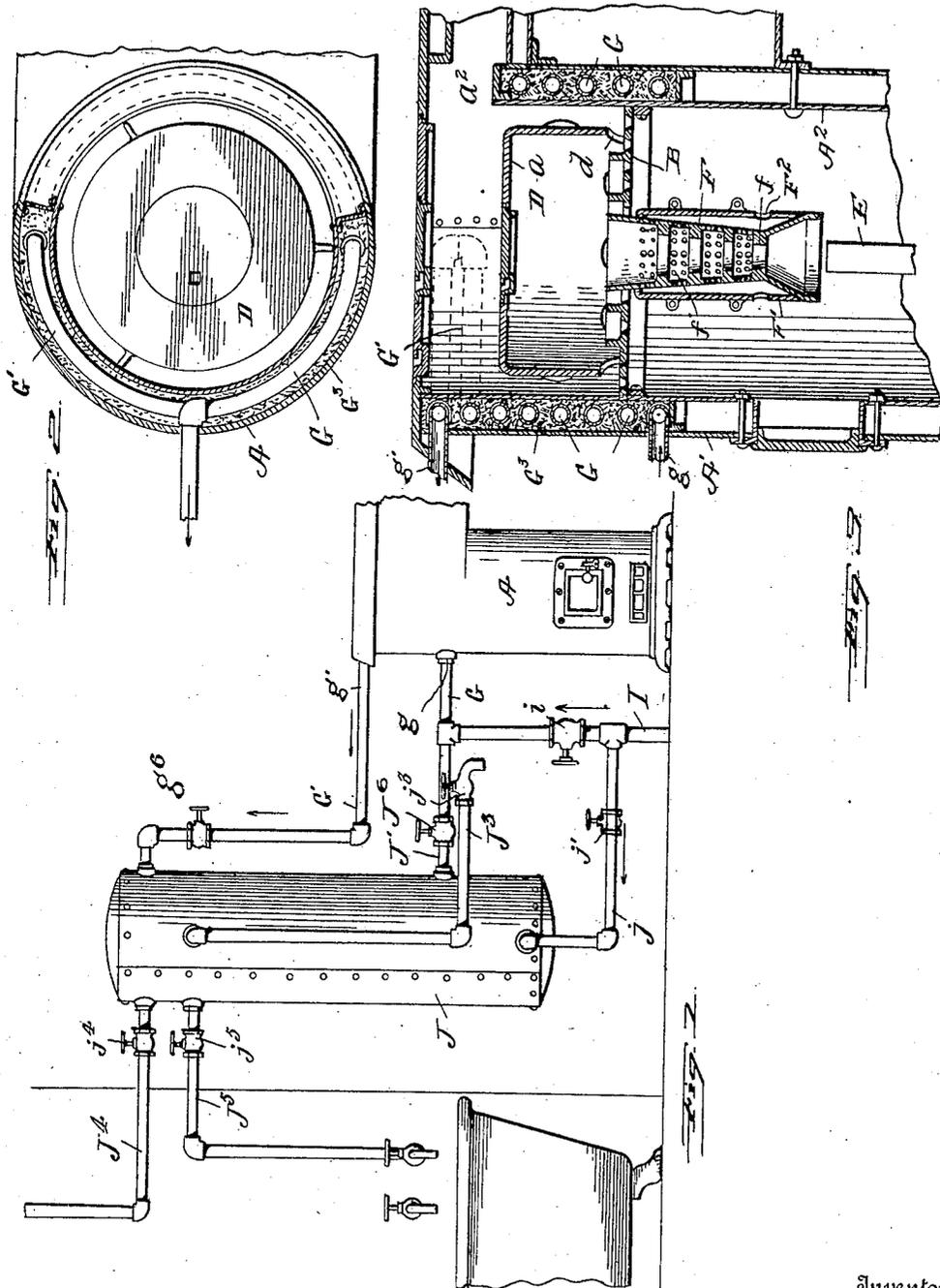


No. 849,317.

PATENTED APR. 2, 1907.

V. W. BLANCHARD.  
WATER HEATING APPARATUS.

APPLICATION FILED JAN. 22, 1906.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## WATER-HEATING APPARATUS.

No. 849,317.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed January 22, 1906. Serial No. 297,252.

*To all whom it may concern:*

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Water-Heating Apparatus; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in water-heating apparatus, designed to be operated by the waste heat from gas burned like coal in the fuel-chamber of a gas cooking-range; and it consists of the novel construction of the water-heating portion of the gas heater or range, as hereinafter described and claimed, and will be fully understood from the description of the apparatus and the drawings, in which—

Figure 1 is an elevation of a complete water-heating system embodying my invention. Fig. 2 is a transverse section through the water-heating portion of the apparatus; and Fig. 3 is a vertical section through the upper part of the gas heater or range, showing the water-heating device therein.

