

RATES OF CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY,

AT THE

ROYAL OBSERVATORY, GREENWICH.

1871.

NAME OF MAKER.	No.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(L) WEEKLY SUMS OF DAILY RATES											
			Jan. 14—21	Jan. 21—28	Jan. 28 Feb. 4—11	Feb. 11—18	Feb. 18—25	Feb. 25 Mar. 4—11	March 11—18	March 18—25	Mar. 25 Apr. 1	Apr. 1 Apr. 8	Apr. 8 Apr. 15	Apr. 15 Apr. 22
C. Frodsham.....	3423	G. Frodsham's new reversed balance.	..	..	..	..	..	..	..	..	..	..	..	..
Wichert.....	3216	Auxiliary compensation.	- 88	- 26	- 33	- 66	- 73	- 92	- 88	- 70	- 100	- 81	- 94	- 94
Kingston.....	5321	Auxiliary acting in cold.	- 97	- 68	- 92	- 21	- 94	- 110	- 81	- 97	- 83	- 93	- 96	- 96
Davison.....	4668	Auxiliary compensation.	- 73	- 99	- 66	- 38	- 16	- 15	- 23	- 64	- 49	- 35	- 69	- 69
Gowland.....	1284	Ordinary balance, with slight alteration.	- 38	- 92	- 66	- 39	- 61	- 91	- 71	- 83	- 97	- 83	- 93	- 93
McGregor.....	4173	Ordinary auxiliary compensation to balance.	+ 13	+ 35	+ 10	+ 10	+ 20	+ 40	+ 38	+ 44	+ 53	+ 83	+ 67	+ 67
Seawell.....	3609	Auxiliary compensation.	- 43	- 92	- 45	- 49	- 52	- 41	- 31	- 87	- 91	- 84	- 100	- 100
C. Frodsham.....	3461	Continuous auxiliary to the balance.	- 25	- 26	- 18	- 29	- 35	- 61	- 21	- 132	- 150	- 99	- 108	- 108
P. Brehal.....	1150	Ordinary balance, with a slight alteration.	+ 59	+ 64	+ 72	+ 53	+ 35	+ 21	+ 10	+ 60	+ 73	+ 103	+ 123	+ 123
Parkinson & Bouts.....	1171	Auxiliary balance, acting in extremes.	+ 37	+ 19	+ 16	+ 51	+ 04	- 21	- 15	+ 10	+ 24	- 32	- 05	- 05
Isaac.....	497	Double arm balance without auxiliary.	- 74	- 73	- 92	- 100	- 04	- 74	- 60	- 70	- 60	- 80	- 80	- 80
E. Dent & Co.....	3106	[No information received.]	+ 13	+ 16	+ 54	+ 77	+ 74	+ 60	+ 74	+ 100	+ 91	+ 71	+ 65	+ 65
G. Davison.....	4673	Auxiliary compensation.	- 79	- 92	- 105	- 64	- 63	- 60	- 38	- 55	- 67	- 43	- 21	- 21
Kullberg.....	1802	Kullberg's flat rim balance, without auxiliary	- 89	- 97	- 35	- 59	- 61	- 35	- 39	- 50	- 35	- 32	- 58	- 58
J. Fletcher.....	2679	Auxiliary compensation.	+ 65	+ 63	+ 59	+ 91	+ 95	+ 98	+ 106	+ 44	+ 57	+ 49	+ 19	+ 19
Usher and Cole.....	357	Auxiliary to balance.	+ 55	+ 51	+ 45	+ 56	+ 53	+ 66	+ 84	+ 26	+ 34	+ 41	+ 20	+ 20
Whiffin.....	350	Auxiliary compensation.	- 64	- 77	- 75	- 149	- 103	- 186	- 301	- 212	- 194	- 173	- 189	- 189
Hensbury.....	4673	Auxiliary compensation.	- 103	- 127	- 137	- 142	- 133	- 148	- 138	- 65	- 65	- 67	- 67	- 67
Kullberg.....	1799	Kullberg's flat rim balance, without auxiliary.	- 103	- 127	- 137	- 142	- 133	- 148	- 138	- 65	- 65	- 67	- 67	- 67
Isaac.....	1153	Ordinary balance, auxiliary acting on jewels.	- 102	- 83	- 70	- 49	- 38	- 35	- 33	- 15	- 63	- 65	- 60	- 60
Chittenden.....	793	Auxiliary as in former years.	+ 22	+ 29	- 11	- 48	- 31	- 63	- 68	- 85	- 87	- 88	- 110	- 110
Lowry.....	770	Auxiliary compensation.	- 66	+ 58	+ 50	+ 56	+ 67	+ 20	- 89	- 76	- 54	- 57	- 57	- 57
Glover.....	284	Auxiliary compensation.	+ 44	+ 126	+ 159	+ 65	+ 158	+ 102	+ 150	+ 75	+ 49	+ 61	+ 34	+ 34
