

910,804.

H. C. FABRI.
BOILER CLEANER.

APPLICATION FILED JULY 3, 1908.

Patented Jan. 26, 1909.

3 SHEETS—SHEET 1.

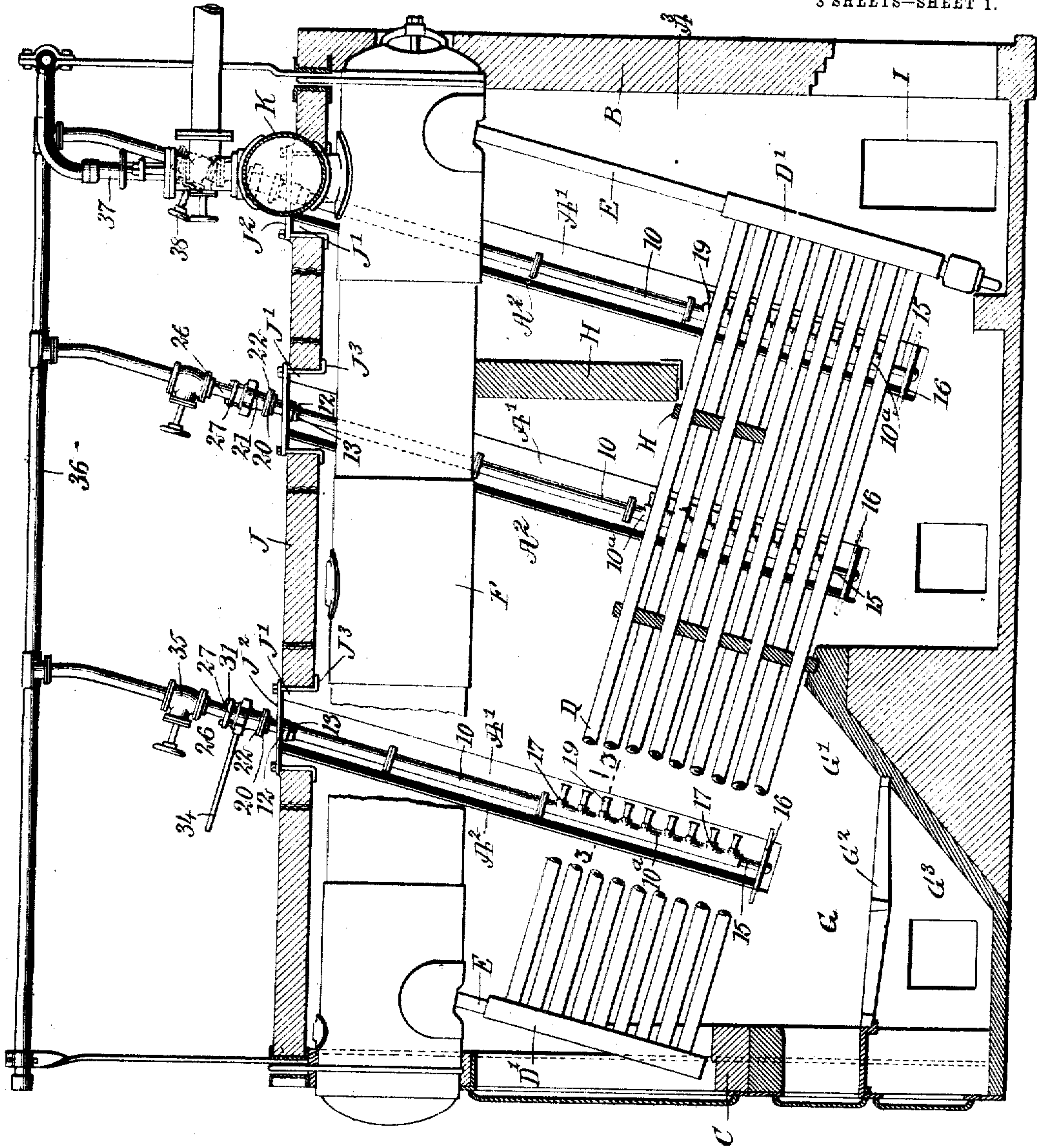


Fig. 1.

