

Nov. 21, 1950

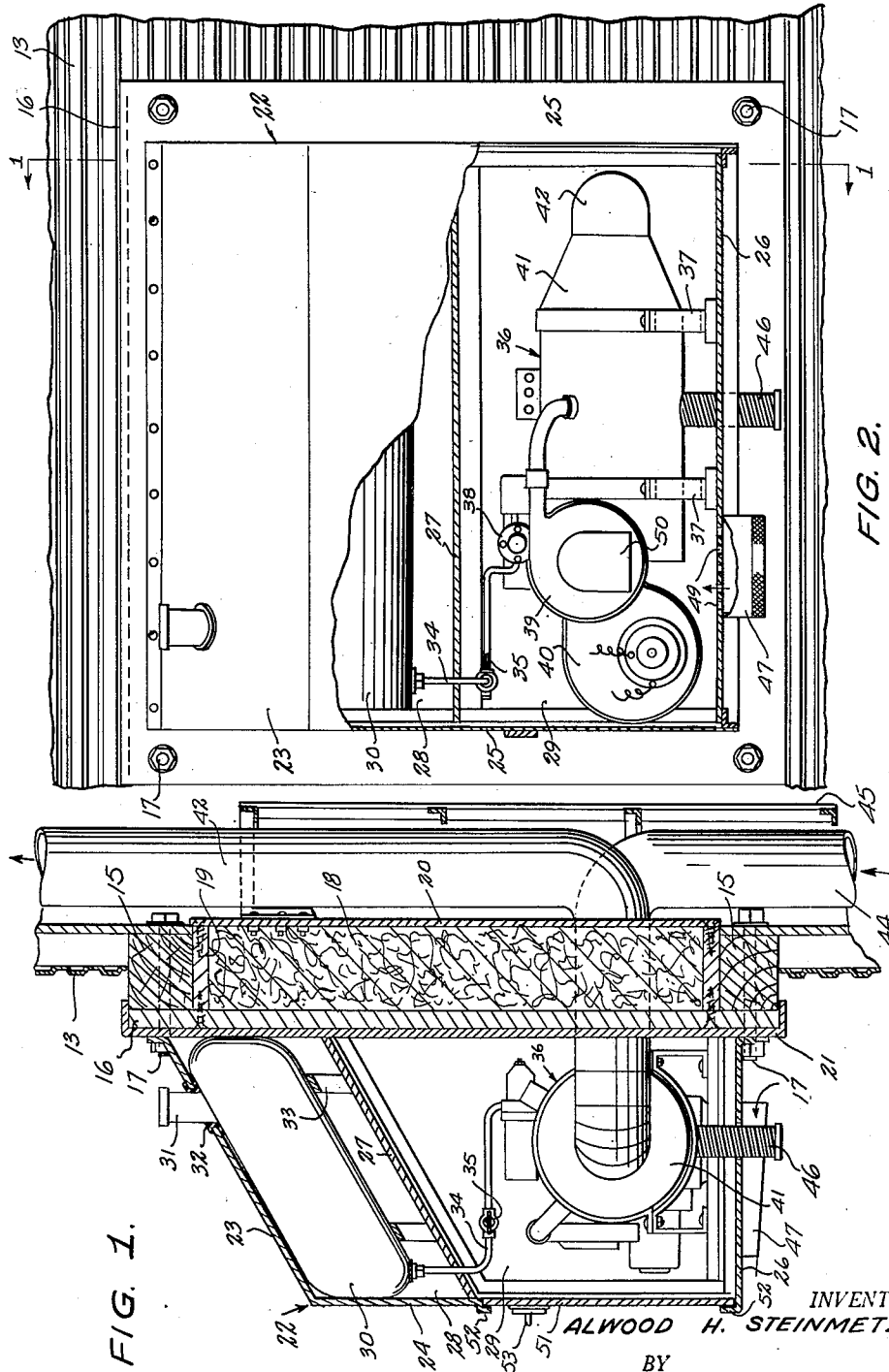
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2,530,486

FORCED FLOW PORTABLE AIR HEATER FOR MOUNTING UPON THE
EXTERIOR WALLS OF ROOMS TO BE HEATED

Filed April 6, 1948

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 3.