Reid and Sons.....	1492	Auxiliary acting in all temperatures.	- 40	- 39	- 41	- 65	- 113	- 120	- 141	- 95	- 63	- 61	- 62	- 62
Parkinson & Bouts.....	1162	Auxiliary to balance acting in extremes.	- 40	- 04	- 92	- 88	- 99	- 01	- 104	- 46	- 51	- 19	- 32	- 32
J. R. Fletcher.....	2969	Auxiliary compensation.	+ 184	+ 201	+ 290	+ 186	+ 169	+ 156	+ 149	+ 135	+ 115	+ 155	+ 175	+ 175
Highley.....	5435	Auxiliary acting in cold.	- 81	- 123	- 75	- 34	- 73	- 71	+ 62	+ 30	+ 60	+ 78	+ 88	+ 88
J. Fletcher.....	2921	Auxiliary compensation.	- 28	- 42	- 38	- 91	- 86	- 95	- 124	- 151	- 155	- 140	- 15	- 15
Vasire.....	326	New auxiliary compensation.	- 47	- 07	- 58	- 18	- 39	- 46	- 74	- 159	- 194	- 217	- 208	- 208
J. B. Fletcher.....	2885	Auxiliary compensation.	- 83	- 106	+ 90	+ 117	- 129	- 136	- 149	- 141	+ 105	+ 9	+ 48	+ 48
Blackie.....	657	Ordinary balance, but with different proportions.	- 12	- 11	- 06	+ 21	- 16	- 01	+ 04	- 95	- 91	- 98	- 135	- 135
Shepherd and Sons.....	1737	Auxiliary to balance.	- 68	- 121	- 149	- 72	- 89	- 70	- 74	- 50	- 41	- 25	- 20	- 20
Whiffin.....	347	Auxiliary compensation.	- 132	- 120	- 138	- 204	- 171	- 158	- 155	- 20	- 00	- 43	- 69	- 69
Chittenden.....	793	Auxiliary acting as in former years.	- 118	- 116	- 110	- 189	- 264	- 274	- 299	- 275	- 275	- 281	- 281	- 281
Crisp.....	2176	Auxiliary compensation as in former years.	- 156	- 174	- 193	- 94	- 132	- 105	- 68	- 48	- 38	- 44	- 93	- 93
Gowland.....	1284	Auxiliary compensation.	+ 182	+ 183	+ 184	+ 172	+ 172	+ 162	+ 178	- 60	- 70	- 62	- 140	- 140
Hensbury.....	4673	Auxiliary compensation.	- 44	- 78	- 90	- 92	- 11	- 10	- 21	- 201	- 214	- 181	- 181	- 181
McGregor.....	4172	Poole's auxiliary compensation to balance.	- 74	- 161	- 185	- 249	- 243	- 211	- 200	- 45	- 71	- 65	- 93	- 93
Shepherd and Sons.....	1737	Auxiliary to balance.	- 03	- 36	- 32	- 19	- 05	- 38	- 36	- 267	- 254	- 251	- 299	- 299
Reid and Sons.....	1215	Auxiliary acting in cold.	- 178	- 177	- 178	- 189	- 141	- 112	- 115	- 149	- 151	- 184	- 184	- 184
D. Reid.....	1870	[No information received.]	- 282	- 280	- 227	- 215	- 220	- 176	- 139	- 123	- 175	- 213	- 280	- 280
Williams and Co.....	97	Auxiliary compensation.	- 373	- 467	- 500	- 519	- 362	- 276	- 217	- 233	- 278	- 337	- 386	- 386
Blackie.....	657	Original auxiliary.	- 192	- 193	- 204	- 99	- 127	- 84	- 49	+ 56	+ 76	+ 101	+ 86	+ 86
Reid and Sons.....	2210	[No information received.]	+ 01	+ 77	+ 74	+ 124	+ 119	+ 155	+ 202	+ 307	+ 328	+ 343	+ 380	+ 380
Chronometrical Thermometer.....	.....	.....	+1562	+2103	+2239	+1556	+1739	+1459	+1310	- 936	- 892	- 935	- 1183	- 1183
Extremes of Temperature as shown by the Self-Registering Thermometers.....	.....	.....	40-43	37-42	36-42	45-49	40-49	42-40	46-54	65-61	69-82	69-83	65-89	65-89

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 some 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 mitigated.

IN THE ORDER OF TIME.																	NAME OF MAKER.		No.
