W. C. MERRILL.

AUTOMOBILE KITCHEN.

APPLICATION FILED MAY 12, 1915.

1,285,304.

Patented Nov. 19, 1918.

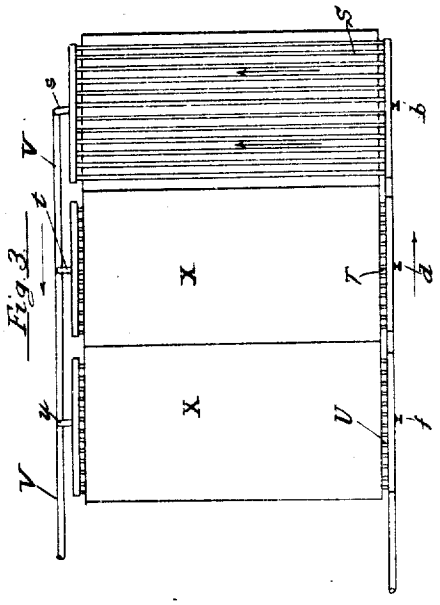


Fig. 3

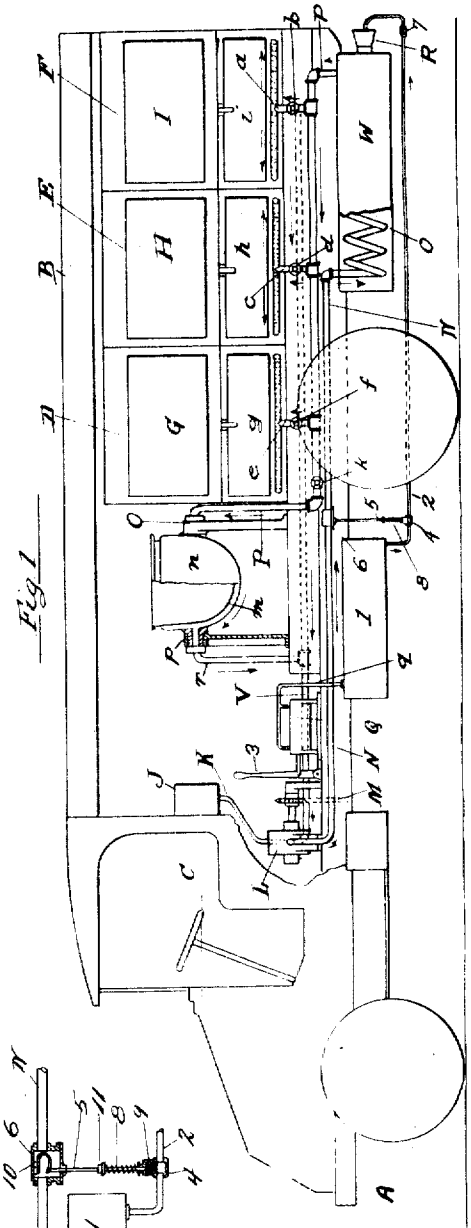


Fig. 1

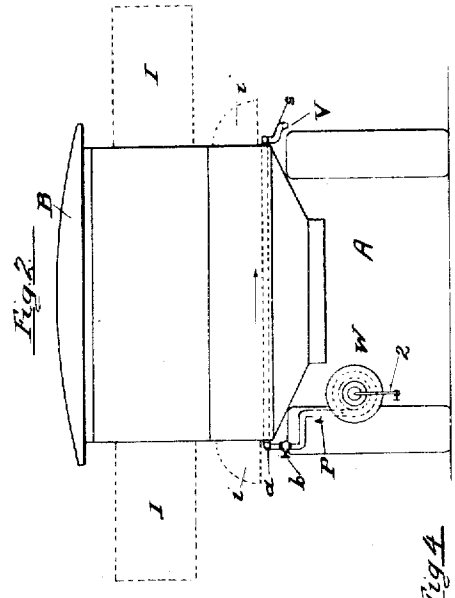


Fig. 2

Fig. 4

Witness:
W. T. Jones

Inventor:
Willis C. Merrill
By J. L. Rusk
Atty

UNITED STATES PATENT OFFICE.

WILLIS C. MERRILL, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE MERRILL PROCESS COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

AUTOMOBILE-KITCHEN.

1,285,304. Specification of Letters Patent. Patented Nov. 19, 1918.

Application filed May 12, 1915. Serial No. 27,548.

To all whom it may concern:

Be it known that I, WILLIS C. MERRILL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Automobile-Kitchens, of which the following is a specification.

My invention relates to automobile kitchens adapted to be used for supplying food to the army or to gangs of workmen or to other bodies of people who are moving from place to place, etc.

