

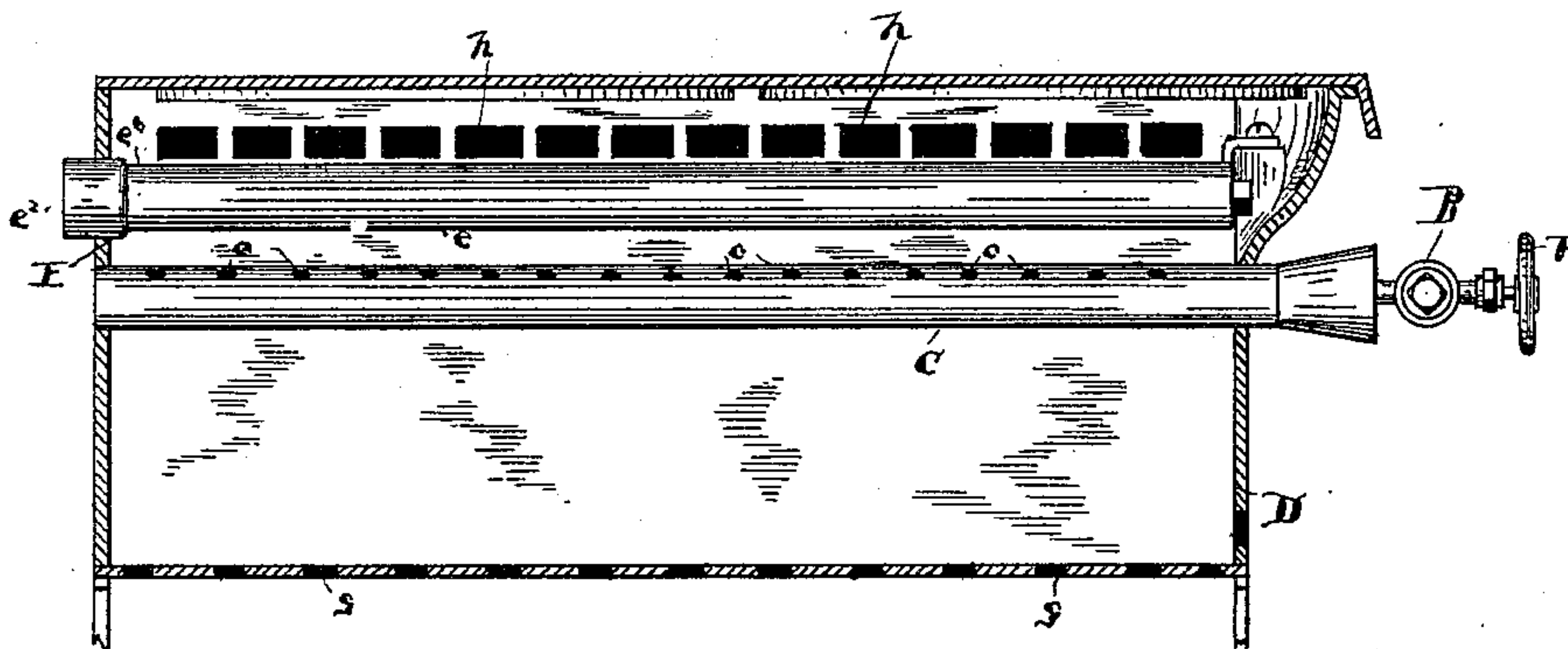
