

No. 883,602.

PATENTED MAR. 31, 1908.

E. C. WILLSON.  
FEED WATER HEATING GRATE.  
APPLICATION FILED JAN. 19, 1905.

Fig. 1.

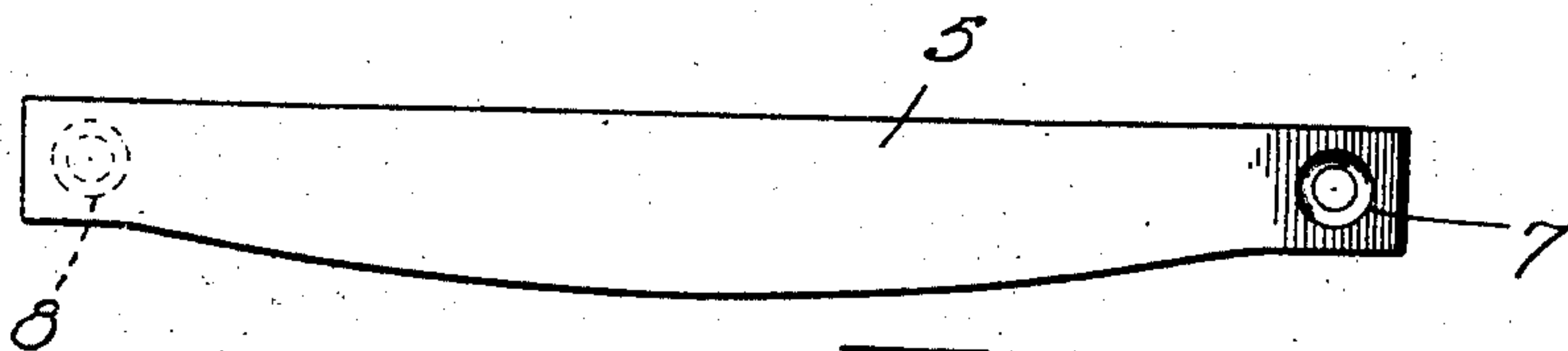
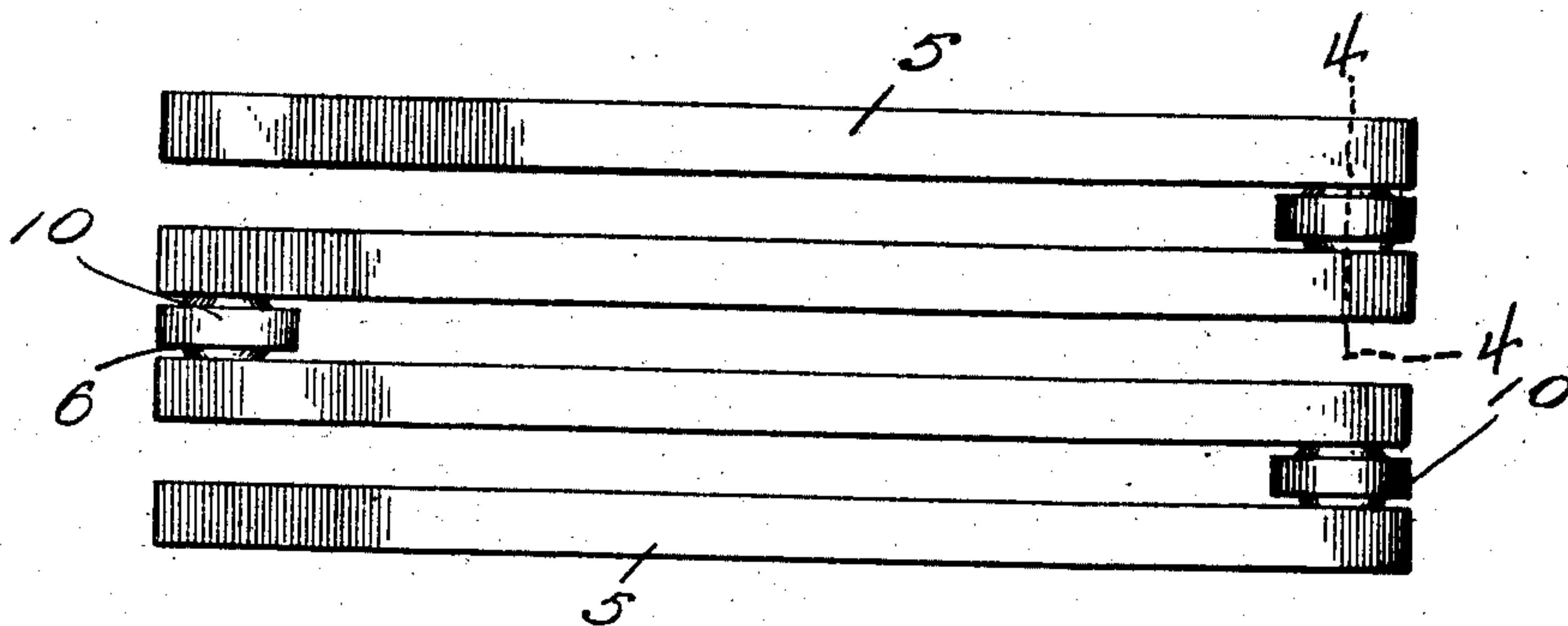


