No. 825,971. PATENTED JULY 17, 1906.

J. HUTCHISON.

BOILER CLEANER.

APPLICATION FILED JULY 14, 1905.

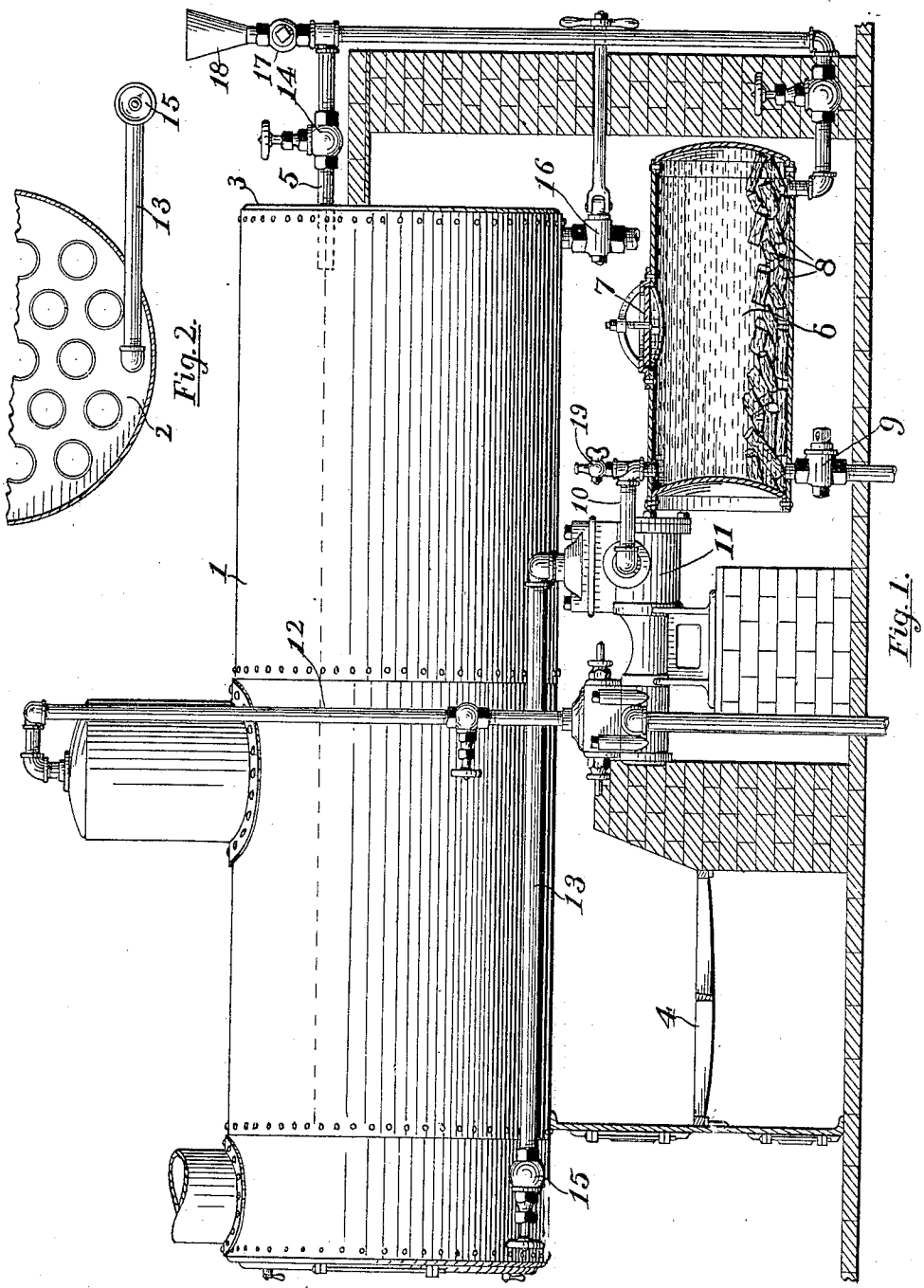

Fig. 2.

Fig. 1.

Witnesses
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JOHN HUTCHISON, OF JACKSON, MICHIGAN.

BOILER-CLEANER.

No. 825,971. Specification of Letters Patent. Patented July 17, 1906.

Application filed July 14, 1905. Serial No. 269,591.

To all whom it may concern:

Be it known that I, JOHN HUTCHISON, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Boiler-Cleaners and Explosion-Preventers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in means for cleaning boilers and preventing explosions of the same; and its object is to provide a continuously-operative means for removing all of the sediment and solid matter from the boiler, to provide means for maintaining constant circulation of the water in the boiler, to provide means for preventing any sediment from accumulating in the boiler directly over the fire, and to provide the device with various new and useful features hereinafter more fully described, and particularly pointed out in the claims.

