



MTO 22.4 Examples: Rehding, Instruments of Music Theory

(Note: audio, video, and other interactive examples are only available online)

<http://www.mtosmt.org/issues/mto.16.22.4/mto.16.22.4.rehding.php>

Figure 1. Mythical acoustic experiments on a variety of instruments, from Franchinus Gaffurius, *Theorica musicae* (1492, Bk. 1, Ch. 8)



Figure 2. Examples of tetrachords in Vicentino’s three genera, from *L’antica musica*, 3.45. Other configurations are possible.

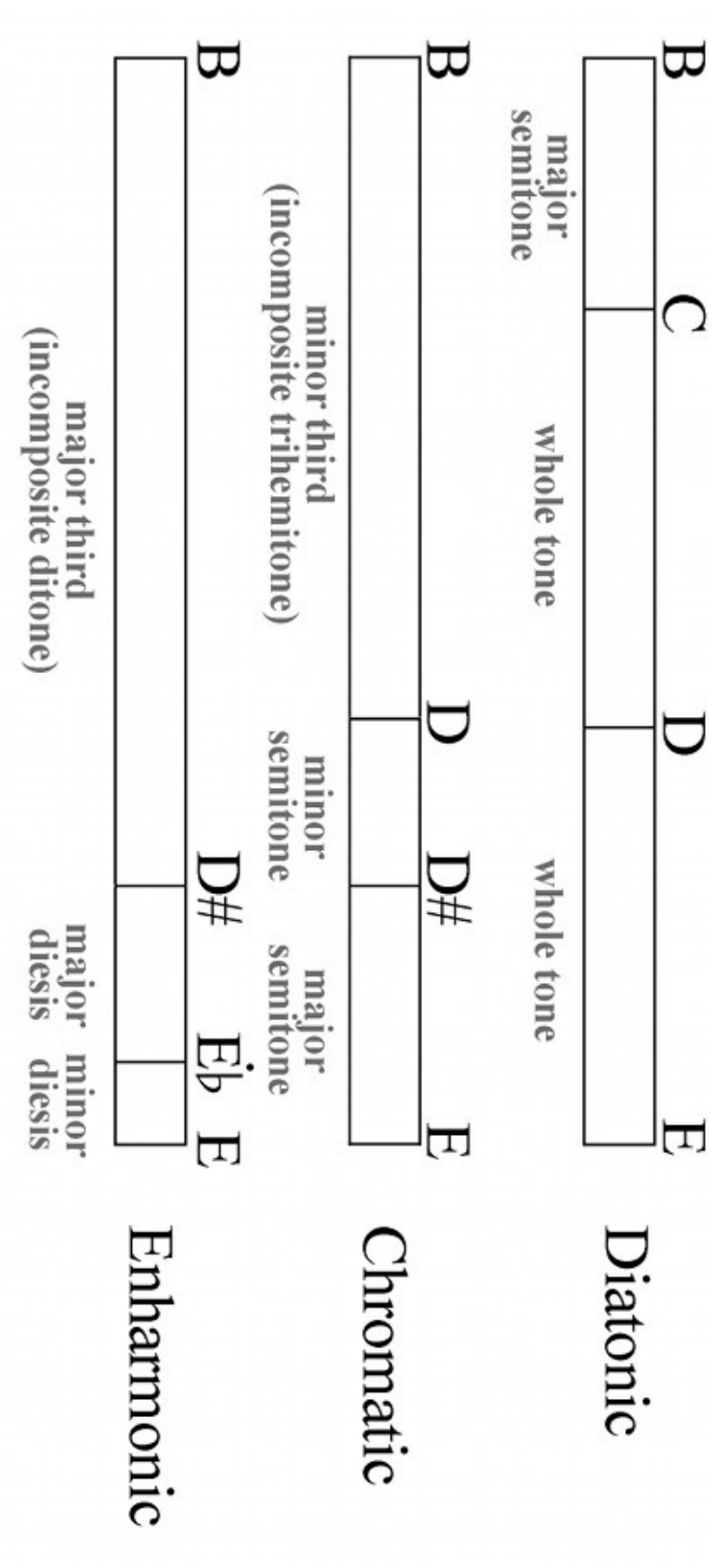


