

# The Hartford Water Line Return Connection

Every heating contractor and every owner of a steam heating boiler understands, or should understand that expensive repairs are likely to become necessary if the water in the boilers is allowed to fall below the safe level, or cannot be seen in the glass gage, whether the low-water is due to loss of water or steam from the heating system or to the failure of the water of condensation to return to the boiler as promptly as it should.

If there are two or more boilers connected to the system slight differences in the steam connections or in the return connections may cause a material variation in the water levels whether condensation is returned by gravity or by a return pump.

Another difficulty frequently encountered, as the result of rapid generation of steam, is the forcing of water through the return pipe

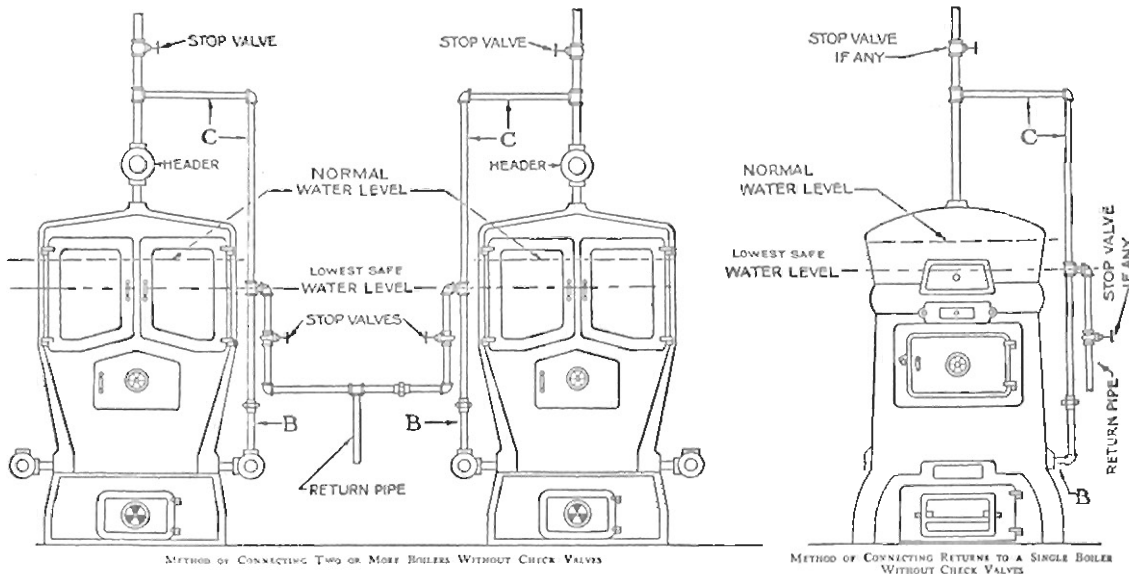
These connections have become quite generally known as "The Hartford Water Line Return".

A study of the illustrations will make clear the basic principles of the plan. Of course, it will be understood that any radical change in the plan will impair its efficiency and may entirely destroy its advantages.

The return pipe and B should be of the size prescribed by modern practice for return lines. The recommended size for the pipe C is as follows:

Grate Area	Size of Pipe "C"
4 square feet or less	1 1/2"
4 square feet to 15 sq. ft.	2 1/2"
15 square feet or more	4"

Instead of connecting the return pipe directly to the boiler near the bottom of a section as was done with the older methods, it will be noted that a loop in the return is carried up-



from one boiler to another in a multiple boiler system or from the boiler into the return pipe of the heating system.

Check valves have been used quite generally to prevent this action and in fact are a definite legal requirement in some cities. However, it is practically impossible to have all of the check valves used in a multiple boiler heating plant identical in every particular, so variations in their operation cannot be avoided, and the return water will not be equally distributed between the boilers. This will mean that the water level will be at times too high and at times too low.

Recognizing the need of simplifying the operation of steam heating boilers, a number of years ago the "Hartford Steam Boiler" advocated the use of connections illustrated.

ward to the line of the lowest safe water level. From that point it descends to the bottom of the boiler as shown by pipe "B" in the illustration. From the line of the lowest safe water level, circulator "C" connects to the steam pipe. If a stop valve is used, the connection should be made between the boiler and the valve.

If, during the normal operation of the heating system, the stop valve above the boiler should be closed, or if there should be a sudden increase in pressure in one of the boilers due to unequal firing, the water will not be forced from the boiler below the lowest safe water level, as steam through connection "C" will enter the return pipe when that level is reached. The resulting noisy operation will serve as an audible warning.

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## THE HARTFORD WATER LINE RETURN CONNECTION

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Loss of water or steam through leakage from the system or unusual delay in the return of the water from the system to the boiler has the same effect.

The stop valve above each boiler in the illustration is intended to separate the boiler from the entire heating system and is not intended to separate one part of the heating system from another part. If the system is provided with other stop valves, by means of which any part of the system can be shut off, there should be a check valve in the branch return line for the part that can be so isolated. Otherwise the water of condensation will flow through the return line into the "dead" section instead of into the boiler.

The water line return will not cause water to return to the boiler if trapped in an improperly constructed system, and cannot be expected to fulfill that function.

The water line return is of the greatest advantage when the water returns to the boiler by gravity, but it may also be used with pumped return systems.—Published through the courtesy of The Hartford Steam Boiler Inspection and Insurance Company.