April 12, 1966 R. E. WILKINSON 3,245,224

LOUVER CONSTRUCTION FOR REFRIGERATOR VENTS IN HOUSE TRAILERS AND THE LIKE

Filed Sept. 8, 1964 3 Sheets-Sheet 1

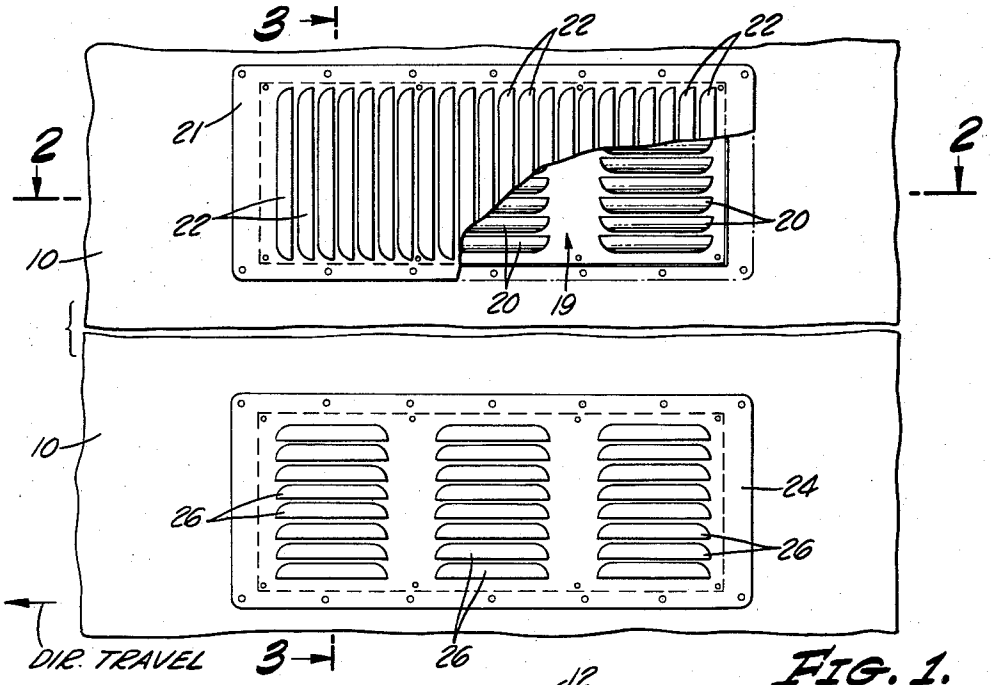


FIG. 1.

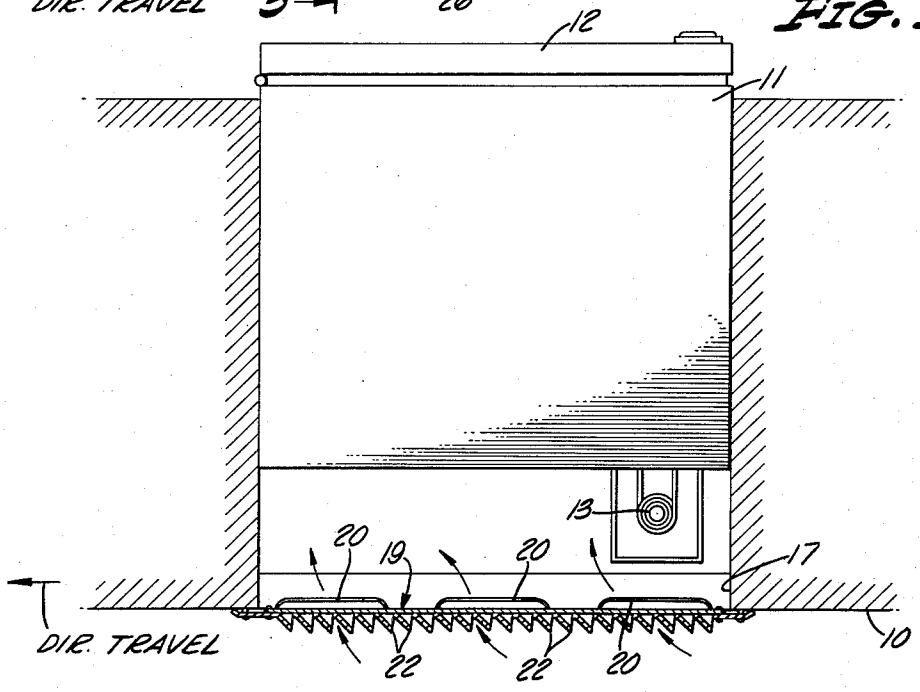


FIG. 2.

