

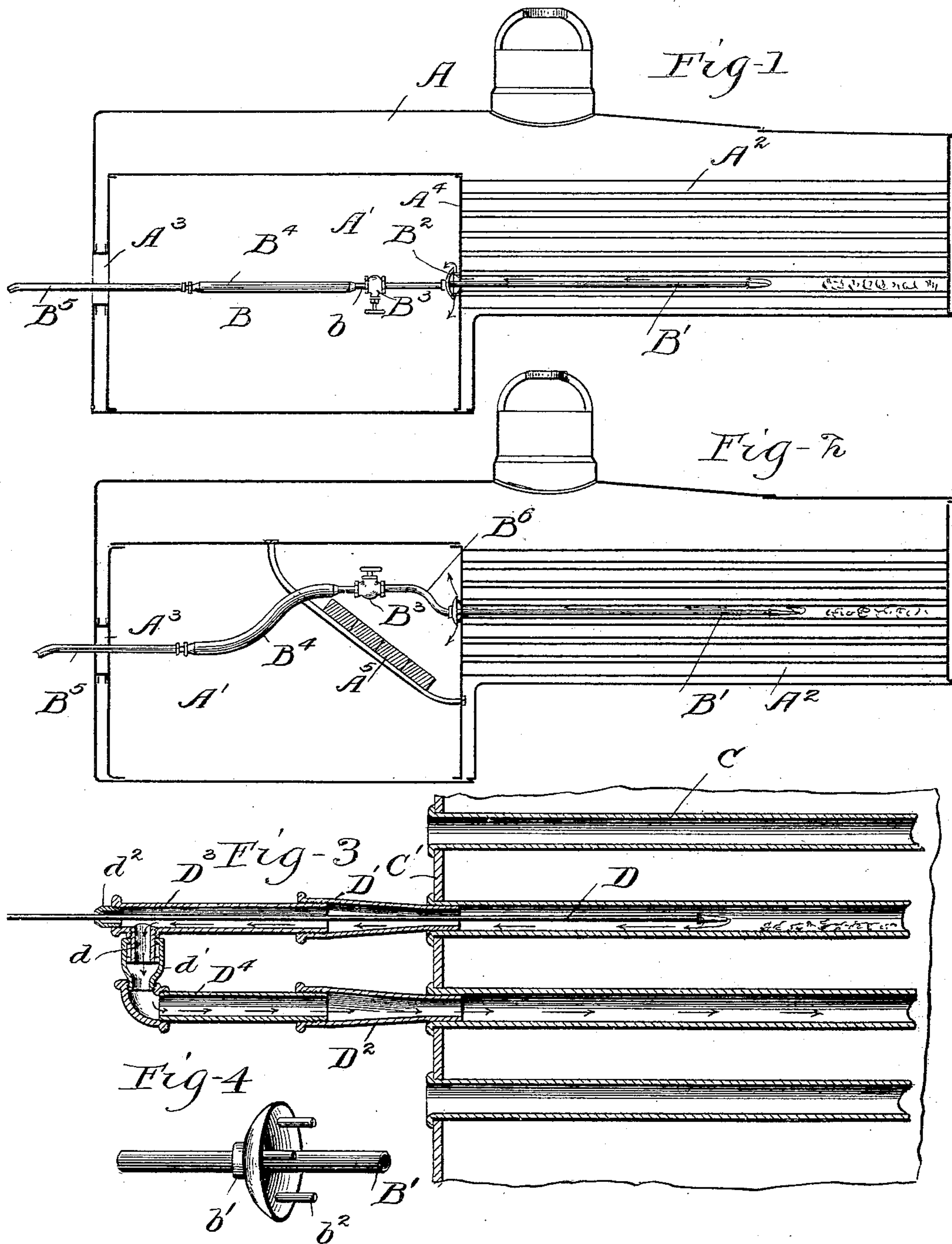
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D. RASO.
FLUE CLEANER FOR BOILERS.

(Application filed Mar. 9, 1898.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

DANTE RASO, OF LIVINGSTON, MONTANA.

FLUE-CLEANER FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 620,670, dated March 7, 1899.

Application filed March 9, 1898. Serial No. 673,185. (No model.)

To all whom it may concern:

Be it known that I, DANTE RASO, of Livingston, in the county of Park and State of Montana, have invented certain new and useful
5 Improvements in Flue-Cleaners for Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked
10 thereon, which form a part of this specification.

