

Inspectors are requested to forward this declaration to the  
Chairman immediately after its submission.

H. G. Robinson

Signature of Inspector.

At Vancouver, B.C., this 24th  
day of February 1912.

That I have tested the said boiler by  
hydraulic test to a pressure of 185 lbs. to  
the square inch, and I believe that it may  
be safely allowed a working pressure of  
185 lbs. to the square inch in accordance  
with the requirements of the law.

Best

Indifferent

Fairly Good

Good

I hereby certify that I have examined  
the within named boiler while it was under  
construction, what the material and work-  
manship in it is:

"CELESTIN"

(2) BOILER IN STEAMER

FORM S. I. 14.

Shop No.

Drawing No.

Register No.

Copy of Boiler Affidavit on file  
in the Steamship Inspector's Office  
Vancouver, B.C.

Register No.

Drawing No.

Shop No.

H. G. Robinson  
Senior Steamship Inspector  
23/1/12

Form S.I. 14

## BOILER AFFIDAVIT

### PARTICULARS TO BE FURNISHED BY MAKER OF BOILER

Stamp or Name of Maker of Material

Tensile Strength in lbs. per sq. in.

Shell Spencer, Newburn-on-Tyne

Furnace Deighton Flue & Tube Co. Leeds

Shell of boiler - 28 1/2 - 32 tons per sq. in.

Combustion Chamber

Flues

Stays

If made in the best manner the following conditions apply—

FIRST—The material in the boiler, whether steel or iron, shall be of the best quality.

SECOND—The rivet holes in the shell shall be drilled in place, the plates being then taken apart and the burrs removed.

THIRD—The longitudinal seams in the shell shall have at least seventy per cent of the strength of the solid plate and be fitted with double butt straps cut across the grain of the plate, and each of at least 3/8 or over the thickness of the plates they cover.

FOURTH—All the seams at least double riveted.

Form of Boiler—Return Tubular, Cylindrical

do If square Furnace, length, breadth, and height

do If Cylindrical furnace, diameter 46 1/2 ext., extreme length 7' 9 1/2 length between rings

thickness of plates 1 1/2 int.

Are joints in furnace butt or lap welded, and number of rows of rivets?

Number of flues, outside diameter, length, thickness Are the joints butt or lap

Number of plain tubes 261, diameter outside 3 1/2 ext., length 7'-6" between plates Plain & W.G. Stay 5/16", 3/8 7/16.

Outside dimensions of boiler	SHELL OF BOILER		DIMENSIONS	RIVETING	No.
	Height	Width			
Length	<u>11' 6"</u>		Height	<u>None</u>	
Diameter outside	<u>14'-11 1/2"</u>		Diameter	<u>None</u>	
Thickness of plate in boiler shell	<u>1-3/8"</u>		Thickness of plate in head	<u>None</u>	
do plate in ends	<u>Tops 1 1/2"</u>		do do in flange	<u>None</u>	
do do	<u>Front Bm 7/8"</u>		Height of chimney	<u>None</u>	
do do	<u>Back Bm 13/16"</u>		Outside diameter	<u>None</u>	
do do			Inside do	<u>None</u>	
do do			Thickness of plate	<u>None</u>	
Percentage of strength in seams	SHELL OF BOILER		SHELL OF BOILER		Inches
	Longitudinal seams	Plate <u>85%</u>	Size of rivet holes	<u>1-5/16"</u>	
	Cylindrical seams	Rivets <u>91%</u>	Pitch of rivet holes in longitudinal seams	<u>4 1/2"</u>	
	Ends of boiler seams	<u>87%</u>	Cylindrical do	<u>2"</u>	
Thickness of plates in furnace	FURNACE		COMBUSTION CHAMBER		Inches
	Top, bottom and sides of furnace	<u>19/32</u>	Thickness of plate in top and sides	<u>11/16"</u>	
	do do flue-head	<u>19/32</u>	Tube sheets	<u>7/8"</u>	
			Flues		

