(No Model.)

H. HAEBERLIN.

WATER HEATER.

No. 570,128. Patented Oct. 27, 1896.

Fig. 1.

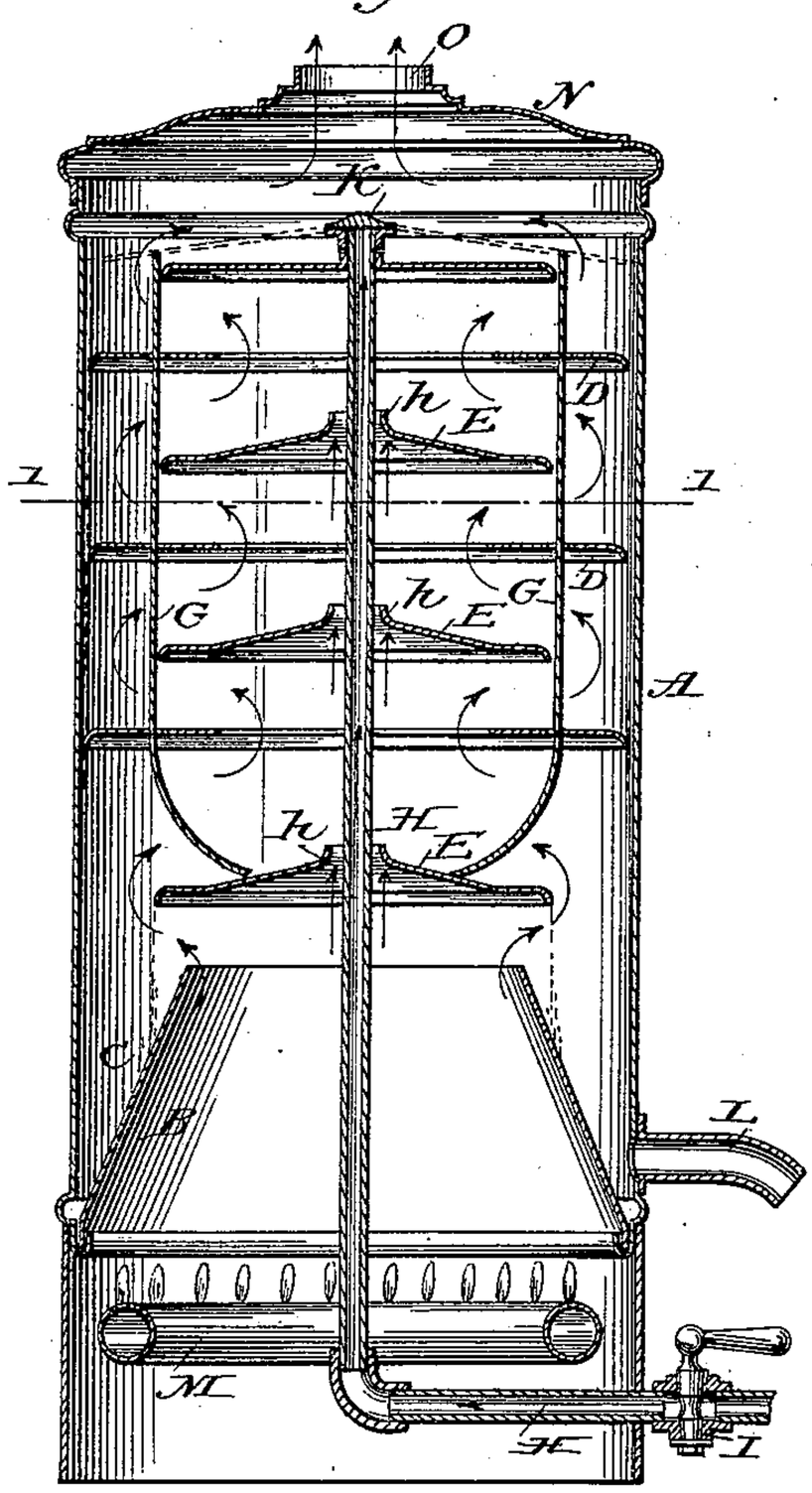


Fig. 2.

