

O. DONATZ.
BOILER CLEANING APPARATUS.
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944,719.

Patented Dec. 28, 1909.

2 SHEETS--SHEET 1

Fig. 3

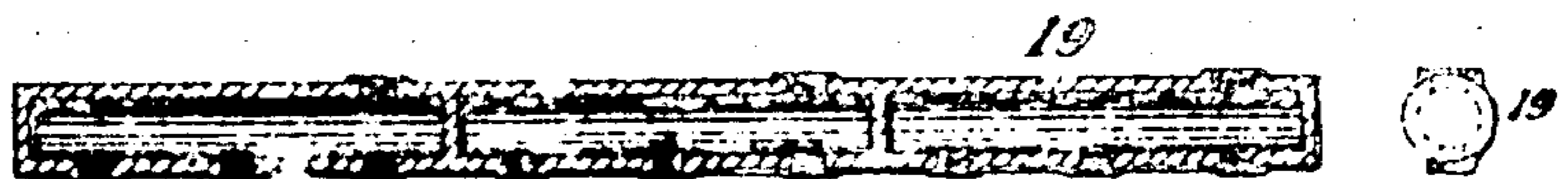
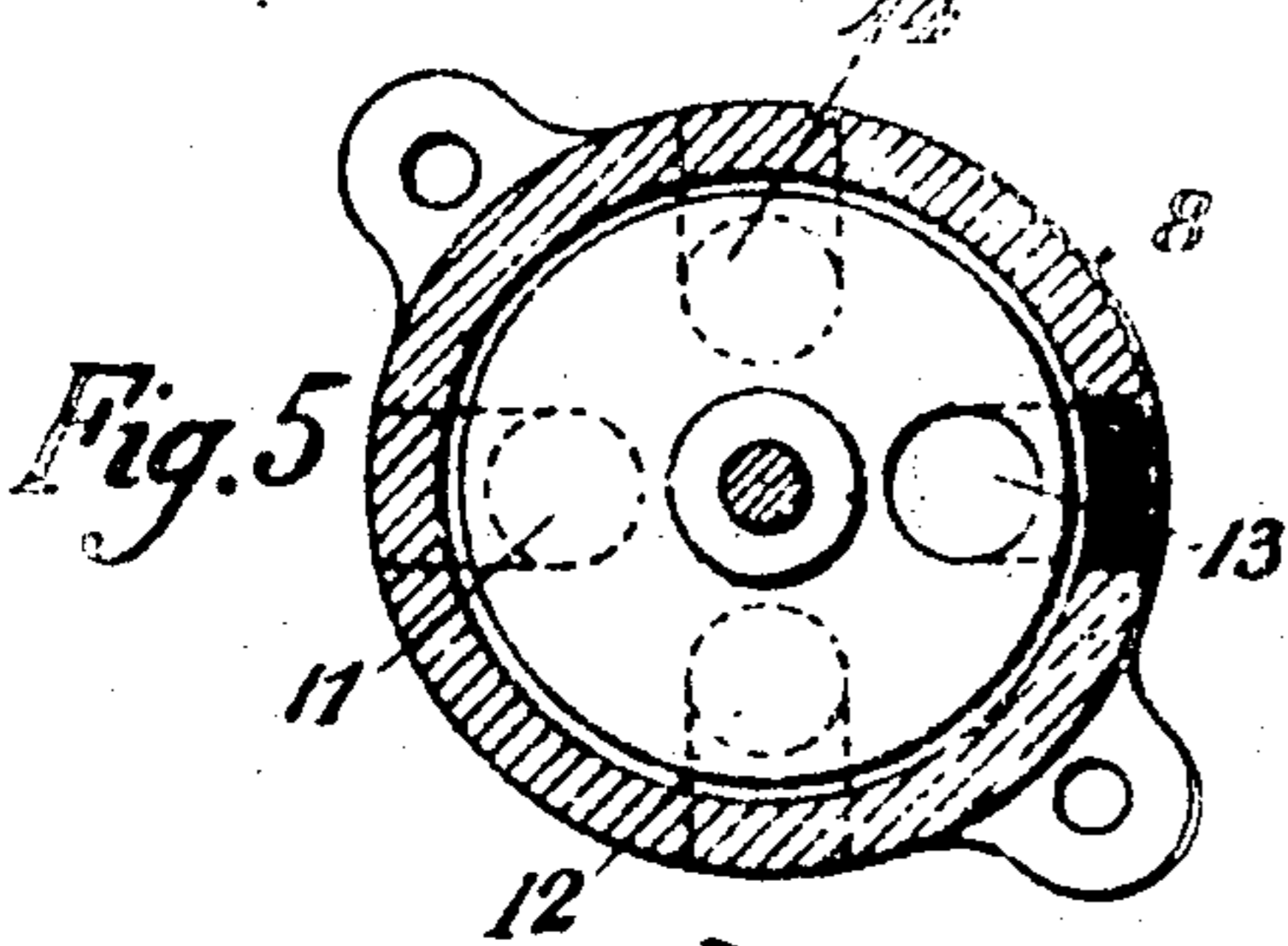
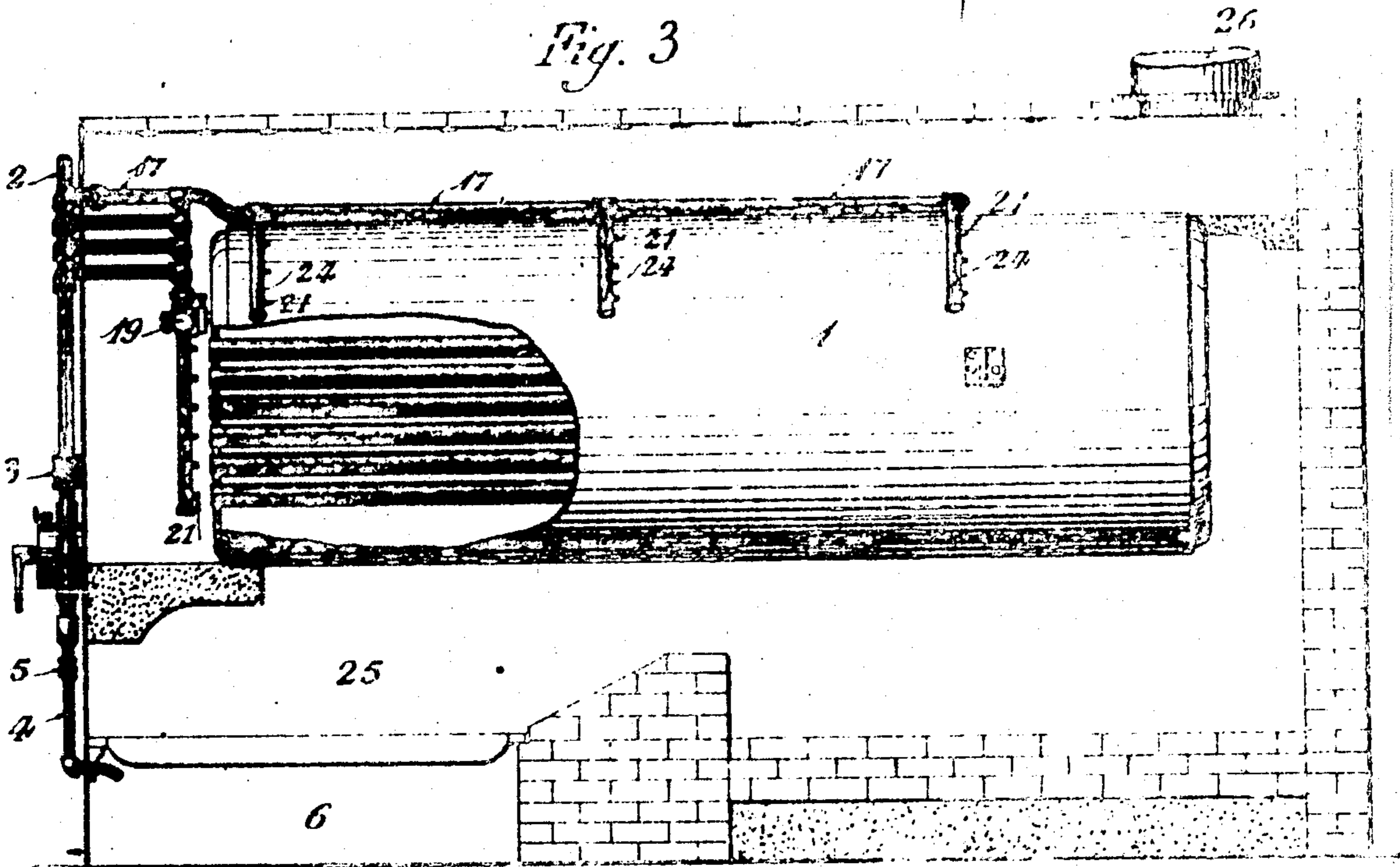


