

RATES OF CHRONOMETERS
ON TRIAL
FOR PURCHASE BY THE BOARD OF ADMIRALTY,
AT THE
ROYAL OBSERVATORY, GREENWICH,
FROM 1892 JULY 2 TO 1893 JANUARY 21.

RATES OF CHRONOMETERS ON TRIAL FOR PURCHASE BY THE MIRALTY,

NAME OF MAKER.	No.	Whether 2 or 8 Days.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(I.) WEEKLY RATES											
				July 2-9	July 9-16	July 16-23	July 23-30	July 30 to Aug. 6	Aug. 6-13	Aug. 13-20	Aug. 20-27	Aug. 27 to Sept. 3	Sept. 3-10	Sept. 10-17	Sept. 17-24
Uhlig	502	8	Uhlig's continually acting auxiliary.	- 6.2	- 5.6	- 4.8	- 5.6	- 5.6	- 5.3	- 4.6	- 6.6	- 7.5	- 7.3	- 8.8	-10.9
Isaac	1899	2	Auxiliary to balance; reverse movement; bright spring	+ 5.8	+ 6.6	+ 6.6	+ 5.9	+ 3.9	+ 4.3	+ 5.6	+ 4.0	+ 4.9	+ 7.1	+ 6.4	+ 6.6
Uhlig	576	2	Uhlig's continually acting auxiliary.	- 3.8	- 2.3	- 1.4	- 0.2	- 0.5	+ 0.2	+ 0.8	+ 2.1	- 2.6	- 1.0	- 0.9	+ 0.6
Isaac	1897	2	Auxiliary to balance; reverse movement; bright spring	- 1.4	- 4.1	- 3.6	- 4.9	-10.4	-10.0	- 8.0	-10.4	- 7.5	- 9.2	- 6.6	- 4.4
Kullberg	5264	2	Auxiliary balance; reversed detent.	- 4.4	- 3.9	- 4.0	- 4.2	- 6.9	- 7.0	- 4.9	- 5.9	- 7.5	- 7.3	- 5.4	- 6.0
Webb	5653	2	Ordinary balance.	- 0.3	+ 1.0	+ 3.0	+ 2.0	+ 2.6	+ 3.5	+ 4.3	+ 3.6	+ 1.9	+ 5.5	+ 7.4	+10.9
Kullberg	5225	2	Auxiliary balance; reversed detent.	- 1.9	- 2.5	- 3.7	- 5.6	- 7.0	- 7.9	- 6.4	- 5.8	- 5.7	- 1.0	+ 0.1	- 5.7
Johannsen & Co.	4156	2	Auxiliary compensation acting in cold.	+ 5.0	+ 3.8	+ 3.4	+ 3.2	+ 3.8	+ 6.1	+ 9.3	+ 6.5	+ 2.8	+ 4.5	+ 5.8	+ 6.7
Kullberg	5230	2	Auxiliary balance; reversed detent.	- 2.2	- 2.7	- 2.6	- 1.4	- 2.1	- 1.9	- 0.4	- 2.6	- 4.1	- 6.9	- 4.3	- 3.3
Johannsen & Co.	4251	2	Auxiliary compensation acting in heat.	+ 2.4	+ 0.9	- 0.1	+ 0.1	- 0.2	+ 1.0	+ 3.8	+ 2.5	- 5.5	- 6.5	0.0	- 1.0
Gardner	3038	2	Reversed detent.	+ 2.5	+ 3.0	+ 2.8	+ 8.7	+ 6.6	+ 7.6	+ 7.8	+ 7.5	+ 4.6	+ 7.3	+ 5.6	+ 4.8
E. Dent & Co.	45445	2	Ordinary balance with Dent's auxiliary.	+10.0	+ 5.9	+ 3.6	+ 2.0	+ 3.0	- 1.9	+ 1.4	+ 1.7	+ 3.4	+ 8.4	+11.4	+ 3.7
Williams	922	2	Auxiliary compensation acting in heat.	- 4.0	- 2.7	- 1.2	- 0.9	- 2.1	- 0.9	- 0.7	- 6.0	- 3.1	- 2.9	- 5.7	+ 2.5
Johannsen & Co.	4261	2	Auxiliary compensation acting in heat.	- 1.2	- 0.3	+ 0.6	+ 0.7	- 0.3	+ 0.9	+ 2.4	+ 2.9	- 1.9	+ 0.9	+ 8.2	+ 5.8
Gardner	3031	2	Loseby balance; improved mount.	+14.9	+17.9	+19.3	+21.9	+20.2	+21.0	+24.2	+14.9	+16.2	+14.0	+12.6	+20.4
Kullberg	5226	2	Auxiliary balance; reversed detent.	- 1.4	- 0.7	- 0.2	+ 0.8	- 0.5	- 4.7	+ 4.2	+ 2.3	+ 0.9	+ 3.4	+ 4.7	+ 6.0
Isaac	1898	2	Auxiliary to balance; reverse movement; bright spring	+ 5.8	+ 6.5	+ 6.5	+ 6.6	+ 6.4	+ 6.3	+ 6.1	+ 2.2	+ 1.0	+ 1.6	+ 1.5	+ 4.9
Haswell & Sons	5002	2	Paillard's non-magnetic balance & spring	+11.5	+11.2	+11.3	+ 8.3	+ 6.4	+ 6.6	+ 7.0	+ 7.7	+14.3	+21.3	+22.0	+23.3
Johannsen & Co.	4242	2	Auxiliary compensation acting in heat.	- 4.6	- 4.6	- 4.3	- 3.9	- 2.1	- 1.1	+ 0.7	+ 0.5	- 6.4	- 4.7	+ 1.1	- 3.0
Johannsen & Co.	3892	2	Auxiliary compensation acting in heat.	- 8.6	- 7.9	- 8.8	-10.4	-12.2	-11.3	- 8.8	+ 1.7	- 1.6	- 2.1	+ 0.7	+ 0.8
Johannsen & Co.	3793	2	Auxiliary compensation acting in heat.	+ 8.2	+ 8.3	+ 8.2	+ 9.4	+ 8.1	+ 9.2	+ 9.2	+10.0	- 1.4	- 2.1	+ 4.9	+ 3.1
Clerke	1728	2	Ordinary balance.	+10.9	+10.6	+10.4	+10.2	+ 9.9	+11.9	+12.3	+12.3	+ 3.0	+ 4.7	+14.0	+15.5
Johannsen & Co.	4017	2	Auxiliary compensation acting in cold.	+ 8.4	+ 8.3	+ 8.6	+ 7.1	+ 7.0	+ 9.6	+ 7.9	+ 7.1	- 1.9	- 1.0	- 0.8	+ 8.6
Webb	5654	2	Ordinary balance.	+14.9	+14.7	+10.8	+ 9.0	+ 7.7	+ 9.4	+10.4	+ 9.7	+ 7.0	+ 8.6	+12.9	+16.0
