

KG
11365
148

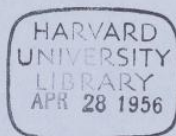
C. 5

*Sidereal and Mean Solar
Clocks.
from
February 28th 1857
to July 2^d 1858*

Sold by T. Groom & Co., Stationers, India Building, 62 State St., Boston.

KG-11365.148

KG 11365.148



Questions propounded by Mr Briggs, relative
to his clock with a circulating Pendulum

" Will a cheap clock of this kind keep better
time than one of same cost with common
pendulum? No.

" Is it probable that as great accuracy of time
keeping can be obtained by this mode as
any known method? No.

" Is the matter of the division of seconds
valuable? possibly,
It is not now however.

In order to obtain data for answering the foregoing
questions, the following experiments were instituted.

1856 March 6/7

Col. 1
Briggs

20.. 25.. 00

27.. 00

28.. 00

29.. 00

30.. 00

31.. 00

32.. 00

33.. 00

34.. 00

35.. 00

40.. 00

50.. 00

Loom

21.. 00.. 00

12.. 00

20.. 00

40.. 00

50.. 00

22.. 00.. 00

22.. 10.. 00

21.. 00

30.. 00

40.. 00

50.. 00

23.. 00.. 00

10.. 00

20.. 00

30.. 00

40.. 00

Col. 2.
E. C.

20.. 24.. 11.15

26.. 11.20

27.. 11.20

28.. 11.20

29.. 11.20

30.. 11.25

31.. 11.00

32.. 11.10

33.. 11.10

34.. 11.10

39.. 11.15

49.. 10.95

59.. 11.10 16.15

21.. 11.. 11.10 16.10

19.. 11.10 16.10

39.. 11.00 16.05

49.. 11.00 15.90

59.. 11.00 15.90

22.. 9.. 11.00 16.00

20.. 10.90 15.90

29.. 10.90 15.90

39.. 10.90 15.90

49.. 10.90 15.90

59.. 10.85 15.85

23.. 9.. 10.95 15.90

19.. 10.95 15.90

29.. 10.85 15.85

39.. 10.90 15.85

J. F. F.

Briggs Patent circulating Pendulum

+ 0.. 48.8

w. E. V.

Compared with our Federal clock by
aid of the Spring-governor. Col. 1. Briggs
Col. 2. E. C. [Federal clock]

+ 0.. 49.1

March 7 1856

W.C.B.

Briggs

2ⁿ 38ⁿ 002ⁿ 39

40

41

E.C.

2ⁿ 36ⁿ 11.0537ⁿ 11.2038ⁿ 11.0039ⁿ 11.0540ⁿ 11.0041ⁿ 11.0042ⁿ 11.0043ⁿ 11.1045ⁿ 11.0546ⁿ 11.0047ⁿ 10.9548ⁿ 11.0049ⁿ 11.0050ⁿ 11.1051ⁿ 11.1052ⁿ 11.1556ⁿ 11.2558ⁿ 11.2059ⁿ 11.053ⁿ 00ⁿ 11.153ⁿ 1ⁿ 11.10+ 1ⁿ 48^s 1The minute is probably
not lost.

33

✓

+ 1ⁿ 48^s 9

March 7/8

E.C. 20ⁿ 6ⁿ 00Briggs 20ⁿ 7ⁿ 22.9+ 1ⁿ 22.9Briggs 20ⁿ 10ⁿ 00 — 20ⁿ 11ⁿ 00E.C. 20ⁿ 9ⁿ 38.5 — 20ⁿ 10ⁿ 38.45+ 1ⁿ 22.5

March 9th noon not wound

8.8

B-23. 4.0

23. 5.12.4

5.0

6. 12.5

6.0

7. 12.5

7.0

8. 12.65

8.0

9. 12.60

12.00

13. 12.70 - 1. 12.7

wound up at noon

12th P.M.

E.C. - 3.34.0

B - 3.34.29

+ 0.19.0

E.C. - 3.35.0

B - 3.35.19

9th P.M.

B - 3. 2.0

E.C. - 3.02.26.6

3.0

3. 26.65

4.0

4. 26.75

5.0

5. 26.75

5.6.0

9. 27.00

13th P.M.

B - 2.48.0 - E.C.

" - 2.49.0 - "

14 Am.

E.C. - 20.18.0

B - 20.20.26.25

+ 2.26.3

E.C. 20.19.0

B. 20.21.26.30

+ 2.26.3

10 P.M.

E.C. - 4. 2.0

B - 4. 0.39.30

- 1.20.70

11th P.M.

B. 5. 2.00

5. 5.15.0

11th Am.

E.C. - 23. 7.0

B - 23. 6.37.3

- 0.22.7

E.C. - 23. 8.0

B - 23. 7.37.2

- 0.22.8

12th Am.

E.C. - 19.40.0

B - 19.40.5.30

+ 5.30

March 7/8 1856

Briggs	g. b	
20 ^h 18 ^m 00	20 ^h 16 ^m 39.0	44.0
20 ^h 00	18 ^m 39.2	44.15
21 ^h 00	19 ^m 39.2	44.30
34 ^h 00	32 ^m 40.25	45.20
35 ^h 00	33 ^m 40.30	45.30
36 ^h 00	34 ^m 40.40	45.25
37 ^h 00	35 ^m 40.45	45.35
39 ^h 00	37 ^m 40.65	45.65
42 ^h 00	40 ^m 40.90	45.90
45 ^h 00	43 ^m 41.00	46.00
50 ^h 00	48 ^m 41.35	46.40
59 ^h 00	57 ^m 41.90	46.90
21 ^h 50 ^m 00	58 ^m 41.90	47.00
21 ^h 1 ^m 00	59 ^m 42.00	47.00
6 ^h 00	21 ^m 42.50	47.45
7 ^h 00	5 ^m 42.60	47.50
8 ^h 00	6 ^m 42.70	47.65
9 ^h 00	7 ^m 42.70	47.75
10 ^h 00	8 ^m 42.80	47.80
wound up - minute hand accidentally pushed back in winding - probably 1 minute		
13 ^h 00	12 ^m 43.00	48.15
14 ^h 00	13 ^m 43.10	48.20
15 ^h 00	14 ^m 43.25	48.25
16 ^h 00	15 ^m 43.45	48.50
17 ^h 00	16 ^m 45.50	48.60
22 ^h 00	21 ^m 44.00	49.00
38 ^h 00	37 ^m 45.50	50.50
39 ^h 00	38 ^m 45.60	50.60
40 ^h 00	39 ^m 45.65	50.70
22 ^h 00 ^m 00	59 ^m 47.20	52.30
1 ^h 00	22 ^m 47.30	52.35
2 ^h 00	1 ^m 47.40	52.50
11 ^h 00	10 ^m 48.20	53.20
12 ^h 00	11 ^m 48.35	53.35

+ 1^m 21.0+ 1^m 17.2+ 0^m 17.0+ 0^m 11.7

March 14thBriggs' Patent
wound up.

EC - 23. 55. 31.8

56. 31.75

57. 31.7

57. 31.75

58. 1.7

58. 31.65

59. 1.65

23. 59. 31.60

0. 00. 1.50

0. 00. 31.50

Briggs - 11. 58. 00 D + 2. 28.2

59. 00 AT

59. 30

12. 00. 00

00. 30

1. 00

1. 30

2. 00

2. 30

12. 3. 00

+ 2. 28.5

EC - 0. 8. 31.0

9. 1.0

9. 30.95

10. 30.9

11. 1.0

11. 30.9

12. 0.95

0. 12. 30.85

Briggs - 12. 11. 0

+ ~~2. 29.0~~

11. 30 break

12. 00 B

12. 30 DB

13. 00

13. 30

14. 00 D

14. 30 B

15. 00 D

EC - 0. 30. 30.25

31. 0.20

31. 30.20

32. 0.15

32. 30.15

33. 0.15

33. 30.15

Briggs - 12. 33. 0 D

+ 2. 29.7

33. 30. B

34. 00 D

34. 30 B

35. 00 D

35. 30 B

36. 00. D

the mount hand
half distance
when the second hand
is up - ?

EC - 1. 6. 28.80

6. 58.80

7. 28.75

7. 58.80

8. 28.75

8. 58.70

9. 28.75

14. 26.50

14. 58.40

Briggs - 1. 09. 0. D

9. 30. B

10. 00.

10. 30

11. 00

11. 30

12. 00

17. 00 D

17. 30 B + 2. 31.6

March $\frac{14}{15}$

Briggs Patent

EC - 21. 11. 59.7
 12. 29.65
 12. 59.6
 13. 29.5
 13. 59.5
 14. 29.5
~~14~~

Briggs - 21. $\frac{15}{16}$ - 0.0 D1 mt. hand held
 16 30.1 B distance between
 17 00 2 the mt marks
 17. 30 - B when the sound
 18. 00 - D mark 0 -
 18. 30. B

EC - 21. 23. 59.5
 24. 29.55
 24. 59.55
 25. 29.50
 25. 59.60
 26. 29.55

21. $\frac{2}{3}$ 0 D
 28. 30 B
 29. 00 D
 29. 30 B
 30. 00 D
 30. 30 B

EC - 21. 43. 59.6
 44. 29.65
 44. 59.65
 45. 29.70
 45. 59.65
 46. 29.80

21. 48. 0.1
 30. B
 49. 00. D
 30. B
 50. 00. D
 30. B calc + $\frac{1}{2}$ 0.2

EC.

22. 35. 0. D
 30. B wrong
 36. 0. D
 30. B
 37. 00. D
 30. B put mt hand
 towards the mist

EC

22. 40. 0 D
 30. B
 41. 0. D
 30 B
 42. 00 D
 30

March 15th

E C - 22ⁿ 42ⁿ 59.4
 43ⁿ 29.3
 43ⁿ 59.35
 44ⁿ 29.30
 44ⁿ 59.30
 45ⁿ 29.20

Briggs - 22ⁿ 46.00 D + 3ⁿ 0.6
 30.13
 47.00
 30
 48.00
 30 wound apr

E C - 4ⁿ 7ⁿ 54.5
 8ⁿ 24.5
 8ⁿ 54.5
 9ⁿ 24.45
 9ⁿ 54.55
 10ⁿ 24.40

Briggs - 4ⁿ 12.0 D
 30.13
 13.0
 30
 14.00
 30 + 4ⁿ 5.6

16/17

E C - 18ⁿ 23ⁿ 34.0
 24ⁿ 4.0
 24ⁿ 34.0
 25ⁿ 3.95
 25ⁿ 33.95
 26ⁿ 4.00

Briggs - 18ⁿ 24.00 D + 4ⁿ 26.0
 30.13
 29.00
 30
 30.00
 18 30.30

E C - 20ⁿ 39ⁿ 30.15
 40ⁿ 0.15
 40ⁿ 30.15
 41ⁿ 0.20
 41ⁿ 30.15
 42ⁿ 0.15

20ⁿ 44ⁿ 00 D
 30
 45.00
 30
 46.00
 30 + 4ⁿ 29.9

March 17/18

block stopped, started with E.C.
at $21\frac{1}{2}^h$

Briggs

21^h 31^m 0031^m 3032^m 0032^m 3033^m 0033^m 30

Briggs -

22.57.00.0

30.

58.00

30

Date	Rate	Rate	Remarks
1856			
March 6/7	20 ^h 25 ^m	+0 ^m 48.8	
" "	23 ^m 40	+0 ^m 49.1	
" 7	2 ^m 38	+1 ^m 48.1	The minute is probably not gained.
" "	3 ^m 3	+1 ^m 48.9	
" 7/8	20 ^m 18	+1 ^m 21.0	
" "	21 ^m 10	+1 ^m 17.2	wound up - the minute hand was accidentally pushed back 1 ^m .
" "	21 ^m 13	+0 ^m 17.0	
" "	22 ^m 12	+0 ^m 11.7	
" 8/9	23 ^m 12	-1 ^m 12.7	The minute hand
" 9	8 ^m 2	-0 ^m 26.6	after disagrees
" 10	4 ^m 2	-1 ^m 20.7	with the second
" 10/11	23 ^m 7	-0 ^m 22.7	hand
" 11/12	19 ^m 40	+0 ^m 5.3	
" 12	3 ^m 34	+0 ^m 19.0	
" 13/14	20 ^m 18	+2 ^m 26.3	
" "	28 ^m 58	+2 ^m 28.2	
" 14	0 ^m 33	+2 ^m 29.7	
" "	1 ^m 17	+2 ^m 31.5	
" 14/15	21 ^m 15	+4 ^m 0.3	
" "	21 ^m 50	+4 ^m 0.3	but min. hand forward 1/2 min.
" "	22 ^m 46	+3 ^m 0.6	
" 15	4 ^m 14	+4 ^m 51.5	
" 16/17	18 ^m 28	+4 ^m 26.0	
" "	20 ^m 46	+4 ^m 29.9	

The workmanship of Mr Briggs' Time piece is too rough to warrant further trial - after going steadily for a while it will then jump off several seconds - enough has been seen however to convince me that it is inferior to the oscillating pendulum in regularity of action.

