T. GRUENWALD.

FLUID JET BLOWER.

APPLICATION FILED SEPT. 25, 1911.

1,023,078. Patented Apr. 9, 1912.

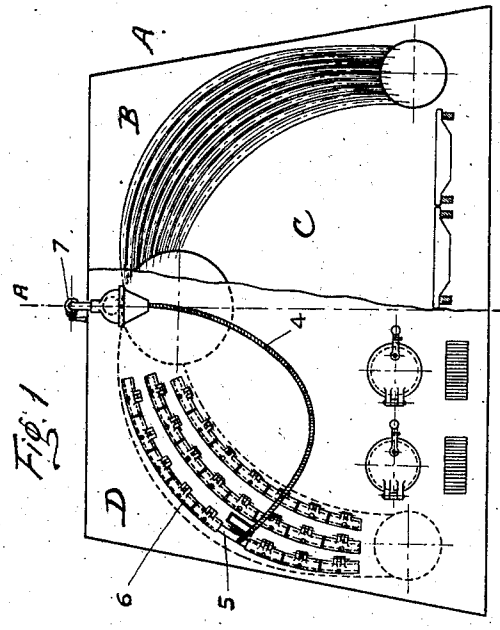

Fig. 1

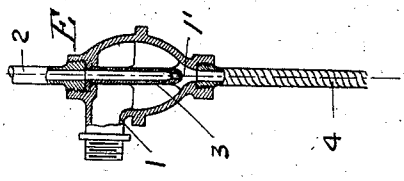

Fig. 3.

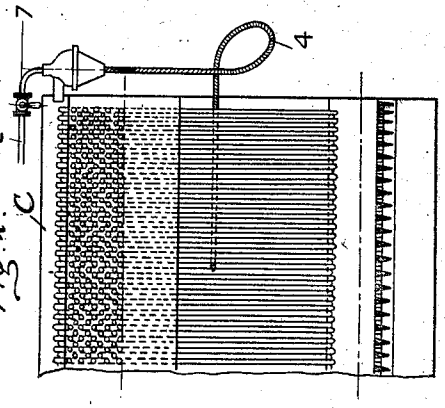

Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

TEODORO GRUENWALD, OF GENOA, ITALY.

FLUID-JET BLOWER.

1,023,078. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed September 25, 1911. Serial No. 651,271.

To all whom it may concern:

Be it known that I, TEODORO GRUENWALD, engineer, a subject of the Emperor of Austria-Hungary, residing at Genoa, Italy, have invented new and useful Fluid-Jet Blowers, of which the following is a specification.

The present invention relates to an apparatus which, provided with suctioning and blowing means, is adapted for the cleaning of the tubes of water tube boilers and flue boilers by blowing a mixture of steam and air on the faces of the tubes to be cleaned.

The purpose of the invention is to prevent the aspiration of cold air within the apparatus applied for the cleaning by which the steam of the aspiring steam jet would get partially condensed and soot and residues of the combustion would get wet such as to stick upon the tube and further to provide means to allow an easy introduction of the apparatus from the outside in its working position and to allow its being worked from the outside of the boiler in an easy manner at closed doors.

The invention will now be described with reference to the accompanying drawings, in which—

Figure 1 is a view of a marine water tube boiler of which the left side is an outside view, the right side is the same view with the walls taken off and the cleaning apparatus applied to. Fig. 2 is a partial vertical sectional view of Fig. 1 at the line A—B. Fig. 3 is a sectional view of the steam jet blower.

In the drawings, A designates a boiler provided with a plurality of tubes B and a fire box C. The face plate or wall D of the boiler is provided with narrow elongated openings or slots 5 which are disposed in convenient proximity to the gas passages about the tubes B and conform substantially to the longitudinal disposition of the tubes, as clearly shown in Fig. 1 of the drawing. These openings may be closed by means of a plurality of pivotally mounted shutters 6, any one of which may be left down to expose a portion of the slot.

I provide a blower casing E which, preferably at one end, is in communication with the fire box C of the boiler through the extension 1, such extension providing ingress means for hot air from the fire box to within the casing E. An egress opening 1′ is also provided for, preferably at the opposite end of the casing E from ingress means 1, and within the casing, is a nozzle 3 having its egress means directed toward the said egress opening 1′. The nozzle 3 is in communication with the steam chamber of the boiler through pipe 2 and, a flexible tube 4 is in fluid tight connection with the egress opening 1′, such tube being adapted to be passed through one of the slots 5, by lowering one of the shutters 6, as clearly shown in Fig. 1. The flexible tube 4 is open at its free end and may be passed between the tubes B, as shown in Fig. 2 of the drawing, to deliver fluid passing through the tube 4, at such portion of the tubes B as may be desired for removing soot or the like therefrom. A valve 7 is provided in the pipe 2 for controlling the entrance of steam into the nozzle 3.

The operation of the device is as follows: Upon admission of steam into the nozzle 3, the latter ejects the steam in the direction of the egress opening 1′ and forces it through the flexible tube 4. During which passage through the casing E, the steam draws in hot air from the fire box C, which intermixes with the steam thus avoiding condensation of the latter upon its first encountering the soot or residues of combustion, and whereby the undesirable matter is removed from the tubes B without the adhering thereof which would occur if moistened by the condensed steam. As the work progresses, the tube 4 may be moved longitudinally of any of the slots 5, and traversing the entire length thereof by alternately opening and closing the shutters 6 to accommodate the tube 4. By this arrangement, the cleaning of the tubes may be accomplished without forming an egress means for the hot gases in the fire box, which must be utilized in the operation of the device, and ingress of cold air to within the fire box is avoided which might otherwise rapidly condense the steam used in the operation of the device.

I claim:—

1. In a device of the character described, the combination with a multitubular boiler, of a mixing casing having an egress opening, a conducting means in communication with the fire box of said boiler and said casing whereby hot air from the former may enter the latter, a nozzle, having its egress means within said casing and directed toward the said egress opening of the latter, means forming a communication between the

steam space of the boiler and said nozzle, and a flexible tube having a fluid tight connection at one end with said egress opening of said casing and adapted to be positioned with its free end in close proximity to the tubes of the boiler, the hot air and steam being thoroughly intermixed by passing through said mixing chambers, substantially as and for the purpose set forth.

2. In a device of the character described, the combination with a multitubular boiler, of a mixing casing having an egress opening, means in communication with the fire box of said boiler at a portion remote from the path of movement of the smoke, and communicating with said mixing chamber, whereby hot air from the fire box may enter the latter, a nozzle, having egress means within said casing and directed toward the said egress opening of the latter, means forming a communication between the steam space of the boiler and said nozzle, and a flexible tube having a fluid tight connection at one end with said egress opening of said casing and adapted to be positioned with its free end in close proximity to the tubes of the boiler, the hot air and steam being thoroughly intermixed by passing through said mixing chamber, substantially as and for the purpose set forth.

3. In a device of the character described, the combination with a multitubular boiler, of a wall for the fire box of said boiler provided with an elongated slot disposed adjacent to the gas passages of said tubes, a plurality of shutters for said slot each adapted to be independently opened or closed, mechanism in communication with the fire box of said boiler and the steam space thereof for intermixing the fluid of steam and hot air, and conducting means in communication with said last mentioned mechanism adapted to be passed through said slot in said wall of the fire box, by opening one of said shutters for the accommodation thereof, whereby egress of hot air from the fire box and ingress of cold air to within the fire box, through the slot, is avoided.

In testimony whereof I have signed my name in this specification in the presence of two witnesses.

TEODORO GRUENWALD.

Witnesses:
ADOLFO WEBER,
AUGSTO SORAGINA.