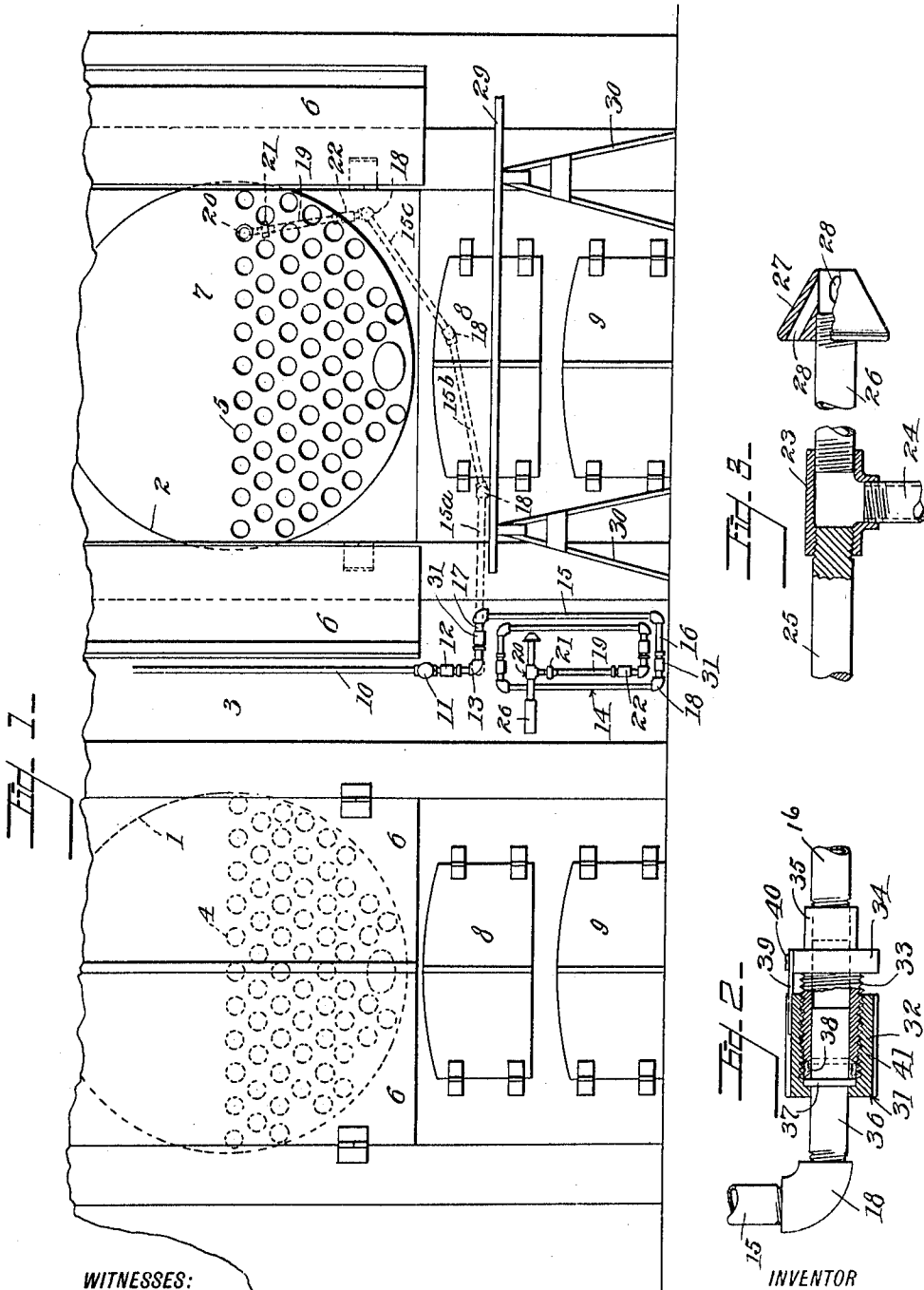


H. CASSIDY.
TUBE CLEANER CONNECTION FOR BOILERS.
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Patented Mar. 19, 1912.



WITNESSES:

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HUGH CASSIDY, OF BROOKLYN, NEW YORK.

TUBE-CLEANER CONNECTION FOR BOILERS.

1,020,635.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HUGH CASSIDY, a citizen of the United States, and resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Tube-Cleaner Connections for Boilers, of which the following is a specification.

In attending to the boilers of power plants it is necessary at frequent intervals to blow out the soot and deposits which accumulate from the gases of combustion as they pass through the tubes.