1857-

E.C. - How. 14.92

March 3-

E.C. - 3..48..0 ME 5..04..15 - ME - 5..07..15

236 - 3..48..31.7 236 - 3..49..45.5 236 - 3..52..46

3..48..14.92

3..49..45.5

3..48..31.7

16.78

22..44..49.76

236 fast 16.78

27..49..28.72

46.74

3)96/3.2

22..45..36.50

22..45..36.50

5..03..52.22

4..59..10.85

2..59..57

57.86

.22

5..03..02.44

ME - 5..04..15

1..12.56

16

ME fast of B - 56.56

Feb 27. " - 54.14

4/242/0.60 gaining

18th 1857-March 6th

E.C. - How - 16.14

E.C. - 3..21..0 ME - 4..29..00

236 - 3..21..35.2 236 - 3..26..14.5

3..21..16.14

3..26..14.5

22..56..39.42

3..21..35.20

19.06

46.74

236 fast - 19.06

27..25..55.44

16.78

22..57..26.16

3/228/0.36

4..28..29.28

2/18

3..59..20.68

27..55.41

28.92

.28

4..27..45.29

4..29..00.00

ME fast of Cam 1..14.71

16

ME fast of Boston

58.71

3

56.56

5/215/0.72

16.16
14.92
2/122/41

857.

March $\frac{8}{9}$

E 6. Star - 18.11

$$\begin{array}{r} 18.11 \\ 16.14 \\ \hline 25 \overline{) 1.97} / 0.8 \end{array}$$

E C - 19.52.60

236 - 19.52.36.5

19.52.18.11

19.52.36.50

236 fast arm 18.39

6th P.M. - 19.06

(Cold very) 25/27 (-0.010)

M C - 20.49.25 M C - 20.52.25

236 - 19.57.12 236 - 20.00.12.5

19.57.12

18.39

19.56.53.61

24

43.56.53.61

23.05.19.27

20.51.34.34

19.56.43.41

50.57.64

33.91

.34

20.48.09.30

20.49.25.00

75.70

16

59.70

58.71

25/100 / 0.40

M C 9 Am

6th P.M.

1857-

March 10

E C - 3.45.00

236 - 3.45.38

M C - 4.35.20

236 - 3.48.21

M C - 4.38.30

236 - 3.51.31.5

March $\frac{12}{13}$ Am

M C - 21.47.05

236 - 21.10.48.5

E C - 21.07.00

236 - 21.07.39.25

21.07.18.56

21.07.39.25

236. fast 20.69

E C - Slow 18.56

M C - 21.50.05

236 - 21.13.49

21.13.49

20.69

23.20.18.74

21.13.28.31

46.74

45.13.28.31

23.21.05.48

23.21.05.48

21.52.22.83

20.56.33.58

57.57.48

21.94

83

21.48.47.83

21.50.05

1.17.17

16

9 Am M C fast of 13. 61.17

8 $\frac{1}{9}$ Am 9 $\frac{1}{10}$ - 59.70

4)147 (0.3)

E C - $\frac{8}{9}$ Am - Slow 18.111 $\frac{1}{13}$ Am - Slow 18.56

4/45 (0.11)

March 14th

E.C. - 4..33..0
 236 - 4..33..40.3

M.C. - 5..7..35
 236 - 4..36..28.5

E.C. Slow
 M.C. - 5..10..35
 236 - 4..39..29

March 16th Am

E.C. Slow - 18.84 -0.11

E.C. - 20..09..0

236 - 20 09 .42.1

20..09..18.84

236 - 20..09..42.10

236 fast + 23.26

12/13 - 18.56

4/4.70 + 1.18

M.C. - 20..34..00

236 - 20..13..20

20..13..20

23.26

44..12..56.74

23..36..57.70

20..36..05.04

3..22.50

20..32..42.54

M.C. - 20..34..00.00

77.46

16

fast B - 61.46

13 Am - 61.17

4/29 [0.07]

M.C. - 20..29..40

236 - 20..29..2.5

23..36..04.96

46.74

23..36..51.70

1857

March 17th

M.C. 0..13..00	1678- 11..09..32.0
1..07.46	21.75
0..11..58.54	11..09..53.75
1678 0..11..35.8	f.b. 11..10..00.00
1678 Show at 0.. -22.74	f.b. fast +6.25
+1	
" " 11 th - 21.75	
11..8..7.6	
11..8..29.35	
4..42..16	
15.52.45.35	
G.C. 15.53.00.00	
G.C. fast - +14.65	

March. $\frac{22}{23}$

E.C. Show 20.60

E.C. 18..15..0	M.C. 18..23..00		
236 - 18..15..48	236 18..26..41.5	23..59..44.28	0..3..40.83
18..15..20.60	18..26..41.5	46.74	46.74
236 18..15..48.00	27.40	0..00..31.02	0 04..27.57
236 fast - 27.40	18..26..14.10		
16/17 23.26	0..00..31.02		3.01.03
6/414/0.69	18..25..43.08		3.1.11
36	3.01.1		
	18..22..41.98		17 18.84
	23.00		23 20.6
			6)174(29
	18.08		
	16		
	62.08		
	61.46		
	6)62(0.10		

1857.

March ²²/₂₃

E.C. — 21..59..0

Dallas-161- 14..40..11.7

M.C. — 21..58..0

D-161- 14..41..40.4

E.C. Shaw 20.60

M.C. — 21..59..0

D-161- 14..42..40.2

M.C. — 9..58..0.00

1..02.08

9..56..57.92

Boston 4..44..16

G.W. 14..41..13.92

161 — 14..41..40.40

161 part of G.W. 26.48

13..28..34.0

13..28..07.52

-4..44..16

8..43..51.52

44..00

S.E. part of Boston 8.48

G.C. — 1..27..00.0

Dallas. — 1..27..11.7

1..27..11.7

26.48

1 26.45.22

G.C. — 1..27..00.00

G.C. part of G.W. 14.78

Land 9..56..

Boston m.s.t. — 9..56..57.92

161 — 14..41..40.40

161 part of Boston 4..44..42.48

1813 28..34..00

8..43..51.52

S.E. 8..44..00

S.E. part of Boston 8.48

1857

March $\frac{24}{25}$

E.C. Nov. 20.92

17/10/7

E.C. - 18.39.0.0 M.C. 19.54.40
 236 - 18.39.57.1 236 20.05.31 0.11.
 18.39.20.92 20.05.31 0.07.37.38
 236 - 18.39.57.10 30.18 46.74
 236 fast 30.18 20.05.00.82 0.08.24.12
 22.5 fast 27.40 0.08.24.12
 2/ 2.78/1.39 19.56.36.70
 3.16.04
 19.53.20.66
 M.C. - 19.54.40.00
 79.34
 16
 63.34
 22/23 62.08
 2) 1.26 10.63

1857. March. 26th

E.C. Nov 21.03 by 3 stars.

E.C. - 5.46.0.0 M.C. - 5.34.0 0.15.30.49 54.55
 236 - 5.46.53.0 236 - 5.50.23.5 46.74 54.64
 5.46.0.0 5.50.23.50 0.16.17.23 23.20.16
 21.03 31.97 0. G.C. - 5.30.0 25.20.92
 5.46.21.03 5.49.51.53 1678-11.49.09.3 32
 5.46.53.00 0.16.17.23 1678-11.50.30.3 } Position
 31.97 5.33.34.30
 - 54.64
 5.32.39.66
 M.C. 5.34.00.00
 80.34
 16
 M.C. fast 64.34 1678 11.50.30.3
 56.19.86
 12.46.50.16
 11.49.09.5 56.19.26
 12.45.28.76
 4.46.16
 17.29.44.76
 E.C. - 17.30.00
 E.C. fast 15.24 of Greenwich.

March $\frac{36}{31}$

E.C. Slow - 21.37

E.C. - 19..21..00

M.C. - 18..49..15

- 18..58..00

236 - 19..21..59.2

236 19..23..39.5

- 19..32..26

19..21..21.37

19..23..39.5

0..31..16.71

236 - 19..21..59.20

37.83

46.74

236 fast 37.83

19..23..01.67

0..32..03.45

24/25 fast - 30.18

0..32..03.45

6/7.65/1.27

18..50..58.22

- 3..05.28

18..47..52.94

M.C. - 18..49..15.00

M.C. fast of Camb. 1..22.06

16

M.C. fast of Proter. 1..06.06

24/25 Am. " " 1..03.36

6/272/0.45

E.C. 25 - 20.92

37 - 21.37

45

08

April 2.

E.C. Slow - 21.65

E.C. - 4..19..0.0

M.C. - 3..59..30

4..2..30

236 - 4..20..02.0

236 - 4..43..20

4..46..20.5

38.991

4..19..21.65

4..43..20

0..43..06.37

128

4..20..02.00

40.35

46.74

39.119

236 fast. 40.35

4..42..39.65

0..43..53.11

1/28

0..43..53.11

3..58..46.54

39.12

3..58..07.42

3..59..30.00

1..22.58

16

66.58

25
100

1857 - April 7th

E C Show - 22.1

E C - 7..26..0
 236 - 7..27..06.8
 7..26..22.1
 7..27..06.8
 236 fast 44.7

M C - 6..26..25
 236 - 7..30..25
 7..30..25
 44.7
 7..29..40.3
 1..03..35.88
 6..26..04.42
 5..59..01.02
 25..55.74
 3.99
 .42

6..25..01.17
 M C 6..26..25.00
 1..23.83
 -16

M C Fast of 13 67.83
 Apr 2nd fast 66.58
 5125/0.25

555/11

1857. April 11 -

E C. Show 23.71

W 1.6 (1.40 Rate)

E C - 5..36..0
 236 - 5..37..12.7
 5..36..23.71
 5..37..12.7
 48.99

M C - 4..21..15
 236 - 5..40..45
 5..40..45
 48.99
 5..39..56.01
 1..19..22.10
 4..20..33.91
 42.68

4..19..51.23
 4..21..15.00
 M C fast 1..23.77
 16
 67.77

4)1.61/40

1857. April 15 - 1 P.M. E.C. Flow by rate of $-25 = 24.71$

EC - 2.6.0

EC - 2.10.0

EC - 2.11.0

188 - 2.6.48.5

235 - 2.10.8.2

2475 - 2.11.0.7

2.6.24.7

2.10.24.7

2.11.24.7

2.6.48.5

2.10.8.2

2.11.09.9

188 fast + 23.8

235 slow - 16.5

2475 slow - 24.9

EC - 2.16.0

EC - 2.18.0

EC - 2.20.0

188 - 2.16.48.5

235 - 2.18.8.2

2475 - 2.20.0.7

2.16.24.7

2.18.24.7

2.20.24.7

2.16.48.5

2.18.8.2

2.20.00.7

fast 23.8

slow - 16.5

slow 24.0

+ 23.8

40.3

1857 - April 18th

E.C. Slow - 22.93 4 stars.

EC - 6..45..0
 236 - 6..46..20.3
 6..45..22.93
 6..46..20..3

236 fast
 11th fast
 57.37
 48.99
 7) 8.38 / 1.19

MC - 5..11..25
 236 - 6..58..46
 6..58..46

57.37
 6..57..48.63
 1..46..57.98
 5..10..50.65
 50.92
 5..09..59.73
 MC - 5..11..25.00
 1..25.23

MC - 5..14..25
 236 - 7..01..46.5

1..46..11.24
 46.74
 1..46..57.98
 5

50.786
 139
 50.925

18th MC fast B
 11 - MC fast B

16
 69.23
 67.77
 7) 146 / 0.21 gaining

April $\frac{22}{23}$

E.C. Slow 22.44

EC - 23..3..0

236 - 23..4..23.7
 23..3..22.44
 23..4..23.70

236 fast
 1.01.26

MC - 21..00..25

236 - 23..6..10.5
 23..6..10.5

1..01.26
 23..05..09.24
 2..02..44.20
 21..02..25.04
 - 3..26.82
 20..58..58.22
 21..00..25.00
 1..26.78
 - 16

23 Am
 18 PM

70.78
 69.23

45) 155 / 0.35 gaining.

MC - 21..03..20

236 - 23..09..06

2..01..57.46
 46.74
 2..02..44.20
 3

3.26.75
 07
 3.26.82

1857 April 27

E.C. - 22.57

E.C. - 22.21.0.0

M.C. - 19.58.10

M.C. - 20.01.15

236 - 22.22.30.2

236 - 22.24.33.5

236 - 22.27.39

22.21.22.57

22.24.33.5

22.22.30.2

1.7.63

2.21.40.24

3.16.541

236 fact 1.07.63

22.23.25.87

16.74

.161

E.C. - 1.06.0

2.22.26.98

2.22.26.98

2.16.752

236 - 1.07.30.3

20.00.58.89

3.16.75

19.57.42.14

19.58.10.01

M.C. fact. C. - 27.86

16

28 Am B - 11.86

23 Am " - 10.78

5108 40.22 spring

1857 May 5th

E C Stone - 24.44

EC - g. 41.0
 236 - g. 42.41.5
 g. 41.24.44
 236 - g. 42.41.52
 236 fast 1.17.06

MC - 6.52.35 2.53.12.68
 236 - g. 48.31.5 46.74 1.07.66
 g. 48.31.5 2.53.59.42 4
 1.17.06 1.07.70
 g. 47.14.44
 2.53.59.42
 6.53.15.02
 1.07.70
 6.52.07.32
 6.52.35.00
 27.68
 16
 11.68
 28th Am 11.86
 .18 / -0.02

1857. May 8/9

EC - 2.07.0
 236 - 2.08.47.7

E C Stone - 25.14

1.06.186
 161
 1.06.347

May 9th g. 25.0

EC - g. 25.00
 236 - g. 26.48.2
 g. 25.25.14
 236 - g. 26.48.20
 236 fast 1.23.06

MC - 6.44.20 6.47.40
 236 - g. 56.08 236 - g. 59.28.5 3.08.58.91
 g. 56.08 g. 59.28.5 46.74
 - 1.23.06 - 1.23.06 3.09.45.65
 g. 54.44.94 g. 58.05.44
 3.09.45.65 3.09.45.65
 6.44.59.29 6.48.19.79
 1.06.35 5.59.01.02
 6.43.52.94 47.52.14
 MC - 6.44.20.00 18.95
 MC fast C 27.06 79
 16 6.47.12.80
 MC fast B - 11.06 6.47.40.00
 27.20
 16
 11.20

