

1873GOAMM..33I....1A

RATES OF CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY,

AT THE

ROYAL OBSERVATORY, GREENWICH.

1872.

A

NAME or MAKER.	No.	Whether a Date	Construction of Escapement and Balance, from the Description furnished by the Maker.	(L) WEEKLY SUMS OF DAILY RATES											
				Jan. 18-30	Jan- 27	Jan 27 to Feb. 3	Feb. 3-10	Feb. 10-17	Feb. 17- 24	Feb. 24 to Mar. 2	March 2-9	March 9-16	March 16-23	March 23-30	
Kullberg.....	1799	2	Kullberg's flat rim balance, without auxiliary.	+ 36	+ 64	+ 46	+ 60	+ 74	+ 75	+ 79	+ 99	+ 79	+ 71	+ 89	
Hannemyer.....	4793	2	Auxiliary compensation.	+ 19	+ 29	+ 29	+ 39	+ 39	+ 23	+ 23	+ 29	+ 39	+ 39	+ 39	
McGregor and Co.....	4173	2	Ordinary auxiliary compensation to balance.	+ 83	+ 83	+ 85	+ 95	+ 95	+ 105	+ 107	+ 61	+ 70	+ 70	+ 84	
Lovry.....	779	2	Auxiliary compensation.	- 26	- 14	- 20	- 21	- 23	- 39	- 37	- 37	- 19	- 14	- 19	
Parkinson & Bosta.....	1173	2	Auxiliary acting in extremes of temperature.	- 111	- 121	- 98	- 71	- 43	- 39	- 32	- 14	- 41	- 84	- 70	
Glover.....	354	2	Auxiliary as before.	- 98	- 78	- 78	- 58	- 63	- 63	- 78	- 79	- 104	- 120	- 115	
Isaac.....	1192	2	Original construction of balance, without auxiliary.	+ 10	+ 28	+ 08	+ 14	+ 20	+ 10	+ 29	+ 29	+ 08	+ 10	+ 35	
Usher and Cole.....	1191	2	Auxiliary to balance.	+ 02	+ 70	+ 71	+ 90	+ 85	+ 95	+ 93	+ 97	+ 35	+ 47	+ 47	
Glover.....	354	2	Auxiliary as before.	+ 08	+ 12	+ 12	+ 16	+ 23	+ 17	+ 17	+ 17	+ 17	+ 17	+ 17	
Kullberg.....	1885	2	Improved ordinary balance.	+ 40	+ 69	+ 71	+ 90	+ 100	+ 103	+ 110	+ 123	+ 99	+ 100	+ 131	
Davidson.....	4765	2	Auxiliary compensation.	+ 55	+ 69	+ 58	+ 89	+ 103	+ 103	+ 98	+ 103	+ 76	+ 94	+ 135	
Servill.....	3040	2	Auxiliary compensation.	- 85	- 75	- 90	- 92	- 88	- 80	- 73	- 58	- 14	- 11	- 00	
Clutton.....	793	2	Auxiliary as in former years.	- 47	- 94	- 94	- 70	- 63	- 47	- 52	- 66	- 119	- 98	- 92	
Parkinson & Bosta.....	1171	2	Auxiliary acting in extremes of temperature.	+ 30	+ 44	+ 39	+ 31	+ 17	+ 17	+ 23	+ 25	- 10	- 10	- 08	
P. Birchall.....	1150	2	Ordinary balance, with a slight alteration.	+ 104	+ 184	+ 137	+ 181	+ 193	+ 205	+ 208	+ 209	+ 124	+ 121	+ 159	
W. P. Birchall.....	271	2	Ordinary balance, with a slight alteration.	- 81	- 70	- 69	- 60	- 50	- 35	- 40	- 35	- 70	- 86	- 39	
Cartier.....	715	2	Ordinary balance, with a slight alteration.	- 15	- 10	- 10	- 04	- 04	- 06	+ 09	+ 13	+ 05	+ 05	+ 20	
Wells.....	3331	2	Auxiliary to balance.	- 210	- 242	- 268	- 265	- 269	- 263	- 270	- 268	- 229	- 161	- 161	
Cartier.....	739	2	Ordinary balance.	- 109	- 113	- 101	- 70	- 63	- 61	- 59	- 50	- 81	- 86	- 93	
