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W. EICHELBERGER, D. E. HIBNER & M. J. BACON.

SOOT CLEANER FOR BOILERS.

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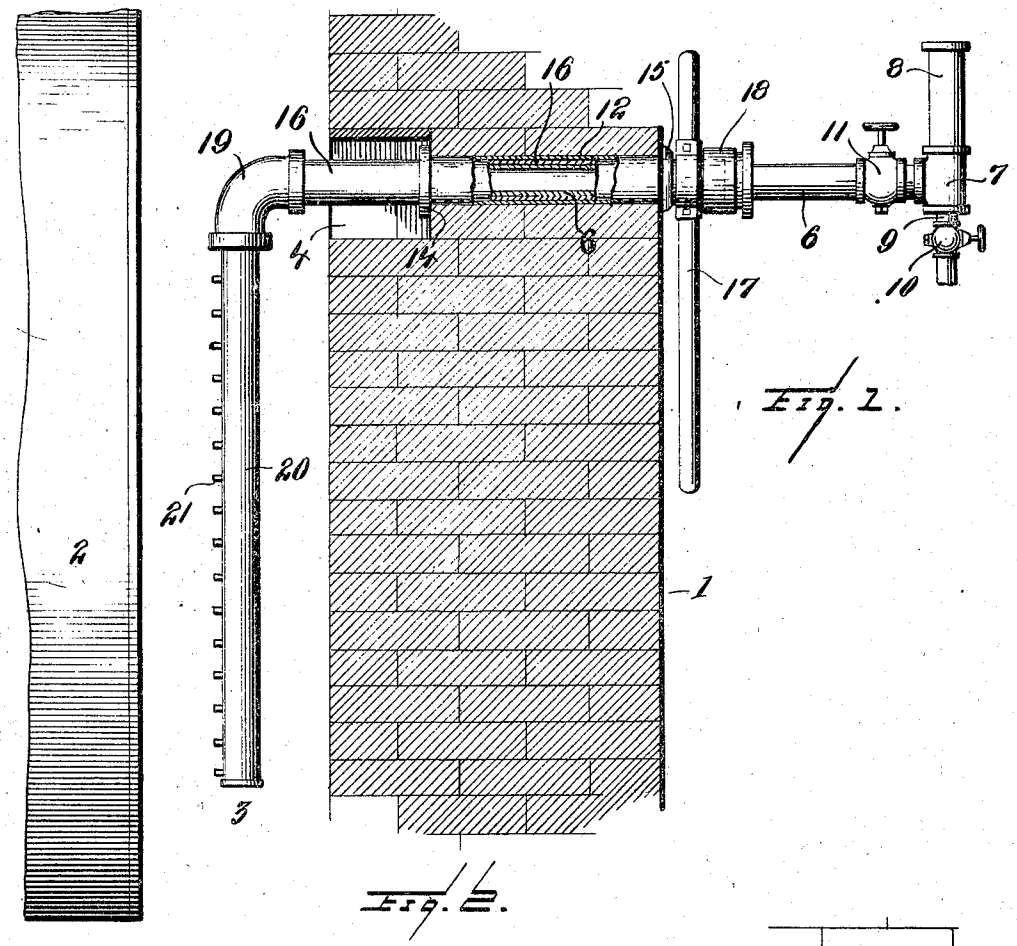
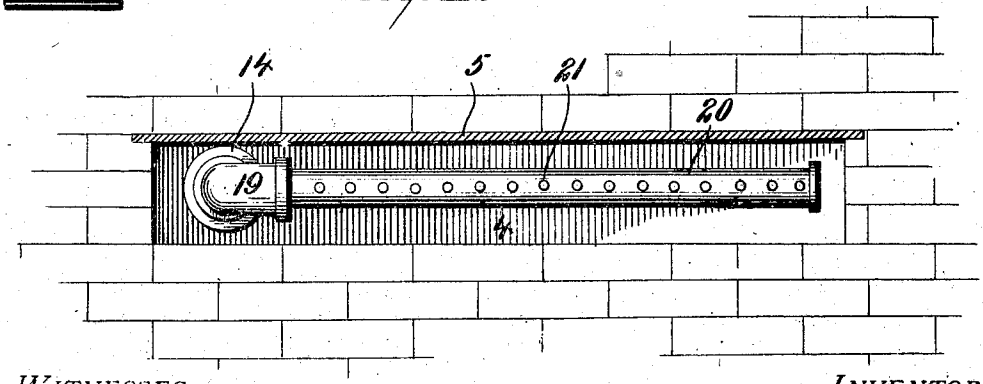


Fig. 1.

Fig. 2.



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WILLIAM EICHELBERGER AND DELOS EUGENE HIBNER, OF DUBOIS, PENNSYLVANIA, AND MARVIN J. BACON, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO THE VULCAN SOOT CLEANER COMPANY OF PITTSBURG, PA., OF DUBOIS, PENNSYLVANIA, A CORPORATION OF NEW JERSEY

SOOT-CLEANER FOR BOILERS.

No. 858,333. Specification of Letters Patent. Patented June 25, 1907.

