

RATES OF BOX AND POCKET CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY,

AT THE

ROYAL OBSERVATORY, GREENWICH,

FROM 1903 JULY 4 TO 1904 JANUARY 23.

(I) WEEKLY RATES

NAME OF MAKER.	No.	Weather and days.	July 4-11	July 11-18	July 18-25	July 25 to Aug. 1	Aug. 1-8	Aug. 8-15	Aug. 15-22	Aug. 22-29	Aug. 29 to Sept. 5	Sept. 5-12	Sept. 12-19	Sept. 19-26	Sept. 26 to Oct. 3	Oct. 3-10
Kullberg.....	6920	2	+1.3	+2.8	+2.3	+3.0	+2.0	+2.3	+2.5	+1.2	-1.8	+0.6	+2.4	+2.8	+4.0	+3.1
Kullberg.....	7127	2	-0.4	+0.6	+0.3	-0.2	-0.1	+0.5	+1.2	+1.8	+0.8	+0.2	+2.6	+1.4	+1.3	+0.3
E. Dent & Co.....	6920	2	+0.2	+0.4	+0.9	+4.8	+0.8	+0.6	+0.7	+0.9	+0.6	+0.6	+1.3	+1.3	+1.3	+0.8
Usher & Co.....	6938	2	-1.9	-0.9	-1.1	-1.7	-2.1	-1.0	-1.0	-1.9	-2.0	-2.7	-3.8	-2.3	-3.0	-2.0
Kullberg.....	7178	2	+4.2	-0.8	-7.2	-9.1	-8.1	-10.4	-10.2	-6.8	-8.2	-9.3	-5.7	-7.9	-9.9	-11.2
Johannsen & Co.....	5602	2	-2.6	-4.0	-2.2	-2.8	-2.4	-2.7	-2.3	-4.8	-7.7	-5.0	-3.1	+0.6	+0.7	+0.0
Johannsen & Co.....	5574	2	+1.3	+2.9	+2.2	+0.4	+1.7	+0.7	0.0	-1.1	+1.8	+2.6	+6.7	+0.7	+6.1	+5.0
Johannsen & Co.....	5574	2	+3.4	+3.7	+1.2	-3.5	+1.7	+0.3	-1.8	+0.5	+4.5	+4.9	+4.1	+1.7	+1.5	+1.0
Kullberg.....	7552	2	+2.7	+3.2	+5.1	+2.9	+5.1	+3.3	+3.8	+0.8	-2.8	-0.8	+3.0	+5.2	+5.7	+4.2
Johannsen & Co.....	5568	2	+2.8	+2.6	-1.3	2.8	-0.1	-1.6	-1.6	-1.6	-6.1	-6.1	+1.8	+2.0	+1.3	-0.9
Johannsen & Co.....	5546	2	+1.4	-0.4	-2.4	-4.3	-4.8	-4.4	-4.4	-1.3	-0.2	-2.2	-0.4	+2.4	+3.4	-0.8
Johannsen & Co.....	5526	2	+3.3	+3.3	+4.2	+4.9	+4.2	+4.3	+3.2	+0.3	-2.2	-8.9	-13.4	-14.3	-14.3	-11.2
Kullberg.....	6740	2	-2.1	-0.6	+0.4	+1.1	-2.1	-2.1	-1.9	-4.9	-8.8	-7.3	-0.8	+3.8	+0.8	+1.7
Kullberg.....	7312	2	-7.6	-6.3	-0.7	-4.0	-0.8	-2.5	-4.0	-4.0	-1.9	-3.1	-2.2	+3.0	+3.0	+3.0
Kullberg.....	7099	2	0.0	+0.2	+1.7	+1.0	+1.7	+1.9	+3.2	+2.3	+3.7	+6.9	+11.6	+10.8	+13.8	+12.3
Johannsen & Co.....	5575	2	-6.9	-9.2	-11.4	-11.1	-11.2	-12.6	-14.4	-8.2	-9.6	-6.9	-1.3	-6.1	-8.9	-11.5
J. Frost.....	1306	2	+3.7	+3.5	+2.9	+1.0	+1.1	+0.9	+1.1	+0.7	+3.4	+1.4	-1.1	+0.9	+3.1	+0.1
Kullberg.....	7320	2	-2.1	-1.9	0.0	+0.9	+1.6	+1.9	-4.1	-5.0	-6.1	-4.8	0.4	+1.5	+1.4	+0.9
Usher & Co.....	8254	2	+1.2	+0.2	+3.0	+3.0	+4.1	+2.3	+4.0	+1.8	+0.3	+1.8	+1.2	+4.4	+5.1	+1.4
E. Dent & Co.....	5120	2	+7.1	+8.0	+12.1	+12.7	+13.2	+12.9	+13.0	+4.4	+0.4	+2.4	+7.8	+9.0	+6.9	+9.2
Webb.....	5685	2	-6.6	-6.6	-7.1	-6.5	-7.8	-6.6	-7.8	-10.7	-12.5	-8.4	-4.9	-7.5	-10.8	-12.4
Usher & Co.....	6964	2	-5.2	-4.9	-5.3	-5.6	-5.2	-4.6	-1.5	-0.9	+0.4	+0.4	+5.3	+2.8	+5.0	+5.0
Johannsen & Co.....	5582	2	-4.1	-4.2	-4.6	-6.1	-6.4	-6.1	-6.4	-6.4	-6.4	-6.4	-6.4	-6.4	-6.4	-6.4
C. Frohman & Co.....	10049	2	+0.8	+0.9	+5.9	+5.7	+6.6	+7.2	+7.9	+9.2	+11.7	+10.6	+19.4	+21.5	+20.5	+20.5
Johannsen & Co.....	5583	2	-0.1	-0.3	+0.9	+0.5	+1.0	+1.7	+1.9	+3.2	+3.9	+6.8	+6.4	+1.5	+0.9	+0.9
E. Dent & Co.....	50052	2	+2.4	+7.0	+7.8	+10.5	+11.4	+12.3	+14.1	+13.2	+12.4	+9.6	+10.3	+4.6	+8.0	+10.0
Johannsen & Co.....	5607	2	-3.3	-10.9	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7
Webb.....	5682	2	-3.4	-3.4	-2.0	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C. Frohman & Co.....	00229	2	+2.9	+2.0	+1.0	+0.2	-2.1	+2.5	+1.6	+4.0	+1.9	+1.1	+8.5	+7.4	+5.2	+3.5
Kullberg.....	6947	2	+1.2	+1.0	+1.1	-0.4	-1.3	-2.3	-0.6	-9.0	-9.1	-9.7	-5.1	-3.4	-3.6	-3.4
Johannsen & Co.....	5606	2	-5.2	-4.9	-6.1	-6.6	-11.3	-7.7	-10.0	-2.1	-3.1	-7.7	-3.6	-1.5	-1.1	-0.9
Johannsen & Co.....	5607	2	-5.3	-4.9	-6.1	-6.6	-11.3	-7.7	-10.0	-2.1	-3.1	-7.7	-3.6	-1.5	-1.1	-0.9
Lilly & Sons.....	4344	2	+6.7	+6.0	+5.9	+4.8	+3.2	+4.5	+6.6	+6.2	+8.3	+12.3	+20.3	+17.9	+17.9	+17.9
E. Dent & Co.....	6942	2	+0.2	+0.1	+1.4	+5.0	+5.0	+7.2	+7.2	+5.7	+7.1	+9.0	+12.3	+17.4	+15.5	+14.0
Kullberg.....	7222	2	+0.2	+0.1	+1.4	+5.0	+5.0	+7.2	+7.2	+5.7	+7.1	+9.0	+12.3	+17.4	+15.5	+14.0
Lynch.....	5000	2	-4.5	-3.0	-1.0	+0.8	+1.2	+1.2	+3.7	+11.1	+5.6	+4.3	+6.0	+4.0	+4.8	+2.9
Kullberg.....	7248	2	+0.2	-1.9	-1.1	-2.8	-2.6	-1.1	-0.9	-5.0	-13.2	-8.4	-4.2	-7.7	-7.7	-7.7
E. Dent & Co.....	51940	2	+6.8	+6.3	+8.4	+6.9	+5.4	+6.9	+6.2	+8.2	+9.7	+10.2	+13.4	+9.0	+9.3	+10.2
J. B. Dent & Sons.....	5580	2	+0.0	+4.1	+5.1	+7.9	+6.6	+5.1	+5.1	+5.8	+10.9	+13.4	+11.2	+7.9	+11.1	+11.1
Webb.....	5679	2	-16.8	-20.3	-19.8	-18.4	-19.4	-20.6	-19.0	-26.1	-27.6	-25.3	-16.6	-10.3	-13.3	-13.7

