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PATENTED FEB. 19, 1907.

G. PATTERSON.
FLUE CLEANER FOR STEAM BOILERS.
APPLICATION FILED OCT. 30, 1906.

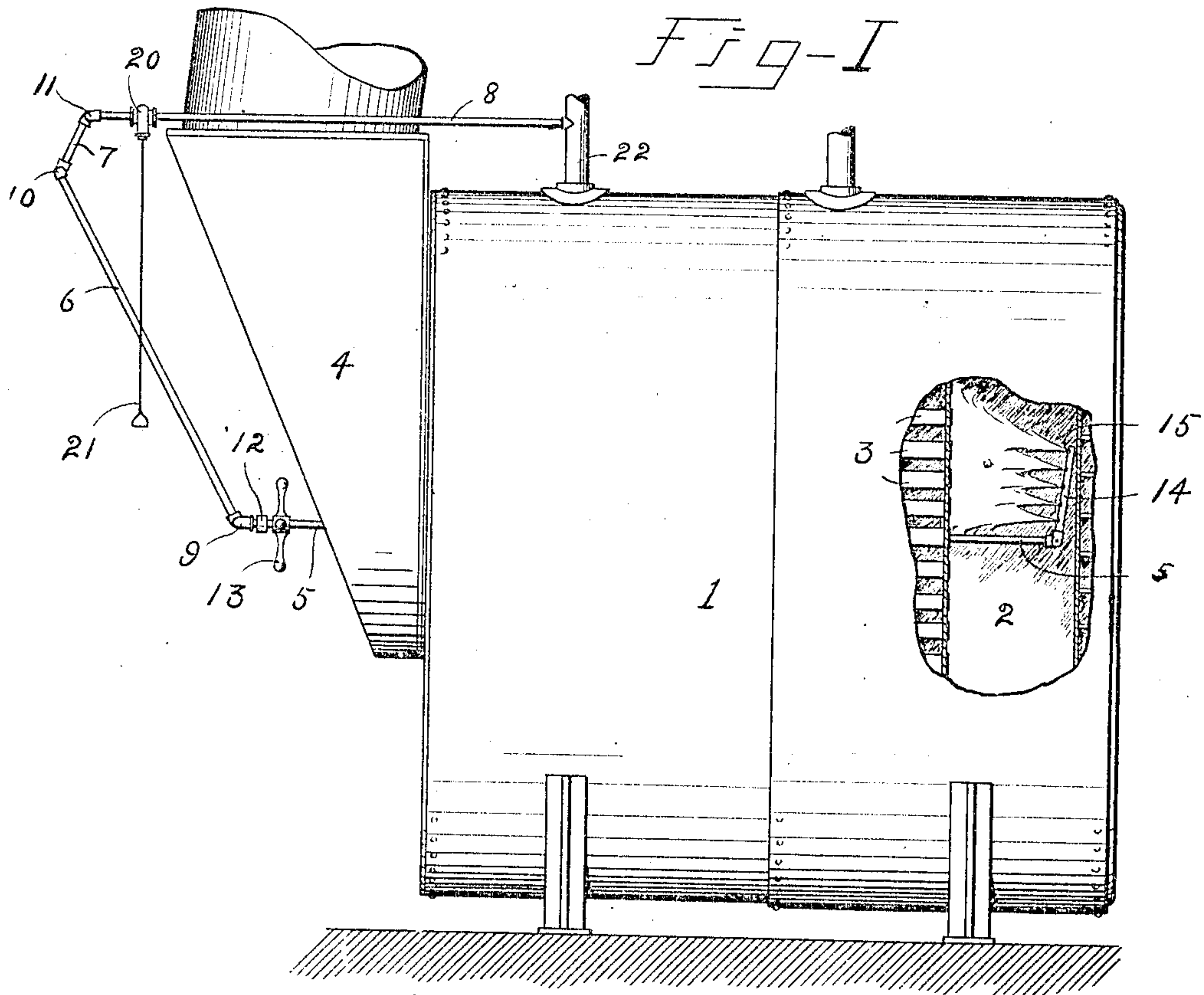


Fig-4

