

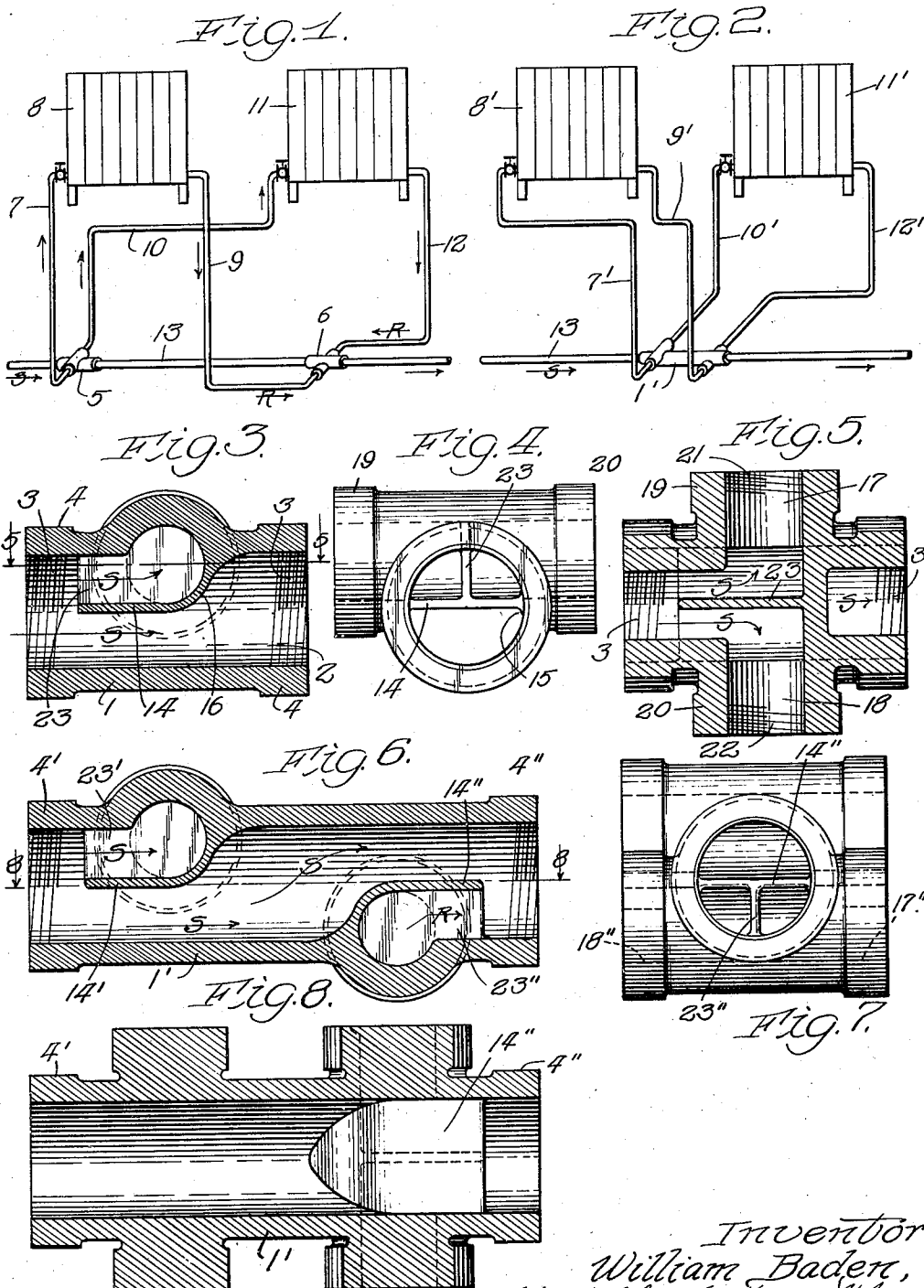
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FLOW REGULATOR

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FLOW REGULATOR

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This invention relates to a pipe fitting and more particularly to such fittings to be installed in a one pipe system and constituting a universal fitting that can be used either as a supply or return fitting.