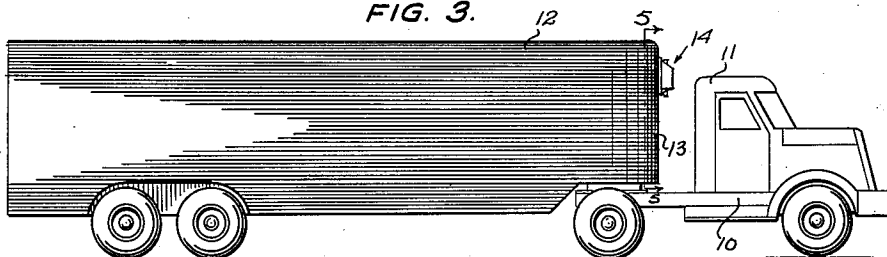


FIG. 4.

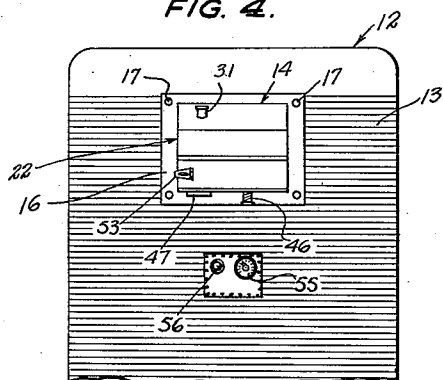


FIG. 5.

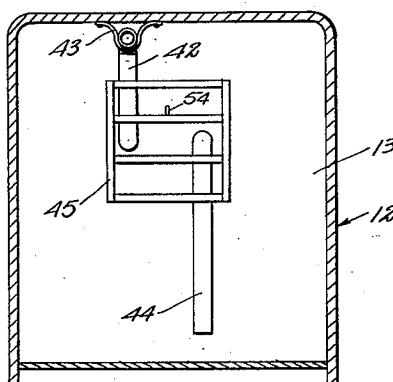


FIG. 6.

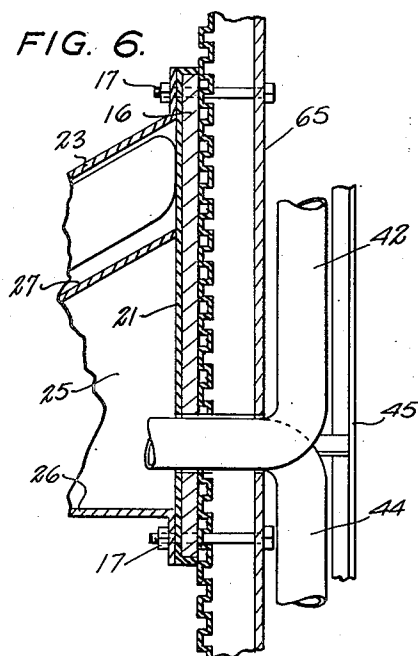
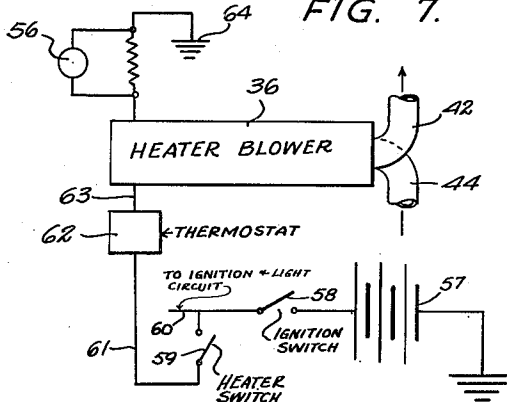


FIG. 7.



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UNITED STATES PATENT OFFICE

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FORCED FLOW PORTABLE AIR HEATER FOR
MOUNTING UPON THE EXTERIOR WALLS
OF ROOMS TO BE HEATED

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4 Claims. (Cl. 126—110)

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My invention relates to portable heaters for rooms or the like, and more particularly to such heaters as are adapted to be detachably secured to the outer side of the exterior walls of such rooms with means carried by the heater and extending into the room for heating the same. One use for the heater according to the invention is to provide a unit for heating the commodity compartment of trucks, trailers, semi-trailers or freight cars.

All of such vehicles at times carry goods which require protection against sub-freezing temperatures and/or perishables which require refrigeration. Indeed, many such vehicles are already equipped with portable refrigerating units to protect such goods in warm weather. However, such refrigerating equipment is dead weight in the winter time and is not readily adaptable or satisfactory when attempts are made to convert them to heating units.