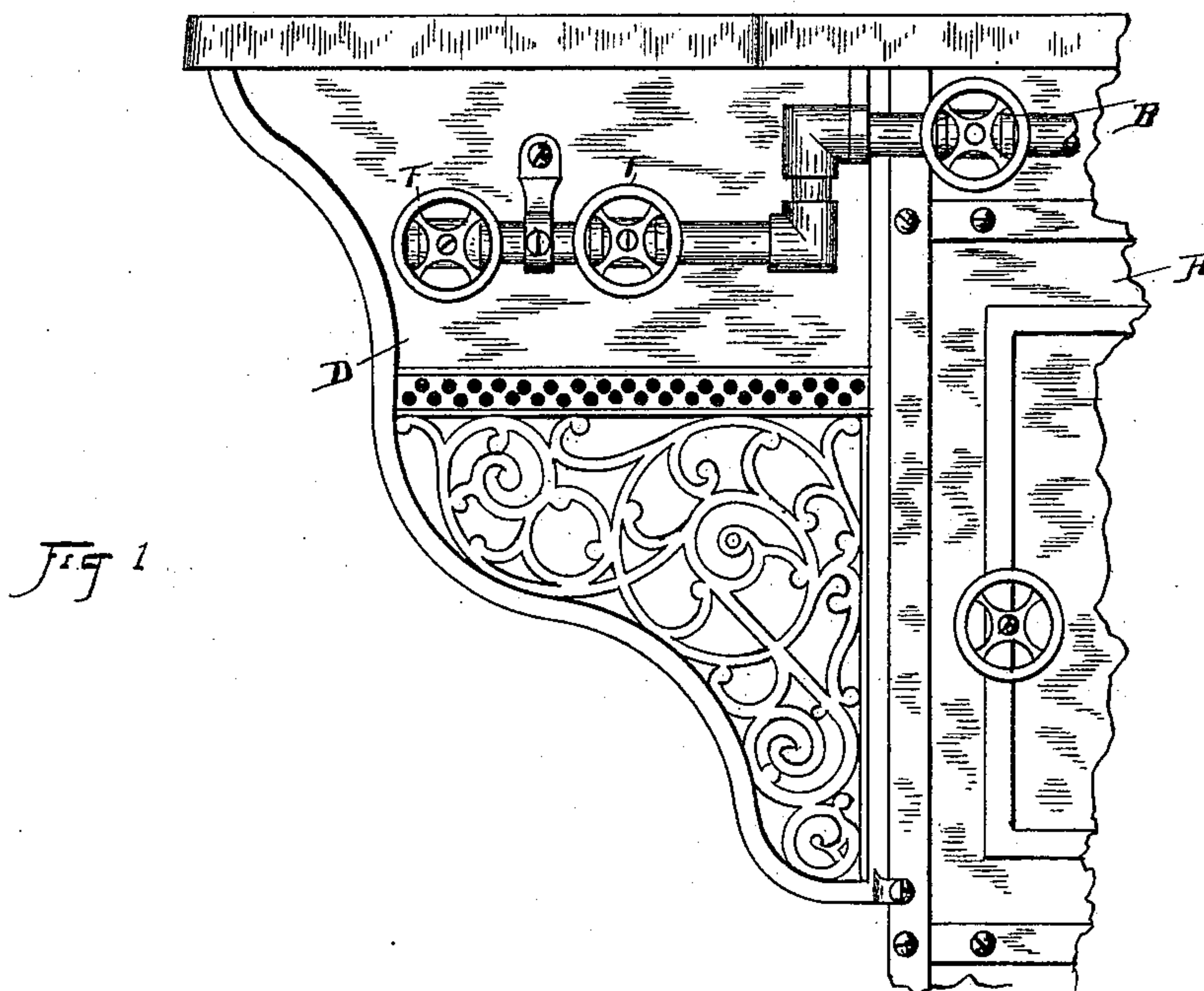
(No Model.)

