

RATES OF CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY,

AT THE

ROYAL OBSERVATORY, GREENWICH.

1869.

NAME or MAKER.			Construction of Escapement and Balance, from the Description furnished by the Maker.		(L) WEEKLY SUMS OF DAILY RATES											
No.	Whether as a Day- watch or Night- watch.		Jan. 9-16	Jan. 16-23	Jan. 23-30	Jan. 30-6 Feb.	Feb. 6-13	Feb. 13-20	Feb. 20-27	Feb. 27-6 Mar.	March 6-13	March 13-20	March 20-27			
			† † † † † † † † † † † † † †													
J. B. Fletcher	2972	2	- 57	- 65	- 89	- 42	- 34	- 37	- 48	- 55	- 26	- 39	- 40			
Whiffin	508	2	- 56	- 50	- 44	- 48	- 47	- 48	- 50	- 48	- 12	- 12	- 12			
Dent	2640	2	- 81	- 73	- 72	- 65	- 72	- 62	- 53	- 48	- 18	- 21	- 20			
Kullberg	1489	2	- 03	- 15	- 42	- 13	- 10	- 12	- 3	- 49	- 13	- 09	- 09			
Kullberg	1489	2	- 02	- 02	- 03	- 15	- 27	- 23	- 02	- 13	- 27	- 23	- 10			
W. P. Birchall	181	2	- 15	- 15	- 21	- 12	- 19	- 07	- 17	- 20	- 04	- 19	- 42			
Dent	3096	2	- 69	- 70	- 101	- 00	- 00	- 00	- 00	- 95	- 70	- 55	- 15			
Clutterdun	740	2	- 129	- 129	- 84	- 126	- 120	- 127	- 108	- 07	- 95	- 70	- 55			
Parkinson & Bouts	1135	2	- 47	- 48	- 46	- 44	- 30	- 08	- 07	- 30	- 87	- 109	- 100			
C. Frodham	3392	2	- 169	- 169	- 189	- 171	- 160	- 159	- 163	- 168	- 168	- 164	- 180			
Roskell and Co.	3392	2	- 38	- 47	- 29	- 69	- 77	- 87	- 53	- 27	- 13	- 03	- 03			
Lister and Sons	636	2	- 200	- 197	- 197	- 138	- 130	- 127	- 128	- 117	- 110	- 110	- 110			
Penlington	1799	2	- 116	- 124	- 111	- 134	- 123	- 121	- 112	- 125	- 189	- 804	- 914			
McGregor and Co.	3804	2	- 70	- 110	- 89	- 106	- 110	- 102	- 82	- 80	- 15	- 25	- 63			
C. Frodham	3392	2	- 81	- 90	- 121	- 95	- 89	- 83	- 56	- 1	- 70	- 60	- 29			
Roskell and Co.	3392	2	- 38	- 47	- 29	- 69	- 77	- 87	- 53	- 27	- 13	- 03	- 03			
Sewill	3963	2	- 61	- 70	- 91	- 75	- 84	- 88	- 112	- 130	- 120	- 175	- 175			
Hemsey	1583	2	- 12	- 20	- 07	- 12	- 13	- 13	- 13	- 13	- 13	- 13	- 41			
McGregor and Co.	3804	2	- 121	- 140	- 119	- 128	- 148	- 132	- 123	- 103	- 160	- 181	- 204			
Shepherd and Son	1722	2	- 165	- 165	- 168	- 164	- 160	- 158	- 170	- 187	- 101	- 104	- 95			
Lister and Sons	636	2	- 177	- 180	- 184	- 206	- 215	- 212	- 158	- 158	- 158	- 158	- 158			
Russell and Son	9080	2	- 70	- 80	- 91	- 127	- 122	- 133	- 127	- 140	- 169	- 181	- 166			
Hemsey and Son	726	2	- 01	- 23	- 18	- 64	- 84	- 62	- 18	- 00	- 20	- 10	- 05			
Cairns	789	2	- 115	- 127	- 89	- 108	- 169	- 142	- 97	- 86	- 207	- 201	- 193			
J. Fletcher	2940	2	- 03	- 07	- 06	- 13	- 11	- 20	- 28	- 42	- 08	- 20	- 25			
Whiffin	322	2	- 124	- 130	- 117	- 133	- 120	- 108	- 85	- 60	- 23	- 06	- 32			
J. Fletcher	2888	2	- 55	- 49	- 36	- 51	- 41	- 38	- 34	- 35	- 35	- 32	- 32			
Broderick	5197	2	- 33	- 28	- 91	- 03	- 02	- 25	- 51	- 69	- 70	- 110	- 121			
Parkinson & Bouts	1147	2	- 69	- 70	- 69	- 07	- 06	- 03	- 02	- 00	- 110	- 120	- 97			
G. E. Frodham	4334	2	- 90	- 90	- 91	- 94	- 95	- 103	- 107	- 110	- 70	- 85	- 77			
J. Fletcher	2912	2	- 55	- 49	- 36	- 51	- 41	- 38	- 34	- 35	- 35	- 32	- 32			
C. Frodham	3372	2	- 35	- 40	- 51	- 103	- 96	- 93	- 87	- 91	- 191	- 198	- 213			
Usher and Cole	427	2	- 148	- 125	- 99	- 128	- 121	- 121	- 121	- 121	- 121	- 121	- 121			
J. B. Fletcher	2972	2	- 109	- 87	- 89	- 74	- 50	- 48	- 65	- 75	- 178	- 177	- 175			
Dent	2640	2	- 11	- 21	- 75	- 28	- 30	- 43	- 72	- 80	- 70	- 62	- 54			
Isaac	436	2	- 93	- 80	- 72	- 32	- 18	- 12	- 43	- 38	- 45	- 44	- 66			
Lowry	1569	2	- 286	- 242	- 232	- 188	- 155	- 162	- 181	- 167	- 50	- 55	- 55			
Dobble	3893	2	- 34	- 50	- 41	- 16	- 08	- 38	- 47	- 45	- 105	- 120	- 125			
Hemsey	1583	2	- 169	- 165	- 169	- 74	- 59	- 77	- 98	- 88	- 32	- 60	- 63			
Glover	352	2	- 181	- 242	- 437	- 393	- 414	- 484	- 488	- 432	- 242	- 362	- 338			
Isaac	328	2	- 02	- 12	- 13	- 27	- 69	- 67	- 98	- 50	- 47	- 161	- 169			
Currier	718	2	- 26	- 20	- 21	- 38	- 38	- 33	- 08	- 40	- 17	- 22	- 60			
Glover	351	2	- 617	- 609	- 554	- 536	- 504	- 544	- 508	- 508	- 419	- 368	- 330			
F. Fletcher	2924	2	- 94	- 102	- 104	- 146	- 129	- 104	- 180	- 180	- 237	- 280	- 283			
Cairns	800	2	- 72	- 75	- 85	- 48	- 56	- 51	- 53	- 17	- 25	- 80	- 123			
Shepherd and Son	1727	2	- 318	- 325	- 331	- 253	- 213	- 222	- 244	- 239	- 26	- 06	- 08			
Currier	719	2	- 223	- 267	- 274	- 229	- 237	- 220	- 174	- 204	- 272	- 276	- 287			
Chronometrical Thermometer			- 1465	- 1590	- 1834	- 1079	- 963	- 1201	- 1401	- 1540	- 6015	- 688	- 8103			
Extremes of Temperature as shown by the Self-Registering Thermometers			44-51	41-50	39-47	46-48	40-45	49-52	44-49	43-51	38-50	54-58	66-87			

The sign + indicates that the rate is gaining.