Shepherd and Son.....	1787	2	Auxiliary to the balance.	- 28	- 09	- 17	- 07	- 27	- 27	- 32	- 38	- 46	- 55	- 20	
McGregor and Co.....	4521	2	Pool's auxiliary.	- 14	- 30	- 78	- 80	- 47	- 30	- 60	- 126	- 35	- 30	- 05	
Williams and Co.....	97	2	Auxiliary compensation.	+ 153	+ 197	+ 200	+ 173	+ 163	+ 163	+ 163	+ 138	+ 179	+ 107	+ 95	
Gowland.....	2974	2	Auxiliary compensation.	+ 31	+ 64	+ 61	+ 45	+ 43	+ 47	+ 30	+ 41	+ 57	- 64	- 90	
Hannemyer.....	4796	2	Auxiliary compensation.	+ 45	+ 58	+ 46	+ 44	+ 43	+ 63	+ 59	+ 53	+ 10	+ 47	+ 53	
Reid and Son.....	1215	2	Auxiliary acting in cold.	+ 71	+ 67	+ 36	+ 27	+ 25	+ 05	+ 53	+ 53	+ 17	+ 27	+ 26	
Servill.....	3039	2	Auxiliary compensation.	- 90	- 96	- 114	- 115	- 127	- 118	- 110	- 116	- 04	- 03	+ 17	
Quilliam.....	17917	2	Continuous auxiliary to balance.	- 95	- 94	- 96	- 44	- 35	- 56	- 41	- 12	+ 10	+ 73	+ 64	
Whiffin.....	361	2	Auxiliary compensation.	- 75	- 89	- 110	- 93	- 82	- 68	- 77	- 70	- 20	- 18	- 47	
Brotherton.....	5417	2	Construction as in former years.	- 64	- 14	- 14	- 92	- 87	- 83	- 68	- 100	- 78	- 84	- 74	
Russell and Son.....	2089	2	Auxiliary to balance.	+ 244	+ 262	+ 254	+ 261	+ 284	+ 310	+ 303	+ 302	+ 145	+ 124	+ 121	
M. F. Dent.....	26440	2	M. F. Dent's new compensation balance, without auxiliary.	+ 29	+ 30	+ 38	+ 12	+ 05	+ 27	- 17	- 93	+ 10	- 114	- 175	
Shepherd and Son.....	1791	2	Auxiliary to the balance.	+ 28	+ 23	+ 29	+ 36	+ 18	+ 39	+ 27	+ 27	+ 130	+ 105	+ 212	
Hannemyer.....	1708	2	Auxiliary compensation.	- 66	- 37	- 07	+ 20	+ 39	+ 14	- 60	- 55	- 22	- 63	- 04	
Dell and Co.....	10663	2	Auxiliary compensation.	+ 125	+ 129	+ 81	+ 73	+ 70	+ 21	+ 82	+ 68	+ 108	- 77	+ 63	
Highley.....	5435	2	Auxiliary acting in cold.	+ 05	- 01	- 13	- 33	- 37	- 03	- 40	- 76	- 12	- 02	+ 17	
Hannemyer.....	1180	2	Auxiliary compensation.	+ 131	+ 150	+ 170	+ 234	+ 265	+ 290	+ 303	+ 309	+ 340	+ 369	+ 367	
Isaac.....	1192	2	Auxiliary compensation for heat.	+ 13	+ 04	+ 11	+ 25	+ 29	+ 15	+ 09	+ 14	+ 9	+ 9	+ 9	
Whiffin.....	358	2	Auxiliary compensation.	+ 14	+ 18	+ 08	+ 18	+ 32	+ 53	+ 47	+ 47	+ 86	+ 105	+ 162	
Parkinson & Bosta.....	1063	2	Auxiliary permanently in action.	+ 03	+ 37	+ 170	+ 178	+ 161	+ 113	+ 68	+ 50	+ 8	+ 73	+ 63	
Reid and Son.....	1492	2	Auxiliary acting in all temperatures.	- 32	- 22	- 51	- 43	- 30	- 20	- 15	- 19	- 88	- 64	- 34	
Chronometrical Thermometer.....				+ 1595.9	+ 1597.0	+ 1407.0	+ 1378.5	+ 1322.0	+ 1320.5	+ 1263.9	+ 1004.2	+ 997.0	+ 1145.9	+ 1130.0	
Extremes of Temperature as shown by the Self-Registering Thermometers.....				44-48	44-48	46-51	48-32	47-54	48-52	47-54	50-55	51-61	64-82	66-86	