It is the usual practice to accomplish this by means of a flexible hose provided with a nozzle which is applied to the ends of the tubes. The pressure of the steam used for this purpose is sometimes as high as ninety pounds per square inch. The high pressure and temperature of the steam often ruptures the hose and causes injury to the workman manipulating the nozzle. I am aware rigid tubes with flexible joint connections for conducting steam have been suggested to overcome this difficulty.

The object of the present invention is to provide an extensible tubular connection of improved form which will enable it to be normally folded out of the way and which will enable it to be readily extended to reach the tubes of a battery of boilers.

A further object is to provide an improved connection for supporting the end of the extension tube at the steam supply pipe, and to provide an improved connection between the nozzle and the extension tube which will cooperate with the extension tube and its supply connection to facilitate the manipulation of the nozzle in applying it to the boiler tubes.

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

In the drawing which fully illustrates my invention Figure 1 is a front elevation showing my device in full lines in its normal folded position and illustrating the same in dotted outline as it is actually applied to the boiler tubes in use. Fig. 2 is a longitudinal section through a flexible coupling which connects the members of the extensible pipe, and which connects the nozzle, so as to permit swivel movement of the parts connected together thereby. This view shows contiguous parts of the pipe.

Fig. 3 is a partial section and elevation showing the nozzle which is connected with the flexible pipe connection.

Referring more particularly to the parts 1 and 2, represent two boilers mounted in a suitable boiler setting or housing 3, and having horizontal fire-tubes 4 and 5 respectively, which lead the gases of combustion from the combustion chamber to the up-take and passing through the water spaces of the boilers in the usual manner. The boiler setting or housing 3 is provided at the front with main doors 6 which may be thrown open as indicated at the boiler 2 so as to give access to the forward head 7 of the boiler 2 as shown at the right of Fig. 1. The boilers are further provided with fire-doors 8 and ash-doors 9 in the usual manner.

In applying my invention I provide a steam pipe 10 which is preferably disposed in a vertical position at the front of the boilers and between the same. This pipe is supplied with steam by the main pipe (not illustrated) from either or both boilers. Near its lower end it is provided with a valve 11 and below the valve a swivel or flexible coupling 12 connects with an elbow 13. To the elbow 13 I attach my extensible pipe-frame or flexible connection 14. This extension tube or pipe when in its folded condition comprises a plurality of radius pipes or tubes 15 which are substantially parallel with each other, and these longitudinal pipes are connected by crosspipes 16 in succession as shown; a crosspipe or arm 17 connects the extension-tube 14 with the elbow 13. Elbows 18 connect the crosspipes with the longitudinal pipes 15. The pipes 15 are progressively shorter, as they are more distant from the coupling 12, so that the device may be folded up and the parts "nested" together, as indicated. The innermost leg 19 of the tubular extension-frame forms a tubular stem for a nozzle 20, which is connected with the tubular stem 19 by means of a union 21, and the lower end of the tubular stem 19 is provided with a swivel coupling 22 which permits a perfect freedom of movement of the nozzle on the axis of its stem 19.

The construction of the nozzle is fully shown in Fig. 3. It comprises a T connection 23 provided with a nipple 24 to which the union 21 is attached. At one side of the T connection 23 a handle 25 is screwed into

place, said handle having a grip 26 of wood or similar material for manipulating the nozzle; at the other side of the T 23 a tubular shank 26 connects, to the end of which is attached a conical tip or nose 27. The steam comes up through the nipple 24 and passes through the tubular shank 26 into the tube 5 to which the nozzle is applied, and as the steam passes through the conical tip 27 air is entrained from the atmosphere through the openings 28 which are formed in the tube, and which converge toward the small end thereof. It will be seen from inspection of the folded extension-tube that the crosspipes 16 also are progressively shorter from the outside of the folded frame in an inward direction, to facilitate the "nesting" of the sections or legs of the device.

In applying the device to the boiler tubes, in practice a scaffold or platform 29 is erected on the horses 30 and a workman stands upon the platform and applies the nozzle successively to the tubes. In order to do this the folded extension tube 14 is swung outwardly on the swivel coupling 12 as an axis and is then extended as indicated by the dotted lines in Fig. 1. The swivel connection 22 permits the nozzle 20 to be passed if desired between adjacent parallel tubes 15, and on account of the progressive shortening of the sections of the extensible tube the different members or sections thereof can be swung out or extended in either direction.