† During those 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 influences 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 or MAKER.		No.				
Mar 27 to April 3	April 3 to 10	April 10 to 17	April 17 to 24	April 24 to May 1	May 1 to 8	May 8 to 15	May 15 to 22	May 22 to 29	May 29 to June 5	June 5 to 12	June 12 to 19	June 19 to 26	June 26 to July 3	July 3 to 10	July 10 to 17	July 17 to 24	July 24 to 31			
- 40	- 12	- 21	- 08	- 18	- 13	- 09	- 06	- 01	- 18	- 11	- 09	- 06	- 14	- 19	- 28	- 31	- 24	- 14	J. B. Fletcher	2972
- 13	- 10	- 09	- 18	- 13	- 09	- 06	- 01	- 18	- 11	- 09	- 06	- 14	- 19	- 28	- 31	- 24	- 14	- 14	Wh. Brin	5076
- 21	- 08	- 01	- 07	- 09	- 18	- 07	- 26	- 23	- 09	- 09	- 17	- 33	- 04	- 19	- 28	- 31	- 24	- 14	Dent	5489
- 06	- 18	- 09	- 03	- 14	- 05	- 13	- 11	- 15	- 06	- 02	- 12	- 00	- 21	- 10	- 09	- 04	- 18	- 24	Curran	1642
- 05	- 10	- 19	- 19	- 23	- 05	- 04	- 20	- 06	- 10	- 21	- 11	- 09	- 04	- 18	- 24	- 31	- 24	- 14	Kulberg	2549
+ 43	+ 65	+ 67	71	87	90	95	90	105	+ 113	+ 110	+ 65	+ 30	+ 14	97	50	70	80	80	W. P. Birchall	181
+ 23	+ 60	+ 21	+ 63	+ 52	+ 75	+ 70	+ 61	+ 64	+ 73	+ 71	+ 61	+ 64	+ 73	+ 71	+ 61	+ 64	+ 73	+ 71	Donington	3096
- 50	- 32	- 42	- 38	- 23	- 20	- 16	- 14	- 10	- 20	- 35	- 06	- 09	- 01	+ 35	+ 29	+ 25	+ 34	+ 28	Chittenden	740
+ 103	+ 40	+ 81	+ 77	+ 67	+ 67	+ 65	+ 75	+ 97	+ 75	+ 75	+ 75	+ 75	+ 75	+ 75	+ 75	+ 75	+ 75	+ 75	Parkinson and Beards	1115
- 170	- 178	- 171	- 164	- 157	- 155	- 157	- 156	- 141	- 179	- 110	- 137	- 172	- 153	- 133	- 105	- 93	- 84	- 78	Kulberg	3043
- 100	- 85	- 129	- 133	- 128	- 125	- 125	- 125	- 120	- 140	- 92	- 114	- 154	- 115	- 116	- 128	- 106	- 115	- 115	Lister and Sons	636
- 210	- 158	- 148	- 157	- 171	- 176	- 160	- 160	- 124	- 155	- 101	- 125	- 144	- 145	- 145	- 145	- 145	- 145	- 145	McGregor and Co.	1799
- 78	- 32	- 49	- 02	- 34	- 46	- 55	- 07	- 10	- 01	- 43	- 23	- 28	- 00	- 20	- 15	- 05	- 05	- 05	McGregor and Co.	3804
+ 50	+ 95	+ 36	+ 47	+ 43	+ 64	+ 45	+ 45	+ 60	+ 60	+ 95	+ 114	+ 41	+ 80	+ 63	+ 70	+ 95	+ 95	+ 95	C. Frodham	3993
+ 27	+ 80	+ 36	+ 16	+ 12	- 05	- 07	- 02	- 06	- 05	- 10	- 24	- 37	- 40	+ 34	+ 10	+ 01	+ 01	+ 01	Ronell and Co.	3901
- 187	- 188	- 178	- 180	- 183	- 194	- 190	- 195	- 211	- 203	- 250	- 197	- 163	- 185	- 185	- 197	- 208	- 210	- 210	Sevill	2965
- 40	- 15	- 49	- 58	- 47	- 54	- 57	- 53	- 70	- 61	- 79	- 131	- 159	- 145	- 70	- 99	- 106	- 93	- 93	Hennesy and Son	4053
- 180	- 205	- 219	- 205	- 213	- 183	- 190	- 192	- 188	- 210	- 210	- 240	- 299	- 280	- 220	- 210	- 187	- 185	- 185	Parkinson and Co.	1474
- 95	- 145	- 145	- 132	- 102	- 98	- 75	- 75	- 75	- 75	- 75	- 75	- 75	- 75	- 75	- 75	- 75	- 75	- 75	Shepherd and Son	1732
- 115	- 128	- 119	- 130	- 124	- 129	- 155	- 180	- 163	- 166	- 179	- 227	- 283	- 219	- 147	- 126	- 123	- 115	- 115	Lister and Sons	636
+ 174	+ 171	+ 175	+ 182	+ 183	+ 208	+ 206	+ 203	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	Russell and Son	6080
- 40	- 15	- 49	- 58	- 47	- 54	- 57	- 53	- 70	- 61	- 79	- 131	- 159	- 145	- 70	- 99	- 106	- 93	- 93	Hennesy and Son	750
- 150	- 100	- 179	- 143	- 163	- 125	- 150	- 129	- 136	- 140	- 171	- 181	- 166	- 139	- 146	- 143	- 143	- 143	- 143	Cairns	786
