

we find that Berlin uses 17½ gallons, Dresden 17 3-5 gallons and Leipzig 23 gallons per person per day.

If the requirements of the citizens can be met, if the sanitary arrangements are complete, with this small consumption of water, there must be great waste in those cities using from six to eight times that volume.

Turning now to American cities where meters are used we find that the consumption is almost as low as in European cities: Worcester, Mass., 43 gallons per capita per day, Brockton 22, and Newton 34. Even with this low water consumption the sanitary requirements are well provided for, and the general health and cleanliness of the people are as in other cities. The only conclusion we can come to is that this great consumption of water by citizens is abuse, not use, and to prevent or check this waste would be better engineering than to increase the supply, for increased supply means increased expenditure, not only on capital account, but it increases the annual fixed charges for fuel and labor. The only way to prevent this waste is to install meters. Regulations and by-laws are too easily and successfully avoided. Education would be even better than regulation, but more effective than either would be a recording meter and a direct tax.

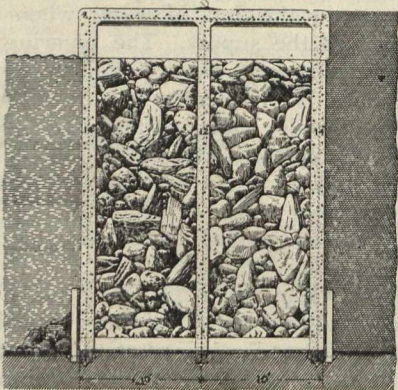
EDITORIAL NOTES.

The convention of the Canadian Manufacturers' Association is to be held in Montreal on September 14th to 18th this year. One of the features will be the general reception on Tuesday evening, September 15th, to the members of the Association, which will be held at McGill University. Next day the Harbor Commissioners will take the party on special steamer down the river; Thursday, probably a civic reception on the mountain. The event of the meeting will be a banquet at the Windsor Hotel on Thursday evening, when at least four hundred guests will be invited.

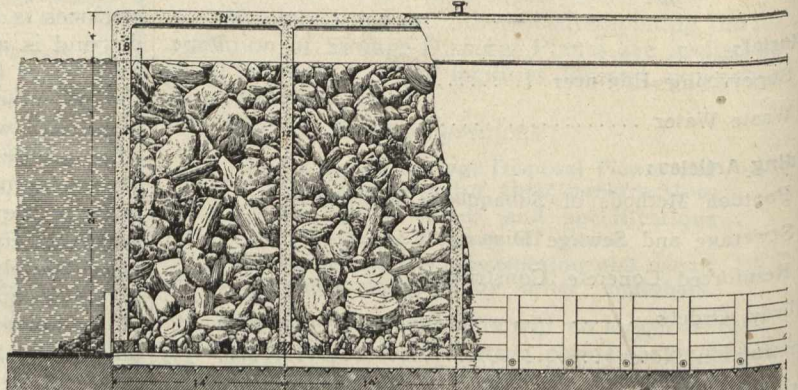
PONTOON METHOD OF SUBAQUEOUS CONCRETE CONSTRUCTION.

The superiority of reinforced monolithic concrete, over all other materials, for all classes of under water construction, is so apparent to a practical mind, as to scarcely warrant mention.

The principal qualities of concrete are, however, its great



Cross-Section of Breakwater.



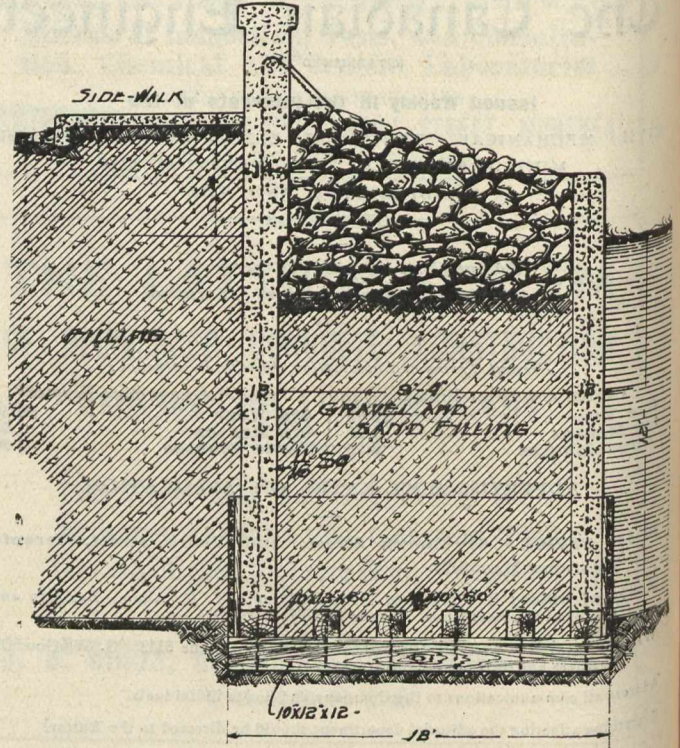
Longitudinal Section.

strength and permanent durability, its absolute resistance to the destructive Teredo worm, and its reasonable cost under proper methods of construction.

The hazard and difficulty of submerged concrete construction in exposed waters are so great, that engineers, while fully recognizing its superior qualities, have hesitated in its employment, solely on account of the risks they incurred and the heavy expense of open sea operation.

The usual methods, at present used in the construction of subaqueous concrete work, are to coffer dam, or built with blocks. By the first method, a coffer dam is built around the site of the proposed structure, the water pumped out and kept dry by pumping until the work of construction is completed within, the coffer dam and pumping frequently costing as much as the permanent work itself.

By the block method, the work is accomplished by making large blocks of concrete on shore, each block weighing many tons, these are transported by scows or trams to the site of the work, and are lowered into the water by heavy der-



Cross-Section of Dock.

ricks, the setting of the blocks being done by divers at the bottom.

Other methods have also been used, but these two are the most practical, either method is very expensive, and both are subject to the dangers and interruption of exposed construction.

When wooden piling, or timber cribs are used in this class of work, it is well-known that every few years all of the woodwork above water must be replaced, and in salt water, all of the submerged timbers must be creosoted to prolong its

life, and even then the Teredo is not prevented from getting in its destructive work.

For these reasons then, it would seem that the utility of concrete for subaqueous work, is, therefore, not a matter of suitability, but entirely a question of practical and economical construction.

The system of construction devised by Mr. J. H. Troman-hauser, 604 Temple Building, Toronto, and covered by