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

IN THE ORDER OF TIME.																		NAME		No.
Mar. 30 to April 6	April 6-13	April 13-20	April 20-27	April 27 to May 4	May 4-11	May 11-18	May 18-25	May 25 to June 1	June 1-8	June 8-15	June 15-22	June 22-29	June 29 to July 6	July 6-13	July 13-20	July 20-27	July 27 to Aug. 3	or MAKER.	No.	
+ 83 + 61 + 71 - 85	+ 93 + 65 + 78 - 85	+ 100 + 69 + 71 - 75	+ 114 + 83 + 83 - 88	+ 108 + 32 + 88 - 73	+ 111 + 68 + 110 - 66	+ 114 + 63 + 129 - 68	+ 113 + 80 + 129 - 65	+ 118 + 63 + 129 - 65	+ 127 + 41 + 113 - 63	+ 108 + 44 + 83 - 78	+ 90 + 65 + 42 - 71	+ 83 + 62 + 38 - 80	+ 92 + 52 + 38 + 84	+ 115 + 82 + 81 - 130	+ 127 + 90 + 113 - 110	+ 140 + 85 + 113 - 115	+ 149 + 90 + 87 - 119	Kullberg..... Hannemyer..... McGregor and Co..... Lovry..... Parkinson & Bosta.....	1799 4793 4173 779 1173	
- 123 + 66 - 75 - 110 + 110	- 128 + 84 - 75 - 100 + 149	- 125 + 83 + 93 - 88 + 175	- 135 + 109 + 92 + 94 + 175	- 135 + 109 + 92 + 94 + 181	- 150 + 145 + 75 + 66 + 185	- 143 + 75 + 79 + 71 + 180	- 131 + 65 + 63 + 24 + 185	- 129 + 61 + 61 + 19 + 185	- 120 + 63 + 61 + 23 + 175	- 130 + 61 + 61 + 18 + 148	- 142 + 101 + 101 + 18 + 116	- 183 + 91 + 91 + 97 + 116	- 185 + 89 + 101 + 97 + 115	- 175 + 156 + 130 + 107 + 130	- 195 + 140 + 135 + 108 + 130	- 175 + 140 + 135 + 108 + 130	- 175 + 140 + 135 + 108 + 130	Glover..... Isaac..... Usher and Cole..... Glover..... Kullberg.....	354 1192 1191 779 1885	
+ 105 - 94 - 08 + 161	+ 134 - 32 + 06 + 169	+ 125 + 20 + 16 + 184	+ 125 + 20 + 16 + 184	+ 125 + 20 + 16 + 184	+ 149 + 14 + 24 + 172	+ 144 + 13 + 45 + 172	+ 150 + 03 + 45 + 159	+ 151 + 03 + 45 + 159	+ 150 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	+ 180 + 02 + 45 + 159	Davidson..... Cartier..... Sewill..... Glover..... Parkinson & Bosta..... P. Birchall.....	4765 715 3040 354 1173 1171	
- 30 - 18 - 158 - 129	- 29 - 13 - 103 - 184	+ 36 + 12 - 109 - 184	+ 61 + 12 - 109 - 184	+ 61 + 12 - 109 - 184	+ 53 + 12 - 109 - 184	+ 49 + 12 - 109 - 184	+ 36 + 12 - 109 - 184	+ 36 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	+ 27 + 12 - 109 - 184	W. P. Birchall..... Cartier..... Sewill..... Glover..... Parkinson & Bosta..... P. Birchall.....	271 715 3040 354 1173 1171	