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To all whom it may concern:

Be it known that we, WILLIAM EICHELBERGER and DELOS EUGENE HIBNER, residing at Dubois, in the county of Clearfield and State of Pennsylvania, and MARVIN J. BACON, residing at Boston, in the county of Suffolk and State of Massachusetts, citizens of the United States of America, have invented certain new and useful Improvements in Soot-Cleaners for Boilers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and useful improvements in soot cleaners for boilers, and is particularly adapted for use in connection with cleaning the flues of horizontal boilers.

The invention has for its object the provision of a soot cleaner particularly adapted for use in the combustion chamber end of boilers, for delivery of a soot cleaning agent in the nature of a gaseous fluid, such as steam, to the fire tubes of the boiler in line with the draft of said fire tubes, the cleaner being so mounted as to be rotated to cover the entire flue area of the boiler, and so arranged that when not in use for cleaning the flues that it may be withdrawn within the boiler setting so as to be effectually protected from the action of the heat within the combustion chamber.

With these ends in view the invention consists in the combination, construction, and arrangement of parts, which will be hereinafter fully described and claimed.

Reference will be had in the description to the accompanying drawings, forming a part of this specification, and in which drawings similar characters of reference indicate corresponding parts throughout the different views.

Figure 1 is a central vertical sectional view of a part of a boiler setting also showing the end of a horizontal boiler, showing in side elevation the arrangement of our improved boiler cleaner, the latter being partly broken away to better illustrate the construction. Fig. 2 is an elevation of a part of a boiler setting, partly in section, illustrating the rotatable steam nozzle withdrawn so as to be housed within the boiler setting, which position it occupies when not in use.

We are aware that heretofore and before our invention, soot cleaners for the fire tubes of horizontal boilers have been devised for rotatable arrangement in the combustion end of a boiler, and rotatable so as to cover the entire area of the tubes at the ends of the boiler. Such devices, however, so far as we are aware have been found commercially satisfactory for the reason that the steam delivering nozzle has been so arranged as to be subjected at all times to the intense heat within the combustion chamber, resulting in early injury to the device, and very short lease of life thereof, with consequent impracticability of the apparatus. Our invention aims to over-come this disadvantage, and we have shown in the accompanying drawings a practical embodiment of a device embodying the invention which will now be described in detail.

1, indicates a boiler setting, 2, indicates the boiler and 3, the combustion chamber between the inner face of the boiler setting and the end of the boiler. The boiler setting is provided on its inner face with a longitudinal recess 4, which is of a length sufficient to receive the steam delivering nozzle of the soot cleaner to be hereinafter described. Where the boiler setting is made of bricks, as it generally is, we simply remove one or more layers of the brick on the inner face of the boiler setting 1, and generally insert along the top of the recess a supporting plate 5, for the layers of bricks above the recess. This recess is preferably arranged at a point approximately opposite or in close proximity to the upper flues of the boiler, the steam delivering nozzle being of sufficient length to cover the entire flue area of the boiler end. The soot cleaner embodies in its construction a pipe 6, preferably, though not essentially, a brass pipe. We prefer to make this pipe of brass, since other parts of the flue cleaner slide thereon, and the brass pipe will be found to afford a better exterior surface than an ordinary iron pipe. This pipe 6 is provided at its outer end with a T, 7 to the upper passage of which is connected a supply pipe 8 leading to a suitable steam supply (not shown). Connected with the lower passage of the T, 7 is a drain pipe 9 provided with a suitable shut off valve 10, a suitable

shut-off valve 11 being also arranged in the pipe 6.

By locating the steam controlling valve 11 in the pipe 6, a free passageway for the steam is provided through the valve or drip-cock 10 when the latter is opened and the valve 11 closed, without possibility of the steam passing into the cleaner structure, thereby permitting the discharge of all moist steam from the pipe 8 before the steam is permitted to enter the cleaner structure by opening the valve 11. As soon as the dry steam appears through the drip-cock 10, the latter is closed and the valve 11 opened, whereupon the dry steam will pass into the cleaner structure through the pipe 6.

The pipe 6 extends into the boiler setting a sufficient length to firmly support the same, being in the present instance shown as extending nearly to the rear wall of the recess 4.

In connection with the steam delivery pipe 6 we employ an expansible joint, which comprises a sleeve or barrel 12, mounted in the boiler setting, and provided at its inner end with a collar 14 to abut against the inner slot of the recess 4 and at its outer end with a collar 15 to abut against the outer face of the boiler setting 1, thus holding the sleeve or barrel in fixed position.

On the pipe 6, and slidable thereon, is a pipe 16, which extends beyond the outer end of the sleeve or barrel 12 and carries on this outer end an operating handle 17, a suitable packing nut or gland 18, being also arranged at the outer end of said pipe 16 to slide on the pipe 6. This construction provides two concentrically-arranged stationary pipes (the pipe 6 and sleeve 12) spaced apart to provide an annular space or passage-way therebetween, through which space the pipe section 16 extends, the pipe 16 being freely movable relatively to said stationary pipes without being affected by the steam pressure and without decreasing the size of the steam opening leading therefrom. Furthermore, there is provided an extended bearing both inside and outside of the pipe 16, insuring the absence of binding, and retaining the pipe section in true horizontal position irrespective of the weight of the steam delivery structure located at one end of the pipe. This pipe 16 extends inwardly through the recess 4, and has connected to its inner end an elbow 19 to which is connected a steam delivery pipe or nozzle 20, provided with a plurality of jets or nipples 21.