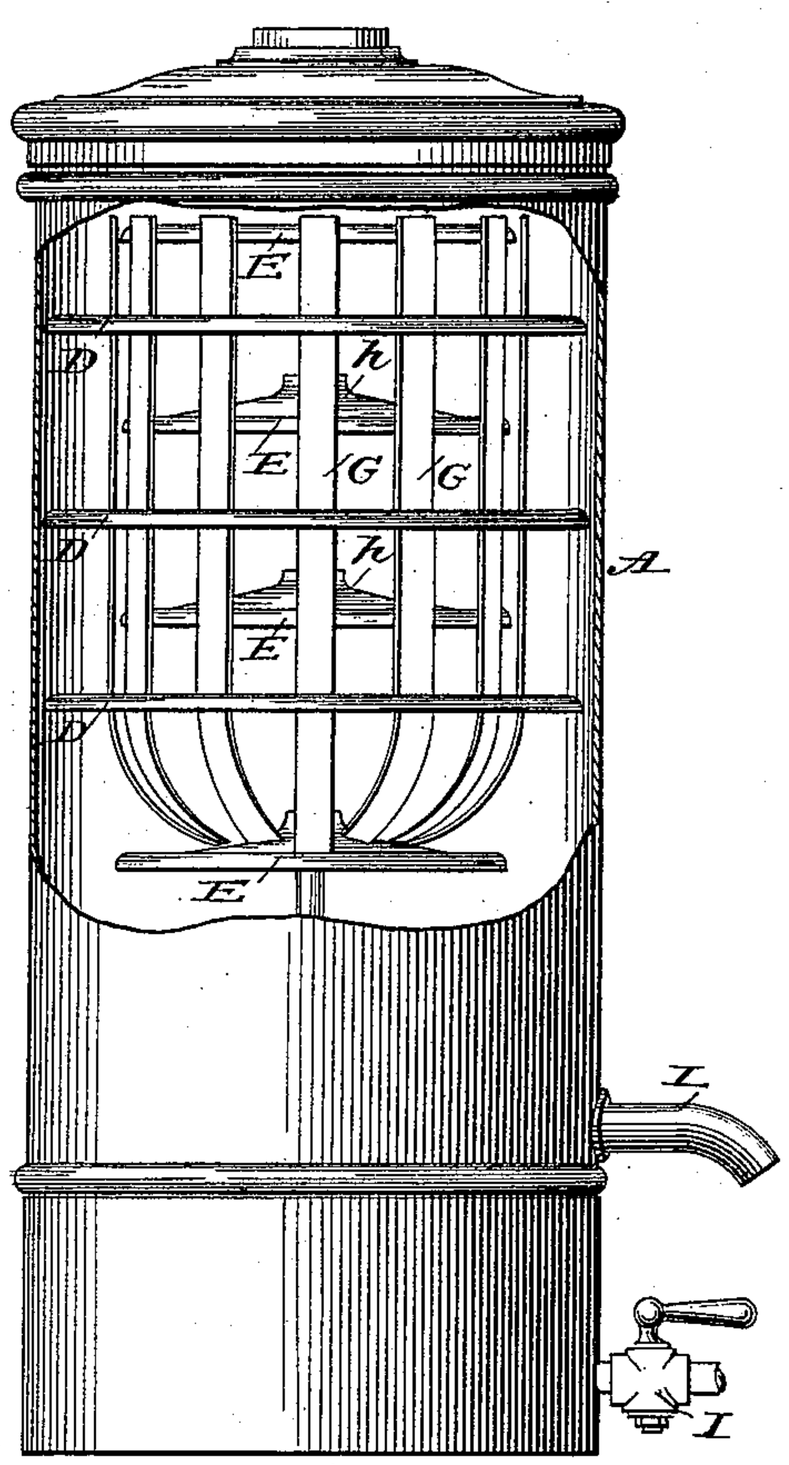


Fig. 3.