April 1—8	April 8—15	April 15—22	April 22—29	April 29 to May 6	May 6—13	May 13—20	May 20—27	May 27 to June 3	June 3—10	June 10—17	June 17—24	June 24 to July 1	July 1—8	July 8—15	July 15—22	July 22 to Aug. 5			
- 70	- 50	- 36	- 73	- 63	- 58	- 63	- 49	- 59	- 80	- 81	- 80	- 104	- 72	- 68	- 47	- 48	- 40	C. Frodsham.....	2423
- 93	- 120	- 117	- 123	- 98	- 107	- 95	- 107	- 104	- 59	- 81	- 108	- 103	- 98	- 96	- 67	- 77	- 84	Wichert.....	3216
- 93	- 16	- 40	- 32	- 32	- 41	- 98	- 49	- 55	- 25	- 64	- 67	- 59	- 36	- 29	- 02	- 15	- 19	Kingston.....	5321
- 71	- 39	- 61	- 67	- 59	- 67	- 35	- 66	- 111	- 85	- 92	- 51	- 30	- 48	- 39	- 38	- 48	- 39	Davison.....	4668
+ 28	+ 57	+ 68	+ 57	+ 61	+ 85	+ 85	+ 98	+ 96	+ 131	+ 84	+ 86	+ 124	+ 124	+ 126	+ 110	+ 120	+ 121	Gowland.....	1284
- 30	- 39	- 28	- 39	- 32	- 64	- 25	- 52	- 76	- 87	- 107	- 109	- 93	- 80	- 60	- 42	- 57	- 45	McGregor.....	4173
- 65	- 120	- 117	- 123	- 98	- 107	- 95	- 107	- 104	- 59	- 81	- 108	- 103	- 98	- 96	- 67	- 77	- 84	Seawell.....	3609
+ 60	+ 69	+ 35	+ 19	+ 42	+ 42	+ 47	+ 50	+ 58	+ 97	+ 66	+ 100	+ 103	+ 76	+ 72	+ 105	+ 113	+ 115	C. Frodsham.....	3461
+ 98	+ 93	+ 32	+ 36	+ 37	- 36	- 16	- 11	- 33	- 11	+ 40	+ 60	+ 30	+ 44	+ 56	+ 04	+ 01	+ 50	P. Brehal.....	1150
- 72	- 61	- 67	- 59	- 56	- 59	- 72	- 70	- 89	- 76	- 89	- 123	- 123	- 117	- 118	- 116	- 105	- 106	Parkinson and Bouts.....	1171
- 26	- 15	- 40	- 49	- 40	- 35	- 16	- 16	- 11	- 09	- 38	- 08	- 11	- 10	+ 05	+ 06	+ 23	+ 33	Isaac.....	497
+ 133	+ 129	+ 134	+ 136	+ 135	+ 150	+ 139	+ 157	+ 139	+ 139	+ 116	+ 112	+ 168	+ 169	+ 171	+ 168	+ 127	+ 129	E. Dent and Co.....	3106
- 97	- 28	- 49	- 45	- 60	- 58	- 84	- 50	- 51	- 08	- 14	- 10	- 95	- 47	- 49	- 41	- 64	- 71	G. Davison.....	4673
+ 05	- 21	- 39	- 51	- 45	- 44	- 40	- 67	- 67	- 94	- 141	- 145	- 116	- 62	- 84	- 105	- 84	- 84	Kullberg.....	1802
+ 98	+ 117	+ 125	+ 111	+ 151	+ 118	+ 150	+ 115	+ 107	- 68	+ 94	+ 30	+ 11	+ 85	- 71	- 55	- 68	- 76	J. Fletcher.....	2679
+ 124	+ 125	+ 86	+ 82	+ 85	+ 83	+ 91	+ 73	+ 66	+ 25	+ 33	+ 69	+ 40	+ 46	+ 45	+ 30	+ 50	+ 52	Usher & Cole.....	357
- 109	- 79	- 92	- 111	- 109	- 123	- 113	- 131	- 146	- 162	- 137	- 121	- 118	- 77	- 66	- 70	- 60	- 69	Whiffin.....	350
- 108	- 112	- 93	- 86	- 68	- 68	- 68	- 74	- 85	- 74	- 78	- 91	- 90	- 80	- 80	- 80	- 80	- 80	Kennedy.....	4673
- 64	- 74	- 75	- 65	- 48	- 38	- 44	- 13	- 19	- 08	+ 12	+ 24	+ 23	+ 30	+ 08	+ 42	+ 17	+ 23	Isaac.....	1799
- 71	- 49	- 11	- 19	- 06	- 64	+ 10	+ 36	+ 36	+ 79	+ 62	+ 72	+ 24	+ 06	+ 60	+ 121	+ 109	+ 111	Isaac.....	1153
+ 01	- 04	- 23	- 21	- 29	- 34	- 26	- 46	- 42	- 87	- 70	- 65	- 82	- 24	- 23	- 21	- 05	- 10	Chittenden.....	793
- 33	- 29	- 71	- 84	- 106	+ 112	+ 119	+ 124	+ 121	+ 104	+ 84	+ 93	+ 128	+ 161	+ 160	+ 149	+ 147	+ 183	Lowry.....	770
