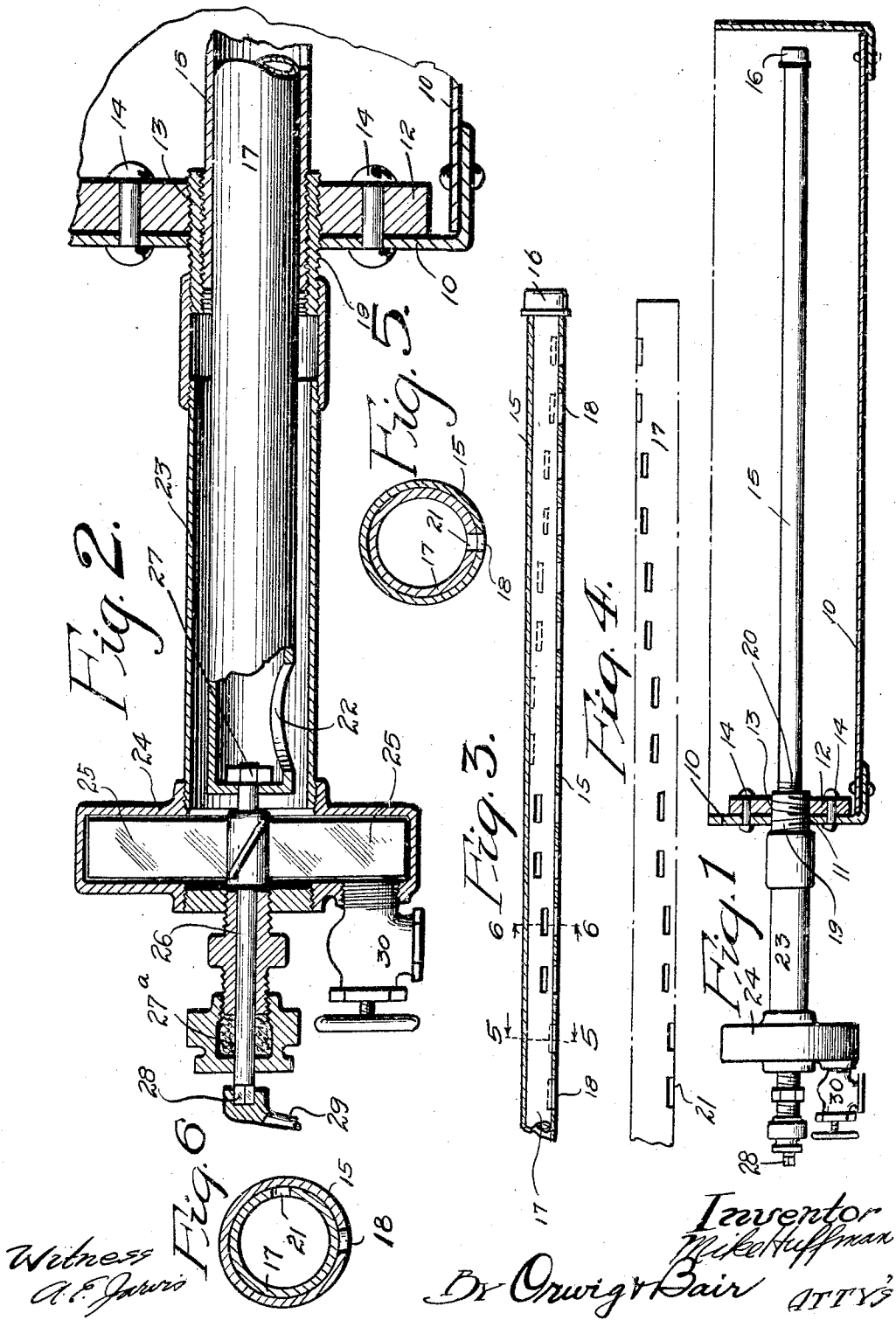


M. HUFFMAN.
STEAM BOILER CLEAN-OUT DEVICE.
APPLICATION FILED MAR. 16, 1920.

1,410,312.

Patented Mar. 21, 1922.



UNITED STATES PATENT OFFICE.

MIKE HUFFMAN, OF DES MOINES, IOWA.

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To all whom it may concern:

Be it known that I, MIKE HUFFMAN, a citizen of the United States, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Steam-Boiler Clean-Out Device, of which the following is a specification.

The object of my invention is to provide a steam boiler clean-out device of simple, durable and inexpensive construction.

A further object of my invention is to provide a rotatable and stationary tube mounted in a steam boiler, near its bottom, and extending outwardly through one of the walls of the boiler, and having means connected with the rotatable tube, exterior to the boiler, whereby the water discharged from the boiler will cause said rotatable tube to rotate.