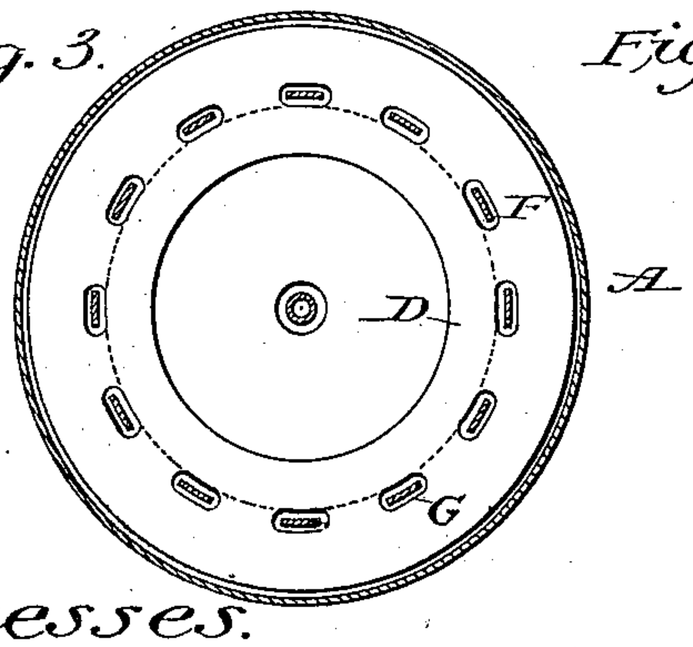
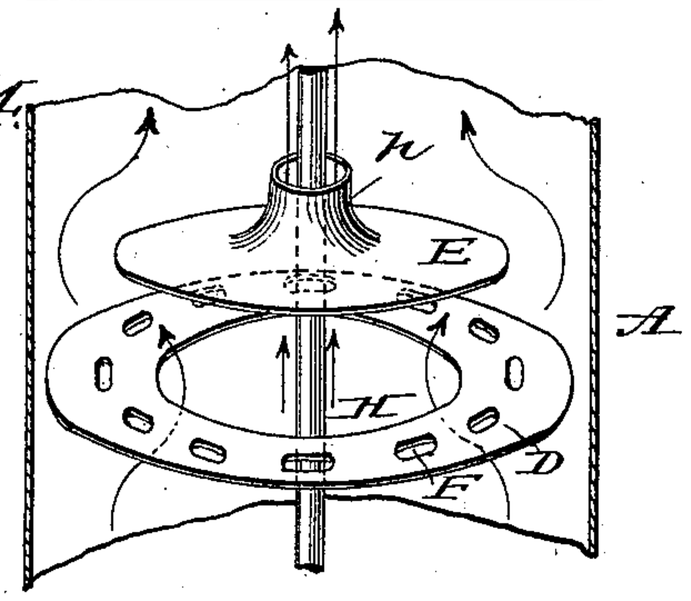


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

HERMANN HAEBERLIN, OF CLEVELAND, OHIO, ASSIGNOR TO THE HORIX MANUFACTURING COMPANY, OF SAME PLACE.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 570,128, dated October 27, 1896.

Application filed December 5, 1894. Serial No. 530,873. (No model.)

To all whom it may concern:

Be it known that I, HERMANN HAEBERLIN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Water-Heaters, of which the following is a specification.

My invention relates to devices for heating water in connection with household, tonsorial, or other special uses, and is designed to be operated for the purposes at a minimum expenditure of time and combustion.

Figure 1 is a longitudinal sectional view of a water-heater comprising a special form of my said invention. Fig. 2 is a perspective view thereof with a portion of the exterior surface removed in order to thereby disclose certain interior features or parts. Fig. 3 is a downward view in cross-section through the line 1 1 of Fig. 1; and Fig. 4 is a partial perspective drawing of certain of the parts outlined in side view in Fig. 1, and is further intended to show by the arrows the upward course of the heated current through the apparatus.

In the drawings, A represents the shell or heating-chamber of any suitable design or substance, but preferably of a general cylindrical form. The shell A is joined at its lower end to a second inwardly-projecting conical shell B, thereby constituting a hot-water cavity or reservoir C at the base of the chamber or shell A, which is provided with a suitable outlet L and also with a cover N, having an opening therein for the discharge of the combustion products. By the conical shape of the inner shell B the extent of heated surface with which the water must come into contact is increased to a considerable degree and the heat applied in the most effective manner, as hereinafter set forth.

Beneath the heater is arranged a heating-furnace M of any suitable character, for which purpose an ordinary ring gas-burner is efficient.

Within the shell A is supported the water-distributing system, which is a structure independent of the particular form of shell in which it is used and which consists of a series of horizontal annular disks D, alternating with plate-like disks E, supported at a sufficient distance apart to allow of the free circulation of the heat between them. Passing vertically through the annular disks D are water-conducting strips G G, preferably arranged in a concentric series around the water-supply pipe H and so that their upper extremities will project above the uppermost of the disks E and within the operative range of the spraying device K. The strips G G are separated from each other and pass through apertures F F in the disk D, which apertures should afford ample clearance for the water, while at the same time causing the strips to firmly and snugly seat in the openings, and the strips are preferably curved at their lower extremities toward the center of the apparatus and rest upon the lowermost of the disks E, so as to deliver the water at the central portion thereof.

For the sake of clearness only one pair of strips G is represented in Fig. 1, but a full equipment is shown in position in Fig. 2. The number of said strips to be employed in my device is not material, and I accordingly do not wish to limit my invention in this respect, nor in respect to the mode of attaching the parts just referred to.

