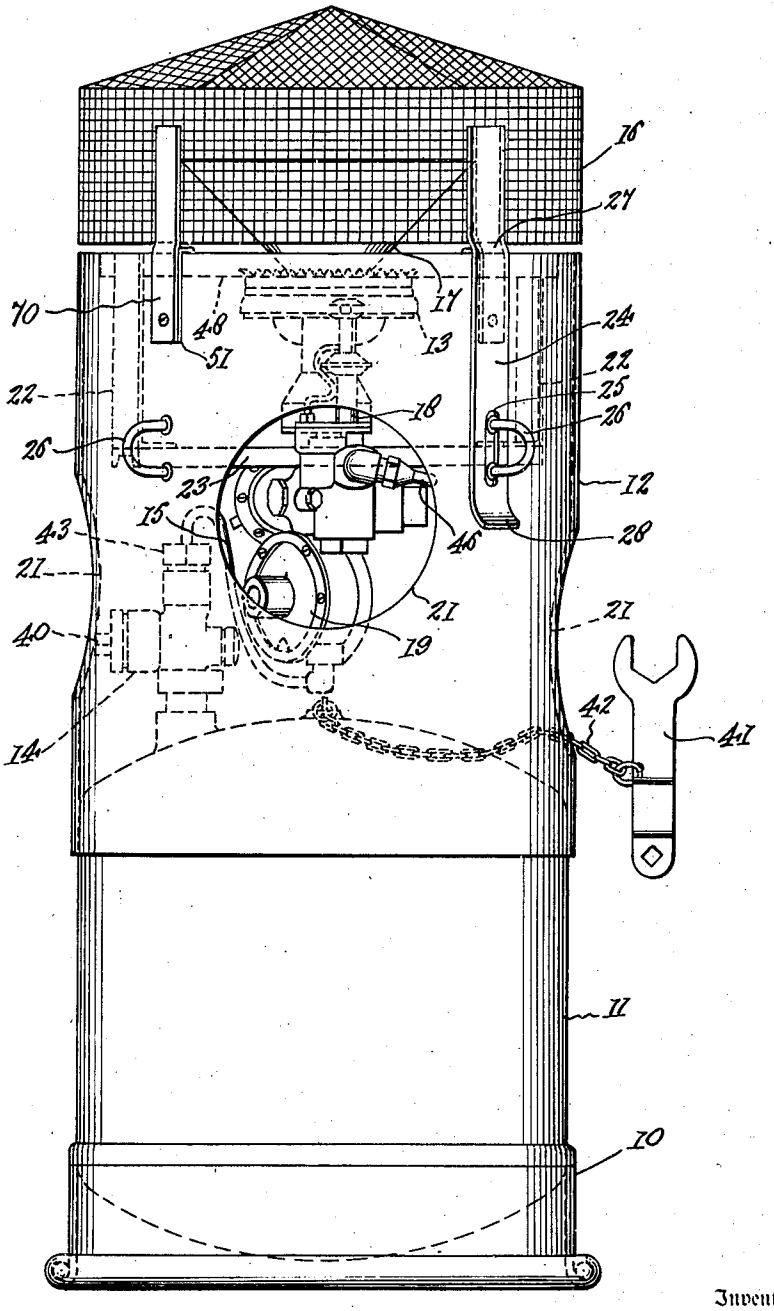
June 6, 1944. P. A. ANDERSON 2,350,860

PORTABLE CAR HEATER

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Fig. 1.



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PORTABLE CAR HEATER

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Fig. 2.

