

THICKINS & SPERRY.

Farmer's Boiler,

2 Sheets—Sheet 1.

No. 113,222.

Patented March 28, 1871.

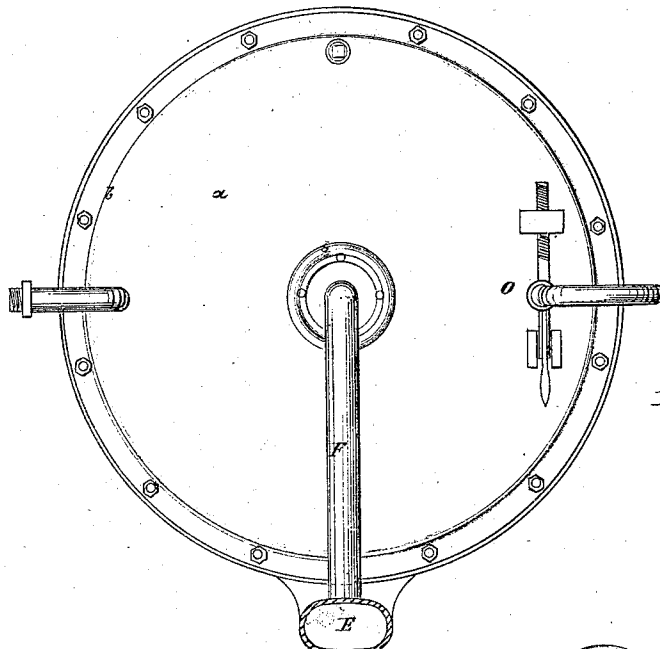


Fig. 1.

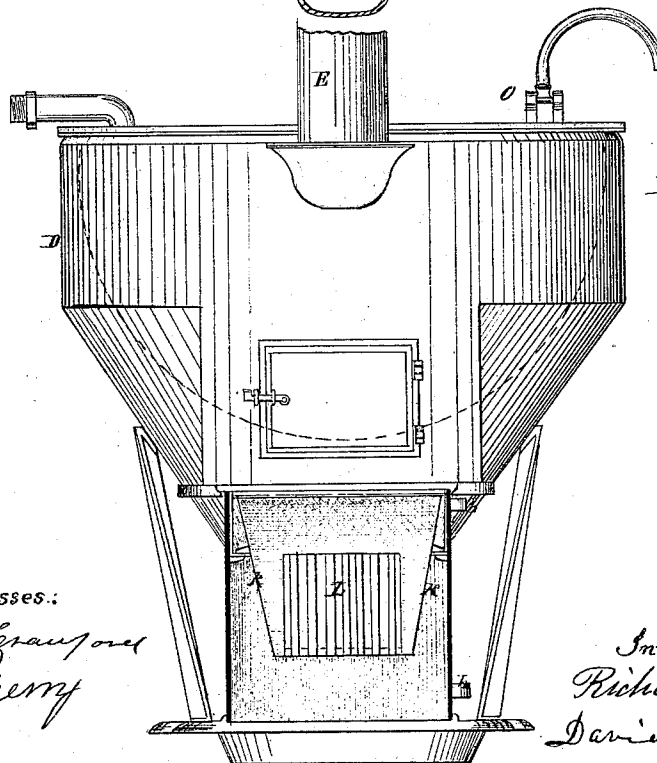


Fig. 2.

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THICKINS & SPERRY.

2 Sheets—Sheet 2.

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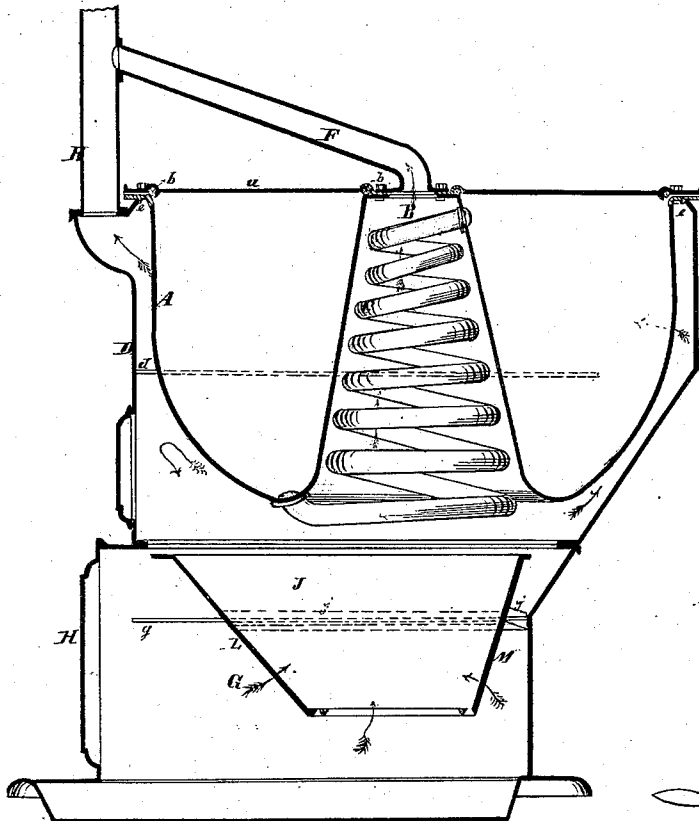


Fig. 3.

