Aug. 29, 1961 E. L. GROOMS, JR 2,998,003

COMBINED ROOM HEATER AND WATER HEATER

Filed Aug. 11, 1958

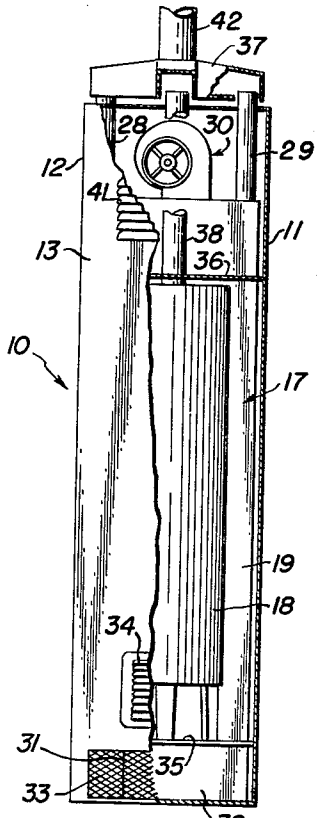


FIG. 1.

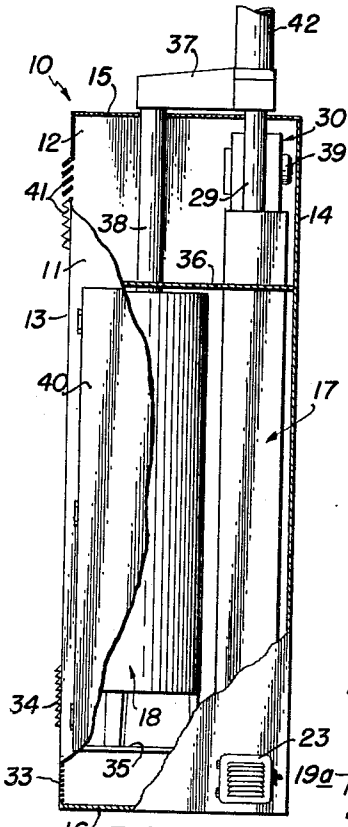


FIG. 2.

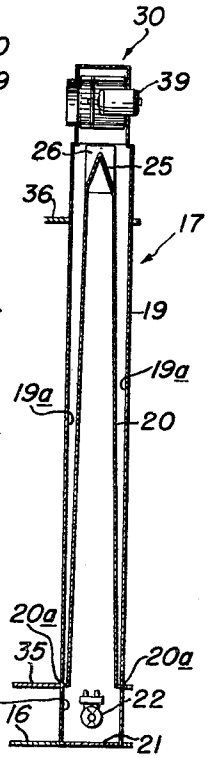


FIG. 3.

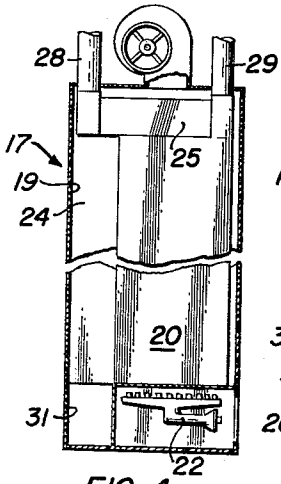


FIG. 4.

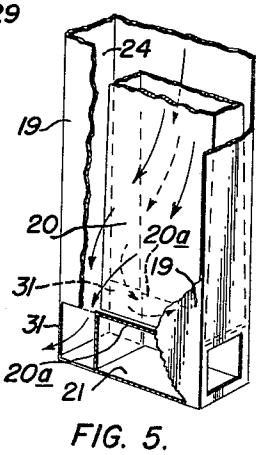


FIG. 5.

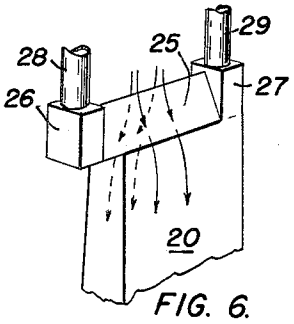


FIG. 6.

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COMBINED ROOM HEATER AND WATER HEATER

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5 Claims. (Cl. 126—101)

This invention relates to heaters and has reference to a combined room heater and water heater which requires a relatively small floor area for its operation. A particular use of the invention is for heating the interiors of house trailers where living areas are limited.

An object of the invention is to provide a combined room heater and water heater arranged in a single casing in a manner so as to occupy relatively little floor space.

Another object is to provide a unique combustion chamber having a relatively large heating surface, yet one which occupies a relatively small space.

A particular object is to provide a combustion chamber which is unusually efficient in its operation.

A further object is to provide a combined room heater and water heater wherein the action of one heater augments the action of the other.

These and other objects will become apparent from the following description and the accompanying drawing, wherein:

FIGURE 1 is a broken side elevation of a combined room and water heater embodying the features of the invention.

FIGURE 2 is a broken front elevation of the heater shown in FIGURE 1 and illustrating the relative positions and means providing coaction between the water heater and the room heater.

FIGURE 3 is a vertical sectional view of the room heater taken across its narrow transverse dimension.

