

187160AMM..31H...1A

RATES OF CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY,

AT THE

ROYAL OBSERVATORY, GREENWICH.

1870.

NAME OF MAKER.	No.	Construction of Escapement and Balance, From the Description furnished by the Maker.	(1.) WEEKLY SUMS OF DAILY RATES											
			Jan. 15-22	Jan. 22-29	Jan. 29 to Feb. 5	Feb. 5-12	Feb. 12-19	Feb. 19-26	Feb. 26 to Mar. 5	March 5-12	March 12-19	March 19-26	Mar. 26 to April 2	
M. F. Dent	25324	2 [No information received.]	-	+	+	+	+	+	+	+	+2	-2	-17	
Chittenden	779	2 Auxiliary as in former years.	+10	+10	+38	+27	+70	+65	+12	+25	+33	+30	+15	
Reid and Sons	1491	2 Auxiliary acting in cold.	-8	-8	-74	-59	-51	-38	-58	-59	-30	-55	-42	
Lowry	1656	2 Auxiliary compensation.	-17	-42	-47	-53	-30	-43	-34	-64	-63	-70	-84	
Kingston	5321	2 Auxiliary acting in cold.	-61	-41	-57	-36	-32	-35	-23	+13	+35	+40	-25	
C. Frodham	3345	2 [No information received.]	+45	+93	+107	+95	+115	+95	+77	+73	+80	+70	+95	
E. Dent and Co.	3092	2 Dent's patent balance.	+107	+197	+194	+212	+184	+177	+177	+166	+170	+160	+124	
Glover	354	2 Auxiliary compensation.	-152	-152	-152	-152	-152	-152	-152	-152	-152	-152	-152	
McGregor and Co.	4172	2 Poole's auxiliary.	-53	-27	-18	-20	-70	-50	-28	-22	00	-40	-113	
F. Fletcher	2921	2 Auxiliary compensation.	+36	+85	+71	+65	+85	+90	+47	+80	+93	+55	+93	
J. B. Fletcher	2969	2 Auxiliary compensation.	+29	+21	+36	+38	-20	+15	+63	+42	+37	+48	+39	
Shepherd and Son	1737	2 Auxiliary compensation.	-65	-44	-57	-88	-40	-41	-107	-112	-100	-120	-123	
Parkinson & Bost	1147	2 Auxiliary to balance acting in extremes.	-61	+20	-34	+20	+23	-37	+27	+28	+40	+17	+87	
Gowland	2711	2 Auxiliary compensation.	-95	+13	+17	+10	+95	-65	-29	+13	+30	+30	-55	
C. Frodham	3354	2 [No information received.]	-18	-34	-95	-25	-65	-40	-12	-22	-15	-10	-40	
Lister and Sons	635	2 Poole's auxiliary.	-167	-173	-155	-160	-165	-165	-181	-189	-190	-195	-200	
McGregor and Co.	4173	2 Auxiliary compensation.	-92	-91	-93	-108	-127	-128	-113	-169	-119	-129	-132	
Davison	1671	2 Auxiliary compensation.	+18	+12	+14	+16	+10	+20	+32	+18	+30	+25	+75	
Penington	1799	2 Auxiliary compensation balance.	-175	-153	-24	-92	-83	-94	-92	-65	-60	-76		
J. Fletcher	2979	2 Auxiliary compensation.	-57	+44	+09	-05	-67	+80	+67	+90	+73	+55	+84	
Roskell and Co.	4233	2 Kullberg's double rim balance, without auxiliary.	-33	+66	+31	-36	+18	+05	-30	+03	+18	+10	+22	
Dobbie	3525	2 Ordinary compound balance, with Poole's auxiliary.	-01	+60	+14	+17	+00	+60	+51	+21	+20	+15	+47	
Hemsey	1613	2 Auxiliary compensation.	-21	-32	+01	-04	-60	-40	+14	+19	+15	-05	-43	
Reid and Sons	1492	2 Auxiliary acting in all temperatures.	-07	-07	-23	-62	-83	-65	-87	+103	+127	+128	+50	
Weichert	2215	2 Ordinary balance, with original auxiliary.	-30	-42	-11	-02	-45	-15	-63	+33	+40	+40	+110	
Shepherd and Son	1732	2 Auxiliary compensation.	+71	+37	+55	+44	+04	+10	+69	+51	+57	+38	+160	
Webb	5550	2 Auxiliary acting in all temperatures.	-77	-61	-59	-58	-73	-73	-88	-67	-70	-90	-145	
Lister and Sons	636	2 Poole's auxiliary.	-170	-170	-170	-170	-170	-170	-170	-170	-170	-170	-170	
Edie	562	8 Improved application to the pendulum spring.	-197	-170	-137	-173	-125	-00	-138	-162	-145	-179	-61	
Riffe, Junr.	562	2 Patent balance : unsupplied figure.	-320	-369	-359	-391	-425	-387	-503	-428	-397	-386	-267	
D. Reid	1870	2 Auxiliary balance.	-12	-53	-38	-37	-125	-115	-63	-92	-93	-127	-50	
Webb	5550	2 Auxiliary acting in all temperatures.	-325	-342	-342	-342	-342	-342	-342	-342	-342	-342	-342	
Whiffin	350	2 Auxiliary compensation.	-109	-110	-112	-133	-123	-137	-147	-145	-153	-153	-83	
Edie	562	2 Improved application to the pendulum spring.	-164	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	
Gowland	2710	2 Ordinary balance with auxiliary.	-60	+14	+15	+69	+423	+240	+143	+12	+13	+58	+100	
Thiessen	399	2 Double locking detent and bi-convex timing spring :	+107	+342	+323	+217	+500	+535	+279	+303	+213	+215	+135	
Whiffin	342	2 Auxiliary compensation.	+26	+45	+66	+75	+30	-05	-03	-100	-67	-70	-60	
Chronometrical Thermometer	.....	.....	+1620.5	+2053.9	+1777.0	+1751.0	+2397.0	+2187.5	+1280.7	+1628.6	+1575.5	+1506.0	-179.5	
Extremes of Temperature as shown by the Self-Registering Thermometers	.....	.....	40-51	38-43	38-48	35-48	33-38	35-42	41-06	43-49	41-51	43-51	55-78	