11.13

1857. May-13th

E.C. Shaw - 25.37

$$\begin{array}{r}
 EC - 4 \dots 26 \dots 0 \\
 236 - 4 \dots 27 \dots 57.6 \\
 4 \dots 26 \dots 25.37 \\
 4 \dots 27 \dots 57.60 \\
 1 \dots 26.23
 \end{array}$$

$$\begin{array}{r}
 MC - 1 \dots 4 \dots 30 \\
 236 - 4 \dots 31 \dots 11 \\
 3 \dots 26 \dots 41
 \end{array}$$

$$\begin{array}{r}
 MC - 1 \dots 7 \dots 35 \\
 236 - 4 \dots 34 \dots 16.5 \\
 3 \dots 26 \dots 41.5
 \end{array}$$

$$\begin{array}{r}
 MC - 1 \dots 10 \dots 25 \\
 236 - 4 \dots 37 \dots 07 \\
 3 \dots 26 \dots 42
 \end{array}$$

$$3 \dots 24 \dots 45.14$$

$$\begin{array}{r}
 4 \dots 37 \dots 07 \\
 1 \dots 26.23
 \end{array}$$

$$\begin{array}{r}
 46.74 \\
 3 \dots 25 \dots 31.88
 \end{array}$$

$$\begin{array}{r}
 4 \dots 35 \dots 40.77 \\
 3 \dots 25 \dots 31.88
 \end{array}$$

$$\begin{array}{r}
 11.468 \\
 022 \\
 \hline
 11.490
 \end{array}$$

$$\begin{array}{r}
 1 \dots 10 \dots 08.89 \\
 11.49
 \end{array}$$

$$1 \dots 09 \dots 57.40$$

$$MC - 1 \dots 10 \dots 25.00$$

$$+ 27.60$$

$$16$$

$$11.60$$

$$11.20$$

$$40 \text{ } 60.10$$

Mc.C. part of B -
8/9 part

May 18th 1857

C.C. Flow. 25.17

2 C 13, 40. —
 330 13, 40, 10, 15
 13, 40, 25, 17
 330 - 15, 02

MC 9.5-9. — MC = 10. = 4510
 330 13, 45, 09, 25-330 = 13, 46, 5-4.5
 15 02
 13, 45, 24, 27

May 22nd

C.C. Flow - 25.43

CC - 10, 20, 0
 236 - 10, 22, 4.5
 10, 20, 25, 43
 236 - 10, 22, 04, 50
 236 fast 1, 39, 07
 13th 1, 26, 23
 9) 12.84 / 1.43
 38

MC - 6, 20, 30 — MC - 6, 23 30
 236 10, 23, 43
 10, 23, 43.00
 1, 39, 07
 10, 22, 03, 93
 4, 01, 00, 89
 6, 21, 03, 04
 1, 02, 42
 6, 20, 00, 62

4, 0, 14, 15 1.02, 418
 4674 8
 4, 1, 00, 89 426

30.00
 29.38
 16
 13.38
 13 11.60
 9) 178 40.2

May 25th

CC Flow - 25.53

CC - 8.. 8.. 0 MC 3 - 58.. 45 MC - 4.. 01.. 45
 236 - 8.. 10.. 10.6 236 - 8.. 13.. 29.5 236 - 8.. 16.. 30

8.. 08.. 25.53	8.. 13.. 29.50	4.. 12.. 03.83	38.991
236 - 8.. 10.. 10.60	1.. 45.07	46.74	.145
1.. 45.07	8.. 11.. 44.43	4.. 12.. 50.57	39.136
22° - 1.. 39.07	4.. 12.. 50.57		
3) 6 00 / +2.00	3.. 58.. 53.86		
	- 39.13		
	3.. 58.. 14.73		
	3.. 58.. 45.0		
	30.27		
	16		
22° MC part B	14.27		
" " " "	13.35		
	3/89/0.29		

May ³¹/₃₂

E.b. — 25.00

E.C. — 1.. 29.. 0

236 — 1.. 31.. 24.5

1.. 29.. 25.0

1.. 31.. 24.5

1.. 59.50

25⁺

1.. 45.07

65) 14.43 + 2.2

13
14

E.C. — 2.. 58.. 0.0

236 — 3.. 00.. 24.6

M.C. 20.. 54 .. 15

236 — 1.. 35 .. 36

1.. 35 .. 36

1.. 59.5

25.. 33 .. 36.5

4.. 36 .. 29.91

20.. 57 .. 06.59

3.. 25.95

20.. 53 .. 40.64

M.C. 20.. 54 .. 15.00

34.36

16

18.36

14.27

65) 4.09 / 0.63

390

19

M.C. — 20.. 57 .. 30.0

236 — 1.. 38 .. 57.5

4.. 35.. 43.17

46.74

4.. 36 .. 29.91

3.25.929

16

945

20.. 57.. 06.59

19.. 56.. 43.41

56.. 50.66

5.99

59

20.. 53.. 40.65

1857. June 2 - P.M.

E.C. - 8..50..0

236 - 8..52..26.7

8..50..24.49

8..52..26.70

2..02.21

25⁺

1..45.07

8) 17.14 / 2.14

M.C. - 4..9..35

236 - 8..56..05.5

8..56..05.50

2..02.21

8..54..03.29

4..44..23.03

4..09..40.26

40.90

4..08..59.36

4..09..35.00

35.64

16.

19.64

18.36

15) 128 / 0.85

C.B. How. 24.49

2..43..36.29 40.793

46.74 109

4..44..23.03 40.902

1

June 3rd P.M.

E.C. - 24.26

EC - 8..39..0
 236- 8..41..28.3

MC - 3..53..55
 236- 8..44..20.5

MC - 3..56..45
 236- 8..47..11

8..39..24.26
 8..41..28.30
 3rd P.M. fast 2..04.04
 2nd P.M. --- 2..02.21
 1.83

8..44..20.5
 2..04.04
 8..42..16.46
 4..48..19.58
 3..53..56.88
 38..32
 3..53..18.56
 3..53..55.00

4..47..32.84 38.171
 46.74 153
 4..48..19.58 38.324
 38

MC 3rd C 36.44
 16
 3rd B 20.44
 2nd B 19.64
 .80

June 6th

E.C. slow. 23.57

EC - 11..00..00
 236- 11..02..34.2
 11..00..23.57
 11..02..34.20
 2..10.69

MC - 6..11..40
 236- 11..14..22
 11..14..22.
 2..10.69
 11..12..11.31
 5..00..09.26
 6..12..02.05
 -1..01.11

4..59..22.52 1.01.11
 46.74
 5..00..09.26
 -1..01.11

6..11..00.94
 MC 6..11..40.00
 39.06
 16
 23.06
 3rd 20.44
 3) 262 (0.87)

857.

June 9th

E.C. from 23.04

CC - 8..23..0

236 - 8..25..39.2

8..23..22.04

236 - 8..25..39.20

2..17..16

2..10..69

2/6.47/2.16

MC - 3..13..20

236 - 8..27..25.5

8..27..25.5

2..17..16

8..25..08..34

5..11..58.94

3..13..09..40

2..59..30.57

12..57.87

8.47

40

3..12..37.75

3..13..20.00

42.25

16

M.C. part of Boston

26.25

6th PM " " "

23.06

23/3 19/1.06

25

5..11..12.20

46.74

5..11..58.94

June 14/15

E. b. - Slow - 21.32

E.C. - 1.. 9.. 0

236 - 1.. 11.. 49

E.C. - 1.. 26.. 0.0

236 - 1.. 28.. 49.0

1.. 26.. 21.32

1.. 28.. 49.00

236. fast 2.. 27.68

M.C. - 19.. 37.. 30

236 - 1.. 14.. 06

1.. 14.. 06.00

2.. 27.68

25.. 11.. 38.32

5.. 31.. 41.74

19.. 39.. 56.58

18.. 56.. 53.24

38.. 53.45

55.84

.58

19.. 36.. 43.18

19.. 37.. 30.00

M.C. fast of Cam. m.s.t. 46.89

16

1.. " - Barton 30.89

9h PM fast 26.25

55) 4.64

4.40

20

(0.85 faint)

2

26.25

30.89

55) 4.64

1.5

June 14/15

E.C. - 4.. 6.. 0

330 - 4.. 6.. 58.7

O₅ at apparent noon - 5.. 35.. 57.8

time of S.D. passing

1.. 08.9

5.. 34.. 42.9

857- June 15

E. b. Slow. 21.32

CC - 4..08..0

330- 4..08..58.7

4..08..21.3

4..08..58.7

330 fast H.L. obsy 37.4

- 3.1

330 fast of old obsy - 34.3

Observed

C alt 70.57

1st Limb - R - 5.34..42.9. fid. time

34.3

5.35..17.2

June 21st
June 22-

EC - 2..28..0
236 - 2..31..3.8

The Transit Clock, EC, has been stopped to adjust to a new Break circuit.

June 22nd

EC - 1..50..0
236 - 1..52..29.8

EC - 2..5..0
236 - 2..7..29.9
2..05..0-0
15.31

236 - 2..07..29.40
236 fast 2..45.21

EC - Fast 15.31

MC - 19..46..50 MC - 19..49..50
236 - 1..55..11.5 236 - 1..58..12
1..55..11.5

-2..45.21 6..02..27.47
25..52..26.29 46.74
6..03..14.21 6..03..14.21

19..49..12.08
18..56..53.24
48..57.97
11.97
.08

19..45..57.26
MC - 19..46..50.00
52.74
16

MC fast of Boston 36.74

June 14/15 MC fast " 30.89

7/5.85 (0.84 gaining daily)
5.6
25

June 24th

EC - 7..57..0-0
236 - 7..59..32.15

EC reset

EC - 11..53..0 EC 11..54..0
236 - 11..55..49.2 236 - 11..56..49.2

1857. July 4th

E.C. part 5.09

EC-13.34.0

236-13.37.7.2

13.34.0.0

5.09

13.33.54.91

236 13.37.07.2

3.12.29

2.45.21

11/27.08/2.46

22
50
1

MC-6.46.45

236-13.40.38

13.40.38

3.12.29

13.37.25.71

6.50.32.90

6.46.52.81

1.06.66

6.45.46.15

6.46.45.15

58.85

16

42.85

36.74

11/611/0.55
55
61

MC-6.49.40

236-13.43.33.5

6.49.46.15

1.6.573

46.75

148

6.50.32.90

1.6.661

MC part of Boston

23 dome part

July $\frac{6}{7}$ E.C. fast. 5.89 + $R_{\text{int}} + 0.14$

EC - 2..49..0

236 - 2..52..13

July 7th PM

EC - 10..44..0

236 - 10..47..13.6

MC - 3..46..0

236. 10..57..18.5

7..01..35.84

46.74

7..02..22.58

10..44..0.00

6.09

10..43..53.91

236 - 10..47..13.60

3..19.69

4th

3..12.29

3) 7.40 / 2.47

10..57..18.5

3..19.69

10..47..58.81

7..02..22.58

3..45..36.23

36.96

3..44..59.27

3..46..00.00

1..00.73

16

44.73

42.85

3) 188 / 0.62

0.36.861

098

36.959

P.M. July 6th MC fast of B

P.M.

July 4th

1857.

