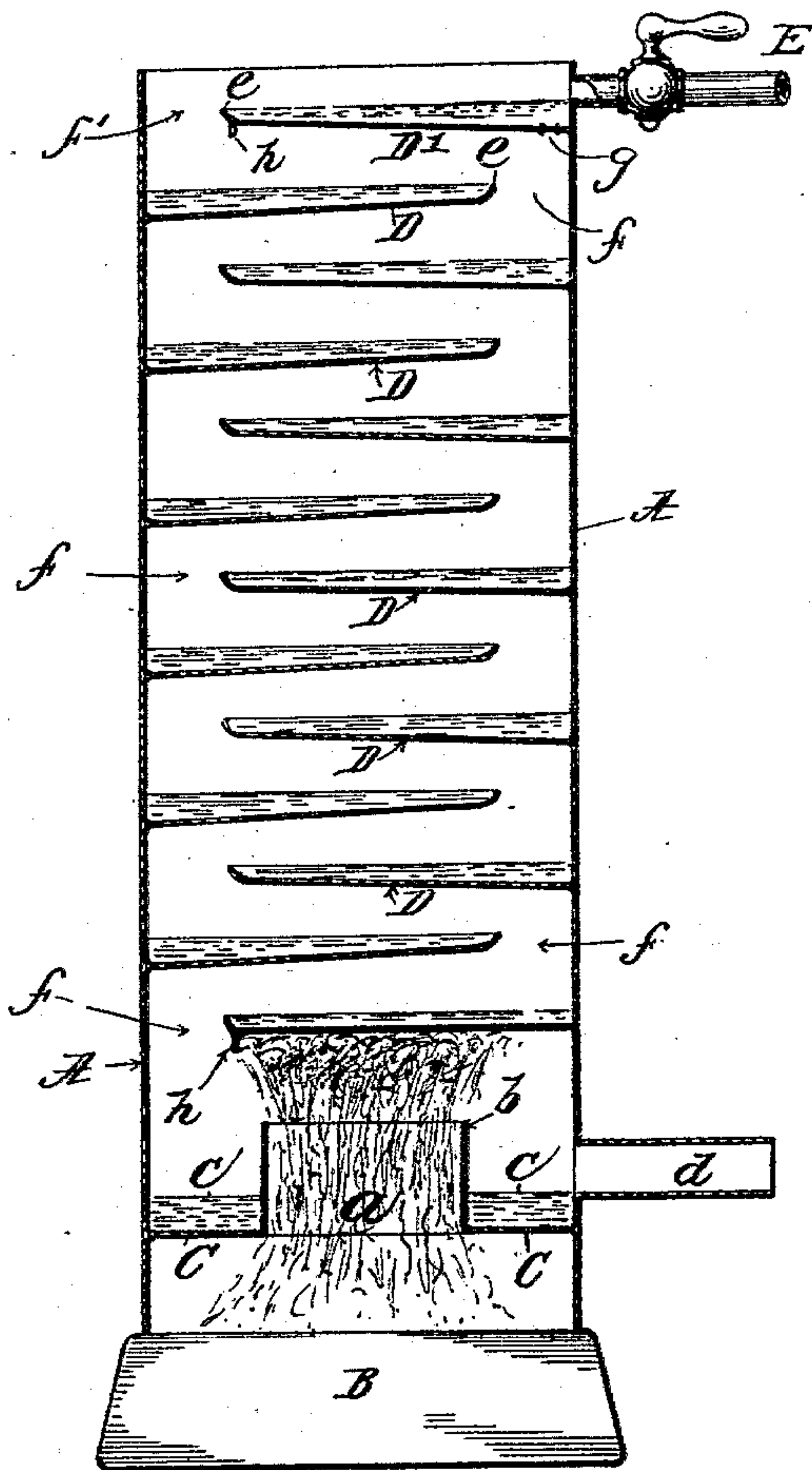


(No Model.)

D. N. HURLBUT.
WATER HEATING APPARATUS.

No. 562,897.

Patented June 30, 1896.



Daniel Hurlbut

INVENTOR

WITNESSES:

Edward C. Rowland.
Stillman F. Rowland

UNITED STATES PATENT OFFICE.

DANIEL N. HURLBUT, OF NEW YORK, N. Y.

WATER-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 562,897, dated June 30, 1896.

Application filed August 13, 1895. Serial No. 559,195. (No model.)

To all whom it may concern:

Be it known that I, DANIEL N. HURLBUT, of the city, county, and State of New York, have invented a new and useful Instantaneous Water-Heating Apparatus, of which the following is a specification.

My invention relates to that class of devices wherein a continuous flow of water is heated.

My invention consists in the arrangement of mechanism whereby hot air is passed upward through a chamber and comes directly in contact with water in its downward flow over and under a series of lateral shelves, thus causing the water to absorb all the heat contained therein in the manner hereinafter more particularly pointed out.

In the accompanying drawing forming a part hereof I show a vertical section of my water-heater resting upon a heating apparatus B.

A is an upright case.

B is a gas-burner or other equivalent heating apparatus.

C is a plate crossing and entirely covering the area of the case having the opening *a* therein and the chimney *b* attached thereto, forming the hot-water chamber *c*, into which the exit-spigot *d* is inserted.

D is a series of lateral shelves covering the whole area of the case except the aperture shown at *f*. These shelves are placed in the case upon an incline upward sufficiently to retard the flow of water and cause it to pass along and in contact with both the upper and under surfaces of the shelves.

The shelves D are placed alternately, from right to left, the upper shelf having the orifice *g*, through which a portion of the water passes to the series of shelves attached to the right-hand side of the case. The outer edge has a downward projection *h*, which causes the remaining water to drop directly upon the shelf below, thus supplying each of the alternate series of shelves on the left. The lower shelf is formed with an edge similar to that of the upper shelf for the purpose of passing all the water down to the chamber *c*.

The operation of my invention is as follows: Water is thrown upon the upper shelf D through the inlet E, a portion of which overflows the edge *e*, through the aperture at the

left, falling upon the shelf below, thence on its upper surface to the aperture on the right, thence returning along the under side of the same shelf, and in contact therewith, to the left side of the case, then passing to the next lower shelf attached to that side, and so on down until it reaches the water-chamber *c*. The portion of the water passing through the orifice *g* in the upper shelf falls upon the next shelf attached to that side of the case, thence over and under the series of shelves attached to that side, as heretofore described. The heated air from the gas-burner B rises upward through the aperture *a*, and thence to the right side of the case and through the aperture *f*, and thus upward, conversely to the action of the water, between the series of shelves and out at the final opening *f* at the top of the case.

I claim—

1. An apparatus for heating running water consisting of a metal case inclosing a series of lateral shelves set with an upward incline and attached to three of the sides of the case with an aperture running across the remaining side, such apertures being alternately on the left and right hand sides of the case and through which the water passes along both the upper and lower surfaces of the shelves from the point of entrance above the upper shelf to the exit-chamber below the under shelf and through which also the hot air passes in the opposite direction from the burner under the case to the open space at the top.

2. The combination with a gas-burner or other equivalent heating apparatus; of a case open at the top containing a series of lateral shelves inclined upward having apertures running alternately across the left and right hand sides of the case; a supply-spigot above the upper shelf and an exit-spigot below the under shelf and connected with the water-chamber near the bottom of the case; substantially as shown and described.

This specification signed and witnessed this 1st day of August, 1895.

DANIEL N. HURLBUT.

Witnesses:

STILLMAN F. KNEELAND,
C. H. PIKE.