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

NAME OF MAKER.	No.	IN THE ORDER OF TIME.											
		April 2-9	April 9-16	April 16-23	April 23-30	April 30 to May 7	May 7-14	May 14-21	May 21-28	May 28 to June 4	June 4-11	June 11-18	June 18-25
M. F. Dent	25324	-41	-39	-58	-21	-23	-23	-23	-23	-23	-23	-23	-23
Chittenden	779	-11	-14	-17	+04	+28	+55	+50	+81	+06	+13	+25	+19
Reid and Sons	1491	-28	-05	-20	-58	-62	-74	-78	-83	-25	-13	-20	-73
Lowry	1656	-81	-73	-42	+04	+20	+35	+06	-02	-15	-23	-33	-15
Kingston	5321	-36	-44	-80	-23	+19	+29	00	-15	00	-25	-38	-06
C. Frodham	3345	+113	+116	+122	+92	+133	+137	+115	+116	+173	+181	+178	+188
E. Dent and Co.	3092	+61	+65	+75	+117	+150	+153	+140	+160	+160	+146	+167	+177
Glover	354	-44	-27	-38	-21	-49	-27	-11	-28	-48	-78	-84	-78
McGregor and Co.	4172	-90	-20	-40	-88	-57	-50	-70	-73	-85	-97	-113	-135
F. Fletcher	2921	-13	-28	+20	+43	+101	+113	-70	+67	+87	+98	+120	+116
J. B. Fletcher	2969	+38	+43	+45	+101	+126	+158	+145	+115	+115	+125	+130	+124
Shepherd and Son	1737	-57	-43	-40	-92	-24	-23	-40	-97	-43	-02	00	00
Parkinson & Bost	1147	-65	-64	-90	-44	-71	-25	+01	-04	+13	-22	-21	-06
Gowland	2711	-58	-50	-22	+28	+56	+70	+40	+34	+40	+45	+20	+26
C. Frodham	3354	-91	-101	-76	-101	+97	+92	+83	-98	-34	-71	-04	-16
Lister and Sons	635	-201	-149	-130	-61	-162	-150	-127	-118	-148	-176	-201	-195
McGregor and Co.	4173	-92	-95	-100	-108	-91	-118	-165	-165	-95	-114	-114	-106
Davison	1671	-93	-95	-85	+77	+94	+109	+115	+148	+130	+116	+115	+181
Penington	1799	+26	-25	-25	-35	+24	+02	+38	+23	-15	+24	+17	+04
J. Fletcher	2979	+43	+67	+93	+51	-19	-26	-46	-55	+37	+42	+63	+61
Roskell and Co.	4233	-53	-76	-94	-83	-57	-55	-51	-51	-49	-60	-103	-93
Dobbie	3525	-25	-14	+04	-54	-57	-71	-66	+110	-03	-19	-03	-02
Hemsey	1613	+40	+73	+82	+86	+120	+114	+15	+50	+60	+92	+84	+172
Reid and Sons	1492	+126	+155	+159	+129	+116	+135	+170	+206	+258	+266	+230	+214
Weichert	2215	+165	+165	+200	+182	+128	+131	+144	+170	+175	+164	+141	+133
Shepherd and Son	1732	-259	-199	-221	-96	-127	-120	-100	-128	-109	-184	-88	-88
Webb	5550	-74	-104	-74	-104	-104	-104	-104	-104	-104	-104	-104	-104
Lister and Sons	636	-101	-110	-88	-229	-206	-130	-115	-193	-101	-94	-115	-180
Edie	562	-273	-297	-262	-317	-268	-275	-301	-314	-318	-272	-295	-290
Riffe, Junr.	562	-55	-44	-09	+78	+57	+70	+70	+90	+59	+66	+50	+61
Whiffin	350	-17	-63	-20	-84	-61	-340	-18	-53	-154	-175	-184	-226
Whiffin	350	+17	-63	-20	-84	-61	-340	-18	-53	-154	-175	-184	-226
Edie	562	-115	-109	+03	-62	-25	-50	-18	-37	+23	+106	+79	+118
Gowland	2710	+243	+345	+321	+241	+188	+160	+200	+212	+239	+320	+370	+240
Thiessen	399	+69	-66	+106	+110	+184	+305	+279	+291	+226	+239	+205	+240
Whiffin	342	-20	-05	-17	-33	+02	..	..	..	..	..	..	..
Chronometrical Thermometer	.....	-834.7	-1451.3	-1485.5	-563.7	+1043.6	+860.7	+281.0	-119.3	-1252.3	-1622.2	-2050.0	-2052.5
Extremes of Temperature as shown by the Self-Registering Thermometers	.....	63-84	72-90	71-92	58-63	50-57	51-58	56-69	63-71	69-87	76-92	81-96	85-95

