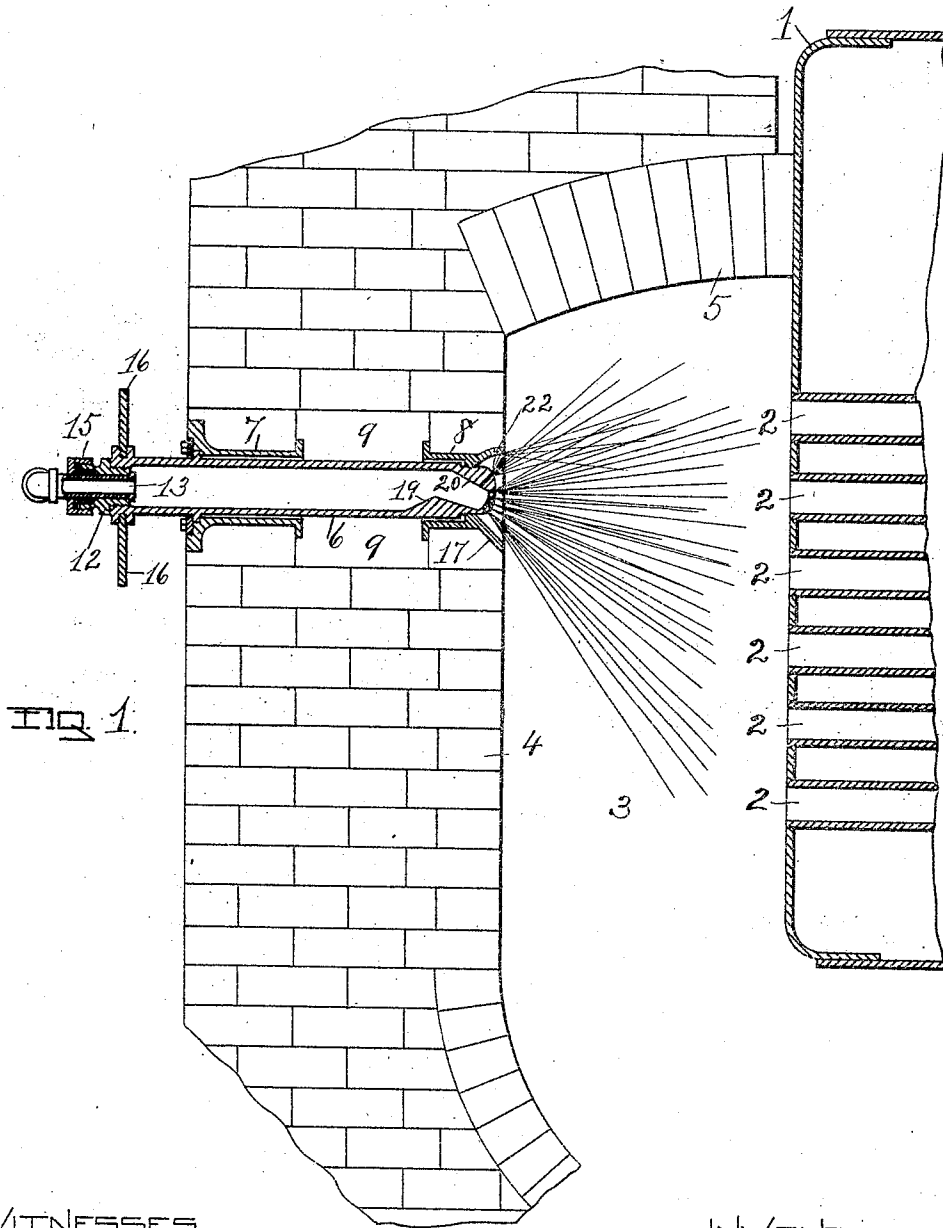


No. 868,403.

PATENTED OCT. 15, 1907.

W. J. BRADLEY.
BOILER FLUE CLEANER.
APPLICATION FILED JUNE 18, 1907.

2 SHEETS—SHEET 1.



WITNESSES
E. M. O'Reilly.
J. Donsbach.

