No. 885,662. PATENTED APR. 21, 1908.

A. J. BOWDEN.

DETACHABLE BOILER FLUE.

APPLICATION FILED MAY 31, 1907.

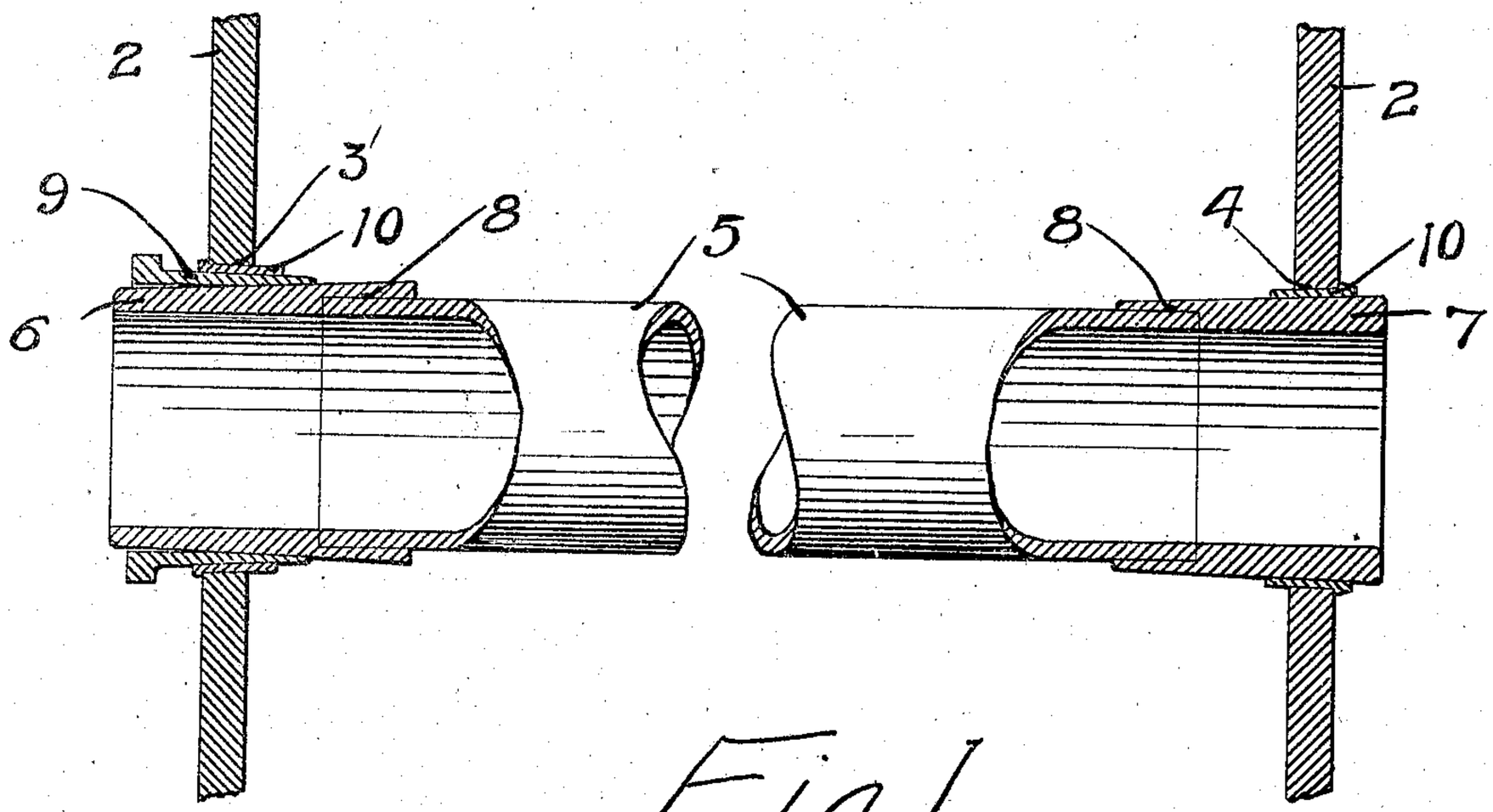

Fig 1.