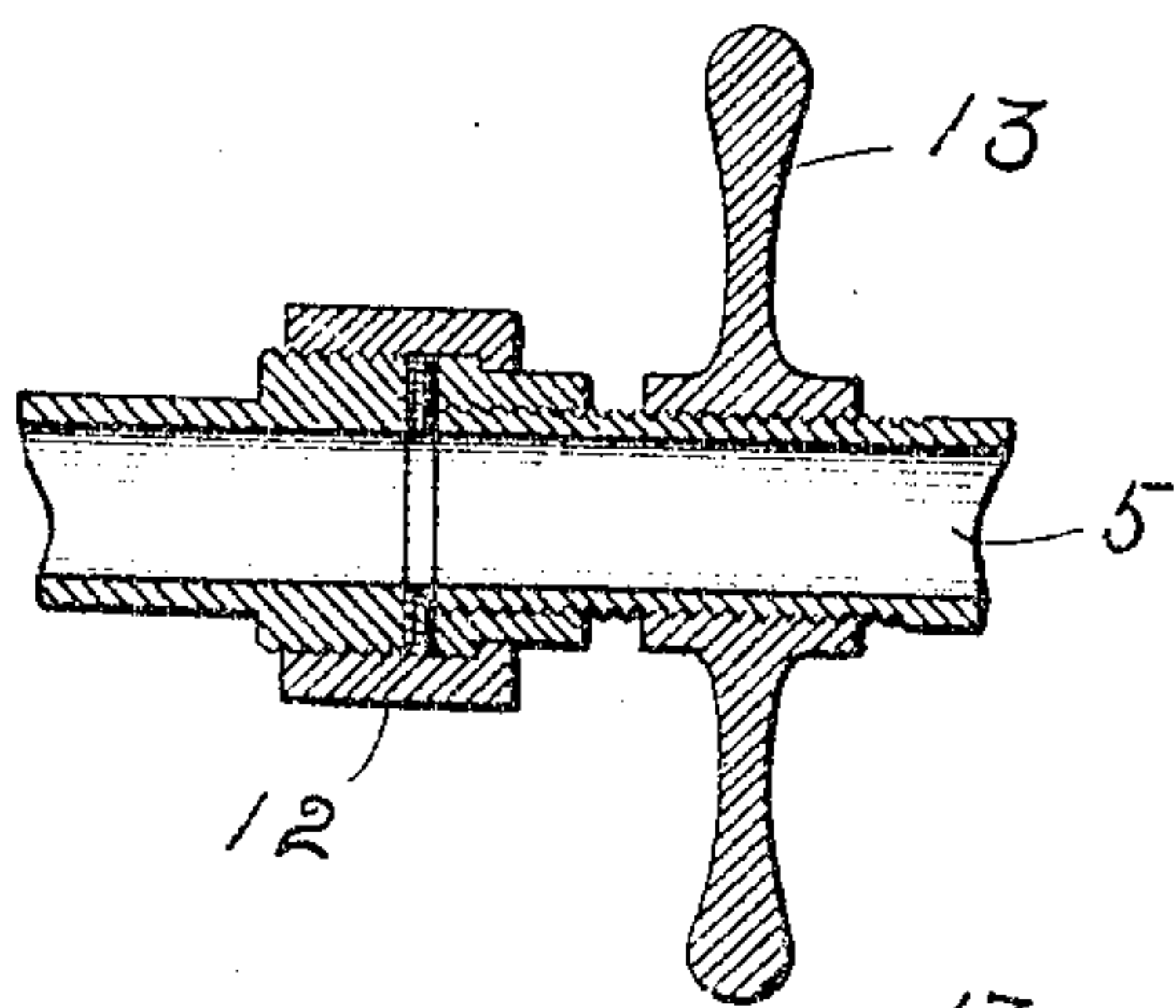
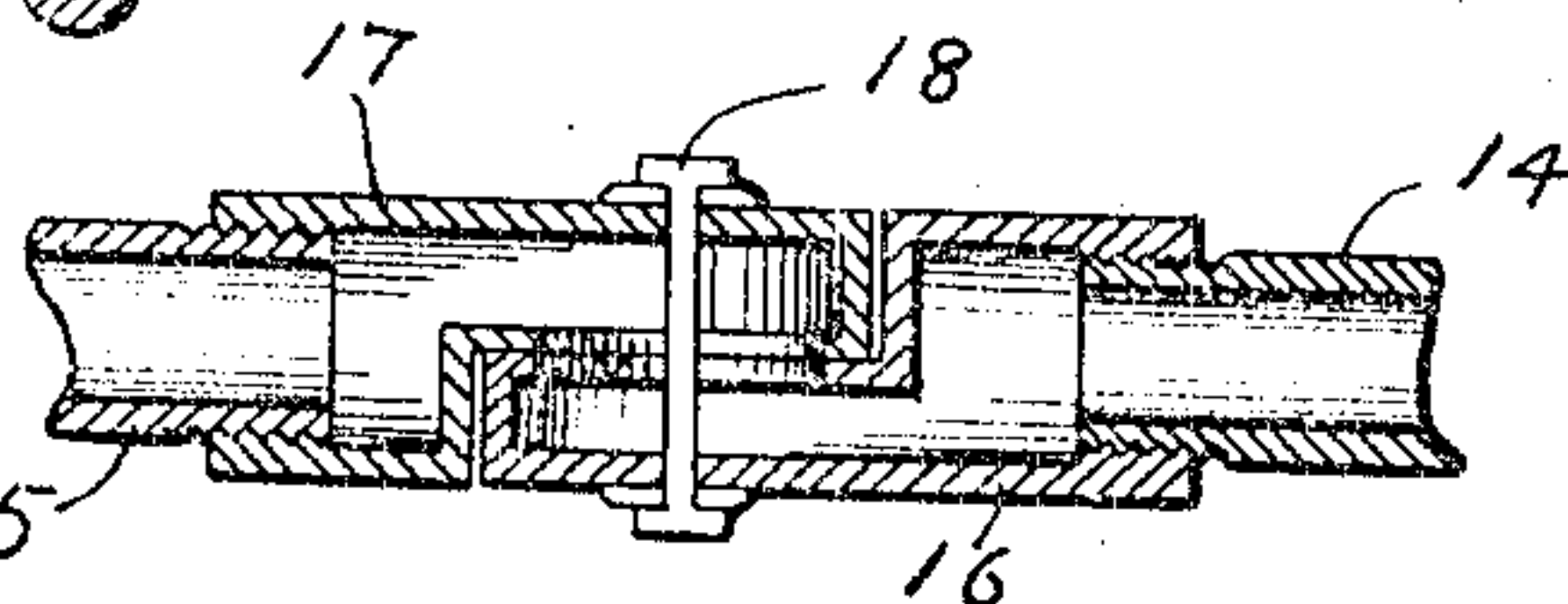
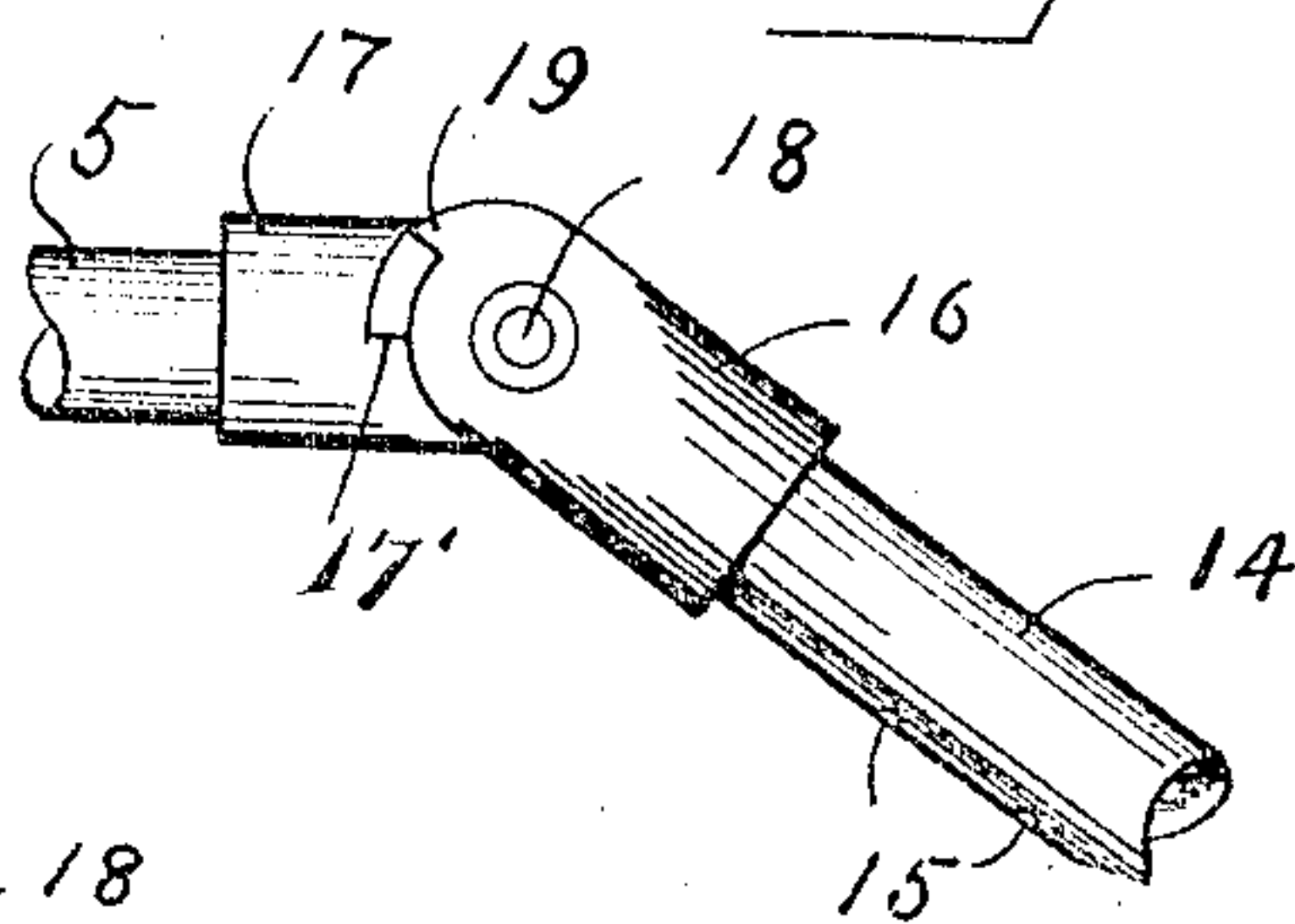


