(No Model.) 2 Sheets—Sheet 1.

T. ROGERS.

WATER HEATING DEVICE.

No. 476,949. Patented June 14, 1892.

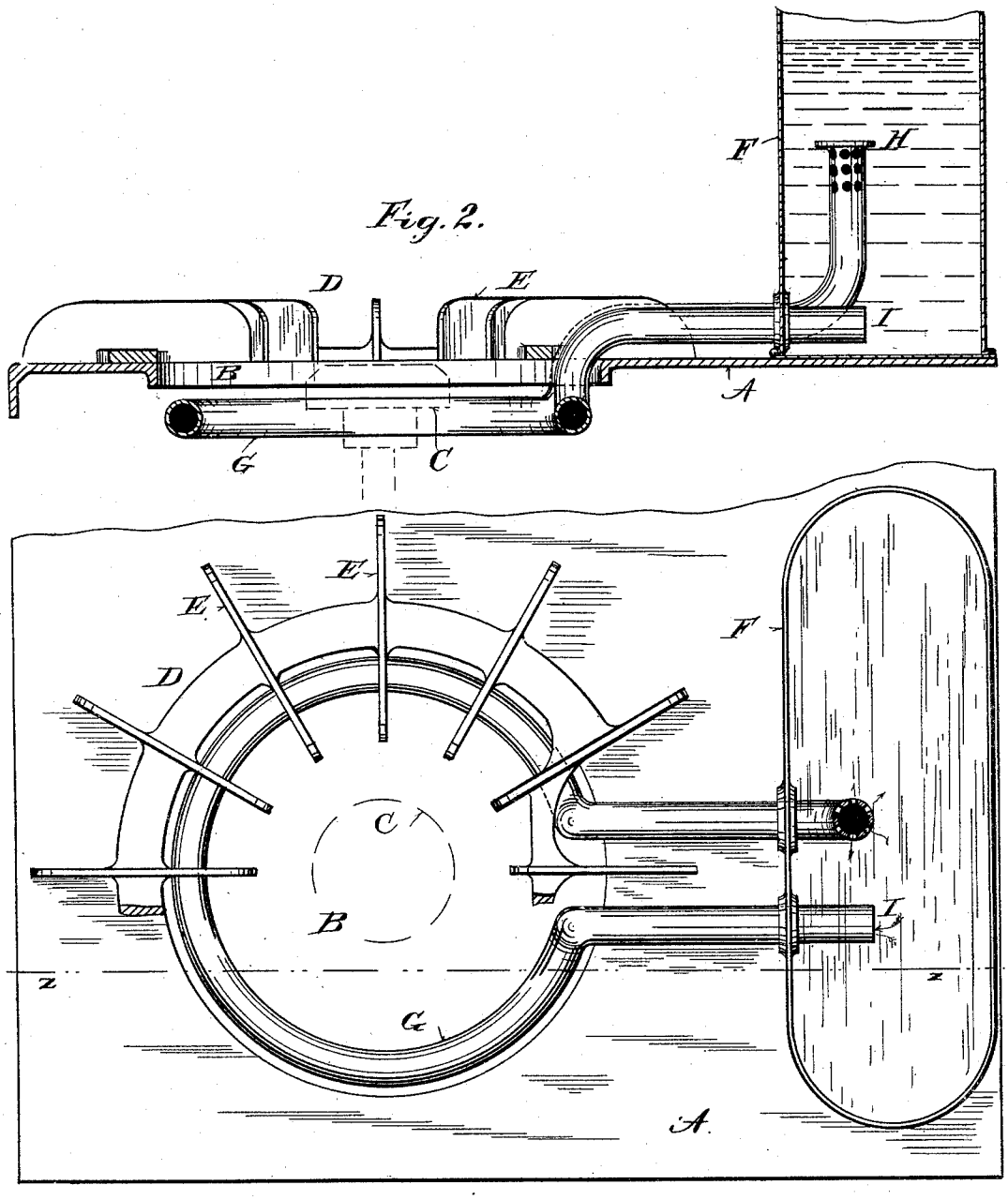

Fig. 2.

