(No Model.)

D. McDONALD.

WASH BOILER.

No. 273,866. Patented Mar. 13, 1883.

FIG. 1.

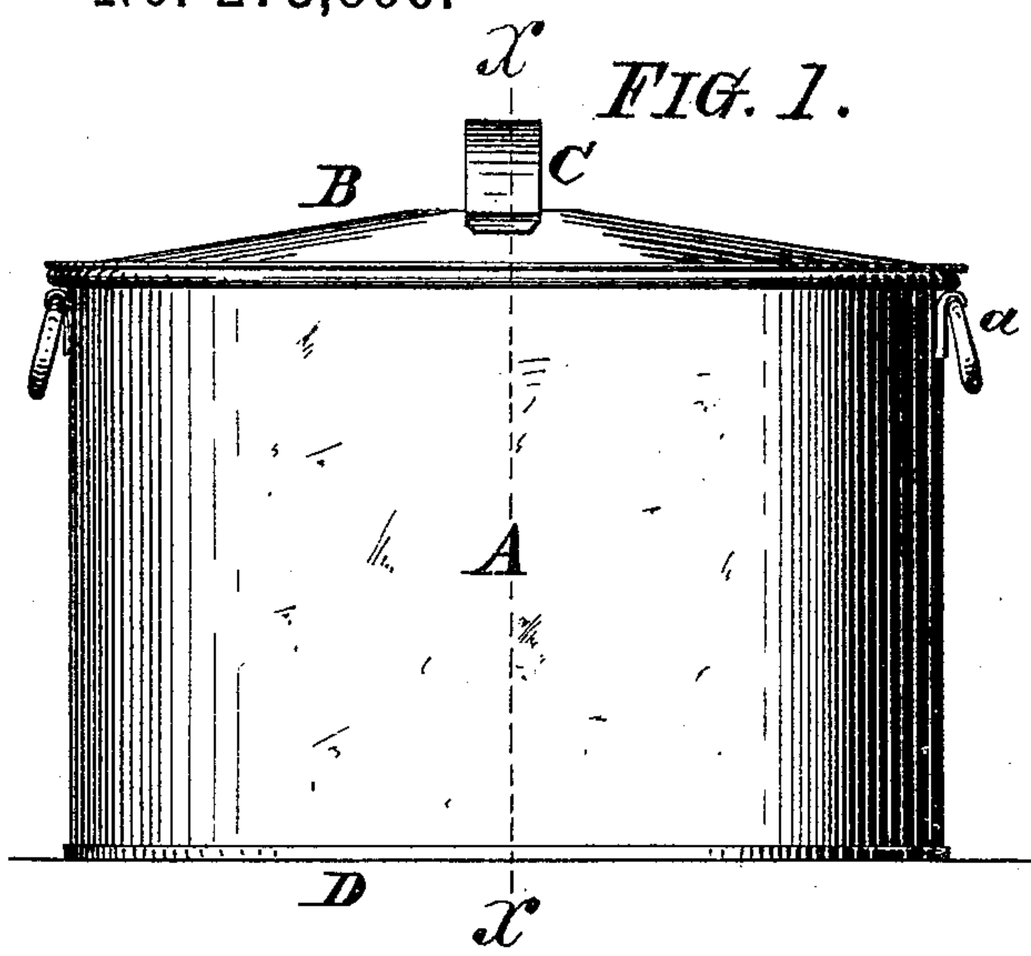


FIG. 2.

