Dec. 26, 1933. P. J. McINTYRE 1,940,964

RADIATOR CONSTRUCTION

Filed Jan. 21, 1931 2 Sheets-Sheet 1

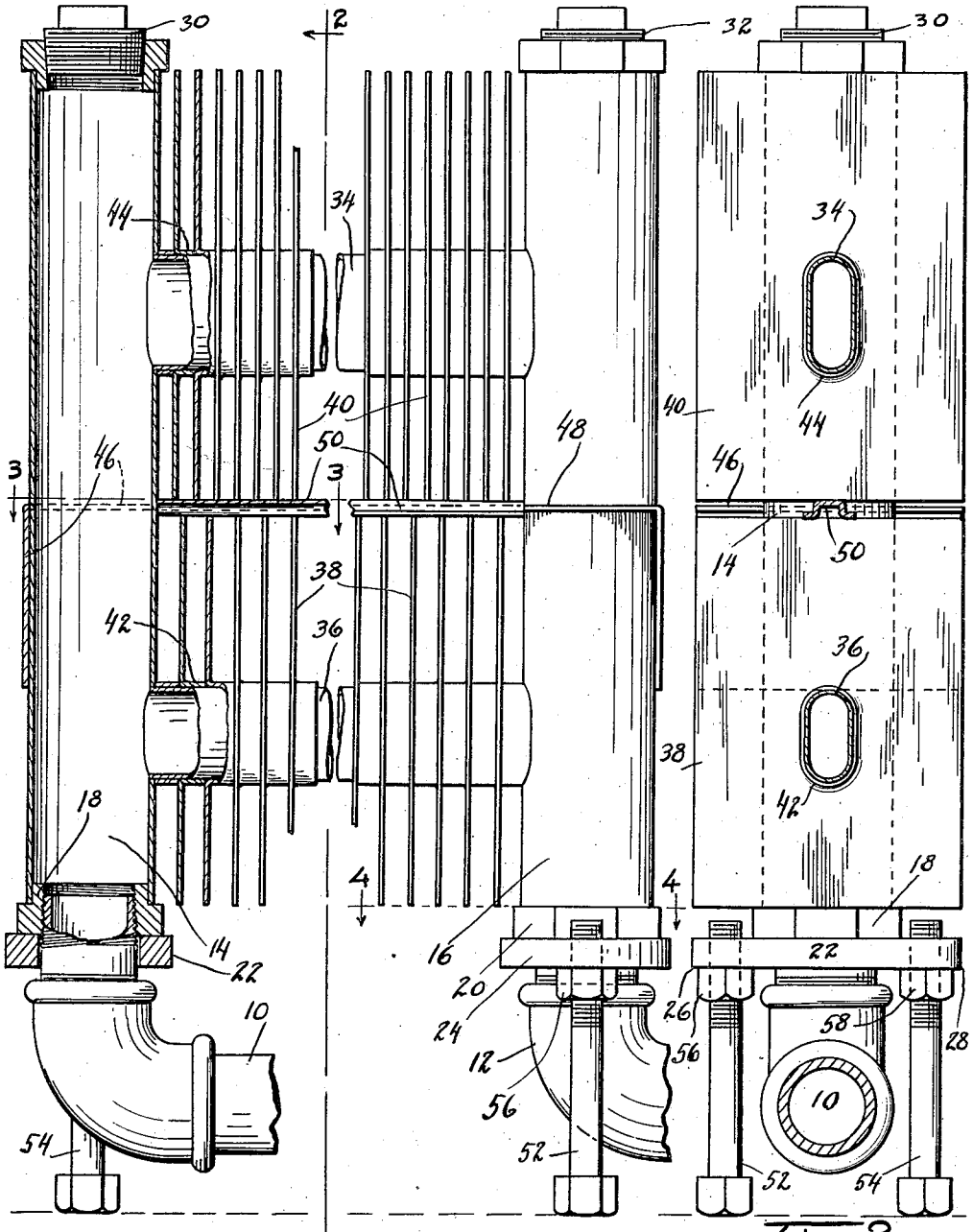

Fig. 1

Fig. 2

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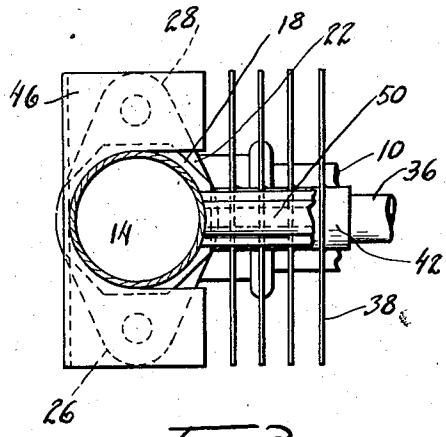

