

RATES OF DECK WATCHES
ON TRIAL
FOR PURCHASE BY THE BOARD OF ADMIRALTY,
AT THE
ROYAL OBSERVATORY, GREENWICH.
FROM 1888 NOVEMBER 24 TO 1889 FEBRUARY 16.

(1) WEEKLY RATES IN ORDER OF TIME

NAME OF MAKER	No.	Nov. 24 to Dec. 1.	Dec. 1-8.	Dec. 8-15.	Dec. 15-19.	Dec. 19-22.	Dec. 22-25.	Dec. 25-29.	Dec. 29 to Jan. 5.	Jan. 5-12.	Jan. 12-19.
		Watch Horizontal. Dial up.	Watch Horizontal. Dial up.	Watch Vertical. Pendant up.	Watch Vertical. Pendant right.	Watch Vertical. Pendant left.	Watch Vertical. Pendant up.	Watch Horizontal. Dial up.			
Isaac	10811	-11.1	-16.0	-8.5	-25.1	-27.3	-48.6	-15.0	-5.0	-10.5	-5.4
Usher and Cole	26314	+13.6	+10.7	+11.9	+27.3	+44.1	+47.1	+44.6	+15.4	+0.8	+5.7
Isaac	10814	-5.5	-12.8	-15.3	-39.3	-44.4	-63.6	-21.7	-7.5	-0.3	+2.7
Buckney	30403	+0.1	+1.1	-19.2	-6.1	-6.6	-8.6	+10.1	-8.5	+2.7	+1.8
Buckney	30401	-3.8	-2.6	-20.6	-12.8	+23.8	-10.6	+5.8	-11.7	-7.1	-4.5
Brookbank and Co.	214	-17.4	-17.1	+0.8	+11.0	+24.0	+4.2	+23.4	+4.7	-10.6	-7.1
Klean and Co.	62110	+39.3	+37.9	+40.3	+65.4	-6.1	-71.6	+55.8	+0.6	+0.0	+1.0
Isaac	10830	-24.0	-30.0	-25.1	-10.1	+43.9	+6.8	+4.7	-11.0	-5.0	-2.0
Buckney	30199	+7.9	+1.8	+15.2	+6.8	+40.7	-16.7	+15.9	+15.8	-6.1	-2.8
J. Poole and Co.	5005	+3.8	-0.5	-2.8	-27.1	-10.0	-25.2	-23.6	+13.8	+25.5	+16.6
Hall	3008	-21.2	-29.8	-23.1	-17.0	-7.9	-8.7	+7.7	-20.2	-12.2	-11.0
Usher and Cole	26281	-5.6	-11.9	+12.4	-4.5	+9.5	-11.7	+3.7	+12.8	+2.9	+6.9
Buckney	30200	+14.6	+19.5	+1.8	+17.7	+27.1	+28.6	-4.0	-4.4	-0.5	-0.5
Buckney	30395	-20.8	-25.1	-22.0	-13.9	+40.4	+5.9	+11.2	-10.7	-27.5	-26.7
Ashley	2737	-14.4	-21.3	+3.0	+1.4	-3.3	-4.5	+11.2	+12.2	-13.1	-11.0
Ashley	3621	-4.0	-14.8	+6.8	+9.1	+7.2	+6.8	+20.3	+15.1	-12.9	-9.2
Kendal and Dent	26175	-43.7	-52.1	-63.2	-35.9	-63.9	-63.4	-21.7	-28.0	-15.5	-41.0
Isaac	10795	-19.8	-27.1	-8.9	-5.4	+41.8	-43.8	+12.4	-5.3	-21.7	-24.5
Isaac	26451	-17.5	-19.8	+6.5	-10.1	+19.4	+13.9	-1.8	-20.6	-26.7	-26.7
Brookbank and Co.	213	-21.5	-22.8	-12.8	+10.6	+55.3	+43.6	+27.1	+27.0	+17.4	+17.1
Buckney	30202	+15.6	+17.2	+23.9	+4.6	+55.7	-17.8	+6.8	+23.5	-4.4	+10.0
J. Poole and Co.	6484	-18.7	-7.5	+11.1	+9.6	+26.1	-7.7	+1.6	+13.2	-21.4	-21.3
Buckney	30402	+23.3	+23.2	+21.5	+21.9	+73.7	+57.9	+30.6	+45.4	+14.5	+3.7
Klean and Co.	62111	-71.1	-75.8	-40.1	-33.6	+10.0	-27.4	-12.6	-37.0	-71.0	-68.0
Kendal and Dent	25450	-54.9	-58.7	-73.5	-46.7	+29.5	-50.1	-54.5	-56.8	-54.2	-55.0
Brookbank and Co.	74212	+43.1	+33.8	+2.1	-4.5	+6.1	+19.8	+5.8	+15.3	+21.0	+59.9
Player	25454	+24.3	+45.5	+54.3	-44.8	+99.9	+43.7	-84.7	+49.0	+46.6	+57.2
Hall	3071	+50.2	+40.7	+84.2	+54.4	+96.0	+30.1	+23.5	+89.2	+53.4	+55.7
Player	25453	-23.7	-24.6	+9.3	-20.5	+59.4	-58.3	-25.4	+21.1	+21.0	+25.7
Buckney	30400	-2.0	-14.8	+6.0	+24.3	+46.4	+69.1	+45.5	+23.6	-23.3	-13.6
J. Poole and Co.	6456	-17.5	+14.2	-70.8	-67.1	+24.3	-73.8	-51.4	-100.0	-24.2	-41.4
Hall	3051	-27.7	-50.1	+01.3	+66.4	+77.5	+53.0	+79.3	+79.3	-27.2	-22.5
Mean Weekly Temperature		54.6	54.0	52.6	53.0	52.7	52.7	52.3	52.3	48.5	50.2
Extremes of Temperature as shown by the Self-Registering Thermometers		55.3-57.3	49.8-56.7	51.3-58.6	52.1-55.9	52.0-53.7	52.0-53.7	51.2-53.4	41.6-54.3	45.8-55.8	