July 13th

E.C. + 6.55

E.C. - 11.12.0

M.C. - 3.50.136

M.C. - 3.53.35

236 - 11.15.25.6

236 - 11.19.40.5

236 - 11.22.46

11.12.0.8

11.19.40.50

7.25.15.20 0.37.68

6.55

3.32.15

46.74

37.70

11.11.53.45

11.16.08.35

7.26.01.94

236 - 11.15.25.60

7.26.01.94

236 fast 3.32.15

3.50.06.41

4th fast 3.12.29

- 37.70

9) 19.86 / 2.21

3.49.28.71

M.C. - 3.50.30.44

1.01.29

16

July 13th - fast B 45.29

July 6 - 44.73

7) 56 / 0.08

July 18th

E.C. fast- 6.46

$$EC - 11..45..0$$

$$236 - 11..48..35$$

$$11..45..0..0$$

$$6.46$$

$$11..44..53.56$$

$$236 - 11..48..35.00$$

$$18^{th} 236 \text{ fast} \quad 3..41.46$$

$$13 - " - " \quad 3..32.15$$

very warm
during the interval

$$5) 9.31/1.86$$

$$M.C. - 11..02..0$$

$$236 - 11..51..4.5$$

$$11..57..04.50$$

$$3..41.46$$

$$11..47..23.04$$

$$7..45..44.72$$

$$4..01..38.32$$

$$- 39.59$$

$$4..00..58.73$$

$$M.C. - 11..02..00.00$$

$$+ 1.01.27$$

$$- 16$$

$$18^{th} M.C. \text{ fast of } B \quad 45.27$$

$$13 - " - " - \quad 45.29$$

$$- .02$$

$$M.C. - 11..5..0$$

$$236 - 11..54..5.0$$

$$7..44..57.98$$

$$46.74$$

$$7..45..44.72$$

$$0.39.482$$

$$104$$

$$39.585$$

July 22nd

E.C. fast 7.09

$$EC - 13..32..0$$

$$236 - 13..35..40.2$$

$$13..32..0$$

$$= 7.09$$

$$13..31..52.91$$

$$236 \quad 13..35..40.20$$

$$236 \text{ fast } 22 \quad 3..47.29$$

$$" - " \quad 14 \quad 3..41.46$$

$$4/5.63/1.46$$

$$M.C. - 5..33..30$$

$$236 - 13..38..41$$

$$13..38..41$$

$$3..47.29$$

$$13..34..53.71$$

$$8..01..30.96$$

$$5..33..22.75$$

$$4..59..10.85$$

$$32..54.59$$

$$21.94$$

$$.75$$

$$5..32..28.13$$

$$5..33..30$$

$$1.01.87$$

$$- 16$$

$$45.87$$

$$45.27$$

$$4) 60 \div 0.15$$

$$8..0..44.22$$

$$46.74$$

$$8..01..30.96$$

157. July. 27th

E.C. fast - 7.95 gain; 0.17

E.C. - 13 .. 53 .. 0.0

M.C. - 5 .. 34 .. 50

M.C. - 5 .. 37 .. 50

236 - 13 .. 56 .. 45.5

236 - 13 .. 59 .. 49.5

236 - 14 .. 02 .. 50

13 .. 53 .. 0.0

13 .. 59 .. 49.5

8 .. 20 .. 26.99

- 7.953 .. 53.4546.74

13 .. 52 .. 52.05

13 .. 55 .. 56.05

8 .. 21 .. 13.73

236 - 13 .. 56 .. 45.50

8 .. 21 .. 13.73

236 fast 3 .. 53.45

5 .. 34 .. 42.32

" - " 22 - 3 .. 47.2954.83

5) 6.16 / 1.23

5 .. 33 .. 47.49

M.C. 5 .. 34 .. 50.00

62.51

-16

M.C. fast 27th

46.51

" 22 -

45.87

5) 6.4 / 0.13

54.718

115

54.833

Aug-1st

E.C. fast-9.69 795 7174/3

E.C. - 13..52..0

236 - 13..55..50.5

13..52..0

9.69

13..51..50.31

13..55..50.50

236 fast 4..00..19

27th fast 3..53..45

5/6 74/1.35

M.C. - 5..13..15 — 5..16..20

236 - 13..58..00.5 — 14..01..06.0

13..58..00.5

4..00..19

13..54..00.31

5..40..56.53

5..13..03.78

4..59..10.85

12..57.87

2.99

.78

5..12..12.49

M.C. - 5..13..15.00

62.51

16

a-1 M.C. fast of Boston 46.51

py-27th M.C. fast — — 46.51 ± 0.00

August 3-

Lieut. Dues set up his Transit Instrument on the e-tance of our Variation-transit and obtained the following, by E.C. and the Spring-forever.

k Ophiuchi.

16..50..34.0

53.7

51..11.5

30.1

48.7

178.0

356.0

-24

E.C. - 16..51..11.60

M.A. 16..50..56.63

E.C. fast

14.97

E.C. "

10.00

4.97

without instrumental correction - axis level in a, small collimation - by our Tr. Circle.

1857. Aug⁵ 5th AM

E.C. - fast. 11.06

EC - 5..54..0
 236 - 5..57..54
 5..52..00
 11.06
 5..53..48.94
 236 - 5..57..54.00
 236 fast 4..05.06

MC - 21..00..245
 236 - 6..00..00.5
 6..00..00.50
 4..05.06
 5..55..55.44
 24
 29..55..55.44
 8..52..46.19
 21..03..09.25
 3..26.94
 20..59..42.31
 MC - 21..00..45.00
 62.69
 16

M.C. fast of Boston 46.69

MC - 21..03..45
 236 - 6..03..01
 8..57..59.45
 46.74
 8..52..46.19

3.26.912
 025
 3.26.937

1857. August-7th PM

E.C. fast - 12.44

2/38/0.65

E.C. - 12..30..0
 236 - 12..33..56.5
12..30..0
 12.44
 12..29..47.56
 236 - 12..33..56.50
4..08..94

M.C. - 3..28..40
 236 - 12..36..56
12..36..56
 4..08..94
 12..32..47.06
 9..04..35.86
3..28..11.20
 34.20
 3..27..37.00
 3..28..40.00
 63.00
 16
 M.C. fast of B 47.00

M.C. - 3..31..45
 236 - 12..40..01.5
9..03..49.12
 46.74
 9..04..35.86

24.169
 036
 34.20

Aug^{10/11}

E.C. fast - 14.29

E.C. - 5..55..0
 236 - 5..59..0.5
5..55..00.0
 14.29
 5..54..45.71
 236 5..59..00
4..14.29
 4..08.94
 35) 5.35 / 1.53
 35
 185
 125
 72

M.C. - 20..38..0
 236 - 6..01..0.5
6..01..0.50
 4..14.29
 25..56..46.21
9..16..25.53
 20..40..20.68
3..23..20
 20..36..57.48
 M.C. 20..38..00.00
62.52
 16
 M.C. fast. B 46.52

9..15..38.79
46.74
 9..16..25.53

3.23.144
 055
 3.23.199

$$\begin{array}{r} 11/12 \quad 14.94 \\ 10/11 \quad 14.29 \\ \hline .65 \end{array}$$
Aug⁶ 11/12 Am.

E.C. fast - 14.94

EC - 5.. 53.. 0	MC - 20.. 33.. 00	MC - 20.. 36.. 00
236 - 5.. 57.. 01.4	236 - 5.. 59.. 58	236 - 6.. 02.. 58.5
5.. 53.. 0-0	5.. 59.. 58.00	
14.94	4.. 16.34	3.. 22.325
5.. 52.. 45.06	29.. 55.. 41.66	9.. 19.. 35.34
236 - 5.. 57.. 01.40	9.. 20.. 22.08	46.74
4 16.34	20.. 35.. 19.58	3 22.377
	3.. 22.38	9 20.. 22.08
	20.. 31.. 57.20	
	MC - 20.. 33.. 00.58	
	63.38	
	16	
	MC. fast	47.38

Aug⁶ 18/19

E.C. - fast 18.09

EC - 5.. 28.. 0	MC - 19.. 43.. 50	MC - 19.. 46.. 45
236 - 5.. 32.. 11	236 - 5.. 38.. 30.5	236 - 5.. 41.. 26
5.. 28.. 0-0	5.. 38.. 30.5	9.. 47.. 11.23
18.09	4.. 29.01	46.74
5.. 27.. 41.91	29.. 34.. 01.49	9 47.. 57.97
236 - 5.. 32.. 11.60	9.. 47.. 57.97	
4 29.09	19.. 46.. 03.52	3.. 14.953
EC - 7.. 57.. 0.00	3.. 14.31	3 14.961
236 - 7.. 55.. 11.20	19.. 42.. 49.20	3.. 14.298
7.. 57.. 0.00	43.. 50.00	008
18.09	60.80	306
7 50.. 41.91	16.00	
236 7 55 11.20	MC. fast. 10/19 44.80	
4 29.29	10/11 - 46.52	
	8) 172 (0.21 lining -	

August 20th P.M.

E.C. fast - 18.15

E.C. - 15 - 35 - 0.0

236 - 15 - 39 - 13.0

15 - 35 - 0.0

18.15

15 - 34 - 41.85

15 - 39 - 13.00

4 - 31.15

M.C. - 5 - 40 - 35

236 - 15 - 40 - 52.5

15 - 40 - 52.5

4 - 31.15

15 - 36 - 21.35

9 - 55 - 57.08

5 - 40 - 30.27

55.78

5 - 39 - 34.49

5 - 40 - 35.00

60.511620th P.M. M.C. fast B 44.57

18/19 - " " " " 44.80

29/0.2 losing

9 - 55 - 04.34

46.74

9 - 55 - 57.08

55.701

082

55.782

Augth 23/24th An

E.C. fast 19.44

E.C. - 6 - 17 - 0

236 - 6 - 21 - 19.0

6 - 17 - 0

19.44

6 - 16 - 40.56

6 - 21 - 19.00

23-24 - 236 fast 4.38.44

18/19 - " " 4.29.09

5) 9 35 (1.87)

M.C. - 20 - 25 - 0

236 - 6 - 39 - 40

6 - 39 - 40

4 - 38.44

30 - 35 - 01.56

10 - 07 - 40.75

20 - 27 - 20.81

3 - 21.07

20 - 23 - 59.74

M.C. - 20 - 25 - 00.00

+ 60.2616

M.C. fast B - 44.26

20 - 28 - 01

6 - 42 - 40

10 - 6 - 54.01

46.74

10 - 07 - 40.75

3.21.017

055

072

1.87

93

2.80

4.38.44

4.41.2 - fast 25th Rec

857 - Aug ²²/₂₈

C 6 part 21.08

$$\begin{array}{r} CC - 7 \dots 33 \dots 0 \\ 236 - 7 \dots 37 \dots 26.3 \\ \hline 7 \dots 33 \dots 0 \\ \hline 21.08 \end{array}$$

$$\begin{array}{r} 7 \dots 32 \dots 38.92 \\ 236 - 7 \dots 37 \dots 26.30 \\ \hline 4 \dots 47 \dots 38 \end{array}$$

$$\begin{array}{r} 23 \\ 24 \end{array} 236 \text{ part} \quad \begin{array}{r} 4 \dots 38 \dots 44 \\ \hline 4 / 8.94 / 2.23 \end{array}$$

71

$$\begin{array}{r} MC - 21 \dots 8 \dots 15 \\ 236 - 7 \dots 38 \dots 58 \\ \hline 7 \dots 38 \dots 58 \end{array}$$

$$\begin{array}{r} 4 \dots 47 \dots 38 \\ 7 \dots 34 \dots 10.62 \\ 24 \\ 31 \dots 34 \dots 10.62 \\ \hline 10 \dots 23 \dots 26.99 \end{array}$$

$$\begin{array}{r} 21 \dots 10 \dots 43.63 \\ 3 \dots 28 \dots 18 \end{array}$$

$$21 \dots 07 \dots 15.45$$

$$MC - 21 \dots 08 \dots 15.00$$

$$59.55$$

$$16$$

$$43.55$$

$$44.26$$

$$4) .71 / 0.18$$

$$236 - 7 \dots 41 \dots 38.5$$

$$10 \dots 22 \dots 40.23$$

$$46.74$$

$$10 \dots 23 \dots 26.99$$

$$\begin{array}{r} 3 \dots 28 \dots 057 \\ 117 \\ \hline 176 \end{array}$$

23/24 MC part

$$\begin{array}{r} 236 \\ \text{just 31st by rate} \end{array} \quad \begin{array}{r} 4 \dots 47 \dots 38 \\ 6 \dots 69 \\ \hline 4 \dots 54 \dots 07 \text{ Am} \end{array}$$

$$\begin{array}{r} 236 \text{ part Aug 31st PM} - 4 \dots 55 \dots 18 \end{array}$$

Sept 2^o

EC - 14.32.0
 236 - 14.36.35.2

14.32.0.0
22.70
 14.31.37.3
 236 14.36.35.2
 4.57.9
2.2
 5.00.1

M.C. fast

M.C. - fast of B
 Aug 27/28

MC - 4.00.40
 236 - 14.52.26

14.52.26
4.57.9
 14.47.28.1
10.47.06.31
 4.00.21.79
-39.38
 3.59.42.41
4.00.40.00

57.59
16
 41.59
43.55
 55) 196 / 0.36
310

MC - 4.03.40
 236 - 14.55.26.5

10.46.19.57
46.74
 10.47.06.31

39.32
06
 39.38

Sept 7th

E.C. fast 23.77

EC - 15.6.0
 236 - 15.10.43
15.6.0.0
23.77
 15.5.36.23
 236 15.10.43.00
5.06.77

MC - 4.01.00 MC - 4.04.00
 236 - 15.12.40 236 - 15.15.40.5
15.12.40
5.06.77
 15.07.33.23
11.06.49.08
4.00.44.15
 3.59.20.68
43.88
15
4.00.04.71
4.01.00

11.06.02.34
46.74
 11.06.49.08

7th
 70
 2

55.29
88
 39.29
41.59
 57230 / 0.46

857 Sept $\frac{10^L}{11}$

8C - 7.48.0
236 - 7.52.50.1

7.48.0.0
23.59

7.47.36.41
236 7.52.50.10
5.13.69

MC - 20.32.20

236 - 7.58.40

7.58.40

5.13.69

31.53.26.31

11.18.38.73

20.34.47.58

3.22.29

20.31.25.29

MC 20.32.20

MC fast 54.71

16

MC fast of 13 38.71

7th P.M. 39.29

35/58 / 0.17 losing

23

8C fast. 23.59

MC - 20.35.20

236 - 8.01.40.5

11.17.57.99 3.22.16

46.74

13

17.18.38.73 3.22.29

ch 8-8.16

236 = 7.35.57.5

8.17. →

7.36.57.7

857 Sept-15-

EC fast - 24.57

$$\begin{array}{r}
 EC - 16.42.0 \\
 236 - 16.46.56.6 \\
 \hline
 16.42.0 \\
 24.57 \\
 16.41.35.43 \\
 16.46.56.6 \\
 \hline
 236 \text{ fast} \quad 5.21.17
 \end{array}$$

$$\begin{array}{r}
 MC - 5.08.55 \quad 5.11.55 \\
 236 - 16.52.35 \quad 16.55.85.5 \\
 \hline
 5.21.17 \quad 11.37.34.75 \\
 16.47.13.83 \quad 46.74 \\
 \hline
 11.38.21.44 \quad 11.38.21.44 \\
 5.08.52.34 \\
 \hline
 50.60
 \end{array}$$

$$\begin{array}{r}
 50.46 \\
 14 \\
 \hline
 .60
 \end{array}$$

$$\begin{array}{r}
 5.08.01.74 \\
 MC - 5.08.55.00 \\
 \hline
 53.26
 \end{array}$$

16

37.26

38.71

10/11 - fast

$$\begin{array}{r}
 45 \overline{) 145} \quad 0.32 \text{ lining} \\
 \underline{135} \\
 100
 \end{array}$$

Sept 20/21

$$\begin{array}{r}
 EC - 8.56.0 \\
 236 - 9.01.07.1
 \end{array}$$

$$\begin{array}{r}
 MC - 21.00.00 \\
 236 - 9.06.10.5
 \end{array}$$

$$\begin{array}{r}
 MC - 21.06.00 \\
 236 - 9.11.11.5
 \end{array}$$

$$\begin{array}{r}
 MC - 21 \\
 236 - 9.15.10
 \end{array}$$

$$\begin{array}{r}
 MC - 21.11.58 \\
 236 - 9.18.10
 \end{array}$$

$$\begin{array}{r}
 MC - 21.15.51 \\
 236 - 9.20.4.5
 \end{array}$$

Sept 21st

E.C. - fast.

