A. THOMAS & E. THOMPSON.

BOILER CLEANING DEVICE.

APPLICATION FILED MAY 15, 1908.

917,380.

Patented Apr. 6, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

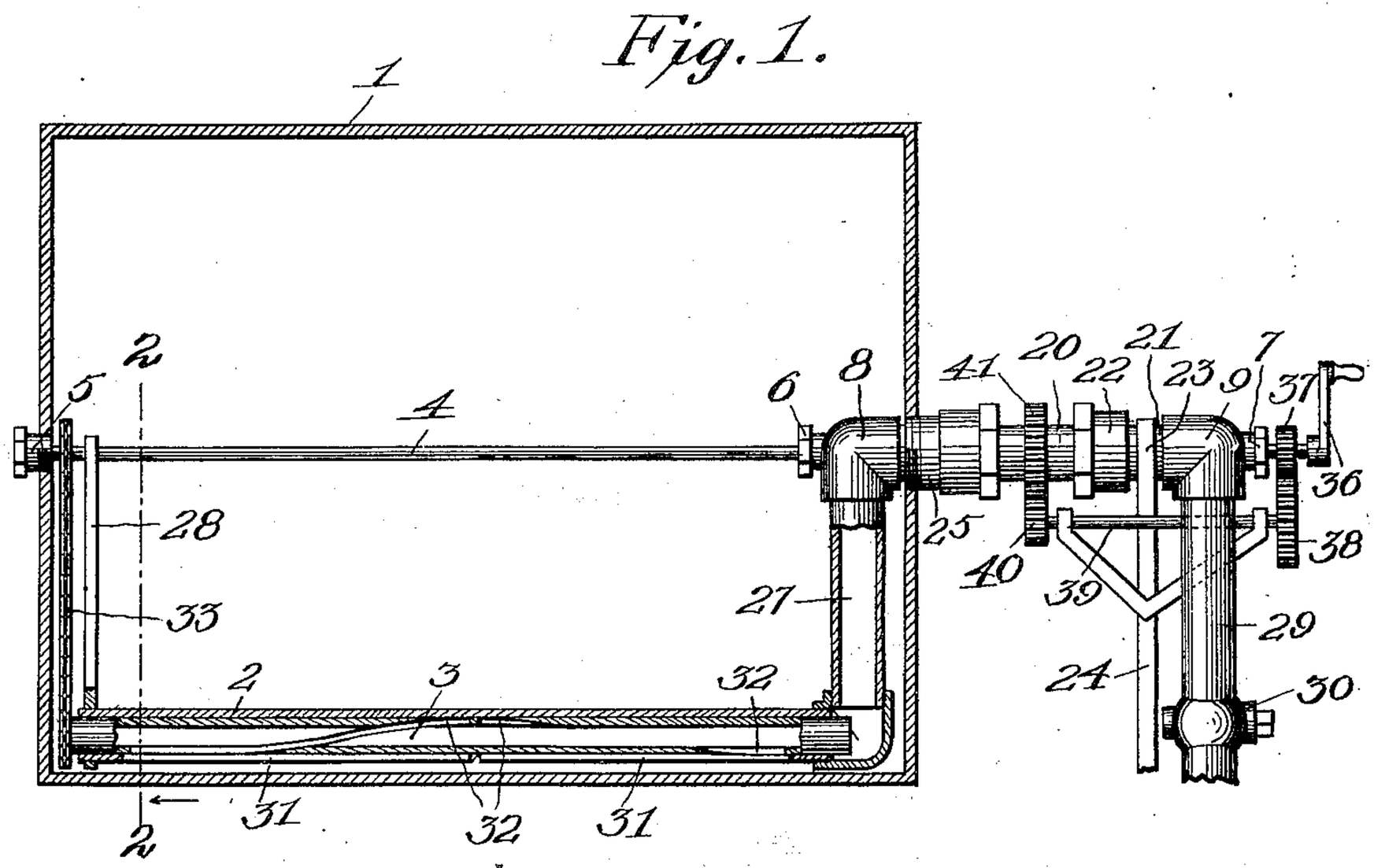


Fig. 2.

