(No Model.)

M. FLEISHER.

WATER TUBE BOILER.

No. 304,090. Patented Aug. 26, 1884.

Fig. 1.

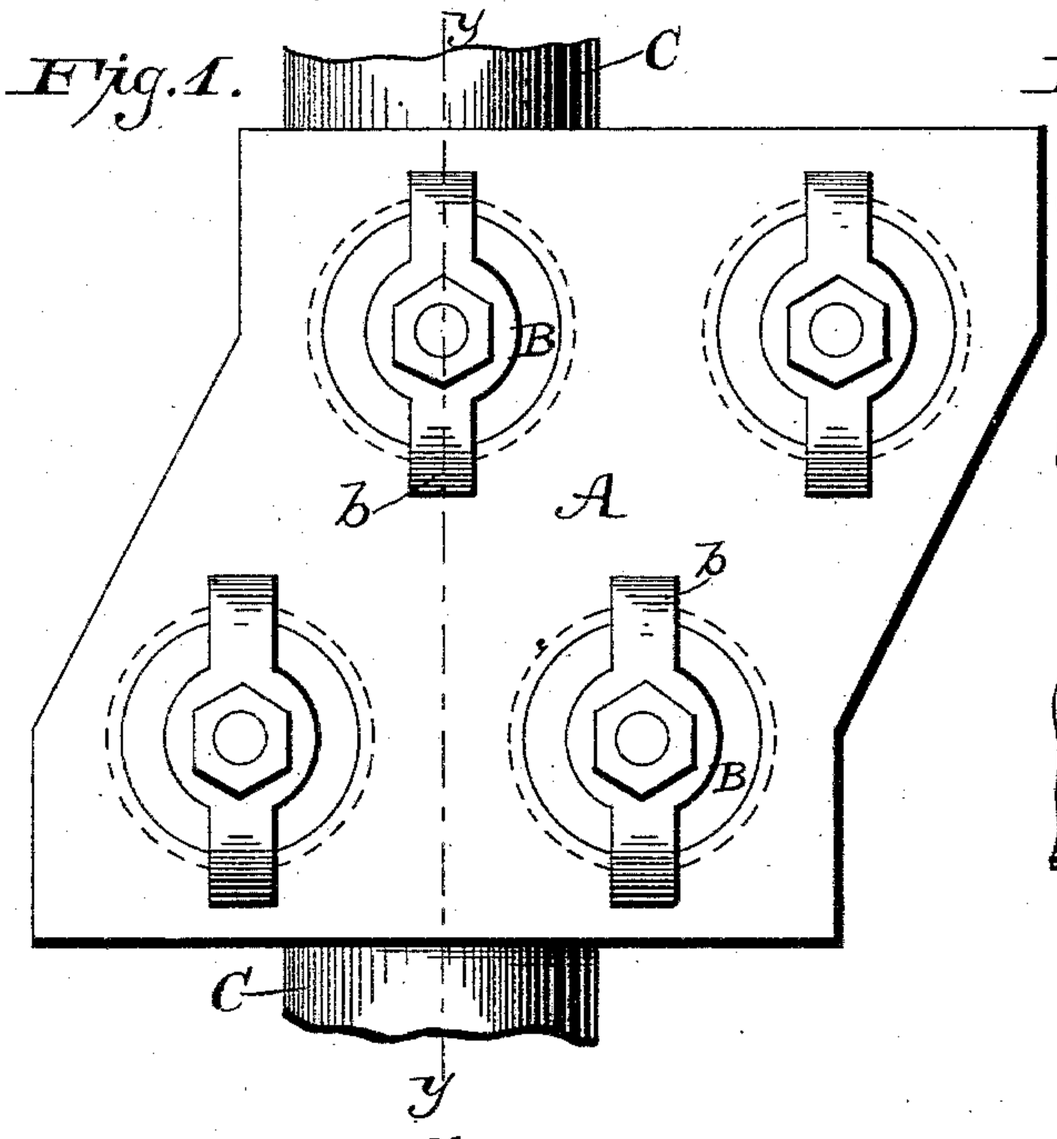


Fig. 2.

