

The importance of careful management of materials in construction work is emphasized. A loss of \$10,000 work of material was reported in one case on account of poor storage facilities during construction.

#### Nitric Acid

Schuyler Frazier, Chicago, Ill.

This paper gives a few notes with reference to the manufacture of nitric acid. The various important advances which have been made in recent years are reviewed, and the advantages secured by each improvement is noted. Tables giving the yield and purity of acid obtained as well as rate of distillation are appended.

#### Problems in Chemical Industry

By John T. Baker of Phillipsburg, N. J.

The number and complexity of the factors involved in chemical operations are so great that many operations are still carried on under the rule of thumb guidance and have not been reduced to a science. On the other hand the trained scientific man is very prone to believe that the matter with which he deals will follow the laws which he has learned and for this reason he often overlooks valuable facts which the untrained observer sees. The untrained observer ignores laws and systems; tries any suggestion that comes along and therefore loses much valuable time and labor. The investigator who is successful follows a mean between these paths. A number of practical illustrations of these principles were given.

#### Commercial Calcium Hydrate—Its Manufacture and Uses

By Lucius E. Allen of New York. Read by N. L. Turner.

This paper gives an outline of the method of manufacture of this product and calls attention to the many cases in which it can be used to better advantage than the unslacked line. It is well adapted for water-proofing Portland cement. Its keeping qualities are excellent.

#### Coal: Its Deterioration in Storage

A. Bement, Chicago, Ill.

Results of experiments given in this paper are the termination of a long period of study with the two coal seams of Illinois, which from the standpoint of production are the most important ones. The experiments show changes in heating power, in quality of the fuel, and disposition to slack down to smaller size during storage.

#### EDGE TOOLS AND CONCRETE FLOORS.

Nicking or breaking of edge tools and machined castings by falling on a concrete floor is one of the objections to granolithic floor finish reported to the Aberthaw Construction Co., of Boston, which has lately made an investigation into the question. That company has just issued a report on its investigation, entitled, "Wearing Surfaces for Factory Floors," in which some of the replies to its inquiries are quoted. The following from a car builder, not included in the report, is of some interest:

"I have found, especially in wood-working shops, or in machine shops, where castings and machined parts are made, that when a tool with a sharp cutting edge is dropped on a concrete floor it is almost invariably so much chipped that it is practically ruined. This is also true of the machined edges of different irons. Castings dropped on a cement surface very often break. Wood floors involve no such inconveniences; tools, particularly, cut into wood, without damage to themselves.

#### THE SHEA THEATRE FROM AN ENGINEERING POINT OF VIEW.

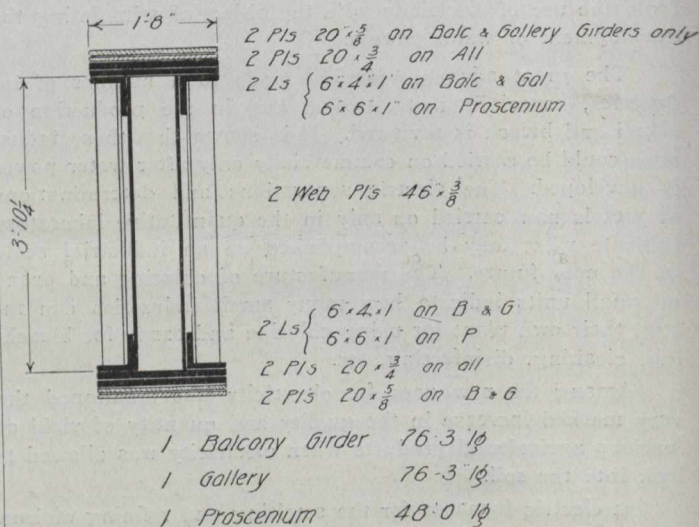
A. C. Oxley.

The construction of a modern theatre of the first rank is of sufficiently rare occurrence in Canada as to be worthy of some notice on the part of engineers. The Shea Theatre, now nearing completion on Victoria Street, in Toronto, is perhaps the most recent example.

The present generation of theatre-goers have now come to demand as a sine qua non that there shall be no pillars in evidence to in any way obstruct the view, and this is the problem which presents itself, namely, to construct an auditorium capable of seating several thousand persons, all of whom must be both close at hand and at the same time have an absolutely clear view. Work of this nature is of as yet too seldom occurrence to have given Canadian architects much opportunity to develop. The design was accordingly entrusted to the firm of Leon H. Lempert & Sons, of Rochester, who were the architects for the Shea Theatre in Buffalo.

#### SECTION OF GIRDERS

on Centre Line



The work was of a sufficiently large nature to make the methods of construction somewhat interesting, and after a general description of the theatre some space will be devoted to this.

The general dimensions of the Shea Theatre are as follows:—Front width, 82½ feet; depth, 168 feet; height, 70 feet 3 inches. It will be seen that this height is too little to make the general use of steel columns advisable, particularly as wall columns would have no lateral bracing. This being the case the roof trusses and proscenium girder are carried on brick piers, while the balcony and gallery girders only are supported on columns reaching to the foundations. The brick piers were also necessary for the architectural effect so that nothing was lost by their use.

The by-laws of Toronto are particularly strict with reference to large public halls, and only the most thoroughly fire-proof construction is allowed.

Roof and all floors are of reinforced concrete slab construction with the single exception of the stage floor, where 2-inch plank is used owing to the occasional necessity of temporary openings. The unit floor loads were taken as