

New York, March 26th 79

From Reinmann &
Baetz

Dear Sir:

I like to call your attention once more ~~to~~ to the perfectness of the mercury, what you want to use with the air pump.¹ The best way, to clean and dry it, is, to put the mercury in a vessel, and mix it with good Plaster of Paris. Than pour it through a funnel from paper, with an opening of about $\frac{1}{2}$ to 1 m/m, continually^a and keep the last drops in the funnel. The mercury must be kept perfectly free from^a all metallic substances, otherwise the pump will be coated in very short time with moisty^a mercurial (metallic)^b parts. As it is a very difficult and dangerous job ~~to~~ clean^a and dry such a pump again, great care has to be taken especially with^b the first mercury used, so the rubber tube does not get wet.² One of us would rather like to come over to you once more, to get the instrument in right work. The mercury, what you had there, should have been washed with the Plaster of Paris anyway, as it showed some remainders in the pump already.

Enclosed please find our bill for \$48.00 for which your check is wellcome—³

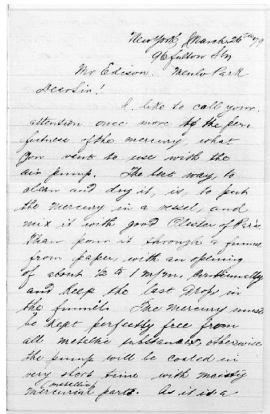
Awaiting Your further [---]^c commands, we remain
Very Rspfly

Reinmann & Baetz⁴

L, NjWoe, DF (TAEM 50:511; TAED D7925U). ^aObscured overwritten text. ^bInterlined above. ^cIllegible.

1. This was a Geissler vacuum pump, which Reinmann & Baetz had promised to deliver on this day. They also advised Edison to have about 25 pounds of mercury ready if he wished to try the instrument immediately. Machinist John Kruesi wrote an order on 28 March to have an "Iron pan made for Geissler Vacuum machine," which was probably to be placed under the pump to collect spilled mercury. Reinmann & Baetz to TAE, 25 Mar. 1879, DF (TAEM 50:510; TAED D7925T); Cat. 1308:127 (Order No. 82), Batchelor (TAEM 90:730; TAED MBN003:37).

2. A thin film of air would cling to the glass tubing under the best cir-

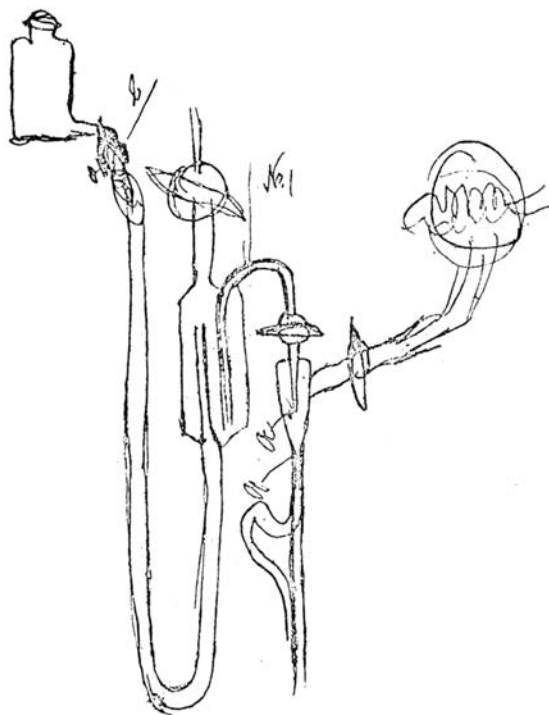


cumstances and the additional vapor pressure of contaminating moisture would seriously impair the pump's operation; see Doc. 1816. Thompson 1887, 588; Tilden 1919, 93–95.

The problem of water and mercury vapors in the pump was one addressed by the British chemist William Crookes, on whose techniques Edison made extensive notes about this time, and a number of whose publications were placed in a laboratory scrapbook devoted to the radiometer, vacuum pumps, and phenomena of high vacua (N-79-04-21:1–25, Lab. [*TAEM* 30:726–39; *TAED* No17:1–13]; Cat. 1050, *passim*, Scraps. [*TAEM* 26:394; *TAED* SM050]). Edison noted Crookes's observation that sulphuric acid used as a drying agent could itself evolve water vapor; however, as he had not yet started using a desiccant in his own pumps, he did not adopt Crookes's preference for phosphorous anhydride until later in the year (see Doc. 1816 n. 5). Edison drew on several of Crookes's publications (including Crookes 1873, 1876, 1876–77, and 1878a), summarizing a number of his techniques and observations relating to other chemical methods of reducing vapor pressure, Geissler spark tubes, and the preparation and operation of pumps. He later referred in passing to Crookes in the patent application executed on 28 January 1880 for his vacuum pump arrangement (U.S. Pat. 248,425). DeKosky 1983 provides a useful discussion of the apparatus and procedures developed by Crookes.

3. A. S. Reinmann offered to come to Menlo Park again on 28 March “to bring everything about the pump in right shape. There are few more

Edison's drawing of a combined Geissler and Sprengel vacuum pump.



little points, which I have to explain by experimenting with the pump.” Edison subsequently hired William Baetz to build additional pumps of the Geissler, Sprengel and other designs, which he did at Menlo Park and his New York shop. Reinmann & Baetz to TAE, 27 Mar., 7 and 19 Aug. 1879, all DF (*TAEM* 50:514, 532; *TAED* D7925W, D7925ZAK, D7925ZAL); Edison’s testimony, pp. 43–44, *Böhm v. Edison* (*TAED* W100DEDo32, images 12–13).

Edison later testified that shortly after receiving the Geissler pump he conceived the idea of combining its action with that of a Sprengel pump, to achieve the latter’s efficacy with the former’s rapidity as shown in a drawing he presented as evidence in the patent interference. He had Reinmann & Baetz build four or five of these instruments (*Böhm v. Edison* (pp. 43–44; Edison Exhibit No. 5 [*TAED* W100DEDo32, images 12–13; W100DEDo59E]). It is not clear if Edison’s payments to the firm of \$89.30 in April for “Mercury Pump & work” and \$23.00 in May for a “vacuum pump and attach[me]nt” were for Geissler or combination pumps (Electric Light Co. Statement Book, Accts. [*TAEM* 88:467, 474; *TAED* AB031:56, 61]).

4. This firm’s letterhead identified it as “Manufacturers of Chemical and Physical Glass Instruments” on Fulton Street in New York City. Reinmann & Baetz had repaired Edison’s mechanical vacuum pump in January (see Doc. 1667 n. 2).