

REPORT ON MACHINERY.

Port of Copenhagen

Received at London Office THUR. 12 JUL 1906

No. in Survey held at Copenhagen

Date, first Survey 13th November Last Survey 13th June 1906

Reg. Book. 90 in Splend on the Steel S. S. "Tranquebar" (Yard No. 249)

(Number of Visits 26)

Tons { Gross 3453
Net 2227

Master J. Thomsen Built at Copenhagen By whom built Aktieselskabet Burmeister & Wain Maskin og Skibsbyggeri When built 1906

Engines made at Copenhagen By whom made Aktieselskabet Burmeister & Wain Maskin og Skibsbyggeri when made 1906

Boilers made at Copenhagen By whom made Aktieselskabet Burmeister & Wain Maskin og Skibsbyggeri when made 1906

Registered Horse Power 380 Owners Det Oslasiaske Kompagni Port belonging to Copenhagen

Nom. Horse Power as per Section 28 380 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

ENGINES, &c.—Description of Engines Inverted triple expansion surface condensing No. of Cylinders 3 No. of Cranks 3

Dia. of Cylinders 24 3/4, 42 & 70 Length of Stroke 45 Revs. per minute 65 Dia. of Screw shaft 14 1/4 as per rule 14 1/4 as fitted 14 3/4 Material of screw shaft S. S. Steel

Is the screw shaft fitted with a continuous liner the whole length of the stern tube yes Is the after end of the liner made water tight in the propeller boss yes If the liner is in more than one length are the joints burned yes If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive ✓ If two liners are fitted, is the shaft lapped for protected between the liners ✓ Length of stern bush 5'-2 1/4"

Dia. of Tunnel shaft 12 1/2 as per rule 12 1/2 as fitted 12 1/2 Dia. of Crank shaft journals 13.05 as per rule 13.05 as fitted 14 Dia. of Crank pin 14 Size of Crank webs 20" x 10" Dia. of thrust shaft under collars 14 Dia. of screw 17'-6" Pitch of Screw 17'-6" No. of Blades 4 State whether moveable no Total surface 86 sq ft

No. of Feed pumps 2 Diameter of ditto 4 1/2" Stroke 21" Can one be overhauled while the other is at work yes One evaporator of 15 Tons capacity

No. of Bilge pumps 2 Diameter of ditto 4 1/2" Stroke 21" Can one be overhauled while the other is at work yes

No. of Donkey Engines 1 Sizes of Pumps 6" x 4 1/2" x 10" No. and size of Suctions connected to both Bilge and Donkey pumps 1 5/8" x 10 1/4" x 12"

In Engine Room 4 - 3 1/2" In Holds, &c. 9 - 3 1/2"

No. of Bilge Injections 1 sizes 7" Connected to condenser, or to circulating pump Is a separate Donkey Suction fitted in Engine room & size 2-6" Ballast Donkey

Are all the bilge suction pipes fitted with roses yes Are the roses in Engine room always accessible yes Are the sluices on Engine room bulkheads always accessible none

Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks Valves except blow off cocks

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates yes Are the Discharge Pipes above or below the deep water line above

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel yes Are the Blow Off Cocks fitted with a spigot and brass covering plate yes

What pipes are carried through the bunkers Bilge pipes How are they protected cased in by ceiling

Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times yes

Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges yes

Dates of examination of completion of fitting of Sea Connections 26th April 06 of Stern Tube 26th April 06 Screw shaft and Propeller 28th April 06

Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from upper platform

BOILERS, &c.—(Letter for record S) Manufacturers of Steel Thyssen & Co. Mülheim a. d. Ruhr, Germany

Total Heating Surface of Boilers 6171 sq ft Is Forced Draft fitted no No. and Description of Boilers 3 single end. hor. return tubular

Working Pressure 180 lbs per sq in Tested by hydraulic pressure to 360 lbs per sq in Date of test 2nd April 06 No. of Certificate 244, 245, 246

Can each boiler be worked separately yes Area of fire grate in each boiler 52.5 sq ft No. and Description of Safety Valves to each boiler 2 off, spring loaded Area of each valve 9.62 sq in Pressure to which they are adjusted 180 lbs Are they fitted with easing gear yes

