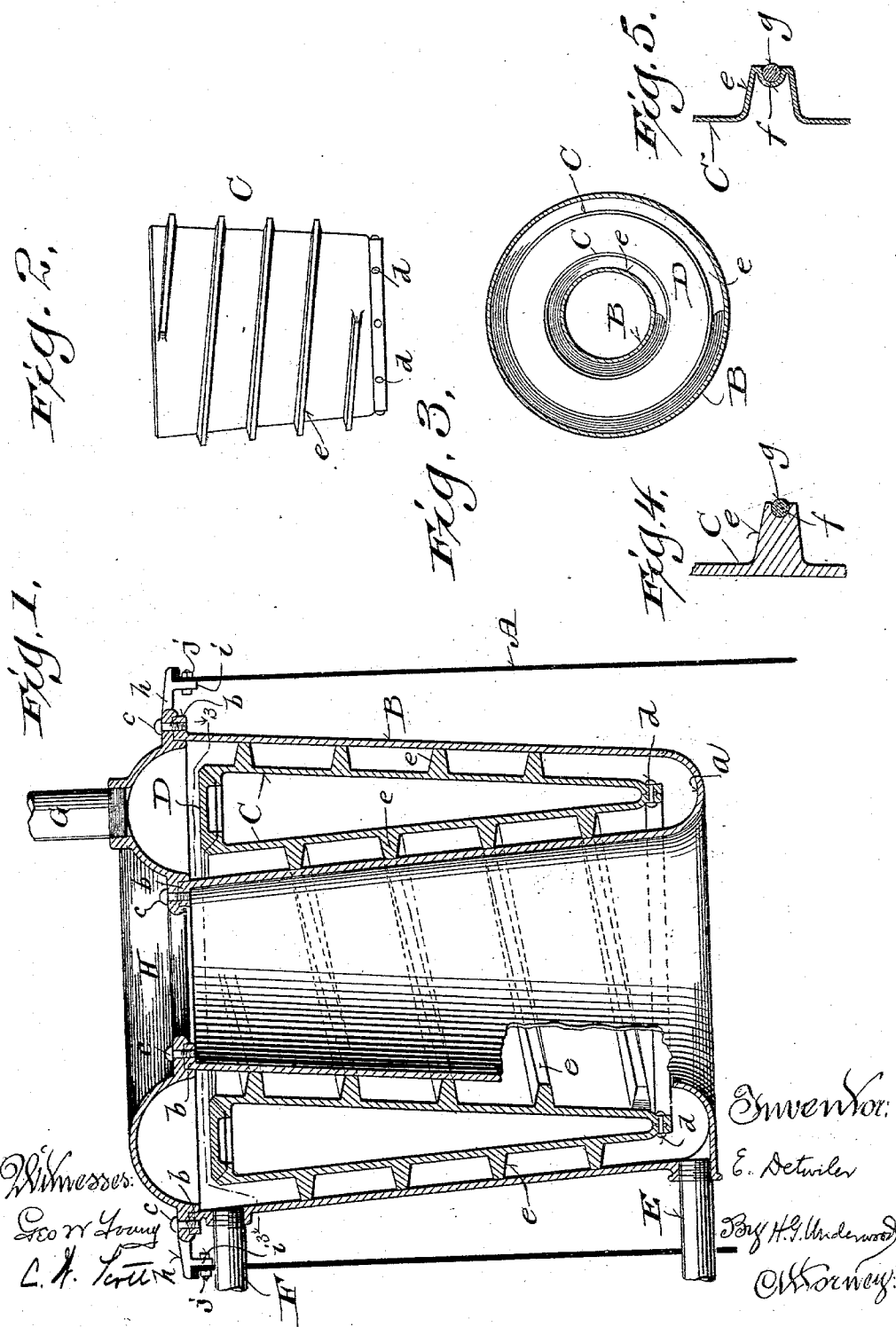


(No Model.)

E. DETWILER.
WATER HEATER.

No. 553,110.

Patented Jan. 14, 1896.



Witnesses:
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C. H. Young

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UNITED STATES PATENT OFFICE.

EMANUEL DETWILER, OF MILWAUKEE, WISCONSIN.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 553,110, dated January 14, 1896.

Application filed April 12, 1895. Serial No. 545,428. (No model.)

To all whom it may concern:

Be it known that I, EMANUEL DETWILER, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Water-Heaters; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to devices for the rapid heating of water and is adapted for use in connection with any fuel desired, and hence may be employed with fuel-burners of any preferred construction; and it consists in certain peculiarities of construction and combination of parts, all as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a vertical sectional view embodying one form of my present invention, partly broken away to better illustrate details of construction. Fig. 2 is a view of a portion of my device shown in elevation. Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 1, drawn to a reduced scale. Figs. 4 and 5 are detail sectional views illustrating modifications in construction.

