# Bart Lee, A Vintage Vignette

## De Forest Adjustable Regenerative Feedback Coils, 1920s:

Lee de Forest sold a great deal of equipment as well as parts for radios and radios. An adjustable three honeycomb coils holder for controlling regeneration appears in several of his 1920s advertisements. De Forest wound his coils in the Duo-Lateral style (which minimized intrinsic capacity) and called them "ULTRA HONEYCOMB."

He also contributed a clever spring plug mounting to keep the coils mechanically stable during adjustment. In the photographs, one can see the top of the holder reading “De Forest Radio Tel. & Tel. Co. New York”.

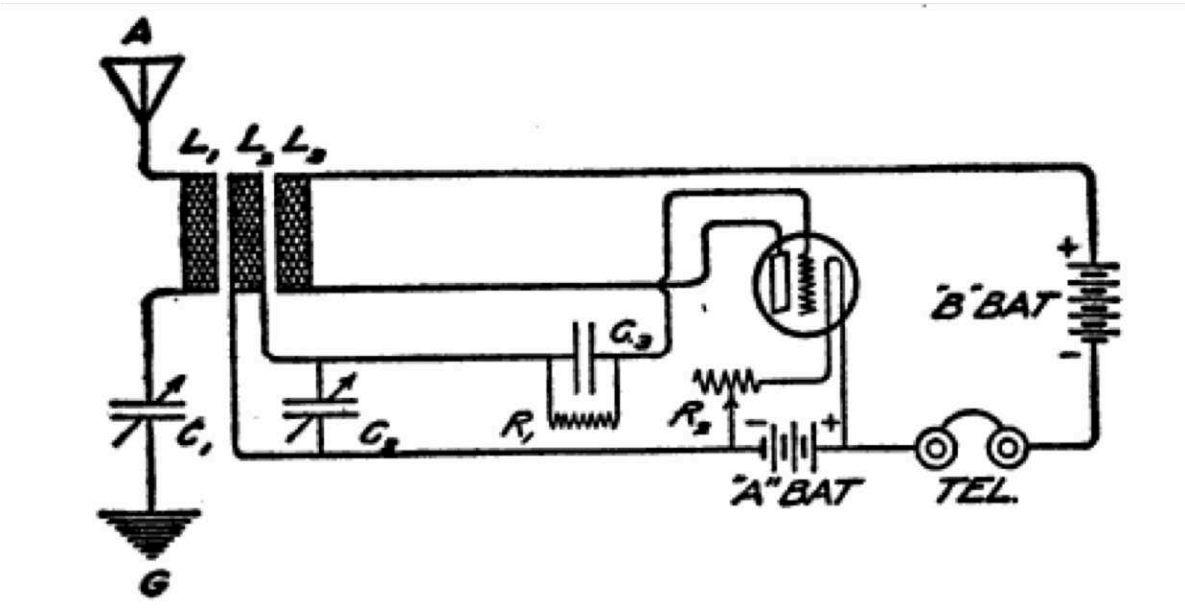

The honeycomb coils in the photos are not De Forest company products but rather Jalisco and the small one GSA. The larger coils uses 750 turns to tune a range of 5,000 meters wavelength to 15,000. The middle coil uses 1000 turns to tune 6,000 meters to 19,000 meters. Wavelength depends on the capacity in the circuit of course, usually variable to 0.001 mfds - 1 nf. The smallest (GSA) coil claims 500 turns.

Despite his world-historical dispute with Edwin Howard Armstrong about who invented vacuum tube oscillation and /or regeneration, de Forest sold his coils and holder by noting that “Honeycomb coils were used by Armstrong in his three tube circuit...”

The Wiki says:

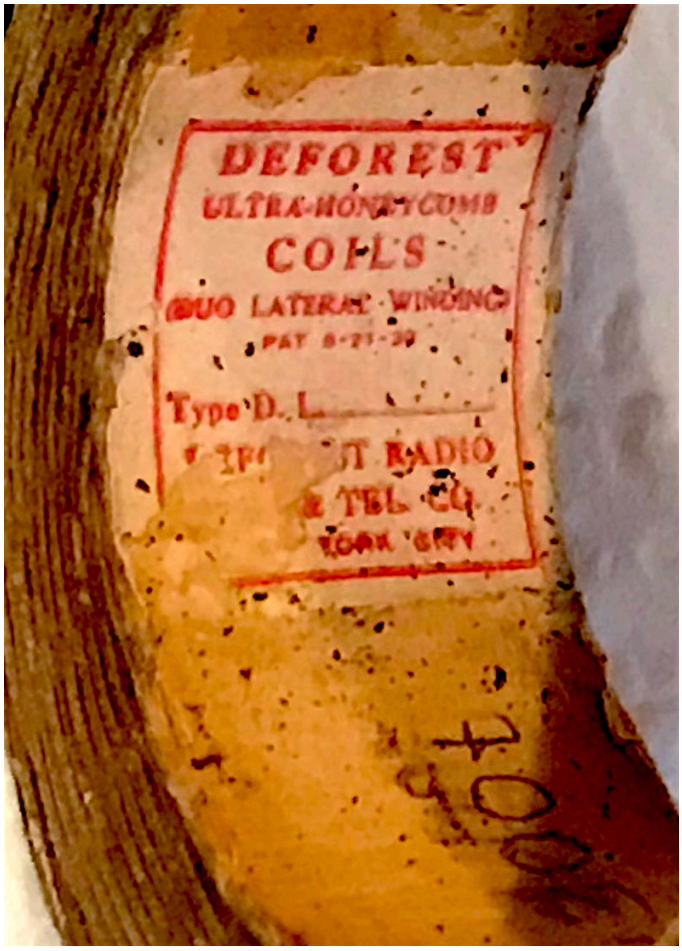
"A triple honeycomb-coil or duo-lateral vario-coupler, an electronic component used in vacuum tube regenerative radio receivers, which were used from WW I to the 1930s to listen to the first radio broadcasts. It was an air-core RF transformer, consisting of three coils of wire mounted on hinges so they could be swung closer or further from each other. The device was used in the common Armstrong regenerative (tickler) circuit to provide positive feedback to the detector tube. The center coil was connected to the grid of the detector tube. The left hand coil was the input tuned circuit which was connected to the antenna and provided the input radio signal for the tube. The righthand coil was the 'tickler,' connected in the detector's plate circuit, which fed energy from the plate output circuit back into the grid, greatly increasing the gain and selectivity of the receiver. The amount of feedback was controlled by moving the left coil closer or further from the center one, changing the coupling (mutual inductance) between the coils. The coils were wound in a crisscrossed 'honeycomb' pattern so adjacent layers of wire were not parallel to each other, which reduced parasitic capacitance and losses due to proximity effect. The coils were often replaceable plug-ins so different radio bands could be received by plugging in different coils."

A circuit diagram appears nearby from Laurence Cockaday, RADIO-TELEPHONY FOR EVERYONE ... (1922). In a nod to de Forest, he calls it the Ultra-Audion circuit. (De Forest liked to call things "ultra.")



Later the flea-market (‘surplus sale’) coughed up a genuine De Forest Radio Tel. & Tel. Co. “ULTRA HONEYCOMB” coil of 300 turns.

The label bears a patent date of June 21, 1920.




Antiquities do not always fit our preconceived notions. In this case, this genuine De Forest coil does not quite fit the genuine De Forest coil holder. It doesn't quite seat as deep as the others. This may, however, be a feature and not a flaw. This smaller coil thus lines up more directly with the centers of the other coils. This would maximize the inductive interaction. (de K6VK) ##