My device consists, essentially, of a settling and purifying tank provided with a manhole for inserting purifying material, a circulating pump or injector, a boiler having a blow-off at the end remote from the fire, and pipes connecting the tank and pump in circuit with the respective ends of the boiler, said pipes forming a complete circuit extending from the rear of the boiler near the water-level, through the settling and purifying tank and pump or injector, and opening into the boiler at the front and near the bottom thereof, whereby a constant circulation of water is maintained in the boiler and the sediment carried by the current of water from the front of the boiler to the rear of the same, the heavier portions of the sediment being discharged through the blow-off and the lighter portions received by the connecting-pipe, carried into the settling and purifying tank, and discharged from the bottom thereof, as will more fully appear by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention with the settling and purifying tank shown in vertical section, and Fig. 2 a detail of a portion of the front end of the boiler and a portion of the circulating-pipe.

Like numbers refer to like parts in both the figures.

1 represents a steam-boiler, 2 the front head thereof, 3 the rear head of the same, 4 a grate on which the fire is maintained, all of the usual construction.

5 is a pipe inserted in the boiler near the rear end thereof and located near the level of the surface of the water in the boiler and adapted to receive whatever deposit or scum from the water that may arise to the surface thereof, together with a current of water from the boiler, and conduct the same to the rear and bottom portion of a settling and purifying tank 6, adapted to withstand the full boiler-pressure and provided with a manhole at the top closed by a suitable plate 7. Within this tank I propose to place any suitable ingredient to aid in purifying the water, the material shown being represented as pieces of oak-wood, the tannin and other chemical ingredients thereof being adapted to separate the sediment and to prevent the same from adhering to the interior of the boiler and surface of the flues. This tank 6 has such capacity that the current therethrough is very slow, and in consequence the sediment therein will settle to the bottom of the tank and can be drawn off by means of the blow-off 9. From the upper part of this tank a pipe 10 extends to a circulating-pump or injector 11, of any convenient construction and operated by steam drawn through the pipe 12 from the boiler. This pump or injector is connected to the boiler at the lower part of the front head by means of a pipe 13, whereby the said pipe discharges a stream of water into the boiler directly over the fire and projects this stream toward the rear end of the boiler, whereby the current carries any sediment that may settle in the boiler toward the rear thereof, where such sediment is periodically drawn off by opening the blow-off 16. It will thus be noted that the constant operation of the pump 11 will maintain a constant circulation throughout the boiler from front to rear and effectually prevent any accumulation of sediment above the fire, which is a prolific cause of boiler explosions. The quiescent condition of the water in the boiler when no steam is being drawn from the same is also very liable to produce an explosion and is effectually prevented by the operation of this device. Furthermore, by means of the blow-off 16 and pipe 5 all sediment, either lighter or heavier than the water is quickly removed from the boiler and either discharged through the valve 16 or collected in the settling-tank 6

and discharged through the valve 9, the consequence being that the boiler is kept entirely free from all deposit or scale or other solid matter and in best possible condition and explosions and incrustations effectually prevented.

A valve 14 in the pipe 5 is provided and also a valve 15 in the pipe 13, which valves when closed will cut out the circuit through the tank and pump, and thus permit of cleaning or repairing either of them as occasion arises. I also provide a petcock 19 to remove the air when filling the tank 6 with water and a stop-cock 17 and funnel 18 for filling the said tank when starting the device.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a steam-boiler having a blow-off at the rear, a settling and purifying tank, a circulating-pump, a pipe connecting the pump and tank, a pipe connecting the tank in a closed circuit with the rear end of the boiler near the water-line, and a pipe connecting the pump with the front end of the boiler at or near the bottom thereof.

2. The combination of a boiler, a grate under the front end of the boiler, a blow-off at the bottom of the rear end of the boiler, a settling and purifying tank and circulating-pump connected to each other, a pipe extending from the water-level at the rear end of the boiler to the tank and a pipe extending from the tank to the pump and from the pump to the front end of the boiler and opening into the same at the bottom of the boiler and above the grate.

3. The combination of a boiler, a grate under the front end of the boiler, a blow-off at the bottom and rear of the boiler, a settling and purifying tank, a circulating-pump connected to the upper part of the said tank, a pipe extending from the rear end of the boiler and from near the water-level of the same to the lower part of the said tank, and a pipe extending from the pump to the lower front part of the boiler and opening rearward above the grate.

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

JOHN HUTCHISON.

Witnesses:

LYMAN B. TRUMBULL,

HERBERT H. MUNRO.