



US005148133A

# United States Patent [19]

[11] Patent Number: **5,148,133**

Zennamo, Jr. et al.

[45] Date of Patent: **Sep. 15, 1992**

[54] **QUALITY FACTOR IMPROVEMENT FOR FILTER APPLICATIONS**

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

[75] Inventors: **Joseph A. Zennamo, Jr.**, Skaneateles;  
**Gary J. Clark**, Constantia, both of N.Y.

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*Attorney, Agent, or Firm*—Parkhurst, Wendel & Rossi

[21] Appl. No.: 707,070

[57] **ABSTRACT**

[22] Filed: **May 29, 1991**

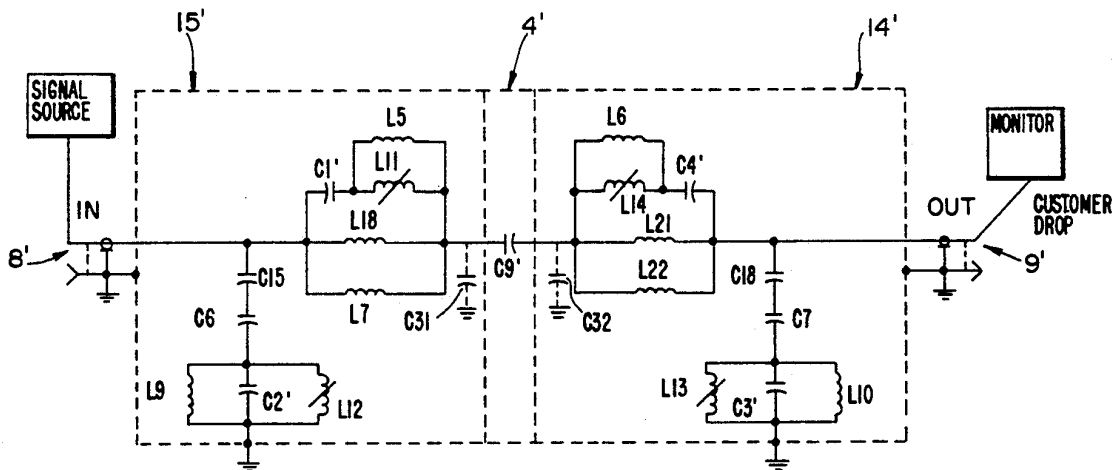
A tuned filter having an improved Q is disclosed in which two or more inductors are placed in parallel to increase the net Q relative to a single inductor of the same net inductance and/or two or more capacitors are placed in series to increase the net Q relative to a single capacitor of the same net capacitance to improve the Q of a tuned filter.

[51] Int. Cl.<sup>5</sup> ..... **H03H 7/00**

[52] U.S. Cl. .... **333/175; 333/167; 333/185; 333/12**

[58] **Field of Search** ..... 333/175, 167, 168, 185, 333/12, 176, 24 R, 24 C, 177, 178, 179, 180, 181, 182, 183, 184

