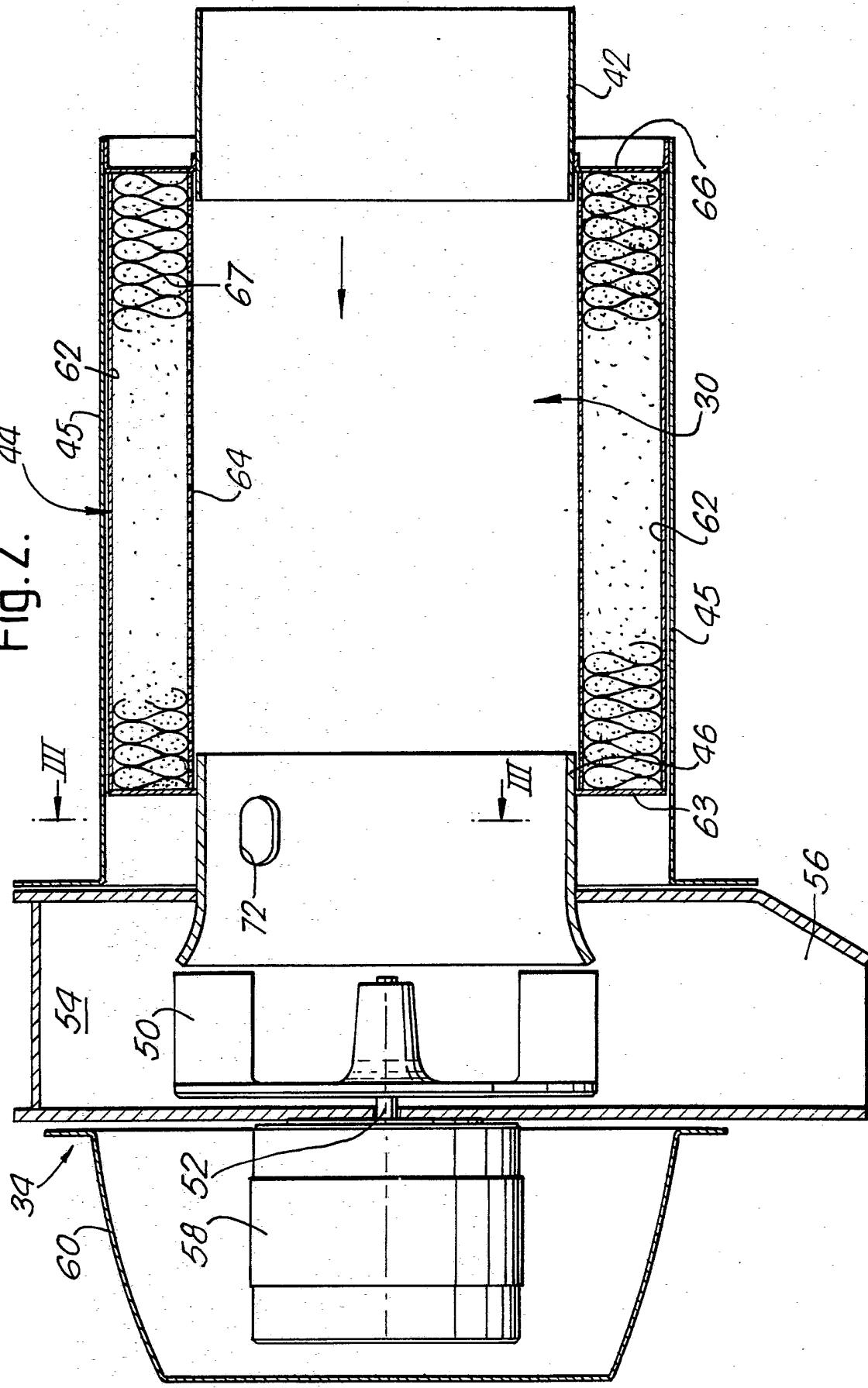


Fig. 2.



Agents' Reference: P4362GB-H/JCC/ac

DESCRIPTION OF INVENTION

Title: "Extraction system for a gas fire or other appliance"

THIS INVENTION relates to gas appliances, such as gas fires, and more particularly to extraction systems therefor.

Gas fires are currently enjoying considerable popularity as a means of 5 heating homes, and it often happens that at the preferred location in a room for a gas fire, there is no existing chimney or adequate flue system for removal of gaseous combustion products.

It is among the objects of the present invention to provide an extraction 10 system for a gas fire or other appliance which can be fitted in a wide variety of locations and which requires only minimal skill for safe and correct installation.

