

# REPORT ON MACHINERY.

No. 4550  
WED. MAR. 28 1923

Received at London Office

Date of writing Report *6<sup>th</sup> March 1923* When handed in at Local Office *8<sup>th</sup> March 1923* Port of *PHILADELPHIA.*

No. in Survey held at *Chester Pa* Date, First Survey *31<sup>st</sup> Jan, 1921* Last Survey *1<sup>st</sup> March 1923*  
Reg. Book. *Chester Pa* (Number of Visits *66*)

on the *S.S. "PENNSYLVANIA SUN"* Tons } Gross *8862*  
Net *5535*

Master Built at *Chester Pa* By whom built *Sun Shipbuilding Co* When built *1923*

Engines made at *Chester Pa* By whom made *Sun Shipbuilding Co* when made *1923*

Boilers made at *Chester Pa* By whom made *Sun Shipbuilding Co* when made *1923*

Registered Horse Power Owners *Sun Oil Co, Inc.* Port belonging to *Philadelphia.*

Nom. Horse Power as per Section 28 *819* Is Refrigerating Machinery fitted for cargo purposes *No.* Is Electric Light fitted *Yes*

**ENGINES, &c.**—Description of Engines *Quadruple Expansion* No. of Cylinders *4* No. of Cranks *4*  
 Dia. of Cylinders *26.384, 56, 82* Length of Stroke *54* Revs. per minute *79* Dia. of Screw shaft as per rule *16.049* 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 *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 *Yes*  
 If two liners are fitted, is the shaft lapped or protected between the liners *Yes* Length of stern bush *6-0"*  
 Dia. of Tunnel shaft as per rule *14.534* Dia. of Crank shaft journals as per rule *15.26* Dia. of Crank pin *16/4* Size of Crank webs *2-2 x 11/4* Dia. of thrust shaft under collars *15 3/4* Dia. of screw *19.2* Pitch of Screw *17.9* No. of Blades *4* State whether moceable *Yes* Total surface *101.7*  
 No. of Feed pumps *2* Diameter of ditto *over* Stroke *over* Can one be overhauled while the other is at work *Yes*  
 No. of Bilge pumps *2* Diameter of ditto *"* Stroke *"* Can one be overhauled while the other is at work *Yes*  
 No. of Donkey Engines *over* Sizes of Pumps *over* No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room *4* Fire Room *4 @ 3 1/2, 7 @ 3, 1 @ 5* In Holds, &c. *Fore hold, 2 @ 3. Fore pump room 1 @ 3 1/2*  
 Cargo pump room, *2 @ 2 1/2*  
 No. of Bilge Injections *1* sizes *10"* Connected to condenser, or to circulating pump *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 sluices on Engine room bulkheads always accessible *Yes*  
 Are all connections with the sea direct on the skin of the ship *Yes* Are they Valves or Cocks *Both*  
 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 *None* How are they protected *Yes*  
 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 *Yes* Is it fitted with a watertight door *Yes* worked from *Yes*

