

A. V. BAYER & G. P. BROWN.
BOILER CLEANER.

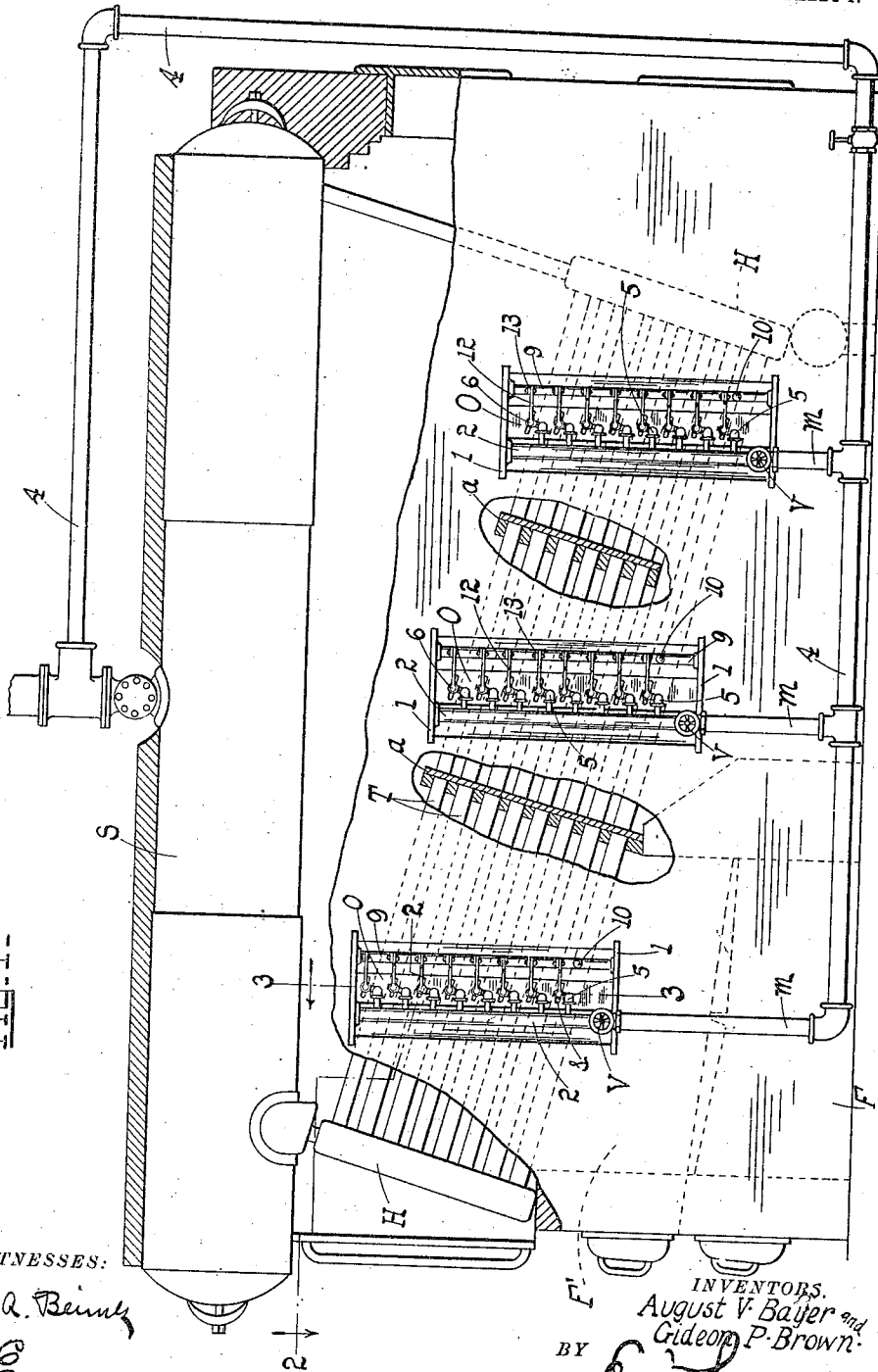
APPLICATION FILED OCT. 25, 1911.