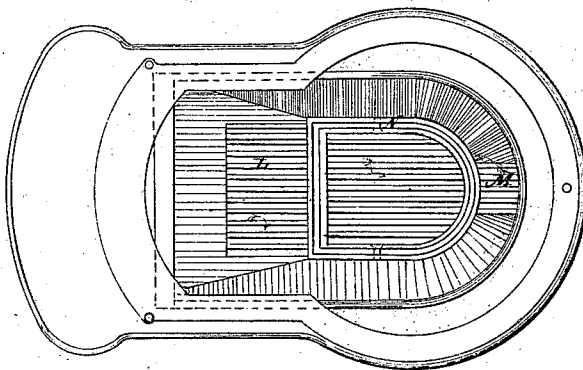


Fig. 4.

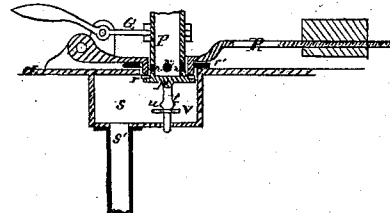


Fig. 5.

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United States Patent Office.

RICHARD W. THICKINS AND DAVID R. SPERRY, OF BATAVIA, ILLINOIS.

Letters Patent No. 113,222, dated March 23, 1871.

IMPROVEMENT IN FARMERS' BOILERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, RICHARD W. THICKINS and DAVID R. SPERRY, of Batavia, in the county of Kane and State of Illinois, have invented certain Improvements in Farmers' Boilers; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, which, together with the letters and figures marked thereon, forms part of this specification, and in which—

Figure 1 is a top or plan view of a farmer's boiler containing our improvements.

Figure 2 is a front elevation of same with the door of the fire-box removed.

Figure 3 is a vertical central section of fig. 2.

Figure 4 is a top or plan view of the lower part or fire-box, the upper part being removed.

Figure 5 is an enlarged detached sectional view of the safety-valve and low water indicator.

Like letters of reference made use of in the several figures indicate like parts.

General Description.

To enable those skilled in the art to make and use my invention I will proceed to describe the same with particularity, making reference in so doing to the aforesaid drawing.

A is caldron or boiler, made with an opening or flue, B, rising from the bottom of the caldron and extending up to a level with the upper outside edge of said caldron. This flue is of a conical shape, being larger at the bottom than at the top, and its purpose is to offer a larger heating surface to the action of the furnace.

To still further extend the heating surface a spirally-coiled pipe, C, is placed within the conical flue, and connected with the caldron at top and bottom, so that the water contained in the said caldron will rise to its level in the said coiled pipe, and the steam formed therein will pass out of the upper opening of the said pipe into the caldron.

The caldron is supported upon trunnions in the usual way, to facilitate dumping to empty the contents, and is surrounded by the usual hinged case or jacket D, which may be swung open to allow of the dumping. This case D is fitted with a horizontal partition, *d*, which divides it for a part of the distance around the caldron into a double flue for the purpose of causing the heat to perform a larger circuit, and more completely surround the boiler or caldron. The course of the heat from the furnace is indicated by the arrows.

E is the chimney which carries off the products of combustion; and

F is a flue connecting the conical flue B with the said chimney.

The cover *a* of the caldron is made with a groove, *b*, upon its under surface, extending entirely around the edge thereof, and also around the inner circumference.

These annular grooves contain round vulcanized-rubber piston-packing, *i*, which rests upon the edge of the caldron and forms steam-tight joints when said cover is bolted to the caldron. This method of joining renders the labor of accurately fitting the joints wholly unnecessary.

The joining of the caldron to the casing or jacket D is rendered tight by making a V-shaped flange, *e*, upon the under side of the lips or horizontal edge of the caldron which rests upon the similarly-beveled upper edge of the inclosing-jacket D; the settling of the caldron by its weight tends to wedge the jacket outward, and effectually renders this joint close.

