March began with Edison's attention focused on testing and modifying his carbon telephone transmitter. By mid-March, the tests he was making with Henry Bentley between Menlo Park and Philadelphia produced such a markedly improved design that Edison decided to send James Adams to introduce it in Europe. And he arranged with Bentley and Samuel Plush, superintendent of the Philadelphia Local Telegraph Company, to feature the new transmitter in a lecture given by Plush to the Franklin Institute on 20 March.¹

The improved transmitter also intensified Western Union's negotiations with Edison, as well as Gardiner Hubbard's efforts to win him over to the Bell Telephone Company. The battle over telephone rights took on new urgency in late March when the Patent Office declared a series of interferences over telephone patents, including several between rival inventors associated with Western Union and Bell Telephone. In late April, just as Edison and William Orton agreed on the terms of a new contract with Western Union, Orton died suddenly at his home in New York. This not only delayed the agreement but left Edison without his strongest and most important supporter in the telegraph industry. On hearing the news of Orton's death, Edison is reported to have exclaimed, "If I get to love a man he dies right away. [Marshall] Lefferts went first, and now Orton's gone, too."²

While telephone developments had occupied much of Edison's time in early March, and negotiations with Western Union continued to require some of his attention, the early spring was taken up by new demands created by his growing fame as newspaper reports spread Edison's name across the
country and through much of Europe. Reporters from the New York papers competed for exclusive interviews with Edison that were widely reprinted elsewhere. One of these reporters, William Croffut of the New York Daily Graphic, dubbed Edison with his famous nickname—"The Wizard of Menlo Park"—and also authored an April Fool's hoax about an Edison invention that could manufacture food out of air, water, and earth. What became standard accounts of his early life also appeared at this time, most notably George Bliss's sketch in the Chicago Tribune.

By the end of March a constant stream of visitors was coming to Menlo Park to see the famous inventor and his phonograph, and in April he began to receive a steady flow of letters asking him for autographs and photographs, for advice, and for financial assistance.

The public interest in Edison derived in large part from the wonder that greeted the phonograph and he received scientific acclaim for this invention as well. Alfred Mayer wrote about his experiments with it for Popular Science Monthly, and in Europe several scientific figures began to investigate the new invention following lectures and demonstrations by William Preece and Theodore Puskas. Joseph Henry, one of America's most renowned scientists, in his capacity as president of the National Academy of Sciences, invited Edison to exhibit his phonograph and telephone at the Academy's April meeting in Washington. While in the nation's capital Edison exhibited his inventions to President Hayes, members of Congress, and other government leaders. He also posed with his phonograph (and with Charles Batchelor and Uriah Painter) in the photographic studio of famed Civil War photographer Mathew Brady.

Members of the scientific community were among those giving public lectures on Edison's invention. Dr. J. W. S. Arnold, a New York physician and a professor at the University of the City of New York (later New York University) gave a benefit lecture on the "Voice and the Ear" for the New York Ear Dispensary which prominently featured Edison's phonograph as well as his telephone inventions. George Barker, physics professor at the University of Pennsylvania, also featured Edison's inventions in a highly successful lecture on the physics of sound that he gave at the Philadelphia Academy of Music. Also in Philadelphia, Samuel Plush included a demonstration of the small phonograph in his lecture at the Franklin Institute. In Paris, Theodore Puskas demonstrated the phonograph before France's prestigious Academy of Science.

March–April 1878
The success of these lectures, combined with that of exhibitions in New York, where several famous persons came to sing and talk into the phonograph, apparently convinced the directors of the newly incorporated Edison Speaking Phonograph Company to lease phonographs for exhibition rather than sell them. Edward Johnson, who was appointed the company’s general agent at the beginning of March, soon ordered the production of exhibition machines. He also had Sigmund Bergmann manufacture twenty-five of the small phonographs, but these were considered unsatisfactory and the phonograph company sold only five. Meanwhile, the noted Paris instrument maker Edme Hardy began to manufacture small phonographs for Puskas to sell in connection with the Universal Exposition; Hardy’s instruments were apparently more successful than the Bergmann machines. Puskas also concluded an agreement with the London Stereoscopic and Photographic Company for a licensing agreement to manufacture and sell phonographs in the United Kingdom.

Edison and Batchelor continued their experiments to produce a standard commercial phonograph. By the end of April, Edison had designed both disk and cylinder machines run by clockwork, which he included in his foreign patents and an American caveat. Though he built experimental machines based on these designs, he felt neither to be suitable for commercial introduction, though a clockwork cylinder based on
his British patent was later manufactured and sold by London Stereoscopic, and Edme Hardy manufactured some in Paris as well.  

To assist with his experiments, Edison hired more machinists and other assistants in early March; by the end of the month he had "ten or twelve men at work in his factory—about 8 on the phonograph & the others on the Telephone."  
The new workmen probably included machinists George Jackson, Thomas Logan, Albert Ekstrom, Charles Flammer, and John Hood, patternmaker Milo Andrus, and young laboratory assistant Alex Craig, Jr.  

One of the new lines of experiment that Edison began to pursue at this time was a heat measurer, soon to be known as the tasimeter, which was based on the same principle as his carbon transmitter—the variable resistance of carbon.  

Even though about using this principle in the design of an electric light. Edison's work on the phonograph also led to other spinoffs that he would pursue in the following months. Besides the aerophone, a loud-speaking device using compressed air which he had included in his original phonograph patent application, but which he subsequently patented independently, Edison also conceived a small motor, known as the phonomotor, that worked by sound and another device, known originally as the telephonoscope and later called the megaphone, for transmitting sound over large distances. In a
newspaper interview he also discussed a hearing aid he had devised for his own use, which led to a large number of requests from the hard-of-hearing for him to develop a commercial design. Another “invention” that Edison mentioned in an interview was a medicinal preparation, which he called “polyform” and claimed would “stop any kind of pain immediately.”

Among the many visitors to Menlo Park was Henry Olcott, who had come to see Edison on behalf of Richard McCormick, the U.S. Commissioner to the Paris Universal Exposition, probably in connection with Edison’s planned exhibition. Olcott, who had cofounded the Theosophical Society with Helena Blavatsky in New York City in 1875, found Edison interested in Blavatsky’s ideas concerning occult forces. Blavatsky had mentioned Edison’s etheric force experiments in her book *Isis Unveiled* and, as Olcott discovered, Edison himself had conducted experiments to detect occult forces in 1874. Although Edison joined the Society in April and Blavatsky expressed an interest in meeting him, Edison’s participation in Theosophy was limited to waiving his royalty on a phonograph purchased by the Bombay branch in December.

Old alliances from his days as a telegraph inventor and manufacturer in Newark also drew Edison’s attention in April. In that month he finally settled his suit against Atlantic and Pacific Telegraph Company for his salary as company electrician as well as a suit against the Domestic Telegraph Company, an Atlantic and Pacific subsidiary, brought by Edison with his manufacturing partner Joseph Murray. Edison had retained an interest in Murray’s manufacturing shop in Newark and when their landlord, William Kirk, threatened to seize their machinery for back rent, Edison loaned Murray nearly $1,100. Nonetheless, Kirk was among the group of Newark’s “first citizens” for whom Murray arranged a visit to Menlo Park at the beginning of May.

Little is known about Edison’s home life during this period, but his busy schedule, as well as his propensity to work nights, probably left little time for family matters. Mary occupied part of her time by lending support to a Sunday school in Menlo Park.

1. Plush 1878.
4. See App. 3.
5. Mayer 1878a.
6. Doc. 1310 n. 5.
7. “A Wonderful Machine That Will Be of Immense Value For Various Purposes,” Cat. 1240, item 435, Batchelor (TAEM 94:131). In a 7 March letter, in the course of turning down an employment request from A. Debens, John Kruesi stated that two new workers had just been hired (Lbk. 1:414 (TAEM 28:276); see also Doc. 1264 n. 2 and employment correspondence in 78-012, DF [TAEM 17:453-65]).
8. George Jackson was hired in early March (see Doc. 1391 n. 10) and Alex Craig, Jr. was at the laboratory by early April (Craig to TAE, 13, 16, and 28 Mar. 1878, DF [TAEM 17:470-74, 476]). Although Jehl 1937-41 (p. 680) claims that Thomas Logan was at the laboratory in 1877, there is no evidence of him before the first week of June 1878. The series of laboratory timesheets that begin in early June show that by that time Logan and all the others were working in Menlo Park.
9. See Doc. 1289 n. 3.
10. See Docs. 1210 n. i, 1287 n. 3, 1298 n. 2, 1314 nn. 1-2, and 1326 n. 2.

St. Louis, March 1st 1878*

From E. C. Quinby

Dear Sir

A friend sent me a “New York Sun” wherein you are described as having invented several telegraphic instruments, and knowing I had tried to get some instrument that would enable me to conduct the sound of voices to my brain through the teeth—marked the article My hearing is somewhat impaired, in the conducting apparatus, but I hear my watch or any like sound as well through my teeth as I ever did

I thought I could use the telephone but have not been able to do it, & now write to see if you cannot help me out of my difficulties.

Hoping to hear from you soon I am Yours Respectfully

E. C. Quinby

(Troubled the same way myself have been told by several Profs that there was nothing matter with my ear only wanting Cleaning out I hear distinctly through my teeth)


2. According to the company letterhead, E. C. Quinby was president of the Metal Mfg. Co. They were manufacturers of “plain tin, stamped and japanned wire.” The letterhead indicated that they planned to change their name to the Metal Stamping Co.
3. On 4 March, William Carman, acting as Edison’s secretary, essentially repeated this marginal note in a letter to Quinby (Lbk. 1:406 [TAEM 28:268]). On 7 March, Quinby responded by again asking Edison if he had a device to “get the sound of a person’s voice to my sense of hearing through the teeth.” Edison did not respond and Quinby wrote again on 20 July to ask if Edison had such a device (DF [TAEM 15:7, 144]). On Edison’s deafness see TAEB 1:7, 643, 656; 2:581, 786; 3:223, 230 n. 2, 399-400, 518, 623, 692-93.

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Friend Mayer=

Phonograph is now perfect. all that was required was1 no 9 or 10 needle1 flattened on top & bottom thus & made smooth with arkansas oil stone, & hair edge taken off = use the thickest size of foil sent you or next size to it2 and dampen thus on speaking side only=

by proper stiffening of rubber tube X

and smooth needle you will get whispering perfectly and beautiful articulation even in hand turning—recognition of voice is easy=3 Let me know how you succeed if not very well will send you spring & needle its nearly all in the manipulation of the needle point by the stone. Yours

T A Edison

ALS, NjP, Hyatt & Mayer. Interlined above.

1. This refers to a number 9 or 10 sewing needle. “Edison Speaking Phonograph Instructions for Operating Experimental Apparatus,” CR (TAEM 96:515).

2. On 19 February Charles Batchelor ordered tinfoil from J. J. Crooke, manufacturer of Crooke’s compound tinfoil, indicating that he liked “the thickest the best.” The following day Batchelor indicated in a technical note that tinfoil for the small phonograph was .002 inches thick. Batchelor to Crooke, Cat. 1238:258, Batchelor (TAEM 93:186); Vol. 14:43, Lab. (TAEM 4:184).

3. Around this time an editor of Popular Science Monthly wrote, “The voice, indeed, is somewhat muffled and miniified when returned from

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March—April 1878
the iron tongue of the phonograph; but its intonations, inflections, pauses, and quality, are rendered with surprising fidelity." "The Edison Phonograph," 10 (1878): 748-49; this issue of the magazine was published by 21 March and contained material prepared as late as the beginning of the month.

New York March 2 [1878]

From John Dalton

Dear Sir

When you mentioned the subject of your deafness yesterday,¹ I suggested your going for advice to the clinique of Dr Agnew, who is one of our most eminent oculists & aurists. Dr Agnew² tells me however that it will not be necessary for you to go to his public clinique, but that he would be happy to see you, on any day, at his office, No 19 East 39th Street, for that purpose— His office hours are from 9 A.M. to 1 P.M. It would be better, however, for you to go early than late, as his office patients are numerous and you will not have so long to wait. If you will send up a card with your name, he will recognize it and treat you accordingly— Yours very truly

J. C. Dalton¹

(Carman Make a memo in book of address & office hours)⁴

ALS, NjWOE, DF (TAEM 15:5).

1. Dalton and J. W. S. Arnold (see Doc. 1263) had visited Edison at Menlo Park the previous day. Dalton wanted both a large and a small phonograph and Edison sent him to Joseph Murray to see about having them made. Murray wrote to Edison about this on 2 March and again on 4 March, inquiring what price he should charge. On 4 March, Murray indicated that Dalton was "delighted" with Edison's phonographs and might "be the means of some outlet for them as he wants to use them on Lecture tour to Illustrate sound." In April, Dalton purchased one of the first small phonographs manufactured by Sigmund Bergmann. Arnold to TAE, 2 Mar. 1878; Murray to TAE, 2 and 4 Mar. 1878; Edison Phonograph Co. royalty report for April 1878, all DF (TAEM 18:932; 19:46-48, 175.)

2. Cornelius Agnew was professor of eye and ear diseases at College of Physicians and Surgeons in New York. DAB, s.v. "Agnew, Cornelius Rea."

3. John Dalton was the first American physician to specialize in experimental physiology. DAB, s.v. "Dalton, John Call."

4. It is not known if Edison went to see Agnew.
My dear Edison

You don't say who is yr agent here if any for yr Telephone—
If you have none I shall be glad to act for you—

In any case you should be on the ground at once—as now is the time—

I have from the highest authority that the P.O. here do not think Bells practical.

If yrs is what it appears there is ready money for you. Let me hear from you at once & if you like to place the matter in my hands send me full particulars

Sir Wm Thomson1 told Mr Fleming2 that he considers you “the very first Electrician of the Age”—

What a corner there would be in the “pie” market if your favorite diet were made publicly known!3

**Automatic Quadruplex**— Pray do what you can to bring about a compromise with Prescott—or depend upon it nothing will be got out of the Eng. P.O. for it by anybody. That may be taken for a fact & now is the time to strike there again—as you will see by S. F. & Cos letter to Reiff—4

**Phonograph!**— After this what may you not do.

I'll tell you one thing wh you can probably easily do—

& and in wh there wd be money— **Spring motor.** Make a light machine for carrying one man on 3 or 4 wheels propelled by a spring under the seat to be wound up in advance for as long a [—]5 journey as yr genius can manage. If you could do this even for only a mile on a level road it wd be much—but if you can manage any ascent it will be better—Try it & you are sure to knock spots out of horses for short journeys. Yours very truly

Geo. E Gouraud6

1 Interlined above. 2 On 3 or 4 wheels” interlined above. 3 Canceled.

1. Sir William Thomson (later Lord Kelvin), professor of natural philosophy at Glasgow University, was among the world’s premier contemporary physicists and electrical engineers. *DSB*, s.v. “Thomson, William.”


3. This statement corroborates William Mallory’s reminiscence that Edison’s favorite meal consisted of apple dumplings (what Gouraud calls a pie) and coffee, which Edison told him was the first meal he ate after he arrived in New York in 1869 with little money in his pockets. Gouraud probably became aware of Edison’s preference for this pastry when he and Edison ate at a French pastry shop in High Holborn Street.
when the inventor was in London in 1873. Dyer and Martin 1910, 116–17, 150.
4. See Doc. 1210 n. 2.
5. George Gouraud had represented the Automatic Telegraph Co. in London. At this time he was resident director in Europe for the Mercantile Trust Co. See TAEI 1:280 n. 7.

Friend Mayer

Prescott is getting up a work on the Telephone and has asked me for all that I can give him.1 I have about 4000 drawings,2 and its too bad to give the results to such a charlatan. Couldnt you and Barnard3 get up a small work on the Telephone; there is a demand answer Yours

T A Edison

ALS, NjP, Hyatt & Mayer.

1. On the previous day, George Prescott had written Edison:

I am going to publish a full account of the telephone, and want to give all the points in yours—of which the Scribner article is a mere sketch. Will you write out such an account of the improvements obtained by your method over all others as you wish to have published & also the particulars as to the manner of their production. Also inform me where your Musical telephone can be seen— I will send an artist to draw it. I want to make the telephone as complete in its description as the telegraph is. [DF (TAEM 17:19)]

Edison eventually supplied Prescott with his account which was published in Prescott 1878, 218–34. Edison’s draft is in DF (TAEM 17:180–96; 162:1047–49).

2. Several hundred pages of drawings related to Edison’s work on telephony up to this time were entered as exhibits in the telephone interference proceedings of the Patent Office and more are in the surviving notebooks and technical notes at the Edison National Historic Site. However, an apparently extensive set of drawings kept in a notebook by James Adams disappeared upon his death. Edison Exhibits, TI 2 (TAEM 11:203–626); Vols. 10–15 and 18, NS-76–003, and NS-Undated-006, all Lab. (TAEM 3:813–1008; 4:1–193; 8:505–22).

3. Charles Barnard (1838–1920) edited the “World’s Work” department of Scribner’s Monthly from 1875 to 1884. Among his writings were articles on scientific and technical subjects (NCAB 13:64–65). He and Mayer had recently coauthored a volume on the science of light (see Doc. 1175 n. 2). On 7 March, Mayer declined Edison’s suggestion that he and Barnard write a book on the telephone and instead suggested Brown Ayres as “a young man in the [Stevens] Institute,” who was an experienced experimenter and “fully competent to write out the work” (DF [TAEM 18:938]).
To William Orton

Menlo Park Mch 3rd 78

Dear Sir

You were partly correct, I did find a “bug” in my apparatus, but it was not in the telephone proper. It was of the genus “callbellum”. The insect appears to find conditions for its existence in all call apparatus of Telephones.1 Another delay was the sickness of Adam’s wife.2 I intend to present you with a first class phonograph for your home, for reproducing music etc. this apparatus will run with a clockwork train. I will also place one in the room called “Experimental room” if you will be so kind as to inform me where that is.3

I wish you could find time some afternoon to come down and see my experimental room, (no desks manned with mathematicians) and hear some good phonographic singing and talking. Yours Truly

Thos A Edison

1. See Doc. 1226.
2. Ellen Adams.
3. The experimental room was connected with the electrician’s office at the Western Union headquarters building. Israel 1992, 144.

To Uriah Painter

Menlo Park NJ Mch 4 78

U.H.P.

I placed Aerophone model for patent in Serrells hands two weeks ago=1 My god do you expect me to speak 48,000 words on a strip to send you it would take 4 hours;2 I put 60 words at every revolution of the cylinder and can put 100 spirals per inch and the cylinder is 8 inches long figure it up3 — Got the little phono’s speaking as clear as the large ones; They are handy go for Johnson for one he is having 50 made=

Edison

2. On 3 March, Painter had written Edison “send me piece of foil with 48 000 words on!” In response to Edison’s statement, Painter replied on 5 March “I wanted to see if you realized how much 48 000 words were! I will be satisfied if you send me a piece at the rate of 48 000” (DF [TAEM 15:305, 313]). See Doc. 1277; Edison and Johnson 1878, 531, 534.
3. The instructions accompanying the commercial tinfoil phonograph (Doc. 1416) recommended an average rate of speed of sixty revo-
solutions per minute. That phonograph also had twenty-four grooves per inch, with a finer model having forty; Edison may have experimented with an even greater number. The eight-inch cylinder refers to the tin-foil recording surface, which was placed over the ten-inch mandrel of the phonograph. “Edison’s Speaking Phonograph: Description and Instructions for Operating,” CR (TAEM 96:510).

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From James Adams

T. A. Edison

Telephones work O. K. Call Bells don’t work with Callaud¹ worked a 220 Mile circuit all right. Mr Bently says you promised him one of the small Phonograph and their has been good many reporters here asking about it if you are going to send it down do so while I am here. if you have get a large one send it. Mr Bently wrote to Mr Orton about the saturday experiments which was red Hot² Induction on those wires not half as bad as New York. Send Phonograph to Mr Bently it will help us more than you think. Prof. Barker was here to day and heard telephone on a 60 Mile [circuit?] wire. Bentley speaks well of teleph[one]³

Receivers is not worth a god dam they are not strong enough Magnetized. everybody is delighted with telephone⁴ will you keep local on No 7. so I can get you any time.

P.S dont forget Phonograph J


1. Adams wrote this on the back of a letter from Batchelor of the same date in which Batchelor indicated that he would “send two Instruments monday night (Mar 4) on brackets to test with new calls” (DF [TAEM 19:643]). Batchelor sent the brackets and a new receiver on 6 March (Doc. 1240).

2. Developed by A. Callaud of France, the Callaud battery was a simplified version of a Daniell gravity battery (see TAEM 1:615 n. 3). King 19623, 243, 245; Pope 1872, 106-7.

3. On Saturday 2 March they made a test on a 30 mile loop to Wilmington and back to Philadelphia. Henry Bentley to George Prescott, 15 Oct. 1880, Box 1093, NJWAT; Bentley’s testimony TI 1:318 (TAEM 11:136).

4. George Barker was professor of physics at the University of Pennsylvania (see TAEB 2:328 n. 8). On 8 March he wrote to Edison that Bentley was “enthusiastic about your carbon telephone, which has surprised and delighted me also beyond measure” (DF [TAEM 15:333]).

5. That is, the transmitter.
Chicago March 5th, 1878

Dear Sir:

Letter rec'd from Beetle of Feb. 16th & 17th. It don't place matters in Europe in very favorable light thus far but seems to promise better for the future.

Story, who is agent for Belgium and Holland is doing well and making good sales considering the extent of his territory.

The Austrian agents are Jews. They paid for their first bill of goods but for the second lot of about $1,000.00 are holding and Beetle expects to cancel their contract and give it to another party whom he thinks will be more energetic and make less trouble.

Germany is not yet started but Beetle expects to get it under way soon.

The sale to Switzerland of 30 is for future delivery and although the party is first class he has gone on a short trip and nothing will be done till his return.

The sale to Portugal is in about the same shape.

Beetle thinks he has a big prospect for a sale to Spain but you are such a lover of accomplished results that I wont mention it.

He also says an arrangement is about closed for Italy. We shall see.

The Baron went back on Beetle in France and he has had to commence selling himself. The French manufacturer has begun to deliver outfits—all sizes at $10.00 and he reports the goods as splendid. This makes a margin on future French sales and he says can do well in France hereafter.

There is a rumor flying round in the papers that the general use of the electric pen in Russia has been prohibited as the gov't controls the printing business. Should this prove so there will be only one thing to do and that is to stock the gov't. I don't take much stock in the report as there are parties negotiating for the agency.

Beetle has gone into an extensive scheme of advertising the pen in France.

Herz has returned from Italy. He reports no prospects of making a sale of the quad there. The gov't has an overstock of wires there. They are poor. They have the Stearns duplex which is not used because not business enough.

They also claim to have the Meyers, or French quad. Herz is going to Germany and Russia and says he is going to make a faithful effort to sell the quad there. He expects to come
back about April. Herz has secured the Gramme machine and Jablockhoff light for the U.S.

At a recent experiment in Paris one Gramme machine ran 16 lights for an several hours without a break of a second in any one of the lamps.\textsuperscript{8}

One of the public squares of Paris was brilliantly illuminated and immense numbers of people took part the the public entertainment so Beetle writes.

Herz claims to have information from Preece that the negotiation in England for the quad is interrupted by Stearns who claims a slice?

Puskas has not turned up in Paris.

Beetle says Mr. Mignon\textsuperscript{b} who has been at the head of the Howe Sewing Machine Co. on the Continent is ready to push the phonograph, telephone and electric pen in Holland and in as much territory as can be allotted if placed in his hands soon.

If Puskas is to be detained in England long would it not be well to let this arrangement go ahead as quickly as it can be agreed upon all round.

The English Co. are pushing the pen in all the colonies. The sale of an English patent virtually means the surrender of an immense portion of the world. You ought to keep this fact in mind in your future sales of patents. Respectfully,


\textsuperscript{ALS, NjWOE, DF (TAEM 15:324). Typed in upper case. Letterhead of Electric Pen and Duplicating Press, George Bliss, General Manager; letterhead and dateline are electric pen copy. "Chicago" and "1878" preprinted. \textsuperscript{b}Obscured overstruck letter.}

\textsuperscript{1. Not found.}

\textsuperscript{2. Gustave Story, electric pen agent for Belgium and Holland, persistently sought an appointment as manager of the European business in place of George Beetle. In a letter to Bliss of 20 December 1878, Story denigrated Beetle's management and boasted, "I am certain that by myself alone I could in one year give greater publicity to the goods than all the agents united" (DF [TAEM 50:387]). An electric pen pamphlet issued by Story is in Cat. 1032:131, Scraps. (TAEM 27: 921).}

\textsuperscript{3. On 14 February, Bliss had written to Edison, "[Baron] D'Apremont being Gen'l agent for the pen in France is anxious to give it a good exhibit." Nothing further is known about him. DF (TAEM 15: 237).}

\textsuperscript{4. Edme Hardy was then manufacturing Edison's electric pen. See Doc. 1259.}

\textsuperscript{5. The Operator of 1 March (p. 9) noted a report by M. Sergins Kern in the Chemical News that "the diffusion of Edison's electric pen is much}

\textit{March–April 1878} 145
checked by Government regulations, as the use of printing implements for private study is strictly forbidden in Russia."

6. Joseph Stearns's duplex, the first practical method of multiple telegraphy, had been adopted by Western Union in 1872 (see TAEB 1:101 n. 3, 521 n. 3). The Stearns duplex was not widely used in France as it proved undependable on Morse ink-recorder lines and inadequate for use with the Hughes printing telegraphs that were extensively employed on major lines (Butrica 1986, 112-13).

7. In the early 1870s, Bernard Meyer invented the first practical synchronous multiplex telegraph. Meyer's design used a distributor which allowed several instruments to share a single wire. It was first put into operation on the Paris-Lyon line in 1872 and subsequently used on other major French lines. Butrica 1986, 88-97.

8. This and the following paragraph probably refer to the lighting of the Place de l'Opéra with Jablockhoff candles driven by a Gramme dynamo. King 1962c, 404.

9. Unidentified.

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London 5th March 78.

My dear Edison,

I got lots of letters from you, many thanks for them.

This is only my first letter to you, but you must excuse me—I was awfully bothered with the English contract.—

Today I sent you 2 registered letters containing the Contract, the Agreement about the advance of fifteen hundred pounds and a Power of Attorney.—

After what I cabled you first you will perhaps not think much of the Contract,—but under the circumstances I don't think that I could have made a better one.— About a fortnight ago,—that is when I cabled you first— I had nearly settled everything with my parties—when they suddenly backed out,— because they were informed by competent people that your English patent was for several reasons a weak one.— In the first place it contains two distinct inventions which is always objectionable at least here in England—because people might infringe on the phonograph on the ground that one of your claims which relate to the telephone is a bad one.— Then to protect your phonograph you have virtually to fight for the telephone although nobody might infringe on the telephone.— That is the reason why the parties would not consent to eventually pay more than one third of expenses for legal proceedings against infringers.—

Secondly you have some thirty claims;—the more claims you have in a patent here—the more they are afraid of such a
patent.— If one claim will not hold good—the whole patent falls to the ground—till you disclaim.— Bessemer* looked through your final specification in the Patent Office—and told me afterwards that there were several claims which you could not uphold in an English Court.— Now he may perhaps be wrong, but his opinion about patent matters goes here a great way.—

Bessemer is also afraid that you have not enough of the Phonograph in your preliminary specification—That is, that there is not enough in it—which will lead up to the phonograph of your final specification.— He says he would be very sorry if the court would declare your patent invalid on this ground.— He asked by the by asked me to give you his compliments, he thinks your Phonograph is a marvellous invention. It certainly is a pity that you have not a separate patent for the phonograph—but that cannot be remedied now—and we have to make the best of it.—

I should like with your consent to put your patent before the best counsel I can get here,—to have it carefully looked through—and to get an advise what parts have to be disclaimed.— I would then be able to send you the written opinion of the best barrister (in patent cases) Mr. Aston;— the sooner you make your necessary disclaimers—the better.—

My letter is very confused, but perhaps you will be able to make something out of it.— I came today late back from the City and am writing in great haste—because tomorrow morning I’ll be off for Paris.— I have lost now time enough here in London—people are awfully slow here;— it took the lawyers nearly a fortnight to draw up the Contract.

The Stereoscopic Co. is a very good firm.— Rich—and do a large business—sell a great deal in retail.— Their principal store is in Regent Street—have the best customers of London.

Nottage is Alderman & Sheriff of London— his influence will help us in litigations.—

If you don’t think it too much—will you give me one third of your interest in the English Contract?—

That will leave you 33½ percent of the profits—or at least a minimum royalty of respectively: 16½—13½ and 10 percent of the selling price.—

If that is agreeable to you,—then please pay to Serrel out of my 500 pounds—the 200 dollars (or there about) which I owe him,—further the costs for patents in all the remaining

March–April 1878
countries which you mentioned in one of your letters— and send me the remainder to Paris care of Col. Beetle.

