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Railways.

WOODEN RAILWAYS.

A committee was appointed by the Ontario Legislature to take evidence respecting wooden railways. Mr. C. W. Moberley, C. E., gave his evidence. It is as follows:—I have examined the systems of wooden rail tracks introduced respectively by Messrs. Foster and Hulburt, and beg to submit the following observations thereon: Mr. Hurlburt's system is the longitudinal maple rail, the grain of the wood running with the track; the rails are supported on cross ties laid two feet apart; these ties are notched out, and the rails are fastened into the notches with wooden wedges. He submits two modifications of his principle. 1st. A plain longitudinal rail 4 inches by 7 inches, in 14 feet lengths, with square end joints, and simply held in place in the ties by the wedges. 2nd. A longitudinal rail 4 inches by 7 inches, two thickness in depth, breaking joint with square ends, each joint being fastened together with two half-inch bolts through from top to bottom of rail, and wedged in the ties in a similar manner to No. 1. Mr. Foster claims an improvement on Hulburt's system, inasmuch as he opposes the end grain of the wood to the action of the trains. He places maple blocks 3½ inches by 7 inches on end to form the rail. These blocks are held together between two longitudinal stringers, slightly notched out, to give a seat for the blocks to rest on; the stringers break joint, thus forming a continuous rail. The cross ties are notched out and the stringers wedged in the same manner, as in Mr. Hulburt's rail. A hardwood pin is driven through the stringers, between each jont of the blocks, in order to keep the blocks from shifting out of place.

The following is a comparative estimate of the cost of each system of wooden rail and of an iron T rail, 56 lbs. to the yard. I do not include the earthwork, ballast, or fencing, as I assume the grades and curves to be common to each. The estimate is based on a 5 feet 6 inch gauge, and the cross ties are included:—

Iron rail (56 lbs.)	$5,000	per mile.
Foster's wood rail	2,100	"
Hulburt's " No. 1	1,290	"
" " No. 2	1,420	"

An iron rail, of say 56 lbs, to the yard, should last in this climate with a fair traffic (such as is done by the Northern Railway of Canada) about ten years, and the best hardwood rail with a similar traffic could not last over two years. A well constructed hardwood rail, if properly maintained, would probably last five years with a small traffic, and light engines not running over a speed of from 10 to 12 miles an hour.

The main points to be considered in comparing the different systems of wooden rail are simplicity in the number of parts, and convenience in construction and repair because the greater the number of parts, the greater is the liability to get out of repair, particularly in such a climate as Canada, when the sudden thaws and extreme frosts throw the rails out of line and out of level.

As to the comparative merits of the different systems under consideration, I am of opinion that Mr Hulburt's single rail No. 1 (with an addition of a wood fish plate, notched and bolted at each point) is the most practicable, as it is the simplest and cheapest in construction, and can most easily be kept in repair.

I consider the wooden railway to be best adapted for colonization roads through new tracts of country where sufficient money cannot be obtained to build an iron road. A wooden railway would serve the purpose until a sufficient traffic could be established to warrant a more substantial track.

Mr. Foster was called to explain his system of wooden block railway track. He said the advantages to be derived from the placing of the blocks with ends upwards was, that the rail resisted the wear and tear of the engine. The rail was also covered with pitch, which, when ground into the rail, would help to make it more durable and to fill up interstices. The dry wood pins driven through the end of each block would compress the blocks so that even though there was a possibility of the wood shrinking afterwards, it would not affect the durability of the rail. The resistance of wood endways was superior to iron or any other material used in railway tracks. He had proved this by experiment. The cost of a railway constructed in this way would exceed that of wooden railway made in any other way; but it would be well worth the extra cost to secure a durable track. The covering of the rail with pitch would render it impervious to the action of the weather. The blocks remained perfectly solid, and were not crushed by the pressure of trains. This system of railways had been tried in the Province of Quebec, on a small scale. The cost of the block rail was $1 per yard, or $1,760 per mile. Of course, it would cost more than a simple straight rail. There was a decided gain over the iron rails in ascending grades. On the Clifton line there were grades of over 300 feet to the mile. The adhesion of a block wooden rail was twenty-five per cent. greater than that of the horizontal rail, that was to say, if the same piece of maple were laid horizontally, the adhesion would not be 1.5th as great as if it had been placed endways, and therefore the block rail would carry 1-5th more.

Dr. Boulter wished to know if the wooden road in Quebec was perfectly level.

Mr. Foster said that it had never been touched since it was laid down, and never had ballast laid under it. In fact it was almost laid down in the mud. Of course there were soft places in the road the same as in iron rails. The dampness in the atmosphere seemed to be sufficient to keep the blocks from opening.

Hon. Mr. McMurrich wished to know if the blocks should all be of the same kind of wood.

Mr. Foster said one piece was maple, another oak, another elm or some other kind of wood; it was difficult to get all maple.

Hon. Mr. McMurrich said his reason for asking this question was, that it might be possible that if the blocks were of different kinds of wood, one would wear out much faster than another. It would be well to bring this point out clearly.

Mr. Foster in reply to Mr. Cumberland, said he would not mix woods if he could avoid it. He considered maple best. Rock elm was also good so was beech, but it did not last long.

Mr. Calvin—Red beech will last as long as oak.

Mr. Foster continued—The wooden railway near Montreal had proved very durable. About thirty trains passed over it every day, and he was satisfi-