Figure 3. Vicentino divides each whole tone into five microtones

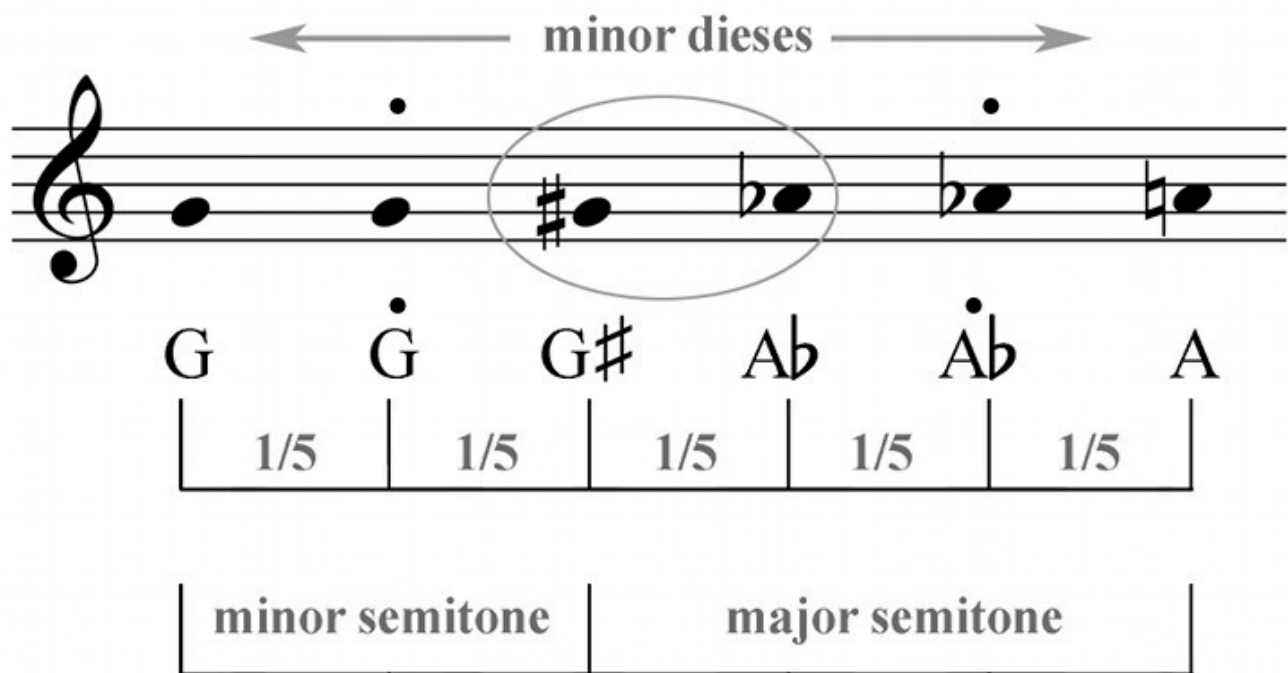


Figure 4. Vicentino celebrates his accomplishments with a medal. The recto shows his profile, the verso shows his two instruments, the archicembalo and the arciorgano. The medal marks him as the “inventor of the perfect division of music.” (From Morton & Eden, Auction Catalog 59, November 13–14, 2012.)



Figure 5. A popular introduction to the mechanism of the siren, from *Harper's New Monthly Magazine* (1872).

