EDISON GENERAL ELECTRIC CO.'S WORKS AT SHERBROOKE, QUE.

THE Canadian works at Sherbrooke, though small in comparison with the Edison company's American establishments, present more points of interest than any one of these, for here are combined the industries embraced by the New York and Schenectady works. Indeed, we find here the manufacture of all machinery and appliances necessary for the equipment of all kinds of plants for the supply of light and power, except lamps. In the dynamo department there are always in course of construction machines of all sizes, from the small 250-watt," which supplies current for five sixteen-candle power lamps, to the "No. Thirty-two," designed to run 1,150 lamps of the same lighting power. The motor department turns out machines for all kinds of work and for a large range of capacity, from ½ to 75 horse power. These are both for stationary and street car work.

The foundry is occupied with the production of castings of brass in every size and shape, ready to be passed on to the machine shop, where by means of lathes, drills, punch-presses and other suitable machinery they are fitted up for the purpose they have eventually to serve. In the carpenters' and pattern makers' shop patterns are made of parts of machines which the moulders will afterwards turn out in brass and iron. The cable department supplies all varieties of stranded conductors for conveying currents for different classes of work, amongst which the chief are telegraph, telephone, lighting and power. Here, amongst others, are made large lead covered telephone cables, some of which contain upwards of two hundred separately insulated wires, and composite conductors designed for every kind of overhead, underground and subaqueous purposes. On these the tube department are now working—the method of manufacture being as follows. Copper rods of thickness varying from ¼ inch to 4-5 inch have wound round them a spiral of rope saturated with a liquid insulation, after which three rods are bound together with a similar larger spiral. The bundle is then slipped into a length of pipe, the ends of the rods being allowed to protrude at each extremity. A viscid bituminous compound is now forced in under pressure, so as to completely fill all the interstices between the copper, rope and pipe, rendering the whole tube impervious to moisture and gases. The ends of the pipe are then closed with rubber plugs, through which the rods are allowed to appear, and the conductors are tested, after which they are ready for shipment. Contigous rods are connected when laid underground, by flexible copper cable, which allows for expansion and contraction of the conductors caused by heat or cold. Two tubes may be joined together, either in a straight line or at any angle required. The connecting joints are covered by cast iron coupling boxes fastened to the ends of the tubes, which are filled with insulating compound. Another product of the Canadian works consists of insulated wire of all descriptions. From the wire department are produced magnet and armature wires, weatherproof line wire, rubber-covered wires for sundry purposes, office wires, annunciator wires, gas fixture wires, tinsel cords, resistance wires, non inflammable house wires, and silk and cotton braided flexible cords for hanging light, and so forth. All sorts of metals are here worked on, from the gold cord in the tinsel and the German silver in the resistance wire to the usual copper conductor and the galvanized iron of telephone lines. The range of size runs from stout rods of copper, half an inch in diameter, to the filament gauging only fifteen ten-thousandths of an inch—half the thickness of the human hair, one pound being 32 miles in length. Insulation is effected by means of silk, cotton, rubber, worsted and other materials of a non-conducting nature. The growth of the whole works has been steady and rapid. Starting in the spring of 1889, only a small force was employed, but this has increased, until to-day there are over 220 hands on the rolls, and this number will soon be considerably added to. The necessities of the industry compel a constant addition to the list of departments, the latest amongst which is the result of a contract with the Thomson International Electric Welding Company, whereby the Edison works have agreed to build the necessary outfits for all welding plants, started in Canada under the Thomson Company's patents. Besides the articles already enumerated, these works produce ready for the market, all kinds of general electric appliances and supplies, such as meters, switches, pockets and receptacles for lamps, cut-outs, regulators, Amperemeters, volt-meters, resistance boxes, etc.

It is gratifying to learn that the company's Canadian business has grown to an extent that has rendered necessary the erection at Peterborough, Ont., of new workshops of greatly increased capacity, in which operations will be continued on an extended scale the coming spring.

WHAT SHALL AN ENGINEER STUDY?

BY "AUTOMATIC CUT-OFF."

