The Papers of Thomas A. Edison

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Chronology of
Thomas A. Edison

January 1879–March 1881

1879
2 January Has laboratory machine shop in Menlo Park, New Jersey, begin constructing first dynamo of his own design.
19 January Begins fundamental experiments on properties of heated wires which lead to discovery of occluded gases.
22 January Unsuccessfully seeks Sprengel mercury vacuum pump in attempt to remove occluded gases from lamp wires.
23 January Conducts vacuum lamp experiments with hand pump.
30 January Son Thomas Alva, Jr., leaves for convalescence in Florida.
6 February Begins several days of vacuum lamp tests using hand pump.
9 February Drafts caveat on use of vacuum to overcome occluded gases in lamp wires.
13 February Begins testing first dynamo machine.
14 February Construction of two demonstration telephones for Great Britain begins at Sigmund Bergmann’s shop.
15 February Devises new arrangement for generators using an odd number of armature coils and commutator blocks.
26 February Sends nephew Charley Edison to London with two telephones and two new electromotograph receivers.
13 March Begins designing bipolar dynamo with large field magnets.
14 March George Gouraud, Edison’s agent in London, presents the first public demonstration of Edison’s new electromotograph receiver.
c. 18 March Begins laboratory demonstration, for investors and others, of incandescent platinum lamps wired in parallel.
19 March Begins planning electric illumination of New York Herald Arctic expedition aboard USS Jeannette.
25 March Begins collecting statistics on gas companies in New York City.
26 March Acquires Geissler mercury vacuum pump.
8 April Begins experiments on thermo electricity.
12 April Decides to incorporate new coil and commutator arrangement into the new bipolar dynamo.
29 April Signs agreement for sale of telephone patents and formation of company on the European continent.
c. 30 April Conducts tests of first large dynamo.
April Designs combined Sprengel and Geissler vacuum pump.
c. 1 May Begins drafting British provisional patent specification describing system of electric lighting.
3 May Writes circular letter inquiring about platinum deposits.
5 May Signs agreement for sale of electric light patents and formation of company on the European continent.
4 May James Adams, Edison’s technical representative in Britain, dies in London.
12 May Agrees to assign to Western Union the U.S. rights to electromotograph receiver.
14 May Edison Telephone Co. of Europe, Ltd., incorporated in New York.
15 May Signs agreement to form Edison telephone companies in Great Britain.
16 May Agrees to assign George Gouraud half of his proceeds from sale of British patent rights for electromotograph receiver.
18 May Makes first drawings for electric railroad.
20 May Ships dynamo and other equipment for USS Jeannette.
26 May Dispatches Frank McLaughlin to investigate platinum deposits in Quebec.
28 May Advertises for an experienced analytic chemist and soon after hires Dr. Otto Moses.
May Agrees to formation of Edison telephone company in England.
Begins developing switchboard for telephone exchanges.
12 June Designs tertiary coil arrangement for electromotograph receiver.
Begins extensive series of tests to find best compositions for chalk buttons for electromotograph receiver.
1 July Sends Edward Johnson to London as chief engineer for telephones.
c. 6 July Agrees to give laboratory assistant Francis Upton 5 percent of profits and 5 percent of Edison Electric Light Co. stock in lieu of salary.
7 July With Francis Upton drafts a letter published under Upton’s name in Engineering regarding John Hopkinson’s paper on dynamo testing.

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9 July Sends first lot of telephones and a switchboard to London.
23 July Proposes to Adolph Sutro use of hydroelectric power in Comstock mines.

July Moves electromotograph receiver from telephone box to adjustable arm and adopts “inertia” arrangement for carbon telephone transmitter in telephones sent to Britain.
Francis Upton and laboratory assistant Francis Jehl begin extensive series of tests of electro-deposition meter.
With chemical staff assays ores sent to laboratory and has shop make apparatus for separating and concentrating the ores.
Makes preliminary arrangements for purchase of platinum ores in California.

6 August U.S. Patent Office declares interference on inertia telephone transmitter application.

7 August Assigns Francis Upton to begin analyzing long-distance transmission of electric power for mines near Virginia City, Nevada.

