June 4, 1929. C. E. DAVIDSON 1,716,213

HEATING STOVE

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Fig 1

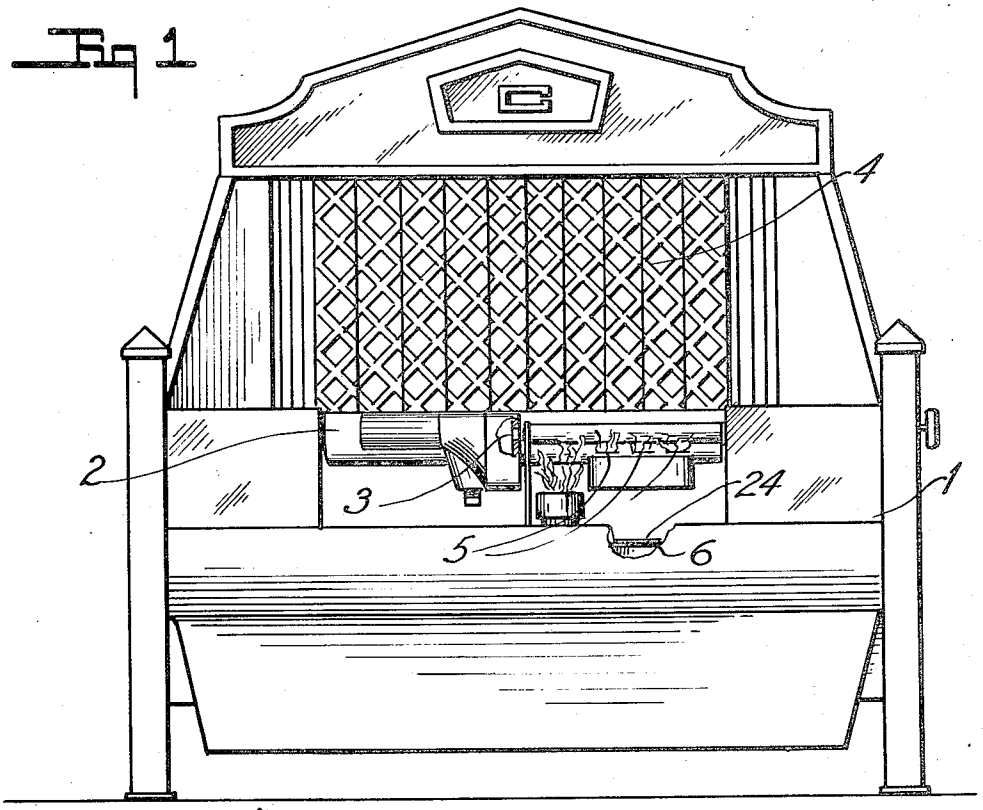

Fig 2

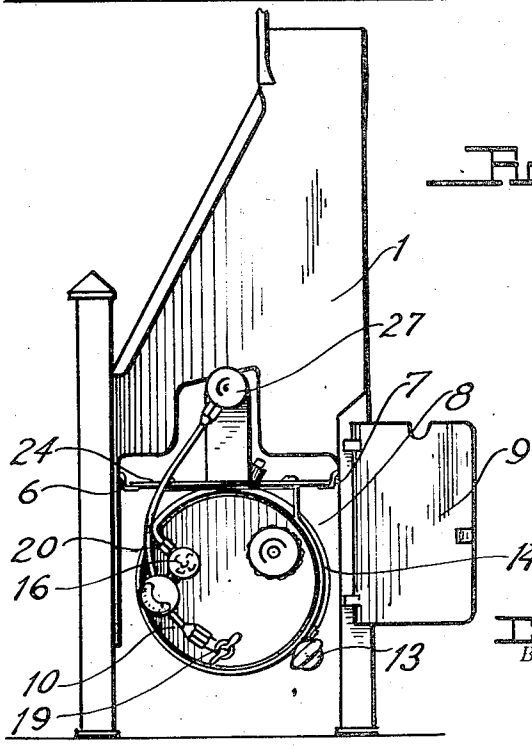

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Fig 3

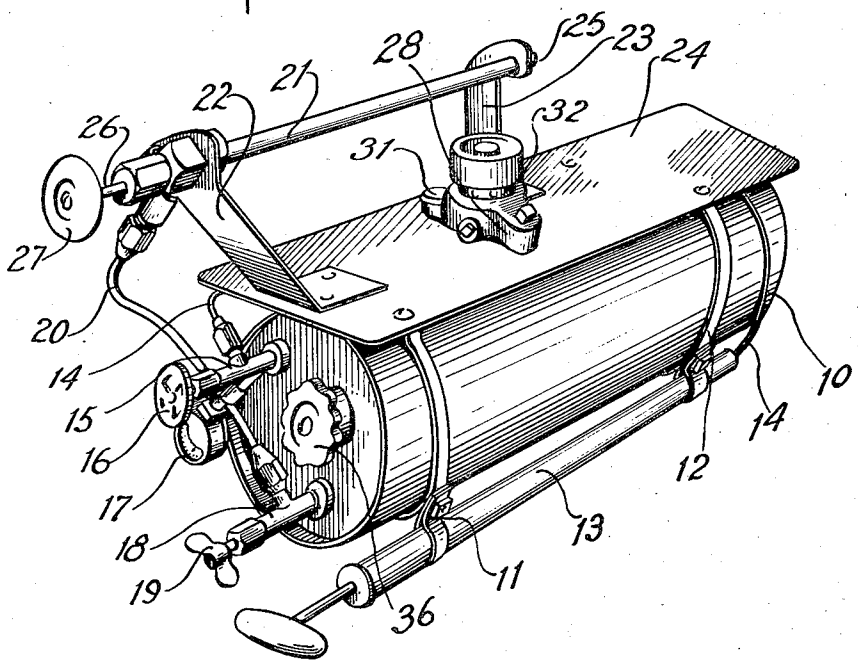
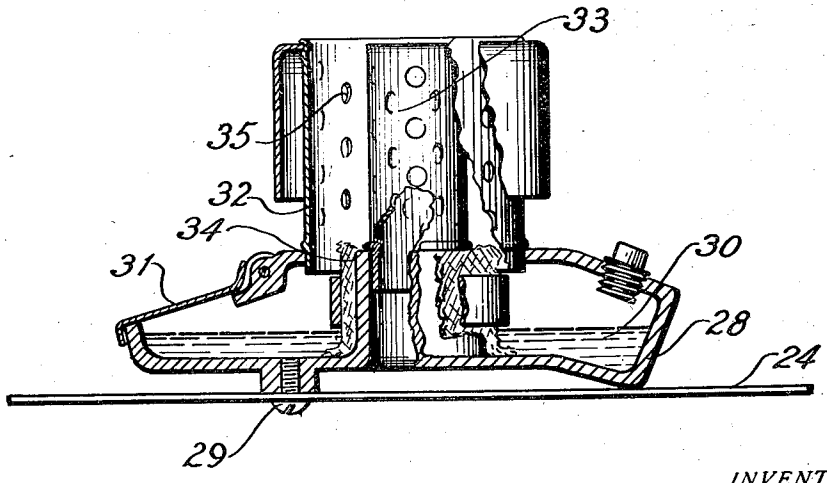


Fig 4



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Patented June 4, 1929. 1,716,213

UNITED STATES PATENT OFFICE.

CHARLES E. DAVIDSON, OF WICHITA, KANSAS, ASSIGNOR TO COLEMAN LAMP AND STOVE CO., OF WICHITA, KANSAS, A CORPORATION OF KANSAS.

HEATING STOVE.

Application filed September 22, 1927. Serial No. 221,238.

This invention relates to heating stoves in which liquid fuel is converted into the vapor phase before it enters the burner. In such stoves, a heat responsive vaporizer, commonly called a generator, communicates with a tank containing liquid fuel under pressure. The liquid fuel forced into the vaporizing generator by the pressure within the tank is vaporized and passes into an intake port in a burner where it is burned. The tank obviously must be filled from time to time, so I have provided a novel removable unit consisting of the tank, a vaporizing generator and a heat insulating plate for the tank, all arranged in a unitary structure so that the unit can be conveniently removed for filling the tank, for inspection and repairs of the parts thereof and for testing the same. The vaporizing generator must of necessity be preheated in order to vaporize the liquid when the fuel from the burner is first ignited, so I have provided a preheater which may be a part of the unit. This preheater can be conveniently carried by the insulating plate which serves to insulate the heat from the tank to thereby prevent the highly volatile liquid from becoming dangerously hot.

I have found it expedient to make certain other improvements in a vapor generating stove, all of which will be specifically referred to hereinafter, reference being had to the accompanying drawings in which:

Fig. 1 is a front elevational view of a stove constructed in accordance with my invention, parts being broken away to better illustrate certain other parts.

