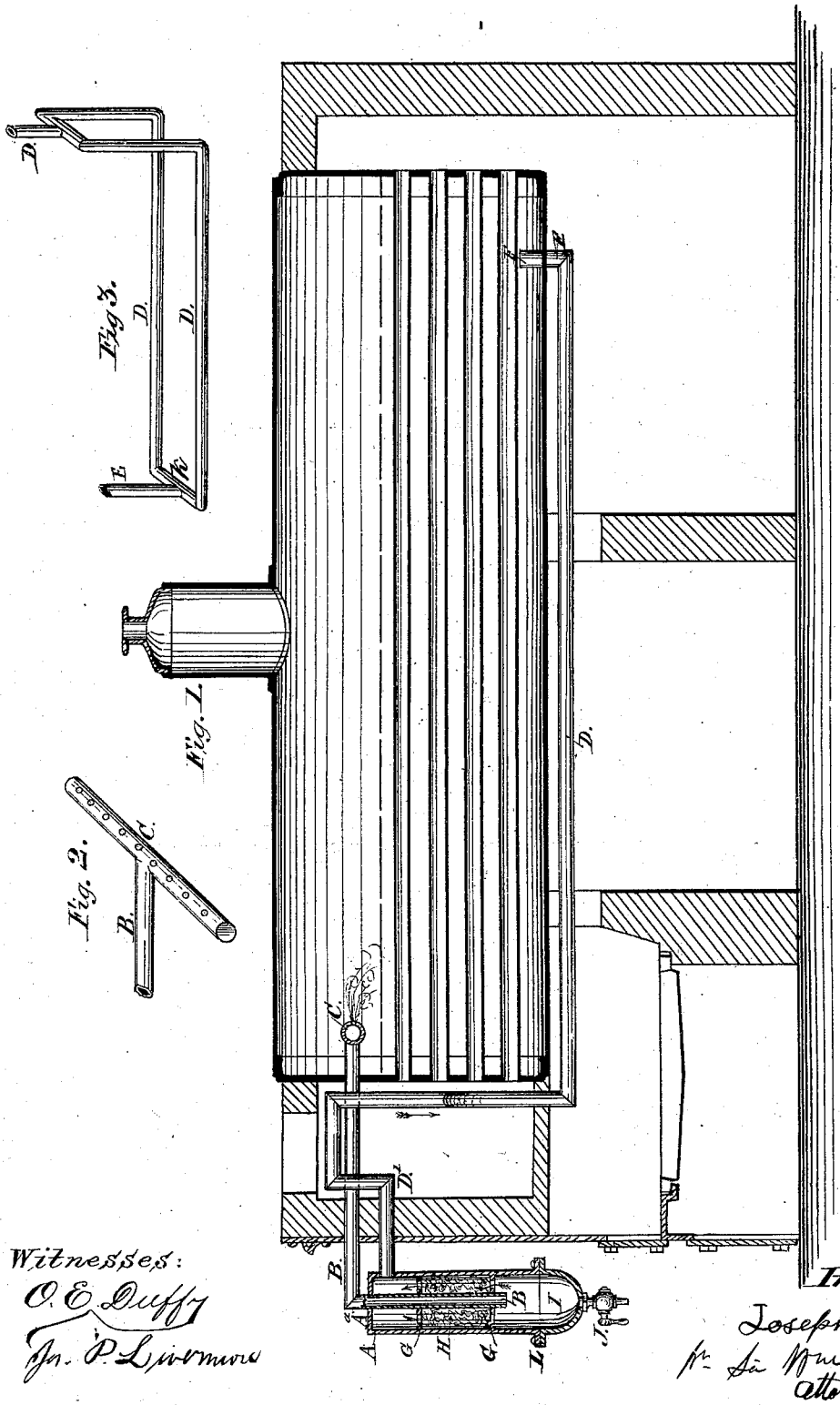
J. CARTER.

Steam-Boiler Cleaners.

No. 209,226. Patented Oct. 22, 1878.



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UNITED STATES PATENT OFFICE.

JOSEPH CARTER, OF BLYTH, ONTARIO, CANADA.

IMPROVEMENT IN STEAM-BOILER CLEANERS.

Specification forming part of Letters Patent No. **209,226,** dated October 22, 1878; application filed October 12, 1878; patented in Canada, October 3, 1878.

To all whom it may concern:

Be it known that I, JOSEPH CARTER, of the village of Blyth, in the Province of Ontario, Dominion of Canada, have invented a new and useful Improvement in Boiler-Cleaners, called "Carter's Excelsior Ne Plus Ultra Boiler Cleaner," of which the following is a specification:

This improvement relates to that class of inventions known as "boiler-cleaners and sediment-collectors;" and, as heretofore known, some of the said inventions collect, and by certain means blow off, the sediment accumulated by precipitation at the bottom of steam-boilers only. Others are designed, by different means, to collect and blow off the scum—foreign and extraneous matter—floating on the surface of the water in the boiler, while mine is designed to perform the function of both—viz., blowing off the floating scum on the surface of the water and the sedimentary matter precipitated and accumulated on the bottom of the boiler, and also to purify, relieve, and filter the water drawn off by my device that would otherwise be wasted, thus not only creating a great saving and economy in fuel by reusing the hot water as well as in the great saving of water itself where it is scarce; and my invention consists in so arranging the various parts of the device that the water drawn off from the boiler is again used and applied to the same, it first going through in its passage a process of filtration, by which all the foreign and extraneous matter is abstracted, and by which device a rapid circulation of the water in the boiler is maintained, and thus a more rapid generation of steam is produced, a greater economy of fuel the result, and a pure, clear, and dry flow of steam supplied to the engine, priming of the boiler being entirely overcome, and consequently the prevention of water and other foreign matter being carried over to the cylinders of the engine, as will be more fully explained.