- 40	- 15	- 49	- 58	- 47	- 54	- 57	- 53	- 70	- 61	- 79	- 131	- 159	- 145	- 70	- 99	- 106	- 93	- 93	Whiffin	750
+ 60	+ 36	+ 14	+ 02	- 08	+ 14	+ 12	+ 18	+ 19	+ 21	+ 65	+ 82	+ 128	+ 136	+ 120	+ 109	+ 113	+ 113	+ 113	Whiffin	2888
- 13	- 44	- 54	- 75	- 52	- 76	- 89	- 103	- 113	- 91	- 58	- 114	- 135	- 84	+ 70	+ 65	+ 71	+ 94	+ 94	J. Fletcher	2888
- 110	- 145	- 112	- 106	- 133	- 144	- 150	- 140	- 136	- 140	- 111	- 111	- 107	- 107	- 109	- 169	- 175	- 183	- 183	Brotherman	5107
- 10	- 40	- 38	- 63	- 40	- 53	- 35	- 35	- 35	- 35	- 35	- 35	- 35	- 35	- 35	- 35	- 35	- 35	- 35	Parkinson and Beards	1117
- 93	- 55	- 81	- 47	- 42	- 35	- 41	- 24	- 15	- 15	- 15	- 15	- 15	- 15	- 15	- 15	- 15	- 15	- 15	Curran	1642
- 105	- 125	- 121	- 127	- 156	- 130	- 200	- 200	- 200	- 180	- 00	- 00	- 109	- 148	- 208	- 205	- 220	- 286	- 286	P. Fletcher	2913
+ 192	+ 121	+ 205	+ 127	+ 187	+ 143	+ 169	+ 163	+ 180	+ 170	+ 266	+ 239	+ 199	+ 185	+ 151	+ 168	+ 168	+ 161	+ 161	C. Frodham	3372
- 125	- 82	- 107	- 80	- 70	- 83	- 87	- 82	- 21	- 14	- 14	- 96	- 93	- 63	- 32	- 50	- 40	- 25	- 25	Usher and Cole	3571
- 44	- 169	- 181	- 242	- 203	- 219	- 191	- 229	- 215	- 230	- 95	- 65	- 47	- 121	- 145	- 143	- 143	- 143	- 143	Dent	5489
- 73	- 22	- 24	- 06	- 03	- 24	- 36	- 145	- 180	- 225	- 137	- 103	- 99	- 116	- 159	- 189	- 181	- 509	- 509	Isaac	436
- 45	- 165	- 32	- 38	- 05	- 18	- 33	- 34	- 20	- 16	- 16	- 33	- 24	- 24	- 40	- 40	+ 17	+ 23	+ 23	Lowry	1569
- 120	- 35	- 59	- 02	- 28	- 05	- 06	- 19	- 23	- 13	- 09	- 120	- 173	- 117	- 50	- 75	- 06	- 03	- 03	Dobbie	3890
- 50	- 80	- 56	- 46	- 63	- 58	- 57	- 45	- 38	- 76	- 33	- 30	- 26	- 70	+ 115	+ 124	+ 140	+ 163	+ 163	Hennesy	1531
- 350	- 520	- 421	- 522	- 407	- 559	- 551	- 560	- 553	- 560	- 390	- 380	- 282	- 495	- 485	- 485	- 485	- 485	- 485	Isaac	3228
+ 200	+ 15	+ 11	+ 15	+ 11	+ 06	+ 02	+ 02	+ 05	+ 00	+ 15	+ 70	- 109	- 106	- 84	+ 59	+ 46	+ 46	+ 46		
- 42	- 120	- 11	- 112	- 84	- 108	- 90	- 100	- 95	- 95	- 73	- 125	- 301	- 103	- 67	- 45	+ 34	+ 58	+ 58	Curran	718
- 290	- 275	- 299	- 293	- 290	- 273	- 282	- 343	- 381	- 244	- 359	- 287	- 225	- 247	- 225	- 247	- 225	- 247	- 247	Glover	351
- 290	- 30	- 145	- 163	- 167	- 151	- 177	- 144	- 154	- 150	- 270	- 297	- 298	- 300	- 295	- 281	- 279	- 280	- 280	F. Fletcher	2921
- 290	- 30	- 145	- 163	- 167	- 151	- 177	- 144	- 154	- 150	- 270	- 297	- 298	- 300	- 295	- 281	- 279	- 280	- 280	Curran	718
- 17	- 900	- 83	- 140	- 93	- 130	- 100	- 150	- 130	- 145	- 34	- 26	+ 25	+ 21	- 38	- 29	- 09	- 16	- 16	Shepherd and Son	1937
- 382	+ 145	- 194	- 13	+ 02	+ 195	+ 60	+ 215	+ 195	+ 330	- 331	- 344	- 335	- 375	- 231	- 339	- 320	- 300	- 300	Curran	718
+ 900	+ 1200	+ 2701	+ 1887	+ 4477	+ 6883	+ 5425	+ 7840	+ 7143	+ 7275	+ 15130	+ 21200	+ 24705	+ 18750	+ 535	+ 3020	+ 4885	+ 3605	+ 3605	Chromothermal Thermometer	
54	- 86	- 45	- 53	- 56	13	- 59	57	- 64	54	- 60	56	- 62	53	- 59	53	- 64	51	- 60	[Exhaust of Temperature is shown by the Self-Registering	

NAME or MAKER.	No.	Construction of Escapement and Balance, Description furnished by the Maker.	(II.) WEEKLY SUMS OF DAILY RATES												IN THE ORDER OF TEMPERATURE, AS DETERMINED BY THE CHRONOMETRIC THERMOMETER.												NAME or MAKER.	No.					