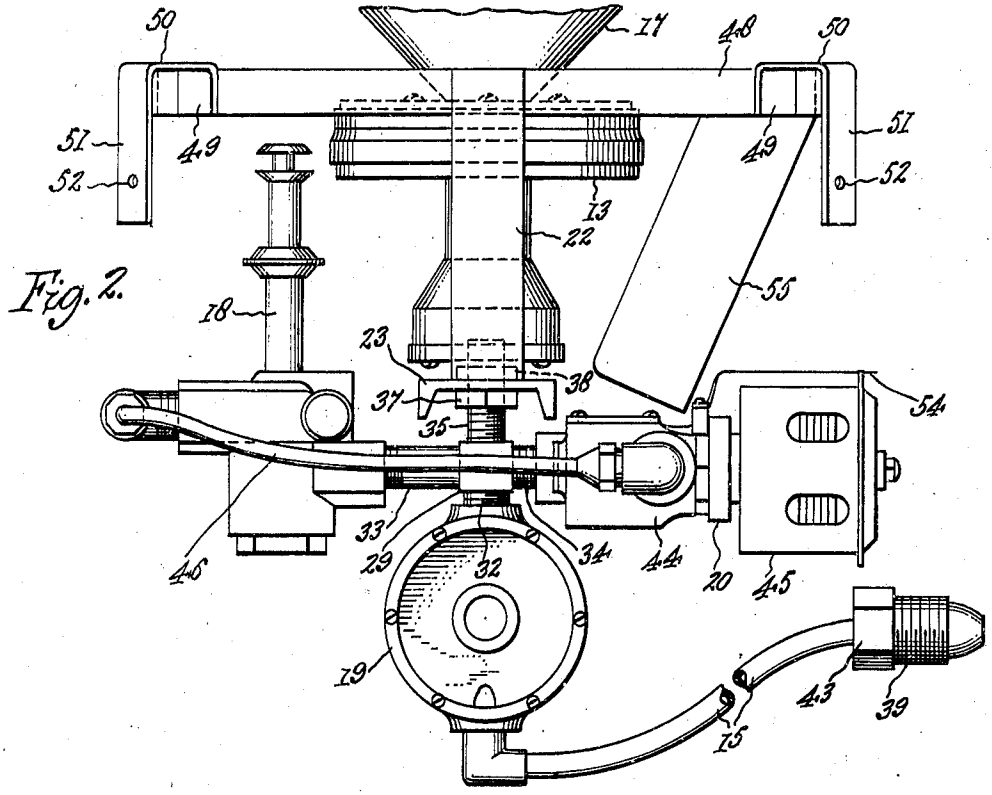


Fig. 3.

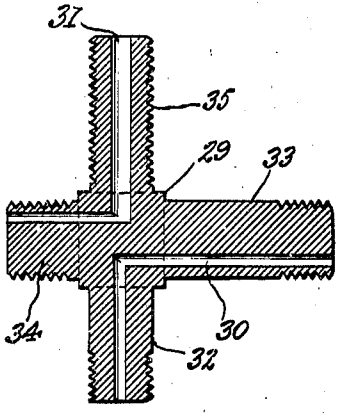


Fig. 4.

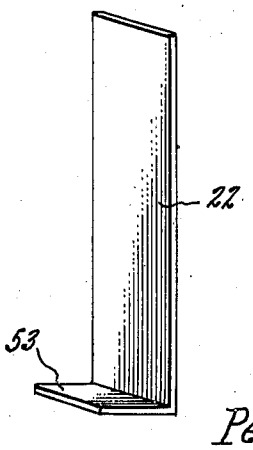
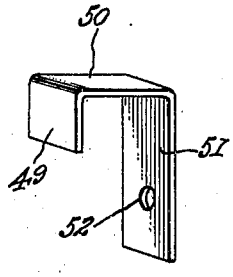


Fig. 5.



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Fig. 6.