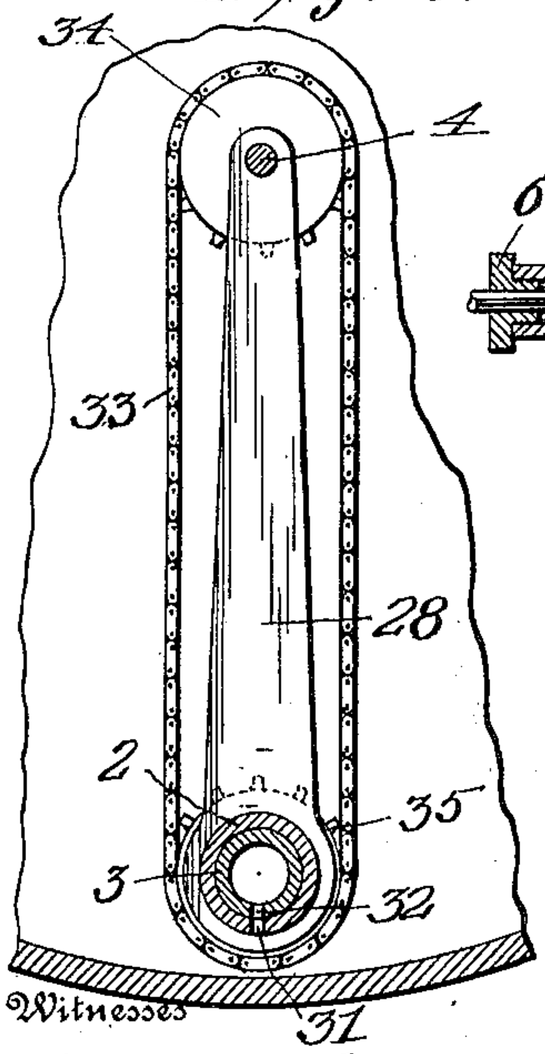
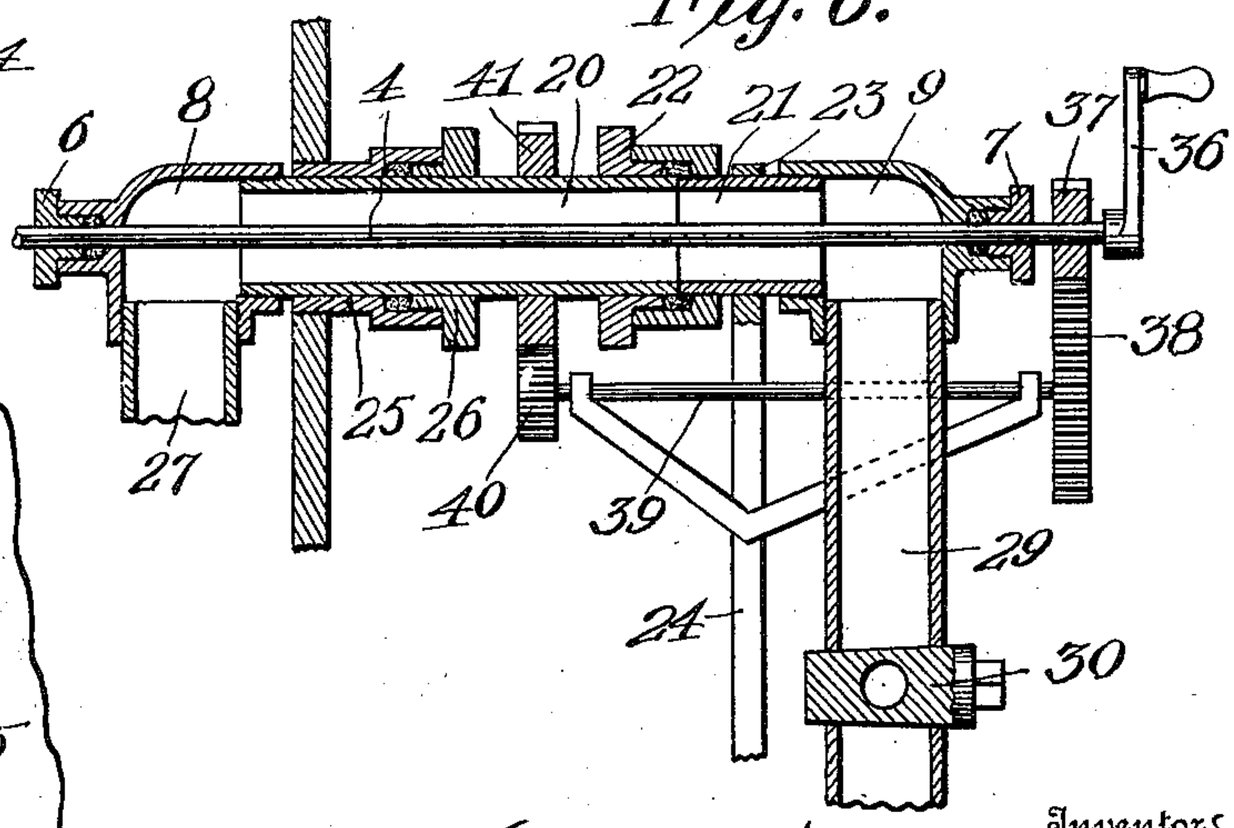