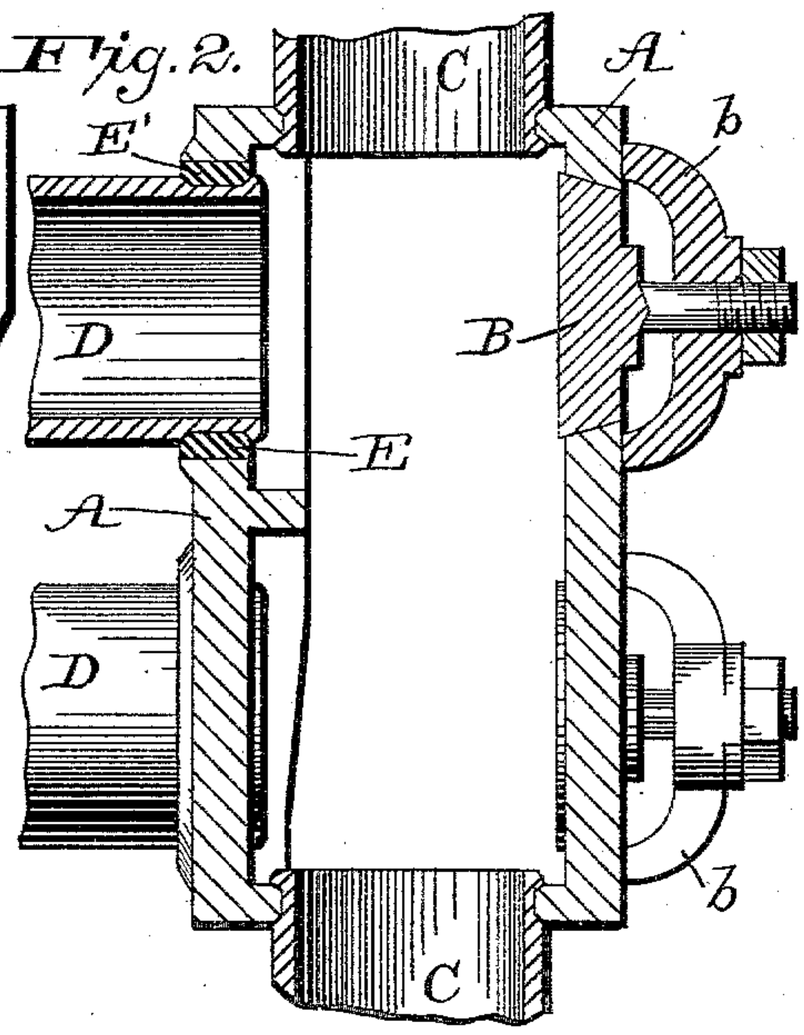


Fig. 3.

