H. F. WEINLAND.

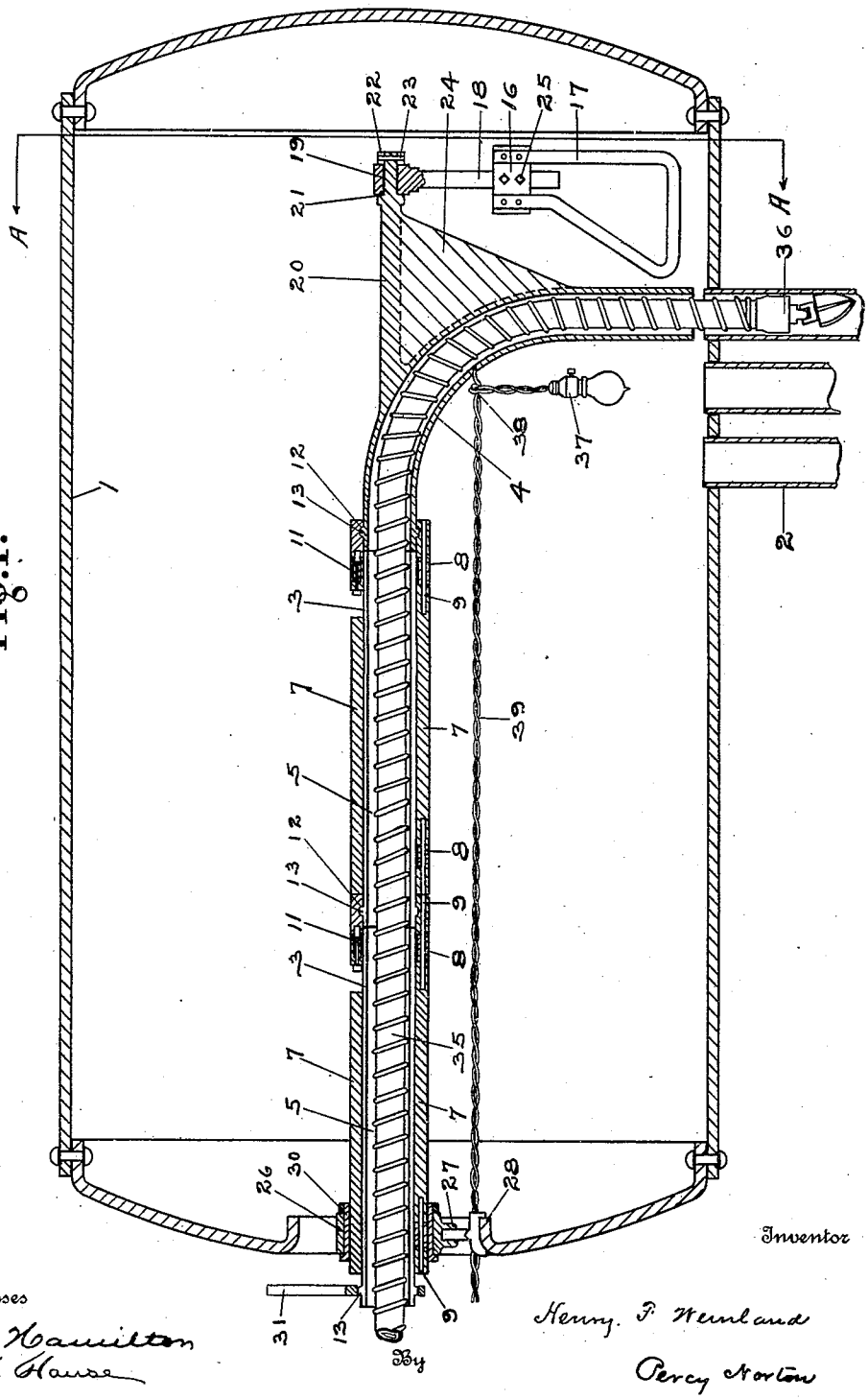
TUBE CLEANING APPARATUS.

APPLICATION FILED APR. 26, 1909.

977,241. Patented Nov. 29, 1910.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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4 SHEETS—SHEET 2.

Fig. 2.