Johannsen & Co.	4245	2	Auxiliary compensation acting in heat.	+ 1.0	+ 3.9	+ 3.9	+ 5.2	+ 5.0	+ 7.2	+ 7.7	+ 7.8	+ 5.7	+ 8.1	+10.8	+10.6
Kendal & Dent	1726	2	Auxiliary compensation acting in ex- [in cold. tremes.	+ 1.5	+ 3.5	+ 6.1	+ 4.8	+ 5.9	+ 7.6	+10.4	+18.6	+13.7	+14.9	+19.4	+ 8.9
Clerke	999	8	Ordinary balance.	- 5.6	- 5.3	- 6.0	- 5.5	- 7.4	- 5.2	- 4.2	- 6.0	-15.5	-13.9	- 3.6	+ 0.2
Pyott	3866	2	Ordinary balance with an addition.	+14.7	+12.7	+11.0	+11.6	+11.5	+14.0	+18.0	+20.8	+15.5	+16.8	+24.2	+11.9
Johannsen & Co.	3866	2	Auxiliary compensation acting in heat.	- 3.6	- 0.8	- 3.1	- 2.8	- 3.7	- 1.9	- 2.4	+ 3.2	- 2.2	- 0.1	- 0.2	+ 8.3
Kendal & Dent	5555	2	Ordinary balance, with broad rim.	+ 1.3	+ 0.9	+ 1.0	+ 0.8	+ 2.0	+ 3.7	+ 6.6	0.0	- 8.0	- 4.7	+ 5.3	+12.0
Penlington	2248	2	Ordinary balance; check action acting	- 7.4	- 7.7	- 7.8	- 7.0	- 6.0	- 5.1	- 3.0	- 3.3	-12.0	-11.6	- 4.6	- 7.1
Johannsen & Co.	4243	2	Auxiliary compensation acting in heat.	+ 1.9	+ 3.4	+ 5.6	+ 6.3	+ 7.6	+ 7.9	+ 8.7	+ 2.3	- 6.7	- 6.8	+ 2.9	+ 8.2
Johannsen & Co.	4176	2	Auxiliary compensation acting in cold.	+20.4	+22.8	+23.3	+ 8.5	+11.8	+11.8	+ 8.7	+19.6	+18.3	+21.2	+14.8	+19.3
Johannsen & Co.	4222	2	Auxiliary compensation acting in cold.	- 7.5	- 5.6	- 7.9	- 9.6	-13.5	-15.6	-14.3	- 3.5	- 3.6	- 7.5	+ 1.1	+ 3.8
Mercer	5454	2	Ordinary balance with small alteration.	- 6.9	- 6.7	- 4.8	- 3.0	- 2.7	- 2.3	- 0.5	-11.8	-24.3	-21.6	-12.1	- 9.9
E. Dent & Co.	45447	2	Ordinary balance with Dent's auxiliary.	-12.8	-10.5	- 9.5	-12.7	-12.9	-13.2	-16.9	-10.0	-10.1	- 8.5	- 7.7	- 6.0
Ramsay	5657	2	Auxiliary to balance, acting in extremes.	-19.6	-19.5	-19.7	-19.8	-17.3	-15.3	-11.9	- 7.3	- 2.9	+ 5.1	+ 9.2	+ 5.4
Pyott	862	2	Ordinary balance with an addition.	+12.9	+14.4	+16.9	+15.7	+16.7	+15.5	+15.0	+12.0	- 0.2	- 2.0	- 3.5	+ 9.7
Johannsen & Co.	4174	2	Auxiliary compensation acting in cold.	+ 1.1	- 0.7	- 0.5	+ 0.1	+ 0.4	+ 2.3	+ 5.3	+ 9.5	+ 3.4	+ 4.4	+12.8	+ 9.9
Isaac	1772	2	Auxiliary to balance; bright spring.	- 1.8	- 0.5	+ 1.3	+ 1.7	+ 1.7	+ 0.2	- 0.8	+ 6.9	+10.1	+14.3	+21.7	+15.6
Williams	921	2	Auxiliary compensation acting in heat.	- 9.4	- 1.1	+ 6.4	+ 7.1	+ 4.0	+ 3.0	+ 3.8	+17.9	+21.7	+16.0	+17.4	+16.0
Penlington	2247	2	Ordinary balance; check action acting in cold.	-13.5	-13.3	-12.6	-11.1	- 8.7	- 8.5	- 4.9	- 9.0	-17.1	-15.0	- 5.1	- 4.9
Mercer	5432	2	Ordinary balance with small alteration.	-13.3	-12.9	-11.7	-11.8	-10.6	-10.3	- 9.0	-11.9	-19.9	-14.3	- 2.9	- 3.6
Isaac	1829	8	Improved ordinary balance.	-10.4	-12.9	-13.8	-14.1	-13.2	-11.3	- 8.1	- 4.6	-13.3	-16.0	- 8.6	-11.4
Keys	924	2	Auxiliary compensation.	+23.8	+22.6	+22.0	+21.4	+19.8	+24.1	+27.1	+31.4	+11.3	- 0.5	+13.5	+11.4
Schoof	6065	2	[piece acting in cold. Schoof's resilient lever escapement check.	+20.3	+19.4	+21.4	+24.7	+24.8	+27.3	+30.1	+28.8	+12.1	+ 6.8	+25.1	+35.6
Haswell & Sons	2921	2	Paillard's non-magnetic balance & spring	+ 8.0	+13.9	+14.0	+12.0	+ 8.0	+ 6.8	+ 8.2	+ 3.1	+ 7.5	+26.3	+39.1	+47.9
Uhlig	573	2	Uhlig's continually acting auxiliary.	- 0.9	+ 0.3	+ 1.2	+ 1.6	+ 1.2	+ 1.8	+ 1.8	- 8.6	-17.2	-14.3	-13.6	+ 2.4
Chronometrical Ther- mometer				-634.0	-327.0	-161.1	-258.8	-387.1	-493.4	*	-1534.0	-2635.5	-2796.0	-1666.6	+ 569.1
Mean Weekly Tempera- ture				66.9	63.6	61.6	62.4	64.0	65.1	67.3	85.1	95.7	98.4	85.8	62.7
Extremes of Tempera- ture as shown by the Self-Registering Ther- mometers				64.0-70.0	60.1-67.0	59.2-64.1	60.2-64.5	62.0-66.1	61.5-69.2	64.9-69.7	80.6-89.2	86.0-100.9	93.5-102.6	81.5-90.3	58.9-66.5

