# TWENTY-THIRD ANNUAL REPORT

OF THE

# CHIEF INSPECTOR OF MACHINERY

FOR THE

## FISCAL YEAR ENDED MARCH 31ST

## 1925

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

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# REPORT OF CHIEF INSPECTOR OF MACHINERY.

NEW WESTMINSTER, B.C., April 1st, 1925.

*E. S. H. Winn, Esq.,*
*Chairman, The Workmen's Compensation Board.*
*Vancouver, B.C.*

SIR,—In accordance with the provisions of the "Boiler Inspection Act" and the 1924 amendment thereto, I have the honour to submit to you the Twenty-third Annual Report of the operation of the Steam-boilers and Machinery Inspection Service for the year ended March 31st, 1925, with comparative statistics for the year 1924.

The personnel of the service at present consists of the Chief Inspector, eleven Inspectors, one clerk, one record and filing clerk, and two stenographers and typists; located as follows: Chief Inspector, four Inspectors, one clerk, one record and filing clerk, one stenographer and typist at head office, New Westminster; one Inspector in Victoria; five Inspectors and one stenographer and typist in Vancouver; and one Inspector at Nelson.

During the year the following changes in staff have taken place:—

Mr. Bath, Inspector in Vancouver office, left the service November 15th, 1924, on account of ill-health. This vacancy has not yet been filled.

Miss Bond, clerk, New Westminster office, left the service March 25th, 1925. Miss Eddy was then promoted to Miss Bond's position and Miss McMurphy promoted from stenographer and typist to record clerk, the position formerly held by Miss Eddy, and Miss Coupland transferred from Victoria to New Westminster.

Since the 1924 amendment to the Act, transferring the direction of administration from the Minister of Public Works to the Workmen's Compensation Board, the following changes have been made with a view to further centralizing control at head office:—

Two accounts were opened at the Canadian Bank of Commerce—one in account with the Minister of Finance and the other in account with the Workmen's Compensation Board Boilers and Machinery Inspection Department.

All moneys collected are daily deposited to the credit of the Minister of Finance in Account No. 1. A statement of deposits and bank remittances to the Treasury Department, signed by the bank manager and by the Chief Inspector of Machinery, is forwarded to the Treasury Department by the Chief Inspector on the second day of each subsequent month.

With respect to Account No. 2, requisitions are made monthly by the Chief Inspector through the Workmen's Compensation Board to the Treasury Department for the amount to cover the succeeding month's estimated expenditure. A cheque for this amount is forwarded by the Finance Department to this office and deposited in the Workmen's Compensation Board Boilers and Machinery Inspection Account. All disbursement cheques are drawn on this account and signed by one of the members of the Workmen's Compensation Board and by the Chief Inspector of Machinery.

With respect to the Inspection Service the following changes have been made:—

The collection of accounts by the District Inspectors have been discontinued and all collections made by the Chief Inspector.

All records of Inspectors which were heretofore kept in the district offices are now being kept in head office. Inspectors make three copies of their reports, one of which is sent to the owner of the steam plant, one placed in the Inspector's file, and one sent to head office, together with the boiler certificate. The records are then examined and, if the fees have been paid, repairs completed, and there is a certificated engineer in charge, the certificate for the boiler is issued by the Chief Inspector; this change makes all information available at head office, whereas the former system required the Chief Inspector to get in touch with the District Inspector, in many cases, before a complete record could be furnished. It also relieved the Inspector of the responsibility of collecting fees and of a considerable amount of clerical work.

With respect to engineers' examinations, it has been considered that these could be more uniformly conducted by confining the general examinations to the head office, New Westminster, the Victoria office, and the Nelson office.

As in the past, first-class examinations are being held at head office only. This arrangement is also being confined, as far as possible, to examinations for second-class certificates, with a proviso that second-class examinations may be held in Victoria and Nelson if it is considered advisable.

Examinations for grades below second-class will be held at outlying points by the Inspectors at the time they are in the district making inspections of the boilers, when applications have been approved by the Chief Inspector and forwarded by him to the Inspector in time to make the necessary arrangements.

The Inspection Service has been relieved of work in connection with the upkeep of the Government ferries and of the work in connection with the installation and upkeep of steam plants in Government institutions, except to complete work now in hand at Essondale Mental Hospital, Tranquille Sanatorium, and at the British Columbia University. This department has taken over the inspection of all boilers, machinery, and pressure-vessels coming under the jurisdiction of the "Workmen's Compensation Act." This work in the outlying districts has been performed by our service for some years; the additions consist of work in the cities which was formerly done by the Factory Inspection Service.

The following is a summary of the work performed in the office of the Chief Inspector for the year ended March 31st, 1925, as compared with the work performed during the year ended March 31st, 1924:—

| | 1924. | 1925. |
|---|---|---|
| Letters inward | 5,393 | 5,475 |
| Letters outward | 7,454 | 6,250 |
| Telegrams inward | 43 | 55 |
| Telegrams outward | 40 | 46 |
| Inspectors' monthly reports examined | 144 | 139 |
| New designs examined, calculated, and reported on | 147 | 159 |
| Workmen's Compensation Board designs examined, calculated, and reported on | 11 | 5 |
| Designs of spark-arresters and fire-pumps examined, calculated, and reported on | 8 | 2 |
| Amendments to designs examined, calculated, and reported on | 21 | 15 |
| Fees collected for designs | $1,062 | $845.33 |
| Fees collected for registration of boilers | $516 | $161 |
| Fees collected for copies of Act | $188 | $9.25 |
| Fines for infraction of the Act | $100 | ..... |
| Number of miles travelled by Chief Inspector | 3,776 | 3,823 |

I am pleased to be able to report that there have been no boiler-explosions during the year. One accident resulting in personal injury occurred in September at the Cameron Lumber Company's mill, Vancouver Island. The fly-wheel of the mill engine exploded on account of failure of the governor to function properly. This governor was the Gardner type and when examined by Mr. Kay was found to have become defective, due to a broken part not having been replaced and the thread being stripped from the nut at the bottom of the spindle. This nut was held in place by a cotter-pin, which had ultimately worn through, allowing the valve to drop. This action should have shut off the steam and stopped the engine, as provision is made in the construction of the governors for such a contingency, by casting a bar across the bottom of the valve-chamber, on which the valve (a piston type) should come to rest with the steam-ports closed. Unfortunately, at some previous time this bar had been broken out and not replaced; therefore the valve passed down through the chamber leaving the steam-port full open. The oiler in attempting to stop the engine by closing the throttle-valve was struck by small pieces of the flying metal. Fortunately his injuries were not of a serious nature.

This case is cited at some length as a warning to engineers to make frequent examinations of governors, as fly-wheel explosions are often as destructive to life and property as are boiler-explosions.

Notwithstanding the provisions of the Act that all safety-valves should be of registered design, twenty-three boilers were found with safety-valves defective in construction, seven of which were considered dangerous, four had safety-valves overloaded, and twelve were found with safety-valves inoperative.

Three boilers were being operated without steam-pressure gauges, 306 with defective gauges, and twenty-nine with gauges inoperative.

To emphasize the importance of frequent tests of steam-gauges and safety-valves by the engineer, I may cite a case which occurred during the year, where a boiler being prepared for inspection was found to have a leaky safety-valve and main stop-valve. In order to apply the hydrostatic test, blank flanges were placed between the main stop-valve and the boiler and between the safety-valve and the boiler. Later the chief engineer gave orders to the shift engineer to get up steam on this boiler and cut it in on the main line, when the pressure equalled that of the other boilers. The shift engineer went off watch before the pressure was high enough for the boiler to be cut in. He repeated the chief engineer's orders to the engineer taking over the shift. At the proper time this man opened the main stop-valve, after which the pressure continued to rise in the boiler, which was allowed 100 lb. working-pressure. When the gauge indicated 120 lb. he called the chief engineer, who suggested the gauge might be defective and ordered one taken off one of the other boilers. By the time this was done the pressure had raised to 180 lb.

About this time some one remembered that the flanges above-mentioned had not been taken out and steps were at once taken to lower the pressure. A little further delay would have resulted in a serious explosion. Fortunately the boiler was not seriously damaged. It should be the general practice of all engineers, when steaming up boilers after a shut-down, to test the water-glass and safety-valve as soon as there is sufficient steam in the boiler. It is also advisable that the safety-valves should be tested by each engineer when he comes on shift.

The total number of new boilers put into operation during the year was 88, 56 of which were built in British Columbia, 15 in Eastern Canada, and 17 in the United States.

Second-hand boilers imported from Eastern Canada, 10; from the United States, 4; inspection of boilers unclassified, 62; first inspections, 124.

The number of boilers registered to March 31st, 1925, was 4,084; inspections completed, 3,110; inspections, external only, 79; internal only, 2; boilers reported as "not operating," 192; boilers registered on which no inspection has been made, 701.

The number of plates tested for new boilers was 333, of which only one was rejected as unfit for boiler-construction.

Boilers built under Inspector's supervision during the year, 56.

In addition to the usual work of this office, under the provisions of the "Boiler Inspection Act," we have during the year undertaken extra work as follows: Supervision of repairs to Ladner–Woodward, Mission–Matsqui, and Agassiz–Rosedale Ferries; supervision of repairs in connection with the steam plants in Government Buildings; supervision of the new central heating plant for the Essondale Mental Hospital; and continued inspection for the Workmen's Compensation Board.

Appended you will find a summary of the total work done by the District Inspectors, as well as their separate reports, together with a summary of work done for the Workmen's Compensation Board.

In conclusion, I desire to thank the Honourable the Minister of Public Works and the Workmen's Compensation Board for their active interest in and support of this office, and also to thank the members of the staff for the efficient and cheerful manner in which they have carried out their work during the year.

Trusting this report will meet with your approval,

I have, etc.,

John Peck,
*Chief Inspector.*

Summary of Total Work done in all Districts.

| | 1924. | 1925. |
|---|---|---|
| Number of drawings and specifications calculated for new boilers | 167 | 176 |
| Number of boiler-plates inspected | 312 | 333 |
| Number of boiler-plates rejected | ..... | 1 |
| Number of boilers built under Inspector's supervision in British Columbia | 71 | 56 |
| Number of boilers inspected built under inspection in Eastern Canada | 2 | 2 |
| Number of boilers inspected built in Eastern Canada not under inspection | 8 | 13 |

SUMMARY OF TOTAL WORK DONE IN ALL DISTRICTS—*Continued.*

| | 1924. | 1925. |
|---|---|---|
| Number of new boilers inspected built in United States | 16 | 17 |
| Number of new boilers inspected built in British Columbia | 14 | 33 |
| Number of new boilers inspected (total) | 102 | 88 |
| Number of boilers imported from Eastern Canada (second-hand) | 10 | 10 |
| Number of boilers imported from United States (second-hand) | 2 | 4 |
| Number of boilers unclassified | 22 | 62 |
| Number of first inspections | 119 | 124 |
| Number of inspections, external and internal | 2,889 | 2,977 |
| Number of internal inspections only | 7 | 2 |
| Number of external inspections only | 122 | 79 |
| Number of special inspections after repairs | 33 | 92 |
| Number of visits in addition to inspections | 796 | 1,015 |
| Number of boilers subjected to hydrostatic test | 2,664 | 2,748 |
| Number of boilers on which pressure was reduced | 108 | 107 |
| Number of boilers unsafe without extensive repairs | 44 | 57 |
| Number of boilers repaired under Inspector's directions | 61 | 98 |
| Number of boilers considered unfit for further use | 17 | 11 |
| Number of accidents to engines and boilers | 17 | 7 |
| Number of accidents resulting in personal injury (not fatal) | 3 | 1 |
| Number of accidents resulting in personal injury (fatal) | 2 | 1 |
| Number of investigations | 16 | 15 |
| Number of inspections completed | 3,292 | 3,110 |
| Total horse-power of boilers inspected | 241,855 | 245,323 |
| Number of defects observed as per summary | 1,938 | 2,102 |
| Number of defects considered dangerous | 185 | 169 |
| Inspection fees collected | $39,427.76 | $37,856.54 |
| Miles travelled by the Inspector | 59,844 | 47,641 |
| Letters inward | 7,375 | 6,342 |
| Letters outward | 10,235 | 8,529 |
| Telegrams inward | 55 | 38 |
| Telegrams outward | 34 | 36 |
| Boilers taken out of service | 50 | 9 |

Summary of Total Defects observed in all Districts.

| Nature of Defects. | Number. | | Dangerous. | |
|---|---|---|---|---|
| | 1924. | 1925. | 1924. | 1925. |
| Boilers without safety-valves | 1 | .... | .... | .... |
| Boilers with safety-valves inoperative | 12 | 12 | 6 | 1 |
| Boilers with safety-valves overloaded | 6 | 4 | 1 | 3 |
| Boilers with safety-valves defective in construction | 32 | 23 | 14 | 7 |
| Boilers without pressure-gauges | .... | 3 | .... | 1 |
| Pressure-gauges inoperative | 31 | 29 | 21 | 19 |
| Pressure-gauges defective | 340 | 306 | 4 | 6 |
| Cases of insufficient staying or bracing | 7 | 15 | 1 | .... |
| Cases of defective stays | 14 | 18 | 1 | .... |
| Cases of broken rivets | 3 | 10 | .... | .... |
| Cases of defective riveting | 6 | 5 | 1 | .... |
| Cases of broken stays or braces | 181 | 89 | 15 | 2 |
| Cases of loose stays or braces | 24 | 27 | 2 | 1 |
| Boilers damaged by low water | 10 | 5 | 1 | 1 |
| Defective settings | 83 | 117 | 10 | 4 |
| Boilers with fractured plates | 42 | 59 | 6 | 13 |
| Boilers with laminated plates | .... | 3 | .... | 1 |
| Boilers with burned plates | 8 | 11 | 8 | 6 |
| Boilers with blistered plates | 24 | 13 | 1 | .... |
| Cases of sediment on fire-sheets | 50 | 87 | 3 | 4 |
| Cases of internal corrosion | 76 | 147 | 1 | 1 |
| Cases of scale or encrustation | 163 | 239 | 3 | 8 |
| Cases of internal grooving | 3 | 16 | 2 | 1 |
| Cases of external corrosion | 116 | 150 | 2 | 6 |
| Cases of defective tubes | 121 | 147 | 10 | 15 |
| Cases of pitting | .... | 6 | .... | .... |
| Cases of defective feed-water arrangement | 9 | 64 | 4 | 1 |
| Cases of broken feed-valves | 4 | 1 | 2 | .... |
| Serious leakage around tube-ends | 29 | 71 | 6 | 7 |
| Serious leakage in rivet-joints | 3 | 16 | .... | .... |
| Defective blow-off pipes or cocks | 90 | 89 | 16 | 75 |
| Defective water-gauges | 30 | 27 | 13 | 12 |
| Broken blow-off pipes or cocks | 9 | 14 | 3 | .... |
| Water-columns without blow-outs | 8 | 6 | .... | .... |
| Cases of broken test-cocks | 156 | 126 | .... | .... |
| Connections to water-columns without valves | 4 | 10 | .... | .... |
| Neutral sheets not stayed | 3 | 1 | .... | .... |
| Neutral sheets improperly stayed | 9 | 1 | .... | .... |
| Furnaces out of shape | .... | 10 | .... | .... |
| Boilers without fusible plugs | 8 | 6 | .... | .... |
| Boilers low at front end | 49 | 70 | .... | .... |
| Cases of serious leakage of fittings | 15 | 28 | 3 | 6 |
| Number of hand-holes, doors having bolts and dogs burned off | 2 | 7 | 1 | .... |
| Defects in engines | 15 | 16 | 7 | 1 |
| Boilers without hand-holes | 1 | 1 | 1 | .... |
| Boilers without stop-valves | 1 | 2 | .... | 2 |
| Cases of defective steam-pipes | 16 | 15 | 10 | 7 |
| Unclassified defects | 74 | 39 | 5 | 3 |
| Totals | 1,938 | 2,141 | 185 | 174 |

John Peck,
*Chief Inspector.*

# REPORT OF THE CHIEF EXAMINER.

NEW WESTMINSTER, B.C., April 1st, 1925.