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

The Chronometer Edie 299 (pocket) accidentally ran down on February 6; the rate for the week February 5 to 12 is therefore wanting, and, consequently, the position of the Chronometer in the Tables is not necessarily correct.

The Chronometer Whiffin 342 was withdrawn from trial, by the maker, by permission. On account of its shorter trial, its rates are not comparable with those of the other Chronometers. It is in consequence placed in a separate division.

Of three other Chronometers, not included in the Tables, one stopped at the commencement of the trial, and was returned to the maker, and two were withdrawn, by permission, at an early period of the trial.

NAME or MAKER.	No.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(1.) WEEKLY SUMS OF DAILY RATES											
			Feb. 12-19	Feb. 19-26	Jan. 22-29	Jan. 29 to Feb. 5	Feb. 5-12	March 5-12	Jan. 12-19	March 12-19	March 19-26	Feb. 26 to Mar. 5	Apr. 30 to May 7	
M. F. Dent.....	25334	2 [No information received.]	- 40	- 28	- 20	- 12	- 03	- 17	- 37	+ 02	- 22	00	- 21	
Chittenden.....	1779	2 Auxiliary as in former years.	+ 70	+ 93	+ 50	+ 36	+ 37	+ 25	+ 10	+ 33	+ 20	+ 12	+ 38	
Reid and Sons.....	1491	2 Auxiliary acting in cold.	- 51	- 38	- 84	- 74	- 39	- 59	00	- 30	- 38	- 08	- 02	
Lowry.....	1656	2 Auxiliary compensation.	- 60	- 43	- 43	- 47	- 53	- 64	- 67	- 65	- 70	- 56	- 53	
Kingston.....	5321	2 Auxiliary acting in cold.	- 32	- 35	- 41	- 57	- 36	- 13	- 61	+ 35	+ 40	- 23	- 19	
C. Frodham.....	3346	2 [No information received.]	+ 115	+ 95	+ 93	+ 107	+ 95	+ 73	+ 46	+ 80	+ 70	+ 77	+ 123	
E. Dent and Co.....	3592	2 Don't patent balance.	+ 184	+ 177	+ 127	+ 104	+ 212	+ 167	+ 177	+ 170	+ 160	+ 177	+ 150	
Glover.....	1003	2 Auxiliary compensation.	- 103	- 90	- 176	- 148	- 87	- 72	- 102	- 73	- 85	- 58	- 49	
McGregor and Co.....	4172	2 Poole's auxiliary.	- 70	- 50	- 27	- 16	- 20	- 22	- 55	00	- 40	- 28	- 67	
J. Fletcher.....	2921	2 Auxiliary compensation.	+ 85	+ 90	+ 85	+ 71	+ 65	+ 80	+ 36	+ 39	+ 89	+ 47	+ 101	
J. B. Fletcher.....	2969	2 Auxiliary compensation.	- 20	+ 15	+ 21	+ 36	+ 38	+ 42	+ 29	+ 57	+ 48	+ 63	+ 126	
Shepherd and Son.....	1737	2 Auxiliary compensation.	- 40	- 41	- 44	- 57	- 88	- 112	- 93	- 100	- 120	- 107	- 34	
Parkinson & Bosts.....	1147	2 Auxiliary to balance acting in extremes.	+ 25	+ 23	+ 20	+ 24	+ 30	+ 28	+ 01	+ 40	+ 17	+ 27	- 71	
Gowland.....	2711	2 Auxiliary compensation.	+ 55	+ 65	+ 13	+ 17	+ 10	+ 13	- 13	- 30	- 20	- 29	- 56	
C. Frodham.....	3344	2 [No information received.]	05	- 40	- 34	- 01	- 25	- 22	- 18	- 15	- 10	- 12	- 73	
Lister and Sons.....	635	2 Poole's auxiliary.	- 105	- 165	- 179	- 195	- 160	- 189	- 167	- 190	- 195	- 191	- 169	
McGregor and Co.....	4172	2 Auxiliary compensation.	- 127	- 128	- 91	- 92	- 108	- 149	- 93	- 113	- 139	- 113	- 61	