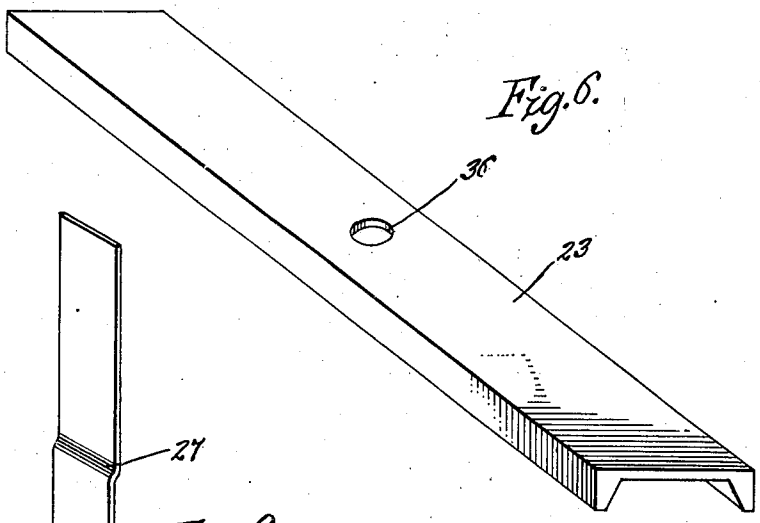


Fig. 9.

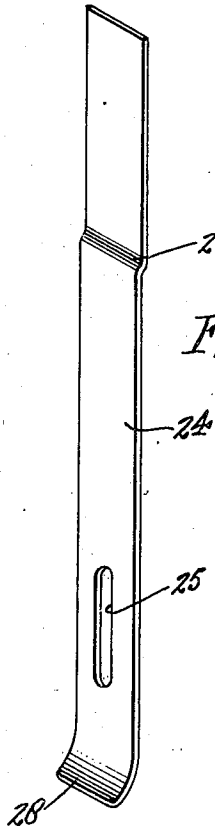


Fig. 7.

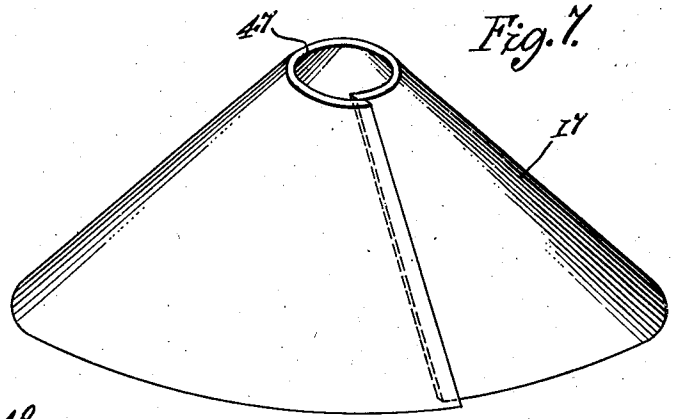
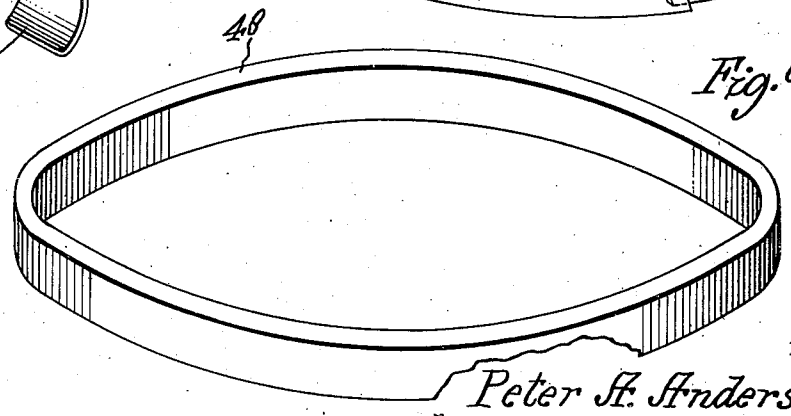


Fig. 8.



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UNITED STATES PATENT OFFICE

2,350,860

PORTABLE CAR HEATER

Peter A. Anderson, Portland, Maine, assignor to Utilities Distributors, Inc., Portland, Maine, a corporation of Maine

Application November 1, 1941, Serial No. 417,555

4 Claims. (Cl. 126—93)

The present invention relates to improvements in portable car heaters or other heaters of a nature particularly useful in connection with liquefied fuel which is deliverable in bottles, cylinders or containers of various kinds and is available in most sections of the country.