INVENTOR.
ROBERT E. WILKINSON
BY Hazard & Miller
ATTORNEYS

April 12, 1966 R. E. WILKINSON 3,245,224

LOUVER CONSTRUCTION FOR REFRIGERATOR VENTS IN HOUSE TRAILERS AND THE LIKE

Filed Sept. 8, 1964 3 Sheets-Sheet 2

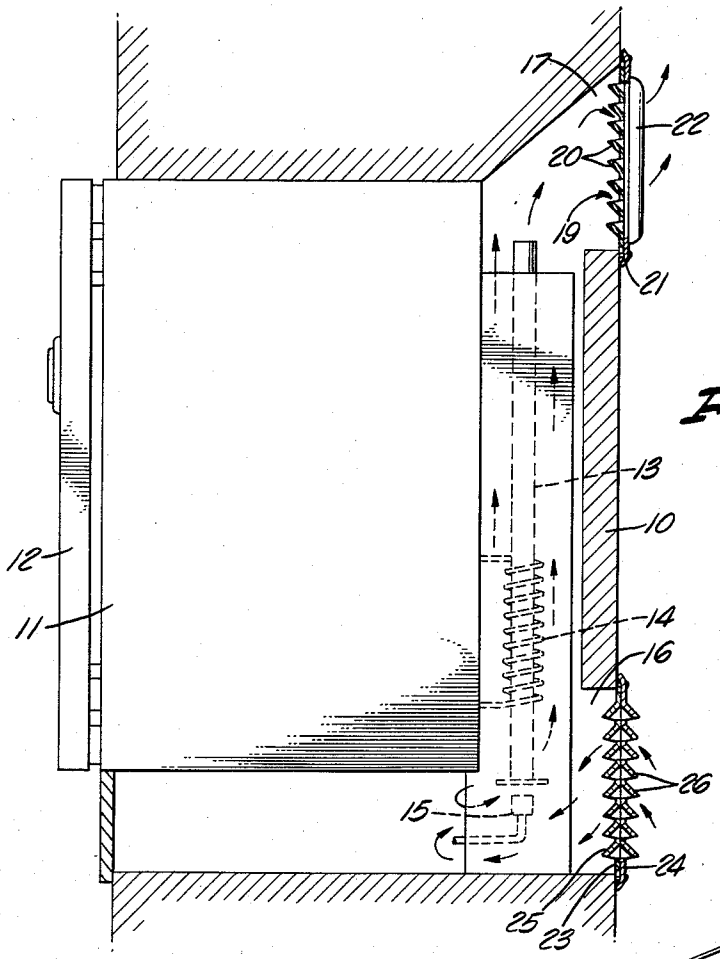


FIG. 3.

