by the Gentlemen of the Board as a personal affront—since one of the main inducements held out to them to go into the enterprize was the feature of Edisons personal association on the board with them" (Johnson to Batchelor, c. 19 Oct. 1879, DF [TAEM 52:837; TAED D7941ZGK1]).

On 20 October Edison wrote Gouraud that he was sorry to have to disappoint you in regard to signing the irrevocable power of attorney, but I cannot do it. Not that I am afraid that you will not act just and honorably but because until lately I had always given irrevocable powers of attorney and these have invariably proven disastrous to me in the extreme. [George] Harrington who was a good sort of a man was the last person to whom I gave an irrevocable power of attorney the irrevocability of which he frequently threw in my face and which was the cause of cheating me out of 4 years of labor 20 hours per day. Mr Orton offered me a large sum of money for my Automatic interest but that word “irrevocable” killed it. From that date I made a vow never to give another irrevocable power of attorney, a resolution which I will not alter although at the present it seems to my interest. [Lbk. 5:291 (TAEM 80:164; TAED LB005291); Edison’s power of attorney to Harrington is Doc. 155]

Gouraud cabled in reply that Edison’s decision was, “in the light of your experiences perfectly satisfactory to me” (Gouraud to TAE, 4 Nov. 1879, DF [TAEM 52:898; TAED D7941ZHP]).

1830

[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 platina so:—

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October–December 1879 445
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 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.

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 and 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 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[jondit] & 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.

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

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

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.

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.

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.”

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-1831-

Notebook Entry:

Electric Lighting

We made some very interesting experiments on straight wires carbons made from cotton thread so.

we took a piece of 6 cord thread No 24s which is about 13 thousandths in thickness and after fastening to Pt wires we carbonized it in a closed chamber. we put in a bulb and in vacuo it gave a light equal to about ½ candle 18 cells carbon. it had resistance of 113 ohms at starting & afterward went up to 140—probably due to vibration

Electric Light Carbon lamps Carbonizing process

We made lamps in same manner

1 of—Vulcanized fibre
2—Thread rubbed with tarred lampblack
3—Soft paper—
4—Fish line
5—Fine thread plaited together 6 strands—
6—Soft paper saturated with tar
7—Tar’d Lampblack with half its bulk of finely divided lime work down to .020—Straight one ½ inch
8—200’s 6 cord 8 strands—
9—20s7 Coats 6 cord not no coating of any kind
10—Cardboard—
11 cotton soaked in tar (boiling) & put in

[Menlo Park,] Oct 22nd 1879 9 A.M.

October–December 1879