

3. Your Excellency's Commission, dated the 14th July, 1908, was received by us on that date, and we at once proceeded to Auckland and opened the Commission there on the 20th July.

4. The procedure was first discussed and formulated, and duly arranged.

5. We append hereto the Commission issued to us by Your Excellency, the minutes of our proceedings, which contain the names of the witnesses examined, and a report of the evidence taken on oath. We also append exhibits handed in and marked Nos. 1, 2, 2A, and 3 to 13.

6. Dealing with the five questions submitted to us,—

(a.) We found the brakes to be in fair working-order but not in efficient repair.

(b.) We are of opinion that the brakes as existing when in good order are sufficient for the ordinary control of the cars, but are not sufficiently powerful or quick in their action for use in emergencies.

(c.) We are of opinion that the motormen are properly trained and have an efficient knowledge of and are practised in the use of the brakes.

(d.) We consider the motormen use the brakes to the best of their ability.

(e.) We have to report having investigated the several subjects of inquiry and also having reviewed the working of the existing law relating to tramway rolling-stock, and as a consequence we consider that the General Government should undertake the periodical inspection of the rolling-stock of the tramway systems in New Zealand.

7. We have the following remarks to make regarding our findings under the several heads :—

(a.) There is clear evidence that the maintenance of the brakes in the past has been neglected, also that the company is now taking steps to place them in good working-order and efficient repair.

(b.) With a view to considering the capabilities of the brakes we conducted a series of tests on College Hill, a grade of 1 in 11·78, so as to compare them with the results of tests made on the Brooklyn line, Wellington tramways, a grade of 1 in 14. The results of the two tests are attached hereto in tabulated form.

The best stop obtained, using the hand-brake alone, was on a four-wheeled car carrying a load equal to the licensed number of passengers, travelling at a speed of 17·8 miles per hour down a grade of 1 in 11·78: the car travelled 232 ft. before stopping, the force developed by the brakes being 1·48 tons.

Using the same brake on an eight-wheeled car under similar conditions, at a speed of 22·1 miles per hour, the car travelled 620 ft. before stopping, the force developed by the brakes being 1·97 tons.

A third trial, using the hand-brake, track brake, and second emergency brakes simultaneously, when the car was travelling at service speed, stopped the car in 242 ft. This must be regarded as an emergency stop.

For comparison the following results were obtained in Wellington :—

A four-wheeled car, carrying $1\frac{1}{2}$ tons more load, travelling at 14 miles per hour down a grade of 1 in 14, was stopped by the hand-brake alone in 74 ft., the force developed by the brakes being 1·93 tons.

With the hand-brake alone, an eight-wheeled bogie car, carrying 2·8 tons more of a load, travelling at 16·4 miles per hour, stopped in 215 ft., the force developed being 2·3 tons. An emergency application of the magnetic brake on this car at 12·7 miles per hour, stopped the car in 34 ft., the force developed being 4·4 tons.

The results obtained in the Auckland tests, using the electrical emergency brakes, were not as good as those obtained by the use of the hand-brake; which shows that the electrical emergency brake is useless for quick stops descending a hill.

We are therefore of opinion that, in the interests of public safety, an improved brake for use in emergencies should be adopted.

The Commission, having had extended personal experience in the use of the Newell Magnetic Combined Track and Wheel Brake, whilst not wishing to unduly advance its claims against competitors, consider it a suitable brake for use on steep grades such as occur on the Auckland tramways.