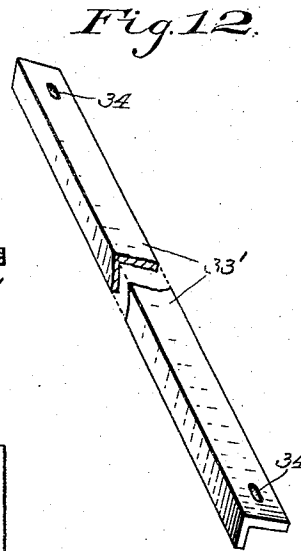
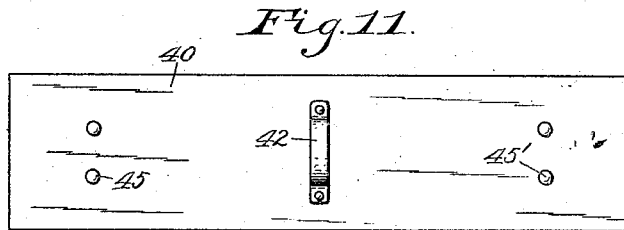
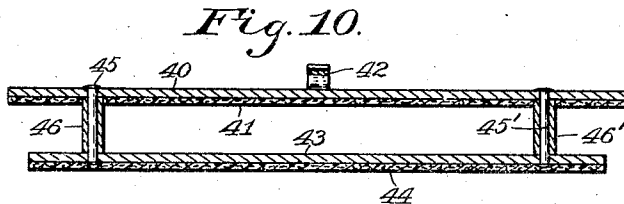
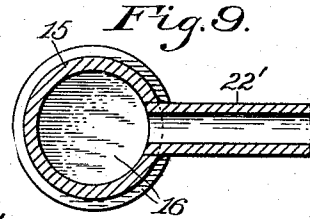
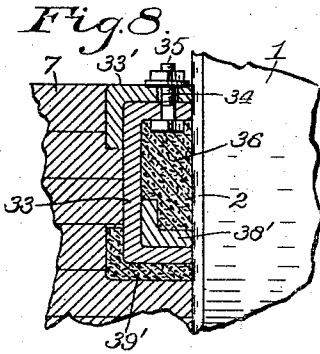
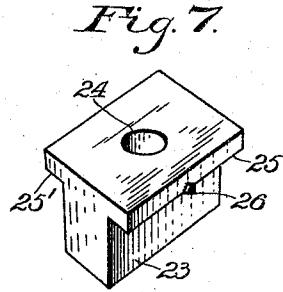
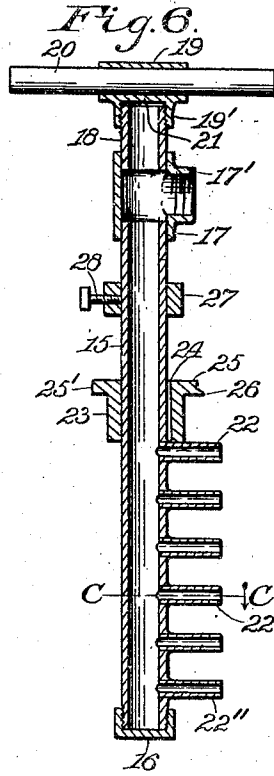
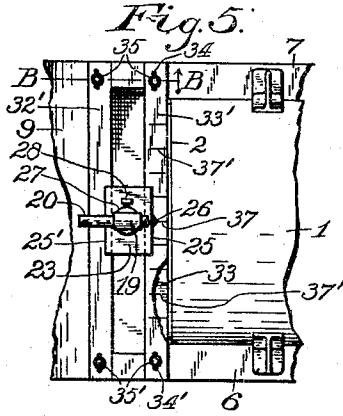


A. CONNOR.
BOILER FLUE CLEANER.
APPLICATION FILED MAR. 25, 1910.

969,461.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ALEXANDER CONNOR, OF MONTEZUMA, INDIANA.

BOILER-FLUE CLEANER.