Fig. 2 is an end view of the stove, the end door being swung into open position.

Fig. 3 is a perspective view of the removable unit and

Fig. 4 is an enlarged view of the preheater, partly in section and partly in elevation.

Referring, now, to the drawings by numerals of reference, 1 designates the casing in which is a horizontally disposed burner 2, having a vapor inlet 3 with top openings to supply fuel vapor to the radiants 4 above it. The burner is also provided with outlets 5, offset from the burner manifold so as to heat the vaporizing generator. Below the burner are supports 6 and 7 upon which the unit may be supported. The unit is adapted to be introduced into the casing 1 through an end opening 8 which may be closed by a door 9. The unit is best illustrated in Fig. 3 as comprising a tank 10, carrying bands 11 and 12 which support a pump 13 having a conduit 14 leading into the connection 15 communicating with the tank. The connection is provided with a valve 16 closing off communication between the conduit 14 and the tank when the pump has supplied sufficient pressure. There is a pressure gage 17 also communicating with the connection 15. Leading from the tank 10, below the liquid level thereof, is a connection 18 having a valve 19 which is adapted to open and close communication between the tank 10 and a conduit 20, connected to a vaporizing generator 21, supported by the brackets 22 and 23, carried by the heat insulating plate 24 for the tank supported by the bands 11 and 12. The vaporizing generator 21 has an outlet tip 25 which can be opened and closed by a valve (not shown) on the end of the stem 26. The stem may be operated by a hand wheel 27. The particular construction of the generator is not shown nor described because such vaporizing generators are well known. The preheater is shown as consisting of a reservoir or base 28 secured to the plate 24 by a fastening device 29. The particular construction of the preheater constitutes no part of my invention as the one selected for illustration has been in use prior to my invention. Briefly, it consists of a reservoir 30 adapted to be supplied with fuel through an opening 31. The liquid is carried up into the space between the tubes 32 and 33 by a wick 34, the tubes having air openings 35. The fuel can be ignited above the wick and since the preheater is below the generator, the generator will be initially heated so that the liquid supplied from the tank will be vaporized. After the fuel from the burner 2 is ignited, the flame passing out of the orifices 5, offset from, and communicating with the burner manifold, will impinge upon the generator 21 and keep it hot enough to vaporize the fuel in the vaporizing generator so long as the stove is in operation. The tank can be filled with liquid through an opening closed by the filler plug 36. The unit can be introduced into the stove by sliding it along the guides 6 and 7 until the tip 25 of the vaporizing generator alines with the inlet port 3 of the burner. When it is desired to fill the tank, to inspect any parts

of the unit or to make any repairs to the unit, it can be readily withdrawn from the casing without disturbing the casing other than to open the door.

I am aware that removable tanks have been used prior to my invention, but I am not aware that a unit including the generic elements recited in the appended claims have been used prior to my invention so I do not wish to be limited to the exact details of construction shown, but reserve the right to make changes in form, proportions and minor details of construction without departing from the spirit of my invention or sacrificing any of its advantages.

What I claim and desire to secure by Letter-Patent is:—

1. A stove comprising a casing having a burner with a vapor inlet, a removable unit comprising a tank to receive liquid fuel under pressure, a vaporizing generator having valved communication with the tank, a heat insulator carried by the tank between the generator and the tank, and means within the casing to support the removable unit in cooperative relation with the vapor inlet.

2. A stove comprising a casing having a burner with a vapor inlet, a removable unit comprising a tank to receive liquid fuel under pressure, a vaporizing generator in valved communication with the tank, a heat insulating element carried by the tank to insulate the tank from the burner, and means for removably supporting the unit within the casing to maintain the vapor generator in line with the vapor inlet.

3. A removable unit for stoves comprising a tank to receive liquid fuel under pressure, a vaporizing generator in valved communication with the tank and a heat insulating member between the tank and the vaporizing generator.

4. A removable unit for stoves comprising a tank to receive liquid fuel under pressure, a vaporizing generator in valved communication with the tank and a heat insulating plate between the tank and the generator.

5. A removable unit for stoves comprising a tank to receive liquid fuel under pressure, a vaporizing generator in valved communication with the tank and heat insulating member between the tank and the generator, the heat insulating element comprising a plate supported by the tank.

6. A removable unit for stoves comprising a tank to receive liquid under pressure, a generator in valved communication with the tank and a heat insulating member comprising a plate supported by the tank.