In carrying out my invention I employ a heating fluid medium which has a boiling point above 212° F. so that temperatures from 300° F. to 400° F. more or less as desired, may be used without danger of pressure, as the only pressure present in my apparatus is a pressure due to the friction of a circulating fluid or circulating oil heating medium traveling through the pipes through which the heat is radiated for the cooking purposes, and not due to the temperature of the circulating heated fluid medium.

This heated circulating fluid medium kept in constaut circulation produces a uniform temperature throughout the oven which may be formed of several independent compartments or contain utensils adapted for separate or independent uses, and circulates through a continuous conduit. The loss by its use is negligible, and for this reason it may be used with great economy in the operation of the oven over the use of coal and coke as at present where the heat generated after being utilized to some extent passes off into the air and is not continuously utilized.

This circulating heating fluid medium, which may be a mineral oil having a high flash point, permits the raising of the temperature of this circulating heating fluid medium to a temperature beyond that required to heat the ovens to accomplish the objects desired, namely, the cooking of food products, that is, such as roasting meats, baking bread, cooking beans or soup or performing any of the necessary acts in the culinary art.

An additional advantage in the use of this circulating heating fluid medium is the facility of producing variable temperatures to meet the different needs in cooking of various articles, and at the same time is under immediate control and may be easily regulated by the attendant.

In the accompanying drawings which illustrate a construction embodying my invention:

Figure 1 is a side elevation partly in section of my improved portable oven mounted on an automobile truck with parts in section.

Fig. 2 is a rear end view of the oven.

Fig. 3 is a plan view through the compartments of the oven.

Fig. 4 is a detail view of the thermostatic device.

Like letters of reference refer to like parts throughout the views.

A is an automobile truck of any desired construction on which is mounted the body B provided with a seat C for the driver. At the rear end of the truck there is carried the oven consisting of the separate compartments D, E and F having respectively the upper and lower doors G, *g*, H, *h*, I, *i*, on opposite sides of the oven, see Fig. 2, and through which doors the food for cooking may be inserted and removed at the proper times. Suitable shelves X (see Fig. 3) may be located in the compartments D, E, and F to provide extra spaces for the materials to be cooked.

The oil used for heating is furnished through the supply tank J and drawn through the pipe K to the pump L which is driven by the chain M from the driving mechanism of the automobile. This heating oil is forced through the pipe N coiled at O in the heater W and passes from the heater to the feed pipe P from which lead three branch pipes *a*, *c* and *e* to a series of hollow pipes forming grills S, T and U respectively in the compartments F, E and D respectively. These branch pipes *a*, *c* and *e* are independently controlled by the hand valves *b*, *d* and *f*, so that the circulating heating oil passes to all or any of the compartments D, E and F as desired.

When the valves *b*, *d* and *f* are opened the circulating heating oil passes through the grills S, T and U in the compartments F, E and D and out through the pipes *s*, *t* and *u* to the return pipe V and back to the pump

L. Any one or more of these compartments may be heated as desired by manipulating the hand valves *b*, *d* and *f*.

The pipe P beyond the branch pipe *f* is controlled by a valve *k* and continues to the hollow bearing *o* and if the valve *k* is opened the circulating heating oil passes into the jacket *m* of the soup tureen *n* and out through the opposite hollow bearing *p* down through the pipe *r* to the pipe V and thence to the pump L. The heater W receives its supply of fuel from the supply tank 1 through the pipe 2 leading to an ordinary atomizer burner R and this tank 1 is put under air pressure from time to time by operating the handle 3 of the air pump Q which air pressure passing through the pipe *q* forces the liquid fuel from the tank 1 through the pipe 2 to the atomizer R located in the heater W from which heater the products of combustion pass off in any desired manner.

By employing forced or rapid circulation of the heating fluid medium it is possible to use high temperatures in the heater W where the circulating heating fluid oil medium is heated, thereby insuring great economy, as the heat units generated by the burning liquid fuel are absorbed and transferred to the ovens by the circulation of the circulating heating fluid medium.

This heating circulating medium is capable of withstanding a temperature of 400° F. more or less without carbonizing so that the temperature necessary in the cooking of the materials, such as roast and bread, reaches a proper degree, that is, in the case of roast about 400° F., before the circulating heated oil reaches a degree where it would begin to deposit carbon, if it contained any such material, upon the interior of the heating coils and thus prevent the free radiation from the circulating heating oil of the heating device to the several compartments of the oven so that the pipes on the inner service remain free from deposits of carbonizing material which would materially interfere with their conductivity of heat to the oven where the articles are being cooked.

