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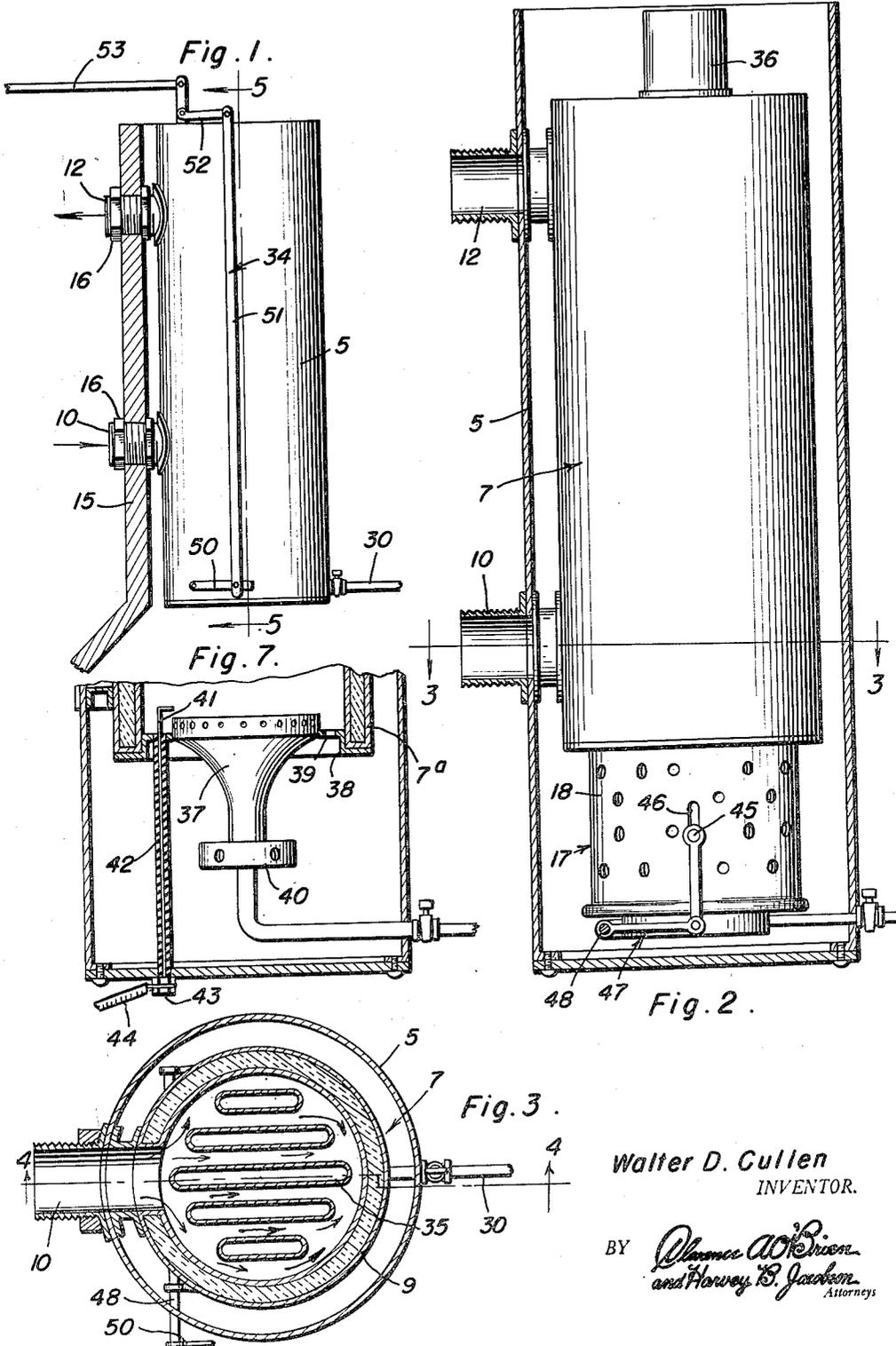
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2,544,446