Davison.....	1671	2 Auxiliary compensation.	- 10	- 20	+ 12	+ 14	+ 16	+ 18	+ 18	+ 30	+ 25	+ 32	+ 64	
Pennington.....	1729	2 Auxiliary compensation balance.	- 12	- 39	- 183	- 84	- 63	- 02	- 175	- 68	- 60	- 84	- 06	
J. Fletcher.....	2679	2 Auxiliary compensation.	+ 57	+ 80	+ 44	+ 09	- 05	- 09	- 67	+ 73	+ 55	+ 67	+ 24	
Rockell and Co.....	4522	2 Kullberg's double rim balance, without auxiliary.	+ 18	+ 05	+ 06	- 31	- 36	+ 02	- 33	+ 18	- 10	- 30	- 19	
Donkell.....	4323	2 Ordinary compound balance, with Poole's auxiliary.	+ 90	+ 60	+ 60	+ 14	+ 17	+ 21	- 01	- 20	- 19	- 51	- 67	
Hemsey.....	1613	2 Auxiliary compensation.	- 60	- 40	- 22	- 01	- 04	- 19	- 12	- 15	- 05	- 14	- 57	
Reid and Sons.....	1491	2 Auxiliary acting in all temperatures.	+ 55	+ 59	- 07	- 25	- 02	- 103	- 27	+ 127	+ 128	+ 97	+ 120	
Weichert.....	2215	2 Ordinary balance, with original auxiliary.	- 45	- 15	- 42	- 11	- 02	- 33	- 50	+ 40	+ 40	+ 52	+ 116	
Shepherd and Son.....	1733	2 Auxiliary compensation.	- 04	+ 10	+ 37	+ 55	+ 44	+ 51	+ 71	+ 57	+ 28	+ 69	+ 128	
Webb.....	5550	2 Poole's auxiliary acting in all temperatures.	- 145	- 172	- 61	- 54	- 58	- 67	- 103	- 91	- 66	- 97	- 68	
Lister and Sons.....	635	2 Poole's auxiliary.	- 149	- 106	- 145	- 142	- 158	- 207	- 193	- 190	- 230	- 123	- 127	
Effie.....	562	2 Improved application to the pendulum spring.	- 175	- 190	- 170	- 137	- 173	- 162	- 197	- 145	- 173	- 128	- 206	
Effie, junr.....	100	2 Patent balance: unassisted figure.	- 455	- 387	- 368	- 359	- 391	- 422	- 393	- 387	- 386	- 363	- 306	
D. Reid.....	1870	2 Auxiliary balance.	- 125	- 115	- 93	- 38	- 37	- 92	- 13	- 93	- 127	- 63	+ 57	
Whiffn.....	342	2 Auxiliary acting in all temperatures.	+ 10	+ 10	+ 19	+ 12	+ 15	- 02	- 01	- 08	- 15	- 02	- 52	
Whiffn.....	350	2 Auxiliary compensation.	- 123	- 117	- 110	- 114	- 137	- 147	- 109	- 145	- 153	- 123	- 148	
Effie.....	562	2 Improved application to the pendulum spring.	- 240	- 198	- 116	- 114	- 125	- 154	- 177	- 145	- 100	- 25	- 35	
Gowland.....	1279	2 Ordinary balance, with auxiliary.	+ 423	+ 440	+ 214	+ 16	+ 49	- 12	- 60	- 15	- 98	- 143	- 183	
Thietchner.....	1000	2 Double locking detent and bi-conical timing spring: plain balance.	+ 590	+ 535	+ 342	+ 228	+ 217	+ 203	+ 107	+ 213	+ 215	+ 279	+ 284	
Whiffn.....	342	2 Auxiliary compensation.	+ 30	- 05	+ 45	+ 66	+ 75	- 100	+ 36	- 67	- 70	- 03	+ 02	
Chronometrical Thermometer.....	.....	.....	+ 2397.0	+ 2187.5	+ 2053.5	+ 1777.0	+ 1751.0	+ 1628.5	+ 1620.5	+ 1573.5	+ 1506.0	+ 1500.7	+ 1042.6	
Extremes of Temperature as shown by the Self-Regulating Thermometers.....	.....	.....	33-30	35-42	38-43	38-48	35-48	43-40	40-51	41-51	43-51	41-66	50-57	

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 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 mitigated.