With the foregoing in view, it is an object of my invention to provide a novel portable heating unit for rooms or the like.

A further object is to provide a novel portable heating unit for rooms or the like which is readily adaptable for attachment to the exterior wall of a room or compartment, such as a vehicle body, without material alteration of such wall.

A further object is to provide a portable heating unit such as that last described which is self-contained and which is adapted to be initially actuated by remote control and thereafter operated as needed by a thermostatic control.

A further object is to provide a novel portable heating unit for vehicle bodies which is adapted to provide a winter replacement for a portable refrigerating unit.

Other objects and advantages reside in the particular structure of the invention, combination and arrangement of the several parts thereof, and will be readily understood by those skilled in the art upon reference to the attached drawing in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawings:

Figure 1 is a transverse vertical section through a preferred form of the invention and taken substantially on the plane of the line 1—1 of Figure 2;

Figure 2 is a front elevation of the invention, parts being broken away and shown in vertical section;

Figure 3 is an elevation on a reduced scale and

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showing the unit according to the invention applied to a trailer truck;

Figure 4 is a fragmentary front elevation of the trailer truck body of Figure 3 on a slightly larger scale;

Figure 5 is a transverse vertical section taken substantially on the plane of the line 5—5 of Figure 3, but on a slightly enlarged scale;

Figure 6 is a fragmentary sectional view like Figure 1, but showing a slightly modified form of the invention;

Figure 7 is a diagrammatic view showing a circuit for controlling the unit.

Referring specifically to the drawing, wherein like reference characters have been used throughout the several views to designate like parts, as illustrated in Figure 3, 10 designates a tractor truck including a cab 11 for a semi-trailer cargo body 12. The semi-trailer body 12 has a front wall 13 to which is detachably connected a portable heating unit 14 according to the invention.

In the form of invention illustrated in Figures 1 to 5, inclusive, the forward wall 13 of the semi-trailer 12 is formed with an opening therein which is framed by any suitable frame members 15, Figure 1. The portable unit according to the invention comprises a base panel 16 which is readily detachably secured across the opening in the forward wall 13 of the trailer by any suitable means, such as the bolts 17 which extend through the frame-providing members 15. A body of insulating material 18 is secured to the rear surface of the panel 17 by any suitable frame members 19 and a rear panel 20. The frame members 19 are formed to be complementary to the opening formed by the first-mentioned frame members 15, whereby to provide a tight fit in such opening. In this connection, it should be stated now that the opening in the front wall of the trailer is adapted in the summer time to have mounted therein a portable refrigerating unit. In the form of invention illustrated in Figures 1 to 5, inclusive, the heating unit is adapted to comprise a winter time replacement for such refrigerating unit.

The forward surface of the panel 16 is covered with a suitable sheath of sheet metallic material 21, the edge portions of which are rearwardly directed to overlie the joint between the panel 16 and the frame-providing members 15, whereby to prevent the entrance of water or dust.

A housing 22 is secured in any suitable manner to the forward surface of the sheath 21 and comprises a roof 23 which is preferably downwardly sloping, as shown, a forward wall 24, side walls 25,

and a floor 26. A partition 27 divides the housing 22 into upper and lower compartments 28 and 29, respectively.

The upper compartment 28 has mounted therein in any suitable manner, as by the brackets 33, a fuel tank 30 which is provided with a filler neck and cap 31 which extends through the roof 23 of the housing with a waterproof fit provided by any suitable gasket means 32 surrounding such neck or spout.