Fig. 4

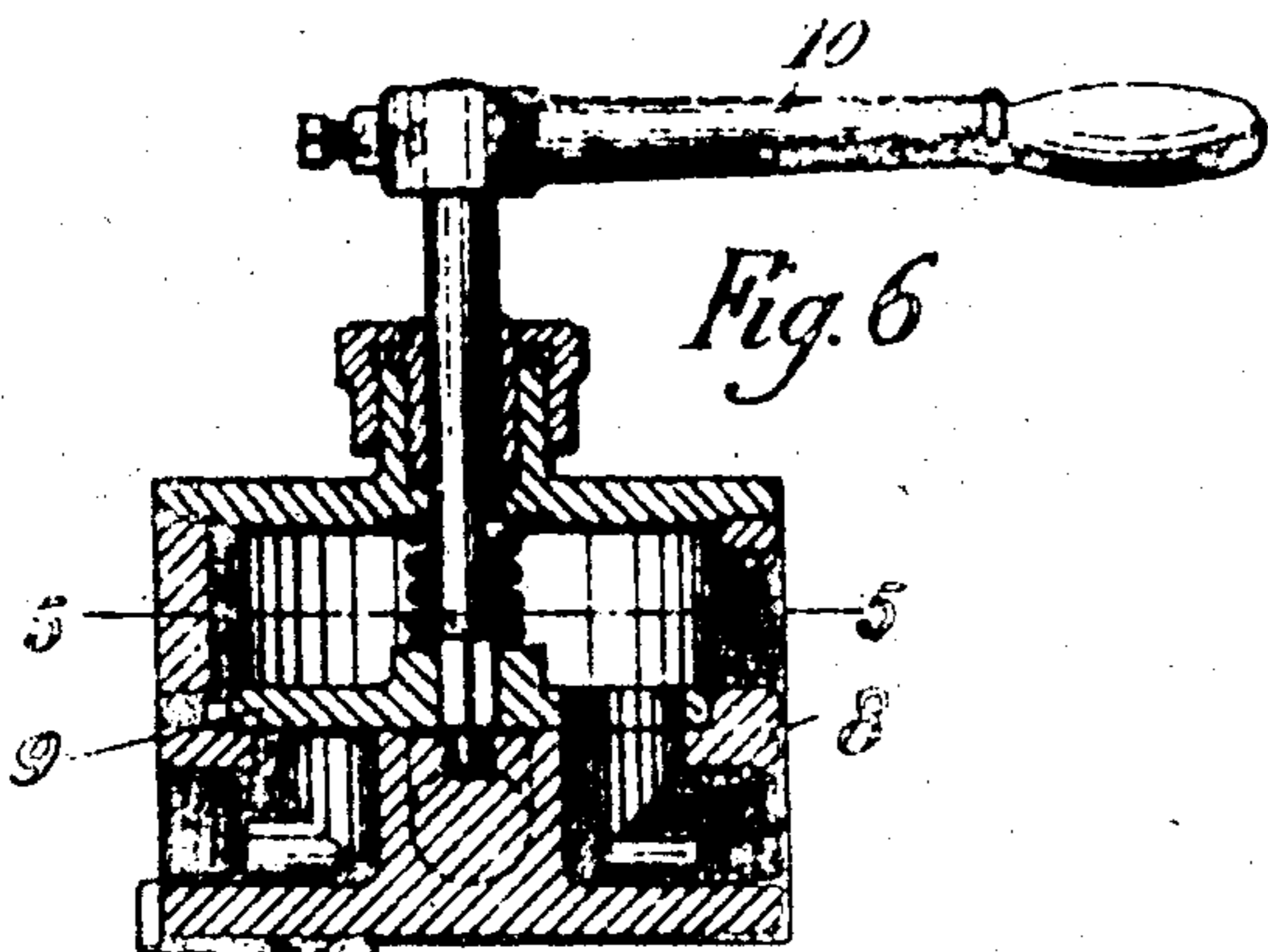


Fig. 6

Fig. 7



Fig. 8

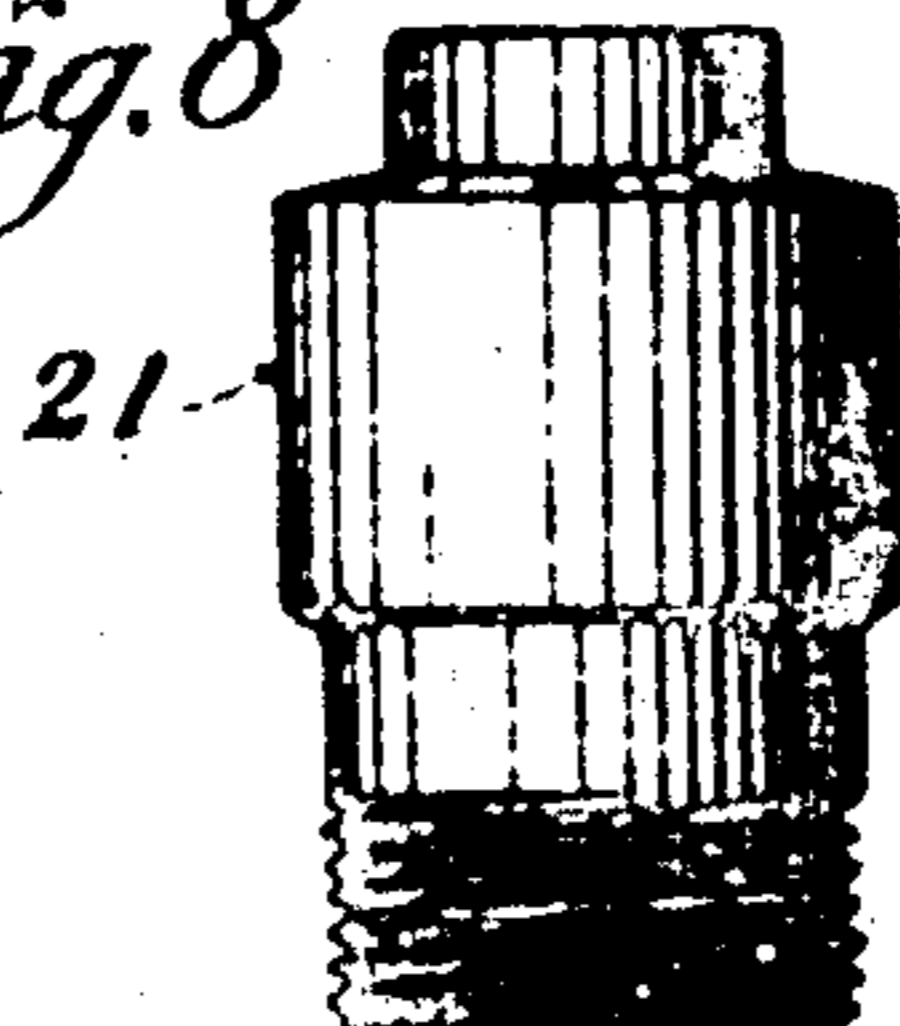


Fig. 10

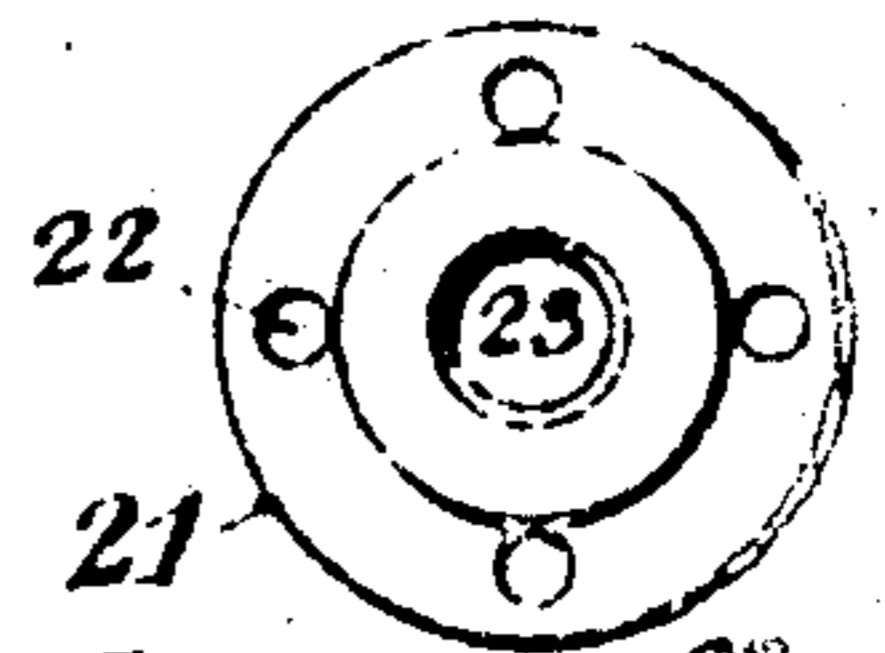


Fig. 9



Witnesses

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BOILER-CLEANING APPARATUS.

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To all whom it may concern:

Be it known that I, OTTO DONATZ, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented a certain new and useful Improvement in Boiler-Cleaning Apparatus, of which the following is a specification.

My invention relates to apparatus adapted to remove from the flues and other parts of steam boilers such accumulation of ashes, soot, etc., as tends to prevent the full utilization