The type of fittings heretofore in use for hot water heating systems, and other purposes, in a one pipe system in which each radiator is connected to the main pipe line by supply and return risers, has been such that the desired heating efficiency has not been attained, and there has not been the proper distribution of liquids in the system. Also such prior fittings have been such as not to effectively separate the higher temperature liquids from the lower temperature liquids, and not to provide the desired minimum of comingling of high and low temperature liquids, as well as being too numerous in quantity and expensive to install.

By the present invention I have overcome the above disadvantages, and have provided a new form and type of fitting which is economical to produce and install, is effective in operation, and is universal in use as the same fitting may be used as either a supply or a return fitting.

Among the objects of my invention are to provide a novel and improved pipe fitting; to provide a novel pipe fitting in which provision is made for better separation of the higher temperature liquids from the lower temperature liquids; to provide a pipe fitting which may be used either as a supply or a return fitting by turning the fitting upside down and end for end; to provide in a one pipe system, in which each radiator is connected to the main pipe line, supply and return risers in the use of which the desired heating efficiency has been maintained or increased and affording the proper distribution of liquids in the system; to reduce to the minimum the comingling of high and low temperature liquids; to provide fittings for a one pipe system in which the supply fitting and the return fitting are identical in construction but reversed in position to provide a separate supply fitting and a separate return fitting, or to incorporate the supply fitting and the return fitting into a unitary structure as desired; and such further objects, advantages and capabilities as will later more fully appear.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawing, and while I have shown therein a preferred embodiment I wish it understood that the same is sus-

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ceptible of modification and change without departing from the spirit of my invention.

In the drawings:

Fig. 1 is a diagrammatic view of a fragment of a one pipe system and showing the supply and return fittings connected to two radiators.

Fig. 2 is a view similar to Fig. 1 except that the supply and return fittings have been incorporated into a unitary structure.

Fig. 3 is a longitudinal vertical central section through a pipe fitting embodying the present invention.

Fig. 4 is an end elevation looking toward the left hand side of Fig. 3.

Fig. 5 is a longitudinal transverse section on the line 5—5 of Fig. 3.

Fig. 6 is a longitudinal vertical central section through a modified form of my fitting.

Fig. 7 is an end elevation looking toward the right hand side of Fig. 6.

Fig. 8 is a longitudinal transverse section on the line 8—8 of Fig. 6.

In the form shown for illustrative purposes in the drawings, my invention comprises a body portion 1 having a longitudinal opening 2 there-through and formed at the opposite ends with screw threads 3 and an enlargement 4 to receive a wrench for tightening the same on the pipes of the pipe system. As seen in Fig. 1 my supply fitting is indicated at 5 and my return fitting (which is identical in construction with the supply fitting) is shown at 6. The supply fitting 5 is connected by pipe 7 to the inlet end of a radiator 8 and this radiator at the opposite end has a return pipe 9 connected to the return fitting 6. The supply pipe 7 leads laterally from one side of the fitting 5, while on the other side of this same fitting is another supply pipe 10 leading to the inlet end of another radiator 11, from the opposite end of which leads the return pipe 12 to the return fitting 6 on the opposite side from that of return pipe 9. The main pipe line is indicated at 13 and will contain as many of these supply and return fittings as may be needed for the number of radiators or other heating or cooling devices in the building. It should be remembered that with separate supply and return fittings there will be a supply fitting for one or two or more radiators and one return fitting for the same number of radiators.

As the supply fitting and the return fitting (when separate fittings are used) are identical I will describe here in detail the supply fitting with the understanding that the return fitting is in reality the same fitting except that when it is

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used as a return fitting it is turned upside down and end for end as compared with its position when used as a supply fitting. I have shown in Figs. 3 and 4 this fitting in the position it will occupy when used as a supply fitting, in which it will be seen that I have provided a horizontal cross partition 14 positioned approximately on the horizontal center plane of the fitting. This cross partition 14 is integrally connected at its side edges 15 with the walls of the body portion 1, and has at its forward end an upwardly curved or inclined wall 16, the curvature of which corresponds to that of the walls of the openings 17 and 18 of the laterally and oppositely projecting extensions 19 and 20. These extensions are interiorly threaded at 21, 22 to threadably receive the adjacent ends of the supply pipes 7 and 10 when used as a supply fitting, and to threadably receive the adjacent ends of the return pipes 9 and 12 when used as a return fitting.

