electric plant the machine generating the power is running all the time, giving a percentage of loss, for it is either full load or no load. The great difficulty is that people are getting into the habit of thinking that if anything is electric it must be the best; that is true in some cases, but those who have had to do with electric elevators have found them to be Jonahs. Consumers of current usually think they are robbed, but when a man pays his bill for current for running his elevator he should laugh in his sleeve for he has got all, and more than all he has paid for. The electric elevator is a curse to a lighting station; they have hurt the incandescent lighting business more than anything else, so much so, that the Toronto company has put nearly all the elevators on a separate current. Now, if a large company has to do this, when an elevator adds such a small percentage of load to the station, it is plainly to be seen how much more it would affect a private plant. If the city will have electric elevators let them buy the power, as the Ontario Government does for the Parliament buildings, even if they can generate it as cheaply in connection with their lights.

Now I am by no means through with the question, but will not take up any more of your valuable space, except to say that if the city will have electric elevators, they need not go to the United States for them. The Robert Simpson Company's electric elevators are the best that are running in Toronto, and if they can handle the traffic of a department store, they can easily handle the traffic of the Court House and City Hall. I hope this matter will be taken up by engineers and dealt with in the interests of the Canadian workmen with fair play to all. Yours truly, E. J. PHILIP.

AN UNUSUALLY LARGE ELEVATOR.

An unusually large elevator has recently been put in the new building of the T. Eaton Company, cor. James and Louisa streets, Toronto. The cylinder is 26 inches in diameter and 24 feet long; the travel of the car is 60 feet; the car is built of steel, and is supported by ten ¾-inch steel cables, and has a platform 17 feet 6 inches by 10 feet. The carrying capacity of the elevator is seven tons, which is the largest elevator with rope machinery in the city. The purpose of the elevator is to be able to run a loaded wagon on to the car, and run it off at the floor where the material is to be unloaded, thus saving handling so many times. This elevator, as well as all the 12 elevators in the company's store, were built by the Fensom Elevator Company, Duke street, Toronto. This is the largest elevator plant in Canada, and it certainly is a credit to the company. The plant is most varied in the character of the work which it performs, from the smooth-running passenger elevator, handling thousands of passengers each day, and the fast-running freights, to the slow-running direct lifts; and last, but by no means least, this mammoth, which has lately been installed. Another novel feature on the T. Eaton Company's premises is the power grooming and clipping machines in the stable, that can clean or clip a horse in almost less time than it takes to tell it. These are driven by two 2 h.p. electric motors, built by the Toronto Electric Motor Co., as also a 15-h.p. motor for cutting and grinding feed. The stable building is heated by steam and lighted by electricity, and is equipped with Grennell sprinklers (dry system), and seven hundred and fifty feet of 2½-inch standard fire hose arranged on each floor. The capacity of the stable, as arranged at present, is one hundred horses.

THE DOHERTY IRON CASTINGS PROCESS.

The recent sale for a large sum, of the British patents of the Doherty process in iron foundry practice, will render a short description of the process of interest to our readers, especially as the discoverer is a native Canadian. The process consists in introducing into the tuyere (or mouthpiece by which the blast is brought into the cupola) a jet of steam, with the result that the casting is made finer in the grain, softer and tougher than is ordinarily the case, and this improvement applies, not only to castings made wholly from pig iron, but from scrap also, the loss being only two per cent. in some cases where scrap is used. It has long been known that humidity in the atmosphere has an effect in iron smelting, but it remained for Thomas Doherty, of Sarnia, by a happy accident to follow up this obscure and uncertain effect till the problem came within his control.

When scrap is used in a foundry a large amount of the oxide of iron is carried off with the slag and lost, this loss being about 30 per cent. in ordinary practice. The introduction of the steam jet—in which the elements of hydrogen and oxygen exist—has the effect of producing a more strict form of metallic iron through the removal of the oxygen from the oxide. In his foundry in Sarnia, Mr. Doherty uses one part of second quality foundry pig and three parts of low-grade scrap with malleable to the extent of not more than 300 lbs. to the ton, the result being a stronger, softer, and more uniform casting than can be obtained in the old way. Various foundries that have adopted the process state that they have saved from $4 to $5 per ton, according to the kind and price of raw material used. Though the principle is the same in all cases, the application of Mr Doherty's process varies according to the work of the foundry, the iron used, and the purposes the castings are turned to, and judgment and experience will determine the success of its adoption in each case For example, one class of pig iron may contain a certain amount of silicon, carbon, phosphorous, manganese and sulphur; and another class contain exactly the same proportions of these substances, yet the two irons will not give the same casting, although melted in the same cupola and under the same conditions. Then we must arrive at the conclusion that there must be a variation in the metallic iron, and in our present state of knowledge chemistry cannot give the character of it, and the consequence is that we are never sure of the same results, even on the same analysis. There may be a variation of 10 per cent. in strength in the castings made from the two irons. Mr. Doherty believes that the introduction of steam produces a molecular change in the casting. This should be conclusive evidence that hydrogen is a powerful reducing agent, that its influence in reduction of the oxide of iron in an ordinary cupola plays a very important part, and aside from this most valuable feature it has other valuable functions, namely, softening and strengthening the castings.

THOMAS DOHERTY.

Thomas Doherty was born near Perth, Ont., in 1854. His grandfather was a British half-pay officer, who had settled in Bathurst township, and his mother was born in Manitoulin Island, when the island was almost a wilderness. Mr. Doherty's family came to Plympton, about 20 miles from Sarnia, where they settled as farmers, but had a small shop on the farm, in which the subject of our sketch picked up with a quick instinct a knowledge of mechanical matters. They moved to Watford, where they ran a small foundry and machine shop, at which they made threshers and other agricultural implements. When Mr. Doherty was 13 years old his father died and he was left to carry on the business—a great undertaking for one so young—but he succeeded well, and fifteen years ago moved to Sarnia and established the foundry business which he still carries on in that town. It was in 1894 that he discovered the process which has made his name so widely known in the iron founding world to-day. This discovery, like so many others, was the result of an accident. The blower had got overheated, and he sent a boy up on the roof to pour water down; the water was sucked into the cupola, and its conversion there into steam had, to his surprise, a marked effect for good on the iron; he began to study the cause, and the result was the process already described. The process is secured by 21 patents in Great Britain and various countries, a company having been formed to operate in England with a capital of £100,000, paying Mr. Doherty £30,000 cash and an interest to the extent of 12 per cent. in the company. This company is known as the Doherty Iron Castings Process, Limited, with offices at 32 Victoria street, London. In the United States a company called the Doherty Iron Castings Process Co., of Ridgway, Pa., has been formed, the company paying him $150,000 for his rights. The Canadian business will be controlled by Mr. Doherty himself. It will be of interest to mention that the patents for this process at first hung in doubt in Great Britain. The claim was in the use of hydrogen "in fixed proportions," and was exactly analogous to the patents for the cyanide process of gold extraction which were being contested in the courts. Cyanide had been used before for extracting gold, and hydrogen had been used in iron melting: but