Chronometrical Thermometer..... -774.8 -844.0 -673.2 -576.3 -541.6 -654.2 -474.0 -2425.3 -3807.0 -3504.7 -2294.7 -512.2 -569.1 -422.9

Mean Weekly Temperature..... 68.9 69.2 67.8 66.6 65.6 67.0 64.9 85.8 99.1 97.8 86.3 63.9 66.2 63.5

Extremes of Temperature as shown by the Self-Registering Thermometers..... 647.789 67.0 75.0 61.2 72.0 63.6 69.3 69.3 66.9 65.6 69.0 60.0 66.5 80.2 90.1 92.8 104.6 105.3 106.6 78.5 89.6 62.2 66.0 65.0 67.5 69.5 65.7

The sign + indicates that the rate is gaining.

† During these weeks the Chronometers were placed in the chamber of a stove 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.

The Chronometrical Thermometer differs from an ordinary Chronometer only in the construction of the balance, the positions of the metals forming the compensating rim being reversed. By this arrangement the effect of temperature is much magnified.

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IN ORDER OF TIME.

NAME OF MAKER.																		No.
Oct. 10-17	Oct. 17-24	Oct. 24-31	Oct. 31 Nov. 7	Nov. 7-14	Nov. 14-21	Nov. 21-28	Nov. 28 to Dec. 5	Dec. 5-12	Dec. 12-19	Dec. 19-26	Dec. 26 to Jan. 2	Jan. 2-9	Jan. 9-16	Jan. 16-23				No.
+ 2.9	+ 1.8	+ 1.7	+ 1.3	+ 2.2	+ 1.6	+ 2.6	+ 3.8	+ 2.8	+ 1.1	+ 2.5	+ 2.6	+ 3.8	+ 2.7	+ 0.1	Kullberg	6920		
+ 0.8	+ 1.4	- 0.8	- 1.3	+ 3.0	+ 1.9	+ 3.2	+ 3.8	+ 4.5	+ 1.2	+ 1.9	+ 3.1	+ 1.5	+ 1.6	+ 1.4	Kullberg	7127		
+ 0.2	+ 0.4	+ 0.9	+ 4.8	+ 0.8	+ 0.6	+ 0.7	+ 0.9	+ 0.6	+ 0.6	+ 1.3	+ 1.3	+ 1.3	+ 0.8	+ 0.8	E. Dent & Co.	6920		
- 1.9	- 0.9	- 1.1	- 1.7	- 2.1	- 1.0	- 1.0	- 1.9	- 2.0	- 2.7	- 3.8	- 2.3	- 3.0	- 2.0	- 2.0	Usher & Co.	6938		
- 8.7	- 7.4	- 2.7	- 2.8	- 2.4	- 4.1	- 2.9	+ 0.9	+ 0.2	+ 0.0	+ 0.9	+ 0.9	- 3.1	- 4.8	- 7.0	Kullberg	7178		
- 1.5	- 4.8	- 5.2	- 6.8	- 2.4	- 1.7	- 1.0	+ 2.9	+ 1.5	+ 2.9	+ 1.4	+ 0.4	+ 0.4	+ 0.7	- 3.9	Johannsen & Co.	5602		
+ 3.1	+ 6.3	+ 7.0	+ 5.5	+ 8.7	+ 8.0	+ 9.0	+ 12.3	+ 13.5	+ 9.8	+ 9.9	+ 7.9	+ 7.7	+ 4.7	+ 4.7	Johannsen & Co.	5574		
+ 1.6	+ 7.0	+ 6.0	+ 7.7	- 5.8	- 2.6	- 2.0	+ 2.6	+ 5.1	- 1.8	- 1.2	+ 1.0	+ 0.7	- 1.1	+ 4.0	Johannsen & Co.	5574		
+ 3.6	+ 0.1	+ 3.1	- 2.1	- 1.8	- 2.2	- 1.8	+ 0.6	+ 6.8	+ 4.3	+ 4.1	+ 3.4	+ 2.5	+ 5.0	+ 5.0	Johannsen & Co.	5574		
+ 1.2	- 2.2	- 1.7	- 2.9	- 0.8	- 0.6	- 0.4	+ 4.7	+ 6.8	+ 4.3	+ 2.7	+ 4.8	+ 4.0	+ 1.8	+ 0.1	Kullberg	7552		
- 2.8	- 3.6	- 7.0	+ 7.4	+ 0.4	- 0.1	- 0.1	+ 3.6	+ 1.9	+ 0.8	+ 0.4	+ 1.0	- 2.4	- 4.3	- 5.5	Johannsen & Co.	5546		
+ 3.1	+ 6.3	+ 7.0	+ 5.5	+ 8.7	+ 8.0	+ 9.0	+ 12.3	+ 13.5	+ 9.8	+ 11.1	+ 13.5	+ 10.3	+ 9.3	+ 8.0	Johannsen & Co.	5526		
+ 1.4	- 1.8	- 1.7	- 2.7	- 3.7	- 5.2	- 2.8	+ 4.3	+ 2.5	- 0.2	- 3.2	- 1.8	- 1.7	- 3.3	- 3.3	Kullberg	6740		
+ 1.6	+ 2.6	+ 3.9	+ 3.9	+ 4.9	+ 4.9	+ 5.9	+ 6.9	+ 7.9	+ 8.9	+ 9.9	+ 10.9	+ 11.9	+ 12.9	+ 13.9	Kullberg	7312		
+ 1.9	+ 4.9	+ 12.1	+ 8.7	+ 11.1	+ 12.4	+ 16.1	+ 18.7	+ 14.1	+ 18.3	+ 18.6	+ 17.3	+ 16.4	+ 14.4	+ 14.0	Kullberg	7099		
- 18.4	- 16.8	- 15.6	- 16.6	- 10.1	- 8.6	- 7.2	- 2.3	- 2.9	- 5.2	- 6.0	- 5.9	- 7.8	- 8.6	- 11.1	Johannsen & Co.	5575		
+ 1.7	+ 4.1	+ 3.5	+ 3.3	+ 8.8	+ 6.2	+ 4.2	+ 3.1	+ 5.0	+ 6.9	+ 8.1	+ 9.8	+ 10.6	+ 9.3	+ 6.6	J. Frost	1206		
+ 4.7	+ 4.7	+ 7.1	+ 5.1	+ 8.1	+ 8.0	+ 2.0	+ 7.9	+ 10.1	+ 8.9	+ 8.9	+ 10.1	+ 9.3	+ 9.1	+ 9.2	Kullberg	7320		
+ 10.1	+ 10.1	+ 13.5	+ 11.8	+ 7.5	+ 8.1	+ 10.2	+ 16.1	+ 12.9	+ 6.9	+ 3.1	+ 1.1	+ 5.6	+ 10.2	+ 6.1	E. Dent & Co.	5120		
- 18.1	- 12.5	- 11.7	- 13.1	- 12.2	- 14.1	- 10.8	- 13.2	- 17.9	- 14.6	- 12.4	- 18.2	- 9.6	- 7.5	- 17.5	Webb	5685		
- 1.6	- 3.7	- 3.2	- 4.0	- 3.9	+ 5.2	+ 4.4	+ 12.5	+ 14.7	+ 7.6	+ 6.8	+ 5.0	+ 6.8	+ 3.2	+ 1.0	Usher & Co.	6964		
+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	+ 0.9	Johannsen & Co.	5582		
+ 20.8	+ 20.0	+ 20.0	+ 20.0	+ 22.1	+ 22.1	+ 22.5	+ 24.9	+ 19.2	+ 19.4	+ 20.5	+ 19.9	+ 21.2	+ 22.2	+ 22.0	C. Frohman & Co.	10049		
- 4.8	- 4.2	- 0.6	- 2.3	+ 3.5	+ 5.5	+ 5.9	+ 5.4	+ 5.5	- 3.6	- 3.4	- 1.1	+ 4.3	+ 11.6	+ 18.5	Johannsen & Co.	5583		
+ 13.1	+ 10.9	+ 14.0	+ 14.0	+ 11.0	+ 12.2	+ 8.8	+ 4.7	+ 0.1	- 4.0	- 2.7	- 9.8	- 5.0	- 3.2	- 5.8	E. Dent & Co.	50052		
- 9.9	- 13.8	- 18.5	- 19.1	- 19.7	- 17.1	- 18.4	- 13.7	- 3.8	- 2.1	- 6.0	- 3.9	- 1.8	- 3.5	- 8.4	Johannsen & Co.	5606		
+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	+ 2.9	Johannsen & Co.	5607		
+ 2.9	+ 0.4	+ 1.2	+ 0.2	+ 9.8	+ 15.3	+ 10.7	+ 18.2	+ 11.8	+ 15.3	+ 14.4	+ 13.7	+ 9.7	+ 8.1	+ 7.9	C. Frohman & Co.	00229		
- 4.6	+ 1.6	+ 7.7	- 3.1	- 6.9	- 3.6	- 1.1	+ 0.8	+ 0.4	+ 1.3	+ 1.9	+ 2.5	+ 4.7	+ 9.8	+ 3.2	Kullberg	6947		
- 5.6	- 10.2	- 12.2	- 14.9	- 5.2	- 3.9	- 4.2	+ 0.3	- 3.2	- 7.0	- 9.4	- 13.5	- 15.3	- 17.8	- 23.0	Johannsen & Co.	5608		
- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	- 9.4	Usher & Co.	5607		
- 1.4	- 2.4	- 1.6	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	- 17.3	Lilly & Sons	4344		
- 1.4	- 2.4	- 2.2	- 6.8	- 12.4	+ 7.6	+ 12.0	+ 11.1	+ 3.1	- 0.6	- 9.0	- 7.9	- 6.1	- 8.1	- 8.1	E. Dent & Co.	5120		
+ 13.8	+ 13.5	+ 13.5	+ 14.0	+ 12.8	+ 12.4	+ 11.8	+ 37.5	+ 37.4	+ 22.3	+ 31.9	+ 22.3	+ 22.3	+ 24.3	+ 25.3	Kullberg	7222		
+ 3.9	+ 12.0	+ 13.7	+ 13.5	+ 11.9	+ 12.4	+ 13.5	+ 12.9	+ 20.1	+ 13.0	+ 14.9	+ 23.6	+ 25.0	+ 24.0	+ 24.0	Lynch	5004		
+ 3.9	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	Johannsen & Co.	7248		
+ 3.9	+ 6.2	+ 2.6	- 8.6	- 2.9	+ 4.7	+ 5.1	+ 7.5	- 2.1	- 4.3	- 8.2	- 11.0	- 11.1	- 9.0	- 10.7	E. Dent & Co.	5120		
+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	+ 11.5	J. J. Webb	5619		
- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	E. Dent & Co.	5004		
- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	Webb	5679		