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 rims being reversed. By this arrangement the effect of temperature is much magnified.

IN ORDER OF TIME.

Sept. 24 to Oct. 1	Oct. 1-8	Oct. 8-15	Oct. 15-22	Oct. 22-29	Oct. 29 to Nov. 5	Nov. 5-12	Nov. 12-19	Nov. 19-26	Nov. 26 to Dec. 3	Dec. 3-10	Dec. 10-17	Dec. 17-24	Dec. 24-31	Dec. 31 to Jan. 7	Jan. 7-14	Jan. 14-21	NAME OF MAKER.	No.
-11.0 +6.2 +1.5 -4.0 -6.5	-12.2 +6.6 +2.3 -3.2 -8.2	-12.1 +6.1 +3.4 -5.9 -8.8	-12.3 +4.5 +2.7 -1.3 -10.7	-10.7 +3.4 +4.7 -5.0 -10.8	-10.2 +3.5 +4.4 -2.5 -9.6	-11.5 +2.5 +0.5 -6.5 -8.0	-7.9 +2.7 +0.1 -4.2 -6.0	-6.4 +4.4 +1.6 -4.0 -7.1	-9.8 +5.4 +2.3 -5.9 -6.2	-13.0 +2.1 +5.2 -3.9 -11.6	-15.3 -1.7 +2.6 -5.3 -15.1	-12.6 +2.2 +6.0 -3.4 -12.7	-10.9 -2.0 +7.2 -2.9 -13.2	-12.1 -3.1 +6.6 -3.0 -14.1	-11.9 -3.0 +5.7 -4.0 -15.5	-11.8 -0.5 +6.6 -3.9 -14.8	Uhrig Isaac Uhrig Isaac Kullberg.....	502 1899 576 1897 5264
+9.8 -7.3 +9.5 -4.4 +1.0	+10.1 -6.1 +10.4 -5.1 -0.6	+10.4 -6.5 +13.1 -5.4 -1.8	+9.7 -7.7 +13.1 -5.9 -2.3	+10.6 -7.5 +15.8 -5.7 -0.9	+11.7 -8.0 +12.9 -5.0 -3.2	+12.4 -3.9 +9.6 -6.6 +3.8	+8.4 -3.4 +11.8 -5.6 -1.9	+8.8 -3.5 +12.2 -7.7 +0.6	+9.0 -3.1 +17.4 -7.1 +4.9	+12.5 -5.7 +17.7 -2.2 +3.3	+9.9 -11.2 +12.8 -7.9 -1.8	+12.3 -9.1 +10.5 -5.3 +0.8	+11.9 -4.2 +13.6 -2.9 +3.0	+13.6 -5.9 +12.7 +2.3 +3.0	+13.1 -8.8 +12.3 +0.2 +2.6	+14.5 -8.5 +13.6 -3.2 +3.1	Webb Kullberg..... Johannsen & Co. Kullberg..... Johannsen & Co.	5653 5225 4156 5230 4251
+10.2 +0.7 +2.1 +5.3 +22.0	+10.1 +1.0 +3.8 +7.7 +22.6	+11.7 +0.3 +4.3 +8.7 +22.9	+10.7 -0.3 +4.5 +8.3 +22.2	+9.4 +1.9 +4.7 +10.6 +25.0	+8.4 -1.2 +4.9 +10.6 +23.9	+6.1 -1.5 -3.7 +11.3 +18.1	+6.9 +3.7 -1.2 +5.3 +16.7	+9.6 +7.1 0.0 +7.5 +17.1	+9.6 +10.0 -0.8 +11.3 +16.0	+2.1 +10.1 +6.2 +10.8 +22.8	+2.3 +2.2 +4.5 +8.5 +19.3	+5.4 +4.5 +5.2 +13.0 +22.5	-0.5 +10.7 +3.6 +14.2 +20.5	-0.9 +7.0 +4.0 +14.2 +22.1	+0.1 +7.9 +4.1 +14.1 +24.2	+3.9 +5.2 +5.5 +14.3 +26.1	Gardner E. Dent & Co... Williams..... Johannsen & Co. Gardner	5653 45445 922 4261 5653
+4.7 +5.5 +18.3 -1.6 -6.4	+1.4 +8.9 +18.0 +0.1 -6.1	+1.4 +13.1 +18.4 +2.5 -6.8	-1.6 +13.7 +18.3 +1.5 -6.5	-5.4 +15.2 +19.7 +2.6 -4.5	-4.6 +11.9 +16.8 +2.6 -3.9	-0.8 +3.0 +20.2 +5.0 +0.5	+0.4 +0.5 +27.7 +2.4 +3.1	+3.6 +2.2 +24.5 +3.8 +3.5	+3.9 +4.9 +25.9 +3.0 +3.7	+0.3 +8.7 +26.6 +4.5 +1.9	-5.3 +7.4 +23.3 +3.7 -3.3	-0.7 +9.1 +23.2 +8.6 -0.8	-2.7 +12.2 +25.4 +14.5 -0.8	-6.9 +12.9 +23.1 +16.0 -4.5	-9.1 +15.9 +21.6 +15.9 -4.5	-9.2 +15.3 +22.0 +16.7 -4.8	Kullberg..... Isaac Haswell & Sons Johannsen & Co. Johannsen & Co.	5226 1898 5002 4242 3892
+5.0 +15.1 +9.2 +15.9 +13.2	+5.0 +13.9 +8.9 +17.9 +13.0	+4.5 +14.2 +9.7 +17.5 +19.1	+5.6 +13.1 +8.0 +15.3 +19.0	+7.5 +11.6 +10.3 +10.1 +21.2	+10.0 +11.9 +6.7 +6.7 +15.1	+6.8 +19.7 -0.7 +15.2 +12.6	+2.6 +13.4 -2.7 +12.3 +13.3	+2.1 +13.8 +1.7 +12.9 +15.6	+6.5 +20.0 +3.1 +16.0 +16.0	+7.3 +9.9 +13.0 +15.8 +23.0	+6.5 +6.7 +5.1 +12.0 +20.5	+9.7 +10.8 +7.7 +14.3 +25.0	+12.0 +2.6 +15.4 +2.4 +27.0	+10.7 +4.4 +15.7 +2.7 +27.6	+9.7 +5.1 +14.5 +3.1 +26.8	+9.2 +7.4 +15.0 +4.1 +27.1	Johannsen & Co. Clerke Johannsen & Co. Webb Johannsen & Co.	3793 1728 4017 5654 4245
+9.1 -1.0 +13.9 +9.7 +12.2	+11.4 -2.0 +16.0 +11.1 +10.4	+13.6 -1.9 +13.4 +9.6 +10.0	+13.1 -2.0 +13.0 +5.6 +10.5	+14.3 -5.2 +15.4 +1.4 +9.2	+11.4 -10.4 +14.1 -6.4 +10.4	+15.4 -0.2 +24.0 -8.4 +14.3	+20.0 -4.4 +25.8 +1.9 +7.3	+21.3 -4.7 +25.1 -5.6 +9.1	+18.3 +2.6 +24.4 -8.5 +16.9	+17.0 -8.4 +10.8 +3.9 +8.2	+13.9 -10.9 +9.9 +4.9 +9.6	+15.3 -5.0 +12.6 +8.9 +13.3	+18.1 -16.9 +14.4 +9.0 +3.0	+18.4 -16.3 +11.9 +10.4 +3.7	+15.5 -15.3 +9.3 +8.5 +5.5	+16.6 -10.6 +15.1 +8.1 +8.3	Kendal & Dent... Clerke Pyott Johannsen & Co. Kendal & Dent...	5653 1726 999 3866 5653
-6.3 +10.8 +18.4 -1.3 -5.9	-10.5 +12.3 +22.8 -1.1 -6.0	-9.9 +14.6 +25.5 +4.3 -3.9	-12.7 +14.1 +22.9 +4.4 -4.2	-13.9 +14.7 +23.8 +6.6 -4.0	-9.7 +15.6 +22.7 +0.3 +1.0	-0.6 +10.6 +18.5 +4.1 -2.0	-5.1 +2.3 +23.6 +5.3 -11.4	-5.5 +2.1 +23.9 +6.0 -7.9	-2.2 +9.5 +16.9 +5.0 -2.1	-16.6 +10.3 +18.1 +5.7 -7.5	-17.9 +11.6 +17.6 +1.8 -6.9	-13.4 +17.4 +28.1 +3.0 +0.1	-17.1 +21.2 +20.3 +12.8 -7.6	-16.4 +17.2 +19.5 +12.8 -8.5	-15.0 +19.8 +21.8 +10.5 -8.4	-13.0 +21.6 +26.7 +9.4 -5.9	Penlington..... Johannsen & Co. Johannsen & Co. Johannsen & Co. Mercer.....	2248 4243 4176 4222 5454
-8.5 +6.4 +12.6 +10.0 +11.1	-9.8 +9.1 +15.9 +9.7 +11.4	-14.0 +9.3 +18.9 +9.9 +8.6	-2.7 +11.3 +20.9 +10.9 +8.6	-2.0 +11.2 +21.9 +13.3 +9.8	-8.2 +7.8 +18.2 +12.9 +7.1	-0.4 +12.3 +10.0 +18.1 +22.6	-6.0 +13.9 +3.6 +15.7 +23.4	-3.1 +17.0 +5.6 +21.3 +25.5	-0.3 +19.2 +7.3 +21.7 +23.3	+7.5 +14.4 +14.2 +21.7 +22.8	-2.2 +11.8 +13.2 +18.1 +19.1	+0.4 +15.1 +19.1 +20.0 +22.1	+11.7 +17.4 +21.3 +32.4 +21.8	+13.9 +15.7 +24.7 +31.5 +17.9	+7.8 +13.7 +27.5 +28.2 +16.4	+5.5 +14.4 +21.5 +24.6 +19.0	E. Dent & Co... Ramsay Pyott Johannsen & Co. Isaac	45447 6567 862 4174 1772
+10.4 -3.6 -5.9 -11.6 +17.2	+17.0 -6.7 -9.3 -16.0 +25.4	+18.7 -6.2 -11.3 -16.4 +25.5	+18.4 -8.4 -12.7 -18.3 +26.7	+17.6 -9.2 -13.6 -19.9 +27.8	+16.5 -3.8 -9.8 -15.9 +26.1	+13.5 +1.3 -3.8 -7.0 +27.1	+15.5 -3.6 -6.7 -10.1 +18.2	+13.3 -2.3 -3.1 -9.8 +8.3	+4.7 +3.0 +0.6 -5.0 +15.2	+13.5 -14.8 -17.7 -23.7 +27.5	+15.5 -15.0 -18.7 -24.7 +22.5	+20.2 -8.1 -14.2 -19.2 +28.3	+18.4 -19.6 -23.6 -33.1 +28.3	+17.0 -19.8 -23.8 -31.6 +28.4	+17.0 -20.7 -22.7 -29.7 +28.0	+13.4 -14.5 -19.1 -25.4 +29.0	Williams..... Penlington..... Mercer..... Isaac..... Keys	921 2247 5432 1820 924
+44.9 +44.1 +1.0	+43.6 +41.4 +9.1	+47.8 +39.7 -3.9	+46.5 +42.0 -1.2	+48.8 +40.7 +5.0	+43.8 +36.7 +2.9	+42.5 +40.9 -8.4	+30.8 +39.0 -10.9	+27.3 +41.4 -3.1	+35.7 +49.6 +10.0	+33.0 +59.4 +30.6	+41.2 +50.6 +24.5	+55.8 +50.9 +34.6	+49.7 +59.3 +39.3	+48.3 +58.9 +23.4	+50.1 +57.8 +10.0	+53.0 +54.9 +12.7	Schoof Haswell & Sons Uhrig	6065 2921 573
+655.0	+1241.8	+1302.6	+1452.9	+1653.6	+1282.1	-641.5	-2100.0	-2181.7	-727.0	+1980.1	+1786.2	+1692.8	+2546.1	+2464.4	+2342.9	+2156.6	(Chronometrical Thermometer.	
61.6	55.5	55.0	53.4	50.6	54.7	75.6	91.6	92.0	76.1	47.3	49.2	50.5	40.6	42.2	42.2	44.9	(Mean Weekly Tem- perature.	
57.7-64.3	58.7-58.6	52.8-58.5	51.0-57.8	47.4-57.1	51.5-57.9	67.8-82.0	88.2-96.5	88.2-94.4	71.2-81.2	37.5-55.9	46.1-56.6	44.4-53.8	36.9-46.1	37.5-48.1	39.9-45.4	39.1-50.6	(Extremes of Tempera- ture as shown by the Self-Registering Thermometers.	

The Chronometers are placed in order of merit, their respective positions being determined by consideration of the irregularities of rate exhibited in Table III.

* The mainspring of the Chronometrical Thermometer was found broken in the seventh week of the trial; it was repaired the same week.