The disks D have a diameter slightly shorter than that of the inclosing shell A, and the disks E have a considerably shorter diameter than D, but exceeding the diameter of the central opening in D. The central opening in the disks E is of a diameter but slightly exceeding that of the water-conveying pipe H. The small annular space left between the disks E and the pipe H induces a directly-ascending heated current along the pipe H, whereby the water entering the apparatus is warmed before emerging from the spraying device K. The disks E may, as preferred, be made flat, as shown by the upper disk in Fig. 1, or with a somewhat convex shape and with its central portion prolonged into an upward-projecting short shelve *h*, by which feature the heating effect of the central current of hot air along the pipe H is intensified. The outer edges of all the disks are preferably turned downward, as shown in Fig. 1, which serves not only to facilitate the drainage of water from the disks but also to increase the rigidity of the disk itself.

The disks D and E alternate in position, but it is preferable that the series of disks should be so arranged that the disks E E form the uppermost and lowermost disks of the series. The oblong apertures F afford a free passage for the water flowing down the strips G G, while that portion of the water which passes between the strips G G either drips from the edges of the disks upon the disks next below or is carried by capillary action along the edge of the disk E to the next contiguous strip G and thence down the same or along the disk D to the outer edge thereof and thence down the inner surface of the shell A. The strips G being located in close juxtaposition to the edges of the disks E will receive and conduct much the greater part of the water and discharge the same nearly centrally upon the lowermost disk E, which being located immediately above the burner M is of course the hottest of the series and quickly imparts to the already partially-heated water any desired degree of heat.

The heat-current striking against and being deflected from the conical inner shell B, which forms the bottom of the shell A, strikes against the under side of the lower disk E, a small portion passing up the central orifice thereof, but the greater portion passing up around the outer edge thereof and thence between the strips G, through the central opening of the disks D, and around the disks E to the top of the apparatus, as shown by the arrows in Fig. 1.

As the water ascending in the pipe H is under pressure it will be subjected to heat until it arrives at the spray K, which will distribute the stream radially toward the walls of the shell A. Since the upper ends of the strips G project within the operative range of the spraying device K a considerable portion of the water will be intercepted by said strips and will follow the same through the apertures F F to the curved terminals on the upper surface of the lower disk E, whence it will descend upon the conical bottom B directly above the burners M, and consequently at the hottest portion thereof, and will flow down the same into the reservoir C.

By the means described a highly efficient and very rapid heating of the water is secured.

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

1. In a water-heater the combination of a chamber adapted to be supported above a burner or equivalent source of heat, and having a conical centrally-open bottom directly above said burner, a deflecting-plate above the open conical bottom of the chamber for deflecting the heat peripherally, a series of centrally-disposed disks alternating with peripherally-disposed annular plates supported at a distance from each other above the deflecting-plate, for imparting a tortuous course to the heat-currents, a series of vertically-disposed water-conducting strips passing through said annular plates and terminating on the deflecting-plate, and a water-inlet pipe passing centrally up through said structure and discharging radially at the top of said chamber above the upper disk, substantially as shown and described.

2. In a water-heater the combination of a chamber suitably supported above a burner or equivalent source of heat, and having a conical centrally-open bottom directly above said burner, a deflecting-plate above the open conical bottom of the chamber for deflecting the heat peripherally, a series of centrally-disposed disks alternating with peripherally-disposed annular plates supported at a distance from each other above the deflecting-plate, for imparting a tortuous course to the heat-currents, a series of vertically-disposed water-conducting strips passing through said annular plates and terminating on the deflecting-plate, water-passages through said annular plates contiguous to said strips, and a water-inlet pipe passing centrally up through said structure and discharging radially at the top of said chamber above the upper disk, substantially as shown and described.

3. In a water-heater the combination of a chamber adapted to be supported above a burner or equivalent source of heat, and having a conical centrally-open bottom directly above said burner, a deflecting-plate above the open conical bottom of the chamber for deflecting the heat peripherally, a series of centrally-disposed disks alternating with peripherally-disposed annular plates supported at a distance from each other above the deflecting-plate, for imparting a tortuous course to the heat-currents, a series of vertically-disposed water-conducting strips passing through said annular plates and terminating on the deflecting-plate, and a water-inlet pipe passing centrally up through said structure and having a deflecting-plate arranged above the open end of said pipe, for discharging the water in a radiating sheet or spray above the upper disk, substantially as shown and described.

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Witnesses:
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