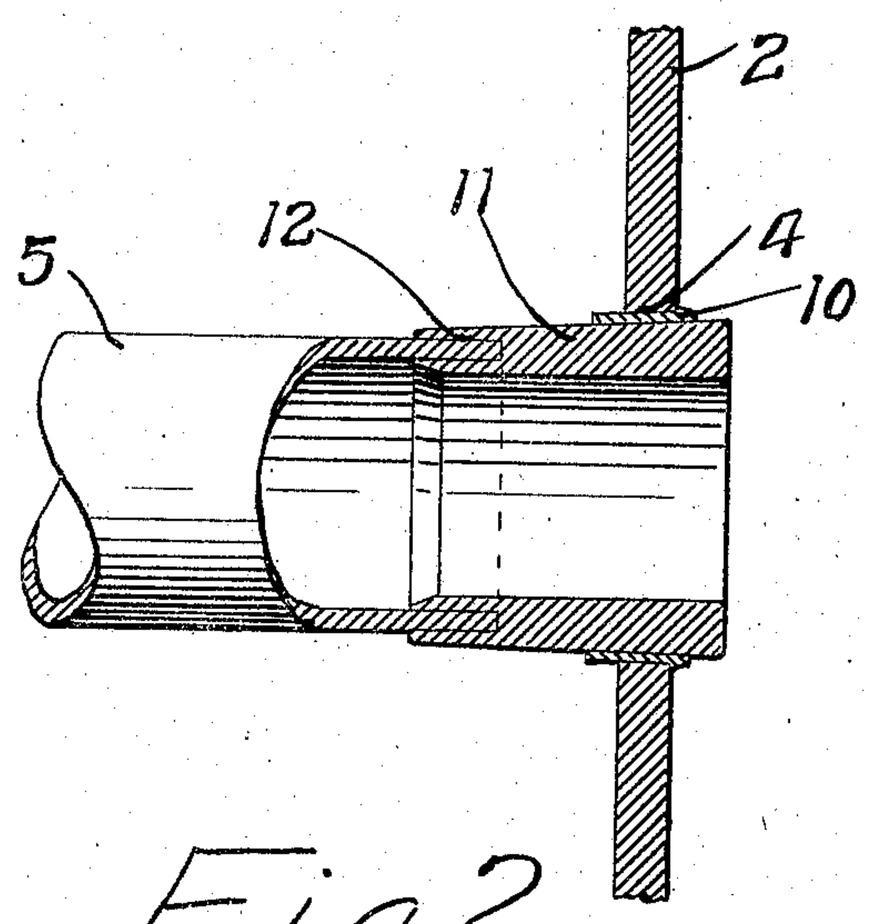

Fig 2.

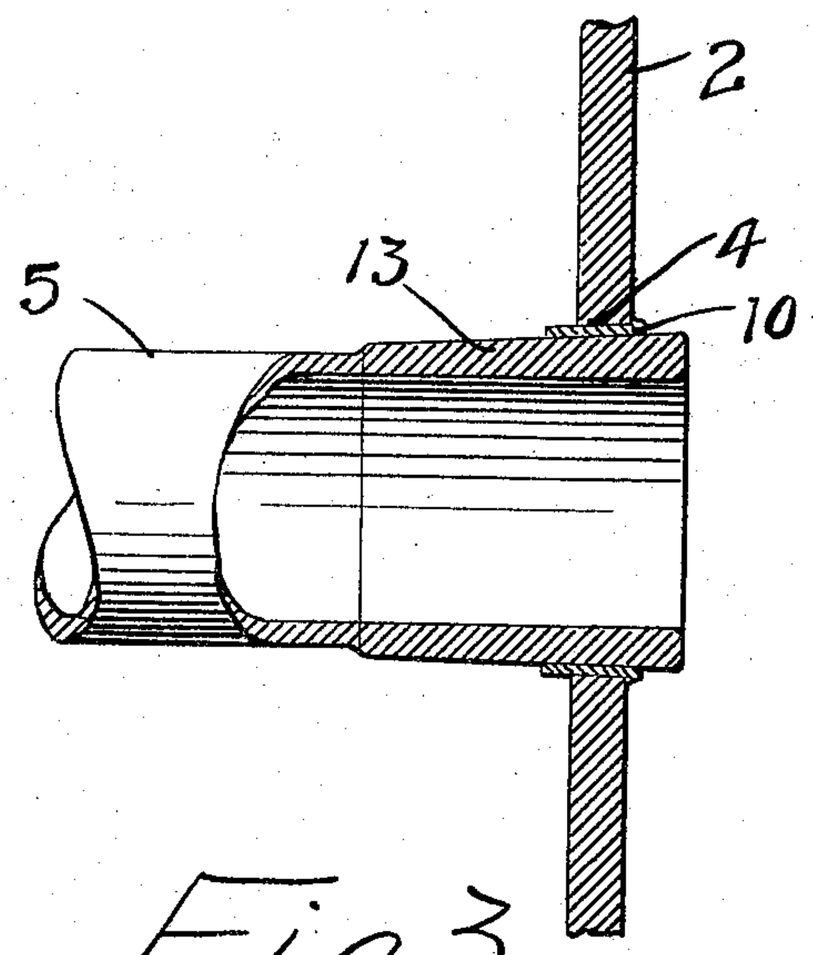

Fig 3.