RATES OF CHRONOMETERS ON TRIAL FOR PURCHASE BY THE ADALTY,

NAME OF MAKER.	No.	Whether 2 or 8 Days.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(II.) WEEKLY RATES IN THE											
				Dec. 24—31	Dec. 31 to Jan. 7.	Jan. 7—14	Jan. 14—21	Dec. 3—10	Dec. 10—17	Dec. 17—24	Oct. 22—29	Oct. 15—22	Oct. 8—15	Oct. 29 to Nov. 5	Oct. 1—8
Uhlig	502	8	Uhlig's continually acting auxiliary.	-10 ^s .9	-12 ^s .1	-11 ^s .9	-11 ^s .8	-13 ^s .0	-15 ^s .3	-12 ^s .6	-10 ^s .7	-12 ^s .3	-12 ^s .1	-10 ^s .2	-12 ^s .2
Isaac	1899	2	Auxiliary to balance; reverse movement; bright spring	-2 ^s .0	-3 ^s .1	-3 ^s .0	-0 ^s .5	+2 ^s .1	-1 ^s .7	+2 ^s .2	+3 ^s .4	+4 ^s .5	+6 ^s .1	+3 ^s .5	+6 ^s .6
Uhlig	576	2	Uhlig's continually acting auxiliary.	+7 ^s .2	+6 ^s .6	+5 ^s .7	+6 ^s .6	+5 ^s .2	+2 ^s .0	+6 ^s .0	+4 ^s .7	+2 ^s .7	+3 ^s .4	+4 ^s .4	+2 ^s .3
Isaac	1897	2	Auxiliary to balance; reverse movement; bright spring	-2 ^s .9	-3 ^s .0	-4 ^s .0	-3 ^s .9	-3 ^s .9	-5 ^s .3	-3 ^s .4	-5 ^s .0	-1 ^s .3	-5 ^s .9	-2 ^s .5	-3 ^s .2
Kullberg	5264	2	Auxiliary balance; reversed detent.	-13 ^s .2	-14 ^s .1	-15 ^s .5	-14 ^s .8	-11 ^s .6	-15 ^s .1	-12 ^s .7	-10 ^s .8	-10 ^s .7	-8 ^s .8	-9 ^s .6	-8 ^s .2
Webb	5653	2	Ordinary balance.	+11 ^s .9	+13 ^s .6	+13 ^s .1	+14 ^s .5	+12 ^s .5	+9 ^s .9	+12 ^s .3	+10 ^s .6	+9 ^s .7	+10 ^s .4	+11 ^s .7	+10 ^s .1
Kullberg	5225	2	Auxiliary balance; reversed detent.	-4 ^s .2	-5 ^s .9	-8 ^s .8	-8 ^s .5	-5 ^s .7	-11 ^s .2	-9 ^s .1	-7 ^s .5	-7 ^s .7	-6 ^s .5	-8 ^s .0	-6 ^s .1
Johannsen & Co.	4156	2	Auxiliary compensation acting in cold.	+13 ^s .6	+12 ^s .7	+12 ^s .3	+13 ^s .6	+17 ^s .7	+12 ^s .8	+10 ^s .5	+15 ^s .8	+13 ^s .1	+13 ^s .1	+12 ^s .9	+10 ^s .4
Kullberg	5230	2	Auxiliary balance; reversed detent.	+2 ^s .9	+2 ^s .3	+0 ^s .2	-3 ^s .2	-2 ^s .2	-7 ^s .9	-5 ^s .3	-5 ^s .7	-5 ^s .9	-5 ^s .4	-5 ^s .9	-5 ^s .1
Johannsen & Co.	4251	2	Auxiliary compensation acting in heat.	+3 ^s .0	+3 ^s .0	+2 ^s .6	+3 ^s .1	+3 ^s .3	-1 ^s .8	+0 ^s .8	-0 ^s .9	-2 ^s .3	-1 ^s .8	-3 ^s .2	-0 ^s .6
Gardner	3944	2	Reversed detent.	-0 ^s .5	-0 ^s .9	+0 ^s .1	+3 ^s .9	+2 ^s .1	+2 ^s .3	+5 ^s .4	+9 ^s .4	+10 ^s .7	+11 ^s .7	+8 ^s .4	+10 ^s .1
E. Dent & Co.	45445	2	Ordinary balance with Dent's auxiliary.	+10 ^s .7	+7 ^s .0	+7 ^s .9	+5 ^s .2	+10 ^s .1	+2 ^s .2	+4 ^s .5	+1 ^s .9	-0 ^s .3	+0 ^s .3	-1 ^s .2	+1 ^s .0
Williams	922	2	Auxiliary compensation acting in heat.	+3 ^s .6	+4 ^s .0	+4 ^s .1	+5 ^s .5	+6 ^s .2	+4 ^s .5	+5 ^s .2	+4 ^s .7	+4 ^s .5	+4 ^s .3	+4 ^s .9	+3 ^s .8
Johannsen & Co.	4261	2	Auxiliary compensation acting in heat.	+14 ^s .2	+14 ^s .2	+14 ^s .1	+14 ^s .3	+10 ^s .8	+8 ^s .5	+13 ^s .0	+10 ^s .6	+8 ^s .3	+8 ^s .7	+10 ^s .6	+7 ^s .7
Gardner	3937	2	Loseby balance; improved mount.	+20 ^s .5	+22 ^s .1	+24 ^s .2	+26 ^s .1	+22 ^s .8	+19 ^s .3	+22 ^s .5	+25 ^s .0	+22 ^s .2	+22 ^s .9	+23 ^s .9	+22 ^s .6
Kullberg	5226	2	Auxiliary balance; reversed detent.	-2 ^s .7	-6 ^s .9	-9 ^s .1	-9 ^s .2	+0 ^s .3	-5 ^s .3	-0 ^s .7	-5 ^s .4	-1 ^s .6	+1 ^s .4	-4 ^s .6	+1 ^s .4
Isaac	1898	2	Auxiliary to balance; reverse movement; bright spring	+12 ^s .2	+12 ^s .9	+15 ^s .9	+15 ^s .3	+8 ^s .7	+7 ^s .4	+9 ^s .1	+15 ^s .2	+13 ^s .7	+13 ^s .1	+11 ^s .9	+8 ^s .9
Haswell & Sons	5002	2	Paillard's non-magnetic balance & spring	+25 ^s .4	+23 ^s .1	+21 ^s .6	+22 ^s .0	+26 ^s .6	+22 ^s .3	+23 ^s .2	+19 ^s .7	+18 ^s .3	+18 ^s .4	+16 ^s .8	+18 ^s .0
Johannsen & Co.	4242	2	Auxiliary compensation acting in heat.	+14 ^s .5	+16 ^s .0	+15 ^s .9	+16 ^s .7	+4 ^s .5	+3 ^s .7	+8 ^s .6	+2 ^s .9	+1 ^s .5	+2 ^s .5	+2 ^s .6	+0 ^s .1
Johannsen & Co.	3892	2	Auxiliary compensation acting in heat.	-0 ^s .8	-4 ^s .5	-4 ^s .5	-4 ^s .8	+1 ^s .9	-3 ^s .3	-0 ^s .8	-4 ^s .5	-6 ^s .5	-6 ^s .8	-3 ^s .9	-6 ^s .1
Johannsen & Co.	3793	2	Auxiliary compensation acting in heat.	+12 ^s .0	+10 ^s .7	+9 ^s .7	+9 ^s .2	+7 ^s .3	+6 ^s .5	+9 ^s .7	+7 ^s .5	+5 ^s .6	+4 ^s .5	+10 ^s .0	+5 ^s .0
Clerke	1728	2	Ordinary balance.	+2 ^s .6	+4 ^s .4	+5 ^s .1	+7 ^s .4	+9 ^s .9	+6 ^s .7	+10 ^s .8	+11 ^s .6	+13 ^s .1	+14 ^s .2	+11 ^s .9	+13 ^s .9
Johannsen & Co.	4017	2	Auxiliary compensation acting in cold.	+15 ^s .4	+15 ^s .7	+14 ^s .5	+15 ^s .0	+13 ^s .0	+5 ^s .1	+7 ^s .7	+10 ^s .3	+8 ^s .0	+9 ^s .7	+6 ^s .7	+8 ^s .9
Webb	5654	2	Ordinary balance.	+2 ^s .4	+2 ^s .7	+3 ^s .1	+4 ^s .1	+15 ^s .8	+12 ^s .0	+14 ^s .3	+10 ^s .1	+15 ^s .3	+17 ^s .5	+6 ^s .7	+17 ^s .9
Johannsen & Co.	4245	2	Auxiliary compensation acting in heat.	+27 ^s .0	+27 ^s .6	+26 ^s .8	+27 ^s .1	+23 ^s .0	+20 ^s .5	+25 ^s .0	+21 ^s .2	+19 ^s .0	+19 ^s .1	+15 ^s .1	+18 ^s .0
