

W. H. WALSH.  
 Tube-Fastenings for Boilers.

No. 211,809

Patented Jan. 28, 1879.

Fig: 1.

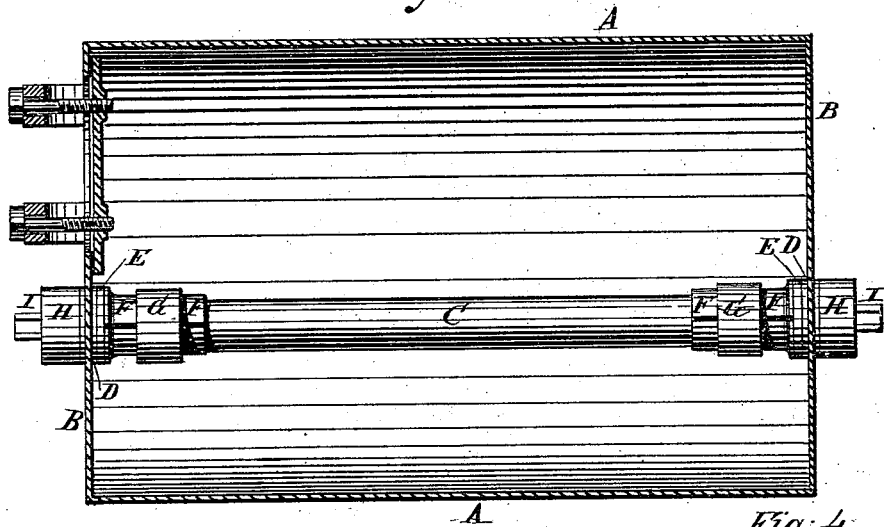


Fig: 3.

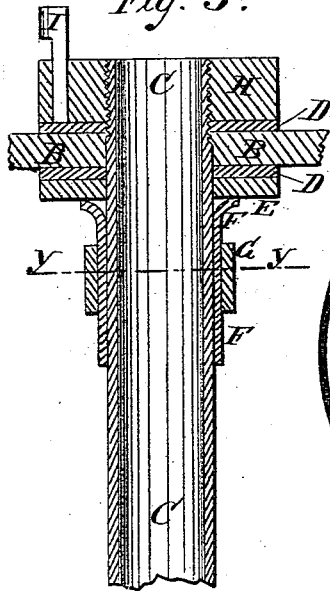


Fig: 2.

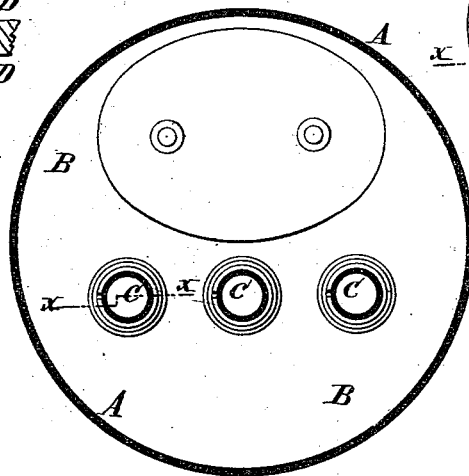


Fig: 4.

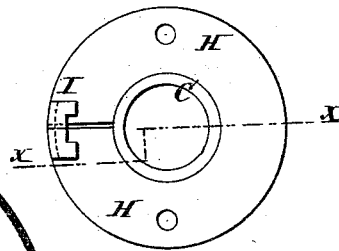
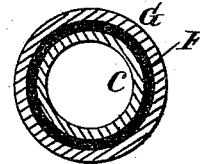


Fig: 5.



WITNESSES:

*Achilles Schehl.*  
*C. Sedgwick*

INVENTOR:

*W. H. Walsh*  
 BY *Munn & Co*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

WILLIAM H. WALSH, OF FORT WORTH, TEXAS, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOSEPH FOWLER, OF SAME PLACE.

## IMPROVEMENT IN TUBE-FASTENINGS FOR BOILERS.

Specification forming part of Letters Patent No. 211,809, dated January 28, 1879; application filed October 28, 1878.

*To all whom it may concern:*

Be it known that I, WILLIAM HENRY WALSH, of Fort Worth, in the county of Tarrant and State of Texas, have invented a new and useful Improvement in Tube-Fastenings for Boilers, of which the following is a specification:

Figure 1 is a longitudinal section of a flue-boiler illustrating my invention. Fig. 2 is a cross-section of the same, showing three flues. Fig. 3 is a longitudinal section of the flue-plate and the end part of a flue, taken through the line *x x*, Fig. 2. Fig. 4 is a detail view of the outer end of a flue and its nut and key. Fig. 5 is a detail cross-section of a flue and its open and solid collars, taken through the line *y y*, Fig. 3.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improvement in securing flues in steam-boilers, the use of which will allow flues to be readily put in and taken out, and which at the same time will make the boilers stronger than when made in the usual way.

The invention consists in the combination of the lead gaskets, the iron washers, the open tapering collars, the solid tapering collars, the open nuts, and the steel keys with the flues and the flue-plates of a steam-boiler, as hereinafter fully described.

A represents the shell of a boiler, D represents the heads or flue-plates, and C represents the flues.

The ends of the flues C project a little beyond the flue-plates B, and have lead gaskets D placed upon them upon each side of each flue-plate B.

Upon the flues C, at the inner side of the inner gaskets D, are placed iron washers E, against which rest the outer ends of the collars F. The collars F are open and are tapered inward, and upon them are placed the solid collars G, which are also correspondingly tapered.

Upon the outer ends of the flues C are cut screw-threads, upon which are screwed the nuts H. The nuts H are open, and their ends are drawn and held together by grooved steel keys I, driven into L-grooves in the ends of the said nuts, as shown in Figs. 3 and 4.

In using the improvement the flues are passed to the men within the boiler, who place the inner lead gaskets D, the iron washers E, the open tapering collars F, and the solid tapering collars G in place upon the said flues, and push them close up against the flue-plates B. The nuts H are then screwed on, and the solid collars G are driven up, forcing the gaskets D, the washers E, and the open collars F closely against the inner sides of the flue-plates B. The nuts H are then screwed off, the outer lead gaskets D are put on, and the nuts H are put on and screwed up tight.

The nuts H are made of such a size as to touch each other, and thus act as a stay to the flue-plates.

The flues C may be removed by taking out the steel keys I, which allows the nuts H to open, and loosens them so that they may be readily removed. The collars G may then be driven back and the flues taken out.

This construction allows the flues to be taken out without injuring the flue-plates in any way.

By this construction, also, patches may be applied, when necessary, by riveting them on, which cannot be done when the flues are secured in the ordinary way.

With this construction the flues C act as safety-plugs, for should the water get below any of the flues, the fire melts the lead gasket, and thus gives warning.

In the face of each nut H are formed two holes, as shown in Fig. 4, so that the said nuts can be conveniently screwed on and off with a forked wrench.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of the lead gaskets D, the iron washers E, the open tapering collars F, the solid tapering collars G, the open nuts H, and the steel keys I with the flues C and the flue-plates B of a steam-boiler, substantially as herein shown and described.

WILLIAM HENRY WALSH.

Witnesses:

THOMAS A. MINTER,  
JAMES A. STUARD.