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[54] **FINNED TUBE BOILER SECTION**
1 Claim, 1 Drawing Fig.

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122/367

[51] Int. Cl. **F22b 23/00**

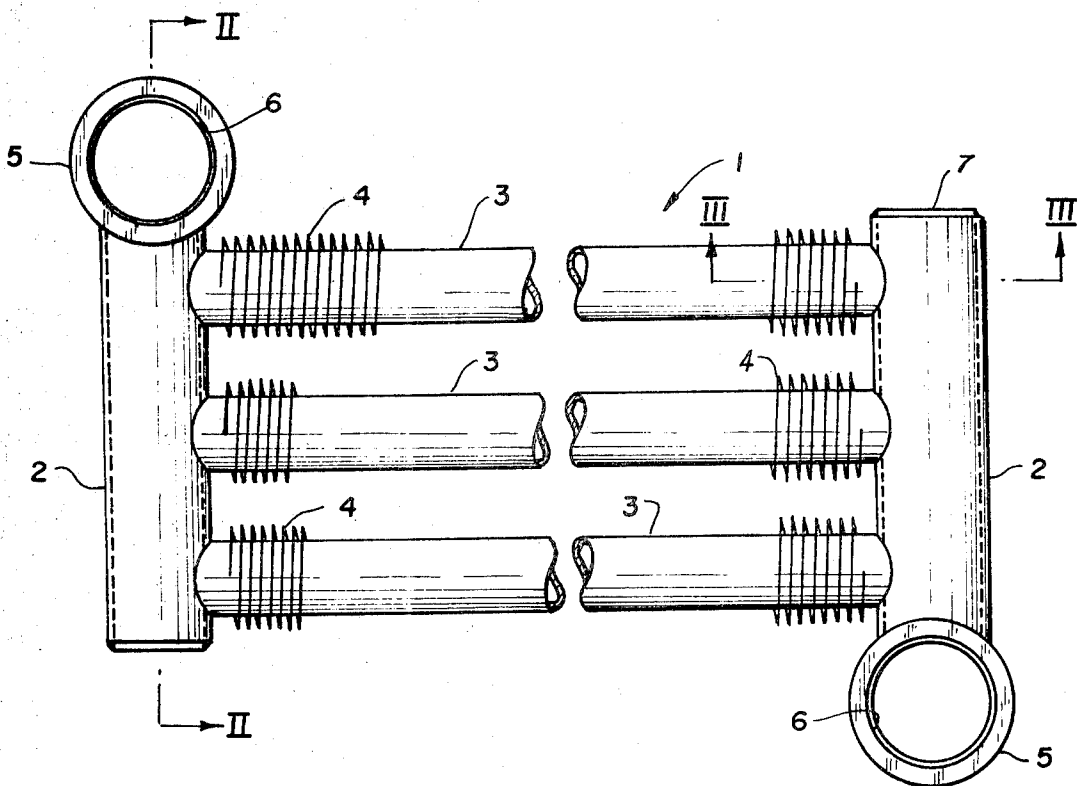
[50] Field of Search **122/225,**
235, 367

[56] **References Cited**
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Primary Examiner—Kenneth W. Sprague
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ABSTRACT: A gas boiler fabricated section of sheet metal, finned tubes which is adapted to be stacked with identical sections, and wherein the metal tubes extend horizontally in spaced parallel relationship and are joined at the ends by vertical inlet and outlet headers or pipes which are held together by push nipples.