- 05 + 205 + 51 + 01	- 30 + 233 + 63 + 55	- 35 + 265 + 73 + 105	- 48 + 278 + 83 + 105	- 48 + 278 + 83 + 105	- 83 + 303 + 83 + 70	- 78 + 316 + 83 + 70	- 104 + 329 + 83 + 71	- 100 + 334 + 83 + 71	- 116 + 343 + 83 + 71	- 123 + 353 + 83 + 71	- 123 + 353 + 83 + 71	- 123 + 353 + 83 + 71	- 123 + 353 + 83 + 71	- 123 + 353 + 83 + 71	- 123 + 353 + 83 + 71	- 123 + 353 + 83 + 71	- 123 + 353 + 83 + 71	McGregor and Co..... Williams and Co..... Gowland..... Hannemyer..... Reid and Son.....	4521 97 2974 4796 1215	
+ 10 + 34 + 62 + 104	- 28 - 41 + 18 + 104	- 32 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	- 31 - 23 + 85 + 113	Sewill..... Quilliam..... Whiffin..... Russell and Son.....	361 17917 361 2081	
- 159 - 177 - 100	- 207 - 23 - 177	- 190 - 33 - 177	- 183 - 33 - 177	- 183 - 33 - 177	- 172 - 34 - 100	- 210 - 34 - 100	- 224 - 37 - 100	- 220 - 37 - 100	- 151 - 33 - 100	- 104 - 33 - 100	- 63 - 33 - 100	- 97 - 33 - 100	- 83 - 33 - 100	- 116 - 33 - 100	- 151 - 33 - 100	- 148 - 33 - 100	- 45 - 33 - 100	M. F. Dent..... Shepherd and Son..... Hannemyer..... Dell and Co..... Highley.....	2840 17917 1708 10663 5435	
+ 400 + 104 + 159 + 104 - 77	+ 390 + 127 + 88 + 101 - 89	+ 434 + 120 + 103 + 109 - 99	+ 428 + 120 + 103 + 109 - 99	+ 428 + 120 + 103 + 109 - 99	+ 462 + 158 + 110 + 110 - 110	+ 461 + 158 + 110 + 110 - 110	+ 470 + 158 + 110 + 110 - 110	+ 470 + 158 + 110 + 110 - 110	+ 474 + 158 + 110 + 110 - 110	+ 481 + 158 + 110 + 110 - 110	+ 497 + 158 + 110 + 110 - 110	+ 488 + 158 + 110 + 110 - 110	+ 490 + 158 + 110 + 110 - 110	+ 501 + 158 + 110 + 110 - 110	+ 565 + 158 + 110 + 110 - 110	+ 604 + 158 + 110 + 110 - 110	+ 615 + 158 + 110 + 110 - 110	Hannemyer..... Isaac..... Whiffin..... Parkinson & Bosta..... Reid and Son.....	1580 1192 361 1063 1428	
- 1023	- 8673	- 6595	- 8900	- 4470	- 7039	- 9355	- 9650	- 4400	- 3520	- 12110	- 12849	- 12717	- 12845	- 554	- 2190	- 8230	- 6195	Chronometrical Thermometer		
65-83	40-61	52-61	51-60	56-63	53-60	52-57	49-59	54-63	54-61	64-89	70-89	80-91	82-95	95-97	74-94	70-68	70-67	Extremes of Temperature		