Still a further object is to provide means whereby a rotation of the movable tube will automatically cause openings therein to progressively register with openings in the outer tube, thereby permitting the steam in the boiler to cause the water to be forced through the registering openings to produce a considerable amount of agitation within the boiler adjacent to the openings, and thus stir up and remove sediment and other foreign material within the boiler.

Still a further object is to provide a pair of tubes, having openings therein, and capable of registering progressively with each other, a water motor exterior of the boiler, operatively connected with one of the tubes, so that when the water from the boiler is discharged through the registering openings into the tubes, it will pass through the water motor, thus causing the water motor to rapidly rotate one of the tubes, the water motor being provided with a lever for rotating it, if for any reason the discharging water fails to start the motor rotating.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a central, sectional view through the lower portion of a steam boiler, with my improved device attached thereto.

Figure 2 shows a central, sectional view

through the operating mechanism of my device.

Figure 3 shows the inner and outer tubes, the outer tube being shown in section to better illustrate the construction.

Figure 4 shows a diagrammatic view of the inner tube, showing the arrangement of the openings.

Figure 5 shows a sectional view on line 5—5 of Figure 3, showing the openings in the inner and outer tube in registering position.

Figure 6 shows a sectional view on line 6—6 of Figure 3, the openings being shown out of registration.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate a portion of a steam boiler. It will be seen that my device may be used as either an attachment for boilers already installed, or may be placed in a boiler when the boiler is first being installed.

In one end of the boiler, an opening 11 is provided through which my device may be inserted into the interior of the steam boiler. Adjacent to that portion of the boiler, having the opening 11 therein, I provide a plate 12, which has a screw-threaded opening 13 therein, adapted to register with the opening 11 in the boiler.

The plate 12 may be bolted or riveted to the boiler 10 by means of rivets or bolts 14.

It will be seen that the plate 12 would be placed on the interior of the boiler, if my device were installed when the boiler was first being installed, and that it would be placed on the outside of the boiler, if my device were installed as an attachment, after the boiler had been in operation for some time.

The outer or stationary clean-out tube is indicated by the reference numeral 15, and is provided with a cap 16 on one end. Rotatably mounted within the outer or clean-out tube 15 is an inner tube 17. The outer tube 15 is provided with a plurality of spaced openings 18, as is clearly shown in Figure 3 of the drawings. The openings 18 are so arranged that they will be on the under side of the tube 15, when the tube is properly installed.

Received in the screw-threaded opening 13 of the plate 12 is a screw-threaded sleeve 19. The sleeve 19 extends outwardly through the walls of the boiler. The tube 15 is pro-

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vided near its forward end with a screw-threaded portion 20, which is designed to be screwed into the screw-threaded opening of the sleeve 19, thereby forming a bearing for the tube 15, and for holding it in proper position.

The inner tube 17 is also provided with a plurality of spaced openings 21. In the drawings, I have shown the openings 21 arranged in pairs, each pair being in a different horizontal plane, so that when the inner tube 17 is rotated only one pair of openings will register at a time with the openings 18 in the outer tube 15.

The inner rotatable tube 17 is of greater length than the outer tube, and is provided near its forward end with an enlarged opening 22, the purpose of which will be hereinafter more fully set forth.

A casing 23 is suitably secured to the sleeve 19, and forms a casing for the extended portion of the inner tube 17. Secured to the free end of the casing 23 is a motor casing 24, in which is mounted a water motor 25. The water motor 25 is mounted on a shaft 26, which is fixed to the inner rotatable tube at 27.

It will be seen from the description of the foregoing parts, that rotation of the water motor 25 will cause the inner tube 17 to rotate. The forward end of the shaft 26 is provided with a packing 27^a to prevent any leakage. The outer end of the shaft 26 is provided with a squared portion 28, which is designed to receive the lever 29 for manually rotating the inner tube 17.

A valve 30 is mounted in the motor casing 24 through which the water from the boiler is permitted to be discharged.

It will be seen that when the valve 30 is opened, that the water in the boiler will be forced through the registering openings into the tubes into the inner tube, and be carried through the inner tube, and through the opening 22 into the motor casing 24, and then discharged through the outlet valve 30.

The action of the water passing through the motor casing 24 will cause the motor 25 to rotate rapidly, thus causing the inner tube 17 to automatically rotate.

It will be seen that by rotating the inner tube 17, one pair of openings will register with the openings in the outer tube at a time. Then when the water is being discharged through the valve 30, a great amount of agitation will be produced within the boiler near the registering openings, which will insure the loosening of any scale or sediment, which is likely to form on the bottom of the boiler, and cause it to be carried out with the discharging water, in this way entirely cleaning the boiler.