Fig. 6.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

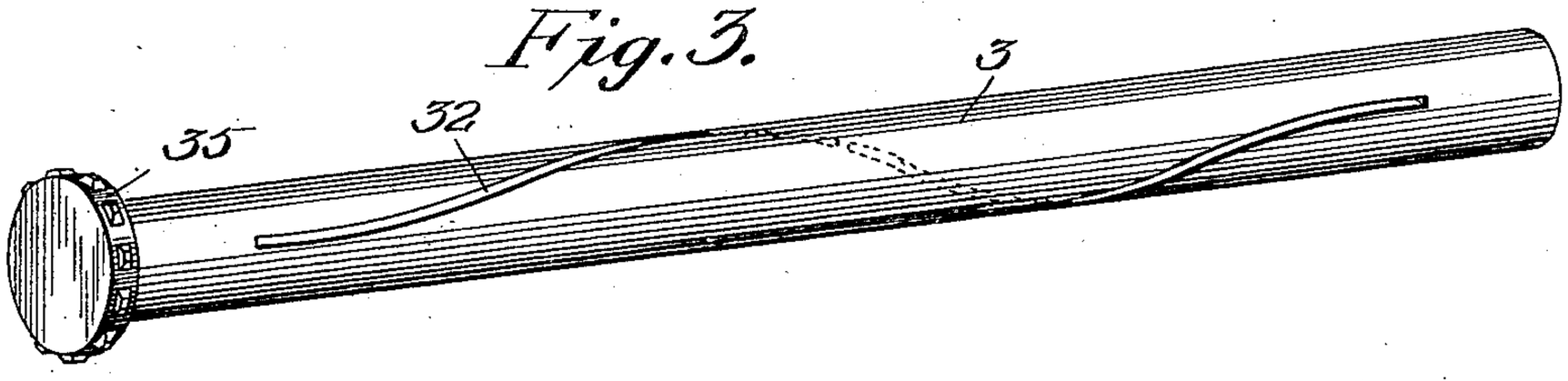


Fig. 4.