Another object of the invention is to produce a heater for cars, dwellings or other places requiring a heater of a portable character in which the fuel container may be a part of the unit, and in which the fuel container may serve as a support for the burner assembly and its associated parts, the arrangement being such that the parts are disconnectible to permit of the gas bottles or containers when exhausted being removed and a full fuel container substituted, whereupon the parts are replaced.

It is a further object of the invention to achieve these purposes in a construction which is compact, easily assembled and taken apart by the user and which may be manufactured easily and cheaply and sold at low cost.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a side elevational view of an improved car heater constructed in accordance with the present invention.

Figure 2 is an enlarged side elevation of the burner assembly apart from its supporting casing and structure and showing the flame deflector partially broken away.

Figure 3 is a cross sectional view through the cross connecting member.

Figure 4 is a perspective view of an upright support employed.

Figure 5 is a similar view of an angle iron support.

Figure 6 is a perspective view of the horizontal or transverse beam.

Figure 7 is an inverted perspective view of the flame deflector.

Figure 8 is a perspective view of the supporting ring, and

Figure 9 is a perspective view of one of the resilient arms employed.

Referring more particularly to the drawings, 10 designates a flat bottom construction or cradle for the gas bottle or liquid fuel container 11, and 12 represents a collar-like casing which is received over the upper end of the container 11. The casing 12 is supported by the fuel container 11 and in turn supports the burner assembly and associated parts. The parts 10, 11 and 12 are solidly welded together thus making a single unit. When the container 11 is exhausted the three parts 10, 11 and 12, are changed as one unit.

The main burner is indicated generally at 13 and it receives its fuel supply from the fuel container 11 through the usual valved connection 14 with which such gas bottles or fuel containers 11 are ordinarily equipped. The improved device includes a pigtail connection 15 detachably made to the valved connection 14.

Above the main burner 13 is a flame guard 16 and a flame deflector 17. The main burner is served by a pilot burner 18 and the fuel from the tank 11 is supplied to the main burner 13 through a regulator 19 with which the pigtail 15 connects. As a part of the burner assembly I provide a thermostatic valve 20 for regulating the operation of the main burner 13 in accordance with thermal conditions in the indoor atmosphere in which the heater is placed.

There are openings 21 in the side wall of the casing 12 at appropriate points to give access to the regulator, burners, both main and pilot, the thermostat and the valved connection 14 for the purpose of regulation.

The main burner and its assembly are carried within the casing 12 by an appropriate supporting structure. In the instance shown uprights 22 support a transverse beam 23. The beam 23 supports a cross or cruciform connecting member 29 (shown in Figure 3), the cross members of which carry the various unts as hereinafter explained. The flame guard 16 is connected to slotted resilient arms 24 whose slots 25 are adapted to engage keepers 26 externally on the casing 12 as shown in Figure 1. These slotted resilient arms may be provided in any suitable number one being shown particularly in Figure 9 as having an offset portion 27 and flared free lower end 28. The length of the arm 24 above the offset 27 is welded or otherwise secured to the outside of the cage or flame guard 16. The offset shoulder 17 provides a seat whereby the arms 24 rest upon the upper edge of the casing 12 or upon the angle iron members shown in Figure 6 which are secured to the casing 12. In accordance with Figure 3 the cross connecting device 29 is provided with angled passages 30 and 31.

As shown in Figures 1 and 2 the regulator 19 is screwed upon or otherwise connected with the bottom branch 32 of the cross connecting member 29. The pilot burner 18 is carried upon one hori-

zontal branch 33, the other horizontal branch 34 carrying the thermostat 20 and its valve. The upper branch 35 passes through an opening 36 made in the transverse beam 23 as shown in Figure 7, and as shown in Figure 2 nuts 37 and 38 threaded upon the branch 35 respectively below and above the beam 23 serve to hold the cross connection 29 and its various members upon such cross beam 23. The main burner 13 of a usual form is also supported by the cross beam 23 or by other members of the supporting structure and connects with its source of fuel supply through the passage 31.

