EDITORIAL NOTES.

The grand jury in Pennsylvania have brought in an indictment against a municipal council for neglecting its duties in road-making. If grand juries in Canada undertook that work they would make the position of councillor far from enviable.

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At the foot of Cherry Street, Toronto, on Monday of this week an event of considerable importance in the industrial development not only of Toronto, but of Canada, took place. The National Foundry Company poured their first cast, thus marking the commencement of the manufacturing activities of this company, which before long is sure to develop into one of the strongest and most progressive of the large Canadian industrial concerns. For the city of Toronto it is a matter of great local importance, as it appears to be the opening up of a large area suitable for manufacturing purposes to the east of the city.

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In Canada to-day there are over twenty-five thousand miles of steam railway. To operate such a system quickly and with safety is one of the aims of the railroad men. In the past railway train operation and railway signalling has not received the attention which so important a matter deserves. For the benefit of the large body of men who are interested in railroad maintenance and operation we have secured a special series of articles from Mr. V. I. Smart, B.A.Sc., Professor of Railway Engineering, McGill University, Montreal. Mr. Smart has given the question of railway signalling and train despatch special study, and his articles will be read with great interest by those concerned in the safe conveyance of passengers on steam roads.

The Engineers' Club of Toronto

96 KING STREET WEST TELEPHONE MAIN 4977

Programme for April, 1910

THURSDAY, 7th, 8 p.m.

"The Water Powers of Northern Ontario."
Address by Mr. L. V. Rorke, Inspector of Surveys, Province of Ontario.

THURSDAY, 14th, 8 p.m.

"Railway Development in Canada."
Postponed Address by Mr. R. A. Baldwin, Engineer, Canadian Northern Railway.

THURSDAY, 21st, 8 p.m.

"Some Examples of Modern Water Works Systems."
Illustrated Address by Mr. H. C. Champ, Insurance Engineer, Canadian Manufacturers' Association.

THURSDAY, 28th, 8 p.m.

Meeting of the Toronto Branch of the Canadian Society of Civil Engineers.

THE EXECUTIVE MEETS EVERY THURSDAY AT 7.30 P.M.

C. M. CANNIFF, President, Fraser Ave.
L. J. STREET, Treasurer, 209 Stair Building.
R. B. WOLSEY, Secretary, 25 Lowther Ave.

ELEMENTARY ELECTRICAL ENGINEERING.

L. W. Gill, M.Sc.

This series of articles will be continued for some months. They will be of particular interest to the student of electrical work and the civil engineer anxious to secure some knowledge of the simpler electrical problems.

Electromotive Force.—In the preceding discussion on potential it was pointed out that a body charged with electricity is analogous to a vessel into which air has been compressed, but no reference was made to the process or operation by which a body is charged or by which air is forced into a vessel. Now, it is well known that an air pump of some kind is necessary to force air into a vessel. This pump may assume any one of a variety of forms—a fan, or a piston pump, or an aspirator, etc., but in every case the pump is the seat of a force which drives the air into the vessel against the pressure which is created therein. This force may be conveniently referred to as an "æromotive force." The same reasoning applies to the charging of a body with electricity. To effect this it is necessary to have something which is the seat of an "electromotive force"; i.e., something that will force electricity against the potential which manifests itself as soon as the charging operation begins. The following analogy will bring out the meaning of this statement more fully: In Fig. 3 F is an ordinary fan, the inlet of which is connected to one tank, B, and the outlet is connected to a second tank, A. The pipes connecting the fan and tanks are each fitted with valves. The rotation of this fan, which may be driven by any motive power, will force air from tank B into tank A aganist the resulting difference of pressure. As the transference of air continues the difference of pressure between B and A will increase until it is sufficient to balance the æromotive force of the fan, and equilibrium is established. If the speed of the fan is increased, its æromotive force is increased, and more air will be driven from B to A. This will further increase the difference of pressure until equilibrium is again established. The pressure in A is now

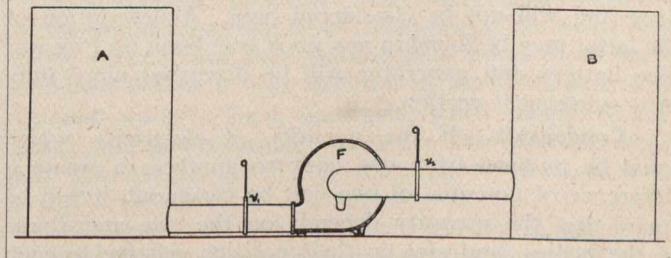

FIG. 3

positive, and the pressure in B is negative (taking the atmosphere as zero). Suppose, now, that the valves are closed and the fan is stopped. The æromotive force is now no longer existent, while the pressure in each of the tanks and the difference of pressure remains unchanged.

The relations between electromotive force, potential and difference of potential are exactly analogous to the relations between æromotive force, pressure and difference of pressure, as illustrated above. Referring to Fig. 4, A and B represent two bodies, which are insulated to prevent electricity from flowing either in or out. G represents an electric pump, commonly known as a "generator," the outlet of which is connected to A and the inlet to B, the connection being made by conductors