(1L) WEEKLY RATES IN

NAME or MAKER.	No.	Weather No.	Dec. 26 to Jan. 2	Jan. 16-23	Jan. 2-9	Jan. 9-16	Dec. 16-26	Dec. 5-12	Dec. 12-19	Oct. 31 to Nov. 7	Oct. 17-24	Oct. 24-31	Oct. 10-17	Oct. 3-10	Aug. 15-22	Sept. 19-26
Kullberg.....	6620	2	+ 2.6	+ 0.1	+ 3.8	+ 2.7	+ 2.5	+ 2.8	+ 1.1	+ 1.3	+ 1.8	+ 1.7	+ 2.9	+ 3.1	+ 2.5	+ 2.8
Kullberg.....	7127	2	+ 3.1	+ 0.1	+ 1.5	+ 2.4	+ 1.9	+ 4.5	+ 1.2	+ 1.5	+ 1.4	+ 0.8	+ 0.9	+ 0.9	+ 1.2	+ 1.4
E. Dent & Co.....	5220	2	+ 1.0	+ 1.9	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.5
Usher & Co.....	0938	2	+ 2.6	+ 2.1	+ 3.2	+ 1.7	+ 3.5	+ 0.8	+ 1.4	+ 1.5	+ 1.5	+ 0.9	+ 0.9	+ 2.0	+ 1.0	+ 1.3
Kullberg.....	7178	2	+ 0.9	+ 7.0	+ 3.1	+ 4.8	+ 0.9	+ 0.2	0.0	+ 2.8	+ 7.4	+ 2.7	+ 8.7	+ 11.2	+ 10.2	+ 7.9
Johannes & Co.....	5602	2	+ 0.4	+ 3.9	+ 0.4	+ 0.7	+ 4.0	+ 5.1	+ 2.9	+ 6.8	+ 4.8	+ 5.2	+ 1.5	+ 0.0	+ 3.3	+ 0.6
Johannes & Co.....	5574	2	+ 4.8	+ 7.0	+ 7.9	+ 7.7	+ 8.0	+ 11.5	+ 3.8	+ 4.3	+ 4.0	+ 5.9	+ 4.4	+ 5.0	+ 0.0	+ 5.7
Johannes & Co.....	5574	2	+ 1.0	+ 4.0	+ 0.7	+ 1.1	+ 1.2	+ 1.5	+ 1.8	+ 7.7	+ 7.0	+ 4.8	+ 4.0	+ 1.3	+ 1.7	+ 1.7
Kullberg.....	7502	2	+ 3.4	+ 5.9	+ 4.5	+ 4.6	+ 4.1	+ 8.9	+ 4.3	+ 2.1	+ 0.1	+ 3.1	+ 2.6	+ 4.2	+ 3.8	+ 9.2
Johannes & Co.....	5598	2	+ 4.8	+ 0.1	+ 2.0	+ 1.8	+ 2.7	+ 8.8	+ 3.9	+ 2.2	+ 1.7	+ 1.2	+ 0.9	+ 1.6	+ 2.0	+ 2.0
Johannes & Co.....	5546	2	+ 1.0	+ 6.5	+ 2.4	+ 4.3	+ 0.4	+ 1.9	+ 0.3	+ 7.4	+ 3.6	+ 7.0	+ 0.8	+ 0.8	+ 4.4	+ 1.4
Johannes & Co.....	5526	2	+ 12.5	+ 8.0	+ 10.8	+ 9.0	+ 11.9	+ 10.9	+ 12.9	+ 5.5	+ 6.3	+ 7.0	+ 9.1	+ 11.2	+ 5.5	+ 12.4
Kullberg.....	6740	2	+ 2.2	+ 3.8	+ 1.8	+ 1.7	+ 0.3	+ 2.6	+ 0.2	+ 2.7	+ 1.8	+ 1.7	+ 1.4	+ 1.7	+ 1.9	+ 3.8
Kullberg.....	7312	2	+ 7.7	+ 7.1	+ 9.1	+ 8.4	+ 10.0	+ 7.5	+ 8.7	+ 4.1	+ 4.6	+ 4.9	+ 3.8	+ 3.0	+ 3.4	+ 3.1
Kullberg.....	7099	2	+ 17.3	+ 14.0	+ 16.4	+ 14.4	+ 13.6	+ 19.1	+ 18.2	+ 8.7	+ 9.9	+ 12.1	+ 11.9	+ 12.8	+ 3.2	+ 13.8
Johannes & Co.....	5575	2	+ 5.9	+ 11.1	+ 7.8	+ 8.6	+ 6.0	+ 2.9	+ 5.2	+ 16.6	+ 16.8	+ 15.6	+ 13.4	+ 11.5	+ 14.4	+ 5.1
J. Pyott.....	1206	2	+ 9.8	+ 6.8	+ 10.5	+ 8.6	+ 8.1	+ 6.0	+ 6.9	+ 8.3	+ 4.1	+ 3.5	+ 1.7	+ 0.1	+ 0.1	+ 3.7
Usher & Co.....	7200	2	+ 10.1	+ 7.5	+ 9.1	+ 9.1	+ 16.2	+ 19.1	+ 14.7	+ 9.1	+ 4.7	+ 7.1	+ 4.7	+ 3.9	+ 1.4	+ 1.5
Usher & Co.....	8254	2	+ 9.3	+ 9.2	+ 7.1	+ 4.8	+ 1.1	+ 4.0	+ 6.1	+ 7.3	+ 8.9	+ 6.1	+ 4.0	+ 6.1	+ 4.0	+ 0.2
E. Dent & Co.....	51520	2	+ 1.1	+ 6.1	+ 5.6	+ 10.2	+ 3.1	+ 12.9	+ 6.9	+ 11.6	+ 10.1	+ 18.5	+ 9.0	+ 9.2	+ 13.0	+ 9.0
Webb.....	5685	2	+ 18.2	+ 17.5	+ 6.9	+ 7.5	+ 12.4	+ 17.9	+ 14.6	+ 18.1	+ 12.5	+ 11.7	+ 13.1	+ 12.4	+ 7.8	+ 7.5
Usher & Co.....	0954	2	+ 5.0	+ 1.0	+ 3.8	+ 3.8	+ 6.8	+ 11.7	+ 7.6	+ 0.7	+ 3.9	+ 1.2	+ 0.5	+ 4.6	+ 5.3	+ 5.3
Johannes & Co.....	5582	2	+ 6.7	+ 7.5	+ 6.5	+ 5.6	+ 6.0	+ 6.7	+ 10.5	+ 2.9	+ 7.5	+ 10.2	+ 7.8	+ 6.1	+ 4.0	+ 4.0
C. Frodham & Co.....	10949	2	+ 19.0	+ 21.0	+ 21.2	+ 22.3	+ 20.5	+ 19.2	+ 14.0	+ 20.0	+ 20.0	+ 20.0	+ 20.0	+ 20.5	+ 7.9	+ 20.0