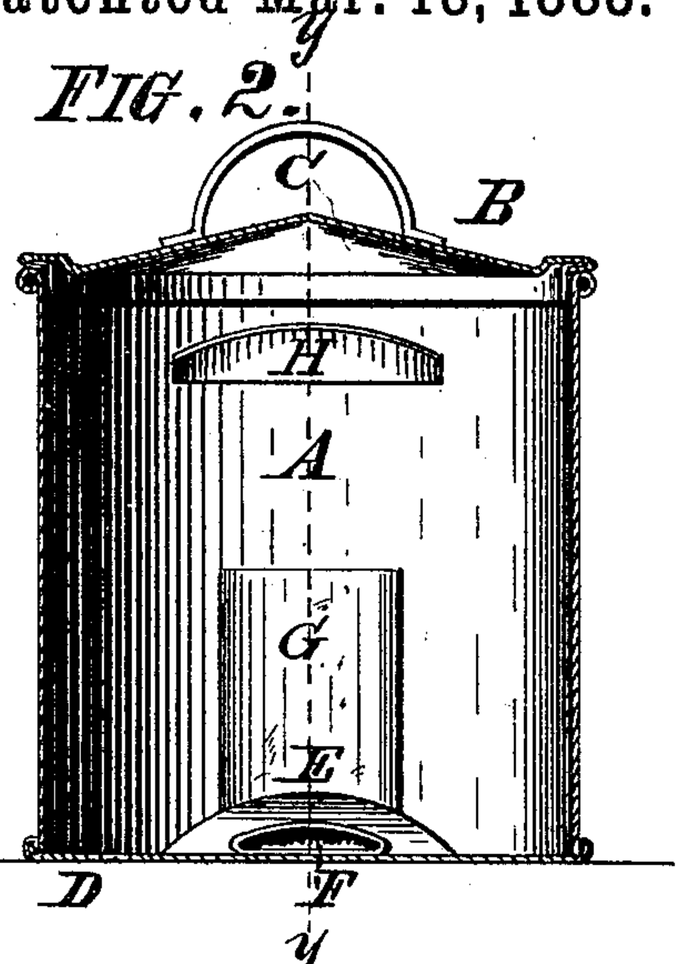
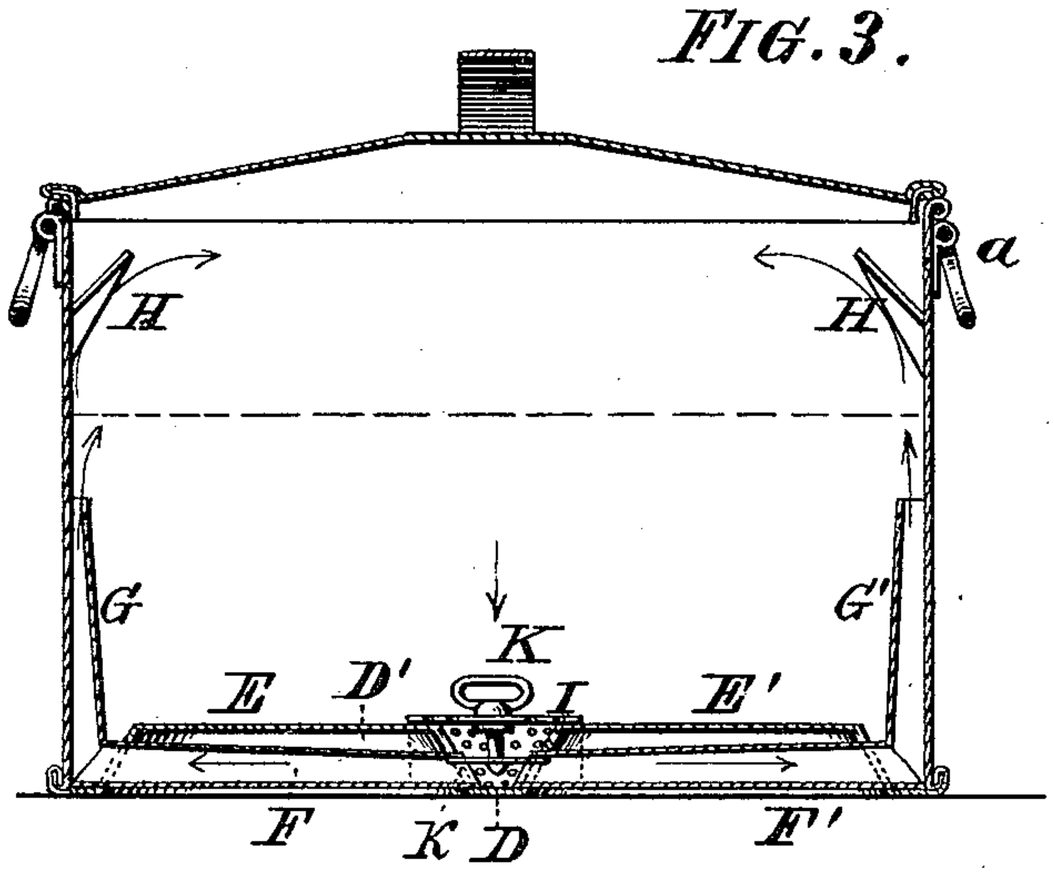


FIG. 3.



