

(No Model.)

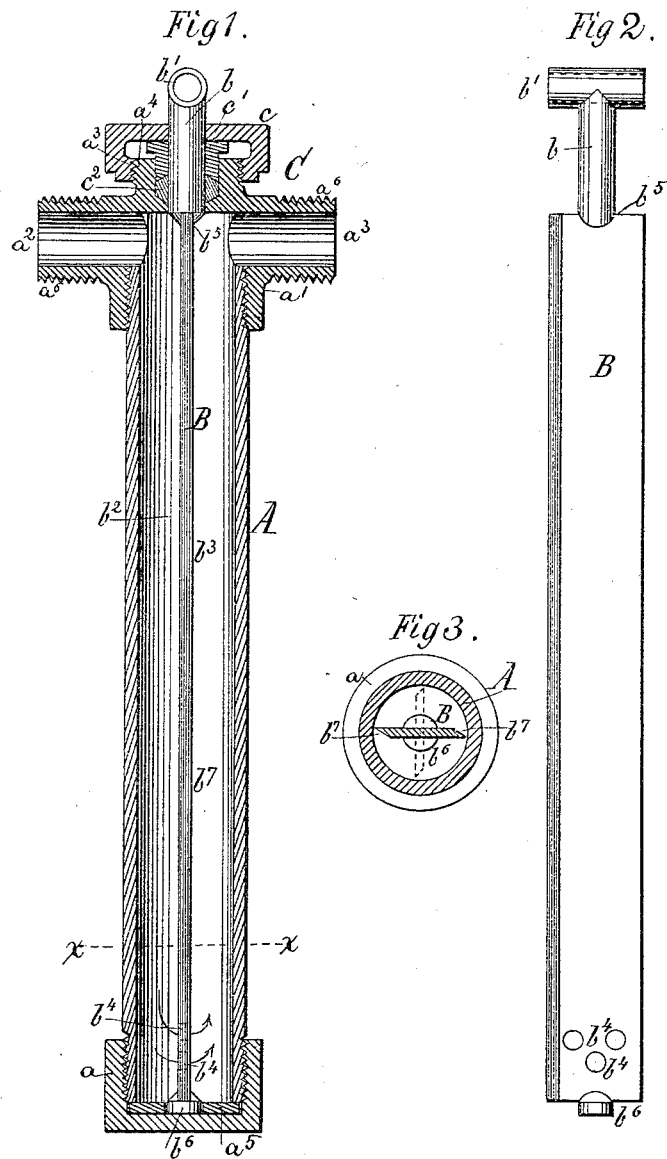
2 Sheets—Sheet 1.

J. M. CARSON.

WATER HEATER FOR STOVES, RANGES, OR FURNACES.

No. 453,855.

Patented June 9, 1891.



Witnesses:

J. P. Theo. Ling.
E. L. Fenwick

Inventor:

John M. Carson
by his Atty
Mason, James & Lawrence

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Fig 4.

