

RATES OF CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY,

AT THE

ROYAL OBSERVATORY, GREENWICH.

1881.

			(1)-WEEKLY SUMS OF DAILY RATES											
NAME or MAKER.	No.	Construction of Escapement and Balance, from the Description furnished by the Maker.												
			Jan. 15-22	Jan. 22-29	Jan. 29 Feb. 5	Feb. 5-12	Feb. 12-19	Feb. 19-26	Feb. 26 Mar. 5	Mar. 5-12	Mar. 12-19	Mar. 19-26	Mar. 26 Apr. 2	
Kullberg.....	3972	2 Reversed detent, with short spring.	- 21	+ 01	+ 15	+ 18	+ 03	- 12	+ 11	+ 19	+ 30	+ 41	+ 48	
Mercer.....	2096	2 Ordinary escapement, with auxiliary to balance.	+ 21	+ 44	+ 46	+ 50	+ 41	+ 28	+ 55	+ 01	- 06	+ 27	+ 35	
J. Poole and Co.	2763	2 Poole's auxiliary.	+ 09	+ 01	+ 28	+ 46	+ 40	+ 60	+ 81	+ 84	+ 100	+ 117	+ 113	
Edward and Sons.	3720	2 Improved ordinary balance.	+ 09	+ 06	+ 37	+ 49	+ 46	+ 35	+ 11	- 22	+ 09	+ 30	+ 43	
J. Poole and Co.	8720	2 Poole's auxiliary. Airy's Compensation.	+ 172	+ 174	+ 81	+ 93	+ 110	+ 125	+ 104	+ 67	+ 96	+ 114	+ 133	
Seewill.....	4795	2 Auxiliary Compensation to balance.	+ 132	+ 119	+ 91	+ 115	+ 103	+ 90	+ 112	+ 93	+ 80	+ 103	+ 104	
Isaac.....	1645	2 Ordinary balance, with auxiliary.	- 29	- 41	- 118	- 110	- 102	- 100	- 84	- 112	- 104	- 120	- 84	
Isaac.....	1667	2 Auxiliary Compensation.	- 27	+ 03	+ 48	+ 70	+ 63	+ 93	+ 75	+ 103	+ 100	+ 99	+ 88	
Later and Sons	824	2 Poole's auxiliary. Airy's Compensation.	- 100	- 99	- 14	- 27	- 26	- 51	- 31	- 116	- 128	- 112	- 100	
Shepherd and Son.	1833	2 Airy's Compensation.	+ 87	+ 103	+ 117	+ 128	+ 110	+ 100	+ 107	+ 100	+ 99	+ 99	+ 61	
Roid and Sons	5996	2 Ordinary balance.	+ 113	+ 117	+ 64	+ 65	+ 74	+ 75	+ 100	- 27	+ 06	+ 40	+ 53	
Johnsons and Co.	2991	2 Auxiliary, acting in high temperatures.	+ 113	+ 153	+ 100	+ 119	+ 116	+ 60	+ 75	+ 30	+ 26	+ 64	+ 70	
Nelson.....	2886	2 Auxiliary to balance.	- 94	- 21	- 56	- 33	- 46	- 90	- 04	- 03	- 49	- 63	- 70	
Webster.....	15083	2 Auxiliary Compensation. [Compensation.]	+ 140	+ 107	+ 88	+ 08	+ 19	+ 10	+ 47	- 42	- 54	- 38	+ 97	
Keys.....	879	2 Ordinary balance, with slight alteration. Airy's	+ 93	+ 09	- 38	- 26	- 33	+ 03	+ 29	- 86	- 98	- 42	- 95	
[Compensation.]														
Crisp.....	4113	2 New balance for high temperatures. Airy's	- 108	- 76	- 25	- 30	- 01	- 60	+ 03	- 159	- 154	- 133	- 162	
P. Birchall.....	1881	2 Ordinary balance, with auxiliary.	- 107	- 76	- 105	- 118	- 110	- 110	- 110	- 110	- 110	- 110	- 110	
Edward and Sons	3688	2 Improved ordinary balance.	+ 172	+ 155	+ 87	+ 93	+ 93	+ 90	+ 120	- 23	+ 03	+ 47	+ 88	
Mercer.....	2883	2 Ordinary escapement, with auxiliary to balance.	+ 125	+ 105	+ 150	+ 172	+ 183	+ 185	+ 206	+ 63	+ 105	+ 126	+ 126	
Perkins & Fisham	4158	2 Auxiliary, acting at low temperatures.	+ 97	+ 89	+ 32	+ 38	+ 32	+ 32	+ 42	- 110	- 106	- 78	- 86	
[Compensation.]														
Fryett.....	474	2 Ordinary balance, with slight alteration. Airy's	+ 90	+ 85	+ 75	+ 45	- 17	+ 08	+ 28	- 96	- 70	- 51	- 49	