Fig. 2.

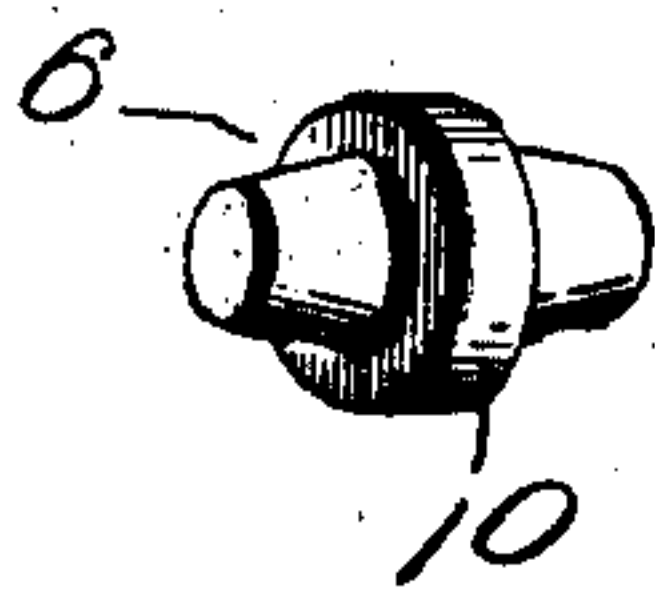


Fig. 3.