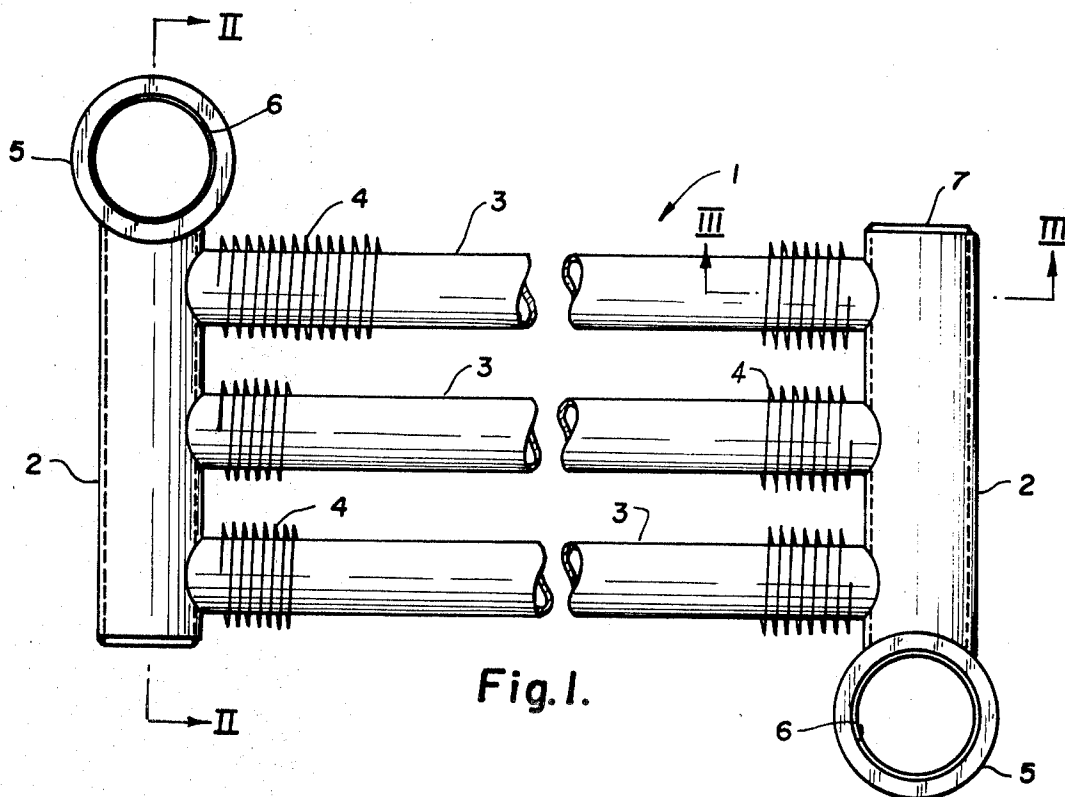


Fig. 1.

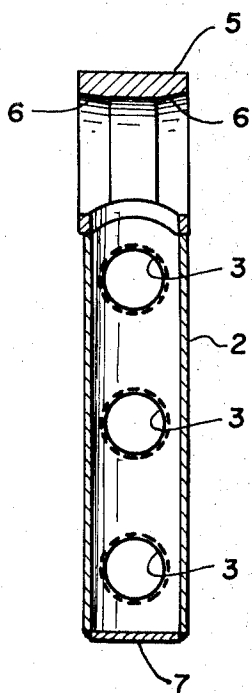


Fig. 2.

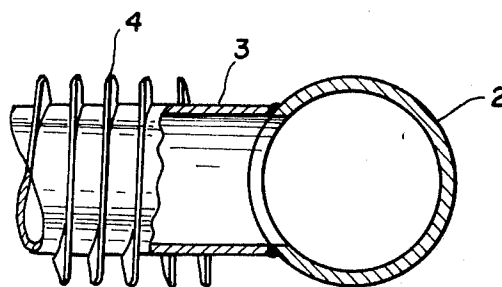


Fig. 3.

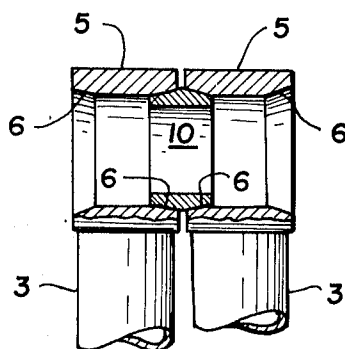


Fig. 4.

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FINNED TUBE BOILER SECTION

This invention relates generally to heat transfer apparatus and, more particularly, to a finned tube gas boiler section adapted to be stacked and joined with identical sections for increasing the heat transfer capacity of the assembly.

In gas boilers of well known construction, such as that shown in U.S. Pat. No. 2,918,043, assigned to the present assignee, heat transfer units are positioned immediately above the gas flame and water is circulated through them.

An outstanding disadvantage of such heat transfer units is that they are of cast iron and are cast into an intricate construction, including fins, therefore involve high manufacturing costs—also such fins do not completely encircle the cast iron water conduits, whereby heat transfer efficiency is decreased.

An object of the present invention is to provide a fabricated, sheet metal, finned tube boiler section which is devoid of the abovenamed disadvantages and which is relatively easy and inexpensive to manufacture.