A fuel line 34 extends downwardly from a lower part of the tank 30 through the partition 27 and into the compartment 29. Inwardly of the compartment 29, the fuel line 34 is provided with a cut-off valve 35 of any suitable or well known form. The compartment 29 has mounted therein on any suitable brackets 37 a combined fluid fuel-burning air heater and hot air-distributing blower generally indicated at 36. Such combined unit 36 includes a fuel pump 38, a fuel burner 39, a blower 40 and a housing 41 for heating hot air. The combined unit just described is of standard make, with the exception of the fuel pump 38 which has been added to provide a more efficient operation of the device. At the same time, the fuel pump 38 is a pump of well known make, although not generally associated with the combined burner and blower. Air heated in the housing 41 is discharged through a conduit 42 through the panel 16 and insulating material 18 into the interior of the semi-trailer 12. As shown in Figure 5 and also Figure 1, the conduit 42 is upwardly directed interiorly of the semi-trailer to the roof thereof and discharges adjacent a rear portion of the trailer. That portion of the conduit 42 which extends along the roof of the trailer may be supported on any suitable brackets 43, Figure 5. Cooled air from the interior of the semi-trailer 13 is returned to the housing 41 by means of a conduit 44 which is located adjacent the floor of the trailer and extends downwardly from the panel 16 to the region of the floor of the semi-trailer. A frame 45 is secured to the inner panel 21 in any suitable manner and overlies portions of the conduits 42 and 44 to protect the same against being damaged by cargo contained in the interior of the semi-trailer in the event that the same moves about in transit. Such frame 45 is adapted to be detachably secured to the rear panel 20, or so formed that it may be passed through the opening in the front wall 13 without being detached from the unitary structure. In this connection, it is noted in Figure 1 that by a simple downward rocking of the housing and connected parts after the bolts 17 have been disconnected, the entire assembly may be removed from the trailer. However, it may be necessary to disconnect several sections of the conduits 44 and 42.

An exhaust conduit 46 extends downwardly through the floor 26 of the housing to discharge products of combustion of the heater 39 outwardly of the trailer. In like manner, an intake conduit 47 is carried by the under surface of the panel 16 and furnishes air to the burner 39 through openings 49 in the floor 26 and the intake 50 of the burner. In this connection, the entrance to the conduit 47 is rearwardly directed and opens adjacent the forward surface of the panel 16, whereby to protect the conduit from being clogged with snow and to limit the entrance of dust, mud or the like to the interior of the housing. If desired, an air filter, not shown, may be associated with the intake conduit 47. That portion of the front wall 24 of the housing which overlies the compartment or section 29 is

provided with a door 51 which is laterally slidable in upper and lower guideways 52 formed on the front wall 24. Any suitable combined lock-providing means and handle 53 is formed on the door 51 for actuating the same in opening and closing directions.

Any suitable temperature-taking means 54, Figure 5, is carried by the frame 45 interiorly of the semi-trailer 12 to take the temperature of the interior thereof. Such thermometer 54 is mechanically connected to a dial 55 carried by the forward wall 13 of the trailer, whereby it will be visible from the cab 11 of the tractor 10. Thus, the driver of the tractor 10 may look through the rear window of the cab and determine the temperature of the interior of the semi-trailer without leaving the cab or even stopping the vehicle. Likewise, a tell-tale light 56, Figure 4, is mounted on the front wall 13 of the semi-trailer, whereby it is visible through the rear window of the cab to indicate whether or not the heater blower unit 36 is operating. Means now to be described control the light 56.

As shown in Figure 7, the circuit for actuating the heater blower unit 36 is diagrammatically shown. Such circuit is connected in series with the tractor battery 57, ignition switch 58 and a heater switch 59. The ignition switch 58 is, as usual, on the dashboard of the tractor 10 and it is contemplated that the heater switch 59 will likewise be so located. A lead 60 extends to the ignition circuit, not shown, of the vehicle, while a second lead 61 extends to a thermostat 62, which controls the operation of the heater blower unit 36 after the same has been initially actuated by the heater switch 59. Such thermostat 62 may be of any suitable well known form. A lead 63 connects the thermostat to the heater blower unit 36 and the tell-tale light 56 is connected in shunt series between the heater blower unit 36 and the ground 64 therefor.

In the operation of the device, when the driver of the vehicle 10 determines by the dial 55, registering the interior temperature of the semi-trailer, that the temperature is too low for safety of the goods contained therein, he actuates or closes the heater switch 59, whereby to initially actuate the heater blower unit 36. Such operation automatically lights the burner 39 to heat air in the housing 41. The blower 40 may be actuated when sufficient heated air is in the housing 41 to feed the same to the interior of the semi-trailer or the blower 40 may be operated simultaneously with the heater 39. In any event, actuation of the heater blower unit 36 continues until the interior temperature of the semi-trailer 12 has been raised to a point where further actuation of the unit is temporarily cut off by the thermostat 62. Thereafter, as long as the heater switch 59 is on, the thermostat 62 will control the operation of the heater blower unit 36 and maintain the interior temperature of the semi-trailer at substantially whatever temperature has been previously set on the thermostat. When further need for heating of the interior of the semi-trailer 12 is not required, the operator of the tractor 10 may cut off operation of the heater blower unit by opening the heater switch 59.