The agents of the Union Bank in New York are (I think) Kuntre Brothers.—

I will look after your interests here in England.—

As soon as I get notice of the arrival of small phono I will come back from Paris and show the same to Nottage whereupon he will order by cable through you a few hundred.—

Please send me also as soon as possible a plate instrument so that I might give orders for the Exhibition.—

Send also clocks.— Nottage wants to give orders for them too.

I have a great deal more to write—but I am too tired today.

Will write you soon from Paris—

Yours truly

Theo. Puskas

Preece got his phono We are now waiting for the Telephones.—


1. The contract was a licensing agreement for manufacture and sale of phonographs in the United Kingdom by a British firm, the London Stereoscopic and Photographic Co. (see note 7). The agreement specified Edison's royalty as half of the net profits on the sale of all phonographs "toys clocks figures and all instruments of all kinds" involving his patented invention. A supplemental agreement provided for a £1,500 non-refundable advance on the royalties anticipated from the contract (both agreements, dated 22 March, are in Miller [TAEM 28:1080, 1086]). On 7 March, George Nottage, manager of the British company, indicated that he was sending the papers to Edison (DF [TAEM 19:215]). The power of attorney sent by Puskas is unsigned (Miller [TAEM 28:1177]), but an agreement of 16 April between Edison and Puskas did include a power of attorney for Puskas regarding these matters (TP).

2. Puskas is probably referring to his cable of 8 February (see Doc. 1196 n. 5).

3. The 22 March contract specified that the company was not bound to participate in any infringement proceedings, but that if it elected to do so it would be responsible for one-third of the cost. Miller (TAEM 28:1080).

4. Henry Bessemer (knighted the following year) was a very prominent and wealthy inventor, engineer, and industrialist (then retired), known primarily for developing the process and equipment for manufacturing steel identified with his name; he had had extensive and expensive experience with issues of patent rights. DNB, s.v. "Bessemer, Sir Henry;" McHugh 1980, ch. 9 & 11 passim.
5. See Doc. 1554.

6. The City of London was a politically separate administrative territory of about one square mile in the midst of metropolitan London, containing the major financial, legal, and press institutions and business headquarters of England and the British Empire.

7. The London Stereoscopic and Photographic Co. advertised itself on its letterhead as a prize-winning portrait photography establishment and official photographers for several international expositions as well as for the Prince and Princess of Wales. The firm was a partnership of George Swan Nottage and Howard John Kennard (of whom nothing further is known), with Nottage managing. According to Nottage, bringing out scientific novelties was also their specialty. Nottage to TAE, 7 Mar. 1878, DF (TAEM 19:215).

8. Located in the western part of central London, Regent Street was (and remains) among the more fashionable and expensive of commercial addresses. The company’s headquarters, however, was in the City of London, at 54 Cheapside. Agreement with Edison, 22 Mar. 1878, Miller (TAEM 28:1080).

9. That is, of the City of London, not of the whole metropolis. On or before 18 February, Nottage sent a cable to Edison, but Edison could not at first establish who “Sheriff Nottage” was. James James to TAE, 18 Feb. 1878, DF (TAEM 15:248); see also Doc. 1248.

10. Edison’s and Puskas’s 16 April 1878 agreement formalized this division (TP).

11. In response to Puskas’s cable of 2 March (see Doc. 1208 n. 7), Edison wrote to Serrell on 5 March “concerning further foreign patents” on the phonograph and Serrell advised him that “it will be best for you to look over the drawings and specifications as we have them, leave out any unnecessary matter, and add any improvements.” He also asked Edison to call at his office to discuss the “best way of proceeding.” Serrell to TAE, 6 Mar. 1878, DF (TAEM 18:634).

12. The advance from the London Stereoscopic and Photographic Co. was put in the hands of this London bank; their New York agents (of whom nothing further is known) were to let Edison have the funds once he presented the signed contract. Contrary to Puskas’s understanding here, George Nottage’s letter to Edison of 7 March indicated that the transaction in New York would be handled by the Bank of New York. DF (TAEM 19:215).

13. See Doc. 1204. Apparently this phonograph did not arrive in time to be used in Preece’s lecture and demonstration at the 27 February meeting of the Society of Telegraph Engineers, as the machine brought by Puskas was the only American-made phonograph shown there (see Doc. 1249 n. 2).

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Edward Johnson to Uriah Painter

Dr U.H.

Have seen Hubbard & made things O.K. I am to help run things at HdQrs till the machines are ready for the mkt. then

NYork 3/5/78

March—April 1878
go ahead with my lecture business. If we find my services are not imperatively demanded at home, I am also to have the sale of machines on commission when out in the lecture field. I began my career today under favorable circumstances—making a little improvement on the Phonograph which increases the sound so enormously that it is now twice as loud without a funnel as anything heretofore produced with a funnel—Kiralfy who was at Menlo Park yesterday says its far ahead of Edisons—I've got the Bell folks wild they were disposed to contest with me in the matter of getting from their machine better & louder talking than I from mine—but they gave it up today & owned up that I knew it better than they. My room is No 28, address all letters to me there. Cheever opened both yeathose you sent to his care—he said "in mistake"—He & I will get along all right—I begin to see through him already—I learned him in 5 minutes talk with He & Hubbard. His weakness is, to be considered fertile in Ideas—I gave him some—which in talking to Hubbard he gave as his own—I've nailed him. I'll keep him supplied with them & allow him to appropriate them—getting my compensation in some direction of more moment. I am to get 50 machines out at once—R Hoe & Co will probably make the first lot. Hubbard has given me to understand that he considers it all important to get control of that Toy License. I told him I thought I could do it & after a final talk on it He has left it entirely in my hands & says he will agree to pay them a royalty of 10% for their franchise. Now I want to do this if I can in order to make me solid with them—Give me some Idea how best to go to work. I'll give you my "leverages"—

1st. Moody & Russell have done nothing so far—but look for money—which they have not—and as yet have failed to get.

2nd. James—who got them this license from Edison is impoecunious to the last degree—and has importuned me to work with him in getting some other parties licenses from the Phono Co. He will be equally ready for a small bonus to join me in getting the Toy license back into the Phono Co's hands—

3rd—I think Edison will join the effort as he will receive his 10% still—and will have a more certain guarantee of getting his $6000. beside he will feel that in our hands toys will begin to appear, while in the present hands there is but limited prospect. It is not agreeable to him to have his Ideas locked up till by degrees other people think of them and appropriate them.
On the other hand there is against me
1st. the undoubted fact that they know & fully appreciate
the value of their license
2nd. They are in more or less harmony with Davis of the
Clock Co—who I understand has made them some over-
tures. It will be to his interest to sustain the Toy license as
against a monopoly.
3rd. Any effort to approach them will of itself raise a point
to overcome.

Give us some of your worldly wisdom—
What, if anything have you done about Blairs appointment
and what if anything additional have you from Robinson. Make
him tell you why it is impossible—get him to make the
explanation he hints at. Let me, in brief—know the other
side of the story—I will go to Orton in this matter—so soon
as I know both sides—He will try to accommodate me I
think? Yours Truly

E. H. Johnson

ALS, PHi, UHP. *Obscured overwritten letters. *Letters written off
right margin.

1. On 3 March, Painter wrote Edison: “I had Johnson come over here
to see Hubbard yesterday—I have got them to agree to make him manager
of the Phono’ Co’—Then you & I can know it is all going on OK. &
can keep it within our control—What do you think of it?” DF
(TAEM 15:308).

2. Imre Kiralfy, a Budapest-born actor and theatrical impresario, had
just returned from Paris where he had “made a Number of important
arrangements for American Inventions” and on 24 February asked to
meet with Edison to discuss similar arrangements for his inventions.
Kiralfy came out to Menlo Park on 1 March, where, according to
Charles Batchelor’s diary, he spent the entire day. On 16 March, Charles
Cheever wrote Gardiner Hubbard that Kiralfy, whom he identified as
“pretty well known in New York as a party who gets out theatrical nov-
elties for exhibition in the various parts of the country,” had applied for
the “exclusive right to use the Phonograph for the exhibition of con-
certs.” Although he thought Kiralfy “about as enterprising a chap as
there is going in the business,” Cheever felt that it would be “injudi-
cious for us to tie ourselves up by giving him exclusive right for all con-
cert purposes.” Obituary, New York Times, 29 Apr. 1919, 15; Kiralfy to
TAE, 24 Feb. 1878, DF (TAEM 19:839); Cat. 1233:60, Batchelor
(TAEM 90:83); Cheever to Hubbard, 16 Mar. 1878, Box 1205, NJWAT.

In a New York Sun interview of 29 April, Edison reported that Kir-
alfy had visited him the previous week and

was in ecstasies over the phonograph. He wants me to make him
forty or fifty large cylinders, which he proposes to take to Paris.
After securing the finest musical performers, each one will be in-
vited to play into different diaphragms, and the notes are to be re-
corded by the cylinders. The greatest prima donnas, tenors, contraltos, and bassos are to sing, and their words and melody transcribed by the phonograph. ["The Inventor of the Age," Cat. 1240, item 561, Batchelor (TAEM 94:186)]

In May and June Kiralfy also sought to exhibit Edison's musical telephone in a series of European concerts; Edison was to receive ten per cent of the gross receipts. On 11 June, Edison gave Kiralfy a six-month option on such exhibitions but nothing appears to have come of this. Kiralfy to TAE, 29 May, and 4, 5, and 8 June, 1878, DF (TAEM 19:854, 858–860); TAE to Kiralfy, 11 June 1878, Lbk. 3:264 (TAEM 28:713).

3. After his signature, Johnson gave his address as "Room 28 Tribune Bldg NY."

4. Robert Hoe & Co., founded in 1822, primarily manufactured printing presses, most notably its famous rotary presses. The company also did repair work, manufactured other items, such as a circular saw, and did contract work for others. Lubar 1987, 259–65.

5. See Doc. 1168 n. 7.

6. Joseph Moody had apparently become Oliver Russell's partner in the toy contract. He was associated with the Lykens Valley Railroad & Coal Co. in New York. William B. Hollingshead deposition, p. 3, American Graphophone v. Leeds & Catlin, Equity No. 8,570, Circuit Court of the U.S., Southern District of New York.

7. James James.

8. Henry Davies.

9. Nothing is known regarding this matter or about Blair, but see TAEB 3:452. Robinson may be Heber Robinson, manager of the Philadelphia Western Union. "The Philadelphia New W.U. Office," Operator, 1 July 1876, 7; Reid 1879, 178.

Friend Edison:

I was going to suggest the very changes you are making—at least 3 of them.1 We have not had success with your Receivers for there was really scarcely any permanent magnetism in them. We soon saw the trouble. But we look on that as of little importance as it is easily remedied. It seems to me as if there was no limit to this thing. I want to get the things now coming from you and then I am going to bring the newspaper men in. Of course to make up for the loss of power in the small induction coil I will put on more cells for a long test. With the arrangement as I want it I will let you know when to go over to Drexels in N.Y. and have a test on his wire2 this week one day. When I think of the limited scope of the Magneto, this Carbon telephone stuns me.

I want the Phonograph here and then I will have a newspaper gathering.3 Also I am going to help Prof— Barker out

From Henry Bentley

Phila 3/6/78

March–April 1878 152
in his Lecture at Academy Music\textsuperscript{4} April 15  Adams is doing A.1.

H Bentley


1. Edison's letter to Bentley describing these changes has not been found. Changes in Edison's telephones from around this time are indicated by Docs. 1222, 1240, and 1241 and include a glass disk and a steel spring to compress the carbon in the transmitter, a new mouthpiece design, and changes in the call signal. Edison and his staff also experimented with the type and number of battery cells and with induction coils. Other possible modifications of the transmitter design are shown in drawings of 22 February, 1 and 6 March, and of the receiver in drawings of 6 March (Vol. 14:45, 51–55, Lab. [TAEM 4:186, 192–96]).


3. According to the 9 March Philadelphia Inquirer ("Phonograph and Telephone Experiments," p. 2), Bentley exhibited the Edison phonograph and the carbon telephone transmitter at a private gathering on 8 March. Probably reflecting Bentley's view, the article called the carbon button "a more important if not more wonderful invention" than the phonograph and noted that Bentley demonstrated the telephone over a seven hundred and fifty mile line from Philadelphia to Pittsburgh via Baltimore. According to Bentley's later testimony in the Telephone Interferences, the Philadelphia Local Telegraph Co. logbook of 8 March recorded a "test with Edison's phonograph and carbon telephones to Baltimore via Pittsburgh, failure." Bentley stated that "the Baltimore operator telegraphed that he failed to hear us" (TI 1:318–19 [TAEM 11:136]).

4. The American Academy of Music on Broad St. in Philadelphia, which opened on 26 January 1857, was at this time the largest opera house in the United States (Blodget and Freedley 1885, 16–17). On 8 March, Barker wrote Edison about his lecture and asked for suggestions of "good things for me to do, and to ask of you the loan of the large phonograph and of some of your carbon telephones." He indicated that Orton had "cheerfully" agreed to the use of Western Union wires for demonstrating the telephone at the lecture and that Bentley "promised to give me talk on the stage with Chicago direct." Barker hoped that Edison himself would "find time to come on to the lecture & stay with me" (DF [TAEM 15:333]).
Jim,

We send you two brackets\(^1\) today connected up like sketch\(^2\) they have Bunnell sounders\(^3\) on for calls and a plug arrangement for switch. When you talk and receive put plug in top when you call put plug in bottom hole— with the bindposts at bottom which go to battery you must put on one bracket line to left, for the other line to right so that you have then when you call the effect of both batteries and use 3 callaud cells on each end Remember that these arrangements are not for more than 300 ohms although you can use telephones with as much resistance as you like but more than that is not good for calls. I send you a receiver that will beat the ones you have and I will send you two transmitters and another soon the transmitters being better for mouth Keep using them all time and find out all about their lines and also any defects that may be in instruments Yours—

Chas Batchelor

P. S. I told Ellen when you wrote I had heard from you B\(^4\)

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\(^1\) brackets
\(^2\) sketch
\(^3\) sounders
\(^4\) B
This circuit diagram for the telephone unit from George Prescott's 1878 book on the telephone shows the plug moved to the center.

An arrangement of Edison's telephone used in demonstrations in France and England during 1878.
When a plug is inserted between 3 and 4, the relay or sounder R', battery E, and key K only are included in the main line circuit, and this is the normal arrangement of the apparatus for signalling purposes. The battery, usually about three cells of the Daniell form, serves also both for a local and main battery. When a plug is inserted between 1, 2 and 4, the apparatus is available for telephonic communication.

A telephone unit of this design was illustrated in Prof. William Barrett's article on the carbon telephone in the 21 November issue of *Nature* (Barrett 1878; see also DuMoncel 1974, 198).

3. This refers to sounders manufactured by Jesse Bunnell, possibly one of two he devised himself. He received a patent for one of these on 16 February 1875 (U.S. Pat. 159,894). The other was known as the giant sounder. According to an advertisement in the *Operator* (15 Aug. 1875, 2), he applied for patent protection for this device, but no patent seems to have been granted. In a 23 March letter to electrical manufacturer Henry Thau, Charles Batchelor indicated that the Bunnell sounders Edison was using were half-size (Lbk. 1:460 [TAEM 28:310]).
nuisance = On a longer wire, small relays like those in the repeating case at G and Stock could be used and these would work to 25 or 30 miles with the 3 cells and a longer distance on 4 cells = a sounder or small bell could be used being supplied from the same cells. Yours

Thos. A. Edison

P.S. I will send your tests to the Society Tel Engineers

London

ALS, MiDbEI, EP&RI.

1. What Edison meant by the "universal mouthpiece" is unknown. It may be the cupped design shown in "Bentley's Exhibit' Edison's Carbon Telephone March 25th 1878" (TI 2:535 [TAEM 11:662]); cf. "Bentley's Exhibit' Edison's Carbon Telephone No. 1," (TI 2:534 [TAEM 11:662]) and Prescott 18783, 854. This cupped design is also shown in a Charles Batchelor drawing of 22 March; however, the telephone based on that drawing was finished with a different mouthpiece (see headnote p. 173, n. 3; NS-78-011, Lab. [TAEM 7:918]. "Bentley's Exhibit' Edison's Carbon Telephone No. 4," TI 2:537 [TAEM 11:665]).

2. See Doc. 1269 (fig. 15).


4. Laboratory records of induction coil experiments are incomplete. Regarding earlier induction coil experiments see Doc. 1219 n. 2. Notes of 14 March record tests with six different coil designs, each using different wire gauges and resistances; "Coil No. 5" became the standard coil (see Doc. 1355). Vol. 14:59, 64-68, Lab. (TAEM 4:201; 207-11).

5. The Society of Telegraph Engineers was founded in London in 1871 and later became the Institution of Electrical Engineers. Edison and Batchelor were both members. Edison sent Bentley's report (Doc. 1247) to William Preece, who was also a member, but no mention was made of the report in the Society's journal.

Friend Mayer.

My man will make you two or three points and send by mail. = the dished diaphragm does not appear to work well either on the telephone or the phonograph, but I think iron is the wrong material. I'm going to try it by making a number of fiddle strings like the spokes of a wheel running from a hub and secured to tension regulators pasting or sewing a thin parchment diaphragm over all and make the indenting spring pull the centre outward funnel or dish shape. = I find that very elastic rubber is all that is required for dampening. = I see you have your hands full with you of work. = I think the new clockwork phonograph with the aid of a good smart boy will

March—April 1878

157
materially assist your in getting through your work—you can dictate enough in 10 minutes to keep him going about 2 hours; Would you be so kind as to ask Mr Ayres to come down and talk the Telephone matter over = Those little corked needles you sent are immense. I got experimenting with them and like a man eating peanuts couldn’t stop. Their movements are certainly curious, and I believe this idea can be worked up into a useful test instrument—I’ve rigged up a jar already with one in for telling which is N. or S in my telephones and the men used it today several times. They are Magnetic Videoqs—Could I ascertain the power of a magnet by placing one in a dish of thick glycerine and take the time it consumes in travelling across the dish to a magnet on the other side, or would the difference in the magnetic fields of long and short magnets be a source of error—Mem—a double point on spring of phono one behind the other gives double sounds and is nice in singing—I’m going to get some diamond—ruby and amethyst points made—will supply you—= I will call on R and see what he can do for my big ears; Yours, Truly
Thos. A. Edison

P.S. Prof Rood ought take a run out here if he can=

Tests of my Carbon Telephone at phil shows that it works 720 miles, on regular WU line, and also talks down completely over 4 Bell instruments in [———] a short line with men shouting in them=


1. In a letter of 6 March, Mayer thanked Edison for devoting a day to showing him experiments during a recent visit and, among other topics, asked for another point and spring for his phonograph as his initial one had been worn almost totally away. DF (TAEM 18:935).

2. Mayer had asked about the dished diaphragm in his 6 March letter (see note 1) and on 14 March he suggested another way to create a “membrane dished like the drumskin of the ear” (DF [TAEM 18:942]). On 29 May, Edison wrote Clarence Blake about a

\[ \text{dished diaphragm of postal card, when it is dished it requires no dampers, but if flat it may be dished by light dampers with same results = Of course the voice is more human and it will record the lowest tones perfectly but the loud talking makes it squeak. [CJB]} \]

See also figure 21 in Doc. 1341, which shows a concave diaphragm.

3. In a 7 March letter Mayer told Edison that in addition to his academic duties he had “given my word to 3 publishers to write 10 books for them within three years.” DF (TAEM 18:938).
4. Brown Ayres was a student at the Stevens Institute in 1878. He had visited Menlo Park with Mayer and Henry Morton in January, and Mayer had suggested that he rather than Mayer write a book on Edison's telephone researches (Doc. 1232 n. 3; Ayres to TAE, 20 Jan. 1878, DF [TAEM 15:187]). On 9 March, Ayres asked Edison to name a day when he could come out to the laboratory to confer on the book, but nothing further came of this and Edison's account was published in Prescott 1878c (DF [TAEM 17:21]; see Doc. 1232 n. 1). Ayres went on to study with Henry Rowland at Johns Hopkins University before becoming professor of physics and electrical engineering at Tulane University. He later became president of Tulane (DAB, s.v. “Ayres, Brown”).

On 30 March, Ayres submitted an article on the theory of “The Telephone” to the Journal of the Franklin Institute, which was published in the June issue (Ayres 1878). Primarily a mathematical analysis of telephone technology, it briefly described Edison's carbon telephone. Ayres also discussed experiments in which telephone conversations were carried on “between different floors of the same building, using the gas and water pipes as conductors” and suggested that there was a “close analogy between these telephonic currents” and Edison's etheric force. This led him to suggest using a telephone as a “delicate electroscope” for detecting rapidly oscillating currents.

5. In his 6 March letter (see note 1), Mayer had enclosed “a dozen of magnetized needles” (each stuck the same distance into the center of a cork with the N pole up) and suggested that Edison “Put two, then 3, then 4, then 5, & so on in a basin of water and bring down over them a rather large cylindrical bar magnet— The experiments will explain themselves. They will greatly amuse you & they are very suggestive.” See also Doc. 1175 n. 4.

6. François Eugène Vidocq was a legendary French police officer and adventurer of the early 1800s who became the quintessential detective in European and American popular fiction and culture for the rest of the century. Edwards 1977.

7. On a letter from John Holland, a Cincinnati pen manufacturer who wrote regarding the use of iridium and diamond points for the phonograph, Edison instructed his secretary to “Write and say that I have both a sapphire and Diamond point both of which work well but are rather expensive. say that I have never tried Iridium and if he would be so kind as to send a small piece I would try it and send him a record with results.” On 10 April, Holland sent a piece of brass wire tipped with iridium in the manner used in his best “Gold Pens.” DF (TAEM 18:974, 980).

8. In his 6 March letter (see note 1), Mayer supplied the address and office hours of Dr. Daniel Roosa, indicating that he was “the best aurist in N.Y.” and “a particular friend of mine.” Roosa, who was on the faculty of the University of the City of New York, had been present when Mayer lectured on the phonograph before the New York Ophthalmological Society two weeks earlier. DAB, s.v. “Roosa, Daniel Bennett St. John.”

9. In a postscript to his letter of 6 March (see note 1), Mayer had written that his friend Ogden Rood, professor of physics at Columbia College, wanted one of the long cylinder phonographs for the college.
and was willing to pay as much as sixty dollars. *DAB*, s.v. “Rood, Ogden Nicholas.”

10. See Doc. 1239 n. 3.

--1243--

To William Orton

Menlo Park N.J. March 7=78

Dear Sir=

You will notice in the contract that all improvements on the phonograph which that¹ connect it with Telegraphy which may be made by me within the next 17 years are reserved.¹

As the phono stands it has no connection with a telegraph and requires a connecting link. This link is reserved.

Again, there is a clause which compels them to make no discrimination between any corporation or individual in the matter of price, when the machines are for the use of such individual or corporation.

Hence should I within the period of my contract with the W.U.² devise the connecting link it would come under the contract and the WU could purchase the phono proper at the same price as others=³

P I put it in this form as the safest. Do you not think this accomplishes the object Yours Truly

Thos A Edison

ALS, CSšt, Linke Collection. ¹Interlined above.

1. Edison was responding to Orton's letter of the previous day, which stated that he had read Edison's phonograph contract (Doc. 1190) and found that it “contains no reservation for the W.U. Co. particularly—nor telegraph business generally.” Orton also asked to see Edison and try his new telephone, noting that “Bentley speaks of it with increasing favor.” LBO 21:32–33.

2. See Doc. 876.

3. On 10 March, Uriah Painter wrote Gardiner Hubbard:

I saw Mr Orton to-day & told him I had secured the ap't of “Phonograph ag[en]t for Johnson & that we would have some machines on the market in few days. He said he considered it one of the most curious things he had ever seen but he did not see how it was going to be brought into practical use— I told him it was a good thing to build on. That we were going to put it into a stock Co & I could get him some of the stock. He said he did not know about it, he would see about after a while— I dont believe he will put up a cent on it at present. [Box 1205, NJWAT]
Friend Edison,

Here I am in a pretty shape. Ashley writes me that my article before the Chi. Electrical Society is a romance and all that I have ever heard about you isn’t so. I am reduced to the necessity of going to New York to write an accurate history of your life in self defence. It is so hard to live now days I can’t spare time for such recreation but what must be done can’t be helped.

I telegraphed you today in Louderbacks behalf. He is red hot on the phonograph question. Hope you will do what you can for him. It looks as if I should not be able to reach N.Y. till last of next week.

Wheeler writes that the fast press is still on the stilts. I shall stay at Menlo till finished so if you don’t want a permanent boarder hurry it up. Gray says you gave Bailey a letter to Puskas but did not say you intended to join teams on the telephone. How is it? Beetle writes that Roosevelt has withdrawn the suit at Paris begun against the parties selling the German telephones. They find a Frenchman has an old patent which endangers the Bell patents. Beetle’s information on such matters is not always reliable. He says the German telephones are sold at $3.00 in Paris and the Bell at $6.00. Respectfully,


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Dr Sir—

Yours without date to hand—

If you can send me down a working aerophone it will be a good leverage— Will I have to wait for “EHJ” to make a Phono before we get you or one over here? J likes his new posi—
tion. He has now a first class chance to show what there is in him— They like him so far, & if he makes it a success we can get plenty money at sight for new things—

I find that Toy concern have done nothing! Have failed to get a cent to manufacture or try any experiments— Will you help us to get it? so we can put on wheels— We wont let 3 months pass idly by as they have! Yrs

U H Painter

ALS, NjWOE, DF (TAEM 15:337). *Date and place from Philadelphia Inquirer hand stamp.

1. Not found.

-1246-

Edward Johnson to Uriah Painter

My Dr U.H.

All right I'll go for James— Clock Co got nothing out yet but hard at it. Its no fool of a problem but it will be done. The Toy problem is the simplest as it does not require that the talking shall be perfect. Baby's dont talk when they are born.

I can't send you my Phono, because I start for Rochester with it monday night.1 Shall get back Friday. My clock work will probably be done on monday. I'll ask Edison to send you one of the little ones.

Hoe is too slow. He wants 10 Days to Estimate on it. So I took the bull by the horns & closed a contract today with a smaller—but good—concern to make 25. Deliverable in a fort-night— More perfect than Edisons model $10. Each— they will be saleable—2

I am seriously thinking of making 25 of the Large ones— They can be sold for 75 or 80 $ at once to colleges alone— with written guarantee not to use outside—Talk to Hubbard about it. Edison advises it.3 I have orders for 2 or 3 now— The small ones will not suffice where power is used These professors have power & want them for illustrating the Laws of sound. The Law permits them to make & use them I am told— They will have them made Elsewhere if we dont make them. Wm Cullen Bryant "gone" on the Phono. Entirely.4

See Mrs Hubbard5 & tell her she is booked for the 1st new machine Yours Truly

E. H. Johnson

Edisons Tel. on trial in Pha— worked OK to Pittsburg & back 700 miles different routes

New York Mch 8th 1878*

March—April 1878 162

1. See Doc. 1224.

2. On the design of these phonographs see Doc. 1195. They were being manufactured in the New York shop of Sigmund Bergmann, and on 18 March, Gardiner Hubbard wrote George Bradley, "Mr Cheever will have 25 Small Phonos — finished the last of this week. Mr Johnson says he has orders sufficient to take the whole lot at once" (Box 1205, NjWAT).

3. On 14 March, Charles Cheever wrote Gardiner Hubbard:

Consultation with Johnson first of this week and with Edison two or three times has resulted in my deciding that it would well for us to have a small lot of 25 of the long cylinder Phonograph made at once to be used for lecturing purposes, by long cylinder Phonograph I mean the larger one of the two that Edison made. Exactly how these should be put out and what royalty we should receive for lecturing purposes I have not exactly made up my mind though I have got the scheme in the rough in my head and I will write you at length about it in a day or two, in the meantime I have two parties bidding on it and wish to give contract tomorrow afternoon for having them made as everydays delay counts against us. [Box 1205, NjWAT; see Doc. 1276 n. 1]

A phonograph demonstration in New York, with William Cullen Bryant seated at right.

March—April 1878 163
4. William Cullen Bryant (1794–1878), the well-known poet, was a staunch Republican who had edited the New York Evening Post for fifty-nine years (DAB, s.v. "Bryant, William Cullen"). On 15 March, Charles Cheever wrote Gardiner Hubbard about the hundreds of persons who had come to the phonograph company headquarters to see the phonograph, including "William Cullen Bryant who has been here once and sent a request to have a chance to come here again and bring some friends. . . . Mrs Astor . . . requested me to bring one to her house and show it to about forty friends" (Box 1205, NiWAT). The New York Daily Graphic of 15 March shows Bryant at a phonograph demonstration in New York ("Singing and Talking by Machinery," Cat. 1240, item 403, Batchelor (TAEM 94:123).