7. A removable unit for stoves comprising a tank to receive liquid fuel under pressure, a vaporizing generator communicating with the tank having a valve for controlling the flow of fuel therethrough, a heat insulating member carried by the tank between the tank and the generator and a preheater for the vaporizing generator constituting part of the unit.

8. A removable unit for stoves comprising a tank to receive liquid fuel under pressure, a vaporizing generator in communication with the tank and a heat insulating member carried by the tank spaced from the wall of the tank.

9. A removable unit for stoves comprising a tank to receive liquid fuel under pressure, a vaporizing generator in communication with the tank and a heat insulating member spaced from the wall of the tank, the insulating member comprising a flat plate, the width of which is equal approximately to the diameter of the tank.

10. A removable unit for stoves comprising a tank to receive liquid fuel under pressure, a vaporizing generator in valved communication with the tank, a heat insulating member comprising a plate supported by the tank and a preheater for the vaporizing generator carried by the plate.

11. A stove comprising a casing, a burner in the casing having a vapor inlet, a unit removably associated with the casing, the unit comprising a tank to contain liquid under pressure, a vapor generator having valve connections with the tank and means of connecting the vapor generator to the tank, the unit being bodily movable into the casing to aline the generator with the vapor inlet in the burner, and spaced supporting means carried by the casing and removably supporting the unit in cooperative relation with the vapor inlet.

12. A stove comprising a casing, a burner in the casing having a vapor inlet, a unit removably associated with the casing, the unit comprising a tank to contain liquid under pressure, a vapor generator having valve connections with the tank and means for rigidly connecting the generator to the tank, the unit being movable through the end of the casing to bring the end of the generator in line with the vapor inlet of the burner, and spaced guiding means carried by the casing and arranged to receive and support the said unit and guide the same in cooperative relation with the vapor inlet.

13. A stove comprising a casing, a burner in the casing having a vapor inlet, a unit removably associated with the casing, the unit comprising a tank to contain liquid under pressure, a vapor generator having valve connections with the tank and means for rigidly connecting the generator to the tank, the unit being movable through the end of the casing to bring the end of the generator in line with the vapor inlet of the burner, and spaced guiding means carried by the casing and arranged to receive and support the said unit and guide the same in cooperation with the vapor inlet.

14. A stove comprising a casing, a burner in the casing having a vapor inlet, a unit removably associated with the casing, the unit comprising a tank to contain liquid under pressure, a vapor generator having valve connection with the tank and a heat insulator between the tank and the vapor generator, the unit being bodily movable into the casing to aline the generator with the vapor inlet in the burner, and spaced supporting means carried by the casing and arranged to receive the unit and removably support the same in cooperative relation with the vapor inlet.

15. A stove comprising a casing, a burner in the casing having a vapor inlet, a unit removably associated with the casing, the unit comprising a tank to contain liquid under pressure, a vapor generator having valve connection with the tank, the unit being bodily movable into and out of the casing, the generator alining with the vapor inlet of the burner when the unit is within the casing and a heat insulating plate interposed between the burner and the tank, and spaced supporting means receiving the insulating plate and removably supporting the unit in cooperative relation with the vapor inlet.

16. A stove comprising a casing having a burner in the casing, a vapor inlet in combination with a removable unit comprising a liquid containing tank, a vapor generator in spaced relation with said tank, a heat insulating plate secured in spaced relation between the vapor generator and the tank, the unit being slidable into the casing to aline the generator with the unit of the burner, and spaced guides receiving the insulating plate for supporting the unit and for guiding the same into cooperative relation with the vapor inlet.

17. A stove comprising a casing having an end opening and a burner fixed in the casing with a vapor inlet, in combination with a unit comprising a pressure tank to contain liquid hydrocarbon, a vapor generator in spaced relation with respect to the tank having communication therewith and a heat insulating plate in spaced relation with the tank and generator, the heat insulating plate being located between them, the entire unit being insertable into the casing, and spaced supports carried by the casing and removably receiving the heat insulating plate and supporting the unit in cooperative relation with the vapor inlet.

18. A stove comprising a casing having an end opening and a burner fixed in the casing with a vapor inlet, in combination with a unit comprising a pressure tank to contain liquid hydrocarbon, a vapor generator in spaced relation with the tank and generator, a heat insulating element located between them, the entire unit being insertable into the casing, through an end opening, and spaced supporting means carried by the casing and receiving the heat insulating element and removably supporting the unit in cooperative relation with the heating unit.

In testimony whereof I affix my signature.

CHARLES E. DAVIDSON.