few managers appreciate the fact that in using an automatic stand the safety of their cars going over a switch is entirely dependent on a spring. The spring in an automatic stand may be tempered too hard, in which case it breaks, and the switch is lying in any position, and if the spring is tempered too soft it takes a permanent set and the clutches of the stand are not held together in which case the switch point may be lying half an inch away from the stock rail. It may be said there is an advantage in the automatic stand, in that a car can trail through the switch without doing any damage. this in spite of the fact that every motorman has orders not to trail through switch set against him. It simply resolves itself into the proposition of whether the management is willing to depend on a spring for the safety of the cars, and incidentally compromise with a motorman breaking rules, or whether they insist on rules being observed and using a positive rigid switch stand which ensures the safety of their cars if rules are observed.

With regard to frogs, modern practice is to use a rigid manganese frog in terminal work where traffic is heavy, and a spring rail frog on main line high speed work. A special light spring rail frog is manufactured for radial lines and if one considers the rate of speed at which many radial cars go over frogs on the main line, the more will one realize the necessity for the abolition of the rigid frog and the substitution of the spring rail frog.

Regarding diamonds little need be said, except that actual practice has shown that the manganese diamond will outlast at least five built up diamonds, and consequently the additional initial cost cannot be reckoned in when deciding on the solid manganese diamond as against the built up diamond.

SOME PROBLEMS OF INTERURBAN RAILWAY OPERATION IN CANADA.

By Garret Pettingell, Superintendent, Winnipeg, Selkirk & Lake Winnipeg Railway.

Before proceeding with the subject upon which I am expected to reflect some light today, I want to thank the Secretary and committee for according me the honor of presenting a paper at this meeting. There is one point at least on which you will probably agree,—that the committee's judgment may have been at fault in insisting that I present this paper, but as we are not supposed to thaw out in Manitoba until April, our western minds would not be expected to be very active thus early in the season, and therefore, undoubtedly, some consideration will be generously given.

The remarkable development of electric motive power for transportation, and the rapidity with which steam is being replaced by electricity on our railways is bringing the management and different methods of electric operation into prominence. The elasticity of electric power, compared with steam, gives it its greatest value Electric roads are expected to run trains at short intervals with frequent stops, catering in every way to the convenience of the public they serve. Therefore when the operating experience of steam roads is brought into play in planning operating methods for electric railways, managers and superintendents immediately find themselves face to face with new and unexpected problems, never met with under steam operation. Interurban companies are continually drawing upon the steam roads for experienced men, and methods of operation; more especially since electric power is being increasingly applied on lines of considerable length, where trains reach a speed at par with that maintained by their parents in transportation. It must not only be admitted that the interurban officials can learn much from the operating system of steam roads, but it is a fact that this is the only source of information and experience to which they can go when the electric line must graduate from the city street car class into that of a railway. The present system of steam railway operation is the result of the experience of a century, and the methods now in use are the