(No Model.) 2 Sheets—Sheet 1.

A. WORTHINGTON.

BOILER.

No. 377,002. Patented Jan. 24, 1888.

Fig. 1.

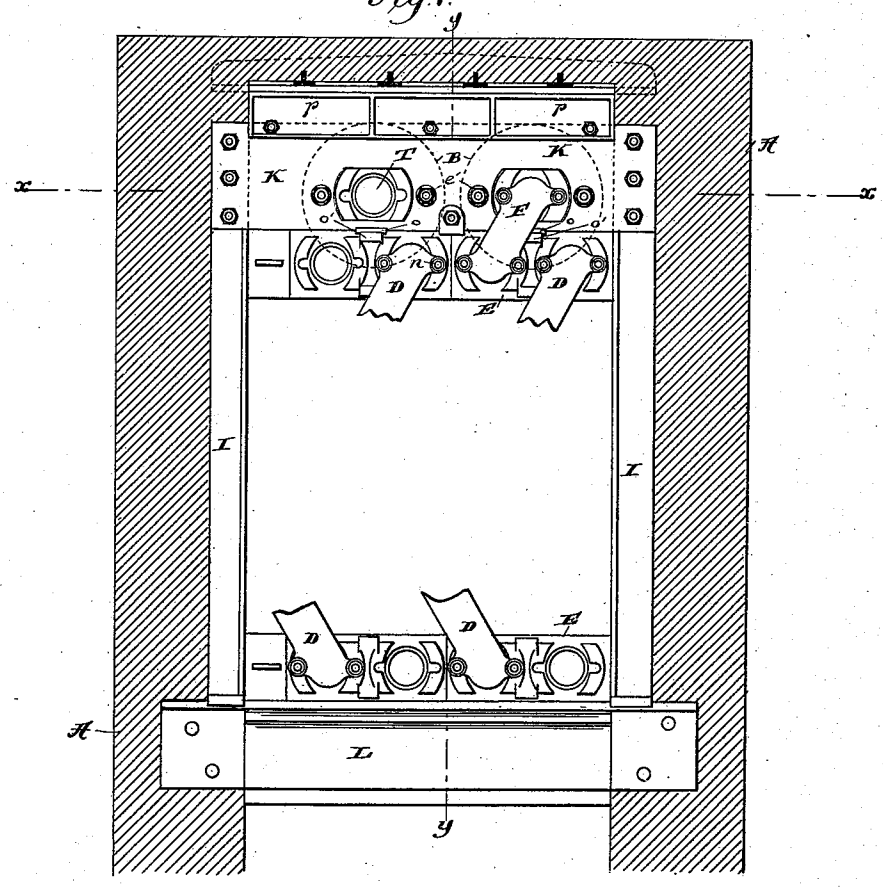
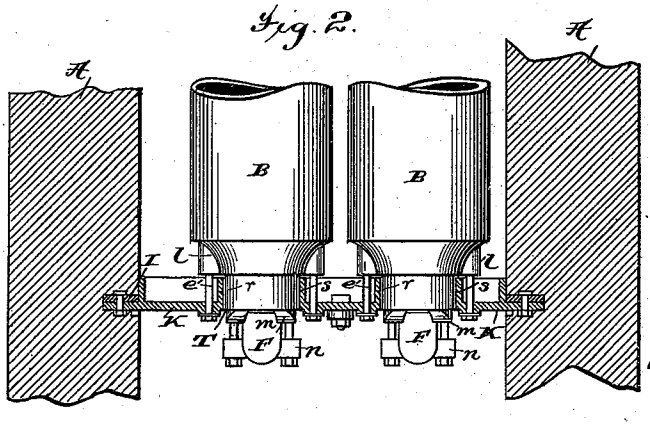


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

A. WORTHINGTON.

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Fig. 3.