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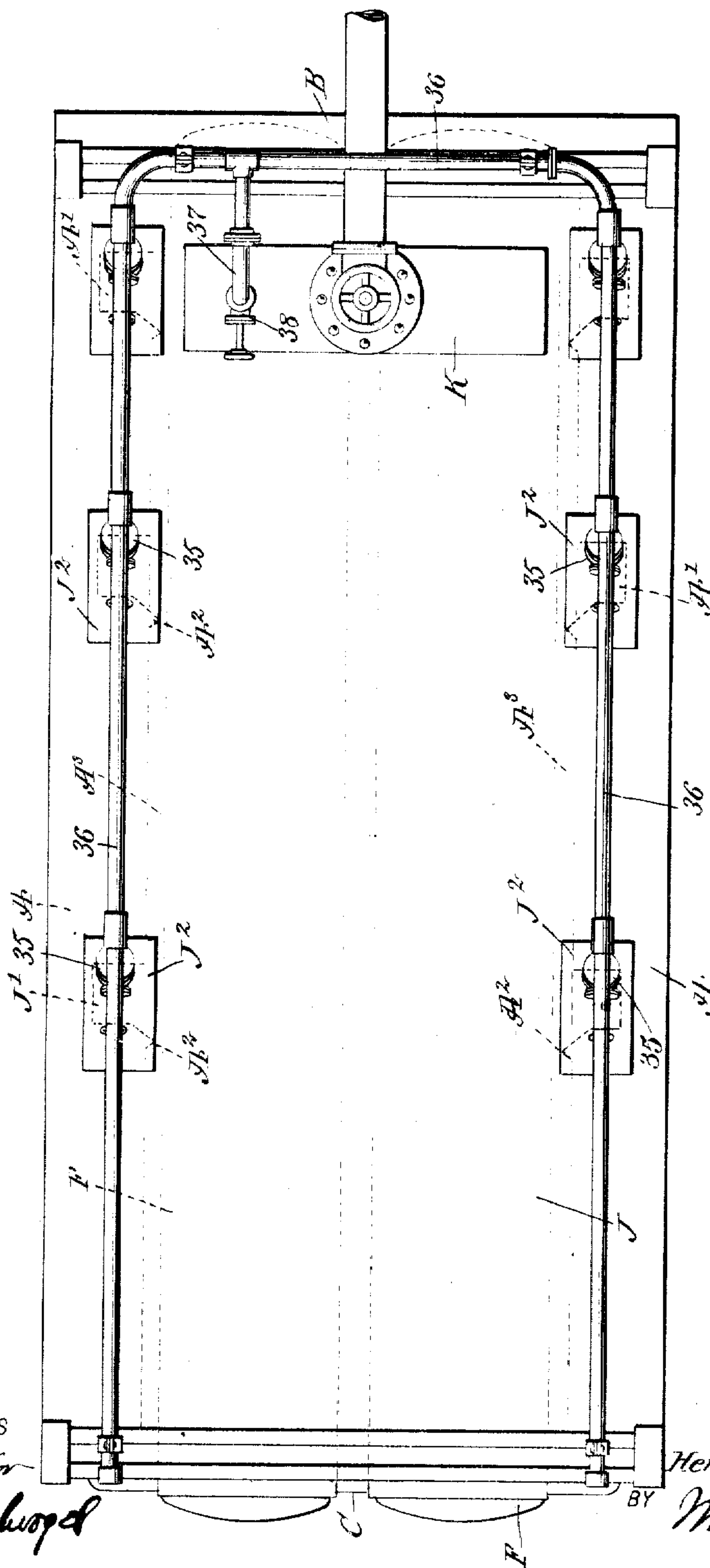
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3 SHEETS—SHEET 2.

Fig. 2.



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Fig. 5.