A designates a gas heating apparatus which is preferably constructed substantially as shown in my application for gas-burners, Serial No. 297,240, filed January 22, 1906. This heater has a double-walled casing, having an outer metallic jacket A' and an inner metallic jacket A<sup>2</sup>. Within this casing is a perforated partition B, from which is suspended a burner F, provided with constrictions *f* and lateral perforations *f'* for the admission of air into the ascending current of burning gases passing through the burner. The burner is also provided with a metallic jacket F', provided with perforations F<sup>2</sup> for the admission of air between it and the burner, so that the air supplied to the perforations *f'* will be highly heated before they enter the burner. The gaseous mixtures to support combustion are supplied to the lower end of the burner from a pipe E connected to any suitable source of supply.

Above the burner and supported on the partition B is an inverted-cup-shaped casting D, which is closed at its upper end and provided with apertures or ports *d* at its lower end for the escape of the heating-gases, which pass outwardly and upwardly around said casting D into the upper end of the heater and impinge against the top plate *a* thereof.

The burner and all the parts mentioned become intensely heated, and the adjacent walls of the casing become highly heated both by direct contact with the gases and by the conduction and radiation of heat from the intensely-heated casting D. To conserve the heat in this upper portion of the heater, I place within the hollow walls thereof a coil of pipe G, water being admitted into the lower end thereof at *g* and taken from the upper end thereof at *g'*. This coil extends entirely around the casing from a point below the plate B to the top of the casting D or bottom of the outlet *a*<sup>2</sup> from the heater. The upper part of coil G adjacent this outlet has a return-bend G', which extends to the top of the casing on each side of the outlet *a*<sup>2</sup>. In this manner the largest amount of water-heating pipe is placed in the casing that it is feasible to do, and this water-pipe is preferably packed between the walls A' and A<sup>2</sup> of the casing with a filling G<sup>3</sup> of pulverized fire-brick or other suitable material. In this manner the heat which would be otherwise wasted by absorption, conduction, and radiations through these walls is utilized to heat the water in the coil G, and owing to the length of this coil (twenty-two feet in length in a small-sized range) a very large amount of water can be rapidly heated by circulating it therethrough.

The pipe G is connected with a water-inlet pipe I, a valve *i* being placed on said pipe so that the water can be cut off from the coil when desired. The pipe G also connects with the return-pipe *j*, leading from the lower end of the tank J, which is of usual construction, while the upper end of pipe G' is connected to the upper end of said tank by a pipe *g'*, as shown in Fig. 1. The pipe *j* may be provided with a valve *j'*, which should normally stand open, and when open a constant circulation of water can be maintained through the coil G, pipe *g*, tank J, and return-pipe *j* to the coil G. The lower end of the tank J may be connected by a pipe J' direct to the supply-pipe I above the valve *i*. The water may be withdrawn from the tank J through a service-pipe J<sup>4</sup>, which may lead to any convenient part of the kitchen, and through other service-pipes J<sup>4</sup> and J<sup>3</sup>, which can be led to any desired part of the building, said pipes J<sup>4</sup>, J<sup>5</sup>, and J<sup>3</sup> being provided with suitable valves *j*<sup>4</sup>, *j*<sup>5</sup>, and *j*<sup>3</sup>.

The gas-burner portion of the apparatus is preferably constructed as described in my

aforesaid application, and the heater may be constructed as described in my application for gas cooking-stoves, Serial No. 297,250, filed January 22, 1906, and utilized either for heating or cooking. The coil itself does not consume any heat except that which would naturally be lost by conduction or radiation through the walls, and all the heated products of combustion can be utilized for cooking purposes or for heating purposes. The employment of a water-coil in the upper portion of the gas heating cooking stove or furnace, both as a means of preventing the loss of heat by radiation from the gas-burning portion of the apparatus during the summer months, thereby adding to the comfort of the kitchen, and also as a means for heating water for domestic purposes, I consider a novel and valuable improvement.

The pipe *J'* may be provided with a valve, as at *J''*, so that the tank can be entirely closed if it is necessary to disconnect the heater therefrom at any time.

Having thus described my invention, what I therefore claim as new, and desire to secure by Letters Patent thereon, is—

1. The combination of a gas heating device, comprising a casing closed at its upper end and having an outlet at one side near its upper end, a partition in said casing below the outlet, and a burner suspended from said partition discharging burning gases above the same; with a water-heating coil, said coil being continuous below the outlet of the fur-

nace and having a return-bend opposite the outlet.

2. The combination of a gas heating device, comprising a double-wall casing closed at its upper end and having an outlet at one side near its upper end, a partition in said casing below the outlet, and a burner suspended from said partition discharging burning gases above the same; with a water-heating coil inclosed in the walls of the casing, said coil being continuous below the outlet of the furnace and having a return-bend opposite the outlet.

3. The combination with a gas-burning stove or furnace having double walls, an annular partition in the upper part thereof, a top plate closing the upper end of said furnace, a burner suspended from said partition, means for discharging gaseous mixtures into said burner, an inverted-cup-shaped casting above the burner adapted to cause the products of combustion to pass up close to the walls of the stove above the partition, and a water-heating coil inclosed in the walls of the furnace adjacent to and surrounding the said casting.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

VIRGIL W. BLANCHARD.

In presence of—

JAMES R. MANSFIELD,  
L. E. WITHAM.