Grützmacher, M.
Das Teiltonspektrum einer Glocke
Vorl
1959 Grav. Bl. 4, H. 13, S. 124-125

Bl. 2

Dia 2/27

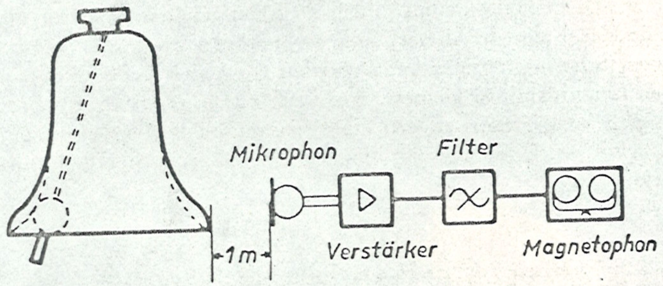


Abb. 1 Versuchsaufbau

2/27

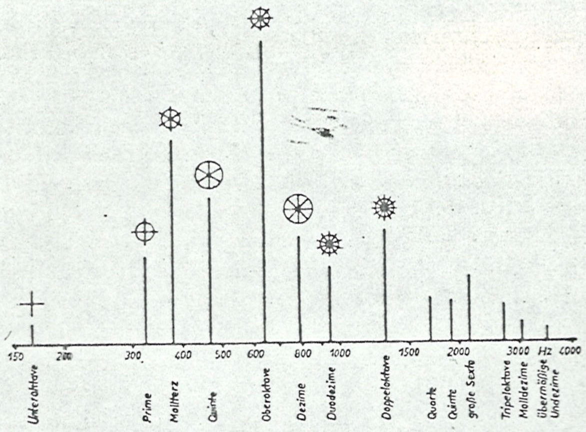


Abb. 2 Frequenzspektrum des untersuchten Glockenklanges, Ordinate: Schalldruck in logarhythmischem relativem Maß



Schallplatte dazu: Mus. I. K.: G 25⁸ (45 u.)

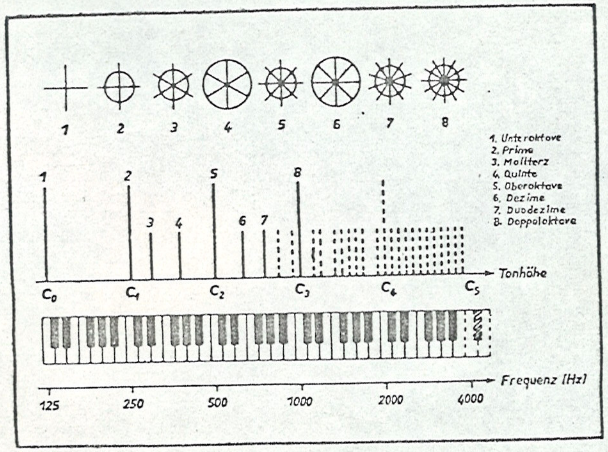


Abb. 3 Schwingungsform und Tonhöhen der Teiltöne der Glocke.

# A Bell's Spectrum of Partial Tones

Explanation of a tape recording presented at Marsaill in May 1958

by

M. GRÜTZMACHER

A bell's spectrum of partial tones cannot be predicted. It cannot even be assumed offhand that a reasonable number of partials will stand in a harmonic relationship to each other, i. e. that pure octaves, fifths or thirds will be well represented in the bell's tone. It is all the more amazing that for centuries bells have been cast whose five lowest partials, the suboctave, prime, minor third, fifth and octave — sometimes also referred to as principal tones — are well in tune, and whose other partials, called mixture tones, blend surprisingly well with this fundamental chord to give a pleasing sound.

To make these relationships clearer even to the less cultivated ear, a tape was produced at the Federal Physical-Technical Institute in Braunschweig at the suggestion of the Bochum Association (in particular of Herr Bröcker). This tape greatly simplifies recognition of the pure intervals in that the normally simultaneous partials are heard in succession; in addition, the bell's