

(No Model.)

W. C. KOETZNER & E. C. LIVINGSTON.  
STEAM GENERATOR AND FLUSHER.

No. 446,223.

Patented Feb. 10, 1891.

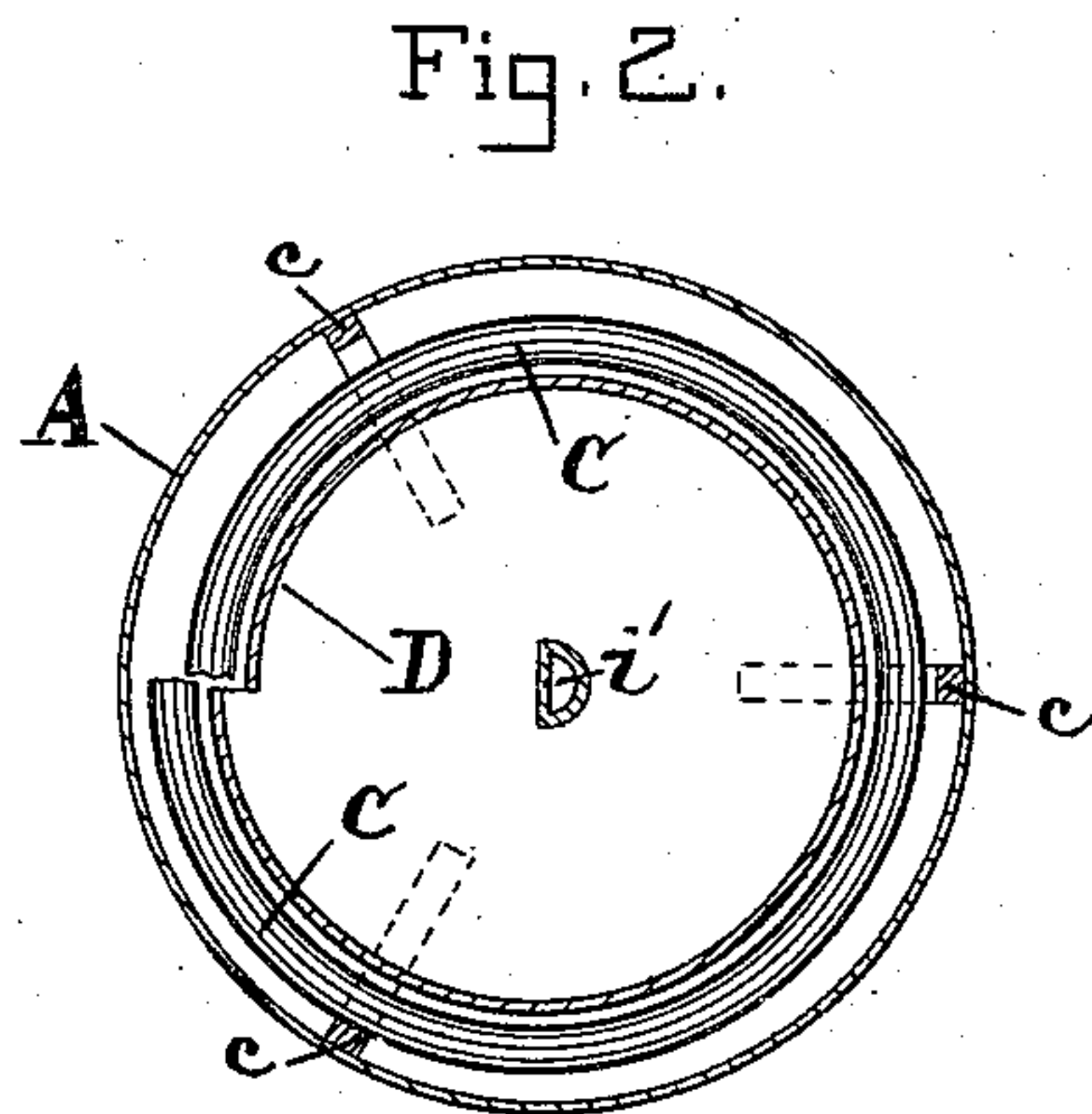
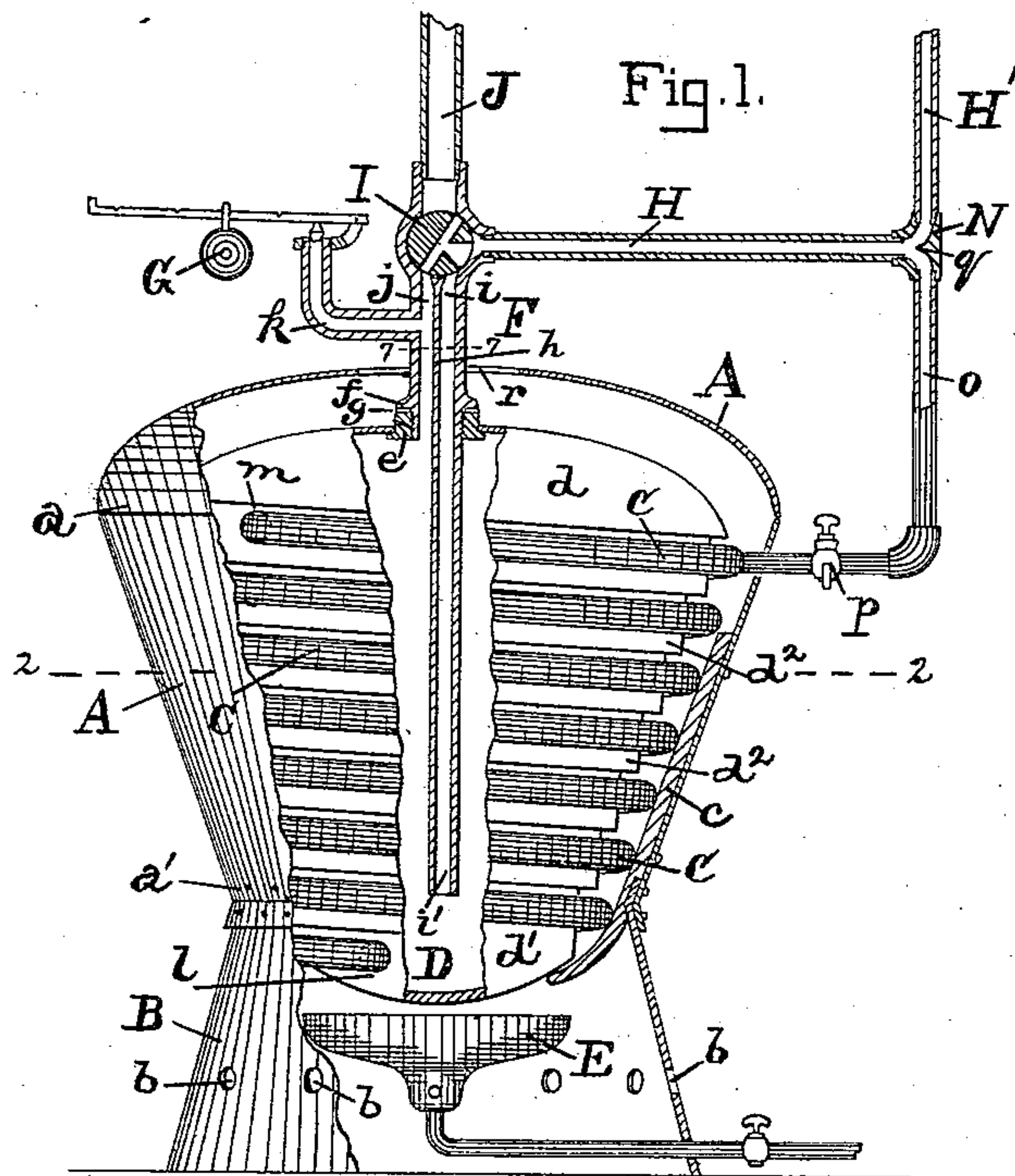