E.C. - 16.07.0

M.C. -

236 - 16.12.7.7

236 -

236 Set back 5^m
 at 16^h 17^m Sept 21st 1857

EC = 16^h 18^m 00
 236 = 16^h 18^m 7.7

97

13

Sept 21stE.C. fast 25^s 34.E.C. 16^h 52^m 00236. 16^h 52^m 08236. fast of E.C. 08^s25^s 34

8.00

33^s 34

236. fast of Sid. Time.

Sept. $\frac{21}{22}$

EE - part - 25.40

368

$$\begin{array}{r} EE - 7.48.0 \\ 236 - 7.48.09.2 \end{array}$$

$$\begin{array}{r} ME - 19.49.45 \\ 236 - 7.54.42 \end{array} \quad \begin{array}{r} 19.52.30 \\ 7.57.27.5 \end{array}$$

$$\begin{array}{r} 7.48.0 \\ 25.40 \\ 7.47.34.60 \\ 236 - 7.48.09.20 \\ 236 \text{ part} - 34.60 \end{array}$$

$$\begin{array}{r} MC, 20.52.55 \\ 236, 8.58.2.5 \end{array}$$

$$\begin{array}{r} MC, 20.55.50 \\ 236, 9.00.58 \end{array}$$

$$\begin{array}{r} MC, 21.01.56 \\ 236, 9.06.39 \end{array}$$

$$\begin{array}{r} MC, 21.08.50 \\ 236, 9.09.00 \end{array}$$

$$\begin{array}{r} MC - 21.23.0.0 \\ 236 - 9.28.12.5 \end{array}$$

$$\begin{array}{r} 3.80.26 \\ 10.1 \\ 62 \end{array}$$

$$\begin{array}{r} 9.28.12.50 \\ 34.60 \end{array}$$

$$33.27.37.90$$

$$12.02.00.81$$

$$21.25.37.09$$

$$-3.30.62$$

$$21.22.06.47$$

$$MC - 21.23.00.0$$

$$53.53$$

$$16$$

$$MC \text{ part of } B - 37.53$$

$$\begin{array}{r} 14.07 \\ 46.76 \\ 0.81 \end{array}$$

$$65/.2) (.04$$

Sept 26*

EC - 16.38.0 - 16.38.0

236 - 16.38.17.3 - 16.38.17.3

16.38.0

25.1

16.37.34.9

236. 16.38.17.3

236 fast 42.4

EC - fast - 25.1

MC - 4.20.20 - 4.38.15

236 - 16.42.36 - 17.00.34

16.42.36

12.20.56.84

42.4

46.74

16.41.53.60

12.21.43.58

12.21.43.58

4.20.10.02

42.62

4.19.27.40

MC - 4.20.20.00

52.60

16

MC fast - 13 - 36.60

21/22 - " - " - 37.53

45/93 [0.21]

42.585
27
622

Sept. $\frac{28}{29}$

E.C. 10 " 7 " 00
 236. 10 " 7 " 23

E.C. 10 " 8 " 00
 236. 10 " 8 " 23

E.C. - 26.49

Sept. 29th

E.C. - fast 26.57

E.C. - 16.. 16.. 0
 236 - 16.. 16.. 23.8
 16.. 16.. 00.0

26.57

16.. 15.. 33.43

236 - 16.. 16.. 23.80

236 fast 49.37

26th 12.40

3) 697 (+2.32)

M.C. - 4.. 04.. 45 - 4.. 7.. 20

236 - 16.. 38.. 56.5 - 16.. 41.. 52

16.. 38.. 56.5

49.37

16.. 38.. 07.13

12.. 33.. 33.26

4.. 04.. 33.87

3.. 59.. 20.68

3.. 59.. 34

32.91

.87

4 03.. 53.80

4.. 04.. 45

51.20

16

35.20

36.60

3) 140 (-0.46)

26th

1857. Oct. $\frac{4}{5}$

EE - 9..14..0
 236 - 9..14..39
 9..14..0
28.19

236 - 9..14..39.00
 67.19

$\frac{49}{18.19/3}$

EE - 16.45.00 ME - 4..10..20
 236 - 16.45..40 236 - 4..10..31

$\frac{1}{1} 7.19$
 17 07..23.81
 12..57..12.57
4..10..11.24

$\frac{40.98}{4} 09.30.26$
 4..10..20

$\frac{44.74}{16}$

33.74

29th

$\frac{35.20}{12} 150/0.25$

40.956
 36
 956

$\frac{3.26.09}{09}$
 3.26.18

Oct. 8/9

EE - 10..03..0
 236 - 10..03..52.5
 10..03..00

$\frac{27.27}{10..02..32.73}$

10..02..32.73

10..03..52.50

236 fast

5th

1..19.77
 67.49

$\frac{4}{12} 12.28(3.67)$

33.68

33.24

$\frac{1}{12} 08/013$

EE fast - 27.27

ME - 20..55..55.0 - 20..58..55.0

236 - 10..08..53.5 - 10..11..54.0

$\frac{1}{1} 19.77$

13..08..15.49

236 - 70..07..33.73

46.74

13..09..02.23

13.09.02.23

20..58..31.50

19..56..43.4088

20..58..31.50

37..50.1981

3.26.18

30.9154

20.55.05.32

49.86

0.55.55.00

20..55..05.3209

45.68

20..55..55

33.74

49.68

16

33.68

1857- Oct 10th

E.C. fast 27.01

EC-16..36..0
 236-16..36..56.3
 16..36..0
 27.01
 16..35..22.99
 16..36..56.30
 1.23.21

MC-3..22..30
 236-16..40..32.5
 16..-1..23.31
 16..39..09.19
 13..16..55.34
 3..22..13.85
 33.12
 3..21..40.72
 MC-3..22..30.00
 49.28
 16
 33.28

33.09
 04
 33.13

13..16..8.60
 46.74
 13..16..55.34

Oct 12th

E.C. fast 27.03

EC-10..3..00.0
 236-10..4..03.5
 1..03.5-
 0..27.03
 136 fast 1..30.53

MC-20..37..15
 236-10..06..8.5
 1..30.53
 10..04..37.97
 13..24..48.45-
 20..39..49.52
 3..23.12
 20..36..26.40
 MC-20..37..15.00
 48.60
 16
 32.60
 33.28
 3..68 (-, 2 3)

20..40..15
 10..09..09
 13..24..01.71
 46.74
 13..24..48.45-

3.22.980
 136
 3..23.116

Oct $\frac{12}{13}$ hE.C. fast $\frac{5}{27,31}$

E.C. - 10 .. 03 .. 00,0
 236 - 10 .. 04 .. 03,5
 1 .. 03,5
 27,31
 236 fast. 1 .. 30.81

M.C. - 20 .. 37 .. 15
 236 - 10 .. 06 .. 08,5
 1 .. 30,81
 10 .. 04 .. 37,69
 13 .. 24 .. 48,45
 20 .. 39 .. 49,24
 3 .. 23,12
 20 .. 36 .. 26,12
 20 .. 37 .. 15,00
 48,88
 16
 32,88 3 .. 22,98
 14
 3 .. 23,12

M.C.

Oct $\frac{16}{17}$ 1857.

E.C. 13 .. 33 .. 00
 236, 13 .. 34 .. 12,5
 1 .. 12,5
 28,56
 236 fast. 1 .. 41.06

E.C. fast 28,56

E.C. 13 .. 34 .. 00
 236. 13 .. 35 .. 12,5

M.C. - 23 .. 53 .. 30
 236 - 13 .. 38 .. 54

13 .. 39 .. 47,93
 46,74
 13 .. 40 .. 34,67

M.C. - 23 .. 56 .. 30
 236 - 13 .. 41 .. 54,5
 1 .. 41,06
 13 .. 40 .. 13,44
 13 .. 40 .. 34,67
 23 .. 59 .. 38,77
 3 .. 55,85
 23 .. 55 .. 42,92
 23 .. 56 .. 30,00
 47,08
 16
 31,08
 32,48
 47,08 10,45

48,88
 47,08
 4) 1,82 (- 45

857. October 21st

E.C. - fast - 29.65

E.C. - 18..08..0

236-18..09..21

1..21

29.62

236 fast

1..50.65

M.C. - 4..12..00

236-18..14..03

1..50.65

18..12..12.35

14..00..17.14

4..1..55.21

41.27

4..11..13.94

M.C.

4..12..00.00

M.C. fast

46.06

16.00

30.06

31.08

4)1.02(-,255

13..59..30.70

46.74

14..00..17.14

41.12

15

41.27

October 24th

E.C. fast 29.36

EC - 18.07.0

236 - 18.08.30

1.30

29.36

236 fast - 1.59.36

MC - 3.57.50 - 4.00.45

236 - 18.11.49 - 18.14.44.5

1.59.36

1.8.09 " 49.64

14.12 " 07.10

3.57 " 42.54

38.95

3.57 " 03.59

MC - 3.57 " 50.00

MC fast 46.41

16.

30.41

30.06

31.35 L+, 12

14.11 " 20.36

46.74

14.12.07.10

38.83

12

38.95

Oct 26/27

EC - 11.50.0.0

236 - 11.57.38.3

1.38.3

29.79

236 fast 2.08.09

MC - 21.29.50 - 21.35.40

236 - 11.54.44 - 12.00.35

2.08.09

11.52 " 35.91

14.20 " 00.21

21.32.35.70

3 31.76

21 29.03.94

21 29 50.00

MC +46.06

16.

30.06

2.08.09 14.19 " 13.47

11.58 " 26.91

14.20 " 00.21

70 14.20.00.21

46.74

57-Oct-30th

E.C. - fast 29.92

EC - 18..24..0.0

236-18..25..48.7

1..48.7

29.92

236 fast 2..18.62

MC - 3..50..20 ~ 3..53..20

236-18..28..17 ~ 18..31..17.5

2..18.62

18..25..58.38

14..35..46.43

3..50..11.95

37.71

3..49..34.24

MC 3..50..20

MC fast ..45.76

16

29.76

30.06

33..30.0 (-09)

14..34..59.69

46.74

14..35..46.43

Oct-Nov-3rd

E.C. fast- 30.52

EC - 13..16..0

236-13..18..2.5

MC - 22..23..0.0

236-13..20..0.5

4th PM MC - 3..20..10

236-18..18..0.0

EC - 18..19..0

236-18..21..3.3

2..03..3

30.42

236 fast 2..33.42

18..18..0.0

2..33.82

18..15..26.18

14..55..29.22

3..19..56.96

32.75

3..19..24.21

MC 3..20..10.00

MC fast 45.79

16.

3 PM MC fast B -

29.79

29.71

.03

14..54..42.48

46.74

14..55..29.22

236 was let to run down on the 9th hour
wound up and reset near EC.

Nov 11th

E.6 - fast - 30.23

CC 18.39.0

236-18.38.57

00.09

30.23

236 fast

21.23

15.22.18.37

46.74

15.23.05.11

MC-3.27.45

236-18.57.00.5

MC-3.30.25.0

236-18.54.01.0

21.23

18.53.39.77

15.23.05.11

3.30.34.56

34.50

3.30.00.16

Ml 3.30.45.00

Ml fast 44.84

16

Ml fast of B

28.84

29.74

75) .90 12

75

15-0

05.0

Nov. #18-

EC- 16 " 33 " 00
 236- 16 " 33 " 12
 12

15 " 49 " 54.26
46.74

15 " 50 " 41.00

EC fast 29.44^s

MC 0 " 45 " 00
 236 16 " 35 " 44.5
 236 fast 41.44

16 " 35 " 03.06

15 " 50 " 41.00

0 " 44 " 22.06

07.27

44 " 14.79

45 " 00

MC fast " 45.21
16

MC fast of B 29.21
28.84

71.37 + 0.5

Nov. $\frac{24}{25}$ El fast $28^{\circ} 96$

EC - 13..27..0 ME - 21..11..50
 236 - 13..27..33.5 236 - 13..29..54.5

25th PM

EC - 20..16..0-0 ME - 3..55..20
 236 - 20..16..34.5 236 - 20..14..31.5

236 fast 1^m 03.46
 28.96
 34.5

20..13..28.04
 16..18..16.92
 3..55..11.12
 3..54..32.59
 3..55..20.00

16..17..30.18
 46.74
 16..18..16.92

ME fast 47.41
 16

ME fast of B 31.41
 29.21

2) 2,20 (+.31)

Dec 2nd 1857

Elb fast. 24.70

Mc 3 " 56 " 31
 236 20 " 44 " 00

Mc " 3 " 59 " 18
 236 " 20 " 46 " 25.5

Mc 4 " 3 58
 236 20 49 00

Elb 20 " 53 " 00
 236 20 " 54 " 00.5
 1 " 00.5

Mc 4 " 12 " 30
 236 20 " 59 " 39.5
 1 " 25.20

236 fast 1 " 25.20

20 " 58 " 14.30

16 " 45 " 52.83

4 " 12 " 21.47

41.34

4 " 12 " 40.13

Mc 4 " 12 " 30.00

Mc fast. " 49.87

16.00

Mc fast of B 33.87

31.41

7.5 / 2.46 (+,33)

16 " 45 " 06.09

46.74

16 " 45 " 52.83

Dec 4th

El fast. 23^s 85

66 20 " 15 " 00
 236 20 " 16 " 07.5
 1 " 07.5
 23.85
 1 " 31.35

Mb - 3 " 17 " 06
 236 - 20 " 12 " 05.0
 1 " 31.35
 20 " 10 " 33.65
 16 " 53 " 45.95
 3 " 16 " 47.70
 32.24

16 " 52 " 59.21
 46.74
 16 " 53 " 45.95

Mb
 Mb fast 50.54
 16.