From Henry Bentley

[Philadelphia,] Sunday PM 3/10/78

We have been waiting for you all this PM to reply from M.S.¹ We found the repairs of the wires were not yet concluded at the burned bridge² so we got a wire to N.Y. and had a man watching out for you from N.Y. to work you around that way. But you were open³ that way also they said. So we, in the meantime, went for Harrisburg &c with good success, as stated on the other leafs.⁴

We will wait for you here until dark and if the bridge wire⁵ is not up by that time we will give you a test around by N.Y. to your place or vice versa any day or night you say this week.⁶ I sent you some papers. And I thank you very kindly for the Phonograph. Whatever the charge is inform me and I will remit. I am keeping Mr Orton posted of each days doings and I am satisfied⁷ you will not regret the fruits of our labors in these tests—nor that you sent the articles here. The more we see of this Carbon Transmitter and the arrangements in connection for general uses the more important it seems to us.

In the little shower we had here on Friday the Bell folks in this city had 30 of their telephones demagnetized and we had 3, which is in about the proportion of the number we each have in use, I judge.

Two drawings were made here yesterday of your Phono. One for a cut in the Graphic⁸ and one for the Journal of the Franklin Institute? If you choose to send me what you would wish to explain and claim as to the important features of your Carbon Telephone—in your own language—I will work the Telephone and explain it before the Franklin Institute here at

March–April 1878  164
the coming meeting.\(^8\) Meetings Monthly and next one next week.

AL, UkLIEE, WHP. Letterhead of Philadelphia Local Telegraph Co. 

1. Bentley probably meant “M.P”; that is, Menlo Park.
2. The Pennsylvania Railroad bridge at New Brunswick, N.J., had burned down the previous day. Cat. 1233:68, Batchelor (TAEM 90:86); Philadelphia Inquirer, 11 Mar. 1878, 1.
3. In American telegraph systems, when messages were not being transmitted the circuits were closed and electric current flowed continuously through the line. An open wire would have signified a break in the line.
4. Edison sent this letter to Preece, but the other leaves have not been found. However, the second enclosure accompanying Doc. 1204 would be appropriate were it not clearly dated “Feb’y.”
5. According to the Philadelphia Local Telegraph Co. logbook, they succeeded in making tests to Menlo Park on 10 March: “Making tests with Menlo Park via New York, 138 miles; also to Menlo Park direct; got talking distinctly, also singing; words in conversation sound muffled” (quoted in Bentley’s testimony, Evidence for Edison, TI 2:319 [TAEM 11:136]). These tests were conducted with both Edison and Batchelor (Bentley to George Prescott, Box 1093, NjWAT).
7. Plush 1878, 270.
8. See Doc. 1195 n. 2.

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My dear Edison,

Just before leaving England I wrote you a long letter;—\(^1\) I hope you got it all right.

I see by one of your letters that Nottage cabled you and sent also a letter.—\(^2\) I never knew anything about it—till I got the\(^b\) information from you.

That was at the time when he backed out from the first arrangement.— Brewer made then the proposition suggestion\(^b\) that he should advance one thousand pounds. [-\(^c\)] I was mad at Brewer because he had no authority to act in the matter. Nottage seized right away the idea and cabled you—(as I see), because I declined his new proposition. I am glad that you left the matter for settling to me with me to settle. Brewer knew all about the cable and the letter—but never said a word to me.— He is a great busy body.
Tomorrow afternoon I am going to show the phono to the members of the "Academy". —

The patent for France has been granted a few days ago.

As soon as I get the small phono which I hope is already coming, I will order here one thousand for the Exhibition.

I am also anxiously waiting for more telephones. — The telephones I brought over with me wouldn't work very well. — I opened them & found that the carbon disks were spoiled; — they were quite wet and fell to pieces when I took them out. — I cannot account for that, but I know positively that there never came a drop of water near to the telephones since you handed the same over to me. — Can it be the effect of the sea air?

I got your cable that the phonograph is perfect. — I congratulate you most heartily.

Please let me have a plate instrument as soon as possible. We can sell here lots of them during the Exhibition. —

Tomorrow night I am off for Brussels. — I heard this afternoon that the belgian government is just now looking into the telephones.

I can work your phono now pretty well. — The other day when Preece lectured before the Institution of Civil Engineers I showed off your phono. — It talked very distinctly and so loud that they heard it all over the hall. There was plenty of applause and cheering. — I thanked in your name. — I don't know whether I mentioned it in my other letter that I showed your phono to the Crown prince of Austria.

If you made an essential improvement on your phono, take a patent out for it in England to strengthen your patent there.

Preece is a pretty decent man, but rather on the Side of Bell. I think a have to work with him; he has great influence at the Post Office.

Paris 12th March 78

I exhibited the phonograph yesterday before the members of the Academy, wh with what success you'll be see by the enclosed letter. — I am just now off for Brussels and from there to London. — Received this morning Bachelor's letter informing me that small phono is shipped.

More from Brussels or London Yours Very Truly

Theo. Puskas

Colonel Beetle is a very nice man.
My Dear Monsieur Beetle:

I have come in from the Institute and will write you an exact account of the presentation of the phonograph, that you may know the details. I never saw such a success. When the Count du Moncel commenced to explain the apparatus and the principles governing it, the greater number of the members of the Academy arose and approached it. M. du Moncel made the presentation in the name of Mr. Edison, and said that the latter had a representative here to exhibit it. M. Pasques then spoke into the phonograph: "The phonograph presents its respects to the Academy." When the apparatus repeated this sentence, there was great excitement and a storm of applause, which was renewed after other sentences. When the presentation was finished, the Count du Moncel came to me and said that several members of the Institute desired to examine the apparatus more particularly. M. Pasques and I went down to the office of M. Dumas, the permanent secretary, accompanied by the following members of the society: First, M. Herve Manson, the son-in-law of M. Dumas, senior professor; second, M. Tresca, professor and director of the Conservatory; third, M. Resal, professor in the Polytechnique School; and fourth, a member whom I do not know. M. Tresca said to me: "We wished to see for ourselves, because, perhaps, some doubt might remain in the minds of certain members. Besides, I will tell you frankly that, some time ago, we went to the Grand Hotel to see a speaking machine. Well, there was a ventriloquist behind it. We are perfectly certain that the invention is real and marvellous, but we wish to make it speak ourselves." M. Pasques then put a new piece of tinfoil around the cylinder and spoke into the mouthpiece. M. Tresca turned the machine, which repeated what had been said. He then spoke himself, and had his own words repeated. M. Resal then spoke into the phonograph, which repeated what he had said.

These gentlemen departed in a state of enthusiasm. M. Herve-Manson said to me: "When I heard it, I applauded frantically."

I beg of you, dear monsieur, to accept my sincere congratulations.

I have little influence in the Academy, but I have already told you how amazed I was by the apparatus, and I beg of you...
to take the first opportunity of being my interpreter to Mr. Edison and of expressing to him my great admiration. Yours ever,

E. HARDY, 31 Engineer Electrician

ALS, NjWOE, DF (TAEM 15:339). 4Second dateline appears below. 4Interlined above. 4Canceled. 4“as soon as possible” underlined twice. 4Enclosure is a PL (translation) in “The Wizard of Menlo Park,” New York Daily Graphic, 10 Apr. 1878, Cat. 1240, item 500, Batchelor (TAEM 94:160).

1. Doc. 1237.
2. Neither Edison’s letter to Puskas nor the Nottage letter and cable have been found. The earliest extant letter from Nottage is dated 7 March. DF (TAEM 19:215).

3. The Académie des Sciences was officially created in 1816 and remains the most prestigious general scientific society in France and a unit of the national government. Crossland 1992, 14–19, 56–56.

4. The patent had been granted on 19 February (see Doc. 1202 n. 4). As in the British patent, the phonograph was part of a telephone patent.

5. Not found; however, Edison made the same proclamation to Alfred Mayer on 2 March (Doc. 1229).

6. Puskas had been interested since sometime the previous year in arranging a telephone exchange system in Brussels but apparently did not establish one. See Doc. 1153; Holcombe 1911, 356.

7. Preece’s talk, on 28 February, was for the Society of Telegraph Engineers, whose meeting was held on the premises of the Institution of Civil Engineers. Puskas’s role in the event is reported (a s “Puscus”) in the 8 March issue of Engineering. “The Phonograph,” Cat. 1240, item 449, Batchelor (TAEM 94:139); see also William Preece to TAE, 28 Feb. 1878, Cat. 1240, item 117, Batchelor (TAEM 94:117).


10. Charles Batchelor wrote Puskas on 27 February; the phonograph had been sent to the express company three days earlier. Batchelor to Puskas, 27 Feb. 1878; Batchelor to Baldwin Bros. & Co., 24 Feb. 1878, Lbk. 1:369, 349 (TAEM 28:233, 221).

11. The original of this letter has not been found; another less complete translation is in DF (TAEM 97:718). This translation was published in the New York Herald of 29 March in an interview with Edison (“That Wonderful Edison,” Cat. 1240, item 463, Batchelor [TAEM 94:147]).


Moncel, Théodore Achille Louis" (both spellings of his first name were and remain common).


15. Jean-Baptiste-André Dumas, among the century's leading industrial and theoretical chemists, as well as a politician, prominent government official, and holder of various professorships, had been permanent secretary of the Académie des Sciences since 1868. *DSB*, s.v. "Dumas, Jean-Baptiste-André."

16. Charles-François-Hervé Mangon was chief engineer (specializing in rural drainage, irrigation, and hydraulics) in the government’s foremost engineering division, the Ponts et Chaussées, and a professor at its professional school. *Gde. Ency.*, s.v. "Mangon (Charles-François-Hervé)."

17. Henri-Édouard Tresca was undersecretary of the Conservatoire des arts et métiers, its professor of industrial mechanics as well as that for applied mechanics at the École Centrale des Arts et Manufactures, and had been commissioner general for the 1855 Universal Exposition in Paris. *Gde. Ency.*, s.v. "Tresca (Henri-Édouard)."


19. Nothing specific has been found about this event, but see Du Moncel 1974, 261.

20. Some accounts in the press indicated that many observers voiced intense scepticism, particularly when Du Moncel failed in his first attempt to make the phonograph work himself (for quotations and discussions see Charbon 1981, 48–49 and Du Moncel 1974, 244–46). Later it was claimed that the eminent chemist Henri Sainte-Claire Deville, professor at the École Normale Supérieure, had been the most outspoken of the scoffers ("The Present Bugbear of French Savants," *Sci. Am. Suppl.* 6 [Dec. 1878]: 2452).

21. Edme Hardy was an award-winning maker of scientific and telegraph instruments (notably chronographs) and the French manufacturer for Edison’s electric pen. He was soon manufacturing Edison phonographs as well. Turner 1983, 75 (fig. 9); Butrica 1986, 164, 185 n. 36, 205; Doc. 1259.

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To Henry Edmunds, Jr.

Friend Edmunds

(Yours of 26 at hand)

I see Preece exhibited your tube experiment at the Royal Institution—² One of my assistants leaves³ for England on the .16. and carries with him ² Small phonographs;³ he understands how to talk them right out I will instruct him to go

*March–April 1878*
with you and assist you when you deliver your lecture. I will let you know if anything comes up new. See Scientific American Supplement of Mch 16—No 115 containing a long and very funny article on the phonograph also get Scribners Monthly and the Popular Science Monthly for April which will soon be out; these especially P.S.M. contain some Scientific Experiments by Prof Mayer of Hoboken. Since you left I have the articulation perfect reproducing whispers. Saphire points very much like the shape of a needle point and proper dampening gives of diaphragm gives it. Carbon Telephone has passed a severe test under WU Tel auspices, worked 720 miles amid other wires at noon when traffic was going on. 100 miles it works loud & perfect. 2 cells of battery at each end only used.

1. This was a reply to Edison’s letter of 12 February (Doc. 1205). Edmunds expressed his disappointment that Edison could not “put the phonograph into my hands commercially,” but indicated that he would be pleased to “lecture & exhibit it scientifically” DF (TAEM 15:288).

2. This was Edmunds’s “phonoscope” in which the vibrations of a diaphragm varied the rate and appearance of electrical discharges in an evacuated chamber (a Gassiot tube). Preece demonstrated one in February during his lectures on the phonograph before the Royal Institution and the Society of Telegraph Engineers. He apparently sent Edison the page proofs of the Society’s 1878 Proceedings (pp. 68–74) containing the text of his lecture at the 27 February meeting (“The Phonograph,” Cat. 1030:45, Scraps. (TAEM 25:281). An extensive description and illustrations of the device were published in the 17 August Scientific American Supplement (“The Phonoscope and the Phoneidoscope” [6: 2182], Cat. 1032:52–53, Scraps. [TAEM 27:846]); another description is in Tritton 1993, 38.

3. James Adams; see Doc. 1258 n. 2.

4. In his 26 February letter (see note 1), Edmunds told Edison that he had “promised to read a paper before the Society of Arts—& am only waiting your notes diagrams & Phonograph,” which Edison had promised in his letter of 12 February (Doc. 1205). The Royal Society of the Arts was Britain’s most prominent organization for promoting technical progress.


6. See Doc. 1239 n. 3.

7. This is in contrast to the 125 carbon cells employed during a musi-

T A Edison


March–April 1878 170
cal telephone demonstration between New York and Albany in August 1877. One hundred miles is roughly the length of the telegraph line between Philadelphia and New York. Prescott 1878c, 281–83.

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To Uriah Painter

Menlo Park N.J. Mch 12—78

Thanx for the patent book=¹ I cannot spare time from the phono to go at Aerophone just yet.² I will send you one of the small phonos just as soon as I get it from the japan shop. I think EH.J. will make a success in his new position. I told him what he should go for dollars & cents for the Phono Co as they wasn't after glory but the rhino³ of an admiring public. I will help you get toy contract I it is possible. I shall undoubted get 2 or 3 news things out in 1879 — and will give you a hack at them= Yours

T.A.E.

ALS, PHi, UHP.

1. Unidentified.

2. Newspaper notices of the aerophone began to appear within a few days, and on 18 March, Gardiner Hubbard told George Bradley that "Mr Edison has never made a single airophone theoretically it is perfect. What practical difficulties there may be in the way he does not know Mr Edison is at work all the time on the Phonograph & will do nothing else, until he has finished that" (see also Cheever to Bradley, 16 Mar. 1878, both Box 1205, NjWAT). Soon after the appearance of the first articles about the aerophone, Edison began to receive letters of inquiry about the invention. In reply to two letters from Allen & Co., Edison wrote, "Aerophone not perfected sufficiently for introduction or sale= The cost will be small at any rate" and indicated "that phono is taking up so much my time at present that aerophone is left in abeyance Expect to take it up in little while when will notify & they can come down & see it." To William Kimball & Co., who wanted him to construct an aerophone to advertise Vanity Fair tobacco, Edison replied, "I will do what you desire but owing to time consumed on my phonograph I will be unable to perfect it for some time you will hear of it through the papers." Edison's answers are marginal notes on Allen & Co. to TAE, 20 and 22 Mar. 1878 and Kimball to TAE, 25 Mar. 1878, all DF (TAE15:373, 387, 400).


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Charles Batchelor
Diary Entry

[Menlo Park.] Tuesday Mch 12 1878

Test with Philadelphia by New York 130 miles not very good= direct 69 miles very fair after we got through found

March–April 1878 171
one transmitter had been breaking circuit & mashed fluff & burnt cork afterwards made a thick tin diaphragm & used spiral springs to press fluff. Kept getting better as we used stiffer springs & finally put on solid tube & got better articulation than on anything else.

D, NjWOE, Batchelor, Cat. 1233:71 (TAEM 90:87).

1. I.e., the carbon button; see, e.g., Doc. 407.

2. According to Bentley's testimony in the Telephone Interferences, on the following day they made another test between Menlo Park and Philadelphia with new disk spring; test very satisfactory. Mr. Edison wrote to me and stated that he had made a spring; he sent me a spring made of brass, and thought there was great advantage in it. After experimenting with it, however, we did not agree with him. The articulation, when conversation was carried on in a low voice, was very rough. TI 1:319 (TAEM 11:136).

3. In Prescott 1878c (pp. 226-27), Edison wrote:

While engaged in experimenting with my telephone for the purpose of ascertaining whether it might not be possible to dispense with the rubber tube which connected the diaphragm with the rheostatic disk, and was objectionable on account of its tendency to become flattened by continued vibrations, and thus necessitate the readjustment of the instrument, I discovered that my principle, unlike all other acoustical devices for the transmission of speech, did not require any vibration of the diaphragm—that, in fact, the sound waves could be transformed into electrical pulsations without the movement of any intervening mechanism.

The manner in which I arrived at this result was as follows: I first substituted a spiral spring of about a quarter inch in length, containing four turns of wire, for the rubber tube which connected the diaphragm with the disks. I found, however, that this spring gave out a musical tone which interfered somewhat with the effects produced by the voice; but, in the hope of overcoming the defect, I kept on substituting spiral springs of thicker wire, and as I did so I found that the articulation became both clearer and louder. At last I substituted a solid substance for the springs that had gradually been made more and more inelastic, and then I obtained very marked improvements in the results. It then occurred to me that the whole question was one of pressure only, and that it was not necessary that the diaphragm should vibrate at all. I consequently put in a heavy diaphragm, one and three quarters inches in diameter and one sixteenth inch thick, and fastened the carbon disk and plate tightly together so that the latter showed no vibration with the loudest tones. Upon testing it I found my surmises verified; the articulation was perfect and the volume of sound so great that conversation carried on in a whisper three feet from the telephone was clearly heard and understood at the other end of the line.
FIRST RIGID-DIAPHRAGM TELEPHONE TRANSMITTER  Doc. 1252

On 12 March, Edison first substituted a rigid brass tube for the rubber tube pressing down on the carbon during telephone tests between Menlo Park and Philadelphia. This instrument incorporated that change and contained an ivory disk, which Edison replaced with a glass disk in the telephone he sent to Henry Bentley for exhibition at the Franklin Institute on 20 March. It also appears to have had a thicker metal plate in place of a thin diaphragm, another change Edison made on 12 March. Bentley subsequently modified the telephones he was testing in Philadelphia to include the 12 March design changes.

1. See Doc. 1251; cf. Doc. 1125.
3. Plush 1878 (p. 269) describes the Franklin Institute telephone:

   1. The carbon disc.
   2. and \( f \), two thin platinum plates, connected in the local circuit.
   3. Resting on the platinum, \( f \), is a small disc of glass, \( h \), of the same diameter as the carbon. On this glass plate rests a short brass tube, \( m \), fastened to the round metal plate, \( c \). This plate does not vibrate as the diaphragm in the ordinary telephone, being quite rigid; it simply arrests the atmospheric concussions, and conveys them, by direct contact, to the carbon disc.
   4. \( k \), the mouthpiece.
   5. \( a \), hard rubber case.
   6. \( d \), a core extending through the handle, from the platinum, \( e \), to the nut, \( k \), to which it is connected by a movable screw, so arranged as to be capable of any desired longitudinal adjustment.

   3. See Bentley’s testimony, TI 1:323, 325, 328, and “Bentley’s Exhibit” Edison’s Carbon Telephone No. 1” and “Bentley’s Exhibit” Edison’s Carbon Telephone, March 25th 1878,” TI 2:534–35 (TAEM 11:138–39, 141, 662–63). On 22 March, Batchelor made a measured drawing of an iron-handle transmitter with a longer carbon-fluff holder. Batchelor erased and redrew the mouthpiece in the drawing, changing it from a cone to a cupped shape. Henry Bentley received an instrument with the mouthpiece as first drawn, but indicated that this design did not give “satisfactory results” (NS–78–011, Lab. [TAEM 7:918]; “Bentley’s Exhibit” Edison’s Carbon Telephone No. 4,” TI 2:537 [TAEM 11:665]).
Experimental Model: Telephony

a. hard rubber
b. tinned iron
c. Brass
d. ivory disk
e. carbon

M (historic drawing) (10.5 cm × 7.5 cm), NJWOE, TI 2:531 (TAEM 11:659). Photolithograph of drawing of exhibit instrument, prepared for printed record.

1. See headnote above.
2. This was entered into evidence in the Telephone Interferences with a date of 26 November 1877 (see TAEB 3:642 n. 1). However, it is clearly the modified design from about 12 March 1878.

From Edward Johnson

My Dr E

Notice the Item at bottom of this Page—¹ The W.U. (Phelps) telephones are being put out here in great profusion² and they are styled the Edison Telephone—not by written—but by a sort of tacit understanding. Clearly they are trading on your name—What do you think of this for a piece of cool impudence³ Speaker worked O.K.—but weak last night Bu to RH.—⁵

My clock work broken by N.Y. Central Bag. Smashers had to return it to NYork—my man is in a bad way for money to pay for springs—I think it would be only fair if you would advance him 30 or 40$ on a/c Hastily

Johnson

1. This letter was written on three small pieces of paper about the size of a Western Union telegram form. No item appears at the bottom of any of them.

2. In a 22 March letter to George Bliss, Enos Barton asked him to intercede on behalf of Western Electric to convince Edison of the fact that his best interest, telephonically, lies in cooperating with us to secure the adoption of his transmitting telephone by the Gold & Stock.

   I think that [Elisha] Gray takes very little stock in having the telephones go by his name. They are making the Phelps instruments in New York, and pressure is being used to extend that style and title of telephones, as you and Edison well know.

   I believe that Edison's instrument is of sufficient merit to secure its adoption sooner or later, certainly for a transmitting instrument, over both the Phelps duplex and the Gray bi-polar. [DF (TAEM 19:664)]

3. Buffalo to Rochester, see Doc. 1224.

My dear Sir:—

Thanks for your letter at hand this morning. You may well be satisfied with your telephone after the splendid success of yesterday. The discovery which you mentioned that the diaphragm should not vibrate is as surprising as it is important. Your telephone must take the front rank, certainly for long lines. I congratulate you cordially. Can you loan me one of your transmitters some time for experiment? I want to try it on my big induction coils to see if I can't get talk loud enough to hear across a room. Can I in any way make talk heard over the Academy? What do you think of talking through the motorgraph simply to show loudness of talk? I remember you received on the motorgraph loud enough to be heard a hundred feet.

As to the phonograph I want of course to show that. But the one Mr. Bentley has here can hardly be heard far enough, Mr. Adams said the large one of yours could be heard 200 feet. What would you suggest that I use and what experiments shall I show with it.

I hear that Mayer's article will not appear in the April no. Yours truly

George F. Barker

(W.H.P. Experiment was from Menlo Park to Phila via NY 138 miles way wire runs dif routes. 11 Receivers at

Philadelphia Mch. 14. 1878

From George Barker

March–April 1878
Phila— They heard 2 columns of newspaper read & many got it 2 feet from Telephone = Barker is prof physics Edison

ALS, U.K.IEE, WHP. "Obscured overstruck letter.

1. This letter, dated "12—78," says:
   You know I am good at a promise, but really this time I will fix you up as I am more satisfied with my Telephone. You better make your Lecture on the spkg phonograph = as Johnson finds in his travels that the phonograph takes away all interest in the Telephone; —Mayer has article April No. Pop Sci Mo. Look for it = [UHP]

2. Academy Music Hall in Philadelphia; see Doc. 1239,

3. Edison forwarded this letter to William Preece.

Dear Sir.

As the visit of Mme Blavatsky\(^1\) and myself, today, was made conditional upon receiving a telegram from you on Wednesday Evening, and no word was received from you, we, of course have remained in the city.\(^2\)

The copy of "Isis Unveiled"\(^3\) awaits your coming to Mme B's house—302 W 47th St—which she trusts may not be long deferred. If you should find it impossible to call in the morning, or before her dinner hour—6 pm—you will do well to let her know a day ahead, as she has engagements at present that take her out frequently, and she would not like to miss the pleasure of seeing so thoroughbred a Heathen—as you say you are. Good people of our kind are scarce in this pretended Christian country! Yours

H. S. Olcott\(^4\)

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From Henry Olcott

N.Y. Mch 15, '78

ALS, NjWOE, DF (TAEM 15:357).

1. Helena Blavatsky was the Russian-born founder of the Theosophical movement, a mix of spiritualism, occult ancient science, and ideas from ancient Egyptian and Asian religions. In 1875, she joined with Henry Olcott and William Judge to found the Theosophical Society in New York City. On 18 December 1878, Blavatsky and Olcott sailed to London, where they formed a branch of the Theosophical Society; they then traveled to India where they established the Society's headquarters. DAB, s.v. "Blavatsky, Helena Petrovna"; the most recent biography of Blavatsky is Cranston 1993; Gomes 1994 provides an extensive bibliography on Theosophy.

2. On 11 March, Olcott had wired Edison from Metuchen, "Came here to see you on important business. Return by next train will go
straight to Church St" (DF [TAEM 15:346]). Later that day he wrote Edison:

Mme Blavatsky hopes you will be able to dine with her on Thursday at 6 pm and will be pleased to explain to you something about the occult forces that you desire to know.

If, however, you shall be unavoidably prevented from coming in town on that day, & will telegraph her on Wednesday evening so that she can make necessary arrangements, she will come out, agreeably to your polite invitation, with me on Friday by the 11 am train & return at 3 o'clock. [DF (TAEM 15:344)]

Edison and Blavatsky never met (Blavatsky to TAE, 14 Dec. 1878, DF [TAEM 16:514]). However, Olcott did go to see Edison, on behalf of U.S. Commissioner Richard McCormick, regarding his exhibit for the Exposition (Olcott to TAE, 20 Dec. 1889, DF [TAEM 125:767]). According to Olcott’s Old Diary Leaves: The History of the Theosophical Society, during this visit

Edison and I got to talking about occult forces, and he interested me greatly by the remark that he had done some experimenting in that direction. His aim was to try whether a pendulum, suspended on the wall of his private laboratory, could be made to move by will-force. To test this he had used as conductors, wire of various metals, simple and compound, and tubes containing different fluids, one end of the conductor being applied to his forehead, the other connected with the pendulum. As no results have since been published, I presume that the experiments did not succeed. [Olcott 1895, 467]

These experiments may have been those described in Doc. 499.

3. The two-volume Isis Unveiled: A Master-key to the Mysteries of Ancient and Modern Science and Theology (Blavatsky 1972) was Blavatsky’s first major work on Theosophy. Although she claimed that it was dictated by “My Master, and occasionally others whom I knew on my travels years ago,” Blavatsky took extensive passages directly from other, unattributed works. Edited by Henry Olcott, Isis Unveiled was published in 1877. The first volume, titled “Science,” included a discussion of Edison’s 1875-76 etheric force experiments (p. 126); the second volume was titled “Theology.” A discussion of Isis Unveiled is in Campbell 1980, 32-39.

4. Before the Civil War, Henry Olcott had been an agricultural teacher and journalist, but by the time he met Edison, he had become a lawyer, although he also continued to act as a journalist. Olcott had met Blavatsky in 1874 while writing a series of articles for the New York Daily Graphic on the spiritualist Eddy brothers. When Olcott and Blavatsky formed the Theosophical Society in 1875 he became president and Blavatsky served as corresponding secretary. In 1878 he was also honorary secretary of the Citizen’s National Council, formed to promote the passage of Congressional legislation authorizing United States participation in the Paris Universal Exposition. DAB, s.v. “Olcott, Henry Steel”; Olcott 1975, 467.
My Dr U.H.

Just got back—and am filled with astonishment at the astounding rapidity with which things have been developing here— I told Orton in the interview I had with him to give Edison a chance to put his Telephone into practical operation and he would soon see what it could do. He acted on the advice—sent for Edison told him to send his man with Telephones to Bentley at Philada which Edison did—Bentley was instructed to do just what he pleased, & Merrihew to assist him in every way— The result has been as I predicted—and more— Bentley's practical mind suggested several changes which Edison made to the great advantage of the thing. Most Important one was to dispense with the elastic rubber cushion between the Diaphragm and the little cup that holds the Carbon as it was not vibration that he required but simply pressure—¹ Edison saw it at once—& Presto—what a change— A thicker plate was at once substituted & clearer articulation obtained—and a volume of sound & far reaching current obtained so far in excess of the capabilities of the magneto as to bring Bentley on to NYork yesterday morning to urge Orton to close the matter up at once  Orton referred him to the Ex[ecutive]. Com[mittee].² He saw them & they are Hell-bent on bringing the matter to a close— Orton asked Edison for his figures & the Dam fool gave them $6000—that too in the face of the fact that he held in his hand an offer of $12 000 lbs for England—& was getting his man ready to go over on Mondays steamer— (we might have had that if you could have been here to find the money'd men)— Orton goes to Washn tonight to return Tuesday—when he has sent word to Edison he will be ready to close the matter up— The Electricians Dept. have got their tails between their legs—Bentley told me today it worked beautifully between Pha & Pittsburg—Pha & Washn.³ Pha & NYork & Pha & Menlo Park via New York— He told Phelps to throw away his magneto Telephone it was no where that the Carbon Telephone was the telephone of the future.

