



WHAT MAKES A RAGG TUNING FORK?

A Ragg tuning fork is an acoustic resonator in the form of a two-pronged fork with the prongs (tines) formed from a U-shaped bar of elastic metal (usually steel or aluminium alloy.) It resonates at a specific constant pitch when set vibrating by striking it against a surface or with an object, and emits a pure musical tone after waiting a moment to allow some high overtones to die out. The pitch that a particular tuning fork generates depends on the length of the two prongs.

Its main traditional use is as a standard of pitch to tune musical instruments. However, tuning forks are also used by medical practitioners to assess a patient's hearing and to check vibration sense as part of the examination of the peripheral nervous system. Laboratory and Education departments use tuning forks to teach students, of all ages, all aspects of the technical use of vibration/frequency/resonance in science. This leads on to applications as diverse as calibration of timing belts, and the most modern of devices, the speed camera.

The main reason for using a fork shape is that it produces a very pure tone, with most of the vibrational energy at the fundamental frequency, and little at the overtones (harmonics), as is not the case with other resonators. The reason for this is that the frequency of the first overtone is about $5^2/2^2 = 25/4 = 6\frac{1}{4}$ times the fundamental (about $2\frac{1}{2}$ octaves above it). By comparison, the first overtone of a vibrating string or metal bar is only one octave above the fundamental. So when the fork is struck, little of the energy goes into the overtone modes; they also die out correspondingly faster, leaving the fundamental. It is easier to tune other instruments with this pure tone.

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