- 39	- 14	- 19	- 16	- 11	- 35	- 44	- 77	- 44	- 23	- 41	- 25	- 39	- 03	- 23	- 40	- 45	- 49	Glover.....	284
+ 73	+ 65	+ 83	+ 77	+ 49	+ 65	+ 70	+ 50	+ 62	+ 59	+ 148	+ 208	+ 155	+ 40	+ 24	+ 30	+ 26	+ 31	Reid and Sons.....	1492
- 83	- 75	- 43	- 37	- 44	- 38	- 104	- 27	- 46	- 30	- 73	- 94	- 121	- 73	- 50	- 45	- 87	- 85	Parkinson & Bouts.....	1162
+ 86	+ 21	+ 206	+ 174	+ 178	+ 149	+ 189	+ 141	+ 130	+ 145	+ 155	+ 122	+ 127	- 69	- 83	+ 126	+ 93	+ 131	J. R. Fletcher.....	2969
+ 12	+ 19	+ 30	+ 27	+ 19	- 51	- 91	- 51	- 95	- 126	- 110	+ 120	+ 147	+ 133	+ 131	+ 159	+ 147	+ 153	Highley.....	5435
+ 55	+ 39	- 51	- 68	- 65	- 73	- 61	- 116	- 99	- 49	+ 43	+ 85	+ 85	- 39	- 95	- 104	- 90	- 90	J. Fletcher.....	2921
+ 107	+ 30	+ 289	+ 224	+ 222	+ 241	+ 241	+ 209	+ 219	+ 246	- 81	+ 200	+ 200	+ 273	+ 270	+ 263	+ 275	+ 281	Vasire.....	32
+ 154	+ 173	+ 186	+ 181	+ 218	+ 209	+ 202	+ 176	+ 182	+ 47	- 22	- 08	+ 04	+ 122	+ 123	+ 151	+ 172	+ 178	J. R. Fletcher.....	2981
- 70	- 25	- 30	- 34	- 35	- 22	- 18	- 10	- 10	- 102	- 225	- 225	- 189	+ 05	+ 10	+ 06	+ 29	+ 22	Blackie.....	826
- 79	- 79	- 79	- 79	- 79	- 79	- 79	- 79	- 79	- 17	- 21	- 50	- 202	- 148	- 123	- 145	- 142	- 137	Sheldord and Son.....	1737
+ 87	+ 43	+ 26	+ 10	+ 34	+ 50	+ 57	+ 57	+ 53	+ 58	+ 151	+ 124	+ 147	+ 186	+ 174	+ 180	+ 183	+ 193	Whiffin.....	3477
+ 33	+ 23	+ 55	+ 48	+ 31	+ 04	+ 16	+ 16	+ 16	+ 16	+ 16	+ 16	+ 16	+ 16	+ 16	+ 16	+ 16	+ 16	Whiffin.....	3477
+ 20	- 64	+ 110	+ 143	+ 175	+ 179	+ 207	+ 207	+ 204	+ 206	- 156	- 30	- 17	- 23	+ 156	+ 184	+ 207	+ 219	Crup.....	2176
+ 07	+ 69	+ 81	+ 94	+ 108	+ 80	+ 88	+ 23	+ 39	- 69	- 92	- 106	- 95	- 109	- 115	- 114	- 91	- 91	Gowland.....	2747
- 19	- 23	- 06	- 04	- 143	- 141	- 120	- 107	- 112	- 03	+ 93	+ 93	+ 125	- 83	- 111	- 81	- 63	- 63	McGregor.....	4668
- 47	- 43	- 61	- 74	- 55	- 55	- 17	- 78	- 75	- 256	- 324	- 371	- 384	- 151	- 100	- 100	- 100	- 100	Reid and Sons.....	1212
- 20	- 18	- 07	- 29	- 37	- 19	- 67	- 35	- 31	- 38	- 06	- 38	- 67	- 114	- 105	- 62	- 113	- 113	McGregor.....	4173
+ 140	+ 150	+ 174	+ 166	+ 191	+ 180	+ 168	+ 231	+ 241	+ 305	+ 181	+ 134	+ 221	+ 224	+ 329	+ 393	+ 414	+ 425	D. Reid.....	2747
+ 26	+ 69	+ 139	+ 141	+ 180	+ 168	+ 234	+ 309	+ 456	+ 279	+ 641	+ 569	+ 437	+ 485	+ 574	+ 626	+ 516	+ 516	Williams and Co.....	97
- 93	- 87	- 16	- 55	+ 53	+ 50	+ 86	+ 96	+ 102	+ 139	+ 40	+ 85	+ 98	+ 51	...	...	...	...	Blackie.....	657
- 292	- 320	- 237	- 241	- 350	+ 432	+ 459	+ 461	+ 483	+ 144	+ 401	+ 305	+ 496	+ 487	...	...	...	...	Reid and Sons.....	2810
+ 12670	+ 10845	+ 8135	+ 7840	+ 7580	+ 7370	+ 5940	+ 5930	+ 2252	+ 1117	+ 30910	+ 23350	+ 19630	+ 90	+ 1515	+ 4715	+ 1510	+ 1469	Chronometrical Thermometer.....	