A further object of the present invention is to provide finned tube sections for gas boilers and the like which has high heat transfer efficiency and which can be very easily and quickly stacked together with selective numbers of identical sections for providing selective heat capacity of the entire assembly.

A still more specific object of the invention is to provide a finned tube, gas boiler section which is made of sheet metal, such as steel of thin gauge, and wherein the tubing is cylindrical and completely surrounded by fins, and wherein the inlet and outlet header passages may be easily attached together with identical units by means of push nipples to increase the overall capacity of the assembly.

Other object and advantages will become more apparent from a study of the following description, taken with the accompanying drawing wherein:

FIG. 1 is an elevational view of one of the finned tube gas boiler sections embodying the present invention;

FIG. 2 is a vertical, cross-sectional view taken along line II-II of FIG. 1;

FIG. 3 is a fragmentary, sectional view taken along line III-III of FIG. 1; and

FIG. 4 is an end view in elevation, and partially in cross section, showing how identical units of the construction shown in FIG. 1 are joined together.

Referring more particularly to FIG. 1 of the drawing, numeral 1 generally denotes a finned tube, gas boiler section constructed in accordance with the principles of the present invention, which section comprises a plurality of sheet metal cylindrical tubes 3, preferably of thin gauge steel such as 2 inch diameter tubes of .12 inch thickness.

Tubes 3 are each completely surrounded by spirally wound, continuous fins 4, such as those 1/2 inch high, about .065 inch thick end of a density of 3 fins per inch adhered to the outer surface of the tubing, such as by spot welding or the like. The right end of said tubes or tubing 3, as viewed in FIG. 1 is connected to a vertically extending, inlet pipe or header 2 having an end cap 7 and which is welded to an inlet pipe 5, extending

at right angles thereto and connected through connection 6 to an inlet source of water.

Header 2 may be 2-1/2 inches in diameter. A suitable length of tubes is 32 inches, although it should be understood that this dimension as well as the aforesaid dimensions may be varied. The left ends of tubes 3 are connected to an outlet, vertically extending header or pipe 2, of hollow, cylindrical construction whose top end is welded to a horizontally extending pipe 5 having a tapered connection 6 to an outlet for the water and whose bottom end is capped.

As shown more clearly in FIG. 2, the outlet header or pipe 5 (as well as the inlet pipe 5) is reamed on both end portions 6 at an angle of about 3° from the horizontal for receiving push nipples 10, as shown more clearly in FIG. 4, having a corresponding external taper so as to form a watertight joint with the reamed surface 6 of pipe 5 of an adjoining section. While only two sections are shown joined together in FIG. 4, it will be readily apparent that any number of sections may be stacked together and joined by push nipples, such as 10, at both the inlet and outlet headers 5, so as to selectively increase or decrease the overall capacity of the heat exchange assembly.

Thus it will be seen that I have provided a highly efficient, finned tube gas boiler section of sheet metal, such as steel, wherein the tubes connecting the headers are cylindrical and completely encircled by spirally wound fins so as to increase the heat transfer capacity about three fold compared to that of cast iron tubes of known construction, and where identical sections are provided to enable stacking of any selective number of sections to provide a heat transfer assembly of any desired heat transfer capacity; also I have provided a gas boiler section having a capacity of at least 120,000 B.t.u. per section which is increased to 240,000 B.t.u. for two sections, etc. and which may operate at pressures within the range of 185 to 750 lbs. per square inch; also I have provided a heat transfer section which is very easily and cheaply manufactured and yet which has exceptionally high heat transfer capacity.

While I have illustrated and described a single specific embodiment of my invention, it will be understood that this is by way of illustration only and that various changes and modifications may be made within the contemplation of my invention and within the scope of the following claim.

I claim:

1. A fabricated boiler section adapted to be stacked and joined together with an identical boiler section for gas boilers and the like, comprising a plurality of hollow, cylindrical sheet metal tubes in spaced parallel relationship and in substantially a common plane, each of said tubes being completely surrounded by continuous spirally wound fins, inlet and outlet header pipes joining together the respective ends of said tubes to provide inlet and outlet connections for flowing fluid through said tubes, each header pipe being internally tapered outwardly at both end sections, and push nipples of cylindrical, tubular outline with correspondingly tapered outer surfaces joining said tapered portions of said header pipes in fluid-tight relationship to enable a selective number of identical boiler sections to be joined together to form a complete heat transfer assembly.

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