quantity of type required for the compositors, give the important economic results which form the great merit of the new plan. A mould was made and a cast taken in presence of the meeting; and Dr. Wilson concluded by remarking that he believed it was by the improvement and more general application of such processes as this, that the great desideratum of cheap literature was to be achieved, and not by diminishing the profits of retail booksellers, as had recently been attempted. If publishers could be induced to try it, there was no real obstacle in the way of applying the stereotyping process, with all its adjuncts, to such standard works as Layard's "Nineveh," or Macaulay's "History of England," than to Mrs. Stowe's "Uncle Tom;" and if the publisher calculated his price for editions of ten, twenty, or thirty thousand of the one, as they had already done of the other, people would learn to purchase, instead of merely borrowing a hasty reading from some lending library. This, he thought, was the direction in which we must now look for securing the grand desideratum of cheap literature of the highest class, in a way that would secure at once the best interests of author, publisher, and readers; whereas, by reducing the profits of the retailer on the present costly two or three guinea editions, the price was, in reality, brought no nearer the means of the ordinary reader; while the bookseller's interest in their sale, and even in their publication, must be greatly diminished with the increase of his risk; and the chance of sale of costly and valuable books was thereby not unlikely to be diminished.

For the Journal of the Franklin Institute.

U. S. Screw Steamship Princeton. By B. F. ISHERWOOD, Chief Engineer
U. S. Navy.

Continued from page 51.

Performance with the Ericsson Screw.

The following table gives the result of all the steaming done with the Ericsson screw recorded in the log; much more steaming was done with it than is here given, but no record was kept of the performance of the machinery.

The data in the table is wanting in several elements; the consumption of fuel, the proportion of the throttle open, and the condenser back pressure, are not given. I have been informed, however, by the engineers of the vessel at that time, that the throttle was carried about $\frac{1}{4}$ th open, and the steam pressure maintained by driving the fan blast very strongly, the back pressure in the condenser averaging 2 pounds per square inch. Under these circumstances, the initial cylinder pressure would be about 3 pounds less than the boiler pressure.

But the data in the table is chiefly valuable as giving the *slip* of the Ericsson screw in sea navigation, and although the means are derived from a less extensive course of steaming than could be desired to ensure positive certainty, yet they are from a sufficient number of observations taken under different circumstances of weather to give the results with enough accuracy for practical purposes.

Table of the Performance of the U. S. Screw Steamship Princeton, with the first boilers and Ericsson's Screw, under Steam assisted by Sail, on the Atlantic Coast of the United States.

DATE.	Number of hours.	Speed of the vessel per hr. in knots of 6082 $\frac{2}{3}$ feet.	Course of the vessel.	WIND.		Sail.	Sea.	Mean draft of vessel.	ENGINES.			
				Direction.	Kind.				Steam pressure in boilers per sq. in. above atmos.	Steam cut off at from commencement of stroke.	Double strokes of piston made per minute.	Slip of the screw in per centums of its speed.
1844. Mar. 15.	10	6-000	N. by E.	E. or abeam.	Moderate breeze.	To topsails.	Rough.	ft. in. 15 8	lbs. 19-3	$\frac{1}{3}$	28-70	39-44
Nov. 26, 1845,	24	8-719	S. by W.	Abeam.	Fresh breeze.		Moderate.	17 4	16-5	"	29-50	14-55
Jan. 8,	21	8-798	N.	N. E. or forward beam.	Moderate Wind.		"	16 9	15-4	"	27-70	8-00
Feb. 2,	6	8-000	W.	N. or abeam.	Fresh breeze.		"	17 0	13-8	"	25-00	7-31
" 4,	7	8-000	S. W.	N. W. or abm.	"		"	16 6	14-6	"	25-00	7-31
" 21,	3	8-667	S. E.	S. W. or abm.	Moderate breeze.		"	17 0	15-7	"	28-33	11-40
Means,		8-223						16 9 $\frac{5}{8}$	16-1	$\frac{1}{3}$	27-98	15-01

Performance under Steam, unassisted by Sail.