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

																N A M E or MAKER.	No.		
May 7-14	April 23-30	May 14-21	June 1-7	June 18-25	May 26-31	May 16-23	July 1-7	July 16-23	July 23-30	July 29-31	April 23-30	April 9-16	April 16-23	June 4-11	June 11-18	June 18-25			
- 12	- 33	- 29	- 24	- 35	- 12	- 17	- 12	- 14	- 16	- 17	- 41	- 17	- 39	- 38	- 10	- 20	M. F. Dent.....	25334	
+ 53	+ 04	+ 50	+ 48	+ 31	+ 41	+ 18	+ 33	+ 37	+ 29	+ 13	+ 11	+ 06	+ 14	+ 17	+ 13	+ 25	Chittenden.....	1779	
- 74	- 59	- 78	- 73	- 83	- 42	- 112	- 104	- 112	- 130	- 29	- 38	- 03	- 20	- 13	- 20	- 10	Reid and Sons.....	1491	
+ 35	+ 04	+ 06	- 03	- 02	- 23	- 84	- 32	- 36	- 29	- 28	- 31	- 19	- 79	- 45	- 35	- 43	Lowry.....	1656	
- 20	- 23	00	- 06	- 10	+ 32	- 23	+ 71	+ 50	+ 81	+ 57	- 36	00	- 44	- 20	- 38	- 28	Kingston.....	5321	
+ 137	+ 92	+ 115	+ 157	+ 116	+ 162	+ 96	+ 184	+ 171	+ 195	+ 203	+ 113	+ 173	+ 116	+ 132	+ 181	+ 173	C. Frodham.....	3346	
+ 153	+ 117	+ 140	+ 171	+ 160	+ 193	+ 183	+ 189	+ 173	+ 183	+ 61	+ 150	+ 65	+ 75	+ 145	+ 167	+ 172	E. Dent and Co.....	3592	
- 27	- 91	- 11	- 122	- 28	- 79	- 68	- 84	- 59	- 55	- 45	- 43	- 27	- 40	- 73	- 87	- 78	Glover.....	1003	
- 00	- 85	- 70	- 110	- 79	- 80	- 115	- 40	- 51	- 35	- 47	- 00	- 30	- 40	- 113	- 125	- 135	McGregor and Co.....	4173	
+ 113	+ 45	+ 70	+ 44	+ 65	+ 80	+ 33	+ 98	+ 100	+ 117	+ 129	- 13	+ 67	+ 28	+ 20	+ 98	+ 110	J. Fletcher.....	2921	
+ 158	+ 101	+ 145	+ 135	+ 115	+ 137	+ 39	+ 113	+ 120	+ 127	+ 118	+ 38	+ 112	+ 43	+ 45	+ 125	+ 130	J. B. Fletcher.....	2969	
- 20	- 39	- 40	- 32	- 44	- 36	- 135	- 118	- 19	- 15	- 17	- 97	- 34	- 43	- 40	- 09	- 02	Parkinson & Sons.....	1147	
- 25	- 44	- 01	- 54	- 04	- 23	- 27	- 37	- 01	- 20	- 12	- 63	- 12	- 64	- 30	- 21	- 84	Gowland.....	2711	
+ 70	+ 08	+ 40	+ 19	+ 34	+ 39	+ 59	+ 64	+ 51	+ 65	+ 09	- 58	+ 00	+ 22	+ 45	+ 20	+ 26	C. Frodham.....	3344	
+ 97	+ 101	+ 85	+ 56	+ 83	+ 55	+ 40	+ 22	+ 81	+ 74	+ 93	+ 91	- 33	+ 107	+ 76	+ 71	- 94	Lister and Sons.....	635	
- 150	- 213	- 127	- 159	- 118	- 131	- 200	- 77	- 93	- 104	- 102	- 201	- 143	- 149	- 120	- 176	- 201	McGregor and Co.....	4172	
- 116	- 105	- 100	- 108	- 100	- 107	- 77	- 93	- 82	- 03	- 30	- 114	- 114	- 106	- 114	- 114	- 106	Davison.....	1671	
+ 109	+ 77	+ 115	+ 141	+ 148	+ 103	+ 75	+ 171	+ 205	+ 206	+ 212	+ 189	+ 150	+ 86	+ 85	+ 136	+ 110	Pennington.....	1729	
- 21	- 33	- 05	- 43	- 108	- 92	- 76	- 103	- 109	- 123	- 123	- 99	- 123	- 85	- 99	- 73	- 69	J. Fletcher.....	2679	
