

## REPORT ON MACHINERY.

No. 4285

Date of writing Report 27 Nov 1921 When handed in at Local Office 1 Dec 1921 Port of Philadelphia  
No. in Survey held at Camden N.J. Date, First Survey 18 Oct 1920 Last Survey 24 Nov 1921  
Reg. Book. on the New Steel S.S. "Dixie Arrow" (Number of Visits 43) Gross 8046.27  
Master Built at Camden By whom built New York S.S. Corp. Tons Net 4960  
Engines made at Camden By whom made New York Shipbuilding Corp. when made 1921  
Boilers made at Camden By whom made New York Shipbuilding Corp. when made 1921  
Registered Horse Power Owners Standard Transportation Co. Port belonging to New York  
Nom. Horse Power as per Section 28 625 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

## ENGINES, &amp;c.—Description of Engines

Quadruple Expansion No. of Cylinders Four No. of Cranks 4  
Dia. of Cylinders 24 x 36 x 51 + 45 Length of Stroke 51 Revs. per minute 80 Dia. of Screw shaft as per rule 15.374 as fitted 16 Material of screw shaft 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 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 or protected between the liners Length of stern bush 5'-4"  
Dia. of Tunnel shaft as per rule 13.546 as fitted none Dia. of Crank shaft journals as per rule 14.22 as fitted 15 Dia. of Crank pin 15 Size of Crank webs 10 1/2 Dia. of thrust shaft under  
collars 14 3/4 Dia. of screw 19'-0" Pitch of Screw 15'-0" No. of Blades 4 State whether movable Yes Total surface 123.2 ft<sup>2</sup>  
No. of Feed pumps Two Diameter of ditto 8" Stroke 24" Can one be overhauled while the other is at work Yes  
No. of Bilge pumps Two Diameter of ditto 14 1/2" Stroke 24" Can one be overhauled while the other is at work Yes  
No. of Donkey Engines 14 Sizes of Pumps 1 low bed 12 x 8 x 12 H.C. 10 x 10 x 12 2 Cargo 18 x 14 x 24 1 Bilge 10 x 10 x 12  
In Engine Room 6 @ 3 1/2" dia 1 low bed 12 x 8 x 12 H.C. 10 x 10 x 12 2 Cargo 18 x 14 x 24 1 Bilge 10 x 10 x 12  
2 @ 4" dia fwd cofferdam, 2 @ 4" dia in aft cofferdam No. and size of Suctions connected to both Bilge and Donkey pumps  
No. of Bilge Injections 1 sizes 11" Connected to condenser, or to circulating pump Is a separate Donkey Suction fitted in Engine room & size Yes 3 1/2"  
Are all the bilge suction pipes fitted with roses yes Are the roses in Engine room always accessible yes Are the valves on Engine room bulkheads always accessible  
Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks Values except blow down 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 below  
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 none How are they protected  
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  
Is the Screw Shaft Tunnel watertight Engines aft Is it fitted with a watertight door worked from

## BOILERS, &amp;c.—(Letter for record)

Manufacturers of Steel Lukins Steel Co.  
Total Heating Surface of Boilers 9052 ft<sup>2</sup> Is Forced Draft fitted yes No. and Description of Boilers Three single ended  
Working Pressure 220 lbs Tested by hydraulic pressure to 330 lbs Date of test 20-7-21 No. of Certificate 526  
Can each boiler be worked separately yes Area of fire grate in each boiler 54.45 ft<sup>2</sup> No. and Description of Safety Valves to  
each boiler Two spring loaded Area of each valve 19.24 ft<sup>2</sup> Pressure to which they are adjusted 220 lbs Are they fitted with easing gear yes  
Smallest distance between boilers or uptakes and bunkers 18" Mean dia. of boilers 15'-3" Length 11'-6" Material of shell plates Steel  
Thickness 1 1/16" Range of tensile strength 60,000 to 168,000 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams P.R. lap  
long. seams T.R.D.B.S. Diameter of rivet holes in long. seams 1 1/16" Pitch of rivets 8 1/16" width of butt straps 22 3/4  
Per centages of strength of longitudinal joint rivets 88 plate 82.2 Working pressure of shell by rules 234 lbs Size of manhole in shell 16" x 12"  
Size of compensating ring 31 3/4 x 28 3/4 x 16 No. and Description of Furnaces in each boiler 3 Morrison Material Steel Outside diameter 4'-0 3/8  
Length of plain part top Thickness of plates crown 1 1/16" Description of longitudinal joint weld No. of strengthening rings  
bottom Thickness of plates bottom 1 1/16" Working pressure of furnace by the rules 234 lbs Combustion chamber plates: Material Steel Thickness: Sides 4 1/16" Back 1 1/16" Top 1 1/16" Bottom 1"  
Pitch of stays to ditto: Sides 4 1/16" Back 4 1/16" Top 4 1/16" If stays are fitted with nuts or riveled heads riveted heads Working pressure by rules 226 lbs.  
Material of stays W. Iron Area at smallest part 1.925 ft<sup>2</sup> Area supported by each stay 53.5 ft<sup>2</sup> Working pressure by rules 270 lbs End plates in steam space:  
Material Steel Thickness 1 1/8" Pitch of stays 16 1/4 x 15 How are stays secured nuts Working pressure by rules 224 lbs Material of stays Steel  
Area at smallest part 6.49 ft<sup>2</sup> Area supported by each stay 251.25 ft<sup>2</sup> Working pressure by rules 268 lbs Material of Front plates at bottom Steel  
Thickness 1 1/16" Material of Lower back plate Steel Thickness 1 1/8" Greatest pitch of stays 14 1/4 x 4 1/2 Working pressure of plate by rules 336 lbs  
Diameter of tubes 2 1/2" Pitch of tubes 3 3/4 x 3 1/4 Material of tube plates Steel Thickness: Front 1 1/16" Back 3/4" Mean pitch of stays 9"  
Pitch across wide water spaces 12 3/4 Working pressures by rules 248 lbs Girders to Chamber tops: Material Steel Depth and  
thickness of girder at centre 2 @ 9" x 1" Length as per rule 35 Distance apart 4 3/8 Number and pitch of stays in each H @ 4"  
Working pressure by rules 265 lbs Steam dome: description of joint to shell none % of strength of joint  
Diameter Thickness of shell plates Material Description of longitudinal joint Diam. of rivet holes  
Pitch of rivets Working pressure of shell by rules Crown plates Thickness How stayed  
SUPERHEATER. Type none Date of Approval of Plan Tested by Hydraulic Pressure to  
Date of Test Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler  
Diameter of Safety Valve Pressure to which each is adjusted Is Easing Gear fitted