Kendal & Dent	1726	2	Auxiliary compensation acting in ex- [tremes.	+18 ^s .1	+18 ^s .4	+15 ^s .5	+16 ^s .6	+17 ^s .0	+13 ^s .9	+15 ^s .3	+14 ^s .3	+13 ^s .1	+13 ^s .6	+11 ^s .4	+11 ^s .4
Clerke	1726	2	Ordinary balance.	-16 ^s .9	-16 ^s .3	-15 ^s .3	-10 ^s .6	-8 ^s .4	-10 ^s .9	-5 ^s .0	-5 ^s .2	-2 ^s .0	-1 ^s .9	-10 ^s .4	-2 ^s .0
Pyott	999	8	Ordinary balance with an addition.	+14 ^s .4	+11 ^s .9	+9 ^s .3	+15 ^s .1	+10 ^s .8	+9 ^s .9	+12 ^s .6	+15 ^s .4	+13 ^s .0	+13 ^s .4	+14 ^s .1	+16 ^s .0
Johannsen & Co.	3866	2	Auxiliary compensation acting in heat.	+9 ^s .0	+10 ^s .4	+8 ^s .5	+8 ^s .1	+3 ^s .9	+4 ^s .9	+8 ^s .9	+1 ^s .4	+5 ^s .6	+9 ^s .6	-6 ^s .4	+11 ^s .1
Kendal & Dent	1726	2	Ordinary balance with broad rim.	+3 ^s .0	+3 ^s .7	+5 ^s .5	+8 ^s .3	+8 ^s .2	+9 ^s .6	+13 ^s .3	+9 ^s .2	+10 ^s .5	+10 ^s .0	+10 ^s .4	+10 ^s .4
Pen'lington	2248	2	Ordinary balance; check action acting [in cold.	-17 ^s .1	-16 ^s .4	-15 ^s .0	-13 ^s .0	-16 ^s .6	-17 ^s .9	-13 ^s .4	-13 ^s .9	-12 ^s .7	-9 ^s .9	-9 ^s .7	-10 ^s .5
Johannsen & Co.	4243	2	Auxiliary compensation acting in heat.	+21 ^s .2	+17 ^s .2	+19 ^s .8	+21 ^s .6	+10 ^s .3	+11 ^s .6	+17 ^s .4	+14 ^s .7	+14 ^s .1	+14 ^s .6	+15 ^s .6	+12 ^s .3
Johannsen & Co.	4176	2	Auxiliary compensation acting in cold.	+20 ^s .3	+19 ^s .5	+21 ^s .8	+26 ^s .7	+18 ^s .1	+17 ^s .6	+28 ^s .1	+23 ^s .8	+22 ^s .9	+25 ^s .5	+22 ^s .7	+22 ^s .8
Johannsen & Co.	4222	2	Auxiliary compensation acting in cold.	+12 ^s .8	+12 ^s .8	+10 ^s .5	+9 ^s .4	+5 ^s .7	+1 ^s .8	+3 ^s .0	+6 ^s .6	+4 ^s .4	+4 ^s .3	+0 ^s .3	+1 ^s .1
Mercer	5454	2	Ordinary balance with small alteration.	-7 ^s .6	-8 ^s .5	-8 ^s .4	-5 ^s .9	-7 ^s .5	-6 ^s .9	+0 ^s .1	-4 ^s .0	-4 ^s .2	-3 ^s .9	+1 ^s .0	-6 ^s .0
E. Dent & Co.	45447	2	Ordinary balance with Dent's auxiliary.	+11 ^s .7	+13 ^s .9	+7 ^s .8	+5 ^s .5	+7 ^s .5	-2 ^s .2	+0 ^s .4	-2 ^s .0	-2 ^s .7	-14 ^s .0	-8 ^s .2	-9 ^s .8
Ramsay	5667	2	Auxiliary to balance, acting in extremes.	+17 ^s .4	+15 ^s .7	+13 ^s .7	+14 ^s .4	+14 ^s .4	+11 ^s .8	+15 ^s .1	+11 ^s .2	+11 ^s .3	+9 ^s .3	+7 ^s .8	+9 ^s .1
Pyott	862	2	Ordinary balance with an addition.	+21 ^s .3	+24 ^s .7	+27 ^s .5	+21 ^s .5	+14 ^s .2	+13 ^s .2	+19 ^s .1	+21 ^s .9	+20 ^s .9	+18 ^s .9	+18 ^s .2	+15 ^s .9
Johannsen & Co.	4174	2	Auxiliary compensation acting in cold.	+32 ^s .4	+31 ^s .5	+28 ^s .2	+24 ^s .6	+21 ^s .7	+18 ^s .1	+20 ^s .0	+13 ^s .3	+10 ^s .9	+9 ^s .9	+12 ^s .9	+9 ^s .7
Isaac	1772	2	Auxiliary to balance; bright spring.	+21 ^s .8	+17 ^s .9	+16 ^s .4	+19 ^s .0	+22 ^s .8	+19 ^s .1	+22 ^s .1	+9 ^s .8	+8 ^s .6	+8 ^s .6	+7 ^s .1	+11 ^s .4
Williams	921	2	Auxiliary compensation acting in heat.	+18 ^s .4	+17 ^s .0	+17 ^s .0	+18 ^s .4	+13 ^s .5	+15 ^s .5	+20 ^s .2	+17 ^s .6	+18 ^s .4	+18 ^s .7	+16 ^s .5	+17 ^s .0
Pen'lington	2247	2	Ordinary balance; check action acting in cold.	-19 ^s .6	-19 ^s .8	-20 ^s .7	-14 ^s .5	-14 ^s .8	-15 ^s .0	-8 ^s .1	-9 ^s .2	-8 ^s .4	-6 ^s .2	-3 ^s .8	-6 ^s .7
Mercer	5432	2	Ordinary balance with small alteration.	-23 ^s .6	-23 ^s .8	-22 ^s .7	-19 ^s .1	-17 ^s .7	-18 ^s .7	-14 ^s .2	-13 ^s .6	-12 ^s .7	-11 ^s .3	-9 ^s .8	-9 ^s .3
Isaac	1829	8	Improved ordinary balance.	-33 ^s .1	-31 ^s .6	-29 ^s .7	-25 ^s .4	-23 ^s .7	-24 ^s .7	-19 ^s .2	-19 ^s .9	-18 ^s .3	-16 ^s .4	-15 ^s .9	-16 ^s .0
Keys	924	2	Auxiliary compensation.	+28 ^s .3	+28 ^s .4	+28 ^s .0	+29 ^s .0	+27 ^s .5	+22 ^s .5	+28 ^s .3	+27 ^s .8	+26 ^s .7	+25 ^s .5	+26 ^s .1	+25 ^s .4
Schoof	6065	2	[piece acting in cold. Schoof's resilient lever escapement check-	+49 ^s .7	+48 ^s .3	+50 ^s .1	+53 ^s .0	+33 ^s .0	+41 ^s .2	+55 ^s .8	+48 ^s .8	+46 ^s .5	+47 ^s .8	+43 ^s .8	+43 ^s .6
Haswell & Sons	2921	2	Paillard's non-magnetic balance & spring	+59 ^s .3	+58 ^s .9	+57 ^s .8	+54 ^s .9	+59 ^s .4	+50 ^s .6	+50 ^s .9	+40 ^s .7	+42 ^s .0	+39 ^s .7	+36 ^s .7	+41 ^s .4
Uhlig	573	2	Uhlig's continually acting auxiliary.	+39 ^s .3	+23 ^s .4	+10 ^s .0	+12 ^s .7	+30 ^s .6	+24 ^s .5	+34 ^s .6	+5 ^s .0	-1 ^s .2	-3 ^s .9	+2 ^s .9	+9 ^s .1
Chronometrical Ther- mometer				+2546 ^s .1	+2464 ^s .4	+2342 ^s .9	+2156 ^s .6	+1960 ^s .1	+1786 ^s .2	+1692 ^s .8	+1653 ^s .6	+1452 ^s .9	+1302 ^s .6	+1282 ^s .1	+1241 ^s .8
Mean Weekly Tempera- ture				40 ^o .6	42 ^o .2	42 ^o .2	44 ^o .9	47 ^o .3	49 ^o .2	50 ^o .5	50 ^o .6	53 ^o .4	55 ^o .0	54 ^o .7	55 ^o .6
Extremes of Tempera- ture as shown by the Self-Registering Ther- mometers				36 ^o .9-46 ^o .1	37 ^o .5-48 ^o .1	39 ^o .9-48 ^o .4	39 ^o .1-50 ^o .6	37 ^o .5-55 ^o .9	45 ^o .1-56 ^o .6	44 ^o .4-53 ^o .8	47 ^o .4-57 ^o .1	51 ^o .0-57 ^o .8	52 ^o .8-56 ^o .5	51 ^o .5-57 ^o .9	53 ^o .7-58 ^o .6

