

(No Model.)

3 Sheets—Sheet 1

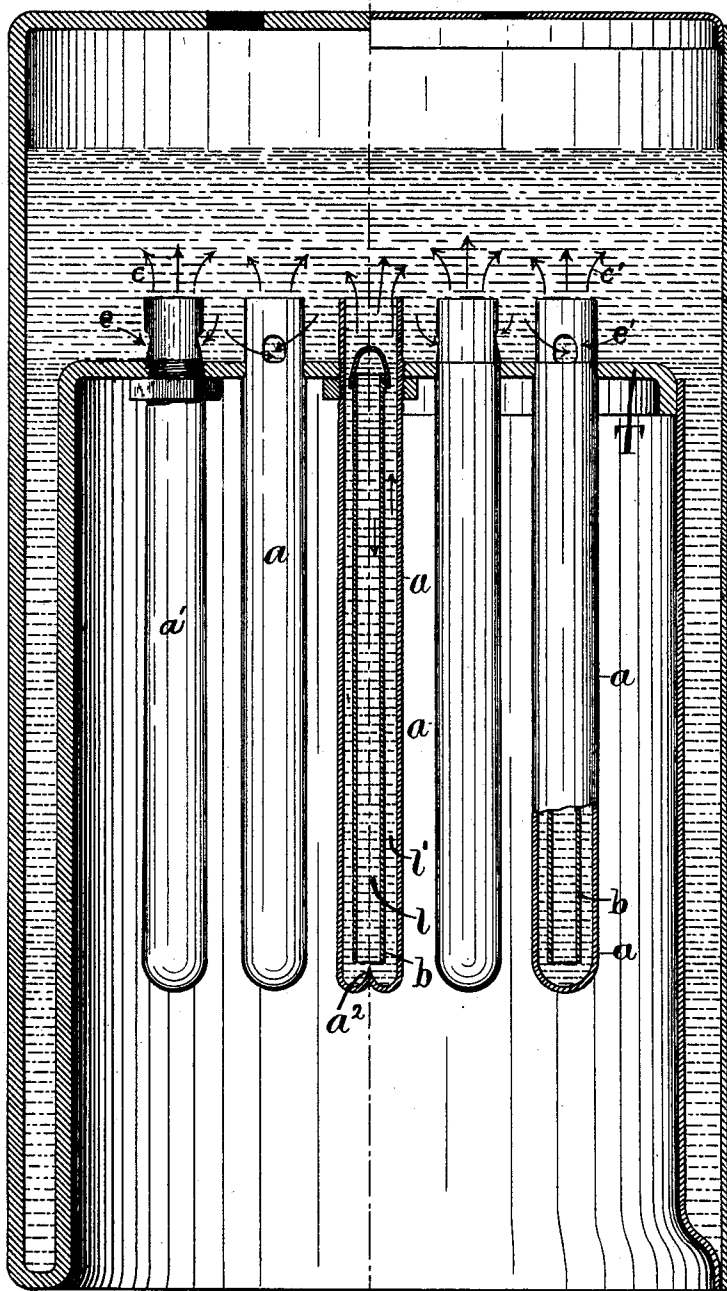
J. A. SCOLLAY.

DROP TUBE FOR STEAM OR HOT WATER BOILERS.

No. 480,786.

Patented Aug. 16, 1892.

Fig. 1.