Fig. 1.

WITNESSES

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Timothy Rogers.
By H. A. Toulmin
his Attorney.

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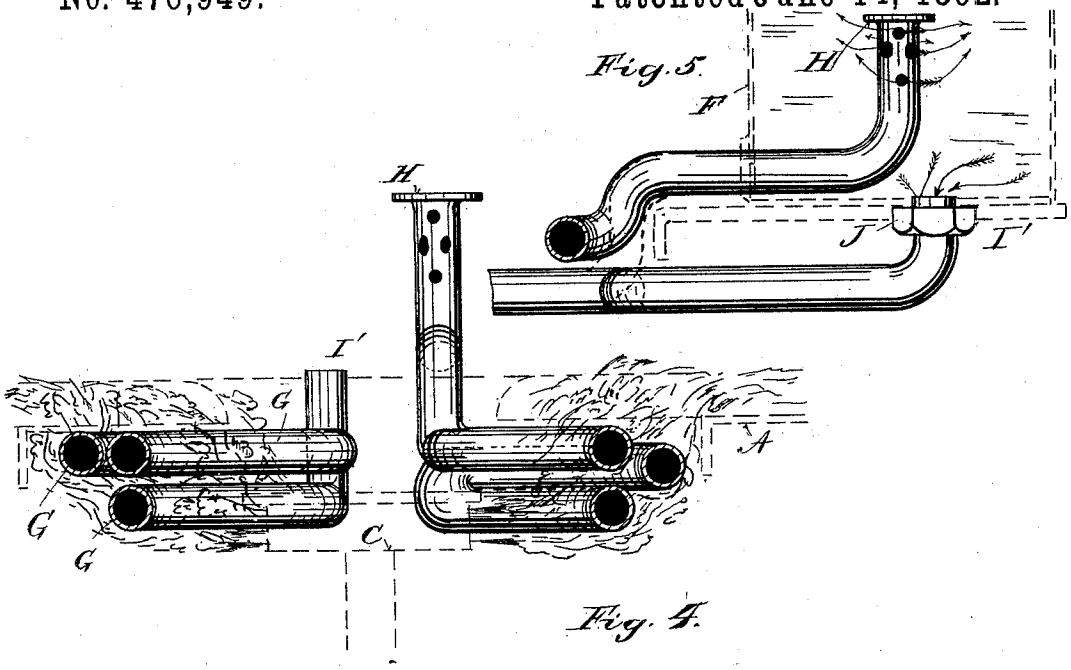

Fig. 4.