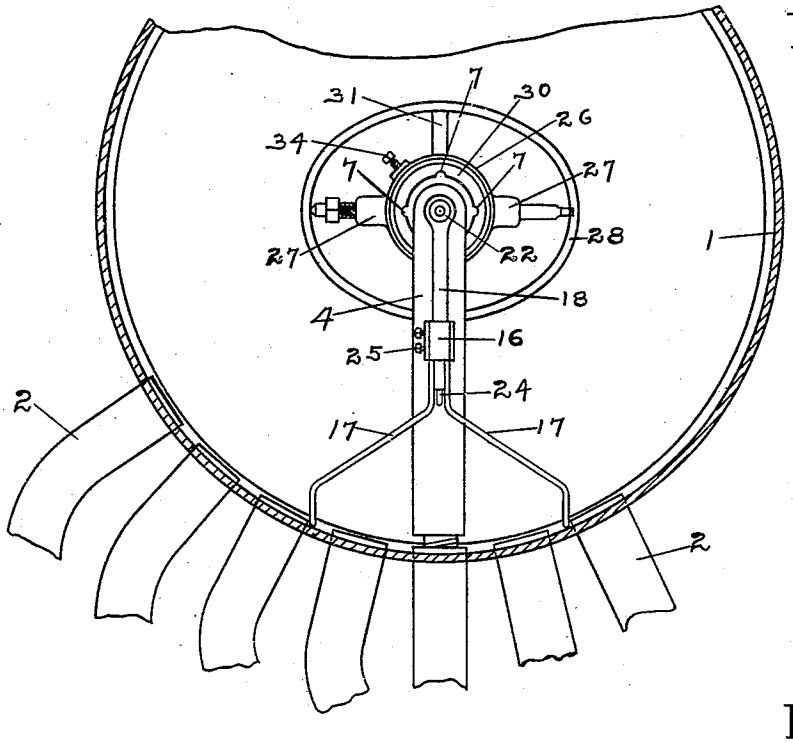
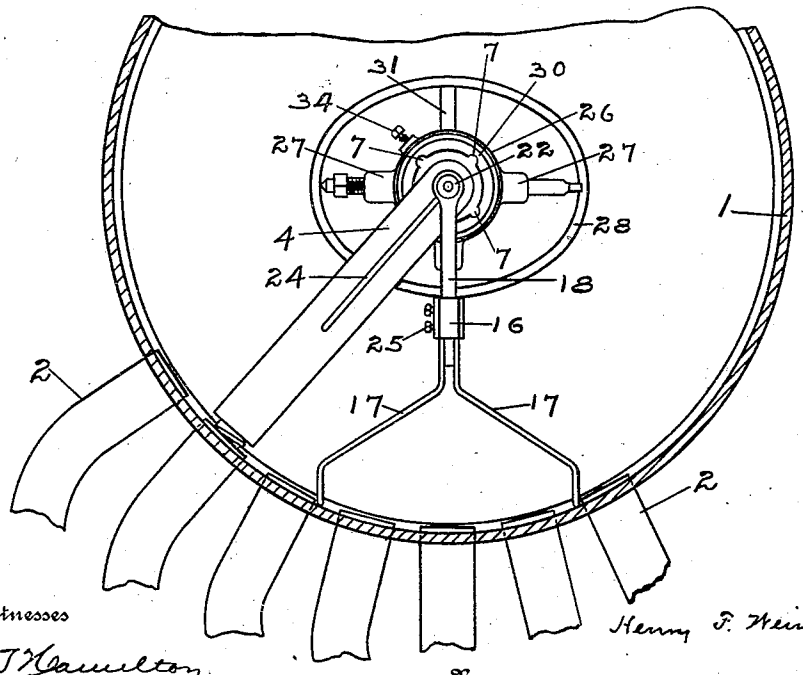


Fig. 3.



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4 SHEETS—SHEET 3.

Fig. 4.

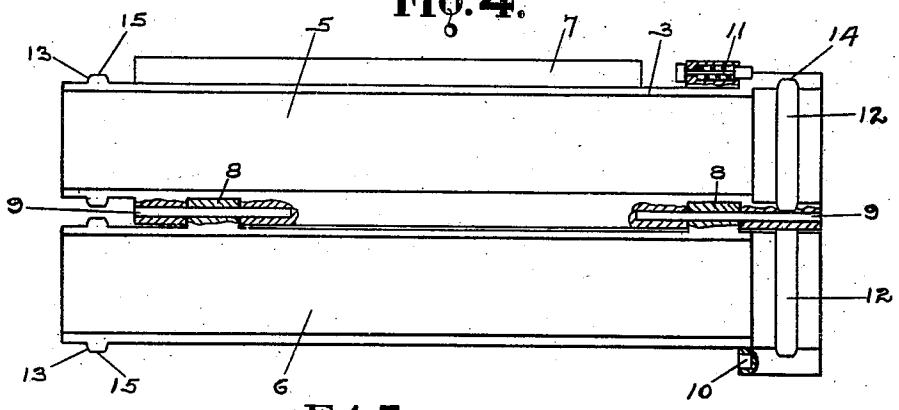


Fig. 5.