Fig-2



WITNESSES:

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Fig-3

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FLUE-CLEANER FOR STEAM-BOILERS.

No. 844,740.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed October 30, 1906. Serial No. 341,311.

To all whom it may concern:

Be it known that I, GILBERT PATTERSON, a citizen of the United States, residing at Duluth, in the county of St. Louis, State of Minnesota, have invented certain new and useful Improvements in Flue-Cleaners for Steam-Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in flue-cleaners for steam-boilers, and has for its object to provide a simple device for this purpose, and especially one whose discharge and radius of action may be moderated by the operator from the front of the boiler.

In drawings forming part of this specification, Figure 1 is a side elevation of a marine boiler fitted with my improved flue-blower, showing a broken portion of the boiler-shell removed to exhibit the blower in operation. Fig. 2 is a side elevation of the elbow-joint which operates within the boiler. Fig. 3 is a longitudinal section of the inner elbow-joint, and Fig. 4 is a vertical section of the joint at the opposite end of the blower-pipe.

Referring now to the drawings, 1 represents the steam-boiler of ordinary construction, in one end of which is formed the combustion-chamber 2, the lower portion of which communicates with the furnace of the boiler and the upper portion with the longitudinal flues 3, which at their upper ends communicate with the stack-breeching 4.

It is found in practice that steam discharged from within the combustion-chamber out through the flues is the most effective way of cleaning the latter and that if this is done frequently the steam-generating capacity of the boiler is greatly increased. To accomplish this in the simplest and most efficient manner possible, I install a small pipe 5 within the centermost flue and which projects at the operating end out through the stack-breeching 4 and from there to communicate by a flexible connection to the steam-supply 22 of the boiler. For this steam connection I have shown the pipes 6, 7, and 8, they being connected by elbows or flexible joints as are in common use at the points 9, 10, and 11, so as to admit of the pipe 5 being drawn back and forth within the tube. A joint 12 is provided adjacent the elbow 9, in which the end of the pipe 5 is securely fastened, and this being constructed on the principle of a regular pipe union will admit of the pipe 5 being revolved, which is

accomplished by means of the hand-wheel 13. To the opposite end of the pipe 5, which extends within the combustion-chamber, is attached the short piece of pipe 14, having perforations 15 in one side thereof through which the steam is designed to pass and discharge within the flues or against the inner walls of the combustion-chamber.

The pipes 5 and 14 are connected by means of a peculiarly-constructed elbow-joint, as shown in detail in Figs. 2 and 3, it consisting of two hollow metal parts 16 and 17, made to cooperate with each other, their inner contacting faces being smooth and held together by means of the through-bolt 18, which will make practically a steam-tight joint and yet admit of an angular movement of the pipe 14 in the direction shown in Fig. 2, but is prevented from moving beyond a straight line with the pipe 5 in the other direction by the engagement of the lugs 17' and 19. Thus it will be seen that the pipe 14 can only attain an angular position relative to the pipe 5 in a certain direction, and that angle is always formed in a direct line with the perforations 15 in the pipe 14, so that if the pipe 5 is shoved through the flue till the pipe 14 extends within the combustion-chamber and if turned with the perforations facing downward said pipe 14 will drop of its own accord to an angle of ninety degrees to the pipe 5, with the perforations 15 facing the ends of the boiler-flues. Now if steam is admitted within the pipe 5 the discharge of same through the perforations within the pipe 14 will have a tendency to throw it back to its original position parallel with the pipe 5. However, it can be prevented from doing so by the operator extending the pipe 5 still farther within the combustion-chamber, so that the end of the pipe 14 will bear against the back wall of the chamber, as shown in Fig. 1. By this arrangement it will be seen that the direction of the discharge of steam from the pipe 14 may be varied to suit the operator, as it frequently happens that there are a number of tubes out of a true radius from the center one, in which is located the pipe 5. Again, if steam is admitted to the blower as soon as the pipe 14 is fully within the combustion-chamber and before it is sufficiently far to touch the back wall thereof then it will attain a horizontal position by the backward action of the discharging steam through the perforations, and if revolved in this position by means of the hand-

wheel 13 the steam will be discharged against the circumferential walls of the combustion-chamber and effectually clean them.