W164-0234



IS A DONKEY BOILER FITTED?

Yes

If so, is a report now forwarded?

Yes

SPARE GEAR. State the articles supplied: Four each bolts & nuts for top & bottom ends of main beam one 1st & 2nd piston rods & nuts, One set coupling bolts, 2 M.B. Bushes. One set feed valve pp valve Quantity assorted bolts nuts & iron. One section Crank shaft, One tail shaft, 2 prop blades & studs One set top & bottom end brasses, One Ecc strap One 1st & 2nd P. Value Spindle 24 Cylinders & valve cranes & junk pump studs or bolts 60 B.H. tubes 24 Cylinders tubes & ferrule & valve spindle for main C. pp. One set packing rings for 1st & 2nd pistons. One set wear rings for piston rod packing. One set air pp valves & pump rod.

The foregoing is a correct description,

New York Shipbuilding Corporation Manufacturer.

Dates of Survey while building { During progress of work in shops -- 1920. Oct 17. Nov 23. Dec 10. 14. 16. 1921. Jan 18. 19. 25. 27. Feb 14. Mar 15. 17. Apr 2. May 13. 25. Jun 7. 11. 13. 20. 30. During erection on board vessel -- 1921. Sept 13. 17. 19. 20. 21. 22. 26. Oct 3. 5. 10. 13. 18. 20. 27. Nov 1. 4. 7. 9. 12. 14. 17. 21. Total No. of visits 43.

Is the approved plan of main boiler forwarded herewith

Yes

" " " donkey " " " Yes

Dates of Examination of principal parts—Cylinders 25-5-21. Slides 25-5-21. Covers 25-5-21. Pistons 13-5-21. Rods 13-5-21.

Connecting rods 13-5-21. Crank shaft 30-6-21. Thrust shaft 5-10-20. Tunnel shafts ✓. Screw shaft 22-5-20. Propeller 13-5-21.

Stern tube 13-5-21. Steam pipes tested 7-11-21. Engine and boiler seatings 4-2-21. Engines holding down bolts 20-10-21.

Completion of pumping arrangements 1-11-21. Boilers fixed 3-10-21. Engines tried under steam 23-11-21.

Completion of fitting sea connections 26-9-21. Stern tube 19-9-21. Screw shaft and propeller 29-9-21.

Main boiler safety valves adjusted 23-11-21. Thickness of adjusting washers STAR'S 1" CEN S. 1 1/2" PORT S. 1 1/2" 1854. 5" R.A.C.R. 5-10-21. 266. 541. 1. LLOYD'S 3267. 11-5-21.

Material of Crank shaft Steel Identification Mark on Do. 2nd M.B. 576-333. WC 17-12-20. 1st M.B. 576-333. WC 17-12-20. Material of Thrust shaft steel Identification Mark on Do. 2nd M.B. 576-333. WC 17-12-20. 1st M.B. 576-333. WC 17-12-20.

Material of Tunnel shafts ✓ Identification Marks on Do. ✓ Material of Screw shafts Iron Identification Marks on Do. ✓

Material of Steam Pipes Steel Test pressure 660-66

Is an installation fitted for burning oil fuel Yes Is the flash point of the oil to be used over 150°F. Yes

Have the requirements of Section 49 of the Rules been complied with Yes

Is this machinery duplicate of a previous case Yes. If so, state name of vessel S.S. Yankee Arrow

General Remarks (State quality of workmanship, opinions as to class, &c. S.S. Empire Arrow. S.S. Levant Arrow.

This machinery has been built under Special Survey, the materials and workmanship found good & all hydraulic tests satisfactory. Securely fixed in the ship, and tried under steam, found in good & safe working condition. It is submitted that the Vessel be Eligible for the Record of + LMC 11-21. Fitted for Oil Fuel 11-21. F.P. above 150°F.

Certificate (if required) to be sent to The Surveyors are requested not to write on or below the space for Committee's Minute.

The amount of Entry Fee ... £ 30.00  
Special ... £ 531.00  
Donkey Boiler Fee ... £ 35.00  
Travelling Expenses (if any) £ 25.00

When applied for,

Dec. 9th 1921

When received,

23.1.22

William Dutton, J. G. Luff

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

New York DEC 23 1921

Assigned

+ LMC-11-21 Subject

2 MACHINERY CERTS  
WRITTEN 23.1.22  
(dated 13/1/22)



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