Now are you the man to grasp this occasion & get out of it something for you & I. Edison will never give us a Cent for what we have done— My constant repetition of the prophecy that this would be the outcome of his Telephone, will go for so much chaff in his view. We must do something— Question—will he put up his figures? I think if you will come on & help me we can make him do it. And I think I can show him
that Orton would just as leave he would have asked more—— What Orton cares for is to have Edison present some good & complete invention to the Ex. Com. under the contract which he O. made against their judgment—— The price is not so much of a consideration with him as the satisfaction of having the correctness of his judgment confirmed—— He (O) told Miller in regard to the English offer of 12,000 pounds that he (O)—was going over shortly and he was satisfied he could have got that much per Annum—that it would have been cheap at that—— If cheap at $12 000 lbs whi for England——what is $6000, in this Country——the whole thing is so supremely ridiculous that I swear all the time because I was not here to prevent him from doing such a foolish thing. —Yet I am so pressed for money that I am compelled to work every wire I can obtain control of

I am going out to Menlo tomorrow morning to see Edison——& feel him——& if I find him weakening ever so little shall want you to come on tomorrow night & spend Sunday with him & me——& will simply Telegraph you to come.

My trip was very successful I made 2 bang up (Eloquent?)——speeches 1½ hours long on Edisons inventions——received hearty congratulations all around (Buffalo & Rochester)——got $100. for each——Auburn was a failure so I had to compromise——crowd was poor—a Hose Co——I got home with $150. clear——that helps. The parties I have been postponing are pressing me by mail & telegraph——and I recd offers for 16 Engagements while on this trip——One man wants to engage me for a trip from Cleveland to Milwaukee & back through Canada——8. in all. Another for Oswego Utica & again at Syracuse——another for five towns in Canada——& I have letters here from Indiana & Illinois urging me to come out that way——in lieu of all this I am idling here——& not a word said as to whether I am even to be paid my board——Again——If I exhibit Edisons Musical Telephone I must use his speaker—as I did on my last trip——working it beautifully between Bu & Rochester 70 miles——As that is the property of the WU Co——I am doing my own friends a positive Injury.——when I show as I can so conclusively that this Carbon Telephone is so superior to theirs——(I can whisper 50 miles) Was ever a man so damned unlucky heres money floating all about just baskets full of it thrown into ones face——& I've been working for the for these thing on the hope that when they came to a head I would be there——Tell me before its too late how to manipulate this state of things to make my knowl——
edge & Electrical competency of some utility to me

Yours Truly

E. H. Johnson

I'll send you papers when they reach me— I travelled from point b to point—just ahead of them


1. According to Bentley's testimony in the Telephone Interferences:

Mr. Edison placed a piece of metal underneath the diaphragm in order to improve its articulation. This piece of metal was not suggested by me, but I stated to him that he must have some substance there which would not expand and contract so much as the rubber tubing which he had placed there. I thought a piece of hard wood would be best, but it was difficult to hold the wood there in a proper position always, so he soldered a small piece of brass tubing underneath the diaphragm. This we continued to use. Mr. Edison also sent me a spiral brass spring to go underneath the diaphragm on the button, but we thought it caused too great vibrations. [TI 1:327 (TAEM 11:140)]

2. The members of the Western Union Board of Directors who sat as the Executive Committee were William Orton, William Vanderbilt, Edwin Morgan, Augustus Schell, Harrison Durkee, James Banker, Alonzo Cornell, Hamilton Twombly, Norvin Green, Joseph Harker, and Samuel Barger. Western Union 1877.

3. According to the Philadelphia Local Telegraph Co. logbook, Merrihew was in Washington on a test line 140 miles and they "got what was said distinctly." Bentley's testimony, TI 1:319 (TAEM 11:136).


[Menlo Park, c. March 15, 1878]

Memorandum.

I commenced experimenting on speaking Telephones about August 1875—which is I think earlier than any other person.

I have continued it unremittingly to date as the record I herewith present will show.

I believe myself to be the legal inventor of every speaking Telephone yet devised. I disclaim in equity however any moral right to the magneto Telephone but I believe I can prove that I was the first to devise apparatus whereby oral communication could be effected on that principle, hence a legal title.
Up to this date no one disputes with me my claim to be the sole inventor of the carbon Telephone.

Tests thus far made show the carbon Telephone to be the only Telephone applicable to general Telegraphy.

I have 12 applications I patent, 1 caveat and records from 1875 to date, which I herewith submit.\(^3\)

The carbon Telephone was invented previous to my contract of March 22, 1877.\(^4\)

In accordance with your expressed desire for an immediate settlement and transfer of my Telephone interest as they now stand I named the following offer.

Six thousand dollars per annum for seventeen years payable in monthly instalments and payments in each and every year guaranteed now by the WU Telegraph Co. The documents are accordingly submitted\(^5\)

Thos A Edison

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\(^1\) Edison had made the offer in this memorandum by 15 March. See Doc. 1256.

\(^2\) See \textit{TAEB} 2:524-25.

\(^3\) The issued patent is probably U.S. Patent 198,087. It includes figure 12 of Caveat 75, which Edison later claimed was the "First Telephone on Record" (see \textit{TAEB} 2:720, 723 n. 17). Other telephone-related applications later issued as U.S. Patents 203,013-203,018, 208,299, 474,230, 474,231, 492,799. The other two applications are probably Cases 145 and 148, executed on 13 and 24 December 1877. Caveat 76A was executed about 28 February 1878 and filed on 8 March; it included 110 drawings (Doc. 1227 n. 1; TAE to Painter, c. 8 Mar. 1878, UHP; Cat. 1146, Lab. [\textit{TAEM} 6:624]). For the record of Edison's experiments see Doc. 1232 n. 2.

\(^4\) Edison used carbon in his telephone experiments as early as October 1876 (Doc. 799). Although he did not execute his first patent application for a carbon telephone until 18 April 1877 (Case 130), the design included in that application dates from 9 February 1877 (Doc. 860).

\(^5\) Edison and Orton met on 21 March following Orton's return from Washington. The next day, Orton wrote Edison concerning their interview and indicated that although by the terms of the contract we are entitled to have "three months satisfactory trial" after the complete issue of letters patent, I am not disposed to avail myself of so much time, and yet it will be necessary for us to have reasonable and proper time in which to make such trials as shall be deemed advisable. I trust, therefore, that you will furnish us with at least one set of Telephones as soon as they can be produced, and as soon thereafter as a satisfactory trial is had and an examination can be made of your pending claims for patents, I shall be ready to close up the matter. [DF (\textit{TAEM} 19:666)]
There are two draft responses to Orton's letter on the back of a 23 March letter from F. M. Beall of Philadelphia. One of these, apparently written by Josiah Reiff, complained that Orton's letter "does not accept my offer but makes a new proposition," then declined to accept it and asked for the appointment of arbitrators to determine the price the company should pay Edison for his telephone as set forth under the terms of the 22 March 1877 agreement (DF {TAEM 19:670}). Edison's own draft protested that

As the telephones have already had an exhaustive test by an officer of your appointment Mr Bently and as my whole experiments & patents matter since 1875 have been a matter of record and accessible to the officers of your Co having that matter in charge I hope you will close the matter at once as my offer was made very low and based upon the supposition that you were ready to close the contract at once but if I am to be delayed by officers of your Co who are personally inimicable to my interest I shall withdraw the offer. [DF (TAEM 19:669)]

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Friend Preece.

At last Telephones= I send one of my assistants Jas Adams who you will perhaps remember, with apparatus and he has instructions to conduct whatever experiments you desire on British Post Office Telegraphs= Please give them the hardest tests you can under all conditions, as they stand every test here: 720 miles I have hopes that even with your reverse currents and greater induction that they will still be found valuable as an adjunct to your small station system= I think after full investigation that you will conclude that the Carbon Telephone is a great advance in the art, Telephonic & otherwise= If tests are successful I should like to place them on your lines on a small royalty= I will have Mr Orton send you copies of the Report of the Very Exhaustive Philadelphia tests= Mr Orton has accepted my offer of a royalty of $6,000 per year with a remark that I was reasonable; and that he was entirely satisfied I refer you to him for any information of that character= I see you are announced for a Phonograph Lecture before the Physical Society= Mr A will stay a month if you so desire= Yours

T A Edison

ALS, UKLIEE, WHP.

2. James Adams sailed on 19 March on the Montana. He took with him two sounder brackets, two relay brackets, two bells, 2 three-cell battery boxes, six carbon transmitters and six Bergmann receivers, one “Iron core Receiver,” one “cut Transmitter,” diaphragms for the receivers, a box of carbon buttons (“fluffs”), a galvanometer, a 600-ohm induction coil, eight cords, two phonographs with tinfoil, miscellaneous tools, and “Diagrams of Sounder & Relay brackets diagrams to work in circuit containing Morse insts & permanent battery also for a long ckt with permanent battery” Cat. 1233:78, Batchelor (TAEM 90:92); Batchelor memorandum, 18 Mar. 1878, DF (TAEM 18:439).

3. By reverse currents, Edison is referring to the alternating currents used with the Wheatstone ink-recording automatic, which was used extensively on British lines and would have caused extensive crosstalk (induction) problems on telephone lines. The small station system was probably the London District Telegraph, established in 1859 and made part of the Post Office system during the nationalization of the telegraph. Preece 1877, 703; Kieve 1973, 56–59, 160, 167, 169.

4. It is not known if Orton sent Preece copies of the report on the Philadelphia tests. Preece did write Orton for information and received a cable from him stating that “Edison has done it can talk perfectly between New York & Philadelphia on regular morse wires twenty to thirty on a pole & running through short cables.” Orton to Preece, n.d., WHP.


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From Theodore Puskas

London. W. 18th March '78

My dear Edison,

I received yesterday in Paris the enclosed letters from Valance & Vallance.—

This morning I arrived here from Paris and unpacked the small phono.— The mouthpiece was broken off, the ferro-type disk cut through ect. ect.— I find that three of the screws by which the phono was fastened to the bottom of the box got loose that is, they were entirely out and the phono was knocked towards against the top of box till the mouthpiece broke off.— The screws are too small, I think they ought to go through the bottom and be fastened to it from the outside by nuts.

I showed the phono to Nottage but naturally could not

March–April 1878 183
work it.— Tonight I am again going over to Paris and will see there for how much I can get them manufactured there. If the difference in price between American & French make is not great then Nottage will give orders at same place where I order mine for the Exhibition. I think Hardy will be my man;— he is also making your pens.— Nottage may perhaps order some phonos in France and some in the States.—

I have not received as yet the tinfoil.— Am also anxiously waiting for the telephones.

My trip to Brussels was very satisfactory,— everybody was enthusiastic about your phonos.— I think I have now to stop with exhibiting the phonos— till I get at least several hundred ready for the market. The excitement is already great.— They write in every Parisian paper long articles about it.

More from Paris Yours truly

Theo. Puskas

Hope you will soon send over all the things you want to have exhibited besides the phonos, Telephone and pen.


1. These letters have not been found, but were no doubt related to concerns by the London Stereoscopic and Photographic Co. about the potential legal strength of Edison’s British Patent 2,909 (1877). On 7 July, Edison’s British patent solicitors, Brewer and Jensen, sent Vallance and Vallance a detailed, expert analysis of that patent both in terms of the technology and of British patent law and practice (Miller [TAEM 28:1131]). Nothing further is known of Vallance and Vallance.

2. This demonstration phonograph had been sent late in February. See headnote p. 63.

3. It is unknown if Edme Hardy manufactured any phonographs for the London Stereoscopic and Photographic Co. They appear to have had their phonographs manufactured in Britain, probably by Augustus Stroh. See headnote p. 63; Docs. 1301 n. 3, 1310 n. 5, and 1645.

4. On 4 March, Edison had sent fifty feet of various thicknesses of tinfoil. TAE to Puskas, 4 Mar. 1878, Lbk. 1:404 (TAEM 28:266).

5. No records have been located regarding the number of phonographs Puskas had manufactured.

6. The Paris Advertiser, an English-language paper, noted on 9 May that “Edison’s phonograph, which is shown four or five times a day at the Salle des Conferences, on the Boulevard des Capucines, is having a great success in society circles at Paris” (Cat. 1029:60, Scraps. [TAEM 25:191]). An example of Parisian press reports about the phonograph is “Phonographe, Téléphone, Phonautographe, Plume Électrique” in the 6 April issue of Le Monde Illustré (Cat. 1029:150, Scraps. [TAEM 25:240]); flyers with text in six languages advertising these demonstrations are in Cat. 1240, items 737–38, Batchelor (TAEM 94:258).
Dear Mr Hubbard,

I am glad that you have taken steps to become interested in the Phonograph for I believe in a great future for it both separately and in connection with the Telephone.¹

It is a most astonishing thing to me that I could possibly have let this invention slip through my fingers when I consider how my thoughts have been directed to this subject for so many years past. So nearly did I come to the idea that I had stated again & again in my public lectures the fundamental principles of the Phonograph. In showing to an audience the tracings produced by the Phonograph I had said if the motions indicated by the curves could be produced mechanically in any way the sounds would be audible. For instance I have said in my lectures that if I were to move my hand in the way indicated by these curves articulate sounds would proceed from the hand. And yet in spite of this the thought never occurred to me to indent a substance and from the indentations to reproduce sound.² Two French physicists² Physicists³ have been working at this subject for a number couple³ of years past and were much chagrined by Edisons phonograph anticipating their invention³

I believe that the phonograph will be enormously improved. I am having made an apparatus that will give still better results ever than those produced by Edison. The articulation of those Phonographs we have seen in this country has been imperfect chiefly I think on account of the fact that the motion of the spring is produced only in one direction. It cannot be pushed up out of a depression but it has to fall into the next depression by its own elasticity & unless the normal rate of vibration is very much slower than the rate of the sound to be produced the shape of one half of the vibration will be distorted.

My idea is to drag a slip of tinfoil rapidly under a vertical style which is caused to press upon the tinfoil with uniform force by means of a weight or spring so that the normal action of the apparatus will be to create a straight furrow or groove⁴ of uniform depth and thickness.

A section of this furrow would be rectangular. The horizontal motion is imparted to the style by a telephone plate and thus the furrow instead of being in a straight line becomes a sinuous line in fact the curves produced by the phonograph will be produced by this apparatus in an indented form.
From this tinfoil a cast can be made in some solid material and an impression taken from this cast in copper or lead or other material as in the case of stereotype plates. Let this solid plate of lead or other material be arranged under the style from which the original impressions were taken so that the style fits into the curves groove. The dragging forward of the plate will then occasion a horizontal motion of the style and thus the sounds will be reproduced from the telephone plate.

In the case of this form of Phonograph the motion of the style is completely controlled and the sounds produced should therefore be a perfect facsimile of the original sounds if the plate is dragged forward at the same rate of speed.

I enclose a drawing of apparatus

Yours very truly

Alexander Graham Bell

P.S. The following rude sketch may give you the idea

A. Two telephone plates united by
B. a slip of wood bearing
C. the style carrying on its top
D. a weight.
E. Tinfoil.


1. Bell's admiration for the phonograph was apparent in his "speech at a large meeting [in London] in behalf of a new school to teach the deaf articulation. He said if Mr Edison could take a piece of iron & make that speak, how much easier should it be for the good teacher to take the vocal engine God had made & bid them talk." Hubbard to TAE, 24 Apr. 1878, DF (TAE 19:60).

2. In another letter from London, probably sent shortly after this, Bell wrote Hubbard:

"There is a question in my mind how far Edison can control the principle of the Phonograph—for I long ago pointed out the very mode of producing sound that he employs. In my public lectures in America I exhibited the tracings obtained by means of the human"
voice and stated that if you could “by any mechanical means” pro-
duce a motion similar to that indicated by a sound-curve you
would produce the sound itself. I have stated the idea in the most
definite terms for instance I have stated in illustration “If I could
move my hand in the way in which the air is now moved by my
voice articulate words would proceed from my hand. Of course the
same result would follow in the case of other materials. For in-
stance if pieces of wood or of iron were moved in the proper man-
ner—articulate sounds could be produced by their motion. Now in
the Telephone this is accomplished by moving a plate of iron in the
desired manner by subjecting it to a varying attraction from a mag-
net” &c &c &c.

It seems to me therefore that all that Edison can rightly claim is
his apparatus and the mode of making the voice produce a record
of its own vibration. That can be utilized as a means of reproducing
the original vibrations. But the idea of producing the effects of ar-
ticulate speech by moving a plate of iron or other material in the
way in which the air is moved by the voice—is certainly my inven-
tion and if that point is not claimed in any of my patents it should
have been—for I stated the principle again & again in my public
lectures. I say this not to detract from the merits of Mr Edison’s in-
vention but to state my opinion that he should not cover too broad
a ground—for I have now a new invention suggested to me by the
Phonograph which can be turned to immediate account so as prob-
bly to realize a large fortune in a couple of months or so. I want
your advice in the matter as to whether I should patent my idea.
Also whether it would be necessary to pay a royalty to Edison. I
give you full power to make any arrangement with him in the mat-
ter. Perhaps he might be glad to unite our interests regarding the
Phonograph & Telephone and give each other the benefit of our
ideas for the phonograph cannot be made a commercial success for
a long time to come whereas my idea immediately available.

Bell’s idea was a policeman’s rattle made by recording “a word such as
‘Fire, Fire’—remove the tinfoil—stereotype the impression—and
then cast copies from it to be placed round a wheel as in the rattle.” The
letter and a transcription are in Box 1103, NJWAT.

Hubbard sent the undated letter to Charles Cheever, who re-
sponded:

Taking the various points into consideration I should not advise
Mr Bell’s applying for a Patent as suggested, it strikes me the re-
result would be very disagreeable for us and injurious to Mr Bell as
well as to our interest in the Phonograph invention.

Mr Bell says that he long ago pointed out the very mode of pro-
ducing sound that he (Edison) employs stating it could be done by
various mechanical means. In that particular sense it certainly was
not patentable by Mr Bell, if it was I fear that in the very same
train of reasoning Mr Bell’s Patents would be considered valueless
for want of novelty, or to illustrate the thing differently I consider
that if a description such as Mr Bell gave of what might be done by
mechanical means in the way of producing articulation were patent-
able from the description given of it by him, then the various de-
scriptions given in different electrical works in regard to the Telephone would date so much prior the time of Mr Bells actual invention, that is the invention would not be considered as new. [Cheever to Hubbard, 21 May 1878, Box 1205, NJWAT]

3. Bell is probably referring to Léon Scott and Charles Cros. Scott was a stenographer and typesetter interested in making a written record of words as fast as they could be spoken. While attempting to create what he called "natural stenography," Scott conceived a mechanical model of the ear to trace acoustical vibrations on a hard surface, which he called the phonautograph. In the introduction to an 1878 collection of his publications on the phonautograph, Le problème de la parole s'écrivant elle-même, Scott insisted that his earlier inventive work and that of Cros had anticipated the Edison phonograph. He also criticized the phonograph because it did not create an intelligible visual record of human speech. Charbon 1981, 16, 25–26; “The Phonograph,” Engineering, 8 Mar. 1878, Cat. 1240, item 449, Batchelor (TAEM 94:139); Hankins and Silverman 1995, 134–37.

-1261-

Edward Johnson to Gardiner Hubbard

Washn DC 3/18/78

My Dr Sir—

In accordance with promise to keep you advised of the development of the Carbon Telephone of Mr Edison I beg to make the following report.

Mr Edison has discovered that it is not by the vibration of the plate that he obtains the variable strength of his currents—but by simply pressure of the air waves against the outside plate covering the Carbon—He thereupon fastens the plate rigidly against the Carbon cup—removing the Elastic rubber cushion which previously provided for the vibration of the plate & obtains the following remarkable results

1st absolute clearness of articulation

2nd 3 to 4 times the disturbance of his Primary current—hence a proportionate increased strength of current in his Secondary coil—(Main Line)—the practical Effect of which is

A = Longer Lines Traversed
B = b Greater volume of sound on receiving Instrument
C = induction—frying pan noises—overpowered
D. It can be heard (the receiver) when the Inst is held at arms length—the words being clearly distinguishable

3rd Increased simplicity—no adjustment of the Instrument requisite—after the first—

It will convey a whisper many miles It will receive & convey clearly whis words whispered at the Transmitter when 6 feet removed from the mouth—
To Alfred Mayer

The idea is good if you will work out a device to reciprocate the diaphragm back and forward by hand but governed to give an even speed and forward feed. I will put it in the Phonograph Co for you on a royalty.

For a diaphragm this would be better.
All that is requisite to carry your idea out is a reciprocating device with a governor, the whole working by hand power.¹

I am making a large machine with a reciprocating lever worked by powerful clockwork using a continuous roll,² but this is for lecture purposes & would be too expensive for the blind who would require something very cheap and easily managed = Will you have time to work it out = Barker writes that your phono article will not appear in the April HP Science Monthly = How is that so & if so how did he find it out.³ You ought to hear My Telephone now its perfect. Struck the best thing yet I use no vibrating diaphragm Nothing Vibrates the sound waves are transmitted directly into electric waves without the movement of any intervening mechanism

My assistant sailed for England this morning to give a big test on P[ost] O[ffice] Telegraph as Bells has been abandoned as impracticable on their noisy lines Yours

Edison


1. On 17 March, Mayer had written Edison about his idea for recording books for the blind on metal sheets, providing the following description and drawing:

Guides on a frame, can readily be placed over the lines of impressions and then a style with a vibrating plate attached can be run over the lines by the blind person and the page will talk to him.

This represents the style and plate running over the elevations and depressions in the electrotyped or cast page. [DF (TAEM 18:948)]

2. For Edison’s clockwork design see Doc. 1310. Edison’s 28 February phonograph caveat shows several designs for recording on continuous rolls by use of a reciprocating lever indenting in a transverse groove across the face of the paper or foil (Doc. 1227 [figs. 44, 45, 54, 59, 60, 61, 62, and 64]). He first conceived such a design in connection with his telegraph recorder/repeater in 1877 (see Doc. 947).

3. Although Mayer responded the following day that he was “en-
couraged to go on" by Edison’s letter, there is no evidence of further work on this idea. DF (TAEM 97:645).

4. Barker’s letter to Edison is Doc. 1254. Mayer replied on 21 March that the article, “On Edison’s Talking Machine” (Mayer 1878a), had already appeared in the April issue and opined that Barker “had better experiment more and talk less.” DF (TAEM 97:645).

-1263-

From J. W. S. Arnold

My dear Sir

Enclosed please find tickets to the lecture for Saturday evening.¹ I shall be happy to have you occupy a seat upon the stage, and will take great pleasure in presenting you to the audience. Very Truly Yours

J W S Arnold²

(Friend Arnold = point received many thanks. I wouldn’t face an audience for 100 dollars the reporters that come down here have already unstrung my nerves that I think of taking to the woods Yours Edison)

ALS, NJWOE, DF (TAEM 97:644).

1. Arnold had written Edison on 2 March about his benefit lecture on the “Voice and the Ear” for the New York Ear Dispensary and asked for the use of a phonograph as well as Edison’s presence at the lecture (DF [TAEM 18:932]; see also “Explaining the Phonograph,” New York Tribune, 20 Mar. 1878, Cat. 1240, item 429 [TAEM 94:130]). The lecture took place on 23 March at Chickering Hall where Arnold exhibited one of Edison’s small phonographs; he was apparently unsuccessful in acquiring the larger phonograph he had asked Edison for on 7 March (DF [TAEM 15:8]). An account of the lecture accompanied by Arnold’s text and illustrations of the phonograph, appeared in the 25 March issue of the New York Tribune (“The Phonograph,” Cat. 1240, item 455, Batchelor [TAEM 94:143]). The “conversational” and “singing” telephones Arnold used in his lecture were probably Edison’s carbon-transmitter (his “speaking” telephone) and electromotograph receiver (his “musical” telephone).

2. According to the New York Tribune article about his lecture (see note 1), Arnold was a professor at the University of the City of New York (later New York University); Wilson 1878 (p. 46) identifies John W. S. Arnold as a physician.

-1264-

Exhibitors Form: Paris Universal Exposition

Exhibitors must immediately answer the following questions,
as far as possible, and forward the blank to R. C. McCormick, U.S. Commissioner General, Room No. 24, Post Office Building, New York City.

1. — Nature of the Exhibit.
   Electrical Acoustic and other apparatus

2. — Number of Application.

3. — Where produced or manufactured.
   Menlo Park New Jersey U.S.A

4. — Extent and capacity of works.
   Laboratory. 28 by 100 2 Stories  = Goods manufactured in various workshops, & countries

5. — Kind and quantity of power used.
   6 horse power

6. — Number of persons employed: Men, Women, Children, b 8 assistants

7. — Extent and value of the annual production.
   In excess of One hundred thousand dollars

8. — Business, when commenced.
   1869.

9. — Markets, and place of consumption.
   In all parts of the world.

10. — Sources of materials used.
    Air Earth and Sea.

11. — Peculiarities of the object shown, or of the manufacture.
    State all considerations relating to invention, discovery, utility, quality, skill, workmanship, fitness for purpose intended, adaptation to public wants, economy and cost.
    This is an inventor’s and not a manufacturers exhibit, and too extensive to attempt detailed information in this limited space.

12. — Special or particular claim of merit to which the exhibitor desired to call the attention of the Jury.
    Originality and usefulness.

13. — What prizes have been awarded to the exhibitor at previous International Exhibitions.
    For the Electric Pen—Quadruplex, and Automatic Telegraph Systems—Philadelphia

14. — State what special provision has been made, if any, for the promotion of the health, morals and education of the workmen.
    Elevated Location, and excessive ventilation

15. — Give signature in full of the applicant for space, with place of business and date; state also Agent’s name and address.

March—April 1878

192
Menlo Park N.J. March 23 1878—

To George Nottage

Dear Sir,

Your letter received, the contracts signed, money paid,¹ my solicitor is now preparing papers for a new phonograph patent in England,² one of my assistants will have arrived with two small phonos ere you receive this.³ The lowest bid I can get is $6.00 each with box in lots of 100. or more; I have a machine here like that of Mr Puskas that talks just as clear as an elocutionist. I have 8 men working on the plate machine; This machine requires time because it must be a practical, marketable machine to do the work that is expected of it, and be simple and easily made and one that will be hard to improve, otherwise we will be changing and improving all the time which lessens profits.⁴ This machine can only be built on the American principle of interchangeability of parts like a gun or a sew-

¹
²
³
⁴
ing machine;5 Hand made machines would create endless confusion— I will send you the 2nd plate machine made and just as soon as the Ansonia Clock Co can furnish a clock I will send that. They have 8 men experimenting their only difficulty is to cheapen the movement. one penny is a large item on a Yankee clock.6 They are now making a machine to stamp the records out from an electrotyping coated with steel I have not heard as yet if it is finished=7

The Toy Co have also several men at work experimenting just as soon as I can get hold of one of their toys I will send= They have models working, but cheap production of numbers is the only drawback= The first small phono sent was not good—8 I think we can get along in business matters all right. I will do the best I can to further the interests of all concerned and endeavor to bring the phono to absolute perfection. I never had but one photo taken and I have lost that— I will however get another and send you=9 Yours Truly

Thos A Edison

P.S. Please take a fatherly care of our patents as you are near and I am far away. E

ALS (letterpress copy), NJWOE, Lbk. 1:463 (TAEM 28:313).

1. On 7 March, Nottage had written Edison, “I have at last settled the agreement with Mr. Puskass relating to the Phonograph and the agreement is transmitted by this mail for your signature, with the sum of £1500 (Fifteen hundred pounds) to be handed to you by the Bank of New York on the due execution of the Deeds.” Edison turned a third of the money (minus expenses due) over to Lemuel Serrell for Puskass’s account. Nottage to TAE, 7 Mar. 1878, DF (TAEM 19:215); agreements with Nottage and George Kennard, 22 Mar. 1878, Miller (TAEM 28:1080, 1086); TAE to Puskass and TAE to Serrell, both 22 Mar. 1878, Lbk. 1:457–58 (TAEM 28:307–8); see also Doc. 1237.

2. In his letter of 7 March (see note 1), Nottage had written: “I consider it most important that if you have made any essential improvements—as I gather from your Telegram to Mr. Puskass, you have—that you should at once Patent them in this Country, so that if the Original Patent should be upset these would stand. This is very necessary to our mutual success.” Puskass made the same point in Doc. 1248, although that letter had not yet reached Edison when he wrote this. Edison’s response refers to preparations already in progress before this problem became evident (see Doc. 1237 n. 11).

3. James Adams, who had departed for England a few days earlier.

4. In his 7 March letter (see note 1), Nottage told Edison that “it is most important that you should send me as early as possible, one or two of the plate machines, in order that our representatives may take orders for them, while the Excitement of the Novelty is commencing.”


7. Nothing more is known about this machine.

8. See Doc. 1239.

9. Nottage had sent his own portrait with his 7 March letter (see note 1) and asked for one of Edison. Other than pictures from his childhood and youth, two undated photographs survive showing Edison in his mid to late twenties. TAEB 1:5, 27, and frontispiece; 2:frontispiece; Frost 1969, 18, 24, 26–27.