Patented June 4, 1912.

2 SHEETS-SHEET 1.

1,028,179.

FIG. 1-



WITNESSES:

Harry A. Beiney
T. Evans

INVENTORS.
August V. Bayer and
Gideon P. Brown.
BY *Emil Hank*
ATTORNEY.

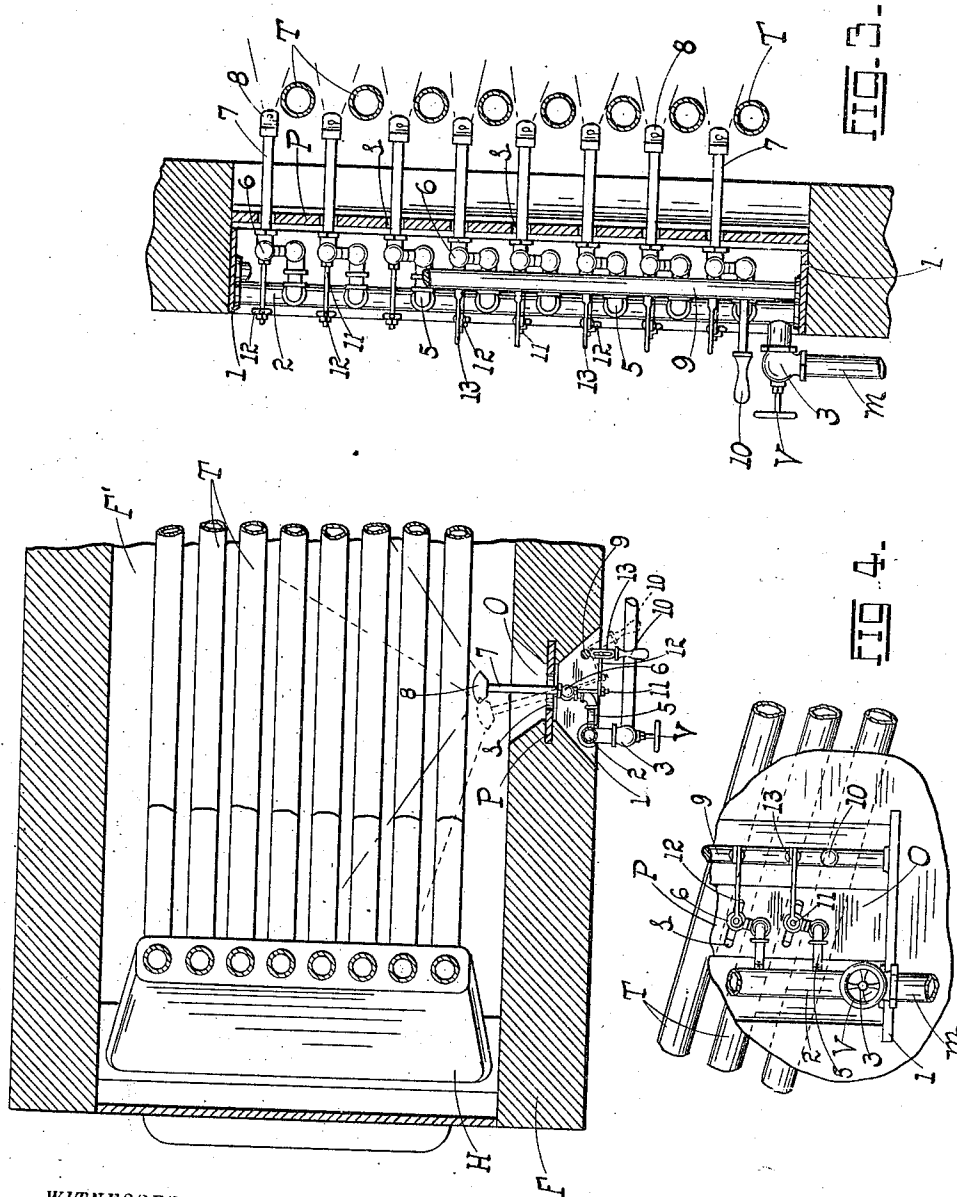
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WITNESSES:

Harry A. Beimes
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FIG. 2.