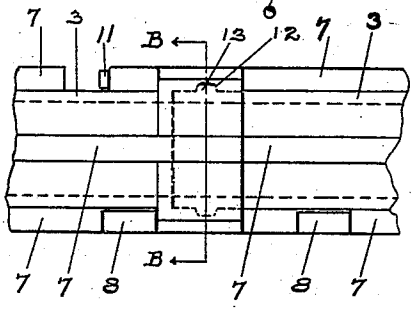


Fig. 6.

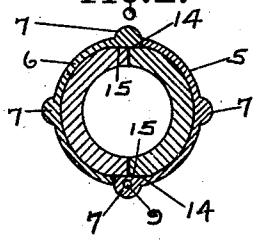
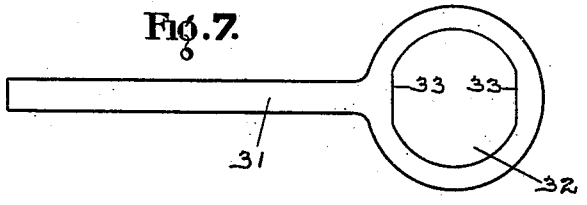


Fig. 7.



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4 SHEETS—SHEET 4.

Fig. 8.

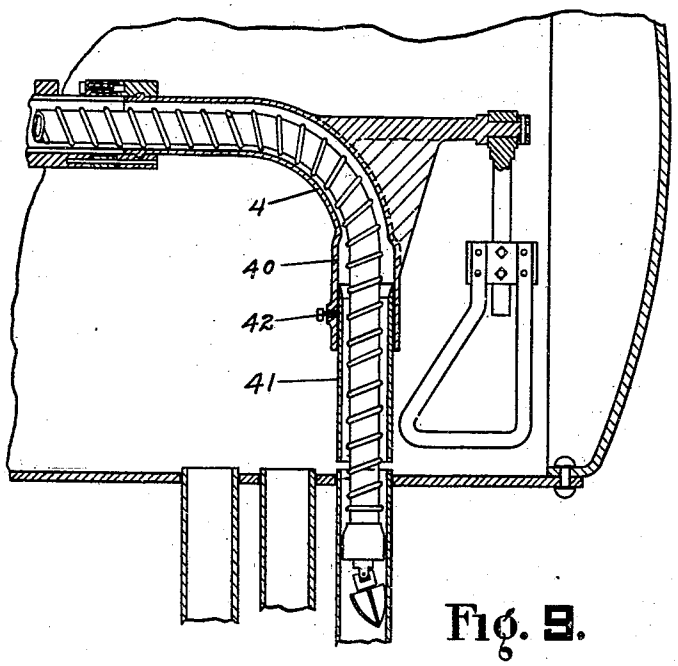
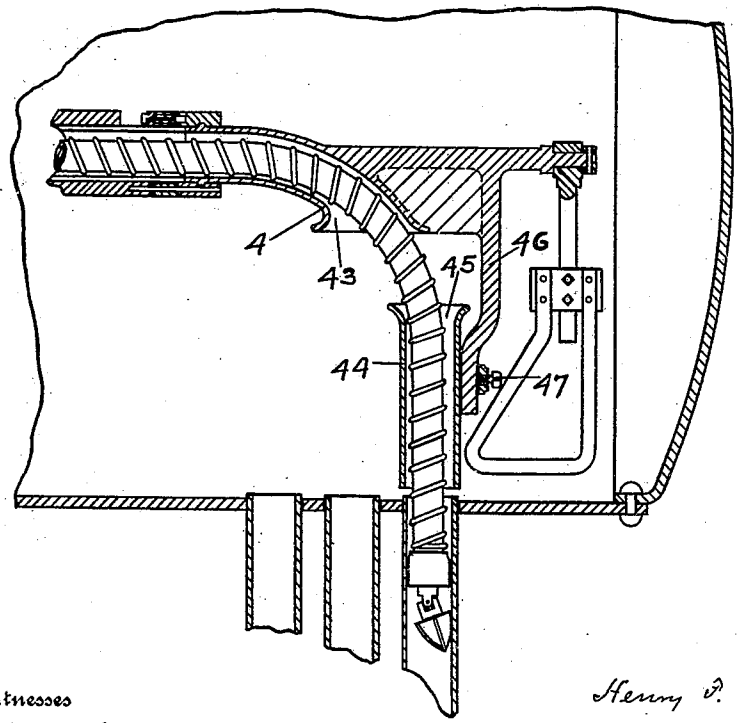