By making the openings progressively register with each other, the entire agitation caused by the steam discharging pressure

upon the water will be centralized upon that point of the boiler adjacent to the openings.

The pressure upon the discharging water will be just exactly the same, whether the registering openings are near the forward end of the boiler or whether the openings are near the opposite end of the boiler, thus insuring the motor to operate regardless of where the water is taken into the inner tube 17.

In the event, that for any reason the motor should fail to start, I have provided the lever 29, which may be manually operated for rotating the motor or for starting it.

Some changes may be made in the construction and arrangement of the parts of my improved device without departing from the essential features and purposes of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a device of the character described, the combination of an outer and an inner tube, one rotatable relative to the other and both being provided with openings capable of being brought into registration upon the turning of the rotatable tube, said tubes being designed to be placed into a steam boiler near its bottom and extended outwardly through the boiler to a point of discharge, and a water motor fixedly connected to the rotatable tube at a point exterior to the boiler, said parts being so arranged that the water forced through the registering openings in the tubes will pass through the water motor and cause the water motor to rapidly rotate said rotatable tube.

2. In a device of the character described, the combination of an outer and an inner tube, one rotatable relative to the other, and both being provided with openings capable of being brought into registration upon the turning of the rotatable tube, said tubes being designed to be placed into a steam boiler near its bottom and extended outwardly through the boiler to a point of discharge, a motor casing exterior to the boiler, a water motor mounted in said casing and fixedly connected to the rotatable tube, a valve controlled outlet in said casing, the parts being arranged that the opening of said valve will cause the water forced through the registering openings in the tubes to pass through the water motor and cause the water motor to rapidly rotate said rotatable tube.

3. In a device of the character described, the combination of an inner and an outer tube, said outer tube being formed with a plurality of spaced aligned openings, said inner tube being formed with a plurality of pairs of spaced openings, said last described pairs of openings being arranged in differ-

ent horizontal planes, whereby rotation of said inner tube relative to said outer tube will cause said pairs of openings to progressively register with said first described openings, and means connected to said inner tube, to be acted upon by the discharging water through it, for causing said inner tube to rotate.

4. In a device of the character described, the combination of an inner and an outer tube, said outer tube being formed with a plurality of spaced aligned openings, said inner tube being formed with a plurality of pairs of spaced openings, said last described pairs of openings being arranged in different horizontal planes, whereby rotation of said inner tube relative to said outer tube will cause said pairs of openings to progressively register with said first described openings, means connected to said inner tube for causing it to rotate, said last means comprising a water motor mounted in a casing, a valve mounted in said casing, whereby the opening of said valve will cause steam from the boiler to force water there-through, the water in its path of travel rotating said water motor which in turn rotates said inner tube.

5. In a device of the character described, the combination of an outer and an inner tube, said outer tube being permanently fixed in the interior of a steam boiler, and formed with a plurality of spaced aligned openings, said inner tube being formed with a plurality of pairs of spaced openings, said last described pairs of openings being arranged in different horizontal planes, a closure member on one end of said outer tube, said inner tube being extended laterally through the free end of said outer tube, a casing secured to the boiler and adapted to encase the extended portion of said inner tube, means within said casing and opera-

tively connected with said inner tube, to be acted upon by the discharging water through it, for causing said inner tube to rotate, a valve mounted in said casing, whereby the opening of said valve will permit water to be discharged, causing said last means to operate.

6. In a device of the character described, the combination of an inner and an outer tube, said outer tube being formed with a plurality of spaced aligned openings, said inner tube being formed with a plurality of pairs of spaced openings, said last described pairs of openings being arranged in different horizontal planes, whereby rotation of said inner tube relative to said outer tube will cause said pairs of openings to progressively register with said first described openings, a valve operatively connected with said inner tube, a water motor interposed between said inner tube and said valve, whereby the opening of said valve will cause the steam from the boiler to force the water through the valve, thus causing said water motor to rotate, which in turn rotates said inner tube.

7. In a device of the character described, the combination of an inner and an outer tube, said tubes being designed to be placed in a steam boiler near its bottom and extended outwardly through the steam boiler, one of said tubes being rotatable relative to the other, both tubes being formed with openings capable of registering progressively with each other, as one of said tubes is rotated relative to the other, means fixedly connected with one of said tubes, exterior to the boiler and adapted to be acted upon by the discharging of water from the steam boiler, for causing one of said tubes to rotate.

Des Moines, Iowa, December 2, 1919.

MIKE HUFFMAN.