

United States Patent

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[56]

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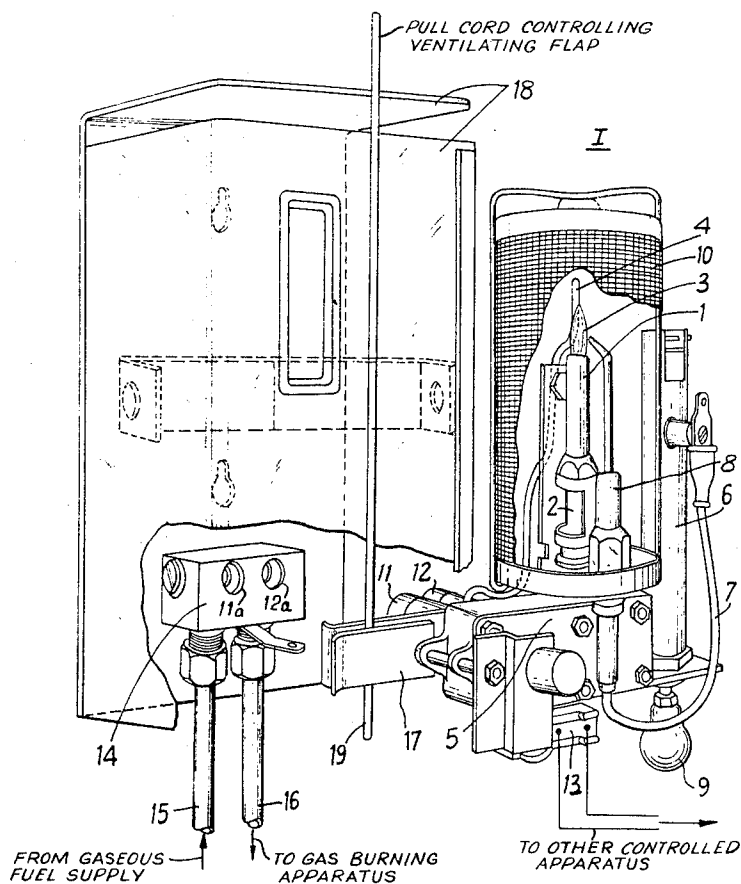
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- [54] ARRANGEMENT FOR CHECKING THE
CONDITION OF THE AIR ENCLOSED IN SMALL-
SIZED PREMISES SUCH AS CARAVANS AND
VENTILATING SAME
4 Claims, 1 Drawing Fig.**