* The Weekly Rates have been computed from the Rates for four days. † The Weekly Rates have been computed from the Rates for three days. Dec. 8 to Jan. 1. During these weeks the watches were placed in an oven heated by jets of gas, the temperature being regulated by Kullberg's automatic governor which controls the supply of gas. The gas flames are exterior to the chamber, into which none of the injurious products of combustion can enter.

(2) ABSTRACT OF THE PRINCIPAL CHANGES OF RATE

Jan. 19-25.	Jan. 26 Feb. 2.	Feb. 3-9.	Feb. 9-16.	Difference between greatest and least of the Weekly Rates. Dial up. a.	Greatest difference between one week and the next. Dial up. b.	Difference of Weekly Rates.			Trial Number.	NAME OF MAKER.	No.
Watch Horizontal. Dial up.				Pendant up -Dial up. c.	Pendant right -Dial up. d.	Pendant left -Dial up. e.	$a + 2b +$ $1 (c + \frac{d+e}{3}).$				
+ 3.9	- 3.3	+ 1.3	+ 3.6	10.9	10.3	- 15.7	- 20.5	- 41.8	57.3	Isaac	10811
+ 8.6	+ 10.2	+ 9.6	+ 3.6	14.6	14.6	+ 22.3	+ 3.3	- 11.1	57.3	Usher and Cole.....	26314
+ 5.3	+ 0.3	+ 7.5	+ 3.5	22.8	7.3	- 14.0	- 20.0	- 52.2	58.7	Isaac	10814
+ 6.0	+ 7.8	+ 0.3	- 1.9	23.0	16.3	+ 16.9	+ 6.3	+ 3.3	65.7	Buckney.....	30403
- 7.7	- 9.4	- 7.3	- 11.7	17.6	17.6	+ 12.5	+ 39.8	+ 5.2	66.6	Buckney.....	30401
- 2.1	- 1.7	- 0.8	- 2.7	22.1	17.9	+ 15.4	+ 21.3	+ 1.4	69.4	Brookbank and Co.	214
+ 58.0	+ 58.5	+ 56.7	+ 51.6	20.6	13.2	- 23.1	+ 44.7	- 20.9	72.0	Klean and Co.	62110
+ 4.1	- 5.1	- 3.0	+ 1.7	24.1	9.2	+ 12.4	+ 0.0	+ 24.9	73.2	Isaac	10830
- 0.7	+ 11.7	+ 1.9	- 0.8	21.9	21.9	- 4.3	+ 23.3	- 23.2	77.4	Buckney.....	30199
+ 12.2	+ 12.2	+ 15.0	+ 16.0	32.0	11.7	- 33.7	- 13.2	- 32.5	80.9	J. Poole and Co.	5005
- 9.4	- 4.8	+ 1.0	+ 3.1	31.9	17.0	+ 21.5	+ 18.3	+ 17.5	82.6	Hall	3008
+ 14.4	+ 12.9	+ 7.5	0.0	20.3	14.3	- 13.0	- 2.8	- 24.3	82.9	Usher and Cole.....	26281