DATE.	Number of hours.	Speed of the vessel per hr. in knots of 6082 $\frac{2}{3}$ feet.	Course of the vessel.	Direction.	Kind.	Sail.	Sea.	Mean draft of vessel.	Steam pressure in boilers per sq. in. above atmos.	Steam cut off at from commencement of stroke.	Double strokes of piston made per minute.	Slip of the screw in per centums of its speed.
1844. Jan. 2.	15	7-733	N. E.	N. E. or ahead.	Moderate breeze.	None.	Smooth.	16 8	16-8	$\frac{1}{3}$	31-26	28-34
Feb. 11.	12	8-083	S. W.	N. W. or abeam.	Fresh breeze.		"	17 6	13-2	"	31-25	25-08
Mar. 14.	13	5-365	N. E.	N. or forward beam.	Moderate Wind.		Rough.	15 10	20-5	"	28-77	45-99
Nov. 27.	18	5-250	S. W.	W. or " "	Strong Wind.		Heavy ahead.	17 6	15-5	"	26-11	47-76
Dec. 9. 1845.	24	8-333	N.	N. or ahead.	Moderate breeze.		Smooth.	17 0	16-6	"	29-46	15-61
Jan. 6 & 7.	7	8-071	S.	N. or aft.	Light airs.		"	16 10	13-7	"	27-07	13-62
" 24	8	6-600	E. S. E.	S. E. or ahead.	Moderate Wind.	None.	Rough.	17 6	15-0	"	25-95	26-33
Feb. 2.	18	5-417	N. W.	N. N. W. or ahead.	Fresh Wind.		"	17 0	14-5	"	23-05	31-93
" 3.	10	8-600	N.	Forward the beam.	Light breezes.		Moderate.	16 9	14-5	"	26-00	4-19
" "	6	5-710	NE by E	S. or on quar	Light airs.		Smooth.	16 9	7-7	"	17-17	3-67
" 4	17	6-280	N. W.	N. W. or ahead.	Moderate breezes.		Moderate.	16 7	15-2	"	24-00	24-21
" 22 & 23	38	7-069	S. W.	S. or forward beam.	Light breeze.		Smooth.	16 10	15-0	"	27-67	26-00
Means,		6-912						16 10 $\frac{1}{8}$	15-6	$\frac{1}{3}$	26-98	25-79

Summary of the Results with the Ericsson Screw.

	Performance under steam assisted by sail.	Performance under steam unassisted by sail.	Mean of the total performance.
Total number of hours,	71	196	267
Speed of the vessel per hour in knots of 6082 $\frac{2}{3}$ feet,	8-226	6-912	7-261
Steam pressure in boilers in lbs. per sq. in. above atmosphere,	16-1	15-6	15-7
Proportion of throttle open,	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Initial steam pressure in cylinders in lbs. per sq. in. above atmos.,	12-1	11-6	11-7
Steam cut off at from commencement of stroke of piston,	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Back pressure in condensers in pounds per square inch,	2	2	2
Mean effective pres. in lbs. pr sq. in. of pistons throughout stroke,	15-3	14-9	15-
Horses power developed by the engines,	404-23	379-59	386-14
Double strokes of piston made per minute,	27-98	26-98	27-25
Slip of the screw in per centums of its speed,	15-01	25-79	22-92
Mean draft of vessel in feet and inches,	16 9 $\frac{5}{8}$	16 10 $\frac{1}{8}$	16 10 $\frac{3}{8}$
Immersion of the centre of the screw below the surface of the water,	9 9 $\frac{5}{8}$	9 10 $\frac{3}{8}$	9 10 $\frac{3}{8}$
Immersed amidship section of the hull in square feet,	358-	360-5	360-5
Displacement of hull in tons,	1028-5	1037-4	1035-3

Performance of the U. S. Screw Steamship Princeton, with the first boilers and Stevens Screw, under the command of Commodore Stockton, in the Atlantic Ocean and Gulf of Mexico.