*E. S. H. Winn, Esquire,*
*Victoria, B.C.*

SIR,—I have the honour to submit to you the following report with respect to examinations of candidates for engineers' certificates for the year ended March 31st, 1925:—

During the year I have received 717 applications for examination for the different grades of certificates.

On March 31st, 1924, I had on hand 301 applications, making a total of 1,020. Of these, 639 have been examined; 130 applicants have had their fees returned, as their testimonials did not show the necessary service qualifications required by the Act. This leaves on the "Accepted for Examination" file 251 application forms.

RESULTS OF EXAMINATIONS.

| Class. | Year ended March 31st, 1924. | | | Year ended March 31st, 1925. | | |
|---|---|---|---|---|---|---|
| | Examined. | Passed. | Failed. | Examined. | Passed. | Failed. |
| First | 6 | 4 | 2 | 9 | 3 | 6 |
| Second | 28 | 18 | 10 | 39 | 26 | 13 |
| Third | 140 | 95 | 45 | 152 | 101 | 51 |
| Fourth | 286 | 194 | 92 | 275 | 200 | 75 |
| Special logging-donkey | 174 | 138 | 36 | 95 | 79 | 16 |
| Special creamery | 6 | 4 | 2 | 3 | 3 | ..... |
| Special heating | 38 | 33 | 5 | 51 | 45 | 6 |
| Special road-roller | 3 | 3 | ..... | ..... | ..... | ..... |
| Special threshing | 3 | 3 | ..... | 2 | 2 | ..... |
| Temporary | 31 | 31 | ..... | 12 | 12 | ..... |
| Special Doukhobor | ..... | ..... | ..... | 1 | 1 | ..... |
| Totals | 715 | 523 | 192 | 639 | 472 | 167 |

| | Year ended March 31st, 1924. | Year ended March 31st, 1925. |
|---|---|---|
| Examination fees collected by Chief Inspector | $3,475 00 | $3,262 50 |
| Examination fees collected by other Inspectors | 72 50 | ..... |
| Duplicate certificate fees | 70 00 | 45 00 |
| Totals | $3,617 50 | $3,307 50 |

Trusting this report will meet with your approval,

I have, etc.,

JOHN PECK,
*Chief Inspector.*

## WORKMEN'S COMPENSATION BOARD.

Summary of Inspections and Safety Orders for the Years ended March 31st, 1924, and March 31st, 1925.

| Inspectors. | 1924. | | 1925. | |
|---|---|---|---|---|
| | No. of Inspections. | No. of Safety Orders. | No. of Inspections. | No. of Safety Orders. |
| District A— | | | | |
| A. S. Bennett | 22 | 68 | 1 | 9 |
| J. B. Tait | 41 | 177 | 70 | 339 |
| S. H. Excell | ..... | ..... | 73 | 416 |
| J. H. Wilson | ..... | ..... | 136 | 461 |
| District B— | | | | |
| S. Baxter | 32 | 124 | ..... | ..... |
| J. D. Kay | ..... | ..... | 44 | 287 |
| John Clark | 70 | 403 | 85 | 494 |
| Louis Duckitt | 27 | 179 | 41 | 201 |
| District C— | | | | |
| A. Sutherland | 33 | 231 | 33 | 176 |
| District D— | | | | |
| Geo. O. Madigan | 16 | 43 | 59 | 164 |
| F. Bath | 1 | 1 | 6 | 22 |
| F. Biggam | 22 | 18 | 97 | 400 |
| John O'Neill | 27 | 53 | 91 | 747 |
| District E— | | | | |
| Jas. Davidson | 82 | 265 | 124 | 436 |
| Totals | 373 | 1,562 | 860 | 4,152 |

## SENIOR INSPECTOR'S REPORT, DISTRICT A.

New Westminster, B.C., April 1st, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

Sir,—I have the honour to submit my annual report for the year ended March 31st, 1925.

During the year I have been principally engaged as Engineer Surveyor on the examination of new designs for boilers, engines, structural steel-work for boiler settings, safety-valves and fittings, power-plant steam and oil-fuel piping, submitted by the manufacturers and the designing engineers, and calculating the working-pressure allowable.

Some interesting work was encountered in connection with the designs for the Imperial Oil Company's new cracking-stills, on which they require a working-pressure of 390 lb. and a temperature of 800° F. The shell-plates are to be 2 inches thick and the longitudinal seams are double butt-strap type, with unusual rivet sizes and dispositions. After much thought had been given the whole question the design was conditionally approved for one installation.

Monthly examinations of candidates for engineers' certificates held in this office occupied my time for about one week in each month. Applicants for special certificates were examined at any time they applied, at or between the regular examinations.

I made a special inspection trip in November to Barkerville to inspect two boilers built in Germany for Kafue Gold Dredging Company. The company asked for a special inspection and paid all expenses.

The following is my tabulated report:—

| | |
|---|---|
| Number of drawings and specifications calculated for new boilers | 159 |
| Number of new boilers inspected built in Germany | 2 |
| Number of first inspections | 2 |
| Number of inspections, external and internal | 9 |
| Number of inspections completed | 11 |
| Total horse-power of boilers inspected | 1,430 |
| Miles travelled by the Inspector | 1,566 |
| Work done for other departments— | |
| Workmen's Compensation Board designs (days) | 3 |
| Work in connection with "Eena" and "Beaver" (days) | 7 |
| Work in connection with Essondale new steam plant (days) | 10 |

Trusting this will meet with your approval,

I have, etc.,

A. S. BENNETT,
*Inspector.*

## INSPECTOR'S REPORT, DISTRICT A (NORTH).

NEW WESTMINSTER, B.C., April 3rd, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

SIR,—I have the honour to submit to you my report for the year ended March 31st, 1925.

There has been no serious accident, due to boilers or engines, in this district during the past year and I found the plants generally in a satisfactory condition.

A number of inspections were made in connection with the Workmen's Compensation Board and much improvement is being made towards accident-prevention.

Trusting this report meets with your approval,

I have, etc.,

J. B. TAIT,
*Inspector.*

SUMMARY OF WORK DONE IN DISTRICT A (NORTH) FOR YEAR ENDED MARCH 31ST, 1925.

| | |
|---|---|
| Number of boilers inspected built under inspection in Eastern Canada | 1 |
| Number of new boilers inspected built in United States | 5 |
| Number of new boilers inspected built in British Columbia | 3 |
| Number of new boilers inspected (total) | 9 |
| Number of boilers imported from Eastern Canada (second-hand) | 2 |
| Number of first inspections | 8 |
| Number of inspections, external and internal | 309 |
| Number of external inspections only | 3 |
| Number of special inspections after repairs | 1 |
| Number of visits in addition to inspections | 11 |
| Number of boilers subjected to hydrostatic test | 293 |
| Number of boilers on which pressure was reduced | 4 |
| Number of boilers repaired under Inspector's directions | 3 |
| Number of accidents to engines and boilers | 1 |
| Number of investigations | 1 |
| Number of inspections completed | 312 |
| Total horse-power of boilers inspected | 28,597 |
| Number of defects observed as per summary | 232 |
| Number of defects considered dangerous | 13 |
| Miles travelled by the Inspector | 5,968 |

Work done for other Districts.

Seventy Workmen's Compensation Board inspections; 339 safety orders.

Summary of Defects observed.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves defective in construction | 3 | 1 |
| Pressure-gauges inoperative | 1 | 1 |
| Pressure-gauges defective | 27 | 2 |
| Cases of broken stays or braces | 5 | .... |
| Defective settings | 10 | .... |
| Boilers with fractured plates | 4 | .... |
| Boilers with laminated plates | 2 | 1 |
| Boilers with burned plates | 1 | .... |
| Cases of internal corrosion | 35 | .... |
| Cases of scale or encrustation | 56 | .... |
| Cases of internal grooving | 7 | .... |
| Cases of external corrosion | 27 | .... |
| Cases of defective tubes | 5 | 1 |
| Cases of pitting | 6 | 1 |
| Serious leakage around tube-ends | 1 | 1 |
| Defective blow-off pipes or cocks | 17 | 6 |
| Water-columns without blow-outs | 1 | .... |
| Cases of broken test-cocks | 13 | .... |
| Connections to water-columns without valves | 2 | .... |
| Boilers low at front end | 8 | .... |
| Cases of serious leakage of fittings | 1 | .... |
| Totals | 232 | 13 |

J. B. Tait,
*Inspector of Steam-boilers, District A (North).*

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## INSPECTOR'S REPORT, DISTRICT A (SOUTH).

New Westminster, B.C., April 7th, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

Sir,—I have the honour to submit my annual report for the year ended March 31st, 1925.

This being my first year in the service and in a district only generally known to me, it gives me much pleasure to record the willing assistance rendered by all with whom I came in contact.

It is gratifying to note the appreciation of the Department by the public, and I trust my efforts in the service shall prove cumulative of this good spirit.

Many plants visited gave evidence of the economic conditions of the year, but everybody concerned is anxious to minimize accidents by improving methods of installation and employing reliable and competent help.

In addition to field inspections, I have assisted with the examination of engineer candidates held monthly at this office and sundry works connected with the Department.

Thanking yourself and my co-workers for the willing advice and assistance freely given,

I have, etc.,

S. H. Excell,
*Inspector.*

### SUMMARY OF WORK DONE IN DISTRICT A (SOUTH) FOR YEAR ENDED MARCH 31ST, 1925.

| | |
|---|---|
| Number of drawings and specifications calculated for new boilers | 9 |
| Number of new boilers inspected (total) | 2 |
| Number of inspections, external and internal | 220 |
| Number of external inspections only | 25 |
| Number of special inspections after repairs | 8 |
| Number of visits in addition to inspections | 57 |
| Number of boilers subjected to hydrostatic test | 199 |
| Number of boilers on which pressure was reduced | 6 |
| Number of boilers unsafe without extensive repairs | 1 |
| Number of boilers repaired under Inspector's directions | 14 |
| Number of boilers considered unfit for further use | 1 |
| Number of investigations (old boiler-plates) | 1 |
| Number of inspections completed | 260 |
| Total horse-power of boilers inspected | 20,820 |
| Number of defects observed as per summary | 334 |
| Miles travelled by the Inspector | 6,302 |

### WORK DONE FOR OTHER DISTRICTS.

Workmen's Compensation Board: Seventy-three inspections; 416 safety orders.

### SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves inoperative | 1 | .... |
| Boilers with safety-valves defective in construction | 5 | .... |
| Pressure-gauges inoperative | 1 | .... |
| Pressure-gauges defective | 40 | .... |
| Cases of insufficient staying or bracing | 1 | .... |
| Cases of defective stays | 2 | .... |
| Cases of broken rivets | 3 | .... |
| Cases of defective riveting | 1 | .... |
| Cases of broken stays or braces | 1 | .... |
| Boilers damaged by low water | 1 | .... |
| Defective settings | 18 | .... |
| Boilers with fractured plates | 3 | .... |
| Boilers with burned plates | 1 | .... |
| Boilers with blistered plates | 5 | .... |
| Cases of sediment on fire-sheets | 10 | .... |
| Cases of internal corrosion | 23 | .... |
| Cases of scale or encrustation | 28 | .... |
| Cases of external corrosion | 31 | .... |
| Cases of defective tubes | 23 | .... |
| Cases of defective feed-water arrangement | 5 | .... |
| Serious leakage around tube-ends | 17 | .... |
| Serious leakage in rivet-joints | 10 | .... |
| Defective blow-off pipes or cocks | 24 | .... |
| Defective water-gauges | 5 | .... |
| Broken blow-off pipes or cocks | 1 | .... |
| Water-columns without blow-outs | 3 | .... |
| Cases of broken test-cocks | 9 | .... |
| Connections to water-columns without valves | 4 | .... |
| Furnaces out of shape | 1 | .... |
| Boilers without fusible plugs | 2 | .... |
| Boilers low at front end | 15 | .... |
| Cases of serious leakage of fittings | 6 | .... |
| Number of hand-holes, doors having bolts and dogs burned off | 6 | .... |

SUMMARY OF DEFECTS OBSERVED—*Continued.*

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Defects in engine | 7 | .... |
| Boilers without stop-valves | 1 | .... |
| Cases of defective steam-pipes | 6 | .... |
| Unclassified defects | 14 | .... |
| Total | 334 | .... |

S. H. EXCELL,
*Inspector of Steam-boilers, District A (South).*

## SUMMARY OF TOTAL WORK DONE IN DISTRICT A FOR YEAR ENDED MARCH 31ST, 1925.

RESULTS OF EXAMINATIONS.

| Class. | Number examined. | Passed. | Failed. |
|---|---|---|---|
| First | 9 | 3 | 6 |
| Second | 13 | 11 | 2 |
| Third | 59 | 42 | 17 |
| Fourth | 99 | 74 | 25 |
| Special logging-donkey | 27 | 27 | .... |
| Special heating | 13 | 13 | .... |
| Temporary | 1 | 1 | .... |
| Totals | 227 | 177 | 50 |

SUMMARY OF WORK DONE.

| | |
|---|---|
| Number of drawings and specifications calculated for new boilers | 168 |
| Number of boilers inspected built under inspection in Eastern Canada | 1 |
| Number of new boilers inspected built in United States | 5 |
| Number of new boilers inspected built in British Columbia | 5 |
| Number of new boilers inspected (total) | 11 |
| Number of boilers imported from Eastern Canada (second-hand) | 2 |
| Number of first inspections | 10 |
| Number of inspections, external and internal | 538 |
| Number of external inspections only | 28 |
| Number of special inspections after repairs | 9 |
| Number of visits in addition to inspections | 68 |
| Number of boilers subjected to hydrostatic test | 490 |
| Number of boilers on which pressure was reduced | 10 |
| Number of boilers unsafe without extensive repairs | 1 |
| Number of boilers repaired under Inspector's directions | 17 |
| Number of boilers considered unfit for further use | 1 |
| Number of accidents to engines and boilers | 1 |
| Number of investigations | 2 |
| Number of inspections completed | 583 |
| Total horse-power of boilers inspected | 50,847 |
| Number of defects observed as per summary | 566 |
| Number of defects considered dangerous | 13 |
| Inspection fees collected | $7,548.97 |
| Miles travelled by the Inspectors | 13,836 |

WORK DONE FOR OTHER DISTRICTS.