According to one aspect of the invention there is provided an extraction system for combustion products of a gas fire or other appliance including a flue 15 pipe extending from said appliance, and a positive extraction device for combustion gases associated with said flue pipe.

According to another aspect of the invention, there is provided a gas fire, or other appliance in combination with an extraction system according to 20 the first-noted aspect of the invention.

An embodiment of the invention is described below by way of example with reference to the accompanying drawings in which:-

25 FIGURE 1 is a sectional side view of a gas fire and extraction system embodying the invention, installed in a building,

FIGURE 2 is a less schematic sectional view, to an enlarged scale, showing a variant extraction system, and

FIGURE 3 is a fragmentary sectional view along the arrow III in Figure 1.

Referring to Figure 1, (which is schematic and not to scale), a gas fire 5 includes a combustion space 12 having a roof 16. The structure defining the combustion space is located within a larger rectangular housing 15. The fire illustrated is an open fire in which a mass of artificial coal 20 is supported on a floor 14 of the combustion space and is retained by a grille or grating 24 10 extended across the lower portion of the open front of the combustion space. A plurality of gas jets, indicated schematically at 22, extend through the bottom wall 14 and into the combustion space, the jets 22 being covered by the layer of artificial coal 20. The roof 16 has the form of a downwardly open cowl or 15 funnel adapted to gather combustion gases rising in the combustion space into a vertically extending flue pipe 26. The fire is designed to be installed in a building, as shown in Figure 2, with the housing 15 resting on the floor 17 of the room in which the fire is installed and with the back of the housing against an external wall 32 of the building.

In use, combustion gases from the fire are drawn through the flue pipe 26 20 along a horizontal flue pipe 30, extending through the external wall 32 of the building, to an electrically powered extractor 34 on the outside of the wall 32.

The gas jets 22 are connected to the domestic gas supply via a conventional manifold, (not shown), a gas inlet pipe (not shown) which leads, by 25 way of an adjustable gas flow valve, (not shown), and an electrically operated on/off valve (not shown).

In use, gas issuing from the nozzles 22 is burnt within the region of the artificial coal 20. The gas so burnt is burnt in air drawn from the room which 30 enters the combustion space through the open front of the fire. The combustion products pass upwardly, through the cowl 16 and the flue 26 into the flue 30 to the outside of the building. The flue pipe 30 is surrounded by an outer shell spaced from the flue pipe to define an air duct, extending from inlet openings on the outside of the wall to the interior of the room, and through which fresh 35 air may be drawn into the room after heat exchange with flue 30.

The extractor 34 principally comprises a variable speed electric fan supplied with electrical power by way of control circuitry. A flow meter 38 is mounted within the flue pipe 30 and provides, to said control circuitry, electrical signals indicative of the flow rate of gases through the flue pipe 30.

5 The flow meter may be of any convenient type, such as a rotating vane type, a pressure differential Pitot type or a "hot-wire" type. The control circuit is arranged so that if, for any reason, the rate of flow of gases through the flue 30 is less than a pre-set value, corresponding to that required for safe extraction of the combustion products at the greatest gas combustion rate which the fire,

10 in use, can provide, the electrically operated on/off valve will be closed by the control circuitry, on the basis that the detected deficiency in extraction rate indicates either an obstruction in the flue system or a malfunction of the extractor 34 itself. As a back-up measure, means may additionally be provided to detect, specifically, a malfunction of the extractor, for example by sensing

15 the electrical current drawn by the electric motor thereof, such means being arranged, via the control circuitry, to close the electrically operable on/off valve even if (e.g. through some defect), the flow meter should indicate normal extraction flow.

20 It is possible, in a variant, for the extractor speed to be variable automatically, by the control circuitry, at any time, in accordance with the instantaneous rate of supply of gas for combustion to the fire. The rate of flow of gas for combustion may be determined directly by means of a further flow meter, or indirectly, for example from the position of the gas flow adjusting

25 valve. The electrical control circuit, in this variant, includes means which controls the extractor speed 34 in accordance with the rate of supply of gas to the fire, to ensure that, in normal operation, the extraction rate is neither too great nor too little for the gas supply to the fire.