Extending upwardly from the center of the cross partition 14 is a vertical longitudinal partition 23 which at its upper edge integrally merges into the inner face of the top portion of the fitting and extends forwardly to integrally join curved end wall 16. As will be understood this completely blocks off any direct connection between the laterally extending openings 17, 18 as will be seen in Fig. 5. The rear end of vertical partition 23 is in line with the rear edge of the cross partition 14. From this construction it will be seen that when this fitting is in the position shown in Fig. 3 the heated water will flow through the main pipe line 13 into the fitting from the left hand side as viewed in Fig. 3, the hotter portion of such water being at the top and the cooler portion of such water being at the bottom of the fitting. This means that the hotter portion of the water will flow into the spaces above the horizontal cross partition 14 and on both sides of the vertical partition 23. It will then be diverted sidewise in opposite directions through the tubular projections 19 and 20 and through the supply pipes 7 and 10 to the radiators 8 and 11. As explained above this same fitting will also be used as a return fitting by turning it upside down and end for end at which time it will assume the position shown at the bottom right hand corner of Fig. 1. When in this position to function as a return fitting the hot water, after passing through the radiators 8 and 11, will flow through return pipes 9 and 12, through openings 17 and 18, and into the spaces on each side of the vertical partition 23 below the cross partition 14 from which it will flow forwardly (to the right in Fig. 1) in the main pipe line. At this time the spaces on each side of the vertical partition 23 will be at the bottom and the cooler water (cooled somewhat during its passage through the radiator and return pipes) will be at the bottom where it should be. This water being cooler will then continue to flow along the lower portion of the one pipe system.

In Figs. 6-8 I have shown a modification in which the supply fitting and the return fitting are integrally connected into a single unit. In this modification the body portion of the fitting is indicated at 1' and in the left hand side as viewed in Fig. 6 the arrangement of the horizontal cross partition 14' and the vertical partition 23' is the same as that of these parts in Fig. 3. In other words, the left hand side of the fitting shown in Fig. 6 is structurally the same as that shown in Fig. 3. In Fig. 6, however, I have eliminated the necessity of turning the sup-

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ply fitting upside down and end for end to enable it to function as a return fitting, by constructing the right hand half of the fitting shown in Fig. 6 to correspond to what would be the structure of the supply fitting after it has been turned upside down and end for end, and have joint 6 integral with the opposite supply end described above. This enables me to construct the supply and return parts in a single unit which is connected to the radiators in the manner shown in Fig. 2. In Figs. 6-8 the same reference numerals have been used for corresponding parts as in Fig. 1 except to add a prime thereto for the supply end and a double prime for the return or discharge end. The end portions 4 in Fig. 3, and 4' and 4'' in Fig. 6 may have any desired contour to better receive a wrench or other turning element, such as being formed with any desired number of flat faces, depressions, knurling or the like.

From the above it is seen that I have provided a simple form of fitting of greatly improved efficiency of operation, in which the liquid of higher temperature is skimmed off or separated and caused to flow above the horizontal cross partition in the supply fitting (or the supply end of the unitary fitting) so that the hotter portion of the liquid will pass directly into the radiator or radiators and when returned to the return fitting (or the return end of the unitary fitting) the water, after having passed through the radiator and being correspondingly lowered in temperature, will be discharged for further passage through the main pipe line below the horizontal cross partition from both sides of the branch connections. This directs the liquid in accordance with its temperature to the place most required.

