Electrical Department.

CANADIAN ELECTRICAL ASSOCIATION CONVENTION.

The forthcoming convention of the Canadian Electrical Association, which is to be held in Montreal, promises to be the most successful yet held. The programme of the convention has not yet been finally settled, but the Entertainment Committee have drawn up the following, which will no doubt be accepted by the Executive.

Wednesday, 19th Sept.—Convention opens with an afternoon session, followed by a trip to Lachine and down the rapids.

Thursday, 20th Sept.—Visit to the Technical Department of McGill University, 9.30 a.m., and the morning session opens at 11 a.m. At the conclusion of the afternoon session an excursion will be held over the Montreal Park and Island Railway Co.'s line to Back River. While at Back River a dinner will be held at Peloquin's Hotel.

Friday, 21st Sept.—Morning and afternoon sessions. The sessions this day will be followed by a trip up Mount Royal and a visit to the new power house of the Montreal Street Railway.

The Entertainment Committee is composed of L. B. MacFarlane, of the Bell Telephone Co., W. B. Shaw; John Carrol, of the Eugene Phillips Electrical Co.; J. Kammerer, of the Royal Electric Co., and D. A. Starr, Board of Trade Building. The sessions will be held in the Long Room, Mechanics' Institute.

ABOUT ELECTRIC MEASURERS.

F. Bain, discussing the subject of electric appliances in *Electrical Industries*, has this to say of meters:

Don't get ammeters or voltmeters for your plant until you are sure you know just what you want. There are instruments now on the market that are not any more reliable than the method used by an old farmer for weighing his pigs—which was to balance a pig on a rail on one side and a stone on the other, and guess at the weight of the stone. I will describe the construction and peculiarities of the instruments you are familiar with, and then give you my idea of what you require.

In a plant where a number of instruments are to be used, it is not necessary to pay extravagant prices for instruments of great delicacy and theoretical precision ; there are cheaper instruments which will answer every purpose. These instruments will indicate within one per cent., which is quite close enough provided they may be depended on, and for this reason one fine, standard instrument—one voltmeter and one ammeter—should be kept for the purpose of checking and recalibrating those in regular use.

Do without an instrument rather than buy one which is unreliable and which does not possess the features described. There are a number of instruments in the market which depend upon the power of a coil to lift a heavy piece of iron and pointer against the varying force of gravity. These instruments are sluggish of action, so that small changes in the strength of the current or potential difference that is being measured is not instantly indicated. The needle and other moving portions being large and heavy, the moment of inertia is great, and this moving in a weak magnetic field, upon any change taking place in the current strength, the needle would simply oscillate over the scale. Many changes might take place in the current strength, the current or potential even remaining constant at each of its various values for a very decided time, before the needle had come to rest and allow any measurement to be taken. An instrument with the needle dancing around over the scale is not of much practical use. These solenoid instruments also indicate differently for the same values, depending upon whether the readings are taken on the rise or fall of potential or current.

Instruments employing permanent magnets are not reliable; the effect of each measurement varies the condition of the permanent magnet. A temper fracture, which is liable to exist undetected, causes the strength to be constantly changing and consequently give variable readings for the same value of current. A spring is the most unreliable and inconstant of all mechanical devices. Temperature affects its value, it is easily misplaced, and its molecular structure is changed with every strain to which it is subjected.

Multiplying devices of all kinds should be abjured ; they have no place in a properly constructed voltmeter or ammeter. Select an instrument in which electro-magnets, or the action due to the currents flowing in diamagnetic conductors, are employed. The moving portion should be the very lightest weight possible, and there should be no complicated multiplying devices. The instrument should be tested to see that it is absolutely dead-beat. This is an important feature. A voltmeter should be wound with a wire having a very small heat coefficient, and it should be wound with a resistance having at least fifty times as many ohms as the highest number of volts on the scale. For instance, a 600-volt instrument should have a resistance of at least 30,000 ohms. An ammeter, on the contrary, should have as little resistance as possible.

For THE CANADIAN ENGINEER.

AN ENGLISH LIGHTING AND POWER PLANT.

BY JAMES H. KILLEY, HAMILTON.

Thinking that it might interest the mechanical and electrical readers of your paper, I now place before them in condensed form a description of what I believe is the most advanced electrical installation in existence for the production of arc and incandescent lights and power from one dynamo. This system is now in successful operation in Portsmouth, England.

The writer, in connection with the Edison Company, inaugurated the first incandescent electric light system on a large scale in Canada, the dynamo having been built in my works in Hamilton. Since that time I have taken a deep interest in the advance of electrical science, and have endeavored to post myself as far as a non-professional could be expected to do. This explanation I hope will be a sufficient reason for my trespassing on your space to so large an extent.

The Portsmouth installation is run in the day time and early in the evening, when under light loads of light and power, by direct driver to dynamo, Parsons' turbo-steam engine running at 3,000 revolutions per minute, one of these machines in the Newcastle, England, plants, runs 5,000 revolutions per minute. It runs on the same principle as a water turbine, the steam taking the place of water as a driving power, acting on a large number of buckets on the periphery of the wheel, and from wheel to wheel as in the