By providing a unitary structure as described above, the unit according to the invention may be moved from trailer to trailer as needed, may be substituted for a refrigerating unit, not shown, used on the trailer during the summer months, and may, likewise, be used to heat small houses or rooms thereof by attaching the same to the ex-

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terior wall. In this connection, the form of invention shown in Figure 6 is adapted to be mounted on the exterior wall. In this connection, the form of invention shown in Figure 6 is adapted to be mounted on the exterior wall 65 of a room which has no opening formed therein. Such wall 65 need be modified only to the extent of providing a pair of spaced openings therethrough for the passage of the conduits 42 and 44. Obviously, there is no need for the body of insulating material 13 or the mount therefor which has been previously described. Likewise, the frame 45 may be eliminated unless the device is used with a trailer or other movable vehicle wherein shifting cargo is likely to damage the conduits 42 and 44. Otherwise, however, the unit is identical to that previously described and need not be specifically described further at this time. However, in the event that the device is used apart from a motor vehicle, it will be necessary to provide a suitable battery or other source of electric current for actuating the motors for the heater and blower.

While I have shown and described what is now thought to be a preferred embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure as shown and described hereinabove, except as hereinafter claimed.

I claim:

1. A portable heater for rooms, comprising a panel adapted to be mounted on an exterior wall of a room, across an opening in such wall, a body of insulating material carried by said panel rearwardly thereof and adapted to fill said opening, a housing carried by said panel forwardly thereof, a partition in said housing and providing two compartments therein, a fuel tank in one of said compartments, a combined fluid fuel-burning air heater and hot air distributing blower in the other compartment, a fuel line extending through said partition and operatively connecting said tank and heater, a hot air conduit connected to said blower and extending through said panel and insulating body interiorly of said room, a cold air return conduit connected to said blower and extending through said panel and insulating body interiorly of said room, and means for detachably connecting said panel to said wall of said room.

2. A portable heater for rooms, comprising a panel adapted to be mounted on an exterior wall of a room, across an opening in such wall, a body of insulating material carried by said panel rearwardly thereof and adapted to fill said opening, a housing carried by said panel forwardly thereof, a partition in said housing and providing two compartments therein, a fuel tank in one of said compartments, a combined fluid fuel-burning air heater and hot air distributing blower in the other compartment, a fuel line extending through said partition and operatively connecting said tank and heater, a hot air conduit connected to said blower and extending through said

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panel and insulating body interiorly of said room, means for detachably connecting said panel to said wall of said room, a relatively rigid frame carried by said panel interiorly of said room, and said frame enclosing portions of said conduits to protect the same.

3. A portable heater for rooms, comprising a panel, means for mounting said panel on an exterior wall of a room across a pair of spaced openings in said wall, a housing carried by said panel exteriorly of the same and said wall, a partition in said housing providing a pair of sections therein, a fuel tank in one of said sections, a combined fluid fuel-burning air heater and hot air-distributing blower in the other section, a fuel line extending through said partition and operatively connecting said tank and heater, a hot air conduit connected to said blower and extending through said panel and one of said openings in said wall to the interior of said room, a cold air return conduit extending from the interior of said room through the other opening in said wall, through said panel and operatively connected to said blower, a relatively rigid frame carried by said wall interiorly of said room, and said frame enclosing portions of said conduits to protect the same.

4. A portable heater for rooms, comprising a panel adapted to be mounted on an exterior wall of a room, a housing carried by said panel, a partition in said housing providing upper and lower compartments, a fuel tank in said upper compartment, a combined fluid fuel air heater and hot air-distributing blower in said lower compartment, a fuel line connecting said tank to said heater, hot air intake and outlet conduits operatively connected to said blower and adapted to be positioned in said room, said lower compartment including a front wall and a floor, a means mounting said front wall for lateral sliding movement to permit access to said lower compartment, an exhaust for said heater extending through said floor, an air intake for said heater extending through said floor, and said intake being directed toward the panel side of the heater, whereby when said panel is applied to a room wall the intake is adapted to face the room wall.

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