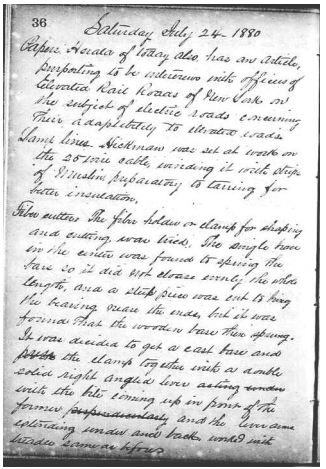
Charles Mott Journal Entry


36 Saturday July 24 1880
Papers. Herald of today also has an article, purporting to be interviews with officers of Elevated Rail Roads of New York on the subject of electric roads concerning their adaptibility to the elevated roads.
Lamp lines. Hickman was set at work on the 25 wire cable, winding it with strips of Muslin preparatory to tarring for better insulation.
Fiber cutters: The fiber holder or clamp for shaping and cutting was tried. The single brace in the center was found to spring the bars so it did not cloase evenly the whole length, and a steep piece was cut to bring the bearing neare the ends, but it was found that the wooden base then sprung. It was decided to get a cast base and press the clamp together with a double solid right angled lever acting under with the bite coming up in front of the former perpendicularly and the lever arms extending under and back. worked with treadle same as before.
Carbonizing former. Andrews is making a former for carbonizing moulds leaving the inside piece loose instead of rivuted as in others, and with a light weight fitted to the press the ends down flat, and prevent them from wharping or curling out of shape, instead of the ends drawing up they are permanently secured and the loop contracting draws with it the

[Menlo Park,] Saturday July 24—1880

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inside piece which[a] at the time keeps it in symmetrical shape. Mr Batchelor has today been trying one in which the ends were clamped with light weights which were drawn up as the carbon shrinks, but did not give entire satisfaction.[5]

Oil carbon. A very interesting experiment was made today by immersing a carbon loop clamped and connected to inner tubes in[a] Kerosene oil and brought up to incandescence by the current, bubbles of gas or air were emitted from the carbon in at high heat the oil (assumed a smoky look) appeared to be infused with carbon. On removing the carbon it was found to be considerably increased in size, greyish in appearance, and perfectly homogenious— it was placed in a lamp, exhausted and burned at 16 candles ~~till~~ 14 minutes when engine was stopped.[6]

Work general Men preparing the gas carbonizing furnaces by putting in the gas and blast pipes and fixtures. Clarke on Electric Locomotives[7] Mr. Batchelor on carbons and apparatuses for carbonizing. conductor gang uncovering street lamp circuits. Men finishing up gear for electric locomotive.[8]

Bast Fibers. Two bundles recd from Baltimore Md.

AD, NjWOE, Lab., N-80-07-10:36 (*TAEM* 37:320; *TAED* N117:18). Written by Charles Mott. [a]Obscured overwritten text.

1. This article was a follow-up to one in the *New York Herald* the day before, in which Edison reportedly claimed that applying his "electric engine" to the New York elevated trains would save $500,000 annually in direct costs. The later article, after noting that the company's directors "would say nothing of importance, one way or the other, about the matter," presented cautiously optimistic comments attributed to operating department officials. "The Electric Motor," *New York Herald,* 24 July 1880, p. 3; a typed transcript of this article and typed extracts from the *Herald*'s 23 July article on "Electric Locomotion" are in Cat. 2174, Scraps. (*TAEM* 89:283, 279; *TAED* SB012:34, SB012AAS).

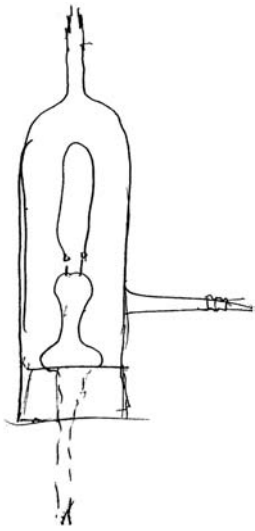
2. David Hickman worked on his uncle's farm in nearby Metuchen before he applied to Edison for a job in 1880. Preparing the underground conductors was his first task at the laboratory. Hickman subsequently superintended the Pump Department of the Menlo Park lamp factory and remained associated with Edison until 1891. "Hickman, David Kelsey," Pioneers Bio.