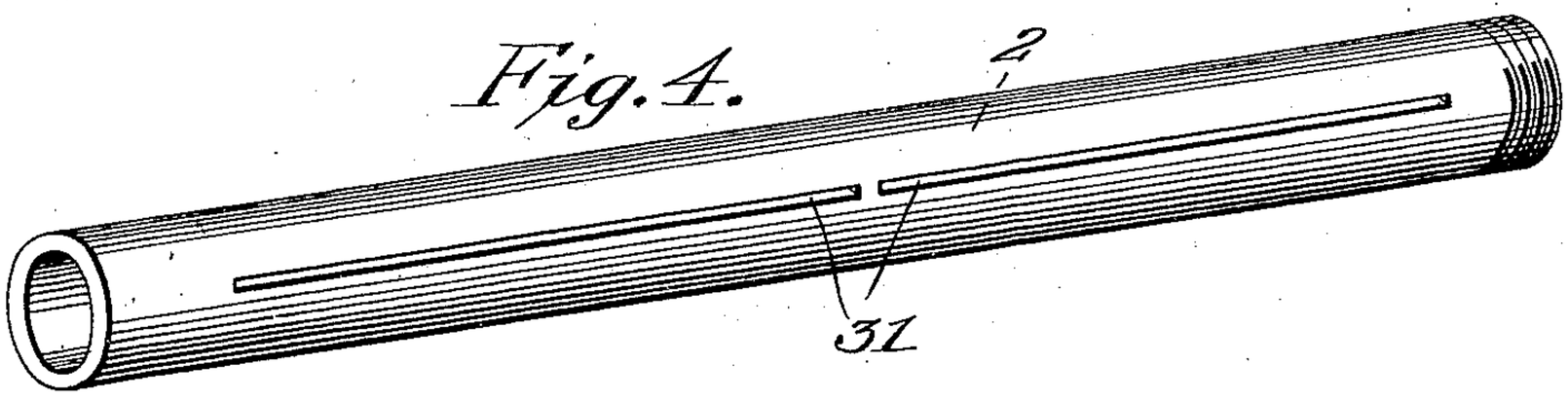
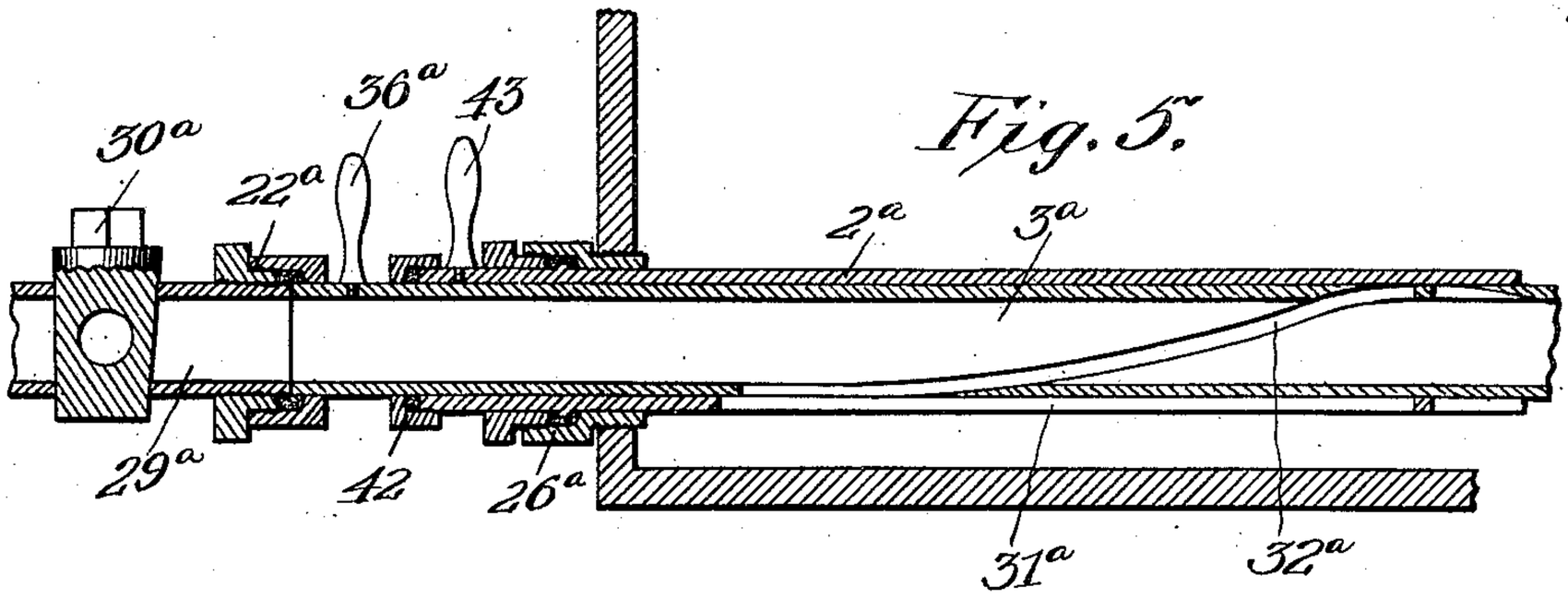


Fig. 5.



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UNITED STATES PATENT OFFICE.

ADOLPH THOMAS AND EDGOR THOMPSON, OF MINNESOTA LAKE, MINNESOTA; SAID THOMAS ASSIGNOR TO NORBERT THOMAS, OF WHEATON, MINNESOTA.

BOILER-CLEANING DEVICE.