969,461.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed March 25, 1910. Serial No. 551,553.

To all whom it may concern:

Be it known that I, ALEXANDER CONNOR, a citizen of the United States, residing at Montezuma, in the county of Parke and State of Indiana, have invented certain new and useful Improvements in Boiler-Flue Cleaners; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to apparatus for clearing boiler flues of soot and ashes by the use of steam jets, the invention having reference more particularly to flue cleaners that are adapted to be operated at the rear ends of the boilers as occasion may require while the boilers are in use.

The object of the invention primarily is to provide improved flue cleaning apparatus that will be adapted to be used frequently and conveniently in order to maintain the highest efficiency of the boiler in operation with the minimum consumption of fuel, a further object being to provide flue cleaning apparatus that will be the most effective at the rear end of the boiler, and which will blow the ashes and soot into the smoke-box to be carried out by the draft, or from which accumulations may be the more easily removed than from the combustion chamber.

With the above-mentioned and minor objects in view the invention consists in boiler flue cleaning apparatus comprising a slotted combustion chamber roof at the rear end of the flue boiler and provided with horizontal guide bars at opposite sides of the slot, and a portable appliance insertible through the slot and provided with supporting and guiding means coöperating with the guide-bars whereby to direct steam jets into all the flues of either vertical row thereof; and the invention consists further in the novel parts, and combinations and arrangements of parts, as hereinafter particularly described and then pointed out in the accompanying claims.

Referring to the drawings, Figure 1 is a side elevation of a flue boiler and its setting partially broken away and having the improved flue cleaner applied thereto; Fig. 2, a vertical section on the line A A in Fig. 1; Fig. 3, a fragmentary vertical section showing the construction of the roof and

guide bars in the slot thereof closed by a cover when the flue cleaning apparatus is not in use; Fig. 4, a fragmentary vertical section illustrating modifications in construction; Fig. 5, a fragmentary top plan of the flue cleaning apparatus in operative position; Fig. 6, a vertical central section of the portable portions of the apparatus; Fig. 7, a perspective view of the guide head of the portable apparatus; Fig. 8, a fragmentary vertical section on the line B B in Fig. 5; Fig. 9, a horizontal section on the line C C in Fig. 6; Fig. 10, a vertical section of the slot cover as on the line D D in Fig. 3; Fig. 11, a top plan of the cover; and Fig. 12, a perspective view of a facing bar with which in some cases the guide bars are provided.

Similar reference characters in the different figures of the drawings indicate like elements or features of construction herein referred to.

In the drawings, the numeral 1 indicates a horizontal flue boiler shell; 2 the rear boiler head, 3 the middle vertical row of flues; 3' the other vertical rows of flues, the boiler head having a hand-hole plate 2' in the lower portion thereof, 4 the smoke-box, 5 the smoke stack or chimney, 6 and 7 the side walls and 8 the rear wall of the boiler setting, 9 the roof or arch extending from the rear wall and side walls to the rear boiler head; 10 the steam dome of the boiler having a valve 11 connected thereto; 12 the front wall of the boiler setting, 13 the bridge wall, and 14 the furnace door.

The invention is illustrated in connection with a single boiler and the description should be understood as referring as well to one of a battery of boilers.

The invention comprises essentially portable apparatus comprising a steam head which is composed of a section 15 of iron-pipe on one end of which is a cap 16 to close it and on the other end of which is secured one end of a pipe-tee 17 having a side branch 17', the steam head comprising also a relatively shorter pipe section 18 secured to the opposite end of the pipe-tee, the end of the section 18 having a tee fitting 19 thereon in the main part of which is a handle-bar preferably composed of wood, so as to not become heated, the fitting 19 having a side branch 19' secured to the pipe section 18 and having a closure 21 therein which closes the end of the pipe section, so that the steam