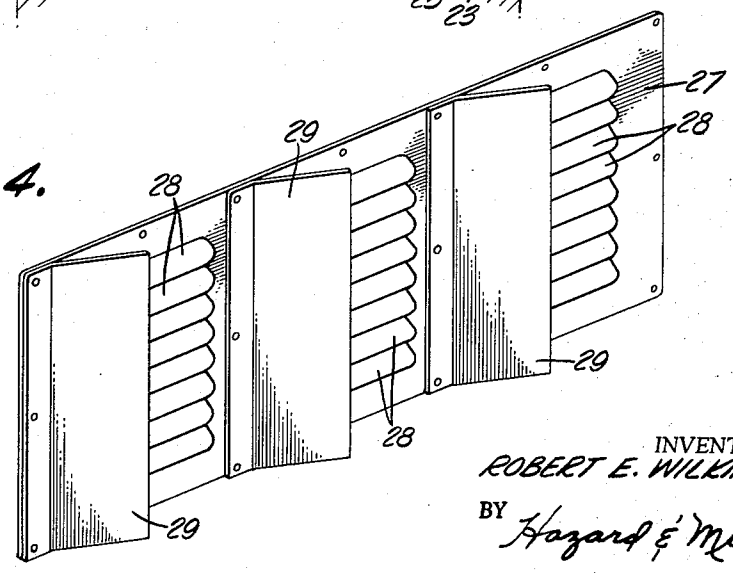


FIG. 4.

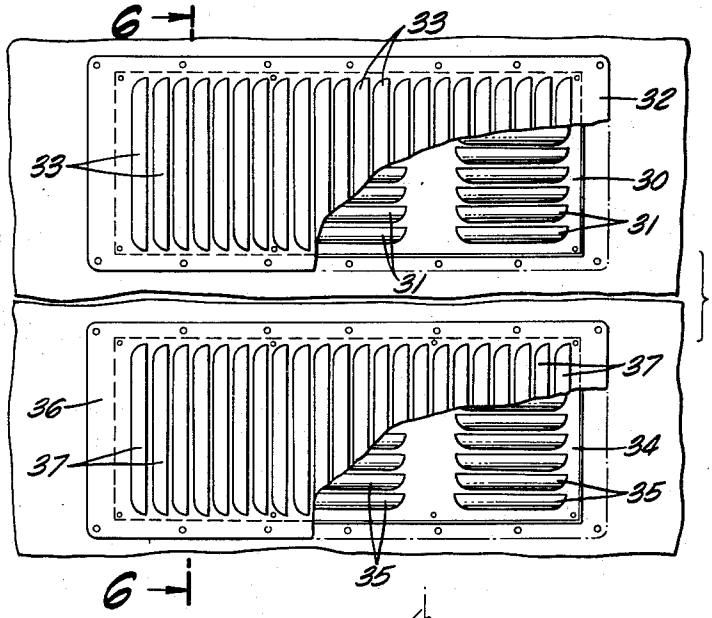
INVENTOR.
ROBERT E. WILKINSON
BY Hazard & Miller
ATTORNEYS

April 12, 1966 R. E. WILKINSON 3,245,224

LOUVER CONSTRUCTION FOR REFRIGERATOR VENTS IN HOUSE TRAILERS AND THE LIKE

Filed Sept. 8, 1964 3 Sheets-Sheet 3

FIG. 5.



