J. J. HANLON.

SOOT EJECTOR FOR WATER TUBE BOILERS.

APPLICATION FILED MAY 20, 1909.

948,761.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 1

WITNESSES

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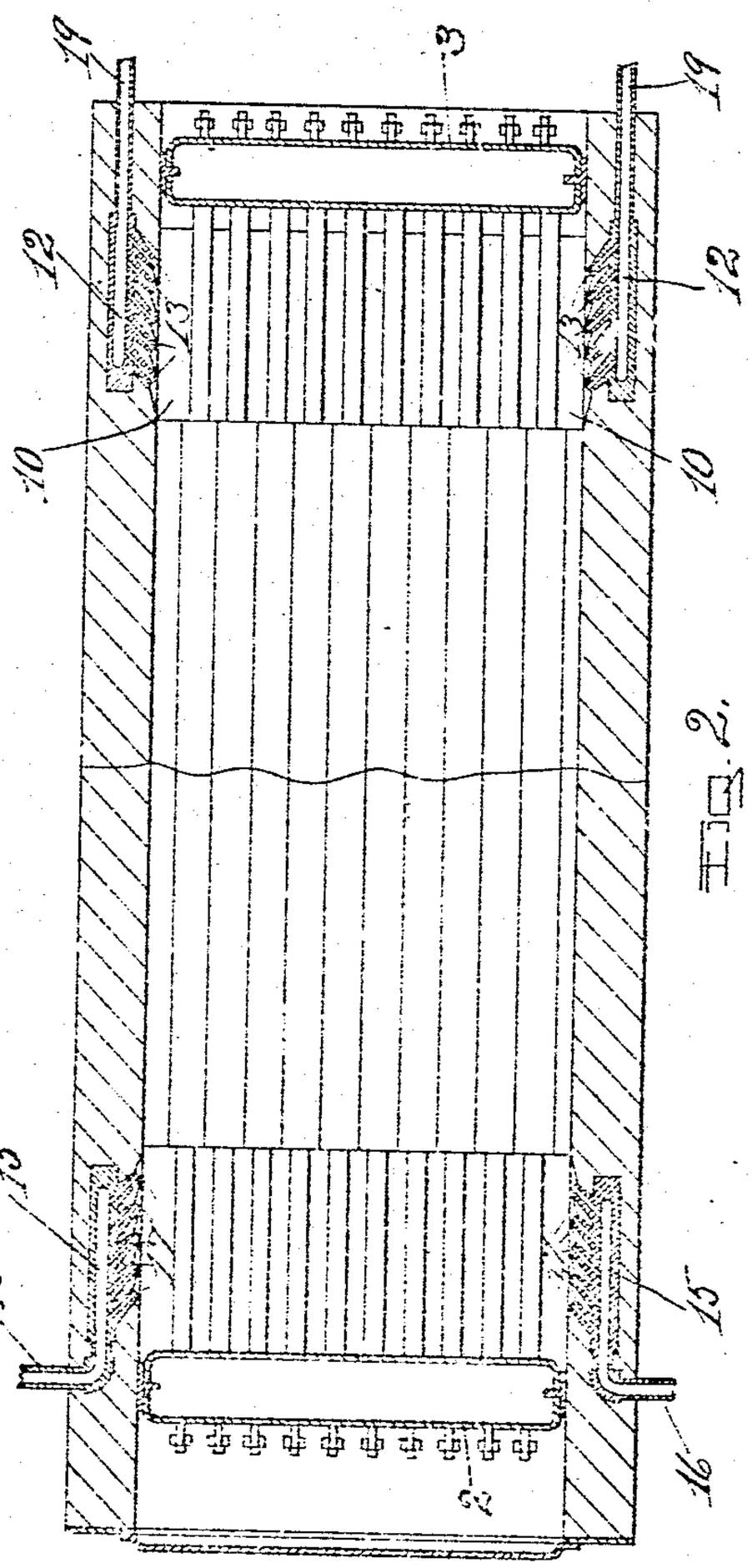

FIG. 2.

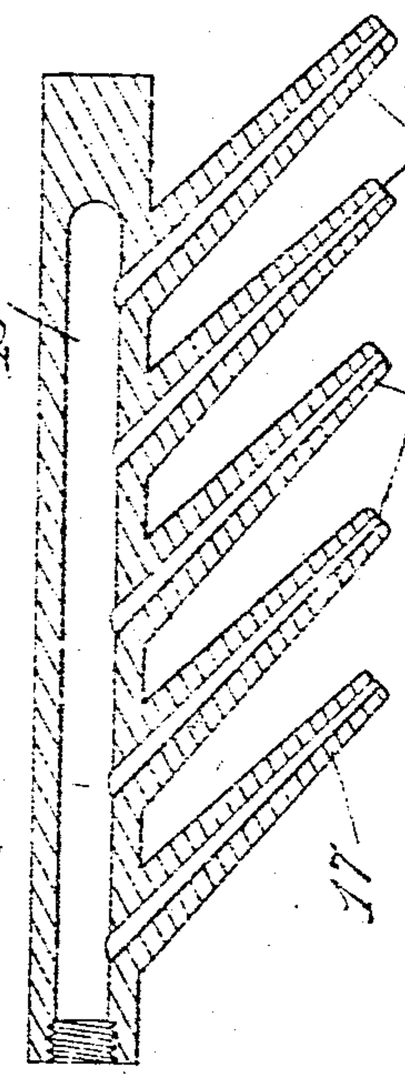

FIG. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN J. HANLON, OF TROY, NEW YORK.

