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MECHANICAL ENGINEERING PROBLEMS IN ILLUMINATING GAS WORKS.*

By Mr. J. A. P. Crisfield, Engineer of Construction, the United Gas Improvement Company, Philadelphia.

[The problems which confront the mechanical engineer, who is connected with a gas plant, are brought to the notice of the reader. How these various questions may be solved to the best interests of all concerned is pointed out].

The business of the manufacture and distribution of gas for lighting, heating and power purposes constitutes one of the most familiar and important examples of that phase of modern civilization in which private capital, enjoying public privilege, undertakes to supply one of the conveniences or necessities of living. With the gradual recognition of the mutuality of the relations between the Gas Company and the community which it serves has come a clearer conception of the obligations of both parties to the unwritten but none the less binding contract between them, and to-day it would be diffi-

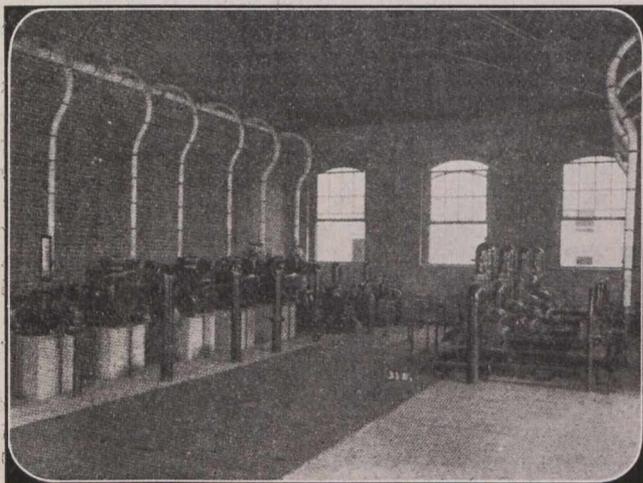


Fig. 1.

A pump room. The pumps shown in this illustration are for the purpose of handling hot and cold water, oil, tar, ammonia, etc. The services of a mechanical engineer are valuable in such work as this.

cult to find a gas company whose officers do not feel in duty bound to render its customers the best service in its power at the lowest rate consistent with a fair return upon the capital invested. To accomplish this result it is essential that the management of the gas company, in its various departments, be expert, each in its particular duty; that the work in hand shall be performed by specially educated and carefully trained men. In no department of the business is this more apparent than in the gas works itself, where technical problems of the most intricate character are continually offering themselves for solution. It is here that the young mechanical engineer begins to realize for what his course at school was

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intended to fit him, and gradually, as he learns to recognize the principles of efficiency, economy and the conservation of energy through their numerous and most cunning disguises, he takes up his work of eliminating waste, extravagance and engineering fallacies.

The modern illuminating gas works is a highly specialized plant, designed for the duty of gasifying coal, either by distillation in an enclosed retort, or else, by making from it, hydrogen and carbonic oxide by the action of steam, and adding thereto the light-giving vapors of liquid hydrocarbons. The former method is known as the coal gas process; the latter as the water gas process.

Before discussing the mechanical engineering problems which are met with in the design and operation of a gas works, it might be profitable to define that branch of engineering which is called mechanical. In the best known schools of mechanical engineering the course of instruction includes, among other things, the following subjects: Mathematics, to and including Thermodynamics; Modern Languages; Mechanical Drawing and Machine Design; Physics;

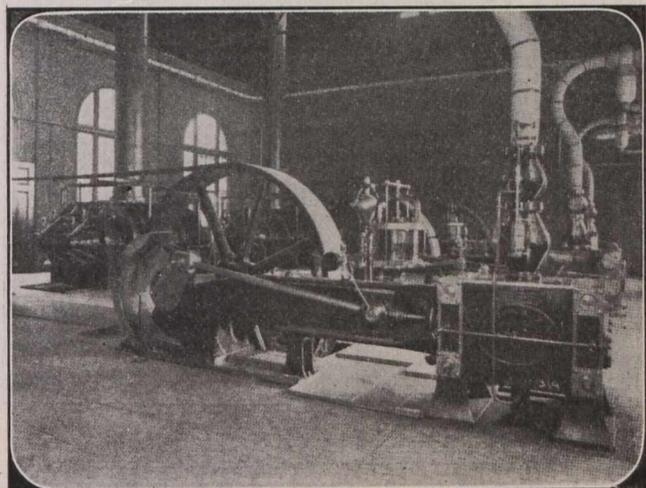


Fig. 2.

Positive blowers compressing air from atmospheric pressure to one pound, for use in a large carburetted water-gas plant. In this case the amount of work to be done is comparatively great and the utmost economy of operation is sought by the use of Corliss engines and efficient blowers, regardless of first cost.

General Chemistry, and Special Engineering Chemistry, including Combustion Engineering; Engineering Practice; Structural Engineering; Electrical Engineering. Hand in hand with instruction in the theory of the foregoing subjects, the scholar is given practical work in physical, chemical and mechanical laboratories. It will be seen that this course of instruction prepares the mechanical engineer for all branches of industrial undertakings in which success depends upon the efficiency of the means and methods employed and upon other economies of operation. He is trained to save; to do work with the least expenditure of energy; to consider no economy too small to be worthy of attention, knowing that in the aggregate many small economies may determine the success