Fig. 3

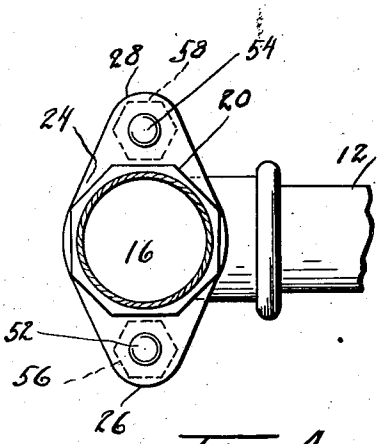

Fig. 4

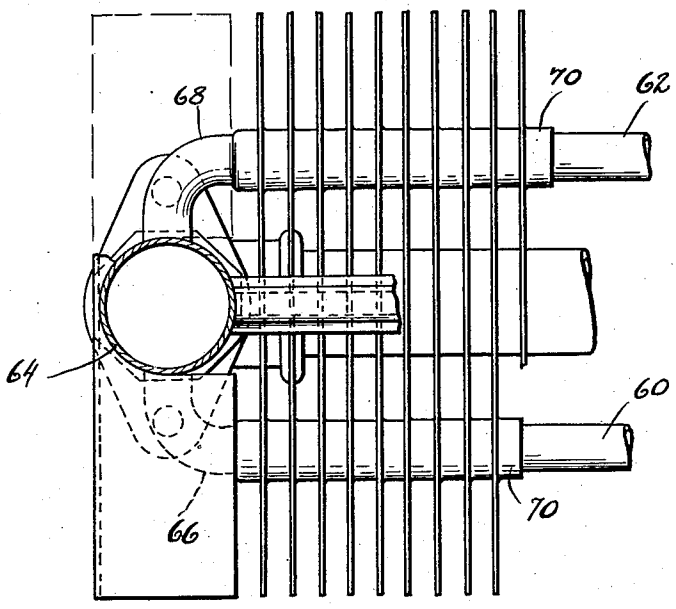

Fig. 5

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UNITED STATES PATENT OFFICE

1,940,964

RADIATOR CONSTRUCTION

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Application January 21, 1931. Serial No. 510,212

5 Claims. (Cl. 257—124)

My invention relates to radiators and has particular reference to an improved heat transfer medium for use in conjunction with steam or hot water heating plants.

An object of my invention is to increase the efficiency of a given amount of steam or hot water and to provide a heating unit which is inexpensive to manufacture, readily assembled, and comprised of relatively simple units which will not easily get out of order.

In accomplishing the above objects I propose to utilize the system of heat radiating fins positioned at relatively close intervals along steam or hot water conduits, the said fins to extend radially in all directions away from the conduits to thereby provide a large heating surface. This relatively large heating surface contacting the adjacent air greatly increases the heating efficiency of the assembly for a given volume of heat source, such as steam or hot water.

A further object of my invention is to so arrange the heating surfaces aforesaid that they produce what may be regarded as a plurality of stages in the heating operation. These stages comprise the admission of a relatively large volume of comparatively cold air into contact with the heating surfaces utilized in the first stage and a second stage which consists of increasing the velocity of the air so preheated and at the same time heating the said air to a higher temperature, whereby a maximum volume of well heated air is thrown out with substantial velocity into the area to be heated.

Still another object of my invention is to associate the various steam or hot water conduits with one another in such a way as to eliminate leakage and to provide means associated with the vertical header units whereby either the upper or lower extremities thereof may be utilized as a support. In this way the assembly may be either suspended, as might be desirable where it is positioned within a cavity provided with a wall, or supported on legs in the more usual fashion.

Various other objects and meritorius features of my invention will be apparent from the following description taken in conjunction with the drawings wherein like numerals refer to like parts throughout the several figures and wherein:

Fig. 1 is a side elevation of my improved assembly, broken away at its center for the sake of clearness, and partly in section,

Fig. 2 is a section along 2—2 of Fig. 1,

Fig. 3 is a section along 3—3 of Fig. 1,

Fig. 4 is a section along 4—4 of Fig. 1, and

Fig. 5 illustrates a modified form of increased heating capacity.

My improved assembly may be utilized in conjunction with any desired type of inlet conduit 10 and outlet conduit 12. End header units 14 and 16 respectively are connected to the inlet and outlet pipes by means of threaded connections 18 and 20. Plates 22 and 24 may be threaded on to the stems of the inlet and outlet conduits respectively, each of these plates having oppositely extending arms 26 and 28 respectively for a purpose to be more clearly explained hereinafter.

The heater units 14 and 16 are closed at their upper extremities, as by means of the threaded caps 30 and 32 and, for purposes of illustration, I have shown two conduits 34 and 36 extending in substantially parallel relation transversely between the two header units. These transversely extending conduits are preferably silver soldered into the header units for the purpose of eliminating any possibility of leakage at the joints. Inasmuch as relatively few joints of this nature are necessary the expense of silver soldering does not exceed the ordinary soldering cost. It will be noted, particularly in Fig. 2, that each of these transversely extending conduits is somewhat elongated in a vertical direction and that the upper conduit is of greater capacity than the lower. The elongated formation is for the purpose of cutting down as far as possible the resistance offered to the upward movement of the heated air and the difference in capacity is for a purpose to be more clearly brought out hereinafter.