The regulator 19 receives its fuel through the pigtail 15. This pigtail as shown in Figure 2 has a screw plug 39 or other form of detachable connection for engaging with the upper end of the valved connection 14 shown in Figure 1. This valved connection has a valve with an exposed turning member 40 which is accessible for opening and closing the valve through one of the openings 21 in the side wall of casing 12. A wrench 41 may be supplied and held captive to the device by a chain or other connection 42, such wrench being suitable for mating with a nut 43 upon the plug 39 whereby the pigtail 15 may be disconnected from the valved connection 14 when a new container 11 is to replace an exhausted one.

Fuel flows through the regulator, passage 30 to the valve member 44 of the thermostatic device 20. The thermostat through its valve member 44 regulates the rate of flow of the gas to the main burner 13. The pilot burner 18 is supplied through a by-pass 46 which by-passes the valve member 44 and allows a restricted amount of fuel to flow at all times to the pilot burner 18.

In Figure 7 the flame deflector is shown in inverted position as being substantially conical in form with a truncated end portion having an opening 47 to fit about a part of the burner 13. The conical wall deflects the rising flame from the burner 13 outwardly in a substantially horizontal direction. In other words it spreads the flame and spreads the influence of the heat. In cooperation with the flame deflector 17 the flame guard 16 acts to prevent this spread flame and heat from contacts with persons or inflammable objects.

In Figure 9 a ring 48 is shown. This ring receives on the outside thereof, as shown in Figure 2, the upper ends of the uprights 22 (Figure 4) and such parts are welded or otherwise secured together so that the uprights 22 depend and are supported from the ring 48.

As shown in Figure 5 angle irons carry downwardly turned terminal ends 49 which are also welded or otherwise secured to the outside surface of the ring 48 at points angularly displaced about the ring 48 from the uprights 22. These angle connections (Figure 5) also have horizontal shanks 50 which span the upper edge of the casing 12 and may rest upon such upper edge and serve to bring the arms 51 of the angle connections slidably down upon the outside of the casing 12. Solid rigid arms 70 are affixed at their lower portions to the arms 51 by screws, rivets or other fastenings passing through the openings 52 (Figure 5). The resilient arms 24 are welded or otherwise secured to the upper portions of the rigid arms 70 above the offsets 27. The rigid arms may be similarly offset, such rigid arms 70 support the screen 16 as a part of the removable burner assembly.

The angle connections 50 serve to support the ring 48 within the confines of the upper end of the casing 12 and spaced from the inner wall of the casing 12. The ring supports the uprights 22 and such uprights carry the horizontal or transverse beam 23 which supports the cross connecting device 29 and the member units thereof.

Referring to Figure 4 flanges 53 are preferably turned from the lower ends of the uprights 22 and welded upon the end portions of the beam 23.

It will be appreciated from the foregoing that I have provided a thermostatically controlled portable space heater for use particularly with railroad cars, trucks, truck-trailers and other similar vehicles.

The burner is preferably of the type designed for liquefied petroleum gas with a capacity of from 10,000 to 19,250 B. t. u.'s per hour.

The thermostat 20 is mounted integrally with the heater and easily accessible. It is preferably adjustable from a range of 50 to 80 degrees but not necessarily limited thereto; and it provides uniform temperature in the space being heated. A spring clip 54 is provided on the face of the thermostat thus assuring a constant temperature setting when the heater is subjected to vibration. The spring clip may be easily raised manually if it is desired to change the temperature setting. For work of this kind what is known as a 100% safety pilot of the Klixon type is provided to ignite the burner and to close off the gas supply completely in case of pilot failure.