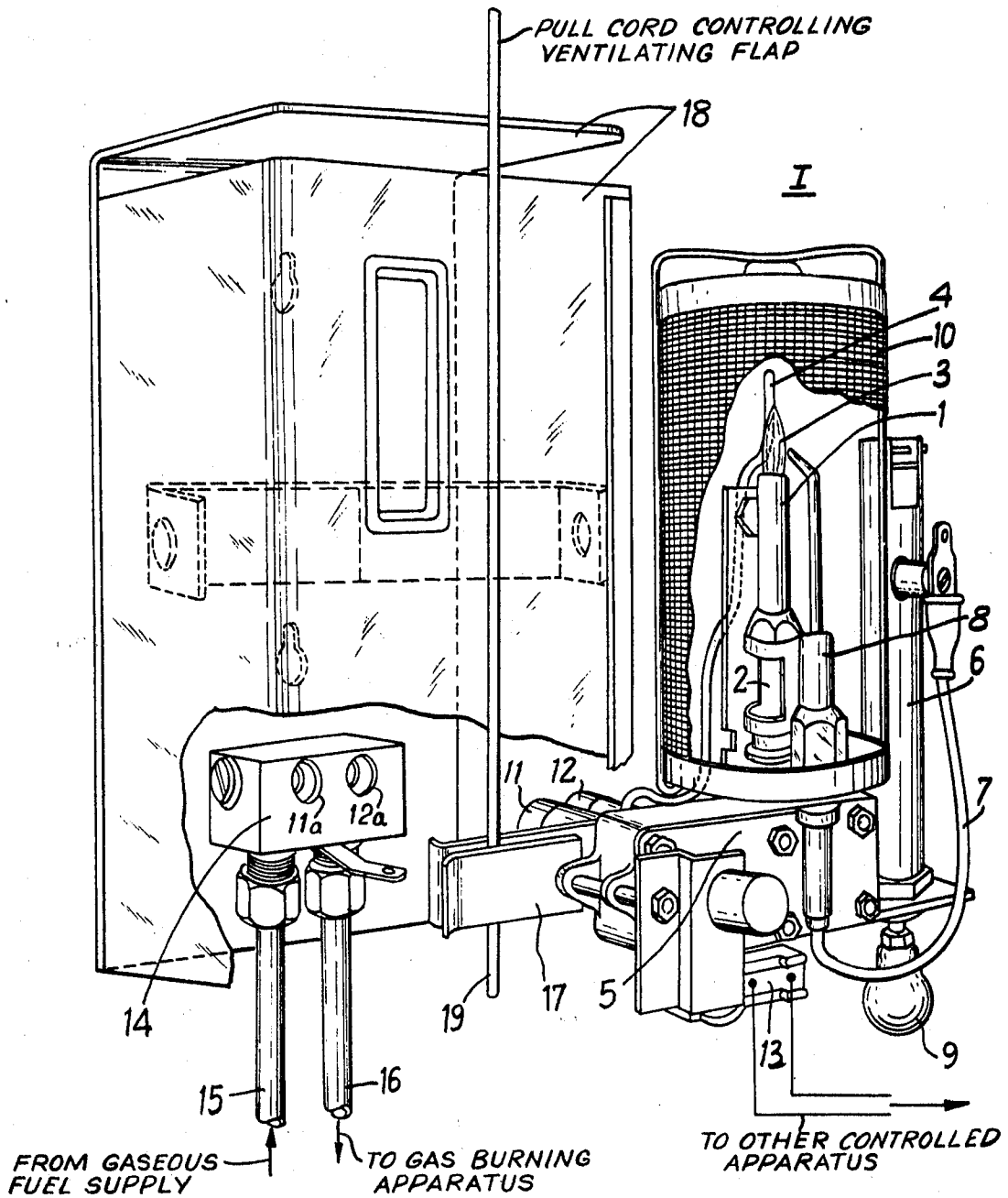
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ABSTRACT: Arrangement for checking the condition of the air enclosed in small-sized premises such as caravans and ventilating same.



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ARRANGEMENT FOR CHECKING THE CONDITION OF THE AIR ENCLOSED IN SMALL-SIZED PREMISES SUCH AS CARAVANS AND VENTILATING SAME

The invention covers a safety system protecting caravans and similarly small closed premises against efflux of carbon dioxide and the like inert gases produced by stoves, cooking apparatus and the like located within the caravan. This is obtained by a monitoring gas flame operating on the verge of stability so that as soon as the contents of carbon dioxide inside the premises rise above a predetermined value, the flame dies out and a thermosensitive member subjected to the action of said flame cuts out the feed of fuel to the apparatus liable to produce carbon dioxide and opens a ventilating flap.

The present invention has for its object a safety arrangement adapted to produce automatically the ventilation of small premises such as a camper caravan within which one or more apparatus producing carbon dioxide and the like inert gases operate, and furthermore to stop operation of said apparatus in case of emergency.

The safety arrangement according to the invention comprises an adjustable gas burner located within the caravan the adjustment of the burner being such as well known in the art that the flame may be under normal conditions just at the limit of breaking away and becomes extinguished when the contents of carbon dioxide or the like inert gases in the ambient atmosphere within the caravan reach a predetermined value said burner being associated with a thermosensitive member subjected to the radiation of the burner flame and controlling simultaneously a valve inserted in the pipe feeding the gas-producing apparatus, a miniature switch producing a signal stopping other apparatus and means opening a ventilating flap in the premises enclosing the apparatus.

According to one embodiment the two operations to wit the ventilation and the stopping of the apparatus may be obtained by means of one or two thermosensitive members heated by the same pilot flame and of which one cuts off the admission of gases into the burner, while the other opens a ventilation flap and operates the miniature switch.

By way of example and in order to further the understanding of the invention there is illustrated in the single FIGURE of the accompanying drawing one suitable embodiment of the arrangement according to the invention, said embodiment being shown in exploded perspective view.

As illustrated it is apparent that the arrangement for monitoring the atmosphere within the interior of the caravan indicated generally on the drawing by the letter I includes an auxiliary monitoring gas burner 1 located within the caravan and which is fed with primary air from within the caravan through an opening 2, said burner being adjusted as well known per se in a manner such that the flame 3 of said burner may under normal conditions be on the verge of instability that is when the contents of carbon dioxide in the ambient atmosphere within the caravan rise beyond a predetermined value, said flame breaks away and is extinguished. Said flame 3 is adapted to heat the end 4 of a bulb of a thermosensitive member including an aneroid cap inserted in the casing 5.