+ 02	+ 29	+ 36	+ 21	+ 23	+ 02	+ 84	+ 27	+ 18	+ 33	+ 20	+ 26	- 13	- 25	- 25	+ 14	+ 04	Rockell and Co.....	4522	
- 26	- 51	- 65	- 45	- 55	- 85	+ 22	- 93	- 85	- 80	- 67	+ 43	+ 37	+ 67	+ 93	+ 42	+ 33	Donkell.....	4323	
- 26	- 51	- 65	- 45	- 55	- 85	+ 22	- 93	- 85	- 80	- 67	+ 43	+ 37	+ 67	+ 93	+ 42	+ 33	Hemsey.....	1613	
+ 71	+ 54	+ 86	+ 76	+ 113	+ 68	+ 43	+ 113	+ 11	+ 117	+ 125	+ 25	- 02	- 14	- 04	- 02	- 02	Weichert.....	2215	
- 114	- 95	- 65	- 90	- 44	- 90	- 117	+ 61	- 85	+ 89	+ 40	+ 92	+ 73	- 84	+ 172	+ 187	+ 117	Shepherd and Son.....	1733	
+ 135	+ 129	+ 170	+ 217	+ 200	+ 210	+ 110	+ 285	+ 245	+ 252	+ 266	+ 126	+ 258	+ 155	+ 159	+ 266	+ 230	Webb.....	5550	
+ 131	+ 182	+ 144	+ 210	+ 170	+ 198	+ 160	+ 186	+ 173	+ 183	+ 206	+ 165	+ 172	+ 165	+ 200	+ 164	+ 113	Shepherd and Son.....	1733	
- 152	- 96	- 265	- 200	- 368	- 343	- 197	- 280	- 269	- 265	- 238	- 255	- 189	- 233	- 184	- 88	- 88	Webb.....	5550	
- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	- 120	Whiffn.....	350	
- 180	- 239	- 115	- 213	- 135	- 164	- 61	- 123	- 127	- 125	- 101	- 101	- 110	- 380	- 94	- 115	- 180	Effie.....	562	
- 275	- 217	- 251	- 148	- 214	- 180	- 267	- 191	- 192	- 202	- 205	- 273	- 218	- 297	- 362	- 272	- 292	Effie, junr.....	100	
+ 70	+ 78	+ 70	+ 165	+ 90	+ 179	- 50	+ 266	+ 190	+ 212	+ 237	- 55	+ 59	- 44	+ 09	+ 06	+ 61	D. Reid.....	1870	
- 240	- 84	- 264	- 185	- 268	- 177	- 198	- 275	- 265	- 265	- 238	- 255	- 189	- 233	- 184	- 88	- 88	Webb.....	5550	
+ 105	+ 137	+ 150	+ 203	+ 150	+ 210	- 33	+ 236	+ 220	+ 325	+ 334	+ 17	+ 173	+ 63	+ 95	+ 101	+ 101	Whiffn.....	350	
+ 50	+ 62	+ 119	+ 116	+ 207	+ 116	- 63	- 71	- 224	- 06	+ 40	- 115	- 233	- 102	- 05	+ 106	+ 79	Effie.....	562	
- 941	- 380	- 425	- 324	- 384	- 150	- 387	- 321	- 315	- 325	- 343	- 369	- 341	- 381	- 320	- 370	- 460	Gowland.....	1779	
+ 305	+ 210	+ 279	+ 350	+ 391	+ 420	+ 300	+ 450	+ 420	+ 450	+ 420	+ 300	+ 450	+ 420	+ 300	+ 450	+ 420	Thietchner.....	1000	
- 33	..	..	..	..	..	..	..	..	..	..	- 20	..	- 05	- 17	..	..	Whiffn.....	342	
+ 8007	+ 5637	+ 2810	- 696	- 1195	- 1355	- 1795	- 3082	- 4946	- 6240	- 6529	- 6847	- 12592	- 14615	- 14559	- 10222	- 25500	- 20525	Chromometer Thermometer.	
+ 51	- 5532	- 6336	- 69	- 62	- 69	- 63	- 71	- 69	- 73	- 70	- 78	- 66	- 75	- 69	- 77	- 67	- 77	Extremes of Temperature as shown by the Self-Registering Thermometer.	