Later and Sons	825	2 Poole's auxiliary. Airy's Compensation.	- 118	- 118	+ 00	+ 03	+ 00	+ 20	+ 06	- 153	- 161	- 131	- 136	
Shepherd and Son.	1833	2 Airy's Compensation.	- 77	- 66	+ 09	+ 48	+ 41	+ 33	+ 37	+ 15	+ 11	+ 136	+ 136	
P. Birchall.....	1881	2 Ordinary balance, with slight alteration.	+ 77	+ 93	+ 60	+ 18	+ 34	+ 43	+ 22	- 132	- 145	- 173	- 173	
Riego.....	3802	2 Ordinary balance, with palladium spring. [Airy's Compensation.]	+ 64	+ 66	+ 53	+ 63	+ 58	+ 53	+ 80	- 20	+ 40	+ 90	+ 133	
Johnson and Son.	6888	2 Double auxiliary.	- 68	- 57	- 39	- 23	- 32	- 54	+ 29	+ 67	+ 104	+ 159	+ 162	
Matheson.....	3001	2 Auxiliary to balance. Airy's Compensation.	- 231	+ 222	+ 165	+ 179	+ 184	+ 183	+ 210	+ 32	+ 28	+ 40	+ 63	
Hennessy.....	5896	2 Auxiliary Compensation to balance.	- 24	- 24	+ 28	+ 48	+ 33	+ 00	+ 38	+ 98	+ 119	+ 171	+ 200	
Williams.....	4764	2 Auxiliary Compensation to balance.	+ 78	+ 89	+ 71	+ 120	+ 110	+ 130	+ 140	+ 21	+ 49	+ 99	+ 40	
Dell and Co.	15988	2 Auxiliary, acting at low temperatures. Airy's [Compensation.]	+ 73	+ 93	+ 142	+ 160	+ 141	+ 124	+ 148	+ 109	+ 127	+ 163	+ 170	
[Compensation.]														
Smith.....	3307	2 Double auxiliary.	- 300	- 220	- 93	- 75	- 86	- 126	- 130	- 73	- 21	+ 40	+ 79	
Riego.....	3802	2 Ordinary construction, with slight variation.	- 47	- 44	- 32	- 08	- 02	- 20	+ 07	- 102	- 147	- 131	- 131	
Stellorn.....	3966	2 Ordinary escapement. Auxiliary to balance.	+ 84	+ 131	+ 226	+ 265	+ 270	+ 300	+ 287	+ 75	+ 107	+ 186	+ 230	
Williams.....	2130	2 Ordinary escapement. Auxiliary to balance.	+ 91	+ 69	+ 179	+ 180	+ 187	+ 190	+ 140	+ 29	+ 140	+ 29	+ 77	
Williams.....	2130	2 Auxiliary. Airy's Compensation.	+ 84	+ 61	+ 40	+ 52	+ 35	+ 08	+ 19	+ 116	+ 155	+ 200	+ 226	
Hennessy.....	5896	2 Auxiliary Compensation to balance.	- 210	- 240	- 145	- 148	- 162	- 195	- 162	+ 29	+ 28	+ 65	+ 46	
Keys.....	267	2 Ordinary balance, with slight alteration. Airy's [Compensation.]	+ 210	+ 160	+ 235	+ 200	+ 242	+ 178	+ 332	+ 73	+ 66	+ 84	+ 93	
Roid and Sons	5996	2 Ordinary balance.	- 110	- 110	- 32	- 13	- 06	- 45	- 29	- 245	- 266	- 197	- 168	
Williams.....	2137	2 Auxiliary Compensation.	- 158	+ 117	+ 08	+ 20	+ 30	+ 37	+ 60	- 177	- 117	- 198	- 195	
Moore.....	5754	2 Ordinary balance. Airy's Compensation.	- 400	- 404	- 215	- 178	- 164	- 229	- 230	- 110	- 100	- 81	- 73	
Moore.....	5756	2 Ordinary balance. Airy's Compensation.	- 297	- 285	- 170	- 149	- 126	- 218	- 201	- 250	- 207	- 182	- 143	
Gram and Son.	3079	2 Auxiliary Compensation.	- 175	- 140	+ 49	+ 40	+ 30	+ 10	+ 62	+ 241	- 329	- 329	- 327	
Nelson.....	2901	2 Auxiliary to balance.	- 140	- 135	- 151	- 135	- 124	- 135	- 114	+ 345	+ 369	+ 315	- 310	
Chronometrical Thermometer.			+2104.6	+2099.2	+1304.0	+1323.2	+1306.0	+1448.5	+1581.5	+2612.3	+2619.2	+2653.2	+2109.0	
Extremes of Temperature as shown by the Self-Registering Thermometers.			31-47	32-50	41-51	44-55	43-63	39-49	39-54	69-106	87-97	85-105	81-102	