It is also to be noted in both Figs. 3 and 6 that that portion of the liquid below the horizontal cross partition 14 in the supply fitting (or 14' in the supply end of the unitary fitting) continues on through the fitting and will be skimmed off from the upper side at the next supply fitting for use in other radiators. Also it is to be seen that in Fig. 6 the liquid passing through the fitting below the cross supply partition 14' passes over the horizontal cross partition 14'' and hence accomplishes a minimum of comingling of liquids when passing these parts in the fittings. The fitting described herein creates a distinct separation, at desired points, of liquids of different temperature and directs such liquids to the place desired for greatest efficiency, at the same time avoiding undesired turbulence or bucking action of the liquids with relation to the stream in the main pipe. The arrangement of the horizontal and vertical partitions gives an equal division of flow of liquids to and from the fixtures. If it is desired to serve only one radiator, one of the lateral side openings of the fitting may be plugged up as desired. It is also to be understood that these universal fittings will be connected in a main pipe line which starts from a boiler, preheater or the like, and returns to the same in the proper manner.

I claim:

1. A pipe fitting comprising a tubular main portion and a pair of laterally extending tubular projections whose axial center line is offset upwardly from the longitudinal center line of the main portion, a horizontal cross partition in the main portion having an upwardly and forwardly extending end portion to form a space above the partition open at its rear end to the interior of

the tubular main portion, and a vertical partition extending upwardly from the horizontal partition to the top of the inside of the tubular main portion to divide said space into two parts, one of said parts connecting with the tubular interior of one of said laterally extending projections, and the other of said parts connecting with the tubular interior of the other of said laterally extending projections.

2. A pipe fitting as claimed in claim 1, in which the vertical partition is substantially in the middle of the horizontal partition, and extends longitudinally therealong and contacts the upwardly and forwardly extending end portion thereof.

3. A pipe fitting comprising a longitudinally extending tubular portion and a pair of laterally extending tubular portions whose interiors connect with the interior of the first mentioned tubular portion, a longitudinally extending horizontal cross partition in the first mentioned tubular portion extending from behind the lateral portions to the front side thereof and joining the top of the first mentioned tubular portion, and a vertical partition extending longitudinally along the upper side of the horizontal partition to form two passageways leading from the upper portion of the inside of the first mentioned tubular portion respectively to the interiors of the two lateral portions, whereby the hottest part of the liquid flowing through the fitting will pass above the horizontal partition and through said two passageways to and through said lateral portions when the fitting is positioned in a pipe line with said two passageways at the top.

4. A pipe fitting as claimed in claim 3, of extended length and having in the front end portion of the longitudinally extending tubular portion similarly formed but reversely positioned laterally extending tubular portions, horizontal cross partition and vertical partition whereby the hottest water will be skimmed from the top of the water flowing along a main pipe line containing the fitting and passed as supply to one or more radi-

ators, and the return flow from the radiators will pass through the reversely positioned passageways into the bottom and cooler portion of the stream flowing through the main pipe line.

5. A pipe fitting having adjacent its rear end a horizontal cross partition which at its forward end merges integrally into the top wall of the fitting and at its side edges is integrally connected with the side walls of the fitting, a vertical partition extending upwardly between the cross partition and the top of the fitting to form two separate spaces above the cross partition, said fitting having lateral openings adjacent the forward end of the cross partition each of said lateral openings being in communication with one of said separate spaces whereby the hotter supply liquid passing through the fitting will pass above the cross partition to the lateral openings, said fitting having adjacent its forward end a pair of laterally extending openings and a horizontal partition closed at its rear end around said last mentioned lateral openings, and a vertical partition extending downwardly between the last mentioned horizontal partition and the bottom of the fitting, to pass the cooler return liquid from these lateral openings to the bottom of the fitting.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
577,793	Stewart	Feb. 23, 1897
1,092,385	Parker	Apr. 7, 1914
2,045,669	Newton	June 30, 1936
2,284,937	Wood	June 2, 1942

FOREIGN PATENTS

Number	Country	Date
11,080	Great Britain	May 27, 1905