NAME OF MAKER.	No.	Address or MAKER.	Construction of the Ensemple and Balance, from the Description furnished by the Maker.	(II.)—ABSTRACT OF THE			
				First Day of Last Week of Rating.	Last Day of Last Week of Rating.	Least Weekly Sum.	
M. F. Dent	3534	33, Cockspur Street, London.	[No information received.]	January 15	August 6	29	- 3
Chilenden	779	10, Wilton Road, Hackney, London.	Auxiliary as in former years.	January 15	August 6	29	- 1.7
Reid and Sons	1491	41, Grey Street, Newcastle-on-Tyne.	Auxiliary acting in cold.	January 15	August 6	29	- 13.0
Lowry	1656	66, High Street, Bialla.	Auxiliary compensation.	January 15	August 6	29	9.5
Kingston	5321	21, High Street, Ramsgate.	Auxiliary acting in cold.	January 15	August 6	29	- 6.1
C. Frodsham	3245	84, Strand, London.	[No information received.]	January 15	August 6	29	+ 4.5
E. Dent and Co.	3092	61, Strand, London.	Dent's patent balance.	January 15	August 6	29	+ 6.1
Glover	364	4, Swinton Street, Gray's Inn Road, London.	Poole's auxiliary.	January 15	August 6	29	- 17.6
McGregor and Co.	4173	38, Clyde Place, Glasgow.	Auxiliary compensation.	January 15	August 6	29	- 13.5
F. Fletcher	2921	144, Leadenhall Street, London.	Auxiliary compensation.	January 15	August 6	29	- 1.3
J. B. Fletcher	2969	148, Leadenhall Street, London.	Auxiliary compensation.	January 15	August 6	29	- 2.0
Shepherd and Son	1737	53, Leadenhall Street, London.	Auxiliary compensation.	January 15	August 6	29	- 13.5
Parkinson and Booth	1147	59, Gracechurch Street, London.	Auxiliary to balance, acting in extreme.	January 15	August 6	29	9.0
Gowland	2711	178, High Street West, Sunderland.	Auxiliary compensation.	January 15	August 6	29	- 5.8
C. Frodsham	3245	84, Strand, London.	[No information received.]	January 15	August 6	29	- 6.5
Lister and Sons	625	21, Mosley Street, Newcastle-on-Tyne.	Poole's auxiliary.	January 15	August 6	29	- 21.3
McGregor and Co.	4173	38, Clyde Place, Glasgow.	Auxiliary compensation.	January 15	August 6	29	- 16.5
Davison	1971	6, Side, Newcastle-on-Tyne.	Auxiliary compensation.	January 15	August 6	29	- 1.0
Pennington	1799	3, St. George's Circus, Liverpool.	Auxiliary compensation balance.	January 15	August 6	29	- 17.6
J. Fletcher	2979	148, Leadenhall Street, London.	Auxiliary compensation	January 15	August 6	29	- 6.7
Roskell and Co.	4173	21, Church Street, Liverpool.	Kullberg's double rim balance, without auxiliary.	January 15	August 6	29	- 9.3
Doobie	4333	24, Clyde Place, Glasgow.	Ordinary compound balance, with Poole's auxiliary.	January 15	August 6	29	- 10.3
Hennessy	1613	2, Wild Street, Swansea.	Auxiliary compensation.	January 15	August 6	29	- 6.0
Reid and Sons	1491	41, Grey Street, Newcastle-on-Tyne.	Auxiliary acting in all temperatures.	January 15	August 6	29	- 2.7
Weichert	2215	119, Rothway Terrace, Butte Docks, Cardiff.	Ordinary balance, with original auxiliary.	January 15	August 6	29	- 4.5
Shepherd and Son	1733	53, Leadenhall Street, London.	Auxiliary compensation.	January 15	August 6	29	- 0.4
Webb	5550	4, Puller Row, Upper St. Ilington, London.	Auxiliary acting in all temperatures.	January 15	August 6	29	- 23.9
Lister and Sons	625	15, Mosley Street, Newcastle-on-Tyne.	Poole's auxiliary.	January 15	August 6	29	- 0.2
Elffe	562	Amerham, Buckinghamshire.	Improved application to the pendulum spring.	January 15	August 6	29	- 28.0
Elffe, junr.	100	Amerham, Buckinghamshire.	Patient balance : unassisted figure.	January 15	August 6	29	- 62.5
D. Reid	1870	21, Grey Street, Newcastle-on-Tyne.	Auxiliary balance.	January 15	August 6	29	- 12.7
Webb	5550	4, Puller Row, Upper St. Ilington, London.	Auxiliary acting in all temperatures.	January 15	August 6	29	- 24.4
Whiffin	350	41, Barnaby Road, Ilington, London.	Auxiliary compensation.	January 15	August 6	29	- 13.5
Elffe	562	Amerham, Buckinghamshire.	Improved application to the pendulum spring.	January 15	August 6	29	- 28.0
Gowland	2711	178, High Street West, Sunderland.	Ordinary balance, with auxiliary.	January 15	August 6	29	- 6.0
Thiessen	1000	324, Goswell Road, Clerkenwell, London.	Double locking detent and bi-conical timing spring : plain balance.	January 15	August 6	29	- 24.6
Whiffin	342	41, Barnaby Road, Ilington, London.	Auxiliary compensation.	January 15	May 7	16	- 10.0