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UNITED STATES PATENT OFFICE.

AUGUST V. BAYER, OF ST. LOUIS, MISSOURI, AND GIDEON PILLOW BROWN, OF CHICAGO, ILLINOIS.

BOILER-CLEANER.

1,028,179.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed October 25, 1911. Serial No. 656,743.

To all whom it may concern:

Be it known that we, AUGUST V. BAYER and GIDEON P. BROWN, citizens of the United States, residing, respectively, at St. Louis, State of Missouri, and Chicago, in the county of Cook and State of Illinois, 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.

Our 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 side elevation of a boiler, with parts broken away, showing our invention applied thereto; Fig. 2 is a horizontal section on the zig-zag line 2-2 of Fig. 1, of one end of the boiler-furnace and boiler; Fig. 3 is an enlarged vertical cross-section on the line 3-3 of Fig. 1; and Fig. 4 is an enlarged elevational view of a portion of the cleaning attachment, showing the riser, the rock-shaft, and intermediate connections.

The present invention is an improvement on the boiler cleaner forming the subject-matter of U. S. Letters Patent numbered 978,830, issued to Leo Jno. Bayer under date of December 20, 1910; and while contemplating the several objects and possessing the various advantages identified with the patented device, the present improvement affords a more varied and more satisfactory control of the spray nozzles by which the cleaning jet is projected between the tubes of the boiler operated on.

The present improvement permits the installation of a fixed vertical riser or steam pipe, thus restricting the movable portions of the device to the nozzles and the parts by which they are directly controlled, the adjustment of the nozzles to the dip of the boiler tubes being a comparatively easy matter and readily acquired by the skilled mechanic.

The advantages of the improvement will be fully apparent from a detailed description of the invention which is as follows:—

Referring to the drawings, F represents the furnace (the walls being broken away in parts) of a well known type of water-tube boiler, S the shell of the boiler, T the water-

tubes thereof, the water-tube section being divided off into independent sections by the baffle-plates *a*, the general draft being rearward and upward from the fire-box F'. Disposed along one of the side walls of the furnace opposite each section or division between and on either side of, the baffle plates are vertical openings O, tapering from opposite ends to a line within the furnace wall, a perforated or transversely slotted plate P being set in the brick work at the meeting of the converging faces of said opening, the slots *s* being availed of for the passage therethrough of the oscillating nozzles as presently to be seen. The top and bottom of the outer portions of each opening O are provided with a shoe or casting 1, between which is rigidly mounted a steam pipe or riser 2, each riser being tapped at the bottom by an elbow valve-casing 3, equipped with a valve V, the bottom of each elbow being connected by a pipe *m* with the bottom horizontal branch of a general steam-supply pipe 4, leading from the steam space of the boiler shell.

Distributed along the walls of each riser 2, and of a number corresponding to the number of spaces between the tubes T, disposed in any given plane between the headers H connecting the tubes, (and if desirable above the top and below the bottom set of tubes) are elbows or branches 5, the inner arms or legs of the branches terminating in close proximity to the plate P and opposite a slot *s* thereof, said terminal being provided with a hollow swivel joint 6 of any approved pattern known to the art, the axis of rotation of the movable upper section of said joint being disposed at right angles to the planes of disposition of the boiler tubes T. From the movable or rotatable member of this joint there leads inwardly through the slot *s* of the plate P, a nozzle 7 terminating in a spray-head 8, the slotted plate P, nozzle 7 and head 8 being substantially the same as described in the Patent 978,830 aforesaid. The head 8 of any nozzle 7 is thus in position to sweep (with any oscillation of the joint and nozzle carried thereby) in a plane disposed in the space between any set of tubes, the same as in the patent aforesaid.