Workmen's Compensation Board inspections, 144; safety orders, 764.

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves inoperative | 1 | .... |
| Boilers with safety-valves defective in construction | 8 | 1 |
| Pressure-gauges inoperative | 2 | 1 |
| Pressure-gauges defective | 67 | 2 |
| Cases of insufficient staying or bracing | 1 | .... |
| Cases of defective stays | 2 | .... |
| Cases of broken rivets | 3 | .... |
| Cases of defective riveting | 1 | .... |
| Cases of broken stays or braces | 6 | .... |
| Boilers damaged by low water | 1 | .... |
| Defective settings | 28 | .... |
| Boilers with fractured plates | 7 | .... |
| Boilers with laminated plates | 2 | 1 |
| Boilers with burned plates | 2 | .... |
| Boilers with blistered plates | 5 | .... |
| Cases of sediment on fire-sheets | 10 | .... |
| Cases of internal corrosion | 58 | .... |
| Cases of scale or encrustation | 84 | .... |
| Cases of internal grooving | 7 | .... |
| Cases of external corrosion | 58 | .... |
| Cases of defective tubes | 28 | 1 |
| Cases of pitting | 6 | 1 |
| Cases of defective feed-water arrangement | 5 | .... |
| Serious leakage around tube-ends | 18 | 1 |
| Serious leakage in rivet-joints | 10 | .... |
| Defective blow-off pipes or cocks | 41 | 6 |
| Defective water-gauges | 5 | .... |
| Broken blow-off pipes or cocks | 1 | .... |
| Water-columns without blow-outs | 4 | .... |
| Cases of broken test-cocks | 22 | .... |
| Connections to water-columns without valves | 6 | .... |
| Furnaces out of shape | 1 | .... |
| Boilers without fusible plugs | 2 | .... |
| Boilers low at front end | 23 | .... |
| Cases of serious leakage of fittings | 7 | .... |
| Number of hand-holes, doors having bolts and dogs burned off | 6 | .... |
| Defects in engines | 7 | .... |
| Boilers without stop-valves | 1 | .... |
| Cases of defective steam-pipes | 6 | .... |
| Unclassified defects | 14 | .... |
| Totals | 566 | 13 |

A. S. BENNETT,
J. B. TAIT,
S. H. EXCELL,
*Inspectors of Steam-boilers, District A.*

## SENIOR INSPECTOR'S REPORT, DISTRICT B.

Victoria, B.C., March 31st, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

Sir,—I have the honour to submit herewith my report for the year ended March 31st, 1925.

I am pleased to report that no fatal accidents occurred during the year. No accidents of even a serious nature have been reported.

Most of the defects noted in the tabulated report were of the nature usually found in the course of our duties, but several defects of quite a serious nature were located at various plants. A number of these were seriously cracked plates over the fires in return-tube boilers.

I inspected three boilers for the Dominion Government at the Esquimalt Graving Dock. These boilers were 48 years old and had not previously been inspected by us. They were in poor condition owing to their age.

The tabulated report will give you an idea of the work done.

I have, etc.,

John D. Kay,
*Inspector of Steam-boilers, District B.*

### Remarks.

Examinations were held monthly in Victoria and bi-monthly in Nanaimo.

### Summary of Work done in District B for Year ended March 31st, 1925.

| | |
|---|---|
| Number of boiler-plates inspected | 26 |
| Number of boiler-plates rejected | 1 |
| Number of boilers built under Inspector's supervision in British Columbia | 7 |
| Number of new boilers inspected built in British Columbia | 8 |
| Number of new boilers inspected (total) | 8 |
| Number of boilers imported from Eastern Canada (second-hand) | 1 |
| Number of boilers unclassified | 7 |
| Number of first inspections | 16 |
| Number of inspections, external and internal | 181 |
| Number of external inspections only | 38 |
| Number of special inspections after repairs | 41 |
| Number of visits in addition to inspections | 155 |
| Number of boilers subjected to hydrostatic test | 206 |
| Number of boilers on which pressure was reduced | 10 |
| Number of boilers unsafe without extensive repairs | 14 |
| Number of boilers repaired under Inspector's directions | 32 |
| Number of boilers considered unfit for further use | 1 |
| Number of accidents to engines and boilers | 1 |
| Number of accidents resulting in personal injury (not fatal) | 1 |
| Number of accidents resulting in personal injury (fatal) | 1 |
| Number of investigations | 1 |
| Number of inspections completed | 211 |
| Total horse-power of boilers inspected | 8,544 |
| Number of defects observed as per summary | 270 |
| Number of defects considered dangerous | 28 |
| Inspection fees collected (total for District B, including North) | $10,982.46 |
| Miles travelled by the Inspector | 3,259 |
| Letters inward | 1,963 |
| Letters outward | 2,940 |
| Telegrams inward | 11 |
| Telegrams outward | 10 |
| Boilers taken out of service | 1 |

### Work done for other Districts.

Workmen's Compensation Board surveys, 44; safety orders given, 287.

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves defective in construction | 1 | .... |
| Pressure-gauges defective | 22 | .... |
| Cases of defective stays | 2 | .... |
| Cases of broken rivets | 4 | .... |
| Cases of broken stays or braces | 4 | .... |
| Cases of loose stays or braces | 8 | .... |
| Defective settings | 20 | 4 |
| Boilers with fractured plates | 12 | 6 |
| Boilers with burned plates | 2 | .... |
| Cases of sediment on fire-sheets | 36 | 3 |
| Cases of internal corrosion | 37 | 1 |
| Cases of scale or encrustation | 43 | 4 |
| Cases of internal grooving | 8 | 1 |
| Cases of external corrosion | 49 | 2 |
| Cases of defective tubes | 9 | 3 |
| Cases of defective feed-water arrangement | 2 | .... |
| Serious leakage around tube-ends | 8 | .... |
| Defective blow-off pipes or cocks | 1 | .... |
| Defective water-gauges | 2 | 1 |
| Water-columns without blow-outs | 1 | .... |
| Cases of broken test-cocks | 26 | .... |
| Boilers without fusible plugs | 3 | .... |
| Boilers low at front end | 3 | .... |
| Cases of serious leakage of fittings | 2 | .... |
| Defects in engines | 1 | .... |
| Unclassified defects | 5 | .... |
| Totals | 311 | 25 |

J. D. KAY,
*Inspector of Steam-boilers, District B.*

## INSPECTOR'S REPORT, DISTRICT B.

VANCOUVER, B.C., April 3rd, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

SIR,—I beg to enclose herewith my annual report for the year ended March 31st, 1925.

During the year my work was confined to Vancouver Island, as far as Headquarters on the eastern side, the western coast as far as Port Alice, and the various places south of these two points.

Engineers' examinations were held at various places and I assisted with examinations in Victoria.

There were few accidents to boilers during the year, only one of any importance being boiler No. 21125-B.C. This was a return-tubular boiler with a treble-riveted lap longitudinal seam, and the plate cracked on a line along the edge of the rivet heads. This crack could not be seen from the inside and was detected by a leak through the test-slot.

I was moved the beginning of March from Victoria to Vancouver office, where I now have my headquarters.

Trusting my report meets with your approval,

I have, etc.,

L. DUCKITT,
*Inspector of Steam-boilers, District B.*

### Remarks.

I held examinations at various places and assisted with examinations at Victoria.

### Summary of Work done in District B for Year ended March 31st, 1925.

| | |
|---|---|
| Number of new boilers inspected built in United States | 7 |
| Number of new boilers inspected (total) | 7 |
| Number of first inspections | 7 |
| Number of inspections, external and internal | 284 |
| Number of internal inspections only | 1 |
| Number of external inspections only | 1 |
| Number of special inspection after repairs | 3 |
| Number of visits in addition to inspections | 89 |
| Number of boilers subjected to hydrostatic test | 261 |
| Number of boilers on which pressure was reduced | 12 |
| Number of boilers unsafe without extensive repairs | 2 |
| Number of boilers repaired under Inspector's directions | 11 |
| Number of boilers considered unfit for further use | 3 |
| Number of inspections completed | 286 |
| Total horse-power of boilers inspected | 24,481 |
| Number of defects observed as per summary | 248 |
| Number of defects considered dangerous | 81 |
| Miles travelled by the Inspector | 5,679 |
| Boilers taken out of service | 3 |

### Work done for other Districts.

Workmen's Compensation Board inspections, 41; safety orders given, 201.

### Summary of Defects observed.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves overloaded | 1 | 1 |
| Boilers with safety-valves defective | 9 | 3 |
| Pressure-gauges inoperative | 17 | 17 |
| Pressure-gauges defective | 53 | .... |
| Cases of defective riveting | 1 | .... |
| Cases of broken stays or braces | 19 | 1 |
| Cases of loose stays or braces | 1 | .... |
| Boilers damaged by low water | 1 | .... |
| Defective settings | 20 | 3 |
| Boilers with fractured plates | 6 | 1 |
| Boilers with burned plates | 2 | 2 |
| Cases of internal corrosion | 7 | .... |
| Cases of scale or encrustation | 16 | 2 |
| Cases of external corrosion | 7 | 1 |
| Cases of defective tubes | 32 | 9 |
| Cases of defective feed-water arrangement | 3 | 1 |
| Serious leakage around tube-ends | 5 | 5 |
| Defective blow-off pipes or cocks | 20 | 16 |
| Defective water-gauges | 11 | 8 |
| Connections to water-columns without valves | 1 | .... |
| Boilers low at front end | 5 | .... |
| Cases of serious leakage of fittings | 6 | 6 |
| Cases of defective steam-pipes | 5 | 5 |
| Totals | 248 | 81 |

L. Duckitt,
*Inspector of Steam-boilers, District B.*

# INSPECTOR'S REPORT, DISTRICTS B AND D.

VANCOUVER, B.C., April 3rd, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

SIR,—I have to submit to you my report for the year ended March 31st, 1925.

During this period I have visited every part of Vancouver Island and conducted engineers' examinations in many parts of the Island.

The most interesting thing to be noted is that some of the older industries are about to introduce more efficient power plants. This is very desirable.

Most of the plants were in fairly satisfactory condition.

Much good work is being done in protecting machinery, and with our closer attention to this, good results will no doubt accrue.

I trust the above report will meet with your approval.

I have, etc.,

JOHN CLARK,
*Inspector of Steam-boilers, Districts B and D.*

SUMMARY OF WORK DONE IN DISTRICTS B AND D FOR YEAR ENDED MARCH 31ST, 1925.

| | |
|---|---|
| Number of boilers unclassified | 1 |
| Number of first inspections | 1 |
| Number of inspections, external and internal | 306 |
| Number of external inspections only (cast-iron heating) | 8 |
| Number of special inspections after repairs | 6 |
| Number of visits in addition to inspections | 178 |
| Number of boilers subjected to hydrostatic test | 290 |
| Number of boilers on which pressure was reduced | 3 |
| Number of boilers unsafe without extensive repairs | 26 |
| Number of boilers repaired under Inspector's directions | 3 |
| Number of boilers considered unfit for further use | 3 |
| Number of accident to engines and boilers | 2 |
| Number of investigations | 4 |
| Number of inspections completed | 304 |
| Total horse-power of boilers inspected | 20,545 |
| Number of defects observed as per summary | 166 |
| Number of defects considered dangerous | 15 |

WORK DONE FOR OTHER DISTRICTS.

Workmen's Compensation Board inspections, 85; safety orders given, 494.

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Pressure-gauges inoperative | 1 | 1 |
| Pressure-gauges defective | 47 | .... |
| Cases of defective riveting | 1 | .... |
| Cases of broken stays or braces | 28 | .... |
| Cases of loose stays or braces | 2 | .... |
| Defective settings | 10 | 3 |
| Boilers with fractured plates | 1 | 1 |
| Boilers with burned plates | 1 | 1 |
| Boilers with blistered plates | 8 | .... |
| Cases of sediment on fire-sheets | 3 | 1 |
| Cases of internal corrosion | 1 | .... |
| Cases of scale or encrustation | 13 | 1 |
| Cases of external corrosion | 8 | 2 |

Summary of Defects observed—*Continued.*

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Cases of defective tubes | 11 | .... |
| Serious leakage around tube-ends | 6 | .... |
| Serious leakage in rivet-joints | 1 | .... |
| Defective blow-off pipes or cocks | 2 | .... |
| Defective water-gauges | 6 | 2 |
| Broken blow-off pipes or cocks | 3 | .... |
| Cases of broken test-cocks | 3 | .... |
| Connections to water-columns without valves | 1 | .... |
| Boilers without fusible plugs | 1 | .... |
| Boilers low at front end | 2 | .... |
| Number of hand-poles, doors having bolts and dogs burned off | 1 | .... |
| Defects in engines | 3 | 1 |
| Cases of defective steam-pipes | 1 | 1 |
| Unclassified defects | 1 | 1 |
| Totals | 166 | 15 |

Remarks.

Above is the detail of my work for the year ended March 31st, 1925.