Johannes & Co.....	5583	2	+ 1.1	+ 18.9	+ 3.3	+ 11.6	+ 3.4	+ 5.6	+ 3.6	+ 2.8	+ 4.2	+ 0.8	+ 0.8	+ 0.8	+ 1.9	+ 1.5
E. Dent & Co.....	50923	2	+ 9.8	+ 5.8	+ 5.0	+ 3.8	+ 2.7	+ 0.1	+ 4.0	+ 10.8	+ 10.9	+ 14.0	+ 10.1	+ 10.0	+ 14.1	+ 4.6
Johannes & Co.....	5607	2	+ 1.0	+ 1.9	+ 1.5	+ 1.1	+ 1.6	+ 1.1	+ 1.8	+ 2.9	+ 3.1	+ 3.1	+ 3.1	+ 3.1	+ 3.1	+ 3.1
Webb.....	5682	2	+ 2.9	+ 8.4	+ 4.8	+ 12.9	+ 2.0	+ 9.0	+ 1.0	+ 2.7	+ 1.9	+ 2.8	+ 4.0	+ 4.2	+ 1.6	+ 2.6
C. Frodham & Co.....	0929	2	+ 13.7	+ 7.9	+ 9.7	+ 9.1	+ 14.4	+ 11.8	+ 15.3	+ 4.0	+ 0.4	+ 1.2	+ 2.9	+ 3.5	+ 1.6	+ 7.4
Kullberg.....	6647	2	+ 2.5	+ 3.3	+ 4.7	+ 6.8	+ 1.9	+ 0.4	+ 1.8	+ 2.1	+ 1.6	+ 7.7	+ 3.5	+ 3.4	+ 6.8	+ 3.4
Johannes & Co.....	5606	2	+ 13.5	+ 20.0	+ 15.3	+ 17.8	+ 9.4	+ 3.2	+ 7.8	+ 14.8	+ 10.2	+ 12.2	+ 5.6	+ 0.9	+ 10.0	+ 1.5
Johannes & Co.....	5607	2	+ 10.9	+ 15.9	+ 16.1	+ 16.2	+ 19.1	+ 14.7	+ 9.1	+ 4.7	+ 9.4	+ 9.9	+ 10.9	+ 10.9	+ 10.9	+ 10.9
Lilly & Sons.....	4944	2	+ 2.5	+ 24.4	+ 26.2	+ 22.3	+ 26.0	+ 24.8	+ 17.0	+ 15.0	+ 15.0	+ 15.0	+ 15.0	+ 15.0	+ 15.0	+ 15.0
E. Dent & Co.....	51942	2	+ 9.1	+ 6.1	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6	+ 5.6
Kullberg.....	7222	2	+ 22.8	+ 23.3	+ 22.6	+ 21.0	+ 21.9	+ 27.4	+ 22.8	+ 14.0	+ 13.5	+ 13.5	+ 13.5	+ 14.0	+ 7.2	+ 17.4
Lynch.....	5000	2	+ 26.6	+ 24.0	+ 25.0	+ 22.9	+ 41.0	+ 39.1	+ 19.0	+ 13.5	+ 12.0	+ 13.7	+ 8.9	+ 2.3	+ 2.7	+ 4.0
Kullberg.....	7248	2	+ 1.0	+ 6.2	+ 9.4	+ 9.1	+ 12.8	+ 7.0	+ 1.5	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0	+ 6.0
E. Dent & Co.....	51940	2	+ 11.0	+ 10.7	+ 11.0	+ 8.0	+ 8.2	+ 2.1	+ 4.3	+ 8.6	+ 6.2	+ 2.6	+ 8.9	+ 10.2	+ 6.2	+ 9.0
J. B. Dent & Sons.....	5680	2	+ 1.0	+ 17.8	+ 17.4	+ 16.7	+ 18.9	+ 21.8	+ 13.8	+ 11.4	+ 10.6	+ 11.1	+ 11.1	+ 11.1	+ 11.1	+ 11.1
Webb.....	5679	2	+ 4.8	+ 7.0	+ 6.2	+ 6.9	+ 7.5	+ 1.8	+ 7.0	+ 12.3	+ 13.2	+ 13.2	+ 13.2	+ 13.2	+ 13.2	+ 13.2
Chronometrical Thermometer.....			+ 1021.6	+ 884.0	+ 822.3	+ 851.0	+ 628.8	+ 598.6	+ 574.3	+ 201.8	+ 96.2	+ 82.8	+ 80.3	+ 82.9	+ 47.4	+ 512.0
Mean Weekly Temperature.....			47.5	49.1	49.7	50.2	51.2	50.5	51.1	56.6	58.1	58.3	60.0	63.5	64.9	63.9
Extremes of Temperature as shown by the Self-Registering Thermometers.....			49.1-50.6-60.1-54.1-46.5-49.7-47.1-52.6-49.0-54.9-47.3-51.5-50.0-55.5-55.7-47.4-56.4-56.9-59.5-59.9-59.0-61.0-59.5-60.7-60.0-58.6-52.2-58.4													

The sign + indicates that the rate is gaining.

† During these weeks the Chronometers were placed in the chamber of a stove 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.

The Chronometrical Thermometer differs from an ordinary Chronometer only in the construction of the balance, the positions of the metals forming the compensating rim being reversed. By this arrangement the effect of temperature is much magnified.