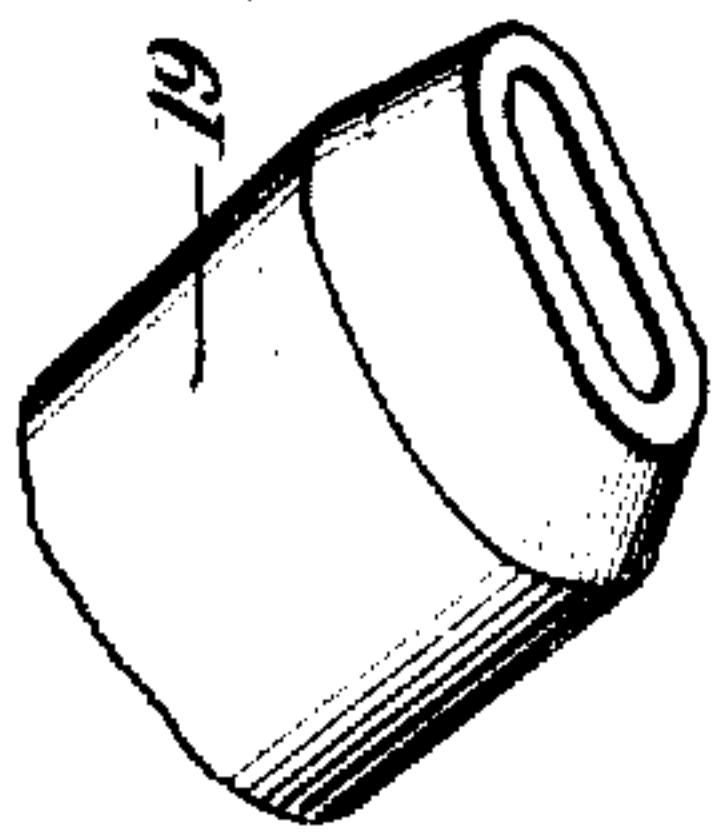
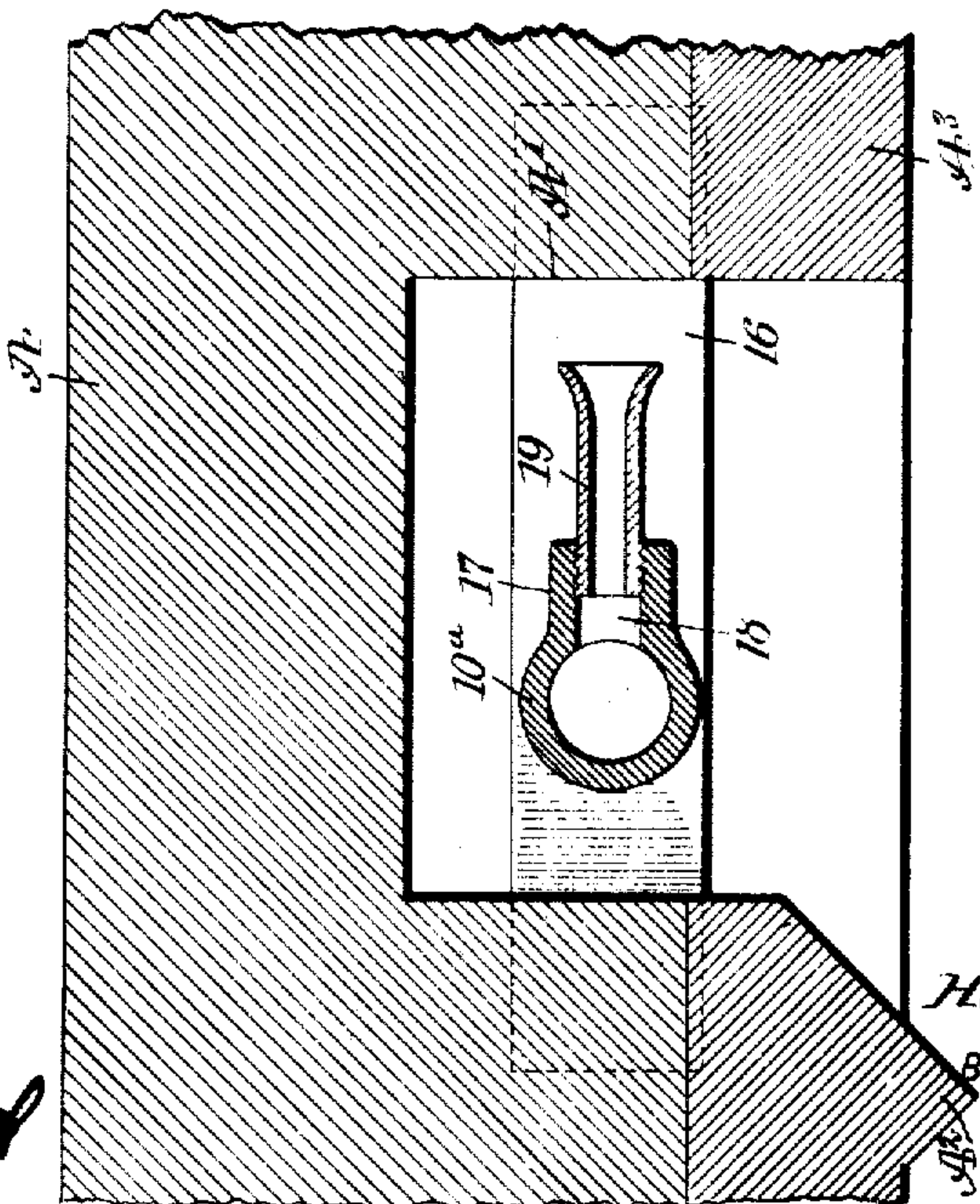