I have shown a globe-valve 20 as being installed in the pipe 8 for admitting or shutting off the steam and for convenience of access provide the valve with a depending hand-rod 21.

From the foregoing it will be seen that the pipe 5 is longitudinally movable and rotatable, carrying at one end a handle for manual operation and at the same end has a flexible and rotatable supply connection with the steam-supply, while its other end is provided with a swinging steam-operated pipe 14, which may be termed a "jet-orifice" pipe. It will also be observed that the swinging jet-orifice pipe has its orifices at the side thereof opposite to the direction in which it swings under the influence of the impact of the escaping steam. It will also be observed that the length of the swinging jet-orifice pipe is less than the longitudinal depth of the fire-box, whereby the said swinging pipe is permitted to assume a horizontal position under the influence of the escaping steam when the pipe 5 is moved outward and that the impact of the escaping steam will hold the said swinging pipe in a horizontal position as the pipe 5 is rotated, and thus cause the escape of the steam to impinge against all portions of the inner wall of the fire-box as the pipe 5 is rotated.

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

1. A boiler-flue-cleaning device, comprising a longitudinally-movable and rotatable pipe adapted to pass through the flue of a boiler and of a length greater than the length of the flue, whereby one end projects to the outside of the boiler, and the inner end projects beyond the inner end of the flue, and a swinging jet-orifice pipe connected and in communication with the inner end of the said pipe.

2. A boiler-flue-cleaning device, comprising a longitudinally-movable and rotatable pipe adapted to pass through the flue of a boiler, and of a length greater than the length of the flue, a handle connected to the outer end of the pipe for rotating and moving it longitudinally, and a swinging jet-orifice pipe in communication with and connected to the inner end of the said longitudinally-movable pipe.

3. A boiler-flue-cleaning device comprising a pipe adapted to be passed through the flue of the boiler and of a length greater than the length of the flue, a jet-orifice pipe swiveled to the inner end of the longitudinal pipe,

the jet-orifice pipe having orifices on the side thereof opposite to the direction of swinging movement of the orifice-pipe, for the purpose described.

4. A boiler-flue-cleaning device, comprising a pipe adapted to be projected into the combustion-chamber of the boiler, a swinging jet-orifice pipe in communication with and connected to one end of the said pipe, the orifices in the swinging pipe being on the side thereof opposite the flues of the boiler for projecting the steam thereinto.

5. A boiler-flue-cleaning device, comprising a longitudinally-movable and rotatable pipe adapted to be projected into the combustion-chamber of a boiler, a swinging jet-orifice pipe connected with the inner end of said pipe and in communication therewith, whereby the same pipe is adapted to be moved by the impact of the steam and by engagement with one of the walls of the fire-box.

6. A flue-cleaning device, comprising a pipe adapted to have its inner end projected into the combustion-chamber of a boiler, a swinging jet-orifice pipe connected to and in communication with the inner end of said pipe, the jet-orifice pipe having its orifices on the side thereof opposite to its direction of movement under the influence of the steam escaping therefrom, and stops adapted to hold the swinging pipe in a horizontal position, for the purpose described.

7. A flue-cleaning device, comprising a pipe adapted to have its inner end projected into the combustion-chamber of a boiler, a swinging jet-orifice pipe connected to and in communication with the inner end of the pipe, the swinging pipe having its orifices on one side thereof for swinging the pipe in one direction by the impact of the steam escaping therefrom, and means for arresting the movement of the swinging pipe against the influence of the escaping steam.

8. A boiler-flue-cleaning device, comprising a pipe adapted to have its inner end projected into the flue of a boiler, a swinging jet-orifice pipe connected to and in communication with the inner end of said pipe, the orifices being in the side of the pipe for swinging it under the influence of the steam, the said pipes having abutting members for the purpose of arresting the movement of the swinging pipe under the influence of escaping steam.

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

GILBERT PATTERSON.

Witnesses:

S. GEO. STEVENS,

DONALD McLENNAN.