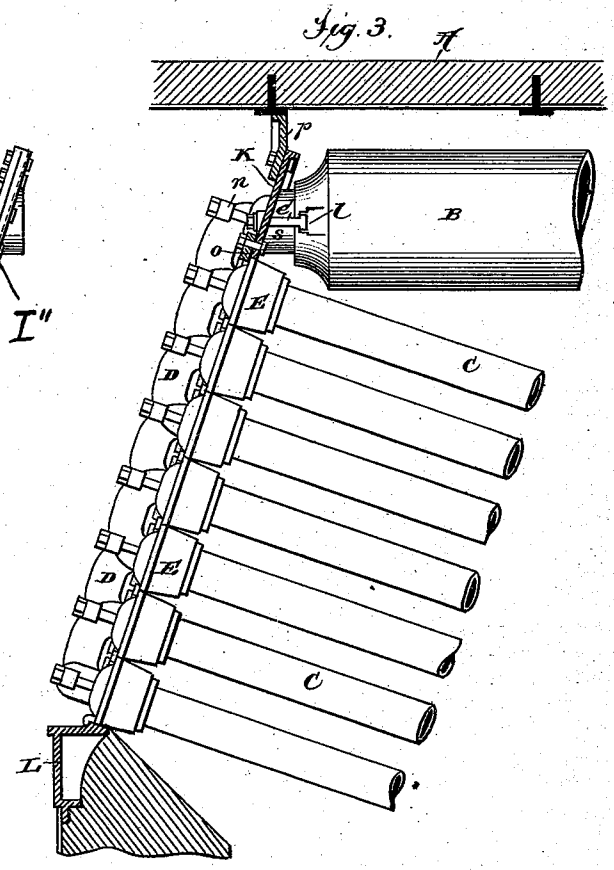


Fig. 4.

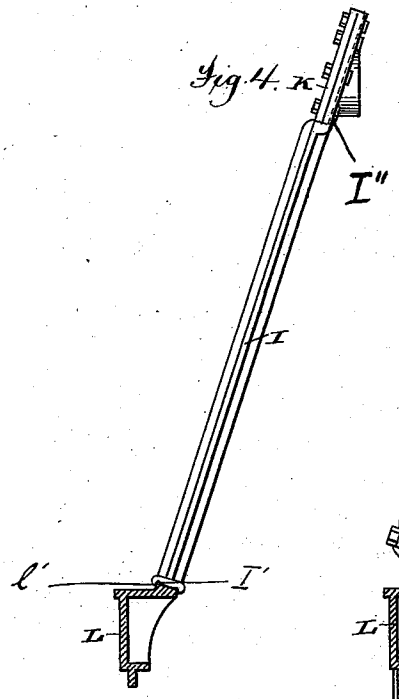


Fig. 6.

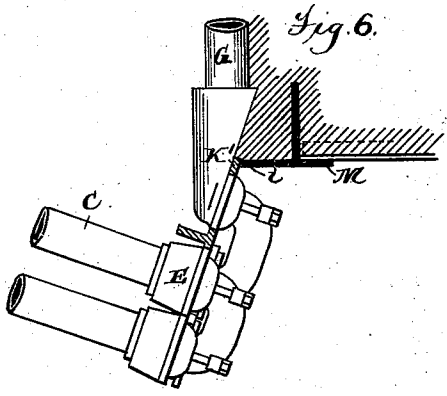
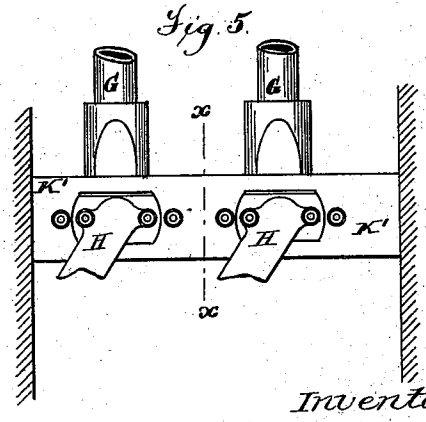


Fig. 5.



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UNITED STATES PATENT OFFICE.

AMASA WORTHINGTON, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE ABENDROTH & ROOT MANUFACTURING COMPANY, OF NEW YORK.

BOILER.

SPECIFICATION forming part of Letters Patent No. 377,002, dated January 24, 1888.

Application filed October 12, 1886. Serial No. 216,064. (No model.)

To all whom it may concern:

Be it known that I, AMASA WORTHINGTON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Boilers, of which the following is a full, clear, and exact description.

My invention relates to an improvement in supports for the forward end of a water-tube boiler; and the purpose of my invention is to combine strength and lightness with a provision for the taking up of the expansion and contraction which shall permit the withdrawal of a pair of tubes without necessitating the displacement of the others, as well as to permit all the tubes to be withdrawn from the boiler without displacement of the steam-drums, which will be maintained in their proper position.