This invention relates to improvements in apparatus for cleaning accumulated soot from the interior of boiler-flues of that class in
15 which a jet of steam or air under pressure is directed into the said flues.

An apparatus embodying my invention comprises a blowpipe of a length approximately equal to the length of the flue to be cleaned,
20 which is adapted to be advanced through the flue during the operation of cleaning, and a deflector located outside of the flue, with which the pipe has sliding engagement and through which it is advanced into the flue.
25 Said blowpipe is made of less external diameter than the internal diameter of the flue, so as to provide a relatively large annular space between the pipe and the flue. In the operation of the device the pipe, through which a
30 suitable cleaning medium is forced, is gradually advanced through the flue to be cleaned, and the cleaning medium acts to separate the soot from the inner surface of the flue as the pipe is advanced therethrough. Owing to
35 the accumulated mass of soot in the end of the flue toward which the pipe is advanced and to the relatively large area of comparatively-unobstructed space between the pipe and flue in the rear of the discharge end of
40 the pipe the current of the cleaning medium will be deflected rearwardly toward the end of the flue into which the device is inserted and will be discharged into the fire-box together with the particles of soot which have
45 been dislodged thereby from the flue. Said deflector is provided for the purpose of preventing the soot from being scattered throughout the fire-box of the boiler and being thrown into the face of the operator, and is therefore
50 so constructed as to fully cover the mouth or rear end of the flue being cleaned. When the pipe has been advanced almost through

the flue, the force of the cleaning medium will be sufficient to break through the accumulated soot at the rear end of the flue and
55 force the same therethrough in the direction in which the blowpipe is being advanced. When this occurs, the direction of the current of cleaning medium will be changed and the injector action of the pipe within the flue
60 will act to draw all of the loose particles of soot which have been dislodged from the flue toward and discharge the same through the forward end thereof.

The invention consists in the matters here-
65 inafter set forth, and more particularly pointed out in the appended claim.

The invention is shown in Figures 1 and 2 as applied to a locomotive-boiler; but it will be understood that the same may be used
70 equally well upon stationary and other boilers.

In said drawings, Figure 1 is a diagrammatic view of a longitudinal section of a locomotive-boiler, showing one form of my invention applied thereto. Fig. 2 is a similar
75 view of a locomotive-boiler provided with a fire-brick arch and showing another form of my invention applied thereto. Fig. 3 is a detail sectional view of a boiler, showing still another form of my invention. Fig. 4 is an
80 enlarged detail view of the nozzle and deflector plate or shield used with the forms of cleaner shown in Figs. 1 and 2.

In said Figs. 1 and 2, A designates as a whole a locomotive-boiler of common form
85 provided with a fire-box A' and with flues A², through which the products of combustion are discharged from the fire-box. Said fire-box is provided with the usual door A³.

B designates as a whole my improved flue-
90 cleaner. Said device consists of a blowpipe B', which is adapted to be inserted into the flues A² to be cleaned; a shield or deflector B², located outside of the flue-sheet A⁴ of the boiler, with which the pipe has sliding en-
95 gagement; a globe-valve B³, by which the passage of the cleaning medium through said pipe is controlled; a connecting-hose B⁴, attached to said globe-valve by means of a nipple b, and a connecting-pipe B⁵, which leads
100 from any suitable source of cleaning medium.

While I do not wish to be restricted to the use of any particular cleaning medium, I have found air under compression to be a suitable

medium for this purpose and will describe the operation of the device in connection therewith.

The blowpipe B' is approximately equal in length to the length of the flues to be cleaned and is adapted to be advanced gradually through said flues while air under pressure is being forced through the same. The deflector B² consists of an inwardly-convex disk provided with an apertured hub or boss b', through which the pipe B' passes and is adapted to rest in contact with the flue-sheet of the boiler. Said deflector does not fit closely upon the flue-sheet, but is located a sufficient distance from the rear end of the flue to form a passage between the same and the flue-sheet. As herein shown, the disk is provided on its inner side with short pins or legs b², which engage the flue-sheet around the flue being cleaned and serve to hold the disk at a distance from said sheet. The pipe B' is of less external diameter than the internal diameter of the flue to be cleaned, so that when the pipe is advanced into the flue the large area of comparatively unobstructed space between said pipe and flue will provide a free egress for the air through the rear end of the flue than through the forward end thereof, and the current of air will be therefore directed toward and discharged from the rear end of the flue and carry with it the particles of soot which have been loosened thereby from the flue. This operation will be continued until the pressure of the air from the blowpipe is sufficient to break through the obstruction in the forward end of the flue, which will occur when said pipe has been advanced almost through the flue, after which the current of air will discharge the soot from the front end of the flue. Any loose soot lying in the tube at the rear of the discharge end of the blowpipe when the direction of the current is changed will be carried to and discharged from the forward end of the flue by the injector-like action of the pipe within the flue.