Smallest distance between boilers or uptakes and bunkers or woodwork 15" Mean dia. of boilers 14'-0" Length 11'-0" Material of shell plates S. S. Steel

Thickness 1 3/16" Range of tensile strength 27-30.2 Tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams Double riveted lap joint

long. seams Double riveted double butt straps Diameter of rivet holes in long. seams 1 1/4" Pitch of rivets 8 3/4" Lap of plates or width of butt straps 18 3/4"

Per centages of strength of longitudinal joint rivets 87.8 plate 85.71 Working pressure of shell by rules 180.8 lbs Size of manhole in shell 12" x 16"

Size of compensating ring 2'-6" x 3'-6" No. and Description of Furnaces in each boiler 3 Morisons Material S. S. Steel Outside diameter 3'-10"

Length of plain part top bottom Thickness of plates top bottom 1 1/16" Description of longitudinal joint ✓ No. of strengthening rings ✓

Working pressure of furnace by the rules 182.9 lbs Combustion chamber plates: Material S. S. Steel Thickness: Sides 9/16" Back 9/16" Top 9/16" Bottom 3/4"

Pitch of stays to ditto: Sides 7 1/4" x 8 1/4" Back 7 1/2" x 8" Top 7" x 8" If stays are fitted with nuts or riveted heads nuts inside riveted heads outside Working pressure by rules 181.8 lbs

Material of stays S. S. Steel Diameter at smallest part 1.384 Area supported by each stay 60 sq in Working pressure by rules 200.5 lbs End plates in steam space: Material S. S. Steel Thickness 1" Pitch of stays 15" x 17" How are stays secured Double nuts & washers Working pressure by rules 184.3 lbs Material of stays S. S. Steel

Diameter at smallest part 2.634 Area supported by each stay 255 sq in Working pressure by rules 213.7 lbs Material of Front plates at bottom S. S. Steel Thickness 3/4" Material of Lower back plate S. S. Steel Thickness 13/16" Greatest pitch of stays 13 9/16" x 7 1/2" Working pressure of plate by rules 190 lbs

Diameter of tubes 3 3/8" Pitch of tubes 4 9/16" x 4 9/16" Material of tube plates S. S. Steel Thickness: Front 1" Back 3/4" Mean pitch of stays 9 1/8" x 11 7/16"

Pitch across wide water spaces 14" Working pressures by rules 183 lbs Girders to Chamber tops: Material S. S. Steel Depth and thickness of girder at centre 7 3/4" x 2 x 3/4" Length as per rule 28" Distance apart 8 1/2" Number and pitch of stays in each 3, 7" pitch

Working pressure by rules 180 lbs Superheater or Steam chest; how connected to boiler ✓ Can the superheater be shut off and the boiler worked separately ✓ Diameter ✓ Length ✓ Thickness of shell plates ✓ Material ✓ Description of longitudinal joint ✓ Diam. of rivet holes ✓ Pitch of rivets ✓ Working pressure of shell by rules ✓ Diameter of flue ✓ Material of flue plates ✓ Thickness ✓

If stiffened with rings ✓ Distance between rings ✓ Working pressure by rules ✓ End plates: Thickness ✓ How stayed ✓

Working pressure of end plates ✓ Area of safety valves to superheater ✓ Are they fitted with easing gear ✓

VERTICAL DONKEY BOILER— Manufacturers of Steel

No.	Description			
Made at	By whom made	When made	Where fixed	
Working pressure	tested by hydraulic pressure to	Date of test	No. of Certificate	Fire grate area
Valves	No. of Safety Valves	Area of each	Pressure to which they are adjusted	Date of adjustment
If fitted with casing gear	If steam from main boilers can enter the donkey boiler		Dia. of donkey boiler	Length
Material of shell plates	Thickness	Range of tensile strength	Descrip. of riveting long. seams	
Dia. of rivet holes	Whether punched or drilled	Pitch of rivets	Lap of plating	Per centage of strength of joint
Working pressure of shell by rules	Thickness of shell crown plates	Radius of do.	No. of stays to do.	Dia. of stays
Diameter of furnace Top	Bottom	Length of furnace	Thickness of furnace plates	Description of joint
Working pressure of furnace by rules	Thickness of furnace crown plates		Stayed by	
Diameter of uptake	Thickness of uptake plates	Thickness of water tubes	Dates of survey	