14 August U.S. Patent Office declares set of six interference cases involving carbon telephone transmitters.

C. 20 August Hires glassblower Ludwig Böhm.

26 August Departs for American Association for the Advancement of Science (AAAS) meeting in Saratoga, New York.

C. 28 August Writes AAAS paper on electric light experiments, to be read by Francis Upton.

30 August Demonstrates telephone to the AAAS.
Leaves Saratoga.

6 September New switchboard exchange demonstrated for newspaper reporters in London.

8 September Drafts circular letter soliciting loan of sewing machines from U.S. manufacturers for electric motor experiments.
Francis Upton and Francis Jehl begin month-long series of experiments on and design changes for vacuum pump.

11 September Sends Frank McLaughlin to California to evaluate platinum-bearing sands.

20 September Files British provisional patent specification for telephone switchboard.

September Abandons inertia telephone transmitter.
Begins hiring inspectors for telephone companies in London and provincial cities.
Assigns U.S. rights for polyform to Charles Lewis and associates, who organize the Menlo Park Manufacturing Co. to promote and sell Edison’s patent medicine.
1 October Western Union orders 100 electromotograph receivers.
3 October Authorizes George Gouraud to organize telephone companies in British colonies.
7 October Begins electric light experiments with molded carbon spirals.
14 October Executes agreement with José Husbands to establish telephone company in Chile.
Drafts letter to Edward Johnson analyzing legal status of his British telephone patent.
Agreement to combine French Edison, Gower, and Blake telephone companies signed in Paris.
15–16 October Begins series of experiments to solve problems with chal-ks for electromotograph receiver.
19 October Charley Edison dies in Paris.
22 October Conducts first successful carbon filament lamp experiments with carbonized thread in a vacuum.
October Prepares to amend basic telephone patent specification in Great Britain.
1 November Executes patent application for high-resistance carbon fila-
ment lamp.
8 November Francis Upton and other laboratory assistants resume experi-
ments with electric meter.
November Francis Upton begins preparing article on Edison’s electric light system, eventually published under Edison’s name in February 1880 issue of Scribner’s Monthly.
1 December Dissolves all financial connections with former partner Joseph Murray.
9 December Organizes Edison Ore Milling Co.
11 December Files patent application for manufacture of horseshoe-
shaped cardboard lamp filaments.
21 December New York Herald publishes detailed description of electric lighting system.
c. 29 December Begins public exhibition of electric lighting system in and around laboratory.
1880
2 January Closes laboratory to public after being inundated with visitors during public demonstrations of electric lighting system.
Begins experimenting with high-speed dynamo and low re-
sistance armature constructed of iron plates.
17 January Agrees to give Western Electric exclusive rights to his Aus-
tralian telephone patents.
Agrees to accept lower royalty on sale of electric pen app-
paratus.
Sends telephone receivers operated by electric motors to London *Times*.

**19 January** Chemist John Lawson begins extensive series of copper deposition experiments for electric meter.

**27 January** Authorizes Edward Johnson to negotiate with Edison Telephone Co. of London regarding his royalties and British interests outside London. Consolidation of Edison, Gower, and Blake telephone interests in Paris collapses.

**28 January** Executes patent application for his system of electric distribution.

**January** Hires engineers Charles Clarke and Julius Hornig.

**7 February** Requested to stop hiring telephone inspectors for Edison Telephone Co. of London because of company’s weak financial condition.

**8 February** Conducts experiments to prevent sparking in commutator brushes of generator.

**12 February** Has Francis Upton prepare a preliminary estimate for a central station supplying 10,000 lights. With principal laboratory assistant Charles Batchelor begins two weeks of experiments on paper and fiber filaments.