Referring to the drawings, A represents the outer casing or heat-retaining shell of my device, and B the conical annular double-walled pot, which may be secured to said outer shell in any suitable manner. This pot has a central vertical opening, which is itself conical, so that the described annular walls of said pot converge from top to bottom, as shown, said walls coming together at the bottom on a rounded line, as shown at *a*, but being open at top, and at their upper ends being preferably formed with horizontal annular flanges *b b* to receive and support the annular dome or top H, which latter is formed with corresponding annular flanges secured to the flanges *b b*, as by screws or bolts *c c*. Within this pot is located the annular coil-shell C. (Shown in Fig. 2.) This is made primarily in two parts secured together at the base, as by rivets *d d*. In Figs. 1 and 2 this coil-shell C is represented as made of cast metal, and said shell is closed by a tight-fitting annular ring D. The interior of the shell C is preferably filled with any suitable non-heat-conducting composition, such as fire-clay or magnesia, or a mixture of fire-clay and asbestos may be employed. The exterior and interior of the

shell C are each formed with a continuous spiral coil *e*, and this coil is preferably cast with the shell. In Fig. 1 I have shown these coils with straight beveled edges to conform to the inner surfaces of the described double-walled pot B, and when the shell C is inserted within said pot it is driven down firmly therein or ground therein, or otherwise secured, so that the joints between the said coil-edges and the walls of the pot B are absolutely fluid-tight.

In Fig. 4 I have shown a semicircular groove *f* in the outer edge of the spiral coil *e*, and this groove may be filled with any suitable packing-cord *g* to insure tight joints.

In place of casting the coil-shell C, I may stamp or press it out of sheet metal, as indicated in Fig. 5, and if desired I may press a groove *f* in the outer edge of the coils of this form of shell also to receive a packing-cord *g*, as before explained.

E represents an inlet-pipe, and F an outlet-pipe connected to the pot B, as shown, and if preferred I may have another outlet-pipe G leading from the top or dome H of the device. These pipes are of course provided with suitable cocks or valves. (Not shown.) The manner in which the pot is secured to the outer casing A is immaterial; but in Fig. 1 I have shown lugs *h* projecting from the top or dome H and resting on the top flange of the casing A, said lugs having downward extensions *i*, which may be secured to said casing A by bolts *j*, as shown, so that the pot B, which, as already explained, is properly secured to its top or dome H, is thereby suspended within said casing A.

The operation of my device will be readily understood from the foregoing description of its construction, taken in connection with the accompanying drawings. Any desired form of fuel may be burned beneath the pot B, within the casing A, and if necessary a smoke hood or pipe may be placed above the top or dome of the pot to receive and conduct away any products of combustion which may escape through the openings between said dome and the top of the casing; but with certain kinds of fuel obviously this smoke hood or pipe would be unnecessary, and hence I have not deemed it requisite to illustrate the same in the drawings. The water enters the pot B through the inlet-pipe E and by reason of the

two continuous described coils *ee* it circulates entirely around the coil-shell C, on both sides thereof, and is drawn off as needed, through one of the described outlets F or G, in a highly-heated condition. By admitting a moderate quantity of water at a time and keeping the same at a proper level I can generate steam with the device, and hence I do not limit myself to its use for hot water alone.

By the described conical construction of my said pot and coil-shell I am enabled to secure a tighter fit of the one part within the other, and lessen the danger of any leakage in the fluid-tight joints between the two, and by the described construction of my coils *ee* there are formed between them continuous flat water-channels, of much greater height than width, and hence a greater body of water is exposed to the heated surface of the pot than would be possible with coils or passages of ordinary form.

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

1. In a water-heater, the combination with a double walled annular water pot, of an annular shell, secured therein between the double walls of said pot, and provided with exterior and interior continuous spiral coils projecting from said shell, and forming fluid-tight joints with the inner surfaces of the said double walled annular pot, and flat narrow continuous water-channels between them, substantially as set forth.

2. In a water-heater, the combination with an outer casing or heat retaining shell, of a doubled-walled annular water pot suspended therefrom and within the same, an annular shell secured within and between the double

walls of said pot, and provided with exterior and interior continuous spiral coils forming fluid-tight joints between said double walled pot and said shell, and flat narrow continuous water channels between them, and suitable inlet and outlet pipes connecting with said pot, substantially as set forth.

3. In a water-heater, the combination with a conical double-walled annular water pot of a conical annular shell secured therein between the double walls of said pot, and having exterior and interior continuous spiral coils forming fluid-tight joints with the inner surfaces of the said double walled pot, and flat narrow continuous water channels between them, substantially as set forth.

4. In a water-heater, the combination with an outer casing or heat retaining shell, of a conical double-walled annular water pot, an annular top or dome secured to said casing and to said water pot whereby the latter is suspended within the former, a conical annular shell filled with suitable non-heat conducting material secured within said pot and provided with exterior and interior continuous spiral coils forming fluid tight joints between said double-walled pot and said shell, and flat narrow continuous water channels between them, and suitable inlets and outlets connecting with said pot, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

EMANUEL DETWILER.

Witnesses:

H. G. UNDERWOOD,
C. W. SCOTT.