Fig. 9.



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UNITED STATES PATENT OFFICE.

HENRY F. WEINLAND, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE LAGONDA MANUFACTURING COMPANY, OF SPRINGFIELD, OHIO, A CORPORATION OF OHIO.

TUBE-CLEANING APPARATUS.

977,241. Specification of Letters Patent. **Patented Nov. 29, 1910.**

Application filed April 26, 1909. Serial No. 492,385.

To all whom it may concern:

Be it known that I, HENRY F. WEINLAND, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Tube-Cleaning Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a tube cleaning apparatus and more particularly to the handling of a flexible member having a tube cleaner thereon.

The object of my invention is to provide mechanical means manipulated from a position outside the drum of a boiler whereby the member and cleaner can be introduced from a position outside the drum into the same and into any one of a longitudinal or transverse row of tubes that open into the drum, said means being devised so that in the event the cleaner, while in the tube, is in need of adjustment or repairs, it can be withdrawn therefrom through the drum and outside of same without the operator entering the drum and without displacing the means that support and guide the member and cleaner into the tube. The flexible member with use becomes more flexible and is likely to buckle and become difficult or impossible to handle in any guide other than one having continuous longitudinal walls to inclose, confine and direct it; and while it is not essential that the walls be continuously solid in cross section, yet solid walls are preferable for the reason that if the cleaner is driven by air or steam, it is desirable to introduce a stream of water through the tube or casing to assist the cleaner in its work. Further, I preferably employ a casing or tubing made in sections with means to readily connect them and also divide the sections longitudinally into halves with means to easily and quickly secure the halves together. When the situation of the drum is such that a long tube or casing cannot be withdrawn from the drum, this construction enables the operator to add sections as required without withdrawing the member and cleaner. The tubing or casing has a bent or curved portion terminating over the mouth of the boiler tube and the extension of this portion can be made adjustable.

The tubing or casing and support for the inner end of same are movable longitudinally in the drum and the tubing or casing is journaled on such support and in a support arranged in the manhole of the drum whereby the tubing or casing can by a handle or other suitable means be turned axially to throw the bent or curved portion in the arc of a circle.

With these and other objects in view my invention consists of the constructions and combinations hereinafter described and set forth in the claims.

In the accompanying drawings Figure 1 is a longitudinal section partly in elevation of a device embodying my invention, Fig. 2 is a cross section on the line A A of the steam drum in Fig. 1 showing in elevation an end view of the device, looking in the direction of the arrows, Fig. 3 is a like view with the curved portion of the casing shown at a different angle, Fig. 4 is a section of the casing or tubing which is divided longitudinally into halves, hinged together and shown in an open position, Fig. 5 shows the two sections of the casing or tubing coupled together, Fig. 6 is a cross section on the line B B of Fig. 5, Fig. 7 is a wrench to turn the casing or tubing axially and Figs. 8 and 9 show adjustable extensions of the bent or curved portion of the casing or tubing.

Like numerals represent the same parts in the several views.

