

CONCLUSIONS.

For suburban services where frequent stopping and starting and high acceleration is necessary, petrol-cars are quite unsuitable. Light trains on such lines should be run with steam-cars or with light steam-locomotives driven by one man.

There is a fairly large field in New Zealand, however, where the petrol-car could be used. This lies in those country districts where passenger service could be reasonably maintained by a car running at thirty to forty-five miles per hour and seating fifty to seventy people. A petrol-car could be designed which would be mechanically economical and reliable for such work, and whose weight would not exceed 15 tons. This car would climb grades up to 1 in 60 in top gear, and up to 1 in 30 at a lower speed. Mr. Jenkinson does not consider that a petrol-engine of less than 100 horse-power will give continued and satisfactory service in such work, and the six-cylinder engine already landed for the Department is a very suitable one for this car. Mr. Jenkinson recommends that such a car be built and tested in service. It would be a one-class car, with a luggage, parcel, and mail compartment, but trailers, either for goods or passengers, could only be hauled under the most favourable conditions, so rare as to be negligible. The working-costs per car-mile would be in the neighbourhood of 1s. 6d. in average service.

The other competitor in such service would be the light steam-locomotive driven by one man.

Beyond this again is a larger field in both country and suburban service where the trains are still light, the number of passengers lying between, say, seventy and two hundred. Petrol-cars are of no use in this service, and he strongly believes that a light steam-locomotive could be designed which would deal with such work economically and reliably, and which would be capable of being driven by one man. This is the type of locomotive referred to in Mr. Jenkinson's report on steam rail-cars, and he recommends that one be built and tested in service against petrol and steam rail-cars. He feels sure that its economy, reliability, power, and flexibility will make it a serious competitor of the petrol rail-car in the latter's own field, and it will cover services, such as suburban and light passenger-trains, that the petrol-car is quite unfitted for.

With regard to steam rail-cars, Mr. Jenkinson reported as follows :—

“There are several instances in Australia where small steam-locomotives operated by one man are hauling trains of one or two cars on isolated short sections—*e.g.*, Yass-Yass Junction. But in all these cases the locomotives used are not specially designed, but are simply tank engines of a light and obsolete type, and the services are of an unimportant and irregular character.

“In Rockhampton, however, a neat design of steam-coach is operating very successfully on the Parkhurst and Lake Creek suburban runs. These are genuine suburban services run over the main line, the sections being seven miles long with several stations, and the time for the run is thirty minutes. Some of the stops are at street intersections where no platforms exist, and in every way the service approximates a tramway service. This is, therefore, a difficult service to work, but the small steam-car is working it in a very efficient and entirely satisfactory way.

“The car is a light four-wheeled car of tram-car type about 30 ft. long, with 8 ft. wheel-base and 33 in. wheels, seating forty passengers, and weighing 11½ tons. A light four-wheeled trailer about 25 ft. long, with 8 ft. wheel-base and 33 in. wheels, seating forty passengers, and weighing about 7 tons, is hauled when necessary. The fuel used is coke, and the speed of forty miles per hour on the level is attained, and about twenty-five miles per hour up a 1-in-60 grade. The main line runs for about a mile through a busy street, and here the car stops at each corner, so the time, thirty minutes, for over seven miles with eight to twelve stops is quite smart. The trailer is hauled on one-third of the trips, and the working-costs are just under 1s. per train-mile.

“This is the most economical and reliable motor coach or train operating in Australia, and appears to solve the difficult problem of suburban working in a thoroughly efficient manner. The design is practically foolproof, the boiler being constructed of steel tubes in such a way that there is no possibility of any serious explosion, while they are practically unharmed in case of the water getting low