## G.T.R. Semi-Annual Meeting.

(Continued from page 381.)

important, so interesting, and so beneficial to this great province of the Empire."

The proposal to acquire the Canada Atlan-tic Ry, was next dealt with. The President, after giving details showing the mileage, etc., of the line, said: "The Canada Atlantic Ry. owes its existence to the energy and the enterprise of one man-Mr. Booth, one of the great merchant citizens of Canada, who has chiefly devoted himself on a very large scale to the development of the lumber industry. This railway he has developed partly by building and partly by absorbing other systems, until now it has assumed the position of one of the most useful and important roads in Canada, running, on the one side, to the frontier line of Quebec, where it effects a junction with the Central Vermont Ry., and on the other side through to Georgian Bay, where it communicates by means of the lakes with the great grain districts of Northwest Canada, and of the U.S. It has been reported on by our engineer, Mr. Hobson, as being in excellent condition; but it is especially with reference to its facilities for handling grain that it will prove an extremely useful adjunct to the G.T.R. At present we have access to no less than ten ports upon the Georgian Bay and Lake Huron, several of which, Midland, Collingwood, Meaford, Wiarton, Goderich, and Sarnia, possess adequate and important ele-vator accommodation. The terminus of the Canada Atlantic Ry. at Depot Harbor will really make the completion of the strong strategical position which we now occupy in those regions. During the season of 1903 there was handled through the elevator at Depot Harbor no less than 4,190,963 bush. of grain. There is another important attraction which it offers to the G.T.R. At present the G.T.R. has no terminus of its own in Ottawa. By becoming the possessors of this road we shall have what we ought to have had already, and which it is almost indispensable that our road should have-our own entrance to and our own terminals in the metropolis of Canada. As regards the finance of the matter, the company has a bonded debt of \$14,000,000, and upon the average of the last three years the earnings have been more than sufficient to pay the interest at 4 % upon that amount. Well, what we propose to do is to ask you to guarantee those bonds with interest at 4 %. It is further proposed, in consideration of the fact that it is desirable to have some money in reserve for future improvements of the road, that the mortgage should be extended by \$2,000,000. Therefore, with Your agreement, we shall ask Parliament, first of all, to give us power to guarantee the bonds and the interest, and also to extend the mort-gage by this odd \$2,000,000. I have pointed out to you the advantages that will accrue to us by obtaining the control of this road, and I will also mention what the additional assets will be which we shall obtain. We shall receive very nearly the whole—within a fractionof the ordinary capital stock of the company we shall receive the whole of the preferred capital stock; we shall receive the whole of the issue of the stock of the Canada Atlantic Transit Co. and of the Canada Atlantic Transit Co. of the U.S., of which I shall speak directly; and we shall also receive the whole of the capital of the small line of three miles which, proceeding from the boundary line, Joins the Central Vermont Ry. You will see, therefore, that we receive certainly substantial assets as well as all the other advantages which I have pointed out to you. I should have mentioned that among the assets will be the valuable fleet of ships which belong to the two transit companies which I have mentioned-a valuable line of steamers which carry the grain from the ports of the U.S. and of Canada on Lake Superior and Lake Michigan, across the lakes to our ports on Georgian Bay and Lake Huron. I think I have said enough to satisfy you that this will be a profitable and important adjunct to the company. As we have stated in the report, we consider it will greatly strengthen and consolidate our position in many ways, and I think we have reason to be gratified at the opportunity which has presented itself of acquiring this very important property."

The report and statement of accounts was then adopted, and a dividend of 2% to the holders of the 4% guaranteed stock was declared.

The President moved a resolution authorizing the G.T.R. to acquire the Canada Atlantic Ry. on the terms mentioned in his speech, and the making of an application next session of the Dominion Parliament for an act authorizing the acquiring of the line on a guarantee of bonds.

A. W. Smithers, Vice-President, seconded the motion, which was carried, after an amendment to defer the matter to the next half-yearly meeting was defeated.