EDISON AND THE PRESS Doc. 1266

Although Edison had begun to receive increasing press attention following the invention of the phonograph, it was not until the end of March that frequent reports and interviews began to appear in the New York press. As Charles Cheever of the Edison Speaking Phonograph Company reported on 15 March, “Newspaper men are wild over it Harpers Weekly—Graphic and Scientific American are all getting large and expensive cuts out at their own expense, in fact the tide has started itself so fast that I have been unable in spite of all that I can do to hold it back until we had the small Phonograph ready to sell.”¹ This growing interest was spurred by phonograph exhibitions in New York City and by the appearance of articles on the phonograph in Popular Science Monthly and Scribner’s earlier in the month.² Some of the articles that began to appear in the New York papers, especially those by William Croffut of the Graphic and Amos Cummings of the Sun, were reprinted in the United States and Europe.³

Edison was quite willing to accommodate the press and to use them in promoting himself and his inventions. As a former press-wire operator, he was familiar with newspaper practices and made friends with reporters and editors. Some of the operators whom Edison had known during his years as an operator subsequently became reporters. Edwin Fox, for example, was a reporter for the New York Herald who began writing articles about his friend in 1878.⁴ Others were Thomas Maquire, a reporter for the Boston Globe, and James Heenan, of the National Associated Press.⁵ Other reporters, Croffut and Cummings in particular, became friends with Edison as a result of their reporting of his activities.⁶

¹. Cheever to Gardiner Hubbard, 15 Mar. 1878, Box 1205, NjWAT. Illustrated articles appeared in the 15 March New York Daily Graphic
("Singing and Talking by Machinery") and in the 30 March issues of
Frank Leslie's Illustrated Newspaper ("The Latest Scientific Wonder"),
Harper's Weekly ("The Phonograph"), and Scientific American ("The
Phonograph") (Cat. 1240, items 403, 428, 436, 439, Batchelor [TAEM
94:123, 129, 132, 136]).

2. Mayer 1878a and Prescott 1878a. On the Edison Speaking Phono-
graph Co. exhibitions see Doc. 1246 n. 4 and "Explaining the Phono-
graph" in the 21 March New York Tribune (Cat. 1240, item 431, Batch-
elor [TAEM 94:130]). Dr. J. W. S. Arnold also exhibited the phonograph
during his lecture at Chickering Hall on 23 March (see Doc. 1263).

3. Articles can be found in Cats. 1029 and 1031, Scraps. (TAEM
25:161; 27:732) and Cat. 1240, Batchelor (TAEM 94:11); correspondence
with reporters can be found in "Edison, T. A.—Articles," 78-005, DF
(TAEM 17:1). The tenor of many of these articles is evident from the
following sample of headlines: "The Napoleon of Science" (New York
Sun), "That Wonderful Edison" (New York World), "The Wizard of
Menlo Park" (New York Daily Graphic), "A Wonderful Genius" (Boston
Herald), and "The Inventor of the Age" (New York Sun).

4. "Four Hours with Edison," New York Sun, 29 Aug. 1878, Cat.
1240, item 859, Batchelor (TAEM 94:339).

5. Maguire to TAE, 17 Mar. 1878, DF (TAEM 17:26); Doc. 1324
n. 8.

6. On Edison's relationships with various reporters, see his corre-
spondence with them in TAEM-Gt-3, s.vv. "Croffut, William," "Cum-
mings, Amos," "Fox, Edwin," and "Maguire, Thomas."

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From William Applebaugh

New York, March 23rd 1878

Dear Edison.

Mr W. A. Croffut¹ one of the enthusiastic editors of the
"N.Y. Graphic" and by the way a good friend of yours, though
unknown to you personally, desires to visit your laboratory
some day next week—² If agreeable will you kindly indicate
two or three days when you expect to be home so that he can
take his choice?— In case you find that you will not be there
on any one of the fixed days please telegraph me— Mr
Croffut has written an article which will appear in today's
Graphic on the "Airophone"³ I don't know from whom he
got his points— The Graphic people have treated your inven-
tions very squarely & I hope you will be able to give Mr
Croffut an interview Yours truly

Ap—³

ALS, NjWOE, DF (TAEM 17:31). Letterhead of the Telephone Company
of New York. "'New York,' and "18" preprinted. "'Boston To
Ap—N.Y. Pls send some business on 28 Martin 'or Wright'" written
by Applebaugh on side of letter.

2. Croffut visited the laboratory and published an account of the visit in the 2 April Daily Graphic (Doc. 1277).

3. This article, titled “The New Speaking Machine” (p. 157), described the aerophone as “in fact, a phonograph with its power tremendously increased.” In it Croffut reported some of the uses Edison thought the device might have, such as in railroad locomotives and lighthouses, then observed that it could prove annoying if applied, for example, to political campaign speeches. He ended the article with the whimsical observation, “What an instrument of slander will the aerophone be in the hands of the malicious! It occurs to us, by the way that this Mr. Edison has done enough, and ought not to be allowed to prosecute his diabolical inventions any further. His brain ought to be muzzled. Will the Sheriff of Menlo Park please to restrain him?”

---

To Benjamin Butler

Friend Butler.¹

I find I cannot get away = Every day a dozen of the heavy lights of literature and science come here; I wish when you go to NY again that you could manage to stop off here one train. Dana² of the Sun comes Wednesday: Yours

Thos A Edison

ALS, DLC, Butler.

¹. The controversial congressman, lawyer, and former general Benjamin Butler had been one of the attorneys for Jay Gould’s Atlantic and Pacific Telegraph Co. in its suit against Western Union over control of the patent rights to Edison’s quadruple telegraph designs. In previous years he had appeared on Edison’s behalf in related actions. See TAEB 2:374, 491, 806.

². Charles Dana had been owner-editor of the New York Sun since 1868 (DAB, s.v. “Dana, Charles Anderson”). On 23 March, Sun reporter Amos Cummings had written Edison:

I find that Mr. Dana is at length satisfied that I have not been imposed on. He has read Scribner’s and the Science Monthly, and astonished me on Wednesday by saying that they backed me up “in every word.” He won’t come to hear my machine nor go into the Tribune and as he wants to see it and know more about it I have invited him and J. S. Pike, late U.S. Minister to the Hague, to come with me and see you on Wednesday next. If I am trespassing on your time or annoying you by the visit, say so and it’s all right. You will find Pike and D. two as sensible old blokes as you ever struck—no frills nor fountains. [DF (TAEM 17:30)]

March–April 1878
To Theodore Puskas

Friend Puskas,

We are hurrying the plate machine—but you know that the plate machine must be perfect before it can go on the market. We got contract from you & closed the matter. I will take out additional patent in England please keep me informed about any necessary steps that must be taken with patents in France, Germany etc. '½ of funds obtained from Nottage I gave to Serrell for your account. He is drawing up a contract between me and you giving you ½ of the English royalty with one or two provisions which I think you will think favorable of. Do what you can about seeing that the English patent is well advised on— Please get permit for entering my goods in Exhibition should I be delayed beyond 1st May. I send you lot of Journals to London the excitement over phono is great here. Telephones that Adams has although about perfect have been greatly improved since he left. In fact the Carbon telephone is going to be one of the greatest successes in that line notwithstanding we have heretofore had hard luck with it. You cannot fail to sell it to every government for general telegraphing where the Bell telephone is conceded to be a failure. Use Adams' if you think best. I send some perfect telephones in few days. The cases are of cast iron, which the rubber cases have enormous expansion with heat & cold & this has been the source of great trouble. I thank you very much for your success before the French academy— Yours

Edison

ALS, HuBPo, TP. 'Obscured overwritten letter.'

1. This is in part a reply to Doc. 1248, which would have just arrived.
2. This is the 16 April agreement, which also gave Puskas power of attorney in regards to the phonograph in Britain (TP).
In figure 1, is shewn a transmitter similar to that shewn in previous caveats, w except that the diaphragm does not vibrate, at least to an extent as to be evidenced by the senses. b is a glass disc resting upon a platina disc connected by a conducting wire to the binding post .g. a is the lampblack button. c is a platinized adjusting pillar connecting to the bi by a wire^{3} to the binding post .h. When properly adjusted the diaphragm, carbon & metallic discs are in contact. The sound impulses striking upon the diaphragm increase the pressure upon the carbon and the effect is to lessen the resistance in proportion to its the pressure hence the primary circuit of an induction coil is increased decreased in resistance by the impact of every soundwave and the secondary coil receives induced currents which are transmitted over the wire & act upon the distant receiver.

In fig 2 3. Rubber dampers are placed between the inner edge of the mouthpiece to check any rebound of the diaphragm which sometimes takes place by loud talking when the instrument is not properly adjusted=

In fig 2 is shewn double carbons the current passing through both, with this the volume of sound is somewhat increased.

In fig .4. The resonant chamber is dispensed with and the diaphragm is laid directly upon the carbon being held in place by 3 pins provided with spiral springs to keep the diaphragm down—
in fig 5 a very large disk of carbon is used

In fig. 6, several carbons are used separated from each other by platina faced metallic discs—

Fig 7

In fig. 7, the induction coil is arranged in the same case as the receiver the poles of the receiver magnet m. being in close proximity to the core of the induction coil. G is the carbon transmitter. Of course the magnet M might be dispensed with and the diaphragm O be worked direct by the induction coil core

Fig 8

In fig. 8, the diaphragm n is laid upon a ring of felt or rubber—

In fig. 9, is shewn a receiver 1 & 2 are diaphragms in front of which are electromagnets B is a battery which determines the effect of the incoming current on either one magnet or the other

Fig 10

Fig 11

Fig 12

fig 10 shews the two magnets arranged with the battery B to produce the same effect.

Fig 11 shews a prismatic diaphragm

fig 12 shews a box containing both the transmitter & receiver with funnels extending outside.
Receiver=

fig 13 shews a diaphragm connected by a wire to an ordinary polarized relay—

fig 14 shows a diaphragm fastened near its center and the poles of the magnets acting upon its edge.

Fig 715

Telephone battery  Hyperoxide of manganese and Lamp-black pure, pressed in mould under great pressure= Sal Am outside= 

fig 15 shews a battery especially designed for telephone work consisting of a cylinder of Hyperoxide of manganese lead formed by hydraulic pressure and immersed in a solution of sal. ammoniac with Zinc;

fig 15?

fig 15 shews a flexible conductor for telephones consisting of rubber tubing with iron wire terminals & the tube being filled with mercury=


1. Edison probably began this draft soon after the successful design changes and tests of his telephone on 12 and 13 March 1878. The page of figures appears to have been drawn before the text was composed; thus, the differing lists of battery materials in the test of the caveat and in the description on the page of figures (see fig. 15).

2. Figure labels are (clockwise) "d," "felting," "g," "h," "c," "a," and "b." An illustration in Plush 1878 (p. 269) shows (on a larger scale) the same electro-mechanical design in an instrument with a handle (see headnote p. 173).

3. Not shown.

4. At center.

5. This paragraph accompanied the figure in the original.

6. It is not clear whether this is the battery design mentioned by Edison in Doc. 1241.

7. Text is "mercury."
Interference A.

Thos. A. Edison

Please find below a copy of a communication from the Examiner concerning your application for patent for Speaking Telegraph (Case 130) filed Apr. 27, 1877. Very respectfully,

Ellis Spear. Commissioner of Patents.

Your case above referred to is adjudged to interfere with the applications and patents named below — and the question of priority will be determined in conformity with the rules accompanying this. The preliminary statement demanded by Rule 53 must be sealed up and filed on or before the 6th day of May, 1878, with the subject of the invention and name of party filing it indorsed on the envelope. The subject-matter involved in the interference is — "The herein before described art of transmitting & reproducing at a distance sonorous waves or vibrations of any description which consists in increasing & decreasing the strength of an electric current traversing a circuit in such a manner as to produce in said circuit a series of electrical waves or vibrations precisely corresponding in their intervals of succession and relative amplitudes to the sonorous waves which are to be reproduced at the receiving station or stations so that oral conversations or sounds of any description whatever may be telegraphically transmitted." (Gray's 1st claim)

This is substantially the method specified in Bell's 5th claim and is described in the applications of Edison, Berliner, Richmond, Dolbear and Holcombe.

Parties to Interference.


A. G. Holcombe. Application filed Jan. 28th, 1878, Attys of record, Moses G. Farmer, Torpedo Station, Newport, R.I.


H. C. Townsend

March-April 1878
This notification constituted part of the official initiation of an extensive set of patent interferences (quasi-judicial proceedings in the Patent Office) to sort out Edison's and others' rights to various telephone designs (on interferences in the context of the U.S. patent system, see TAEB 1, App. 3; Israel and Rosenberg 1991). Faced with several inventors seeking patents for all or some aspects of telephone technology, the patent office examiners declared a set of thirteen interferences on this date, each on a separate feature or on a small number of closely related ones (see note 7). The initial set of interferences included Edison and the six persons listed below, some of whom later were fully or partly dropped while others were added and the issues somewhat reconstrued. In “Speaking Telephone Interferences: Decisions of the Examiners-in-Chief” (TI 5 [TAEM 11:891]), the original contestants were said to be fourteen in number, but that many have not been identified. More declarations followed, different interferences involved different antagonists, and no one individual, including Edison, Alexander Graham Bell, and Elisha Gray, the primary claimants to fundamental telephone patents, figured in all of them.

The first thirteen interferences were designated by letters A through M (headings on some records refer to A through N but no other records of N have been found). Others of which Edison retained records were Interferences 1 through 6, Interference B3, and Edison v. Dolbear v. Anders (TI 6–8 [TAEM 11:919, 977, 1019]). Although not declared until 14 August 1879, Interferences 1 through 6 also involved earlier inventive work and the depositions, exhibits, and arguments regarding them significantly overlapped those for the initial set of telephone interferences; No. 1 was combined procedurally with the earlier set. Almost all of the decisions on the initial set of interferences were appealed within the Patent Office and the consequent rulings were announced on 23 October 1884, but that by no means settled all the disputes (some of the patents involved did not issue until the 1890s; see notes 3 and 13).

Printed records of all these cases constitute the materials designated “TI” and “Telephone Interferences” in TAEM and TAEB; the portions directly related to Edison's involvement in the proceedings are on TAEM 11, passim. The document file at the Edison National Historic Site for the years involved also includes considerable related correspondence. During 1880, Edison's laboratory and workshop records were examined, categorized, and rearranged as documentary evidence was prepared for use as exhibits (see TAEB 3:19–20). Further material exists in the application files for the various patents involved and in the collections of papers and artifacts of Bell and Gray.

2. This was sent to Edison in care of his patent attorney Lemuel Serrrell and a marginal note indicates that a copy was sent to Western Union, the assignee of the patent.

1892. It was the earliest application for a variable-resistance telephone transmitter in which a diaphragm pressed against carbon. The patent drawing is reproduced in TAEB 3:254; a transcription of the original application and a copy of the drawing are in TI 2:2-5, 13 (TAEM 11:185-86, 190). Case 130 was also involved in Interference B.

Four of Edison's other applications were caught up in this first set of telephone interferences, namely Cases 141 (executed 9 July 1877, involved in Interferences M and I), 144 (31 August 1877, C and D), 145 (13 December 1877, L and E), and 148 (24 December 1877, G and J). The patents that eventually emerged were 474,231 and 474,232 (both from Case 141, issued 3 May 1892) and 492,789 (Case 144, issued 7 March 1893). Neither Case 145 nor 148 (which actually concerned a design for acoustic telegraphy but which included features relevant to telephony) resulted in a patent; for transcriptions of the applications see TI 2:25-30 (TAEM 11:198-202).

Further applications (Cases 158 and 178) were dealt with in other, later telephone interferences. See TI 6 and 7 (TAEM 11:919, 977).


5. No copy of the U.S. Patent Office Rules of Practice remains with the original. A copy of the 1875 edition is in Quad. 72.15; the section dealing with interferences is on pages 15-19 (TAEM 9:228-30).

6. A preliminary statement was a sworn affirmation stating when the inventor claimed to have accomplished the point in question and what kinds of evidence would be presented to support that assertion. Attorneys for opposing parties regularly sought to use such claims as final limits on what evidence could be introduced and what questions could be raised throughout the rest of the proceedings. The due date for these statements was changed and Edison did not officially attest to his preliminary statements on these interferences until 25 September 1878. They were filed three days later. TI i:ix-xi (TAEM 11:14-20).

7. Similar statements concerning the claim(s) in question were provided for each of the other interferences. TI i:ii-vi (TAEM 11:10-12).

8. This read: “The method of, and apparatus for, transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth.” See note 20.

9. This interference was expanded to include claims by two more inventors, W. L. Voelkers and J. W. McDonough, and it was linked with Interference No. 1, which involved John Irwin, Francis Blake, Jr., Edison, and Voelkers.

10. Four applications by Gray were at issue in the initial set of telephone interferences, three from this date and one from 17 January 1878. Whether any part of these eventuated in an issued patent has not been determined. Gray's deposition and supporting evidence are in TI 3:289-434, NjWoe; transcriptions of the applications are at TI 3:289, 307, 319, and 333. For Gray's inventive work and claims regarding telephony see also Doc. 1212 n. 13; Prescott 1878c, 151-217; Gray 1977; Hounshell 1975; Gorman et al. 1993.

11. Otherwise unidentified.

12. Emile Berliner had immigrated to the United States from his
native Hanover (recently annexed by Prussia) in 1870. His principal inventive work to this point involved telephone-transmitter and microphone designs (DAH, s.v. “Berliner, Emile”; Wile 1974). On 3 September 1880 all claims he had in this and other general interferences were dismissed, but Interference M, with Edison, and his patent application remained pending (TI i:ii [TAEM 11:1:10]).

13. Berliner’s telephone-transmitter application eventuated in U.S. Patent 463,569, issued on 17 November 1891. The text of the April 1877 caveat upon which it was based is transcribed in Wile 1974, 309–13. The patent drawing is shown in King 1962b, 325.

14. Unidentified beyond his association with Dolbear and Pope shown below.

15. George Richmond had developed a variable-resistance telephone transmitter employing water (Doc. 1021; TAEB 3:517 n. 2). On 1 May 1879 his claims were dismissed from this and all but one of the other interferences. He submitted no evidence or argument to support that case. (TI i:ii [TAEM 11:1:10]). No copy of Richmond’s application has been located.

16. In January 1880, Washington, D.C., patent attorneys George Dyer and Zenas Wilber took charge of Edison’s new U.S. patent applications. Lemuel Serrell continued to act for him in regard to prior U.S. applications and interferences and foreign patents. The firm dissolved in February 1882, at which time Edison transferred all of his new patent business to the firm of Richard Dyer (George’s son) and Henry Seely, with Dyer acting as his principal attorney. George Dyer and Serrell continued to act on Edison’s behalf in regard to some of his older cases. See TAEM-G2, s.vv. “Dyer, George W,” “Dyer, Richard N.,” “Dyer & Seely,” and “Wilber, Zenas Fisk.”

17. Dolbear was professor of physics and astronomy at Tufts University in Boston. He had an agreement with Gold and Stock Telegraph Co. that gave him funding and the assistance of Franklin Pope, as patent solicitor, to prepare, file, and argue for a patent application on his claimed invention, and gave Gold and Stock (and thus Western Union) ownership of any resulting patent; BDAS, s.v. “Dolbear, Amos Emerson”; Dolbear’s deposition, p. 9, Telephone Interferences; Dolbear’s application and supporting deposition are in TI 3:435–70, NJWOE.

18. Holcombe (otherwise unidentified) was dismissed from the interferences on 29 July 1879 (TI i:ii [TAEM 11:1:10]). No copy of Holcombe’s application has been found.

19. The prominent inventor Moses Farmer was electrician at the U.S. Torpedo Station in Newport, R.I. See TAEB 1:68 n. 8; on the role of inventors as patent attorneys see TAEB 1, App. 3.

20. This was Bell’s patent for the use of “undulating current” in telegraphy, which emerged through judicial and business decisions as the key patent for all telephony. It is printed in Prescott 1878c, 205–15.

21. Anthony Pollok was a partner in one of the leading law firms dealing with patents in Washington, D.C., patent attorney for Bell and Gardiner Hubbard, and a longtime advisor to Hubbard. Bruce 1973, 130, 138, 161.

22. Henry Townsend, first assistant patent examiner, was apparently also a friend of Edison’s, cf. TAE to Townsend, 26 Feb. 1878; Townsend to TAE, 16 and 28 May 1878; all DF (TAEM 18:1000, 15:285, 715).
Friend Puskas

A gentleman named Bailey representing what he calls Grays Telephone interest will call on you with a short letter from me. I had to give him the letter to get rid of him from all I can learn Gray has no patent interest or claims whatsoever in foreign countries on Speaking Telegraphs although he probably has on Musical Telephones; Bailey claims that the there is things in his foreign patents that covers Bells telephone. I don't believe a word of it. Our telephone is free from any claims he can bring up and will work on Government telegraphs where neither Gray nor Bells will work please do not mention that I wrote you this letter or that you have heard from me in regard to the Bell Telephone Gray Telephone's.

Phono = Plate machine most finished will test in few days will telegraph if perfect. Your people must not get excited if plate machine is slow coming out as it is very essential that it should be as nearly perfect as the state of the art will admit.

In haste Yours

T A Edison

ALS, HuBPo, TP. *Obscured overwritten letters.

1. Joshua Bailey. A typed transcript of the letter to Puskas is in TP (a photocopy of the original, which may also be in TP, is at NJWOE). Dated 21 March, it states: "This will be handed to you by Mr Bailey who goes to Europe to represent the Gray interest. He desires to effect a consolidation of certain Telephone interests. I leave this matter wholly to your discretion."

Friend Puskas:

1 and V Letter reed. I will see Serrell at once he is now preparing the second English patent. If your lawyer will carefully examine that patent he will find that the phono & Telephone are knit together that there is not two distinct inventions because I have combined with the Telephone a machine to record making it a Recording Telephone. However I am in the dark here about their laws. I wish you would have them write out and send this what paragraphs claims etc do they suggest shall be disclaimed.

In haste Yours

T A Edison

March—April 1878

206
P.S. 60th people just left for NY came down in a special car—all big bugs—5


1. This is a response to Puskas's 18 March letter (Doc. 1259) enclosing letters from Vallance & Vallance; these letters have not been found.

2. The provisional specification of British Patent 1,644 (1878) was filed on 24 April.

3. That is, Edison's first British patent covering the phonograph, No. 2,909 (1877).

4. The same day, Edison wrote another letter to Puskas about this issue:

As far as I can learn I think I am entitled to every claim I have made in my patent and possibly I could prove priority of invention on every one. What I want to know is this

If a person patents an article and makes a great number of claims all of which he is entitled to by reason of being the first can he not hold them or is the number of claims limited? I want some light. Let them specify. [TP]

5. Nothing is known of this visit. However, an illustration of Edison demonstrating the phonograph to visitors at his laboratory, published in the 30 March issue of Frank Leslie's Illustrated Newspaper, represents a visit from around this time. "The Latest Scientific Wonder," Cat. 1240, item 428, Batchelor (TAEM 94:129).

From Vesey Butler

New York—March 31st [1878]1

Important immediate

My dear Sir—

I have the great pleasure to inform you that my wife & ten children have just arrived from Havana (also our four negro servants) as we propose to spend some three or four weeks at your hospitable mansion. I thought it would be well to let you know beforehand so as to get things ready — Tell your amiable lady that she need not make any special arrangements for us as my wife is very easily pleased & is a charming companion — the darling children are very good — My poor servants are very helpless & may require a good Irish servant to attend to them— have the beds well aired and extra blankets as we are rather chilly from long residence in Habana —

My wife is deeply interested in Science in fact a blue- stocking — Mrs Edison might give her an idea of the working of that useful invention the Sewing Machine —

Please have some Rye whiskey & Bass ale in stock. My presence no doubt will assist you greatly in the development of your ideas I hope to make a great man of you yet

March—April 1878
God bless you my noble friend Your sincere friend & Colleague

V F Butler

My friend Mr James will accompany us & will require a room or two with Bath (hot & cold water) & all modern improvements. VFB


1. Butler wrote from New York on 5 March, from Ansonia, Conn., on 21 March, and from Havana on 17 May, when he told Edison, "I write to you in order that it may not be a case of 'out of sight out of mind!'" DF (TAEM 19:840; 15:377, 676).

2. Nothing is known of Vesey Butler beyond his association with Edison. The jocular familiarity shown in correspondence such as this indicates that he knew Edison rather well, perhaps as a telegraph operator. In 1876 he was selling Edison's electric-pen copying system. He continued his association with Edison through 1880, promoting the inventor's electrical inventions in Cuba. See TAEM-G1, s.v. "Butler, Vesey F."

3. On 5 March, Butler wrote from New York,

I was very much surprised at meeting a man today who told me he was Prof Edisons agent for the "Telefone" in the Island of Cuba—the individuals name is "James"—and I told him that I had an idea that he was mistaken that I was Butler of Havana & I considered myself one of Professor Edisons special staff & his head cook & bottle washer in Cuba—& nearly two years in his respectable service—& that if there was any Telephoning to be done that I was the boy who was going to do it— [DF (TAEM 19:840)]

Chicago April 1 1878

From George Bliss

Dear Sir:

Dont forget that only 30 days remain to get your exhibit to Paris. Nothing will be received after May 1st. Gray's goods have already gone forward. Gray thinks when his case goes into the patent office that he shall make a scoop on the Telephone. He has a bell shaped ring with diaphram & on the inside a common electromagnet attracting diaphram Also a bottle shaped arrangement with diaphram in place of bottom and electromagnet outside attracting diaphram both made in 1874 also model of water telephone described in caveat and these with other claims, & descriptions, patents &c pertaining to the harmonic system he expects will take him through with flying colors. He even claims induction coil arrangements in some of his patents. He wants to know why the Bell people
dont hurry up and commence suit and says they will be sued unless the fight is begun by them. I see nothing to change my opinion that you have the telephone and the party who gets it will have a great advantage. I hope you will get a good contract and be able to look on a disinterested spectator. V. Prest Walker of the Gold & Stock has been here. I think Gray has realized on enough of his interest so that he feels independent. He is disposed to congratulate you on your good telephone luck and thinks this is a case where the inventors win! Respectfully

Geo. H. Bliss G.M.

Is there such a thing as an Automatic Press?

ALS, NjWOE, DF (TAEM 19:677). Letterhead of the Electric Pen and Duplicating Press, George Bliss, General Manager; letterhead and dateline are electric pen copy. "Chicago" and "1878" preprinted. b"electro" written under date, marked for insertion in text.

1. 1 May was the scheduled opening day of the 1878 Universal Exposition in Paris.
3. Bliss is referring to the pending Patent Office interference proceedings and Gray's claims of priority to the invention of the telephone. See Doc. 1270 n. 9.
4. On 19 April, Bliss wrote Edison, "Gray now draws compensation from the Telephone Co. He spends most of his time in the country ala Edison! He came in a day or two ago and remarked that 'I did not need to go down to Menlo Park to find material for a newspaper article.' It makes all the difference in the world how a fellow feels about that." DF (TAEM 18:288).
5. Edison drafted a note to Zenas Wilbur in the margins of the first page of this letter and then heavily canceled much of it. The legible remnant is: "...made at the time mentioned—The whole thing I believe to be a damned Swindle—GBP is to get 3/10 of Grays Interest & Pope 1/10 for doing the business—Edison."
6. That is, the rotary press for use with the electric pen.

New York, Apl 2nd 1878

T.A.E.

Col Gouraud arrived from Europe today to remain one week. He is fresh from Sir Wm Thomson, Preece, Fleming & others & can give Expression to their views of Edison—The Telephone, Phonograph etc. Preece says the time has now come to utilize automatic & other improvements with P.O. Dept. Many prejudices have been broken down & the fever of

March–April 1878 209
improvement seems to be on—Sir Wm Thomson said the other day that Edison is undoubtedly one of the leading Electrical genius’s of the day—It is therefore the opportunity to utilize the reputation your own work has given you stimulated by our friends—You will notice that all my friends recognize your merit & laud it & dont call you “thief”—“fraud,” “Prof of duplicity”—“void of moral sense” etc etc, as the friends of some other people do.2

I wrote you several times lately about Washington matters etc, but you did not answer.3

If in town tomorrow let me know & also call on Gouraud at Mercantile Trust Co. Equitable building, 120 Bway.

Dont settle with A&P for salary for less than $5,000 & the other Bill for its face with their note say at 4 mos.4

Otherwise you better take nothing.

I submitted the paper I showed you & Wm5 told me yesterday he would have reply for me6 within day or two.

How about the Graphic yesterday & the “Food for the world”7 Yrs

JCR

PS Have you made definite disposition of Telephone abroad. Gouraud wants to know.


1. Probably John Fleming of Smith, Fleming and Co.
4. Edison was suing Atlantic and Pacific Telegraph Co. for his salary as company electrician. He settled this suit and the Domestic Telegraph Co. suit (see Doc. 1170 n. 1) about ten days later when he accepted a payment of $1,500. A&P Executive (1878-79): 7-8; see also TAE to George Norris, 23 Mar. 1878, Lbk. 3:461 (TAE 28:311).
5. Neither the paper nor “Wm” have been identified.
6. See Doc. 1282 n. 1.