**13 February** Plans experiments to prevent “electrical carrying” in lamps.

**19 February** Chemist Otto Moses begins working on problem of darkening of lamp bulbs.

**10 March** Executes patent application for electric meter.

**10–12 March** Visited by professors George Barker and Henry Rowland, who test the thermal efficiency of the lamp.

**11 March** Executes patent application for iron plate armature.

**14 March** Has Charles Mott begin keeping journal of daily activities at the laboratory.

**19 March** Visited by professors Cyrus Brackett and Charles Young, who test the efficiency of the dynamo.

**21 March** Discontinues night work because of problem with Charles Batchelor’s eyes.

**25 March** Begins experiments with magnetic iron ore separator.

**27 March** Agreement establishing new combined French telephone company signed in Paris.

**Winter–Spring** With laboratory staff tests wide variety of paper, wood, and vegetable fibers as lamp filaments.

**1 April** Begins experiments with Francis Jehl and Otto Moses on using single instead of double vacuum pump.

**3 April** Executes patent application for magnetic ore separator. Sells U.S. patent rights for motograph relay to Western Union.
6 April
*American Machinist* sends engineers to Menlo Park to make tests of the efficiency of Edison’s electric light and power system.

23 April
Francis Upton and David Cunningham begin supervising installation of electric lighting system on the steamship *Columbia*.

24 April
Purchases former electric pen factory across the railroad tracks in Menlo Park for lamp factory.

26 April
Granted exclusive eight-year license for telephones by president of Chile.

27 April
Edison, his wife, and several assistants attend reception aboard the *Columbia* in New York.

April
Workmen begin constructing electric railroad. Experiments with frosted lamp bulbs.

1 May
Workmen begin laying nearly five miles of underground electrical cables throughout Menlo Park.

8 May
Charles Clarke and Francis Upton begin designing a large generator to be directly connected to a Porter-Allen steam engine.

13 May
Begins operating electric railroad.

c. 13 May
Agrees to underwrite publication of *Science*.

1 June
Agreement reached to combine British Edison and Bell telephone companies into the United Telephone Co., Ltd.

16 June
With Princeton University professor Charles Young conducts spectroscopic examination of lamps to determine cause of electrical carrying.

21 June
Visited by representative of Corning Glass Works, which subsequently supplies bulbs for lamps.

c. 2 July
Laboratory staff finishes making 400 vacuum pumps for factory.

3 July
Publication of first issue of *Science*.

4 July
Offers to file dynamo patent application for Henry Rowland in order to challenge patent application of Siemens & Halske.

7–19 July
With Charles Batchelor conducts experiments on electric air balloon.

9 July
Begins experimenting with bamboo filaments.

16 July
Francis Upton begins testing underground conductors in Menlo Park and finds insulation defective.

17 July
Workmen begin digging up underground conductors.

23 July
Francis Upton calculates the costs and profits for a central station.

24 July
Begins experiments with depositing volatile hydrocarbons on lamp filaments.
28 July  Executes patent application for lamp filament of carbonized bamboo or similar fiber.
      With Charles Batchelor, executes patent application for device to test lamp filaments after carbonization.

30 July  Reinstates night work at the laboratory.

c. 30 July Assigns chemist Otto Moses to conduct literature search on carbonaceous materials and processes of carbonization.

31 July  Executes patent application for a symmetrical system of electrical distribution to maintain uniform voltage.

July  Begins survey of proposed central station district in lower Manhattan to collect statistics on the use of gas lights and power.

4 August  Executes patent application for “feeder and main” system of electrical distribution.

c. 9 August  Executes patent application for direct-connected steam dynamo.

16–24 August  Experiments on vacuum preservation of fruit.

17 August  French Edison telephone company merges with Gower and Soulerin companies to form the Société Générale des Téléphones.

18 August  Signs several agreements authorizing sale of patents for telephone, electric light and power, and electric railways in dozens of foreign countries and colonies.

19 August  Drexel, Morgan & Co. agree to arrange a line of credit for Edison’s electric railway experiments.

27 August  Sends John Segredor to Georgia, Florida, and Cuba to gather plant samples for possible use as filaments.

c. 30 August  Sends inquiries about bamboo to Brazil, Panama, Cuba, and other Caribbean islands.

c. 31 August  Edison gives laboratory assistant Wilson Howell the task of developing a better insulating compound for underground cables.