2 Sheets—Sheet 1.

H. TRENKAMP.  
WATER HEATER.

No. 470,224.

Patented Mar. 8, 1892.



*Fig 2*

Witnesses  
P. B. Moser.  
A. S. Amstutz

Henry Trencamp Inventor:

By H. J. Fisher. Attorney

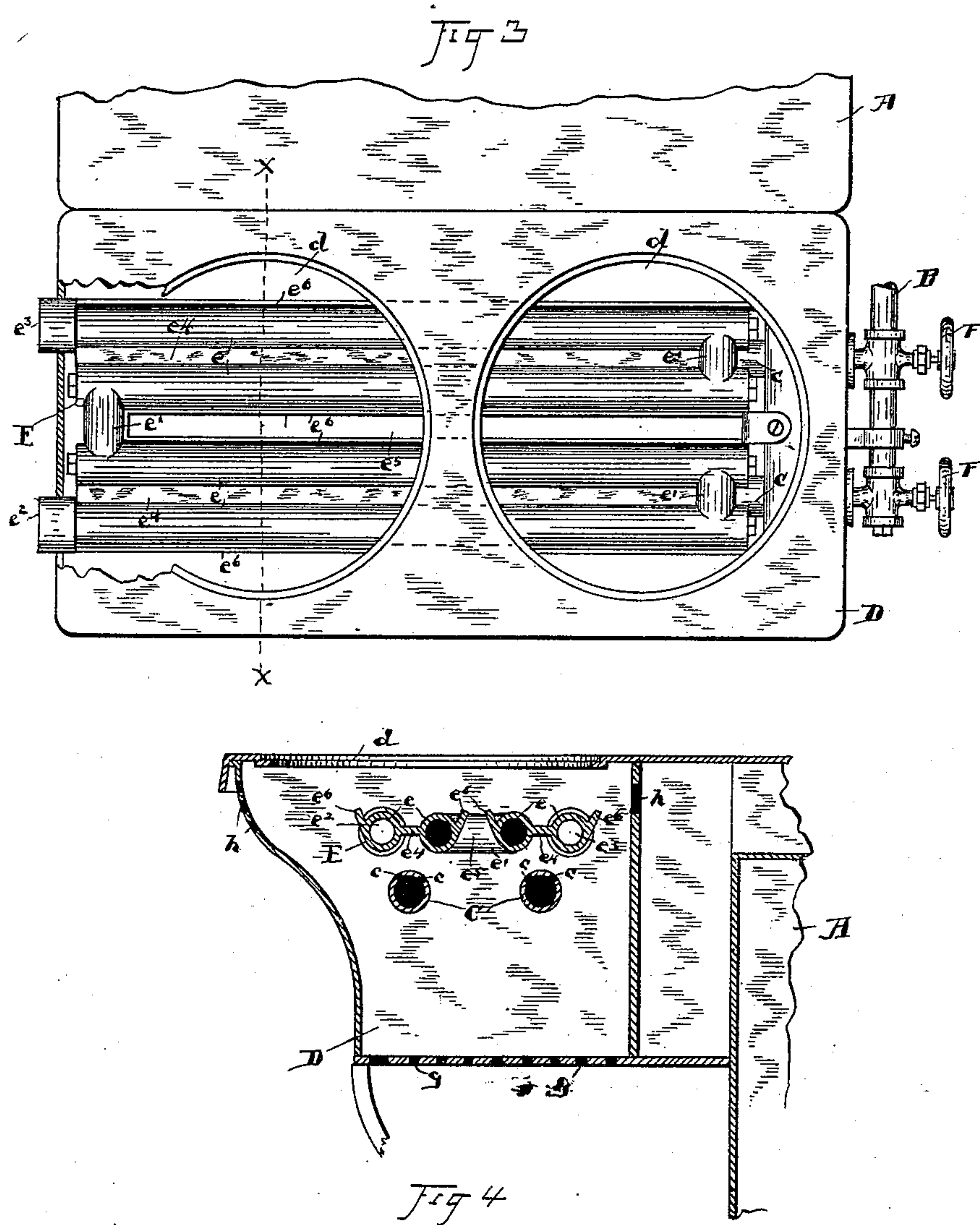
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R. B. Moser.  
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Henry Trenkamp Inventor:

By his Attorney

H. T. Fisher.



# UNITED STATES PATENT OFFICE.

HENRY TRENKAMP, OF CLEVELAND, OHIO.

## WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 470,224, dated March 8, 1892.

Application filed December 1, 1890. Serial No. 373,144. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY TRENKAMP, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Water-Heaters for Vapor or Gas Stoves; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to improvements in water-heaters; and it consists in an attachment especially adapted to vapor or gas stoves, the same comprising a device for heating water circulated through the same and arranged between the burner-tubes and the openings for vessels on the top of the heater, so that water may be heated while the heat used for that purpose may also be utilized, as in other stoves, all substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the rear end of a stove to which the attachment comprising the invention is fixed, as shown in full lines. Fig. 2 is a rear elevation of Fig. 1 with the curved back plate removed and the top part in section, so as to show the relation of the heating-tubes, the water-heater, and the openings in the top of the stove. Fig. 3 is a plan view of Fig. 1 with the covers to the openings of the top removed, so as to fully disclose the water-heater beneath. Fig. 4 is a cross-section taken on line *x x*, Fig. 3.

A represents the back part of a well-known form of vapor or gas stove and provided with tube B for the distribution of vapor or gas to the burners—that is to say, either vapor produced from gasoline or the like may be used and conveyed through tube C from a generator, or natural gas or illuminating-gas or the like may be employed. The vapor or gas flows through the tube B into the two parallel tubes C, which constitute the burner-tubes for this attachment and are provided along their top with a series of small diagonal perforations *c*, through which the gas issues and burns.

D represents the attachment casing or

frame, secured, as shown, to the back of the stove by any suitable means, and provided with one or more openings *d* in its top adapted to receive vessels for cooking, the same as on an ordinary stove.