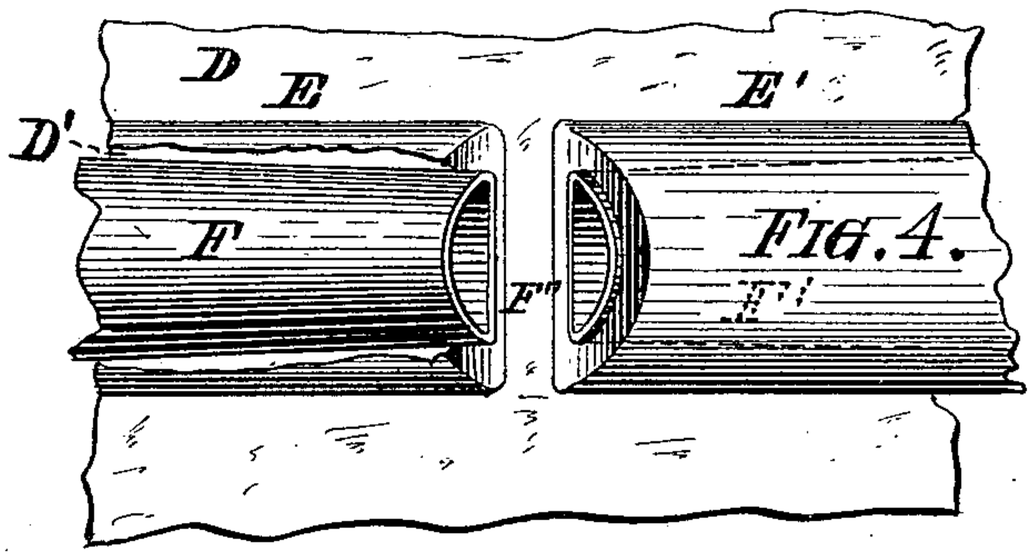


FIG. 4.

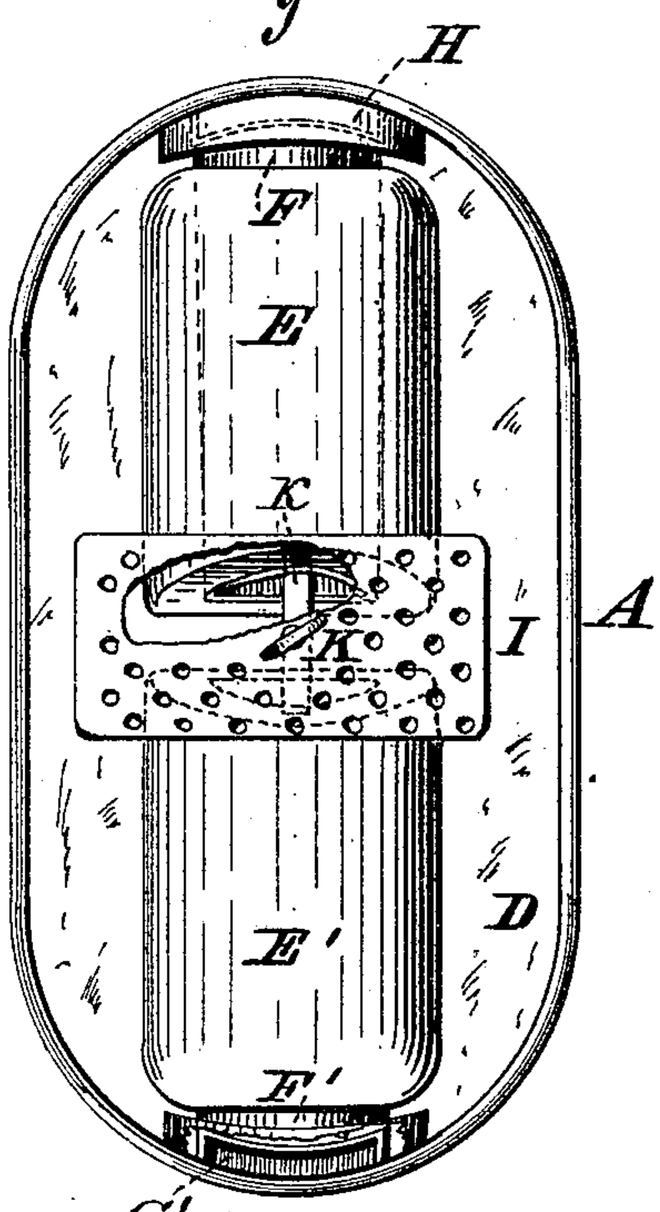


FIG. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

DENNIS McDONALD, OF NIAGARA FALLS, NEW YORK.

WASH-BOILER.

SPECIFICATION forming part of Letters Patent No. 273,866, dated March 13, 1883.

Application filed October 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, DENNIS MCDONALD, of Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements on a Wash-Boiler, &c.; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

My present invention has general reference to improvements on wash-boilers; and it consists essentially in the novel and peculiar combination of parts and details of construction, as hereinafter first fully set forth and described, and then pointed out in the claims.

In the drawings already mentioned, which serve to illustrate my said invention more fully, Figure 1 is a side elevation of my improved wash-boiler. Fig. 2 is a transverse sectional elevation in line *x x* of Fig. 1. Fig. 3 is a longitudinal sectional elevation in line *y y* of Fig. 2. Fig. 4 is a plan, and Fig. 5 a similar view, of a portion of my said apparatus.

Like parts are designated by corresponding letters of reference in all the figures.