IN THE ORDER OF TEMPERATURE, AS DETERMINED BY THE CHRONOMETRICAL THERMOMETER.

																		NAME OF MAKER.		No.
April 6-13	May 4-11	June 1-8	June 15	Apr 27 May 4	May 25 June 1	July 13-20	July 27-30	July Aug. 3	July 20-27	March 9-16	Mar. 30 to Apr. 6	March 23-30	March 16-23	March 8-15	June 15-22	June 22-29	June 29 July 6			
+ 93	+ 111	+ 100	+ 127	+ 106	+ 113	+ 120	+ 115	+ 142	+ 140	+ 79	+ 83	+ 89	+ 71	+ 106	+ 99	+ 93	+ 93	Kulberg	1799	
+ 95	+ 98	+ 99	+ 44	+ 23	+ 41	+ 89	+ 82	+ 83	+ 86	+ 20	+ 61	+ 61	+ 57	+ 85	+ 65	+ 62	+ 53	Hemery	4793	
+ 75	+ 110	+ 71	+ 120	+ 98	+ 115	+ 91	+ 82	+ 97	+ 103	+ 97	+ 81	+ 84	+ 70	+ 83	+ 43	+ 36	+ 38	Hemery	4173	
+ 13	+ 26	+ 27	+ 39	+ 45	+ 46	+ 84	+ 87	+ 83	+ 78	+ 19	+ 15	+ 19	+ 14	+ 60	+ 39	+ 45	+ 50	Lowry	779	
- 85	- 68	- 75	- 63	- 73	- 97	- 110	- 120	- 129	- 115	- 41	- 85	- 76	- 64	- 75	- 71	- 60	- 64	Parkinson & Sons	1159	
- 128	- 150	- 125	- 130	- 135	- 150	- 155	- 175	- 175	- 165	- 104	- 123	- 115	- 120	- 118	- 142	- 185	- 185	Glover	354	
- 84	- 73	- 83	- 65	- 83	- 113	- 133	- 140	- 130	- 120	+ 9	+ 33	+ 25	+ 13	+ 61	+ 91	+ 91	+ 100	Hemery	1150	
+ 51	+ 71	+ 56	+ 44	+ 48	+ 56	+ 97	- 01	+ 12	+ 30	+ 39	+ 33	+ 47	+ 47	+ 50	+ 50	+ 49	+ 35	Usher and Cole	417	
+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	Hemery	417	
+ 149	+ 185	+ 175	+ 175	+ 169	+ 180	+ 190	+ 160	+ 173	+ 165	+ 99	+ 110	+ 131	+ 100	+ 148	+ 116	+ 116	+ 113	Kulberg	1885	
+ 134	+ 144	+ 125	+ 180	+ 149	+ 156	+ 115	+ 110	+ 137	+ 140	+ 74	+ 105	+ 125	+ 94	+ 121	+ 90	+ 89	+ 89	Davidson	4765	
- 32	- 13	- 20	+ 97	- 14	- 02	+ 40	+ 25	+ 93	+ 63	- 14	- 04	- 00	- 11	+ 43	- 11	- 04	- 01	Sewall	3040	
+ 74	+ 83	+ 80	+ 96	+ 81	+ 88	+ 101	+ 105	+ 102	- 8	- 113	- 69	- 62	- 59	- 88	- 69	- 60	- 55	Childrens	799	
+ 04	+ 49	+ 15	+ 123	+ 24	+ 96	+ 109	+ 109	+ 102	- 8	- 113	- 69	- 62	- 59	- 88	- 69	- 60	- 55	Robertson	1171	
+ 169	+ 172	+ 164	+ 156	+ 149	+ 134	+ 121	+ 108	+ 129	+ 150	+ 124	+ 141	+ 159	+ 121	+ 156	+ 143	+ 145	+ 142	P. Birchall	1150	
+ 29	+ 53	+ 36	+ 33	+ 46	+ 27	- 00	- 35	+ 10	- 20	- 70	- 30	- 29	- 56	+ 29	+ 40	+ 39	+ 23	W. P. Birchall	271	
+ 13	+ 21	+ 12	+ 45	+ 24	+ 38	+ 70	+ 60	+ 30	+ 35	+ 05	+ 20	+ 30	+ 53	+ 29	- 09	- 16	- 24	Carter	715	
- 37	- 102	- 121	- 111	- 118	- 113	- 120	- 129	- 108	- 122	- 158	- 121	- 118	- 115	- 109	- 91	- 87	- 83	Well	3531	
+ 154	+ 136	+ 130	+ 120	+ 131	+ 119	+ 250	+ 234	+ 298	+ 353	+ 81	+ 129	+ 93	- 86	+ 177	+ 171	+ 162	+ 176	Carter	739	