It may be remarked that the circulation of the water is sluggish in that portion of the boiler not exposed to extreme heat, the flame being generally deflected from its bottom by many causes, and thus, while some portions of the water are in a violent state of ebullition, other portions are at a standstill. This, in many instances, is detrimental and dangerous—first, by the loss of the absorption of heat by the water on account of the sediment resting where the water is still, thus wasting fuel; and, secondly, where the circulation of the water is more rapid and the heat is intense the boiler is subject to greater wear and tear, and consequently one end of it is nearly worn out, while the other end is in comparatively good condition, incurring the danger of explosion from the unequal resistance of the surface and the unequal expansion and contraction in such cases, all of which are more or less avoided by my invention.

Referring to the accompanying drawing, forming part of this specification, in which like letters indicate corresponding parts in all the figures—

Figure 1 represents a vertical longitudinal section of a boiler with my improved apparatus attached. This figure clearly shows the location of the various parts of the machine. The filtering apparatus A is shown at the front end of the boiler, and contains two perforated disks, G G, having between them fibrous material H—such as hay, hair, charcoal, or other mud-abstracting substances. This figure also shows a cross-section of the perforated pipe C within the shell of the boiler, and the pipe B, extending through the smoke-box into the top of filtering-vessel and down through the perforated disks and filtering material to a point where it discharges the scum and sediment abstracted from the surface of the water in the boiler. The particles of water in this state—viz., under steam-pressure—is infinitesimal, and just in condition to part with any extraneous matter connected therewith, and therefore, on its passage through the perforated disks and filtering material, parts with such foreign matter and is conducted off through the pipe D′, where it branches off through a branch pipe, K, and thence through two or more pipes, D D, located immediately under the boiler and over the fire, where the flame licks and impinges upon their outer surface, plashing the water in their interior into steam, the said steam rushing into and through the water in the bottom of the boiler at a rapid rate, displacing said water and causing a rapid circulation

and agitation of all the water in the boiler. When the water leaves the pipes D D in such a rapid manner the water in the filterer, of course, rushes after that which has left the said pipes, and thus a fierce and rapid circulation is kept up until all, or nearly all, the water in the boiler has passed through the filtering material, and particularly that portion which comes within the range of the water-line of the boiler. These pipes D D may enter the boiler at any point where the heating-coil is sufficiently exposed to the fire, and the end of the coil is below the surface of the water in the boiler; but I prefer to introduce the end of the pipe near the bottom of the boiler, as shown.

I, Fig. 1, shows the bottom of filterer, which is capable of being detached; and J a blow-off cock, for discharging the accumulated mud and sediment.

It will be readily seen that the pipes may be made of any curve or contour conformable to the style of the boiler to which they may be attached. The style of filterer may also be changed without departing from the spirit of my invention. The pipes D D may be formed in a horizontal coil under the boiler and exposed to the fire with good effect.

Fig. 2 shows a perspective view of my perforated pipe, and B its conduit. Several such pipes may be used, or other devices that may serve the purpose, or trap the scum and sediment rising to the surface of the water in the boiler.

Fig. 3 shows a plan and vertical view, in perspective, of my heating and connecting pipe D′, showing the end connected to the filter; and E, the end connected to the boiler.

A tubular boiler is shown; but my invention may be attached to all kinds of boilers.

I am aware that many attempts have been made to successfully trap, extract, and blow off the sediment of steam-boilers, none of which I claim; but

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

1. The combination, with a steam-boiler, of the sediment-collector C, filterer A, and heating-pipes D D, as set forth and described.

2. The combination, with a steam-boiler, of the sediment-collector, the branch pipes D′ and E, with heating-pipes, and a filterer, all arranged as herein set forth and described.

3. The combination, with a steam-boiler, of a filtering apparatus provided with perforated disks G G, filtering material H, and sediment and heating-pipes, arranged to operate substantially as set forth, and for the purpose indicated.

4. In a filtering and sediment collecting apparatus for steam-boilers, the perforated pipe C, conduit-pipe B, filtering-vessel A, heating-pipes D D, and their elbow-connections D′ and E, all arranged and adapted to collect the sediment from boiler and filter and additionally heat the water before its induction into the boiler, substantially as set forth.

5. The method herein described of maintaining a circulation of the water in the boiler by first extracting the water through a sediment-collector, then filtering and heating by passing it through suitable pipes located in or subjected to the heat of the furnace, whereby a rapid current is kept up through the pipes and boiler, in the manner and for the purpose set forth and described.

JOSEPH CARTER.

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