head is closed at both ends and the lower portion thereof is provided with a suitable number of jet nozzles 22, 22', 22'', inserted in suitable apertures in the wall of the pipe section 15, there being a nozzle for each flue in a vertical row. The section 15 of the steam head has a combined supporting and guide head 23 thereon in which is a vertical guide opening 24 receiving the pipe section loosely, so as to be rotative and adjustable vertically therein, the guide-head having two flanges or bearing portions 25 and 25' on opposite sides thereof for its support, one flange preferably having a pointer 26 thereon. A collar 27 is secured on the section 15 of the steam head between the guide head and the pipe-tee 17 by means of a set-screw 28, and in operation the collar rests upon the guide-head and supports the steam-head, the latter being provided with a steam supply hose 29 connected to the side-branch 17' by means of a union 30, the hose being connected by means of a union 31 to the valve 11, so that the portable apparatus may be disconnected and laid aside when not in use.

The roof or arch 9 as above mentioned is built with a slot therein parallel to the rear boiler head 2 and provided at opposite sides of the slot with guide bars 32 and 33 preferably composed of channel iron, and inasmuch as the heat may in some cases slightly warp the guide-bars, one of which assists in supporting the roof, the guide bars are preferably provided with facing bars 32' and 33', respectively, composed each of L-section iron placed on the tops thereof and extending partially down the opposing faces of the guide-bars, the facing bars having longitudinal slots 34 and 34' in the end portions thereof through which extends bolts 35 and 35' which secure them to the guide-bars and permit expansion and contraction of the guide-bars while the facing-bars remain relatively cool and not liable to warp, the facing bars therefor providing true surfaces on which the flanges of the guide-head may slide while the body portion of the guide head extends into the slot and is guided by the vertical sides of the facing-bars. The space between the guide-bar 33 and the boiler-head is filled preferably with asbestos filling 36. The upper surface of one of the facing-bars has indicating markings 37, 37', thereon and when the facing-bars are not employed the guide-bar has similar markings 37'' thereon to indicate that the jet nozzles shall be opposite the boiler flues or in alinement therewith when the pointer 26 is brought to the markings, each marking being in the vertical plane coinciding with the axes of the flues of each row.

In some cases the guide-bars 32 and 33 have linings 38, 38', respectively in the lower angles thereof, so as to reinforce the roof structure in case the lower portions of the

guide bars partially burn away from excessive heat and become weakened, and also in some cases the lower portions of the guide-bars are provided with asbestos coverings 39 and 39' to shield them from the heat.

When the apparatus is not in use in cleaning the flues it is preferable to remove the steam-head so that it will not be liable to injury from the heat of the fires, and when removed the slot is closed by a cover plate 40 provided on the under side thereof with an asbestos lining 41, the cover having a handle 42 on the top thereof for removing it, and preferably the cover comprises also a lining plate 43 provided on the under side thereof with an asbestos lining 44, the plate 43 being connected to the outer portion or cover proper that rests on the guide-bars by means of rods 45, 45', and spacing thimbles 46, 46', thereon, so that the plate 43 and its lining is suspended in the slot near the lower portions of the guide-bars to exclude the heat in a measure from the upper portions of the guide-bars which therefore will not be subject to intense heat.

Various modifications, of course, may be made in the guiding and supporting means of the steam head within the scope of the claims.

In practical use, with steam pressure in the boiler the fires are gotten into good condition, so as to avoid excessive smoke if such is ordinarily produced, and then the cover 40 is removed, so as to clear the guide-bars, after which the steam-head is inserted in the slot and the guide-head placed upon the guide-bars, the steam-head being turned suitably so that the nozzles may pass through the slot and then the steam head is rotated until the handle-bar 20 indicates that the nozzles project in alinement with the flues; the steam connections are then made, if not previously made, and steam is turned into the steam head with the result that the steam will escape forcibly and expansively into the rear ends of the flues and blow the ashes and soot therefrom and into the smoke-box, the height of the steam head having previously been adjusted relatively to the guide-head by adjusting the collar 27 thereon, but it is obvious that further adjustments may be made if they are required, as may be ascertained by observing the action of the nozzles through the slot. The guide-head 23 is moved along the guide-bars after each vertical row of flues have been cleaned.

