

WOODEN RAILWAY TRETTLES.

By R. Balfour.

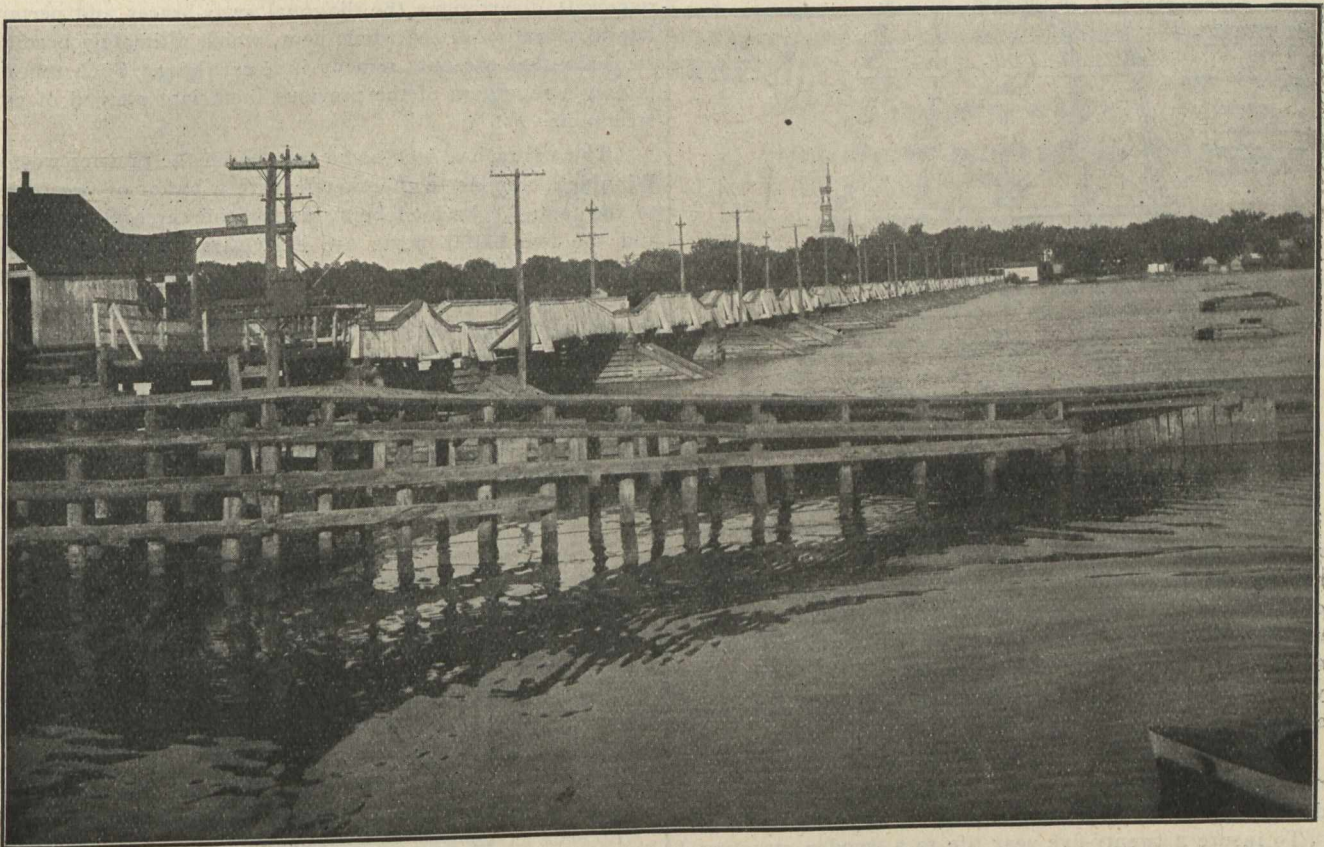
The advantage of railway trestles constructed of timber, are not generally appreciated by railway corporations or governments, principally for the reason that their life is restricted to within eight to fifteen years, and the cause for this short life may be found in faulty design and construction. If railway timber trestles were properly designed and carefully constructed their life might safely be placed at twenty-five years as a minimum. As an example of their maximum endurance, I might refer to Jones' Highway Bridge over the Richelieu River at St. Johns, Quebec. This bridge was built entirely of timber in 1827. The superstructure is still in use, but the upper portion of the cribwork in the piers was renewed in 1904. This bridge stood, without renewal, for seventy-seven years, and the greater portion of the structure is still in use, and apparently as sound to-day as it was when erected, eighty years ago.

It appears strange indeed that corporations and governments spend hundreds of thousands of dollars in timber work,

and the function of the batter posts was to brace the bent. In the ordinary steel trestle of to-day there is no plumb post, the load is carried directly on the batter posts. With this development and improved method of structure with respect to steel and iron, there has been no corresponding advance in the design of a wooden trestle bent. We are using the same design our forefathers used fifty or sixty years ago.

If the late Mr. Jones, of St. Johns, Quebec, who was neither a bridge builder nor an engineer, could design and erect in 1827 a wooden bridge, which sustained the heavy traffic of the early freighting and stage coaching between Montreal, Boston, and New York, and which, three years ago was sound, without renewals, except flooring, it appears of importance to ask the engineering profession of Canada, why the wooden trestles built ten years ago, are to-day rickety and dangerous to such a degree that the problem is, will they sustain another year's traffic?

This leads to the inquiry—wherein has there been failure to improve the design of wooden structures, which in conse-



Jones' Highway Bridge at St. Johns, Que., Built in 1827.

in these days of advanced ideas in other branches of mechanics, following faulty designs, with the result that in ten years the outlay must be duplicated, whereas their timber trestles might be made almost as durable as steel, and far less expensive.

The designing of timber structures during the past twenty years has not received the studious and intelligent consideration of engineers the subject merited. The writer remembers that thirty years ago it was a common remark of bridge men that the timber trestle was practically a thing of the past, and general attention was directed to the steel and iron form of structure. For years past the inventive genius of bridge engineers has been confined to the development of designs in steel and iron to the exclusion of any improvement in the wooden structure.

Thirty years ago the design of timber trestles was as far advanced as it is to-day. That design involved at least two plumb posts and two batter posts. The plumb posts were so constructed that they inevitably had to carry the load,

quence of such faulty design are weak, after ten years' usage, to the danger point.

An examination of wooden timber structures will disclose the fact that the load is carried on vertical posts, and that batter posts were introduced to keep the bent erect. This I believe to be a wrong principle, as it permits of lateral movement. If the batter posts carried the weight as they do on steel structures, there would be no initial lateral movement. As at present constructed, little or no strain comes on the batter posts until some lateral movement occurs to the whole bent, and then the danger has accrued, for the sway-bracing is distorted and weakened, and a general break-down of the entire structure is a matter of time.

This is not all. The batter posts are not placed in a position to do effective service, they have a batter of only two inches to the foot, instead of at least three inches to the foot, in a windy country such as that now being crossed by the Grand Trunk Pacific, west of Winnipeg. Yet in the case of wooden structures in this system they are being con-