## Hot Water Heating.

A few weeks ago a representative of THE COMMERCIAL, while visiting and inspecting the extensive foundries and wire works of H. R. Ives & Co, of Montreal, endeavored to procure some information as to the relative value of hot air, steam and hot water heating, knowing that this firm had expended heavily both in money and effort, to secure their present system of hot water heating in the state of practical perfection, to which they have now brought it. The courteous head of the firm, after answering numerous questions, assured the representative that nowhere had he met with a more lucid and comprehensive comparison of steam and hot water heating and their respective advantages, than in an article in the September number of the *Engineering Magazine*, and at his request we append the article in question in full.

"The amount of heat carried by a pound of steam, and the rapidity with which steam circulates through pipes are sometimes made to appear important advantages as compared with the less heat carried by a pound of water and the slower circulation of the latter, effected solely by changes in specific gravity.

"While by virtue of its latent heat it forms in proportion to its weight the most admirable carrier of heat known to science; and by reason of its expansibility its rapid circulation in any direction is easily effected, yet the very fact that is steam imposes a rigid limit of temperature that unfortunately cannot be passed. It never can be cooler than 212° under ordinary atmospheric pressure, this pressure being a condition of all practical steam heating as applied to buildings. The necessity of some unbalanced pressure to secure circulation compels even a higher temperature than this, the temperature corresponding to the average low pressure maintained (5 lb per square inch above that of the atmosphere) being almost exactly 228° F.

"Time and again attempts have been made to reduce the temperature in radiators, by means of pressure reducing valves, and regulating valves, but the fact that below 212° F., there can be no steam and circulation ceases has barred any useful progress in this direction.

"Within the last decade there has been a remarkable increase in the popularity of hot water heating, due to a combination of causes. There is a much larger proportion of our population possessed of means to purchase superior appliances than formerly. The extending taste for good solid reading has largely increased the stock of general information upon subjects pertaining to sanitation, among which the heating and ventilating of homes occupy a most important place.

"While a pound of steam in condensing to water can give off 966.5 thermal units, and a pound of water in cooling from 180° to 70° can give off only 110 thermal units, it has been shown above that a pound of steam as ordinarily used for steam heating occupies a space of 20 cubic feet, or a space that would hold over 1,200 pounds of water heated to 180° F. A simple multiplication shows this volume of water to contain over 130,000 available units as compared 966 units in the steam filling the same space. It forms, therefore, a storehouse for heat to which steam is in no way comparable, and the velocity of its circulation may be immensely lower than steam, and yet it is able to conver all and more than the radiators can extract from it. Hence it is that while the temperature of a room heated by steam falls rapidly whenever the fire in the boiler gets low, the water continues its action for a long time without any perceptible diminution. The sudden and violent fluctuations to which temperature produced by steam heating are liable are unknown in hot water heating. This is its crowning advantage. Uniform heating of buildings worthy the name 'uniform' has never been reached by any other means.

"But there is this important and fundamental distinction between the action of a steam coil or radiator and one which takes its heat from hot water, and whereas, as has already been shown, the former can only operate at the temperature of 212° F., and higher than that of the air surrounding it. Thus if the air at 60° F. envelops the radiator and the apparatus is adjusted to heat water to 180° F. as its maximum, there is a range of 120° F., all through which the hot water radiator can work, and this range is perfectly controllable. In mild weather just the heat needed can be supplied and no more. As the weather gets colder the heating can be increased to meet the exact requirements. Compare this with a low pressure steam apparatus adjusted to carry steam at 228° F. as its maximum. It cannot work below 212° F., hence the difference between this and the maximum temperature, or 16° F., is the range through which any variation is possible. The hot water heating apparatus is therefore adapted to all climatic conditions, while the steam heating radiators, if proportion to the demand for extreme cold weather, are and must remain too powerful for any weather much warmer than the extreme. For mild weather when the steam heat becomes unbearable, the remedy is to open the windows and waste heat by these avenues to intersellar space, or to shut of the radiators and send the waste heat out of the chimney, while the room cools down. In steam heating a condition of health and comfort is exactly reversed. The range of temperature variation which should be confined to the heating apparatus alone, is transferred to the apartments, which are now too cold and anon too warm, instead of being heated to a uniform pleasant and wholesome temperature."

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The *Times*, of Deloraine, Man., has the following crop items: "Phil and W. Johnston, got through with threshing a few days ago, securing the magnificent total of 9,800 bushels of wheat, and 3,000 bushels of oats. Their farm is on 14-2 21, and they had 350 acres in crop. An average of nearly 37 bushels to the acre on 350 acres shows that the Deloraine district has a record to be proud of.—J. E. Cranston, who farms near Lennox, made a test of his crop yield when he was threshing. He measured off eight acres and had it threshed separately, and got 402 bushels of fine wheat. The rest of his crop is said to have gone about the same rate."

A hardware store will be started at Napinka, Man., by A. Titus, who is getting prices from contractors for putting up a store, in which he will place a stock of hardware goods.

A petition is being signed at Deloraine asking that a liquor license be granted to J. Williams. He will take possession of the Revere house, now conducted by McLellan, about the middle of next month.

Slater & Anderson, lumber dealers, Napinka, Man., have dissolved partnership, and the business will be carried on by A. E. Slater.