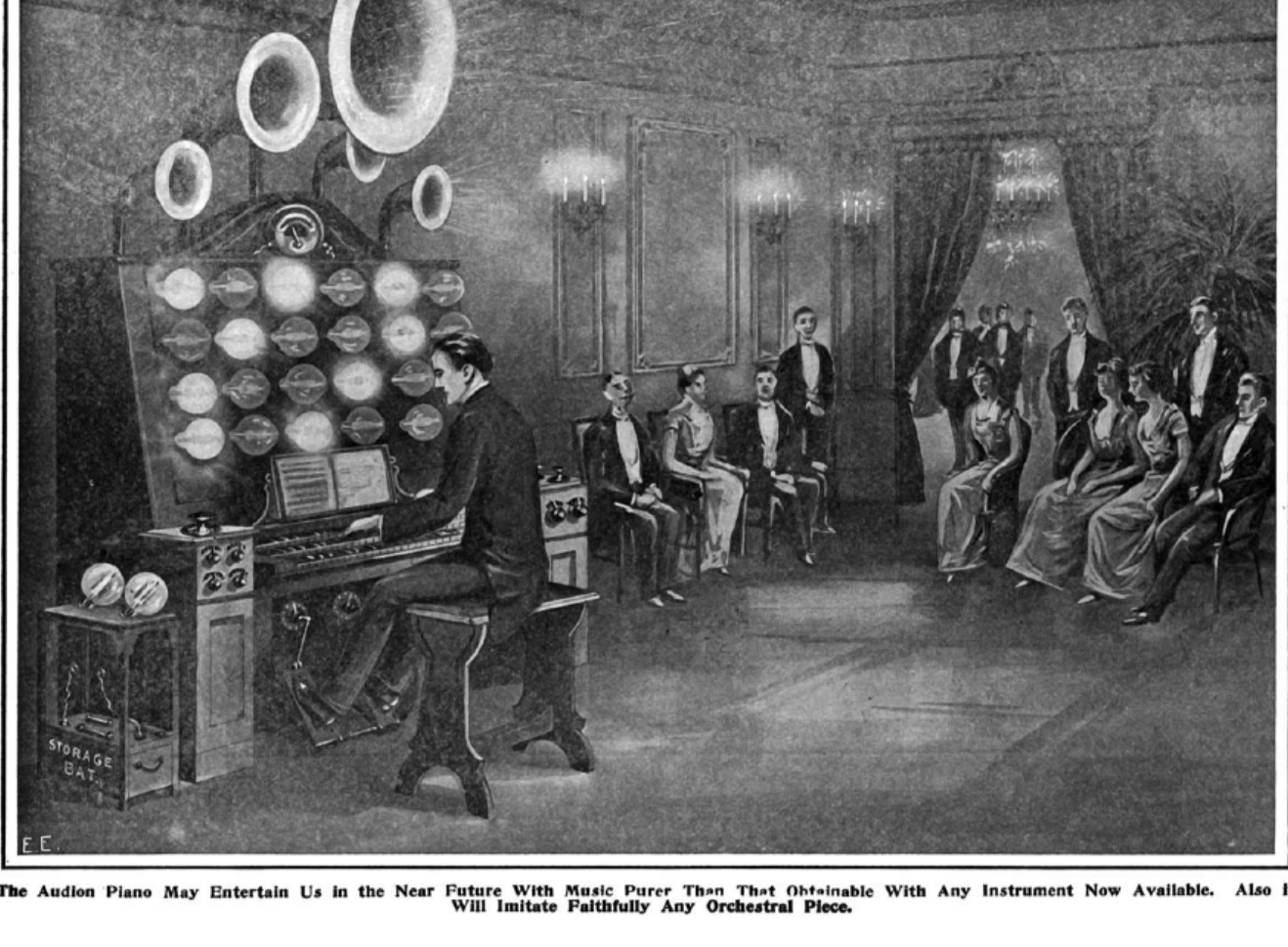


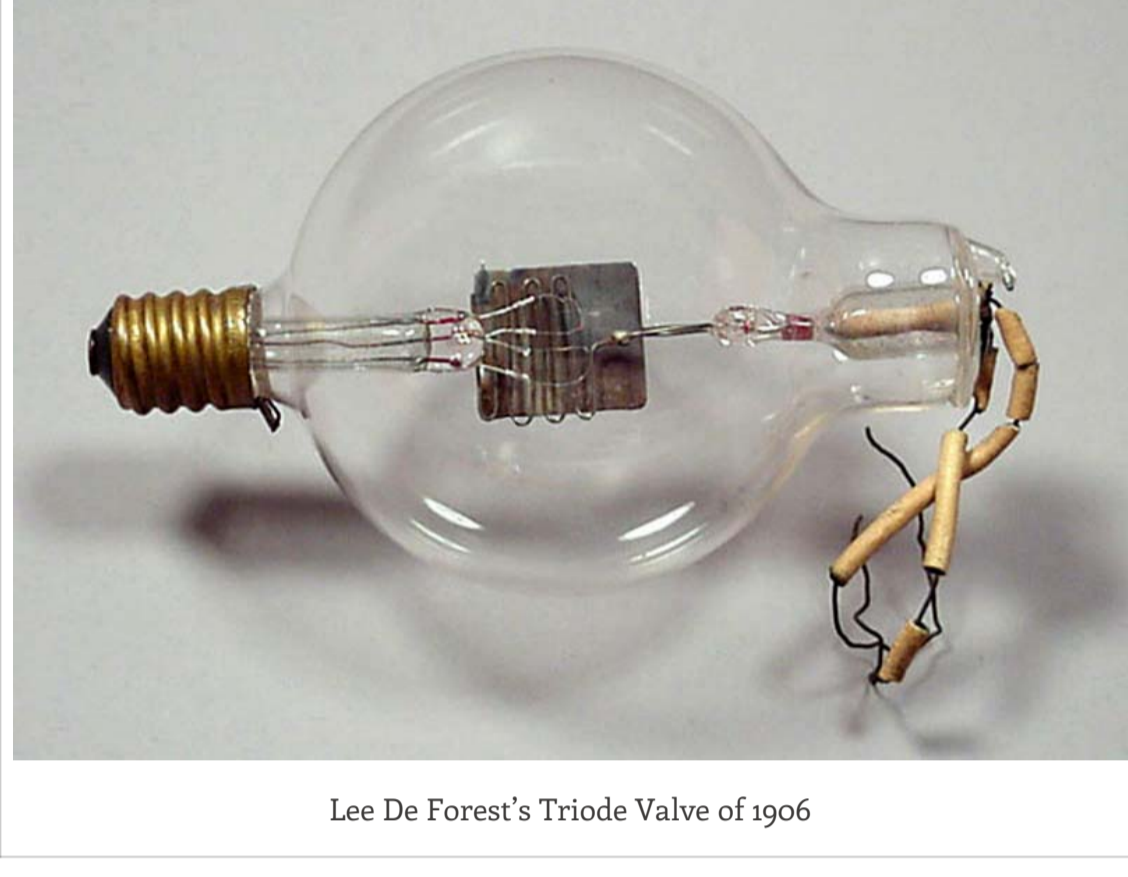
The 'Audion Piano' and Audio Oscillator. Lee De Forest. USA, 1915



The Audion Piano May Entertain Us in the Near Future With Music Purer Than That Obtainable With Any Instrument Now Available. Also It Will Imitate Faithfully Any Orchestral Piece.

"Audion Bulbs as Producers of Pure Musical Tones" from 'The Electrical Experimenter' December 1915

Lee De Forest, The self styled "Father Of Radio" (the title of his 1950 autobiography) inventor and holder of over 300 patents, invented the triode electronic valve or 'Audion valve' in 1906- a much more sensitive development of John A. Fleming's diode valve. The immediate application of De Forest's triode valve was in the emerging radio technology of which De Forest was a tenacious promoter. De Forest also discovered that the valve was capable of creating audible sounds using the "heterodyning"/beat frequency technique: a way of creating sounds by combining two high frequency signals to create a composite lower frequency within audible range and in so doing inadvertently invented the first true audio oscillator that paved he way for future electronic instruments and music.