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

IN THE ORDER OF TIME.

NAME or MAKER.																			No.
April 2-9	April 9-16	April 16-23	April 23-30	Apr. 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	June 25 to July 2	July 2-9	July 9-16	July 16-23	July 23-30			
+ 46	+ 47	+ 40	+ 48	+ 40	+ 60	+ 57	+ 43	+ 50	+ 50	+ 51	+ 63	+ 53	+ 56	+ 58	+ 62	+ 58	Kullberg	3972	
+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	+ 48	Mercer	3990	
+ 68	+ 53	+ 61	+ 68	+ 70	+ 71	+ 91	+ 149	+ 161	+ 177	+ 176	+ 118	+ 121	+ 123	+ 127	+ 143	+ 150	J. Poole and Co.	2686	
+ 110	+ 70	+ 90	+ 97	+ 88	+ 80	+ 80	+ 23	+ 31	+ 41	+ 30	+ 35	+ 27	+ 25	+ 23	+ 27	+ 44	Edward and Sons.	3720	
+ 121	+ 115	+ 112	+ 119	+ 108	+ 108	+ 112	+ 121	+ 121	+ 121	+ 121	+ 102	+ 101	+ 100	+ 108	+ 108	+ 102	J. Poole and Co.	8720	
+ 53	+ 52	+ 50	+ 70	+ 68	+ 81	+ 75	+ 129	+ 140	+ 162	+ 149	+ 188	+ 187	+ 212	+ 222	+ 293	+ 293	Seewill	4795	
- 121	- 119	- 101	- 99	- 88	- 57	- 58	- 93	- 103	- 51	- 77	- 09	- 23	- 08	- 05	- 00	- 01	Isaac	1645	
+ 100	+ 125	+ 127	+ 138	+ 123	+ 118	+ 110	+ 127	+ 98	+ 91	+ 116	+ 48	+ 45	+ 25	+ 25	+ 22	+ 63	Isaac	1667	
- 105	- 108	- 96	- 96	- 90	- 105	- 88	- 173	- 189	- 151	- 159	- 190	- 147	- 163	- 163	- 137	- 109	Later and Sons	824	
+ 51	+ 59	+ 75	+ 100	+ 83	+ 63	+ 92	+ 20	+ 10	+ 34	+ 11	+ 25	+ 28	+ 62	+ 65	+ 75	+ 71	Shepherd and Son.	1833	
+ 51	+ 30	+ 43	+ 41	+ 48	+ 41	+ 49	+ 48	+ 48	+ 82	+ 52	+ 31	+ 46	+ 65	+ 70	+ 73	+ 65	Roid and Sons	5996	
- 93	- 40	+ 45	- 84	- 06	+ 19	+ 31	+ 80	+ 70	+ 94	+ 61	+ 70	+ 72	+ 113	+ 120	+ 120	+ 120	Johnsons and Co.	2991	
+ 92	+ 56	+ 62	+ 62	+ 50	+ 50	+ 57	+ 104	+ 184	+ 151	+ 159	+ 82	+ 68	+ 89	+ 77	+ 82	+ 95	Nelson	2886	
+ 13	+ 03	+ 10	+ 11	+ 14	+ 41	+ 48	+ 14	+ 27	+ 27	+ 21	- 09	+ 01	+ 15	+ 25	+ 33	+ 23	Webster	15083	
- 149	- 136	- 109	- 104	- 110	- 98	- 104	- 19	+ 22	+ 38	+ 29	- 00	+ 53	00	00	+ 45	+ 26	Keys	879	
- 112	- 96	- 97	- 91	- 87	- 73	- 44	- 96	- 99	- 127	- 98	- 103	- 74	- 69	- 77	- 105	- 105	Crisp	4113	
- 270	- 205	- 197	- 175	- 183	- 145	- 117	- 94	- 80	- 120	- 106	- 141	- 119	- 95	- 95	- 109	- 96	P. Birchall	1881	
+ 185	+ 107	+ 121	+ 122	+ 95	+ 80	+ 91	+ 49	+ 70	+ 84	+ 46	+ 136	+ 145	+ 160	+ 166	+ 175	+ 179	Edward and Sons	3688	
+ 209	+ 195	+ 206	+ 210	+ 205	+ 185	+ 201	+ 66	+ 183	+ 221	+ 224	+ 223	+ 233	+ 250	+ 257	+ 283	+ 283	Mercer	2883	
- 15	- 45	- 34	- 24	- 62	- 85	- 58	- 71	- 61	- 61	- 69	- 40	- 39	- 06	- 05	+ 06	+ 15	Perkins & Fisham	4158	
- 82	- 82	- 71	- 61	- 69	- 68	- 57	- 78	- 6	- 36	- 34	- 11	- 07	+ 04	+ 05	+ 15	06	Fryett	474	