John Clark,
*Inspector of Steam-boilers, Districts B and D.*

## SUMMARY OF TOTAL WORK DONE IN DISTRICT B FOR YEAR ENDED MARCH 31st, 1925.

Results of Examinations.

| Class. | Number examined. | Passed. | Failed. |
|---|---|---|---|
| Second | 10 | 4 | 6 |
| Third | 30 | 20 | 10 |
| Fourth | 53 | 40 | 13 |
| Special logging-donkey | 10 | 8 | 2 |
| Special heating | 14 | 14 | .... |
| Temporary | 5 | 5 | .... |
| Totals | 122 | 91 | 31 |

Summary of Work done.

| | |
|---|---|
| Number of boiler-plates inspected | 26 |
| Number of boiler-plates rejected | 1 |
| Number of boilers built under Inspector's supervision in British Columbia | 7 |
| Number of new boilers inspected built in United States | 7 |
| Number of new boilers inspected built in British Columbia | 8 |
| Number of new boilers inspected (total) | 15 |
| Number of boilers imported from Eastern Canada (second-hand) | 1 |
| Number of boilers unclassified | 8 |
| Number of first inspections | 24 |
| Number of inspections, external and internal | 771 |
| Number of internal inspections only | 1 |
| Number of external inspections only | 47 |
| Number of special inspections after repairs | 50 |
| Number of visits in addition to inspections | 422 |
| Number of boilers subjected to hydrostatic test | 757 |

SUMMARY OF WORK DONE—*Continued.*

| | |
|---|---|
| Number of boilers on which pressure was reduced | 25 |
| Number of boilers unsafe without extensive repairs | 42 |
| Number of boilers repaired under Inspector's directions | 46 |
| Number of boilers considered unfit for further use | 7 |
| Number of accidents to engines and boilers | 3 |
| Number of accidents resulting in personal injury (not fatal) | 1 |
| Number of accidents resulting in personal injury (fatal) | 1 |
| Number of investigations | 5 |
| Number of inspections completed | 801 |
| Total horse-power of boilers inspected | 53,570 |
| Number of defects observed as per summary | 684 |
| Number of defects considered dangerous | 124 |
| Inspection fees collected | $10,982 46 |
| Letters inward | 1,963 |
| Letters outward | 2,940 |
| Telegrams inward | 11 |
| Telegrams outward | 10 |
| Boilers taken out of service | 4 |

WORK DONE FOR OTHER DISTRICTS.

Workmen's Compensation Board inspections, 170; safety orders, 982.

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves overloaded | 1 | 1 |
| Boilers with safety-valves defective in construction | 10 | 3 |
| Pressure-gauges inoperative | 18 | 18 |
| Pressure-gauges defective | 122 | .... |
| Cases of defective stays | 2 | .... |
| Cases of broken rivets | 4 | .... |
| Cases of defective riveting | 2 | .... |
| Cases of broken stays or braces | 51 | 1 |
| Cases of loose stays or braces | 11 | .... |
| Boilers damaged by low water | 1 | .... |
| Defective settings | 50 | 10 |
| Boilers with fractured plates | 19 | 8 |
| Boilers with burned plates | 5 | 3 |
| Boilers with blistered plates | 8 | .... |
| Cases of sediment on fire-sheets | 39 | 4 |
| Cases of internal corrosion | 45 | 1 |
| Cases of scale or encrustation | 72 | 7 |
| Cases of internal grooving | 8 | 1 |
| Cases of external corrosion | 64 | 5 |
| Cases of defective tubes | 52 | 12 |
| Cases of defective feed-water arrangement | 5 | 1 |
| Serious leakage around tube-ends | 19 | 5 |
| Serious leakage in rivet-joints | 1 | .... |
| Defective blow-off pipes or cocks | 23 | 16 |
| Defective water-gauges | 19 | 11 |
| Broken blow-off pipes or cocks | 3 | .... |
| Water-columns without blow-outs | 1 | .... |
| Cases of broken test-cocks | 29 | .... |
| Connections to water-columns without valves | 2 | .... |
| Boilers without fusible plugs | 4 | .... |
| Boilers low at front end | 10 | .... |
| Cases of serious leakage of fittings | 8 | 6 |

SUMMARY OF DEFECTS OBSERVED—*Continued.*

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Number of hand-holes, doors having bolts and dogs burned off | 1 | .... |
| Defects in engines | 4 | 1 |
| Cases of defective steam-pipes | 6 | 6 |
| Unclassified defects | 6 | 1 |
| Totals | 725 | 121 |

J. D. KAY,
JOHN CLARK,
L. DUCKITT,
*Inspectors of Steam-boilers, District B.*

## INSPECTOR'S REPORT, DISTRICT C.

NELSON, B.C., April 1st, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

SIR,—I have the honour to submit my report for the year ended March 31st, 1925.

Apart from the usual number of small accidents to boilers, such as cracks on circumferential seams at the rivets and on the flanges on locomotive fire-boxes, there have been few accidents during the year.

There was an accident to an engine which was fitted with a riding cut-off valve actuated by an inertia governor. This valve broke into a number of pieces, allowing the engine to race, with a result that the main pulley on the line-shaft was broken. No one was injured.

Appended you will find tabulated report.

ANDREW SUTHERLAND,
*Inspector of Steam-boilers, District C.*

RESULTS OF EXAMINATIONS.

| Class. | Number examined. | Passed. | Failed. |
|---|---|---|---|
| Second | 4 | 3 | 1 |
| Third | 12 | 7 | 5 |
| Fourth | 25 | 24 | 1 |
| Special logging-donkey | 1 | 1 | .... |
| Special creamery | 1 | 1 | .... |
| Special heating | 1 | 1 | .... |
| Special Doukhobor | 1 | 1 | .... |
| Temporary | 1 | 1 | .... |
| Totals | 46 | 39 | 7 |

SUMMARY OF WORK DONE IN DISTRICT C FOR YEAR ENDED MARCH 31ST, 1925.

| | |
|---|---|
| Number of boilers inspected built in Eastern Canada not under inspection | 5 |
| Number of new boilers inspected (total) | 5 |
| Number of boilers imported from Eastern Canada (second-hand) | 1 |
| Number of first inspections | 7 |
| Number of inspections, external and internal | 253 |
| Number of special inspections after repairs | 6 |
| Number of visits in addition to inspections | 216 |
| Number of boilers subjected to hydrostatic test | 249 |

SUMMARY OF WORK DONE IN DISTRICT C FOR YEAR ENDED MARCH 31ST, 1925—*Continued.*

| | |
|---|---|
| Number of boilers on which pressure was reduced | 13 |
| Number of boilers repaired under Inspector's directions | 14 |
| Number of accidents to engines and boilers | 1 |
| Number of investigations | 1 |
| Number of inspections completed | 253 |
| Total horse-power of boilers inspected | 24,617 |
| Number of defects observed as per summary | 370 |
| Number of defects considered dangerous | 7 |
| Inspection fees collected | $3,348.18 |
| Miles travelled by the Inspector | 8,797 |
| Letters inward | 412 |
| Letters outward | 579 |
| Telegrams inward | 24 |
| Telegrams outward | 20 |
| Boilers taken out of service | 2 |

WORK DONE FOR OTHER DISTRICTS.

Inspections made for Workmen's Compensation Board, 33; safety orders given, 176.

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves defective in construction | 1 | .... |
| Pressure-gauges defective | 52 | .... |
| Cases of insufficient staying or bracing | 2 | .... |
| Cases of defective stays | 7 | 2 |
| Cases of broken rivets | 2 | .... |
| Cases of broken stays or braces | 4 | .... |
| Cases of loose stays or braces | 15 | 1 |
| Boilers damaged by low water | 1 | .... |
| Defective settings | 32 | 1 |
| Boilers with fractured plates | 12 | .... |
| Cases of sediment on fire-sheets | 22 | .... |
| Cases of internal corrosion | 9 | .... |
| Cases of scale or encrustation | 52 | .... |
| Cases of internal grooving | 1 | .... |
| Cases of external corrosion | 19 | .... |
| Cases of defective tubes | 12 | 1 |
| Cases of defective feed-water arrangement | 4 | .... |
| Cases of broken feed-valves | 1 | .... |
| Serious leakage around tube-ends | 13 | .... |
| Defective blow-off pipes or cocks | 14 | 2 |
| Defective water-gauges | 2 | .... |
| Broken blow-off pipes or cocks | 1 | .... |
| Cases of broken test-cocks | 46 | .... |
| Connections to water-columns without valves | 1 | .... |
| Neutral sheets not stayed | 1 | .... |
| Neutral sheets improperly stayed | 1 | .... |
| Furnaces out of shape | 9 | .... |
| Boilers low at front end | 29 | .... |
| Cases of serious leakage of fittings | 1 | .... |
| Defects in engines | 3 | .... |
| Totals | 369 | 7 |

ANDREW SUTHERLAND,
*Inspector of Steam-boilers, District C.*

## SENIOR INSPECTOR'S REPORT, DISTRICT D.

VANCOUVER, B.C., April 1st, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

SIR,—Enclosed please find tabulated report for the year 1924–25.

During the year past there has been very little to report out of the ordinary, other than the change from the Public Works Department to the Workmen's Compensation Board.

The elimination of districts will, I think, make the work easier in the outlying territory, and should save considerable time during the course of the year.

Another welcome change is the collection of all fees by the head office. This will make for better collections, as where payments are slow a letter from the Chief Inspector will have more weight than from an Inspector with whom the delinquent is more or less personally acquainted.

There have been no serious accidents in this district during the year, but danger has been averted by the discovery of cracks in lap-seam boilers by means of the test-slots. Some action should be taken in the matter of new boilers with lap-seams, so that in time this type of construction can be eliminated entirely.

Trusting that my work has been satisfactory to you,

I have, etc.,

GEORGE O. MADIGAN,
*Inspector of Steam-boilers, District D.*

SUMMARY OF WORK DONE IN DISTRICT D FOR YEAR ENDED MARCH 31ST, 1925.

| | |
|---|---|
| Number of boiler-plates inspected | 120 |
| Number of boilers built under Inspector's supervision in British Columbia | 15 |
| Number of new boilers inspected built in British Columbia (fittings) | 19 |
| Number of new boilers inspected (total) | 15 |
| Number of boilers imported from United States (second-hand) | 2 |
| Number of boilers unclassified (Retort B.U.I.) | 1 |
| Number of first inspections | 17 |
| Number of external inspections only and test | 1 |
| Number of special inspections after repairs | 1 |
| Number of visits in addition to inspections | 43 |
| Number of boilers on which pressure was reduced | 3 |
| Number of boilers unsafe without extensive repairs | 1 |
| Number of boilers considered unfit for further use | 1 |
| Number of inspections completed | 19 |
| Total horse-power of boilers inspected | 921 |
| Inspection fees collected | $14,112.66 |
| Miles travelled by the Inspector | 617 |
| Letters inward | 2,070 |
| Letters outward | 3,943 |
| Telegrams inward | 1 |
| Telegrams outward | 1 |
| Boilers taken out of service | 1 |

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Cases of external corrosion | 1 | .... |
| Connections to water-columns without valves | 1 | .... |
| Cases of defective steam-pipes | 1 | .... |
| Unclassified defects (damaged by fire) | 1 | 1 |
| Totals | 4 | 1 |

GEORGE O. MADIGAN,
*Inspector of Steam-boilers, District D.*

# INSPECTOR'S REPORT, DISTRICT D.

VANCOUVER, B.C., November 1st, 1924.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

SIR,—As I am resigning on account of ill-health I am herewith enclosing my report of work done up to October 31st, 1924.

I have not found anything requiring special mention.

I have, etc.,

FREDERICK BATH,
*Inspector of Steam-boilers, District D.*

SUMMARY OF WORK DONE IN DISTRICT D FOR YEAR ENDED MARCH 31ST, 1925.

| | |
|---|---|
| Number of boiler-plates inspected | 41 |
| Number of boilers built under Inspector's supervision in British Columbia | 4 |
| Number of boilers inspected built in Eastern Canada not under inspection | 2 |
| Number of new boilers inspected built in United States | 2 |
| Number of new boilers inspected built in British Columbia | 1 |
| Number of new boilers inspected (total) | 6 |
| Number of boilers imported from Eastern Canada (second-hand) | 2 |
| Number of boilers imported from United States (second-hand) | 1 |
| Number of boilers unclassified | 1 |
| Number of first inspections | 13 |
| Number of inspections, external and internal | 368 |
| Number of external inspections only | 12 |
| Number of special inspections after repairs | 5 |
| Number of visits in addition to inspections | 18 |
| Number boilers subjected to hydrostatic test | 260 |
| Number of boilers on which pressure was reduced | 3 |
| Number of boilers unsafe without extensive repairs | 2 |
| Number of boilers repaired under Inspector's directions | 1 |
| Number of inspections completed | 379 |
| Total horse-power of boilers inspected | 19,797 |
| Number of defects observed as per summary | 18 |
| Number of defects considered dangerous | 1 |
| Miles travelled by the Inspector | 1,000 |

WORK DONE FOR OTHER DISTRICTS.

Workmen's Compensation Board inspections, 6; safety orders, 22.

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Cases of insufficient staying or bracing | 12 | .... |
| Boilers with fractured plates | 4 | .... |
| Serious leakage around tube-ends | 3 | .... |
| Serious leakage in rivet-joints | 1 | .... |
| Broken blow-off pipes or cocks | 1 | .... |
| Water-columns without blow-outs | 1 | .... |
| Unclassified defects | 1 | 1 |
| Totals | 23 | 1 |

F. BATH,
*Inspector of Steam-boilers, District D.*

# INSPECTOR'S REPORT, DISTRICT D.

Vancouver, B.C., April 3rd, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

Sir,—I beg to submit my annual report for 1924–25.

The statement varies but little with those of past years, except that it notes for the first time the local manufacture of water-tube boilers of large capacity and high pressure. Three large Sterling type and one Kidwell type were made at a local shop and, especially with the former, results have been quite satisfactory.

During the months of August, September, and October I was on leave of absence by doctor's orders. Mr. Bath resigned from the service on my return at the end of October, thus this office was understaffed for five months of the year.

Since the beginning of 1925 work for the Compensation Board has occupied any spare time which the existing dullness of trade has permitted. In this regard it has to be noted that a line of endeavour so far-reaching in its incidents and multifarious in its nature must be very effectively controlled if confusion to the public, as well as to the officials, is to be averted.

Appreciating your unfailing kindness and sympathy during the past year,

I have, etc.,

Fred Biggam,
*Inspector of Steam-boilers, District D.*

## Remarks.

Of all candidates, approximately 73 per cent. gained certificates.