## Fuel Economy.

## By J. V. Paul, General Fuel and Locomotive Inspector, C.P.R.

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The cost of fuel consumed on railroads in the U.S. and Canada yearly approximates about \$90,000,000, and, next to the salary account, is the largest item of expense that railway companies have to meet. Steam is but an agency for conveying the energy stored up in the coal, in the form of heat, to the cylinders where the work is performed. Owing to the large number of locomotives in daily use, the enormous daily consumption of fuel, and the various conditions surrounding the generation of the steam and the conveying of it to the cylinders, there is bound to be a loss of a certain percentage of the energy of the fuel, and this loss is greater or less depend-ent upon the vigilance of those who have to do with the construction, maintenance and operation of locomotives. As an instance: Not long since, while in conversation with a leading official of one of the prominent roads to the south of us, I commented on the number of engines that could be seen popping. This road had previously passed through the hands of a receiver. After estimating the loss from this one source he remarked that if that one leak had been stopped the need for the appointment of a receiver would never have occurred. It was estimated that about \$45,000 were being wasted annually due to engines popping.

I do not propose to take up the construction of locomotive boilers with regard to their capacity for generating steam, but rather to go to the maintenance and economical operation of locomotives. As cold weather appears we are made visibly and painfully aware of every loose joint and faulty packing where steam can blow out to the atmosphere and be wasted. If it is at all convenient, valve stem and piston rod packing are usually renewed or closed, but it is not always so in the cases of steampipe joints and cab mountings that the leak of steam is stopped. This is strikingly so of engines that are assigned to pooled service, or where regularly assigned crews are unable to follow their engines. This necessarily means a waste of fuel inasmuch as fuel must be consumed to generate the heat which has evaporated the water and which is then There are other leaks about an engine, lost. however, which in the losses they cause are two-fold, in this, that not only is the steam wasted, but the effect produced on the engine is to increase its load. These leaks are those from main valves and pistons. Not only is the steam escaping unused, but it has been clearly demonstrated to me that an engine working heavy on one side and not maintaining a constant or steady drawbar pull has the effect of increasing the train resistance. Any condition causing an engine to be heavier on one side than on the other, such as valves out of square, or restricted exhaust passage, will have this same effect, and this is much more noticeable on compound than on simple en-For instance: Suppose that an engine gines. is making ten miles an hour and working at her full capacity, one cylinder is doing more work than the other. When the cylinder takes steam on the heavier side, the slack of the train is entirely taken out, and when steam is taken on the weaker side the strain on the draught rigging perceptibly decreases with the tendency toward bunching the The effect to the hauling of the train train is of the same nature as that produced by an

engine slipping, but to a much lesser degree. The labors of engine crews have been lightened from time to time in different directions until to-day about all that is asked of engineers and firemen is that they shall successfully operate their machines while on the road. and report at the end of the trip such defects as may have developed about the engine. Due to traffic or other conditions, it sometimes becomes necessary to send an engine out without all necessary repairs having been made. If the defective parts have a bearing on the generation and utilization of steam, the coal pile must suffer, for the steam is wasted, and a constant repetition or neglect on the part of the round house staff to keep engines in good repair has a demoralizing effect on the engine crew; and, as a result, their best efforts are not put forward to get economical results.

The question is often asked why two engines built from the same templates and supposedly alike in all respects will not do the same work under like conditions. The trouble is that they are not alike, and it seems to me to be largely a question of valves-a little more lead in one case than in the other, or a slight difference in the inside clearance, or, perhaps, a little more slack in the motion of the one than in that of the other. If you will ask the average engineer he will probably tell you that, generally speaking, a good steaming engine, whose draught appliances are in normal condition, is light on water; and an engine light on water will be light on fuel The valves are the life of an engine, and this superior performance can be credited to the high efficiency obtained from the steam through the action of the valves. In cases of poor steaming engines, or of ones that are not giving satisfactory results, the indicator might be employed to good advantage.

Leaks and blows from cab mountings, air and steam connections to air pumps, and air and steam train lines are other sources of fuel waste. It might be interesting to know that a  $0\frac{1}{2}$ -in. pump, working at 60 double strokes a minute, will consume 216 pounds of coal an hour. Saying nothing of the annoyance and trouble of a leaky trainline, one that would require a pump to work at that speed would, in an ordinary eight hour run, eat up a thousand or more pounds of coal.

In the equipping of an engine it sometimes occurs that the fitness of things is lost sight of, and that injectors are used that are entirely out of proportion to the work that is required of them. Either they flood the boiler while the injector is working, and the fire must be forced to keep the pressure up, or the capacity of the injector is too small and the second one must be called upon to keep the crown sheet covered, which means the forcing of the fire for steam and a decided fluctuation of steam pressure. In either case it means an extra consumption of fuel.

But even though an engine be made perfect as regards leaks, blows and valve performance, there is another source of waste which could easily outrank all others in its inroads on the coal pile and that is the work of the