Each of the conduits 34 and 36 is provided with a plurality of axially spaced apart fins extending radially in all directions away from the conduit. These fins are preferably slid over their respective conduits prior to their connection with the second header unit and each is provided with a sleeve portion which functions as a spacer between the respective fins. The lower conduit 36 is so provided with fins 38 and similar fins 40 are positioned on the upper conduit. It will be noted in Fig. 1 that the sleeve portions 42 which function as spacers for the lower fins are of greater length than the sleeve portions 44 spacing the upper fins 40. The lower fins are, therefore, of greater pitch, so to speak, than the upper fins.

Baffle plates 46 and 48 are positioned about the header units 14 and 16 respectively at a point

intermediate the two sets of fins. These baffle plates may be positioned by soldering, or any desired means, and function to prevent the upward passage of air around the header units instead of through the fins, where the heating capacity is greatest. A channel shaped strip 50 extends between the two header units 14 and 16 intermediate the two sets of fins and the fins of each set are secured thereto, preferably by soldering, as clearly indicated in Fig. 2. This strip is for the purpose of maintaining the necessary rigidity between adjacent edges of the fins should there be a tendency to warp due to the high temperature. Any expansion and contraction resulting from the heat is cared for by the fact that the elongated conduits 34 and 36 will be more or less flexible due to their length and relatively small cross section. The conduits will therefore flex sidewise, thereby eliminating the possibility of fracturing the joints.

Each of the ears 26 and 28 on plates 22 is apertured to receive the threaded end of a bolt, which bolts 52 and 54 may function as legs for each of the assembly. The height at which the assembly is supported may be readily adjusted by means of lock nuts 56 and 58 upon which the plates are adapted to seat. While I have not illustrated the use of bolts such as 52 and 54 as hangers for the purpose of suspending the assembly, it will be apparent that they may be readily utilized in this manner.

Where a greater heating capacity is desirable the modification illustrated in Fig. 5 may be utilized. This structure is substantially like that already described in conjunction with the other figures, but includes a plurality of laterally spaced conduits 60 and 62 in addition to the conduits described in conjunction with the other modification. As many pairs of such laterally extending conduits as desired may be utilized, each pair being hooked into the header unit 64 by means of elbow joints 66 and 68. Where this particular structure is desired apertures and spacer sleeves 70 are provided in each fin for each of the plurality of conduits, as in Fig. 5 for instance.

By reason of the fact that the lower group of fins 38 are of a relatively coarse pitch a relatively large volume of comparatively cold air may pass up through the passageways between the fins. In this way a maximum of cold air is preheated. These lower fins 38 do not reach the high temperature of the upper fins by reason of the fact that the conduit 36 is of less capacity than upper conduit 34. Having been preheated to a certain extent by passing through the lower fins, the air enters the passageways provided by the upper group of fins 40. These fins, as hitherto stated, are of finer pitch than the lower fins and attain a higher temperature by reason of the fact that the capacity of conduit 34 is greater than that of 36. Due to the fact that the air passes through what may be regarded as a restricted passageway and the fact that it is subjected to a higher temperature during its passage, the velocity of the upwardly moving air is increased substantially and it emerges into the space to be heated at this increased velocity.

In utilizing a heating assembly such as herein described, I contemplate positioning it in a wall pocket, or some similar place, and providing an opening at top and bottom for purposes of intake and outlet of air into the space to be heated. By virtue of this two stage heating performance I am able to heat a relatively larger volume of air and, after heating the air by passage through the fins, discharge it at relatively higher velocity whereby the heat is carried further into the space to be heated.

Having illustrated a preferred form of my improved unit various modifications will be apparent to those skilled in the art and for that reason I intend to limit myself only within the scope of the appended claims.

What I claim is:

1. A heat radiating assembly comprising spaced apart conduits of varying capacity, and radially extending axially spaced apart fins supported by each of said conduits, the space between the fins on the conduit of lesser capacity being the greater.

2. A heat radiating assembly comprising upper and lower heat conduits, the upper conduit being of greater capacity than the lower, axially spaced apart fins extending radially from each of said conduits, the spacing between fins on the lower conduit being greater than between fins on the upper conduit.

3. In a radiator the combination with a vertically extending header and a pipe connected with the end thereof by an elbow joint, a plate supported between the said elbow and the base of said header, said plate having oppositely extending ears apertured to receive bolts, and bolts in said apertures, the heads of said bolts adapted to rest upon a support for supporting said header.

4. A heating assembly comprising a pair of spaced apart heat conduits of different capacity, and means carried respectively thereby for creating an induced draft in two velocity stages transversely past the conduits.

5. In a radiator the combination with a vertically extending header and a pipe connected with the end thereof by an elbow joint, a plate supported between the said elbow and the base of the header, said plate having oppositely extending ears apertured to receive bolts, and bolts axially adjustable in said apertures, said bolts being adapted to extend beyond said elbow joint and provide a support for the header.

PATRICK J. McINTYRE.