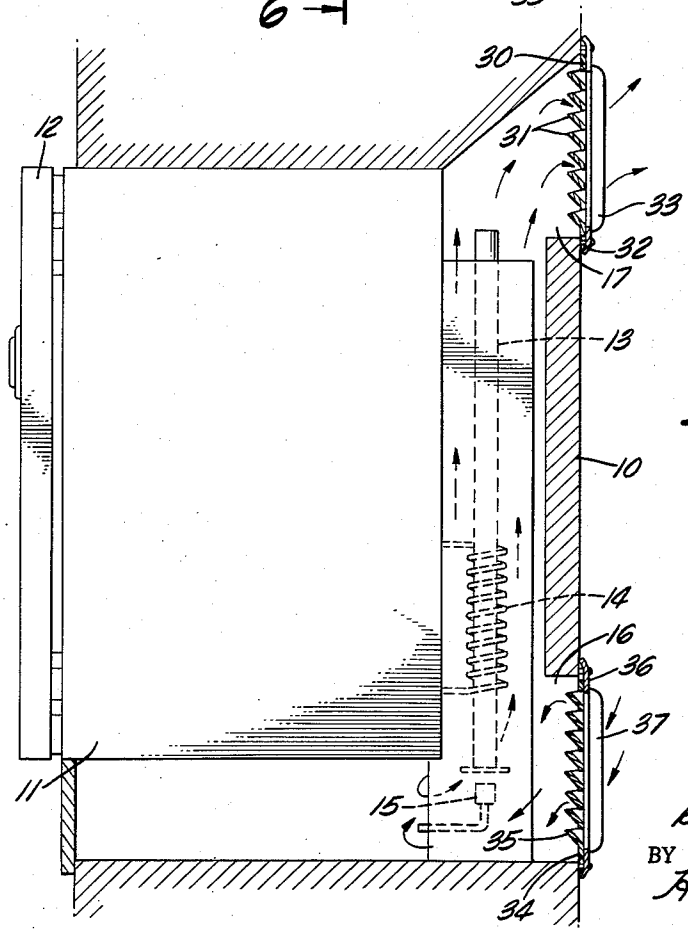


FIG. 6.

INVENTOR.
ROBERT E. WILKINSON
BY Hazard & Miller
ATTORNEYS

United States Patent Office 3,245,224 Patented Apr. 12, 1966

3,245,224

LOUVER CONSTRUCTION FOR REFRIGERATOR VENTS IN HOUSE TRAILERS AND THE LIKE

Robert E. Wilkinson, La Mirada, Calif., assignor to Interstate Engineering Corporation, Anaheim, Calif., a corporation of California

Filed Sept. 8, 1964, Ser. No. 394,974
3 Claims. (Cl. 62—239)

This invention relates to a louver construction for vents of refrigerators used in house trailers, campers, and similar vehicles.

Explanatory of the present invention, a refrigerator that is being commonly used in house trailers, campers, and similar vehicles has a flue tube located at the back of the refrigerator that is vertically arranged and which has a gas burner at the lower end thereof. Such a gas burner is supplied with gas from a butane or propane tank carried by the vehicle, the supply being thermostatically controlled by a thermostat usually located within the refrigerator box. A coil for refrigerant surrounds the flue tube and is heated by the heat rising through the flue tube from the burner and the refrigerant being thus heated is cycled through the cooling apparatus of the refrigerator in a conventional and well known manner.

The flue tube, coil, and burner are usually located in back of the left rear corner of the refrigerator considered when the front of the refrigerator is being faced by the observer. Usually the refrigerator, flue tube, and burner are located adjacent an outside wall of the trailer or camper so that vent openings may be formed in the outside wall to supply air for the combustion at the burner and carry off the products of combustion that rise around and through the flue tube.

When the refrigerator is mounted adjacent a right hand outside wall of the trailer or camper considered looking forwardly or in the direction of travel, the burner and flue tube are located near the forward ends of the vent openings, and to a large extent they are protected thereby against drafts which tend to cause blow-out of the burner. Also, there is little occasion for passing vehicles to pass the trailer on the right hand side in the opposite direction which might cause blow-out.

When the refrigerator, burner, and flue tube are located adjacent a left hand outside wall of the trailer or camper, the conditions are reversed. The burner and flue tube are then normally located near the rear ends of the vent openings which have heretofore been merely traversed by horizontal louvers designed to prevent ingress of rain or snow. Winds approaching the vent openings in any direction in a forward quadrant may readily enter between the louvers and either directly blow out the flame of the burner, or due to turbulence, sometimes puffs enter the upper vent opening and blow reversely down through the flue tube extinguishing the flame of the burner. The latter condition is very apt to occur when the trailer or camper is passing a large truck or semi-trailer travelling at a high rate of speed in the opposite direction.

A primary object of the present invention is to provide an improved louver construction which will greatly resist, if not entirely prevent blow-out of the flame of the burner under these and similar conditions.

With the foregoing and other objects in view, which will be manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

FIGURE 1 is a partial view in side elevation of a left hand wall of a house trailer or camper illustrating the louver construction embodying the present invention.

FIGURE 2 is a horizontal section taken substantially upon line 2—2 upon FIGURE 1, in the direction indicated.

FIGURE 3 is a vertical section taken substantially upon line 3—3 upon FIGURE 1, in the direction indicated.

FIGURE 4 is a perspective view of an alternative form of the upper louver construction that may be employed.

FIGURE 5 is a partial view in side elevation of an exterior of a house trailer or camper illustrating an alternative form of construction as applied thereto.