**BOILERS, &c.**—(Letter for record *Y*) Manufacturers of Steel *Lukens Steel & Iron Co*  
 Total Heating Surface of Boilers *12264* Is Forced Draft fitted *Yes* No. and Description of Boilers *4 S.E. SCOTCH*  
 Working Pressure *220* Tested by hydraulic pressure to *330* Date of test *17-3-21* No. of Certificate *515*  
 Can each boiler be worked separately *Yes* Area of fire grate in each boiler *65.6* No. and Description of Safety Valves to each boiler *3 1/2* *Levin* Area of each valve *9.62* Pressure to which they are adjusted *220* Are they fitted with easing gear *Yes*  
 Smallest distance between boilers or uptakes and bunkers or woodwork *20"* Mean dia. of boilers *15.11 1/4* Length *12.0 7/16* Material of shell plates *Steel*  
 Thickness *1 3/4* Range of tensile strength *26,75 - 31,25* Are the shell plates welded or flanged *No* Descrip. of riveting: cir. seams *DRL*  
 long. seams *TRDBS* Diameter of rivet holes in long. seams *1 1/16* Pitch of rivets *9 7/16* Lap of plates or width of butt straps *25 3/4*  
 Per centages of strength of longitudinal joint rivets *95.5%* Working pressure of shell by rules *236* Size of manhole in shell *12" x 16"*  
 Size of compensating ring *flanged* No. and Description of Furnaces in each boiler *3* *Monison* Material *Steel* Outside diameter *52 7/16*  
 Length of plain part top *23 1/2* Thickness of plates crown *23 1/2* Description of longitudinal joint *Weld* No. of strengthening rings *Yes*  
 Working pressure of furnace by the rules *229* Combustion chamber plates: Material *Steel* Thickness: Sides *1/16* Back *3/4* Top *1/16* Bottom *1/16*  
 Pitch of stays to ditto: Sides *8 1/2 x 6 1/2* Back *8 x 8* Top *8 3/4 x 8 1/2* If stays are fitted with nuts or riveted heads *Both* Working pressure by rules *223*  
 Material of stays *W. I.* Area at smallest part *1.994* Area supported by each stay *68.046* Working pressure by rules *220* End plates in steam space: Material *Steel* Thickness *1 3/16* Pitch of stays *16 5/8 x 16* How are stays secured *D nuts* Working pressure by rules *233* Material of stays *Steel*  
 Area at smallest part *7.0686* Area supported by each stay *240* Working pressure by rules *242* Material of Front plates at bottom *Steel*  
 Thickness *1 1/16* Material of Lower back plate *Steel* Thickness *1 1/32* Greatest pitch of stays *13"* Working pressure of plate by rules *249*  
 Diameter of tubes *2 1/2* Pitch of tubes *3 3/4 x 3 1/2* Material of tube plates *Steel* Thickness: Front *1/32* Back *2 1/32* Mean pitch of stays *9"*  
 Pitch across wide water spaces *13"* Working pressures by rules *225* Girders to Chamber tops: Material *Steel* Depth and thickness of girder at centre *11" x 2"* Length as per rule *3.4* Distance apart *8 3/8* Number and pitch of stays in each *4 @ 8 1/8"*  
 Working pressure by rules *268* Steam dome: description of joint to shell *Yes* % of strength of joint *Yes*

**SUPERHEATER.** Type *Yes* Date of Approval of Plan *Yes* Tested by Hydraulic Pressure to *Yes*  
 Date of Test *Yes* Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler *Yes*  
 Diameter of Safety Valve *Yes* Pressure to which each is adjusted *Yes* Is Easing Gear fitted *Yes*

IS A DONKEY BOILER FITTED? *No*

If so, is a report now forwarded? *✓*

SPARE GEAR. State the articles supplied:— 4 Connecting rod top end bolts & nuts, 2 bottom end bolts & nuts, 4 main bearing bolts, 1 set of coupling bolts, 1 set of feed & bilge pump valves, 1 propeller shaft, 1 set of top end brasses, 1 set of bottom end brasses, 1 propeller blade, 24 follower bolts, 1 set of piston rings & springs for each piston fitted, 8 valve stem studs, 8 piston rod studs, 1 relief valve spring for each one fitted, 50 condenser tubes & 100 ferrules, a quantity of assorted bolts & nuts, iron of various sizes.

The foregoing is a correct description,

*John J. Sew. Prov.*

Manufacturer.

Dates of Survey while building: During progress of work in shops -- 1921: Jan 31, Feb 7, 15, 17, 24, 28, Mar 4, 9, 10, 16, 17, 30, Apr 2, 7, 20, 29, May 4, 6, 16, 20, 23, 31, June 3, 6, 14, 17, 21, 29, July 6, 14, 22, 26, Aug 5, 10, 11, 15, 18, 24, 30, Sep 7, 23, 30, Oct 3, 5. During erection on board vessel --- 1921: Oct 11, 19, 27, Nov 2, 10, 14, 21, 30, Dec 8, 14, 16. 1922: Jan 18, 24, Feb 9, 16, Mar 30, Apr 19. 1923: Jan 10, Feb 5, 8, 21, 25, 28, Mar 1. Total No. of visits 66.