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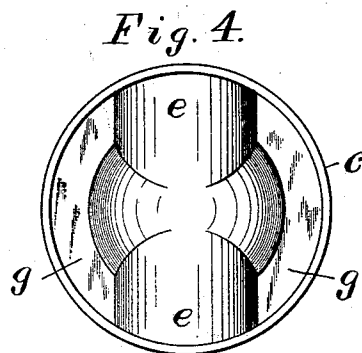
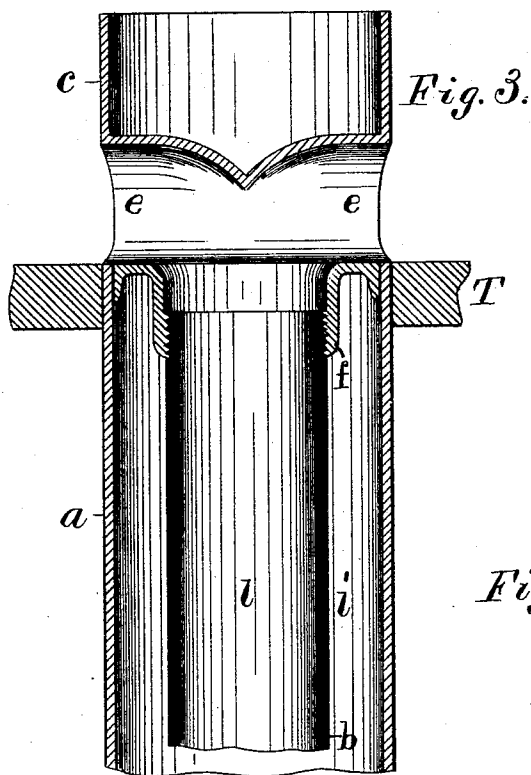
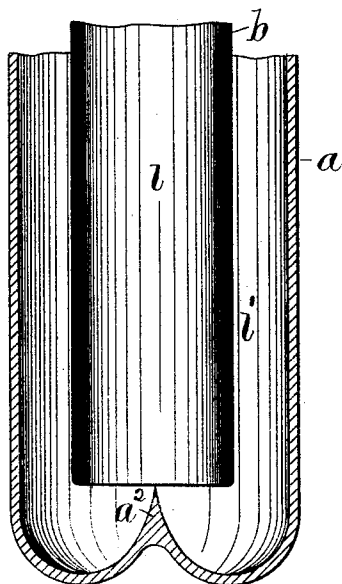
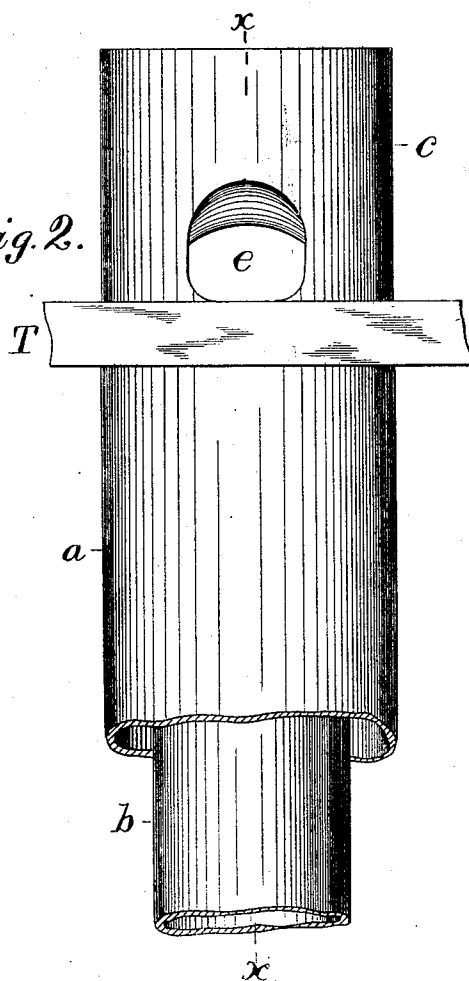


Fig. 2.



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Fig. 5.

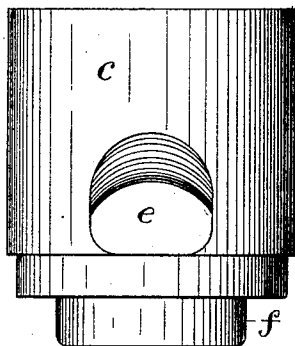


Fig. 6.

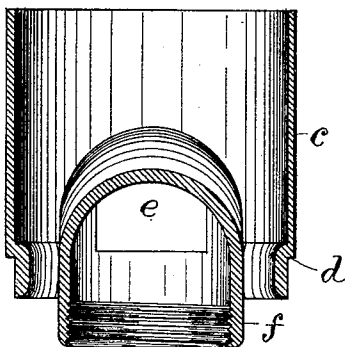
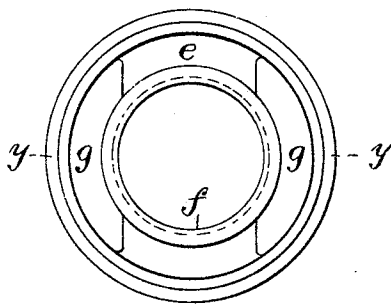


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN A. SCOLLAY, OF BROOKLYN, NEW YORK.

DROP-TUBE FOR STEAM OR HOT-WATER BOILERS.

SPECIFICATION forming part of Letters Patent No. 480,786, dated August 16, 1892.

Application filed February 5, 1892. Serial No. 420,427. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. SCOLLAY, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Drop-Tubes for Steam or Hot-Water Boilers, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to the drop-tubes which are commonly suspended from the crown-sheet in a boiler and have their lower ends in close proximity to the fire.

The invention consists in an improved cast-metal mouthpiece adapted to rest upon the top of the drop-tube and to sustain a division-pipe within the same, the division-pipe being suspended from a nozzle which is connected with inlets extended through the walls of the cylinder, such inlets dividing the interior of the cylinder transversely and forming at its opposite sides vertical passages which connect the drop-tube with the top of the cylinder. The fluid in contact with the exterior of the drop-tube being hotter than the inner fluid, rises within the drop-tube and is discharged through the passages *g* to the top of the cylinder, while the fluid of the boiler freely enters the inlets and passes downward through the division-pipe to supply the place of such outer fluid. The rising and descending currents are thus kept from interference with one another, and where steam is generated in contact with the walls of the drop-tube such steam is discharged from the top of the cylinder, while any water which rises therewith falls over the sides of the same and enters the lateral inlets.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is a central vertical section of a boiler, the right-hand side of the view showing an upright cylindrical shell of wrought metal and the left-hand side showing a cast-iron boiler of similar shape. The upper end of one of the drop-tubes, with a portion of the tube-plate, is shown in Fig. 2. Fig. 3 is a view of one of the drop-tubes, taken in vertical section on line *x x* in Fig. 2, the tube being broken transversely for want of space upon the drawings. Fig. 4 is a plan of the cap for such tube. Fig. 5 is an external view

of such cap turned at right angles to the position shown in Fig. 2. Fig. 6 is a vertical section on line *y y* in Fig. 7. Fig. 7 is a view of the bottom end of the cap.