FIGURE 6 is a vertical section taken substantially upon line 6—6 upon FIGURE 5, in the direction indicated.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the wall **10** illustrated is the exterior left hand wall of a house trailer or camper considered in the direction of normal travel. Adjacent the interior of this wall there is a refrigerator **11** having a hinged door **12**. Between the back of the refrigerator and the wall **10** adjacent the rear or trailing corner of the refrigerator, there is a flue tube **13** surrounded by a refrigerant containing coil **14**. **15** indicates a gas burner that may be supplied with gas from a butane or propane tank, not shown. The flame from the burner **15** is directed upwardly through the flue tube **13** and heats the refrigerant in the coil **14**, which is cycled through the cooling apparatus of the refrigerator to cool its interior. A vent opening **16** is formed in the outside wall **10** to permit ingress of air to supply oxygen for combustion of the gas that is burned at the burner. An upper vent opening **17** is formed in the outside wall **10** to carry off heated air and the products of combustion.

Heretofore, these vent openings **16** and **17** have merely been covered or traversed by plates having horizontal louvers designed to prevent ingress of rain, hail, snow, and the like.

When the flue tube and burner have been thus located in relation to the openings **16** and **17** and in relation to the refrigerator **11**, as shown, adjacent the left hand wall **10**, there has heretofore been considerable danger of blow-out. Winds approaching the left hand wall **10** from a forward 90° quadrant could enter either or both of the vent openings **16** and **17** and cause the flame to be blown out and extinguished. This was particularly true when the trailer or camper was passing a large truck or semi-trailer travelling at high speed in the opposite direction. The sudden blast or puff of air entering the lower vent opening **16** might directly blow out the flame of the burner. In other situations, the turbulence created might temporarily cause the puff to enter the upper opening **16**, blow down through the flue tube **13**, and extinguish the flame.

In accordance with the present invention, the upper vent opening **17** is covered with an inner plate **19**, in which are formed rows of parallel horizontal louvers **20** and an upper plate **21** is mounted thereover in which are formed parallel vertical louvers **22**. These louvers are directed rearwardly or toward the rear of the trailer. The lower vent opening **16** is similarly covered with two plates **23** and **24**. In the inner plate **23** there are parallel horizontal louvers **25**, which are directed downwardly and inwardly, and in the outer plate **24** there are horizontal parallel louvers **26** which are directed downwardly and outwardly.

If wind approaches the wall **10** from a direction in a 90° forward quadrant, the air passing between the louvers **26** is first directed upwardly thereby and then downwardly by the parallel louvers **25** in a direction adjacent but seldom, if ever, against the flame of the burner **15**. In the case of the upper vent **17**, such winds are resisted against entry by the outer vertical louvers **22**, but rising

air and the products of combustion may nevertheless find egress between the horizontal inner louvers **20** and thereafter through or between the outer vertical louvers **22**. The result is that usually air pressure adjacent the top of the flue tube **13** is less than air pressure at the bottom of the flue tube adjacent the burner **15**. This inequality of air pressure is conducive to cause air and the products of combustion to rise through and around the flue tube. If, because of turbulence, there should be a momentary condition when air might be urged to enter the upper vent opening **17**, the rising column of warm air and products of combustion must first be stopped and then reversed in flow before a reversal of direction through the flue tube can cause blow-out of the flame at the burner.

Where a large truck or semi-trailer should be passing speedily in the opposite direction, the air blast created thereby and the turbulence created thereby are usually so controlled by the louvers that blow-out of the flame is not occasioned by puffs of air entering the lower vent openings **16** or the upper vent openings **17**.

If wind approaches the outer wall **10** from a direction in a rear 90° quadrant, such wind can, of course, enter between the parallel rearwardly directed outer louvers **22**. However, as the flue tube and burner are located near the rear ends of the vent openings **16** and **17**, blow-out under these conditions does not ordinarily occur. A blow-out of a flame usually occurs when wind or air puffs approach the outer wall **10** from a direction in the forward 90° quadrant, and blow-out under these conditions is effectively protected against by the improved louver construction.