Lee De Forest's Triode Valve of 1906

De Forest Created the 'Audion Piano', the first vacuum tube instrument in 1915 based on earlier audio experiments in 1907 and by using his invention of the triode tube as an audio oscillator had laid the blueprint for most future electronic instruments until the emergence of transistor technology some fifty year later. The Audion Piano was the first instrument to use a beat-frequency or "heterodyning" oscillator system and also the first to use body capacitance to control pitch and timbre (The heterodyning effect was later much exploited by the Leon Termen with his Theremin series of instruments and Maurice Martenot's Ondes-Martenot amongst many others.). The Audion Piano, controlled by a single keyboard manual, used a single triode valve per octave controlled by a set of keys allowing one monophonic note to be played per octave. This audio signal could be processed by a series of capacitors and resistors to produce variable and complex timbres and the output of the instrument could be sent to a set of speakers placed around a room giving the sound a novel spatial effect. De Forest planned a later version of the instrument that would have separate valves per key allowing full polyphony- it is not known if this instrument was ever constructed.

De Forest described the Audio Piano as capable of producing:

"Sounds resembling a violin, Cello, Woodwind, muted brass and other sounds resembling nothing ever heard from an orchestra or by the human ear up to that time - of the sort now often heard in nerve racking maniacal cacophonies of a lunatic swing band. Such tones led me to dub my new instrument the 'Squawk-a-phone' .The Pitch of the notes is very easily regulated by changing the capacity or the inductance in the circuits, which can be easily effected by a sliding contact or simply by turning the knob of a condenser. In fact, the pitch of the notes can be changed by merely putting the finger on certain parts of the circuit. In this way very weird and beautiful effects can easily be obtained."

(Lee De Forest's Autobiography "The Father Of Radio")

And From a 1915 news story on a concert held for the National Electric Light Association

"Not only does de Forest detect with the Audion musical sounds silently sent by wireless from great distances, but he creates the music of a flute, a violin or the singing of a bird by pressing button. The tune quality and the intensity are regulated by the resistors and by induction coils You have doubtless heard the peculiar, plaintive notes of the Hawaiian ukulele, produced by the players sliding their ngers along the strings after they have been put in vibration. Now, this same effect, which can be weirdly pleasing when skilfully made, can he obtained with the musical Audion."

THE DE FOREST AUDION

"There is only one Audion—the De Forest"

MOST SENSITIVE
The Bulletin of the U. S. Bureau of Standards states that the De Forest Audion is fully 50 per cent. more sensitive than any other known form of detector (Vol. 6, No. 4, page 540).

MOST RELIABLE
It is not affected by mechanical vibration nor burned out by static or the transmitting spark. It never fails at the critical moment. The detector is the heart of the receiving set. Why waste valuable time on an insensitive, unreliable detector? The genuine De Forest Audion is now within the means of every operator.

THE GENUINE DE FOREST TUBULAR AUDION DETECTOR
Is sold separately to any amateur who prefers to build his own Audion Detector. **Price \$5.50**
Adapter 40 cents extra.
Get the Bulletin (X16)

THE TYPE R39 DE FOREST AUDION DETECTOR
Incorporates the Audion Bulb and the genuine De Forest patented circuits with the most approved accessories needed to form a complete detector. The most popular Audion Detector ever offered. **Price \$14.00**
Get the Bulletin (M16)

