

able consulting engineer. Even the consulting engineer may make a mistake.

Now regarding the remark Mr. Walsh made about the "wide open" specifications. That is all right for the City of Toronto, but to the smaller towns the thing is, what is the best course for them to pursue? It is a debatable question. The engineer's position depends upon it, and what had he better do under the circumstances? In a great many instances he will say, we want a so and so pump, as he has been running that class of pump for a number of years and it has given him good satisfaction, but he does not know whether there is any other pump which will give better efficiency. He only knows about that particular pump. Then, of course, you can go to the consulting engineer, and he is not always infallible. He may be a very good man and conscientious, yet does not know what best to recommend. Now the question is what is the best course for the average man who is buying material. The only thing he can do is to take the best builder's specifications and pick out the best points in them all. Then again the builders do not appreciate having their specifications changed. The engineer does not always have an opportunity of consulting an expert, and I think it places him in a very critical position, and I believe a great deal of the trouble with the machinery bought at the present day is due to this one fact, that they expect the man who is filling the engineer's position, to know everything. Of course if anything is wrong he is responsible. The majority of the men who are at the head of corporations are in other walks of life and do not know what is best to do under the circumstances, and that, I think, is the true cause of a great many blunders and mistakes, which are not always up to the water works engineer or builders.

Mr. Walsh,—

In answer to our Chairman, I do not believe myself, and in fact my paper is not intended to infer that the engineer should draw up the specifications. We can call for the general data of a pump. It is an easy matter to draw up specifications to suit your requirements, after you have chosen your design, to cover general data. Then they submit their details within a certain time and we look over their drawings and after a thorough study we make changes to suit. If not satisfactory we can change certain parts, but of course taking into consideration the type of pump we are having built. As I have said before, it is an easy matter for a man to investigate for himself. Builders will submit you drawings and details. There is quite a difference in the opinions of designers in detail parts. One will ask for a 4" crank pin where another will put in a 6". Some one will have probably a crosshead