John G. Wolbach Library, Harvard-Smithsonian Project for Astrophysics

ORDER OF TEMPERATURE AS DETERMINED GENERALLY BY THE CHRONOMETRICAL THERMOMETER.

NAME OF MAKER.																	No.
Aug. 1-8	Sept. 26 to Oct. 3	July 25 to Aug. 1	Aug. 8-15	July 18-25	July 4-11	July 11-18	Nov. 28 to Dec. 5	Nov. 7-14	Sept. 12-19	Aug. 22-29	Nov. 11-21	Nov. 21-28 †	Sept. 6-12	Aug. 29 to Sept. 5			
+ 2.0 - 0.1 - 0.1 - 8.1	+ 4.0 + 1.8 + 4.5 - 9.9	+ 3.0 - 0.2 - 1.7 - 9.1	+ 2.3 + 0.3 - 0.9 - 10.4	+ 2.3 + 0.9 - 0.3 - 7.2	+ 1.3 - 0.4 - 0.2 - 4.2	+ 2.8 + 0.6 - 0.4 - 6.8	+ 3.8 + 1.3 - 1.9 - 5.8	+ 2.2 + 0.8 + 2.3 - 0.9	+ 2.4 + 1.1 + 3.8 - 0.7	+ 1.2 + 1.9 + 7.9 - 0.8	+ 1.6 + 3.2 + 14.3 - 4.1	+ 2.6 + 1.9 + 16.4 - 2.9	+ 0.6 + 0.6 + 1.8 - 3.8	+ 1.8 + 0.6 + 7.1 - 9.3	Kullberg..... E. Dent & Co. Usher & Coles Kullberg.....	6620 7127 52920 7178	
- 2.4 + 3.7 + 0.1 + 5.1	+ 4.0 + 1.8 + 4.5 + 1.2	+ 3.0 - 0.2 - 1.7 - 2.3	+ 2.3 + 0.3 - 0.9 - 0.1	+ 2.3 + 0.9 - 0.3 + 1.5	+ 1.3 - 0.4 - 0.2 + 0.1	+ 2.8 + 0.6 - 0.4 + 2.5	+ 3.8 + 1.3 - 1.9 + 4.7	+ 2.2 + 0.8 + 2.3 + 2.5	+ 2.4 + 1.1 + 3.8 + 1.8	+ 1.2 + 1.9 + 7.9 - 0.7	+ 1.6 + 3.2 + 14.3 - 4.1	+ 2.6 + 1.9 + 16.4 - 2.9	+ 0.6 + 0.6 + 1.8 - 3.8	+ 1.8 + 0.6 + 7.1 - 9.3	Johannes & Co. Johannes & Co. Johannes & Co. Johannes & Co.	5602 5574 5574 7502	
- 1.4 + 1.7 + 0.1 + 5.1	+ 4.0 + 1.8 + 4.5 + 1.2	+ 3.0 - 0.2 - 1.7 - 2.3	+ 2.3 + 0.3 - 0.9 - 0.1	+ 2.3 + 0.9 - 0.3 + 1.5	+ 1.3 - 0.4 - 0.2 + 0.1	+ 2.8 + 0.6 - 0.4 + 2.5	+ 3.8 + 1.3 - 1.9 + 4.7	+ 2.2 + 0.8 + 2.3 + 2.5	+ 2.4 + 1.1 + 3.8 + 1.8	+ 1.2 + 1.9 + 7.9 - 0.7	+ 1.6 + 3.2 + 14.3 - 4.1	+ 2.6 + 1.9 + 16.4 - 2.9	+ 0.6 + 0.6 + 1.8 - 3.8	+ 1.8 + 0.6 + 7.1 - 9.3	Johannes & Co. Johannes & Co. Johannes & Co. Johannes & Co.	5602 5574 5574 7502	
+ 4.8 + 3.7 + 2.1 + 1.7	+ 3.4 + 2.4 + 0.8 + 1.3	+ 4.3 + 4.9 + 1.1 + 0.8	+ 4.2 + 2.5 - 2.1 + 1.0	+ 2.4 + 3.5 - 0.1 + 1.7	+ 1.4 + 4.2 - 0.1 + 1.0	+ 0.4 + 3.3 - 0.6 + 0.2	+ 3.0 + 13.3 + 4.3 + 18.7	+ 0.4 + 9.7 + 3.7 + 11.1	+ 0.4 + 5.7 + 1.8 + 11.6	+ 1.3 + 3.2 - 0.8 + 2.3	+ 0.1 + 8.9 + 12.4 + 12.8	+ 0.1 + 9.0 + 2.8 + 1.9	+ 2.2 + 0.2 + 1.8 + 6.9	+ 0.2 + 0.3 + 7.8 + 3.7	Johannes & Co. Johannes & Co. Kullberg..... Kullberg.....	5546 5526 6740 7099	
- 11.2 + 1.5 + 1.1 + 13.2	- 8.9 + 1.4 + 1.1 + 8.9	- 11.1 + 1.0 + 0.9 + 12.7	- 12.6 + 1.9 + 2.9 + 12.9	- 11.4 + 1.9 + 0.9 + 12.1	- 6.9 + 2.7 + 3.5 + 7.1	- 9.2 + 3.5 + 8.1 + 8.0	- 2.2 + 3.1 + 8.1 + 16.1	- 10.1 + 9.7 + 8.1 + 7.5	- 1.2 + 0.4 + 0.6 + 7.8	- 8.2 + 7.3 + 5.0 + 4.4	- 8.6 + 6.2 + 0.8 + 8.1	- 7.2 + 4.2 + 11.2 + 10.2	- 5.9 + 4.2 + 11.2 + 2.4	- 9.6 + 1.1 + 1.4 + 0.4	- 9.6 J. Pyott..... Usher & Co. E. Dent & Co.	5575 1206 7200 51520	
- 7.8 + 5.2 + 6.6 + 1.0	- 10.8 + 2.3 + 1.9 + 0.5	- 6.5 - 5.6 + 0.9 + 0.5	- 6.6 - 4.2 + 0.9 + 7.2	- 7.1 - 5.1 + 0.9 + 5.9	- 6.6 - 5.2 + 0.9 + 0.1	- 6.6 - 4.9 + 1.9 + 0.3	- 13.2 + 12.5 + 24.9 + 42.1	- 13.2 + 12.5 + 22.1 + 32.5	- 4.9 + 10.7 + 19.5 + 6.4	- 10.7 + 14.1 + 21.5 + 3.2	- 10.8 + 5.2 + 23.5 + 3.2	- 8.4 + 4.2 + 22.5 + 11.7	- 12.5 + 4.2 + 16.4 + 6.8	- 12.5 + 0.9 + 11.7 + 8.9	Webb..... Usher & Coles Johannes & Co. C. Frodham & Co.	5685 0954 5582 10949	
+ 11.4 - 17.1 + 4.1 - 1.3	+ 8.0 - 14.0 + 4.3 - 3.6	+ 10.5 - 16.2 + 2.5 - 0.4	+ 12.3 - 13.0 + 2.5 - 2.8	+ 7.8 - 13.0 + 1.5 + 1.1	+ 2.4 - 9.1 + 2.9 + 1.2	+ 7.0 - 13.7 + 2.4 + 1.0	+ 4.7 - 13.7 + 11.2 + 0.8	+ 11.0 - 14.1 + 11.2 + 0.8	+ 10.8 - 15.8 + 10.9 + 5.1	+ 12.2 - 19.1 + 12.9 + 5.1	+ 12.2 - 18.4 + 12.9 + 3.6	+ 8.8 + 15.4 + 10.8 - 3.6	+ 9.6 + 12.4 + 11.8 + 8.7	+ 12.4 + 1.9 + 1.8 + 9.1	E. Dent & Co..... Johannes & Co. Webb..... C. Frodham & Co.	50923 5607 5682 0947	
- 11.3 - 3.9 + 1.5 + 5.6	- 1.1 + 1.2 + 4.1 + 1.9	- 6.6 - 3.8 + 4.4 - 3.4	- 7.7 - 8.7 + 2.7 + 2.2	- 7.7 - 8.7 + 2.7 + 2.1	- 5.2 - 3.7 + 1.7 + 0.4	- 4.9 - 3.8 + 1.2 + 0.5	+ 2.3 + 22.3 + 11.2 + 27.6	+ 12.9 + 14.2 + 12.3 + 12.8	- 3.6 + 0.4 + 6.8 + 1.2	- 2.1 + 5.0 + 2.8 + 6.7	- 2.1 + 5.0 + 2.8 + 6.7	- 2.1 + 5.0 + 2.8 + 6.7	- 2.1 + 5.0 + 2.8 + 6.7	- 2.1 + 5.0 + 2.8 + 6.7	Johannes & Co. Lilly & Sons..... E. Dent & Co.	5606 5607 4944 5142	
+ 1.2 + 5.4 + 0.8 - 19.4	+ 4.8 + 6.9 + 6.9 + 13.3	+ 4.8 + 6.9 + 6.9 + 13.3	+ 1.2 + 6.1 + 6.1 + 20.5	+ 1.0 + 6.1 + 6.1 + 19.8	- 4.5 + 1.1 + 6.8 - 16.8	+ 2.9 + 12.9 + 11.2 + 20.4	+ 11.9 + 0.4 + 2.5 - 0.9	+ 6.0 + 8.4 + 12.9 + 16.6	+ 11.1 + 5.0 + 8.2 + 12.7	+ 12.4 + 8.9 + 8.2 + 12.7	+ 12.4 + 8.9 + 8.2 + 12.7	+ 12.4 + 8.9 + 8.2 + 12.7	+ 12.4 + 8.9 + 8.2 + 12.7	+ 12.4 + 8.9 + 8.2 + 12.7	Lynch..... Kullberg..... E. Dent & Co. Webb.....	5208 7099 5619 5690	
- 541.6	- 559.1	- 575.3	- 564.2	- 673.2	- 774.8	- 884.0	- 1409.8	- 1649.6	- 2394.7	- 2422.6	- 3027.2	- 3186.8	- 3534.7	- 3607.5	Chronometrical Thermometer		
65.6	66.2	66.6	67.0	67.8	68.9	69.2	73.9	77.3	85.3	85.8	91.8	93.3	97.8	99.1	Mean Weekly Temperature.		
† Extremes of Temperature observed by the Self- Registering Thermometer																	