WITNESSES

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ALEXANDER J. BOWDEN, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO AMOS B. ROBBINS, OF ELROY, WISCONSIN.

DETACHABLE BOILER-FLUE.

No. 885,662. Specification of Letters Patent. Patented April 21, 1908.

Application filed May 31, 1907. Serial No. 376,625.

To all whom it may concern:

Be it known that I, ALEXANDER J. BOWDEN, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Detachable Boiler-Flues, of which the following is a specification.

My invention relates to detachable boiler flues, and the object of the invention is to provide means for securing the flue in the flue sheets which will permit the ready and convenient removal of the flue whenever desired.

A further object is to provide means whereby the ends of the flue will be protected from the heat in the fire box.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a view partially in section and partially in plan illustrating the application of my invention to a boiler flue and flue sheet. Fig. 2 is a similar view illustrating a modification in the manner of uniting the flue with the end section thereof. Fig. 3 is a similar view showing another modification.

In the drawing, 2 represents the flue sheets having flue seats 3 and 4 tapered slightly in opposite directions, that is each seat flares from the inner toward the outer surface of the flue sheet.

5 represents a flue having the end extensions or sections 6 and 7. These extensions are provided with sockets 8 in which the ends of the flue are brazed or welded by an electric or other suitable process.

The end section 6 is tapered from its inner toward its outer end, and the section 7 is tapered from its outer toward its inner end. A sleeve 9, tapered from its outer toward its inner end, is adapted to slip in between the end section 6 and the flue seat 3, a suitable packing ring 10 being arranged between the sleeve and the seat. At the other end of the flue a similar packing ring is provided between the tapered end section 7 and the seat 4. The section 7 will be driven into its seat in the flue sheet and then the sleeve 9 inserted at the other end of the flue and while it is being driven in, a tool may be held against the section 7 to prevent the flue from being driven out at that end. When the sleeve 9 has been firmly driven to its seat a tight joint will be formed around the end of the flue without the use of threads. Whenever it is desired to remove a flue a suitable tool is applied to the end of the section 6 and the flue may be driven out of the sheets and readily removed from the boiler.

In Fig. 2 I have illustrated an end section 11 having an annular recess or groove 12 in its inner end to receive the end of the flue. In other respects it corresponds to the end sections above described.

In Fig. 3 another modified form of end section 13 is shown in which the recesses and grooves are omitted and merely a square flat end provided, against which the end of the flue abuts and is welded or brazed. These end sections are made of heavier material and by using them I am able to protect the ends of the flue from the intense heat of the fire box.

One of the particular advantages of this invention is its ease of application to the boiler and the facility with which a wornout flue may be removed.

I claim as my invention:

1. In a boiler, the combination, with the flue sheets spaced apart and in parallel relation with one another and having flue seats extending therethrough from one side to the other, said seats being tapered from the outer toward the inner surfaces of said sheets, a flue extending between said sheets and having end sections fitting within the openings in said sheets, the section at the fire box end of said flue being tapered from its outer end toward its inner end to fit the flue seat at that end and having a suitable packing ring, and the section at the opposite end of said flue being tapered from its inner end toward its outer end whereby both sleeves and the flue may be driven in the same direction out of the flue sheets, and an oppositely tapered sleeve inclosing said last named section and fitting between it and its flue seat and having a suitable packing ring, substantially as described.

2. In a boiler, the combination, with the flue sheets spaced apart and in parallel relation with one another and having flue seats extending therethrough from one side to the other, said seats being tapered from the outer toward the inner surfaces of said sheets, a flue provided between said sheets, tapered sections mounted on the ends of said flue, said sections being tapered in the same direction and fitting within the openings in said sheets,

a sleeve tapered from its outer toward its inner end fitting between one of said sections and its flue seat and adapted when tightened to form a tight joint between the flue and seat, and said flue being removable by applying a tool to the end of one of said sections and driving it out of its flue sheet toward the other sheet, substantially as described.

3. In a boiler, the combination with the flue sheets having flue seats extending therethrough from one side to the other, said seats being tapered from the outer toward the inner surfaces of said sheets, of a flue having tapered ends, the taper at the fire box end of said flue being toward the middle of the flue and the taper at the opposite end of the flue being toward its outer end, whereby a tool may be applied to drive it through the flue sheets into the fire box, packing rings interposed between the ends of the flue and the seats thereof in the flue sheets and a tapered sleeve fitting between the flue and its packing ring at the end thereof opposite from the fire box, substantially as described.

In witness whereof, I have hereunto set my hand this 28th day of May 1907.

ALEXANDER J. BOWDEN.

Witnesses:

RICHARD PAUL,

J. B. ERA.