To this end my invention consists in the construction and arrangement of parts, all as hereinafter more fully described and claimed.

In the drawings, Figure 1 is a front elevation of the interior of a furnace, showing the supporting-frame for the forward part of the boiler in elevation. Fig. 2 is a horizontal section on the line *x x* of Fig. 1. Fig. 3 is a sectional side elevation on the line *y y*, Fig. 1. Fig. 4 is a side elevation of the front supporting-frame detached; Fig. 5, a rear elevation of part of the boiler, showing the rear support; and Fig. 6, a vertical cross-section on the line *x x* of Fig. 5, showing details.

A is the furnace-wall; B, the steam-drums; C, the water-tubes; D and E, the bends and headers, respectively, connecting the water-tubes together; F, the bends connecting the upper series of the water-tubes with the steam-drums; G, the downtake and shell-connector, and H the bends connecting the downtake with the boiler-tubes at the rear, all the foregoing parts being substantially of the character described in another application for a patent filed by me of even date herewith.

The support of the steam-drum comprises side pieces, I, having flanges formed upon their upper end to permit the reception of the upper cross-plate, K, and to enable the same to be bolted thereto. Upon the lower end of each of said supports I is formed a groove, I′, for the purpose hereinafter described. These supports are made of T or angle iron and set into the side walls of the furnace.

Bolted at each end to the side pieces is the upper cross-plate, K, in the form of a plate provided with apertures T, to receive the projecting reduced ends *s* of the steam-drums B.

In place of simple apertures a sleeve, *r*, may be cast into the rear part of the plate, into which the ends *s* may be inserted.

The lower cross-piece or bearing-beam, L, is made of angle-iron and bolted to the corner-posts and provides a support for the forward end of the tubes, and has formed upon its inner side a rib, *l*′, which fits into the longitudinal groove I′ of the uprights I I and provides a support therefor. The headers E occupy the space between the upper plate, K, and bearing-beam L, resting upon the latter, and are caused to engage with the upper plate, K, to prevent displacement by means of locking-plates *o*, inserted into the grooved tongues *o*′, formed on the uppermost headers.

The upper series of bends are of the same construction as those of the front and back of the boiler throughout, and are provided with projecting perforated ears to receive T-bolts *n*, the heads of which are inserted into recessed lugs *m*, formed on the end of the drums B. For further security, recessed lugs *l* may be formed on the drums B to receive T-bolts *e*′, passing through the plate K.

To afford perfect security against forward and backward displacement, I find it advisable to set the side frame, I, and the ends of the plates K and L into the wall of the furnace, although it is obvious that any tendency to displacement is largely overcome by the securing medium afforded in the plate *p* and lower support, L, resting on the furnace-wall. At the rear of the furnace a plate, K′, is provided at the point of communication between the downtake-shell G and the upper bends, H, provided with the necessary apertures for the insertion of a bend and header and set into the wall of the furnace. Displacement is prevented by a locking-plate similar to that employed between the upper front plate and headers, which engages the rear upper headers and rear supporting-plate through recessed lugs formed on the headers.

It will be seen that by the use of my invention a means is provided for supporting the drums independently of the boiler-tubes, which may be withdrawn and replaced without displacement of the drum or connections or affecting the security of the support provided therefor.

What I claim as new, and desire to secure by Letters Patent, is—

1. A supporting-frame for the forward end of a water-tube boiler, consisting, in combination, of the upper cross-piece, K, side supports, I I, supporting the cross-piece K, and having formed upon their lower ends grooves I′, and lower cross-piece, L, provided upon its inner end with a rib, *l*′, to engage with the groove formed in the lower end of the supports I I, substantially as and for the purpose set forth.

2. A supporting-frame for the forward end of a water-tube boiler, consisting, in combination, of the upper cross-piece, K, side supports, I I, having flanges formed upon their upper ends to engage with and support the cross-piece K, and provided with groove at their lower ends to engage with the rib formed upon the inner side of the lower cross-piece, L, and said cross-piece L having a rib formed on its inner side, substantially as and for the purpose herein shown and described.

In testimony whereof I have hereunto set my hand this 7th day of October, A. D. 1886.

AMASA WORTHINGTON.

Witnesses:
THORNE S. WALLING,
DOUGLAS DYRENFORTH.