			Jan. 23-30	Jan. 16-23	Feb. 27 Mar. 6	Jan. 30-27	Jan. 9-16	Feb. 13-20	April 3-10	Jan. 10-Feb. 6	Feb. 6-13	April 17-24	May 1-12	May 10-17	May 20-27	May 1-8	May 8-15	April 10-17	April 17-24	July 1-8	July 8-15	March 1-8	March 15-22	March 22-29	March 29-Apr. 5	June 5-12	June 12-19	June 19-26					
J. B. Fletcher	2972	Auxiliary compensation.	- 89	- 65	- 55	- 48	- 57	- 37	- 38	- 42	- 34	- 49	- 95	- 51	- 56	- 47	- 52	- 53	- 51	- 21	- 26	- 14	- 19	- 26	- 39	- 40	- 40	- 18	- 30	- 10	J. B. Fletcher	2972	
Whiffin	2988	Auxiliary compensation.	- 44	- 50	- 47	- 19	- 44	- 17	- 18	- 44	- 17	- 18	- 38	- 41	- 46	- 47	- 52	- 53	- 51	- 21	- 26	- 14	- 19	- 26	- 39	- 40	- 40	- 18	- 30	- 10	Whiffin	2988	
Dent	2992	Auxiliary setting in cold.	- 72	- 73	- 50	- 53	- 81	- 62	- 68	- 65	- 73	- 67	- 26	- 20	- 22	- 18	- 07	- 09	- 01	- 33	- 14	- 04	- 06	- 18	- 21	- 20	- 21	- 09	- 17	- 16	Dent	2992	
Kullberg	1488	Kullberg's flat rim balance, without auxiliary.	- 42	- 15	- 40	- 32	- 05	- 13	- 38	- 13	- 10	- 03	- 11	- 15	- 19	- 05	- 10	- 14	- 09	- 00	- 19	- 13	- 21	- 15	- 13	- 09	- 06	- 30	- 13	- 26	Kullberg	1488	
Kullberg	1489	Kullberg's flat rim balance, without auxiliary.	- 02	- 03	- 13	- 02	- 07	- 23	- 10	- 13	- 10	- 03	- 11	- 15	- 19	- 05	- 10	- 14	- 09	- 00	- 19	- 13	- 21	- 15	- 13	- 09	- 06	- 30	- 13	- 26	Kullberg	1489	
W. P. Birchall	181	Ordinary balance, with a slight alteration.	+ 21	- 15	+ 20	+ 17	- 15	- 07	+ 65	- 12	- 19	+ 71	+ 90	+ 115	+ 105	+ 90	+ 95	+ 87	+ 67	+ 57	+ 59	+ 80	+ 70	+ 04	+ 19	+ 42	+ 43	+ 110	+ 14	+ 65	+ 20	W. P. Birchall	181
Dent	3096	Dent's patent balance.	+ 101	+ 87	+ 87	+ 85	+ 66	+ 60	+ 70	+ 64	+ 66	+ 80	+ 80	+ 73	+ 85	+ 75	+ 70	+ 53	+ 54	+ 77	+ 73	+ 110	+ 90	+ 29	+ 35	+ 15	+ 25	+ 71	+ 64	+ 61	+ 61	Dent	3096
Chittenden	3094	Auxiliary setting in cold.	- 94	- 125	- 104	- 95	- 105	- 127	- 92	- 126	- 120	- 98	- 14	- 20	- 20	- 16	- 23	- 42	- 33	- 29	- 34	- 25	- 70	- 63	- 60	- 59	- 23	- 01	- 06	- 08	Chittenden	3094	
Parkinson & Bouts	1135	Auxiliary to balance acting in extremes.	+ 40	+ 28	+ 30	+ 07	+ 47	+ 08	+ 40	+ 44	+ 20	+ 77	+ 93	+ 57	+ 75	+ 80	+ 67	+ 81	+ 76	+ 59	+ 35	+ 35	+ 87	+ 108	+ 100	+ 105	+ 98	+ 70	+ 85	+ 75	Parkinson & Bouts	1135	
Dent	3042	Dent's patent balance.	- 189	- 182	- 168	- 163	- 159	- 152	- 178	- 171	- 164	- 164	- 156	- 179	- 161	- 152	- 147	- 171	- 171	- 135	- 135	- 93	- 105	- 158	- 164	- 160	- 170	- 110	- 172	- 157	- 163	Dent	3042
Lister and Sons	636	Poole's auxiliary.	- 197	- 157	- 128	- 128	- 200	- 127	- 85	- 128	- 130	- 133	- 195	- 140	- 120	- 125	- 125	- 128	- 138	- 139	- 116	- 128	- 113	- 106	- 117	- 110	- 100	- 92	- 115	- 114	- 154	Lister and Sons	636
Pennington	1799	Auxiliary compensation to the balance.	+ 111	+ 124	+ 125	+ 113	+ 116	+ 131	+ 108	+ 142	+ 128	+ 167	+ 160	+ 105	+ 125	+ 126	+ 126	+ 148	+ 169	+ 133	+ 145	+ 145	+ 185	+ 200	+ 916	+ 210	+ 101	+ 145	+ 133	+ 144	Pennington	1799	
McGregor and Co.	3054	Poole's auxiliary compensation.	- 89	- 110	- 80	- 83	- 70	- 102	- 32	- 106	- 110	- 02	- 07	- 15	- 10	- 45	- 25	- 34	- 43	- 00	- 20	- 05	- 15	- 15	- 25	- 65	- 78	- 01	- 21	- 49	- 91	McGregor and Co.	3054