In practice the platform 29 is at or near the level of the elbow 13 so that the longest pipe section or leg 15^a lies upon and is supported by the platform. The leg 15^b which is slightly shorter than the leg 15^a connects with the leg 15^c so as to permit a free vertical or horizontal movement of the nozzle 20. The swivel connection 22 connected with the tubular stem 19 facilitates the withdrawal of the nozzle and the insertion of the same in the tubes 5 successively; the entire extension tube may be swung toward or away from the head 7 by a rotation at the swivel coupling 12. The necessary rotation at this point however is produced simply by the manipulation of the nozzle in applying it to the tubes.

Special attention is called to the fixed swivel coupling 12 which permits the entire extension frame to be swung away from or toward the boiler-head, and attention is also called particularly to the swivel connection 22 which permits a rotation of the nozzle in a plane substantially at right-angles to the boiler-head. In this way I give the nozzle perfect freedom of movement without necessitating the employment of a hose, which is liable to rupture by the pressure of the steam within it; and I produce a device which operates effectively for the purpose stated without danger to the workman.

Swivel couplings 31 similar to the swivel coupling 12 are provided in the crosspipes 16 to permit the extending of the device as illustrated in the dotted lines. All these couplings may be of any suitable construction, such as illustrated in Fig. 2. Each coupling comprises a cap or nut 32 which is threaded internally, to receive a threaded gland 33, formed on a collar 34, said collar having a nipple 35 to which the pipe 16 is connected. At the other end of the nut 31 a nipple 36 is provided which extends into the gland and has a collar 37 seating against the inner end thereof. Between the collar 37 and the inner end of the gland 33 a suitable packing 38 is provided which may be tightened by screwing up the nut 31. The nut 31 is held in any adjusted position by a tongue 39 in the form of a leaf spring which is secured to the side of the collar 34 by screw 40, and which is received in any one of a plurality of longitudinal grooves 41 formed in the outer face of the nut as indicated.

The extension pipe or tube 14 can evidently be applied to the tubes 4 of the boiler with the same facility that it may be applied to the tubes 5; furthermore, although I have illustrated the device as applied to a battery of two boilers only, it may be used with a greater number of boilers if desired.

What I claim and desire to secure by Letters Patent is:—

1. A pair of boilers having tubes in combination with a fixed pipe, an extension-pipe, a swivel coupling connecting said extension-pipe with said fixed pipe, said tubular extension pipe having swivel couplings adapted to permit extending the members thereof and a nozzle carried by said extension-pipe and adapted to be applied to the said boiler-tubes.

2. A pair of boilers having tubes, in combination with a fixed steam pipe disposed between said boilers, an extension-pipe having swivel connections and flexibly connected with said fixed steam pipe, and a nozzle carried by said extension-pipe and adapted to be applied to said boiler-tubes.

3. A boiler having tubes in combination with an extensible pipe frame consisting of a plurality of radius tubes, a plurality of movable cross pipes connecting the ends of said radius tubes, said cross pipes having swivel connections therein, a swivel connection for supporting said extensible pipe frame at one end, a nozzle and a swivel connection connecting said nozzle with said frame at the other end, adapted to be applied to the boiler tubes.

4. A boiler having tubes, in combination with an extensible pipe-frame having swivel joints therein, a swivel connection for supporting one end of said pipe-frame and for supplying steam thereto, said frame

being formed of members normally lying in substantially parallel planes, said members being progressively shorter than each other, and a nozzle having a swivel connection
5 with one end of said pipe-frame and adapted to be applied to said tubes.

5. A boiler having a plurality of horizontal tubes, a fixed steam supply pipe adjacent said boiler, an elbow having a swivel connection on the axis of said pipe and having
10 an arm adapted to swing in a plane substantially at right angles to the plane of the ends of said radius tubes, a plurality of tubes jointed together forming an extensible tubular frame and including cross pipes
15 constantly parallel with said arm, a swivel connection connecting the same with said arm, and a nozzle jointed to the outer end of said tubular frame and adapted to be applied
20 to the boiler tubes.

6. An extension pipe for connecting a steam supply with boiler tubes, consisting of a plurality of parallel pipe-sections having swivel joints therein, and pipes connecting said parallel pipe sections in series. 25

7. A fixed steam supply pipe, a tubular arm having a swivel connection therewith, a plurality of movable parallel cross pipes, parallel with said tubular arm, a plurality of radius pipes connecting said parallel
30 cross pipes in series, said tubular arm and said parallel cross pipes having swivel joints therein.

Signed at New York city in the county of New York and State of New York this 9th
35 day of December A. D. 1911.

HUGH CASSIDY.

Witnesses:

CHAS. H. TOPPING,
F. D. AMMEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."