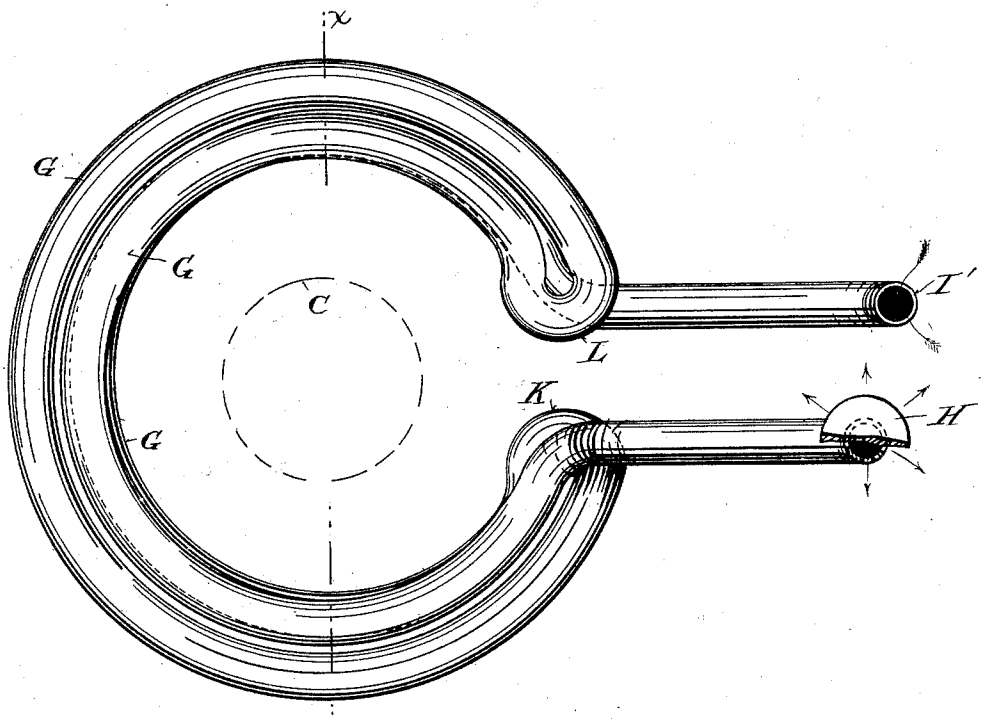

Fig. 3.

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UNITED STATES PATENT OFFICE.

TIMOTHY ROGERS, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF TO ALFONSO FERRELL, OF SAME PLACE.

WATER-HEATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 476,949, dated June 14, 1892.

Application filed May 25, 1891. Serial No. 394,026. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY ROGERS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Water-Heating Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in water-heating devices, the peculiarities of which will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and on which like reference-letters indicate corresponding parts, Figure 1 represents a plan view of a portion of a stove-top with my device mounted thereon, the grate being broken away in part; Fig. 2, a vertical sectional view on the line *z z* of Fig. 1; Fig. 3, a detached view of a plurality of loops of pipe constituting the water-heating chamber; Fig. 4, a transverse sectional view on the line *x x* of Fig. 3, showing the position of the loops with regard to the burner; and Fig. 5, a side view of a portion of Fig. 3, showing the inlet and discharge ends of the pipe.

The letter A designates a stove-top of a gasoline or other suitable variety of stove having an opening B therein, in which is mounted a burner C. The grate D rests on said stove-top and is preferably provided with radiating webs E, connected together and preferably having a height sufficient to support a cooking utensil out of contact with the pipe connection between the water-heating chamber and the water-tank F. The water-heating chamber shown in Figs. 1 and 2 consists of a single loop G, surrounding said burner and adapted to be supported within the opening B by means of its connection with the said tank F. After forming the loop or bight of pipe about the burner a bend in each end of the loop carries the pipe above the stove-top, whereby the said loop G may be readily inserted within the stove-opening by removing the grate and setting the tank in position. One end of the pipe is turned up, as shown in Fig. 2, and provided with a series of holes and a cap or plug H, having a disk-like top, as shown in Figs. 4 and 5, whereby the water discharging from said pipe will be deflected sidewise and prevented from spurting upward within the tank. The other end I of the pipe is simply inserted within the tank and, being lower than the perforated end, is adapted to form the inlet-pipe to the water-heating chamber, where the temperature of the water is raised as it circulates about the lighted burner, and it is then discharged from the perforated end.

The grate D is notched or otherwise adapted to fit about the pipes as they bend upward from the water-heating chamber.