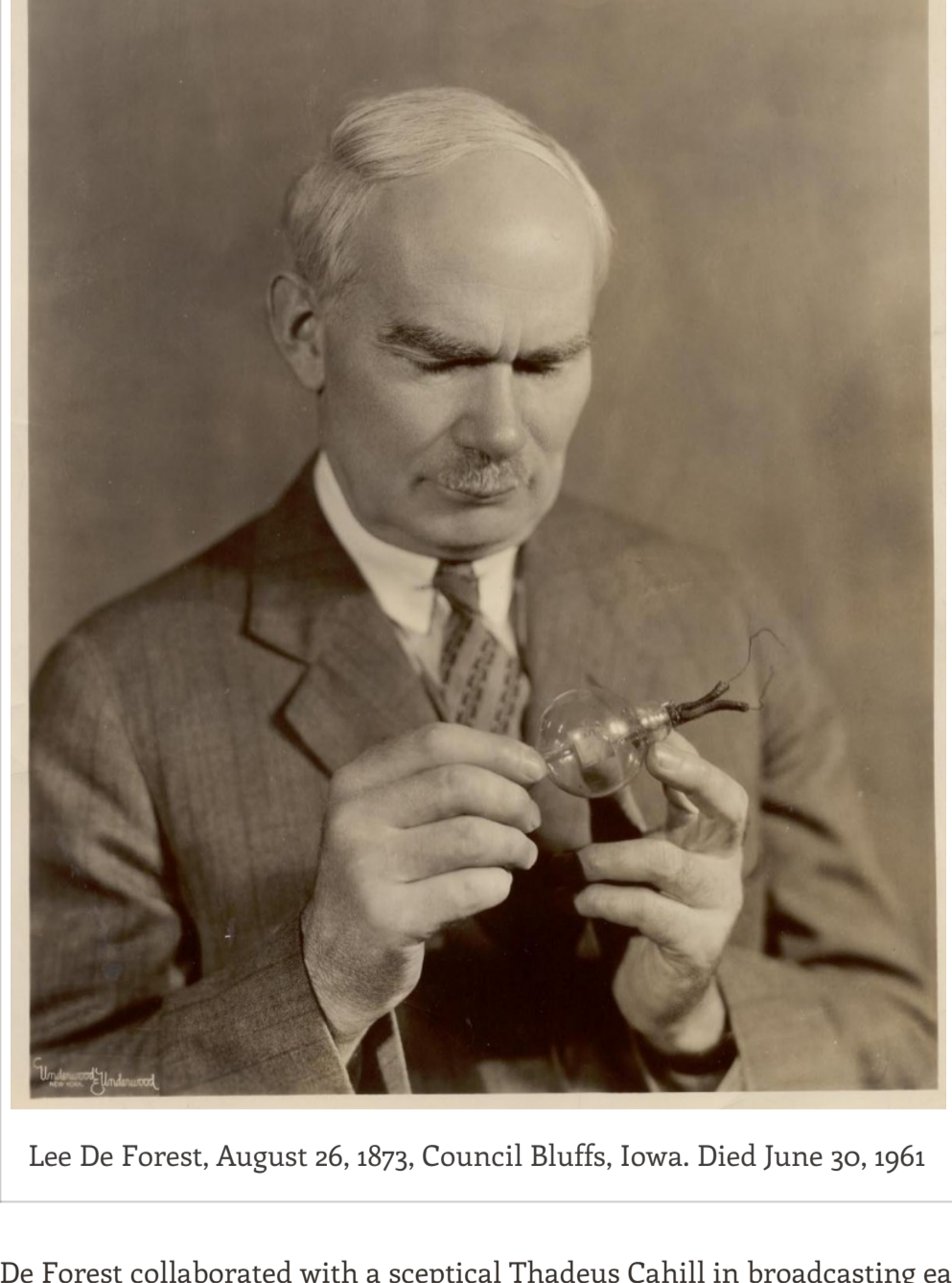
SEND FOR BULLETINS X16 AND M16 DESCRIBING DETECTORS, AUDION AMPLIFIERS AND AUDION RECEIVING CABINETS

DE FOREST RADIO TELEPHONE & TELEGRAPH CO.
101 PARK AVENUE -:- NEW YORK, N. Y.
Makers of the Highest Grade Receiving Equipment in the World

Advert for De Forest wireless equipment

De Forest, the tireless promoter, demonstrated his electronic instrument around the New York area at public events alongside fund raising spectacles of his radio technology. These events were often criticised and ridiculed by his peers and led to a famous trial where De Forest was accused of misleading the public for his own ends:

"De Forest has said in many newspapers and over his signature that it would be possible to transmit human voice across the Atlantic before many years. Based on these absurd and deliberately misleading statements, the misguided public has been persuaded to purchase stock in his company. "



Lee De Forest, August 26, 1873, Council Bluffs, Iowa. Died June 30, 1961

De Forest collaborated with a sceptical Thaddeus Cahill in broadcasting early concerts of the Telharmonium using his radio transmitters (1907). Cahill's insistence on using the telephone wire network to broadcast his electronic music was a major factor in the demise of the Telharmonium. Vacuum tube technology was to dominate electronic instrument design until the invention of transistors in the 1960 s. The Triode amplifier also freed electronic instruments from having to use the telephone system as a means of amplifying the signal.

Sources:

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