AIR HEATER FOR MOTOR VEHICLES

Filed June 23, 1948

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

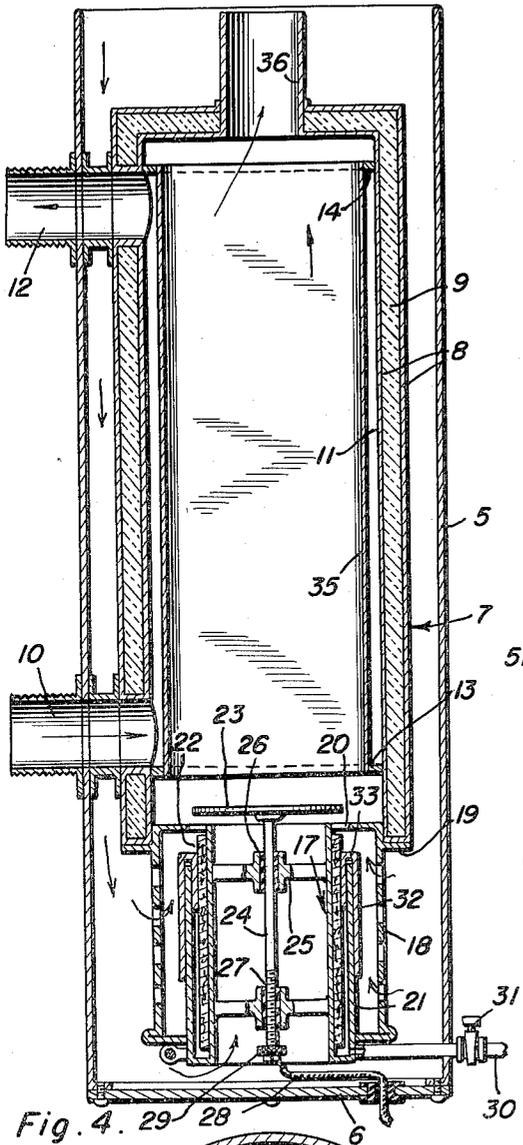


Fig. 4.

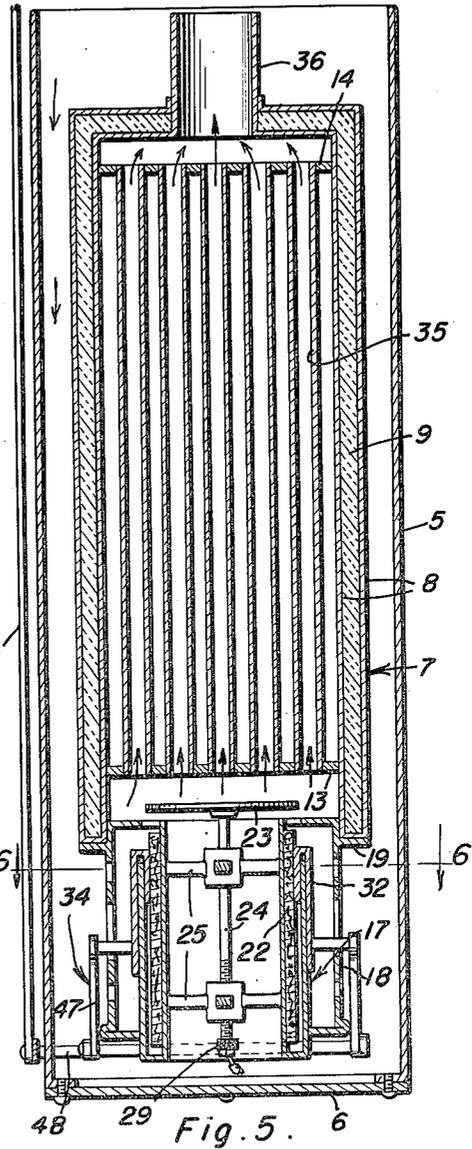


Fig. 5.

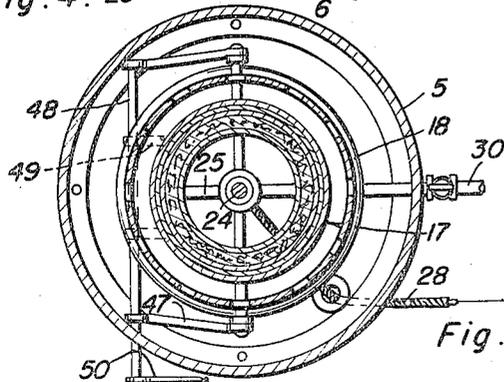


Fig. 6.

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# UNITED STATES PATENT OFFICE

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## AIR HEATER FOR MOTOR VEHICLES

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4 Claims. (Cl. 126-67)

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The present invention relates to new and useful improvements in heaters designed particularly for use with automobiles and other motor vehicles and more particularly to a heater burning oil or other low grade fuel.