Fig. 3.

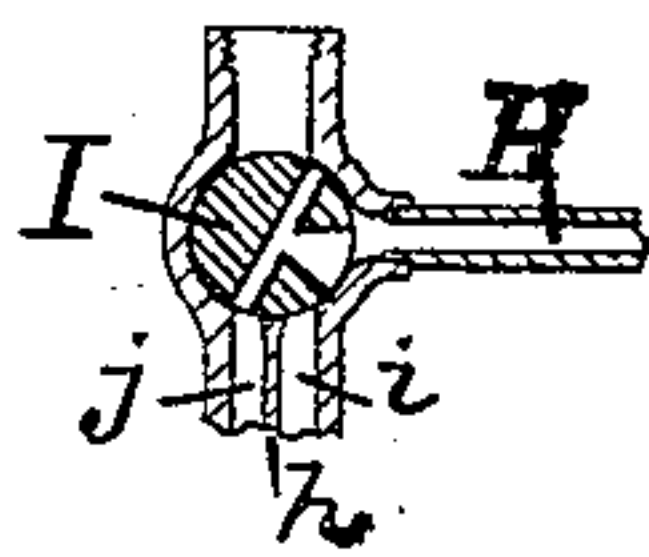


Fig. 4.

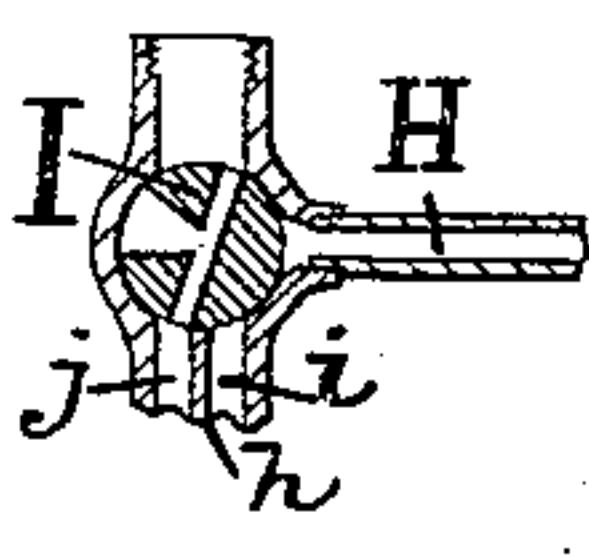


Fig. 5.

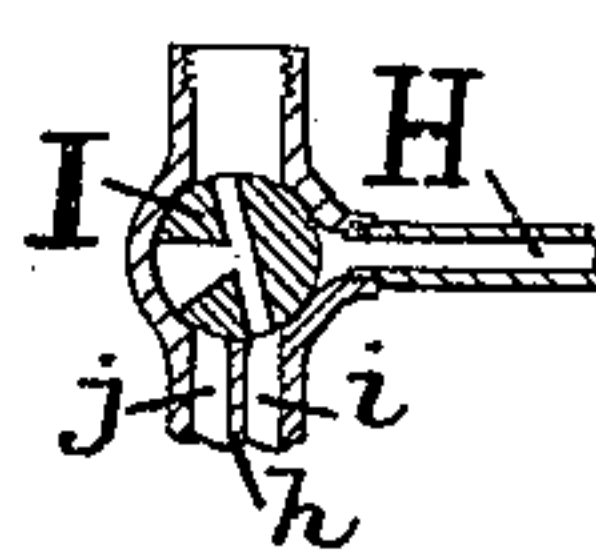
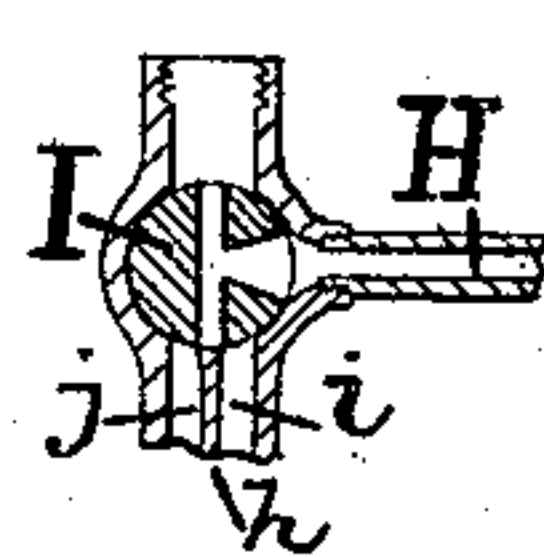


Fig. 6.



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# UNITED STATES PATENT OFFICE.

WILLIAM C. KOETZNER AND EDWIN C. LIVINGSTON, OF BALTIMORE,  
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## STEAM GENERATOR AND FLUSHER.

SPECIFICATION forming part of Letters Patent No. 446,223, dated February 10, 1891.

Application filed April 1, 1890. Serial No. 346,213. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM C. KOETZNER and EDWIN C. LIVINGSTON, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Steam Generators and Flushers, of which the following is a specification.

