F. X. BAYER.

BOILER CLEANER.

APPLICATION FILED NOV. 30, 1908.

919,680.

Patented Apr. 27, 1909.

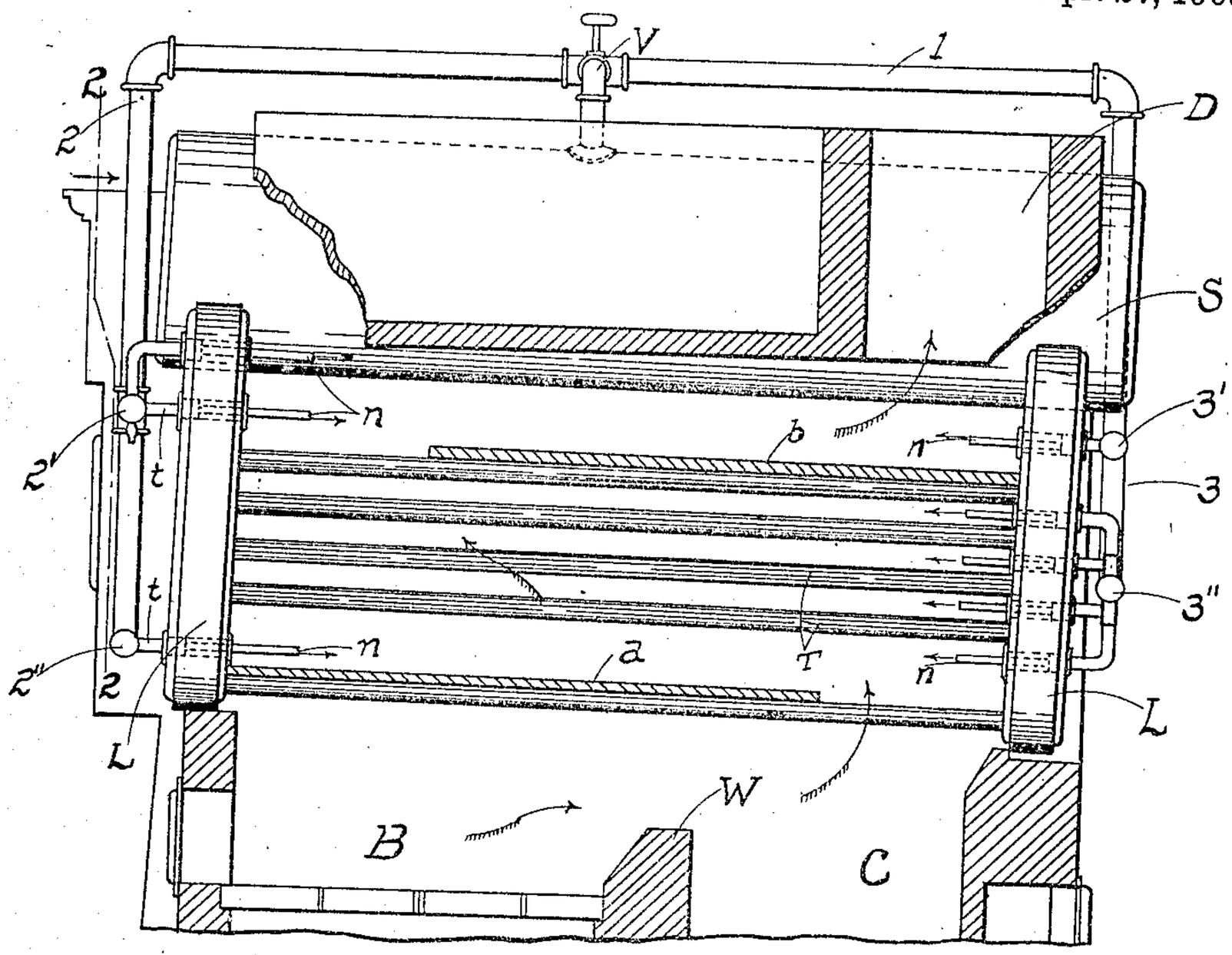

FIG. 1.