**11 Claims, 9 Drawing Sheets**



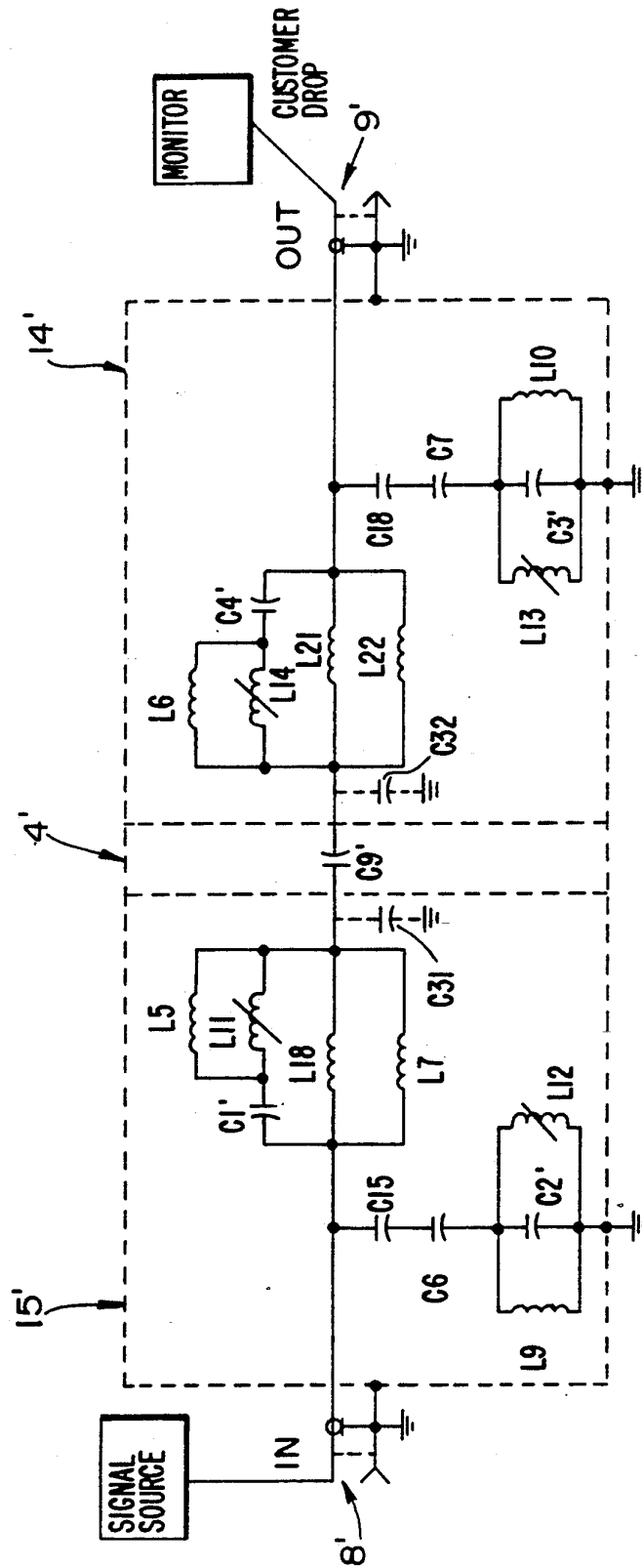


FIG- 1A

