

**THE LEICH FOUR PARTY LINE
TELEPHONE SYSTEM AND
SOME INVESTIGATIONS OF
ITS LIMITATIONS**

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by

WALTER HENRY INBUSCH

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SOME INVESTIGATIONS OF ITS LIMITATIONS.

PARTY LINES.

A party line is a line which has more than two stations, as for example a four party line is a line having four subscribers on the same line. Its distinction from a private line is that a private line simply connects one subscriber with the central office.

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Party lines are divided into two classes:

(1). Lines where a code of audible signals is employed to enable the various parties to distinguish their calls from those of others.

(2). Those lines where a system of selective signaling is employed so that any one party may be called up without disturbing any other subscriber on the same line.

The first of these classes are known as the non-selective systems and are divided into two general sub-classes, those in which the instruments are connected in series and those in which the instruments are connected in multiple in the line circuits.

American Telephone Practice by Kempster B. Miller.

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Since the object of this thesis is to dwell more on the selective signaling class the writer will not go further into detail of non-selective systems, but will refer those who are interested in same to an article by Kempster B. Miller, M.E., in Electrical Engineering, August, 1898 on Party Lines.

The selective-signaling class can be divided into three sub-classes.

(a). Those employing step-by-step movements to complete the desired circuit.

(b). Those using the harmonic system of selecting—that is, those using currents of various frequencies for actuating the different signals.

(c). Those using currents of different strengths or polarities or both, for ringing the bells at the different sub-stations.

The "step-by-step" system depends on step-by-step mechanisms located at subscribers stations and controlled from the central station in such a manner as to enable the operator to pick out or select the desired station and ring its bell to the exclusion of all others on the same line. There have been several men who have applied this system to party lines but for some reason or other it has not been used much in actual practice, although there does not appear to be any unsurmountable obstacles in the way of making the system practical. Mr. E.N. Dickerson, Jr. in Jan.,



1879, was the first to apply step-by-step mechanisms to party lines. About the same time, George L. Anders also devised a step-by-step system.

The third system is operated according to the strength and polarity of the current passing through the calling devices. These calling devices may depend for their operation on either changes in strength or in direction of a current or both. Of the many systems devised the one by W.W. Dean of the Western Electric company is one of the few examples of a true strength and polarity system. In this system, four stations are placed on each limb of a metallic-circuit line. The two call-bells on each of the limbs at the four stations farthest away from the central office are oppositely polarized and bridged between the respective line wires and ground. The two call-bells on each limb at the four stations nearest the central office are wound for low resistance and placed in the line wires and are also polarized. A relay is provided for each limb, each having a high resistance magnet, and these are bridged to ground at a point between the two high-resistance bells and the two low-resistance bells on each limb. Each of these relays, when operated, serves to ground the opposite limb of the line at that point. The principle of operation is that when a current adapted to ring one of the high-resistance bells at one of the four remote stations will not be of sufficient strength, owing to the high resistance of the circuit, to ring one of the low-wound series bells at