This circulating heating oil has the advantage over steam of reaching a high degree of temperature without pressure excepting a negligible pressure, say 5 to 10 lbs. per sq. in. due to the friction of the circulating oil through the pipes and not due to pressure from any gasification of the heating oil circulating through the heating pipes or coils and also avoids the necessity of steam tight joints which are necessary where high pressures are used which should be the case where steam was raised to the temperature necessary to radiate heat at such a temperature as to cook roast, that is about 400° F. The supply tank J for the circulating heating oil also acts as the expansion tank to take care of this pressure, which being low as above stated obviates the necessity of supervision and constant attendance, which would be the case in the use of steam, if safety is to be considered. The pressure being negligible, no extra provisions are necessary, as in steam heated apparatus, and attendance is reduced to a minimum.

A distinctive feature in this system is the storing of the heat in the liquid fuel and not requiring a storage capacity in the oven, as is now required in ordinary ovens with tile or cast iron as a lining for storing the heat. And further in this system the regulation of the heating means is capable of easy control which is not the case where direct fire is used which is not susceptible of such control.

In this system the heat is generated exterior and apart from the oven and is transmitted through a closed conduit by radiation into a closed insulated chamber through which no open drafts are maintained and the result is greater economy in operation and better results in the cooking because of freedom from movement of the heated air through the chamber or chambers, and also the chamber or chambers being selfcontained escape of odors is lessened. The heat losses are very slight, as the oven is insulated and no loss or escape takes place, as the chamber or chambers of the oven have no direct draft or outlet as is required to keep the fires in ordinary ovens in operation to sustain combustion.

In this system there is a further advantage of an even sustained temperature, which is possible, as no replenishing of fuel is necessary within the oven. There is no appreciable loss to the heat circulating fluid medium, as the temperatures are not raised high enough to gasify materially the circulating heating fluid medium, and as long as the circulating heating fluid medium is sustained at the required temperature by the heating liquid fuel in the heater, there is a continuous supply of heat to the chamber or chambers of the oven at a predetermined temperature, for instance, for roasts about 400° F., cake about 400° F., bread about 350° F., beans about 300° F. and so on for various other articles of food which may be cooked in this system.

When steam or indirect heating is employed for bread baking the operation is extremely long, as the temperatures obtained, without undue pressure, are too low to accomplish the desired results quickly.

In the continuous circulation of this heating fluid medium, the losses usually attendant upon circulating steam do not occur, the loss being negligible in this circulating heating fluid medium, as condensation does not take place and the absorption of the heat

units imparted to the circulating heating fluid medium are given up directly when brought in contact with the material to be heated. No provision in this system of circulation is necessarily provided as with steam to dispose of the condensation. In the use of this circulating heating fluid medium there is no renewal of the circulating heating fluid medium and no supply has to be furnished like the water supply when steam is generated.

An automatic thermostatic device may be located in the circulating pipe N and control a valve in the pipe 2 so that the liquid fuel supply to the burner R in the heater W would be shut off when the temperature of the circulating heating fluid medium in the pipe N reached a predetermined fixed point, say 420° F., by the spring 4 expanding and moving the rod 5 to close the valve 6 in the fuel supply pipe 2. Similar independent automatic thermostatic devices may also be arranged for each of the chambers D, E and F and also the soup tureen *n* so that the circulating heating fluid medium flowing through the pipes *a*, *c* and *e* and the hollow bearing *o* may be independently cut off at a predetermined fixed temperature by independent thermostatic devices provided for each heating compartment or utensil; in each case the thermostatic device being set at the proper degree for the food under treatment. The automatic thermostatic device 4 in the pipe N controlling the valve 6 would be set at a predetermined temperature higher than the thermostatic devices for the chambers D, E and F and soup tureen *n*, so that there would be a flow of the circulating heating oil to that chamber requiring the highest degree of heat or temperature before the liquid fuel supply was cut off through the pipe 2 upon a rise in temperature of the circulating heating fluid medium in the pipe N above the temperature at which the thermostatic device 4 is set to operate in the pipe N.

In practice by this system no material loss of this circulating heating fluid medium of high boiling point occurs, as the temperature at which vaporization would take place is not approached and the circulating heating fluid medium being a non-elastic liquid differs from a condensable elastic fluid like steam and may be used over and over again for heating the material under treatment.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus described the nature of my invention and set forth a construction embodying the same, what I claim as new and desire to secure by Letters Patent of the United States, is:

An automobile kitchen comprising a self propelled truck having an operator's station at its forward portion, a series of cooking utensils arranged along the truck body, a heater mounted at the rear portion of said truck, a pump located between said operator's station and said utensils, a continuous conduit extending through said heater and pump and adjacent said utensils to supply heat to the latter, viscous liquid filling said conduit, a fluid fuel supply for said heater having a pump located adjacent said operator's station, and means to maintain a slight static supply pressure on said viscous liquid in said conduit.

In testimony whereof I have signed my name to this specification, this 10th day of May, A. D. 1915.

WILLIS C. MERRILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."