This invention relates to an apparatus for heating water and generating steam for flushing and cleaning beverage-pipes, such as pipes used in drawing beer from the cask. The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the improved apparatus. Fig. 2 is a horizontal section of the same on the line 2 2. Figs. 3, 4, 5, and 6 illustrate different positions of the three-way cock. Fig. 7 is a cross-section of the combined hot water and steam pipe.

The object of the invention is to provide a simple and inexpensive apparatus to be used either by connection with the water-supply of the city or by connection with a water-tank for heating water and generating steam for cleansing and flushing beer and other pipes.

The letter A designates a sheet-metal shell or case, which is tapered, being largest at the top *a* and smallest at the bottom *a'*. This shell is supported on a base B, which is provided with air-inlets *b*. Within the shell and attached to its walls are three upright bars *c*, which sustain the coil C and boiler D within the coil. The boiler D is tapering, being largest at the arched top *d* and smallest at the bottom *d'*. Its wall is provided with spiral steps *d<sup>2</sup>*, and the coils of the pipe C are outside of the boiler and have position in the angular grooves formed by the spiral steps around. The lower end *l* of the coil makes connection with the boiler near the bottom and the upper end *m* makes connection near the top. Water from the boiler D will enter the lower end of the coil at *l* and circulate around the coils and then pass from the coil at the top end *m* into the boiler D. By this construction the heat of the burner E is very effective in quickly raising the temperature of the water. I prefer to leave some space

between the coils and the surface of the spiral

steps, as by so doing the hot air ascending from the burner E may have better access to the surface of the steps and also entirely around the pipes.

The boiler D is a closed boiler and of strength capable of withstanding a pressure that will allow sufficient steam to be generated to force through the pipes to be cleaned. The top *d* of the boiler has a screw-threaded collar *e*, which opens into the boiler, and the combined steam and hot-water pipe F is connected to the collar. A shoulder *f* is on the pipe, and a suitable washer can be inserted at *g* between the collar *e* and shoulder *f*, and thereby make a tight joint. The pipe F above the boiler has a longitudinal division *h*, which forms two passages *i j*, one being for water and the other for steam. That side or passage *i* which is for water has a down-projecting end *i'*, which enters the boiler and extends to near the bottom *d'*, as will be seen in Fig. 1, where the side of the coils and boiler are broken away to exhibit the down-projecting end *i'*. The side or passage *j* for steam opens inside of the boiler at the top. By this construction of combined hot-water and steam-pipe provision is made, when desired, for the outlet of steam to the pipes to be cleaned, or by confining the steam in the boiler and thereby creating a steam-pressure in the top of the boiler hot water may be forced into the down-projecting end *i'* of the pipe, and thence upward to the pipes to be cleaned. A branch pipe *k* is connected with the steam-passage *j*, and is provided with a safety-valve G.

The combined steam and hot-water pipe F has at its top end a branch pipe H for cold water. A three-way cock I is in the pipe F at the upper end of the longitudinal division *h*, where also the said cold-water pipe intersects, and this cock controls the flow of cold water, steam, and hot water, so that cold water may be cut off entirely, as shown by the position seen in Figs. 4 and 5, or cold water directed down into the boiler, as shown by the position in Figs. 1 and 3, or steam directed from the boiler to the pipes to be cleaned, as shown by the position in Fig. 4, or hot water directed from the boiler to the pipes to be



cleansed, as shown by the position in Fig. 5, or cold water passed from the cold-water pipe H direct to the pipes to be cleansed, as shown by the position in Fig. 6. Above the  
 5 three-way cock I is a pipe J, which can be readily connected with the pipes to be cleaned.

The cold-water pipe H may be connected with the water-supply pipes of the city, or in small towns or villages where there are no  
 10 water systems this pipe H may connect with a water-tank elevated above the boiler, or instead of being elevated such water-tank may be supplied with a suitable force-pump by which water can be supplied to the boiler.