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 rims being reversed. By this arrangement the effect of temperature is much magnified.

ORDER OF TEMPERATURE AS DETERMINED GENERALLY BY THE CHRONOMETRICAL THERMOMETER.

ORDER OF TEMPERATURE AS DETERMINED GENERALLY BY THE CHRONOMETRICAL THERMOMETER.																	N A M E OF M A K E R.	No.
Sept. 24 to Oct. 1	Sept. 17-24	July 16-23	July 23-30	July 9-16	July 30 to Aug. 6	Aug. 6-13	July 2-9	Aug. 13-20	Nov. 5-12	Nov. 26 to Dec. 3	Aug. 20-27	Sept. 10-17	Nov. 12-19	Nov. 19-26	Aug. 27 to Sept. 3	Sept. 3-10		
-11.0 +6.2 +1.5 -4.0 -6.5	-10.9 +6.6 +0.6 -4.4 -6.0	-4.8 +6.6 +1.4 -3.6 -4.0	-5.6 +5.9 +0.2 -4.9 -4.2	-5.6 +6.6 -2.3 -4.1 -3.9	-5.6 +3.9 -0.5 -10.4 -6.9	-5.3 +4.3 +0.2 -10.0 -7.0	-6.2 +5.8 -3.8 -1.4 -4.4	-4.6 +5.6 +0.8 -8.0 -4.9	-11.5 +2.5 +0.5 -6.5 -8.0	-9.8 +5.4 +2.3 -5.9 -6.2	-6.6 +4.0 -2.1 -10.4 -5.9	-8.8 +6.4 +0.9 -6.6 -5.4	-7.9 +2.7 +0.1 -4.2 -6.0	-6.4 +4.4 +1.6 -4.0 -7.1	-7.5 +4.9 -2.6 -7.5 -7.5	-7.3 +7.1 -1.0 -9.2 -7.3	Uhrig Isaac Uhrig Isaac Kullberg	502 1899 576 1897 5284
+9.8 -7.3 +9.5 -4.4 +1.0	+10.9 -5.7 +6.7 -3.3 -1.0	+3.0 -3.7 +3.4 -2.6 -0.1	+2.0 -5.6 +3.2 -1.4 +0.1	+1.0 -2.5 +3.8 -2.7 +0.9	+2.6 -7.0 +3.8 -2.1 -0.2	+3.5 -7.9 +6.1 -1.9 +1.0	-0.3 -1.9 +5.0 -2.2 +2.4	+4.3 -6.4 +9.3 -0.4 +3.8	+12.4 -3.9 +9.6 -6.6 +3.8	+9.0 -3.1 +17.4 -7.1 +4.9	+3.6 -5.8 +6.5 -2.6 +2.5	+7.4 +0.1 +5.8 -4.3 0.0	+8.4 -3.4 +11.8 -5.6 -1.9	+8.8 -3.5 +12.2 -7.7 +0.6	+1.9 -5.7 +2.8 -4.1 -5.5	+5.5 -1.0 +4.5 -6.9 -6.5	Webb Kullberg Johannsen & Co. Kullberg Johannsen & Co.	5653 5225 4156 5230 4251
+10.2 +0.7 +2.1 +5.3 +22.0	+4.8 +3.7 +2.5 +5.8 +20.4	+2.8 +3.6 -1.2 +0.6 +19.3	+8.7 +2.0 -0.9 +0.7 +21.9	+3.0 +5.9 -2.7 -0.3 +17.9	+6.6 +3.0 -2.1 -0.3 +20.2	+7.6 -1.9 -0.9 +0.9 +21.0	+2.5 +10.0 -4.0 -1.2 +14.9	+7.8 +1.4 -0.7 -2.4 +24.2	+6.1 -1.5 -3.7 +11.3 +18.1	+9.6 +10.0 -0.8 +11.3 +16.0	+7.5 +1.7 -6.0 +2.9 +14.9	+5.6 +11.4 -5.7 +8.2 +12.6	+6.9 +3.7 -1.2 +5.3 +16.7	+9.6 +7.1 0.0 +7.5 +17.1	+4.6 +3.4 -3.1 +1.9 +16.2	+7.3 +8.4 -2.9 +0.9 +14.0	Gardner E. Dent & Co. Williams Johannsen & Co. Gardner	5653 45445 922 4261 3931
+4.7 +5.5 +18.3 -1.6 -6.4	+6.0 +4.9 +23.3 -3.0 +0.3	-0.2 +6.5 +11.3 -4.3 -8.8	+0.8 +6.6 +8.3 -3.9 -10.4	-0.7 +6.5 +11.2 -4.6 -7.9	-0.5 +6.4 +6.4 -2.1 -12.2	-4.7 +6.3 +6.6 -1.1 -11.3	-1.4 +5.8 +11.5 -4.6 -8.6	+4.2 +6.1 +7.0 +0.7 -8.8	-0.8 +3.0 +20.2 +5.0 +0.5	+3.9 +4.9 +25.9 +3.0 +3.7	+2.3 +2.2 +7.7 +0.5 +1.7	+4.7 +1.5 +22.0 +1.1 +0.7	+0.4 +0.5 +24.5 +2.4 +3.1	+3.6 +2.2 +27.7 +3.8 +3.5	+0.9 +1.0 +14.3 -6.4 -1.6	+3.4 +1.6 +21.3 -4.7 -2.1	Kullberg Isaac Haswell & Sons Johannsen & Co. Johannsen & Co.	5226 1898 5002 4242 3892
+5.0 +15.1 +9.2 +15.9 +13.2	+3.1 +15.5 +8.6 +16.0 +10.5	+8.2 +10.4 +8.6 +10.8 +3.9	+9.4 +10.2 +7.1 +9.0 +5.2	+8.3 +10.6 +8.3 +14.7 +3.9	+8.1 +9.9 +7.0 +7.7 +5.0	+9.2 +11.9 +9.6 +9.4 +7.2	+8.2 +10.9 +8.4 +14.9 +1.0	+9.2 +12.3 +7.9 +10.4 +7.7	+6.8 +19.7 -0.7 +15.2 +12.6	+6.5 +20.0 +3.1 +16.0 +16.0	+10.0 +12.3 +7.1 +9.7 +7.8	+4.9 +14.0 -0.8 +12.9 +10.8	+2.6 +13.4 -2.7 +12.3 +13.3	+2.1 +13.8 +1.7 +12.9 +15.6	-1.4 +3.0 -1.9 +7.0 +5.7	-2.1 +4.7 -1.0 +8.6 +8.1	Johannsen & Co. Clerke Johannsen & Co. Webb Johannsen & Co.	3793 1728 4017 5654 4245
+9.1 -1.0 +13.9 +9.7 +12.2	+8.9 +0.2 +11.9 +8.3 +12.0	+6.1 -6.0 +11.0 -2.8 +1.0	+4.8 -5.5 +11.6 -2.8 +0.8	+3.5 -5.3 +12.7 -0.8 +0.9	+5.9 -7.4 +11.5 -3.7 +2.0	+7.6 -5.2 +14.0 -1.9 +3.7	+1.5 -5.6 +14.7 -3.6 +1.3	+10.4 -4.2 +18.0 -2.4 +6.6	+15.4 -0.2 +24.0 -8.4 +14.3	+18.3 +2.6 +24.4 -8.5 +16.9	+18.6 -6.0 +20.8 +3.2 0.0	+19.4 -3.6 +24.2 -0.2 +5.3	+20.0 -4.4 +25.8 +1.9 +7.3	+21.3 -4.7 +25.1 -5.6 +9.1	+13.7 -15.5 +15.5 -2.2 -8.0	+14.9 -13.9 +16.8 -0.1 -4.7	Kendal & Dent. Clerke Pyott Johannsen & Co. Kendal & Dent.	5337 1726 999 3866 6566
-6.3 +10.8 +18.4 -1.3 -5.9	-7.1 +8.2 +19.3 +3.8 -9.9	-7.8 +5.6 +23.3 -7.9 -4.8	-7.0 +6.3 +8.5 -9.6 -3.0	-7.7 +3.4 +22.8 -5.6 -6.7	-6.0 +7.6 +11.8 -13.5 -2.7	-5.1 +7.9 +11.8 -15.6 -2.3	-7.4 +1.9 +20.4 -7.5 -6.9	-3.0 +8.7 +8.7 -14.3 -0.5	-0.6 +10.6 +18.5 +4.1 -2.0	-2.2 +9.5 +16.9 +5.0 -2.1	-3.3 +2.3 +19.6 -3.5 -11.8	-4.6 +2.9 +14.8 +1.1 -12.1	-5.1 +2.1 +23.6 +6.0 -11.4	-5.5 +2.1 +23.9 +6.0 -7.9	-12.0 -6.7 +18.3 -3.6 -24.3	-11.6 -6.8 +21.2 -7.5 -21.6	Penlington ... Johannsen & Co. Johannsen & Co. Johannsen & Co. Mercer	2248 4243 4176 4222 5454
-8.5 +6.4 +12.6 +10.0 +11.1	-6.0 +5.4 +9.7 +9.9 +15.5	-9.5 -19.7 +16.9 -0.5 +1.3	-12.7 -19.8 +15.7 +0.1 +1.7	-10.5 -19.5 +14.4 -0.7 +1.7	-12.9 -17.3 +16.7 +0.4 +1.7	-13.2 -15.3 +15.5 +2.3 +0.2	-12.8 -19.6 +12.9 +1.1 -1.8	-16.9 -11.9 +15.0 +5.3 -0.8	-0.4 +12.3 +10.0 +13.1 +22.6	-0.3 +19.2 +7.3 +21.3 +23.3	-10.0 -7.3 +12.0 +9.5 +6.9	-7.7 +9.2 -3.5 +12.8 +21.7	-6.0 +13.9 +3.6 +17.4 +23.4	-3.1 +17.0 +5.6 +15.7 +25.5	-10.1 -2.9 -0.2 +3.4 +10.1	-8.5 +5.1 -2.0 +4.4 +14.3	E. Dent & Co. ... Ramsay Pyott Johannsen & Co. Isaac	45447 6567 862 4174 1772
+10.4 -3.6 -5.9 -11.6 +17.2	+16.0 -4.9 -3.6 -11.4 +11.4	+6.4 -12.6 -11.7 -13.8 +22.0	+7.1 -11.1 -11.8 -14.1 +21.4	-1.1 -13.3 -12.9 -12.9 +22.6	+4.0 -8.7 -10.6 -13.2 +19.8	+3.0 -8.5 -10.3 -11.3 +24.1	-9.4 -13.5 -13.3 -10.4 +23.8	+3.8 -4.9 -9.0 -8.1 +27.1	+13.5 +1.3 -3.8 -7.0 +27.1	+4.7 +3.0 +0.6 -5.0 +15.2	+17.9 -9.0 -11.9 -4.6 +31.4	+17.4 -5.1 -2.9 -8.6 +13.5	+15.5 -3.6 -6.7 -10.1 +18.2	+13.3 -2.3 -3.1 -9.8 +8.3	+21.7 -17.1 -19.9 -13.3 +11.3	+16.0 -15.0 -14.3 -16.0 -0.5	Williams Penlington ... Mercer Isaac Keys	921 2247 5432 1829 924
+44.9 +44.1 +1.0	+35.6 +47.9 +2.4	+21.4 +14.0 +1.2	+24.7 +12.0 +1.6	+19.4 +13.9 +0.3	+24.8 +8.0 +1.2	+27.3 +6.8 +1.8	+20.3 +8.0 -0.9	+30.1 +8.2 +1.8	+42.5 +40.9 -8.4	+35.7 +49.6 +10.0	+28.8 +3.1 -8.6	+25.1 +39.1 -13.6	+30.8 +39.0 -10.9	+27.3 +41.4 -3.1	+12.1 +7.5 -17.2	+6.8 +26.3 -14.3	Schoof Haswell & Sons. Uhrig	6065 2921 573
+655.0	+569.1	-161.1	-258.8	-327.0	-387.1	-493.4	-634.0	*	-641.5	-727.0	-1534.0	-1666.6	-2100.0	-2181.7	-2635.5	-2796.0	{ Chronometrical Thermometer.	
61.6	62.7	61.6	62.4	63.6	64.0	65.1	66.9	67.3	75.6	76.1	85.1	85.8	91.6	92.0	95.7	98.4	{ Mean Weekly Temperature.	
67.7-64.8	58.9-66.5	59.2-64.1	60.2-64.5	60.1-67.0	62.0-66.1	61.5-69.2	64.0-70.0	64.9-69.7	67.8-82.0	71.2-81.2	80.6-89.2	81.5-90.3	88.2-95.5	88.2-94.4	86.0-100.9	93.5-102.6	{ Extremes of Tempera- ture as shown by the Self-Registering Thermometers.	