- 82	- 82	- 70	- 60	- 59	- 59	- 47	- 123	- 91	- 97	- 123	- 93	- 84	- 47	- 18	- 07	- 05	Later and Sons	825	
+ 70	+ 138	+ 147	+ 163	+ 174	+ 204	+ 211	+ 44	+ 66	+ 118	+ 80	+ 210	+ 210	+ 230	+ 207	+ 203	+ 211	Shepherd and Son.	1832	
+ 173	+ 116	+ 14	+ 14	+ 16	+ 26	+ 26	- 120	- 95	- 161	- 161	- 161	- 161	- 161	- 161	- 161	- 161	P. Birchall	1880	
+ 267	+ 251	+ 213	+ 206	+ 177	+ 185	+ 183	+ 119	+ 121	+ 165	+ 180	+ 305	+ 280	+ 257	+ 255	+ 280	+ 280	Roid and Sons	5996	
+ 180	+ 205	+ 217	+ 218	+ 215	+ 225	+ 234	+ 167	+ 139	+ 184	+ 141	+ 265	+ 270	+ 247	+ 245	+ 283	+ 283	Johnson and Son.	6988	
- 81	- 15	+ 10	+ 37	+ 48	+ 55	+ 70	+ 65	+ 45	+ 54	+ 36	+ 66	+ 33	+ 67	+ 94	+ 43	+ 43	Matheson	3901	
+ 249	+ 249	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	+ 250	Matheson	3901	
+ 112	+ 111	+ 114	+ 126	+ 131	+ 147	+ 32	+ 68	+ 88	+ 74	+ 119	+ 218	+ 205	+ 192	+ 208	+ 210	+ 210	Seewill	4795	
+ 195	+ 267	+ 274	+ 294	+ 300	+ 295	+ 317	+ 238	+ 245	+ 261	+ 269	+ 152	+ 163	+ 241	+ 255	+ 105	+ 128	Dell and Co.	19368	
- 21	+ 42	+ 40	+ 66	+ 65	+ 83	+ 85	+ 25	+ 37	+ 32	+ 16	+ 110	+ 120	+ 130	+ 130	+ 135	+ 140	Smith	5776	
- 18	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	+ 05	Skollern	3990	
+ 290	+ 290	+ 290	+ 293	+ 324	+ 359	+ 369	+ 228	+ 138	+ 190	+ 179	+ 201	+ 310	+ 320	+ 372	+ 373	+ 380	Skollern	3990	
+ 178	+ 201	+ 233	+ 263	+ 278	+ 300	+ 312	+ 316	+ 117	+ 124	+ 76	+ 251	+ 344	+ 237	+ 270	+ 268	+ 306	Williams	2190	
+ 174	+ 220	+ 228	+ 232	+ 247	+ 275	+ 283	+ 169	+ 140	+ 183	+ 145	+ 306	+ 399	+ 334	+ 339	+ 342	+ 350		3990	
- 16	+ 26	+ 27	+ 32	+ 35	+ 26	+ 30	+ 34	+ 64	+ 76	+ 75	+ 90	+ 80	+ 130	+ 140	+ 145	+ 145	Hemstedt	5900	
+ 247	+ 226	+ 244	+ 247	+ 237	+ 225	+ 219	+ 237	+ 97	+ 96	+ 118	+ 91	+ 120	+ 150	+ 183	+ 187	+ 183	Keys	879	
- 70	- 23	+ 04	+ 27	+ 40	+ 32	+ 48	- 179	- 176	- 194	- 181	+ 30	+ 45	+ 40	+ 49	+ 43	+ 51	Roid and Sons	5989	
- 178	- 88	- 69	- 51	- 30	- 20	- 00	- 42	- 36	- 20	- 23	- 34	+ 04	+ 37	+ 43	+ 45	+ 51	Moore	5554	
- 45	- 15	- 35	- 40	- 45	- 35	- 30	- 251	- 264	- 156	- 209	+ 65	+ 62	+ 42	+ 41	+ 35	+ 78	Moore	5756	
+ 173	+ 280	+ 300	+ 305	+ 375	+ 410	+ 425	+ 397	+ 405	+ 434	+ 436	+ 45	+ 505	+ 536	+ 534	+ 543	+ 536	Orms and Son.	18079	
- 97	- 88	- 88	- 87	- 115	- 110	- 110	- 323	- 343	- 387	- 386	- 40	- 55	+ 93	+ 58	+ 150	+ 99	Nelson	2901	
+ 10840	+ 4884	+ 6016	+ 6000	+ 5376	+ 1450	+ 1371	- 29512	- 30564	- 30191	- 32214	- 47890	- 42115	- 87900	- 86700	- 100930	- 14640	Chromometer Thermometer		
46-55	50-60	40-63	51-60	54-63	57-66	58-67	63-105	64-108	67-101	64-101	70-73	63-72	66-79	66-79	68-81	64-74	[Extremes of Temperature as shown by the Chromometer Thermometers.		