An important object of the present invention is to provide a heater for air circulating there-through for supplying the heated air to a desired part of the automobile.

A still further object of the invention is to provide novel draft means for the oil burner and wherein a downdraft is provided for cold air supplied to the burners to provide a proper combustion therefor.

A still further object is to provide a heater of this character including a wick type oil burner having flat fire tubes leading therefrom to more effectively heat the air circulating around the tubes and providing an outer shell for the burner and insulated from the fire tubes to reduce heating of air admitted to the shell whereby an effective downdraft of cool air is provided which is supplied to the burner in an effective combustible mixture with the fuel.

A still further object is to provide a device of this character of simple and practical construction, which is efficient and reliable in operation, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view showing the heater mounted in position to the fire wall of an automobile;

Figure 2 is an enlarged vertical sectional view;

Figure 3 is a transverse sectional view taken on a line 3-3 of Figure 2;

Figure 4 is an enlarged vertical sectional view taken on a line 4-4 of Figure 3;

Figure 5 is a similar view taken on a line 5-5 of Figure 1;

Figure 6 is a transverse sectional view taken substantially on a line 6-6 of Figure 5; and

Figure 7 is an enlarged fragmentary vertical sectional view of a modified burner construction.

Referring now to the drawings in detail wherein, for the purpose of illustration, I have disclosed a preferred embodiment of the invention, the numeral 5 designates the outer shell

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of the heater which is open at its top and provided with a bottom plate 6 closing the lower end thereof.

An inner shell is designated generally at 7 constructed of hollow walls 8 packed with a suitable heat insulation material 9, the inner shell 7 being spaced centrally within the walls of the outer shell 5. A cool air inlet pipe 10 extends through the outer shell 5 and through the lower portion of the inner shell 7 to supply cool air to an air chamber 11 within the inner shell 7 and a hot air outlet pipe 12 also extends through the outer shell 5 and the inner shell 7 for discharging heated air from the upper portion of air chamber 11.

A lower plate 13 closes the bottom of air chamber 11 at a point immediately below the inlet pipe 10 and an upper plate 14 closes the top of air chamber 11 at a point immediately above outlet pipe 12.

The outer shell 5 is secured in a vertical position under the hood of an automobile or other motor vehicle by attaching the inlet and outlet pipes 10 and 12 to the fire wall or dashboard 15 of the vehicle by nuts or the like 16 and whereby cool air from the region of the floor of the vehicle will be admitted into the inlet pipe 10 and heated air will be discharged into the vehicle by the outlet pipe 12.

An oil burner designated generally at 17 includes an annular perforated shell 18 suitably secured in the lower portion of outer shell 5 and is provided adjacent its upper portion with an annular flange 19 supporting the lower end of inner shell 7. A substantially enlarged central opening 20 is formed in the top of burner shell 18.

A wick holder 21 formed of annular hollow walls is open at its top and in which a wick 22 of cylindrical shape is positioned with the upper edge of the wick exposed at the top of the wick holder.

An air regulating disk 23 is supported at the top of wick holder 21 by means of a stem 24 extending downwardly from the disk through the wick holder and supported by one or more spiders 25; the stem being insulated from the spiders by insulation collars 26. The lower end of the stem is threaded as shown at 27 for threaded adjustment in the lower collar 26 and a circuit wire 28 is attached to the lower end of stem 24 by means of a terminal nut 29. The disk 23 is of a diameter slightly less than the diameter of central opening 20 in the top of burner shell 18 whereby to regulate the volume of air passing

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through the shell 18 and upwardly through opening 20.

A fuel supply pipe 30 is connected to the lower portion of wick holder 21 and is provided with a cut-off valve 31.

The flame of wick 22 is controlled by means of a sleeve 32 having an inverted channel upper end 33 receiving the upper edge of the outer wall of wick holder 21. The sleeve 32 surrounds the upper portion of wick 22 and the sleeve is vertically adjustable by means of a lever mechanism 34 attached to the sleeve, the raising and lowering of the sleeve exposing more or less of the upper portion of wick 22 to thus control the flame thereof.

A plurality of flat fire tubes 35 extend vertically in air chamber 11 with the upper and lower ends of the fire tubes suitably secured respectively to the upper and lower plates 14 and 13 whereby the products of combustion or heated gases from the burner will pass upwardly through the fire tubes and outwardly through a flue 36 in the top of inner shell 7.