No. 917,380. Specification of Letters Patent. Patented April 6, 1909.

Application filed May 15, 1908. Serial No. 433,137.

To all whom it may concern:

Be it known that we, ADOLPH THOMAS and EDGOR THOMPSON, citizens of the United States, residing at Minnesota Lake, in the county of Faribault and State of Minnesota, have invented certain new and useful Improvements in Boiler-Cleaning Devices, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to improvements in devices for cleaning steam boilers and the like, and more particularly an improved means for removing the scale and dirt from a boiler while it is under pressure.

The object of the invention is to provide an appliance or device of this character which will be simple, practical, and efficient.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of devices hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view through a steam boiler illustrating the application of our invention thereto; Fig. 2 is a section taken on the plane indicated by the line 2—2 in Fig. 1; Figs. 3 and 4 are enlarged detail views of the inner and outer pipes; Fig. 5 is a sectional view through the lower portion of a boiler showing a modified form of our invention mounted therein; and Fig. 6 is an enlarged sectional view through parts shown in Fig. 1.

Referring more particularly to Figs. 1 to 4 inclusive of the drawings in which our invention is shown applied to a steam boiler of the horizontally disposed cylindrical type, the interior of which is free from pipes and stay bolts, 1 denotes the shell of the boiler and 2 and 3 denote outer and inner cleaning pipes adapted to be moved over the inner surface of said shell to remove the scale and dirt from the same. The inner pipe 3 is mounted for rotation within the outer one, which latter extends substantially the length of the boiler and is hung from a horizontal shaft 4 extending centrally and longitudinally through the boiler. The shaft 4 has one of its ends mounted for rotation in a bearing provided with a stuffing box 5 arranged in the rear end of the boiler shell and the other end of said shaft is mounted in bearings provided with stuffing boxes 6, 7 arranged, respectively, in elbows 8, 9 located at the ends of a horizontal pipe consisting of a rotatable section 20 and a stationary section 21 through which sections said shaft extends. The two pipe sections 20, 21 have their opposing ends united by a stuffing box 22 and the outer or stationary section 21 is supported by a strap or band 23 upon the upper end of a standard or any other suitable support 24 arranged adjacent to the front end of the boiler. The rotatable section 20 extends through and is rotatably mounted in a bearing pipe or sleeve 25 projecting from the front end or head of the boiler and provided at its outer portion with a stuffing box 26. The elbow 8 is arranged within the boiler upon the inner end of the section 20 and is connected by a pipe 27 to one end of the outer cleaning pipe 2 so that said pipe 27 serves as a hanger for one end of the pipe 2. The other end of the latter is hung from the shaft 4 by a rigid hanger arm 28. The elbow 9 is arranged upon the outer end of the rigid pipe section 21 and projecting downwardly from it is a discharge pipe 29 containing a cut off valve 30 which may be in the form of a rotary plug, as illustrated. In the outer cleaning pipe 2 is formed a straight slot 31 which extends longitudinally from end to end of said pipe and in the inner pipe 3, which rotates within the outer one, is formed a spiral slot 32 which extends, preferably, once around said pipe, as illustrated. By slotting these pipes as set forth, it will be seen that when the pipe 3 is rotated within the pipe 2 the spiral slot 32 will be caused to register with the straight slot 31 at a constantly advancing point along the length of said pipe so that the pressure within the boiler will force the dirt and scale through the registering portions of said slots and out through the pipes 27, 20, 21 and 29 when the valve 30 is opened. The slot 31 is disposed opposite the inner face of the boiler shell and is adapted to advance over the same as the pipe 2 is swung about its axis or shaft 4, thereby enabling the entire inner surface of the boiler shell to be effectively cleaned as the pipe 2 is oscillated or revolved and the pipe 3 rotated within it. While any suitable means may be provided for operating the pipes 2, 3, we preferably employ that illustrated which comprises a sprocket chain 33 passed over sprocket wheels 34, 35 fixed to the shaft 4 and to one end of the inner pipe

3; a crank handle 36 at the front end of the shaft 4 and a reducing gear between said shaft and the rotatable pipe section 20. This reducing gear comprises a pinion 37 fixed on the shaft 4 to mesh with the gear 38 on one end of a shaft 39 journaled in bearings upon the standard 24 and provided at its other end with a pinion 40 to mesh with a gear 41 fixed to the rotatable pipe section 20. It will be seen that when the crank handle 36 is rotated the inner cleaning pipe 3 will be rapidly rotated within the outer pipe 2, while the latter will be slowly revolved within the boiler.