of the heat applied to the boiler, and has for its object apparatus adapted to the prompt and convenient removal of such ashes and soot from all parts of the boiler where they may lodge.

In the drawings accompanying, and forming a part of this specification, Figure 1 shows a front elevation of a return tubular boiler fitted with my invention; Fig. 2 shows a top view of the front portion of the boiler, and the connections illustrated in Fig. 1; Fig. 3 shows a side elevation of said boiler and fittings, with a portion of the shell of the boiler removed; Fig. 4 is a longitudinal section of the header; Fig. 5 is a horizontal section of the four-way valve, taken on the line 5-5 of Fig. 6, looking down; Fig. 6 is a vertical mid-section of said valve and its case; Fig. 7 is a section of valve proper; Fig. 8 is a side elevation of a nozzle; Fig. 9 is a vertical mid-section of said nozzle; and Fig. 10 is a top view thereof.

My invention as herein shown and described is an improvement on the construction shown and described in United States Letters Patent No. 784,552, granted to me for boiler flue cleaner, March 14th, 1905, and is applicable to tubular boilers, and useful in cleaning the flues and shell of the boiler from the accumulation of ashes and soot, which form rapidly in said parts, and prevent the direct action upon the boiler of the heat generated in the fire-box.

Referring to the accompanying drawings, I shall now describe my invention.