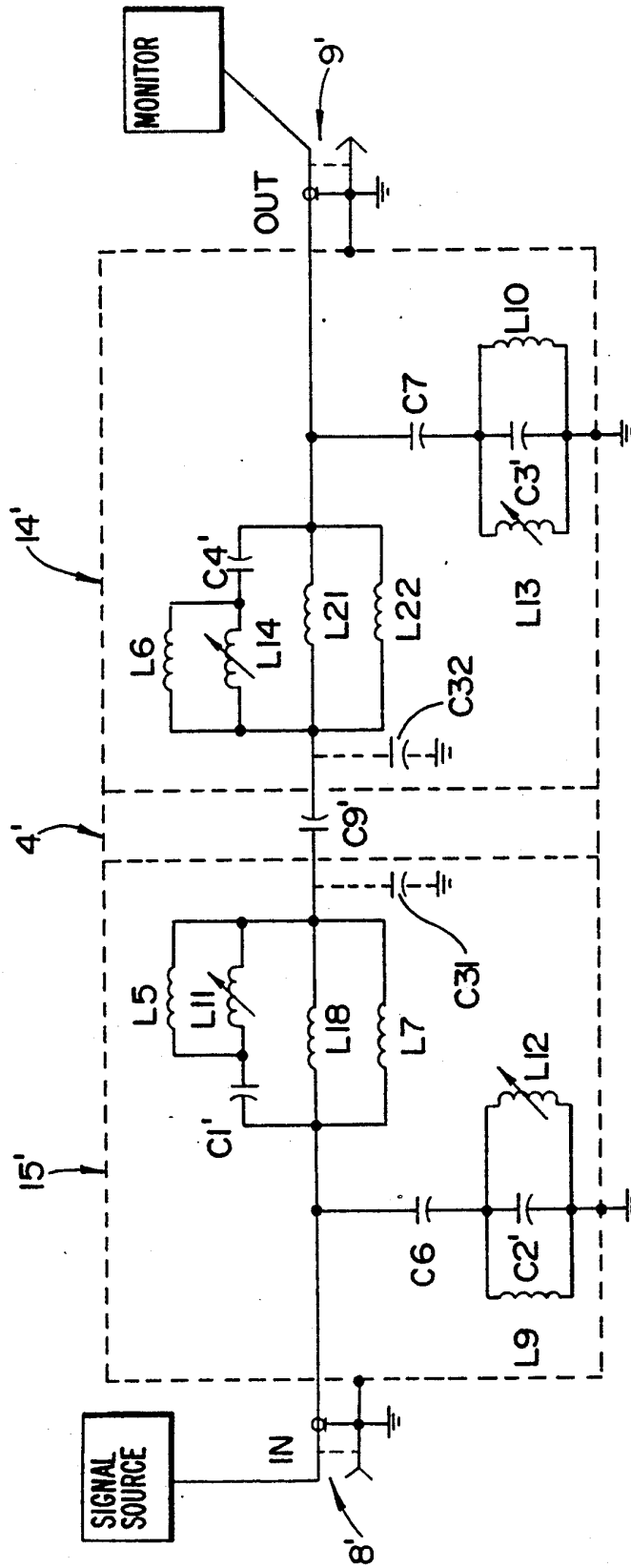


FIG - 1B

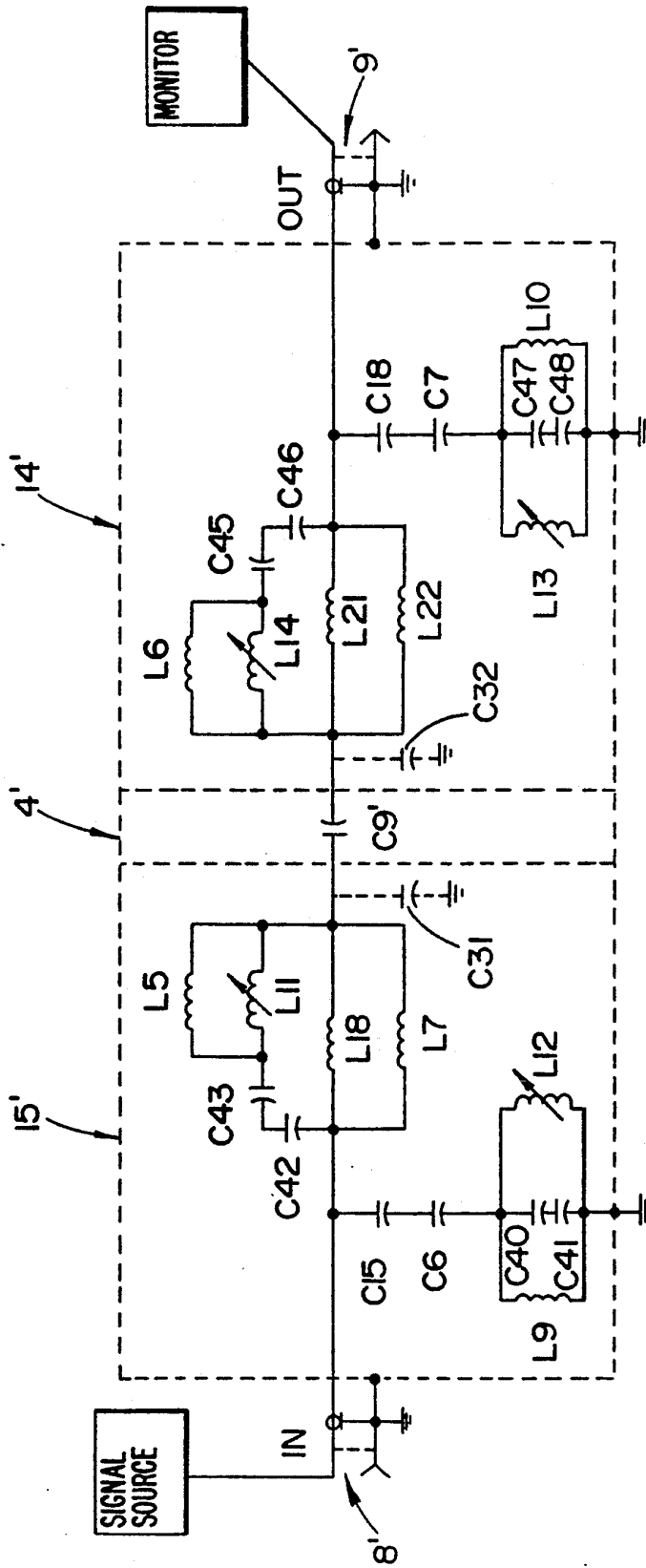


FIG- 1C