In Fig. 5 of the drawings, we have illustrated another embodiment of our invention especially adapted for use in boilers containing stay bolts and pipes which would interfere with the revolution of the outer cleaning pipe around the interior surface of the boiler shell. In this embodiment of our invention, 2^a denotes the outer cleaning pipe which is disposed adjacent to the center of the bottom of the boiler and has one of its ends projecting through the stuffing box 26^a in which it is rotatably mounted in order to permit its straight longitudinal slot 31^a to be turned in any direction by means of a handle 43. The inner pipe 3^a of this device is rotatably mounted within the pipe 2^a so that its spiral slot 32^a may be caused to intersect the slot 31^a at different points. The outer end of the inner pipe 3^a extends through a stuffing box 42 and is connected by a stuffing box 22^a to a stationary discharge pipe 29^a containing a cut off valve 30^a. Upon the projecting outer portion of the pipe 3^a is a radially projecting handle 36^a by means of which said pipe may be rotated.

From the foregoing, it will be seen that our invention provides an exceedingly simple and practical device for cleaning out boilers and other liquid containers while they are under pressure.

While we have shown and described in detail the preferred embodiments of our invention we wish it understood that we do not limit ourselves to the precise showing set forth and that various changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described our invention what we claim is:

1. In a cleaning device of the character described, the combination with the shell of a boiler or the like, of inner and outer cleaning pipes arranged within the same and formed with slots adapted to be moved into and out of register with each other, a shaft, means for hanging the outer pipe from the same, means between said shaft and the inner pipe for rotating the latter within the outer one and means for rotating said shaft.

2. In a cleaning device of the character described, the combination with the shell of a boiler or the like, of inner and outer cleaning pipes arranged within the same and formed with slots adapted to be moved into and out of register with each other, a shaft, means for hanging the outer pipe from the same, a pipe concentric with said shaft and having stationary and rotatable sections, the rotatable section projecting through the shell and connected at its inner end to the outer pipe, driving connections between the shaft and the inner pipe, driving connections between the shaft and said rotatable pipe section, a valve for controlling the discharge from the stationary pipe section and means for rotating said shaft.

3. In a cleaning device of the character described, the combination with a shell of a boiler or the like, of inner and outer cleaning pipes arranged within the same and formed with slots adapted to be moved into and out of register with each other, a shaft, means for hanging the outer pipe from said shaft, an outlet for the outer pipe, means for rotating the shaft and means for rotating the inner pipe.

4. In a cleaning device of the character described the combination with a shell of a boiler or the like, of inner and outer cleaning pipes arranged within the same and formed with slots adapted to be moved into and out of register with each other, a shaft, means for hanging the outer pipe from said shaft, an outlet pipe concentric with the shaft and having stationary and rotatable sections, the rotatable section projecting through the shell and being connected at its inner end to the outer pipe, means for rotating the rotatable section and means for rotating said inner pipe.

5. In a cleaning device of the character described the combination with a shell of a boiler or the like, of inner and outer cleaning pipes arranged within the same and formed with slots adapted to be moved into and out of register with each other, a shaft, means for hanging the outer pipe from said shaft, an outlet pipe concentric with the shaft and having stationary and rotatable sections, the rotatable section projecting through the shell and being connected at its inner end to the outer pipe, means for rotating the rotatable section, driving connections between the shaft and said inner cleaning pipe and means for rotating said shaft.

6. In a cleaning device of the character described the combination with a shell of a boiler or the like, of inner and outer cleaning pipes arranged within the same and formed with slots adapted to be moved into and out of register with each other, a shaft, means for hanging the outer pipe from said shaft, means between said shaft and the inner pipe for rotating the latter within the outer one,

an outlet pipe concentric with the shaft and having a stationary section and a rotatable section, the latter extending through the shell and being connected to the outer cleaning pipe and means for simultaneously rotating the shaft and the rotatable section of the outlet pipe.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

ADOLPH THOMAS.
EDGOR THOMPSON.

Witnesses:
O. H. SCHROEDER,
E. COTE.