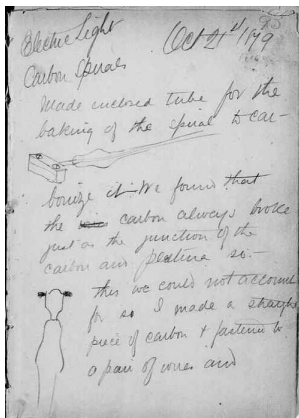


-1830-

*Notebook Entry:
Electric Lighting¹*



[Menlo Park,] Oct 21st 1879

Electric Light Carbon Spirals

Made enclosed tube for the baking of the spiral to carbonize
it—



We found that the wires carbon always broke just as the junction of the carbon and platinum^a so:—²



October–December 1879

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This we could not account for so I made a straight piece of carbon & fastened to a pair of wires and put in a closed tube and heated the tube— I then found that at quite a low heat ^a yellow oil^a came from the carbon and ran down the wire and the carbon parted very easily just as if it had melted filling the tube with white smoke and having a yellow oily liquid on the top of centre glass which I suppose is Benzole or one of it first compounds^b

I now put another in a tube and baked it 1 hour at 165 F then ½ hour at 220 then 1 hour 320 when I took it out it showed an oily liquid (yellowish green) on glass showing that the first product had gone off and that is the one that busted it before

I now heated the^a tube as hot as I could in the flame and I could not see anything come off except a slight white smoke this we now blew in a bulb & made a vacuum and with 9 cells C[ondit] & H[anson] cells gave a deflec[tion] 43° showing as Upton tested

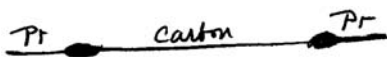
Electric Light Carbon wire

A spiral wound round a paper core no matter how thin always breaks, because it contracts so much. If the heating is done slowly this is modified but with the present proportion of Tar and Lampblack it will always break.^b

Clay put on a spiral to insulate the outside and prevent it from sticking together tends to crack the spiral still more ~~and~~^b

We now put a larger per centage of lampblack to same tar about ~~z~~twice as much and the wire would still draw out at the ordinary temperature^b

The better way to carbonize these carbon wires would seem to be to take the wire so:



and fasten 2 platina ends in it, and then wind in form of a spiral ~~so~~^b



One of the great difficulties is to keep the spiral in position whilst you carbonize it this might be remedied to a great extent by using a hollow sleeve & winding the spiral inside with something to hold the ends whilst they are being fastened to the leading wires

X, NjWOE, Lab., N-79-07-31:93 (*TAEM* 33:588; *TAED* No52:46).
Written by Charles Batchelor; document multiply dated. ^aObscured
overwritten text. ^bFollowed by dividing mark.

1. This entry is continued in Doc. 1831; see Doc. 1818 for earlier experiments with carbon spirals.

2. In the carbon-filament patent application that he executed on 1 November (U.S. Patent 223,898) Edison noted that the forms of filament described here and in Doc. 1818 “cannot be clamped to the leading wires with sufficient force to insure good contact and prevent heating. I have discovered that if platinum wires are used and the plastic lamp-black and tar material be molded around it in the act of carbonization there is an intimate union by combination and by pressure between the carbon and platina, and nearly perfect contact is obtained without the necessity of clamps.”