NAME OF MAKER.	No.	Whether on or off Days.	ADDRESS OF MAKER.	Construction of Escapement, Balance, and Spring, from the Description furnished by the Maker.	(III.) ABSTRACT OF		Least Weekly Sum.	Extremes of Temperature.	Mean Temperature.
Kullberg.....	6620	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	1-8	92.8 - 104.8	99.1	+ 4.0
Kullberg.....	7127	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	1-4	96.4 - 98.9	99.1	+ 6.3
E. Dent & Co.....	52920	2	61, Strand, London, W.C.	Plain balance; palladium spring.	-	4-8	98.9 - 99.0	98.9	+ 18.6
Usher & Cole.....	6988	2	105, St John Street Road, Clerkenwell, E.C.	Reversing acting in cold; palladium spring.	-	3-2	96.6 - 99.7	98.7	+ 4.4
Kullberg.....	7178	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	11-2	99.0 - 65.7	68.5	+ 0.9
Johannsen & Co.....	5602	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	7-7	92.8 - 104.8	99.1	+ 5.1
Johannsen & Co.....	5274	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	0-0	90.0 - 96.5	94.9	+ 12.3
Johannsen & Co.....	5274	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	7-7	92.8 - 104.8	99.1	+ 4.9
Kullberg.....	7302	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	9-2	92.8 - 104.8	99.1	+ 8.9
Johannsen & Co.....	5568	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	6-1	92.8 - 104.8	99.1	+ 8.9
Johannsen & Co.....	5546	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	7-4	92.8 - 104.8	99.1	+ 15.9
Johannsen & Co.....	5526	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	8-8	92.8 - 104.8	99.1	+ 4.3
Kullberg.....	6740	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	7-6	92.8 - 104.8	99.1	+ 10.0
Kullberg.....	7312	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	0-0	94.7 - 73.9	68.9	+ 19.1
Johannsen & Co.....	5575	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	16-8	92.8 - 104.8	99.1	+ 1.2
J. Fyot.....	1206	2	65, Hyde Vale, Blackheath, S.E.	Improved ordinary balance; bright steel spring.	-	8-7	92.8 - 104.8	99.1	+ 10.5
Kullberg.....	7200	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	6-1	92.8 - 104.8	99.1	+ 10.1
Usher & Cole.....	8254	2	105, St John Street Road, Clerkenwell, E.C.	Reversing acting in heat and cold; palladium spring.	-	1-1	94.7 - 73.9	68.9	+ 16.1
E. Dent & Co.....	51520	2	61, Strand, London, W.C.	Plain balance; palladium spring.	+	0-4	92.8 - 104.8	99.1	+ 16.1
Webb.....	5685	2	23, Amwell Street, London, E.C.	Ordinary balance; palladium spring.	-	18-2	43.1 - 56.0	47.5	- 4.9
Usher & Cole.....	6864	2	105, St John Street Road, Clerkenwell, E.C.	Auxiliary acting in cold; palladium spring.	-	5-6	93.8 - 69.9	66.6	+ 12.5
C. Frodsham & Co.....	10049	2	115, New Bond Street, London, W.	Nickel steel balance; bright steel spring.	+	0-8	94.7 - 73.9	68.9	+ 18.6
Johannsen & Co.....	5568	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	4-2	92.8 - 104.8	99.1	+ 18.6
E. Dent & Co.....	50552	2	61, Strand, London, W.C.	Dent's balance; steel spring.	-	9-8	43.1 - 56.0	47.5	+ 1.1
Johannsen & Co.....	5605	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	19-8	90.2 - 96.5	94.9	+ 14.5
Webb.....	5682	2	23, Amwell Street, London, E.C.	Ordinary balance; palladium spring.	-	4-8	93.8 - 69.9	66.6	+ 12.8
C. Frodsham & Co.....	10029	2	115, New Bond Street, London, W.	Nickel steel balance; bright steel spring.	-	1-1	94.7 - 73.9	68.9	+ 18.6
Kullberg.....	6947	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	9-1	92.8 - 104.8	99.1	+ 8.9
Johannsen & Co.....	5606	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	20-0	46.1 - 54.1	49.1	+ 0.3
Johannsen & Co.....	5607	2	149, Minories, London, E.	Auxiliary to balance acting in heat; palladium spring.	-	3-9	90.2 - 96.5	94.9	+ 2.8
Lilly & Sons.....	5144	2	10, London St, Fenchurch St, London, E.C.	Ordinary balance with an additional palladium spring.	+	3-2	93.8 - 69.9	66.6	+ 12.8
E. Dent & Co.....	5142	2	61, Strand, London, W.C.	Auxiliary balance; palladium spring.	-	18-2	43.1 - 56.0	47.5	+ 1.1
Kullberg.....	7222	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	+	0-1	97.0 - 75.9	69.2	+ 27.5
Lynch.....	5000	2	54, Spencer St, Goswell Road, London, E.C.	Auxiliary compensation acting in cold; steel spring.	-	4-5	94.7 - 73.9	68.9	+ 26.6
Kullberg.....	7248	2	105, Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	-	13-2	92.8 - 104.8	99.1	+ 13.9
E. Dent & Co.....	51940	2	61, Strand, London, W.C.	Dent's balance; steel spring.	-	11-1	46.5 - 49.7	48.7	+ 1.4
E. R. Dent & Sons.....	5680	2	189, Blackfriars Road, London, S.E.	Ordinary balance; palladium spring.	-	6-6	93.8 - 69.9	66.6	+ 13.9
Webb.....	5679	2	23, Amwell Street, London, E.C.	Ordinary balance; palladium spring.	-	27-6	92.8 - 104.8	99.1	+ 0.9

The sign + indicates that the rate is gaining.