In FIGURE 4, I have illustrated a modified or alternative form of construction for use over the upper vent opening **17**. In this form of construction, the upper vent opening **17** is covered by a plate **27**, in which there are formed horizontal louvers **28** that may be downwardly and outwardly directed so as to be designed to prevent ingress of rain, snow, hail, and the like. Between these groups of horizontal louvers there may be secured rearwardly and outwardly directed vanes **29**, which serve the same purpose and perform the same function as the rearwardly directed outer louvers **22**. In this sense, the vanes **29** may be regarded as rearwardly directed vertical louvers disposed outwardly of the inner horizontal louvers **28**. Winds or puffs of air from a direction in the forward 90° quadrant are to a large extent prevented from entering directly between or through the louvers **28** and causing blow-out.

In FIGURES 5 and 6, an alternative form of construction is illustrated wherein the upper vent opening is covered by an inner plate **30**, in which there are upwardly and inwardly directed horizontal louvers **31**, similar to the construction shown in FIGURE 3. These, in turn, are covered by a plate **32** in which vertical louvers **33**, which are rearwardly directed, are formed. In this form of construction, the lower vent opening is covered by a plate **34** in which upwardly and inwardly directed horizontal louvers **35** are formed and these, in turn, are covered by a plate **36** in which vertical rearwardly directed louvers **37** are formed.

In all forms of construction, the outer rearwardly directed vertical louvers are designed to prevent ready ingress of air blasts approaching the house trailer or camper from a direction in a 90° forward quadrant.

While the invention has been primarily designed for use on vehicles used in countries where vehicles are driven on the right hand side of the road and pass each other left to left and in situations where the refrigerator is located on the left hand side of the vehicle and the vent tube and burner are disposed toward the rear, it will be appreciated that by a mere reversal of parts it can be applied to vehicles used in countries where the vehicles are driven on the left hand side of the road and pass each other right to right and the refrigerator is mounted on the right hand side of the vehicle.

It will be appreciated by those skilled in the art that the louver construction employed may be easily and economically manufactured and installed and that, when installed, blow-out of the flame of the burner can be effectively prevented.

Various changes may be made in the details of the construction without departing from the spirit and scope of the invention, as defined by the appended claims.

I claim:

1. In combination with a trailer or the like having a flame energized refrigerator with a burner wherein portions of the trailer and refrigerator define a flue space and a flue tube in the flue space over the burner adjacent an exterior wall of the trailer, and openings in the exterior wall adjacent the top and the bottom of the flue space and flue tube, respectively, means causing the upper vent opening to be traversed by inner horizontal upwardly directed louvers and outer vertical rearwardly directed louvers.

2. In combination with a trailer or the like having a flame energized refrigerator with a burner wherein portions of the trailer and refrigerator define a flue space and a flue tube in the flue space over the burner adjacent an exterior wall of the trailer, and openings in the exterior wall adjacent the top and the bottom of the flue space and flue tube, respectively, means causing the upper vent opening to be traversed by inner horizontal downwardly directed louvers and outer vertical rearwardly directed louvers, the lower opening being traversed by inner horizontal louvers that are downwardly and inwardly directed, and outer horizontal louvers that are downwardly and outwardly directed.

3. In combination with a trailer or the like having a flame energized refrigerator with a burner wherein portions of the trailer and refrigerator define a flue space and a flue tube in the flue space over the burner adjacent an exterior wall of the trailer, and openings in the exterior wall adjacent the top and the bottom of the flue space and flue tube, respectively, means providing the openings with upwardly and inwardly directed inner horizontal louvers and rearwardly directed vertical louvers disposed outwardly thereover.

References Cited by the Examiner

UNITED STATES PATENTS

2,225,244	12/1940	Anderson	98—10 X
2,250,944	7/1941	Brace	62—456 X
2,685,246	8/1954	Saunders	98—121 X
3,087,412	4/1963	Holmes	98—121

ROBERT A. O'LEARY, *Primary Examiner.*

LLOYD L. KING, *Examiner.*