DATE.	Number of hours.	Speed of the vessel per hr. in knots of 6082 $\frac{2}{3}$ ft.	Course of the vessel.	WIND.		Sail.	Sea.	Mean draft of vessel.	Slip of the screw in per centums of its speed.	ENGINES.			
				Direction.	Kind.					Steam pressure in boilers per sq. in. above atmosphere.	Double strokes of piston made per minute.	Steam cut off at from commencement of stroke.	Anthracite burned per hour with fan blast.
1845.								ft. in.		lbs.		lbs.	
April 7,	14	9-100	N. E. by N.	S. or on qur.	Light breeze.	All sail.		17 0	17-09	18-0	34-30	$\frac{1}{3}$	2700
May 6,	10	7-400	W.	E. by S. or aft.	"	"		17 8	11-35	6-8	20-50	"	1040
" 8,	12	9-200	W by N	N. or abeam.	"	"		17 6		12-7	28-40	"	2217
" 9,	24	9-067	"	"	Mod. wind	"		17 6	3-19	10-6	27-46	"	1715
" 10,	24	8-567	"	"	Light "	"		17 4	2-22	9-5	27-38	"	1434
" 11,	11	8-705	N. W. by W.	N. or forw'd. the beam.	"	"		17 3	1-44	10-0	27-60	"	1042
" 11,	7	7-250	"	N. W. or ah'd.	"	No sail.		17 3	9-37	10-0	25-00	"	1022
" 12,	10	8-100	N. W.	N. E. or abm.	"	All sail.		17 2	1-66	9-9	24-90	"	960
June 25,	16	8-531	E. by S.	E. S. E. or ahead.	Moderate breeze.	No sail.	Smooth.	17 3	8-07	12-3	29-00	"	1440
" 26,	8	8-375	S. E. by E.	E. or forw'd. the beam.	"	"		17 1	11-28	12-2	29-50	"	1224
" 26,	16	8-797	E.	E. or ahead.	"	"		16 11	6-20	12-2	29-31	"	1332
" 27,	24	8-427	S. E. by E.	S. E. or ah'd.	"	"		16 9	10-35	12-1	29-38	"	1344
" 28,	20	7-412	E.	E. or ahead.	"	"		16 8	18-88	12-0	28-55	"	1208
" 28 and 29,	18	8-903	N. E. by E.	E. or forw'd. the beam.	Fresh brez	All sail.		16 6	1-72	10-6	28-31	"	1181
June 29,	8	7-406	N.	W. or abeam.	Light "	"		16 6	2-05	6-0	23-63	"	624
" 30,	24	8-354	N N E.	W. or on qr.	Fresh "	"		16 5	1-90	7-8	25-62	"	720
July 1,	8	7-750	"	N'd. & W'd. or abeam.	Light "	"		16 4	9-46	12-0	26-75	"	804
" 1,	16	5-719	"	N. E. or ah'd.	Mod. "	No sail.		16 4	24-75	9-8	23-75	"	768
" 2,	24	6-692	N. E.	N'd. & E'd. or ahead	Light "	"		16 3	16-48	8-0	25-04	"	844
" 3,	20	8-250	N. W.	N'd. & E'd. or abeam.	Mod. "	All sail.		16 2	1-41	6-8	26-15	"	674

Summary of the Results from the above Table.

	Performance under steam assisted by sail.	Performance under steam unassisted by sail.	Mean of the total performance
Total number of hours,	183 $\frac{1}{2}$	131	3 4 $\frac{1}{2}$
Speed of the vessel per hour in knots of 6082 $\frac{2}{3}$ feet,	8-515	7-615	8-140
Steam pressure in boilers in lbs. per sq. in. above atmosphere,	10	11	10-4
Proportion of throttle open,	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Initial steam pressure in cylinders in lbs. pr sq. in. above atmos.,	6	7	6-4
Steam cut off at from commencement of stroke of piston,	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Back pressure in condensers in pounds per square inch,	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Mean effective pres. in lbs. pr sq. in. of pistons throughout stroke,	10-7	11-4	11-0
Horses power developed by the engines,	274-01	295-92	283-14
Double strokes of piston made per minute,	27-12	27-49	27-27
Slip of the screw in per centums of its speed,	1-88	13-43	6-69
Mean draft of vessel in feet and inches,	16 11	16 7 $\frac{3}{8}$	16 9 $\frac{1}{2}$
Immersion of centre of the screw below the surface of the water,	9 11	9 7 $\frac{3}{8}$	9 9 $\frac{1}{2}$
Pounds of anthracite burned per hour with a fan blast,	1283	1147	1226
Immersed amidship section of the hull in square feet,	361-8	352-6	358
Displacement of the hull in tons,	1041-1	1007-9	1027-4

Table of the Performance of the U. S. Screw Steamship Princeton, under the command of Capt. Engle, with the first boilers and Stevens Screw, under steam assisted by sail, in the Atlantic Ocean and Gulf of Mexico.