In the operation of the device, the disk 23 not only controls the volume of air passing through opening 20 but also provides an igniter for the wick by passing an electric current from circuit wire 28 upwardly through stem 24 to the disk, the edges of the disk forming a spark gap between either the top of burner shell 18 or the top of wick holder 21.

Cool air under the hood of the vehicle is admitted into the open top of outer shell 5 and the heated gases from burner 17 passing upwardly through fire tubes 35 will cause a downdraft of the air between the inner and outer shells 5 and 7 and into the perforated burner shell 18 for mixing with the fuel at the top of wick 22, thus providing an effective combustion for the fuel.

Cool air from the vehicle is admitted into pipe 10 where the same passes upwardly through air chamber 11 and is heated by the fire tubes 35, the heating of the air in the air chamber 11 causing the same to circulate upwardly for passing out of the outlet pipe 12, to thus heat the interior of the vehicle.

In Figure 7 I have illustrated a modified burner construction which comprises a gas burner 37 supported centrally in a plate 38 suitably secured to the lower end of inner shell 7a, the plate having draft openings 39 surrounding the burner. An air inlet manifold 40 is positioned at the lower portion of the burner to supply air thereto for proper combustion.

An igniting electrode 41 is supported at one side of the burner 37 in porcelain or other insulation tube 42 and a terminal 43 is provided for the lower end of the electrode for attaching a circuit wire 44 thereto.

The lever mechanism 34 for raising and lowering wick regulating sleeve 32 comprises trunnions 45 projecting from the sides of the sleeve vertically adjustable in slots 46 in burner shell 18. A linkage 47 connects the trunnions to a shaft 48 journaled in brackets 49 supported by the burner.

One end of shaft 48 projects outwardly through the outer shell 5 and to which one end of an arm 50 is secured. A vertical rod 51 is pivoted at its lower end to arm 50 and is pivoted at its upper end to one end of a bell crank lever 52 pivoted to the upper edge of shell 5. A rod 53 extends from the other end of the bell crank lever 52 to a position for convenient operation of the driver of the car.

In view of the foregoing description taken in

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conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be had by those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claims.

Having described the invention, what is claimed as new is:

15 1. A heater for motor vehicles comprising inner and outer shells in spaced relation to each other, said outer shell being open at its upper end and closed at its lower end, a burner in the lower portion of the outer shell and with the upper end of the burner positioned in the lower end of the inner shell, said burner having draft openings by means of which air is supplied to the burner from the outer shell by down draft, upper and lower plates in the inner shell forming an air chamber above the burner, air inlet and outlet means leading from the air chamber outwardly at one side of the inner and outer shells, and fire tubes leading from the burner through the air chamber, said inlet and outlet means comprising pipes including means for attaching the pipes to a supporting structure to hold the shells in an upright position.

25 2. A heater for motor vehicles comprising inner and outer shells in spaced relation to each other, said outer shell being at its upper end and closed at its lower end, a burner closing the lower end of the inner shell and including a perforated burner shell below the lower end of the inner shell and exposed in the lower portion of the outer shell, a wick holder in the burner shell, igniting means for the burner, upper and lower plates in the inner shell forming an air chamber therein, an air inlet tube and an air outlet tube leading from the chamber outwardly through the shells, and fire tubes leading from the burner through the air chamber.

3. A heater for motor vehicles comprising inner and outer shells in spaced relation to each other, a burner supported by and extending from the lower end of the inner shell and having draft openings, a flue at the top of the inner shell, said outer shell being closed at its bottom and open at its top to provide a downdraft for air supplied to the draft openings of the burner, upper and lower plates in the inner shell forming an air chamber therein, inlet and outlet tubes leading from the air chamber outwardly through one side of the inner and outer shells, and fire tubes extending vertically through the plates and through the air chamber.

4. A heater for motor vehicles comprising inner and outer shells in spaced relation to each other, a burner supported by the lower end of the inner shell and projecting therefrom downwardly into the lower portion of the outer shell, said burner having draft openings exposed in the lower portion of the outer shell, said outer shell being closed at its bottom and open at its top and said shells having an air passage therebetween to provide a downdraft of air supplied to the draft openings of the burner, insulation means surrounding the inner shell, upper and lower plates in the inner shell forming an air chamber, an inlet tube and an outlet tube for the air chamber leading to the atmosphere to circulate

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air through the chamber to be heated, and fire tubes extending vertically through the upper and lower plates and through the air chamber.

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