Mb fast of B.
 34.54
 33.87
 2, 67 (+33)

Dec 11th

El fast 23^s 01
 4th 23^s 85 (0.12)

66 - 20.30 " 00
 236 - 20.31 " 29
 1 " 29
 23.01
 1 " 52.01

Mb - 3 " 11 " 20
 236 - 20.34 " 31
 1 " 52.01

20 " 32.38.94
 17 " 21 " 21.85
 3 " 11 " 17.14
 31.34

17 " 20 " 35.11
 46.74
 17 " 21 " 21.85

Mb - 3 " 11 " 40.
 Mb fast 54.2
 Mb fast of B 16

38.2
 34.54
 7) 3.66 (+5.2)

Dec 19 1857.

M6 - 4 " 46.15
 236 - 22 " 41 " 13.00
 2 " 14.86
 22 " 38 " 58.14
 17 " 52 " 54.32
 4 " 46 " 03.82
 46.86
 4 " 45 " 16.96
 4 " 46 " 15

M6 fast " 58.04
 16.00

M6 fast of B 42.04
 38.20
 8) 3.84 (+, 48

E6 fast 21.06

E6 22 " 42 " 00
 236 22 " 43 " 53.8

E6 22 " 43 " 00
 236 22 " 44 " 53.8
 1 " 53.8
 21.01

236 fast 2 " 14.86

17 " 52 " 07.58
 46.74

17 " 52 " 54.32

Dec 23rd

M6 4 " 02 " 15.0

236 21 " 10 " 36.50

59 " 57.28

22 " 10 " 33.78

18 " 08 " 40.36

4 " 01 " 53.22

39.62

4 " 01 " 13.60

M6 4 " 02 " 15.00

M6 fast 1 " 01.40

16.00

M fast of Boston 45.40

42.04

4) 3.36 (+, 84

E6 fast 19.92

E6 22 " 15 " 00

236 21 " 14 " 42.8

21 " 00 " 17.20 22 " 15 " 00.0

19.92

236 slow of B " 59 " 57.28

22 " 14 " 40.08

14 " 42.80

2.02.72

18 " 07 " 53.82

59 " 57.28

46.74

18 " 08 " 40.36

21 " 10 " 36.50

1857-

Dec^r 26th Am

Mc-20-32.00

236-13.50-59.5

59.50.9

14 " 50 " 50.40

18 " 16 " 33.68

20 " 34 " 16.72

3.22.21

20 " 30 " 54.51

20 " 32 " 00.00

Mc fast 1.05.49

16.00

Mc fast of B 49.49

45.40

25) 4.09 (+1.64)

Eb fast 19.70

Eb 14 " 56 " 00

236 13 " 55 " 49.4

1 " 00 " 10.6

19.70

236 slow of Sid. 59 " 50.90

18 " 15 " 46.94

46.74

18 " 16 " 33.68

Dec 28
29

Mc 20 " 25 " 30

236 14 " 56 " 24.5

Mc 20 " 28 " 30.

236 14 " 59 " 25.00

16.75

14 " 59 " 08.25

18 " 28 " 23.35

20 " 30 " 44.90

3 " 21.68

20 " 27 " 23.27

20 " 28 " 30.00

Mc fast

1 " 06.73

16.00

Mc fast of B

50.73

49.49

3) 1.24 (+1.1)

Eb fast 19.35

Eb 15 " 03 " 00

236 15 " 02 " 57.4

" 02.6

19.35

16.75

18 " 27 " 36.61

46.74

18 " 28 " 23.35

Dec 31. 1857.

Mb 9 " 33 " 18

236 4 " 14 " 21

24.50

4 " 13 " 56.50

18 " 40 " 13.06

9 " 33 " 43.46

1 " 33.99

9 " 32 " 09.47

9 " 33 " 18

Mb Jan 01 " 08.53

16.00

Mb fast of 13 52.53

Eb Jan 18.70

Eb 4 " 33 " 00

236 4 " 33 " 05.8

5.818.70

24.50

18 " 39 " 26.30

46.74

18 " 40 " 13.04

Jan 5 A.M. 1858.

Mb. 21 " 13 " 46

236 16 " 12 " 40.5

Mb 21 " 16 " 35

236 16 " 15 " 30.00

37.16

16 " 14 " 52.84

18 " 55 " 59.27

27 " 18 " 53.57

3 " 29.52

21 " 15 " 24.05

21 " 16 " 35.00

Mb Jan 1 " 10.95

16.00

Mb fast of 13 54.95

52.53

4.5 / 2.42 (+.53)

Eb fast 17.86

Eb 16 " 21 " 00

236 16 " 21 " 19.3

19.30

19.317.86

37.16

18 " 55 " 12.53

46.74

18 " 55 " 59.27

Jan 8. 1858. A.M.

EC- 17. 35. 00 MC-22. 21. 20.0

236- 17. 35. 27.3 236-17. 32. 20.5

<u>17.25</u>	<u>44.55</u>
--------------	--------------

44.55

17. 31. 35.95

19. 7. 2.21

19. 7. 48.9546.74

34. 2.75

22. 23. 47.00

19. 7. 48.95

55. 27.30

3. 40.15

236-fast

46.55

22. 20. 06.85

22. 21. 20.00

Mb fan

1. 13.15

16.00

Mb fan of B

57.15

54.95

3) 2.20 (+.73

Eb fan. 17.25

Jan 14. A.M.

Eb fan 14.37

Mb 23. 24. 37

236 18. 59. 40

Eb 19. 6. 00

236 19. 6. 46.5

1. 00.8714.37

18. 58. 39.13

1. 00.87

19. 31. 28.30

23. 27. 10.83

3. 50.37

19. 30. 41.56

23. 23. 20.46

46.74

23. 24. 37.00

19. 31. 28.30

Mb fan

1. 16.54

16.00

Mb fast of B

1. 00.54

57.15

6) 3.39 (+.56

Jan 19. 1858. A.M.

E b fast. 13^s, 16

Mb 20 " 31 " 28

236 16 " 25 " 55

Mb 20 " 34 " 58

236 16 " 29 " 25.5

1 " 12.86

16 " 28 " 12.64

19 " 51 " 11.09

20 " 37 " 01.55

3 " 22.66

20 " 33 " 38.89

20 " 34 " 58.00

Mb fast 1 " 19.11

16.00

Mb fast of B 1 " 03.11

1 " 00.54

5) 62.57 (+57)

E b 16 " 31 " 00

236 16 " 31 " 59.7

13.16

236 fast 1 " 12.86

19 " 50 " 24.35

46.74

19 " 51 " 11.09

Jan. 20. P.M.

E b - 1 " 5 " 0.0

Mb - 5 " 8 " 30.0

E b - 12^s, 33

236 - 1 " 6 " 4.0

236 - 1 " 8 " 21.0

5 " 11 " 30

1 " 4.0

12.33

1 " 16.33

19 " 58 " 17.46

46.74

19 " 59 " 04.20

1 " 16.33

1 " 10 " 05.77

19 " 59 " 04.20

5 " 11 " 00.97

50.95

5 " 10 " 10.02

5 " 11 " 30.

Mb fast 1 " 19.98

16

Mb fast of B 1 " 03.98

+0.29

+1.58

Jan 26 P.M.

EC fast 9.70

$$\begin{array}{r} MB \ 4 \ 45 \ 1 \\ 236 \ 1 \ 10 \ 40.5 \end{array}$$

$$\begin{array}{r} MB \ 4 \ 49 \ 1 \\ 236 \ 1 \ 12 \ 41. \\ \hline 1 \ 31.7 \end{array}$$

$$\begin{array}{r} EC \ 1 \ 15 \ 00 \\ 236 \ 1 \ 16 \ 22 \\ \hline 1 \ 22 \end{array}$$

$$\begin{array}{r} 1 \ 11 \ 09.3 \\ 20 \ 22 \ 43.55 \\ \hline 4 \ 48 \ 25.75 \\ \hline 47.25 \end{array}$$

$$\begin{array}{r} 9.7 \\ 1 \ 31.7 \end{array}$$

$$\begin{array}{r} 4 \ 47 \ 38.50 \\ 4 \ 49 \ 1. \end{array}$$

$$20 \ 21 \ 56.81$$

$$46.74$$

$$20 \ 22 \ 43.55$$

$$\begin{array}{r} MC \ fast \ 1 \ 22.50 \\ \hline 16 \end{array}$$

$$\begin{array}{r} MC \ fast \ of \ B \ 1 \ 6.50 \\ 1 \ 3.98 \end{array}$$

$$6) \ 2.52 (+.42)$$

1858

Jan-30. P.M.

EC fast 8.78

$$\begin{array}{r} EC - 2 \ 3 \ 00 \quad MC - 5 \ 15 \ 0 \\ 236 - 2 \ 4 \ 34.8 \quad 236 - 1 \ 54 \ 40.00 \\ \hline 1 \ 34.8 \quad 1 \ 43.58 \end{array}$$

$$\begin{array}{r} 8.78 \\ 1 \ 43.58 \end{array}$$

$$\begin{array}{r} 1 \ 52 \ 56.42 \\ 20 \ 38 \ 29.78 \end{array}$$

$$20 \ 37 \ 48.04$$

$$46.74$$

$$20 \ 38 \ 29.78$$

$$\begin{array}{r} 5 \ 14 \ 26.64 \\ \hline 51.51 \end{array}$$

$$5 \ 13 \ 35.13$$

$$\begin{array}{r} MB \ 5 \ 15 \ 00.00 \end{array}$$

$$\begin{array}{r} MC \ fast \ 1 \ 24.87 \\ \hline 16 \end{array}$$

$$\begin{array}{r} MB \ fast \ of \ B \ 1 \ 8.87 \\ 1 \ 6.30 \end{array}$$

$$4) \ 2.37 (+.59)$$

Feb. 1 P.M.

E b fast. 8^s.26

Mc	5	6	22	-	5	9	22.	86	2	3	..00
236	1	53	55.5	-	1	56	56	236	2	4	..39
						1	47.26			1	39
					1	55	8.74				8.26
					20	46	22.89			1	47.26
					5	8	45.85				
							50.58	20	45	36.15	
					5	7	55.27				46.74
					5	9	22.00	20	46	22.89	
Mc						1	26.73				
Mc fast							16				
Mc fast of 13						1	10.73				
						1	8.87				
							2) 1.86 (+, 93)				

Feb 4 A.M.

E b fast 7^s.46

Mc	23	31	51	-	23	34	52	86	20	34	..00
236	20	30	25	-	20	33	26.5	236	20	35	47.5
							1	54.96			1 47.5
											1 7.46
											1 54.96
	20	28	30.04								
	20	54	16.01								
	23	34	14.03								
			3	51.69							
	23	30	22.34								
	23	31	51.00								
Mc fast					1	28.66					
						16.00					
Mc fast of 13					1	12.66					
					1	8.87					
						5) 3.79 (+, 76)					

Feb 6. A.M.

Eb fast 6.87

Mc	21	23	35	EB	18	31	00.0		
236	18	29	45.00	236	18	32	53.4		
		2	0.27			1	53.4		
18	27	44.73					6.87	21	1 22.38
21	2	9.12				2	0.27		46.74
21	25	35.61						21	2 9.12
	3	30.61							
21	22	5.00							
Mc	= 21	23	35.00						
Mc fast		1	30.00						
			16						
Mc fast of B		1	14.00						
		1	22.66						
			2/1.34 (+.67)						

Feb 11. P.M.

Eb fast. 4.21

Mc	3	58	0.0	-	4	1	00.0	EC	1	18	00
236	1	23	3.5	-	1	26	4.0	236	1	18	55
			9.71								5.5
1	22	53.79									4.21
21	25	48.45									9.71
3	57	5.34									
		38.84									
3	56	26.50									
Mc	3	58	00.0								
Mc fast		1	33.5								
			16.0								
Mc fast of B		1	17.5								
		1	14.0								
			5) 3.5 (+.70)								

Feb 16 P.M.

MC 5

236 3

23

235 - 5

26

20

EC

3

EC fast 2.06^s

18 00

3

17 6

51.94

54

3 11 6.54

2.06

22 45 31.29

51.94

5 25 35.31

21 44 44.49

53.34

46.74

5 24 41.99

21 45 31.23

5 26 20.

MC fast 1 38.01

16

MC fast of B 1 22.01

1 17.5

5) 4.5 (+9)

Feb. 22nd A.M.

