

Lined-up Axle-boxes.

The Commission met with several cases of lined-up axle-boxes. It considers the practice allowable, especially when the finally condemned axle-boxes are replaced, as appears to be the practice, by new ones of the more durable standard pattern.

REVIEW OF EXPERIMENTS.

The Commission, with a view to the determination of the value of pieced and other draw-bar springs, conducted various experiments.

At Auckland the experiment was made of violently buffing a wagon fitted at one end with a pieced, and at the other with a whole, draw-bar spring. No difference in the behaviour of the springs could be detected. (See Appendix III.)

Throughout the South Island the Commission travelled in a Class A bogie carriage in which arrangements were made for the observation of the action and measurement of the deflection of the draw-bar springs. This carriage was always placed at the front end of the ordinary train, and runs were made with whole and with pieced springs. No difference in the running of the carriage or in the behaviour of the springs could be discovered. (See Appendix IV.)

Tests at Canterbury College. (Appendix V).

The Commission had various draw-bar springs accurately tested under its observation at the Engineering Laboratories of Canterbury College, with the following results: The maximum resistance of the whole spring, B.P. 4310, was 5·3 tons; that of the pieced spring was 5·1 tons; that of the new type of double-coil spring, B.P. Z6540, was 6·6 tons. The deflections corresponding to these loads were 2·67, 2·20, and 1·66 inches respectively. The works done in compressing the springs to these extents were—For the whole spring, 7·08 in. tons; for the pieced spring, 5·61 in. tons; for the new-type double-coil spring, 5·48 in. tons.

It would appear from these experiments that the pieced spring, though inferior, is not greatly inferior to the whole spring.

Further experiments conducted at Addington took the form of subjecting springs to the blows of a steam-hammer. Under this test of rough treatment the pieced springs proved equal to the whole springs. (See Appendix VI.)

The Commission also had a Class L wagon buffing and draw-bar subjected to tests of progressive loading at Canterbury College. Two tests were made, the draw-hook failing in each case, one at 25 tons load and the other at 33 tons load. (See Appendix VII.)

The results of these tests, together with the large number of breakages of draw-bar springs, appear to indicate that an investigation is desirable as to the suitability of the existing type of draw-gear for the greatly increased weight of modern trains. It is understood that the Department have already taken some steps in this direction.

MAY IT PLEASE YOUR EXCELLENCY,—

Regarding the matters specifically referred to the Commission, we find—

1. That the rolling-stock on the New Zealand Government railways was in July, one thousand nine hundred and sixteen, in good and safe-running order.

2. That such rolling-stock has been maintained in good and efficient order and condition during the three years between August, one thousand nine hundred and thirteen, and July, one thousand nine hundred and sixteen.

3. That, generally, proper provision has been made for the upkeep and renewal of the rolling-stock, but that the facilities for lifting at station-yards are not sufficient for dealing with the present volume of traffic; that this fact has been recognized by the responsible officers of the Department, but execution of the necessary works has been delayed by war conditions.