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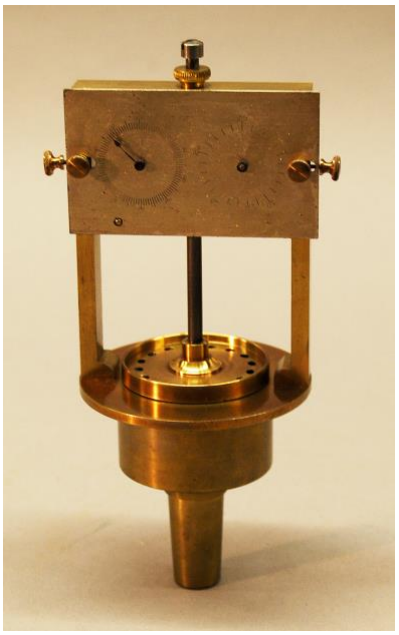

When You Come to a Tuning Fork in the Road, Take It

The invention of the first tuning fork, originally called a “Pitch-fork,” is credited to an English trumpeter, John Shore, in 1711.

When you come to a tuning fork in the road, take it, don’t pitch it. Tuning forks have been one of the most important tools in an instrument craftsman’s toolbox for the last few hundred years. They have been used to tune freshly made trumpets and other instruments. Piano tuners used to carry a few of them tuned to different “A”s or “C”s depending on context. A device was made from a collection of tuning forks tuned to steadily increasing frequencies for the purpose of tuning newly made tuning forks and measuring the pitches of old forks and a variety of other sounds. Besides to demonstrate the physics of acoustics, tuning forks are not used much anymore due to the invention of electronic tuning devices which are not dependent on temperature like a metal tuning fork.

The invention of the first tuning fork, originally called a “Pitch-fork,” is credited to an English trumpeter, John Shore, in 1711. Alexander J. Ellis, in his book *The History of Musical Pitch*, recorded the pitch of this fork to be A419.9Hz. He describes it as a large, “rude,” tenor fork. Shore invented the fork to help him build consistently pitched trumpets and to provide a reference pitch for the ensembles he played in. He was also the lutist for the Royal Chapel in 1715 and used his fork to tune the A string on his lute. The tuning fork became very popular as it was easier to use, more stable, and more precise than the other tools at the time used to create a reference pitch.

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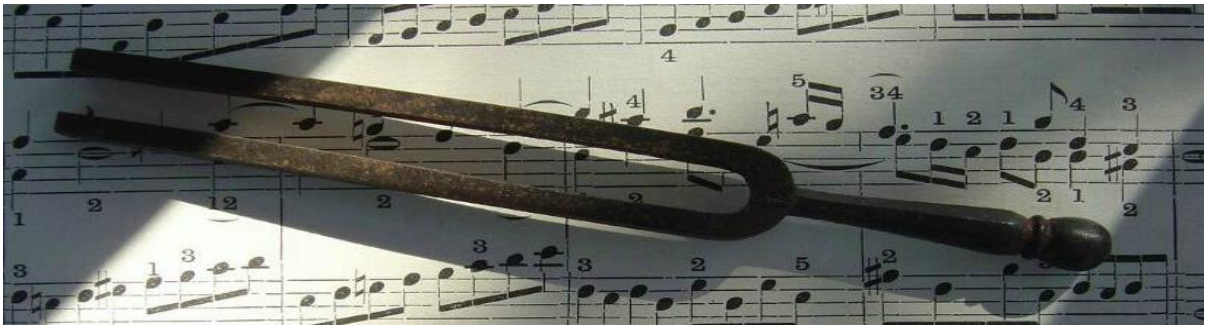

If a tuning fork is the reference pitch, how does one tune a tuning fork? A pitch pipe is not the answer as hot breath and inconsistent speed of air blown will produce slight variations in pitch. Maybe a string, but to know the frequency, it must have visible waves to be measured in relation to a second (unit of time). The best option at the time was the siren. Quoting Ellis: “The Siren of Baron Cagnard de la Tour consists of a perforated disc, which is driven round by a stream of air, and, allowing puffs to pass through the oblique holes, makes a musical sound, of which the V [frequency] is the number of such puffs in a second counted by an appended mechanism.” With this device, if one knows the number of rotations per second of the spinning disc, one can calculate the frequency of the generated tone. A main issue in tuning tuning forks is that they are dependent on temperature. If heat is added, the frequency goes down, and the opposite is true if heat is removed. Filing the metal tines of the fork to tune it will cause a drop in pitch. The fork must be set aside to cool until it reaches the fixed temperature the fork was originally measured at before its pitch can be measured again for another round of tuning. Once the fork is carefully tuned at a certain temperature, it is unlikely to change unless affected by rust or other damage to the tines.

The most advanced version of Scheibler’s device consisted of a metronome and 56 tuning forks tuned 4Hz apart ranging from A220 to A440 fixed to a wooden frame.

In 1834, Johann Scheibler invented a device using tuning forks called a “tonometer.” (This is NOT to be confused with a similarly named device used for measuring the pressure inside of the eye.) The most advanced version of Scheibler’s device consisted of a metronome and 56 tuning forks tuned 4Hz apart ranging from A220 to A440 fixed to a wooden frame. This contraption was used to measure pitches of sounds by counting the beats of the destructive interference between the tonometer fork and the pitch being measured. This feature could similarly be used to measure speed by relating the tone of something such as a mosquito’s beating wings to a frequency, thus determining speed by beats per second. It was also used as a reference to tune tuning forks and instruments. Scheibler was one of the first to suggest an A440 pitch standard based on his device. In 1876, Rudolph Koenig presented a version with 670 tuning forks ranging from 16Hz to 4,096Hz.

In modern times, many piano tuners use ETDs (Electronic Tuning Devices) to measure pitch. Some ETDs are simple and others are quite complex.

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