SPARE GEAR. State the articles supplied:— 2 conn. rod top end bolts, 2 " bottom end bolts, 2 main bearing bolts, 1 set coupling bolts, 1 set feed, bilge, air & donkey engine pump valves, 1 set valve seats for feed pumps, 1 set packing rings for each piston, 6 junk ring bolts, a quantity of assorted bolts & nuts, iron of various sizes, 1 cast iron propeller, 1 propeller shaft, 1 pair crank pin brasses, 1 pair crosshead brasses, brasses for circ. pump, 27 plain boiler tubes 12 stay tubes, 56 cond. tubes with screw ferrules, springs for all escape valves, 24 arg. pins.

The foregoing is a correct description,

Manufacturer.

Aktieselskabet
Burmeister & Wain Maskin- og Skibsbyggeri
John Burmeister

Dates of Survey while building	During progress of work in shops	13/11, 11/12, 14/12, 16/12, 20/12, 27/12, 29/12, 10/1, 22/1, 14/2, 17/2, 22/2, 2/3, 3/3, 5/3, 2/4, 10/4, 26/4, 28/4
	During erection on board vessel	30/4, 14/5, 17/5, 31/5, 2/6, 13/6
	Total No. of visits	26

Is the approved plan of main boiler forwarded herewith yes

" " " donkey " " " ✓

Dates of Examination of principal parts—	Cylinders 22/2	Slides 22/2	Covers 22/2	Pistons 5/3	Rods 5/3
Connecting rods	5/3	Crank shaft 22/1	Thrust shaft 10/4	Tunnel shafts 10/4 & 30/4	Screw shaft 11/4
Stern tube	26/4	Steam pipes tested 4/5	Engine and boiler seatings 26/4	Engines holding down bolts 17/5	
Completion of pumping arrangements	19/5	Boilers fixed 17/5	Engines tried under steam 23/5		
Main boiler safety valves adjusted	2/6	Thickness of adjusting washers all about 1/2"			
Material of Crank shaft	S. M. Steel	Identification Mark on Do. R. N. 597-10, 11, 12	Material of Thrust shaft	S. M. Steel	Identification Mark on Do. R. N. 615-4, 6, H.S.
Material of Tunnel shafts	S. M. Steel	Identification Marks on Do. R. N. 612, 13, 14, 16, 17, 18	Material of Screw shafts	S. M. Steel	Identification Marks on Do. R. N. 620-4, 6, A.F. 6
Material of Steam Pipes	Steel	Test pressure 360 lbs per sq"			

General Remarks (State quality of workmanship, opinions as to class, &c.)
In accordance with the rules for special survey we have examined the material and workmanship from the commencement until the final trial under steam and found it good in every respect. All the forgings are of Siemens Martin Steel and have been found good. All the castings are sound and good, the bearings of proper dimensions and sound material. The boiler material has been tested as per rules as per test notes received, and satisfactory hot & cold tests of the material has been carried out by us. The dimensions are as specified and in accordance with the rules and the approved plan. On the trial trip the engines and boilers worked satisfactorily.

It is submitted that this vessel is eligible for THE RECORD F.L.M.C G.06. ELEC: LIGHT

J.M.
12.7.06
J. Romm
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

The amount of Entry Fee..	£ 3 : -	When applied for,
Special Electric Light Donkey Boiler Fee ..	£ 39 : -	9 th July 1906.
Travelling Expenses (if any) £	" : 3 : 9	When received, 27.7.06

Committee's Minute **FRI. 13 JUL 1906**

Assigned

MACHINERY CERTIFICATE WRITTEN.



Certificate (if required) to be sent to Surveyors' office, Copenhagen.

The Surveyors are requested not to write on or below the space for Committee's Minute.