Is the approved plan of main boiler forwarded herewith *✓*

Is the approved plan of donkey boiler forwarded herewith *✓*

Dates of Examination of principal parts—Cylinders 3-10-21. Slides 7-9-21. Covers 3-10-21. Pistons 7-9-21. Rods 6-7-21. Connecting rods 6-7-21. Crank shaft 21-5-21. Thrust shaft 26-9-21. Tunnel shafts 26-9-21. Screw shaft 26-9-21. Propeller 26-9-21. Stern tube 17-5-21. Steam pipes tested 21-2-23. Engine and boiler seatings 30-3-22. Engines holding down bolts 30-3-22. Completion of pumping arrangements 25-2-23. Boilers fixed 8-2-23. Engines tried under steam 28-2-23. Completion of fitting sea connections 10-1-23. Stern tube 14-11-21. Screw shaft and propeller 8-12-21. Main boiler safety valves adjusted 28-2-23. Thickness of adjusting washers *Lock nuts.* Material of Crank shaft *Steel* Identification Mark on Do. *R.S. F.W.T.* Material of Thrust shaft *Steel* Identification Mark on Do. *F.W.T.* Material of Tunnel shafts *Steel* Identification Marks on Do. *R.S. F.W.T.* Material of Screw shafts *Steel* Identification Marks on Do. *F.W.T.* Material of Steam Pipes *Steel* Test pressure *770 lbs.* 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.* "Aowimex" Is this machinery duplicate of a previous case *Yes.* If so, state name of vessel *S.S. Aowimex, Rpt. No. 4243*

General Remarks (State quality of workmanship, opinions as to class, &c. Pumps: For pump room, transfer 7 1/2 x 6 x 10, bilge 6 x 4 x 6, cargo pump room 2-12 x 20 x 13 x 24, bilge 6 x 4 x 6, donkey 14 x 10 1/4 x 12, evaporator 5 1/2 x 4 3/4 x 5, condenser 7 1/2 x 8 1/2 x 10, feed pumps 2-15 x 10 x 24, stripper 12 x 8 x 12, sanitary 7 1/2 x 6 x 10, fresh water 5 1/4 x 4 3/4 x 5, bilge 2-7 1/2 x 6 x 10, fuel oil 2-6 x 4 x 6, auxy condenser 12 x 14 x 14 x 12.

The machinery of this vessel has been built under special survey, the materials and workmanship are of good quality, and the machinery has been securely fitted on board and proved satisfactory under steam trial.

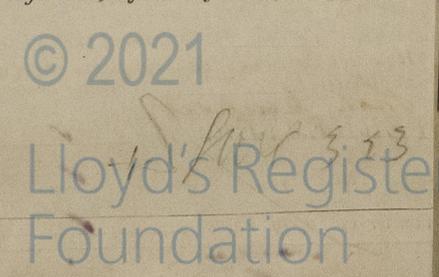
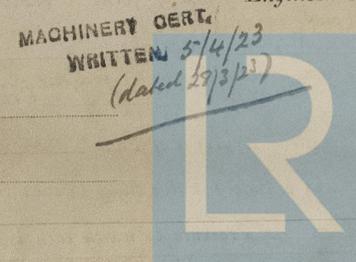
It is submitted that the vessel be eligible for a record of LMC 3, 23, and to have the notation "Fitted for oil fuel 3, 23, flash point above 150°F." in the Register Book.

It is submitted that this vessel is eligible for THE RECORD. + LMC 3. 23. CL. FD. Fitted for oil fuel 3. 23. FP above 150°F.

The amount of Entry Fee ... \$ 30 : 00 - When applied for, Special ... \$ 579 : 75 : 9th March 1923. Donkey Boiler Fee ELEC. LIGHT \$ 250 : 00 : Travelling Expenses (if any) \$ 50 : 00 : When received, 26/3/23 1923

*J. Adamson per E. J. E.* Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute *New York MAR 13 1923* Assigned + LMC-3.23



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