It is contemplated to provide the chimney E, and also the flue F, with dampers, so that the direction and quantity of the heat-current may be regulated, and made to pass either through the flue B or simply around the caldron, or by both exits, as may be deemed most expedient.

G is the fire-box, upon which rests the superstructure of casing, caldron, &c., above described. This fire-box is intended for burning either wood or coal, at pleasure.

The door H is made to open the full size of the front of the fire-box, upon hinges *h h*, and a flange, *g*, extends along the side and back of said fire-box for the purpose of supporting a basket-grate, J, which is employed when coal instead of wood is burned.

This grate is made with flanges, *j*, at the sides and back, to rest on the flanges *g*.

The front plate of the grate extends in two wings, *k*, at the sides, above the flanges, so that, when the grate is pushed into place through the doorway, which is made of full size for this purpose, the said wings extend out to the sides of the fire-box in front, so that the fire-box is divided, by means of the wings and flanges, into two compartments, which have no intercommunication except through the grate.

This grate is made with bars in front at L, and at the back at M, and is provided at the bottom with the usual pivoted dump N.

The basket-grate, it will thus be seen, is surrounded on all sides by an air-space, and a current of air is constantly flowing around the sides of the grate and passing into the fire through the bars M at the back, so that a stratum of air is interposed at all sides between the grate and the sides of the fire-box, which tends to prevent loss of heat by radiation, the radiated heat being taken up by the air-current and returned to the grate, whence it passes up into the surrounding jacket and around the caldron, as above set forth.

A safety-valve, O, is attached to the cover of the caldron.

This valve is shown detached and enlarged, for the sake of clearness, at fig. 5, and it consists of a vertical tube, P, provided with a bottom, *p*, from which extends a flange or collar, upon which rests a rubber washer or packing, *r*.

This tube passes through a hole in the cover *a* of the caldron, which opens into a chamber, *s*, cast or constructed upon the under side of said cover.

A pipe, *s'* extends downward from this chamber into the caldron or boiler as far as low-water mark.

The bottom of the tube P is furnished with a pin or plug, *t*, having a conical flange, *u*, below, which said plug is encircled by a rubber packing, *v*. This plug projects down through a hole in the bottom of the chamber *s*, but does not close said aperture, being fitted loosely therein.

A weighted lever, Q, is provided with an annular bearing, which encircles the tube P and rests on the packing *r*, and also on an outside packing, *r'*, placed around the outside of the aperture in the cover *a* of the caldron.

A second weighted lever, R, serves to hold the tube P up against the lever Q.

This device serves as a safety-valve, a low-water indicator, and a faucet by which to withdraw water from the caldron; and operates as follows:

The steam in the caldron, when it attains a sufficient pressure to overcome the weight of the lever Q, lifts the pipe P and the annular bearing of the lever Q out of the aperture in the cover *a* of the caldron, and the steam escapes.

When it is desired to test the quantity of water that is contained in the boiler the tube P is pressed down by raising the free end of the lever R until the plug *t* has descended far enough to bring the conical flange *u* and packing *v* against the hole in the bottom of the chamber S, whereby it is closed, and the pressure of the steam upon the surface of the water in the caldron will force it up the tube *s'* and into the chamber.

Now the tube P is provided with apertures *w* near the bottom, which are disclosed when the said tube is pressed down in the position described, and the

water passes into said tube through these apertures, and so out into any convenient desired receptacle. If no water appears that fact will indicate that the water in the boiler is below the lower extremity of the tube *s'*—that is to say, below low-water mark.

Claims.

Having thus fully described the construction and operation of our invention,

What we claim, and desire to secure by Letters Patent, is—

1. The caldron A, made with a central flue or passage for the heat B, constructed and arranged substantially as specified and shown, and for the purpose set forth.

2. The caldron A, made with a central flue, B in combination with the coiled pipe C, substantially as and for the purpose specified.

3. The combination of the caldron A and cover *a*, with annular grooves, with the round packing *i*, substantially as and for the purpose specified.

4. The combination and arrangement of the caldron A, having a V-shaped flange, *e*, with the inclosing-jacket D, having a beveled edge, as described and shown and for the purpose specified.

5. The construction and arrangement of the basket-grate J, in connection with the fire-box G, whereby an air-space is made to surround the said grate, substantially in the manner specified, and for the purpose of preventing the loss of heat by radiation.

6. The conical basket-grate J, with bars at front and rear, in combination with the fire-box G, having the full-sized door H and the flanges *g*, as and for the purpose specified.

7. The combined safety-valve, low-water indicator, and hot-water faucet O, consisting of the tube P, levers Q R, chamber S, and tube S', when constructed and operating substantially as and for the purpose specified.

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Witnesses:—

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