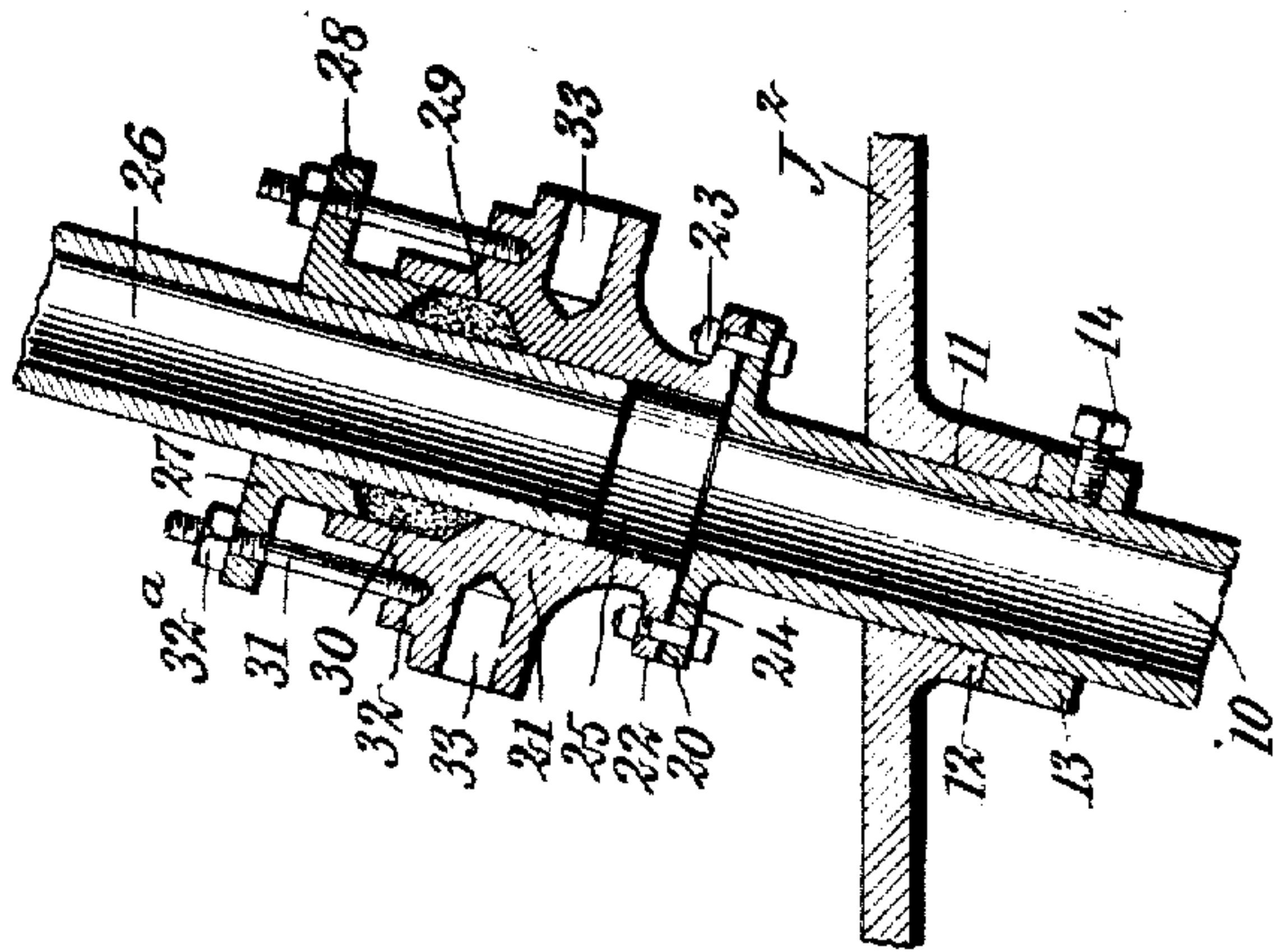