### QUESTIONS TO BE ANSWERED YES OR NO.\*

ANSWER		ANSWER		ANSWER	
Are the holes in longitudinal seams drilled in place?	Yes	Are the holes in the circumferential seams punched?	No	Have the plates been punched before bending?	No
Are the holes in the circumferential seams drilled in place?	Yes	Have the plates been taken apart and burrs taken off?	Yes	Have the plates been punched after bending?	No
Are the holes in the longitudinal seams punched?	No	Have the plates been drilled before bending?	No	Have the plates been drilled after bending?	Yes

\*These questions refer to the plates in the shell of the boiler. In a good boiler all rivet holes will be drilled.

W1067-0042 1/2



PARTICULARS OF BOILER FURNISHED BY THE MAKER.—Concluded

STAYS IN SHELL OF BOILER

	Number	Size	Long End	Short End	Size and Pitch of Rivets	Inches
Number and size of stays in each end of boiler.....	12	3 $\frac{1}{4}$ "			Size and pitch of direct stays in ends of boiler.....	3 $\frac{1}{4}$ " 1'7 $\frac{1}{4}$ "x1-7 $\frac{3}{8}$ "
Number and size of diagonal stays in each end of boiler.....					Number, size and pitch of direct stay ends.....	
Number of plates in each end of boiler.....					Diameter under thread and pitch of screw stays in steam chimney.....	3-1/16"
Number of direct stays from end to end of boiler, and size.....	12	2 $\frac{1}{4}$ "			Number of rivets in stay ends in chimney uptake.....	2-1/16"
Number and diameter of screw stays under throat of steam chimney.....	4	2 $\frac{1}{4}$ "			Number of rows of cross stays in boiler over furnace.....	
Number and size of stays in chimney uptake.....					Diameter under thread and pitch of screw stays in all flat surfaces.....	1 $\frac{5}{8}$ " 3 $\frac{3}{8}$ x9 $\frac{7}{8}$ "
Number and size of cross stays over furnace in boiler.....					Diameter under thread of screw bolts in cross stays over furnace.....	
Number and size of rivets in foot of cross stay over furnace.....					Number, size and pitch of direct stay in steam drum head.....	
Number and diameter under thread of cross stay over furnace.....					Number and size of rivets in end of true head stays.....	
Number and size of diagonal or direct stays in steam drum head.....						
Number and size of diagonal or direct stays in true head.....						

Note—Where crow feet or half moons are used the size of the pins and number and size of rivets in each must be given.

STAYS IN CROWN SHEET OF FURNACE

FURNACE	Number	Size	FURNACE	Number	Size	FURNACE	Inches
Number and size of upright stays from furnace crown sheet to top of boiler.....			Number and size of rivets in each end of upright stay.....			Pitch between centres of upright stays.....	
Number of angle iron over crown sheet of furnace, size of.....			Top.....			Pitch and size of rivets in crow feet of crown of furnace, top and bottom.....	
Number and size of girders over crown sheet of furnace.....			Bottom.....			Pitch and size of bolts in girders in crown sheet.....	
			Distance between centres if angle iron is used, on crown sheet.....			Dimensions of crow feet.....	
			Length of girders on crown sheet of furnace.....			Size of cross pins used in crow feet or stays.....	

Taking the whole area of the crown of furnace, width x length in inches x working pressure, the stay power should be within 6,000 pounds to the square inch. The measurement of furnace crown sheet is to be taken between the ends and sides of furnace, making proper allowance for heads and bend of sides.

STAYS IN CROWN OF BACK CONNECTION

Combustion Chamber

SMOKE BOX	Number	Size	SMOKE BOX	Number	Size	SMOKE BOX	Inches
Number and size of upright stays from crown to top of boiler.....			Number and size of rivets in each end of upright stay.....			Pitch between centres of upright stays.....	
Number of angle iron over crown sheet of furnace, size of.....			Top.....			Pitch and size of rivets in crow feet of crown of furnace, top and bottom.....	
Number and size of girders over crown.....	4 on each crown		Bottom.....			Pitch and size of bolts in girders in crown sheet.....	
			Length of girders in crown of connection.....	eff. length 21'-7 $\frac{1}{2}$ "		Dimensions of crow feet.....	
			Distance between centres of girders in crown.....	9 $\frac{5}{8}$ "		Size of cross pins used in crow feet or stays.....	

