

The question of heating a building with exhaust steam from an engine in place of live steam through a pressure-reducing valve is an interesting one. As far as my experience goes I have found that the exhaust steam from the engine is the best method. I have found that I cannot get live steam at  $2\frac{1}{2}$  pounds or three pounds' pressure into some radiators, whereas I can get all the heat I require in these same radiators with exhaust steam at 2 or sometimes below 2 pounds. This may be entirely due to the pulsating motion caused by the engine.

Another thing I have noticed is, that providing the load on your engine is sufficient to give only the exhaust steam you required to heat the building, the coal consumption is about the same and you get the work done in the engine free, or else the heating free. I have thought this matter over very seriously and have arrived at some conclusions, but do not know that I will be able to put them in such a form as to make them intelligible to you. When we put steam through a pressure reducing valve from high pressure to low pressure, I think we should call it heat not steam that we put through. We just let enough heat through that pressure reducing valve to keep up the required temperature, and it seems to me that the same thing takes place with the engine. We let in a certain amount of steam before the cut-off, the temperature of which is very high at that point, but, after the valve cuts off the supply the steam starts to expand, that is, it takes up more volume, as the piston moves along, consequently it takes no more live steam to get the same amount of heat in the system than when the steam comes through the reducing valve.

Chairman,—

I might also say that I personally do not agree with the remarks Mr. Wickens made in regard to the value of live steam versus exhaust for heating.

I have always been taught that it takes heat to run an engine, and if you utilize the heat in the steam after running your engine you are saving yourself that much steam. I have taken this matter up with several first-class engineers, and one of them, a friend of mine in Buffalo, states that you can do much better with exhaust steam. But none of them have come forward with any facts, they tell us that the conditions are so in their particular plant, but they have not produced any facts to bear this out. It is all very well to say that you can heat a building to-day with exhaust steam better than you can with live steam. If a man is running a 500 h.p. plant and is generating 500 h.p. at the bus bar,