In the immediate vicinity of the nozzle of the burner 1 there is located an electrode of an electric igniter 8 connected through an electric lead with a piezoelectric control member 6 actuated manually by a handle 9.

The system including the burner 1, the bulb 4 of the thermosensitive member and the igniter 8 is housed in a chamber 10 protected by a grating against deflagration. The casing 5 is provided with two ports 11 and 12 connected with the gas pipes 15 and 16 through corresponding apertures 11a, 12a in a connecting box 14. Pipe 15 is connected with a gas supply source and pipe 16 is connected to the apparatus such as a cooking stove which produces the carbon dioxide or similar gas within the caravan which is desired to be monitored. Furthermore there are provided a clip 17 associated with a pull cord 19 controlling a ventilator and a miniature switch 13. The whole arrangement is enclosed within a housing 18 which is adapted to be mounted at a convenient place within the

caravan. The burner 1 is supplied with combustible gas from pipe 15 within casing 5.

The operation of the arrangement is as follows:

When the carbon dioxide content in the atmosphere within the caravan rises beyond a predetermined value, the flame 3 breaks off the nozzle of the burner 1 and dies out since the burner no longer receives the required amount of primary air through opening 2 to maintain combustion. The bulb 4 being no longer subjected to the radiation of the flame 3 the aneroid cap enclosed within the casing 5 is deformed and its deformation closes off through the agency of well-known mechanical means the communication between the pipes 15 and 16 whereby the gas burning apparatus fed by the pipe 15 can no longer remain operative. The miniature switch 13 which is actuated simultaneously with closing off of the communication between pipes 15 and 16 controls for instance the closing of a pipe not illustrated feeding fuel oil for example to a stove heating or similar apparatus. Furthermore, the deformation of the aneroid cap contained within the casing 5 opens the clip 17 to which is secured the cord 19 controlling the opening of a ventilation flap. The latter may be associated with a conventional exhaust fan for force-ventilating the interior of the caravan of the type wherein cord 19, when released from clip 17 permits the flap to open and simultaneously turn on the exhaust fan.

The arrangement disclosed is of particular advantage for ensuring safety inside caravans carrying, within a confined space, cooking apparatus, illuminating and cooling apparatus and also heating apparatus without any exhaust being provided for the burnt gases. The arrangement according to the invention ensures as a matter of fact an automatic stoppage of any defective apparatus of which the efflux may be dangerous and simultaneously it produces an automatic ventilation of the premises.

The chamber 10 protected against deflagration is essential for the incorporation of the improved arrangement disclosed with caravans since it often occurs that such caravans stand on sites infested by mosquitoes and generally the inhabitants of caravans destroy the latter by means of aerosol bombs projecting highly inflammable gases.

What I claim is:

1. The combination with a caravan of the camper type or a similarly small enclosed space which is provided with apparatus such as a cooking stove heated by combustion of a gaseous fuel and which produces carbon dioxide or similar inert and deleterious gas, of means for monitoring the level of the carbon dioxide content within the caravan which comprises an auxiliary monitoring gas burner within the caravan and which is adjusted so as to normally produce a monitoring flame just on the verge of extinction, said auxiliary gas burner being supplied with primary air from the atmosphere within the caravan and said flame being extinguished as the carbon dioxide content in said atmosphere rises above a predetermined level, a thermosensitive member located in the vicinity of the gas burner flame so as to be subjected to the heat produced by the monitoring flame, and means controlled by said thermosensitive member upon extinction of the flame for cutting off the supply of fuel to said gas producing apparatus and for opening a ventilation flap in the caravan so as to vent the interior thereof.

2. The invention as defined in claim 1 and which further includes an electrical switch actuated by said thermosensitive member upon extinction of the monitoring flame, said switch being connected in a control circuit for other apparatus located within the caravan such as a heating stove.

3. The invention as defined in claim 1 wherein said means controlled by said thermosensitive member for opening said ventilation flap includes a clip in association with an operating cord for the flap, said clip serving to release the cord so as to open the flap when the monitoring flame is extinguished.

4. The invention as defined in claim 1 and wherein said auxiliary monitoring gas burner includes an electrical lighter and a manually controlled piezoelectric generator for energizing said lighter.