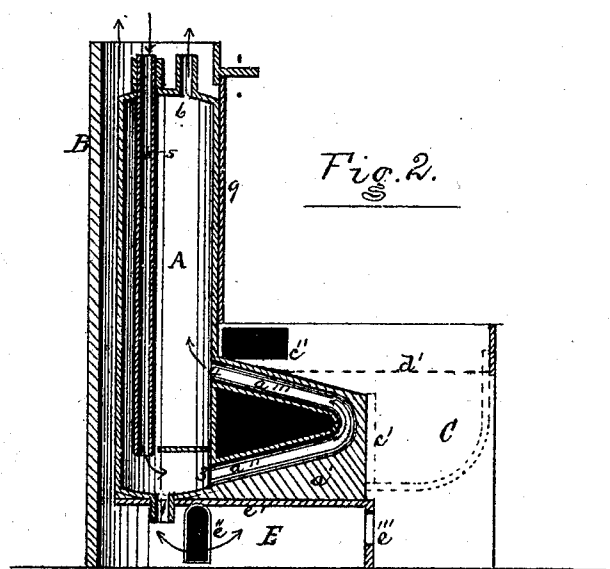
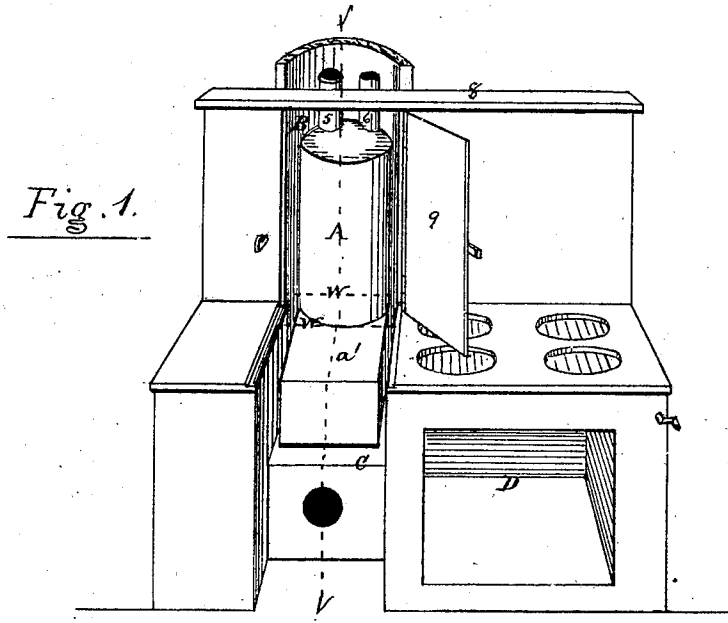


W. HOPKIN, Jr.

Improvement in Boilers for Ranges.

No. 131,350.

Patented Sep. 17, 1872



WITNESSES:

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IMPROVEMENT IN BOILERS FOR RANGES.

Specification forming part of Letters Patent No. 131,350, dated September 17, 1872.

To all whom it may concern:

Be it known that I, WILLIAM HOPKIN, Jr., of the city of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in the Construction and Application of Range-Boilers, of which the following is a specification:

My invention relates to the construction and application of a range-boiler in such manner that it can be removed and replaced without tearing out the brick wall in front of the chimney-flue, and so also that the said boiler will, when in place in the chimney-flue, be in a vertical position and with a circulating water-channel projecting forward from its lower end into direct contact with the usual fire-back plate of the fuel-chamber or furnace; the object of my invention being two-fold—first, to facilitate the removal and replacement of the boiler at any time, as occasion for cleaning or repairing it may arise; and, second, to expedite the heating of the contained water.

Figure 1 is a front perspective view of the main portions of a single oven-range embodying my invention. Fig. 2 is a vertical section in the dotted line *v v* of Fig. 1.