C. Frodham	3292	Ordinary compensation balance, with equation compensation clock-piece fitted on the arm of the balance.	+ 131	- 90	+ 51	+ 56	+ 81	+ 83	+ 95	+ 93	+ 87	+ 43	+ 65	+ 65	+ 64	+ 45	+ 43	+ 36	+ 80	+ 65	+ 95	+ 70	+ 62	+ 29	+ 100	+ 60	+ 41	+ 95	+ 114	+ 95	C. Frodham	3292	
Roskell and Co.	2974	Kullberg's double rim balance, without auxiliary.	- 29	- 47	- 37	- 53	- 38	- 57	- 80	- 69	- 77	- 16	- 02	- 05	- 06	- 05	- 07	- 12	+ 36	+ 34	+ 10	+ 11	- 00	- 13	+ 05	+ 03	+ 27	- 10	+ 40	+ 24	+ 37	Roskell and Co.	2974
Seewill	2965	Auxiliary compensation.	+ 91	+ 70	+ 130	+ 113	+ 61	- 88	+ 188	+ 75	+ 84	+ 180	+ 195	+ 211	+ 211	+ 194	+ 100	+ 183	+ 178	+ 188	+ 185	+ 308	+ 307	+ 120	+ 175	+ 173	+ 187	+ 203	+ 163	+ 220	+ 197	Seewill	2965
Hamsey	1553	Auxiliary compensation.	+ 03	+ 10	+ 12	+ 13	+ 15	+ 16	+ 18	+ 19	+ 23	+ 35	+ 40	- 33	- 40	- 40	- 50	- 33	- 49	- 30	- 36	- 40	- 79	- 65	- 41	- 20	- 50	- 50	- 65	- 80	Hamsey	1553	
McGregor and Co.	3054	Usual auxiliary compensation.	- 119	- 140	- 105	- 123	- 121	- 122	- 205	- 128	- 148	- 205	- 192	- 191	- 188	- 183	- 190	- 213	- 192	- 210	- 210	- 183	- 157	- 169	- 181	- 204	- 180	- 219	- 200	- 240	- 209	McGregor and Co.	3054
Shepherd and Son	1732	Ordinary compensation balance, with a small addition.	+ 186	+ 165	+ 167	+ 170	+ 165	+ 128	+ 150	+ 164	+ 140	+ 166	+ 129	+ 126	+ 120	+ 120	+ 188	+ 68	+ 85	+ 80	+ 90	+ 90	+ 101	+ 104	+ 95	+ 95	+ 75	+ 74	+ 70	+ 40	Shepherd and Son	1732	
Later and Sons	635	Poole's auxiliary.	- 154	- 145	- 158	- 170	- 177	- 182	- 125	- 106	- 215	- 130	- 180	- 166	- 163	- 150	- 155	- 148	- 110	- 147	- 126	- 113	- 125	- 102	- 108	- 110	- 113	- 179	- 219	- 227	- 259	Later and Sons	635
Russell and Son	9080	Auxiliary compensation.	+ 91	+ 80	+ 140	+ 127	+ 70	+ 133	+ 171	+ 127	+ 123	+ 182	+ 205	+ 210	+ 210	+ 208	+ 208	+ 173	+ 178	+ 189	+ 153	+ 170	+ 160	+ 169	+ 181	+ 168	+ 174	+ 123	+ 111	+ 96	+ 85	Russell and Son	9080
Hamsey and Son	756	Auxiliary compensation to the balance.	+ 18	- 25	- 00	- 10	- 01	- 62	- 15	- 04	- 94	- 55	- 35	- 61	- 70	- 84	- 57	- 47	- 40	- 70	- 99	- 95	- 106	- 30	- 10	- 93	- 40	- 79	- 145	- 135	- 107	Hamsey and Son	756
Colins	1599	Auxiliary to balance.	- 89	- 127	- 98	- 97	- 115	- 142	- 100	- 128	- 188	- 163	- 108	- 140	- 126	- 123	- 150	- 163	- 179	- 139	- 149	- 145	- 207	- 201	- 193	- 150	- 171	- 160	- 198	- 218	- 198	Colins	1599
J. Fletcher	2940	Auxiliary compensation.	- 06	- 07	- 42	- 28	- 03	- 28	+ 115	+ 13	+ 115	+ 117	+ 107	+ 103	+ 111	+ 145	+ 104	+ 142	+ 133	+ 61	+ 60	+ 75	+ 76	- 08	- 20	+ 28	+ 20	+ 50	+ 33	+ 66	+ 64	J. Fletcher	2940
Whiffin	322	Auxiliary compensation.	- 117	- 110	- 60	- 85	- 124	- 100	- 38	- 123	- 130	- 02	+ 16	+ 21	+ 19	+ 14	+ 12	- 08	+ 14	+ 126	+ 122	+ 113	+ 109	- 23	+ 06	+ 33	+ 60	+ 65	+ 158	+ 70	+ 82	Whiffin	322
J. Fletcher	2988	Auxiliary compensation.	+ 38	+ 40	+ 63	+ 34	+ 55	+ 38	+ 64	+ 51	+ 41	+ 75	+ 103	+ 126	+ 126	+ 126	+ 120	+ 123	+ 112	+ 108	+ 156	+ 183	+ 175	+ 70	+ 110	+ 121	+ 124	+ 102	+ 155	+ 111	+ 107	J. Fletcher	2988