E represents the water-heating device, corresponding in one sense with the water-back found in cooking-stoves and ranges and serving a kindred purpose. This heater is novel in both construction and arrangement, it being formed in a solid piece of casting consisting, preferably, of brass, although copper or other metal may be used for this purpose, and has its water-channel cored therein, so as to afford a free and open circulation for the water. This device is arranged horizontally toward the top of chamber D and is formed of four or more parallel tubes *e*, connected at their opposite ends alternately by the short tubes *e'*, or suitable curved returns, so that, supposing the fluid to enter the first or rear pipe at *e*<sup>2</sup>, the water will flow thence to the opposite end of said tube, across through the connecting-tube *e'*, and thence back through the next tube *e*, and so on around until it issues out of the heater at *e*<sup>3</sup>, whence it is carried to the reservoir or boiler or other place where desired for storage or use. The four or more parallel tubes *e* are arranged, practically, in pairs of two or more upon either side of the center, and the pairs are shown here as connected by a web *e*<sup>4</sup>. An open-draft passage *e*<sup>5</sup> is provided between the two sets of tubes. Upon either side of the air-passage *e*<sup>5</sup> on the two inner tubes and on the outer side of the two outer tubes are parallel vertically-inclined flanges *e*<sup>6</sup>, partaking somewhat of the curvature of the respective tubes and extending upward therefrom a slight distance, so that the flame which strikes these tubes will have a tendency to roll around the same and be directed in a sheet upward to the openings on top, where it does effective work in heating vessels placed in said openings. The inner flanges *e*<sup>6</sup> converge, as seen, thus serving to concentrate the central flame and adding to its heating value.

Suitable valves F are provided, one for each burner-tube C, so that one or both of said tubes may be used at a time, as may be found most convenient or desirable.



Combustion is supported through the air-openings *g* in the bottom of the attachment chamber, and openings *h*, front and rear, at the top of the chamber afford outlets for the products of combustion, so that a steady draft is afforded up through the attachment chamber and combustion is made complete. The bottom of the attachment D might be entirely open; but a perforated plate at this point is preferable. It will be noticed that the cored water-heater is arranged horizontally, with the burner-tubes beneath the same in such relation that the flame strikes the tubes diagonally along their bottom.

The attachment D, which contains the water-heater, and the tubes C are shown here as connected with a vapor or gas stove; but it will be understood that this attachment is not necessarily so connected and that it may be used separately from the stove, if preferred. Each of the tubes C has its openings *c* arranged in parallel rows at an outward angle to each other, so that while each tube occupies a central position with respect to two of the parallel heater-tubes the jets of flame will issue diagonally therefrom against the bottom of each heater-tube, from which point the flame rolls round in unbroken volume over the side of the heater. The webs *e'* serve as diaphragms between the allied pairs of tubes *e*, and are located centrally thereof, so that while they serve to connect the said tubes and to close the space between them they also allow sufficient exposure to the flame. By this means at least thirty gallons of water can be heated per hour, while a full flame of heat is maintained for the cooking-openings on the top of the attachment-chamber.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a water-heater, a pair of parallel water-tubes *e*, connected by a web *e'* and at one end by a cross-tube *e'*, and a perforated burner-tube arranged beneath said pair, substantially as shown and described.

2. A water-heating attachment consisting of parallel water-tubes *e*, connected in pairs by webs *e'* and from one tube to the other by cross-tubes *e'*, in combination with a perforated burner-tube arranged beneath each pair of water-tubes, substantially as described.

3. The water-heating attachment herein described, consisting of parallel water-tubes having open communication one to the other to establish circulation, the said tubes connected in pairs, and the two adjacent tubes of opposite pairs provided along their top inner portion with longitudinal flanges on either side of the draft-space between said tubes, in combination with the burners beneath said tubes, substantially as described.

4. In a water-heater, a pair of parallel water-tubes *e*, connected at one end by a cross-tube *e'*, a burner-tube below said tubes provided with two rows of jet-orifices arranged so that the flames therefrom will be directed diagonally against the bottom and toward the outer opposite sides of the water-tubes *e*, and the flanges *e'* on the said sides of tubes *e*, substantially as shown and described.

Witness my hand to the foregoing specification this 21st day of November, 1890.

HENRY TRENKAMP.

Witnesses:

H. T. FISHER,  
NELLIE L. McLANE.