The Chronometers are placed in order of merit, their respective positions being determined by consideration of the irregularities of rate exhibited in Table III.

*The mainspring of the Chronometrical Thermometer was found broken in the seventh week of the trial; it was repaired the same week, and the order determined by the mean thermometer reading.

RATES OF CHRONOMETERS ON TRIAL FOR PURCHASE BY THE ADMIRALTY,

NAME OF MAKER.	No.	Whether 2 or 8 Days.	ADDRESS OF MAKER.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(III.) ABSTRACT OF	
					Least Weekly Sum.	Extremes of Temperature.
Uhrig	502	8	8, Quadrant Road, Essex Road, N.	Uhrig's continually acting auxiliary. [spring	— 15.3	45.1 — 56.6
Isaac	1899	2	10, Spencer Street, Clerkenwell, E.C.	Auxiliary to balance ; reverse movement ; bright	— 3.1	37.5 — 48.1
Uhrig	576	2	8, Quadrant Road, Essex Road, N.	Uhrig's continually acting auxiliary. [spring	— 3.8	64.0 — 70.0
Isaac	1897	2	10, Spencer Street, Clerkenwell, E.C.	Auxiliary to balance ; reverse movement ; bright	— 10.4	62.0 — 66.1
Kullberg	5264	2	105, Liverpool Road, N.	Auxiliary balance ; reversed detent.	— 15.5	80.6 — 89.2
Webb	5653	2	90, High Street, Islington, N.	Ordinary balance.	— 0.3	64.0 — 70.0
Kullberg	5225	2	105, Liverpool Road, N.	Auxiliary balance ; reversed detent.	— 11.2	45.1 — 56.6
Johannsen & Co.	4156	2	149, Minories, E.C.	Auxiliary compensation acting in cold.	+ 2.8	86.0 — 100.9
Kullberg	5230	2	105, Liverpool Road, N.	Auxiliary balance ; reversed detent.	— 7.9	45.1 — 56.6
Johannsen & Co.	4251	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	— 6.5	98.5 — 102.6
Gardner	3783	2	20, Lloyd's Square, W.C.	Reversed detent.	— 0.9	37.5 — 48.1
E. Dent & Co.	45445	2	61, Strand, W.C.	Ordinary balance with Dent's auxiliary.	— 1.9	61.5 — 69.2
Williams	922	2	Barry Dock, Cardiff.	Auxiliary compensation acting in heat.	— 6.0	80.6 — 89.2
Johannsen & Co.	4261	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	— 1.9	86.0 — 100.9
Gardner	3781	2	20, Lloyd's Square, W.C.	Loseby balance ; improved mount.	+ 12.6	81.5 — 90.3
Kullberg	5226	2	105, Liverpool Road, N.	Auxiliary balance ; reversed detent. [spring	— 9.2	39.1 — 50.6
Isaac	1898	2	10, Spencer Street, Clerkenwell, E.C.	Auxiliary to balance ; reverse movement ; bright	+ 0.5	88.2 — 95.6
Haswell & Sons	5002	2	49 & 50, Spencer Street, Clerkenwell, E.C.	Paillard's non-magnetic balance and spring.	+ 6.4	62.0 — 66.1
Johannsen & Co.	4242	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	— 6.4	86.0 — 100.9
Johannsen & Co.	3892	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	— 12.2	62.0 — 66.1
Johannsen & Co.	3793	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	— 2.1	93.5 — 102.6
Clerke	1728	2	1, Royal Exchange, E.C.	Ordinary balance.	+ 2.6	36.9 — 46.1
Johannsen & Co.	4017	2	149, Minories, E.C.	Auxiliary compensation acting in cold.	— 2.7	88.2 — 95.6
Webb	5654	2	90, High Street, Islington, N.	Ordinary balance.	+ 2.4	36.9 — 46.1
Johannsen & Co.	4245	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	+ 1.0	64.0 — 70.0
Kendal & Dent	4257	2	106, Cheapside, E.C.	Auxiliary compensation acting in extremes.	+ 1.5	64.0 — 70.0
Clerke	1726	2	1, Royal Exchange, E.C.	Ordinary balance.	— 16.9	36.9 — 46.1
Pyott	999	8	74, West India Dock Road, E.	Ordinary balance with an addition.	+ 9.3	39.9 — 48.4
Johannsen & Co.	3866	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	— 8.5	71.2 — 81.2
Kendal & Dent	4255	2	106, Cheapside, E.C.	Ordinary balance with broad rim.	— 8.0	86.0 — 100.9
Penlington	2248	2	2 & 3, St. George's Crescent, Liverpool.	Ordinary balance, check action, acting in cold.	— 17.9	45.1 — 56.6
Johannsen & Co.	4243	2	149, Minories, E.C.	Auxiliary compensation acting in heat.	— 6.8	93.5 — 102.6
Johannsen & Co.	4176	2	149, Minories, E.C.	Auxiliary compensation acting in cold.	+ 8.5	60.2 — 64.5
Johannsen & Co.	4222	2	149, Minories, E.C.	Auxiliary compensation acting in cold.	— 15.6	61.5 — 69.2
Mercer	5454	2	Prospect Road, St. Albans, Herts.	Ordinary balance with small alteration.	— 24.3	86.0 — 100.9
E. Dent & Co.	45447	2	61, Strand, W.C.	Ordinary balance with Dent's auxiliary.	— 16.9	64.9 — 69.7
Ramsay	6567	2	9, High Street, Dundee.	Auxiliary to balance, acting in extremes.	— 19.8	60.2 — 64.5
Pyott	862	2	74, West India Dock Road, E.	Ordinary balance with an addition.	— 3.5	81.5 — 90.3
Johannsen & Co.	4174	2	149, Minories, E.C.	Auxiliary compensation acting in cold.	— 0.7	60.1 — 67.0
Isaac	1772	2	10, Spencer Street, Clerkenwell, E.C.	Auxiliary to balance ; bright spring.	— 1.8	64.0 — 70.0
Williams	921	2	Barry Dock, Cardiff.	Auxiliary compensation acting in heat.	— 9.4	64.0 — 70.0
Penlington	2247	2	2 & 3, St. George's Crescent, Liverpool.	Ordinary balance ; check action acting in cold.	— 20.7	39.9 — 48.4
Mercer	5432	2	Prospect Road, St. Albans, Herts.	Ordinary balance with small alteration.	— 23.8	37.5 — 48.1
Isaac	1829	8	10, Spencer Street, Clerkenwell, E.C.	Improved ordinary balance.	— 33.1	36.9 — 46.1
Keys	924	2	15, Craven Street, Strand, W.C.	Auxiliary compensation.	— 0.5	93.5 — 102.6
Schoof	6065	2	99, St. John Street Road, London, E.C.	[acting in cold. Schoof's resilient lever escapement check-piece	+ 6.8	93.5 — 102.6
Haswell & Sons	2921	2	49 & 50, Spencer Street, Clerkenwell, E.C.	Paillard's non-magnetic balance and spring.	+ 3.1	80.6 — 89.2
Uhrig	573	2	8, Quadrant Road, Essex Road, N.	Uhrig's continually acting auxiliary.	— 17.2	86.0 — 100.9

The sign + indicates that the rate is gaining.