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENDRIK CORNELIS FABRI, OF SIDHOARDJO, JAVA.

BOILER-CLEANER.

No. 910,804.

Specification of Letters Patent.

Patented Jan. 26, 1909.

Application filed July 3, 1908. Serial No. 441,908.

To all whom it may concern:

Be it known that I, HENDRIK CORNELIS FABRI, a subject of the Queen of the Netherlands, and a resident of Sidhoardjo, Soerabaya, Island of Java, Dutch East Indies, have invented a new and Improved Boiler-Cleaner, of which the following is a full, clear, and exact description.

This invention relates to boiler cleaners, and is especially useful in connection with water tube boilers.

More particularly, the invention relates to a boiler cleaner having adjustable steam conduits provided with a plurality of nozzles arranged to be directed toward the tubes of the boiler and permitting the steam to escape in jets to remove the soot, ashes and other accumulations upon the tubes, and further having means for introducing steam into the conduits, and means for adjusting the conduits to direct the steam jets in different directions, the conduits being located in recesses provided therefor in walls of the boiler, to protect the conduits from the gases of combustion.

An object of the invention is to provide a simple, strong and efficient boiler cleaner for use in connection with water tube and other boilers, which can be manufactured inexpensively, and which can be applied to boilers of various forms of construction.

A further object of the invention is to provide a device of the class described which has adjustable means for directing steam jets against the tubes of boilers, to free the tubes from accumulations of soot, ashes and the like, and which is arranged so that it is normally protected when not in use, from the burning gases in the boiler.

A still further object of the invention is to provide a boiler cleaner which is extremely rapid in operation, which can be controlled from the top of the boiler, so that in a battery the boilers can be arranged side by side, without intervening spaces therebetween, and which can be used to clean the boiler tubes without interrupting the operation of the boiler.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference

indicate corresponding parts in all the views, and in which—

Figure 1 is a longitudinal section of a water tube boiler having my invention applied thereto; Fig. 2 is a plan view of the boiler, showing the arrangement of the boiler cleaner; Fig. 3 is an enlarged transverse section, on the line 3—3 of Fig. 1, of a portion of one of the side walls of the boiler, showing in cross-section one of the steam-conduits and a nozzle; Fig. 4 is an enlarged longitudinal section of a detail of one of the steam-conduits, and Fig. 5 is a perspective view showing a nozzle of modified form.