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 igneous 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 one Week and the next.	Before and after what day.	NAME OF MAKER.	No.
April 16 to 22†	+ 0.3	March 12 to 19	5.5	5.8	February 26	M. F. Dent	3534
April 16 to 22†	+ 7.0	February 12 to 19	8.7	9.3	February 26	Chilenden	779
July 23 to 30	- 0.5	April 9 to 16†	12.5	5.1	May 28†	Reid and Sons	1491
June 25 to July 3	+ 3.5	May 7 to 14	13.0	6.0	July 6	Lowry	1656
January 15 to 22	+ 7.1	July 30 to August 6	13.2	6.5	March 26†	Kingston	5321
January 15 to 22	+ 20.3	July 23 to 30	15.8	5.7	May 28†	C. Frodsham	3245
April 2 to 9†	+ 21.2	February 5 to 12	15.1	6.3	† April 2†	E. Dent and Co.	3092
April 22 to 29	- 1.1	March 12 to 19	16.1	9.3	† February 5	Glover	364
June 18 to 25†	0.0	March 12 to 19	13.5	7.5	March 26†	McGregor and Co.	4173
April 2 to 9†	+ 12.9	July 23 to 30	14.2	7.2	† June 25	F. Fletcher	2921
February 12 to 19	+ 15.8	May 7 to 14	17.8	5.8	February 12	J. B. Fletcher	2969
March 26 to April 2	+ 2.4	May 28 to June 4†	13.0	6.4	April 30	Shepherd and Son	1737
April 16 to 22†	+ 4.0	March 12 to 19	13.0	9.3	† April 2†	Parkinson and Booth	1147
April 2 to 9†	+ 7.0	May 7 to 14	12.8	6.8	February 26	Gowland	2711
February 12 to 19	+ 10.7	April 9 to 16†	17.2	7.5	† June 11†	C. Frodsham	3245
April 16 to 22	- 7.7	July 30 to August 6	13.6	6.8	† April 23	Lister and Sons	625
May 14 to 21; May 21 to 28	- 0.5	April 9 to 16†	18.0	9.3	† April 23	McGregor and Co.	4173
February 12 to 19	+ 21.2	July 23 to 30	22.2	6.2	† June 25	Davison	1971
January 15 to 22	- 0.6	April 30 to May 7	16.9	9.8	January 29	Pennington	1799
January 15 to 22	+ 9.0	March 5 to 12	15.7	11.1	January 22	J. Fletcher	2979
July 20 to August 6	+ 9.3	April 16 to 22†	18.6	10.4	† June 25	Roskell and Co.	4173
June 10 to 16†	+ 9.0	February 12 to 19	19.3	11.1	February 26	Doobie	4333
February 12 to 19	+ 12.5	July 23 to 30	18.6	11.6	May 28†	Hennessy	1613
January 15 to 22	+ 18.7	July 23 to 30	21.4	11.7	May 28†	Reid and Sons	1491
February 12 to 19	+ 28.5	July 30 to August 6	33.0	7.0	March 26†	Weichert	2215
February 12 to 19	+ 21.0	June 25 to July 2	21.4	13.9	March 26†	Shepherd and Son	1733
July 9 to 16	- 5.8	February 5 to 12	23.1	13.5	† April 23	Webb	5550
March 19 to 26	- 0.2	July 2 to 9; July 16 to 23	22.8	18.5	March 26†	Lister and Sons	625
April 16 to 22†	- 6.1	March 26 to April 2†	21.9	17.0	† April 16†	Elffe	562
February 12 to 19	- 14.8	June 25 to July 2	27.7	14.2	† June 25	Elffe, junr.	100
March 19 to 26	+ 26.6	July 30 to August 6	38.3	10.4	† June 25	D. Reid	1870
May 14 to 21	+ 9.4	February 26 to 5	28.4	17.4	May 7	Webb	5550
March 19 to 26	+ 33.6	July 30 to August 6	40.9	12.1	March 26†	Whiffin	350
February 12 to 19	+ 32.5	May 28 to June 4†	50.5	23.0	July 13	Elffe	562
February 26 to March 5	+ 44.0	June 15 to 22†	58.3	28.3	February 26	Gowland	2711
April 9 to 16†	+ 72.2	July 30 to August 6	65.6	37.3	February 13	Thiessen	1000
March 5 to 12	+ 7.5	February 5 to 12	17.5	9.7	March 5	Whiffin	342

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

The Chronometer Elffe 599 (pocket) accidentally ran down on February 6; the rate for the week February 5 to 12 is therefore wanting, and, consequently, the position of the Chronometer in the Table is not necessarily correct.

The Chronometer Whiffin 342 was withdrawn from trial by the maker, by permission. On account of its shorter trial, its rate is not comparable with those of the other Chronometers; it is in consequence placed in a separate division.

Of three other Chronometers, not included in the Table, one stopped at the commencement of the trial, and was returned to the maker, and two were withdrawn, by permission, at an early period of the trial.