Date.	Speed of the vessel per hr. in knots of 6082½ ft.	Course of the vessel.	WIND.		Sail.	Sea.	ENGINES.								
			Direction.	Kind.			Mean draft of vessel.	Slip of the screw in per centums of its speed.	Steam pres. in boil. pr sq. in. abv. atmo.	Double strokes of piston per minute.	Steam cut off at from com. of stroke.	Propor. of throttle open.	Back press. in condenser per gauge.	Anthracite burned pr hr. with moder. fan blast.	
Sept. 7 and 8, 1845,	43 7-400	S. W. ½ W.	S. E. or abeam.	Gentle brez.	"	"	ft. in.	lbs.	lbs.					lbs.	
" 9 " 10, "	31 6-100	"	N. E. or aft.	Light	"	"	17 3	1-17	8-7	23-40			2-2	1120	
Oct. 1, 2 and 3, "	60 7-587	S. W.	S. E. or abeam.	Mod.	"	"	17 1	1-17-5	9-4	21-60			2-2	851	
July 17 and 19, '46,	24 7-460	N. E.	Abeam the beam.	"	To topsails.	Mod.	17 5	1-11-53	11-0	26-80			2-2	1652	
" 30 and 31, "	24 7-750	S. S. W.	E. or abeam the beam.	"	To royals.	Smo'th	16 4	1-42	12-3	23-65			3-2	859	
August 22, "	3 8-750	S. E. by E. ½ E.	S. S. E. or forward beam.	"	Fore&aft sails.	Mod.	17 11	2-50	10-6	23-63			2-2	923	
September 6, "	12 7-667	N. N. E. ½ E.	N'd. & E'd. or for'd. beam.	"	"	Smo'th	18 0	10-60	11-8	26-80			2-7	1700	
" 7, "	8 8-000	"	"	Light	To topsails.	"	17 10	3-84	12-3	26-00			4-2	1360	
" 9 & 10, "	42 8-810	"	Abeam.	Mod.	To topgallants	"	17 7	2-35	13-2	28-20			7-32	4-2	1724
" 14 & 15, "	36 8-000	S. S. E.	E. or abeam.	"	"	"	18 1	4-25	12-5	26-11			7-32	3-5	1761
" 16, "	18 7-800	S. by E.	"	"	To royals.	"	17 11	0-51	12-7	24-50			3-7	1450	
" 17, "	7 6-730	S. E. ½ S.	E. or forward the beam.	"	Fore&aft sails.	Mod.	17 9	10-07	13-0	23-57			3-16	34	1429
" 19 & 20, "	23 6-217	S. S. E.	"	Strong	"	Rough.	17 6	12-25	13-0	22-14			3-16	34	1552
Oct. 2 and 3, "	36 5-200	N. N. E.	"	Light	To topgallants	Smo'th	16 6	18-62	7-6	13-70			1-32	4-4	511
Oct. 31, & Nv. 1, "	39 5-570	S. S. E.	"	Mod.	"	Mod.	17 8	19-41	10-5	21-60			5-32	3-7	1146
Nov. 2 and 3, "	36 6-717	"	W. N. W. or abeam.	"	"	"	17 6	4-58	10-4	22-00			3-16	3-7	1183
" 3 and 4, "	15 6-600	"	E. or abeam.	"	"	"	17 5	6-08	9-5	21-96			3-2	3-2	1114
" 4 and 5, "	27 6-900	"	"	Light	"	"	17 4	5-38	10-6	22-79			3-32	3-4	933
January 25, 1847, "	12 6-400	W. ½ S.	N. W. or on quarter.	Mod.	"	"	17 4	5-38	10-6	22-79			3-	3-	1356
Mar. 29, 30, 31, "	54 7-156	N. N. E. ½ E.	N. or abeam.	Light	"	"	16 8	10-31	10-0	22-30			2-5	2-5	1656
			E. or abeam.	Mod.	"	Smo'th	17 9	12-27	9-7	25-49			3-1	3-1	1290
Means,	7-071						17 5	6-46	10-7	23-61					

Table of the Performance of the U. S. Screw Steamship Princeton, with the first boilers and Stevens Screw, under steam alone, in the Atlantic Ocean and Gulf of Mexico.