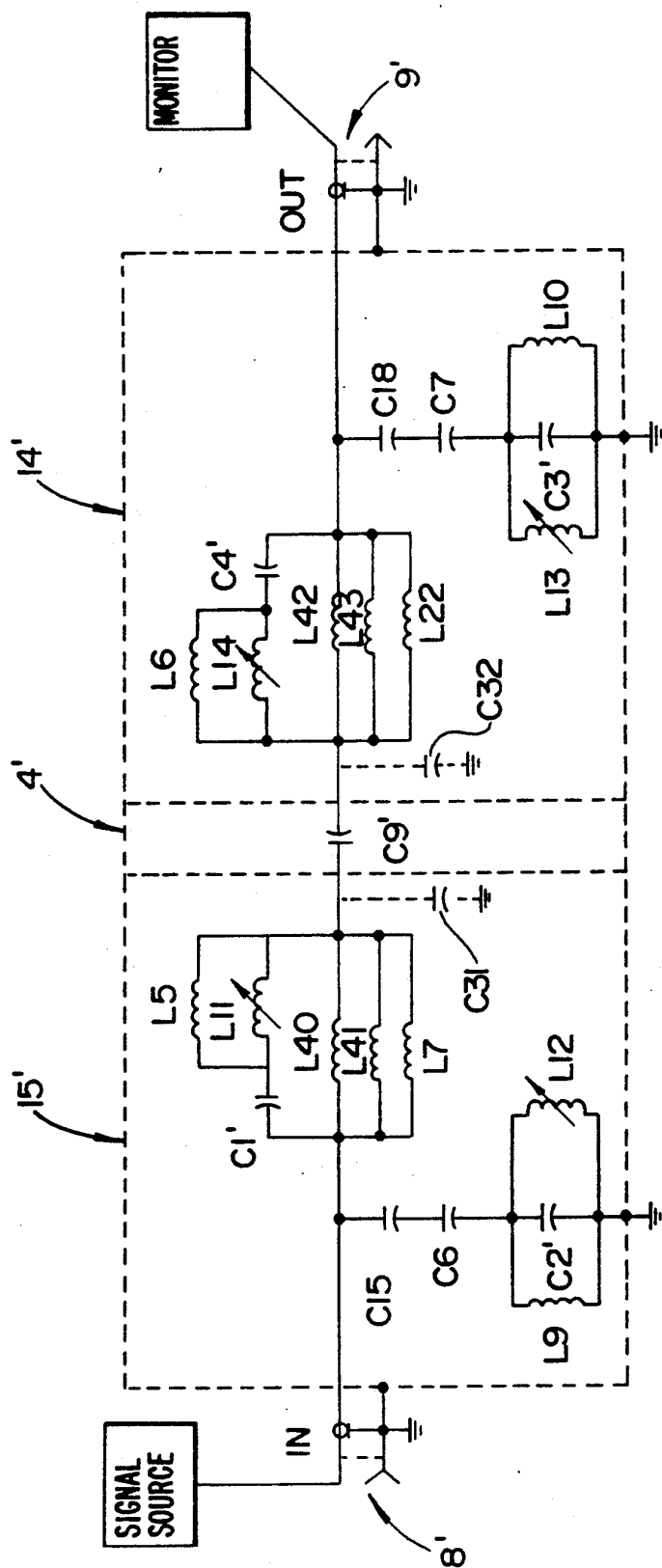


FIG - 1D

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