3. Six days later this line was wrapped with tarred twine. Francis Upton tested the insulation, finding 1,400 ohms resistance to ground and 4,000 between the wires. Insulation of this and the other lines continued until 28 August, when Charles Mott reported that Edison suspended the work. Insulation tests were conducted at intervals both on these lines and in the laboratory until September. Mott Journal N-80-07-10:52, 55, 81, 105; N-80-07-16:47–51, 71–76, 79–101; N-80-07-05:72–75; all Lab. (*TAEM* 37:328–39, 342, 354; 38:508–10, 520–33; 36:303–04;

TAED N117:26–27, 40, 52; N137:24–26, 36–49; N104:38–39); see also Doc. 1985.

4. Mott reported on 20 July that Charles Dean was "making a pair of formers for cutting out fibers each one is designed only to cut one side or edge and intended to be secured to the bench and drawn and held together by a treadle leaving the operator both hands to adjust and use in cutting." On 3 August Dean completed and tested one pair; Mott noted that they produced fibers of uniform dimensions and "are very convenient effective and work satisfactorily." He noted in weekly summaries of work that Dean continued to work on the instrument and on 1 September one was sent to the lamp factory, "made very heavy to avoid all danger of springing and tempered to prevent scarrification by knife or hammer." Mott Journal N-80-07-10:26, 61, 68, 93, 105, 108, Lab. (*TAEM* 37:315, 332, 336, 348, 354, 356; *TAED* N117:13, 30, 34, 46, 52, 54).

5. Two days later an arrangement in which the filament ends were secured was again tried. On 28 July Edison executed a patent application covering several similar devices to keep the filament "under strain during carbonization, with one or more points fixed against moving, and the contraction proceeds against the strain, which constantly keeps the filament against or in contact with a former, preserving its shape and obviating any risk of warping or twisting." Such a device was particularly important with bamboo filaments, which shrank about 20% during carbonization. Mott Journal N-80-07-10:41, Lab. (*TAEM* 37:322; *TAED* N117:20); U.S. Pat. 263,139.



Chamber for passing a hydrocarbon atmosphere around a heated carbon.

6. This is the first of a number of experiments in which filaments were heated in the presence of volatile hydrocarbons, particularly kerosene and gasoline, although paraffin, bituminous coal, and other substances were tried. The object seems to have been to deposit a uniform coating of carbon on the filament. In one series of tests, however, Batchelor deposited the carbon on thin platinum wires which he then instructed Alfred Haid to dissolve, leaving a narrow tubular conductor (see Doc. 2007 n. 1). Some hydrocarbons were placed in the carbonizing mould with the fiber but in most cases a carbonized filament was electrically heated in a chamber filled with a hydrocarbon. Mott recorded related experiments through the end of July and a number of lamps were made with carbons treated in this way before the experiments were suspended. Edison later returned to the subject but heating lamp filaments in a hydrocarbon atmosphere (called "flashing") became an important manufacturing process for his competitors. N-80-03-06:181–93; N-80-06-02:8–15; N-80-07-23:281; Mott Journal N-80-07-10:39–41, 44–45, 50–52, 54–55, 57; all Lab. (*TAEM* 33:1050–56; 36:401–04, 981; 37:321–22, 324, 327–30; *TAED* N057:90–96; N105:4–7; N112:140; N117:19–20, 22, 25–28); Howell and Schroeder 1927, 79–81.

7. Beginning on 21 July Charles Clarke made numerous drawings and calculations pertaining to power transmission in the locomotive, especially reduction gearing and clutches for the wheels and modifications to the "climbers" for steep grades (see note 8). He did most of this work before the end of the month but continued it intermittently through mid-August. N-80-07-19:15–35, 45–135, Lab. (*TAEM* 37:113–25, 130–75; *TAED* N115:8–18, 23–68).

8. On June 15 Mott described Julius Hornig's design for "a novel gear

for attachment in front of motor to climb steep grades, its motion and action is very similar to hand over hand climbing, being composed of arms and clutches which grapple the rails one of each [side?] and by a cam movement the clutch is released arm raised up and extended, dropped down on and again clutched on the rail, the arms acting alternately." Mott reported at intervals the progress of laboratory assistants in constructing and installing this equipment, which is described more fully in Doc. 1987. Mott Journal N-80-03-14:236, 249, 257, 263; Mott Journal N-80-07-10:4, 21, 30, 33; both Lab. (*TAEM* 33:802, 808, 812, 815; 37:304, 312, 317–18; *TAED* N053:120, 126, 130, 133; N117:2, 10, 15–16).