

shortness of water within the boiler, and an inquiry into the circumstances attending the accident proved this to be the case. The engineer who was responsible for the safe-working of the boilers did not examine the water-level for three and one-half hours before going off shifts, the duty of attending to the water-level being left to an uncertificated fireman engaged on firing the boilers. The relieving engineer who took over the watch shortly before the furnaces collapsed did not examine the boilers, and so failed to notice that the water-level in the damaged boiler was dangerously low. After the accident the feed check-valve was found shut, and had been closed for at least one and three-quarter hours before the furnaces collapsed. The accident was due to mismanagement on the part of those who were responsible for the safe-working of the plant, and illustrates the importance of the regulation of feed-water. This duty should always receive the attention of the person in effective charge, and never be left to an uncertificated fireman.

#### *Machinery.*

The total number of machinery inspections for the year was 48,186. Among these, 83 lifts and 22 cranes were inspected for the first time.

The following table shows the number of inspections of boilers and machinery from 1915-16 onwards :—

Year.	Number of Inspections.	Year.	Number of Inspections.
1915-16 .. ..	17,857	1923-24 .. ..	32,891
1916-17 .. ..	19,362	1924-25 .. ..	35,797
1917-18 .. ..	21,118	1925-26 .. ..	42,529
1918-19 .. ..	22,614	1926-27 .. ..	47,209
1919-20 .. ..	25,824	1927-28 .. ..	48,638
1920-21 .. ..	28,553	1928-29 .. ..	47,393
1921-22 .. ..	31,876	1929-30 .. ..	50,189
1922-23 .. ..	33,124	1930-31 .. ..	56,330

From this statement it will be seen that the number of inspections has practically doubled in the past ten years.

There were reported during the year 11 fatal and 67 non-fatal accidents. Three of the fatal accidents were not due to machinery causes in respect of which the Department had any responsibility. In the case of each accident the circumstances were closely investigated, and an Inspector of Machinery has made a detailed report. Where practicable, steps were taken to prevent a recurrence of similar accidents. As is usual with machinery accidents, indifference or ignorance on the part of workers of the potential dangers of moving machinery were the cause of the majority of the accidents. Among the fatal accidents two of the victims were, unfortunately, children of four years of age. In each case the accident occurred in milking-sheds. The children accompanied their parents to the sheds and played about the machinery during milking operations. Loose clothing becoming entangled with running shafts was the cause of the accident in each instance. In both these cases the unguarded machinery had not been examined by an officer of the Department, one plant being a new installation and the other had been rearranged since the last visit of inspection. Transmission machinery was responsible for four of the fatal accidents, two occurring with shafting and two with belts. Loose clothing was the primary cause of the accidents with the running shafts. The circumstances which occasion many transmission machinery accidents show that the dangers are not understood as they should be by both employers and operatives, and to indicate the principal sources of danger and the precautions to be taken when working near machinery a conspicuous danger notice has been recently distributed to factories and power plants in the Dominion. An unusual fatality occurred when an operator of a chaff-cutting machine fainted and fell across the machine. His hand was badly mangled necessitating amputation, but death, according to medical evidence, was due to natural causes. One lift fatality occurred during the year. A cot patient in a hospital, through the unexpected movement of a lift, was thrown to the floor and rolling into the lift well, was killed. The coincidence of a simultaneous breakdown of three safety devices used in this lift was the cause of the accident.

Of the 67 non-fatal accidents, 31 occurred at wood-working machinery, 14 of which were at circular saws. Among the remainder 5 were connected with power presses, 2 with lifts, and 2 with milking machines. In one case of an accident at a milking-machine plant a man had his right arm torn off at the shoulder. It is of interest to note the severe nature of the accident, as the electric motor driving the machinery was only 2 horse-power. The dangers of even the smallest power-driven machinery cannot be too often stressed.

Circulars dealing with guards for gear wheels and shafting, feed rollers of printing machines, circular saws (two), shaping-machines, and rolling-machines in confectionery works were issued during the year. Copies of nine safety pamphlets issued by the Imperial Home Office were distributed to all Inspectors of Machinery. These pamphlets have been adopted by the Department as a standard of safety for the fencing and guarding of machinery in New Zealand. The pamphlets cover a wide field, and in addition to illustrations of mechanical safety devices contain many suggestions and much information which should be helpful in the prevention of machinery accidents. A stock of the pamphlets is carried by the Department and any machinery owner or worker interested in the guarding of machinery can obtain copies on application to the head office at a very moderate price.

For some years past there has been more or less agitation against the annual inspection of farm machinery. The grounds of objection have been various : That it is unnecessary, that it is a burdensome or irritating tax, or that the expenditure on salary and travelling-expenses of the Inspectors is a waste of public money. During the more recent times of depression the protest has become more vigorous and widespread.