In the drawings, 1 represents the shell of the steam drum of a water tube boiler and 2 the tubes in said boiler. A casing or tubing 3 extends into said drum and has a curved portion 4 terminating over the tubes 2 of the boiler, said casing or tubing being preferably made in sections, divided longitudinally into halves 5 and 6 having outwardly projecting longitudinally extending ribs 7 to strengthen the same, one of the ribs on the half 5 having recesses therein to receive ears 8 projecting from the other half 6 and spindles 9 extending through perforations therein form a hinge upon which the halves can be opened and closed. A recess 10 in half 6 and a spring pressed catch 11

in the half 5 form the means of locking the halves together in their closed position. One end of each of said sections is formed with an enlarged opening or bore having an annular recess 12 and the other end with an annular rib 13 to fit said recess so that any two of the sections can be joined together by closing the enlarged open end of one with its annular recess over the end of the other having the annular rib, the catch 11 locking them in position as particularly shown in Figs. 4, 5 and 6. Furthermore the interior portion of the enlarged bore of one end and the periphery of the other end have oppositely disposed flattened portions so that when two sections are joined together the flattened portion 14 of one will abut the flattened portion 15 of the other as particularly shown in Fig. 6 whereby the sections can be turned axially in unison. In the drawings I have shown two of said sections in connection with the curved portion but it is apparent any number of sections may be connected and advanced into the drum of a boiler.

A support having a body portion 16 with legs or runners 17 adapted to move along the bottom of the drum between the ends of the tubes 2 and be guided thereby, is provided with a vertically adjustable bar 18 extending through an opening in said body and having a bearing 19 in which a reduced circular portion of a frame or shaft 20 projecting from the curved portion of the casing or tubing, is journaled. A shoulder 21 on the frame or shaft and a collar 22 fixed on the shaft by a pin 23, secures the casing to the support and is movable therewith. A web 24 strengthens the frame or shaft 20 and set screws 25 fix the bar 18 in its adjusted position.

The casing or tubing is supported at its outer end by a box 26 having outwardly extending spindles 27 secured thereto, the outer ends of which rest against the flange 28 of the manhole, one of said spindles being screw threaded into the box and adapted to be turned by a wrench to tighten the box in a fixed position as particularly shown in Figs. 2 and 3. A bushing 30 is journaled in said box and has longitudinal recesses on its inner surface to conform with the ribs 7 of the casing. The arrangement is such that the casing with the bushing can be turned axially in said box and any suitable means may be employed to turn the same. A handle 31 is shown for this purpose. It has an opening 32 to fit over the end of the casing and is provided with flat portions 33 to engage flattened portions 15 of the casing. The casing or tubing being journaled in the box 26 and in the bearing 19, by operating the handle 31, the casing or tubing can be turned axially so that its curved portion will turn in the arc of a circle and the open end of the curved portion is thus brought over any one of a transverse row of tubes as particularly shown in Figs. 2 and 3; and a set screw 34 fixes it in its adjusted position.

It will be further seen that by taking hold of the tubing or casing from a position outside the drum, it can be shifted on its support 16 so that the open end of the curved portion can be positioned over any one of a longitudinal row of tubes; and the bearing 19 of the support being vertically shiftable, the device can be adjusted for use in drums of different diameters.

A feed hose 35 having a rotary tube cleaner 36 on the end thereof, is advanced from a suitable source of supply outside the drum through the casing or tubing 3 and its curved portion 4 into a tube 2, and it will be seen the construction of the casing or tubing is such that the hose and cleaner can be withdrawn from the tube and drum without the operator going into the drum or displacing the casing or tubing or support.

As the device is manipulated from a position outside the drum it is desirable to have an artificial light within the drum to assist the operator in positioning the inner end of the casing over a tube. Any suitable light may be carried by the casing or its support for this purpose. In the drawings I have shown an electric lamp 37 secured to a bracket 38 projecting from the casing and having operating wires 39 extending outside the drum to suitable source of supply.

In Fig. 8 I have shown the curved portion 4 of the casing or tubing with an enlarged portion 40 and having a telescoping section 41 extending therefrom that can be adjusted and fixed in its adjusted position by a set screw 42.

In Fig. 9 I have shown the curved portion 4 of the casing or tubing shortened and terminating in a flaring mouth 43, and a vertically adjustable section 44 having a flaring mouth 45 and carried by an arm 46 fixed in its adjusted position by a set screw 47.

Having thus described my invention, I claim:—

1. The combination of a casing or tubing having a curved portion at its inner end, said casing or tubing adapted to be inserted into and manipulated from outside of the drum of a boiler to position its inner end over any one of a longitudinal row of tubes, means independent of the tube, accessible from outside said drum, to fix said casing or tubing to the drum, in its adjusted position, a member having a tube cleaner thereon, movable from a position outside said drum through said casing or tubing into the tube, said casing or tubing permitting the with-

drawal of said member and cleaner from said tube and drum without disturbing said casing or tubing in its adjusted position in the drum, substantially as described.