New York April 2d 1878

Gardiner Hubbard to Uriah Painter

Dear Sir

I have had a long conference with Mr Johnson this morning in regard to the Phonograph. I find from him that almost all the letters of inquiry for purchasers of Phonographs have been from parties who desire to use them for exhibition purposes.
There are from 10 to 12 letters a day of this kind received by Mr Johnson and as many more by Mr Edison. I have therefore concluded, provided it meets your approval to have a large Phonograph prepared which can be used for lecture, musical and other public entertainments and also for private use to be sold for $100 each. These will be sent out in advance of the Standard machine which will not be ready for several months.¹

I propose to send out circulars to the various agents of the Bell Telephone Co asking them to notify us by the 10th of April how many of these instruments they desire, that they will be ready for delivery by the 1st of May, that they must pay an advance on each machine and the price of packing and Freight, that they will be allowed a commission of 15% on the cost price²

The cost of these instruments will be about $15, the outfit say $5 more making $20.—

- Royalty to Mr Edison 20% or 20. —
- Commission to Agents 15. —
- Making Total Expense $55. —
- Net profit to us $45. —

We incur no risk as we shall not deliver any until payment of the advance which is sufficient to cover the cost and disbursements.

Please inform me by return mail if this arrangement is satisfactory. I have given up the design of public exhibition as it was complicated and would render it almost impossible to sell any Phonographs³

The small instruments are not yet ready but will be today or tomorrow⁴ I am Yours Truly

Gardiner G. Hubbard per Gref [Steno.?]⁵


¹ Edward Johnson had begun to receive manufacturing bids for twenty-five large phonographs at the end of March. The instruments, made by Wm. G. & G. Greenfield (also known as the Hope Machine Works) of East Newark, were to be capable of recording six times more than the small demonstration phonographs (Doc. 1195). The completed instruments actually recorded five times as much. The Greenfield shop produced twenty-six machines, one of which is in the private collection of Charles Hummel. Although Johnson initially hoped to provide clockwork drives for the large cylinder phonographs, none were ever supplied. Johnson to Painter, 28 Mar. 1878, and Cheever to March-April 1878 211
One of the phonographs manufactured by Wm. G. & G. Greenfield for the Edison Speaking Phonograph Co.

Hubbard, 30 Mar. 1878, both Box 1205, NjWAT; Wm. G. & G. Greenfield bill to Edison Speaking Phonograph Co., 1 July 1878, and Edison Speaking Phonograph Co. circular, Form 502, n.d., both UHP; Wm. G. & G. Greenfield to TAE, 27 June and 5 July 1878, both DF (THEM 19:90, 94). Regarding the letters of inquiry see 78-018 (DF [THEM 17:877]) and scrapbooks of “Applications for Phonographs” (UHP).

The Edison Speaking Phonograph Co. advertised the small phonograph as suitable for “private use and instruction, being very portable.” Johnson believed that the large phonograph would be more suitable for public entertainments such as lectures and musical performances. Like the small ones, they were offered only for “experimental demonstration, in advance of the Standard Instrument which Mr. Edison is now at work upon, and which, when completed, will be practically applied to numerous branches of commercial and scientific industry.” The standard, which was not expected to be ready for three to six months, was to be a disk phonograph. Edison Speaking Phonograph Co. circular, Form 502, n.d., UHP; Johnson to Painter, 28 Mar. 1878, Box 1205, NjWAT.

2. It is unknown if a special circular was printed for Bell Telephone agents. Johnson printed a circular for the Edison Speaking Phonograph Co. (which may not have been distributed) offering for sale small $30 and large $60 phonographs and the outfits for them. The outfit comprised five pounds of tinfoil, a gum pot and brush, an extra embossing point, a piece of rubber for damping, a centering pin, and a small screw-driver, all in a “Neat Box.” Edison Speaking Phonograph Co. circular, Form 502, n.d., UHP; Hilborne Roosevelt to Gardiner Hubbard, 12 Apr. 1878, Box 1205, NjWAT.

3. In a 20 March letter to Hubbard, Charles Cheever had proposed leasing small phonographs to lecturers who would have exclusive rights to exhibit within assigned territories. Cheever believed “the interest in the thing as a lecture will only last while it is a novelty and for that reason it seems best to start the thing at one and the same time in all parts of the country” through such leasing plans. Cheever expected that purchasers of the small phonograph would either lose interest in its novelty or become dissatisfied as improved models were made available. He thought the main advantage of leasing the small machines for a year instead of selling them is that by the end of the year we suppose our apparatus will be so much more perfect in every way, that the apparatus now made will be a detriment to us rather than a benefit if in the hands of the public and we therefore prefer to call them in and smash them up. [Box 1205, NjWAT]

March–April 1878
Johnson's circular (see note 2) indicated that the phonograph company was planning to sell these instruments and was "not at present prepared to appoint exclusive agents."

4. Although Johnson ordered twenty-five small ($30) phonographs, the company only sold five in April. Edison received a 20% royalty on each machine. One small phonograph was sent that month to Thomas Watson, superintendent of the Bell Telephone Co. The company failed to sell any others until the following January. See Doc. 1302; Edison Speaking Phonograph Co. to Watson, 15 Apr. 1878, Box 1205, NJWAT; Edison Speaking Phonograph Co. royalty statement for April 1878, DF (TAEM 19:175); Doc. 1397 n. 3.

5. Anthony Gref, Jr., was a clerk or secretary to Charles Cheever.

New York, April 2, 1878.

THE PAPA OF THE PHONOGRAPH.*

AN AFTERNOON WITH EDISON, THE INVENTOR
OF THE TALKING MACHINES.*

HIS HOME AND WORKSHOP IN MENLO PARK—
A FOUR-MILE SPEECH BY STEAM.

SKETCHES AT THOMAS A. EDISON'S LABORATORY AT
MENLO PARK, N. J.

A VISIT TO THE INVENTOR OF THE PHONOGRAPH.

We went over to Menlo Park, N. J., two of us,¹ to see Edison and his wonderful inventions and make some discoveries and sketches for THE GRAPHIC. Menlo Park is not a park. It is not a city. It is not a town. It is not in any way related to Mungo Park,² the great Scotch-African. Although it is on the Pennsylvania Railroad (just beyond Rahway), it is not even a stopping place, except when the station agent flags the train to take on waiting passengers. It is composed wholly of Edison's laboratory and half a dozen houses where his employees live. It is, in short, Edisonia, and nothing else.³

Just north of the track is a long, plain, white wooden building, full of windows and two stories high (see picture); this is the laboratory of the Jersey Columbus whose name has suddenly become famous. Many telegraph wires are festooned from it. The first floor is occupied by scribes and bookkeepers in one end, and at the other some ten or twelve skilful workers in iron, who, at anvil and forge, lathe and drill, are noisily engaged in making patterns and models for the genius of the establishment. His iron ideas, in tangled shapes, are scattered and piled everywhere; turning lathes are thickly set on the floor, and the room is filled with the screech of the tortured metal.
Up stairs we climb—to a room the size of the building, with twenty windows on sides and ends. It is walled with shelves of bottles, like an apothecary shop—thousands of bottles of all sizes and colors. In the corner is a cabinet organ. On benches and tables are batteries of all descriptions, microscopes, magnifying glasses, crucibles, retorts, an ash-covered forge, and all the apparatus of a chemist. At a table sit two earnest men (see picture) each holding alternately to mouth and ear the mouthpiece of a telephone.

"Well, what are you up to to-day?" asks an acquaintance who has sauntered in.

"We have got the Chicago telephone repeater in the circuit at last, and we are now talking through 800 miles of wire, via St. Louis, Cincinnati, Louisville, Washington and Philadelphia—the parabola of the West. It doesn't work well yet. This is the largest circuit ever attempted and it would not be possible without Edison's repeating machine. What's that? Can't hear all the words!"

This last he shouted into the mouthpiece and the words flew to the Mississippi and back in a second, and the man across the table shouted back, "Do you hear me now?"

Two other men are standing near together in the middle of the room.

"Why, you be! You certainly be!" exclaimed the elder with much earnestness. "You air the greatest man in the world to-day!"

"Oh, nonsense! Don't talk that way!" said the younger, laughing and waving him off deprecatingly as he turned quickly and greeted us with a shy welcome.

That the man who first spoke was altogether in earnest his face and voice were a sufficient assurance. He was apparently a farmer who had put on his Sunday apparel and driven down to Menlo Park to see the marvels of which he had incredulously heard. And now, though the miracle-worker turned away from him, he added, in a strident tone, "You air the most popler man in Ameriky! There ain't any man the people air so anxious to see!"

The younger man was now busy with a sheet of tinfoil, which he had laid on a piece of cardboard and was trying to rub the wrinkles out of. He is a man about five feet ten inches high with a thin face, high cheek bones and lean, long neck. He would not be picked out in a crowd as a man of more than ordinary intelligence, and he is the person whom a banco steerer would be likely to take into his confidence. Time he
evidently considers too valuable to waste on personal decoration, for his boots have not been blackened this week, and, although he is ostensibly whiskerless, his beard has had about a five days' growth. His hair is of a chestnut brown, and I judge he cuts it himself, for it stands up in an anxious way all over his head, with a striking tendency forward, and at the crown it stiffly radiates like the thorny top of a pineapple. There is a quid of tobacco in his cheek. His mouth is sensitive, the blue veins show on his hands and the fingers flutter as if each had an intelligent purpose; but the only feature that would immediately attract the attention of a stranger as worth a second look is his keen, deep, eager gray eye which reveals the intensity of the man. This is Thomas Alva Edison.

"You have turned out a good many inventions, Mr. Edison."

"Yes;" he answers, with a perceptible Western twang in his speech, "I've made some machines; but this is my baby," pattering the speaking phonograph and taking a chair before it, "and I expect it to grow up to be a big feller and support me in my old age."

He touches a lever with his foot, and shifts a narrow belt upon the phonograph cylinder, which is thus operated through the floor by the large steam-engine below (see picture). The cylinder is three inches in diameter, and makes some forty or fifty revolutions a minute. It is covered with a fresh and perfectly smooth sheet of tinfoil.

Into a simple mouthpiece at the side Mr. Edison speaks, in a loud tone of voice, addressing a Spanish gentleman who has just been presented, "Buenos dias Senor, como esta usted?" To which the gentleman, taking his place at the phonograph, immediately replies, "Setze judges mentjan, feixa d'un penja." This exchange of compliments has occupied, perhaps, a minute of time.

Edison touches his foot to the lever and stops the cylinder and turns back the mouthpiece from contact with it. We examine the tinfoil. At least half of that which was smooth before is now corrugated, creased in lines running close together, fifteen to the inch, most of the creases being marked with small and scarcely perceptible indentations. (The Graphic has already given a picture of these marks, and of the sharp stylus with which they are made.) Meantime the cylinder has been moved a couple of inches towards the right by means of a thread in the bearings.

Edison touches the lever again and reverses the movement, until the cylinder, following the screw thread, has returned.
to the point of starting. Then he replaces the mouthpiece; starts the cylinder; the little stylus, pressed down, again traverses the spiral line of indentations, and, lo! the machine talks! From the mouthpiece comes the Spanish salutation, “Buenos dias, Senor;” &c.—not more than a quarter as loud as when first spoken, but perfect in articulation and inflection, even the timbre of the two voices being plainly distinguishable.

Edison then speaks into the mouthpiece: “Mary had a little lamb its fleece was white as Jack and Jill went oh stop that! shut up!”—the last rebukes being sharply spoken. It is presently repeated by the machine with startling effect—but as the cylinder is set back a little too far it laps over upon the former speech and comes out, “Fetxa d’un penjat Mary had a little lamb,” &c.

The sheet is not at all injured by the service, and can be preserved forever or sent anywhere, and whenever laid on a phonograph cylinder will exactly repeat the voice that has been impressed on it.

The machine can whistle as well as talk. Edison whistles into the mouthpiece a bit of an opera, and it is returned as clear as a bell and apparently without much diminution.

To show its precocity in dialect, he shouts in a strident tone: “Ah-a-a-I say-stranger-ah-ah—would you-ah—would you-ah—ah—how far is it—ah—ah—what time is it?” The machine repeats the absurd speech precisely, and its stammers are very amusing indeed.

The sheet is now full to the edge, wrinkled and speckled, and Edison tears it off, throws it away and substitutes a fresh one. “Shall we give you a song?” he asks, and, as the suggestion is received with applause by the ten or a dozen visitors, he calls an assistant, adjusts a queer-looking double mouthpiece with two tubes meeting in one (see picture), and they sing, “Tramp, tramp, tramp, the boys are marching”—6 the assistant singing bass and Edison singing the air in a bass voice.

He turns back the cylinder, puts on steam, and presently the machine begins to sing that famous war-song—all the words being clearly articulated, and the two parts being perfectly distinct.

“What'll you have next?” asks Edison. “Shakespeare,” replies THE GRAPHIC. And the inventor gives this to the machine in a solemn tone:

“Now is the winter of our discontent Made glorious summer by this son of York;
And all the clouds that lower'd upon our house
In the deep bosom of the ocean buried!"

It was returned in a tone of voice and accentuation almost melancholy, the declamation being quite tragic. The word "lowered" was mispronounced as it had been at first, to rhyme with "board" instead of "showered," and many characteristics of the voice were preserved.

"A dog came along here the other day and barked in the mouthpiece," said Edison, "and the voice was admirably reproduced. We have hung up that sheet yonder, and now we can make him bark any time. That dog, perchance, may die and pass away to dog-heaven," added he in a blood-curdling voice and an impressive wave of the hand, "but we've got them—all that is vocal survives."

"Now you try it," he said to a gentleman present, offering the chair, and while a laugh went up at the expense of that gentleman, he took the mouthpiece and delivered the following in a deep bass:

"The boast of heraldry, the pomp of power,
And all that beauty, all that wealth e'er gave,
Alike await the inevitable hour—
The path of glory leads but to the grave."

"If a friend of yours were to speak in here in your absence, would you recognize it when repeated from the tinfoil?" I asked him.

"We have tried it and sometimes can tell easily, but the phonograph is a young thing yet and must be greatly improved before it will do just what it should. Tinfoil is not exactly the thing; it wrinkles so easily; and this needle is too 'scratchy.' Johnson is getting me a sapphire point to take its place. I tried a sapphire, and the softest whisper was reproduced accurately and the vocal timbre was exactly retained. You could tell the voice in a minute."

"Two other things I am going to do—substitute some sort of membrane for this ferrotype-tympanum, and put some sort of a voice-chamber over the mouthpiece about the size of the human mouth with teeth and perhaps tongue. This will give the resonance that is lacking in this machine.

"Another thing I am going to do right away—abolish this whole cylinder and supersede it with a flat circular steel plate about as big as a dinner-plate. This plate will be reamed with a fine groove running around itself, beginning in the centre and ending in the circumference. I can make that groove so fine that the plate will hold 50,000 words—(see picture)—
that is, it will hold the whole of one of Dickens's novels.11 My puzzle now is to decide whether to make it fine enough to hold 50,000 words or coarse enough to hold only 200. A merchant may not want all his business mixed up on his phonograph. He may prefer to shift the tinfoil."


1. For Croffut's authorship see Doc. 1266. He was evidently accompanied by Peter Cusacks, an artist, whose signature is in the lower right corner of the illustration. Wilson 1878, 307.

2. Mungo Park was a Scottish surgeon and explorer who made several expeditions to Africa. He died leading a British party down the Niger River in 1826. DNB, s.v. "Park, Mungo."


4. Repeaters were used to overcome the attenuation of electrical signals over long distances. They were used routinely in long-distance telegraphy, although Edison had been unable to develop a repeater well-adapted to the rapid transmission of signals by automatic telegraphy (TAEB 1:30–31; 2:661). The even higher frequency of telephone signals posed still greater difficulties, which were not overcome until the early twentieth century (Wasserman 1985; Fagen 1975). In April 1877, Edison had developed his first telephone repeater—the pressure relay (see Docs. 885, 887, 926).

The repeater discussed by the Graphic consisted of a magnet (M), a carbon-telephone transmitter (C), and an induction coil (I). As the magnet responded to fluctuations in the main line current, it activated the transmitter by vibrating its diaphragm which in turn pressed on the carbon button and altered the resistance of the repeater circuit. This varied the resistance of the primary winding of the induction coil and induced a current in the secondary winding, which was passed to the main line. This device is illustrated and described in Prescott 1878c, 39–40.

5. Slang term for a swindler or confidence man. Farmer and Henley 1970, s.v. "banco-steerer."

6. "Tramp, Tramp, Tramp, the Boys are Marching," by George Root,
was a popular Union song during the Civil War. DAB, s.v. "Root, George Frederick."

7. The opening lines from Shakespeare's Richard III occasionally appeared in Edison's notebooks; he and Batchelor also used them for the text of electric pen tests. See, for example, Cat. 298:133(2); NS-77-004; all Lab. (TAEM 5:259; 7:539); DF (TAEM 13:290, 293, 295).

8. This quotation is from Thomas Gray's "Elegy Written in a Country Church-Yard." Edison had inscribed this stanza in laboratory notebooks on at least two previous occasions. Cat. 297:88, NS-77-004, both Lab. (TAEM 5:798, 7:619).

9. Edison experimented with different substances, including sapphire, as recording points for his phonograph. See Doc. 1242 n. 7 and Johnson to TAE, 28 Mar. 1878, DF (TAEM 19:53).

10. Alfred Mayer had suggested this to Edison in early March (see Doc. 1242 n. 2).

11. Charles Dickens's novels are actually considerably longer. Edison repeated this claim in the North American Review. Edison and Johnson 1878, 531, 534.

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[Menlo Park,] Apl 2nd 1878

We had a test today with Edison in New York and Batchelor in Philadelphia of the Edison Carbon telephone and the Phelps Magneto telephone. The wire used was a no 6 wire and runs right along the railroad amongst 22 or 23 other wires some of which were working the Washington 'Quad'. The induction was very heavy notwithstanding this Orton and Bentley conversed with perfect ease on the Edison instrument whereas with the Phelps not a single distinguishable word could be got.1 The Edison was the most improved pattern transmitter with thick plate and solid connection between the plate and the aluminium so that it works more by pressure than by vibration 2 The Phelps was a new large magnet and double diaphragm placed as in sketch and when put on the line the usual 'frying pan' is turned into a complete roar.3

Nothing could be got over the wire and in a conversation over the Edison instrument Mr Phelps acknowledged to Mr Orton that the magneto was not capable of working such wires.

[Caricature of the Edison Carbon telephone and the Phelps Magneto telephone.]

CB

X, NJWOE, Batchelor, Cat. 1317:56 (TAEM 90:685). Written by Charles Batchelor.

1. Batchelor entered in his diary that day: "Orton Bentley & many others conversed over the wire but could not get a single word over Phelps." According to press accounts, several dozen witnesses shared nine receivers in Bentley's office to listen to the conversations. Present
were George Phelps and James Merrihew, Western Union superintendent for Philadelphia. Among those with Edison and Orton at the Western Union building in New York was George Phelps, Jr. Philadelphia newspapers reported enthusiastically on the carbon telephone's "highly successful" hour-long test over the difficult route to New York. They also gave more charitable reviews of the magneto's performance than Batchelor did; one noted that it transmitted "words and occasional sentences." Cat. 1233:92; "Experiments with Telephones," Philadelphia Record and "Long-Range Chatting," Philadelphia Times, both 3 Apr. 1878, Cat. 1240, items 493, 496; all Batchelor (TAEM 90:99, 94:156).

2. The telephone in question is probably the design shown in George Prescott's article from the August 1878 issue of Scribner's Monthly (Prescott 1878d, 601--2). In this article and in the revised edition of his book on telephony (Prescott 1879, 565--67), Prescott presented this design as the new form of transmitter that followed Edison's decision to remove the rubber tube in mid-March (see Doc. 1252). In the first edition of his book, which appeared in June, Prescott added a paragraph at the last moment (probably in late March or early April) which discussed but did not illustrate "the latest form of transmitter which Mr. Edison has introduced" (Prescott 1878c, 36--37). In the Scribner's article, this paragraph introduces the drawing and description of this transmitter:

\[\text{Diagram of Edison's carbon-telephone transmitter design of early April.}\]

The prepared carbon, represented at C, is contained in a hard-rubber block open clear through so that one side of the former is made to rest upon the metallic part of the frame which forms one side of the connections of the circuit. The opposite side of the carbon is covered with a circular piece of platinum foil, \(P\), with leads to a binding post insulated from the frame and forming the other connection for placing the instrument in circuit. A glass disk, \(G\), upon which is placed a projecting knob, \(A\), of aluminum, is glued to the foil; and the diaphragm, \(D\), connecting with the knob serves when spoken against, to communicate the resulting pressure to the carbon. A substantial metallic frame surrounds the carbon and its connections, and their complete protection against injury, to which they are liable from careless handling, is thereby secured.

Prescott also indicated in the article that the function of the design was "to concentrate a greater pressure upon the small surface of the carbon."

3. See Doc. 1173 n. 3.

-1279-

From Edward Johnson

[New York,] Apl 3/78

Edison

If you are in town today come direct here before going to W.U. Mr H[ubbard] wants to see you was sorry he missed you yesterday. He leaves this P.M.

Johnson

ALS, NjWOE, DF (TAEM 15:455).

March–April 1878
From Edward Johnson

E

Ans me about Barker¹ am waiting on you B₄ answering him

"Jo"

O[nton]. called in Vanderbilt² to help him decide on your terms³ Don't Budge an inch "Jo"

ALS, NJWOE, DF (TAEM 15:454).

1. This letter was prompted by George Barker's letter of 31 March in which he asked for Johnson's help in exhibiting Edison's phonograph and musical telephone during his 15 April lecture at the Philadelphia Academy of Music. At Edison's request, Johnson had offered his phonograph to Barker, but there had been some confusion on Barker's part as to whether he would have to pay Johnson the $100 fee he charged for phonograph exhibitions (see Doc. 1211). On 26 March, Edison wrote Johnson and asked if he would be willing to waive the fee if Barker paid his expenses and in his 31 March letter Barker himself stated that he could not pay the fee. On 4 April, Johnson replied to Barker that his promised phonograph was unavailable because it was on permanent exhibition in New York. On 6 April, Barker expressed dismay and asked if Johnson could "get Edison's for that evening, for I would rather omit the phonograph altogether, than attempt to use the little concern Mr. Bentley had here." Barker to TAE, 25 Mar. 1878; Johnson to TAE, 28 Mar. 1878; Barker to Johnson, 31 Mar. and 6 Apr. 1878; all DF (TAEM 15:395, 414, 434, 472); TAE to Johnson, 26 Mar. 1878, Lbk. 1:473 (TAEM 23:319); see also Doc. 1286.

2. William Vanderbilt was the majority stockholder of Western Union. He had taken over the family's railroad and telegraph empire after the death of his father, Cornelius, in January 1877. DAB, s.v. "Vanderbilt, William Henry"; Klein 1986, 202.

3. Although there is no record of Orton's discussions with Vanderbilt, on 6 April Orton and other directors of the American Speaking Telephone Co. met informally to discuss the proposed agreement with Edison regarding his carbon telephone. (A majority of the board was affiliated with Western Union.) On 16 April the full board of the company approved a resolution agreeing that Western Union should guarantee Edison a payment of up to $6,000 per year for the life of the patents with American Speaking Telephone to assume the actual costs. The directors also wanted the agreement to provide for the acquisition of his future telephone patents to "be bought, and paid for, year by year, as patents are secured at a price, not to exceed a moderate fixed sum in any one year, rather than by adding to the contemplated annuity." American Speaking Telephone Minutes, 25.

Dear Sir,


I herewith return signed, the forms of the Theosophical
Society, and thank you for the same. Please say to Madame Blavatsky that I have received her very curious work and I thank her for the same. I SHALL READ BETWEEN THE LINES!

Yours truly,

(sgd) THOMAS A. EDISON.


1. On 20 December 1889, Olcott wrote Edison regarding a letter from Edison's private secretary, Alfred Tate, that had been printed in a Manchester newspaper and which claimed that Edison had never been a member of the Theosophical Society. As evidence to the contrary Olcott sent this copy of the 4 April 1878 letter in which Edison had enclosed his membership certificate. Olcott also indicated that he had a second letter from Edison "acknowledging your receipt of the Society's Diploma of Fellowship with thanks." Olcott noted that both of these letters were then at the Society's headquarters in Madras, India. DF (TAEM 125:767).

2. Edison's membership form is illustrated in Cranston 1993, 184. In a letter dated 30 April 1878, Helena Blavatsky told Edison that he was now "a 'Fellow' of our Society—which is more than proud of its new Son" (DF [TAEM 15:579]). The only role Edison played in the Theosophical Society was to waive the royalty on the exhibition phonograph purchased by the Bombay branch of the Society and to provide copies of his portrait for this and other branches of the Society (Olcott to TAE, 14 Dec. 1878; Blavatsky to TAE, 14 Dec. 1878; Edison Speaking Phonograph Co. royalty statement for December 1878; all DF [TAEM 16:512–14; 19:204]).

Menlo Park N.J. April 6 1878.

Friend Croffut

Your article is the most ingenious hoax that I have ever seen. Everyone, without exception was fooled by it. I am receiving letters asking the lowest prices for food-machines, and asking when they will be ready for the market. I intend giving you one of the new plate machines when we get them in quantity. If I can get one of the small phonos from one of the savans to whom I have loaned them, I will let you have it. Perhaps one will reach here Wednesday if so would it not be best for you to come down and learn how to manipulate it to the best advantage. I have a box for it and can give you a supply of foil.

Yours Truly

Thomas A Edison

March–April 1878 223
1. Edison was replying to Croffut’s letter of 4 April in which he had asked, “Did you see my hoax? And are you in a state of fiery wrath? Or how is it?” (DF [TAEM 17:70]). The hoax was an article by Croffut that appeared in the 1 April New York Daily Graphic (p. 215), titled “A Food Creator,” which described a fictitious Edison invention that could manufacture food out of air, water, and earth (Cat. 1240, item 470, Batchelor [TAEM 94:150]). During the 2 April telephone test (see Doc. 1278), Edison reportedly joked over the line to Batchelor in Philadelphia: “By the way, don’t you want half a dozen of my latest? Invented since you left this morning. It changes fire clay into rice pudding and corn meal into gold dust. Warranted for nine hundred and ninety-nine years.” (“Long-Range Chatting,” Philadelphia Times, 3 Apr. 1878, Cat. 1240, item 496, Batchelor [TAEM 94:156]).

2. In his 4 April letter (see note 1), Croffut had asked to “borrow a phonograph a little while to experiment with. Have you got an old rusty one anywhere?” Edison loaned him one of the small phonographs (see Doc. 1304).

April 6, 1878

T. A. Edison

Mr Johnson will write article, your signature to it indispensable. please consider the character of our readers, and allow him to use it.¹ reply to

North American Review

[Menlo Park]

North American Review

All right could I see proof early monday morning.²

T A Edison

L and ALS (telegrams), NjWOE, DF (TAEM 97:649; 17:71). First message on Western Union Telegraph Co. message form. *Date from text, form altered.

1. The June issue of the North American Review carried an article with Edison’s byline titled “The Phonograph and Its Future” (Edison and Johnson 1878). This article described the present capabilities of the phonograph and discussed possible uses which included “Letter-writing, and other forms of dictation books, education, reader, music, family record; and such electrotype applications as books, musical-boxes, toys, clocks, advertising and signalling apparatus, speeches, etc., etc.” The article concluded by describing how the phonograph could make the telephone a valuable adjunct to long-distance telegraph service by allowing messages to be recorded. The issue carrying this article had appeared by 28 April, when several New York papers carried ex-

2. Edison also telegraphed Johnson, "Can I see proof of Review article early Monday morning" DF (TAEM 71:72).

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-1284-

*Charles Batchelor*  
*Diary Entry*  

[Menlo Park,] Saturday Apl 6 1878

Paid Gould Attys for suit against Edison  
Went with Edison to A&P to fix Domestic a/c.  
Sent $200 to Z. F. Wilbur for Edison, by Express under the name of G Wilson for Edison, by Express under the name of G Wilson.  
Talked with Professor Barker at University of Pennsylvania for an hour.

D, NjWOF, Batchelor, Cat. 1233:96 (TAEM 90:101).

1. Ezra and Roscoe Gould, from whom Edison and George Harrington had leased space for the American Telegraph Works in October 1876, had brought suit against Edison in 1877, presumably for back rent. A final hearing before a referee had been scheduled for 6 April, but Edison finally accepted Gould's offer to settle the claim for $300. No record of the case has been found. TAEM-G1, s.v. “Manners, A”; receipt of 6 Apr. 1878, DF (TAEM 19:498).

2. See Docs. 1170 n. 1 and 1275 n. 4.

3. Zenas Wilbur had written Edison on 31 March urgently requesting a confidential loan of "$200 or $250 immediately." Since Wilbur was the Patent Office's chief examiner of electrical apparatus and would have reviewed many of Edison's patent applications, such a loan would likely have been considered highly inappropriate. In another letter of 31 March, James MacKenzie wrote that "our friend Wilbur calls in very often and always has a talk with me about you he is evidently your staunch friend and also Prescotts (in my eye) who is going to be Prest W[estern]U[non]T[elegraph]." DF (TAEM 15:432, 436); on Wilbur see *TAEB* 2:87 n. 3.