Brotherton	5157	Construction as in former years.	+ 91	+ 28	+ 69	+ 51	+ 38	+ 25	+ 145	+ 93	+ 02	+ 136	+ 140	+ 126	+ 126	+ 126	+ 120	+ 123	+ 112	+ 108	+ 156	+ 183	+ 175	+ 70	+ 110	+ 121	+ 124	+ 102	+ 155	+ 111	+ 107	Brotherton	5157
Parkinson & Bouts	1135	Auxiliary to balance acting in extremes.	- 69	- 70	- 00	- 02	- 60	- 03	+ 94	+ 97	+ 06	+ 42	+ 24	- 13	- 15	- 35	+ 41	+ 42	+ 51	+ 13	- 14	- 20	- 20	+ 110	+ 120	+ 97	+ 93	+ 19	+ 25	+ 30	- 08	Parkinson & Bouts	1135
G. E. Frodham	6234	Auxiliary for extreme heat.	+ 91	+ 90	+ 110	+ 107	+ 60	+ 103	+ 155	+ 94	+ 95	+ 167	+ 200	+ 180	+ 200	+ 180	+ 150	+ 161	+ 161	+ 208	+ 205	+ 286	+ 220	+ 70	+ 85	+ 75	+ 105	+ 80	+ 145	+ 90	+ 109	G. E. Frodham	6234
Y. Fletcher	2913	Auxiliary compensation.	+ 180	+ 200	+ 180	+ 150	+ 161	+ 161	+ 208	+ 205	+ 286	+ 220	+ 70	+ 85	+ 75	+ 105	+ 80	+ 145	+ 90	+ 109	+ 109	+ 109	+ 109	+ 109	+ 109	+ 109	+ 109	+ 109	+ 109	+ 109	+ 109	Y. Fletcher	2913
C. Frodham	3372	{ New continuous auxiliary to balance; has also patent apparatus for recording its rate on chronographs.	+ 51	+ 40	+ 91	+ 87	+ 35	+ 93	+ 121	+ 108	+ 96	+ 137	+ 163	+ 170	+ 180	+ 143	+ 160	+ 187	+ 205	+ 151	+ 163	+ 161	+ 168	+ 191	+ 198	+ 213	+ 192	+ 226	+ 185	+ 229	+ 199	C. Frodham	3372
Vicker and Cole	171	Auxiliary to balance.	- 87	- 87	- 72	- 65	+ 105	- 88	- 82	- 129	- 115	- 88	- 83	- 41	- 51	- 63	- 57	- 70	- 107	- 33	- 50	- 25	- 40	- 78	- 177	- 175	- 135	- 114	- 63	- 96	- 95	Vicker and Cole	171
J. B. Fletcher	2972	Auxiliary compensation.	- 89	- 65	- 55	- 48	- 57	- 37	- 38	- 42	- 34	- 49	- 95	- 51	- 56	- 47	- 52	- 53	- 51	- 21	- 26	- 14	- 19	- 26	- 39	- 40	- 40	- 18	- 30	- 10	- 10	J. B. Fletcher	2972
Dent	3042	Auxiliary balance, with slight alteration.	+ 75	+ 21	- 00	- 72	- 11	- 43	+ 135	+ 25	+ 28	+ 55	+ 83	+ 123	+ 00	+ 78	+ 70	+ 44	+ 18	+ 109	+ 90	+ 154	+ 120	+ 70	+ 63	+ 54	+ 73	- 12	- 01	+ 5	- 80	Dent	3042
Isaac	456	Ordinary balance, with auxiliary.	- 79	- 90	- 25	- 43	- 98	- 42	- 22	- 22	- 39	- 08	- 145	- 125	- 120	- 14	- 36	- 05	- 34	+ 195	+ 189	+ 205	+ 181	+ 45	- 44	- 96	- 73	+ 127	- 116	- 103	+ 80	Isaac	456
Lowry	1569	Ordinary auxiliary.	- 232	- 242	- 167	- 181	- 256	- 162	- 195	- 188	- 155	- 38	- 34	- 26	- 30	- 16	- 23	- 05	- 32	- 40	+ 40	+ 23	+ 17	- 55	- 55	- 55	- 45	- 16	+ 24	- 23	- 24	Lowry	1569
Dobbe	3289	Poole's auxiliary.	+ 81	+ 50	+ 45	+ 47	+ 34	+ 26	+ 35	+ 16	+ 08	+ 93	+ 160	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	+ 155	Dobbe	3289
Hamsey	1553	Auxiliary compensation.	- 169	- 143	- 88	- 98	- 153	- 77	- 80	- 74	- 59	- 46	- 48	- 78	- 58	- 57	- 63	- 56	- 115	- 124	- 135	- 140	- 39	- 50	- 45	- 25	- 70	+ 30	+ 20	+ 20	Hamsey	1553	
Glover	3352	Auxiliary acting on a flat pendulum spring.	+ 437	+ 242	+ 488	+ 484	+ 312	+ 441	+ 530	+ 393	+ 393	+ 523	+ 160	+ 505	+ 535	+ 539	+ 521	+ 497	+ 451	+ 495	+ 485	+ 480	+ 305	+ 342	+ 325	+ 350	+ 390	+ 352	+ 380	+ 358	+ 358	Glover	3352
Isaac	456	Improved balance; an alloy in atomic proportion.	- 13	- 12	- 90	- 98	-																										

NAME OF MAKER.	No.	Watches on Trial.	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.