### Summary of Work done in District D for Year ended March 31st, 1925.

| | |
|---|---|
| Number of boiler-plates inspected | 141 |
| Number of boilers built under Inspector's supervision in British Columbia | 30 |
| Number of boilers inspected built under inspection in Eastern Canada | 1 |
| Number of boilers inspected built in Eastern Canada not under inspection | 2 |
| Number of new boilers inspected built in United States | 3 |
| Number of new boilers inspected (total) | 35 |
| Number of boilers imported from Eastern Canada (second-hand) | 3 |
| Number of boilers imported from United States (second-hand) | 1 |
| Number of boilers unclassified | 14 |
| Number of first inspections | 42 |
| Number of inspections, external and internal | 278 |
| Number of internal inspections only | 1 |
| Number of external inspections only | 13 |
| Number of special inspections after repairs | 5 |
| Number of visits in addition to inspections | 126 |
| Number of boilers subjected to hydrostatic test | 299 |
| Number of boilers on which pressure was reduced | 21 |
| Number of boilers unsafe without extensive repairs | 2 |
| Number of boilers repaired under Inspector's directions | 9 |
| Number of inspections completed | 290 |
| Total horse-power of boilers inspected | 28,279 |
| Number of defects observed as per summary | 203 |
| Number of defects considered dangerous | 5 |
| Miles travelled by the Inspector | 1,886½ |

SUMMARY OF DEFECTS OBSERVED.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves overloaded | 1 | .... |
| Boilers with safety-valves defective in construction | 1 | .... |
| Boilers without pressure-gauges | 2 | .... |
| Pressure-gauges defective | 15 | 2 |
| Cases of defective stays | 1 | .... |
| Cases of broken rivets | 1 | .... |
| Cases of broken stays or braces | 1 | 1 |
| Cases of loose stays or braces | 1 | .... |
| Defective settings | 1 | .... |
| Boilers with fractured plates | 12 | 1 |
| Cases of sediment on fire-sheets | 15 | .... |
| Cases of internal corrosion | 14 | .... |
| Cases of scale or encrustation | 30 | .... |
| Cases of defective tubes | 20 | .... |
| Serious leakage around tube-ends | 15 | 1 |
| Serious leakage in rivet-joints | 3 | .... |
| Defective water-gauges | 1 | .... |
| Broken blow-off pipes or cocks | 2 | .... |
| Cases of broken test-cocks | 29 | .... |
| Boilers low at front end | 8 | .... |
| Cases of serious leakage of fittings | 11 | .... |
| Unclassified defects | 10 | .... |
| Totals | 197 | 5 |

REMARKS.

From August 8th till October 30th I was on leave of absence.

FRED BIGGAM,
*Inspector of Steam-boilers, District D.*

## INSPECTOR'S REPORT, DISTRICT D.

VANCOUVER, B.C., March 31st, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

SIR,—Please find enclosed my annual report for 1924–25.

A feature of the observed defects is the cracked shell-plates in old lap-seam boilers. Two of these samples may be seen in Vancouver at the Pioneer Laundry and Robertson & Hackett Sawmill. The crystallization is unmistakable and the probability of a boiler-explosion is brought nearer. I notice that this type of boiler is being heavily penalized elsewhere, and I am informed that in some quarters its use is prohibited entirely. So long as our laws permit the building of lap-seam boilers for the higher pressures used in modern industry, no Inspector is free to interfere with the subsequent operation of such units, under conditions which produce crystallization, until such crystallization is manifest, and then he is limited to ordering repairs with a possible reduction in pressure. The fatal weakness in this system is of course that hardening of the plate occurs without being noticed, cracks will develop under cover of the laps, and as in hundreds of cases a major accident results. I wish to say here that steam science and the safety movements have left lap-seam construction in boilers far behind, and as one of the body to whom our public looks for some leadership in this matter, I am of the opinion that action is overdue and we should without delay seek such amendments to the "Boiler Inspection Act" as will immediately lessen the menace and ultimately remove this danger to life and property.

Other items observed during the past year were of the wear-and-tear order and capable of rectification by our prescribed methods.

I have, etc.,

J. O'Neill,
*Inspector of Steam-boilers, District D.*

Summary of Work done in District D for Year ended March 31st, 1925.

| | |
|---|---|
| Number of boiler-plates inspected (sets) | 5 |
| Number of boilers inspected built in Eastern Canada not under inspection (electric boiler) | 1 |
| Number of boilers unclassified (retorts, 32; welded boilers below 2 horse-power, 6) | 38 |
| Number of first inspections | 1 |
| Number of inspections, external and internal (boilers) | 464 |
| Number of external inspections only | 16 |
| Number of special inspections after repairs | 12 |
| Number of visits in addition to inspections | 72 |
| Number of boilers subjected to hydrostatic test | 388 |
| Number of boilers on which pressure was reduced | 28 |
| Number of boilers unsafe without extensive repairs | 3 |
| Number of boilers repaired under Inspector's directions | 6 |
| Number of inspections completed | 480 |
| Total horse-power of boilers inspected | 46,805 |
| Number of defects observed as per summary | 245 |
| Number of defects considered dangerous | 11 |
| Miles travelled by the Inspector | 4,070 |
| Telegrams inward | 1 |
| Telegrams outward | 4 |

Summary of Defects observed.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves inoperative | 1 | 1 |
| Boilers with safety-valves overloaded | 2 | 2 |
| Boilers with safety-valves too small | 3 | 3 |
| Boilers without pressure-gauges | 1 | 1 |
| Pressure-gauges defective | 48 | .... |
| Cases of defective stays | 6 | .... |
| Cases of defective riveting | 1 | .... |
| Cases of broken stays or braces | 27 | .... |
| Boilers damaged by low water | 2 | 1 |
| Defective settings | 2 | 1 |
| Boilers with fractured plates | 5 | 4 |
| Boilers with laminated plates | 1 | .... |
| Cases of internal corrosion | 21 | .... |
| Cases of scale or encrustation | 1 | .... |
| Cases of external corrosion | 7 | .... |
| Cases of defective tubes | 33 | .... |
| Cases of defective feed-water arrangement | 50 | .... |
| Serious leakage around tube-ends | 3 | .... |
| Serious leakage in rivet-joints | 1 | .... |
| Defective blow-off pipes or cocks | 11 | 1 |
| Broken blow-off pipes or cocks | 6 | .... |
| Cases of serious leakage of fittings | 1 | .... |
| Defects in engines (cracked cylinders) | 2 | .... |
| Boilers without hand-holes | 1 | .... |
| Cases of defective steam-pipes | 2 | 1 |
| Unclassified defects (rotary retort, sulphite digester, small fittings, vertical boiler with top head cracked through tube-hole ligaments | 7 | .... |
| Totals | 245 | 15 |

REMARKS.

Inspections for Workmen's Compensation Board, 168; safety orders since January 1st, 1925, 345.

Three months of this year spent outfitting the Department cruiser "Insboy" at New Westminster, so that foregoing summary refers to period beginning July 9th, 1924, and ending March 31st, 1925.

J. O'NEILL,
*Inspector of Steam-boilers, District D.*

## SUMMARY OF TOTAL WORK DONE IN DISTRICT D FOR YEAR ENDED MARCH 31ST, 1925.

RESULTS OF EXAMINATIONS.

| Class. | Number examined. | Passed. | Failed. |
|---|---|---|---|
| Second | 11 | 8 | 3 |
| Third | 40 | 23 | 17 |
| Fourth | 80 | 52 | 28 |
| Special logging-donkey | 56 | 42 | 14 |
| Special creamery | 1 | 1 | .... |
| Special heating | 17 | 11 | 6 |
| Totals | 205 | 137 | 68 |

SUMMARY OF WORK DONE.

| | |
|---|---|
| Number of boiler-plates inspected | 307 |
| Number of boilers built under Inspector's supervision in British Columbia | 49 |
| Number of boilers inspected built under inspection in Eastern Canada | 1 |
| Number of boilers inspected built in Eastern Canada not under inspection | 5 |
| Number of new boilers inspected built in United States | 5 |
| Number of new boilers inspected built in British Columbia | 20 |
| Number of new boilers inspected (total) | 56 |
| Number of boilers imported from Eastern Canada (second-hand) | 5 |
| Number of boilers imported from United States (second-hand) | 4 |
| Number of boilers unclassified | 54 |
| Number of first inspections | 73 |
| Number of inspections, external and internal | 1,110 |
| Number of internal inspections only | 1 |
| Number of external inspections only | 42 |
| Number of special inspections after repairs | 23 |
| Number of visits in addition to inspections | 259 |
| Number of boilers subjected to hydrostatic test | 947 |
| Number of boilers on which pressure was reduced | 55 |
| Number of boilers unsafe without extensive repairs | 8 |
| Number of boilers repaired under Inspector's directions | 16 |
| Number of boilers considered unfit for further use | 1 |
| Number of inspections completed | 1,168 |
| Total horse-power of boilers inspected | 95,802 |
| Number of defects observed as per summary | 466 |
| Number of defects considered dangerous | 17 |
| Inspection fees collected | $14,112.66 |
| Miles travelled by the Inspector | 7,573½ |
| Letters inward | 2,070 |
| Letters outward | 3,943 |
| Telegrams inward | 2 |
| Telegrams outward | 5 |
| Boilers taken out of service | 1 |

Summary of Defects observed.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Boilers with safety-valves inoperative | 1 | 1 |
| Boilers with safety-valves overloaded | 3 | 2 |
| Boilers with safety-valves defective in construction | 4 | 3 |
| Boilers without pressure-gauges | 3 | 1 |
| Pressure-gauges defective | 63 | 2 |
| Cases of insufficient staying or bracing | 12 | .... |
| Cases of defective stays | 7 | .... |
| Cases of broken rivets | 1 | .... |
| Cases of defective riveting | 1 | .... |
| Cases of broken stays or braces | 28 | 1 |
| Cases of loose stays or braces | 1 | .... |
| Boilers damaged by low water | 2 | 1 |
| Defective settings | 3 | 1 |
| Boilers with fractured plates | 21 | 5 |
| Boilers with laminated plates | 1 | .... |
| Cases of sediment on fire-sheets | 15 | .... |
| Cases of internal corrosion | 35 | .... |
| Cases of scale or encrustation | 31 | .... |
| Cases of external corrosion | 8 | .... |
| Cases of defective tubes | 53 | .... |
| Cases of defective feed-water arrangement | 50 | .... |
| Serious leakage around tube-ends | 21 | 1 |
| Serious leakage in rivet-joints | 5 | .... |
| Defective blow-off pipes or cocks | 11 | 1 |
| Defective water-gauges | 1 | .... |
| Broken blow-off pipes or cocks | 9 | .... |
| Water-columns without blow-outs | 1 | .... |
| Cases of broken test-cocks | 29 | .... |
| Connections to water-columns without valves | 1 | .... |
| Boilers low at front end | 8 | .... |
| Cases of serious leakage of fittings | 12 | .... |
| Defects in engines | 2 | .... |
| Boilers without hand-holes | 1 | .... |
| Cases of defective steam-pipes | 3 | 1 |
| Unclassified defects | 19 | 2 |
| Totals | 466 | 22 |

G. O. Madigan,
F. Biggam,
F. Bath,
J. O'Neill,
*Inspectors of Steam-boilers, District D.*

## INSPECTOR'S REPORT, DISTRICT E.

New Westminster, B.C., April 6th, 1925.

*John Peck, Esq.,*
*Chief Inspector of Machinery, New Westminster, B.C.*

Sir,—I beg to submit my report for the year 1924–25.

I am pleased to inform you that there have been no accidents to engines or boilers resulting in personal injury to any one, although there have been several cases of damaged boilers.

Two boilers which had been placed over Dutch ovens had so badly deteriorated under this method of firing that they had to be condemned.

Your decision to forbid this method of setting I consider to be in the best interests of safety and economy.

In addition to the work tabulated below, I inspected guards on machines in 116 plants and made requests for 417 guards.

Examinations were held in Vernon, Kamloops, Revelstoke, Prince Rupert, Prince George, Smithers, Telkwa, and Hutton.

Trusting that this may meet with your approval,

I have, etc.,

JAS. DAVIDSON,
*Inspector of Steam-boilers, District E.*

RESULTS OF EXAMINATIONS.

| Class. | Number examined. | Passed. | Failed. |
|---|---|---|---|
| Second | 1 | .... | 1 |
| Third | 11 | 9 | 2 |
| Fourth | 17 | 12 | 5 |
| Special logging-donkey | 1 | 1 | .... |
| Special creamery | 1 | 1 | .... |
| Special heating | 7 | 7 | .... |
| Special threshing | 2 | 2 | .... |
| Temporary | 5 | 5 | .... |
| Totals | 45 | 37 | 8 |

SUMMARY OF WORK DONE IN DISTRICT E FOR YEAR ENDED MARCH 31ST, 1925.

| | |
|---|---|
| Number of drawings and specifications calculated for new boilers | 8 |
| Number of boilers inspected built in Eastern Canada not under inspection | 3 |
| Number of new boilers inspected (total) | 1 |
| Number of boilers imported from Eastern Canada (second-hand) | 3 |
| Number of first inspections | 10 |
| Number of inspections, external and internal | 305 |
| Number of special inspections after repairs | 4 |
| Number of visits in addition to inspections | 50 |
| Number of boilers subjected to hydrostatic test | 305 |
| Number of boilers on which pressure was reduced | 4 |
| Number of boilers unsafe without extensive repairs | 6 |
| Number of boilers repaired under Inspector's directions | 5 |
| Number of boilers considered unfit for further use | 2 |
| Number of accidents to engines and boilers | 2 |
| Number of investigations | 7 |
| Number of inspections completed | 305 |
| Total horse-power of boilers inspected | 20,487 |
| Number of defects observed as per summary | 16 |
| Number of defects considered dangerous | 8 |
| Inspection fees collected | $1,864.27 |
| Miles travelled by the Inspector | 8,497 |
| Letters inward | 1,897 |
| Letters outward | 1,067 |
| Telegrams inward | 1 |
| Telegrams outward | 1 |
| Boilers taken out of service | 2 |

WORK DONE FOR OTHER DISTRICTS.

One boiler inspected for District A. Inspections made for Workmen's Compensation Board, 124; orders given, 436.

### Work done by other Inspectors for this District.

Two boilers inspected at Barkerville.