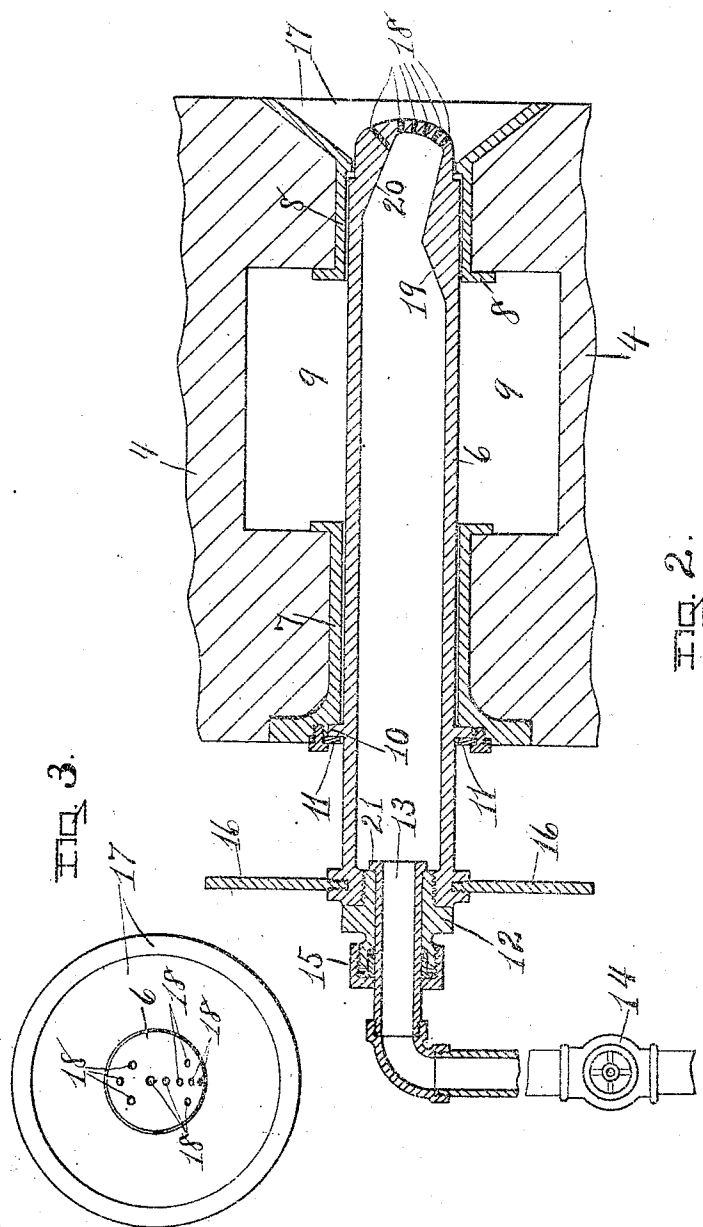
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No. 868,408.

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2 SHEETS--SHEET 2.



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UNITED STATES PATENT OFFICE.

WILLIAM J. BRADLEY, OF TROY, NEW YORK.

BOILER-FLUE CLEANER.

No. 868,403.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed June 18, 1907. Serial No. 379,601.

To all whom it may concern:

Be it known that I, WILLIAM J. BRADLEY, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Boiler-Flue Cleaners, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in central, vertical, longitudinal section showing my invention applied to the setting of an ordinary form of steam-boiler having horizontal flues. Fig. 2 is a similar view, on an enlarged scale, with the boiler omitted. Fig. 3 is a similar view of the nozzle-end of the apparatus.

The invention relates to a class of steam-boiler-cleaners employing a blast of steam directed against the ends of the flues whereby the draft through the flues is accelerated, and accumulations of soot, ashes, &c., are removed from the interior of the flues.

The principal object of the invention is to simplify the construction and increase the efficiency and durability of such a steam-boiler-cleaner.

Referring to the drawings wherein the invention is shown in preferred form, 1, represents the boiler having the horizontal flues, 2, open at their rear ends to the combustion-chamber, 3, of the furnace, of which, 4, is the back wall and, 5, the top arch.

The steam nozzle, 6, extends through a horizontal aperture in the rear wall of the furnace, being rotatively mounted in bushings, 7 and 8, separate from each other, the bushing, 7, being located in the outer end of said aperture in the rear wall, and the bushing, 8, in the inner end thereof. Between the bushings, 7 and 8, the nozzle passes through, and is surrounded by, an air space 9. Near the outer side of the end wall, 4, the nozzle, 6, has an annular peripheral flange, 10, adapted to occupy a seat in the outer end of the bushing, 7, and to be confined to said seat by a split clamping ring, 11, the members of which are bolted to the bushing, 7, as shown in Figs. 1 and 2, whereby the nozzle is rotatively mounted within the bushing, 7, but is prevented from longitudinal movement relatively thereto, and to the furnace-wall and boiler. The outer end of the nozzle has a screw plug, 12, secured therein, through an aperture in which plug passes a steam-inlet-pipe, 13, adapted to be connected with a source of steam-supply which may be the boiler 1. The supply through the pipe, 13, is controlled by a valve, 14. A tight joint is effected between the pipe, 13, and the

plug, 12, by means of a stuffing box 15. The outer end of the nozzle is provided with outwardly projecting spokes, 16, whereby the nozzle can be rotated by hand. The nozzle is of such a length that when mounted in the furnace-wall, the inner-end of the nozzle lies within the dimensions of the wall, and within a pocket or recess formed by the funnel-shaped end, 17, of the bushing 8. The nozzle is provided in its inner end with a plurality of outlet apertures, 18, arranged at different distances from the axis of the nozzle and inclined relatively thereto, the apertures differing in inclination from each other, the apertures more remote from said axis preferably having the greater inclination. I have shown the nozzle thus provided with ten outlet apertures, as seen in Fig. 3, one of said apertures being approximately at the axis or center of the head; six of the apertures being on one side of the axis, and three, on the other side thereof. The interior of the nozzle is formed with deflecting surfaces, 19 and 20, whereby the passageway through the nozzle is caused to extend obliquely of the axis of the nozzle at the inner end thereof, causing the flow of steam through the nozzle to be delivered more directly to certain of the apertures on one side of the axis of the nozzle than to certain of the other apertures.