In Fig. 1 of the drawings, the device is shown in position to be rotated, and deliver steam to the fire tubes of the boiler. Assuming the valve 11 to be open, the operator, by manipulating the handle 17 turns the pipe 16 to swing or rotate the nozzle 20 so as to deliver the steam or other gaseous liquid to all of the fire tubes of the boiler. After the fire tubes have been cleaned, the operator turns the handle so as to bring the nozzle 20 in alinement with the recess 4 in the boiler setting, and then by pulling outward on the handle 17, withdraws the nozzle 20 within the recess 4, away from the heat zone of the combustion chamber where it is effectually protected from the heat of said combustion chamber at all times when not in use. To again use the device, it is only necessary to force the handle 17 toward the boiler setting, thus moving pipe 16 inwardly, carrying the steam delivering nozzle 20 therewith, so as to project it into the combustion chamber, in which position it may be again rotated to the limits permitted by the crown of the boiler.

We desire to call attention to the fact that in this device none of the parts are subjected to the action of the heat within the combustion chamber except when the device is being used, the nozzle at all other times being housed within the boiler setting, out of the zone of the heat of the combustion chamber and effectually protected therefrom.

While we have herein shown and described in detail a practical embodiment of the invention, as the same has been practiced by us, yet we do not wish to confine ourselves to the specified construction shown and described, as in the practice of the invention, various changes may be made in the details of construction without departing from the spirit of the invention or scope thereof, as described in the appended claims.

Having fully described our invention what we claim as new and desire to obtain by Letters Patent, is:—

1. The combination with a flue boiler, and a boiler setting having a recess therein, of a delivery pipe for gaseous fluid extending into the boiler setting, an expansion joint comprising a stationary member and a member slidably mounted on the steam delivery pipe, the said slidable member being rotatable on the steam delivery pipe, a steam delivering nozzle connected to said slidable member and adapted to be withdrawn within the recess of said boiler setting when not in use, and a handle connected to said rotatable slidable member of the expansion joint, substantially as described.

2. In a boiler flue cleaner, the combination with a boiler setting having a longitudinal recess in the inner face thereof, of a steam delivery pipe extending into the boiler setting, a steam delivering nozzle slidably mounted on said steam delivery pipe to be rotated with respect thereto and moved toward and away from the recess in the boiler setting and when not in use to be housed within said recess.

3. In combination with a boiler setting or furnace wall having a longitudinal recess, a flue cleaner comprising a stationary steam delivery pipe extending into the boiler set-

ting or furnace wall, an expansion joint surrounding said steam delivery pipe, a steam delivering nozzle connected to said expansion joint and adapted to be projected outwardly beyond the inner face of the boiler setting or furnace wall for rotation and withdrawn within the recess of said boiler or furnace wall when not in use.

4. In combination a boiler setting or furnace wall having a longitudinal recess in the inner face thereof, a steam delivery pipe extending into said boiler setting or furnace wall and terminating adjacent said recess, a barrel or sleeve mounted in the boiler setting or furnace wall, a pipe extending through said barrel or sleeve beyond both ends thereof and being slidable and rotatable on the steam delivery pipe, a steam delivering nozzle connected to the inner end of said pipe for rotation with the pipe when the latter is projected inwardly and adapted to be housed within said recess when the pipe is drawn outwardly of the boiler setting, and means connected to said pipe for rotating the same and sliding it longitudinally on the steam delivery pipe.

5. The combination with a boiler setting or furnace wall, of two spaced concentrically-arranged stationary pipes located within the boiler setting, and a flue-cleaner having a pipe section passing through the annular space formed between said stationary pipes, the outer end of said pipe section being closed against the escape of the cleaning agent, said pipe section being of greater length than the outer stationary pipe, whereby said pipe section may have a relative movement on the inner stationary pipe both longitudinally and rotatively without decreasing the size of the passageway for the cleaning agent.

6. The combination with a boiler setting or furnace wall having an elongated recess in its inner face, of two spaced concentrically-arranged stationary pipes located within the boiler setting, and a flue-cleaner having a pipe section passing through the annular space formed between said stationary pipes, the outer end of said pipe section being closed against the escape of the cleaning agent, said pipe section being of greater length than the outer stationary pipe, said pipe section extending through the elongated recess, the longitudinal movement of said pipe section moving the discharge nozzle of the cleaner toward or from said recess to house the nozzle therein or project it therefrom.

In testimony whereof we affix our signatures in the presence of two witnesses.

WILLIAM EICHELBERGER.
DELOS EUGENE HIBNER.
MARVIN J. BACON.

Witnesses to signatures of W. Eichelberger and D. E. Hibner:
CHARLES A. FYE,
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Witnesses to signature of M. J. Bacon:
A. A. TUBMAN,
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