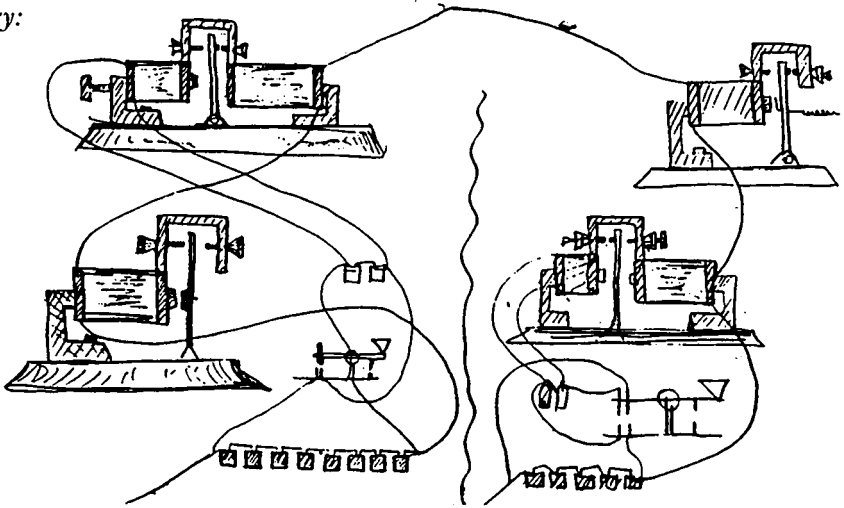


*Notebook Entry:
Multiple
Telegraphy¹*



AX, NjWOE, Lab., PN-69-08-08 (TAEM 6:770).

1. See headnote, pp. 29-32. This duplex design and that in Doc. 24 are the earliest extant evidence of Edison's work on multiple telegraphy. This arrangement uses a "differential" method, or more specifically a "compensation" method like that of the first successful duplex devised by the Austrian Wilhelm Gintl in 1853 (Schellen 1888, 779-85; Prescott 1877, 769-71). Most differential designs divided a single current rather than providing separate circuits for the opposing electromagnets (see Doc. 28). In Edison's design the opposing magnets are in separate circuits, operated simultaneously by a key. As a message is sent, each magnet of the transmitter's relay negates the effect of the other, but at the receiving end of the line nothing compensates for the effect of the incoming signal. Unlike normal American telegraph practice, the sounder each relay operates (not shown) thus responds to incoming signals but does not respond to outgoing ones. Edison rewired and used relays with opposed electromagnets, like those found in some repeaters (see Doc. 11; and Doc. 17, n. 1). The other relays (shown at the bottom left and top right of the drawing) and the different number of battery cells at each terminal probably represent an attempt (only partially successful) to provide transmitting operators with separate sounders that would respond only to outgoing signals, thus allowing senders to hear better what they were sending. Cf. Doc. 50, n. 3.

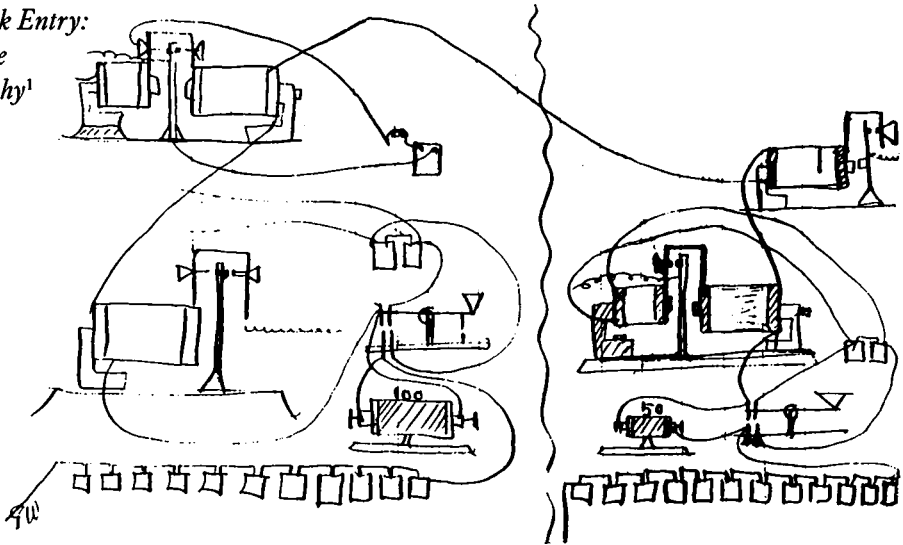
2. Edison could have produced this design earlier than 1867 but not later. By early 1868 he had sufficient familiarity with duplex designs that the flaws in this design and that of Doc. 24 would have been obvious. By then he had a workable duplex design (Doc. 28), knew of Stearns's simple device of adding separate local sounders to allow the sender to listen to his work, and had access to the works of Culley and Sabine (see Docs. 8 and 9), both of which clearly explain contemporary duplex telegraphy. Ezra Gilliland recounted in 1878 that Edison had experimented on duplex designs in Cincinnati and had made an experimental

model from discarded repeater parts. *Cincinnati Commercial*, 18 Mar. 1878, Cat. 1240, Scraps. (*TAEM* 94:126); headnote, p. 32, n. 8.

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[Cincinnati?, Summer 1867?]

Notebook Entry:
Multiple
*Telegraphy*¹



AX, NjWOE, Lab., PN-69-08-08 (*TAEM* 6:771).

1. See headnote, pp. 29-32. This duplex design is clearly related to that in Doc. 23. The two basic differences here are (1) the key puts a resistance into and out of the main-line circuit, and (2) the main batteries are always on the line. Edison seems to have reversed the local circuit (two batteries and the short relay coil) from what is needed; that is, when the sender's key increases the current on the line coil of the main relay, it cuts off the opposing compensating magnet instead of charging it.