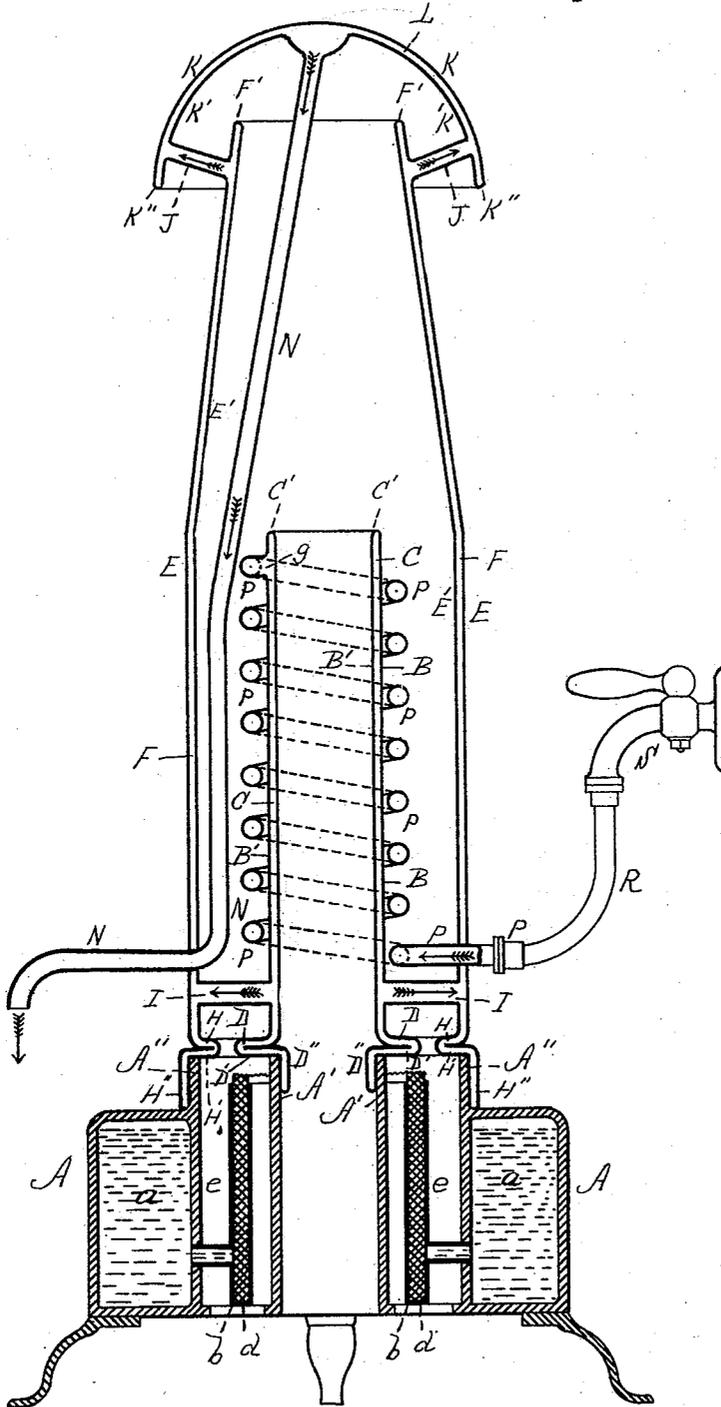


(No Model.)

G. D. B. SMALL.  
WATER HEATER.

No. 495,143.

Patented Apr. 11, 1893.



WITNESSES

*J. M. Hartnett.*  
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# UNITED STATES PATENT OFFICE.

GEORGE D. B. SMALL, OF CHELSEA, ASSIGNOR OF ONE-HALF TO CHARLES M. WESCOTT, OF BOSTON, MASSACHUSETTS.

## WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 495,143, dated April 11, 1893.

Application filed June 28, 1892. Serial No. 438,277. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE D. B. SMALL, a citizen of the United States, residing at Chelsea, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Water-Heaters, of which the following is a specification.

This is an apparatus which is constructed and intended to heat water with great rapidity, and is adapted to be placed in any room or building to which water can be supplied.

The invention consists in the construction below described and illustrated in the accompanying drawing, whereby the water is conducted over a stove or heater through my apparatus in the form of sheets or films which by reason of their exceeding thinness are heated very quickly, practically in a few seconds.