2. The combination of a casing or tubing having a curved portion at its inner end and a support therefor freely movable on the inner walls of the drum of a boiler, said casing or tubing adapted to turn axially in said support and to be inserted, with said support, into and manipulated from outside of said drum, to position its inner end over any one of a longitudinal or transverse row of tubes, means independent of the tube, accessible from outside said drum, to fix said casing or tubing to the drum in its adjusted position, a member having a tube cleaner thereon, movable from a position outside said drum through said casing or tubing into the tube, said casing or tubing permitting the withdrawal of said member and cleaner from said tube and drum without disturbing said casing or tubing in its adjusted position in the drum, substantially as described.

3. The combination with a member having a tube cleaner thereon of a casing or tubing extending into the drum of a boiler and having a curved portion terminating over the open end of a boiler tube, through which said member and cleaner are advanced and withdrawn from outside said drum into said tube, said curved portion having an adjustable extension, substantially as described.

4. The combination with a member having a tube cleaner thereon of a casing or tubing extending into the drum of a boiler and having a curved portion with an adjustable extension terminating over the open end of a boiler tube, through which said member and cleaner are advanced and withdrawn from outside said drum into said tube, a support having runners resting solely on the inner wall of the bottom of said drum and freely movable thereon, said support being adapted to adjust and carry said casing or tubing in the longitudinal center of the drum, substantially as described.

5. The combination with a member having a tube cleaner thereon of a casing or tubing through which said member and cleaner are advanced, said casing or tubing being divided into sections, the adjacent ends of the sections having complementary engaging portions coupling the sections to turn axially in unison and means to fix said engagement, substantially as described.

6. The combination with a member having a tube cleaner thereon of a casing or tubing through which said member and cleaner are advanced, said casing or tubing being divided into sections, the adjacent ends of the sections having complementary engaging portions coupling the sections to turn axially in unison and means to fix said engagement, said casing or tubing extending into the drum of a boiler, the section at the inner end being curved and terminating over the open end of a boiler tube, substantially as described.

7. The combination with a member having a tube cleaner thereon of a casing or tubing extending into the drum of a boiler and having a curved portion terminating over the open end of a boiler tube, said casing or tubing being divided into sections, the straight sections being also divided longitudinally, the adjacent ends of the sections having complementary engaging portions coupling the sections to turn axially in unison to move the curved portion in the arc of a circle, means to close and lock the longitudinally divided portions of each section in closed position, said closure fixing the coupling of the sections together, substantially as described.

8. The combination with a member having a tube cleaner thereon of a casing or tubing extending into the drum of a boiler and having a curved portion terminating over the open end of a boiler tube, said casing or tubing being divided into sections, the straight sections being also divided longitudinally, one of the adjacent ends of each section having an annular rib thereon and the other an annular recess to receive said rib, the engaging ends of the respective sections also having flattened portions abutting each other, means to close and lock the longitudinally divided portions of each section in closed position, said closure securing the engaging portions of the respective ends coupling them together to turn in unison, substantially as described.

9. The combination with a member having a tube cleaner thereon of a casing or tubing extending into the drum of a boiler and having a curved portion terminating over the open end of a boiler tube, said casing or tubing being divided into sections, the straight sections being also divided longitudinally and having outwardly projecting longitudinally extending ribs thereon, one of the adjacent ends of each section having an annular rib thereon and the other an annular recess to receive said rib, the engaging ends also having flattened portions abutting each other, the longitudinally divided sections being hinged and provided with a lock to fix them in closed position and secure the sections together, substantially as described.

10. The combination with a member having a tube cleaner thereon of a casing or tubing extending into the drum of a boiler and having a curved portion terminating over the open end of a boiler tube, said cas-

ing or tubing having outwardly projecting longitudinally extending ribs thereon and a horizontally projecting frame or shaft, a support on which said frame or shaft is journaled, a box with means to fix the same in the manhole of the drum, said box having a bushing journaled therein, said bushing having longitudinal recesses to engage the ribs of the casing or tubing, means located and manipulated outside said drum to turn said casing or tubing axially and means to fix the same in an adjusted position, substantially as described.

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

HENRY F. WEINLAND.

Witnesses:
MAURICE M. SELLERS,
CARL CASKEY.