### Summary of Defects observed.

| Nature of Defects. | Number. | Dangerous. |
|---|---|---|
| Pressure-gauges defective | 2 | 2 |
| Defective settings | 4 | 2 |
| Boilers with burned plates | 4 | 3 |
| Cases of sediment on fire-sheets | 1 | .... |
| Cases of scale or encrustation | 1 | 1 |
| Cases of external corrosion | 1 | 1 |
| Cases of defective tubes | 2 | 1 |
| Boilers without stop-valves | 1 | 1 |
| Totals | 16 | 11 |

Jas. Davidson,
*Inspector of Steam-boilers, District E.*

# LIST OF REGISTERED DESIGNS.

LIST OF BOILER MANUFACTURERS, WITH THEIR NUMBER OF APPROVED AND REGISTERED DESIGNS.

| | |
|---|---|
| Atlas Boiler Works Co., Prince Rupert, B.C. | 1 |
| American Nitrogen Products Co., Vancouver, B.C. | 1 |
| Alley & McLellan, Glasgow, Scotland | 1 |
| Allbright-Nell Co., Chicago, Ill., U.S.A. | 1 |
| American Radiator Co. of Canada, Toronto, Ont. | 31 |
| American Hoist & Derrick Co., St. Paul, Minn., U.S.A. | 38 |
| Ames Iron Works, Oswego, N.Y., U.S.A. | 8 |
| Atlas Engine Works, Indianapolis, U.S.A. | 1 |
| Averling & Porter, Rochester, England | 1 |
| Avery Co., Peoria, Ill., U.S.A. | 2 |
| Babcock & Wilcox, Renfrew, Scotland | 29 |
| Babcock, Wilcox & Goldie-McCulloch, Galt., Ont. | 6 |
| Badenhausen Co., Philadelphia, Pa., U.S.A. | 4 |
| B.C. Iron Works, Victoria, B.C. | 3 |
| B.C. Marine Railway Co., Vancouver and Victoria, B.C. | 7 |
| Beatty, M., & Sons, Ltd., Welland, Ont. | 15 |
| Berg Machinery Manufacturing Co., Toronto, Ont. | 1 |
| Bell, Robert, Engine & Threshing Co., Ltd., Seaforth, Ont. | 7 |
| Blain Boiler Works, Vancouver, B.C. | 1 |
| Brown Hoisting Co., Cleveland, Ohio, U.S.A. | 2 |
| Broderick Boiler Co., Uncre, Ind., U.S.A. | 2 |
| Brownell Co., The, Dayton, Ohio, U.S.A. | 3 |
| Browning Engineering Co., Cleveland, Ohio, U.S.A. | 3 |
| Bucyrus Co., South Milwaukee, U.S.A. | 30 |
| Buffalo Steam Boiler Co., Buffalo, N.Y., U.S.A. | 1 |
| Canadian Allis-Chalmers, Ltd., Toronto, Ont. | 3 |
| Canada Foundry Co., Toronto, Ont. | 22 |
| Canadian Collieries, Ltd., Union Bay, B.C. | 1 |
| Canada Iron Corporation, Ltd., Midland, Ont. | 6 |
| Canadian Northern Railway, Winnipeg, Man. | 3 |
| Canadian Talbot Boiler Co., Vancouver, B.C. | 1 |
| Case, J. I., Threshing Co., Racine, Wis., U.S.A. | 26 |
| Casey-Hedges Co., Ltd., Chattanooga, Tenn., U.S.A. | 1 |
| Canadian Western Manufacturing & Supply Co., Calgary, Alta. | 1 |
| Clyde Iron Works, Duluth, Minn., U.S.A. | 10 |
| Climax Manufacturing Co., Corry, Pa., U.S.A. | 6 |
| Clayton, Son & Co., Leeds, England | 1 |
| Columbiana Boiler Works Co., Ltd., Ohio, U.S.A. | 4 |
| Continental Iron Works, New York, U.S.A. | 1 |
| Cochrane & Co., Annan, Scotland | 1 |
| Decarie Safety Boiler Co., Vancouver, B.C. | 4 |
| Diamond Boiler Works, Minneapolis, U.S.A. | 1 |
| Doty Engine Works, Goderich, Ont. | 6 |
| Dominion Engineering Works, Montreal, Can. | 1 |
| Dutton Co., C. H., Kalamazoo, U.S.A. | 7 |
| Engineering & Machine Co. of Canada, St. Catharines, Ont. | 96 |
| Empire Manufacturing Co., Ltd., Vancouver, B.C. | 14 |
| Erie City Iron Works, Erie, Pa., U.S.A. | 5 |
| Erie Steam Shovel Co., Erie, Pa., U.S.A. | 3 |
| Farquhar Co., A. B., York, Pa., U.S.A. | 7 |
| Foden, Ltd., Sandback, England | 2 |
| Frost Manufacturing Co., Galeburg, Ill., U.S.A. | 36 |

List of Boiler Manufacturers—*Continued.*

| | |
|---|---|
| Garr, Scott & Co., Richmond, Ind., U.S.A. | 1 |
| Gem City Boiler Works, Dayton, Ohio, U.S.A. | 1 |
| Georgian Bay Engine Works, Midland, Ont. | 1 |
| Goldie-McCulloch Co., Galt, Ont. | 51 |
| Grand Trunk Pacific Railway Co. | 2 |
| Gray, Andrew, Marine Iron Works, Victoria, B.C. | 8 |
| Great Northern Railway, Winnipeg, Man. | 2 |
| Gurney Foundry Co., Ltd., Toronto, Ont. | 21 |
| Hamilton Manufacturing Co., W. Peterboro, Ont. | 1 |
| Heaps Engineering Co., Ltd., New Westminster, B.C. | 4 |
| Holt Manufacturing Co., Stockton, Cal., U.S.A. | 2 |
| Houston, Stanwood & Gambie, Cincinnati, Ohio, U.S.A. | 1 |
| Imperial Oil Co., Sarnia, Ont. | 15 |
| International Engineering Works, Amherst, N.S. | 34 |
| International Boiler Works, Stroudsburg, P.A., U.S.A. | 12 |
| Inglis Co., John, Toronto, Ont. | 8 |
| Industrial Works, Bay City, Mich., U.S.A. | 7 |
| Johnston Bros., Ferryburg, Pa., U.S.A. | 4 |
| Keeler, E., Co., Williamsport, Pa., U.S.A. | 1 |
| Kelly Springfield Road Roller Co., Springfield, Ohio, U.S.A. | 1 |
| Kewanee Boiler Co., Kewanee, Ill., U.S.A. | 16 |
| Keystone Driller Co., Beaver Falls, Pa., U.S.A. | 3 |
| Kidwell Boiler Co., Milwaukee, Wis., U.S.A. | 1 |
| Lanz, H., Mannheim, Germany | 1 |
| Leonard & Sons, E., London, Ont. | 40 |
| Lefell & Co., James, Springfield, Ohio, U.S.A. | 1 |
| Lidgerwood Manufacturing Co., Brooklyn, N.Y., U.S.A. | 4 |
| Lyons Boiler Works, DePere, Wis., U.S.A. | 2 |
| Manitowoc Iron Works, Manitowoc, Wis., U.S.A. | 2 |
| Mann's Patent Steam Cart & Wagon, Leeds, England | 3 |
| Marine Iron Works, Victoria, B.C. | 8 |
| Marion Steam Shovel Co., Marion, Ohio, U.S.A. | 52 |
| Marion Osgood Co., Marion, Ohio, U.S.A. | 6 |
| Marsh & Henthorne, Belleville, Ont. | 10 |
| Marsh Engineering Works, Belleville, Ont. | 1 |
| Matheson & Co., J., Ltd., New Glasgow, N.S. | 10 |
| Marshall & Sons Co., Ltd., Gainsborough, England | 1 |
| Mainland Iron Works, Vancouver, B.C. | 1 |
| MacDougall Co., John, Caledonian Iron Works, Montreal, Que. | 3 |
| McMyler Interestate Co., Bedford, Ohio | 3 |
| Mechanical Manufacturing Co., Chicago, Ill., U.S.A. | 1 |
| Murray-Latta Machine Works, Vancouver, B.C. | 1 |
| Nagle Engine & Boiler Works, Erie, Pa., U.S.A. | 1 |
| National Machinery Co., Vancouver, B.C. | 2 |
| Nicol Boiler Works, Vancouver, B.C. | 2 |
| Napanee Iron Works, Napanee, Ont. | 1 |
| North Shore Iron Works, North Vancouver, B.C. | 41 |
| Northern Aluminium Co., Toronto, Ont. | 3 |
| Ofeldt Boiler Co., New York, N.Y., U.S.A. | 1 |
| Oil City Boiler Works, Oil City, Pa., U.S.A. | 1 |
| Orr & Sembower, Reading, Pa., U.S.A. | 19 |
| Pennsylvania Boiler Works, Erie, Pa., U.S.A. | 3 |
| Polson Iron Works, Toronto, Ont. | 1 |
| Port Arthur Shipbuilding Co., Port Arthur, Ont. | 2 |
| Puget Sound Iron & Steel Works, Tacoma, Wash., U.S.A. | 2 |
| Risdon Locomotive & Iron Co., San Francisco, Cal., U.S.A. | 1 |

LIST OF BOILER MANUFACTURERS—*Continued.*

| | |
|---|---|
| Robey & Co., Lincoln, England | 2 |
| Rooke, W. M., Vancouver, B.C. | 37 |
| Ross & Howard Iron Works, Vancouver, B.C. | 35 |
| Sawyer-Massey Co., Ltd., Hamilton, Ont. | 15 |
| Spencer-Bonecourt, Kirke, England | 4 |
| Seattle-Astoria Iron Works, Seattle, Wash., U.S.A. | 1 |
| Standard Iron Works, Vancouver, B.C. | 1 |
| Sterns Co., Erie, Pa., U.S.A. | 1 |
| Schway-Lezotte Boiler Co., Milwaukee, U.S.A. | 1 |
| Sumner Iron Works, Everett, Wash., U.S.A. | 1 |
| Swift & Co., Chicago, Ill., U.S.A. | 1 |
| Taylor-Forbes & Co., Ltd., Vancouver, B.C. | 31 |
| Thew Automatic Shovel Co., Lorraine, Ohio, U.S.A. | 5 |
| Toronto Iron Works, Ltd., Toronto, Ont. | 1 |
| Union Iron Works, Erie, Pa., U.S.A. | 49 |
| Vancouver Engineering Works, Ltd., Vancouver, B.C. | 102 |
| Victoria Machinery Depot Co., Victoria, B.C. | 39 |
| Vulcan Iron Works, Vancouver, B.C. | 134 |
| Vulcan Iron Works, Seattle, Wash., U.S.A. | 1 |
| Vulcan Iron Works, Wilkes-Barre, Pa., U.S.A. | 1 |
| Vulcan Iron Works, Winnipeg, Man. | 5 |
| Waterous Engine Works, Brantford, Ont. | 76 |
| Washington Iron Works, Seattle, Wash., U.S.A. | 55 |
| Western Dry Dock & Shipbuilding Co., Ltd., Port Arthur, Ont. | 3 |
| Wickes Boiler Co., Saginaw, Mich., U.S.A. | 8 |
| Willamette Iron & Steel Works, Portland, Ore., U.S.A. | 13 |
| William Bros., Minneapolis, U.S.A. | 7 |

LIST OF MAKERS WHO HAVE REGISTERED AND APPROVED BOILER ACCESSORY DESIGNS.

*Spring Safety-valves.*

| | INCHES. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 5 | 4½ | 4 | 3½ | 3 | 2½ | 2 | 1½ | 1¼ | 1 | ¾ | ½ |
| J. E. Lonergan & Co., Philadelphia, Pa., U.S.A. | | | | | | 1 | 1 | 3 | 3 | 1 | 1 | | |
| American Steam Gauge & Valve Co., Boston, U.S.A. | 1 | 1 | 1 | 1 | | 2 | 5 | 5 | 3 | 3 | 2 | 2 | |
| Ashton Valve Co., Boston, Mass., U.S.A. | | | | 3 | 2 | | 1 | | | | | | |
| Consolidated Safety Valve Co., New York, U.S.A. | | | | 1 | | 6 | 3 | 3 | 3 | | | | |
| Crane Co., Chicago, Ill., U.S.A. | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 4 | 4 | 2 | 3 | 2 | 2 |
| Crosby Steam Gauge & Valve Co., Chicago, Ill., U.S.A. | | | | | | 5 | 3 | 1 | 1 | | | | |
| E. Leonard & Sons, London, Ont. | | | | | | 1 | 1 | 1 | 1 | | | | |
| Jas. Morrison Brass Mfg. Co., Ltd., Toronto, Ont. | | | 1 | | 2 | 1 | 1 | | 1 | | | | |
| Letson & Burpee, Ltd., Vancouver, B.C. | | | | | | | | | 1 | | | | |
| Lunkenheimer Co., Cincinnati, U.S.A. | | 1 | 1 | 3 | 3 | 6 | 4 | 4 | 1 | 1 | 1 | 1 | 1 |
| T. McAvity & Sons, St. John, N.B. | | | | 1 | | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 |
| Ruston, Procter & Co., Ltd., Lincoln, England | | | | | | | | | 1 | | | | |
| International Engineering Works, Amherst, N.S. | | | | | | 1 | | | | | | | |
| Waterous Engine Works, Ltd., Brantford, Ont. | | | | | | 1 | | | | | | | |
| Rooke, W. M., & Co., Vancouver, B.C. | | | | | 1 | 1 | 1 | | | | | | |
| American Schaeffer & Budenberg, New York | | | | | 1 | | | | | | | | |

*Main Stop-valves.*

| | |
|---|---|
| Canadian Fairbanks-Morse Co., Vancouver, B.C. | 6 |
| Crane & Co., Chicago, Ill., U.S.A. | 12 |
| Empire Manufacturing Co., London, Ont. | 8 |
| G. M. Favis Regulator Co., Chicago, Ill., U.S.A. | 1 |

List of Makers of Boiler Accessories—*Continued.*

*Main Stop-valves*—Continued.

| | |
|---|---|
| Jenkins Bros., Ltd., Montreal, Que. | 16 |
| Lagonda Manufacturing Co., Springfield, Ohio, U.S.A. | 3 |
| Lunkenheimer Co., Cincinnati, Ohio, U.S.A. | 13 |
| Morrison, Jas., Brass Manufacturing Co., Toronto, Ont. | 3 |
| Nathan Manufacturing Co., New York, U.S.A. | 1 |
| Pemberthy Injector Co., Ltd., Windsor, Ont. | 2 |
| Sumner Iron Works, Everett, Wash., U.S.A. | 2 |
| Foster Engineering Co., Newark, N.J., U.S.A. | 10 |
| Rooke, W. M., & Co., Vancouver, B.C. | 1 |
| Spencer-Bonecourt, Kirke, England | 1 |
| Walworth Manufacturing Co., Seattle, U.S.A. | 9 |
| Edward Valve & Manufacturing Co., Chicago | 2 |

*Steam-gauges.*

| | |
|---|---|
| Ashcroft Manufacturing Co., New York, U.S.A. | 6 |
| Federal Gauge Co., Chicago, Ill., U.S.A. | 6 |
| Marshalltown Manufacturing Co., Marshalltown, Ia., U.S.A. | 1 |
| Morrison, Jas., Brass Manufacturing Co., Toronto, Ont. | 2 |
| Rooke, W. M., & Co., Vancouver, B.C. | 1 |
| United States Gauge Co., New York, U.S.A. | 4 |

*Blow-off Cocks and Valves.*

| | |
|---|---|
| Babcock, Wilcox & Goldie-McCulloch, Galt, Ont. | 2 |
| Babcock & Wilcox, Montreal, Que. | 3 |
| Crane Co., Chicago, Ill., U.S.A. | 4 |
| Cadman Manufacturing Co., Pittsburgh, Pa., U.S.A. | 1 |
| Elliott Co., Pittsburgh, Pa., U.S.A. | 1 |
| Engineering Specialties Co., Toronto, Ont. | 4 |
| Homestead Valve Manufacturing Co., Pittsburgh, Pa., U.S.A. | 3 |
| Jenkins Bros., Ltd., Montreal, Que. | 3 |
| Judson Governor Co., Rochester, N.Y., U.S.A. | 1 |
| Lunkenheimer Co., Cincinnati, Ohio, U.S.A. | 7 |
| Morrison, Jas., Brass Manufacturing Co., Toronto, Ont. | 1 |
| Roland Safety Valve Co., Seattle, Wash., U.S.A. | 1 |
| Wickes Boiler Co., Saginaw, Mich., U.S.A. | 1 |
| Everlasting Valve Co., Toronto, Ont. | 1 |
| Rooke, W. M., & Co., Vancouver, B.C. | 1 |
| Spencer-Bonecourt, Kirke, England | 1 |
| W. Powell Co., Cincinnati, U.S.A. | 2 |