The means for imparting oscillation to the nozzles 7 may be described as follows:— Mounted rotatably between the castings 1, 1, at a convenient point removed from the riser

2 is a vertical rock-shaft or rocker-bar 9, the bottom of which is provided with an operating handle or lever 10 set so as to be accorded sufficient play between the outer converging sides of the wall opening O. Extending outwardly from the movable section of the joint 6, and in substantial continuation of the nozzle 7 is an arm or extension 11 (the same terminating a slight distance forward of the angle or corner of the elbow 5), to the outer end of which is pivotally coupled the adjacent end of a link 12 whose opposite end is loosely connected to a slotted arm 13 rigidly carried by the rock-shaft 9. There is thus a link connection between the shaft 9 and the end of each nozzle arm 11.

The operation will be clear from the foregoing, but may be described briefly as follows:—By opening any valve V so as to admit steam to the riser 2, the corresponding section or division into which the boiler is divided by the baffles *a* may be cleaned of soot, dirt, cinders and other accumulations. The engineer by then seizing the handle bar 10 and rocking the shaft 9 back and forth will, (through the link connections described) oscillate the entire series of nozzles 7 identified with any opening O, said nozzles and their terminal spray heads 8, by reason of the inclination of the hollow joints 6 being caused to sweep in planes parallel to the planes of disposition of the boiler-tubes, the cleaning fluid (steam) being thus projected into, through and across the spaces between the tubes (and above and below the water-tubes if desired, by providing additional nozzles for that purpose).

It will be seen that we are thus enabled to install a rigid riser 2, the link connections from the rock-shaft 9 and the inclination imparted to the axis of rotation of the steam joint 6, permitting the manipulation of each nozzle 7 so that it may oscillate in a plane parallel to the general planes of disposition of the several tubes T. The average dip of the water-tube section of a boiler is about fifteen degrees, so that the axis of oscillation of the joint 6 (to be at right angles to such dip) would be disposed at an angle of fifteen degrees to the vertical. Where the tube dip was less, the angle between the vertical and the axis of the joint would be correspondingly less; if it were more a corresponding change in the joint would be necessary, the object sought being to maintain the axis of the steam-joint at right angles to the planes of disposition of the boiler tubes. Obviously, the cleaner is not necessarily limited to water-tube boilers. In the present soot-blower or cleaner, therefore, it will be seen that the several nozzles are arranged one above the other in

vertical series, each nozzle following the direction of the tubes and oscillating or swinging in a plane oblique to the said vertical series arrangement of the nozzles, a fixed vertical supply pipe furnishing the cleaning fluid (steam) to the several nozzles.

The fixed riser 2 being vertical, and the axes of oscillation of the several nozzles being inclined to bring them substantially at right angles to the general dip of the tubes T, it follows that these axes must be non-coincident and at the same time parallel to one another (Fig. 4). In this way we can utilize the vertical openings O already present in the furnace (for the accommodation of hand-blowing tools or lances) and still connect our nozzles to the riser so as to cause them to swing parallel to the general planes of disposition of the inclined water-tubes.

Having described our invention, what we claim is:

1. In a soot-blower for water-tube boilers having inclined tubes, a fixed riser mounted opposite the sides of the tubes, a set of pivoted nozzles communicating with the riser, arranged one above the other in vertical series and oscillating about non-coincident axes in the general direction of the tubes, thereby following the dip of the tubes during the blowing operation.

2. In a soot-blower for water-tube boilers having inclined tubes, a fixed vertical riser mounted opposite the sides of the tubes, a set of pivoted nozzles communicating with the riser, arranged one above the other in vertical series and oscillating about non-coincident axes in the general direction of the tubes, thereby following the dip of the tubes during the blowing operation.

3. In a soot-blower for water-tube boilers having inclined tubes, a fixed vertical riser mounted opposite the sides of the tubes, a series of branches leading from the riser hollow joints on said branches arranged one above the other in vertical series, and nozzles leading from the joints and oscillating about the axes of the several joints, said axes being non-coincident and substantially at right angles to the dip of the water-tubes, whereby the nozzles follow the dip of the tubes during the blowing operation.

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

AUGUST V. BAYER.

GIDEON PILLOW BROWN.

Witnesses for August V. Bayer:

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