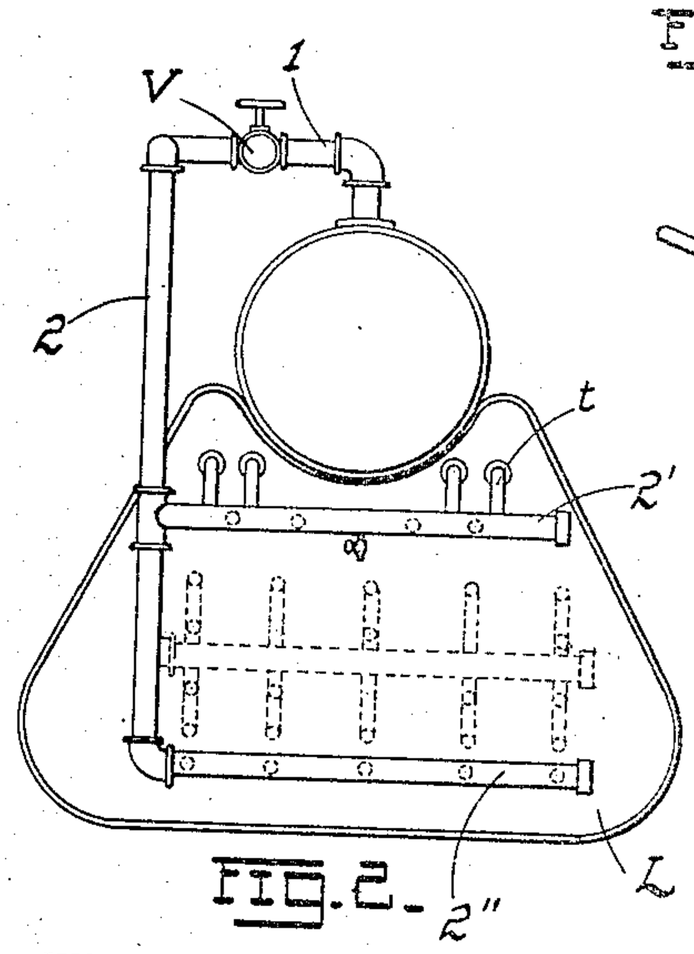

FIG. 2.