The object of my present invention is the production of an efficient, durable, and economical wash-boiler that shall be capable of raising the water to the boiling-point in the shortest possible time in virtue of a perfect circulation and an increased heating-surface, my said invention consisting in improvements in the construction of a washing apparatus for which Letters Patent of the United States were granted to me on the 15th day of August, 1882.

A in these drawings designates a wash-boiler of any suitable and desirable form, my invention being applicable to any and all the different wash-boilers now in use. It is provided with the usual cover, B, having a cover-bail, C, and with handles *a*, as clearly shown in Fig. 1.

D is the bottom of my wash-boiler, double-seamed to the body and soldered, if desired. In this bottom I provide one or more cavities or concavities, E E′, of substantially circular or any other suitable and desired contour, said cavity or cavities extending from near one end to near the other opposite end of said bottom, there being a gap, F″, Fig. 4, between the two concavities E E′, (when there are more than one,) for the purpose hereinafter to be referred to.

In the concavities E E′ are two flattened tubes, F F′, passing through the end walls of said cavities, where one end thereof joints to upright tubes G G′ and the other ends terminate in said gap F″. These tubes F F′ are constructed substantially of a cross-section represented by the arc and chord of a circle, and they are tapering, so as to increase in area from the gap F″ toward the end tubes G G′, the object of which is to facilitate the circulation and passage of the water and steam through the said tubes F F′ in view of its increased bulk and the steam mixed therewith. The two side tubes G G′ are gradually decreasing—*i. e.*, contracted toward their discharge-orifice—so as to increase the velocity of the discharging liquid from said tubes.

In the ends of the boiler, a proper distance above the discharge-orifice of the tubes G G′, there are two deflectors, H, which cause the deflection of the rising current of water toward the central portion of the boiler.

The gap F″ in the concavities in the bottom D is covered by the perforated plate I, having a locking-button or similar means, K, the tongue K′ of which catches in the ends of the tubes F F′, and thereby locks the said plate I in position.

In operation the boiler is filled with water to the water-line, (indicated by a dotted or broken line in Fig. 3,) and the clothes put into the same, the boiling being performed in any of the well-known manners, (or any other, for that matter.) Owing to the introduction of the tubes F F′ and the concavities E E′, the heating-surface—that is, that surface exposed, either directly or indirectly, to the action of the fire or flame in my boiler—is increased nearly fifty per centum, the result of which is that water is much more rapidly heated in my boiler than in the ordinary flat or pitted bottom boiler, while, owing to the fact that the water, passing in a wide but very thin body over the flame in its passage through the said tubes F F′, is in the best possible condition to convert the heat of the flame into motion and absorb the said heat, (or motion.) From this it follows that the heating of the water is accomplished with the least expendi-

ture of fuel, that the circulation of the same is perfect, and that as a result the boiling and cleansing of the clothes is performed in the best possible manner. When the boiler is placed over the fire the water in the tube or tubes F F′ heats rapidly and commences to flow up through the upper or discharge ends of the tubes. With the increase of heat this circular motion of the water increases, and when the boiling-point is reached and steam is being formed it rushes with the water through the tubes with great speed, and, striking the deflectors H, is thrown inwardly over the clothes, thus producing a very rapid circulation or rotary motion of the water, which, separating the dirt, &c., particles from the clothes, cleanses them in the shortest possible time.

It will be readily observed that at a trifling expense over an ordinary wash-boiler my boiler readily takes the place of that and a washing-machine, it being, in fact, a boiler and washing-machine combined; that it requires less fuel than the ordinary boiler; that, owing to the peculiar construction of the bottom D, the entire boiler is strengthened and stiffened, and that boilers of ordinary construction can be readily provided with my improved devices for heating, &c.

It is perfectly obvious that instead of the two cavities E E′ but one such cavity, extending from one to the other end of the boiler, may be used. In this case but one vertical tube will be required, although two of them may be used; but such a device will not give as good results as when two cavities and a corresponding number of vertical tubes G G′ and horizontal heating-tubes F F′ are used.

Owing to the fact that the water passes through the horizontal tubes very rapidly, there is no liability to accumulate sediments in said tubes, thus rendering them free from burning and other accidents to which other heating devices are subject.

Having thus fully described my invention, I claim as new and desire to secure to me by Letters Patent of the United States—

1. The boiler having concavities E E′ in its bottom and intervening gap, F, in combination with removable plate I, covering said gap, bottom K, provided with tongue *k*, and tubes F, fixed in said concavities, the inner ends of said tubes receiving the ends of said tongue and locking said plate in position, as set forth.

2. A boiler having a concavity in its bottom, in combination with a horizontal tube passing through said concavity, and a vertical tube connected to one end of said horizontal tube, the water of the boiler being allowed to circulate through said tubes, substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereto set my hand in the presence of two subscribing witnesses.

DENNIS McDONALD.

Attest:

MICHAEL J. STARK,

JOHN C. DUERR.