48—51	48—57	53—56	53—57	53—58	50—60	52—58	52—57	56—63	66—84	68—94	70—94	74—85	82—67	63—67	73—64	70—63	71—	Extremes of Temperature as Recorded by the Registered Thermometers.	

NAME or MAKER.	No.	Construction of Equipment and Balance, from the Description furnished by the Maker.	(II.) WEEKLY SUMS OF DAILY RATES											
			Jan. 28 Feb. 4	Jan. 11-28	Jan. 14-21	Feb. 11-18	Feb. 4-11	Feb. 18-25	Feb. 25 Mar. 4	April 1-8	April 8-15	May 15-20	April 15-22	
C. Frodham.	3423	2 C. Frodham's new reversed balance.	-	-	-	-	-	-	-	-	-	-	-	
Weichert	3216	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Kington	3221	2 Auxiliary setting in cold.	-	-	-	-	-	-	-	-	-	-	-	
Davison	4668	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Gowland	1284	2 Ordinary balance, with slight alteration.	-	-	-	-	-	-	-	-	-	-	-	
McGregor	4173	2 Ordinary auxiliary compensation to balance.	-	-	-	-	-	-	-	-	-	-	-	
Seewill	3009	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
C. Frodham	3423	2 Continuous auxiliary to the balance.	-	-	-	-	-	-	-	-	-	-	-	
C. Birchall	1150	2 Ordinary balance, with a slight alteration.	-	-	-	-	-	-	-	-	-	-	-	
Parkinson & Bouts.	1171	2 Auxiliary to balance acting in extremes.	-	-	-	-	-	-	-	-	-	-	-	
Isaac	497	2 Double arm balance without auxiliary.	-	-	-	-	-	-	-	-	-	-	-	
D. Dent & Co.	3106	6 [No information received.]	-	-	-	-	-	-	-	-	-	-	-	
G. Davies	4675	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Kullberg	1862	2 Kullberg's flat rim balance, without auxiliary.	-	-	-	-	-	-	-	-	-	-	-	
J. Fletcher	2679	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Usher and Cole.	31	2 Auxiliary to balance.	-	-	-	-	-	-	-	-	-	-	-	
Whiffin	350	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Hemsey	4673	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
G. Davies	1799	2 Auxiliary setting in cold.	-	-	-	-	-	-	-	-	-	-	-	
Isaac	1152	2 Ordinary balance, auxiliary acting on jewels.	-	-	-	-	-	-	-	-	-	-	-	
Chittenden	793	2 Auxiliary as in former years.	-	-	-	-	-	-	-	-	-	-	-	
Lowry	770	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Glover	354	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Field and Sons	1492	2 Auxiliary acting in all temperatures.	-	-	-	-	-	-	-	-	-	-	-	
Parkinson & Bouts.	1162	2 Auxiliary to balance acting in extremes.	-	-	-	-	-	-	-	-	-	-	-	
J. B. Fletcher	3969	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Highly	5455	2 Auxiliary setting in cold.	-	-	-	-	-	-	-	-	-	-	-	
J. Fletcher	2921	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
C. Davies	326	2 New auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
J. B. Fletcher	3885	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Blackie	657	2 Ordinary balance, but with different proportions.	-	-	-	-	-	-	-	-	-	-	-	
Shepherd and Son.	1723	2 Auxiliary to balance.	-	-	-	-	-	-	-	-	-	-	-	
Whiffin	347	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Brotherton	5417	2 Construction as in former years.	-	-	-	-	-	-	-	-	-	-	-	
Crip	3176	2 Auxiliary compensation as in former years.	-	-	-	-	-	-	-	-	-	-	-	
Gowland	2747	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Hemsey	4682	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
McGregor	4173	2 Ponce's auxiliary compensation to balance.	-	-	-	-	-	-	-	-	-	-	-	
Shepherd and Son.	1723	2 Auxiliary to balance.	-	-	-	-	-	-	-	-	-	-	-	
Reid and Sons	1215	2 Auxiliary acting in cold.	-	-	-	-	-	-	-	-	-	-	-	
D. Reid	1870	2 [No information received.]	-	-	-	-	-	-	-	-	-	-	-	
Williams and Co.	97	2 Auxiliary compensation.	-	-	-	-	-	-	-	-	-	-	-	
Blackie	657	2 Original auxiliary.	-	-	-	-	-	-	-	-	-	-	-	
Reid and Sons	2210	2 [No information received.]	-	-	-	-	-	-	-	-	-	-	-	
Chronometrical Thermometer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Extremes of Temperature as shown by the Self-Registering Thermometer														

The sign + indicates that the rate is gaining.