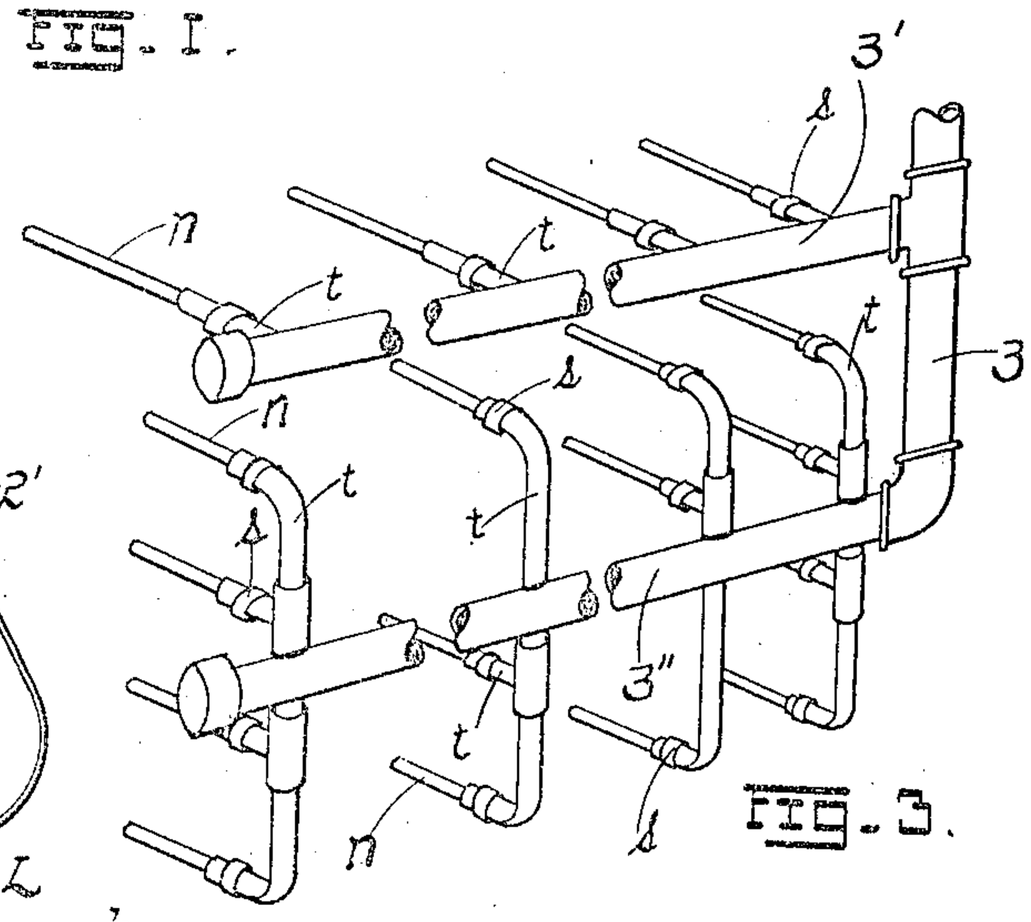

FIG. 3.

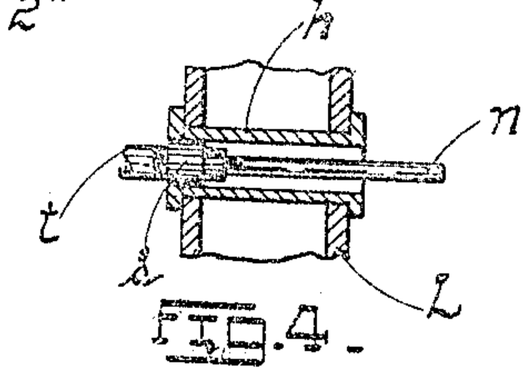

FIG. 4.

WITNESSES:

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BOILER-CLEANER.

No. 919,680. Specification of Letters Patent. Patented April 27, 1909.

Application filed November 30, 1908. Serial No. 465,381.

To all whom it may concern:

Be it known that I, FRANK X. BAYER, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Boiler-Cleaners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in boiler-cleaners; and it consists in the novel details of construction more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a sectional side elevation of a conventional water-tube boiler showing my invention applied thereto; Fig. 2 is a vertical transverse section on the line 2—2 of Fig. 1; Fig. 3 is a perspective of the rear series of steam branches and nozzles leading therefrom, being broken in places; and Fig. 4 is an enlarged sectional detail showing the manner of inserting the nozzles through the hollow stay-bolts of the water-legs.

The present invention is an extension of the construction of boiler-cleaner covered by my U. S. Patent 900,078, dated October 6, 1908, and has for its object to effect a positive dislodgment of the dirt immediately removed by the steam-jets, but which subsequently settles at the base of the exit flue in some particular types of boiler.

A further object is to prevent access of cold air into the combustion chamber of the boiler and into the space immediately below the boiler shell.

A further object to utilize the present hollow stay-bolts of the water-legs for directly supporting the nozzles from which the steam jets issue in the cleaning operation.

The present improvement possesses further and other advantages better apparent from a detailed description of the invention which is as follows:—

Referring to the drawings, S, represents a boiler shell having terminal water-legs L, L, connected by circulating water-tubes T. Extending over the fire-box B, and above the bridge-wall W, and a suitable distance over the rear combustion chamber C, is a deflecting wall *a*, the products of combustion passing rearwardly below said wall *a*, thence upwardly between the tubes T, and forwardly, where they pass above the upper deflecting wall *b* between said wall and shell S, into the stack D. These features of course, form no part of my invention.

Tapping the shell S at a convenient point above the water line is a steam pipe 1 having front and rear depending terminals 2 and 3 respectively, controlled by valves V at convenient points. From the terminal 2 lead horizontal branches 2′ and 2″ respectively the free ends of said branches being closed. The terminal 3 is likewise provided with horizontal branches 3′ and 3″ disposed at different elevations, the free ends of said branches being likewise closed. Projecting in proper direction toward their adjacent water-legs, from the branches 2′, 2″ and 3″ are distributing tubes *t* each terminating in a screw socket *s* to which in turn is screwed a steam nozzle or reduced extension *n*. In the present invention the hollow stay-bolts *h* by which the sheets of the water-legs are connected and reinforced are availed of to receive the spray nozzles *n*, the sockets *s* serving as plugs to close the stay-bolt openings and thereby prevent the influx of undesirable quantities of cold air into the space under the boiler shell or into the combustion chamber, a result to be studiously avoided as it reduces the capacity of the boiler.