14 September  Edward Johnson designs a screw-in lamp socket as part of a general effort to develop electric lamp fixtures.

23–24 September  With Francis Upton and Francis Jehl conducts tests of gas lighting using lamps at Sigmund Bergmann’s New York shop.

24 September  Workmen begin insulating underground conductors with improved compound developed by Wilson Howell.

28 September  With Charles Clarke conducts experiments on heating of copper rods revolved through magnetic lines of force.

30 September  Charles Clarke begins redesigning large dynamo armature using copper bars instead of insulated wire.
      First lot of thirty lamps completed at lamp factory and sent to laboratory for testing.
September  Publishes article drafted by Francis Upton on electric light and power system in *North American Review*.

c. 6 October  Sends William Moore to China and Japan to search for best variety of bamboo to use for lamp filaments.

12 October  Second lot of 100 test lamps completed at factory and sent to laboratory.

21 October  With Francis Jehl begins experiments on treating filaments in hydrocarbon vapor.

22 October  Glassblower Ludwig Böhm leaves his position at the laboratory.

27 October  John Segredor dies of yellow fever in Havana, Cuba.

October  Has Francis Upton make new estimate for the cost of a 10,000-light central station plant.

8 November  Prepares to send John Branner to South America to procure bamboo and cane for use in filaments.

8–12 November  Testifies in telephone interference cases.

16 November  Attorney for Lucy Seyfert demands $7,000 in payment of promissory notes made by Edison in 1874 as part of a plan to raise money for the Automatic Telegraph Co.

C. 18 November  Forms Edison Electric Lamp Co. as a partnership with Charles Batchelor, Edward Johnson, and Francis Upton.

28 November  Assisted by William Hammer begins two weeks of experiments on electrical carrying in lamps.

1 December  Decides that all lamps made by factory will use bamboo filaments.

2 December  Asks Edison Electric Light Co. to authorize payment for services of electrical engineer Hermann Claudius to map out feeder and main system of conductors for first central station district in New York City.

3 December  Glassblowers begin making 200 simplified single vacuum pumps for lamp factory.

11 December  Executes patent application for improved dynamo armature using copper bars in the induction circuit.

15 December  Writes William Crookes about manufacturing Crookes’s radiometer at the lamp factory.

16 December  Executes two caveats on voltage regulation.

17 December  Albert Herrick begins experiments on electroplating carbons directly to the lead-in wires.

20 December  Edison Electric Illuminating Co. of New York incorporated.

Demonstrates electric light and power system at Menlo Park to New York aldermen and other city officials and provides them with a lavish banquet catered by Delmonico.

1881

1 January  Francis Upton takes over management of the lamp factory.

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15 January Asks Sherbourne Eaton to assume major responsibility for management of the Edison Electric Light Co.

17 January Has Charles Clarke answer inquiries from Antoine Breguet, director of installation services, regarding his plans to exhibit at the Exposition Internationale d’Électricité in Paris.

27 January Hinds, Ketcham & Co. printing plant is first manufacturing establishment lighted with Edison system.

7 February Drexel, Morgan & Co. order Edison to construct a direct-connected steam dynamo for an exhibition installation in London.

c. 10 February Agrees to supply equipment for exhibition of electric lighting system in South America.

14 February Appoints Thomas Logan as foreman of the Menlo Park machine shop in place of John Kruesi, who becomes manager of the Edison Tube Co.

26 February Conducts first test of the Porter-Allen direct-connected steam dynamo.

28 February Samuel Insull becomes Edison’s private secretary.

Feb 1881 Leases office space in New York City, with Edison Electric Light Co.

c. 1 March Acquires shop at 104 Goerck Street in New York for the Edison Machine Works.

4 March Incorporates Electric Tube Co. in New York.

8 March Signs agreement with Edison Electric Light Co. regarding manufacture of lamps.

26 March Has Yale locks put on doors of the Menlo Park laboratory after staff complain of being overrun with uninvited visitors.

28 March Asks bookkeeper William Carman to compile an account of the cost of electric light experiments and of money received from the Edison Electric Light Co.

March Begins spending majority of working days in New York.