J. B. Fletcher	2972	2	148, Leadenhall Street, London.	Auxiliary compensation.	January 9	July 31	29 - 8.9
Whiffin	598	2	East End, Finsbury, London.	Auxiliary compensation.	January 9	July 31	29 - 7.1
Dent	254928	2	33, Cockspur Street, London.	Auxiliary acting in cold.	January 9	July 31	29 - 8.1
Kailberg	1489	2	12, Cloudeley Terrace, Islington, London.	Kailberg's flat rim balance, without auxiliary.	January 9	July 31	29 - 8.4
Kailberg	1489	2	12, Cloudeley Terrace, Islington, London.	Kailberg's flat rim balance, without auxiliary.	January 9	July 31	29 - 8.1
W. P. Birchall	181	2	124, Stonefield Street, Islington, London.	Ordinary balance, with a slight alteration.	January 9	July 31	29 - 1.9
Dent	3096	2	61, Strand, London.	Dent's patent balance.	January 9	July 31	29 - 1.1
Whiffin	740	2	10, Wilton Road, Hackney, London.	Auxiliary as in former years.	January 9	July 31	29 - 12.7
Parkinson and Bouts	1135	2	59, Gracechurch Street, London.	Auxiliary to balance acting in extremes.	January 9	July 31	29 - 0.7
Dent	3043	2	61, Strand, London.	Dent's patent balance.	January 9	July 31	29 - 14.9
Lister and Sons	636	2	12, Mooley Street, Newcastle-on-Tyne.	Poole's auxiliary.	January 9	July 31	29 - 20.0
Penlington	1790	2	3, St. George's Crescent, Liverpool.	Auxiliary compensation to the balance.	January 9	July 31	29 - 10.1
McGregor and Co.	3804	2	28, Clyde Place, Glasgow.	Poole's auxiliary compensation.	January 9	July 31	29 - 11.0
C. Frodham	3392	2	84, Strand, London.	Ordinary compensation balance, with equation; equal chain-piece fitted on the arm of the balance.	January 9	July 31	29 - 2.9
Roskell and Co.	3392	2	21, Church Street, Liverpool.	Kailberg's double rim balance, without auxiliary.	January 9	July 31	29 - 7.7
Sewill	2965	2	61, South Castle Street, Liverpool.	Auxiliary compensation.	January 9	July 31	29 - 8.1
Hemsey	1553	2	5, Wind Street, Swansea.	Auxiliary compensation.	January 9	July 31	29 - 6.0
McGregor and Co.	3804	2	28, Clyde Place, Glasgow.	Equal auxiliary compensation.	January 9	July 31	29 - 29.0
Shepherd and Son	1732	2	63, Leadenhall Street, London.	Ordinary compensation balance, with a small addition.	January 9	July 31	29 - 4.6
Lister and Sons	635	2	12, Mooley Street, Newcastle-on-Tyne.	Poole's auxiliary.	January 9	July 31	29 - 28.5
Russell and Son	9080	2	30, Star Street, Liverpool.	Auxiliary compensation.	January 9	July 31	29 - 5.5
Hemsey and Son	756	2	5, Wind Street, Swansea.	Auxiliary compensation to the balance.	January 9	July 31	29 - 15.9
Cairns	789	2	12, Waterloo Road, Liverpool.	Auxiliary to balance.	January 9	July 31	29 - 21.8
J. Fletcher	2940	2	148, Leadenhall Street, London.	Auxiliary compensation.	January 9	July 31	29 - 0.8
Whiffin	322	2	East End, Finsbury, London.	Auxiliary compensation.	January 9	July 31	29 - 13.3
J. Fletcher	2888	2	148, Leadenhall Street, London.	Auxiliary compensation.	January 9	July 31	29 - 3.5
Brotherton	5197	2	11, Spencer Street, Gower Road, London.	Construction as in former years.	January 9	July 31	29 - 0.3
Parkinson and Bouts	1147	2	59, Gracechurch Street, London.	Auxiliary to balance, acting in extremes.	January 9	July 31	29 - 3.1
G. E. Frodham	6234	2	31, Gracechurch Street, London.	Auxiliary for extreme heat.	January 9	July 31	29 - 7.0
F. Fletcher	2913	2	148, Leadenhall Street, London.	Auxiliary compensation.	January 9	July 31	29 - 28.6
C. Frodham	3373	2	84, Strand, London.	New continuous auxiliary to balance; has also galvanic apparatus for receiving its time on chronograph.	January 9	July 31	29 - 3.5
Usher and Cole	717	2	46, St. John's Square, Clerkenwell, London.	Auxiliary to balance.	January 9	July 31	29 - 17.8
J. B. Fletcher	1258	2	148, Leadenhall Street, London.	Auxiliary compensation.	January 9	July 31	29 - 2.2
Dent	24848	2	33, Cockspur Street, London.	Ordinary balance, with slight alteration.	January 9	July 31	29 - 8.0
Isaac	436	2	39, Essex Street, Islington, London.	Ordinary balance, with auxiliary.	January 9	July 31	29 - 9.3
Lowry	1569	2	66, High Street, Belfast.	Auxiliary compensation.	January 9	July 31	29 - 25.6
Dobbie	3989	2	24, Clyde Place, Glasgow.	Poole's auxiliary.	January 9	July 31	29 - 17.3
Hemsey	1553	2	5, Wind Street, Swansea.	Auxiliary compensation.	January 9	July 31	29 - 16.9
Glover	359	2	4, Swinton Street, Gray's Inn Road, London.	Auxiliary acting on a flat pendulum spring.	January 9	July 31	29 - 31.2
Isaac	326	2	39, Essex Street, Islington, London.	Improved balance; in alloy in atomic proportion.	January 9	July 31	29 - 6.7
Carter	718	2	61, Cornhill, London.	Extra compensation for heat.	January 9	July 31	29 - 20.1
Glover	351	2	4, Swinton Street, Gray's Inn Road, London.	Gridiron auxiliary.	January 9	July 31	29 - 61.7
F. Fletcher	2921	2	148, Leadenhall Street, London.	Auxiliary compensation.	January 9	July 31	29 - 30.0
Cairns	800	2	12, Waterloo Road, Liverpool.	Auxiliary to balance.	January 9	July 31	29 - 28.9
Shepherd and Son	1737	2	53, Leadenhall Street, London.	Ordinary compensation balance, with a small addition.	January 9	July 31	29 - 53.1
Carter	719	2	61, Cornhill, London.	Ordinary balance.	January 9	July 31	29 - 37.5

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 directed 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 one Week and the next.	Before and after what day.	NAME OF MAKER.	No.