Before proceeding to a more detailed explanation of my invention, it should be understood that while the same is particularly useful in connection with that type of boiler known as a water tube boiler, it can also be advantageously applied to other types of boilers in which banks or nests of tubes are provided, and which it is necessary, from time to time, to free from accumulations of soot, ashes or the like. When boilers are arranged in a battery it is essential to position the individual boilers closely adjacent to prevent loss of heat, due to radiation from the sides of the boiler. With many forms of water tube boilers this cannot be done, as it is necessary to leave openings in the side walls and spaces at the sides, so that the banks of water tubes can be easily cleaned. My boiler cleaner is operated from the top of the boiler and thus permits the boilers to be arranged side by side without intervening spaces, when located in batteries. Furthermore, the use of my boiler cleaner does not interfere with the operation of the boiler and thus neither time nor combustible is lost. It will be understood that if the boiler tubes are incrustated with accumulations of soot or ashes, the efficiency of the boiler is lowered, and it is not only of advantage but is often absolutely necessary, to keep the tubes free from such accumulations, especially for the generation of steam under high pressure.

Referring more particularly to the drawings, A represents the side walls of a water tube boiler, having preferably, a lining of fire brick or the like. The walls may be fashioned from brick, masonry or any other suitable material.

B represents the back wall of the boiler, and C the front thereof.

The boiler includes the usual bank of water tubes D arranged at an angle with the horizontal and connected at the opposite ends by means of headers D'. The latter
5 are joined by means of circulating tubes E with the water and steam drums F.

At the front of the boiler is the furnace G having the furnace wall G', the grate-bars G² and the ash-pit G³. The flame and
10 gases of combustion from the furnace pass along the bank D of tubes, being suitably directed by baffle walls H, and subsequently escape from the boiler through the chimney flue I. Above the drums F is the usual
15 boiler top or roof J fashioned from brick, masonry or the like.

In each of the side walls A, at the inside thereof, are elongated recesses A' arranged at an angle with the horizontal, and at sub-
20 stantially right angles to the lengths of the tubes of the bank D. The roof of the boiler J has at the upper ends of the recesses A', openings J', closed by means of cover plates J² held in position by bolt clamps J³. At
25 the forward edge of each of the recesses A' is an inwardly extending lip A² fashioned from fire brick or other suitable material and preferably integral with the lining A³ of the wall A.

In each of the recesses A' is located an elongated steam conduit 10 consisting preferably of a cast iron pipe and extending through a suitable opening 11 of the plate J². At the opening 11, the plate, at the in-
35 side has a neck 12 against which abuts a collar 13 adjustably mounted upon the conduit 10 by means of a set screw 14. The collar serves to prevent the upward movement of the conduit though leaving it free to
40 turn. At the lower end each of the conduits has a stud 15, pivotally carried by a plate 16 mounted near the bottom of the recess A'. The section 10^a of the conduit adjacent to the bank D of tubes, has a series of lateral
45 extensions 17 provided with outlet openings 18. At the outer ends, the extensions 17 are interiorly threaded and receive the correspondingly threaded ends of nozzles 19 of any preferred or common form, and serving
50 to permit the escape of steam from the conduit in jets. The nozzles are so arranged that by suitably adjusting the conduits they can be directed between the tubes of the bank D so that the steam escaping from the
55 nozzles can blow away the accumulations upon the tubes.

At the upper end of each of the conduits 10 is formed a laterally extended flange 20 upon which is a head 21 having a flange 22
60 engaging the flange 20 and secured thereto by means of bolts 23 or in any other convenient manner. Between the flanges, if necessary, may be provided a gasket 24. The head 21 has an opening 25 therethrough,

registering with the top of the conduit 10. 65
A tube 26 has the end inserted in the opening 25 of the head and carries a stuffing-box gland 27 provided with a flange 28 and movable into an annular recess 29 of the head. The recess 29 contains suitable packing 30. 70
Bolts 31 having threaded extremities arranged in correspondingly threaded openings 32 of the head are arranged in openings of the flange 28 and carry nuts 32^a by means of which the gland 27 can be adjusted so that 75
a steam and water-tight fit between the head 21 and the tube 26 can be effected. At the sides, the head 21 has openings 33 in which can be inserted the end of a rod 34 by means of which the head and the conduit 80
10 can be turned and adjusted.