NAME or MAKER.	No.	Whether a Day.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(II).—WEEKLY SUMS OF DAILY RATES											
				Jan. 16-22	Jan. 23-29	Feb. 1 to Mar. 5	Feb. 16-22	Feb. 23-29	Jan. 30 to Feb. 5	Feb. 6-12	April 2-8	April 9-15	April 16-22	April 23-29	April 30-6
Kullberg.....	3072	2	Reversed detent, with short spring.	- 21	+ 01	+ 11	- 12	+ 03	+ 15	+ 18	+ 46	+ 48	+ 40	+ 47	
Mercer.....	2696	2	Ordinary escapement, with auxiliary to balance.	+ 21	+ 44	+ 55	+ 29	+ 41	+ 46	+ 50	+ 19	+ 25	+ 25	+ 10	
J. Poole & Co.....	3730	2	Improved ordinary balance.	+ 29	+ 21	+ 81	+ 69	+ 84	+ 46	+ 69	+ 68	+ 61			
Edward & Sons.....	3730	2	Improved ordinary balance.	+ 69	+ 56	+ 51	+ 35	+ 46	+ 37	+ 49	+ 110	+ 97	+ 90	+ 70	
J. Poole & Co.....	5750	2	Poole's auxiliary. Airy's Compensation.	+ 172	+ 174	+ 164	+ 125	+ 110	+ 81	+ 93	+ 121	+ 113	+ 112	+ 113	
Sewill.....	1475	2	Auxiliary Compensation to balance.	+ 132	+ 119	+ 113	+ 90	+ 103	+ 91	+ 114	+ 53	+ 70	+ 80	+ 115	
Isaac.....	1607	2	Ordinary balance, with auxiliary.	- 27	+ 03	- 79	- 120	- 118	- 110	- 191	- 99	- 101	- 101	- 103	
Isaac.....	1607	2	Auxiliary Compensation.	- 27	+ 03	- 79	- 120	- 118	- 110	- 191	- 99	- 101	- 101	- 103	
Lester and Sons.....	884	2	Poole's auxiliary. Airy's Compensation.	+ 100	+ 69	+ 100	+ 69	+ 84	+ 37	+ 105	+ 96	+ 96	+ 96	+ 96	
Shepherd & Son.....	1683	2	Airy's Compensation.	+ 87	+ 103	+ 107	+ 100	+ 110	+ 117	+ 128	+ 51	+ 100	+ 73	+ 109	
Rold and Sons.....	5596	2	Ordinary balance.	+ 118	+ 117	+ 100	+ 75	+ 74	+ 64	+ 65	+ 51	+ 41	+ 42	+ 30	
Johnannes & Co.....	5991	2	Auxiliary, acting in high temperatures.	+ 113	+ 152	+ 75	+ 60	+ 116	+ 100	- 95	- 84	- 49	- 48	- 40	
Webster.....	15083	2	Auxiliary to balance. [Compensation.]	- 24	- 21	- 04	- 90	- 46	- 96	- 92	- 69	- 62	- 63	- 58	
Keys.....	379	2	Ordinary balance, with slight alteration. Airy's	+ 140	+ 107	+ 47	+ 10	+ 10	- 08	+ 06	+ 13	+ 11	+ 10	- 03	
[Compensation.]															
Crip.....	4113	2	New balance for high temperatures. Airy's	- 108	- 76	+ 03	- 60	- 01	- 25	- 20	- 112	- 21	- 57	- 96	
F. Birchall.....	1281	2	Ordinary balance, with slight alteration. Airy's	- 107	- 79	- 171	- 107	- 168	- 84	- 195	- 187	- 187	- 187	- 187	
Edward & Sons.....	3688	2	Improved ordinary balance.	+ 172	+ 158	+ 120	+ 90	+ 93	+ 87	+ 93	+ 185	+ 152	+ 121	+ 107	
Mercer.....	2696	2	Ordinary escapement, with auxiliary to balance.	+ 165	+ 165	+ 80	+ 185	+ 183	+ 160	+ 173	+ 229	+ 219	+ 202	+ 195	
Parkinson & Probbins.....	4158	2	Auxiliary, acting at low temperatures. [Compensation.]	+ 67	+ 98	+ 43	+ 38	+ 32	+ 38	+ 16	- 34	- 34	- 34	- 40	
Pyott.....	474	2	Ordinary balance, with slight alteration. Airy's	+ 90	+ 85	+ 26	+ 02	- 17	- 73	- 45	- 82	- 61	- 71	- 82	
Lester & Sons.....	825	2	Poole's auxiliary. Airy's Compensation.	- 18	- 18	+ 06	- 20	- 00	00	+ 03	- 39	- 10	- 30	- 38	
Shepherd & Son.....	1683	2	Airy's Compensation.	- 77	- 66	- 37	- 32	- 41	- 09	- 48	- 173	- 14	- 147	- 186	
F. Birchall.....	1282	2	Ordinary balance, with slight alteration.	+ 77	+ 32	+ 45	+ 94	+ 90	+ 18	- 173	- 14	- 14	- 147	- 186	
Riego.....	3802	2	Ordinary balance, with palladium spring. Airy's	+ 04	+ 68	+ 60	+ 52	+ 58	+ 53	+ 63	+ 247	+ 206	+ 212	+ 211	
[Compensation.]															
Johnson & Son.....	6081	2	Double auxiliary.	- 68	- 57	- 23	- 54	- 32	- 39	- 23	+ 180	+ 218	+ 217	+ 205	
Matheson.....	3698	2	Auxiliary to balance. Airy's Compensation.	+ 221	+ 222	+ 01	+ 182	+ 164	+ 149	+ 179	+ 21	+ 27	+ 30	+ 15	
Hennessy.....	5896	2	Auxiliary Compensation to balance.	- 24	- 24	- 38	- 09	- 33	- 28	+ 43	+ 234	+ 270	+ 282	+ 289	
Seawell.....	4764	2	Auxiliary Compensation to balance.	+ 78	+ 83	+ 130	+ 120	+ 119	+ 71	+ 120	+ 124	+ 114	+ 111	+ 112	
Dell & Co.....	1968	2	Auxiliary, acting at low temperatures. [Compensation.]	+ 973	+ 322	+ 148	+ 134	+ 141	+ 149	+ 160	+ 195	+ 234	+ 274	+ 307	
Smith.....	21	2	Double auxiliary.	- 260	- 220	- 120	- 158	- 68	- 93	- 73	- 21	- 66	+ 40	+ 42	
Riego.....	3800	2	Ordinary construction, with slight variation.	- 47	- 44	- 07	- 20	- 02	- 32	- 48	+ 16	+ 03	+ 05	+ 10	
Skellern.....	3956	2	Ordinary escapement. Auxiliary to balance.	+ 89	+ 133	+ 287	+ 190	+ 270	+ 229	+ 263	+ 265	+ 283	+ 280	+ 290	
Skellern.....	3956	2	Auxiliary to balance. Auxiliary to balance.	+ 31	+ 68	+ 140	+ 119	+ 167	+ 173	+ 205	+ 178	+ 263	+ 293	+ 291	
Williams.....	2130	2	Auxiliary. Airy's Compensation.	- 94	- 61	+ 17	+ 00	- 35	+ 40	+ 53	+ 174	+ 232	+ 228	+ 220	
Hennessy.....	5896	2	Auxiliary Compensation to balance.	- 210	- 240	- 162	- 195	- 162	- 145	- 148	- 16	+ 22	+ 27	+ 26	
Keys.....	2697	2	Ordinary balance, with slight alteration. [Compensation.]	+ 210	+ 160	+ 323	+ 178	+ 263	+ 285	+ 300	+ 247	+ 237	+ 244	+ 226	
Williams.....	2137	2	Auxiliary Compensation.	- 138	+ 117	+ 60	+ 37	+ 20	- 08	+ 20	- 70	- 18	- 13	- 23	
Moore.....	5754	2	Ordinary balance. Airy's Compensation.	- 400	- 404	- 201	- 218	- 164	- 218	- 178	- 178	- 51	- 69	- 88	
Moore.....	5754	2	Ordinary balance. Airy's Compensation.	- 297	- 265	- 300	- 229	- 166	- 170	- 149	- 43	- 40	- 38	- 13	
Oram & Son.....	18079	2	Auxiliary Compensation.	- 176	- 140	+ 85	+ 10	+ 30	+ 40	+ 173	+ 305	+ 300	+ 280	+ 260	
Nealon.....	2901	2	Auxiliary to balance.	- 140	- 135	- 114	- 135	- 124	- 151	- 189	- 97	- 87	- 88	- 88	
Chronometrical Thermometer.....				+ 2198	+ 2069	+ 1581	+ 1548	+ 1306	+ 1304	+ 1232	+ 1024	+ 600	+ 601	+ 488	
Extremes of Temperature as shown by the Self-Registering Thermometers.....				31-47	32-50	38-54	39-49	43-62	41-51	44-52	46-55	51-60	49-63	50-60	

