J. M. SHEA.

STEAM BLAST CLEANER FOR BOILER FLUES.

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1,227,007. Patented May 22, 1917.

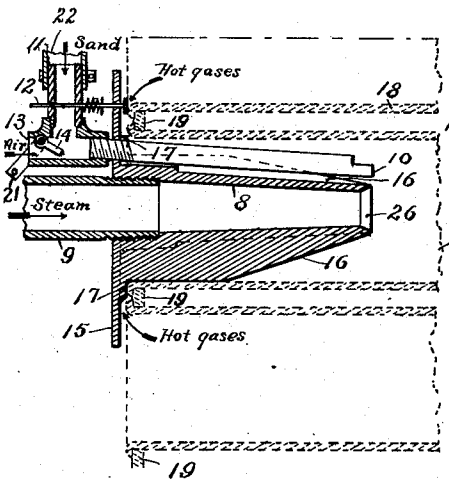


Fig. 1

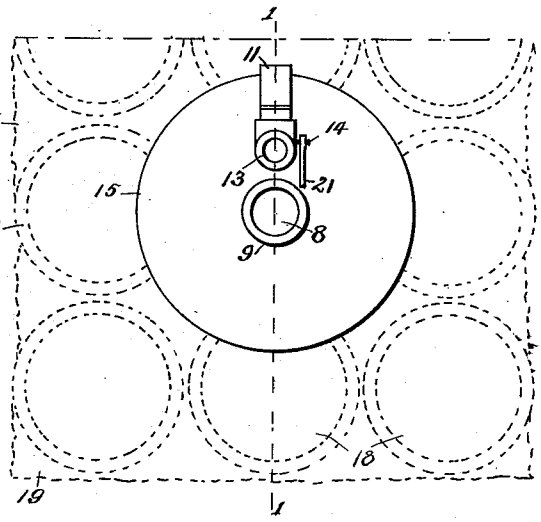
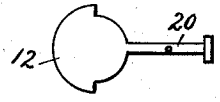


Fig. 2

Fig. 4



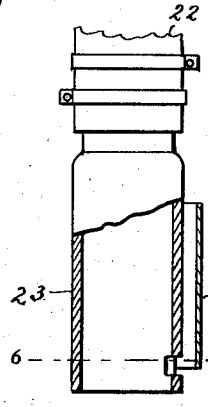
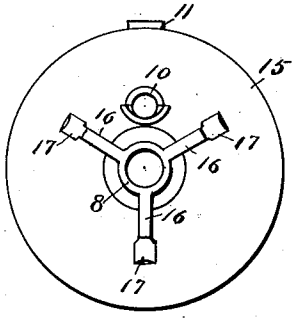


Fig. 5

Fig. 3



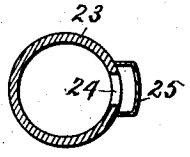


Fig. 6

INVENTOR

John M Shea

BY

Delbert H Decker

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN M. SHEA, OF SIOUX CITY, IOWA.

STEAM-BLAST CLEANER FOR BOILER-FLUES.

1,227,007. Specification of Letters Patent. Patented May 22, 1917.

Application filed August 4, 1916. Serial No. 113,075.

To all whom it may concern:

Be it known that I, JOHN M. SHEA, a citizen of the United States, residing at Sioux City, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Steam-Blast Cleaners for Boiler-Flues, of which the following is a specification.

The principal object of this invention is to provide a steam flue cleaner for fire tubes of boilers which shall draw in the hot gases from tubes adjacent to the one being cleaned thereby preventing condensation of the cleaning steam which usually occurs when air is drawn into the tube or flue by the blast of steam.

Other advantageous features of the invention will appear during the description of the device embodying the invention and its mode of use.

The invention therefore consists in the structure of parts and in their combination substantially as herein set forth and claimed.

