First Parametric Traveling-Wave Amplifier

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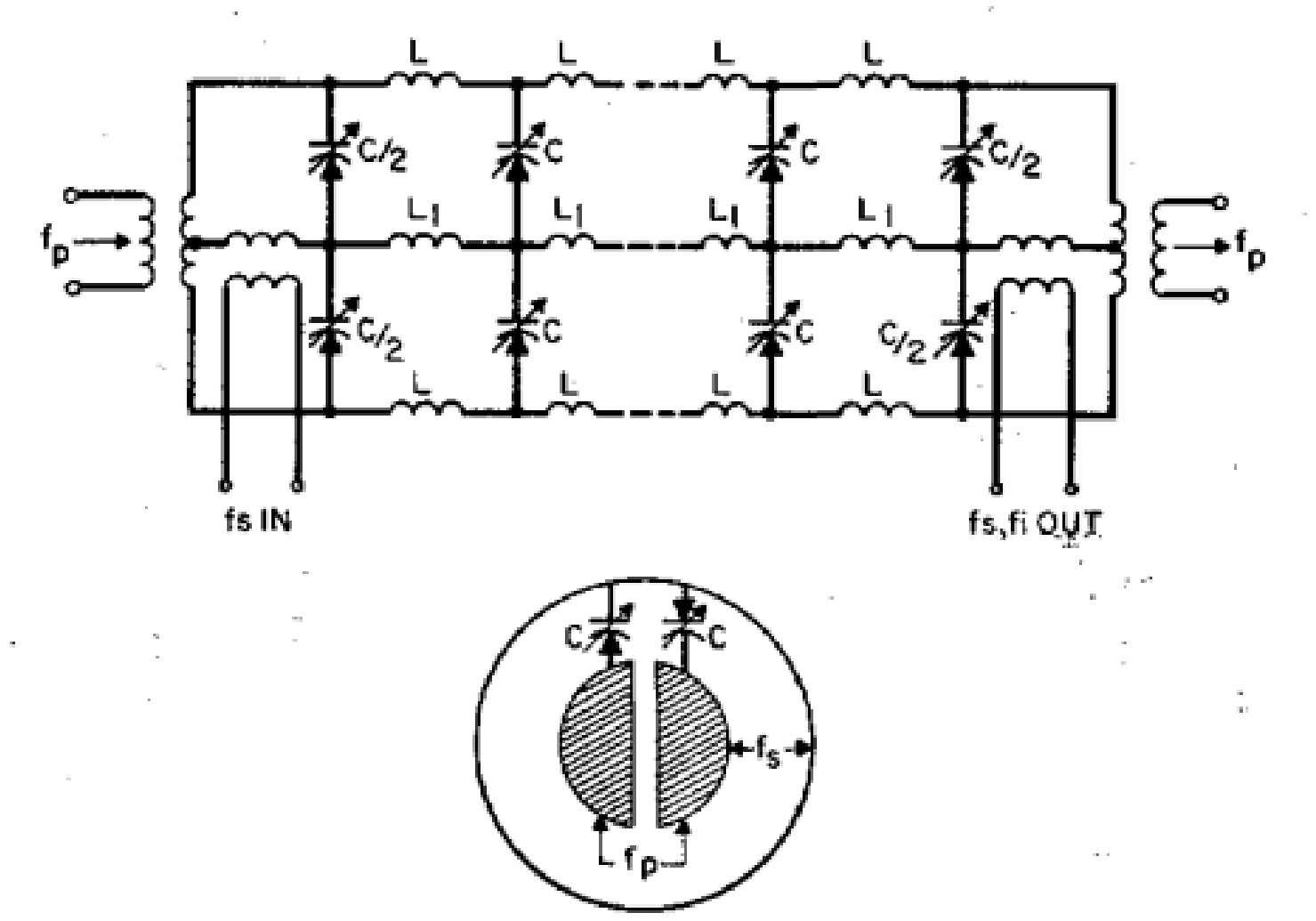

Nonlinear-Reactance (Parametric) Traveling-Wave Amplifier for UHF

IN 1936, PERCIVAL patented the distributed amplifier, which evades conventional gain-bandwidth limitations by absorbing device capacitances into a transmission line. Around the end of the second world war, researchers at the MIT Radiation Laboratory accidentally discovered that diodes could amplify. Subsequent research revealed that, unlike conventional amplifiers, "parametric" amplifiers transfer energy to the output from an ac, rather than dc, source. Engelbrecht's paper, from 1959, describes how to combine parametric and distributed principles to build broadband semiconductor amplifiers without transistors. Because the diodes are used as pure (albeit nonlinear and time-varying) reactances, the noise figures can be quite low, such as the 1.0dB value achieved here.

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