EC - 21 23 00

236 21 22 23.3

36.7

0.59

236 slow

36.11

MC - 21 29 1.5

236 - 19 35 36

36.11

19 36 12.11

22 4 27.26

22 5 14.00

46.74

21 30 58.11

22 5 14.00

3 31.49

21 27 26.62

21 29 5.00

MC fast 1 38.38

16.00

MC fast of B 1 22.38

1 22.01

6) .37 (+0.6)

Feb 23

Eb slow 0.62

Mc 9.09, 21.0
 236 7, 21, 42.0
32.12

7 22 14.12
 22 13 7.11
 9 9 7.01
1 29.96

9 7 37.05

Mc 9 9 21.00

Mc fan 1 43.95
16.00

Mc fan of B 1 27.95
 1 22.01

7/5.94 (+85)

Mc=9, 10. =
 236=7, 22, 21.2

Ec 7 30 00
 236 7 29 28.5
31.5
52.12

22 12 20.87

46.74

22 13 7.11

Feb. 26

Ec - slow 2.40

Ec - 19 15 00

236 19 14 41.2

18.8

2.40

236 slow 21.20

Mc - 19.24, 20 - 20.27, 20

236 18.50, 31 - 18.53, 31.5

21.2

18 53 52.7

22 24 10.04

22 24 56.78

46.74

20 28 55.92

22 24 56.78

3 21.33

20 25 34.59

20 27 20.00

Mc fan 1 45.41

16.00

Mc fan of B 1 29.41

1 27.95

3.5/1.46 (+.42)

MCL 3 185-8

$$\begin{array}{r} \text{MB} = 8, 33, 350 \\ 236 = 7, 17, 45, 0 \\ \hline 6 \quad 44 \end{array}$$

$$7 \quad 17 \quad 51.44$$

$$22 \quad 44 \quad 39.99$$

$$8 \quad 33 \quad 11.45$$

$$1 \quad 24.07$$

$$8 \quad 31 \quad 47.38$$

$$8 \quad 33 \quad 35.00$$

$$\text{MB for } 1 \quad 47.62$$

$$16.00$$

$$1 \quad 31.62$$

$$1 \quad 29.41$$

$$4.5) 2.21 (+.50)$$

EB slow 2.94

$$\text{EB } 7 \quad 22 \quad 00$$

$$236 \quad 7 \quad 21 \quad 36.5$$

$$3.5$$

$$2.94$$

$$- 236 \text{ slow} \quad 6.44$$

$$22 \quad 43 \quad 53.25$$

$$46.74$$

$$22 \quad 44 \quad 39.99$$

March 10th PM

EB slow 5^h 00

MC = 9.01, —
236 = 8, 13, 06.7

MC 9.03, 20.0 EB 8 19 00
236 8, 15 27.0 236 8 19 18.8
13.8
8 1 5 13.2 18.8
23 1 2 15.43 5.00
9 2 57.77
1 28.95
9 1 28.82 } 23 11 28.69
9 3 20.00 46.74
MC fan 1 51.18 23 12 15.43
16.
MC fan of B 1 35.18
1 31.67
7) 3, 51 (+, 50

March 12th

EB slow 5^h 59

MC 8 16 00 — 8 17 00
236 7 35 57.5 — 7 36 57.7
19.91

EB 7 40 00
236 7 40 25.5
25.5

7 36 37.79
23 20 8.99

5.59
236 fan 19.91

8 16 28.80

1 21.34

8 15 7.46

8 17 00.

23 19 22.25

46.74

23 20 08.99

MC fan

1 52.56

16.00

1 36.56

1 35.18

2) 1.38 (4.69

1.36.66

4
1-37.46

March 14/15 1858

MB 22 45 5 - 22 46 5
 236 22 13 25 - 22 16 25.5
 27.41
 22 15 58.09
 23 28 1.64
 22 47 56.45
 3 44.10
 22 44 12.35
 22 46 5.00
 1 52.65
 1 16.40
 1 36.65
 1 36.56
 0.09

Eb slow 6.79

Eb 22 7 00
 236 22 7 34.2
 34.2
 6.79
 27.41

 23 27 14.90
 46.74
 23 28 01.64

March 15 1858

Eb slow 6.79

MC 13 10 35 - Eb 2 43.0
 236 2 41 39.5 - 236 2 43.35
 28.21 6.79
 2 41 11.29 236 for 2 28.21
 23 31 58.19 46.74
 3 09 13.10 23 31 58.19
 0 31.00
 3 8 42.10
 3 10 35.00
 MC for 1 52.90
 1 16
 1 36.90
 1 36.56
 3) .33 (+.11

March 17 1858

MC - 6 57 15 - 7 0 0.0

236 - 6 36 56.5 - 6 38 42.0

33.99

6 39.08.01

23 39 51.30

6 59.16.71

1 08.69

6 58 8.02

7 00 0.00

MC for 1 51.98

16.00

MC for 13 1 35.98

1 26.90

2 10.92 (-.46)

EC slow 8.91

EC 6 43 00

236 6 43 42.9

42.9

8.91

236 for 33.99

23 39 4.56

46.74

23 39 51.30

March 19th

EC -

239 -

MC - 8.43.0.0

236 - 8.30.58.4

41.0

8 30 17.4

23 47 24.41

8 42 32.99

1 25.61

8 41.07.38

8 43.00.00

1 52.62

16.00

1 36.62

1 33.98

2 10.64 (+.32)

236 for 41.00

23 46 57.67

46.74

23 47 44.41

March 2/22 1858

E C slow 9.15

MC 20 59 0.0
 236 20 57 0.0
44.45

20 56 15.55

23 55 37.51

21 00 38.04

3 26.52

20 57 11.52

20 59 0.00

MC feet 1 48.48
16.00

MC feet of B 1 32.48
1 36.62

2.5) 4.14 (-1.66

EC 20 59 00

236 20 59 53.6 a mistake of 5³?

63.6

9.15

236 feet 44.45 23 54 50.77

46.74

23 55 37.51

1. 32.48

or 1 35.98

4.5) 3.50 (-0.78

March 23.

E C slow 9.18

Mc 8 25 35.0

236 8 29 28.5

34.02

8 28 34.48

0 3 30.62

8 25 3.86

1 22.74

8 23 41.12

8 25 35.00

Mc feet 1 53.88
16.00

Mc feet of B 1 37.88
 1 36.62

4) 1.26 (+315

EC 8 32 00

236 8 33 3.5

1 3.5

236 feet 54.02 0 2 43.88

46.74

0 3 30.62

March 26

EC slow 9.95

MC 8 6 00.0
 236 8 21 48.5
 1 3.55
 8 20 44.95
 0 15 20.74
 8 5 24.21
 1 19.52
 8 4 4.69
 8 6 0.00

MC fast 1 55.31
 16.00

MC fast of B 1 39.31
 1 37.88
 3) 1.43 (+.48)

EC 8 17 00.0
 236 8 18 13.5
 1 13.5
 9.95
 236 fast 1 3.55

0 14 34.00
 46.74
 0 15 20.74

March 30

EC slow 10.73

MC 7 56 15
 236 8 27 59.00
 1 15.67
 8 26 43.33
 0 31 6.50
 7 55 36.83
 1 17.82
 7 54 19.01
 7 56 15.00

Me fast 1 55.99
 16.00

Me fast of B 1 39.99
 1 39.31
 4) 68 (+.17)

EC 8 30 00
 236 8 31 26.4
 1 26.4
 10.73
 236 fast 1 15.67

0 30 19.76
 26.74
 0 31 6.50

April 7³ 1858

E C slow 11.51

MB 22 7 45.0
 236 22 53 50.0
 1 27.29

2 2 52 22.71

0 42 36.16

2 2 0.9 26.55

3 37.80

2 2 5 48.75

2 2 7 45.00

MC for 1 56.25
 16.00

MC for of B 1 40.25
 1 39.99

3.5) .26 t.08

EB 22 56 00
 236 22 37 38.8
 7 38.8

11.51

236 for 1 27.29

0 42 9.42

46.74

0 42 56.16

April 4/5^t

E C slow 11.39

MC - 21 13 35.0

236 - 22 7 30.5

1 33.71

2 2 5 58.79

0 50 49.27

2 1 13 7.52

3 28.90

21 11 38.62

21 13 35.00

MC for 1 56.38
 16.00

MC for of B 1 40.38
 1 40.25

2) .13 (+.06)

EC - 22 9 00.

236 - 22 10 45.1

1 45.1

11.39

0 50 2.53

236 for 1 33.71

46.74

0 50 49.27

1858.

April 8th Am

EC slow - 11.50

EC - 22 - 24 - 0.0

236 - 22 - 25 - 55.7

$$\begin{array}{r} 1 \ 55.7 \\ \hline 11.30 \end{array}$$
236_{fast} 1 44.20

MC - 21 - 17 - 0.0

236 - 22 - 22 - 55.5

$$\begin{array}{r} 1 \ 44.2 \\ \hline 22 \ 21 \ 11.30 \end{array}$$

1 2 38.93

21 18 32.37

3 29.46

21 15 2.91

21 17 0.00

$$\begin{array}{r} MC_{fast} \quad 1 \ 57.09 \\ \hline 16.00 \end{array}$$

$$\begin{array}{r} MC_{fast} \text{ of } B \\ \text{fast } 5I \quad 1 \ 41.09 \\ \hline 1 \ 40.38 \end{array}$$

3) 71/40.27

1 1 52.19

46.74

1 2 38.83

44.45

1.46.2

17/54 75/3.5

51

87

April 14.

EC slow 11.17

MC 8 39 50

236 10 11 37

2 6.03

Sid Dim 10 9 30.97

1 30 14.81

8 39 16.16

1 24.91

8 39 51.25

MC 8 39 50.00

MC_{fast} 1 58.75

16.00

MC_{fast} of B 1 42.75

1 41.09

6.5) 1.66 (+255)

EC 10 19 00

236 10 21 17.2

2 17.20

00 11.17

236_{fast} 2 06.03

1,29 28.07

46.74

1 30 14.81

58 April 22. P.M.

MC - 4..56..10 MC - 4..58..0 ?

236 - 6..59..17.5 236 - 7..0..07.7
2 33.40E.C. - 10³.90

EC -	7	12	00	6	57	33.30
236 -	7	14	44.3	2	1	47.25
		2	44.3	4	55	46.05
			10.90			48.45

236 feet	2	33.40	4	54	57.60
			4	57	0.00

MC feet	2	2.40
		16.00

MC feet of B	1	46.40
	1	42.75

8/3.65 (+.456)

- 2	1	0.51
		46.74
- 2	1	47.25

April 26. P.M.

MC - 5	17	5	5	20	5
236 - 7	36	15	7	39	15.5
			2		47.93
			7	36	27.57
			2	17	33.47
			5	18	54.10
					52.15

5	18	1.95
5	20	5.00

MC feet	2	3.05
		16.00

MC feet of B	1	47.05
	1	46.40
	4	.65 (+.16)

EC	7	39	00
236	7	41	58.8
		2	58.8
			10.87
236 feet	2	47.93	

2	16	46.73
		46.74
2	17	33.47

28/29

April 29/30? 1858

E b slow 10^s.59

$$\begin{array}{rcl}
 MC = 21 & 25 & 50.0 \\
 236 = 23 & 55 & 40.5 \\
 \hline
 & & 21.5 \\
 & & 23 & 54 & 54.24 \\
 & & 2 & 25 & 26.58 \\
 & & 21 & 29 & 27.66 \\
 & & 3 & & 31.25
 \end{array}$$

$$\begin{array}{rcl}
 EC = 23 & 58 & 0 \\
 236 = 24 & 01 & 7.1 \\
 \hline
 & & 3 & 7.1 \\
 & & & 10.59
 \end{array}$$

236 fast 2.5-6.51

MC fast

$$\begin{array}{rcl}
 21 & 25 & 56.21 \\
 21 & 28 & 0.00 \\
 \hline
 & 2 & 3.59 \\
 & & 16.00
 \end{array}$$

MC fast of B

$$\begin{array}{rcl}
 1 & 47.59 \\
 1 & 47.65 \\
 \hline
 & 2.5 & 1.54 (+216)
 \end{array}$$

$$\begin{array}{rcl}
 2 & 24 & 39.84 \\
 & & 46.74 \\
 2 & 25 & 26.58
 \end{array}$$

May 1

E b slow 10^s.54

$$\begin{array}{rcl}
 MC & 7 & 89 & 00 & - & 7 & 40 & 15 \\
 236 & 10 & 18 & 32.7 & - & 10 & 19 & 48 \\
 \hline
 & & & & & 3 & 3.76 \\
 & & & & & 10 & 16 & 42.64 \\
 & & & & & 2 & 37 & 16.25 \\
 & & & & & 7 & 39 & 26.39 \\
 & & & & & & 1 & 15.27 \\
 & & & & & 7 & 38 & 11.12 \\
 & & & & & 7 & 40 & 15.00
 \end{array}$$

$$\begin{array}{rcl}
 EC = 10 & 21 & 00 \\
 236 = 10 & 24 & 15.9 \\
 \hline
 & & 3 & 15.9 \\
 & & & 10.54
 \end{array}$$

236 fast 3 5.36

MC fast

$$\begin{array}{rcl}
 & & 2 & 3.88 \\
 & & & 16.00 \\
 & & 1 & 47.88 \\
 & & 1 & 47.55 \\
 \hline
 & & 2.5 & .29 (+12)
 \end{array}$$

MC fast of B

$$\begin{array}{rcl}
 2 & 36 & 29.51 \\
 & & 46.74 \\
 2 & 37 & 16.25
 \end{array}$$

858. May $\frac{3}{4}$.MC-20 $\frac{1}{4}$ 40 $\frac{1}{4}$ 00 — 20 40 50.0

236-23 — 29 42.5 — 20 30 32.5

3 13.91

23 27 18.59

2 45 9.36

20 42 9.23

3 23.50

20 38 45.83

20 40 50.00

MC-for 2 4.17

2 16.00

MC for of B 1 48.17

1 47.88

2.5) .29 (+.12

EC slow 10.69

EC 23 31 00

236 23 34 24.6

3 24.6

10.69

236 fast 3 13.91

2 44 22.62

46.74

2 45 9.36

May 4

EC slow 10.79

MC 5 27 10 MC=5 30 10

236 8 18 20 236=8 21 20.5

3 14.91

8 18 5.69

2 49 5.92

5 28 59.67

53.90

5 28 5.77

5 30 10.00

MC fast 2 4.23

16.00

MC fast of B 1 48.23

1 48.17

.5) .06 (+.12

EC = 8 12 00

236 = 8 13 25.7

3 25.7

10.79

3 14.91

2 48 19.18

46.74

2 49 5.92

12

72

am 4th 1. 48.17

10th 1. 48.89

By note of .12

May 12th PM

E.C. slow 10.50?