- 37	- 10	+ 05	+ 30	+ 09	+ 36	- 05	- 24	- 94	- 24	- 35	+ 45	+ 40	- 20	+ 65	- 32	- 106	- 119	Shepherd and Son	1797	
- 30	- 76	- 33	- 123	- 93	- 116	- 15	- 01	- 05	- 35	- 39	- 05	- 05	- 30	- 12	- 82	- 101	- 120	McGraw and Co.	4571	
- 32	- 316	- 363	- 321	- 308	- 281	- 290	- 275	- 265	- 275	- 306	- 295	- 280	- 303	- 323	- 323	- 311	- 329	Hemery	1150	
- 03	+ 31	+ 02	+ 61	+ 10	+ 44	- 58	- 67	- 35	- 35	- 57	- 05	- 09	- 64	- 47	- 93	- 95	- 95	Woolland	2274	
+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	+ 95	McGraw	4796	
+ 55	+ 70	+ 70	+ 44	+ 60	+ 56	+ 29	+ 04	+ 14	+ 30	+ 19	+ 01	+ 26	+ 27	+ 23	- 03	- 44	- 57	Reid and Sons	1513	
- 28	- 28	- 23	- 98	- 20	- 08	+ 45	+ 30	+ 36	+ 40	+ 04	+ 10	+ 17	+ 63	+ 23	+ 11	+ 12	+ 98	Swinnell	3039	
+ 41	+ 20	+ 23	+ 51	+ 10	+ 59	+ 83	+ 74	+ 102	+ 100	+ 34	+ 64	+ 73	+ 97	+ 51	+ 41	+ 41	+ 17	Quitman	17217	
+ 74	+ 83	+ 80	+ 96	+ 81	+ 88	+ 101	+ 105	+ 102	- 8	- 113	- 69	- 62	- 59	- 88	- 69	- 60	- 55	Whiffin	361	
+ 104	+ 120	+ 85	+ 116	+ 118	+ 113	+ 120	+ 129	+ 108	+ 122	- 158	- 121	- 118	- 115	- 109	- 91	- 87	- 83	Roberts	5417	
+ 150	+ 141	+ 113	+ 149	+ 107	+ 140	+ 104	+ 108	+ 142	+ 133	+ 145	+ 95	+ 121	+ 124	+ 217	+ 253	+ 255	+ 243	Russell and Son	2089	
- 307	- 310	- 120	- 104	- 172	- 161	- 148	- 151	- 55	- 45	+ 19	+ 129	- 176	- 114	- 63	+ 97	- 85	- 116	M. F. Dent	26440	
- 23	+ 10	- 33	+ 24	+ 34	+ 16	- 05	- 102	- 79	- 95	- 130	- 177	- 212	- 195	- 73	- 113	- 148	- 159	Shepherd and Son	1761	
- 177	- 293	- 179	- 179	- 179	- 179	- 351	- 355	- 369	- 337	- 25	- 100	- 63	- 63	- 279	- 247	- 206	- 220	Hammersley	1708	
+ 0	+ 10	+ 23	+ 39	+ 19	+ 47	+ 12	+ 23	+ 60	+ 12	+ 20	- 12	+ 00	+ 17	- 02	- 12	- 96	- 110	McGraw	4535	
+ 00	+ 125	+ 85	+ 92	+ 96	+ 80	+ 87	+ 52	+ 46	+ 20	- 12	+ 00	+ 17	- 02	- 12	- 96	- 110	- 128	Hemery		
+ 230	+ 454	+ 434	+ 481	+ 462	+ 474	+ 504	+ 565	+ 620	+ 615	+ 340	+ 400	+ 397	+ 369	+ 497	+ 488	+ 490	+ 501	Hammersley	1580	
+ 157	+ 96	+ 220	+ 73	+ 158	+ 77	+ 205	+ 260	+ 165	+ 170	+ 98	+ 104	+ 81	+ 83	+ 223	+ 263	+ 283	+ 300	Ismene	1122	
+ 85	+ 104	+ 90	+ 440	+ 163	+ 376	+ 355	+ 338	+ 365	+ 89	+ 159	+ 143	+ 105	+ 207	+ 263	+ 293	+ 305	+ 310	Whiffin	358	
- 101	- 71	- 102	+ 05	+ 63	+ 13	+ 60	+ 12	+ 30	+ 60	+ 12	+ 30	+ 60	+ 12	+ 30	+ 60	+ 12	+ 30	Deit and Co	12668	
- 89	- 81	- 99	- 59	- 110	- 71	- 215	- 185	- 190	- 133	- 88	- 77	- 64	- 64	- 74	- 52	- 37	- 70	Reid and Sons	1492	
+ 867	+ 703	+ 659	+ 520	+ 497	+ 440	+ 210	- 554	- 619	- 832	- 997	- 1026	- 1113	- 1143	- 1213	- 1384	- 1571	- 2184	Chronometrical Thermometer.		