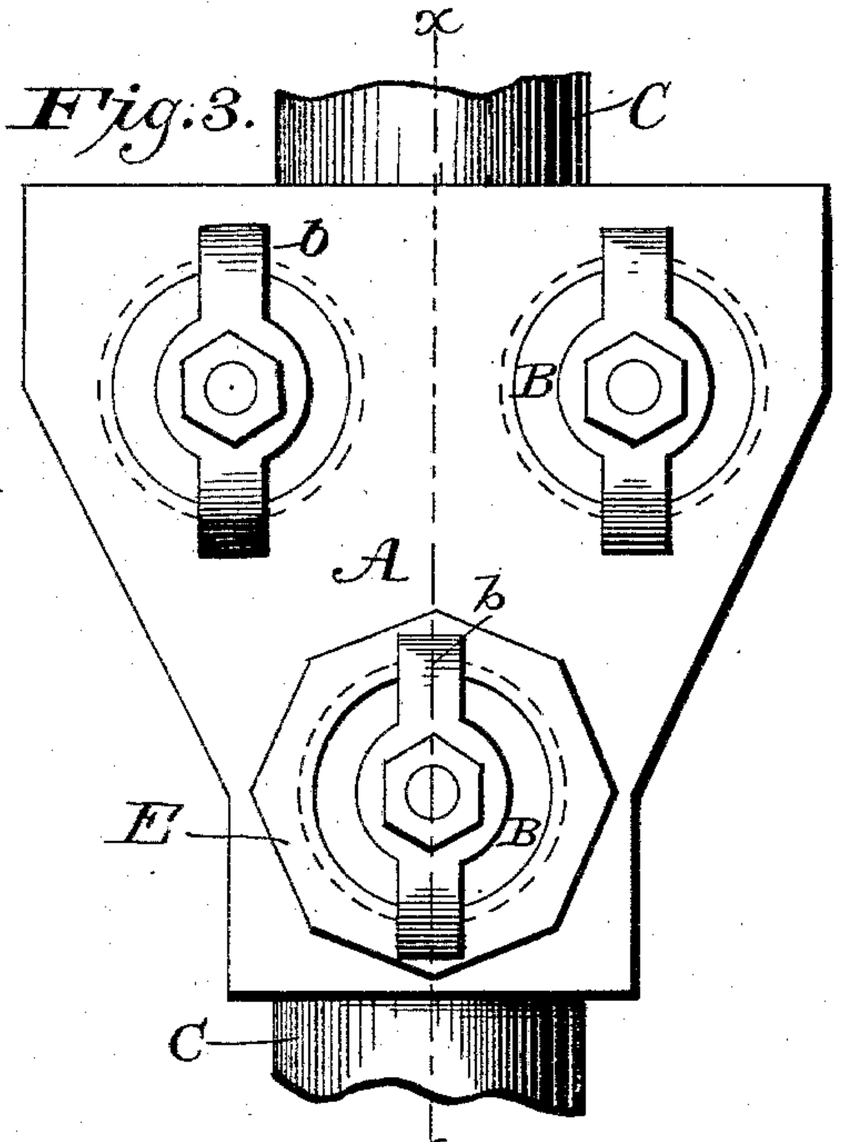
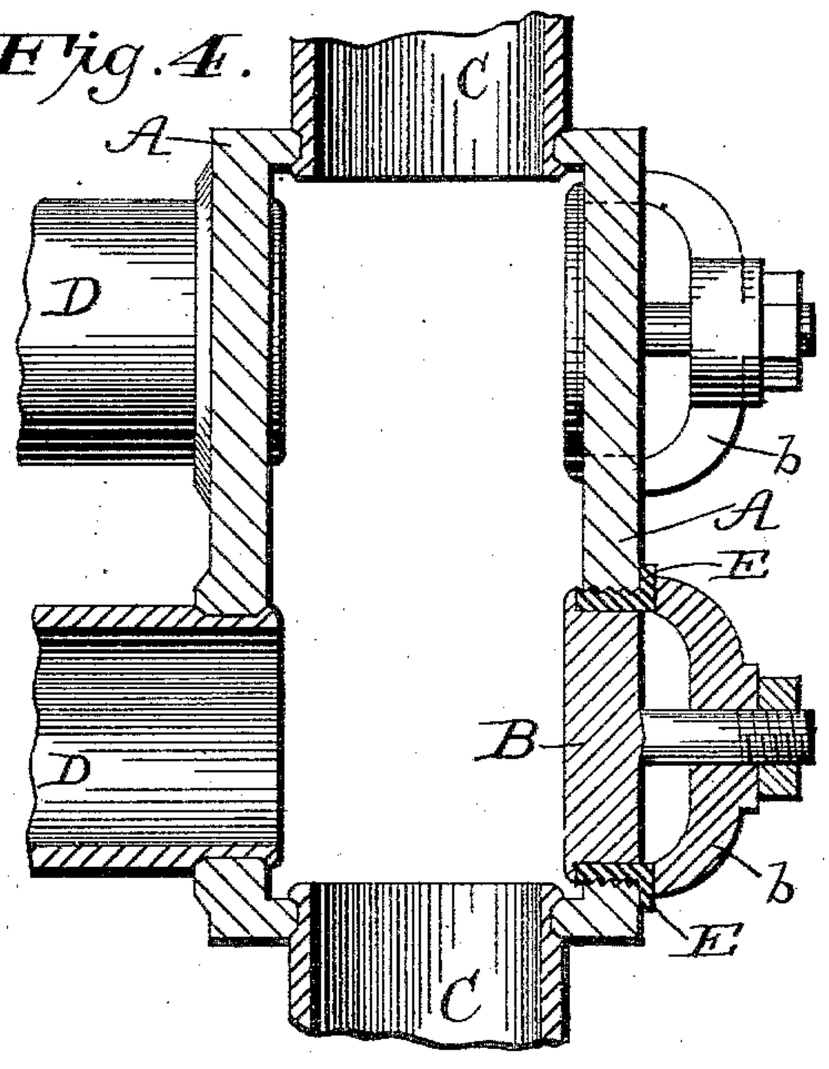


Fig. 4.



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MOYER FLEISHER, OF PHILADELPHIA, PENNSYLVANIA.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 304,090, dated August 26, 1884.

Application filed April 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, MOYER FLEISHER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Water-Tube Boilers, of which the following is a specification.