DATE.	Number of hours.	Speed of the vessel per hour, in knots per 6082 $\frac{2}{3}$ feet.	Course of the Vessel.	WIND.		Sea.	Mean draft of vessel.	Slip of the screw in per cents. of its speed.	ENGINES.					Anthracite coal burned per hour with moderate fan blast.
				Direction.	Kind.				Steam pressure in boiler per square inch above atmos.	Double strokes of piston per minute.	Steam cut off at from commencement of stroke.	Proportion of throttle open.	Back pressure in condenser per gauge.	
August 7, 1845.	14	6-278	S. S. W. $\frac{1}{2}$ W.	S. E. or for'd the beam.	Light breeze.	"	17 0	10-00	lbs. 10-5	21-80	$\frac{1}{4}$	$\frac{3}{16}$	lbs. 2.	lbs. 1083
September 5 and 6, " "	32	7-400	N. E.	S. W. or ahead.	"	"	17 6	13-91	11-4	27-50	"	$\frac{1}{4}$	2-2	1600
Sep. 13, 16, 17, 18 & 19, " "	101	7-339	S. S. W.	N. E. or ahead.	Gentle "	"	17 8	13-83	11-7	27-47	"	$\frac{1}{4}$	2-2	1508
October 3 and 4, " "	24	8-000	S. S. W.	S. W. or ahead.	Light	"	16 4	9-76	10-8	27-70	"	$\frac{1}{4}$	1-2	1854
Oct. 24, 25, 26 & 27, 1846.	96	5-240	S. S. W.	N. and E. or ahead.	Fresh wind.	Heavy head sea.	16 9	8-89	11-2	24-40	"	$\frac{1}{4}$	2-7	2154
May 12 and 13, " "	25	7-000	S. S. W.	S. S. W. or ahead.	Light breeze.	Ordinary.	18 0	8-85	11-4	24-00	"	$\frac{1}{4}$	2-2	1402
" 20 and 21, " "	49	6-882	S. by W $\frac{1}{2}$ W.	N. E. or on quarter.	Light breeze.	Smooth.	17 10	8-00	12-4	22-70	"	$\frac{1}{4}$	2-7	1402
July 14, 15 and 16, " "	12	6-555	N. N. E. $\frac{1}{2}$ E.	N. E. or ahead.	Light breeze.	Smooth.	17 10	8-00	12-4	22-70	"	$\frac{1}{4}$	2-7	1402
" 19, " "	12	6-431	S. S. W.	N. E. or ahead.	Mod. breeze.	"	16 5	21-87	13-0	23-00	"	$\frac{1}{4}$	2-2	1129
" 29, " "	6	6-000	S. S. W. $\frac{1}{2}$ E.	S. E. or ahead.	Light breeze.	Moderate.	17 10	8-00	12-0	23-00	"	$\frac{1}{4}$	2-2	1067
August 1, " "	31	8-001	S. S. W. $\frac{1}{2}$ E.	"	Light breeze.	Smooth.	18 0	14-77	9-8	22-00	"	$\frac{1}{4}$	2-2	900
September 7 and 9, " "	8	7-357	S. E. $\frac{1}{2}$ S.	N. E. or ahead.	"	"	17 9	8-00	12-8	27-18	"	$\frac{1}{4}$	2-2	1726
" 17, 18 & 19, " "	27	6-430	S. E. $\frac{1}{2}$ S.	Variable.	"	Moderate.	17 9	9-00	13-0	23-30	"	$\frac{1}{4}$	3-7	1870
" 19, " "	9	6-333	S. E. $\frac{1}{2}$ S.	E. S. E. or for'd beam.	Gentle "	"	17 8	17-92	13-3	24-48	"	$\frac{1}{4}$	3-7	1892
" 21 and 22, " "	36	6-111	S. by E. $\frac{1}{2}$ E.	E. or ahead.	"	"	17 7	14-63	12-7	26-20	"	$\frac{1}{4}$	3-16	1583
October 1 and 2, " "	15	3-900	S. by E. $\frac{1}{2}$ E.	S. E. or for'd the beam.	"	Long swell.	17 4	15-24	12-7	22-53	"	$\frac{1}{4}$	3-16	1548
November 3, " "	3	5-000	N. N. E.	S. and E. or on quar.	Mod.	Smooth.	16 7	8-00	8-9	13-23	"	$\frac{1}{4}$	3-16	637
" 8 and 4, " "	24	6-412	S. S. W.	S. W. or ahead.	"	Moderate.	17 6	23-02	10-0	20-30	"	$\frac{1}{4}$	3-6	1209
" 12 and 13, " "	31	5-174	N. by W $\frac{3}{4}$ W.	S. E. or ahead.	Light	"	17 5	8-83	9-3	21-86	"	$\frac{1}{4}$	3-2	1154
" 17 and 18, " "	19	3-184	N. W.	N. W. or for'd the beam.	Light breeze.	Smooth.	17 2	23-14	10-5	21-60	"	$\frac{1}{4}$	3-16	1105
" 20, " "	12	5-400	N. W. $\frac{1}{2}$ S.	Ahead.	Gale.	Heavy head sea.	16 10	46-47	9-9	18-59	"	$\frac{1}{4}$	3-6	1248
January 26, 1847.	20	6-000	W. $\frac{1}{4}$ S.	N. W. or ahead.	Strong wind.	Mod. head sea.	16 9	15-60	9-8	20-00	"	$\frac{1}{4}$	3-16	1183
Means,		6-243		N. or ahead.	Calm.	Smooth.	16 9	15-92	10-0	22-30	"	$\frac{1}{4}$	3-6	1160
							17 1	17-79	11-5	24-11	$\frac{1}{4}$	$\frac{1}{4}$	2-9	1511