THIS is a very important question, and one that cannot be settled offhand. The term engineer is so widely used that every person who has anything to do with boilers, engines or steam, whether he be the veriest stocker who just knows a steam gauge from a glass water gauge, or a first-class man, even a graduate from a Technical College or a man capable of taking full charge of one of our ocean greyhounds—all come under the name of engineer.

No matter what position a man holds in the engineering world, he should have knowledge enough to manage safely the steam plant under his care, and if the employers insisted upon this being proved to their satisfaction, they would save themselves some anxiety and considerable money. I heard an employer say, "I don't want any book-learned engineer around my place, I pay my men to work." Well, he got what he wanted, and in a few days there was a shut-down in the middle of the afternoon—146 men standing still. Upon inquiry as to what was wrong, the engineer (?) said he had no water, and could not get the pump to work. After spending two hours on it, they sent to a neighboring machine shop for a man. In ten minutes the machinist found a piece of scale under check valve, and had there been water enough in the boiler, the machinery could have started at once, but as the case was the boiler had to be cooled off and then filled up by hand. The loss in this case is considerable – 146 men three hours, equals 438 hours, or 43 days for one man

Now if this engineer (?) had "book-learned" enough of the principles upon which a boiler feed pump works, he would not have been stuck so easily, and undoubtedly in that case would have saved his employer the cost of 43 days labor.

From the fact that at the present day steam engineering is running to faster speeds and higher pressures, as well as better compounded engines, it becomes necessary for the engineer himself to acquire more knowledge in order to work with the same degree of safety for himself, his fellow employees, and his neighbors. The opportunities for gaining knowledge have advanced as rapidly as the improvements in the machinery, so that there is no excuse to be made for the engineer who does not keep up with the procession. It is not to be expected that all men can attain the same degree of knowledge, even with the same advantages, neither is it necessary for men running engines to have a technical education, but all men in charge of steam plants should study natural philosophy and hrydrostatics. They should learn enough about chemistry to help them about combustion, that they may properly use their employer's coal. They should understand arithmetic, at least as far as square cube root. Any engineer who is master of common arithmetic that far, can always work the problems he may meet with in ordinary, everyday practice.

One trouble the student meets right on the threshold is, that the mechanical books he studies from do not agree on many points. In some instances the rules given by two different writers result in different answers. This is confusing to the student, and should be corrected by some means. We should have standard rules, so that results would be alike in the whole mechanical world. If we had license and inspection laws it would tend greatly to remedy this trouble, as it would become a necessity to have a fixed standard by which to conduct the business.

There are many instances occurring wherein the engineer who studies has the advantage. One I call to mind where an engine had been doing very well for nearly a year from the time it was started. All at once the crank pin brasses began to give trouble. The connecting rod was of the English stubb end pattern; and the brasses were held in place by two bolts with jamb nuts on them bolting them to the stub end of rod. The engineer soon found that these bolts were stretching, and wrote the builders of the engine to that effect. They were positive the bolts were all right—had been making many just like them and all were satisfactory but this one—the engineer must be mistaken, etc., etc., in fact they repudiated the whole thing. In the meantime one of the bolts broke. It was renewed by the builders, but at once began to stretch. Our engineer by this time had got tired trying to get these brasses to run right. As he was a member of one of the engineering associations and had been gaining knowledge, he concluded to figure out the strength of the bolts, and the strain put on them when the steam was admitted to the cylinder. These figures proved plainly that the bolts were too small in sectional area to stand the strain put upon them. These figures were sent to the builder of the engine, and the result is that the engine is supplied with stronger bolts and the trouble for ever cured Now if that engineer could not have done this, there would have been many shut downs, and every body and every thing but the right one would have been blamed.

I may say here that when this engineer joined the society he could not figure up the strength of one of those bolts any more than he could fly. I could go on and cite instances enough to fill this paper, where the engineer has been of signal service to his employer by studying and practising a little "book larnin." I say, engineers, study to be equal to all your duties, and employers, get a man who can prove he knows how to manage a steam plant.