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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 or MAKER.	No.	IN THE ORDER OF TEMPERATURE, AS DETERMINED BY THE CHRONOMETRICAL THERMOMETER.																							
		April 22-29	April 30-May 6	May 7-13	May 14-20	May 21-27	June 1-7	June 8-14	June 15-21	July 1-7	July 8-14	July 15-21	July 22-28	July 29-Aug. 5	August 6-12	August 13-19	August 20-26	August 27-Sept. 3	September 4-10	September 11-17	September 18-24	September 25-30	October 1-7	October 8-14	October 15-21
C. Frodham.	3423	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Weichert	3216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kington	3221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Davison	4668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gowland	1284	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
McGregor	4173	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seewill	3009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. Frodham	3423	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P. Bichal	1150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parkinson & Bouts.	1171	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isaac	497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D. Dent & Co.	3106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G. Davies	4675	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kullberg	1862	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J. Fletcher	2679	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Usher and Cole	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Whiffin	350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hemsey	4673	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G. Davies	1799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isaac	1152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chittenden	793	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lowry	770	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glover	354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field and Sons	1492	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parkinson & Bouts.	1162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J. B. Fletcher	3969	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Highly	5455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J. Fletcher	2921	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. Davies	326	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J. B. Fletcher	3885	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blackie	657	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shepherd and Son.	1723	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Whiffin	347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brotherton	5417	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crip	3176	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gowland	2747	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hemsey	4682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
McGregor	4173	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shepherd and Son.	1723	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reid and Sons	1215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D. Reid	1870	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Williams and Co.	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blackie	657	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reid and Sons	2210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chronometrical Thermometer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Extremes of Temperature as shown by the Self-Registering Thermometer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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

The Chronometer Blackie 657 was found stopped on July 10; on examination by the maker it appeared that the main spring had broken. Held and Sons 2210 was withdrawn from trial on July 17 by the maker, by permission. The rates of these Chronometers are in consequence placed in a separate division, in alphabetical order of maker's name, as, on account of the somewhat shorter duration of trial, they are not strictly comparable with those of the remaining Chronometers.

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 First Week of Rating.	Last Day of Last Week of Rating.	Least Weekly Sum.	
C. Frodham.....	2423	2 84, Strand, London.	C. Frodham's new reversed balance.	January 14	August 5	29	+
Weichert.....	2216	2 114, Robbery Terrace, Date Docks, Cardiff.	Auxiliary compensation.	January 14	August 5	29	-12-3
Kingston.....	5321	2 18, High Street, Ramsgate.	Auxiliary acting in cold.	January 14	August 5	29	-9-2
Davison.....	4668	2 6, Side, Newcastle-on-Tyne.	Auxiliary compensation.	January 14	August 5	29	-11-1
