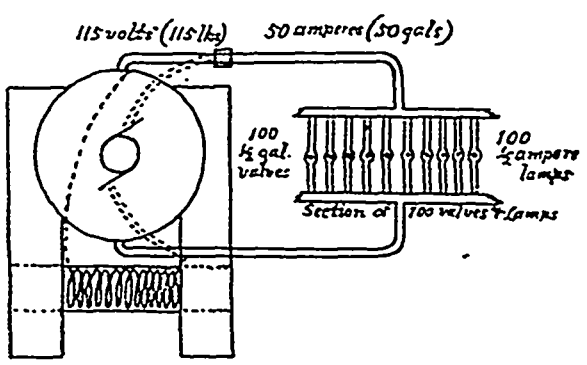
Electrical Department.

AN ILLUSTRATION FOR ELECTRICAL STUDENTS.

At a meeting of No. 1 branch of the Canadian Association of Stationary Engineers in Toronto last month, J. C. McLachlan, manager of the Toronto Electric Motor Co., gave a familiar talk on the care of electric motors. To make his remarks clear to steam engineers, Mr. McLachlan made use of a form of illustration which we do not remember to have seen adopted by instructors in electricity, and his method is so clear and simple that we make no apology for reproducing it. He draws an ingenious analogy between the steam engine and the motor, and supposing the boiler to have a double steam pipe, converts the flow and pressure of steam into their equivalents in electricity. The following is the report of Mr. McLachlan's "blackboard talk":

He first illustrated the boiler with pipes leading from the top of the boiler into headers with small pipes between, and valves placed half way between headers, then back to the bottom of the boiler as shown. These valves, 100 in number, will allow, say, one-half gallon to pass through them per hour, at a boiler pressure of, say, 115 lbs. This would require 50 gallons to pass through the main pipes in the same time. To keep up an even pressure on each valve, and to give an even distribution, we place the main pipes in the centre of the headers. Now, by keeping up a steady fire you will get a continuous flow from top to bottom of the boiler through these valves. He did not give these figures as correct, but simply for convenience of illustration. Proceeding with his sketch, Mr. McLachlan said:—



"Now we will change this boiler arrangement into an electric-light plant of one hundred 16-candle power incandescent lamps, and to do this you will see that it is very simple. We use the boiler for the armature, the brick work for the poles, the fire-place for the field, the main pipes for main wires, the headers for feed wires, and the half-gallon valves for lamps. Now we have a complete 100-light plant installed, and using the same figures, the 115 lbs. become 115 volts, the 50 gallons become 50 amperes, and the half-gallon valves become half-ampere lamps. Now by keeping up a steady speed on the armature we get a steady pressure, but by increasing the speed the voltage will increase, and increase the force of the current at the lamps, which is very bad for the lamps, as they will not last as they would do if kept at their proper voltage. Many times the makers of the lamps are condemned for not making a good serviceable lamp, when the fault is in the engine or in lack of knowledge, or carelessness in not attending to the rehostat so as to keep up an even pressure. Now, going back to the boiler, we find if we increase the pressure we increase the quantity circulating in a given time, and we have identically the same if we increase the voltage of the dynamos. In such case the damage to the filament of the lamp would be greater (as it is very tender) than any to the valves already referred to. You will notice the square on the main pipe at the top. This would be a safety valve for the boiler, and we use it for the electric plant for the same purpose, but call it a "cut-out." If we get a short circuit it will melt this and save the armature of the dynamo. I have seen parties put in copper wire in place of fuse wire of proper size. You might as well tie down the safety valve on your boiler; the result would be destruction in either case. If a fuse blow is caused by a short circuit, you will find the trouble between that and the end of that circuit. The cause may be water in a lamp or in a socket, or a nail may have been driven through between lamp cords. If there is no water, and no pipes or rods which the wire passes over, then we must look for the cause elsewhere. Now we come to taking care of the dynamo. First, keep it clean. Clean your commutator and keep it true and smooth, and the results will be in your favor. If you see myriads of small red sparks around the commutator you will find it dirty; if there is a clear electric spark about ⅜ of an inch long, look for a broken wire or bad connection; if a flash, look for a "ground." If you are unfortunate enough to have a burnt section, cut off the wires of that section and connect the commutator section on each side, and you will be able to get along if your dynamo has not been overloaded before. Sometimes you will see that the commutator shows a mark as if struck with a sharp hammer. This may be caused by a closed circuit."

THE electricians of the Sherbrooke, Que., Light and Power Company have recently introduced for their own convenience a device which we do not remember to have seen elsewhere or read of. They have a telephone in their power house, but of course such is the noise of the water-wheels that the telephone bell could never be heard nor the instrument made use of in the power room. The instrument is therefore enclosed in a cabinet and with it is connected a wire leading to a large gong in the middle of the room. To this gong is attached a battery similar to the call-bell battery of the telephone, only much stronger, and when anyone rings up the power house the drop falls and the gong rings loudly enough to be heard all over the room. Such a device will be found very useful in all offices or factories where the noise of machinery prevents one from hearing a call or hearing the manager when at the telephone. The same company have improved the construction of their arc light pole-attachments by having a chain instead of a rope to lift the lamps by. The movement of the lamps in high winds cuts the rope and open circuits are not infrequent. No difficulty is experienced with chain lifters.