Each tube 26, above the head 21, has a valve 35 by means of which the flow of steam through the tube can be regulated. The tubes 26 of all the conduits 10 commu- 85
nicate with a common pipe 36 connected with the steam dome K of the boiler, through a connection 37 having a valve 38, by means of which the flow of steam therethrough can be controlled. 90

The arrangement is such that the conduits 10 are at substantially right angles to the lengths of the tubes of the bank D, so that when the conduits are adjusted, the nozzles 19 can be directed squarely between the 95
tubes to blow the accumulation therefrom. When not in use the conduits can be adjusted to swing the nozzles into the recesses A' which serve to protect them from contact with the flame and gases of combustion, the 100
lips A² of the recesses assisting to protect the conduits and the nozzles.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent: 105

1. A boiler cleaner, comprising an adjustable steam conduit having a plurality of nozzles for the escape of steam, the conduit being provided with a laterally extending flange at its upper end, a fixed steam pipe, a 110
steam-tight connection between said fixed pipe and said conduit, said connection including a head mounted to turn on the fixed pipe and having a flange rigidly secured to the flange of the conduit, means for adjust- 115
ing said connection to adjust said conduit whereby the steam escaping from said nozzles can be directed in a plurality of directions, and means for controlling the flow of steam into said conduit. 120

2. In combination, a boiler having a side wall provided with a recess at the inside thereof, a steam conduit movably arranged in said recess and having a plurality of lateral extensions provided with outlet openings in- 125
ternally threaded at their outer ends, nozzles for the escape of steam, the said nozzles having threaded ends for screwing in the

aids extensions of the conduit, means for introducing steam into said conduit, and means for adjusting said conduit from the outside of said boiler.

- 5 3. In combination, a boiler having a side wall provided with a recess at the inside thereof, a steam conduit rotatably mounted in said recess and having a plurality of nozzles for the escape of steam, said nozzles being adapted to be arranged within said recess and to be projected therefrom when said conduit is rotated, a cover plate at the upper end of said recess provided with an opening through which the said conduit extends, the
10 said cover plate having an inwardly extending neck, a collar adjustably secured on the said conduit and engaging the said neck, a fixed steam pipe at the outside of said boiler, a connection between said conduit and said
15 fixed pipe, said connection having a movable steam-tight communication with said fixed pipe, and means for adjusting said connection to adjust said conduit.

4. In combination with a boiler, a rotatable steam conduit therewithin having a plurality of escape nozzles, the said conduit having a laterally extending flange at its upper end, a fixed steam pipe outside of said boiler, a head rotatably mounted upon said
25 fixed pipe and having an adjustable gland, said head communicating with said conduit, and having a flange at its lower end rigidly secured to the flange of the conduit, means for adjusting said head to adjust said con-

duit, and means for controlling the flow of steam through said pipes. 35

5. In combination, a boiler having a side wall provided with a recess, said recess at one edge having an inwardly extended protective lip, a movable steam conduit within said recess and having lateral extensions provided with outlet openings, escape nozzles secured in the outlet ends of said extensions, said conduit being adjustable to project said nozzles from said recess or to withdraw said nozzles into the same, means for adjusting said conduit, and means for introducing steam into the same. 40 45

6. In combination a boiler, a plurality of steam conduits arranged within said boiler and having escape nozzles, said conduits extending through the top of said boiler, a valve controlled steam pipe connected with the dome of the boiler, valve controlled tubes leading from said pipe, and heads mounted to turn on the lower ends of said tubes, the heads being rigidly secured to the respective conduits and communicating therewith, each of said heads being provided with openings in its sides for the insertion of a tool to turn the head and conduit. 50 55 60

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENDRIK CORNELIS FABRI.

Witnesses:

JOHAN HENDRIK GUIJT,

ROBERT SCOTT KEASBERRY.