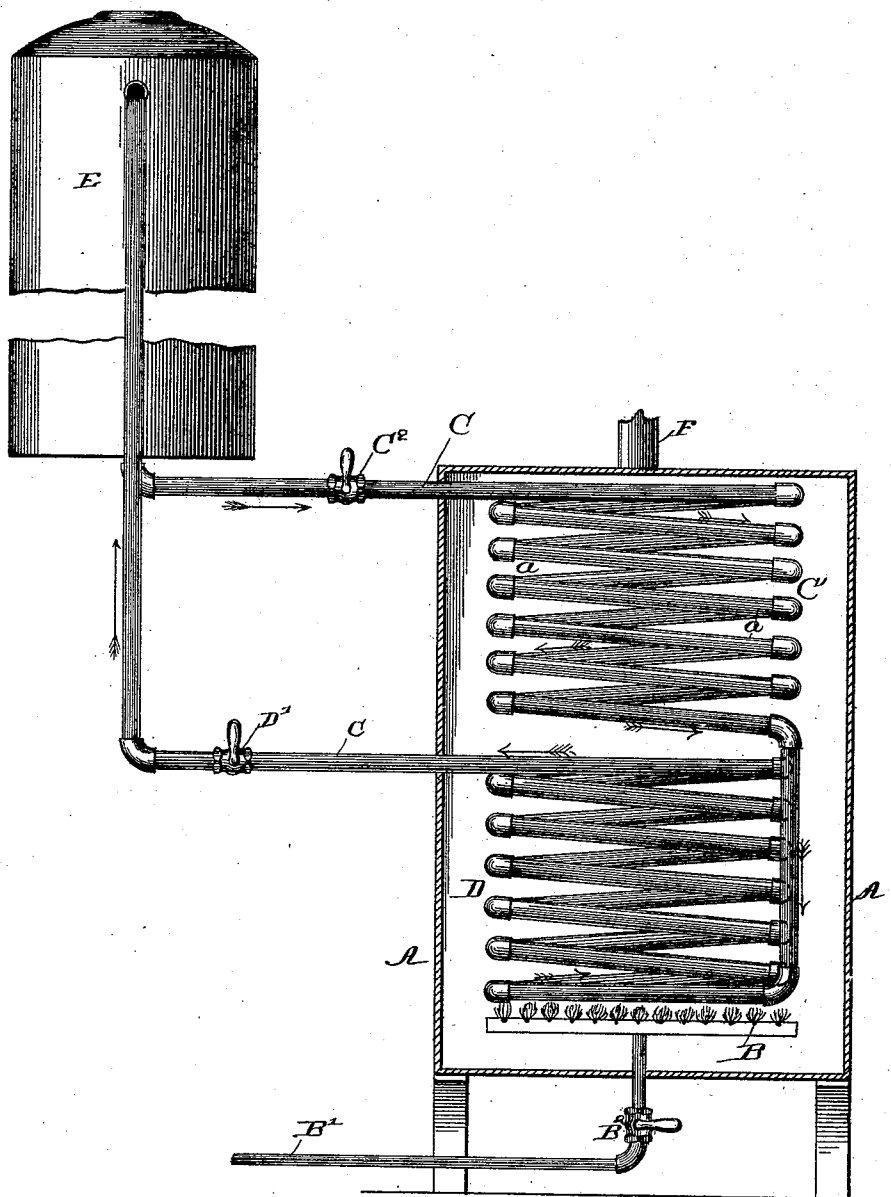


(No Model.)

W. S. WRIGHT.
GAS WATER HEATER.

No. 479,869.

Patented Aug. 2, 1892.



Witnesses:

Frank L. Stevens.
Robert Ryan

Inventor:

Walter S. Wright
By Cyrus K. K.
Atty.

UNITED STATES PATENT OFFICE.

WALTER S. WRIGHT, OF CHICAGO, ILLINOIS.

GAS WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 479,869, dated August 2, 1892.

Application filed August 25, 1890. Renewed June 25, 1892. Serial No. 437,952. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. WRIGHT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas Water-Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, which form a part of this specification.