FIGURE 4 is a vertical sectional view of the room heater taken across its wide transverse dimension.

FIGURE 5 is a broken perspective view of the lower portion of the room heater and showing the flow of air currents therein, and

FIGURE 6 is a broken perspective view of the upper portion of room heater combustion chamber and showing the down draft air current divider comprising a part thereof.

In the drawing, the numeral **10** generally designates a rectilinear vertical outer casing **10** having front and rear walls **11** and **12**, side walls **13** and **14**, a top **15** and a bottom **16**. As viewed from the front, FIGURE 2, there is a room heater in one side of the casing **10**, adjacent but spaced from a side wall **14**, and next to the room heater there is a vertical cylindrical water heater **18**. The room heater **17** is comprised of a narrow vertical housing **19**, the greatest transverse dimension of which is nearly equal to the width of the outer casing **10**. Within the room heater case **19** there is a combustion chamber **20** which is rectangular in transverse section but convergingly tapered toward its upper end. The lower end of the combustion chamber **20** is spaced from the bottom **21** of the housing **19** where it is secured by narrow flanges **20***a* to the vertical walls **19***a* of the housing, as by welding. The space beneath the lower end of the combustion chamber **20** and above the bottom **21** thereof accommodates a burner **22** extending substantially across the greater transverse dimension of the housing **17**. A louvered door **23** in the outer case **10** supplies air to the burner **22**.

As particularly shown in FIGURES 4 and 5, one vertical end wall of the combustion chamber **20** is spaced from the adjacent wall of the heater housing **19** so as

to provide a down draft air channel **24**. A hollow wedge shaped divider **25** mounted on the upper end of the combustion chamber **20** extends across the housing. The ends of the divider are rectangular, as at **26** and **27**, and communicate with upwardly directed vent stacks **28** and **29**. Between the vent stacks **28** and **29**, there is a housed fan **30** having its discharge directed downwardly into the upper end of the housing **19**. By reason of the locations of the divider **25**, the tapered surface of the combustion chamber **20** and the down draft channel **24**, the air from the fan **30** is effectively heated prior to passing through discharge ports **31** into a plenum **32** beneath the water heater **18**. A grill **33** in the side of the casing **10** discharges hot air from the plenum into the room to be heated, or the plenum may be connected with a duct, not shown. A louvered opening **34** in the casing **10** just above the plenum **32** supplies air to the water heater **18**, and it will be noted in FIGURES 1 and 2 that the water heater rests on the upper surface of the top wall **35** of the plenum **32**.

Above the water heater there is a horizontal partition **36** of sheets metal which fits around the upper portion of the room heater housing **19**. There is a T-shaped draft diverter **37** above the casing **10**, the arms of which diverter are connected with the previously described vent stacks **28** and **29** and with the vent stack **38** which extends upwardly from the water heater **18** through the horizontal partition **36**. Other details shown on the drawing include a motor **39** for driving the fan **30**, an access door **40** in the front of the casing **10**, air inlet louver **41** in the casing **10** above the partition **36**, and a flue **42** atop the draft diverter **37**.

In operation, air is drawn inwardly through the upper louvers **41** by means of the fan **30** and is then directed downwardly through the room heater housing **19**, over the relatively tall and wide combustion chamber **20** and thence to one side and downwardly through the down draft channel **24**, into the plenum **32** and outwardly through grill **33**. The horizontal partition **36** entraps radiant heat from the room heater housing **19** and thus augments the heating effect of the burner, not shown, of the water heater **18**. Since the water heater **18** rests on and above the plenum **32** additional radiant heat augments the operation of the water heater **18**. It is also pointed out that by reason of the location of the water heater atop the plenum, considerable floor space is saved by reason of the present construction and arrangement.

The invention is not limited to the exemplary construction herein shown and described, but may be made in various ways within the scope of the appended claims.

What is claimed is:

1. A combined room heater and water heater comprising a vertical casing having a side wall, means forming an air inlet in the upper portion of said casing, a room heater within said casing adjacent but spaced from said side wall, said room heater being comprised of a narrow vertical housing, the greatest transverse dimension of which is nearly equal to the width of said side wall, fan means for drawing air from the inlet to the top of the heater housing, said room heater including a wall means forming a combustion chamber therein and extending upwardly in said housing, a burner within the lower portion of said combustion chamber, means including a louvered door in said outer casing and communicating with said burner to supply air thereto, a water heater within said casing adjacent said room heater, wall means forming a plenum in said casing beneath said water heater, means forming an outlet through said casing from said plenum, and means communicating the lower end of said housing of said room heater with said plenum.

2. The construction defined in claim 1, and wherein

the combustion chamber within said room heater housing is spaced from an end wall thereof providing a down draft channel substantially along the side thereof.

3. The construction defined in claim 1, and including a horizontal partition within said casing above said water heater and around the upper portion of said room heater.

4. The construction defined in claim 2 and wherein the lower end of said down draft channel extends to the bottom of said casing where it communicates with said plenum.

5. The construction defined in claim 2, and including a wedge shaped divider on the upper end of the combustion chamber of said room heater.

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