Gowland.....	1284	2 178, High Street West, Sunderland.	Ordinary balance, with slight alteration.	January 14	August 5	29	+1-0
McGregor.....	4173	2 Clyde Place, Glasgow.	Ordinary auxiliary compensation to balance.	January 14	August 5	29	-10-8
Sevill.....	3009	2 61, South Castle Street, Liverpool.	Auxiliary compensation.	January 14	August 5	29	-13-3
C. Frodham.....	2401	2 84, Strand, London.	Continuous auxiliary to the balance.	January 14	August 5	29	+1-6
F. Riechall.....	1540	2 128, Stamford Street, Islington, London.	Ordinary balance, with slight alteration.	January 14	August 5	29	-13-6
Parkinson and Bouts.....	1171	2 29, Gracechurch Street, London.	Auxiliary to balance, acting in extremes.	January 14	August 5	29	-13-6
Isaac.....	497	2 147, Liverpool Road, Islington, London.	Double arm balance, without auxiliary.	January 14	August 5	29	-10-0
E. Dent & Co.....	3108	2 61, Strand, London.	[No information received.]	January 14	August 5	29	+6-0
G. Davison.....	4673	2 6, Side, Newcastle-on-Tyne.	Auxiliary compensation.	January 14	August 5	29	-10-5
Kulberg.....	1802	2 103, Liverpool Road, London.	Kulberg's flat rim balance, without auxiliary.	January 14	August 5	29	-14-5
J. Fletcher.....	2679	2 148, Leadenhall Street, London.	Auxiliary compensation.	January 14	August 5	29	+1-1
Ulmer and Cole.....	317	2 46, St. John's Square, Clerkenwell, London.	Auxiliary to balance.	January 14	August 5	29	+2-0
Widfin.....	347	2 10, Clendy Square, Islington, London.	Auxiliary compensation.	January 14	August 5	29	-21-2
Hennessy.....	4673	2 5, Wind Street, Swansea.	Auxiliary compensation.	January 14	August 5	29	-19-8
Kulberg.....	1799	2 103, Liverpool Road, London.	Kulberg's flat rim balance, without auxiliary.	January 14	August 5	29	-14-5
Isaac.....	1152	2 147, Liverpool Road, Islington, London.	Ordinary balance, auxiliary acting on jewels.	January 14	August 5	29	-10-2
Chittenden.....	793	2 10, Wilton Road, Hackney, London.	Auxiliary as in former years.	January 14	August 5	29	-11-0
Lowry.....	770	2 66, High Street, Belfast.	Auxiliary compensation.	January 14	August 5	29	-8-9
Reid and Sons.....	1492	2 5, Wroham Road, Camden Town, London.	Auxiliary compensation.	January 14	August 5	29	-3-9
Parkinson and Bouts.....	1162	2 41, Grey Street, Newcastle-on-Tyne.	Auxiliary acting in all temperatures.	January 14	August 5	29	+2-4
		2 29, Gracechurch Street, London.	Auxiliary to balance acting in extremes.	January 14	August 5	29	-12-1
J. B. Fletcher.....	2969	2 148, Leadenhall Street, London.	Auxiliary compensation.	January 14	August 5	29	+6-9
Highly.....	5435	2 45, High Street, Shermers.	Auxiliary acting in cold.	January 14	August 5	29	-12-2
Visseire.....	326	2 148, Leadenhall Street, London.	Auxiliary compensation.	January 14	August 5	29	-1-1
J. B. Fletcher.....	2885	2 31, Rue des Drapiers, Havre, France.	New auxiliary compensation.	January 14	August 5	29	-4-7
		2 148, Leadenhall Street, London.	Auxiliary compensation.	January 14	August 5	29	-2-5
Blackie.....	826	2 24, Anwell Street, Clerkenwell, London.	Ordinary balance, but with different proportions.	January 14	August 5	29	-2-2
Shepherd and Son.....	1737	2 25, Leadenhall Street, London.	Auxiliary to balance.	January 14	August 5	29	-20-3
Whitall.....	5417	2 10, Clendy Square, Islington, London.	Auxiliary compensation.	January 14	August 5	29	-20-4
Brotherton.....	5417	2 11, Spencer Street, Gower Road, London.	Construction as in former years.	January 14	August 5	29	-27-4
Crip.....	2176	2 174, St. John Street Road, London.	Auxiliary compensation as in former years.	January 14	August 5	29	-19-5
Gowland.....	2747	2 178, High Street West, Sunderland.	Auxiliary compensation.	January 14	August 5	29	-14-0
Hennessy.....	4682	2 5, Wind Street, Swansea.	Auxiliary compensation.	January 14	August 5	29	-23-1
McGregor.....	4172	2 Greenock.	Pode's auxiliary compensation to balance.	January 14	August 5	29	-24-9
Shepherd and Son.....	1723	2 25, Leadenhall Street, London.	Auxiliary compensation.	January 14	August 5	29	-1-1
Reid and Sons.....	1215	2 41, Grey Street, Newcastle-on-Tyne.	Auxiliary acting in cold.	January 14	August 5	29	-19-5
D. Reid.....	1870	2 41, Grey Street, Newcastle-on-Tyne.	[No information received.]	January 14	August 5	29	-23-7
Williams and Co.....	97	2 2, Date Docks, Cardiff.	Auxiliary compensation.	January 14	August 5	29	-50-0
Blackie.....	657	2 24, Anwell Street, Clerkenwell, London.	Original auxiliary.	January 14	July 8	25	-20-4
Reid and Sons.....	2210	2 41, Grey Street, Newcastle-on-Tyne.	[No information received.]	January 14	July 8	25	+0-1

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.								NAME OF MAKER.	No.
In what Week.	Greatest Weekly Sum.	In what Week.	Difference between the Greatest and Least.	Greatest Difference between one and the next.	Before and after what day.				