The gas container 11 is a steel cylinder preferably with a capacity of 20 pounds of propane gas. This container provides not only the source of the fuel but also a support for the heater mechanism and a protection against damage to any part of the mechanism.

The openings 21 in the casing or collar 12 not only provide for access to the various members or units as hereinbefore explained but also allow for the necessary air circulation.

When the cylinder 11 is exhausted of fuel, the complete burner assembly may be removed from the cylinder 11 by first unscrewing the plug 39 and removing the pigtail connection 15 from the valved connection 14 which is a part of the fuel container 11. This is done by use of the wrench 41. The lower ends of spring arms 24 are then pried out from the keepers 26 and the entire burner assembly including the guard 16 may be lifted off and out of the collar or casing 12. The unit 10, 11 and 12 is then removed and replaced by a full unit; whereupon the burner assembly is put in place, the spring arms snapped in the keepers and the plug 39 screwed in the connection 14. When the valve at 40 is opened the new supply of fuel is made available to the regulator 19 and other parts of the device.

The nature of the described heater is such that the cylinder 11 supplies an unusual amount of thermostatically controlled heat in relation to its size and weight; one filling of fuel being sufficient for 22½ to 43 hours of continuous operation. When the temperature is raised only a few degrees, the life of the fuel charge is much longer, depending on the size of the space and the temperature required.

The heater is extremely portable as the fuel supply is self-contained and as the heater requires no venting or other external connections.

If desired the cradle 10 or other parts may be firmly attached to the foundation upon which

it rests by means of suitable linkage, such as hooks, chains, wires, hold-down bolts, metal straps, etc.

The cone **17** is in the nature of a baffle and it serves to increase the heating efficiency and to protect the upper portion of the heater from direct heat. There is also a baffle **55** interposed between the thermostat **20** and the burner **13** to protect the thermostat from the direct heat of the burner. The opening **47** (Fig. 7) is for the purpose of attachment of the flame spreader **17** to the burner **13** and still allow the guard to be adjusted to compensate for any unevenness in the top of the standard burner construction making it possible to level the spreader for the sake of appearance.

The screen **16** will preferably be of heavy wire mesh, perforated steel, or similar substance but not necessarily limited thereto.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. A heater unit comprising a fuel container, a hollow casing having one end received over the fuel container, a supporting structure removably disposed on the inside of the casing, a burner assembly carried on said structure and having a detachable connection to the source of fuel in the container, a flame guard positioned above the casing, slotted resilient arms on the guard, and keepers on the casing to detachably receive the slotted portions of said arms.

2. In combination, a cradle, a fuel container supported in the cradle, a casing supported upon the container and secured thereto, a burner assembly carried within said casing, a flame guard positioned above the casing, slotted resilient arms on the guard, and keepers on the casing to detachably receive the slotted portions of said arms.

3. A heater comprising a fuel container, a hollow casing having one end received over the fuel container, a burner assembly removably carried within the casing, a ring having arms dependent therefrom, a beam carried by said arms, clips supporting said ring and detachably hooking over the edge of the casing, a flame guard supported by rigid arms and attached to said clips, slotted spring arms affixed at the upper portions over the upper parts of said flame guard supporting arms, said arms having offset portions supported by the upper edge of the casing through said clips, and keepers on the casing detachably and interlockingly engaging the slotted portions of the resilient arms.

4. A heater comprising a fuel container, a hollow casing having one end received over the fuel container, a burner assembly removably carried within the casing and having a detachable connection to the source of fuel in the container, a supporting structure carrying the assembly and having parts detachably supported on the casing, said supporting structure comprising a ring having arms dependent therefrom, a beam carried by said arms, clips supporting said ring and detachably hooking over the edge of the casing, a flame guard supported by rigid arms and attached to said clips, slotted spring arms affixed at the upper portions over the upper parts of said flame guard supporting arms, said arms having offset portions supported by the upper edge of the casing by said clips, and keepers on the casing detachably and interlockingly engaging the slotted portions of the resilient arms.

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