

next point is to get the pump plungers to reduce the friction as much as possible. This means the adopting of such plants as Mr. Walsh has told us about in his paper. When we have done all this we have to take care of the condensed water that we get from our steam jackets, and we must return that to the boilers. I think, perhaps, the best practice, as far as condensers are concerned, is to use the surface condenser and put it in the path of the water coming to the pump. Then the incoming water acts as a condenser for the steam. I know of one case with a two million gallon pump where this was done and the temperature of the water was very carefully taken at each side of the condenser, and it altered the temperature of the water coming from the pumping well less than one degree. It made a happy arrangement because it cost nothing to get the water for condensing purposes, and in that case it worked out remarkably well.

The idea of comparing a fifteen or twenty million gallon pump that is self contained and built with a triple expansion engine, to a pump of two or three million gallons, is absurd as you cannot expect to get the duties from a smaller engine with two cylinders that we get from a large pump with four cylinders or more.

My particular knowledge is more along the lines of pumps from five million gallons down, and not so much with very large pumps. We have in many instances run tests along the efficiency lines on various pumps. We have even had a trial test of a rotary pump run by a turbine engine. This was only a million gallon pumping outfit, the engine running at 10,000 revolutions. We were pumping against 100 pounds head. The plant worked fairly well, but it had one very serious disadvantage, however—they could not run it slow. While it was running they had to pump its maximum capacity, and as the pump was rather larger than the town required and the supply of water would not permit of it running steadily, it could only run two or three hours or until the stand pipe got full, then they had to shut the pump down. This was a bad arrangement as while the pump was laying idle, they were wasting steam and coal. This plant was in existence in a small town who thought they were getting something away better than any other thing in Canada, and imported this particular pump from England.

I am sure the paper Mr. Walsh has read, has brought out many points, and there are a number of gentlemen here who are thoroughly posted in the handling of water, and I am sure that they will be able to say something of interest to us. Before I take my seat I would like to say that I have enjoyed the paper very much.