June 24 to July 11	- 9-8	January 21 to 28	7-8	8-7	April 29		C. Frodham.....	2423	
April 22 to 29	- 1-0	Feb. 25 to Mar. 4	11-3	4-5	February 4; June 3†		Weichert.....	2216	
January 21 to 28	+ 0-8	May 13 to 20	10-1	5-3	† April 1		Kingston.....	5321	
June 17 to 24	- 2-5	January 28 to Feb. 4	8-6	6-1	† June 10†		Davison.....	4668	
February 4 to 11	+ 13-1	June 3 to 10†	12-1	4-7	† June 10†		Gowland.....	1284	
June 17 to 24†	- 2-5	May 13 to 20	8-4	7-1	† April 1		McGregor.....	4173	
March 4 to 11†	- 1-3	January 28 to Feb. 4	11-5	5-6	January 21		Sevill.....	3009	
February 25 to Mar. 4	+ 13-3	June 24 to July 11	11-7	5-5	† April 23		C. Frodham.....	2401	
June 17 to 24†	- 2-5	January 28 to Feb. 4	8-6	7-1	† April 23		F. Riechall.....	1540	
March 4 to 11†; March 11 to 18†	- 0-3	February 11 to 18	8-3	5-8	March 4†		Parkinson and Bouts.....	1171	
February 11 to 18	+ 3-3	July 29 to August 5	13-3	5-4	† April 1		Isaac.....	497	
January 18 to 25	+ 10-2	July 22 to 29	13-3	7-9	† April 1		E. Dent & Co.....	3108	
February 18 to 25	+ 7-1	July 29 to August 5	17-6	4-9	† July 1		G. Davison.....	4673	
June 17 to 24†	+ 0-6	April 1 to 8	15-0	7-9	† April 1		Kulberg.....	1802	
June 24 to July 11	+ 13-0	May 13 to 20	11-0	4-9	† April 1		J. Fletcher.....	2679	
March 25 to April 1†	+ 12-5	April 8 to 15	10-5	10-4	† April 1		Ulmer and Cole.....	317	
March 4 to 11†	- 8-0	July 22 to 29	18-2	7-9	† April 1		Widfin.....	347	
March 4 to 11†	- 8-0	May 13 to 20	14-2	9-1	March 4†		Hennessy.....	4673	
February 18 to 25	+ 4-2	July 15 to 22	18-7	0-3	March 4†		Kulberg.....	1799	
January 14 to 21	+ 15-1	July 15 to 22	22-3	6-1	July 15		Isaac.....	1152	
March 25 to April 1†	+ 2-9	January 21 to 28	13-9	11-1	† April 1		Chittenden.....	793	
March 4 to 11†	+ 16-1	July 1 to 8	25-0	6-0	March 4†		Lowry.....	770	
April 1 to 8	+ 15-9	January 28 to Feb. 4	18-8	11-3	February 4		Glover.....	354	
July 8 to 15	+ 20-8	June 17 to 24†	16-0	11-2	† July 1		Reid and Sons.....	1492	
July 1 to 8	+ 4-6	May 27 to June 3	10-7	14-0	May 13		Parkinson and Bouts.....	1162	
July 1 to 8	+ 41-3	April 8 to 15	24-4	10-7	April 15		J. B. Fletcher.....	2969	
January 21 to 28	+ 15-9	July 15 to 22	23-1	10-7	February 11		Highly.....	5435	
March 4 to 11†	+ 10-5	April 1 to 8	18-8	8-7	† July 1		Visseire.....	326	
January 14 to 21	+ 20-0	June 24 to July 11	36-7	8-5	March 4†		Blackie.....	826	
June 10 to 17†	+ 21-8	April 29 to May 6	25-4	13-5	March 4†; June 3†		J. B. Fletcher.....	2885	
June 10 to 17†; June 17 to 24†	+ 21-8	July 22 to 29	25-4	13-5	† July 1		Blackie.....	826	
July 1 to 8	+ 14-9	January 28 to Feb. 4	39-2	15-3	† July 1		Shepherd and Son.....	1737	
February 4 to 11	+ 10-3	July 22 to 29	33-2	15-3	† March 4†		Whitall.....	5417	
February 18 to 25	+ 2-2	April 8 to 15	39-2	15-3	February 25		Brotherton.....	5417	
January 28 to Feb. 4	+ 26-7	May 27 to June 3	46-2	23-3	† July 1		Crip.....	2176	
January 28 to Feb. 4	+ 18-4	January 28 to Feb. 4	39-4	23-3	March 4†		Gowland.....	2747	
March 4 to 11†	+ 9-0	January 28 to Feb. 4	37-1	22-8	March 4†		Hennessy.....	4682	
February 4 to 11	+ 12-5	June 24 to July 11	34-4	24-6	March 4†		McGregor.....	4172	
June 17 to 24†	- 2-5	January 28 to Feb. 4	40-2	20-5	† April 1		Shepherd and Son.....	1723	
January 28 to Feb. 4	+ 20-5	March 18 to 25†	40-0	20-0	March 4†		Reid and Sons.....	1215	
January 28 to Feb. 4	+ 45-9	July 29 to August 5	75-3	35-1	March 4†		D. Reid.....	1870	
January 28 to Feb. 4	+ 42-5	June 24 to July 11	115-9	42-0	March 4†		Williams and Co.....	97	
January 28 to Feb. 4	+ 13-9	June 3 to 10†	34-3	17-9	† April 1		Blackie.....	657	
January 28 to Feb. 4	+ 54-4	June 3 to 10†	54-3	10-5	March 4†		Reid and Sons.....	2210	

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 Chronometer Blackie 657 was found stopped on July 10; on examination by the maker it appeared that the main spring had broken. Reid and Sons 2210 was withdrawn from trial on July 17 by the maker, by permission. The rates of these chronometers are in separate divisions, a separate division, in alphabetical order of maker's name, as, on account of the somewhat shorter duration of trial, they are not strictly comparable with those of the remaining Chronometers.