In Fig. 2 I have shown the invention as applied to a locomotive-boiler having a fire-brick arch A⁴ of common form, which is located between the door A³ and the rear ends of the flues A². When such arch is employed, the lower flues, which open into the fire-box adjacent to the base of said arch, cannot be cleaned by a device having an inflexible blowpipe without disturbing said arch. In said construction the blowpipe consists of a flexible hose B⁶, which is of such flexibility as to permit the same to be bent at the required angles to be inserted into the lower flues, while possessing sufficient rigidity to permit the same to be forced through said flues. The construction and operation of said device are similar in other respects to the device shown in Fig. 1 and heretofore described. In the constructions shown in Figs. 1 and 2 the soot during the first part of the operation of the device will be forced back against

the deflector B² and will drop into the fire-box adjacent to the flue-sheet of the boiler.

In Fig. 3 I have shown a device which is designed to prevent the escape of any of the soot into the fire-box, but which forces all of the same through the forward ends of the flues. In said construction the deflector is constructed to place the rear end of the flue being cleaned into communication with an adjacent flue which has previously been cleaned, so that the soot-laden current of air from the flue being cleaned will be forced through the clean flue and discharged through the outer end thereof. Said deflector consists of an outlet-nozzle D', which fits tightly in the end of the flue C to be cleaned and with which the blowpipe D has sliding engagement. Said nozzle is in open communication with a second or inlet nozzle D², which is adapted to fit into a flue which has been cleaned, so that when the blowpipe is advanced through the flue and air forced through the same the backward current of air will pass through said nozzles and through the clean flue and out at the forward end of the same. This operation will continue until the current of air from the blowpipe is sufficient to force its way through the flue, when the direction of the current will be changed and the remaining contents of the flue will be discharged through the forward end of the same. As herein shown, said nozzles D' D² are provided with rearwardly-extending short pipe-sections D³ D⁴, which are connected at their rear ends by a transverse joint. In order to use said device upon boilers in which the flues are of varying distances apart, said transverse connection between the pipe-sections D³ D⁴ is made adjustable. As herein shown, the section D³ is provided with a short nipple d, which is adapted to fit within and have sliding engagement with a short nipple d', attached to the pipe-section D⁴. The fit between said connecting-nipples d d' will be such as to normally maintain the same in any adjusted position. The blowpipe D passes through a stuffing-box d² in the outer end of the pipe-section D³, which provides an airtight connection between said blowpipe and the deflector.

When the parts are in the position shown in Fig. 3 and air is forced through the pipe D, the rearwardly-directed current of air, laden with the dislodged particles of soot, will pass through the deflector into the clean flue, in which the nozzle D² fits, and out through the forward end thereof. As the nozzle approaches the forward end of the flue and breaks through the accumulated soot therein the direction of the current of air will be changed and the injector action of the same will cause the loose particles of soot and dust in the clean flue and the stationary parts of the device to be forced through the flue which is being cleaned in a manner similar to the operation previously described.

A boiler-flue can be cleaned by the use of

my device during the time required for forcing the blowpipe through the length of the flue, so that when said pipe has been forced through the flue a single time the latter will
5 be entirely cleaned and a repetition of the operation will not be required.

I claim as my invention—

10 A flue-cleaner comprising a blowpipe which is adapted to be advanced through the entire length of the flue to be cleaned and a deflector plate or disk adapted to cover the outer end of the flue and with which said pipe has slid-

ing engagement, said deflector-plate being provided on its inner side with suitable lugs or projections by which it is held out of con- 15 tact with the flue-sheet.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 2d day of March, A. D. 1898.

DANTE RASO.

Witnesses:

NICOLA CARUSO,
MARINO NAPOLI.