SOOT-EJECTOR FOR WATER-TUBE BOILERS.

948,761. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed May 20, 1909. Serial No. 497,281.

To all whom it may concern:

Be it known that I, JOHN J. HANLON, 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 Soot-Ejectors for Water-Tube Boilers, 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 vertical longitudinal section of a water-tube boiler provided with my novel soot-ejecting mechanism. Fig. 2 is a horizontal section of the same taken on the broken line 2—2 in Fig. 1. Fig. 3 is a horizontal section of one of the soot-ejecting nozzles detached.

The principal object of my invention is to effectively remove from time to time accumulations of soot, ashes, &c., from a water-tube boiler without injury to the brick-work incasing the boiler.

Other objects will appear in connection with the following description.

Referring to the drawings wherein the invention is shown in preferred form, 1, represents the cylindrical body of the boiler, from which depend the front water-leg, 2, and rear water-leg, 3, said water-legs being connected together by a series of water-tubes, 4, in the usual manner. Above the uppermost row of tubes, 4, is the usual baffle-plate, 5, formed by tiles of fire-brick extending from the rear water-leg to within a short distance of the front water-leg, leaving thereat an opening, 6, from the space containing the water-tubes up into the space, 7, between the baffle-plate, 5, cylindrical body, 1, and the setting of the boiler, which space communicates with the stack 8. In like manner above the lowermost row of tubes is a baffle-plate, 9, extending from the front water-leg to within a short distance of the rear water-leg, leaving thereat an opening, 10, leading from the combustion-chamber, 11, upward into the space between the two baffle plates.

On opposite sides of the boiler, adjacent to the opening, 10, I mount in the boiler-setting a pair of nozzles, 12, each in connection with a supply-pipe, 19, leading from a suitable supply of steam or air under pressure, which source of supply may be the body, 1, of the boiler. Each of the nozzles, 12, is provided with a plurality of inwardly and forwardly extending nipples, 13, the nipples of said two nozzles being directed convergently forward toward a common point just above the opening, 10, whereby the jets or steam or air ejected under pressure from said nipples are caused to impinge, those from one nozzle against those from the other, while causing a forward current of great velocity which not only drives before it toward the front end of the boiler soot accumulated upon the several tubes, but also causes a forced-up draft through the opening, 10, adapted to force upward through said opening accumulations of soot or ashes on the bridge-wall, 14, or walls of the combustion-chamber 11. In like manner I mount in the boiler-setting on opposite sides of, and just above, the opening, 6, a similar pair of nozzles, 15, each connected with a supply-pipe, 16, leading from the boiler-body or other source of supply of steam or air under pressure, each of said nozzles, 15, being provided with a plurality of forwardly and rearwardly extending nipples, 17, the nipples of said two nozzles, 15, being directed convergently rearward just above the opening, 6, whereby the jets of steam or air ejected under pressure from said nipples, 17, are caused to impinge, those from one nozzle against those from the other, while causing a rearward current of great velocity which not only drives before it toward the rear end of the boiler soot accumulated upon the baffle-plate, 5, body, 1, of the boiler, and walls of the boiler-setting, but also greatly accelerates the forced-up draft through the opening, 6, whereby the nozzles, 15, coöperate with the nozzles, 12, to eject accumulations of soot and ashes from the water-tubes. The members of each pair of oppositely-located nozzle-outlets which converge toward a common point preferably occupy substantially the same horizontal plane just above the draft-opening. By having the oppositely located nipples directed convergently and obliquely, the impingement of the jets from one nozzle upon those from the other oppositely located nozzle prevents the jets from striking the side walls of the boiler-setting at a favor-

able angle, and with sufficient force, to injure or wear away said walls.

The removed soot and ashes are carried up the stack by the forced draft created by the combined action of the nozzles, 12 and 15.

By admitting to the nozzles steam or air under pressure for a period of a few minutes each day, the tubes and walls of the boiler can be kept practically clean and free from accumulations of soot and ashes.

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

1. In a water-tube boiler, the combination with the boiler-body; water-tubes; and boiler-setting; of a baffle-plate partly inclosing the tube-containing space and provided with a draft-opening; a pair of ejector nozzles mounted in the setting on opposite sides of one of said draft-openings, said nozzles having nipples convergently inclined toward each other in the direction of the draft, and having their outlets in substantially the same horizontal plane just above said draft-opening.

2. In a water-tube boiler, the combination with the boiler-body; water-tubes; and boiler-setting; of upper and lower baffle-plates partly inclosing the tube-containing space, said upper baffle-plate being provided with a draft-opening at its front end, and said lower baffle-plate with a draft-opening at its rear end; a pair of ejector nozzles mounted in the setting on opposite sides of, and just above, the draft-opening in the upper baffle-plate, and having nipples convergently and rearwardly inclined, with their outlets in substantially the same horizontal plane; and a pair of nozzles mounted in the setting on opposite sides of, and just above, said draft-opening in the lower baffle-plate, and having nipples convergently and forwardly inclined, with their outlets in substantially the same horizontal plane.

3. In a water-tube boiler, the combination with the boiler-setting; of a pair of ejector nozzles mounted on opposite sides of the space inclosed by the setting, and having their outlets convergent toward each other in the direction of the draft through said space and toward a common point.

In testimony whereof, I have hereunto set my hand this 14th day of May, 1909.

JOHN J. HANLON.

Witnesses:
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FRANK C. CURTIS.