40-61-93-60-93-61-54-61-56-63-64-63-64-70-67-74-66-75-68-70-61-81-66-83-56-88-64-85-64-89-73-89-80-81-83-95

Excesses of Temperature as shown by the Self-Registering Thermometer.

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

NAME OF MAKER.	No.	Where made or Date.	ADDRESS OF MAKER.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(III).—ABSTRACT OF THE				
					First Day of First Week of Rating.	Last Day of Last Week of Rating.	Week of Week.	Least Weekly Sum.	
Kullberg.....	1799	2	105, Liverpool Road, London.	Kullberg's flat rim balance, without auxiliary.	January 13	August 3	20	+ 3.6	
Hemery.....	4793	2	5, Wind Street, Swansea.	Auxiliary compensation.	January 13	August 3	20	+ 1.5	
McGregor and Co.....	4173	2	10, Park Place, Glasgow.	Ordinary auxiliary compensation to balance.	January 13	August 3	20	+ 3.6	
Levery.....	779	2	66, High Street, Belfast.	Auxiliary compensation.	January 13	August 3	20	+ 2.7	
Parkinson and Bouts.....	1129	2	59, Gracechurch Street, London.	Auxiliary acting in extremes of temperature.	January 13	August 3	20	+ 13.1	
Glover.....	354	2	8, Wrotham Road, Camden New Town, Isane	Auxiliary as before.	January 13	August 3	20	+ 18.5	
Isane.....	1120	2	147, Liverpool Road, London. [London]	Original construction of balance without auxiliary.	January 13	August 3	20	+ 0.1	
Isane and Cole.....	317	2	46, St. John's Square, Clerkenwell, London.	Auxiliary to balance.	January 13	August 3	20	+ 10.0	
Glover.....	333	2	8, Wrotham Road, Camden New Town, Isane	Auxiliary as before.	January 13	August 3	20	+ 4.0	
Kullberg.....	1883	2	105, Liverpool Road, London. [London]	Improved ordinary balance.	January 13	August 3	20	+ 5.5	
Davidson.....	4765	2	6, Side, Newcastle-on-Tyne.	Auxiliary compensation.	January 13	August 3	20	+ 9.2	
Sevill.....	3040	2	61, South Castle Street, Liverpool.	Auxiliary compensation.	January 13	August 3	20	+ 11.2	
Chittenden.....	793	2	10, Wilton Road, Hackney, London.	Auxiliary as in former years.	January 13	August 3	20	+ 1.0	
Parkinson and Bouts.....	1171	2	59, Gracechurch Street, London.	Auxiliary acting in extremes of temperature.	January 13	August 3	20	+ 10.8	
F. Birchall.....	1150	2	12a, Stonefield Street, Islington, London.	Ordinary balance, with a slight alteration.	January 13	August 3	20	+ 8.1	
W. P. Birchall.....	271	2	12a, Stonefield Street, Islington, London.	Ordinary balance, with a slight alteration.	January 13	August 3	20	+ 2.4	
Cartier.....	715	2	61, Cornhill, London.	Ordinary balance, with a slight addition.	January 13	August 3	20	+ 27.0	
Wells.....	3331	2	25, High Street, Newport, Monmouth.	Auxiliary to balance.	January 13	August 3	20	+ 26.8	
Cartier.....	729	2	61, Cornhill, London.	Ordinary balance.	January 13	August 3	20	+ 12.5	
Shepherd and Son.....	1787	2	55, Lendalhall Street, London.	Auxiliary to the balance.	January 13	August 3	20	+ 12.8	
McGregor and Co.....	4571	2	3, Clyde Place, Glasgow.	Poole's auxiliary.	January 13	August 3	20	+ 13.8	
Williams and Co.....	97	2	2, Bate Dock, Cardiff.	Auxiliary compensation.	January 13	August 3	20	+ 10.0	
Gowland.....	2374	2	178, High Street West, Sunderland.	Auxiliary compensation.	January 13	August 3	20	+ 8.7	
Hemery.....	4796	2	5, Wind Street, Swansea.	Auxiliary compensation.	January 13	August 3	20	+ 10.0	
Reid and Sons.....	1215	2	41, Grey Street, Newcastle-on-Tyne.	Auxiliary acting in cold.	January 13	August 3	20	+ 12.7	
Sevill.....	3039	2	61, South Castle Street, Liverpool.	Auxiliary compensation.	January 13	August 3	20	+ 11.0	
Quilliam.....	17917	2	32, Elizabeth Street, Liverpool.	Continuous auxiliary to balance.	January 13	August 3	20	+ 9.6	
Whiffin.....	361	2	10, Chesham Square, Islington, London.	Auxiliary permanently in action.	January 13	August 3	20	+ 9.5	
Brotherton.....	5417	2	11, Spencer Street, Goswell Road, London.	Construction as in former years.	January 13	August 3	20	+ 22.4	
Russell and Son.....	3007	2	90, Slater Street, Liverpool.	Auxiliary to balance.	January 13	August 3	20	+ 36.9	
M. F. Dent.....	26440	2	35, Cockspur Street, London.	M. F. Dent's new compensation balance, without auxiliary.	January 13	August 3	20	+ 12.8	
Shepherd and Son.....	1761	2	55, Lendalhall Street, London.	Auxiliary to the balance.	January 13	August 3	20	+ 10.9	
Hammerley.....	1708	2	54, Spencer Street, Clerkenwell, London.	Auxiliary compensation.	January 13	August 3	20	+ 19.2	
Dell and Co.....	13988	2	2, Broad Street, Bristol.	Auxiliary compensation.	January 13	August 3	20	+ 19.2	
Highly.....	3435	2	45, High Street, Shrewsbury.	Auxiliary acting in cold.	January 13	August 3	20	+ 19.2	
Hammerley.....	1580	2	54, Spencer Street, Clerkenwell, London.	Auxiliary compensation.	January 13	August 3	20	+ 19.2	
Isane.....	1122	2	147, Liverpool Road, London.	Auxiliary compensation for heat.	January 13	August 3	20	+ 1.3	
Whiffin.....	335	2	10, Chesham Square, Islington, London.	Auxiliary compensation.	January 13	August 3	20	+ 1.4	
Parkinson & Prossham.....	4033	2	4, Change Alley, Cornhill, London.	Auxiliary permanently in action.	January 13	August 3	20	+ 21.5	
Reid and Sons.....	1492	2	41, Grey Street, Newcastle-on-Tyne.	Auxiliary acting in all temperatures.	January 13	August 3	20	+ 21.5	

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 gas flames are exterior to the chamber, into which none of the injurious products of combustion can enter. In the column "Before and after what Day" the positions of the symbol (†), before or after the date, indicate respectively exposure to heat in the week immediately preceding, or in the week immediately following.