From the steam dome of the boiler 1, or the steam drum of a battery of such boilers, is led the tube 2, in which is located the valve 3. This tube 2 connects with a drip pipe 4, provided with the valve 5, and having its lower terminal in the ash pit 6 of the furnace. Said tube 2 also opens into the tube 7, which in turn opens into the case of

the valve 8. The valve 8 is a four-way valve, the valve plate 9 having but one port therein, and being operated by the lever 10, so that on turning the plate 9, a complete revolution, steam may be discharged in turn from each of the ports 11, 12, 13 and 14. Leading from these ports, respectively, are the tubes 15, 16, 17 and 18; the first three whereof connect with the header 19. This header is interiorly chambered in three compartments, (see Fig. 4). From each of these compartments open three of the depending tubes 20. Each of these tubes 20 is plugged at its lower end, and has formed in it a series of apertures opening centrally toward the ends of the boiler flues, before which the tubes 20 depend. Fitted in each of these openings is a nozzle 21, provided with four marginal apertures 22, and a central aperture 23, the last mentioned aperture 23, having its wall rifled, as shown in Fig. 9. The tube 18 opening from the valve 8 passes through the casing of the boiler and along the top of the shell of the boiler, as shown in Figs. 2 and 3, and is provided with the branching tubes 24, which are formed in pairs, and are provided with nozzles 21, directed toward the rear end of the boiler.

The operation of my construction is as follows. The draft from the fire-box 25, carries the light ashes and soot to the rear end of the boiler 1, and through the tubes thereof to the front end of the boiler, and thence over the top of the boiler to the stack 26. My apparatus is arranged to drive the accumulation of ashes from the flues at the boiler back into the space behind the fire-box, and such accumulation as forms upon the shell of the boiler out through the stack 24. When it is desired to clean the boiler, the valve 5 being opened, the valve 3 is opened, and the steam from the boiler passes first into the drip pipe 4, and into the ash pit 6, clearing all condensed steam from the pipes 2 and 4. The valve 4 is then closed and live steam passes into the case of the valve 8. As the lever 10 is turned the opening in the valve plate 9 is brought consecutively to the openings 11, 12, 13 and 14, and the steam is directed into the tubes 15, 16, 17 and 18, in turn or alternately as desired. If the steam be first driven through the tube 18 it is ejected through the nozzles 21 on the branch pipes 24, and sweeps from the boiler shell all the ashes and soot accumu-

lated thereon, driving the same up the stack 26. This accomplished the lever 10 is turned one-quarter of a revolution to right or left, and the steam passes through the tube 17, or the tube 15, accordingly, and passing through that one of the compartments or chambers of the header 19 with which the tube used is connected, enters the three depending tubes 20, opening from such compartment or chamber, and is ejected through the nozzles 21 thereon, and into and through the boiler flues opposite which those nozzles are placed. Clearing said flues of all deposits of products of combustion and throwing the same into the space below the rear end of the boiler. At each quarter turn of the lever 10 the same result is effected in three series of boiler flues, until all are thoroughly cleaned, when valve 3 is closed to shut off steam, and valve 5 opened to drain tubes and valve 8 into the ash pit.

The nozzles 21, are formed as shown, with marginal apertures opening outwardly at an angle with the axis of the nozzle, and the central aperture of the nozzle is rifled to project the steam against the entire inner side of each boiler flue, and to give it a whirling motion, calculated to more efficiently clear the tubes of all loose deposits.

Having thus described my invention, I claim:

1. The combination of a boiler, and means for simultaneously driving a plurality of jets of steam over the upper surface of the shell of said boiler, to clear it of accumulations of ashes and the like.

2. In boiler cleaning apparatus, the com-

bination of a steam duct located in part on the top of the shell of a boiler, and having a lateral extension provided with apertures opening therefrom with their axes substantially parallel with the top of said boiler shell, and a controlling valve for regulating the flow of steam through said duct and lateral extension.

3. In boiler cleaning apparatus, the combination of a main steam duct located on the upper part of the shell of a boiler, and extending longitudinally thereof, a series of lateral branches of said steam duct, each of said branches having a plurality of apertures opening toward one end of the boiler, and contiguous to the shell thereof, and means for controlling the flow of steam through said main duct and said lateral branches.

4. In boiler cleaning apparatus, the combination of a main steam duct; a plurality of secondary ducts directed respectively to the upper portion of the shell of a boiler, and to the ends of the flues thereof; one or more lateral extensions of the secondary duct directed to the upper portion of the shell of the boiler having apertures therein opening toward one end of the boiler; apertures in the others of said secondary ducts opening toward the ends of the boiler flues, and means for directing the flow of steam through said secondary ducts successively.

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