Table of the Performance of the U. S. Screw Steamship Princeton, with the last boilers, under steam assisted by sail, in the Atlantic Ocean and Mediterranean Sea.

DATE.	Speed of the vessel per hr. in knots of 6082 $\frac{2}{3}$ ft.	Number of hours.	Course of the vessel.	WIND.		Sail.	Sea.	Mean draft of vessel.	Slip of the screw in per centums of its speed.	ENGINES.					Anthracite burned pr hr. with a mod. fan blast.
				Direction.	Kind.					Steam pres. in boil. pr sq. in. abv. atmos.	Double strokes of piston per minute.	Steam cut off at from com. of stroke.	Propor. of throttle open.	Back press. in condenser per gauge.	
July 25 & 26, 1847,	24.9-542		E.	S. or ahead.	Fresh breeze.	To topgallants	Moder.	17 6 20-7		lbs.	12-2 24-71	1-31	1-24	2-2	lbs. 854
" 30, "	18.5-830		E. by S.	S. S. W. or for'd beam.	Light "	"	"	17 4 27-19		lbs.	10-6 23-60	1-24	1-24	2-2	968
August 2, "	8.7-000		S. E.	E. N. E. or for'd beam.	Gentle "	To topsails.	Sm'o'th	17 1 9-79			13-0 24-25	3-16	3-16	2-2	925
" 10, 11 & 12 "	47.8-413		S. E. by E.	S. W. or ahead.	Mod. "	"	Moder.	17 3 5-76			11-8 27-90	3-16	3-16	2-2	1294
" 13 & 14, "	40.8-224		"	N. E. or ahead.	"	"	"	17 1 4-03			11-6 26-88	3-16	3-16	2-2	1428
September 13, "	10.6-200		"	S. W. or ahead.	Gentle "	To topsails.	Sm'o'th	16 8 13-89		lbs.	12-5 22-50	3-16	3-16	2-2	845
" 22, "	7.5-430		E. N. E.	S. E. or forward beam.	Light "	"	"	17 5 21-33			11-5 21-57	3-16	3-16	2-2	914
Dec. 3 and 4, "	36.6-143		E. by S.	N. E. or forward beam.	Mod. Gale.	"	Rough.	17 6 20-01			11-7 24-00	3-16	3-16	2-2	1167
" 5, "	21.8-100		W. by N.	"	Strong wind	"	Moder.	17 5 5-72			13-0 26-85	3-16	3-16	2-2	1154
January 7, 1848,	12.7-830		W. by N.	S. W. or forward beam.	Mod. breeze.	"	"	16 9 7-97			11-5 26-59	3-16	3-16	2-2	1467
" 26, "	3.7-500		E. by S.	N. or ahead.	Light "	"	"	16 10 15-39			12-7 27-67	3-16	3-16	2-2	1697
March 5 and 6, "	14.7-150		"	S. W. or on quarter.	"	"	Sm'o'th	17 2 9-03			12-3 24-64	3-16	3-16	2-2	1915
" 19, "	12.7-333		N. N. E. $\frac{1}{2}$ E.	E. by S. or ahead.	Moderate.	Fore, aft & courses.	"	16 9 15-12			12-3 27-00	3-16	3-16	2-2	1824
Means.	7-580							17 2 $\frac{1}{2}$ 7-76			13-3 25-68	3-16	3-16	2-2	1253

