

10015
7-4-97
14

The Canadian Engineer

VOL. V.—No. 1.

TORONTO AND MONTREAL, MAY, 1897.

PRICE, 10 CENTS
\$1.00 PER YEAR.

The Canadian Engineer.

ISSUED MONTHLY IN THE INTERESTS OF THE
CIVIL, MECHANICAL, ELECTRICAL, LOCOMOTIVE, STATIONARY,
MARINE AND SANITARY ENGINEER; THE MANUFACTURER,
THE CONTRACTOR AND THE MERCHANT IN THE
METAL TRADES.

SUBSCRIPTION—Canada and the United States, \$1.00 per year; Great Britain and foreign, 6s. Advertising rates on application.
OFFICES—62 Church Street, Toronto; and Fraser Building, Montreal.

BIGGAR, SAMUEL & CO., Publishers,

E. B. BIGGAR Address—Fraser Building, MONTREAL, QUEBEC
R. R. SAMUEL Toronto Telephone, 1802. Montreal Telephone, 2689.

All business correspondence should be addressed to our Montreal office. Editorial matter, cuts, electrots and drawings should be addressed to the Toronto Office, and should be sent whenever possible, by mail, not by express. The publishers do not undertake to pay duty on cuts from abroad. Changes of advertisements should be in our hands not later than the 1st of each month to ensure insertion.

CONTENTS OF THIS NUMBER :

	PAGE		PAGE
Acetylene Gas Lamps	22	Marine News.....	27
Assay, Anyone can	10	Metal Imports from Great Britain	23
Canadian Society of Civil Engineers	52	McCormick Turbines	16
Canadian Association of Stationary Engineers, The	23	Mining Matters	25
Canadian Electrical Association	23	Mines of Ontario, The	21
Crocker Turbine, The New	20	Mineral Production of British Columbia	22
Electric Flashes	28	Mica, A new use of Scrap	17
Engineering, Railway	1	Peat Fuel on Railways	24
Engineers, Canadian Society of ..	22	Railway Enterprise, British	4
Estimates brought down by Dominion Government	20	" Engineering.....	1
Fires of the Month	23	" Matters	25
Frazil and Anchor Ice, Formation and Agglomeration of	6	Rope Driving	23
Gold Quartz Mining in Canada and Vic oria, Australia	12	Sewage Disposal	24
Hydraulic Manhole Punch	21	Shafting, Care and Erection of ..	13
Industrial Notes	29	Tariff, The	23
Literary Notes	25	Valdicatorian at McGill	24
		Victoria Jubilee Tower for Quebec, Proposed	11
		Waterway to the Great Lakes, The Ottawa	14

For THE CANADIAN ENGINEER.

RAILWAY ENGINEERING.*

BY CECIL B. SMITH, MA. E., MEM. CAN. SOC. C. E.,
ASSISTANT PROF. OF CIVIL ENGINEERING IN
M'GILL UNIVERSITY.

INTRODUCTION.

These papers are the outcome of an endeavor on the writer's part to epitomize a vast subject into such a compass that the student or layman whose experience is pre-supposed to be "nil" may grasp it in an intelligent way. It is intended to be a foundation course only, and as such, has been largely selected from the various works bearing on each department of the subject; but the proper balancing of the parts, if such there be, giving each its due importance, the combination of the whole subject, technically considered, as a ground work for future study, and the exclusion of much confusing detail which obscures the mental vision, the writer may claim as his own.

During the present period of depression, which always so seriously affects railway construction, it might be thought that the vocation of the railway engineer was being largely obliterated; but this is not at all a consequence. Our railways must be maintained, and while more engineers, per mile, are employed during construction than afterwards on maintenance, yet, although there are, no doubt, pleasant and remunerative positions to be had during the former period, there is no condition of permanence that makes them desirable. On the other hand, railway companies

recognize more, every day, the value of a technical engineering training for those young men who fill junior positions in the operating and maintenance departments, not strictly engineering in their nature.

And those companies (e.g., Pennsylvania, or Norfolk and Western) that have persistently filled such positions with young engineering graduates, that have had them do routine work and given them a business training, have seen their highest offices filled by men whose engineering knowledge has brought them to the front, when aided by a good business training, a knowledge of ways and means, and of traffic and operation.

In the future, such positions, and those on the maintenance staff proper, would seem to be the paths more likely to lead to success than the more strictly technical work of location and construction, particularly as the construction in future will be chiefly in the shape of short extensions of large systems having permanent staffs.

These papers, however, will deal chiefly with location, construction and maintenance, not because these cover the whole ground, but because a knowledge of traffic, rates, operation and management can be gained only by experience, whereas a good grasp of the former may be had previous to employment of such an extent, at least, as will be valuable in obtaining and filling junior railway positions, and also form a basis for future study. And even though very little of what is here given may be used at once by the young engineer, yet it will enable him to take a more intelligent interest in all that his superior officer does, which he could not otherwise do unless he had a proper understanding of the general principles on which railways are surveyed, constructed and operated. He is warned against having his faith in these principles shaken by the adverse criticism of men who do not appreciate or understand them. Care is taken to give here only what is fairly well tried and established.

On the other hand, he is advised to keep his opinions, largely, to himself, and to carry out faithfully the instructions of his superiors in office. These instructions, though perhaps sometimes faulty, should be studied and respected, so that when the time arrives that he, in turn, gives orders which must be obeyed, he may put into practice what he then considers, after several years' experience, to be best, not only theoretically, but from the standpoint of being feasible and advantageous, capable of being put into execution by his assistants—the best, all things considered.

It must not be forgotten that these papers are not exhaustive, but merely introductory. Years of reading, conversation, experience, observation, and above all, honest hard thinking, are necessary to complete a man's knowledge on any subject, and even then it is not complete. So that we must never desist, but always persevere, if we wish to keep up with the progress of this most progressive subject.

C. B. S.

Montreal, Que., Canada, May, 1897.

CHAPTER I.—FUNDAMENTAL CONSIDERATIONS.

ARTICLE I.—TRANSPORTATION.

The inhabitants of the civilized world have, since the year 1825, been enabled to remodel their ideas of

* This series of papers will be issued in book form as soon as they have appeared in THE CANADIAN ENGINEER.