THE PRINCIPAL CHANGES OF RATE DURING THE 29 WEEKS.

NAME OF MAKER.	No.	Mean Temperature.	Greatest Weekly Sum.	Extremes of Temperature.	Mean Temperature.	Difference between the Greatest and Least.	Greatest Difference between one Week and the next.	Mean Temperatures for those two Weeks.	Trial No. a + 2b.	NAME OF MAKER.	No.
Kullberg.....	6620	99.1	+ 4.0	92.8 - 104.8	68.2	5.8	3.0	85.8 - 99.1	11.8	Kullberg.....	6620
Kullberg.....	7127	99.1	+ 6.3	96.4 - 98.9	73.9	4.3	7.7	96.6 - 97.3	16.3	Kullberg.....	7127
E. Dent & Co.....	52920	98.6	+ 18.6	98.9 - 99.0	98.3	5.8	3.0	85.8 - 93.9	20.6	E. Dent & Co.....	52920
Usher & Cole.....	6988	98.7	+ 4.4	96.6 - 99.7	73.9	7.6	6.5	97.8 - 98.3	20.6	Usher & Cole.....	6988
Kullberg.....	7178	68.5	+ 0.9	99.0 - 65.7	68.5	12.1	4.7	58.1 - 58.3	21.6	Kullberg.....	7178
Johannsen & Co.....	5602	99.1	+ 5.1	92.8 - 104.8	50.5	13.8	4.4	56.6 - 77.3	21.6	Johannsen & Co.....	5602
Johannsen & Co.....	5274	94.9	+ 12.3	90.0 - 96.5	73.9	12.3	4.9	91.8 - 93.3	22.1	Johannsen & Co.....	5274
Johannsen & Co.....	5274	99.1	+ 4.9	92.8 - 104.8	97.8	12.6	5.8	85.3 - 93.9	24.2	Johannsen & Co.....	5274
Kullberg.....	7302	99.1	+ 8.9	92.8 - 104.8	68.9	15.1	6.2	85.3 - 93.9	24.5	Kullberg.....	7302
Johannsen & Co.....	5568	99.1	+ 8.9	92.8 - 104.8	50.5	15.0	5.3	58.1 - 61.1	25.6	Johannsen & Co.....	5568
Johannsen & Co.....	5546	99.1	+ 15.9	92.8 - 104.8	50.5	15.0	5.3	58.1 - 61.1	25.6	Johannsen & Co.....	5546
Johannsen & Co.....	5526	99.1	+ 4.3	92.8 - 104.8	73.9	13.1	7.1	93.8 - 73.9	27.9	Johannsen & Co.....	5526
Kullberg.....	6740	98.9	+ 10.0	92.8 - 104.8	51.2	17.4	4.9	93.8 - 73.9	27.4	Kullberg.....	6740
Kullberg.....	7312	68.9	+ 19.1	92.8 - 104.8	50.5	19.1	4.7	97.8 - 85.3	28.5	Kullberg.....	7312
Johannsen & Co.....	5575	99.1	+ 1.2	92.8 - 104.8	85.3	15.6	6.5	56.6 - 77.3	28.8	Johannsen & Co.....	5575
J. Fyot.....	1206	99.1	+ 10.5	92.8 - 104.8	48.7	14.2	7.2	64.9 - 85.8	28.6	J. Fyot.....	1206
Kullberg.....	7200	99.1	+ 10.1	92.8 - 104.8	47.5	16.2	6.4	64.9 - 85.8	29.0	Kullberg.....	7200
Usher & Cole.....	8254	99.1	+ 16.1	92.8 - 104.8	73.9	15.7	8.6	64.9 - 85.8	31.2	Usher & Cole.....	8254
E. Dent & Co.....	51520	99.1	+ 16.1	92.8 - 104.8	73.9	15.7	8.6	64.9 - 85.8	32.9	E. Dent & Co.....	51520
Webb.....	5685	47.5	- 4.9	73.5 - 89.5	85.3	13.8	10.0	60.2 - 49.1	33.3	Webb.....	5685
Usher & Cole.....	6864	66.6	+ 12.5	93.8 - 69.9	73.9	18.1	7.8	56.6 - 77.3	33.7	Usher & Cole.....	6864
C. Frodsham & Co.....	10049	68.9	+ 18.6	92.8 - 104.8	69.9	16.3	9.3	63.9 - 66.2	34.9	C. Frodsham & Co.....	10049
Johannsen & Co.....	5568	99.1	+ 8.9	92.8 - 104.8	73.9	24.1	5.7	73.9 - 50.5	35.5	Johannsen & Co.....	5568
Johannsen & Co.....	5568	99.1	+ 18.6	92.8 - 104.8	49.1	22.7	7.8	48.7 - 50.2	37.3	Johannsen & Co.....	5568
E. Dent & Co.....	50552	47.5	+ 1.1	60.0 - 66.5	64.9	22.9	9.1	51.2 - 47.5	38.1	E. Dent & Co.....	50552
Johannsen & Co.....	5605	94.9	+ 14.5	90.2 - 96.5	48.7	18.3	7.9	73.9 - 50.5	38.1	Johannsen & Co.....	5605
Webb.....	5682	66.6	+ 12.8	93.8 - 69.9	50.2	16.6	10.9	63.9 - 73.9	38.4	Webb.....	5682
C. Frodsham & Co.....	10029	68.9	+ 18.6	92.8 - 104.8	73.9	20.3	9.6	63.9 - 73.9	38.4	C. Frodsham & Co.....	10029
Kullberg.....	6947	99.1	+ 8.9	92.8 - 104.8	50.2	17.9	10.9	58.3 - 73.9	39.5	Kullberg.....	6947
Johannsen & Co.....	5606	49.1	+ 0.3	67.6 - 85.3	73.9	20.3	9.7	56.6 - 77.3	39.7	Johannsen & Co.....	5606
Johannsen & Co.....	5607	94.9	+ 2.8	90.2 - 96.5	93.3	26.9	6.6	99.1 - 97.8	40.1	Johannsen & Co.....	5607
Lilly & Sons.....	5144	66.6	+ 12.8	93.8 - 69.9	50.5	20.6	7.5	97.8 - 85.3	41.6	Lilly & Sons.....	5144
E. Dent & Co.....	5142	47.5	+ 1.1	60.0 - 66.5	64.9	22.9	9.1	51.2 - 47.5	41.6	E. Dent & Co.....	5142
Kullberg.....	7222	69.2	+ 27.5	92.8 - 104.8	73.9	27.4	8.7	93.8 - 73.9	44.8	Kullberg.....	7222
Lynch.....	5000	68.9	+ 26.6	92.8 - 104.8	47.5	31.1	7.4	64.9 - 85.8	45.9	Lynch.....	5000
Kullberg.....	7248	97.8	+ 13.9	92.8 - 104.8	51.2	25.5	11.2	93.8 - 69.9	46.7	Kullberg.....	7248
E. Dent & Co.....	51940	48.7	+ 1.4	73.5 - 89.5	85.3	24.5	11.2	58.3 - 66.6	46.9	E. Dent & Co.....	51940
E. R. Dent & Sons.....	5680	66.6	+ 13.9	93.8 - 69.9	50.5	29.7	9.1	99.1 - 97.8	47.9	E. R. Dent & Sons.....	5680
Webb.....	5679	99.1	+ 0.9	92.8 - 104.8	73.9	26.7	11.5	93.8 - 73.9	49.7	Webb.....	5679

The Chronometers are placed in order of merit, their respective positions being determined by consideration of the irregularities of rate exhibited in the Table above. The Trial No. a + 2b is taken as a measure of the irregularities of rate.

