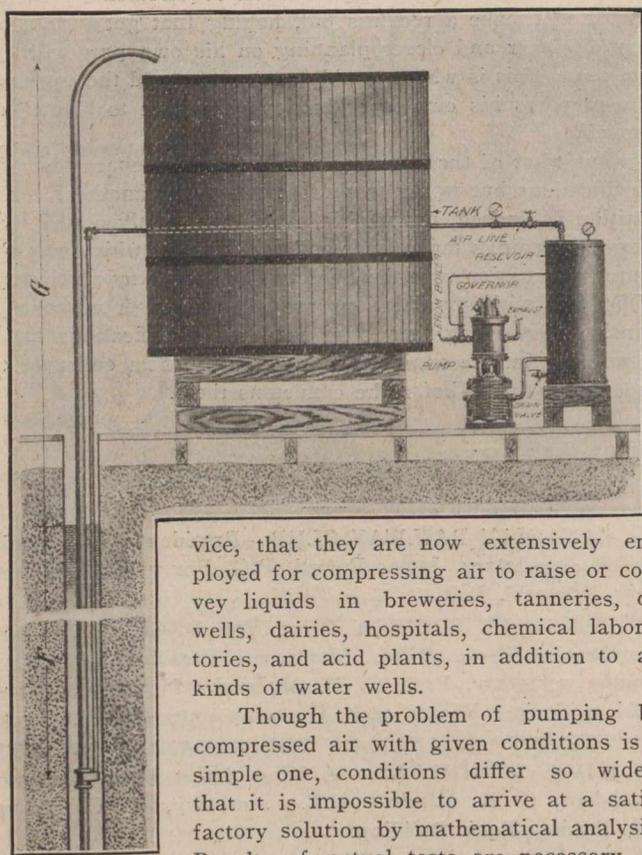


WESTINGHOUSE AIR COMPRESSORS FOR PUMPING AND CONVEYING LIQUIDS.

The advantages of employing compressed air for pumping water, oil and other liquids from wells, vats and tanks, are so pronounced that within the last few years this system has come into general use in a great variety of industries. Its simplicity and ease of maintenance make it far superior to any other means of conveying liquids. In deep wells particularly, great economy is found in the use of air as compared with the old time deep-well pump. No valves, no reciprocating rods and plungers, and no wasteful steam cylinders at the well to operate them are needed. The air system requires nothing but pipes properly proportioned as to the size, length and connections, which when once placed in position, remain indefinitely without need of attention and repairs.

The air may be compressed in an existing power house, or at any convenient point, regardless of the distance from the well. Several separate wells, if desirable, can be pumped from one central station.

Westinghouse compressors, both steam and motor driven, have been found so well adapted to this class of ser-



vice, that they are now extensively employed for compressing air to raise or convey liquids in breweries, tanneries, oil wells, dairies, hospitals, chemical laboratories, and acid plants, in addition to all kinds of water wells.

Though the problem of pumping by compressed air with given conditions is a simple one, conditions differ so widely that it is impossible to arrive at a satisfactory solution by mathematical analysis.

Results of actual tests are necessary to form a correct basis of figuring. Realizing this and desirous of assisting their patrons in every possible way to obtain the best results, the Westinghouse Air Brake Company has lately completed a series of nearly 2,000 tests covering a range of from 350 to 400 different conditions of deep-well pumping, to obtain data concerning water delivered, air consumed and the best proportion and arrangement of piping and apparatus.

Heretofore tests have been made on wells having fixed conditions, and the results, covering a number of isolated cases, have been the only guide in considering the requirements for all other installations. In this case, however, the tests were made with a well driven on the premises of the Westinghouse Air Brake Company specially fitted up for experimental work.

So far as is known, no such wide range of tests have ever before been made upon a single well. The results place the manufacturers in a position to be of great assistance to those desiring to install compressors for direct air pressure pumping.

The accompanying illustration shows the simple arrangement of piping used when the inside diameter of the well casing permits a discharge pipe and an air pipe, both of suitable size, to be placed side by side in the casing.

PROTECTION FOR ENGINEERS.

We, last week, reported the proceedings of the general meeting of the above, but reserved for a separate article the impressions left on our mind by the speeches of the members.

It is impossible to avoid the conclusion that the members who do not live in Montreal derive but little material benefit from the Society. The Transactions are "put on a shelf for our son to read," as one member expressed it.

The dissatisfaction at this state of affairs is at present inarticulate, partly on account of the innate shyness of some members, partly because of the difficulty involved in reducing to definite propositions the many germinating ideas, and, correlatively, procedure precludes the expression thereof.

First, dealing with the last difficulty. It is inevitable that the routine work, such as presenting reports and financial statements, the elections, etc., must take priority. Consequently, discussion of grievances or suggestions is relegated to the fag end of the annual meeting. By that time the enthusiasm of reformers has been effectually "damped down" by the laudatory torrent emitted by the selected orators at the previous night's banquet. The classical advice to "feed the brute" is applicable to other besides marital relationships, and has a stultifying effect on the discussions of the following day.

There is little doubt that members have in past years given utterance to valuable suggestions at this last day's meeting, but, owing, no doubt, to lack of recording arrangements, they have been lost sight of, especially those suggested by drastic reformers.

The thin edge of the wedge of reformation has at last been inserted by Messrs. W. J. Camp and William McNab in a far-reaching resolution. Notwithstanding the whittling efforts of some members, the meeting decided that all the resolutions, amendments, comments and discussions, suggestions, etc., made during the annual meeting should be recorded by a stenographer, and copies thereof should be sent within a given date to each member.

Unfortunately, a resolution of this nature cannot bear fruit until next year's meeting, as only a few desultory notes were made of this year's discussions. We, therefore, desire to give publicity to this reform and to other recommendations and suggestions made this year.

It is the opinion of many that but little good is derived by individual members from Parliamentary and such like artificial support. A charter of incorporation is, of course, necessary, but to seek powers from Parliament, whereby civil and other engineers would be forced to join the Society, involves injustice and bigotry, and creates a monopoly of the rankest character.

The Society of Civil Engineers should, of its own accord and from its great financial resources offer such material benefits to its members that its attitude to non-members could be one of "repulsion" rather than being one of "compulsion."

On these grounds we desire to call attention to the remarks made by Mr. Hilder Daw, of Montreal. Speaking under the heading of "For the Good of the Order," he drew the attention of the members present to the foregoing aspect of the case. Pointing to the Institution of Civil Engineers of Great Britain, he gave the following reasons for the dominating position which that Society holds:—

Firstly, the Institution of Great Britain upholds its members in times of tribulation.

A small committee of investigation is entrusted with powers to investigate and remove pecuniary difficulties. No record of such assistance is kept, such being the trust reposed in this committee, so no stigma rests upon that member who receives their timely aid.