

There were nine persons killed in accidents to machinery. Three were caught by revolving shafting, one was struck by belting, one was struck by the flying fragments of an oil-tank which exploded during an experiment, one was struck by flying metal from a hydro-extractor, and three deaths were due to lift accidents.

There were seventy-four non-fatal accidents in connection with machinery. The machinery at which these accidents occurred is as follows: Woodworking machinery, 21; shafting, 9; lifts, 7; rollers, 6; meat-mincers, 4; belting and platen machines, each 3; gearing, 2; and miscellaneous machinery, 19. Many of the accidents were due to operators failing to exercise due caution in operating the machines. In some cases improvements in guarding were indicated, and suitable additional safeguards for the prevention of further accidents have in such cases been fitted. In the design of cranes a common defect is the small ratio of the pulley and rope diameters. Many cases have been noted where there is no obstacle to the use of large pulleys, and it would seem that some crane-users are not aware that, in order to obtain full value from a rope, it is essential that it should run over pulleys properly proportioned for the diameter of the rope, its construction and quality, and for the speed at which it is working. An indication of the increased service which may be expected from a rope running over large pulleys may be obtained by reference to a report of a special committee of the Institution of Mechanical Engineers. A rope 6/19 construction and of 80/90 tons per square inch breaking-strength, working at a factor of safety of 8, required 100,000 bends to fracture it when running over a pulley 22 times the diameter of the rope. When working over a pulley of 30 diameters the number of bends to fracture amounted to 250,000.

INSPECTION OF BOILERS.

The number of new boilers inspected during the year is slightly less than last year's total, and amounted to 261. The total number of boilers inspected is 7,681, as against 7,986 for the previous year. Our regulations for boiler design and construction require revision. The drafting of new regulations has been under way for some time, but, as this is a work of some magnitude and difficult to accomplish by intermittent effort, the work will have to stand over until other more pressing matters have been dealt with.

The following table shows the rapid increase during recent years in the number of inspections of both machinery and boilers:—

Year.		Number of Inspections.	Year.		Number of Inspections.
1915-16	..	17,857	1922-23	..	33,124
1916-17	..	19,362	1923-24	..	32,891
1917-18	..	21,118	1924-25	..	35,797
1918-19	..	22,614	1925-26	..	42,529
1919-20	..	25,824	1926-27	..	47,209
1920-21	..	28,553	1927-28	..	48,638
1921-22	..	31,876			

From this it will be seen that the number of inspections has increased by practically 100 per cent. since 1919-20.

During last session the Inspection of Machinery Amendment Act, 1927, was passed by Parliament. There had not been an amendment of the Inspection of Machinery Act since 1914, and the main object of the 1927 amendment was to bring the law on this subject up to date and to clear up some anomalies that existed previously. There has been considerable progress in mechanical engineering during the last decade, and every year sees new applications of mechanical power to industrial processes. As a consequence interest in "safety-first" movements is world-wide.

Authority was obtained in the 1927 amendment to make regulations as to the safe working of boilers, lifts, and cranes. Previously, lifts and cranes were dealt with as machinery generally, but the time has now come for treating these separately. The guarding of machinery is now a specialized subject, and it is necessary that those who have to do business with the Department should know what requirements they have to comply with in order to obtain the Department's certificate.

It is with feelings of deepest regret that I report the death during the year of Mr. W. G. Scott, who served this Department in the capacity of Surveyor of Ships and Inspector of Machinery at Invercargill. I desire to place on record the Department's high appreciation of his services and of the conscientious manner in which his duties were invariably carried out. To his widow and daughter the staff of the Department extend their deep sympathy.

EXAMINATIONS OF LAND ENGINEERS, ENGINE-DRIVERS, AND ELECTRIC-TRAM DRIVERS.

These examinations were held at the various offices of the Inspectors of Machinery throughout the Dominion at the regular intervals provided for in the regulations—namely, in the months of May, August, November, and February. In addition, a few special examinations were granted, but the holding of special examinations is not encouraged, as it is considered that the regular examinations are of sufficient frequency, and, except in very exceptional circumstances, candidates are expected to arrange that they may attend the scheduled examinations.

The full list of places where the examinations were held is shown in an appended return, as also is the number of candidates examined at each place. The classes of certificates for which examinations were held were—First-class engine-driver, second-class engine-driver, steam winding engine-driver, locomotive-engine driver, traction-engine driver, locomotive and traction engine driver, and electric-tram driver. The total number of candidates examined was 474; of this number 330 passed and 144 failed in their examinations.