In Figs. 2 and 3 the drop-tube *a* is shown provided with an internal division-pipe *b*, the latter being supported by a mouthpiece or cap of cast metal, consisting in a cylinder *c*, provided with a collar *d'* to fit therein and a shoulder *d* to rest upon the top of the tube *a* and having a transverse passage forming inlets *e*, connecting with a nozzle *f* below the passage. The nozzle is threaded internally and a division-pipe *b* is screwed therein and made of suitable length to extend nearly to the bottom of the drop-tube, as shown in Fig. 1. The division-pipe thus divides the space within the drop-tube into a downward channel *l* within the pipe and an upward channel *l'* between the pipe and the drop-tube. The inlets are connected with a nozzle *f* by an arch *e'*, which is curved downward over the center of the nozzle, as shown in Fig. 3, thus forming a forked arch which deflects the fluid downward into the pipe as it enters the inlet *e* and avoids conflict between the two opposite currents. The walls of the inlets *e* divide the space within the cylinder *c* internally, leaving two vertical passages *g*, by which the fluid from the channel *l'* may rise above the level of the inlets *e* and escape from the top of the cylinder.

In Fig. 1 several tubes of this construction are indicated at *a* with arrows *c'*, indicating the movement of the fluid escaping from the top of the cylinder *c*, and arrows *e'*, indicating the flow of the fluid into the passages *e* to supply the downward current in the channel *l*. The mouthpiece *c* is adapted for application to drop-tubes of wrought metal, which would be expanded in the tube-sheet *T* of the boiler, as shown in the tubes *a* in Fig. 1; but for low-pressure boilers the entire drop-tube, with a division-pipe inside the same and the mouthpiece attached, may be formed all in one piece of cast metal and secured in the tube-plate by a screw-thread, as shown in the tube *a'* in Fig. 1.

The bottom of the drop-tube in Fig. 3 is shown with an inwardly-projecting cone *a''*, which is adapted to divide the downward current and deflect it smoothly into the upper

channel *l*. Such cone may be formed by an attachment secured to the bottom of a tube, but may be readily provided integral with the tube if formed by casting, as described

5 above.

The inlet-passages in the drawings are shown close to the tube-plate to permit the downward flow of water from the steam-dome of the boiler to the inlets of the tubes with the least resistance; and it will be obvious that the raising of the outlet above the tube-plate wholly prevents the interference of the rising fluid from the currents which are entering the inlets of the tubes.

15 The importance of circulation within boilers is already well known and the desirability of an active circulation within a drop-tube is also understood, as it not only promotes the discharge of the steam which may be formed in the tube, and thus secures a more rapid generation of such steam, but it also prevents the walls of the tube from being overheated, and thus increases the durability of the same.

25 I am aware that various devices have been employed to secure separate channels for circulation within a drop-tube; but I am not aware of any attachment to the mouth of a drop-tube which provides two lateral inlets for a downward current, with a mouthpiece or cylinder extended upward above such inlets, and thus adapted to discharge the rising fluid into the boiler above the fluid which tends to enter such inlets and pass downward in the

35 division-pipe.

Having thus set forth the nature of the invention, what is claimed herein is—

1. The mouthpiece for drop-tubes, consist-

ing in the upright cast-metal cylinder *c*, adapted to rest upon the top of the tube and provided with a collar *d'*, adapted to fit therein and having the nozzle *f* threaded to receive a division-tube, the nozzle being closed at the top by an arch and being connected with the walls of the cylinder by means of the inlets *e*, extending from the arch through the sides of the cylinder, as and for the purpose set forth.

2. The mouthpiece for drop-tubes, consisting in the upright cast-metal cylinder *c*, adapted to rest upon the top of the tube and provided with the collar *d'*, adapted to fit therein and having the nozzle *f* threaded to receive a division-tube, the nozzle being closed by the forked arch *e'* and being connected with the walls of the cylinder by means of the inlets *e*, extending from the arch through the sides of the cylinder, combined with the wrought-metal division-tube *l*, secured within the nozzle, as and for the purpose set forth.

3. The combination, with the drop-tube, of a cylinder *c*, extended above the tube-plate in which the tube is secured, the inlets *e* in opposite sides of the cylinder, united by the nozzle *f* and forming the vertical passages *g*, connecting the drop-tube with the top of the cylinder, and the nozzle being provided with the division-tube *l*, connected internally with the inlets *e*, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN A. SCOLLAY.

Witnesses:

JOSEPH M. STOUGHTON,
THOMAS S. CRANE.