The valves were supplied by the General Supply Co., Ottawa, and the castings by the Victoria Foundry Company, Ottawa.

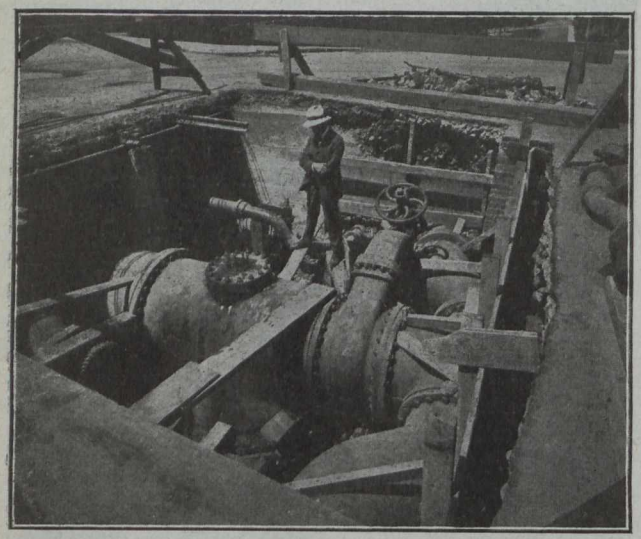

Fig. No. 8.—Junction of Overland Pipe System with City Distribution System. Five Valves are Installed Here

The overland pipe system and its various structures were designed by and constructed under the direction of John B. McRae, B.Sc., consulting engineer, Ottawa, and also latterly under the supervision of A. F. Macallum, B.Sc., commissioner of works, Ottawa.

A.I.E.E. TORONTO SECTION

Major Chas. H. Riches, late of the Canadian Expeditionary Force, will address the Toronto section of the American Institute of Electrical Engineers at 8 o'clock to-morrow evening, Friday, December 21st, at the Engineers' Club, Toronto, on the history and development of patents. Major Riches is a patent attorney-at-law.

MANITOBA BRANCH, CAN. SOC. C.E.

A meeting of the Manitoba Branch of the Canadian Society of Civil Engineers was called for 8.15 p.m. Monday, December 17th, at the Engineering Building of the University of Manitoba, Winnipeg. T. L. Roberts delivered a paper on lignite coal as applied to modern steam plants. Mr. Roberts dealt with the application of lignite coal to high pressure boilers with stoker and hand feeding and forced draft. His paper was well illustrated with drawings and charts.

OTTAWA BRANCH, CAN. SOC. C.E.

Lieut.-Col. C. N. Monsarrat, M.Can.Soc.C.E., chief engineer and chairman of the Quebec Bridge Commission, will address the Ottawa Branch of the Canadian Society of Civil Engineers this evening at the Normal School, Ottawa. on the Quebec Bridge, describing the construction of caissons, piers and superstructure, and the lifting of the central span. His lecture will be illustrated by slides and moving pictures.

NOTES ON THE USES OF CONCRETE

By A. E. Eastman, A.M.Can.Soc.C.E.

MUCH valuable information on the subject of concrete and its uses is being given to the engineering profession in book form, and also in the published reports of experiments and investigations from time to time. In view of this, to make any attempt to bring forward any new or advanced ideas on the subject would be assuming a good deal on the part of one who has not made this subject a particular study, but has only made observations and deductions from what has come under his notice in his work.

It has been remarked that, from an engineer's viewpoint at least, we are living in the "concrete age," and facts seem to bear this out. Many notable engineering works, once laughed at as the dream of some crank, or even worse, but now established facts, were made possible to a great extent by the use of concrete. To mention but a few within the borders of our own Dominion, the new Welland Ship Canal with its immense lock walls; in bridges, the Quebec Bridge, soon to be in use, which while classed as a steel bridge, has upwards of 75,000 cubic yards of concrete in its piers; the C.P.R. bridge at Outlook, Sask., whose piers are concrete monoliths 110 feet high; the huge grain elevators on the Great Lakes ports and elsewhere; in fact to attempt to make a list even approximately complete would require much time and work.

The reasons for the widespread use of concrete are numerous, and will not be discussed here. The old idea that concrete is made by mixing cement, sand and either broken stone or gravel, whichever might be more convenient, with water, hit or miss, any way at all, is fast disappearing, if not entirely gone. Recent experiments have shown the value of grading the sand upon the resulting mixture. "Clean, sharp sand" does not cover the requirements sufficiently to give the best results. The amount of water is also shown to affect the concrete. Former specifications called for the concrete to be "well mixed" or "thoroughly mixed"; now the minimum time for each batch to remain in the mixer after the water is added is commonly given. All these, once considered as minor points, are now shown to be important.

The value of "plums" in a mass of concrete, such as a wall, may be debatable. The writer was with one engineer of considerable experience who would allow no "plums" under any circumstance; while another case came under his observation where the "plums" used were so large as to require a derrick to place them. Here are instances entirely opposite and in both cases the results were entirely satisfactory. Clean, sound "plums" should not diminish the strength of a wall.

In highway and street construction there is no doubt that concrete has at least one place where it will be hard to find a substitute for it, even if one were needed; that is, as a base for the surfacing material, whatever that may be. In fact, in a large proportion of cases concrete itself as a surfacing material is found satisfactory. As a surfacing, however, there are times and places when its disadvantages practically prohibit its use; for instance, on steep grades, as it does not give good foothold for horses, particularly in cold weather. As a material for permanent sidewalks, its use is fast becoming universal.

Mention has been made of the Welland Ship Canal and the use of concrete in the lock walls, etc., and it may be a question whether the same design would have been used had it been necessary to build with masonry instead