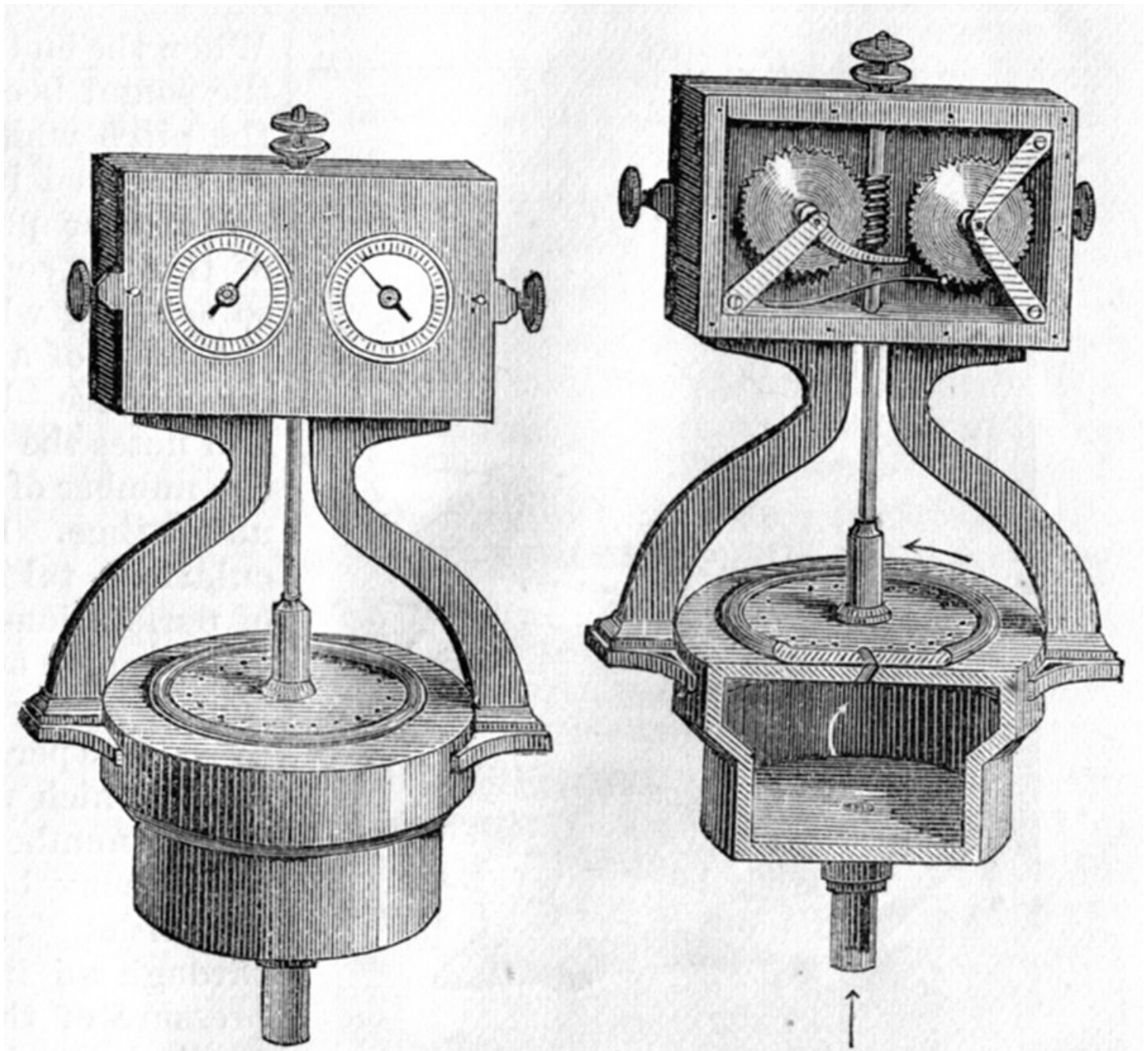


Figure 6. The ratio 3:2 corresponds to the interval of the fifth. Opelt's multiphonic siren shows how the compound rhythms, translated into spatial sequences of dots, as shown on the right, produce two (or more) sounds. (The circular diagram included in Figure 7 shows this pattern in its second ring from the center.)



Figure 7. Even chords can be captured as compound rhythms. The ratio 4:5:6:8, first marked by arrows along the harmonic series, then translated into a sequence of holes, corresponding to the compound rhythm of our complex ratio, and finally projected onto a schematized siren disc.