The sign + indicates that the rate is gaining.

† During these weeks the Chronometers were placed in the chamber of a stove heated by the gas. The gas flames are exterior to the chamber, into which none of the insidious 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.

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

Apr. 30 to May 7	May 7-14	May 14-21	June 23 to July 2	June 18-25	July 25-30	July 30-31	July 31-Aug. 1	July 1-Aug. 2	July 2-Aug. 3	July 3-Aug. 4	July 4-Aug. 5	July 5-Aug. 6	July 6-Aug. 7	July 7-Aug. 8	July 8-Aug. 9	July 9-Aug. 10	July 10-Aug. 11	July 11-Aug. 12	July 12-Aug. 13	July 13-Aug. 14	July 14-Aug. 15	July 15-Aug. 16	July 16-Aug. 17	July 17-Aug. 18	July 18-Aug. 19	July 19-Aug. 20	July 20-Aug. 21	July 21-Aug. 22	July 22-Aug. 23	July 23-Aug. 24	July 24-Aug. 25	July 25-Aug. 26	July 26-Aug. 27	July 27-Aug. 28	July 28-Aug. 29	July 29-Aug. 30	July 30-Aug. 31	July 31-Sep. 1	July 1-Sep. 2	July 2-Sep. 3	July 3-Sep. 4	July 4-Sep. 5	July 5-Sep. 6	July 6-Sep. 7	July 7-Sep. 8	July 8-Sep. 9	July 9-Sep. 10	July 10-Sep. 11	July 11-Sep. 12	July 12-Sep. 13	July 13-Sep. 14	July 14-Sep. 15	July 15-Sep. 16	July 16-Sep. 17	July 17-Sep. 18	July 18-Sep. 19	July 19-Sep. 20	July 20-Sep. 21	July 21-Sep. 22	July 22-Sep. 23	July 23-Sep. 24	July 24-Sep. 25	July 25-Sep. 26	July 26-Sep. 27	July 27-Sep. 28	July 28-Sep. 29	July 29-Sep. 30	July 30-Sep. 31	July 31-Oct. 1	July 1-Oct. 2	July 2-Oct. 3	July 3-Oct. 4	July 4-Oct. 5	July 5-Oct. 6	July 6-Oct. 7	July 7-Oct. 8	July 8-Oct. 9	July 9-Oct. 10	July 10-Oct. 11	July 11-Oct. 12	July 12-Oct. 13	July 13-Oct. 14	July 14-Oct. 15	July 15-Oct. 16	July 16-Oct. 17	July 17-Oct. 18	July 18-Oct. 19	July 19-Oct. 20	July 20-Oct. 21	July 21-Oct. 22	July 22-Oct. 23	July 23-Oct. 24	July 24-Oct. 25	July 25-Oct. 26	July 26-Oct. 27	July 27-Oct. 28	July 28-Oct. 29	July 29-Oct. 30	July 30-Oct. 31	July 31-Nov. 1	July 1-Nov. 2	July 2-Nov. 3	July 3-Nov. 4	July 4-Nov. 5	July 5-Nov. 6	July 6-Nov. 7	July 7-Nov. 8	July 8-Nov. 9	July 9-Nov. 10	July 10-Nov. 11	July 11-Nov. 12	July 12-Nov. 13	July 13-Nov. 14	July 14-Nov. 15	July 15-Nov. 16	July 16-Nov. 17	July 17-Nov. 18	July 18-Nov. 19	July 19-Nov. 20	July 20-Nov. 21	July 21-Nov. 22	July 22-Nov. 23	July 23-Nov. 24	July 24-Nov. 25	July 25-Nov. 26	July 26-Nov. 27	July 27-Nov. 28	July 28-Nov. 29	July 29-Nov. 30	July 30-Nov. 31	July 31-Dec. 1	July 1-Dec. 2	July 2-Dec. 3	July 3-Dec. 4	July 4-Dec. 5	July 5-Dec. 6	July 6-Dec. 7	July 7-Dec. 8	July 8-Dec. 9	July 9-Dec. 10	July 10-Dec. 11	July 11-Dec. 12	July 12-Dec. 13	July 13-Dec. 14	July 14-Dec. 15	July 15-Dec. 16	July 16-Dec. 17	July 17-Dec. 18	July 18-Dec. 19	July 19-Dec. 20	July 20-Dec. 21	July 21-Dec. 22	July 22-Dec. 23	July 23-Dec. 24	July 24-Dec. 25	July 25-Dec. 26	July 26-Dec. 27	July 27-Dec. 28	July 28-Dec. 29	July 29-Dec. 30	July 30-Dec. 31	July 31-Jan. 1	July 1-Jan. 2	July 2-Jan. 3	July 3-Jan. 4	July 4-Jan. 5	July 5-Jan. 6	July 6-Jan. 7	July 7-Jan. 8	July 8-Jan. 9	July 9-Jan. 10	July 10-Jan. 11	July 11-Jan. 12	July 12-Jan. 13	July 13-Jan. 14	July 14-Jan. 15	July 15-Jan. 16	July 16-Jan. 17	July 17-Jan. 18	July 18-Jan. 19	July 19-Jan. 20	July 20-Jan. 21	July 21-Jan. 22	July 22-Jan. 23	July 23-Jan. 24	July 24-Jan. 25	July 25-Jan. 26	July 26-Jan. 27	July 27-Jan. 28	July 28-Jan. 29	July 29-Jan. 30	July 30-Jan. 31	July 31-Feb. 1	July 1-Feb. 2	July 2-Feb. 3	July 3-Feb. 4	July 4-Feb. 5	July 5-Feb. 6	July 6-Feb. 7	July 7-Feb. 8	July 8-Feb. 9	July 9-Feb. 10	July 10-Feb. 11	July 11-Feb. 12	July 12-Feb. 13	July 13-Feb. 14	July 14-Feb. 15	July 15-Feb. 16	July 16-Feb. 17	July 17-Feb. 18	July 18-Feb. 19	July 19-Feb. 20	July 20-Feb. 21	July 21-Feb. 22	July 22-Feb. 23	July 23-Feb. 24	July 24-Feb. 25	July 25-Feb. 26	July 26-Feb. 27	July 27-Feb. 28	July 28-Feb. 29	July 29-Feb. 30	July 30-Feb. 31	July 31-Mar. 1	July 1-Mar. 2	July 2-Mar. 3	July 3-Mar. 4	July 4-Mar. 5	July 5-Mar. 6	July 6-Mar. 7	July 7-Mar. 8	July 8-Mar. 9	July 9-Mar. 10	July 10-Mar. 11	July 11-Mar. 12	July 12-Mar. 13	July 13-Mar. 14	July 14-Mar. 15	July 15-Mar. 16	July 16-Mar. 17	July 17-Mar. 18	July 18-Mar. 19	July 19-Mar. 20	July 20-Mar. 21	July 21-Mar. 22	July 22-Mar. 23	July 23-Mar. 24	July 24-Mar. 25	July 25-Mar. 26	July 26-Mar. 27	July 27-Mar. 28	July 28-Mar. 29	July 29-Mar. 30	July 30-Mar. 31	July 31-Apr. 1	July 1-Apr. 2	July 2-Apr. 3	July 3-Apr. 4	July 4-Apr. 5	July 5-Apr. 6	July 6-Apr. 7	July 7-Apr. 8	July 8-Apr. 9	July 9-Apr. 10	July 10-Apr. 11	July 11-Apr. 12	July 12-Apr. 13	July 13-Apr. 14	July 14-Apr. 15	July 15-Apr. 16	July 16-Apr. 17	July 17-Apr. 18	July 18-Apr. 19	July 19-Apr. 20	July 20-Apr. 21	July 21-Apr. 22	July 2
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NAME OF MAKER.	No.	ADDRESS OF MAKER.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(III).—ABSTRACT OF THE			