In the accompanying drawings which form a part of this specification Figure 1 shows a central longitudinal section through the improved blast nozzle taken in the plane indicated on Fig. 2 by the line 1—1, a group of flues and their flue sheet being indicated in dotted lines in both said figures to better illustrate the use of the invention. Fig. 2 is a front elevation and Fig. 3 a rear elevation of the blast nozzle. Fig. 4 is a plan of the sand controlling valve. Fig. 5 is a partially sectionized elevation of a foot valve for use on the sand hose and Fig. 6 is a transverse section thereof on the line 6—6 Fig. 5.

The invention contemplates also the use of sand with the steam blast that the cleaning may be more effective and rapid. In the drawings therefore the blast tube of the cleaning nozzle is represented at 8, the pipe leading steam thereto is seen at 9, the sand pipe at 10, the sand inlet at 11, the sand valve at 12, the air inlet for assisting the flow of sand at 13 and a regulating valve for the air at 14.

At the rear end of the tube 8 projects an air shield 15 at right angles to the axis of the nozzle. Also on the sides of the blast tube are radial wings 16, preferably three suitably tapered, for centering the nozzle in the boiler flues. Upon said shield and preferably at the base of said wings are spacing ribs 17 which rest against the ends of the boiler flues 18 flanged against the flue sheet 19.

The shield 15 may be extended to any desired area sufficient to insure that the blast of steam through tube 8 shall draw in hot gases from the flues adjacent to that in which the nozzle is working. The spacing ribs 17 provide passages for said gases between the shield 15 and the ends of the flues. The provision for drawing in a preponderance of hot gases precludes to a great degree the condensation of the working steam.

With the device described may also be associated a sand feeding adjunct of any practical form. The one shown in the drawings has its pipe 10 secured in the shield 15 above the tube 8 its inner end reaching to that of tube 8 and there cut away at the upper side and the lower side expanded to drop the sand into the steam issuing from the nozzle. Any suitable valve for controlling the sand may be used. The sliding disk 12 here shown is placed across the pipe 11 and the stem 20 protrudes forward through the shield 15 so that it may abut against the flue sheet 19 or the end of a flue 18 when the nozzle is inserted in a flue. When the nozzle is removed the valve is closed by a spring about its stem 20 as seen in Fig. 1.

The amount of air entering the inlet 13 to aid in the flow of sand may be controlled in any suitable way as for instance by the valve 14 in said inlet the position of which may be determined by the crank or handle 21.

The sand may be supplied to the inlet 11 from a hopper or any convenient holder or it may be fed to the inlet by a hose attached thereto. Such hose is indicated at 22 and in Fig. 5 is shown provided with a foot valve consisting of a piece of pipe 23 open at its lower end and also provided with a lateral opening 24 near the lower end. Extending upwardly from said opening 24 is a duct 25 on the side of the pipe 23 through which air may pass to assist in the flow of sand through the hose and to clear sand away from the opening 24 should it become clogged. The foot valve being laid in the container sand air to assist in the flow thereof through the hose, will enter the lower end of pipe 23.

The interior of the nozzle converges forward and the outlet diverges as seen at 26. Thus a greater diffusion of the cleaning

blast is obtained and cleaning accelerated. Obviously compressed air may be used in the place of steam if desired.

The invention claimed is:

1. A blast nozzle provided with centering means and having an extended air shield at its rear end for the purpose set forth.

2. A blast nozzle provided with centering wings and having an extended air shield at its rear end and spacing ribs on said shield for the purpose specified.

3. A blast nozzle for cleaning the flues of steam boilers consisting of a central tube, an extended flange at the rear end of said tube forming an air shield for the purpose specified, centering means for the nozzle, spacing ribs on the inner face of said shield, a sand supply pipe secured in said shield and provided with valve-controlled air inlet and with a sand valve.

4. A foot valve for a sand blast nozzle consisting of a pipe open at its lower end and provided with a lateral opening near said end and an air duct leading along the side of said pipe to said lateral opening for the purpose set forth.

In testimony whereof I have affixed my signature.

JOHN M. SHEA.