Note—Screw stays must be as near as possible at right angles to the surface they support.

Note—Diameter of screw stays to be measured inside of thread.

I hereby declare that the foregoing statement, having reference to the boiler built at Sunderland and completed the 3rd day of June, 1911, as manufactured by me, is in all respects true.

Sworn before me Herbert Sampson Payne Meitland Signature of Maker of Boiler,  
at Sunderland this 19th  
day of September, 19 11. Hugo MacCall  
A Commissioner for Oaths.

Note—Inspectors are to furnish the Chairman, as soon as possible after the boiler is built, the original copy of this declaration.

INSPECTOR'S REPORT AND GENERAL REMARKS

\*The Inspector is to state below, under the head of remarks, the general quality of material and workmanship in the boiler, defining in what respect they are Good, Fairly Good, Indifferent, or Bad as the case may be, and will also note all percentages of reductions in the factor of safety where the pressure has been reduced and to what part these reductions apply as given in the rules accompanying the Act.

MAXIMUM STRENGTH OF THE FOLLOWING PARTS :

Tensile strength of plate to the square inch in the outside shell of boiler, as verified by the maker of the plates, or his agent.....	28 $\frac{1}{2}$ to pounds.
Tensile strength of iron or steel to the square inch of all plates in the interior of boiler, as verified by the maker of the plates, or his agents.....	32 tons per sq. inch.
Tensile strength of materials in stays, bolts, pins or other parts of the boiler to the square inch.....	" "
Percentage of strength of plate at joint as compared to the solid plate.....	85.35 per cent.
Percentage of strength of rivets as compared to the solid plate.....	36.45 "
Percentage of combined plate and rivet section.....	87.99 "
Strength of cylinder shell of boiler, as working pressure, to the square inch.....	199 pounds
Strength of semi-cylindrical shell to the square inch.....	" "
Strength of ends of boiler.....	202 "
Strength of circular surfaces.....	206 "
Strength of flat surfaces.....	185 "
Strength of flues or cylindrical furnaces.....	192 "
Strength of crown of square furnace.....	" "
Strength of smoke box crown.....	185 "
Strength of head of steam drum.....	" "
Strength of neutral part of boiler within steam drum.....	" "
Strength of steam chimney inside.....	" "
Strength of steam chimney outside.....	" "
Working pressure allowed on boiler in the boat.....	185 "

FORMULA  
Tensile strength of plate in pounds  $\times$  percentage of strength of joint  $\times$  twice the thickness of the plate in inches.  
 $\frac{63840 \times .8535 \times 2 \times 1\frac{3}{8}}{177} = 199$  pounds

Inside diameter of the boiler in inches  $\times$  factor of safety.  
 $\frac{177}{4.25}$

NOTE.—Before fixing the factor of safety the Inspector is to include in it all reductions for inferior workmanship or material, as given in the rules, and state whether the boiler has been under his inspection during its construction; also particulars as to the joints in seams in shell, furnaces and flues, describing specially the longitudinal joints in shell, under Remarks.

REMARKS:

Part 1 of Rules.

These two boilers were built under the survey of the Board of Trade and British Corporation. Certificate of Survey and Test produced.

Stamp on Boilers  
B. T.  
Tested to 370 lbs.  
3. 6. 11.  
H. C.

B. C. Test  
No. 1428  
370 Lbs.  
H.N. 3. 6. 11.

At Vancouver, B. C.  
Date 24th February, 19 12.

Signature of Inspector,  
H. G. Robinson

\* "Good" is to be used in this sense as "First Class."

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Lloyd's Register  
Foundation  
W1067-00422/2