				First Day of Rating.	Last Day of Rating.	Least Weekly Sum.	
Kullberg	3972	2 105, Liverpool Road, N.	Reversed detent, with short spring.	January 15	July 30	28	- 2.1
Mercer	2696	2 161, Goswell Road, E.C.	Ordinary escapement, with auxiliary to balance.	January 15	July 30	28	- 0.6
J. Poole and Co.	3763	2 33, Spencer Street, Clerkenwell, E.C.	Poole's auxiliary.	January 15	July 30	28	+ 3.8
Edward and Sons	3730	1 1, Poultry, E.C.	Improved ordinary balance.	January 15	July 30	28	- 0.9
J. Poole and Co.	3720	2 33, Spencer Street, Clerkenwell, E.C.	Poole's auxiliary. Airy's Compensation.	January 15	July 30	28	+ 8.1
Sewill	4795	2 61, South Castle Street, Liverpool.	Auxiliary Compensation to balance.	January 15	July 30	28	+ 5.3
Isaac	1645	2 10, Spencer Street, E.C.	Ordinary balance, with auxiliary.	January 15	July 30	28	- 12.1
Isaac	1647	2 10, Spencer Street, E.C.	Auxiliary Compensation.	January 15	July 30	28	- 1.6
Lister and Sons	824	2 12, Mosley Street, Newcastle-on-Tyne.	Poole's auxiliary. Airy's Compensation.	January 15	July 30	28	- 18.9
Shepherd and Son	1833	2 63, Leadenhall Street, E.C.	Airy's Compensation.	January 15	July 30	28	- 1.0
Reid and Sons	5596	2 41, Grey Street, Newcastle-on-Tyne.	Ordinary balance.	January 15	July 30	28	- 2.7
Johannsen and Co.	3991	2 149, Minorca, E.	Auxiliary, acting in high temperatures.	January 15	July 30	28	- 4.5
Nelson	2856	2 31, Hatton Road, Cannonbury, N.	Auxiliary to balance.	January 15	July 30	28	- 5.6
Webster	15083	2 6, Queen Victoria Street, E.C.	Auxiliary Compensation.	January 15	July 30	28	- 5.7
Kays	377	2 15, Craven Street, Strand, W.C.	Ordinary balance, with slight alteration. Airy's Compensation.	January 15	July 30	28	- 14.3
Crisp	4113	2 174, St. John's Street Road, E.C.	New balance for high temperatures.	January 15	July 30	28	- 18.2
P. Birchall	1381	2 131, Stonefield Street, Islington, London.	Ordinary balance, with auxiliary. Compensation.	January 15	July 30	28	- 27.0
Edward and Sons	3688	2 131, Stonefield Street, Islington, London.	Improved ordinary balance.	January 15	July 30	28	- 2.3
Mercer	2693	2 161, Goswell Road, E.C.	Ordinary escapement, with auxiliary to balance.	January 15	July 30	28	+ 9.0
Parkinson and Frodham	4158	4 4, Change Alley, Cornhill, E.C.	Auxiliary, acting at low temperatures.	January 15	July 30	28	- 11.0
Proyt	474	2 74, West India Dock Road, E.	Ordinary balance, with slight alteration. Airy's Compensation.	January 15	July 30	28	- 9.6
Lister and Sons	825	2 12, Mosley Street, Newcastle-on-Tyne.	Poole's auxiliary. Airy's Compensation.	January 15	July 30	28	- 18.1
Shepherd and Son	1836	2 63, Leadenhall Street, E.C.	Airy's Compensation.	January 15	July 30	28	- 7.7
P. Birchall	1382	2 131, Stonefield Street, Islington, London.	Ordinary balance, with slight alteration.	January 15	July 30	28	- 17.3
Riegos	3802	2 184, Regent Street, W.	Ordinary balance, with palladium spring. Airy's Compensation.	January 15	July 30	28	- 2.0
Johannsen and Son	3998	2 10, Wilmington Square, W.C.	Double auxiliary.	January 15	July 30	28	- 8.8
Matheson	3001	2 30, Shoreditch, E.C.	Auxiliary to balance. Airy's Compensation.	January 15	July 30	28	- 2.1
Hennessey	5967	2 5, Wind Street, Swansea.	Auxiliary Compensation to balance.	January 15	July 30	28	- 2.4
Sewill	4764	2 61, South Castle Street, Liverpool.	Auxiliary Compensation to balance.	January 15	July 30	28	- 4.0
Dell and Co.	19368	2 Broad Street, Bristol.	Auxiliary, acting at low temperatures. Airy's Compensation.	January 15	July 30	28	- 10.0
Smith	572	2 48, Southside Street, Plymouth.	Double auxiliary.	January 15	July 30	28	- 26.0
Riegos	3850	2 284, Regent Street, W.	Ordinary construction with slight variation.	January 15	July 30	28	- 20.3
Skellern	3556	2 57, South John Street, Liverpool.	Ordinary escapement. Auxiliary to balance.	January 15	July 30	28	+ 7.8
Skellern	3569	2 57, South John Street, Liverpool.	Ordinary escapement. Auxiliary to balance.	January 15	July 30	28	- 4.9
Williams	2130	2 3, Bute Docks, Cardiff.	Auxiliary. Airy's Compensation.	January 15	July 30	28	- 9.4
Hennessey	5896	2 5, Wind Street, Swansea.	Auxiliary Compensation to balance.	January 15	July 30	28	- 24.0
Reid and Sons	5589	2 15, Craven Street, Strand, W.C.	Ordinary balance, with slight alteration. Compensation.	January 15	July 30	28	- 6.6
Williams	2127	2 3, Bute Docks, Cardiff.	Auxiliary Compensation.	January 15	July 30	28	- 21.7
Moore	5754	2 33, Eden Quay, Dublin.	Ordinary balance. Airy's Compensation.	January 15	July 30	28	- 40.4
Moore	5756	2 33, Eden Quay, Dublin.	Ordinary balance. Airy's Compensation.	January 15	July 30	28	- 29.7
Oram and Son	18079	2 31, Hatton Road, Cannonbury, N.	Auxiliary Compensation.	January 15	July 30	28	- 17.6
Nelson	2901	2 31, Hatton Road, Cannonbury, N.	Auxiliary to balance.	January 15	July 30	28	- 15.1