My invention relates to improvements in means for adjusting in place the plate-plugs for closing hand-holes and in openings for their reception, and is specially adapted for use on the class of water-tube boilers. For this reason I will proceed to describe it as applied to such devices, although I do not desire to restrict myself to such use. Boilers of this character, as is well known, consist of groups of tubes the ends of which are expanded into a steam-circulating end chamber, commonly known as a "header" or "water-leg." These headers are made to receive the ends of all the tubes of the boiler; but sometimes said headers are made in sections, each section adapted to receive two or more of the tubes. Said headers must be provided with hand-holes, which before steam is generated have to be tightly closed. When the headers are made sectional, they are connected together by a short tube or open-ended thimble, by which means a free circulation of steam is maintained. My improvement is adaptable to either form of header.

Hitherto there has been great difficulty in providing means for introducing within the chambers (or "boxes," as they are sometimes called) of the headers the closing plates or plugs for the hand-holes, which, as is well known, must have a larger area on the inside or lower surface, either by beveling or flaring the periphery or by overlapping or extending said plates a given distance within the box or chamber over and beyond the hand-hole opening, by which means the pressure of steam is resisted.

To overcome this difficulty has been the object of my improvement; and it consists in forming apertures for reception of the tubes, as well as the apertures for the connecting-thimbles, when such are employed, larger in diameter relatively to the hand-hole-closing plugs, by which construction is provided one or more openings large enough for admission of the hand-hole-closing plates or plugs, and through which larger opening or openings said closing-plates can be introduced into the respective headers, whether sectional or not, from the inside, and be readily placed in position for closing said hand-holes.

My improvement further contemplates that one or more of the apertures into which the ends of the tubes are to be expanded may be reduced in size by bushing. This construction admits the free passage (before the bushing is placed in position) of the closing-plate, when said plate is of much larger diameter than its opposite tube. So, too, may one or more of the hand-hole apertures be made much larger than its respective closing-plate, said aperture to be afterward reduced in diameter by bushing to a required size, thus admitting the introduction of the tubes and the closing-plate into the header or water-leg through such enlarged hand-hole aperture previous to its reduction by bushing, all as hereinafter described, and pointed out in the claims.

Referring to the accompanying drawings, in which like letters of reference point out similar parts on each figure, Figure 1 is an elevation of the side chamber or header of a water-tube boiler. Fig. 2 is a section of the same on the line *y y*. Fig. 3 is an other elevation of a header. Fig. 4 is a sectional view thereof on the line *x x*.

A is the outer plate; B, the hand-hole plugs or plates; C, the connecting-thimble; D, the boiler-tubes; E E′, the bushing, which may be either expanded or screwed into place; *b*, the plug bridge or brace.

Figs. 2 and 4 fully illustrate my invention. It will be seen that one or more of the hand-hole openings are larger than necessary for passage of the tube, being made so for introduction of the hand-hole plate, after which said enlarged opening is reduced to the proper size by screwing or expanding the bushing E into place; or the hand-hole plate may be introduced through the thimble C, in which case the bushing E is dispensed with.

It is manifest that the hand-hole plug B may be introduced through the aperture for reception of the tube D, instead of through the thim-

ble C, in which case the bushing E′ (see Fig. 2) must be employed.

In Figs. 2 and 4 I have shown thimble C and bushing E E′ all of an enlarged size relative to the hand-hole plate B; but in practice it is not necessary that all be so enlarged; either one may be sufficient to carry out my invention.

Although the drawings illustrate my improvement as applied to a sectional header, I desire to be understood as not limiting myself to this special form, it being equally adaptable to a continuous vertical passage.

My invention, although simple in its nature, provides for a long felt want, and will be found very useful for the purpose intended.

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

1. A header for water-tube boilers, provided with aperture for the reception of connecting-thimble C, aperture for the reception of tube D, and an aperture for reception of plug B, either or all of the said apertures being made of larger diameter than the hand-hole plate, as and for the purpose intended, substantially as described.

2. In a header for a water-tube boiler, having on one side of its shell hand-holes, and on its opposite side apertures for reception of tubes to be expanded therein, wherein the hand-hole-closing plates are larger in diameter upon their lower surface than the hand-holes, and wherein one or more of the tube-receiving apertures are of a larger diameter than the closing-plug B, whereby said closing-plug can be introduced within the shell of the header through the tube-opening, in combination with bushing E′, as and for the purpose intended, substantially as described.

3. In a header for water-tube boilers, provided at one side with apertures for reception of tubes D, and on the opposite side with hand-holes, wherein said hand-holes are larger in diameter than their closing-plugs B, in combination with bushing E, whereby said hand-holes may be reduced in diameter after the passage of the tubes D and introduction of the closing-plugs B, as and for the purpose intended, substantially as described.

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