4. Unidentified.

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-1285-

*From George Gouraud*  

London 9 Apl. 1878

My dear Edison  
I lunched yestly with Alderman Nottage who is also Sheriff of London & I think I may say that so far as he is concerned he is a very good man to have the phonograph in hand—but he is evidently not pleased at having to do with Puscus—a subject upon which he spoke with much emphasis and some
feeling I thought— He expressed the hope that you had not
given him Puscus a power of attorney to act for you in any
commission with your interests in England— [and?] and begged me to persuade you not to do so. Puscus told him he had written to you to give him such a Power.1 If not too late you may have my services in this commission upon the same terms as you had thought of giving Puscus. I am especially well situated here to cooperate with Nottage & am sure I could make your ultimate profits larger than they would be otherwise be. It seems absolutely indispensable to your best interests that you should have some interested with you in whom you know you rely & who lives here. Preece says your last first telephone didn’t work at all2 He is much interested to see how the last will go. If you cable me simply Gouraud London Accepted3—I shall know that you accept me as yr attorney in the Phonograph and will at once advise Nottage who will I know be much pleased— I will then have proper paper drawn ready to fill in the share in the Royalty—which you shall desire to give me for my services Yours truly
Geo E Gouraud

Besides this let me know soon as you promised—what you will take for ¼ of your interest in English Royalties of Phono.

ALS, NjWOE, DF (TAEM 19:226) Letterhead of Mercantile Trust Co., George Gouraud, Resident Director in Europe. “London” and “187” preprinted. 1. See Doc. 1237 n. 1. 2. See Doc. 1248. 3. Edison did not cable Gouraud and did not give him power of attorney in regard to the British phonograph.

My Dear Edison

About Barker—

Like all other perfectly gratuitous business, this going to Philada with the Phonograph is going to give me a heap of trouble.1 My Phonograph is under steady engagement & cannot be spared a single day or night— Applebaughs is likewise engaged in Brooklyn.2 We shall have no others until the 23rd of this month—3 His space is on the 15th— Now what am I to do— Can you not ship yours over on Saturday If I have it promptly returned on Tuesday.4 Barker does not want the little unsatisfactory machines Bentley had—nor would I oper-

New York, Apl 10th 1878

From Edward Johnson

March—April 1878 226
ate it in the presence of so large an audience as he will have at
the Academy.

I am having a special Phono made for our Exhib. but it will
not be done in time to relieve mine—nor could I go myself if
it were— Indeed I don't see how I can get away as it is I am
compelled to work there now nearly all day—and to give quite
an extended Lecture in the Evening—no one else can take my
place— Yesterday our receipts were $84. they steadily in-
crease day by day—by next Monday it may simply be impos-
sible for me to go— Prof Barker seems to be filled with the
Idea that I am forcing myself on him for the purpose of mak-
ing something— The fact is I will pay him to release me from
what I volunteered to do at your suggestion before I became
so involved in the meshes of this Phono. business here. It is
due me, that you set me right with Barker & if possible get me
released from this annoying dilemma Can't you write him &
explain & if possible send him your Phono instead of me. He
would doubtless prefer it to my personal services with a little
one Truly Yours

E. H. Johnson

See what he Says in re. to E.M.G. Tel. You have it

ALS, NjWOE, DF (TAEM 15:493). Letterhead of Edison Speaking

1. See Doc. 1280 n. 1.

2. According to a local paper, William Applebaugh had demon-
strated an Edison phonograph at a private party in his Brooklyn home
the evening of 25 February. He may have continued to exhibit his pho-
nograph there. "Phonograph, A Machine that Talks and Sings," Brook-
llyn Daily Eagle, 26 Feb. 1878, Cat. 1240, item 385, Batchelor (TAEM
94:117).

3. These are probably the machines manufactured by Wm. G. & G.
Greenfield. See Doc. 1276 n. 1.

4. On 9 April, Barker had asked Edison to loan Johnson a large pho-
nograph for the Philadelphia engagement and, in return, promised to
give "the Phono. Co. a big puff if they care to have it" (DF [TAEM
15:486]). Barker's lecture was scheduled for Monday, 15 April.

5. Nothing is known of this machine.

6. In an undated memorandum, probably written about 12 April
while he was in Philadelphia helping Barker prepare for his lecture,
Batchelor informed Edison that "I told him [Barker] I thought you
would lend your big one [phonograph] just for that occasion." Batch-
elor also notified Edison that Barker "wants a rehearsal on Sunday [14
April] to the Academy and will send letter previous as to the experi-
ments to try on that morning." DF (TAEM 15:517).

7. Johnson apparently enclosed Barker's 6 April letter to him in
which Barker asked Johnson to arrange with Edison to transmit music from Menlo Park over the electromotograph telephone during his lecture. DF (TAEM 15:472).

New Orleans April 11th/78

From H. L. Leclare

Dear Sir:

In an account of an interview had with you—published in the "World"—the Reporter states that you have a preparation which will instantly stop pain. He gives the ingredients but not the proportions. My wife has suffered greatly for years with pains in the back & Doctor after Doctor has failed to give her relief. Believing, with the rest of the world, that whatever you do is a success, I write this to beg of you to inform me how or where I can get a bottle of this preparation. Of course I am aware that you are not a vendor of medicine, but on the other hand, the chance of benefitting my wife makes me run the risk of being considered impertinent. If you can, without inconvenience, give me the information asked for you will greatly oblige. Yours most Respectfully

H. L. Leclare

(The reporter made a mistatement in regard to curing all pains. It relieves neurologic pains etc=)

1 oz alcohol
2 oz Chloroform
1 oz Chloral Hydrate
1 oz Camphor Gum
1 oz Sulphuric Ether
8 grains Sulphate Morphine
1 drachm Oil Cassia
1 " " Cloves.

Apply externally. Do not take it inwardly)

ALS, NJWOE, DF (TAEM 19:347). Edison wrote "over" and then drafted his reply on the other side of the letter. Underlined twice.


2. The reporter was probably a Mr. Babcock, who was introduced by an 18 March letter to Edison from John Speed, editor of the New York World. DF (TAEM 17:29).

3. After briefly describing the vast range of chemicals kept in the Menlo Park laboratory, the World reporter asked "What is the idea of your keeping a wholesale drug-store here, Mr. Edison?" Edison replied, "I keep all these things, because I don't know how soon I may need
them. Whenever I see a new chemical or drug announced I buy it, no matter what it costs." He then described "a bottle containing a clear, straw-colored liquid" as "composed of morphine, chloral-hydrate, chloroform, nitrate of amyle, cassia and cloves. Those things have no chemical action on each other, and they'll stop any kind of pain immediately."

By the time a group of reporters visited from Boston on 22 May, Edison had labeled the preparation in the bottle "Polyform" (clipping from the *Boston Evening Transcript* of 23 May 1878 enclosed with George Chapman to TAE, 10 June 1878, DF [TAEM 19:365]). Edison and his assistants tried other words—polyanodyne, polypharmakon, and polymorph—as part of a general effort to find Greek-based names for several of his inventions (see Doc. 1303).

4. Edison freely provided recipes for the mixture; see other letters in 78-033, DF (TAEM 19:345). He did not file a patent application for it until 1879 and no U.S. patent issued (Serial No. 2,206, 8 Sept. 1879, "Medicinal Preparation" in "Abstract of Edison's Abandoned Applications," p. 12, PS [TAEM 8:539]). In 1880 a British patent (No. 599) was issued to William Lake, as Edison's agent. For a discussion of nineteenth-century patent medicines see Young 1961.

5. Unidentified.

6. Edison stated in his British patent that the preparation was a combination of "all of the most powerful chemical compounds which act anaesthetically," dissolved in "menstruums which are also anaesthetics" (alcohol, ether, and chloroform), all subject to the limitation that they "have no chemical action upon each other." Edison's list of ingredients and proportions here omits the amyl nitrate mentioned in the news account (see note 3) and differs from those in the British patent and elsewhere. The formulas in the U.S. and British patent applications are in agreement except for 3 pennyweights of opium included in the former, which was mentioned in the preliminary version of the latter but dropped from the final specification. The ingredients from the British patent are: "One ounce of hydrate of chloral, four ounces of alcohol, two ounces of chloroform, two ounces of camphor, two minimis of oil of peppermint, two minimis of oil of cloves, three pennyweights of salicylic acid, three pennyweights of nitrate amyl, two pennyweights of morphia sulphate, two ounces of ether." Brit. Pat. 599 (1880); W. H. Hayward to TAE, 9 July 1878, DF (TAEM 19:375); Serial No. 2,206, 8 Sept. 1879, "Medicinal Preparation" in "Abstract of Edison's Abandoned Applications," p. 12, PS (TAEM 8:539).

7. A fluid ounce equals 29.76 ml.
8. A grain is 1/480 troy ounce, i.e., 0.06479 g.
9. A drachm (or dram) equals 60 minimis (drops) or 1/8 fluid ounce, i.e., 3.72 ml.

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*From George Bliss*

Chicago Apr 13th 1878

Dear Sir:

I send you a dozen copies of the Tribune as requested.¹

The Mania has broken out this way—School-girls write

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*From George Bliss*

March–April 1878 229
compositions on Edison: The funny papers publish squibs on Edison: The religious papers write editorials on Edison: The daily papers write up his life: The Rev. Woodbury is writing a magazine article on Edison &c &c

When shall we get a visit? Respose

Geo. H. Bliss  G.M.

Why don't the Graphic fill up exclusively with Edison and done with?


1. Bliss's biographical essay on Edison had appeared in the 8 April Chicago Tribune. See App. 3.
3. Neither the clergyman nor the magazine has been identified.

Technical Note: Electric Lighting

Electric Light

[Menlo Park,] April 14, 1878

(Regulating by Tasimeter principle.)

March–April 1878  230
1. This technical note and another dated 12 May containing obscure designs are the only indication that Edison worked on electric lighting between the fall of 1877 and the summer of 1878. Several items dated January 1878 are actually from 1879 and are related to U.S. Patent 224,329, which Edison executed on 23 January 1879 (Vol. 16:1-5, Lab. [TAEM 3:227]). For Edison's 1877 work on electric lighting see Docs. 1044, 1048, 1078, 1098, and 1136.

2. Edison was thinking of using his newly discovered tasimeter principle to regulate the current in incandescent lighting elements in order to prevent their destruction from overheating. At the right of the top drawing the lighting elements are shown as coiled metal wire (probably platinum). As the elements heated and the temperature in the lamp increased, a rubber rod (the vertical piece in the middle of the drawing) expanded and pushed down on the horizontal pivoted lever, thus reducing the pressure on the carbon button at the left. As the pressure decreased, the carbon's resistance increased which reduced the current flow and allowed the lighting elements to cool. As they cooled, the process would reverse. In the other drawing the rubber rod is moved to the center of the carbon mount.

3. This explanatory note was added later by Edison; the term "tasimeter" was not used until June (see Docs. 1316 and 1329 n. 1). The first notice of the tasimeter principle appears in the Washington Evening Star of 19 April where Edison stated:

Night before last I found out some additional points about the carbon which I use in my carbon telephone. It may be used as a heat measurer. It will detect one fifty-thousandth of a degree Fahrenheit. I don't know but what I can make an arrangement by which the heat of the stars will close the circuit at the proper time automatically, and directly. It is a curious idea that the heat of a star millions of miles away should close a circuit on this miserable little earth, isn't it? But I do not think that it is impossible. ["National Academy of Sciences," Cat. 1240, item 537, Batchelor (TAEM 94:71)]
In the following drawing, the expansion and contraction of the rubber rod, rather than changing the resistance of carbon, brings more or less resistance (the coils at top) in and out of the circuit. The text on this drawing ("platina") seems to indicate that the wire descending from the coils and possibly the coils themselves are platinum.

Washington, D.C. April 15 1878

Dear Mr Watson

Mr Smith is here. Says you should apply at once for a patent dispensing with the use of the rubber in the Edison Telephone—That you better make the Edison Telephone at once taking the Scribner article & description for your guide. That Edison cannot use his Telephone without infringing ours—nor we his provided he gets a patent—Mr Maynard has just called he heard the Edison Tel. in Philadelphia & did not think much of it altho—they thought it was the greatest instrument out. The advices I had speak in loud terms of it. I heard it two three weeks ago between different parts of Edison's factory & it was very loud & distinct—more clear & louder than any of ours, though no better—

Mr Smith agrees with me in saying you should lose no time in applying for a patent on your improvement—not as an original idea instrument but as an improvement—

You should spend your time experimenting & when we are reorganized, you shall be properly furnished with room & an assistant—We do not now get out of you, half you are worth—

I do hope you will improve your bells—I am yours truly

Gardiner G Hubbard

P.S. I enclose herewith trial balance please ask Mr. Devonshire if it is correct—


1. Thomas Watson had been a machinist at Charles Williams's Boston telegraph shop when he became Alexander Graham Bell's assistant on telephone experiments. In 1877 he became chief electrician and superintendent of manufacturing of the newly formed Bell Telephone Co. DAB, s.v. "Watson, Thomas Augustus."

2. Probably Chauncey Smith, counsel for the Bell Telephone Co. DAB, s.v. "Smith, Chauncy."

3. Hubbard had written Watson on 10 April:

I think you told me when I saw you last in Boston, that you had sometime since tried a Telephone, discarding the use of rubber
making it identical to the present telephone of Mr. Edison. If such is the fact, please apply for a patent at once as an improvement on the Bell Telephone & please also make a couple of telephones after this pattern that we may see how they work. [Box 1193, NJWAT]

On 17 April, Watson informed Hubbard that he had written out his patent specification and would send it with the model. Though he had been experimenting with an Edison-style carbon telephone for only a few days, Watson claimed in a 12 April letter to Hubbard that he had experimented “with plumbago without rubber and have 2 witnesses of the fact... Sept or Oct 1877.” Both letters are in Box 1205, NJWAT; a copy of the specification is in General Manager Letterbook 1:386–88, NJWAT; see also Doc. 1302.

5. George Maynard was the Washington, D.C., agent for the Bell Telephone Co. Later in the year, Uriah Painter asked him to file Edison’s patent specifications for the phonomotor. Maynard to TAE, 16 Sept. 1878, DF (TAEM 16:55).
6. Balance not found. Devonshire has not been identified, but was apparently a clerk at Bell Telephone Co.

April 16, 1878
Washington D.C.

Thos. A. Edison

National Academy of Science invites you to attend its meeting and exhibit your Phonograph and Telephone on Wednesday or Thursday next. Please answer if you can come

Jos. S. Henry, President Academy of Science

Menlo Park NJ 8:22 PM

Prof Jos Henry

I will come if possible but will send assistant with apparatus at all events

T A Edison

L (telegrams), NJWOE, DF (TAEM 15:530) and JHP, Both on Western Union Telegraph Co. message form.

1. Joseph Henry was director of the Smithsonian Institution and one of the elder statesmen of American science. His major research concerned electromagnetism. DSB, s.v. “Henry, Joseph.”
2. Henry wired Edison the next day: “Telegram received shall be happy to see you” (DF [TAEM 15:530]). On the afternoon of 18 April, Edison and Batchelor demonstrated the phonograph and carbon telephone to the National Academy meeting at the Smithsonian Institution (see Doc. 1299). George Barker had written Johnson on 6 April that he wanted to borrow a phonograph “to show it to some friends here and also to present it before the National Academy of Science at Washing-
ton week after next” (DF [TAEM 15:472]). According to the Washington Press and Union, Barker introduced Edison and described the machines and their development (“Genius Before Science,” Cat. 1240, item 535, Batchelor [TAEM 94:170]). On the National Academy of Sciences see TAEB 2:238 n. 2.

-1292-

MENLO PARK, N.J. April 16 ’78

FROM THE LABORATORY OF

T. A. EDISON.

MENLO PARK, N. J.

U. S. A.

high tone

U.H.P.

Your letter came late= That was a fearful “pictur” I sent your point to E.H.J. I expect come down Thursday= Will fix up that 5 per cent contract then. This is the last of 52 letters I’ve written tonight besides having sent 23 to E.H.J to answer this morning. 103 letters was the biggest mail in one day— Its getting too thin=

Edison

Autographs & Begging letters commencing to come in

My god how they little suspect

ALS, PFi, UHP. "Place from Edison’s laboratory handstamp.

1. Edison had just begun using the new laboratory handstamp.

2. Edison is referring to his portrait that had appeared in the 10 April New York Daily Graphic article “The Wizard of Menlo Park” (p. 281). The photograph on which the engraving was based is classification #14.910/8 (neg. 61216), NjWOE. Cat. 1240, item 500, Batchelor (TAEM 94:158).

3. On 10 April, Edward Johnson had written Edison, “Please oblige me by sending Painter one of your good Points for his Phono. I get them by filing as you directed but can’t get them made so as to work ok for me.” DF (TAEM 15:492).

4. See Doc. 1190 addendum.

5. A few begging letters and autograph requests that Edison answered are in folder 78-002 in TAEM reels 15 and 16; unfilmed begging letters are in folder 78-002 and unfilmed autograph letters are in folder 78-006, both DF, NjWOE. Edison continued to receive such letters throughout his life.

-1293-

[Menlo Park.] April 16th [187]8

Dear Jim,

Yours to Edison I hasten to answer.¹ Dont leave them till you have satisfied them in every respect and get as much ex-

March—April 1878 234
perimenting as you can for your own information. As regards
Edmonds we can not give him a Phonograph as it is in the
hands of the Stereosopic Co. of Cheapside London, but you
can do any thing you can for him as regards exhibiting yours.¹
You must go to Paris and put up the telephones in the Exhibition
for Puskas. Glad you have got over first difficulty all right.
Had a glorious exhibition of Phonograph at Barker’s lecture
at Academy of Music at Philadelphia last night² I showed it;
and I go to Washington tomorrow to shew it to Prof Henry
at Academy of Sciences. Ellen is well and all O.K. you need
not worry about her We will take care of her. After you have
put up the telephones at Paris you must wait till I send
you the two clockwork Phonograph’s which I am making.
Have sent you lots of Papers and send you two more of Phila-
delphia Academy last night.

I have written Ellen tonight to let her know what you are
doing³ Yours in friendship

Chas Batchelor.

ALS (letterpress copy), NjWOE, Batchelor, Cat. 1238:265 (TAEM
93:190).

1. Not found.

2. See Doc. 1249. Henry Edmunds had written Edison on 2 April
that he was “much surprised” that Adams had not brought a phonog-
raph for him as he had expected. He again requested a phonograph
and also asked Edison to “put something else in my way as soon as you
have something good—for I am sure I can introduce here for you in the
best manner—both among scientific & business men.” He also asked if
Edison had done any work on electric lighting as “that is a subject of
great importance just now.” DF (TAEM 15:450).

3. Philadelphia newspapers carried enthusiastic reviews of the event,
for which the Academy of Music had been “crowded to its utmost ca-
pacity.” Over the course of two and one-half hours, Barker lectured on
the physics of sound and received music and speech via telephone from
Menlo Park. Batchelor also demonstrated the phonograph, which “was
applauded again and again,” causing him to repeat the experiment. The
Press noted that speech received on the telephone was quite soft and
“not a brilliant success” but still considered the evening a “delightfully
unconventional and scientifically successful demonstration of the won-
ders of the telephone.” “The Telephone,” Philadelphia Inquirer, and “A
Talk on the Telephone,” Philadelphia Press, both 16 Apr. 1878, Cat.
1240, items 527–28, Batchelor (TAEM 94:168); advertisement, Cat.

4. Not found.

March–April 1878 235
Newark April 17th 1878

Dear Sir,

I am in receipt of your telegram, but I wish to see you. I have taken out a landlord’s warrant on all of the machinery in Murray’s place, as you have not renewed your chattel mortgage; you will plainly see that I can sell all the machinery or enough to satisfy my claim. I have not received a dollar in seventeen months from Murray with the exception of the two hundred dollars check which you gave this month and yet I am not disposed to sell him out if I can make some of the payment of what is due to me. I have waited patiently for it and as I am now secure I do not wish to run any risk and relinquish my claim for the moment I lift my lien your chattel mortgage is good again. I think it would be very much to your advantage to pay me and save your mortgage. I have no confidence in Murray paying those notes, and will not relinquish my claim without collateral security. It is for your sake that I hold up for the present. If I don’t hear from you or see you I shall sell at once. I will meet you on the cars,—at New York—or at Menlo Park at any time you will state by sending me word when and where. Please pay attention to this as I am tired of waiting and want my money. Very Truly Yours &c

Wm H Kirk

ALS, NjWOE, DF (TAEM 15:531).

1. This same day Edison had telegraphed, “Is not my proposition satisfactory. I assure you that you will be paid.” What Edison had suggested is not known. DF (TAEM 15:534).

2. A landlord’s warrant provided authorization to seize a tenant’s personal property in order to compel payment of back rent and, if necessary, to sell it. Black 1968, s.v. “Landlord’s Warrant.”


4. Edison evidently remained a silent financial partner in Murray’s business. The full extent of his involvement is unclear. See Docs. 1108 and 1113.

5. This same day Murray telegraphed Edison “please come see Kirk or he will sell us out he talks well but wants to meet you send me dispatch and I will pay for it as it will quiet him.” DF (TAEM 15:533).

6. Edison had written a $200 check, which Murray acknowledged on 6 April as a loan “to be Returned as soon as possible.” Murray to TAE, DF (TAEM 17:599).

7. William Kirk was a Newark builder and landlord. See Doc. 157.
Thomas Sanders to Gardiner Hubbard

Boston April 18, 1878

Dear Mr. Hubbard,

Mr. Watson thinks it extremely important that we secure Edison's claims to improvement on Telephone or his Telephone if it is really original.

His experiments this morning convinced him that it was a good instrument being very loud and distinct.¹

You know what steps to take in the matter, we all advocate getting possession of the invention if we can on reasonable terms. Mr. Bradley on the part of the NE² is equally desirous.

I hope you have made such arrangements with Mr. Bradley as will be acceptable to all parties in interest—Time is precious. Yrs truly in haste.

Thomas Sanders—³

ALS, NjWAT, Box 1193. Letterhead of Bell Telephone Co. "Boston" and "187" preprinted.

1. On 17 April, Watson had reported to Hubbard:

   In my experiments to day I succeeded in producing excellent results with the Carbon Telephone and although my apparatus was rough I got articulation twice as loud as the loudest I have ever got from our instruments and perfectly distinct.

   I have written out my specification for the improvement which I will mail you tomorrow afternoon with the model. I send it to you so that you can look it over and bring it to Pollok's notice. I think it very important we should control the Carbon patent. Is it possible?

2. George Bradley of the New England Telephone Co.

3. Thomas Sanders was a wealthy Massachusetts merchant who, with Gardiner Hubbard, had formed the Bell Patent Association in 1875. At this time he was treasurer of the Bell Telephone Co., a position he held until 1879. DAB, s.v. "Sanders, Thomas."

Gardiner Hubbard to Thomas Sanders

[April 18, 1878]¹

I am in receipt of your favor of this date relating to Mr. Edison's new patent Telephone. I understand from Mr. Edison that by his contract with the West. Union Tel. Co.—It has the refusal of his inventions relating to Telegraphy either at such prices Mr. Edison may fix or if that is thought too high then at an appointed value—That subject to this agreement he is at full liberty to sell his inventions to any other party, to negotiate with any other party in regards to these inventions.⁶

Mr. Edison I know does not intend to infringe any of Mr. Bells patents, & as I understand from you this present Tele-
phone is not an infringement; in that case & if it will work as well as your letter states I desire to purchase his invention for the Bell Tel. Co. in case the Western Union do not take it— I am prepared to offer him not less than ten twelve thousand dollars a year & a royalty on every Telephone made under his patents or an interest in our Co. I think we can afford to give more than other party in consequence of our command of the business of Telephones


1. This is an answer to Doc. 1295.
2. The changes made in this letter suggest that Hubbard may have shown it to Edison; the word "twelve" appears to be in Edison’s hand.

WASHINGTON, D.C. Apr 22 1878

From Uriah Painter

My Dr E—

How little any of us know what the morrow will bring forth! Orton had many good qualities & was a giant among pigmies at Bdw & Dey St. When he was Orton he was a kind hearted man & if he had not been worn down by the hungry stockholders would have been a different man— Now that he is gone the Prescott ring will rule. Your only friend is gone, your enemies are now rulers & it is very fortunate that your Tel'-phone was not bought—now you are free to get its value. The pecuniary sacrifice which you felt like making to help Orton need not now be done— Now you can do whatever is best for the Edisons & live up to your contract—

The Photos are excellent— I will send you specimens to-morrow— Brady is willing to copyright them & put on the market & pay a per cent on his sales— I will try for ¼ & promise him that you will not sit for any other Photographer while he makes their a sale a success— I think a good many can be sold

I got 3 applications today to show Phono for Churches &c! Yrs

U H Painter


1. Painter is referring to Western Union headquarters. William Orton died around six o’clock on the morning of 22 April. On hearing the news, Edison is reported to have exclaimed, "If I get to love a man he

2. Painter had tried to forestall Edison's negotiations with Western Union. Shortly before Orton's death, he asked Edison “are you going to be skinned by WU?” and warned that “They say you are 'Their meat.'” Painter to TAE, 11 Apr. 1878, DF (TAEM 15:504).

3. While Edison was in Washington, he sat with a phonograph for formal photographic portraits at Mathew Brady's gallery; the photographer was Levin Handy. Four poses are known. A widely-reproduced one shows Edison seated at a table to the right of the machine, his hand on its crank (see Doc. 1308 n. 1). Edison is posed similarly in the other portraits. In one, also republished frequently, Charles Batchelor and Uriah Painter stand behind the phonograph, the former in the middle of the picture. In another only Batchelor appears with Edison. A second view of Edison and the phonograph alone, with his position very slightly shifted and without a decorative backdrop, has also been reproduced. Painter enclosed the photographs in a 23 April letter to Edison in which he indicated that he had arranged for more plates to be completed the following day. In a 1 May letter Painter stated he would send that evening a copy of a stereoscopic version of one of the pictures, which has not been found. Photographs 14.650/1, 14.651/2, 14.651/1 (Neg. Nos. 7001, 06424, 6521B), NJWOE; Jehl 1937-41, 157; DF (TAEM 15:546, 585).


This Brady studio photograph shows Uriah Painter and Charles Batchelor with Edison and the phonograph demonstrated in Washington in April 1878.
Dear Sir:

I was very much pleased to learn through an interview with you published in the "Evening Star" of this city on Friday last\(^1\) that you had invented an improved ear trumpet which I regard as one of the best of your many useful & wonderful inventions—

As I am myself quite deaf I am deeply interested in this invention and I am anxious to learn more of it.

Will you be pleased to give me a more detailed description as to size portability &c and whether you would undertake the manufacture of one for me at an early day & what would be the probable cost? An early answer will greatly oblige

Very truly yours,

Jas W. Somers\(^1\)

My deafness is of course not entire I hear thru an ordinary tube quite well— But cannot hear lectures &c

A friend of mine here also desire one—

(Dear Sir— I stated to the Star reporter that I had constructed & used such an apparatus to enable me to hear theatrical plays but that it would be generally impracticable owing to cumbersomeness; I am going to work soon on an apparatus to accomplish the object in a practical manner & if successful you will learn of it through the papers)\(^4\)

ALS, NJWOE, DF (TAEM 15:34). \(^{-1}\)Followed by "over" to indicate page turn.

1. In the interview, which followed an account of his phonograph demonstration to the National Academy of Sciences, Edison stated, "I have invented an instrument, a sort of improved ear trumpet, with a large air chamber, and a tube which gradually decreases in size, whose end is inserted in the ear, with which I can hear perfectly well. I sat as an experiment once as far back in the theater as I could get, and yet I heard with perfect distinctness." "National Academy of Sciences," Washington Evening Star, 19 Apr. 1878, Cat. 1240, item 537, Batchelor (TAEM 94:171).

2. Somers's inquiry is one of many that Edison received about hearing aids following the Star interview and subsequent press reports of his work on such a device. In a 10 May letter to an "acquaintance in Chicago" which appeared in an undated newspaper clipping Edison stated: "The many letters that I have received on the subject of an apparatus for the deaf has convinced me that the demand would be enormous. So I have put two of my most skilful assistants at work testing my ideas. I feel sure that I will produce a practical apparatus within six months" (Cat. 1240, item 598, Batchelor [TAEM 94:197]). By the end of May, Edison had printed a circular to answer the continuing stream of inquiries. Two copies of this circular, copied by electric pen and headed "The Megaphone," are in UHP; they were sent to Uriah Painter.
in July because Stockton Griffin had indicated on each that Painter would have “sole control of the above invention” (Theo. Wing to Painter, 5 July 1878; A. W. McPherson to Painter, 13 July 1878; both UHP). Written by Griffin and signed by Edison, they read:

I have now two assistants engaged at my laboratory in experimenting upon an apparatus for the benefit of the deaf.