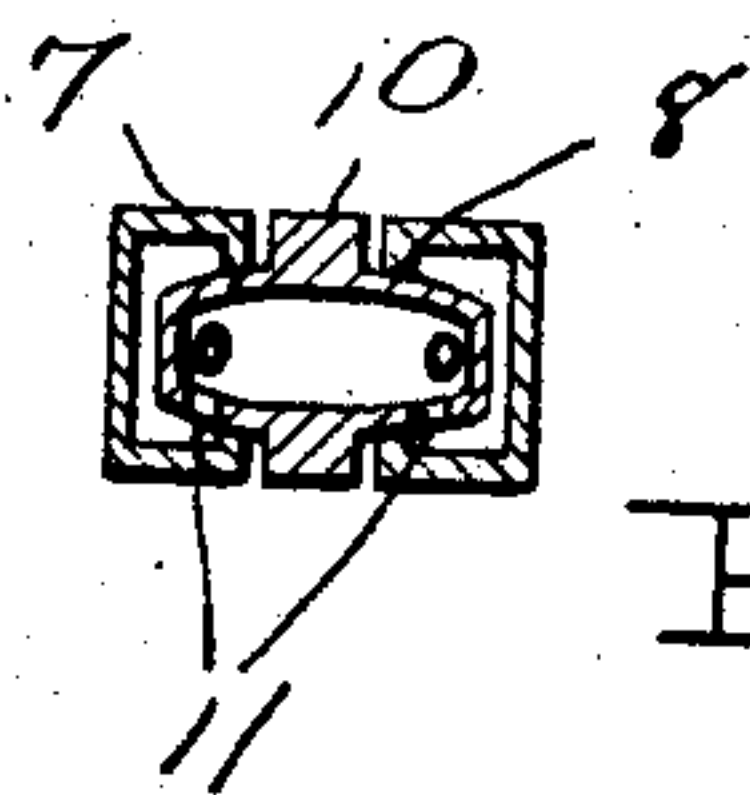


Fig. 4.

Witnesses  
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# UNITED STATES PATENT OFFICE.

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## FEED-WATER-HEATING GRATE.

No. 883,602.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed January 19, 1905. Serial No. 241,878.

*To all whom it may concern:*

Be it known that I, ELON C. WILLSON, a citizen of the United States, residing at Tillamook, in the county of Tillamook, State of Oregon, have invented certain new and useful Improvements in Feed-Water-Heating Grates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has relation to that form of grate-bars that are made hollow, and are so constructed and connected that the water supplied to the boiler may be fed there-through with the dual purpose of preserving the grate-bar and assisting in the generation of steam in the boiler.

It is the general purpose of my invention to simplify the means for connecting the alternate ends of the grate-bars and at the same time enhance their efficiency.

The nature of the invention is fully and clearly ascertainable from the device portrayed in the annexed drawings forming a part of this specification in view of which it will first be described with respect to its construction and mode of operation and then be pointed out in the subjoined claims.

Of the said drawings—Figure 1 is a top plan view of a grate constructed in accordance with the present invention. Fig. 2 is a side elevation of one of the units. Fig. 3 is a perspective view of one of the connecting members. Fig. 4 is a transverse section taken through one of the connecting members and the adjacent grate bars, on line 4—4 of Fig. 1.

Referring now to the drawings, the present invention comprises a plurality of units 5 and connecting members 6. The units 5 constitute the bars of the grate and have the usual form of such bars. In the present invention, these bars are hollow and formed in each bar are a pair of inwardly tapered openings 7, and 8, these openings lying at opposite ends of the bars and being formed in opposite sides thereof. Connecting members 6 are provided, which consist of tubes tapered from their centers to their ends and having filling flanges 10 formed thereupon at their centers and extending at right angles to the

central longitudinal axis of the tubes, the flanges entirely surrounding the tubes, as shown. The tubes are closed at their ends, and formed through the tubes adjacent to their ends and at one side thereof, are openings 11, these openings communicating with the interior of the tubes, both openings of each tube being disposed at the same side thereof. The taper of the tubes corresponds to the taper of the openings 7 and 8, and in assembling the parts, an end of each tube is driven into the opening 7 of one of the bars, the other ends of the tubes being driven into the openings 8, of the adjacent bars it being understood that the bars are turned with the openings toward each other. As shown, the openings 11 lie wholly within the bar. There is thus formed a continuous passage through the bars and connecting members, the outer ends of the outermost connecting members having suitable water supply and discharge pipes respectively, connected therewith.

My improved coupling affords a perfectly tight connection between the tapering tubes or nipples and the tapering holes 7 and 8 in which they fit, and that the connection can be readily effected through the ease with which the coupling devices may be handled by reason of the spacing annular flange 10. The construction at the same time is most economical.

What is claimed is:

A feed-water heating grate composed of a series of hollow bars connected alternately at their ends, said connections comprising tapered openings formed in the opposite sides of the end portions of a pair of bars; a hollow coupling having a central annular spacing rib and tapering nipples extending from opposite sides of the rib and adapted to fit in a steam-tight manner in said openings in the grate bars, said nipples having their inner extremities closed and being provided at the sides of inner end portions with holes opening within the hollow grate-bars.

In testimony whereof, I affix my signature, in presence of two witnesses.

ELON C. WILLSON.

Witnesses:

S. C. FOSTER,  
J. M. MORGAN.