EC - 8 00 00
 236 - 8 3 55.1
 3 55.1

10.5
 236 fast 3 44.6

3 19 51.68
 46.74

3 20 38.37

MC - 4 22 15
 236 - 7 45 14.5
 3 44.6

MC - 4 23 0
 236 - 8 1 45 59.6
 3 44.6

7 42 15.0

3 20 38.37

5 21 36.63

42.86

4 20 53.77

4 23 0.00

MC fast 2 6.23

16.00

MC fast of B 1 50.23

1 48 23

8 12.00 (+2.5)

May 17th a.m.

E.C. slow 10.56

EC - 0 36 0.0

236 - 0 40 12.0

4 12.0

EC slow 10.56

236 fast 4 1.44

3 35 37.86

46.74

3 36 24.60

MC - 20 55 20.0

236 - 24 37 5.0

MC - 20 57 0

236 - 24 38 45.3

4 1.44

24 34 43.86

3 36 24.60

20 58 19.26

3 26.15

20 54 53.11

20 57 00.00

MC
 MC fast 2 6.89

16.00

MC fast of B 1 50.89

1 50.23

4.5 6.6 (+1.5)

May 22

EC slow

MC	2	50	30	-	2.52	00
236	6	53	14.5	-	6	34 44.7
					4	21.68

could not find the Letter Book
and the transits are not
corrected for instrument
errors.

6	50	23.02	3	59	17.66
4	00	4.40			46.74
2	50	18.62	4	00	4.40
0		27.90			
2	49	50.72			
2	52	00.00			

MC ferr

2	9.28
	16.00

MC ferr of B

1	53.28
1	30.89

5) 2.39 (+.48)

May 28thEC 10³ 41

EC- 5 16 00

MC- 0. 50 5 MC- 0.57 0

236 5 20 55.5

236- 5 16 31.1 236- 5 17 26.2

4 55.5

4 45.09

10.41

236 ferr 4 45.09

5 11 46.01

4 23 43.29

0 48 2.72

4 22 56.55

7.87

46.74

0 47 54.85

4 23 43.29

0 50 5.00

MC ferr

2 10.15

16.00

MC ferr of B

1 54.15

53.28

6 7.87 (+.145)

29th - a mMC- 10²² 59.54

239-10 57.59.3

1.54.7

1855

May 31 - a.m.

E.6 slow 11.20

EE - 2..59..0

236 - 3..04..7.7

5 7.7

11.20

236 fast 4 56.50

4 30 49.66

46.74

4 31 36.40

EE - 3..43..0

236 - 3..48..7.8

3..43..0

11.20

3..43..11.20

3..48..7.8

4.56.60

ME - 22..22..10

236 - 3..08..11.5

4 56.5

2 55 15.0

4 31 36.4

22 23 38.6

22 19 58.47

22 22 10.00

2 11.53

16.00

1 55.53

1 54.15

0 1.38 (+4.6)

ME - 23..11..10

236 3..49..14.5

3..49..19.5

4..56.60

23..44..22.90

4..31..36.40

23..12..46.50

22..56..13.92

11..58.03

45.87

.50

23..08..58.32

23..11..10.00

2.11.68

16

ME fast - B. 1.55.68

- 22..24..0

- 3..02..1.8

21 56 23.75

22 56.23

37.85

.60

22 19 58.47

ME - 23..14..0

239 - 23..02..5.1

give signals 0.2 later

23..14..00

1..55.68

3.72 04.32

5.1

.78

June 2^d.

EC - slow 12.13

EC - 7 51 00

236 - 7 56 16

5 16

00 12.13

5 3.87

May 31

4 56.50 + 3.68

28

4 45.09 + 3.80

17

4 01.44 + 3.99

236. Run down, and was set
right again June 7th a.m.

MC - 2 49 00

236 - 7 35 45.50

5 3.87

7 30 41.63

4 43 26.08

2 47 15.55

27.40

2 46 48.15

2 49 00.00

MC fast

2 11.85

16.00

MC fast of B

1 55.85

81

1 55.53

2/32 (0.16)

7.37

11.41/3.8

11) 43.65/3.99

3.3

106

9.5

June 7th A.M.

EC - 3 3 00

236 - 3 3 41.9

44.9

12.3

236 fast

29.6

236 - 3 37 00.0

204 - 3 39 42.0

MC - 21.59.10

236 - 3 00.15

29.6

2 59 45.50

2 59 12.31

22 00 23.09

3 36.34

21 56 56.78

21 59 10.00

MC fast

2 13.28

16.00

MC fast of B

1 57.25

1 55.85

4.3) 1.40 (+, 32)

EC slow 12.30

MC - 22 00

236 - 3 01 5.15

4^h 5^m 25^s 57

46.74

4 59 12.31

Telegraphed the time to Boston
correct.

1858

June 10 - a.m.

EC - 2.49. 0.0

236 - 2.49. 57.2

51.2

12.29

236 fast 38.91

MC - 21 45 40

236 - 2 58 40

38.91

2 58 1.09

5 11 1.99

21 46 59.10

3 34.12

21 43 24.98

21 45 40.00

MC fast

2 15.02

16.00

MC fast of B

1 59.02

1 37.25

3) 1.77 (+.59)

EB slow 12.29

5 10^m 15.25

46.74

5 11 1.99

M.C. run down on the 13th

June 16. P.M.

EB slow 10.90

MB 5 50 37.0

236 11 28 50.5

5 54 00.

11 32 14.

EC 11 33 0.0

236 11 34 9.7

38.8

1 9.7

11 31 15.2

10.9

5 38 37.9

236 fast 58.8

5 52 37.3

37.77

5 37 51.06

5 51 39.53

46.74

5 54 00.00

5 38 38.90

MC fast

2 20.47

16.00

MC fast of B

2 4.47

1 59.02

6) 5.45 (+.91)

M.C. was let down
this cannot be taken
as the rateJune 17th Put back M.C. Two minutes.

Jun 19 1858

p. m.

dry rate) EC slow 10.1

236	4	~~2~~	0	-	4	4	30.0
MC	9	~~53~~	52	-	9	56	22.5
						1	8.0
	9		55				14.5
	5		50				27.57
	4		4				46.93
							10.10
	4		4				6.83
	4		4				30.00
MC fan							23.17
							16.00
MC fan of B							7.17
							5.45

3) 1.72 (45)

EC	10	00	00
236	10	1	18.1
		1	18.1
			10.1
236 fan	1		8.0

5	49	40.83
		46.74
5	50	27.57

185-8 June 22nd

Tel with Fire Alarm Office

Steamers at Fire al of the signal at
no seconds for 3 minutes by his Chr²

Steamers ^{See}
12.3
12.1

12.2

12.3

12.2

Given Steam 3 signals to commence
with his ^{See} ov. o

Result.

Result Time to be given
4 1/2 seconds sooner at
Cambridge than the bells
at Boston should strike.

June 22/23 1858

EC slow 9.28

EB	4	16	00
236	4	17	28.8
		1	28.8
			9.28
236 fast		1	19.52
6	1	30.51	
		46.74	
6	2	17.25	

MB	22	12	35.0
236	4	19	25.0
		1	19.52
4	18	5.48	
6	2	17.25	
22	15	48.23	
	3	38.84	
22	12	9.39	
22	12	35.00	

MC fast

MC fast of B

25.61
16.00
9.61
2.17
35.72.44 (+.70)

23 - p.m. gave signals to Boston.

MB - 3.54.00.0 at +0.7

239 - 3.53.57.1

3.54.00.0

-9.7

B - 3.53.50.3

239 - 3.53.57.1

0.8

Set No 418.

24/25 June MB fast of Boston - 11.33

MB - 21.21.00	264	MB - 20.14.0
418 - 20.20.48.8	418 - 20.13.54.4	
21.21.00.0	264 05.6	
- 11.33	25 +11.2	
21.20.48.67	5.6	
20.20.48.80	6.6	
.13		

Set 418 to Boston

June 25/26

MB - 20.19.0	MB - 22.53.0	MB - 23.37.0
418 - 20.18.47.5	418 - 22.52.48	418 - 23.36.47.6
sent time to R.F.B. at 11 ^h	-12	-12.4
		MC fast 12.24
		.16

1858 June 24

E C slow 16.27

$$\begin{array}{r} \text{ME} = 11.19 \\ 236 = 17.31.59.6 \end{array}$$

$$\begin{array}{r} \text{ME} = 11.21.30.0 \\ 236 = 17.34.30.0 \end{array}$$

$$\begin{array}{r} \text{EC} \quad 17 \quad 36 \quad 00 \\ 236 \quad 17 \quad 37 \quad 40.5 \\ \quad \quad \quad 1 \quad 40.5 \\ \quad \quad \quad 16.27 \\ 236 \text{ fast} \quad 1 \quad 24.23 \end{array}$$

$$\begin{array}{r} 1 \quad 24.23 \\ 1.7 \quad 33 \quad 5.77 \\ 6 \quad 10 \quad 10.77 \\ 11 \quad 22 \quad 55.40 \\ \quad \quad 1 \quad 51.88 \\ 11 \quad 21 \quad 3.52 \\ 11 \quad 21 \quad 30.00 \end{array}$$

MC fast

26.48

MC fast of B

16.00

10.48

9.61

1.5) 1.87 (4.58

June

25

$$\begin{array}{r} \text{ME} = 2.01. \\ 236 = 2.02.41.5 \end{array}$$

$$\begin{array}{r} \text{ME} = 7.49 \\ 236 = 2.03.24.2 \end{array} \quad \begin{array}{r} = 7.51.16.0 \\ = 2.05.40.5 \end{array}$$

$$\begin{array}{r} 2.04.00 \\ \quad 15.68 \\ 2.01.15.68 \\ 236.2.02.41.50 \\ 236 \text{ fast} \quad 1.25.82 \end{array}$$

$$\begin{array}{r} \text{EC} = 2.49.0.0 \\ 236 = 2.50.41.5 \\ \quad 2.49.0.0 \\ \quad 15.68 \\ 2.49.15.68 \\ 2.50.41.50 \\ 236 \text{ fast} \quad 1.25.82 \end{array}$$

$$\text{ME} = 20.29.50$$

$$236 = 2.44.21$$

$$2.44.21$$

$$-1.25.82$$

$$26.42.55.18$$

$$6.10.10.37$$

$$20.32.44.81$$

$$19.56.43.41$$

$$31.54.77$$

$$43.88$$

$$.81$$

$$20.29.22.77$$

$$20.29.50.$$

$$27.23$$

$$16$$

$$\text{ME fast of Boston} \quad 11.33$$

$$22$$

$$-9.61$$

$$172.0.86$$

$$\text{ME} = 20.31.0$$

$$236 = 2.45.31$$

$$6.09.23.63$$

$$46.74$$

$$6.10.10.37$$

E C slow 15.68

11.33

91

$$\text{noon } 26 - 12.24$$

1855

by observation - 14.53

by rate EB slow 15.08

10.0 EB = 3 2 00.0

38.5 236 = 3 3 49.5

1 49.5

15.1

236 fast 1 34.4

6 21 13.31

46.74

6 22 00.05

June 27/28

Mb = 20 32 10 Mb = 20 35

236 = 2 58 38. 236 = 3 1

1 34.4

2 57 3.60

6 22 0.05

20 35 3.55

3 22.34

20 31 41.21

20 32 10.00

Mb fast 28.79

16.00

by rate of E.C. 12.79

by rate of M.C. 13.64

Mb 21..11..0 8.9

418-21..10..58 1/26.43

Feb 2 fast 13.21 used, mean of both clocks

Mb - 21..17..0

218-21..16..46

14

Mb - 21..52..0 - 23..53..0 - 0..4..0

418-21..51..46.3 - 23..52..47.0 - 0..3..47

13.7

13.0

13

418 slow 13.2

.5

418 fast

13.3

.3

Mb fast C. 29.36

made 16

28th fast 13 13.36

25 12.24

3) 112 1.38

29th

Mb fast - 13.8 by rate of +0.5

Mb - 21..46..0

Mb - 21..50..0

418-21..45..52.2

418-21..49..46.1

-7.8 Feb

13.9

28

-13.2

Rate gaining +5.9 .2

Mb fast 13.8

.1

Sent the time to Boston by this diff.

1855 June 30 ^{29 1/2}

EC show 13,31

Mc-22-26-0

236-5-00-45

EC = 5 1 00

236 = 5 2 55

1 55

13.31

641.69

6 29 6.42

46.74

6 29 53.16

4 59 3.31

6 29 53.16

22 29 10.15

3 41.03

22 25 29.12

22 26 10.00

Mc for

30.88

Mc for 1/3

10

14.88 time for Boston

Mc-22-44-0

418-22-43-44.7

July 1st

Mc-22-6-0

Mc part by rate 15.6

418-22-5-50.2

12 - 9.8

Mc-22-10-0

418-22-09-44.4