THE PRINCIPAL CHANGES OF RATE DURING THE 29 WEEKS.

Mean Temperature.	Greatest Weekly Sum.	Extremes of Temperature.	Mean Temperature.	Difference between the Greatest and Least. (a)	Greatest Difference between one Week and the next. (b)	Mean Temperature for these two Weeks.	Trial No. a + 2 b.	NAME OF MAKER.	No.
40° 2	— 4.6	64° 9 — 60° 7	67° 3	10° 7	3° 6	75° 6 — 91° 6	17° 9	Uhrig	502
42° 2	+ 7.1	93° 5 — 102° 6	98° 4	10° 2	4° 2	50° 5 — 40° 6	18° 6	Isaac	1899
66° 9	+ 7.2	36° 9 — 46° 1	40° 6	11° 0	3° 9	54° 7 — 75° 6	18° 8	Uhrig	576
{ 64° 0 }	— 1.3	51° 0 — 57° 8	53° 4	9° 1	5° 5	62° 4 — 64° 0	20° 1	Isaac	1897
{ 85° 1 }	— 3.9	60° 1 — 67° 0	63° 6	11° 6	5° 4	76° 1 — 47° 3	22° 4	Kullberg	5264
42° 2	— 3.9	60° 1 — 67° 0	63° 6	11° 6	5° 4	76° 1 — 47° 3	22° 4	Kullberg	5264
66° 9	+ 14.5	39° 1 — 50° 6	44° 9	14° 8	4° 0	75° 6 — 91° 6	22° 8	Webb	5653
49° 2	+ 0.1	81° 5 — 90° 3	85° 8	11° 3	5° 8	85° 8 — 62° 7	22° 9	Kullberg	5225
95° 7	+ 17.7	37° 5 — 55° 9	47° 3	14° 9	5° 2	92° 0 — 76° 1	25° 3	Johannsen & Co.	4156
49° 2	+ 9.9	36° 9 — 46° 1	40° 6	10° 8	8° 2	50° 5 — 40° 6	27° 2	Kullberg	5230
98° 4	+ 4.9	71° 2 — 81° 2	76° 1	11° 4	8° 0	85° 1 — 95° 7	27° 4	Johannsen & Co.	4251
42° 2	+ 11.7	52° 8 — 56° 5	55° 0	12° 6	7° 5	76° 1 — 47° 3	27° 6	Gardner	5
65° 1	+ 11.4	81° 5 — 90° 3	85° 8	13° 3	7° 9	47° 3 — 49° 2	29° 1	E. Dent & Co.	45445
85° 1	+ 6.2	37° 5 — 55° 9	47° 3	12° 2	8° 6	54° 7 — 75° 6	29° 4	Williams	922
95° 7	+ 14.3	39° 1 — 50° 6	44° 9	16° 2	7° 3	98° 4 — 85° 8	30° 8	Johannsen & Co.	4261
85° 8	+ 26.1	39° 1 — 50° 6	44° 9	13° 5	9° 3	67° 3 — 85° 1	32° 1	Gardner	3931
44° 9	+ 6.0	58° 9 — 66° 5	62° 7	15° 2	8° 9	65° 1 — 67° 3	33° 0	Kullberg	5226
91° 6	+ 15.9	39° 9 — 48° 4	42° 2	15° 4	8° 9	54° 7 — 75° 6	33° 2	Isaac	1898
64° 0	+ 27.7	88° 2 — 94° 4	92° 0	21° 3	7° 0	95° 7 — 98° 4	35° 3	Haswell & Sons	5002
95° 7	+ 16.7	39° 1 — 50° 6	44° 9	23° 1	6° 9	85° 1 — 95° 7	36° 9	Johannsen & Co.	4242
64° 0	+ 3.7	71° 2 — 81° 2	76° 1	15° 9	10° 5	67° 3 — 85° 1	36° 9	Johannsen & Co.	3892
98° 4	+ 12.0	36° 9 — 46° 1	40° 6	14° 1	11° 4	85° 1 — 95° 7	36° 9	Johannsen & Co.	3793
40° 6	+ 20.0	71° 2 — 81° 2	76° 1	17° 4	10° 1	76° 1 — 47° 3	37° 6	Clerke	1728
91° 6	+ 15.7	87° 5 — 48° 1	42° 2	18° 4	9° 9	76° 1 — 47° 3	38° 2	Johannsen & Co.	4017
40° 6	+ 17.9	53° 7 — 58° 6	55° 5	15° 5	11° 9	50° 5 — 40° 6	39° 3	Webb	5654
66° 9	+ 27.6	37° 5 — 48° 1	42° 2	26° 6	7° 0	76° 1 — 47° 3	40° 6	Johannsen & Co.	4245
66° 9	+ 21.3	88° 2 — 94° 4	92° 0	19° 8	10° 5	85° 8 — 62° 7	40° 8	Kendal & Dent	2
40° 6	+ 2.6	71° 2 — 81° 2	76° 1	19° 5	11° 9	50° 5 — 40° 6	43° 3	Clerke	1726
42° 2	+ 25.8	88° 2 — 95° 5	91° 6	16° 5	13° 6	76° 1 — 47° 3	43° 7	Pyott	999
76° 1	+ 11.1	53° 7 — 58° 6	55° 5	19° 6	12° 4	76° 1 — 47° 3	44° 4	Johannsen & Co.	3866
95° 7	+ 16.9	71° 2 — 81° 2	76° 1	24° 9	10° 3	50° 5 — 40° 6	45° 5	Kendal & Dent	2
49° 2	— 0.6	67° 8 — 82° 0	75° 6	17° 3	14° 4	76° 1 — 47° 3	46° 1	Penlington	2248
98° 4	+ 21.6	39° 1 — 50° 6	44° 9	28° 4	9° 7	98° 4 — 85° 8	47° 8	Johannsen & Co.	4243
62° 4	+ 23.1	44° 4 — 53° 8	50° 5	19° 6	14° 8	61° 6 — 62° 4	49° 2	Johannsen & Co.	4176
65° 1	+ 12.8	{ 36° 9 — 46° 1 }	{ 40° 6 }	28° 4	10° 8	67° 3 — 85° 1	50° 0	Johannsen & Co.	4222
95° 7	+ 1.0	{ 37° 5 — 48° 1 }	{ 42° 2 }	25° 3	12° 5	85° 1 — 95° 7	50° 3	Mercer	5454
67° 3	+ 13.9	37° 5 — 48° 1	42° 2	30° 8	11° 3	50° 5 — 40° 6	53° 4	E. Dent & Co.	45447
62° 4	+ 19.2	71° 2 — 81° 2	76° 1	39° 0	8° 0	95° 7 — 98° 4	55° 0	Ramsay	6567
85° 8	+ 27.5	39° 9 — 48° 4	42° 2	31° 0	13° 2	85° 8 — 62° 7	57° 4	Pyott	862
63° 6	+ 32.4	36° 9 — 46° 1	40° 6	33° 1	12° 4	50° 5 — 40° 6	57° 9	Johannsen & Co.	4174
66° 9	+ 25.5	88° 2 — 94° 4	92° 0	27° 3	15° 5	54° 7 — 75° 6	58° 3	Isaac	1772
66° 9	+ 21.7	86° 0 — 100° 9	95° 7	31° 1	14° 1	67° 3 — 85° 1	59° 3	Williams	921
42° 2	+ 3.0	71° 2 — 81° 2	76° 1	23° 7	17° 8	76° 1 — 47° 3	59° 3	Penlington	2247
42° 2	+ 0.6	71° 2 — 81° 2	76° 1	24° 4	18° 3	76° 1 — 47° 3	61° 0	Mercer	5432
40° 6	— 4.6	80° 6 — 89° 2	85° 1	28° 5	18° 7	76° 1 — 47° 3	65° 9	Isaac	1829
98° 4	+ 31.4	80° 6 — 89° 2	85° 1	31° 9	20° 1	85° 1 — 95° 7	72° 1	Keys	924
98° 4	+ 55.8	44° 4 — 53° 8	50° 5	49° 0	18° 3	98° 4 — 85° 8	85° 6	Schoof	6065
85° 1	+ 59.4	37° 5 — 55° 9	47° 3	56° 3	18° 8	95° 7 — 98° 4	93° 9	Haswell & Sons	2921
95° 7	+ 39.3	36° 9 — 46° 1	40° 6	56° 5	20° 6	76° 1 — 47° 3	97° 7	Uhrig	573

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.