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facturer asserts that the action in one of his pianos has some 7,000 separate parts. Nearly all modern actions are versions of Christofori's original upward-striking ones, which took advantage of the downward force of gravity for the key's return. Some workers have experimented with downward-striking actions, so far without success.

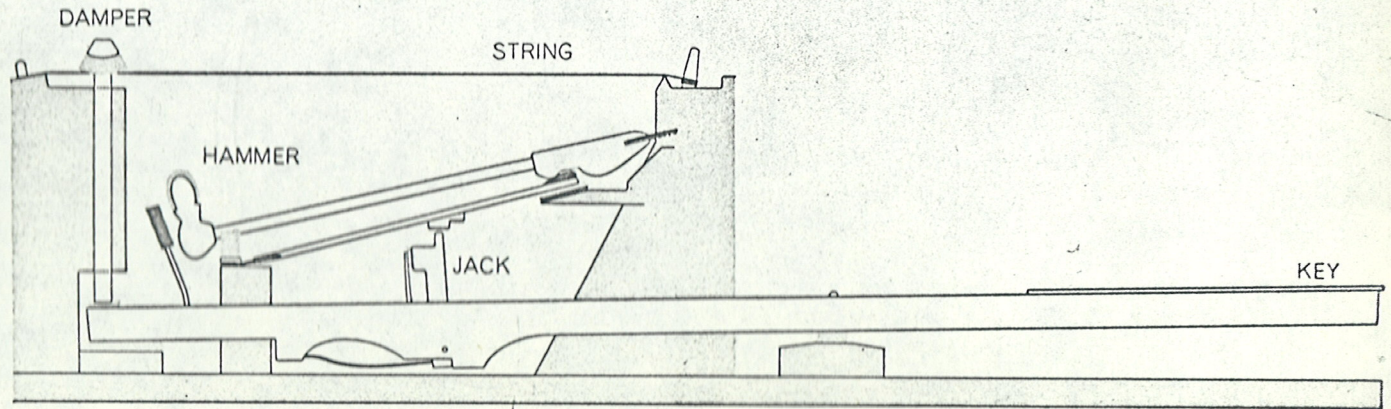
Early in the history of piano-building the hammers were small blocks of wood covered with soft leather. The inability of leather to maintain its resiliency after many successive strikings led eventually to the use of felt-covered hammers. If the felt is too hard and produces a

harsh tone, it can be pricked with a needle to loosen its fibers and will produce a mellower tone. If the tone is too mellow and lacks brilliance, the felt can be filed and made harder.

A standard piano has three pedals that serve to control the dampers. The forte, or sustaining, pedal on the right disengages all the dampers so that the strings are free to vibrate until the pedal is released or the tones die away. The sostenuto pedal in the middle sustains only the tones that are played at the time the pedal is depressed; all the other tones are damped normally when their respective keys are released. The "soft"

pedal on the left shifts the entire action so that the hammers strike fewer than the usual number of strings, decreasing the loudness of the instrument.

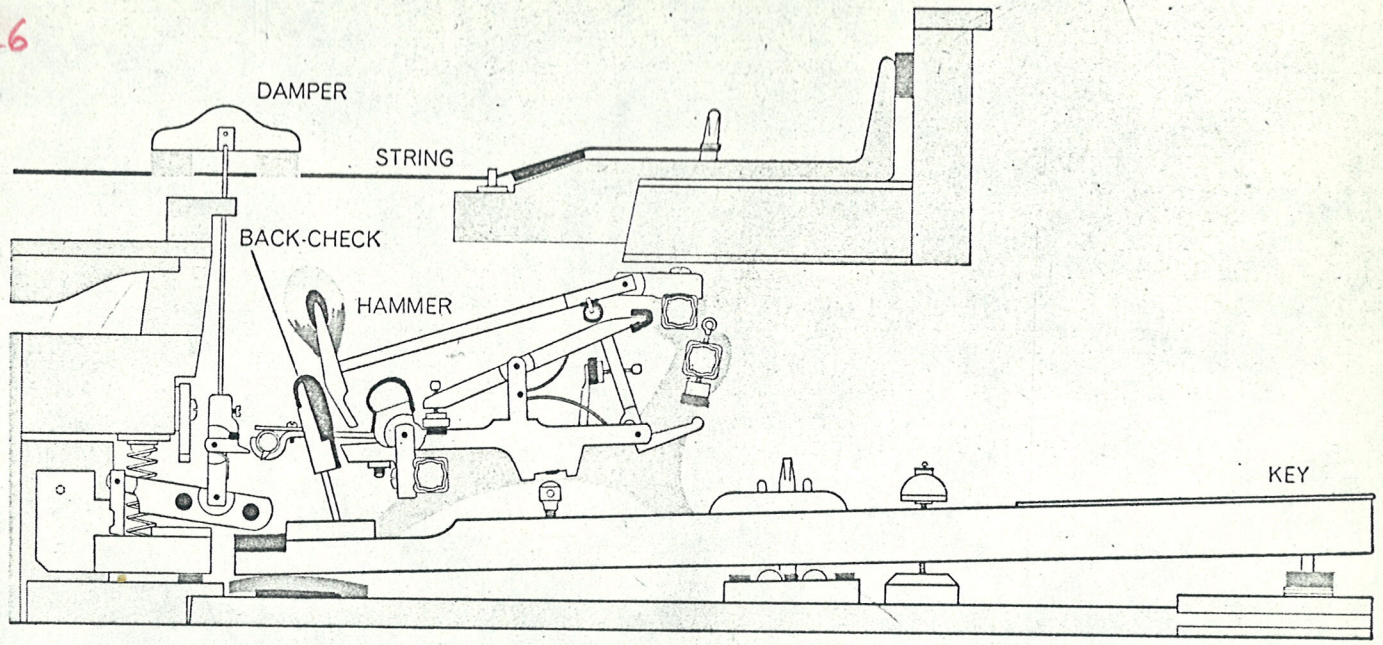
The most interesting part of the piano from the standpoint of the acoustical physicist is of course the strings. The strings used in pianos today are made of steel wire with an ultimate tensile strength of from 300,000 to 400,000 pounds per square inch. Additional weight is needed to make the bass strings vibrate slower and so generate sounds of lower pitch; this is provided by wrapping the steel wire with wire of



CHRISTOFORI ACTION, invented by Bartolommeo Christofori in the early 18th century, was the first hammer action and the prototype of all modern piano actions. It included an escapement device that "threw" the free-swinging hammer upward at the string

and also a back-check that regulated the hammer's downward return. An individual damper connected to the action of the hammer was provided for each note. Christofori called his instrument the "piano-forte," meaning it could be played either softly or loudly.

Dia
29/26



MODERN PIANO ACTION is modeled closely on Christofori's original upward-striking actions, which took advantage of the downward force of gravity for the key's return. Unlike the early hammers, which were small blocks of wood covered with soft

leather, the modern hammer is covered with felt. If the felt is too hard and produces a harsh tone, it can be pricked with a needle to loosen its fibers and will produce a mellower tone. If the tone is too mellow and lacks brilliance, the felt can be filed and made harder.