The bushing, 7, is built into the brickwork of the furnace-wall by means of flanges on its inner and outer ends; and the bushing, 8, is similarly built into the wall by means of flanges on its inner and outer ends, one of which flanges forms the funnel-shaped end, 17, of said bushing.

In operating the device, a supply of steam is admitted through the supply pipe, 13, into the nozzle, 6, and escapes thence through the various outlet apertures, 18, from which it is projected in jets against the open ends of the flues, 2, and against certain of the walls of the combustion-chamber, thus serving to forcibly detach from the surfaces with which it comes in contact accumulations of soot, ashes, and the like, while at the same time it accelerates the draft and causes the detached material to be carried through the flues into the stack (not shown). While the steam is thus being directed against the open ends of the flues, the nozzle is rotated by hand, causing the steam jets to traverse all of the space occupied by the flue ends in the neighboring head of the boiler. The operation may be continued for as long a time as desired, and may be repeated as frequently as desired or found necessary.

While I have described the use of steam with my improved apparatus, the apparatus is adapted for use with any fluid under pressure.

The upper part of the funnel-shaped end, 17, of the bushing, 8, is preferably formed with a curved deflecting surface, as shown at, 22, in Fig. 1, to deflect away from the top arch of the furnace the steam from the up-

wardly directed outlet apertures in the nozzle, the nozzle being located in the upper part of the combustion-chamber in close proximity to said top arch.

In Figs. 2 and 3 the end of the bushing, 8, is shown with a full funnel-shaped end.

The inner end of the steam supply pipe, 13, is provided with an external peripheral flange, 21, adapted to be forced tightly against the inner end of the screw plug, 12, by the reaction of the steam entering the nozzle.

10 What I claim as new and desire to secure by Letters Patent is

1. In an apparatus of the class described, the combination with the boiler-head; flues opening therethrough; and a furnace-wall opposite said flue-openings; of a pair of separate bushings individually mounted in the opposite ends of an aperture in said wall with a free air-space between said bushings; a nozzle rotatively mounted in said bushings and provided in its inner end with an outlet aperture arranged at an angle to the axis of the nozzle; means for supplying steam to said nozzle; and means whereby said nozzle can be rotated.

2. In an apparatus of the class described, the combination with the boiler-head; flues opening therethrough; and a furnace-wall opposite said flue-openings; of a nozzle rotatively mounted in an aperture in said wall and provided in its inner end with an aperture inclined to the axis of the nozzle, said nozzle having interior inclined surfaces whereby an oblique passageway is formed near its inner end leading to said inclined outlet aperture; means for supplying steam to said nozzle; and means whereby said nozzle can be rotated.

3. In an apparatus of the class described, the combination with the boiler-head; and flues opening therethrough; of a furnace-wall provided with an aperture; a nozzle rotatively mounted at its inner and outer ends in said aperture with its inner end opposite said boiler-head, and having its intermediate portion surrounded by a free air-space within said wall; means for supplying steam to said nozzle; and means whereby the nozzle can be rotated.

4. In a device of the class described, the combination with the boiler-head; and flues opening therethrough; of a furnace-wall provided with an aperture opening toward said boiler-head; an externally flanged bushing for said aperture built into said wall, and provided with an annular seat surrounding the opening through said bushing; a nozzle rotatively mounted within said bushing and aperture, and having an external flange adapted to occupy said seat in said bushing; means for holding said nozzle-flange in said seat; means whereby said nozzle can be rotated; and means for supplying steam to said nozzle.

5. In an apparatus of the class described, the combination with the boiler-head; flues opening therethrough; and a furnace-wall opposite said flue-openings; of a nozzle rotatively mounted in an aperture in said wall and provided in its inner end with an outlet aperture at one side of the axis of the nozzle, said nozzle having interior inclined surfaces whereby an oblique passageway is formed near its end leading to said outlet aperture; means for supplying steam to said nozzle; and means whereby said nozzle can be rotated.

6. In an apparatus of the class described, the combination with the boiler-head; flues opening therethrough; a furnace-wall opposite said flue-openings; and the top arch of the combustion-chamber; of a nozzle rotatively mounted in an aperture in said wall and provided in its inner end with an aperture inclined to the axis of the nozzle; a bushing for the inner end of the nozzle having a funnel-shaped end open to the combustion-chamber opposite said flue-openings, and having the upper portion of said funnel-shaped end formed with a curved deflecting surface whereby an upwardly directed jet from the nozzle will be deflected away from the top arch; means for supplying steam to said nozzle; and means whereby said nozzle can be rotated.

In testimony whereof, I have hereunto set my hand this 15th day of June, 1907.

WILLIAM J. BRADLEY.

Witnesses:

E. M. O'REILLY,
J. DONSBACH.