The branch 3″ has its distributing tubes *t* disposed in pairs the members of which extend respectively above and below said branch, each member of a pair terminating in a nozzle, and the several pairs having an intermediate nozzle disposed between the pipe 3″ and the end of one of the members of the pair, such intermediate nozzles being disposed on opposite sides of the branch 3″ with each consecutive pair (Fig. 3). In this way an even distribution of the steam jets or sprays is effected, and the cleaning is accomplished in a minimum amount of time. The terminal pairs of distributing tubes on the branch 3″ have however each four nozzles instead of three.

The planes of disposition of the several branches 2′, 2″, 3′, 3″ are such that the nozzles of the branch 2′ discharge into the space at the front of the boiler behind the front water-leg and immediately beneath the shell S; the nozzles from the branch 2″ discharge behind the front water-leg immediately above the wall *a;* the nozzles of the branch 3′ discharge behind the rear water-leg immediately over the rear end of the wall *b;* and the nozzles of the branch 3″ discharge behind the rear water-leg into the

spaces between the water-tubes T. By virtue of the disposition of the nozzles as here described, it follows that the combined action of the jets issuing from the several nozzles when the steam is turned on, will serve to mechanically dislodge any accumulations of dirt which may have settled around the tubes T, and will impel them along when once dislodged, in the general direction followed by the products of combustion. Any material which becomes deposited on the upper deflecting wall *b* will be effectively dislodged by the jets issuing from the nozzles leading from the branch *3'*, the general direction of the draft carrying the material onward to the stack D. In no instance is cold air sucked or drafted into either the combustion chamber or the space beneath the shell S, inasmuch as the openings of the hollow stay-bolts *h* are effectively closed or plugged up by the sockets *s* to which the nozzles are attached. (Fig. 4.)

Having described my invention, what I claim is:—

1. In combination with a boiler comprising a shell, a front and a rear water-leg, hollow stay-bolts connecting the sheets of the water-legs, a series of water-tubes communicating with the interiors of the respective water-legs, a fire-box and rear combustion chamber, a deflecting wall extending from the base of the front water-leg rearwardly over a portion of the combustion chamber, a second deflecting wall extending from the top of the rear water-leg and below the shell, forwardly to a suitable distance from the front water-leg, a steam pipe leading from the steam space of the shell and having branches provided with nozzles passing through the water-legs and discharging at one end of the boiler respectively behind the front water-leg immediately beneath the shell and immediately above the lower deflecting wall, and at the opposite end of the boiler respectively behind the rear water-leg above the upper deflecting wall, and below said wall into the space between the water-tubes, the nozzles passing through registering stay-bolts, and operating substantially as set forth.

2. In combination with a boiler comprising a shell, a front and rear water-leg, hollow stay-bolts connecting the sheets of the water-legs, a series of water-tubes communicating with the interiors of the respective water-legs, a fire-box and combustion chamber, a deflecting wall extending from the base of the front water-leg rearwardly over a portion of the combustion chamber, a second deflecting wall extending from the top of the rear water-leg and below the shell, forwardly to a suitable distance from the front water-leg, a steam pipe leading from the steam space of the shell and having branches provided with nozzles passing through the hollow stay-bolts of the water-legs and discharging at one end of the boiler respectively behind the front water-leg immediately beneath the shell and above the lower deflecting wall, and at the opposite end of the boiler respectively behind the rear water-leg above the upper deflecting wall and below said wall into the space between the water-tubes, the nozzles passing through registering stay-bolts, and sockets surrounding the nozzles and sealing the openings of the hollow stays around the nozzles whereby cold air is excluded from the space beneath the boiler.

In testimony whereof I affix my signature, in presence of two witnesses.

FRANK X. BAYER.

Witnesses:
EMIL STAREK,
JOS. A. MICHEL.