Table of the Performance of the U. States Screw Steamship Princeton, with the last boilers, under steam unassisted by sail, in the Atlantic Ocean and Mediterranean Sea.

DATE.	Number of hours.	Speed of the vessel per hr. in knots of 6082 $\frac{2}{3}$ ft.	Course of the vessel.	WIND.		Sea.	Mean draft of vessel.	Slip of the screw in per cents of its speed.	ENGINES.					Anthracite burned pr hr. with a mod. fan blast.
				Direction.	Kind.				Steam press. in boil. pr sq. in. abv. atmo.	Double strokes of piston per minute.	Steam cut off at from com. of stroke.	Proport. of throttle open.	Back press. in condenser per gauge.	
July 31, & Aug. 1 & 2, '47.	64	6-303	S. E.	S. E. or ahead.	Light breeze.	Smooth.	17 3 17-96	11-9 24-01	lbs.				lbs. 1093	
August 3, 4, 5, 6, & 7, "	106	6-218	S. E. by E.	"	Strong	Rolling.	16 10 20-14	12-2 24-33	2-5 1193				2-5 1193	
" 13, "	5	7-600	"	S. W. or abeam.	Light	Moderate.	17 1 8-65	11-8 26-00	3-16 1444				2-5 1444	
September 10 and 11, "	32	4-155	"	S. E. or ahead.	Mod. Gale.	Very Rough.	16 10 38-34	13-4 21-06	3- 1182				3- 1182	
" 16, "	9	5-000	N. E.	N. E. by E. or ahead.	Mod. breeze.	Smooth.	16 9 32-36	12-0 23-10	3-16 3-2				3-16 3-2	1438
" 21, "	4	5-750	E.	—	Calm.	"	17 6 20-14	12-0 22-50	3- 828				3- 828	
" 22 and 23, "	10	5-856	N. E.	—	"	"	17 5 15-47	12-7 21-65	3- 830				3- 830	
" 28, "	9	6-220	S. E.	E. or forward the beam.	Strong breeze.	"	17 6 21-53	12-0 24-77	3- 1245				3- 1245	
" 29, "	18	5-330	E. by N.	E. or ahead.	"	Moderate.	17 5 30-01	13-0 23-80	3- 1170				3- 1170	
October 6 and 7, "	13	5-700	S. S. E.	S. E. or for'd. the beam.	Light	Smooth.	17 5 21-53	12-3 23-70	2-7 1008				2-7 1008	
Oct. 12, 13 and 14, "	42	5-452	S. E.	S. or forward the beam.	Strong	"	17 2 25-27	12-2 22-80	3-16 2-7				3-16 2-7	2153
Nov. 3, "	15	5-400	E. by S.	N. E. or for'd. the beam.	Light	"	17 6 28-80	13-0 23-70	3-16 2-5				3-16 2-5	1177
" 12, "	6	5-670	S. W. by S.	N. N. W. or on quarter.	Strong	Rough.	16 9 26-70	13-0 24-17	2-5 1100				2-5 1100	
" 14 and 15, "	10	6-500	S. W. $\frac{3}{4}$ S.	(Not given.)	Light	Smooth.	17 6 17-43	13-8 24-60	3-16 2-6				3-16 2-6	1160
December 28, "	5	6-150	S. E. by S.	N. E. or abeam.	"	"	17 2 23-12	14-0 25-00	3-16 2-2				3-16 2-2	1120
January 6 and 7, 1848, "	32	6-375	W. by N.	S. W. or for'd. the beam.	"	"	16 9 19-55	12-0 24-75	2-5 1250				2-5 1250	
" 21 and 22, "	17	7-294	N. E.	N. W. or abeam.	Light airs.	"	17 6 15-58	11-7 27-00	2-5 1527				2-5 1527	
" 25 and 26, "	15	6-328	W. by N.	N. W. or for'd. the beam.	Strong breeze.	Moderate.	16 10 23-53	11-8 25-86	2-5 1619				2-5 1619	
" 27, "	10	7-400	E. by S.	S. E. or for'd. the beam.	Light	Smooth.	16 8 13-61	10-8 26-60	2-5 1662				2-5 1662	
March 2 and 3, "	20	5-150	W. by N.	W. by N. or ahead.	Strong wind.	Rough head sea.	17 6 33-08	12-0 24-05	2-2 1615				2-2 1615	
" 15 and 16, "	16	5-683	"	S. W. or for'd. the beam.	Strong breeze.	Smooth.	17 0 28-07	12-5 24-69	2-2 1865				2-2 1865	
Means,		5-932					17 0 $\frac{2}{3}$ 22-76	12-3 24-00	2-5 1245				2-5 1245	