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 the next.	Before and after what Day.	NAME OF MAKER.	No.
January 15 to 22	+ 6.3	June 18 to 25	8.4	2.3	Feb. 26	Kullberg	3972
March 12 to 19	+ 8.7	June 4 to 11†	9.3	8.4	March 3†	Mercer	2696
January 29 to Feb. 5	+ 17.7	June 4 to 11†	14.9	8.4	† June 18	J. Poole and Co.	3763
March 5 to 12†	+ 17.0	April 2 to 9	13.2	7.3	March 3†	Edward and Sons	3730
January 29 to Feb. 5	+ 11.4	January 22 to 29	9.3	9.3	Jan. 29	J. Poole and Co.	3720
April 9 to 16	+ 22.8	July 16 to 23	17.6	5.4	May 21†	Sewill	4795
April 9 to 16	0.0	June 18 to 25	13.1	7.7	Jan. 29	Isaac	1645
January 29 to Feb. 5	+ 13.8	January 15 to 22	17.6	6.8	† June 18	Isaac	1647
May 28 to June 4	- 1.4	January 29 to Feb. 5	17.3	8.5	March 3†	Lister and Sons	824
June 11 to 18†	- 1.4	January 29 to Feb. 5	17.3	8.5	May 21†	Shepherd and Son	1833
March 5 to 12†	+ 12.8	February 5 to 12	13.8	11.7	March 3†	Reid and Sons	5596
May 28 to June 4	+ 11.8	January 15 to 22	14.5	13.7	March 3†	Johannsen and Co.	3991
March 5 to 12†	+ 10.2	January 22 to 29	19.7	10.5	† April 2	Nelson	2856
January 29 to Feb. 5	+ 10.4	May 28 to June 4	23.0	17.6	Jan. 29	Webster	15083
May 28 to June 4	+ 14.0	January 15 to 22	19.7	11.5	Jan. 29	Kays	377
April 2 to 9	+ 9.3	January 15 to 22	23.6	12.3	Jan. 29	Crisp	4113
March 26 to April 2†	+ 0.3	Feb. 26 to March 5	18.5	16.3	March 3†	P. Birchall	1381
April 2 to 9	- 0.6	March 5 to 12†	21.4	14.0	† April 2	Edward and Sons	3688
March 5 to 12†	+ 18.5	April 2 to 9	20.8	14.3	March 3†	Mercer	2693
March 5 to 12†	+ 28.1	July 23 to 30	21.9	14.0	March 3†	Parkinson and Frodham	4158
March 5 to 12†	+ 8.8	January 22 to 29	19.8	15.2	March 3†	Proyt	474
March 5 to 12†	+ 9.0	January 15 to 22	18.6	16.0	Jan. 29	Lister and Sons	825
January 15 to 22	+ 22.0	July 2 to 9	29.7	13.0	† June 18	Shepherd and Son	1836
March 26 to April 2†	+ 6.0	January 29 to Feb. 5	23.3	16.4	May 21†	P. Birchall	1382
March 5 to 12†	+ 30.5	June 18 to 25	33.5	12.5	† June 18	Riegos	3802
January 15 to 22	+ 27.0	June 25 to July 2	33.8	12.4	† June 18	Johannsen and Son	3998
April 2 to 9	+ 22.0	January 22 to 29	24.3	20.7	March 3†	Matheson	3001
January 15 to 22	+ 39.8	July 23 to 30	42.2	9.1	† June 18	Hennessey	5967
January 22 to 29	+ 21.8	June 25 to July 2	36.7	17.1	March 3†	Sewill	4764
March 5 to 12†	+ 27.3	January 15 to 22	27.3	10.0	Jan. 29	Dell and Co.	19368
January 15 to 22	+ 14.0	July 23 to 30	40.0	12.7	Jan. 29	Smith	572
June 11 to 18†	+ 29.6	July 23 to 30	32.1	21.2	† June 18	Riegos	3850
March 5 to 12†	+ 39.6	July 23 to 30	35.1	21.2	March 3†	Skellern	3556
March 12 to 19†	+ 21.2	May 14 to 21	35.4	19.6	May 21†	Skellern	3569
January 15 to 22	+ 35.0	July 23 to 30	44.4	10.1	† June 18	Williams	2130
January 22 to 29	+ 14.5	July 16 to 23	38.5	19.1	March 3†	Hennessey	5896
March 12 to 19†	+ 43.2	Feb. 26 to March 5	36.6	25.9	March 3†	Reid and Sons	5589
March 12 to 19†	+ 9.1	July 23 to 30	35.7	20.7	May 21†	Williams	2127
March 12 to 19†	+ 13.8	January 15 to 22	35.5	23.7	March 3†	Moore	5754
January 22 to 29	+ 5.1	July 23 to 30	45.5	18.9	Jan. 29	Moore	5756
January 15 to 22	+ 7.8	July 23 to 30	37.5	27.4	† June 18	Oram and Son	18079
January 15 to 22	+ 84.3	July 16 to 23	71.9	18.4	† April 2	Nelson	2901
January 29 to Feb. 5	+ 36.9	March 12 to 19†	52.0	45.9	March 3†	Nelson	2901

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