The boiler A is cylindrical in form at the part which is within the chimney B, but the portion which projects forward, *a'*, is rectangular in its transverse section, and forms a projection which nearly fills the space which is left between the front wall of the chimney B or back wall of the range and the fire-back plate *c'* of the furnace C. (See dotted lines, Fig. 2.) The interior of the projection *a'* forms a flat channel, *a''*, which communicates with the bottom of the boiler at 3, and also at another point, 4, above or nearly at the height of the usual top-plate *d'* of the oven D, and thus produces two downward sloping channels, *a''* and *a'''*, which communicate with each other in front and open separately into the boiler A, producing a forward and a return channel which allows the water at the bottom of the boiler to flow upward through the lower channel to the front end of the projection *a'*, where the heat will be the strongest, (in consequence of the contact with the fire-back plate of the hot furnace C,) and thence onward, through the upper channel *a'''*, back to the boiler A, thus heating the water, which enters the pipe 5 and passes out through the pipe

6. At the extreme lower end of the boiler A an outlet-pipe, 7, is provided, which is intended to be fitted with a stop-cock, for the purpose of washing out the usual sediment. The boiler A is supported upon iron bars, or upon a plate, *e'*, which forms the top plate of the ash-pit E, which communicates with the chimney B. The draft-flue *e''* from the furnace C causes the hot products of combustion to pass over the top of the projection *a'*, thence over the top plate of the oven, down a diving-flue, and along under the bottom plate of the said oven, in the usual manner, to the outlet-opening *e''* in the ash-pit B, where it heats the lower portion of the projection *a'*, and, finally, the sides of the boiler A, as it passes upward around the latter to the final outlet. The back wall of the range is open to the interior of the chimney B, from the bottom of the ash-pit E to the top of the mantle or cap-plate 8, and of such a width as will freely admit the boiler through the same, so that it may rest upon the bars or top plate *e'* of the ash-pit E in a vertical position, and with the projecting portion *a'* extending forward so as to come in contact with the fire-back plate *c'* when the latter is (afterward) inserted. That part of the opening in the back wall of the range which will be above the top of the projection *a'* is fitted with a cast-iron door, 9, shown as open in Fig. 1, and as closed in Fig. 2, so that when closed air cannot pass into the chimney from any point above the usual covering-plate of this part of the top of the range, a bearing-plate, indicated by the dotted lines W W in Fig. 1, being fixed to the boiler, against which plate the closed door bears.

It will be readily seen that in order to withdraw the boiler at any time all that will be necessary will be to open the door 9, remove the loose portion of the top plate, which usually covers the furnace and direct flue, and also the fire-back plate *c'*, and then raise the boiler vertically upward a short distance and draw it out by its lower or projecting end, the screw-cap connections between the pipes 5 6 7 and the boiler being, of course, released beforehand. The draft passes from the furnace C over the top of the projection *a'* through the opening *e''*, thence over and under the oven D to the outlet *e''* into the ash-pit E, and, finally, upward around the boiler A to the top of

the chimney. The cold water enters through the pipe 5 to the bottom of the boiler, thence upward through the lower channel *a''*, and onward through the upper channel *a'''*, and upward, as hot water, to the outlet-pipe 6, the water having become heated in the channels; the lower channel *a''* being inclined for the purpose of facilitating the discharge of dirt deposits when the screw-cap (not shown) of the outlet-pipe 7 is removed for the purpose.

The ash-pit partition *e'''* must be closed airtight to prevent a direct draft through its opening when the range is in operation, and opened when the fire is being raked. A direct draft over the projection *a'* into the chimney is not necessary; but if desired a sliding valve-plate may be substituted for the fixed plate W W in the constructing of the range.

I am aware that portable boilers have been made with a projecting portion to enter the fire-chamber of a stove through an opening for the purpose in the side or back plate of the latter; and also that a "back-log boiler," built permanently in a horizontal position between the back wall and the range, with a chamber extending from its front side horizontally, forward into contact with the back fire-plate of the furnace, has been made and used for the purpose of expediting the heating of the wa-

ter in the said boiler; and therefore I do not desire to claim, broadly, the combination with a range-boiler of a projecting chamber in contact with the fire-box; but what I desire to secure by Letters Patent is confined to the following, *i. e.*:

I claim as my invention—

1. In combination with the lower end of a vertical or upright boiler, A, the projecting chamber *a'*, forming two downward-sloping channels *a''* and *a'''*, in communication with each other and with the interior of the said boiler, and the said chamber extending forward through the draft-flue into contact with the back-plate of the fire-box when the said boiler is adjusted in a vertical or upright position in the chimney-flue of the range, substantially as and for the purpose hereinbefore set forth.

2. The combination, with the back-wall of a range and the chimney of the latter, of an opening provided with a covering-door, 9, the said parts being constructed and arranged substantially in the manner shown and described, and for the purpose set forth.

WILLIAM HOPKIN, JR.

Witnesses:

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