*Safety Apparatus.*

| | |
|---|---|
| Kilkenny Automatic Safety Appliance Co., Walla Walla, Wash., U.S.A. | 1 |
| Waterous Engine Works, Brantford, Ont. | 1 |

*Water-gauge Fittings.*

| | |
|---|---|
| Babcock & Wilcox, Montreal, Que. | 4 |
| Edna Brass Manufacturing Co., Cincinnati, Ohio, U.S.A. | 1 |
| Jenkins Bros., Ltd., Montreal, Que. | 1 |
| McAvity & Sons, T., St. John, N.B. | 1 |
| Morrison, Jas., Brass Manufacturing Co., Toronto, Ont. | 6 |
| Nathan Manufacturing Co., New York, U.S.A. | 2 |
| Pemberthy Injector Co., Ltd., Windsor, Ont. | 4 |
| Huyette, Paul B., Co., Philadelphia, Pa., U.S.A. | 1 |
| Waterous Engine Works, Brantford, Ont. | 1 |
| Rooke, W. M., & Co., Vancouver, B.C. | 1 |

LIST OF MAKERS OF BOILER ACCESSORIES—*Continued.*

*Test-cocks (or Valves).*

| | |
|---|---|
| Babcock & Wilcox, Montreal, Que. | 1 |
| Case, J. I., Threshing Machine Co., Racine, Wis., U.S.A. | 1 |
| Huyette, Paul B., Co., Philadelphia, Pa., U.S.A. | 1 |
| Morrison, Jas., Brass Manufacturing Co., Toronto, Ont. | 4 |
| McAvity, T., & Sons, St. John, N.B. | 2 |
| Nathan Manufacturing Co., New York, U.S.A. | 3 |
| Pemberthy Injector Co., Ltd., Windsor, Ont. | 2 |
| Rooke, W. M., & Co., Vancouver, B.C. | 1 |

*Superheaters.*

| | |
|---|---|
| Moore & Co., Seattle, Wash., U.S.A. | 1 |
| Power Specialty Co., New York, U.S.A. | 3 |
| Rooke, W. M., & Co., Vancouver, B.C. | 1 |

*Economizers.*

| | |
|---|---|
| Green Economizer Co., Toronto, Ont. | 3 |
| Sturtevant, B. F., Co., Boston, Mass., U.S.A. | 1 |

*Combined Check and Feed Valves.*

| | |
|---|---|
| Babcock & Wilcox, Montreal, Que. | 1 |
| Lagonda Manufacturing Co., Springfield, Ohio, U.S.A. | 1 |
| Lytte Manufacturing Co., Montreal, Que. | 2 |
| Nathan Manufacturing Co., New York, N.Y., U.S.A. | 6 |
| Morrison, J., Brass Manufacturing Co., Toronto, Ont. | 3 |

*Retorts, Digesters, etc.*

| | | |
|---|---|---|
| Alaska Copper Co., Vancouver, B.C. | Copper kettle | 1 |
| Black-Clawston Co., Hamilton, Ont. | Mangle-cylinder | 1 |
| Bucyrus Copper Co., Bucyrus, U.S.A. | Copper kettle | 1 |
| Engineering & Machine Co. of Canada, St. Catharines, Ont. | Drying-rolls | 1 |
| B.C. Iron Works, Victoria, B.C. | Jacketed tank | 1 |
| Coughlan & Son, Vancouver, B.C. | Rendering-tank | 1 |
| Elliott Copper Co., Vancouver, B.C. | Copper kettle | 4 |
| B.C. Iron Works, Victoria, B.C. | Retort | 1 |
| Horton Steel Works, Ontario | Digester | 2 |
| Letson & Burpee, Ltd., Vancouver, B.C. | Retort | 1 |
| Schaake Co., Ltd., Vancouver, B.C. | Retort | 3 |
| Letson & Burpee, Ltd., Vancouver, B.C. | Steam-jacketed kettle | 1 |
| Schaake Co., Ltd., Vancouver, B.C. | Steam-jacketed kettle | 1 |
| Vulcan Iron Works, Vancouver, B.C. | Digester | 7 |
| Vulcan Iron Works, Vancouver, B.C. | Steam-jacketed retort | 3 |
| Vulcan Iron Works, Vancouver, B.C. | Water-tank | 1 |
| Vulcan Iron Works, Vancouver, B.C. | Air-tank | 1 |
| Vulcan Iron Works, Vancouver, B.C. | Feed-heater | 2 |
| Vancouver Engineering Works, Vancouver, B.C. | Steam-drier | 2 |
| Booth-Coulter, Toronto, Ont. | Copper kettle | 8 |
| Dominion Engineering Co., Ontario | Drying-rolls | 1 |
| Ross & Howard, Vancouver, B.C. | Corliss cylinder | 1 |
| Ross & Howard, Vancouver, B.C. | Rendering-tank | 1 |
| Ross & Howard, Vancouver, B.C. | Air-receiver | 1 |
| Ross & Howard, Vancouver, B.C. | Steam-separator | 1 |
| Ross & Howard, Vancouver, B.C. | Steam-cooker | 1 |
| Manitowoc Engineering Works, Manitowoc, Wis., U.S.A. | Digester | 1 |
| Canadian Ingersoll-Rand Co., Ontario | Tire-vulcanizer | 1 |

List of Makers of Boiler Accessories—*Continued.*

*Retorts, Digesters, etc.*—Continued.

| | | |
|---|---|---|
| Canadian Ingersoll-Rand Co., Ontario | Air-receiver | 1 |
| F. Darling & Co., Montreal | Water-heater | 1 |
| Sumner Iron Works, Everett, Wash. | Engine-cylinder | 1 |
| Pfaudler Co., Rochester | Milk-evaporators | 2 |
| Barrett & Co., Marpole, B.C. | Tube-still | 1 |
| Barrett & Co., Marpole, B.C. | Retort | 1 |
| Canadian Laundry Machinery Co., Toronto, Ont. | Body-ironer | 1 |
| Canadian Laundry Machinery Co., Toronto, Ont. | Flat-ironer | 1 |
| Canadian Laundry Machinery Co., Toronto, Ont. | Mangle-press | 2 |
| City Welders, Vancouver, B.C. | Copper kettle | 1 |
| Heaps Engineering Co., New Westminster, B.C. | Rubber digester | 1 |
| Oakland Brass Co., Oakland, Cal., U.S.A. | Vacuum pan | 1 |
| Pacific Copper Co., Vancouver, B.C. | Copper kettle | 4 |
| Patterson Boiler Works, Vancouver, B.C. | Fish-tank | 1 |
| Patterson Boiler Works, Vancouver, B.C. | Retort | 1 |
| Patterson Boiler Works, Vancouver, B.C. | Air-receiver | 3 |
| Port Arthur Shipbuilding Co., Port Arthur, Ont. | Steam-receiver | 1 |
| Sverson Evaporating Co., Chicago, Ill. | Evaporator | 1 |
| Strong-Scott Co. | Air-heater | 2 |
| Vancouver Engineering Co., Vancouver, B.C. | Digester | 5 |
| Vancouver Engineering Co., Vancouver, B.C. | Nitrate-drier | 1 |
| Vancouver Engineering Co., Vancouver, B.C. | Feed-heater | 1 |
| Vancouver Engineering Co., Vancouver, B.C. | Air-receiver | 1 |
| Vancouver Engineering Co., Vancouver, B.C. | Water-tank | 1 |
| Woodcraft Co., St. Paul, U.S.A. | Tire-vulcanizer | 1 |
| Kewanee Boiler Co., Kewanee, Ill., U.S.A. | Air-receiver | 2 |
| Canadian General Electric, Toronto, Ont. | Electric boiler | 1 |
| Milwaukee Reliance Boiler Co., Milwaukee, U.S.A. | Air-tank | 1 |
| Yarrows, Ltd., Victoria, B.C. | Copper kettle | 4 |
| Willamette Iron & Steel Co., Portland, Ore. | Digester | 1 |
| Yarrows, Ltd., Victoria, B.C. | Saturating-tank | 2 |
| North Shore Iron Works, North Vancouver, B.C. | Still | 1 |
| Waterous Engine Works, Brantford, Ont. | Boiler-stays | 1 |
| Wagner & Sons | Copper kettle | 1 |
| Williams, A. R., Co., Vancouver, B.C. | Mangle-roll | 1 |
| Leader Iron Works, Decatur, Ill., U.S.A. | Air-tank | 1 |

*Feed-water Regulators.*

| | |
|---|---|
| Northern Equipment Co., Erie, Pa., U.S.A. | 1 |
| Babcock & Wilcox, Montreal, Que. | 1 |
| S.C. Regulator Manufacturing Co., Fostoria, U.S.A. | 1 |
| R. Frost & Co., London, England | 2 |

*Oil-burners.*

| | |
|---|---|
| Willamette Iron & Steel Co., Portland, Ore., U.S.A. | 1 |

*Return-steam Traps.*

| | |
|---|---|
| Cole, G. W., Toronto, Ont. | 7 |

*Steam-separators.*

| | |
|---|---|
| Cochrane Co., Philadelphia, Pa., U.S.A. | 5 |

*Stokers.*

| | | |
|---|---|---|
| National Machinery Co., Vancouver, B.C. | McLean underfeed stoker | 1 |

LIST OF MAKERS OF BOILER ACCESSORIES—*Continued.*

*Check-valves.*

Crane Co., Chicago, Ill., U.S.A. ..... 1

*Governors.*

Sumner Iron Works, Everett, Wash., U.S.A. ..... 1

*Reducing-valves.*

Dunham, C. A., Co., Toronto, Ont. ..... 1

# ENGINEERS WHO OBTAINED CERTIFICATES.

(Year ended March 31st, 1925.)

## First Class.

| | |
|---|---|
| Excell, S. H. | 17020 |
| Hemer, Herbert | 17469 |
| Williamson, Alexander | 17015 |

## Second Class.

| | |
|---|---|
| Ashcroft, James | 16924 |
| Bearpark, Frank | 17062 |
| Charlton, A. W. | 16933 |
| Cheyne, J. G. | 17200 |
| Clark, A. M. | 16934 |
| Cook, S. G. | 16939 |
| Cook, H. Y. | 17150 |
| Craigie, N. C. | 17269 |
| Calverley, Walter | 17353 |
| Dale, W. E. | 16942 |
| Farquhar, A. W. | 17455 |
| Hampson, James | 17104 |
| Hunt, J. C. L. | 17402 |
| Jaunay, Hubert | 17034 |
| Jamison, J. W. | 17432 |
| Kidd, G. W. | 17462 |
| Lonsdale, William | 17541 |
| Mercer, John | 17040 |
| Mitchell, G. W. | 16980 |
| McEachern, J. A. | 17042 |
| McLauchlan, L. A. | 16987 |
| Parker, William | 17512 |
| Parkin, W. N. | 17287 |
| Reeve, John | 17045 |
| Semple, William | 17006 |
| Williamson, William | 17351 |

## Third Class.

| | |
|---|---|
| Barnes, Thomas | 17450 |
| Bellis, Frederick | 16926 |
| Boll, H. J. | 17063 |
| Bolton, A. H. | 17086 |
| Bragg, J. L. | 17428 |
| Cardinell, F. O. | 17023 |
| Campbell, G. A. | 17299 |
| Camm, T. A. | 17485 |
| Christensen, Andrew | 17268 |
| Chatters, W. W. | 17383 |
| Clark, L. H. | 17201 |
| Colthurst, Richard | 16935 |
| Cook, S. M. | 16936 |
| Combatley, W. R. | 17101 |
| Collier, H. M. | 17386 |
| Dillon, Robert | 17325 |
| Doran, H. J. | 16750 |
| Douglas, J. F. | 17102 |
| Drysdale, J. R. | 17029 |
| Fraser, D. P. R. | 17076 |
| Garton, Arthur | 17033 |
| Galloway, R. A. | 17069 |
| Gandy, W. J. | 17209 |
| Goss, James | 17489 |
| Goulding, Thos. | 17490 |
| Graham, Thos. | 17491 |
| Greaves, A. W. | 17533 |
| Haynes, J. K. | 16957 |
| Hansen, Edward | 17246 |
| Hawley, C. M. | 17248 |
| Harding, S. E. | 17398 |
| Harrison, Charles | 17494 |
| Henderson, William | 16958 |
| Hollett, Alfred | 16962 |
| Holford, J. C. | 17459 |
| Hopkins, A. E. | 17534 |
| Hughes, E. B. | 17071 |
| Huey, J. W. | 17280 |
| James, Ellis | 16964 |
| Johnston, J. A. | 16967 |
| Johnson, F. C. | 17461 |
| Kenshole, John | 16968 |
| Kelly, A. E. | 17434 |
| Kean, James | 17435 |
| Kitching, A. E. | 17497 |
| Knott, Ronald | 16972 |
| Kyle, Francis | 17334 |
| Landers, Patrick | 17282 |
| Lackey, H. A. | 17436 |
| Lawson, B. R. | 17464 |
| Lindsay, Alexander | 17161 |
| Matthews, R. H. | 16977 |
| Malcolm, A. A. | 17088 |
| Mawhinney, Mathew | 17089 |
| Mastin, James | 17164 |
| Madelay, M. J. | 17409 |
| Mercer, William | 17039 |
| Morrow, S. A. | 17221 |
| Mogg, J. W. | 17307 |
| Muir, George | 16983 |
| Muirhead, William | 17466 |
| Macdonald, W. R. | 16984 |

THIRD CLASS—*Continued.*

McKenzie, Donald ..... 17252
McLellan, Colin ..... 17440
McLean, Hugh ..... 17506
Nelson, H. E. ..... 17547
Orr, E. J. ..... 16993
Osborne, John ..... 17255
Parker, W. C. ..... 17511
Partington, William ..... 17513
Peterson, William ..... 17091
Pickford, H. H. ..... 16996
Porter, John ..... 17116
Ray, J. E. ..... 17316
Rennison, Stanley ..... 17047
Ridsdale, R. S. ..... 17288
Roots, F. C. ..... 17000
Roberts, David ..... 17093
Ross, K. A. ..... 17178
Robertson, A. W. ..... 17179
Simpson, Arthur ..... 17185
Smith, Arthur ..... 17051
Smith, H. J. ..... 17186
Smith, C. A. G. ..... 17344
Tamboline, Olinto ..... 17558
Trodd, G. P. ..... 17121
Turnbull, Joseph ..... 17295
Tweedie, C. J. ..... 17559
Tyler, B. E. ..... 17346
Vickers, Harold ..... 17311
Villers, J. E. ..... 17423
Watson, Charles ..... 17348
Wallace, D. R. ..... 17562
Whittey, Thomas ..... 17095
Whistler, H. W. ..... 17237
Whittam, Arthur ..... 17425
Wither, J. M. ..... 17296
Woods, R. A. ..... 17312
Wolley, F. E. ..... 17426
Wright, John ..... 17360
Zailo, George ..... 17447

FOURTH CLASS.