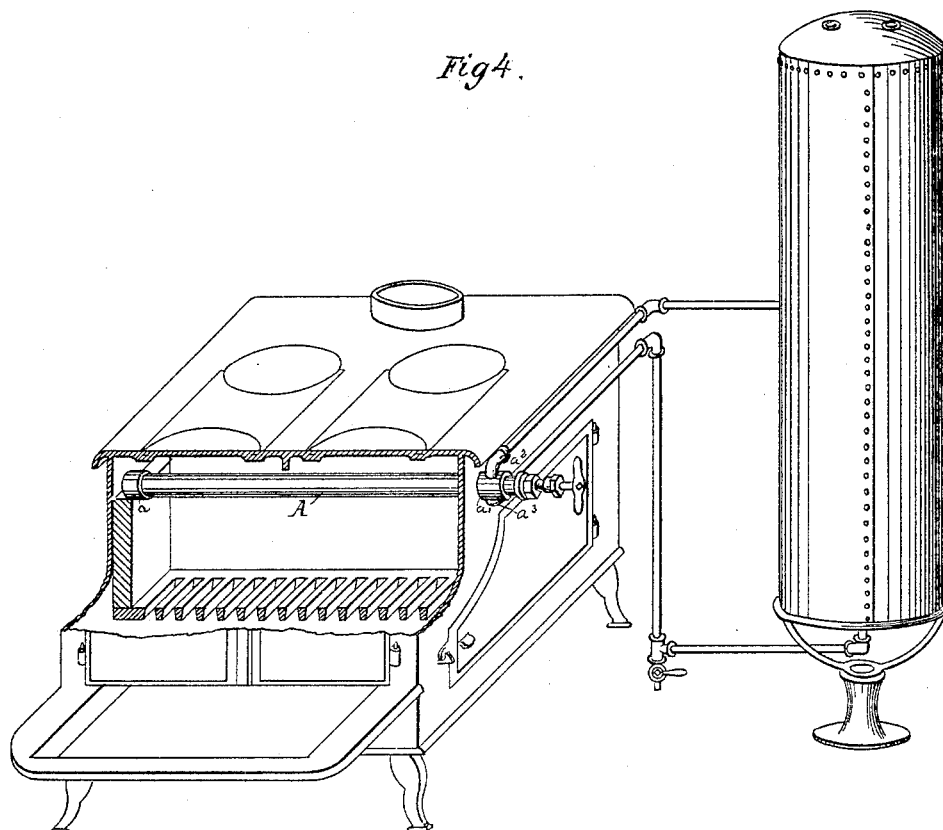
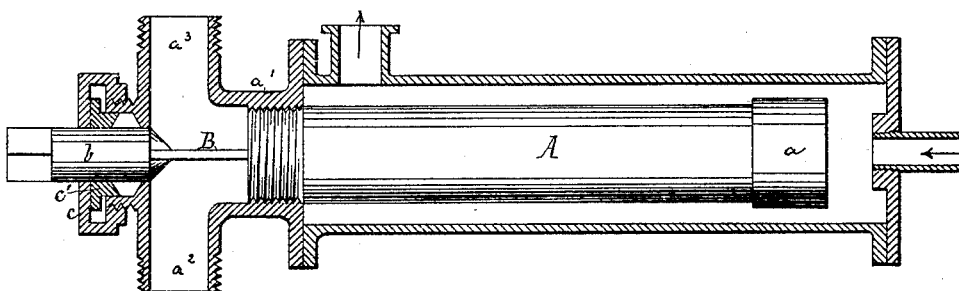


Fig 5.



Witnesses:

J. P. New Lang.
E. J. Furbuck

Inventor:
John M. Carson
by his Attorneys
Mason, Sewick & Lawrence

UNITED STATES PATENT OFFICE.

JOHN M. CARSON, OF DANVILLE, ILLINOIS.

WATER-HEATER FOR STOVES, RANGES, OR FURNACES.

SPECIFICATION forming part of Letters Patent No. 453,855, dated June 9, 1891.

Application filed September 1, 1890. Serial No. 363,633. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. CARSON, a citizen of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Water-Heaters for Stoves, Ranges, Furnaces, &c.; 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.

My invention relates to water-heaters employed in connection with stoves or ranges, and in other localities; and it consists in a heater-pipe constructed with a central longitudinal perforated diaphragm, whereby the water is caused to flow downward on one side and upward on the other side of the diaphragm and thereby heated and circulated in the one pipe, which pipe is adapted to be applied in the fire-chamber of a stove or range, or in other locality where it is immersed in heat.

It also consists in certain novel constructions, arrangements, and combinations of the parts of which the heater is composed, as hereinafter described, and pointed out in the claims, whereby sediments which may deposit upon the interior surfaces of the heater-pipe can be scraped off and stirred up preparatory to their being discharged or forced out, and whereby the diaphragm can be removed without disturbing the heater-pipe and its connection with its supply and discharge pipes.

In the accompanying drawings, Figure 1 is a central vertical section of my improved heater-pipe. Fig. 2 is an elevation of the diaphragm detached from the pipe, and Fig. 3 is a transverse section of the heater-pipe with diaphragm in the line *xx* of Fig. 1. Fig. 4 is an illustration of the invention as applied in a stove or range, and Fig. 5 is an illustration of the same as applied in the exhaust-pipe of a steam-engine.

The letter A in the drawings represents the heater-pipe, B its diaphragm, and C a stuffing-box.

The heater-pipe A is made, preferably, of ordinary wrought-iron tubing of such dimensions as will answer the purposes for which the water-heater is to be employed. This pipe

is closed at the end by means of an ordinary screw-cap *a* or by any other suitable means. The other end of the pipe A is provided with a branching head *a'*, which receives and discharges the water by means of two branch formations *a² a³*. In the top of the head *a'* a stuffing-box C is formed. This stuffing-box C consists of a screw-threaded head *c*, a gland *c'*, and packing-chamber *c²*, the head *c* being fitted by means of a screw-thread *c³* to the screw-threaded top portion *a¹* of the head *a'*, and bearing upon the top surface of the gland, as shown. A round shank *b*, fitted by means of a notch *b⁵* to the top of the diaphragm B, passes through said stuffing-box, and terminates with a transverse tubular head *b'* above the same.