- 4.7	+ 4.3	+ 4.3	+ 3.9	22.9	17.7	+ 23.2	+ 23.2	+ 42.2	86.1	Buckney.....	30200
- 20.3	- 23.6	- 24.5	- 28.9	23.1	16.8	+ 13.3	+ 29.3	+ 25.3	86.3	Buckney.....	30395
- 5.0	- 3.0	- 3.7	- 6.0	33.5	25.3	- 1.6	- 11.2	- 12.4	88.3	Ashley	2737
- 1.5	- 3.5	- 3.9	- 4.8	22.9	22.0	+ 3.7	- 3.8	- 4.2	89.1	Ashley	3621
- 27.9	- 35.8	- 30.2	- 30.2	44.7	28.5	+ 16.8	- 8.3	- 7.8	100.8	Kendal and Dent	26175
- 20.5	- 21.5	- 27.3	- 35.6	26.2	26.4	+ 10.6	+ 45.9	- 26.7	101.6	Isaac	10795
- 22.9	- 20.3	- 5.3	- 11.1	26.3	26.3	+ 9.4	+ 1.4	+ 25.4	103.0	Isaac	26451
+ 10.7	+ 23.4	+ 33.0	+ 37.7	69.5	11.7	+ 16.7	+ 31.5	+ 39.5	103.6	Brookbank and Co.	213
+ 13.3	+ 13.9	+ 14.7	+ 6.0	33.3	27.9	- 20.4	+ 30.2	- 69.0	111.7	Buckney.....	30202
- 14.9	- 12.4	- 15.6	- 10.1	24.6	24.6	- 6.0	+ 13.9	- 19.9	112.7	J. Poole and Co.	6484
+ 10.2	+ 13.3	+ 12.3	+ 10.3	44.8	34.0	- 13.7	+ 33.7	+ 17.9	128.3	Buckney.....	30402
- 64.5	- 65.4	- 67.7	- 70.6	38.8	35.7	+ 20.3	+ 43.6	+ 1.2	128.8	Klean and Co.	62111
- 13.9	- 41.7	- 46.0	- 42.5	39.6	27.6	+ 22.1	+ 132.2	+ 62.6	136.7	Kendal and Dent	25450
+ 61.8	+ 61.4	+ 67.3	+ 66.6	65.2	36.7	- 8.5	- 3.1	+ 10.6	145.2	Brookbank and Co.	74212
+ 72.2	+ 79.7	+ 90.3	+ 78.9	65.0	10.0	- 116.5	+ 45.2	- 8.0	153.6	Player.....	25454
+ 58.2	+ 59.9	+ 56.7	+ 60.0	49.5	43.5	- 23.2	+ 9.3	- 56.6	158.1	Hall	3071
+ 17.7	+ 9.9	+ 30.4	+ 40.8	65.4	33.9	- 33.7	+ 73.7	- 74.0	177.2	Player.....	25453
- 4.3	+ 1.2	+ 1.4	- 0.9	51.9	51.9	+ 17.6	+ 29.1	+ 71.8	181.3	Buckney.....	30400
- 38.5	- 4.7	- 26.0	- 21.3	117.2	85.0	+ 27.6	+ 121.2	+ 14.1	308.6	J. Poole and Co.	6456
- 69.6	- 67.7	- 70.1	- 70.2	135.4	117.4	+ 1.6	+ 7.2	- 19.3	375.3	Hall	3051
55.3	55.1	51.3	46.5	The sign + indicates that the rate is gaining. The quantities a, b, c, d, e, in the formula $a + 2b + 1 (c + \frac{d+e}{3})$, are taken numerically, without regard to sign.							
45.9-59.0	55.5-59.0	46.9-58.8	45.0-54.5								