January 23 to 30	- 1.0	June 12 to 19†	7.9	4.7	January 30	J. B. Fletcher	2972
January 6 to 13	- 6.0	July 2 to 9	10.1	2.6	January 30	Whiffin	598
January 9 to 16	+ 3.9	January 19 to 26†	12.0	2.6	March 6†	Dent	254928
June 5 to 12†	+ 4.2	January 23 to 30	7.8	5.5	March 6†	Kailberg	1489
July 10 to 17	+ 2.9	Feb. 6 to 13; March 6 to 13†	6.9	6.9	July 10	Kailberg	1489
February 6 to 13	+ 11.5	May 29 to June 5	13.4	4.5	† June 19†; † June 19†	W. P. Birchall	181
March 20 to 27	+ 11.0	July 24 to 31	9.5	6.7	March 6†	Dent	3096
February 13 to 20	+ 3.4	July 2 to 9	10.1	2.4	July 5	Chittenden	740
February 20 to 27	+ 10.8	March 13 to 20†	10.1	6.5	April 3	Parkinson and Bouts	1135
January 23 to 30	- 9.5	July 24 to 31	9.4	6.9	January 5†	Dent	3043
January 9 to 16	- 8.5	April 2 to 9	11.5	5.9	June 5†	Lister and Sons	636
June 5 to 12†	+ 21.6	March 20 to 27	11.5	6.0	March 6†	Penlington	1790
Jan. 14 to 23; Feb. 6 to 13	+ 0.7	May 15 to 22	11.7	6.0	March 6†	McGregor and Co.	3804
March 20 to 27†	+ 13.1	January 23 to 30	10.2	7.3	† June 26†	C. Frodham	3392
February 6 to 13	+ 8.0	April 3 to 10	16.7	5.8	† April 3	Roskell and Co.	3392
January 9 to 16	+ 22.0	June 12 to 19†	11.5	5.5	† March 13†	Sewill	2965
June 19 to 26†	+ 3.5	April 3 to 10	15.9	8.4	April 10	Hemsey	1553
June 19 to 26†	- 10.1	February 27 to March 6	19.4	5.5	† June 19†	McGregor and Co.	4074
June 19 to 26†	- 18.7	February 27 to March 6	14.1	8.6	March 6†	Shepherd and Son	1732
June 19 to 26†	- 10.2	March 6 to 13†	18.1	7.2	† July 3	Lister and Sons	635
June 19 to 26†	+ 21.0	May 23 to 29; May 29 to June 5	15.5	8.7	June 5†	Russell and Son	9080
June 19 to 26†	+ 1.8	January 23 to 30	17.7	11.0	January 30	Hemsey and Son	756
June 19 to 26†	- 8.9	January 23 to 30	13.9	11.1	March 6†	Cairns	789
March 6 to 13	+ 13.6	April 17 to 24	15.3	9.5	† April 3	J. Fletcher	2940
January 30 to Feb. 6	- 13.6	July 3 to 10	26.9	4.6	† June 26†	Whiffin	322
Mar. 6 to 13†; Mar. 13 to 20†	+ 18.5	June 19 to 26†	17.0	9.8	March 6†	J. Fletcher	2888
January 30 to Feb. 6	- 18.2	July 24 to 31	18.0	9.4	January 30	Brotherton	5197
January 23 to 30	- 19.0	July 2 to 9	15.0	11.0	June 5†	Parkinson and Bouts	1147
January 16 to 23	- 12.0	March 13 to 20†	10.0	9.0	March 6†	G. E. Frodham	6234
March 6 to 13†	- 28.6	July 24 to 31	21.1	10.0	June 5†	F. Fletcher	2913
January 9 to 16	+ 26.6	June 5 to 12†	23.6	10.5	March 6†	C. Frodham	3373
March 6 to 13†	- 1.4	May 29 to June 5	11.1	10.0	March 6†	Usher and Cole	717
Mar. 13 to 20†; Mar. 20 to 27†	+ 24.2	July 17 to 24	22.0	13.5	June 5†	J. B. Fletcher	1258
January 9 to 16	+ 15.4	July 24 to 31	21.8	10.7	June 5†	Dent	24848
May 25 to 31	+ 25.2	May 29 to June 5	31.4	13.7	May 15	Isaac	436
January 9 to 16	+ 4.0	July 3 to 10; July 10 to 17	29.6	13.3	April 10	Lowry	1569
June 19 to 26†	+ 8.1	January 23 to 30	25.4	15.5	† April 3	Dobbie	3989
January 23 to 30	+ 18.2	July 24 to 31	32.4	13.6	April 10	Hemsey	1553
January 9 to 16	+ 56.0	May 15 to 22; May 29 to June 5	24.8	18.0	† April 3	Glover	359
February 13 to 20	+ 20.0	March 27 to April 3†	26.7	18.5	† April 3	Isaac	326
June 19 to 26†	+ 12.0	April 3 to 10	32.0	17.0	† July 3	Carter	718
January 9 to 16	- 23.7	July 17 to 24	39.1	13.7	May 29	Glover	351
June 26 to July 3†	- 2.0	April 3 to 10	37.0	20.0	† April 3	F. Fletcher	2921
January 19 to 26†	+ 7.2	June 10 to 16	36.1	18.0	† April 3	Cairns	800
June 23 to 30	+ 3.4	June 5 to 12†	26.5	26.5	March 6†	Shepherd and Son	1737
June 26 to July 3†	+ 23.0	May 29 to June 5	60.5	56.1	June 5†	Carter	719

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