The diaphragm B occupies a central position in the pipe A, the interior of which pipe is thereby divided into two equal chambers *b² b³*, which communicate with each other by means of apertures *b⁴* in the diaphragm, near the end portion thereof. A cylindrical end portion *b⁶* is provided on the diaphragm, and the same is inserted into a central bearing of a disk *a⁵* at the bottom of the pipe A. The branch formations of the head *a'* are provided with outer screw-threads *a⁶*, by means of which they are adapted, respectively, to be connected to supply and discharge pipes, which pipes are not illustrated. The water enters from a supply-pipe the branch *a²*, descends into the chamber *b²*, on one side of the diaphragm B, passes through the apertures *b⁴* into the chamber *b³* on the other side of the diaphragm B, where it returns to the branch *a³*, and is conducted therefrom by a suitable discharge-pipe. (Not shown in the drawings.) In the chambers *a² a³* of the pipe the water is heated by the flames of a stove, range, or furnace, as illustrated in Fig. 4, or by the exhaust-steam of a steam-engine, as illustrated in Fig. 5, to which the pipe A may be arranged to be exposed.

In most cases a single pipe, as A, will be sufficient for heating a supply of warm or hot water for ordinary household purposes; but in cases where a larger amount of hot water is required several pipes, as A, arranged in a row and coupled together by means of their branches *a² a³* and suitable ordinary pipe-joints may be provided, or a

single pipe A of increased size might answer all demands.

When it is found necessary to remove from the pipe A any accumulated sediment lodged upon the interior surfaces of the heater, the head b' of the shank b is revolved several times backward and forward, carrying with it the diaphragm B, and causing it by its tapered edges to scrape off the sediment from the inner surface of the cylinder, and also agitate the water in such manner as to cause the sediment to be washed away from said surfaces, and this accomplished, the mixed water and sediment is discharged through the portion a^3 of the heater-pipe. When, by the discharge of clear water, a clean condition of the heater is indicated, the diaphragm is readjusted to its normal position, as shown in Figs. 1 and 3, and the heater thus again made ready for use.

In Figs. 1 and 3 the edges b' of the diaphragm are shown tapered or sharpened, and this construction is found more effective in scraping off the sediment from the interior surface and less liable to become choked or wedged by contact with the tougher portions of the sediment than would a diaphragm with edges which are not thus reduced in thickness. In cases where the water used is comparatively free from sediment a diaphragm of uniform thickness or without tapered edges could be used effectively. In order to remove the diaphragm from the heater-pipe the screw-cap a is removed and the diaphragm pulled out of the notch b^5 of the shank b and out of the pipe A.

From the foregoing description it will be seen that a water-heater of the improved construction herein described possesses many advantages over other water-heaters now used in kitchens and other places, in that it can be cleaned of sediment without being disconnected from its supply and discharge adjuncts or pipes and without serious interruption of

its main functions, that its construction is very simple and comparatively inexpensive, and that its jointed parts can be placed out of direct contact with the fire, and thus the burning out of said parts and consequent leakage avoided. As represented in Figs. 1 and 2, the heater A is in a vertical position, this being only one of many available positions in which it may be used. It will, however, operate well in an inclined or horizontal position, as in Fig. 4, or in an inclined position, or in a position with its head portion downward.

The heater is adapted for immediate application to almost any style of a stove, range, or furnace, and can be applied without much extra labor, which is not the case with other constructions which combine cast-iron heating-boxes or water-backs and return-pipes connected by U-joints.

What I claim as my invention is—

1. A water-heater consisting of a heating-pipe A, having branches a^2 a^3 , and a central longitudinal diaphragm B, having communication-apertures b^4 through it, substantially as described.

2. A water-heating pipe having inlet and outlet passages at its top, and a longitudinal rotary movable diaphragm, having communicating passages through it and provided with means for operating it from the outside of the heating-pipe, said diaphragm serving for dividing the pipe into two chambers, allowing circulation of water from one chamber to the other, and as a means for scraping the sediment from the inside of the pipe, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

JOHN M. CARSON.

Witnesses:

J. D. CUMMINGS,
GEO. BOYER.