The results so far have been quite satisfactory and I hope soon to have a practical apparatus for introduction to the public.

The only drawback as yet is the large size of the apparatus.

I cannot at present say what the cost will be. Your letter will be filed for future reference.

Other letters of inquiry, some of which contain marginal notes for reply, can be found in 78-001, DF (TAEM 15:3). Descriptions of the device are in “Ears for the Deaf,” New York Daily Graphic, 5 June 1878, and “Edison’s Ear Telescope,” New York Sun, 9 June 1878 (Cat. 1240, items 645, 660, Batchelor [TAEM 94:221, 227]); see also Doc. 1361.

3. Somers wrote from the Mt. Vernon Seminary in Washington, D.C., and listed his address as 204 F St., NW.

4. On 24 April, Edison sent Somers a reply based on this marginal draft. Lbk. 3:222 (TAEM 28:677).
I tried to talk with Robinson\(^6\) of W.U. at 10th & Chestnut but it was perfectly horrible. I don't see how he ever expects to do any thing with such instruments as those. Edison & I have been 3 days in Washington and we showed both houses of Congress the Academy of Sciences, President Hayes and wife and many minor institutes the Phonograph and we worked telephone from Philadelphia and Menlo Park to Smithsonian Institute, Washington. Induction fearful but talking elegant.\(^7\)

I have better carbons now none of them having the gloss and I send you 50 as perhaps you may want to try some experiment \[and?\]^* leave with Puskas the rest. Our contracts with W.U. Tel. Co. are about complete but we have a telegram today that Orton is dead and if it affects us at all I will let you know. I don't think it will as there are other parties waiting ready to gobble it up if they show a disposition to throw us off. Edison had it all arranged for them\(^9\) to pay us our salaries every week guaranteed for 17 years but of course this may alter things a little. If you see Jack\(^8\) tonight or Brown\(^9\) get all the information you can out of them for the benefit of Edison you can.

Ellen is well and was at our house when I gave her your letter she wants a letter often even if you have nothing to say Annie\(^10\) is well & fat Mr Gallagher\(^11\) is working at Edison's house they sent for him probably he will be able to keep it longer than most of them.

Dont leave Paris or London for home\(^c\) before we send you word remember it is more important to find out everything than to rush home quick. I will look out for Ellen. Look out for things this week Yours

Chas Batchelor

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1. This letter was almost certainly written on 22 April, the day of William Orton's death.
2. Not found.
5. Amos Dolbear had visited Batchelor and Barker about 12 April while they were preparing for the lecture and told them that "he had made a pair of large magnets & worked between N.Y. & Boston." Batchelor memorandum, c. 12 Apr. 1878, DF (TAEM 15:517).
7. The demonstration of the telephone to the National Academy on 18 April consisted of Edison talking with Henry Bentley in Philadelphia. Barker also invited audience members to speak with Bentley, and
many of them reportedly did so. When the Academy resumed its normal sessions late in the afternoon the exhibition was moved to the Western Union building a few blocks away, where it continued until sundown. A Philadelphia paper explained that the induction reported by Batchelor was caused by the wires being bundled into cables across the Susquehanna and two smaller rivers. "Genius Before Science," Washington Post and Union, 19 Apr. 1878, Cat. 1240, item 535, Batchelor (TAEM 94:170); "Talking Through Space," Philadelphia Record, 20 Apr. 1878, Cat. 1029, Scrap. (TAEM 25:165).

The next morning Edison demonstrated the phonograph in a Senate committee room and again in a House room. According to news accounts, the Capitol exhibition lasted several hours and drew large crowds. Late that night he demonstrated it to President Hayes and others at the White House. "The Phonograph at the Capitol" and "National Academy of Sciences," both Washington Evening Star, 19 Apr. 1878, and "Astonished Congressmen," Baltimore Gazette, 20 Apr. 1878, Cat. 1240, items 537-38, Batchelor (TAEM 94:171-72); App. 1.027.

8. Jack Wright had assisted Edison with his English automatic telegraph experiments. See TAEB 1:595 n. 5.
9. James Brown had been Edison’s experimental assistant in 1872-73 and also assisted with the English automatic telegraph experiments. See TAEB 1:508 n. 2.
10. Unidentified; possibly a child.
11. Probably a house servant.

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From Grosvenor Lowrey

Philadelphia, April 23 1878

My dear Edison

I am here in attendance upon my poor wife who is seeking strength & courage for the great trial she must undergo on Saturday next.¹

I parted with Orton on Saturday evening:² & his last words to me were of you— I am sure it will gratify you to know that they were words of more than esteem, —of affection. Even in the times when we were differing³ he had always a warm place in his heart for you, among those few who were admitted to that inner place.

I am thankful for having known William Orton. I never yet heard from his lips a thought which was not upright, noble & just. I think he was incapable of a mean thought as he was of a wrong action. It is for those of us who must look to other things than pecuniary success for distinction to cherish the memory, & spread the repute of such a man as Orton; whose qualities of head & heart should outweigh⁴ all the money of Wall Street, in the esteem of intelligent men. As he spoke to me last of you, I write first to you of him. Truly Yours

G. P. Lowrey

¹ March-April 1878

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Grosvenor Lowrey, Western Union’s general counsel.

1. Lowrey had married Laura Tryon, daughter of New York merchant Francis Tryon, in 1862. She developed a cancer in 1876 that proved to be incurable. She died in August 1879. Taylor 1978, 18, 23.

2. 20 April.

3. Lowrey referred here primarily to the conflict over rights to Edison's inventions in quadruplex telegraphy. See TAEB 2, App. 3; cf. TAEB 3:289.

4. Grosvenor Lowrey had become Edison's attorney for Western Union-related patent matters in December 1875. He was the company's general counsel, and his law firm—Porter, Lowrey, Soren, and Stone—served as its legal department. See TAEB 2:696 n. 2.

-1301-

From George Nottage

LONDON E.C. April 24th 1878

Dear Mr. Edison

I duly received the Deeds & your letter of the 23rd Ulto. & a Magazine and Newspaper since, for which accept my thanks. There was something I ought to have had but only received the cover. Perhaps it would be as well in future to tie the publication round with twine & write on it, instead of on a paper wrapper.

Disclaimers

It's very important you should settle these, as if any claims are bad they affect the Phono part of the patent equally with the other. Mr Preece thinks with myself that this is most essential so I hope you will give your Solicitor instructions immediately.

Improvements

It is also very important you should secure these or we shall be having persons taking out Patents here for the improvements you have already invented in America which will preclude our using them—

Plate Machine

I quite appreciate what you say upon this & that it would be very unwise to bring it out prematurely. I shall be glad to receive the 2nd Instrument you promise.

Clock

I shall be glad to get this so that we may send over orders for them—I do not think they need trouble themselves about excessive cheapness for a Novel article like this, we can come to cheapness afterwards. This remark will also apply to Toys—any one of which I shall be glad to see.

Instruments

March-April 1878 244
I was about cabling to you to send over 200 immediately, but Mr Puska advised me to wait till he got a manufacturer in Paris to produce them— I am waiting to be satisfied that the manufacturer can produce the right article when I shall immediately order. Mr Puska informs me that he shall get a very superior article, many parts in Nickel Silver for $8— or 2 Dollars each more & that the manufacturer can produce several hundreds in 3 weeks from date of order— In the meantime I have had a machine made with Clockwork, which was yesterday exhibited at the Crystal Palace & I shall send it elsewhere & the Lecturers wherever they shew the Instruments will take orders for the smaller ones

If this turns out a success I shall be pleased to place a portion of the results to your credit

If the Instruments were sold outright at the present moment each purchaser could adopt this course, but would not obtain orders. I am afraid Mr Puska is too fierce & litigious in his disposition for me to work with him satisfactorily, & as at present our relations are direct—with you & I hope they will continue so, If he be constituted your representative here & you give up your power to him I feel sure things will not work harmoniously or profitably—I have said this, because I think I heard something about his asking for a "Power of Attorney" from you— I must ask you to regard this portion of my letter as perfectly private & confidential

Trusting you will not overwork your Brain & hoping soon to hear from you I am Dear Mr Edison Yours faithfully

George S Nottage

""Trusting . . . George S. Nottage" written by Nottage.

1. See Doc. 1265.

2. Charles Batchelor kept a running list of press reports to be sent to various correspondents. He planned to mail Nottage copies of the April issues of *Scribler's Monthly* and *Popular Science Monthly*, containing articles by George Prescott and Alfred Mayer, respectively. He also planned to send the 18 March *Cincinnati Commercial*, which carried a biographical sketch of Edison provided by Edward Gilliland. The listed items have been crossed out and the one for *Popular Science* is also marked "OK." Cat. 1308:57-58, Batchelor (TAEM 90:695-96).

3. The *London Daily News* of 20 April provided an account of the London Stereoscopic Company's exhibition and indicated that A. Stroh had devised the clockwork arrangement. See Doc. 1310 nn. 3 and 5.

4. See Doc. 1237 n. 1.
Dear Mr. Watson,

I have given the model for the Carbon specification to Mr. Pollok,¹ and asked him to attend to it.

In the Carbon Telephone of Mr. Edison, the carbon is not over ¼ inch thick.

We broke the carbon in the telephone we have into little pieces by accident & still it worked tolerably well.

It is idle to undertake to divert Mr. Edison's attention from the telephone, as it is exciting almost as much interest among telegraphers at present as the phonograph.²

He has ten or twelve men at work in his factory—about 8 on the phonograph & the others on the Telephone.³ He has two or three assistants, each of whom have a partial interest in every invention he makes.

The small phonographs as you say are a failure.

We shall not sell any of them. I wish you could work upon them, but am afraid you have enough to do.⁴ Yours Truly

Gardiner G. Hubbard


¹ Watson had mailed the model on 20 April (Watson to Hubbard, 20 Apr. 1878, Box 1205, NjWAT). The application (see Doc. 1290 n. 3) was filed on 25 April, and after significant modification was finally granted as U.S. Patent 245,105 on 2 August 1881.

² In his 20 April letter to Hubbard (see note 1), Watson suggested that “It would be well to divert Edison's attention from the Telephone if possible. Perhaps it could be done by telling him how much more interest the Phonograph & Airophone is exciting throughout the world than the Telephone did etc. etc.” Hubbard's reply marks a change from earlier assurances that “we need [not] fear any danger from Mr. Edison, for he is working right along with us, & thinks of nothing but the Phonograph” (Hubbard to Charles Bradley, 22 Mar. 1878, Box 1205, NjWAT).

³ Hubbard had visited Menlo Park on 23 March (see Doc. 1261 n. 2).

⁴ Watson reported in his 20 April letter (see note 1):

I have received a Phonograph and after some alterations I have made it work indifferently well, as received it would not work at all. If it had gone to any one who was not a mechanic and had no tools it would have done the Phonograph Co great injury. I wish I had time to make them. I think I could do better than the present makers, but that is entirely out of the question, as matters are at present.

In a letter of the same day to Sigmund Bergmann, Charles Batchelor wrote:
I saw one of your first Phonographs in Washington and I must say it was anything but good workmanship as the shaft had a least \( \frac{1}{16} \) of an inch play in the bearings such machines cannot be worked by inexperienced hands and I had the greatest difficulty to make it work myself. [Cat. 1238:267, Batchelor (TAEM 93:191)]

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To D. Van Nostrand

Menlo Park Apr 25, 1878

Gents

Please send an Etymological Glossary of nearly 2500 English words in common use derived from the Greek\(^2\) by Edward Jacob Boyce MA. Rector of Houghton Hants. London, Geo Bell & Sons York St Convent Garden 1878 Yours truly

T A Edison per Carman

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From William Crockett

New York, April 25—1878.

Dear Mr. Edison:

Hurrah! Your name has gone abroad among all nations—Yea, Verily! Every paper I take up is full of you—not less than
190,547 columns in American newspapers every day. Did you see my Cincinnati Commercial article?¹

I want to get another little illustration from you for the Graphic if you will come in sometime, as soon as possible (when next in town.) (41 Park Place.)

I am delighted to state that the little phono. works beautifully. I received some friends out at Montclair last Friday evening, & others up at Birmingham, Conn., (at my father's) on Sat. evening, (not less than a hundred, filling three parlors) and they all heard it & were much delighted.

The letters you wrote me have attracted as much attention as anything else & are greatly admired.² (It is in connection with that your writing that I want the additional illustration.)

I hope you will be able to spare the machine without much inconvenience, as it is giving great amusement. Most Cordially Yrs

W. A. Croffut

I copy something about you almost every day=


1. Probably "Edison, the Magician," Cincinnati Commercial, 1 Apr. 1878, Cat. 1031:94, Scraps. (TAEM 27:790).
2. Montclair, N.J.
3. Doc. 1282 was one; no others have been found.

Dr Sir

I am informed that by granting permission to exhibit the Phonograph at a Jersey City Sabbath School free of charge—I can promote the interests of a sabbath school at Menlo Park in which Mrs Edison is interested¹ In such case It gives me pleasure to extend the permission on behalf of the "Edison Speaking Phonograph Co"² Yours Very Truly

E. H. Johnson Gen Agt


1. Nothing further is known about these Sunday schools.
2. Although the company had been operating for some time, and adopted by-laws on 20 April, it had only just come into legal existence. Following extensive debate among the original investors in Edison's
phonograph patents concerning which state's laws would be most advantageous for them to operate under, the company was incorporated at Norwalk, Conn., on 24 April and the papers filed the following day. None of the incorporators were parties to the original agreement with Edison (Doc. 1190), though William Applebaugh, who was listed as company president, had been a witness to that agreement. The other incorporators were William Hayward (the only one with a Connecticut residence), Timothy Cornwell and Willard Candee (apparently assistants of some sort to Applebaugh and Charles Cheever, respectively), and Anthony Gref, Jr. (a clerk or secretary for Cheever). Their combined stock represented about one-tenth of one per cent of the nominal capital. Certificate of incorporation, articles of association, and by-laws of the Edison Speaking Phonograph Co., all DF (TAEM 19:62; 51:771-72).

Newark, N.J., April 29th 1878

Sir

Newark Bord of Trade & Several other Gentlemen friends will visit your laboratory on Thursday May 2nd at 3—Oclock on especial car and will be pleased to see you¹ Hon W. H. Kirk will be one of the party. do pray for him on Phonograph on that occasion as he needs it very much— oblige Yours truly

J T Murray

many thanks for the notes & check² he dont want machinery moved till notes are paid but will make Rent $360 per year with Power³


¹. On 25 April, Murray had written Edison that "several of the first citizens of Newark" had asked him to arrange a visit to see Edison's laboratory and "the Great Ex Newarker who they all seem delighted with" (DF [TAEM 15:554]). One hundred thirty-four members of Newark's Essex Club visited Menlo Park on 2 May. Afterwards, Murray reported to Edison that the "visitors were delighted with your entertainment and several of them came to me and asked me if you could be induced to return to Newark" (Murray to TAE, 3 May 1878, DF [TAEM 15:602]). Accounts of the visit appeared in the Newark newspapers the following day ("Edison's Phonograph," Newark Daily Journal; "A Call upon the Phonograph," Newark Daily Advertiser; "Edison's Machine," Newark Morning Register, Cat. 1240, items 572, 574-75, Batchelor [TAEM 94:191-92]).

². Edison gave Murray a $250 check for rent on 26 April. In a 4 May summary of his debts Murray also acknowledged Edison's notes to William Kirk for one, two, and three months. Murray calculated that Edison had loaned him $1,100 to pay the landlord, who, he reported, was
"determined to have it— after all the rent he received from us I sup-posed he would be easy with me." He also asked whether Edison had "any work for me to do I should like it I am near busted" (Murray to TAE, 4 May 1878; see also bank notes and related correspondence, all DF [TAEM 15:604, 17:601-9]). A list of Edison's notes to William Kirk is in Cat. 1185:376, Accts. (TAEM 22:703).

[Menlo Park,] April 29th 1878

Is the sound on the telephone receiver produced by rarefaction and condensation, or by vibration of the diaphragm?¹

Experiments to find out something definite in regard to the above:

1. This experiment was the placing a telephone receiver on the mouthpiece of the phonograph from which with our loudest talking we could not get an indent on the tinfoil.

2. I took the spool and core out of receiver and also mouth-piece out of the phonograph, and then fixed the core and spool so that it acted directly on diaphragm of phonograph the core only being \( \frac{1}{8} \) of an inch away from it with this device we could not get anything at all. This shows that the indents (if any are made by vibration) are infinitely smaller than those produced by the music box² although you cannot detect even them with a magnifying glass of ordinary power. It may be that the action of the magnet core had something to do with the dampening of the diaphragm so as not to leave it free to work.

Chas Batchelor

X, NJWOE, Batchelor, Cat. 1317:57 (TAEM 90:685). Written by Batchelor. "we could not" repeated on next line following drawing.

¹. See Doc. 1251 n. 3.
². In a February experiment Batchelor had used a music box to show that indentations small enough to be visible only under a microscope could generate recognizable sounds. See Doc. 1188 n. 2.

My Dr E

I enclose you two more Photo's— How do you like them?²
I have promised Brady that you will not sit to anyone else at

From Uriah Painter

March–April 1878
present & give him a chance to keep poor pictures out of the market! He sends 50 to Johnson to-morrow & 50 more daily for few days. I can secure you a royalty of 25 per cent on their sale which will count up fast. If you don’t let others ‘take’ you— one man estimates 100,000 will be sold this summer— I am going to ship lot to London & Paris in few days.

We put the Phonograph into stock Company Saturday at $600,000. You get $30,000 of it, & we have an order application for some of it at 50 cents on dollar. If the stock is going to be good your receipts will be immense!

We expect to arrange for 1000 public exhibitions in next 90 days! It grows daily! I sat by Charles Dana Saturday night in Johnson’s show & helped fill him up! He has it now bad! Is coming out to see you!!

Was sorry to miss you Saturday, was busy helping organize & push Phonograph business all day!

Brady was with Barnum on ‘Tom Thumb’ & made 150,000 photos for him of Tom! so you see he understands it— Will send you large one framed Wednesday.

I think the side one is superb. Johnson was very much pleased with it, says this is the first picture of Edison he has ever seen—

How is the telephone? Stager told me Saturday that Phelps has the big thing now! Beats all the rest— Loudest sound ever obtained— In a box! big magnet! big disk! big thing & more such rot!

There is no doubt but that Prescott ring are now dominant! Twombly was sat down on by all hands.

Got the extension you wanted this am— & so wired you—

Yrs

U. H. Painter

Did you see Sunday’s Herald? They fell into line!

ALS, NjWOE, DF (TAEM 15:575). 1 Cancelled. 2 Underlined twice. 3 Obscured overwritten letters. 4 Overwrites a ‘—.’

1. The only known Brady photographs are those mentioned in Doc. 1297 n. 3, though there may have been others. On 23 April, Painter had indicated that he was sending Edison two copies of the “best of all the plates” DF (TAEM 15:546).

2. In a 1 May letter to Edison, Painter reported that Brady had printed and was about to send 200 copies of one or more of the pictures to London and Paris (DF [TAEM 15:585]). Nothing further is known about the envisioned royalties from domestic or foreign photograph sales. However, an Edison Speaking Phonograph Co. circular issued by James Redpath to prospective exhibitors indicated that George May-
nard of Washington, D.C., could supply "photographs of Edison in different sizes, made by Brady." The circular also indicated that A. S. Seer, a New York "Dramatic Printer," had "a handsome Three Sheet Poster with a portrait of Edison, and attractive Window Cards, specially made for Phonographic Exhibitions" (UHP). It is not known if these were Brady photographs.

In late May, Redpath wrote Painter on behalf of the phonograph company to request that he take over the Brady photograph business, telling him that "you will do better in selling the photos than any one here because every one has more than they can do, not least all that they ought to attend to." The company proposed to send Painter a list of phonograph agents to assist his efforts. There is no evidence, however, of any subsequent effort by Painter or others to sell these photographs. Redpath to Painter, 23 May 1878, ESP Lbk. 2:74; Charles Cheever to Painter, 23 May 1878, ESP Lbk. 1:306-7; both UHP.

3. That Saturday was 27 April. Though Doc. 1190 only required a $50,000 investment, the new Edison Speaking Phonograph Co. had a capital stock of $600,000. However, only twenty-five shares at $25 per share (a total of $625) had been paid in at the time of incorporation (Edison Speaking Phonograph Co. certificate of incorporation, DF [TAEM 19:62]). For the disposition of the other 23,975 shares (with 1,200 for Edison and 4,400—the largest holding—for Painter) after the January partners formally signed their rights over to their corporation, see Charles Cheever to Gardiner Hubbard, 16 May 1878, Box 1205, NjWAT. The agreement among the five partners of 23 May 1878 and an undated memo showing phonograph stock shares are both in UHP.

4. Nothing is known of the prospective purchaser.

5. Johnson was exhibiting the phonograph nightly at artist William.
Kurtz's gallery on Madison Square and the Edison Speaking Phonograph Co. was planning to license exclusive exhibition territories throughout the United States. By mid-May the company was training eighty men who had each paid $100 for the right to exhibit the phonograph. They were to charge twenty-five cents admission for their exhibitions with the company getting twenty-five percent of the gross receipts. Edison got twenty percent of the net receipts of these exhibitions, which continued through October. He received a total of $1,031.91. Advertisement, Cat. 1031:91; "The Phonograph's Last Device," New York World, 17 May, Cat. 1029:68, both Scraps. (TAEM 27:789; 25:193); agreement between Ezra and Robert Gilliland and the Edison Speaking Phonograph Co., 31 May 1878, UHP; Edison Speaking Phonograph Co. royalty statement for December 1878, DF (TAEM 19:204); see also Docs. 1314 n. 4 and 1326.

6. Social philosopher Phineas T. Barnum was one of the most successful and innovative producers of popular entertainment in the nineteenth century, specializing in spectacles, hoaxes, and a circus. “General Tom Thumb” was the stage name of Charles Stratton, a midget who was a major attraction at Barnum’s American Museum in New York. DAB, s.vv. “Barnum, Phineas Taylor,” and “Stratton, Charles Sherwood.”

7. 1 May; no such photograph has been found.

8. Businessman Hamilton McKown Twombly was an investor and manager in many companies, primarily in the railroad industry. He married Florence Vanderbilt, daughter of William H. Vanderbilt, in 1877. After the death of Cornelius Vanderbilt the same year, Twombly was extensively involved with his father-in-law in the handling of that family’s fortunes, including its substantial ownership of Western Union, where both served on the Executive Committee. At this time Twombly was in charge of Western Union’s telephone business. Twombly’s middle name was often abbreviated as “McK.” and he was often referred to as “Hamilton McKay Twombly.” NCAB 30:17; Western Union 1877; TAEB 3, App. 1.G18.

9. Not found.

10. Painter is probably referring to the fact that on 28 April the New York Herald, like other newspapers on or near that date, devoted considerable space to reprinting and praising Edison’s article on “The Future of the Phonograph.” See Doc. 1283 n. 1.

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To Uriah Painter

MENLO PARK, N.J. April 30—78

U.H.P

I will not have any other photographs taken if Kurtz² does the right thing—am glad you are getting the Co organized on some basis. The W. U. have scooped me, but it will turn out right for us all. Prescott if he plays any shines on me may get tipped up. The phonograph I have here brings out everyone’s voice as well as mine so that removes a small weight from my mind. The electrotyping is a perfect success. Yours

T.A.E

March—April 1878 253
1. This appears to be an answer to Painter's letter of the same day (Doc. 1308).

2. Painter noted in a May reply that Edison meant the photographer Brady rather than the portraitist William Kurtz (DF [TAEM 15:585], Wilson 1878, 788). Kurtz had a gallery on Madison Square. He had written Edison on 20 April asking him to sit for "a large picture (Crayon) of you for my Gallery" (DF [TAEM 15:543]). Edison had replied the same day that he would call upon Kurtz at "the earliest opportunity." (Lbk. 3:218 [TAEM 28:673]). It is not known if he did so.

Technical Note:
Phonograph

Edison's Speaking Phonograph with clockwork and pendulum regulator.

MENLO PARK, N.J. April 30th 1878

March–April 1878 254
The top of this bearing for shaft is made adjustable sideways so that if the point on diaphragm is not quite opposite groove on cylinder by turning thumb nut x it will move the cylinder, shaft on top of bracket bodily sideways—

Chas Batchelor

X (copy), NJWOE, PS, Caveat Drawings (TAEM 8:897). Written by Charles Batchelor. Document is a tracing, probably made by William Carman. Place from Edison's laboratory handstamp. Paragraph connected by a line to “x” on drawing.

1. This document is on one of three sheets of tracings of draft drawings labeled “Caveat 80” by William Carman. Edison did not include the drawings from this document in his filed caveat (Doc. 1341), but did use detailed versions of them in his September patent application (Case 154, figs. 1 and 2). Another tracing, of 11 April drawings by Charles Batchelor, was probably also part of this group. Caveat Drawings, Patent Drawings, both PS (TAEM 8:898–99, 749); patent application, Case 154, DF (TAEM 18:747); Vol. 17:75, Lab. (TAEM 4:942).

2. This machine had been in the works for several weeks before Batchelor made these drawings. He had written on 16 April of making two clockwork-driven phonographs, at least one of which was completed by 19 May, TAE to New Jersey Steel and Iron Co., 29 Mar. and 3 Apr. 1878, Lbk. 1:478, 487 (TAEM 28:324, 332); Henry Davies to TAE, 6 Apr. 1878, DF (TAEM 18:975); Vol. 17:61, 63, 73, 75–76, 78–80, 82–83, Lab. (TAEM 4:927, 929, 940, 942–43, 945, 947, 949, 951–52); Docs. 1293, 1317, 1332; see also TAE to Clarence Blake, 21 May 1878, CJB.

3. Aside from the clockwork and the adjustable bearing (see note 6), this phonograph incorporated two significant improvements. First, instead of being glued, the ends of the foil were held in place by a metal bar pushed into a longitudinal groove. This design first appeared in a sketch of 19 March. Second, the bearing at the threaded end of the shaft (away from the clockwork) was designed to release the shaft so that the cylinder could be slid back to its starting position, rather than cranked.
backwards. This also showed up in the same 19 March sketch. The mechanism drawn there strongly resembles the release shown on the clockwork phonograph of the English instrument maker Augustus Stroh, which Stroh had built in February and which was illustrated in the 8 March issue of the English journal *Engineering*. Vol. 17:61, Lab. (TAEM 4:927); “The Phonograph,” *Engineering*, 8 Mar. 1878, Cat. 1240, item 449, Batchelor (TAEM 94:138).

**Augustus Stroh’s clockwork phonograph, from the 8 March issue of *Engineering*.**

4. Edison had intended to apply a clockwork to his cylinder phonograph since its inception and had succeeded to some extent in February (see Docs. 1147, 1153–54, 1174, 1199, 1200, and 1204 n. 3). The arrangement of the weight and chain, invented by Christiaan Huygens in 1660 and known as “Huygens’s maintaining principle,” was common on weight-driven machinery such as European Morse telegraph registers (Knight 1877, 569; “The Phonograph,” *Engineering*, 8 Mar. 1878, Cat. 1240, item 449, Batchelor [TAEM 94:140]; Prescott 1877, 484, 486). Batchelor had drawn it in 1874 (TAEB 2:292). It allowed the operator to wind up the weight without disturbing the running clockwork. The specific type of chain Edison wanted was not readily available and he had to have it made to order (TAE to New Jersey Steel and Iron Co., 29 Mar. and 3 Apr. 1878, Lbk. 1:478, 487 [TAEM 28:324, 332]; Henry Davies to TAE, 6 Apr. 1878, DF [TAEM 18:975]).

5. The pendulum, to the left of the hanging weight, is a conical (rather than oscillating) pendulum—that is, the weight moves circularly. At this time conical pendula were used in telescope drives and Hughes printing telegraphs (Knight 1877, 1661; Prescott 1877, 619, 628–29). Batchelor first drew a conical pendulum on 15 February. The design reappeared in a series of drawings beginning on 9 April and was included in Edison’s 29 May caveat (Doc. 1341, figs. 64–66) and his 16 September patent application Case 154 (Vol. 17:53, 66–67, 72–74, 76–77, 80, 82, 95, 103, 108, 114–15, Lab. [TAEM 4:920, 932–33, 938–41, 943–44, 949, 951, 964, 972, 975, 980–81]; Caveat Drawings, Patent Application Drawings, both PS [TAEM 8:808, 749]; patent application, Case 154, DF [TAEM 18:747]). Clockwork phonographs made in Eu-

**March—April 1878**

256
A weight-powered clock-work-driven tinfoil phonograph.

rope by Stroh and Edme Hardy employed fan governors rather than pendula. A representative Stroh phonograph is in the Science Museum, London (Inv. 1929-283); one made by Edme Hardy, now in the collection of the Musée National des Techniques, CNAM, Paris (Inv. 9364-0000), is pictured in Charbon 1981 (p. 64).