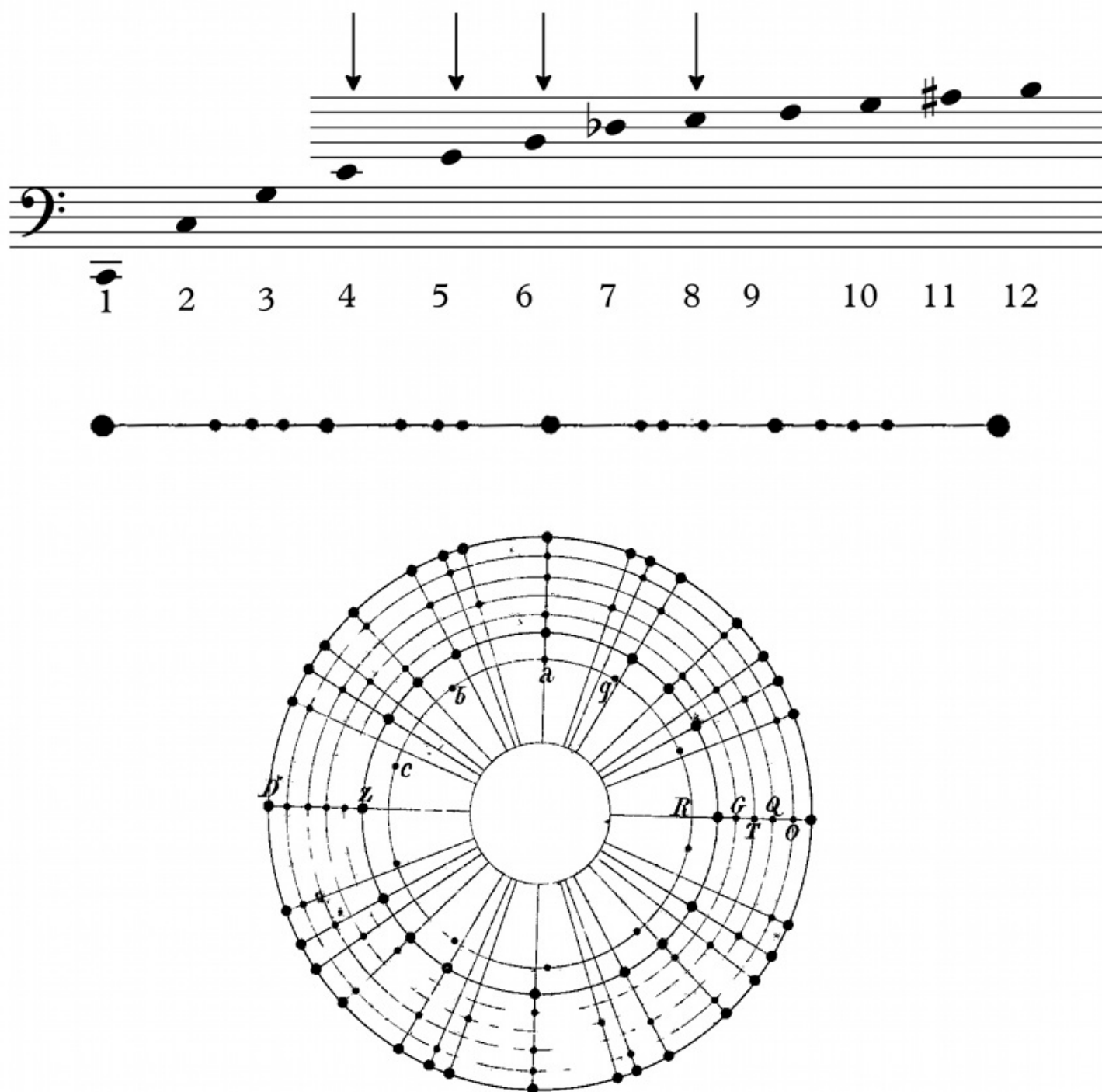


Figure 8. Henry Cowell's friend Joseph Schillinger behind the rhythmicon (1932). Photo now held at Stanford University.



Figure 9a. The opening of Henry Cowell's *Quartet Romantic* (1915) codifies a major harmony in four voices in the pulsating rhythms of each part

The image displays the opening of Henry Cowell's *Quartet Romantic* (1915) for four instruments: Flute I, Flute II, Violin, and Viola. The score is written in 3/4 time and consists of 16 measures. The Flute I and Flute II parts feature complex, pulsating rhythms with many beamed notes and slurs. The Violin and Viola parts have simpler, more rhythmic lines. A large arrow points from the Flute I part down to a single staff at the bottom, which shows the harmonic structure of the first 16 measures.

Flute I

Flute II

Violin

Viola

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Figure 9b. In his own analysis of *Quartet Romantic*, Cowell decodes the rhythmic structure of his music into higher-order harmonies

The image displays two systems of musical notation, likely representing a complex rhythmic structure being analyzed or simplified. The left system consists of two staves, each with a treble and bass clef, containing a dense sequence of notes and rests, suggesting a complex rhythmic pattern. The right system also consists of two staves, but the notation is significantly simplified, featuring fewer notes and rests, indicating a higher-order harmonic or rhythmic reduction. A tempo marking 'J = 100' is visible on the right system.