Only those Chronometers have been included in this list for which it did not exceed 12 seconds.

(1) WEEKLY RATES IN ORDER OF TIME.

NAME OF MAKER.	No.	July 4-11	July 11-18	July 18-25	July 25 to Aug. 1	Aug. 1-8	Aug. 8-15	Aug. 15-22	Aug. 22-29	Aug. 29 to Sept. 5	Sept. 5-12	Sept. 12-19	Sept. 19-26	Sept. 26 to Oct. 3	Oct. 3-10	Oct. 10-17	Oct. 17-24	Oct. 24-31	Nov. Oct. 31 to Nov. 7	Nov. 7-14
		Pocket Chronometer Horizontal. Dial up.																		
*Newsome & Co.....	151412	+ 15.0	+ 13.8	+ 14.4	+ 14.8	+ 15.6	+ 14.7	+ 15.6	+ 7.9	- 0.6	- 2.7	- 2.8	+ 4.6	+ 1.7	+ 1.1	+ 1.0	+ 0.8	+ 3.7	+ 0.9	- 4.6
Lindqvist.....	108	+ 7.4	+ 8.7	+ 5.2	+ 5.4	+ 1.5					- 52.1	- 53.9	- 52.1	- 54.3	- 50.8	- 50.6	- 51.9	- 52.6	- 52.0	- 60.2
*Newsome & Co.....	150707	+ 7.1	+ 9.5	+ 15.2	+ 15.8	+ 16.0	+ 17.9	+ 14.7	- 5.0	- 27.5	- 34.2	- 14.6	+ 6.8	+ 1.4	- 2.5	- 3.4	- 3.9	- 4.0	- 9.5	- 12.1
*Newsome & Co.....	150708	- 3.8	- 2.6	- 2.5	- 4.3	- 8.5	- 8.8	- 10.8	- 19.5	- 47.1	- 53.6	- 55.3	- 47.8	- 48.0	- 47.0	- 48.8	- 48.8	- 45.5	- 48.2	- 37.5
Thorneloe.....	57075	+ 1.8	+ 1.9	- 1.2	- 2.3	- 5.2	- 8.1	- 8.8	- 25.5	- 50.7	- 62.9	- 56.6	- 49.4	- 53.7	- 54.6	- 55.0	- 55.1	- 57.9	- 58.9	- 69.1
*Chandler.....	57076	- 2.0	- 3.4	+ 1.5	+ 5.1	+ 4.4	- 9.1	- 10.9	- 20.9	- 55.7	- 61.6	- 47.9	- 30.1	- 27.3	- 26.6	- 24.9	- 27.7	- 27.2	- 27.0	- 41.8
*J. Player & Son.....	38489	- 5.6	- 2.7	+ 2.7	+ 4.6	+ 3.7	- 1.6	+ 4.8	- 13.7	- 40.4	- 53.0	- 43.3	- 45.6	- 46.0	- 48.2	- 53.3	- 55.7	- 55.7	- 59.0	- 42.2
*J. White & Son.....	37558	+ 30.7	+ 32.2	+ 42.5	+ 48.0	+ 58.7	+ 59.0	+ 52.8	+ 39.5	+ 27.2	+ 41.7	+ 53.0	+ 57.4	+ 59.2	+ 100.6	+ 110.0	+ 113.1	+ 116.9	+ 119.9	+ 87.8
*J. Player & Son.....	38488	- 7.1	- 3.0	- 14.1	- 8.2	- 10.0	- 13.8	- 28.9	- 9.6	- 53.7	- 66.6	- 62.8	- 55.9	- 46.1	- 32.8	- 61.4	- 80.2	- 86.6	- 116.0	- 43.2
{ Mean Weekly Tem- perature. }		68.9	69.2	67.8	66.6	65.6	67.0	64.9	85.8	99.1	97.8	85.3	63.9	66.2	63.5	60.0	58.1	58.3	56.6	78.6
{ Extremes of Tempera- ture as shown by the Self-Registering Thermometers. }		64.7	67.0	61.2	63.6	63.9	65.3	60.0	80.2	92.8	92.5	78.5	62.2	65.0	59.5	59.0	56.4	56.9	56.7	74.0
		73.9	75.9	72.0	69.3	66.9	69.0	66.5	90.1	104.8	103.6	89.5	66.0	67.5	65.7	61.0	58.9	59.9	57.4	82.4

* These Pocket Chronometers have the Karsell movement.

(2) ABSTRACT OF THE PRINCIPAL CHANGES OF RATE.

(A) ABSTRACT OF THE RESULTS.												Difference between greatest and least Weekly Rate. Dial up. Dial up. Dial up. Dial up. Dial up.	Difference of Weekly Rates. Dial up. Dial up. Dial up. Dial up. Dial up.	Trial Number. $a + 2b + \frac{c+d+e}{2}$	NAME OF MAKER.	No.			
Nov. 14-18	Nov. 18-21	Nov. 21-24	Nov. 24-28	Nov. 28 to Dec. 5	Dec. 5-12	Dec. 12-19	Dec. 19-26	Dec. 26 to Jan. 2	Jan. 2-9	Jan. 9-16	Jan. 16-23								
Watch Vertical Pendulum up.	Watch Vertical Pendulum right.	Watch Vertical Pendulum left.	Watch Vertical Pendulum up.	Pocket Chronometer Horizontal. Dial up.															
+	+	+	+																
a.	b.	c.	d.	e.															
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
89.9	89.9	35.0	42.7	3.8	5.7	4.9	4.0	0.8	6.2	4.4	3.4	201	9.5	40.6	35.7	30.8	70.5	*Newsome & Co.....	151412
36.4	109.0	34.5	46.4	63.7	59.9	60.4	60.0	62.5	60.0	63.8	67.7	171	8.3	103.4	47.3	27.2	97.6	Lindqvist.....	108
30.0	18.7	24.5	23.2	14.8	22.8	23.6	21.0	12.5	9.4	6.1	4.4	521	22.5	7.1	4.7	10.6	103.2	*Newsome & Co.....	150707
54.5	55.8	54.6	52.9	49.1	59.2	62.0	62.0	64.0	68.8	63.1	68.9	687	27.6	0.5	2.5	1.9	122.6	*Newsome & Co.....	150708
77.2	79.1	74.2	71.6	67.6	64.9	69.5	61.9	67.8	69.9	67.7	72.8	747	29.2	7.6	8.3	7.4	131.5	Thorneloe.....	57075
69.8	62.5	64.9	73.3	43.0	27.0	27.5	25.1	23.6	27.4	27.6	30.5	667	24.6	27.6	30.3	22.7	137.3	*Chandler.....	57076
75.1	66.5	67.2	69.2	63.6	73.8	77.4	77.8	81.4	79.9	77.9	81.3	862	28.7	19.8	15.6	16.3	154.6	*J. Player & Son.....	38489
57.8	55.1	57.6	64.4	36.8	133.7	131.3	130.0	132.3	126.0	126.4	125.1	106.5	37.3	30.7	29.7	24.2	209.5	*J. White & Son.....	37558
41.1	50.4	44.3	40.4	100.6	110.9	88.2	86.2	102.7	74.1	69.5	48.0	113.0	72.8	31.1	21.5	27.1	232.3	*J. Player & Son.....	38488
78.6	79.4	77.6	50.3	51.1	51.6	47.5	46.7	50.6	49.1	The sign + indicates a gaining rate.									
75.5	74.5	75.1	47.2	50.0	49.0	43.1	46.5	47.1	46.1	The quantities a, b, c, d, e, in the formula $a + 2b + \frac{c+d+e}{2}$ are taken numerically without regard to sign.									
81.1	81.2	79.3	59.1	53.5	57.7	56.0	49.7	56.9	54.1	The weekly rates have been computed from the rates for four days. During the periods Aug. 22 to Sept. 19 and Nov. 7 to Dec. 5, Pocket Chronometers were placed in the chamber of 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.									