Summary of the Performance of the U. S. Screw Steamship Princeton, while under the command of Captain Frederick Engle, U. S. Navy, embracing all the Steaming done between July 25, 1845, and July 17, 1849, recorded in the Steam Logs at the Navy Department.

	With the first boilers and Stevens' screw, in the Atlantic Ocean and Gulf of Mexico.			With the last boilers and Stevens' screw, in the Atlantic Ocean & Mediterranean Sea.		
	Under steam assisted by sail.	Under steam alone.	Mean of total steam'g. with and without sail.	Under steam assisted by sail.	Under steam alone.	Mean of total steam'g. with and without sail.
OBSERVED.						
Total number of hours,	550	641	1191	252	458	710
Speed of vessel per hour in knots of 6082½ feet,	7·071	6·343	6·680	7·580	5·932	6·517
Steam pressure in boilers in pounds per square inch above atmosphere,	10·7	11·5	11·1	12·3	12·3	12·3
Steam pressure in cylinders in pounds per square inch above atmosphere,	5·7	7·5	6·6	7·3	7·3	7·3
Double strokes of piston (and revolutions of screw) per minute,	23·61	24·11	23·88	25·68	24·00	24·60
Steam cut off at from commencement of stroke of piston,	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
Proportion of throttle open,	·170	·216	·195	·163	·168	·166
Back pressure in condensers, in lbs. per square inch,	3·1	2·9	3.	2·3	2·5	2·4
Pounds of anthracite coal burned per hour, with a moderate fan blast,	1290	1511	1409	1253	1245	1248
Tons of anthracite coal burned per 24 hours, with a moderate fan blast,	13·82	16·19	15·10	13·42	13·34	13·38
Mean draft of vessel in feet and inches,	17·5	17·1	17·3	17·2½	17·0⅜	17·1¼
Immersion of centre of screw below surface of water in feet and inches,	10·5	10·1	10·3	10·2½	10·0⅜	10·1¼
Immersed amidship area of hull in sq. ft.	376·7	364·3	371·8	370·5	365·2	368·
Displacement of the hull in tons,	1096·1	1050·3	1077·8	1073·2	1053·7	1061·7
CALCULATED.						
Slip of screw in per cent. of its speed,	6·46	17·79	12·58	7·76	22·76	17·21
Mean effective pressure on pistons in pounds per square inch,	9·40	9·95	9·70	11·40	11·20	11·27
Horses power developed by engines,	209·56	226·52	218·67	276·43	253·82	261·84
Pounds of coal burned per hour per square foot of grate surface,	9·627	11·276	10·515	9·213	9·155	9·176
Pounds of coal burned per hour per sq. foot of heating surface,	0·533	0·624	0·582	0·418	0·415	0·416
Cubic feet of steam of atmospheric pressure furnished per minute, from sea water of twice the natural concentration, with temperature of feed water 100° F., inclusive of loss by blowing off to maintain that concentration, and of loss between valves and pistons and in steam ports, but <i>exclusive</i> of the steam required to work the fan blast,	. . .	. . .	3689·850	. . .	. . .	3926·524
Pounds of steam evaporated per hour, from one square foot of heating surface, under the above conditions,	. . .	. . .	3·363	. . .	. . .	2·887
Pounds of steam evaporated per hour, by one pound of coal, under the above conditions,	. . .	. . .	5·777	. . .	. . .	6·940