PRINCIPAL CHANGES OF RATE.							
In what Week.	Greatest Weekly Sum.	In what Week.	Difference between the Greatest and Least.	Greatest Difference between the Greatest and Least.	Before and after what Day.	NAME OF MAKER.	No.
January 13 to 20	+ 14.2	July 27 to August 3	10.6	2.8	January 20	Kullberg.....	1799
January 13 to 20	+ 8.9	July 13 to 20	7.4	5.1	April 27	Hemery.....	4793
June 23 to 29†	+ 8.9	May 11 to 18	9.3	4.6	March 9†	McGregor and Co.....	4173
March 23 to 9	+ 8.4	July 13 to 20	11.1	4.6	March 9†	Levery.....	779
January 20 to 27	+ 1.4	March 2 to 9	11.7	4.6	† July 6	Parkinson and Bouts.....	1129
June 22 to 29†, June 26 to 27	+ 5.8	February 3 to 10	12.7	4.3	† June 22†	Glover.....	354
Jan. 27 to Feb. 3, March 3 to 9	+ 14.0	July 6 to 13	12.3	4.3	February 24	Isane.....	1120
July 6 to 13	+ 9.7	March 2 to 9	9.8	4.3	Isane and Cole.....	317	
April 6 to 13	+ 1.3	January 20 to 27	11.3	3.9	March 9†	Glover.....	333
January 13 to 20	+ 10.0	May 11 to 18; July 13 to 20	15.0	4.5	† July 6	Kullberg.....	1883
January 13 to 20	+ 18.0	June 1 to 8	12.5	5.9	June 8†	Davidson.....	4765
February 3 to 10	+ 6.0	July 20 to 27	15.7	4.4	March 9†	Sevill.....	3040
March 16 to 23†, June 26 to 27	+ 2.4	April 20 to 27	8.8	8.1	April 27	Chittenden.....	793
July 6 to 13	+ 13.3	Feb. 24 to March 2	10.0	7.6	† July 6	Parkinson and Bouts.....	1171
January 13 to 20	+ 6.1	April 20 to 27	14.2	3.8	March 9†	F. Birchall.....	1150
June 29 to July 6†	+ 7.0	July 13 to 20	9.4	8.4	† April 6	W. P. Birchall.....	271
February 24 to March 2	+ 6.2	June 29 to July 6†	20.8	6.6	† July 6	Cartier.....	715
June 29 to July 6†	+ 3.5	March 2 to 9	21.8	5.8	† March 16†	Wells.....	3331
March 2 to 9	+ 0.1	May 25 to June 1	16.0	10.1	† July 6	Cartier.....	729
March 2 to 9	+ 28.4	July 6 to 13	19.9	12.1	† July 6	Shepherd and Son.....	1787
June 29 to July 6†	+ 7.6	May 11 to 18	16.8	9.1	† July 6	McGregor and Co.....	4571
June 29 to July 6†	+ 7.6	May 4 to 11	16.3	11.1	June 8†	Gowland.....	2374
June 29 to July 6†	+ 10.5	April 20 to 27	20.5	9.6	† July 6	Hemery.....	4796
February 10 to 17	+ 4.6	July 13 to 20	17.3	11.2	† July 6	Reid and Sons.....	1215
January 13 to 20	+ 10.2	July 27 to August 3	27.1	8.9	March 9†	Sevill.....	3039
January 27 to Feb. 3	+ 16.1	July 13 to 20	27.5	11.3	† July 6	Quilliam.....	17917
February 3 to 10	+ 12.8	April 20 to 27	23.5	9.9	† July 6	Whiffin.....	361
March 30 to April 6†	+ 31.0	February 17 to 24	31.5	19.7	March 2	Brotherton.....	5417
May 11 to 18	+ 8.0	January 20 to 27	30.4	12.4	† March 9†	Russell and Son.....	3007
March 23 to 29†	+ 4.8	May 11 to 18	30.8	8.5	† March 16†	M. F. Dent.....	26440
June 29 to July 6†	+ 12.5	February 10 to 17	30.4	12.4	† March 9†	Shepherd and Son.....	1761
January 20 to 27	+ 12.5	January 13 to 20	24.3	17.4	† July 6	Hammerley.....	1708
May 29 to July 6†	+ 12.5	May 4 to 11	25.3	18.0	† March 9†	Dell and Co.....	13988
January 13 to 20	+ 62.0	July 27 to August 3	48.9	6.4	† July 6	Highly.....	3435
January 13 to 20	+ 35.1	June 29 to July 6†	31.9	15.0	† July 6	Hammerley.....	1580
July 27 to August 3	+ 12.5	July 6 to 13	26.5	12.7	June 8†	Isane.....	1122
April 20 to 27	+ 7.0	February 3 to 10	28.7	20.3	† June 8†	Whiffin.....	335
July 27 to August 3	+ 17.8	May 11 to 18	28.7	20.3	† July 6	Parkinson & Prossham.....	4033
July 27 to August 3	+ 17.8	May 11 to 18	28.7	20.3	† July 6	Reid and Sons.....	1492

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.