It is evident that the cleaning operations may be done very quickly and then the steam head may be promptly withdrawn through the slot, and the latter may be closed by the cover 40. It should be understood, however, in case it be desired to leave the steam head remain permanently in one end of the slot; the cover of the slot may be

made of suitable length, so that it with the guide-head at one end thereof will entirely close the slot.

Having thus described the invention, what is claimed as new, is—

1. A boiler-flue cleaner including a steam-head comprising a main pipe section, nozzles attached to the pipe section, a cap on one end of the pipe section, a pipe-tee secured to the opposite end of the pipe section, a relatively short pipe section secured to the pipe-tee in alinement with the main pipe section, a tee-fitting secured to the short pipe section and having a closure therein closing the end of the pipe section, and a handle in the tee-fitting.

2. A boiler-flue cleaner including a guide-head, and a steam-head comprising a main pipe section extending through the guide-head, nozzles attached to the pipe section, a cap on one end of the pipe section, a pipe-tee secured to the opposite end of the pipe-section, a relatively short pipe section secured to the pipe-tee in alinement with the main pipe section, a tee-fitting secured to the short pipe section and having a closure therein closing the end of the pipe section, and a device connected to the main pipe section and cooperating with the guide-head to support the steam-head in vertical position.

3. A boiler-flue cleaner including a pair of horizontal guide-bars, a guide-head movable on the guide-bars and having a vertical guide-opening therein, a hollow steam-head extending vertically through the guide-opening and having nozzles on the lower portion thereof below the guide-head and an inlet opening in the side of the upper portion thereof above the guide-head, a handle-bar connected to the upper end of the steam-head, and a device connected to the steam head and cooperating with the guide-head to support the steam-head in vertical position.

4. In a boiler-flue cleaner, the combination with a flue-boiler, and the rear wall of the boiler-setting, of a roof-wall at the rear end of the flue-boiler having a slot therein parallel to the end of the boiler provided with a pair of guide-bars that extend in opposite sides of the slot and also upon the roof-wall, a guide-head movable upon and between the guide-bars and having a vertical guide-opening therein, a hollow steam-head extending vertically through the

guide-opening and having nozzles on the lower portion thereof spaced opposite the ends of the flues of the boiler in vertical rows for directing blasts through all the flues in either vertical row simultaneously, and a device connected to the steam-head and cooperating with the guide-head to support the steam-head in vertical position.

5. In a boiler-flue cleaner, the combination with a flue-boiler, and the rear wall of the boiler-setting, of a roof-wall at the rear end of the flue-boiler having a slot therein parallel to the end of the boiler provided with a removable cover, a pair of guide-bars in opposite sides of the slot, and a portable steam-head insertible in or removable from the slot when the cover thereof is removed, the steam-head carrying a guide-head that is freely insertible between or removable from between the guide-bars and having nozzles thereon that are spaced to correspond with the spacing of the flues in the boiler in vertical rows, and a device for adjustably connecting the guide-head to the steam-head.

6. In a boiler flue cleaner, the combination with a flue-boiler, and the rear wall of the boiler-setting, of a roof wall at the rear end of the boiler having a slot therein parallel to the end of the boiler provided with a removable cover, a pair of guide-bars in opposite sides of the slot, one of the guide-bars having marks thereon indicating the vertical rows of the boiler flues, a guide-head movable in the slot and having flanges thereon bearing upon the guide-bars, one of the flanges having a pointer thereon to register with the marks, the guide-head having a vertical guide opening therein, a hollow steam-head extending movably through the guide-opening and having nozzles on the lower portion thereof below the guide head and an inlet-opening in the upper portion thereof above the guide-head, a collar secured adjustably on the steam-head and bearing upon the guide-head, and a handle-bar on the upper end of the steam-head, with a steam-supply hose connected to the steam-head at the inlet-opening.

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

ALEXANDER CONNOR.

Witnesses:

ASHER T. STRIBLING,
FRANCIS M. M. LAUGHLIN.