15 The cold-water pipe H has a right-angled connection H', and a T-joint N at the angle provides for connecting a branch pipe o, which leads to the boiler and coil and attaches thereto at a point which shall be the  
 20 highest for water to occupy. This branch pipe o has an ordinary three-way cock p, like that shown in the other figures, which when turned in one position cuts off all passage through the pipe, and when turned in the  
 25 other position opens to allow water to flow from the boiler. When the boiler is being filled with water through the pipes H and F and the cock p is turned to the last position, the said cock p then serves to determine the  
 30 water-line or highest point of water in the boiler, and when water flows through it the cock I must be turned to stop the filling. The T-joint at the angle-connection has an internal V-shaped guide q, which points directly  
 35 toward the end or bore of the cold-water pipe H. This V-shaped guide q, branch pipe o, and cock p enable the pipes H', H, and J to be used as a siphon when the supply comes from a water-tank to flow cold water through  
 40 the pipes that are being cleansed, as herein-after stated.

The burner E may be of any desired kind. A gas Bunsen burner is preferred.

The outer shell or case A has in its crown  
 45 or top a central air-opening r. (Indicated in Fig. 1 by the narrow white-line space.) The pipe F passes up through this opening, and the air-draft and products of combustion escape at this opening r. The shell A confines  
 50 the heat.

From the foregoing description it will be seen that the pipe J will carry superheated steam to the pipes to be cleaned; also, that hot boiling water may be forced to and  
 55 through said pipes, and that these cleansing elements—steam and hot water—may be used alternately. After the pipes to be cleansed have been subjected to the cleaning action of the steam and hot water it is desirable to  
 60 cool them at once. To this end it is only necessary to turn the cock I to the position shown in Fig. 6, whereupon if the supply comes from a connection with the city pipes cold water will flow through the pipe J. If  
 65 the supply, however, comes from a tank that is not elevated, then the cock p may be

turned to allow steam under pressure to force its way past the V-shaped guide q, and thereby, on the ejector principle, draw water from  
 70 the pipe H' to start the flow of cold water through the pipes H and J and the pipes to be cooled, and a suitable pipe or hose attached to the said pipes to be cooled to act as the long arm of a siphon will cause the  
 75 cold water to flow.

Having described our invention, we claim—

1. The combination of a sheet-metal shell or case A, which is tapering, being largest at the top, a boiler-vessel D, also tapering and fitted within the said shell, a pipe coiled out-  
 80 side of and fitted close to the exterior of said tapered boiler, with one end connected thereto near the bottom and the other end near the top, a pipe at the top of the boiler for the  
 85 outlet of steam, a pipe opening into the boiler near the bottom for the outlet of hot water, and a cock to control the said steam and hot water.

2. The combination of a sheet-metal shell or case A, which is tapering, being largest at  
 90 the top, a boiler-vessel D, also tapering and largest at the top and having spiral steps in its wall, and a pipe coiled outside of the boiler, with a coil in each groove that is formed by the said spiral steps and the ends of the coiled  
 95 pipe connected with the boiler.

3. The combination of a boiler, a pipe connected with the top of the boiler and having a longitudinal division which forms two pas-  
 100 sages i j, one of which projects down into the boiler to near the bottom and the other opens into the boiler at the top, a supply-pipe H, connected with the two-passage pipe at the  
 105 outer end of the said longitudinal division, a three-way cock I in the said pipe at the intersection of the branch pipe, and a delivery-pipe J, connected outside of said cock.

4. The combination of a boiler, a pipe connected with the top of the boiler and having  
 110 a longitudinal division which forms two passages i j, one of which projects down into the boiler to near the bottom and the other opens into the boiler at the top, a supply-pipe H, connected with the two-passage pipe at the  
 115 outer end of the said longitudinal division, a three-way cock I in the said pipe at the intersection of the branch pipe, a delivery-pipe J, connected outside of said cock, a branch pipe o, connecting the supply-pipe and the  
 120 boiler at a point which shall determine the high-water line, and a three-way cock p in the branch pipe.

5. The combination of a boiler, a pipe connected with the top of the boiler and having  
 125 a longitudinal division which forms two passages i j, one of which projects down into the boiler to near the bottom and the other opens into the boiler at the top, a supply-pipe H, connected with the two-passage pipe at the  
 130 outer end of the said longitudinal division, a three-way cock I in the said pipe at the intersection of the branch pipe, a delivery-pipe



J, connected outside of said cock, a T-joint  
attached to the supply-pipe and having an  
internal V-shaped guide *q*, which points di-  
rectly toward the end or bore thereof, a branch  
5 pipe *o*, connecting the said T-joint and the  
upper part of the boiler, and a cock in the  
branch pipe.

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

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Witnesses:

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