

Wales, 1; Queensland, 2; Victoria, 4. The total number who sat for these examinations was 391. Of this number ninety-five failed.

Examination of Electric-tram Drivers.

Examinations for this certificate were held at Auckland,* Christchurch,* Dunedin,* Gisborne, Invercargill,* Napier, New Plymouth, Wanganui,* Wellington.* The numbers who sat for examination totalled 119. Of this number nine failed.

Board of Examiners.

The Board of Examiners, consisting of the Chief Inspector of Machinery of the Marine and Inspection of Machinery Department, the Inspecting Engineer of the Mines Department, the Engineer in Chief and the Electrical Engineer of the Public Works Department, with Mr. J. G. Macpherson as Secretary, sat in Wellington on eight days to issue certificates to candidates and for other business with which the Board deals.

Inspection of Gas-, Oil-, Water-, and Electric-driven Machinery, including Lifts.

This work has increased very much during late years. I am glad that local machinery-manufacturers throughout the Dominion have taken up the construction of oil-engines. Several firms now make a capital engine, which favourably compares both as to price and efficiency with imported ones, and I would like to see all such engines in the future built in our own workshops. The total number of inspections made of this class of machinery amount to 12,405, being an increase of nearly 2,000 inspections this year, which gives some idea of the growth and the use of these appliances in the short period of one year. Gas-engines numbered 1,418, oil-engines 5,761, water and electric motors, including water-wheels, 3,489.

There were a great number of oil-engines still due for inspection at the end of the year.

Fencing and Guarding of Machinery.

This branch of the work has been carefully attended to, and all assistance and advice rendered to owners of machinery at the annual visit of the Inspector. The number of notices given to fence dangerous parts of the machinery in motion was 1,612, just double the number of the notices given to owners last year. I regret to have to report several accidents to life and limb of persons employed amongst moving machinery. Some of these proved fatal. A detailed account of these appear in a return appended.

Boilers inspected.

During the year 6,951 boilers were inspected and certificates issued for same. At the end of the year there were many boilers uninspected. It is difficult to cope with the increases to boilers and machinery in any one year as well as to get over the old work. Each Inspector has been fully occupied this year. There are so many circumstances occurring to take up the time of Inspectors, such as piecemeal surveys of steamers, extra examinations of marine engineers, and of land-engine drivers and electric-motormen, all of which have been more apparent since the war started. Boilers and machinery are increasing in all districts at a very rapid rate, and longer trips have to be made by Inspectors in country districts.

The number of defects discovered in boilers and digesters was 908, of which twelve were very dangerous. Written notices given to owners to repair boilers numbered 561. This branch of work has gone on very smoothly. Times suitable for inspection to owners as far as possible have been arranged for. This applies more especially to dairy-factory owners, but these factories are so numerous and so scattered that it has been found impossible to comply in all cases in the slack season of the year.

Considerable discussion has arisen with pressures allowed on peculiarly constructed vessels, carrying pressures at new freezing-works, at laundries, and at motor-garages. The correspondence has been of a very pleasant and instructive nature, and pressures have been allowed satisfactory to both the owner and the Department after due consideration.

New Boilers inspected.

The number of new boilers inspected for the first time this year totals 353, which is an increase of 8 per cent. on last year's total. It is satisfactory to report the increase in the number of locally made boilers this year. The local boilers made include all sizes, from the smallest farm boiler to a large multitubular boiler of 82 horse-power, 6 ft. 5 in. diameter, and 17 ft. 9 in. long.

The attention of boilermakers is drawn to the matter of safety-valves. In many cases particulars of the lever and weight type are submitted which show that the weight on the lever and of the valve itself have never been considered. This has necessitated the cutting of levers after the safety-valves have been put together. In the case of direct spring-loaded valves many cases have occurred where the springs have been too rigid to permit the valve lifting an amount equal to one-quarter its diameter.

Boilermakers who desire to avoid repeated calculations are recommended to record essential dimensions of safety-valves as they are correctly made, and thus effect standardization. Some authorities restrict the lift of spring-loaded safety-valves to less than one-quarter its diameter, and buyers of foreign safety-valves are wrong in assuming that a safety-valve so designed is equal to one of the same diameter made according to the Department's requirements. To compensate for such restricted lift valves larger in diameter or more in number must be fitted, or the rigid spring replaced by one permitting the required compression.

* Places at which examinations have been held more than once during the year.