30 Referring to Figure 2, a flue pipe extending through a horizontal bore (not shown) formed through a wall of a building is made up of a number of interfitted components, including a flue stub 42 for connection with a gas fire or other appliance, a central section, afforded by a silencer unit 44 in the form of an open-ended tube of annular cross section, and an extractor stub 46 extending from the extractor unit 34. The outer periphery of the silencer unit 44 fits closely within an open-ended tubular metal liner 45 fitted in the bore formed through the wall. The flue stub 42 and extractor stub 46 extend within

respective ends of the inner bore of the unit 44. The axial length of the silencer unit 44 is somewhat less than that of liner 45 which in turn is selected to be somewhat less than the thickness of the building wall so that, as the stubs 42 and 46 are effectively telescopically extensible into the interior of the silencer 44, it can readily be ensured that the gas fire or other appliance can be fitted closely to the inner side of the wall and the extractor 34 fitted closely to the outer side of the wall, using standardised components, despite the wide variation in wall thicknesses likely to be encountered.

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10 The extractor 34 takes the form of a centrifugal or tangential flow blower including an impeller 50 substantially coaxial with the extractor stub 46 and the remainder of the flue 30, the impeller 40 being mounted on an impeller shaft 52 for rotation within a housing 54 which is fixed to the outer side of the wall 32 and which provides an outlet opening 56 at its lower end to prevent 15 ingress of rainwater from outside and allow ready drainage of any condensation from the extracted gases. The impeller 50 and shaft 52 are rotated by an electric motor 58 mounted on the outer side of the housing 54 and covered by a cover plate 60 secured to the outer side of the housing 54 and affording weather protection for the motor 58.

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25 The silencer unit 44 comprises a thin outer tubular wall 62 of metal and a thin perforated inner wall 64 of metal connected by annular end pieces 63 and 66. The space between the inner wall 64 and the outer wall 62 is filled with a mineral wool acoustic infill 66, whereby the silencer unit 44 serves to attenuate sound from the extractor unit 34 passing inwardly through the flues 30, 26 into the room in which the fire is installed.

30

35 In the embodiment of Figure 2 airflow detection means takes the form of a switch 68 (Figure 3) operable by an arm 70 extending through an aperture 72 in the wall of the extractor stub 46 and carrying, within the extractor stub 46, an integral vane 74 adapted to be deflected by gas flow through the extractor stub 46, whereby, when the rate of flow of gases through the extractor stub 46 is less than a pre-set value, the switch 68 will revert to a position towards which it is permanently biased and in which it will close the electrically operated on/off valve in the gas supply. When the flow of gases through the extractor stub 46 is adequate, the aerodynamic forces exerted by such gases on the vane 74 displace the latter from its non-operational position to the position

in which it moves the switch 68 away from the position to which it is biased, allowing the on/off valve in the gas supply to remain open. The extractor speed is variable in order that, on installation, a workman can set the extraction rate to an appropriate level for the particular fire or the like, to provide fine 5 adjustment and to cope with the situation where the required extraction rate is lower than that provided by the extractor at its lowest speed, it is possible to provide a variable opening or bleed allowing passage of air from outside to the interior of the housing 54 without passing through the flue.

10 It will be appreciated that, in order to cope with different wall thicknesses, only the stub 46, which is fixed to the extractor housing, need be telescopically adjustable within the adjacent end of the silencer element 44. The stub 42, for example, may be fixed within the end of the silencer element 44.

15 Furthermore, the silencer unit 44, with the stub 42, may be removably fitted within the liner 45.

CLAIMS

1. An extraction system for combustion products of a gas fire or other appliance including a flue pipe extending from said appliance, and a positive extraction device for combustion gases associated with said flue pipe.
- 5
2. An extraction system according to claim 1 including flow sensing means for sensing the flow rate of gaseous combustion products through said flue and for providing an electrical signal dependent upon said flow rate, by means of which, in use, the system can be used to operate a valve in a gas supply to a gas fire or other appliance if the flow of combustion products through said flue is less than a predetermined value adequate for safe extraction of the products of combustion of the gas supplied.
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- 15
3. A gas fire or other appliance in combination with an extraction system according to claim 1 or claim 2.
4. A gas fire according to claim 3, including flow metering means in said flue pipe for providing an output signal significant of the flow rate of gaseous combustion products through said flue, valve means disposed in a gas supply line supplying gas for combustion to said combustion space or said burners, control means arranged to receive said signal from said flow metering means and to close said valve means to cut off the flow of gas to said combustion space or said burners if the flow of combustion products through said flue is less than a predetermined value adequate for safe extraction of the products of combustion of the gas supplied for combustion.
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- 25
5. An extraction system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.
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6. A gas fire in combination with an extractor system, substantially as hereinbefore described with reference to and as shown in the accompanying drawings.
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7. Any novel feature or combination of features described herein.