Referring to Fig. 3, a plurality of loops G G are shown as constituting the water-heating chamber. This form has special advantages in that it presents a large amount of heating-surface within a small space. The inlet end I′ of the pipe is in this case connected to the bottom of the water-tank, as shown in Fig. 5, by any suitable form of joint, such as by a collar J, adapted to form the coupling with said tank. The pipe, starting from the inlet end, curves around the burner, making a bend at K and, returning in a reverse direction, forms a loop at L opposite and adjacent to the one at K. Then the return-bend carries the pipe around and above the former loop until it is adjacent to the bend at K and directly above the same, and whence it is carried above the stove-top and into the tank, as indicated by Fig. 5. It will be observed that both the above forms of loop—namely, the single and the plurality form—have a space between the pipe connections, where they emerge from the stove-opening B. This allows the flexible pipe-chamber to be sprung open in order to pass the burner branch or support, which might otherwise interfere with placing the water-heating chamber in position. The sectional view in Fig. 4 shows the action of the flames upon the surrounding loops of pipe and illustrates the advantage of a plurality of loops in intercepting the flames. It will be observed that the loops are so formed as to present a gradual ascent for the circulating water in its passage back and forth around the lighted burner and back again to the water-tank. If desired, the entrance-pipe I′ may also have an upward bend above the stove-top, as indicated by the dotted lines in

Fig. 5. This form of heating-chamber, composed of a plurality of loops arranged about a burner, has been found to possess special advantages in heating water. The amount of heating-surface presented by these loops facilitates the heating of water, and the peculiar form promotes the circulation away from and back to the water-tank, as well as allowing the ready adjustment of the chamber within a stove. The force of the returning water is such as to cause a spouting action from the discharge end of the pipe, which is therefore preferably provided with a deflecting device, as above described and illustrated.

The construction of the water-heating chamber out of one or more loops of pipe reduces the weight of the chamber over other forms of construction, so as to allow it to be easily supported by means of its connection with the water-tank, which is the preferred construction. There is, also, no loosening of joints caused by the expansion and contraction of the supporting connections, since in this device the water-heating chamber is preferably entirely detached from either stove grate or top.

Referring to Fig. 3, it will be seen that the colder water from said tank enters the heating-chamber at its lower portion, and circulating back and forth within the reversed loops it finally returns to the water-tank, the last portion of its travel within the water-heating chamber being through the inner loop constituting the hottest portion of the chamber. This construction carries out the well-known law governing the best results in heating liquids—namely, that the water or liquid should enter the heating-chamber at its colder portion, and as the temperature of the water rises it should be subjected to the highest degree of heat. In other words, the hottest water should be circulated through the hottest part of the chamber. Referring to the drawings, Fig. 3, it will be seen that this result is secured by locating the loop delivering into the tank within the inside of the other loops and in closest proximity to the flames of the burner.

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

1. The combination, with a stove-top and a water-tank supported thereon, of a grate extending over the hole in said top to support a cooking utensil and notched to the hole at one side of said grate, and a water-heating chamber consisting of a looped pipe, both ends being connected to said tank and adapted to extend along above the stove-top to the said hole, then bent downward through said notched grate and outward horizontally in reverse directions under the same, leaving a space between the opposing bends, whereby the water-heating chamber and tank may be readily set on or removed from said stove-top, the grate being adjusted above said looped pipe by means of said notched portion for the admission of the pipe below the grate.

2. The combination, with a water-tank, of a water-heating chamber consisting of a plurality of loops of pipe communicating with said tank and adapted to embrace a burner, said loops being laid in reverse directions with a space between the opposing return-bends.

3. The combination, with a water-tank, of a water-heating chamber consisting of a plurality of loops of pipe communicating with said tank, the said loops being laid in reversely-horizontal directions, but with ascending inclination as the loops extend back and forth, the opposing loops being separated by a space at their return-bends.

4. As an improved article of manufacture, a water-heating chamber consisting of a plurality of loops of pipe laid in reverse directions, with a space between the opposing bends of said loops.

5. As an improved article of manufacture, a water-heating chamber consisting of a plurality of loops of pipe laid in reversely-horizontal directions, but with ascending inclination to facilitate the passage of the water from said pipe as it rises under the influence of heat, the reverse bends of said pipe leaving an open space at one side of the device where the loops are separated.

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

TIMOTHY ROGERS.

Witnesses:
H. M. PLAISTED,
A. FERRELL.