The accompanying drawing represents a central vertical section of an apparatus embodying my invention.

A represents an ordinary stove or heater, in this instance adapted to burn kerosene oil. Any suitable stove or heating device may be employed, however. In the stove shown in the drawing, *a* is the oil-reservoir, *b* the wick-tube, *d* the wick, and *e* air spaces. The cylindrical or concentric portions *A' A''* which extend up from the body of the stove and inclose the wick, serve as supports for my apparatus proper.

*B B'* represent respectively the outer and inner walls of an inner tube or cylinder, and *C* is an annular water-space between said walls. This space is very small in cross section—smaller than can be shown in the drawing made in accordance with the rules of the Patent Office. The upper end *C'* of this double cylinder is closed, and the lower end extends outward into the shape of an annular flange *D* which doubles back upon itself at *D'*, and then drops at *D''* into the ring-shape shown, and fits against the inside of the portion *A'* of the stove, the portion *D'* resting upon the upper edge of said portion *A'*. *E E'* are respectively the outer and inner walls of the outer tube or cylinder, and *F* is the annular water space between said walls, said space being of about the same depth as that shown at *C*. The upper portion of this cylinder is preferably, but not necessarily, cone-shaped and its upper

end is closed at *F'*. The lower end extends inward at *H* into the shape of an inner flange, which doubles back upon itself at *H'* and then drops at *H''* into the ring shape shown and fits around the outside of the portion *A''* of the stove, the portion *H'* resting on the upper edge of said portion *A''*. The water-spaces *C F* are continuous for the entire lengths of both the inner and outer cylinders above described, and said water-spaces are connected by means of horizontal pipes or passages *I*.

Near the upper end of the outer cylinder, pipes or tubes *J* extend from the outer wall *E*. These pipes connect with and support the inner wall *K'* of a double concavo-convex cap, which consists of said inner wall *K'* and outer wall *K* connected at *K''* and having a thin water-space *L* between them similar in depth to the water-spaces *C F*. The said pipes *J* hence connect the water-spaces *F L*. A tube *N* extends from the wall *K'* down through the interior of the outer cylinder as shown, and through a suitable opening therein to the outside. This is the outlet pipe, which supplies the heated water to a suitable vessel or receptacle placed beneath its mouth. The outer wall *B* of the inner cylinder is pierced at *g* to receive the upper end of a pipe or tube *P*. This tube may be of any desired shape or length, but is preferably made spiral as shown, winding around the inner cylinder, and finally extending, by means of a suitable opening in the outer cylinder, to the outside, where it is coupled onto a suitable connecting tube *R* which leads to the faucet *S* connecting with the source of supply.

In the operation, the water from the faucet *S* passes through the connecting tube *R* into the tube *P* and through it around the inner cylinder, and at *g* into the space *C* between the inner and outer walls *B'* and *B* thereof, then, circulating throughout such space and down through the portion *D D'* next the flame, the water passes through the passages *I* into the space *F* between the inner and the outer walls *E' E* of the outer cylinder. The water circulates through all parts of this space and down into the parts *H H'* next the flame and thence is forced by the water pressing behind, through the passages *J* into the concavo-convex space *L*, and thence through the outlet

tube N to a suitable receptacle for use. Thus it will be seen that a constant circulation is had of water in the form of thin sheets or films which are heated with great rapidity by the flames from the stove. In practice it is a matter of a few seconds only, after turning on the supply of cold water, before hot water issues from the pipe N.

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

1. In a water-heater, the combination of a stove, the inner cylinder consisting of the walls B B' with the water-space C between them, the spiral tube P extending from said cylinder and winding spirally around it and connecting with the source of supply, the passages I, the outer cylinder consisting of the walls E E' and with the water space F be-

tween them, and an outlet, substantially as described.

2. In a water-heater, the combination of a stove as A provided with the upwardly projecting walls A' A'' on the opposite sides of the wick-tube, the inner cylinder consisting of the walls B B' with the water-space C between them said walls being formed into the hollow annular flange D D', the passages I, the outer cylinder consisting of the walls E E' with the water-space F between them said walls being formed into the hollow internal flange H H', a tubular connection with the source of supply, and an outlet, substantially as set forth.

GEORGE D. B. SMALL.

Witnesses:

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J. M. HARTNETT.