The object of the invention is to utilize to the fullest extent possible the heat of the gas flames.

The drawing is a sectional elevation of the apparatus.

A is an upright combustion-chamber made of sheet metal or other suitable material.

B is a gas-burner located horizontally in the lower portion of the chamber and connected with the gas-supply pipe B'. It is obvious that when the burner B is in operation the heat immediately above said burner is intense, while in the upper portion of said chamber it is moderate.

E is an ordinary kitchen-boiler, into which the heated water is to be delivered. In ordinary practice the water is to be heated almost to the boiling-point.

C is a water-pipe leading from the boiler E or other source of water-supply and entering the upper portion of the chamber and turning back and forth in the upper half of said chamber, so as to make the coil C'. Thence said pipe descends to the bottom of the chamber A, and thence turns back and forth in an ascending coil D to the middle of said chamber, and thence outward to the boiler E.

C² is a cut-off valve in the ingoing portion of the pipe, and D' is a similar valve in the outgoing portion of the pipe. The purpose of these valves is to afford means for shutting off the water when desired.

B² is a cut-off valve in the gas-supply pipe.

F is a chimney rising from the upper portion of the chamber A, to carry the products of combustion from said chamber.

In operation the water flows from the boiler E through the pipe C into the upper portion of the chamber A, and thence back and forth

downward through the coil C', and thence downward into the lower portion of the coil D, and thence upward through the latter and out of the chamber A. The coil C' is exposed to only the heat of the products of combustion after such heat has been reduced below the heat to be imparted to the water before leaving the apparatus. This reduced heat may be, so far as the coil D is concerned, called "waste" heat, and said waste heat acts directly and effectively upon the water in the coil C', so long as the temperature of said water is below that of the products of combustion. Upon entering the coil D the water, already partially heated, is subjected to the intense heat of the burner B and heated to the fullest degree. It is to be observed that nothing would be gained by making the coil D continuous into the upper portion of the chamber A and omitting the coil C'. In that case the heated water would rise into a space of lower temperature, where it could obviously receive no additional heat. For example, if the water were heated to 170° by the heat of the lower portion of the chamber A, it would acquire no additional heat by passing through a space having a temperature of only 150°. It is to be noted, also, that a continuous coil could not be placed into the chamber so as to extend from the upper portion of the latter downward to the bottom of the chamber and thence out and be used for conducting the water downward from the upper portion of the chamber to the bottom of the latter and thence out, so that the cold water would be exposed to the moderate temperature of the upper portion of the chamber and all the water exposed to higher temperature as it descends. This would be impractical unless artificial means were used for effecting a flow of water. The tendency of the water would be to flow upward through the coil. By means of my apparatus the cold water is fully exposed to the waste heat, and yet provision is made for a proper flow of the water. The water in the coil C' is heavier than the water in the coil D and the outlet for the water from the coil D is from the upper portion of said coil, so that the water rendered lighter by heating will rise through this coil in response to the preponderance of pressure of the heavier water in the coil C'.

The mechanical arrangement of the parts in my apparatus renders it simple and economical as to manufacture, and tests have proven that a given quantity of gas used in my apparatus will heat a greater quantity of water than can be heated by any other apparatus with which I am familiar.

I claim as my invention—

1. The combination of the upright chamber
10 A, coil C', located in the upper portion of said chamber, coil D, located in the lower portion of said chamber, and a burner B, located within said chamber and beneath the coil D, said coil C' having an inlet at its upper portion and
15 an outlet at its lower portion leading into the lower portion of the coil D, and the coil D having an outlet from its upper portion, substantially as shown and described.

2. The combination of the boiler E, the up-

right chamber A, the coil C', located in the upper portion of said chamber, the coil D, located in the lower portion of said chamber, and a burner B, located within said chamber and beneath the coil D, said coil C' having an inlet at its upper portion from the boiler E and an outlet from its lower portion leading into the lower portion of the coil D, and the coil D having an outlet from its upper portion to the boiler E, substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 5th day of July, in the year 1890.

WALTER S. WRIGHT.

Witnesses:

AMBROSE RISDON,
CYRUS KEHR.