Adams, H. W. ..... 17625
Addor, Auguste ..... 17521
Allen, William ..... 17194
Allan, W. N. ..... 17522
Anderlang, Matt ..... 17143
Anderson, Theodor ..... 17448
Barrie, R. C. ..... 17145
Barr, G. H. ..... 17196
Batchelor, H. T. ..... 17197
Bazley, A. G. ..... 17376
Baker, R. S. ..... 17378
Boyd, Christopher ..... 17379
Barton, B. A. ..... 17524
Beaddie, D. J. ..... 17198
Belanger, S. C. ..... 17266
Benham, B. H. ..... 17322
Bott, H. B. ..... 17298
Bonfield, R. J. ..... 17627
Boyes, Joseph ..... 17380
Bradford, Edward ..... 16927
Briggs, Fred ..... 17199
Carey, G. B. ..... 16929
Campbell, K. C. ..... 16930
Carey, R. W. ..... 16932
Cameron, Somerled ..... 17148
Carter, Harold ..... 17382
Chester, Henry ..... 17024
Collier, H. M. ..... 16938
Copithorn, G. W. ..... 17059
Corbett, D. C. J. ..... 17149
Coates, Charles ..... 17300
Currie, C. J. ..... 17151
Cummins, A. C. ..... 17452
Davies, E. E. ..... 17324
Danielson, D. T. ..... 17527
Descoteau, William ..... 16946
Dewey, W. A. ..... 17028
Dickinson, G. V. ..... 16876
Docherty, C. T. ..... 16947
Dosie, J. C. ..... 17152
Donahue, Leo ..... 17387
Drinkwater, W. R. ..... 17242
Duncan, Alexander ..... 16948
Dunnett, A. C. ..... 16949
Dunn, William ..... 17030
Duncan, F. C. ..... 17203
Dupis, Frank ..... 17388
English, R. A. ..... 17271
Espley, W. E. ..... 17391
Evans, John ..... 17454
Faull, John ..... 17031
Fenna, J. W. ..... 17206
Fey, Jacob ..... 17530
Fielden, Harry ..... 17032
Flora, R. H. ..... 17068
Forrest, J. A. ..... 16954
Forscutt, Lewis ..... 17204
Forsyth, R. M. ..... 17244
Fox, G. H. ..... 17531
Geesdale, C. S. ..... 17328
Gill, J. P. ..... 16956
Gibson, Robert ..... 17211
Gittins, W. H. ..... 17532
Godfrey, J. P. ..... 17087
Goodwill, J. B. ..... 17153
Goodchild, C. R. ..... 17432
Graham, J. W. ..... 17212
Green, John ..... 17213

Fourth Class—*Continued.*

| | |
|---|---|
| Greer, W. H. | 17493 |
| Guilhamoulie, Paul | 17395 |
| Harnish, E. N. | 17070 |
| Hartrick, G. J. | 17126 |
| Hamilton, J. H. | 17396 |
| Hart, C. S. | 17397 |
| Hedman, A. T. | 16959 |
| Hereron, J. J. | 17214 |
| Herring, George | 17276 |
| Hemming, H. J. | 17458 |
| Hewitt, Otho | 17495 |
| Holford, J. C. | 16961 |
| Holley, Harry | 17279 |
| Holliday, James | 17356 |
| Horne, G. W. | 17536 |
| Hunter, R. W. | 16963 |
| Hunter, E. D. | 17401 |
| Hudson, Percy | 17537 |
| Ingham, F. H. | 17538 |
| James, E. B. | 17158 |
| Jackson, R. Mc. G. | 17539 |
| Johnston, Roland | 17333 |
| Johnson, F. A. | 17540 |
| Kalesnikoff, M. W. | 17403 |
| Keith, T. W. | 16969 |
| Kickbush, F. W. | 17218 |
| King, H. G. | 17463 |
| Lambert, C. F. | 17036 |
| Laird, Marshall | 17072 |
| Larson, A. C. | 17283 |
| Lambdin, Alva | 17303 |
| Land, C. J. | 17437 |
| Lerche, Y. W. | 16976 |
| LeMottee, J. W. | 17108 |
| Leigh, B. T. | 17406 |
| Linke, F. E. | 17162 |
| Litt, R. T. | 17407 |
| Low, F. H. | 17163 |
| Long, L. R. | 17285 |
| Lusse, J. C. | 17408 |
| Marlow, A. W. | 16978 |
| Matusch, C. A. | 17037 |
| Mason, Harold | 17305 |
| Mathers, Robert | 17438 |
| Marshall, Cyril | 17543 |
| Mitchell, Walter | 16981 |
| Miller, A. McKee | 17109 |
| Mills, W. F. | 17129 |
| Michelson, Richard | 17167 |
| Michie, G. J. | 17357 |
| Monroe, Charles | 17041 |
| Mosdell, Robert | 17110 |
| Moore, J. C. | 17306 |
| Morrison, Samuel | 17411 |
| McArthur, W. E. | 17544 |
| McCandlish, R. R. | 17545 |
| McIndoe, G. T. | 17224 |
| MacKenzie, Louis | 17414 |
| McKinnon, Neil | 17441 |
| MacKenzie, D. G. | 17505 |
| McLeod, H. S. | 16988 |
| McLean, J. F. | 17090 |
| McLeod, Norman | 17169 |
| MacLeod, D. R. | 17335 |
| McLaren, John | 17336 |
| McManus, Charles | 16989 |
| MacRae, J. A. | 17415 |
| McRae, Robert | 17472 |
| MacSween, M. A. | 16990 |
| Nees, Lewis | 16991 |
| Neilson, G. E. | 17337 |
| Newman, S. F. | 17507 |
| Norman, C. M. | 17172 |
| Norton, Joseph | 17368 |
| Ogilvie, C. O. | 17549 |
| Oliver, M. J. | 16992 |
| Over, Herbert | 17338 |
| Paulson, Theodore | 17339 |
| Peters, C. W. | 17061 |
| Pheely, A. F. | 16995 |
| Phillip, Edward | 17114 |
| Pozdniakoff, Joseph | 17115 |
| Pring, John | 17551 |
| Reardon, E. J. | 16997 |
| Robertson, James | 17001 |
| Rouse, Eugene | 17092 |
| Rollman, Joseph | 17177 |
| Roddie, J. A. | 17310 |
| Rowse, R. R. | 17516 |
| Russell, James | 17231 |
| Rutherford, A. E. | 17289 |
| Sallis, F. A. | 17342 |
| Sallis, V. R. | 17343 |
| Sallis, W. K. | 17553 |
| Scott, C. J. | 17002 |
| Schufletowski, S. V. | 17003 |
| Scott, Robert | 17182 |
| Seabrook, S. R. | 17183 |
| Sillerud, Belmer | 17050 |
| Smith, C. A. G. | 17081 |
| Smith, N. W. | 17131 |
| Smith, James | 17138 |
| Smith, T. D. | 17420 |
| Spencer, A. J. | 17291 |
| Stockill, Arthur | 17052 |
| Strachan, W. N. | 17119 |
| Stanton, H. F. | 17187 |
| Stevenson, James | 17292 |
| Sullivan, T. W. | 17445 |
| Sylvester, A. G. | 17188 |
| Telford, James | 17189 |
| Templeman, V. E. | 17293 |

FOURTH CLASS—*Continued.*

| | | | |
|---|---|---|---|
| Thompson, T. L. | 17422 | Walker, W. T. | 17083 |
| Thom, David | 17557 | Watkins, A. S. | 17349 |
| Tordoff, Harry | 17476 | Watson, C. H. | 17424 |
| Trowsdale, P. A. | 17082 | Williamson, Frank | 17017 |
| Trimble, E. T. | 17477 | Wilson, Alexander | 17056 |
| Tyler, A. A. | 17519 | Winger, J. W. | 17238 |
| Ullman, A. C. | 17560 | Willis, P. W. | 17563 |
| Valentine, Richard | 17075 | Woodworth, C. C. | 17018 |
| Watson, F. W. | 17012 | Wood, Albert | 17019 |
| Walling, W. R. | 17013 | Wright, W. I. | 17564 |

SPECIAL LOGGING.

| | | | |
|---|---|---|---|
| Adams, W. M. | 17361 | Lampert, Rene | 17364 |
| Anderson, A. G. | 16923 | Leckoff, Sam | 17499 |
| Anderson, C. D. | 17362 | Maars, John | 17165 |
| Anderson, C. F. | 17363 | Marchi, Domissio | 17542 |
| Angel, H. C. | 17375 | Miller, Frederick | 17251 |
| Basiren, Dee | 16925 | MacDougall, G. T. | 17412 |
| Babcock, C. E. | 17240 | Murphy, D. D. | 17222 |
| Baysen, L. R. | 17483 | Murphy, Frederick | 17365 |
| Bindinoff, F. K. | 17058 | McClusky, J. F. | 17111 |
| Berteaux, R. C. | 17241 | McDonald, J. H. | 16985 |
| Binkhorst, Frank | 17146 | McMillan, Hector | 17170 |
| Bray, W. G. | 17381 | Nagle, Thomas | 17253 |
| Buss, W. J. | 17064 | Nelson, Tom | 17043 |
| Campbell, F. A. | 16931 | Nelson, K. A. | 17467 |
| Carter, Harold | 17100 | Nichols, William | 17254 |
| Castle, Alfred | 17134 | Norlander, E. A. | 17508 |
| Carlson, E. E. | 17242 | Nygaard, J. L. | 17509 |
| Crowley, L. M. | 16940 | Olson, J. A. | 17470 |
| Dougan, H. C. | 17124 | Owens, R. W. | 17256 |
| Duckering, Christopher | 17389 | Owens, L. M. | 17257 |
| Ellis, Arthur | 17270 | Palmer, G. O. | 17078 |
| Evendson, Edgar | 17140 | Patch, Jim | 17258 |
| Fernyhough, Harry | 17529 | Reynolds, Charles | 17260 |
| Fox, F. H. | 16955 | Riddell, G. A. | 16999 |
| Ford, E. G. | 17274 | Richardson, D. M. | 17418 |
| Freeson, J. H. | 17125 | Roberts, V. A. | 17419 |
| Fraser, James | 17245 | Roxano, B. D. | 17552 |
| Fulton, E. E. | 17327 | Schelin, M. A. | 17232 |
| Gagne, J. L. | 17210 | Singer, W. H. S. | 17007 |
| Hallett, F. J. | 17247 | Spilsbury, A. J. W. | 17421 |
| Hardie, T. Mc. | 17275 | Stewart, John | 17094 |
| Hemphill, O. W. | 17215 | Stoutenberg, A. J. V. | 17139 |
| Hingley, J. B. | 17471 | Sullivan, P. J. | 17173 |
| Hunter, G. Mc. | 17106 | Swanson, Albert | 17053 |
| Isherwood, Tommy | 17496 | Toothman, J. S. | 17366 |
| James, Sam | 17249 | Wall, A. C. | 17262 |
| Kitsom, John | 16971 | Webster, W. W. | 17326 |
| Knutson, E. C. | 17250 | Williamson, Frank | 17263 |
| Lamb, George | 17060 | Widgren, E. A. | 17367 |
| Layden, Archie | 17284 | | |

SPECIAL HEATING.

| | | | |
|---|---|---|---|
| Batt, John | 17097 | Ball, H. A. R. | 17479 |
| Baxter, Ben | 17144 | Brewer, E. D. | 16928 |

Special Heating—*Continued.*

| | | | |
|---|---|---|---|
| Bridgemen, Henry | 17123 | Loggie, John | 17135 |
| Burr, E. J. | 17147 | McGrath, James | 17136 |
| Butler, Albert | 17429 | Outram, E. P. | 17113 |
| Dawes, A. T. | 17453 | Paterson, Adam | 17174 |
| Denley, William | 16944 | Pitman, Ainsley | 17226 |
| Errington, R. J. | 17204 | Portman, F. G. G. | 17442 |
| Evans, H. C. B. | 17431 | Rashleigh, Walter | 17259 |
| Finlay, James | 17273 | Rossney, J. A. | 17117 |
| Flanagan, D. L. | 17456 | Robertson, Robert | 17230 |
| Flannagan, Samuel | 17326 | Russel, Gray | 17341 |
| Francis, W. J. | 17488 | Shergold, J. W. | 17137 |
| Gardiner, Herbert | 17393 | Sherriff, W. M. | 17184 |
| Glahome, Robert | 17394 | Stevenson, T. G. | 17358 |
| Greenwood, John | 17492 | Stignant, Edward | 17518 |
| Hill, John | 17155 | Tulloch, Derronda | 17190 |
| Holmes, A. E. | 17157 | Walton, Robert | 17191 |
| Holliday, W. H. | 17302 | Watson, Arthur | 17325 |
| Irving, J. R. | 17332 | Walls, F. M. | 17261 |
| Johnson, Ernest | 16966 | Work, Quitman | 17264 |
| Judd, J. W. | 17217 | Zimmerman, Fred | 17192 |
| Keating, J. L. | 17159 | | |

Special Creamery.

| | | | |
|---|---|---|---|
| Dempster, A. M. | 17066 | Skelton, R. J. | 17554 |
| McLeary, Samuel | 17546 | | |

Special Threshing.

| | | | |
|---|---|---|---|
| Tamboline, J. F. | 17132 | Sullivan, T. W. | 17120 |

Special Doukhobor.

| | |
|---|---|
| Stucknoff, G. P. | 17118 |

Temporary.

| | | | |
|---|---|---|---|
| Butterworth, Walter | 17317 | Harrison, W. H. | 17320 |
| Clark, R. M. | 17318 | Hansen, A. B. | 17372 |
| Corliss, A. M. | 17141 | Naphan, Daniel | 17121 |
| Cook, Peter | 17239 | Rowan, A. H. | 17096 |
| Davidson, J. O. | 17319 | Skelton, R. J. | 17370 |
| Frederick, C. B. | 17142 | Whale, H. J. | 17371 |

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