

# Piano Plate Breakage: A Case

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Journal Editor

The story I relate here is about an event, or series of events, in the life of Marnie Squire, an Associate member of the Cincinnati, OH, chapter of PTG. She has been kind enough to provide the documentation from her case for use in this issue of the *Journal*. "If it can help save someone else from the kind of nightmare I went through," she says, "I'm happy to share my story."

At about 10:30 a.m. on Friday, July 2, 1993, Marnie Squire arrived to tune a small Fischer grand piano at a home in Middletown, OH. The piano, an Aeolian product, had not been tuned in 13 years. Squire played the piano briefly to evaluate its condition and found several keys not playing as well as some damper problems. The piano was 37 cents flat. After bringing the piano back to a condition of rough playability, Squire began the process of raising pitch. Using a Sanderson Accu-Tuner™, she completed a "normal" first pass and had nearly completed a second pass. Then, "I was about to tune the second or third string from the bottom of the bass section. I played the keys and a huge 'bang!' happened. I had no idea what had happened and was very shaken." Looking over the piano she saw a crack in the second plate strut from the top and another crack in the tuning pin area at the bass/tenor break. Mortified, she called the owner of the piano, who was at work and explained what had happened.

The piano owner filed a lawsuit over the broken plate. The owner enlisted the aid of another piano technician in the area as an "expert" witness and this technician (whose name is omitted here) told the piano owner that Squire had brought the pitch up too fast, that she didn't know what she was doing, and that she had actually **broken** the plate!

In September of 1993, Marnie Squire retained an attorney to defend herself in the lawsuit and the long process of gathering evidence began. Several PTG members sprang to Squire's aid by examining the piano and writing opinions, some even performing sophisticated analyses based on the physical evidence. From over two dozen written opinions placed at my disposal by Marnie Squire, I have excerpted a number of relevant quotations.

*Willard Sims, piano service manager at Baldwin from 1946 to 1984, wrote on September 17, 1993:*

"The tuning of a piano by an experienced technician will not cause the string plate to fail." In another letter dated April 10, 1994, Sims reiterated this stance: "I repeat my statement that the tuning of a piano will not cause plate failure. If a rebuilder refurbished and perhaps rescaled the piano, re-

moving and resetting the plate, then that action may result in plate failure."

*Sandy West, a later piano service manager for Baldwin, elaborated:*

"It is my considered opinion that a broken plate cannot be blamed or attributed to a typical tuning/service call. My experience is that strings will break before the plate will. A broken plate is usually the result of some major trauma, such as the piano being dropped or the result of a defect in the manufacture of the plate. In both such instances the actual crack or break may not show up for quite some time. It will develop over time as an eventual result of the continued pressure on the fault by all the strings. Simply tuning the piano would not cause such damage."

*Dr. Albert Sanderson pointed out that Marnie Squire's pitch-raising method had been entirely appropriate, then added:*

"It has been my observation that plates that break under normal tuning stress have a flaw in the casting that can be seen when the break is examined. A flaw could be a bubble in the casting or a crack that has been growing gradually over the years owing to metal fatigue."

*Noted piano rebuilder Tony Geers reiterated the now-familiar theme:*

"Based on the information we have at hand, most notably the fact that the piano plate broke in both the tuning pin area and treble bar, it would be our conclusion that faulty installation of the plate during the manufacturing process is the most likely cause for the breakage. It is impossible for a tuner to break a plate by tuning alone. There must be other circumstances present, i.e., faulty manufacturing, flaw in the cast iron, piano dropped, etc. Tuning works against the strength of the cast-iron plate. Over-tuning would cause string breakage long before any possible damage to the plate could occur.

"If the plate was improperly installed at the factory, plate breakage is a very real possibility. Improper installation could be the bending of the plate over the pinblock or securing bolts or screws. When tension is added by tuning, extreme stress is focused on the bent portion of the plate; such as in the area of the tuning pins and treble bars."

*A letter from prominent piano technician and educator Jim Geiger stated:*

"The conclusion is that a normal piano plate, designed to withstand 40 tons of pressure would not be broken by the tension from the piano strings regardless of the applied tension, how fast the tension is applied and at what point of the

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scale the tension is applied. In the piano factories the tension is applied as fast as the tuner can bring the strings up to pitch. Indeed, it should not be possible to break a normal piano plate with string tension alone, because the strings would break first. There is just not enough margin between the actual string tension and the tension at which failure will occur for the piano wire to be able to produce the force necessary to cause a good piano plate to fracture.”

*University technician Rolf von Walthausen added some background on the material, then pointed out that some piano models frequently suffer cracked plates. In this particular case, it turned out that many Aeolian grands had suffered the same fate. von Walthausen wrote:*

“Piano plates are made of cast iron, which is a material that is extremely hard, but also brittle. Properly cast and installed, it is capable of withstanding tremendous pressure from the strings, which are fastened to and held in tension by the plate. Improperly cast or installed, a cast-iron plate could easily break or crack. Even if piano wire, which is a steel alloy with great tensile strength, is stretched quickly beyond a certain stiffness, the wire will break far, far before exerting a force on the piano plate that would cause breakage or any type of damage to the plate.

“Some brands of pianos have frequent occurrence of plate breakage or cracking. It is rare to find an old Bechstein grand piano, for example, without a crack in the plate. Opinions from experts differ as to why this is so (poor casting, design or installation), but **one**thing is never disputed: tuning or pitch raising was never the cause.”

*Nevin Essex, another highly regarded technician from the Cincinnati area, wrote:*

“I have been teaching piano tuning and technology through the Guild, at universities and on my own since 1982. I have researched teaching methods and developed my own. Nowhere have I ever seen or heard any scientific evidence that suggests that a piano tuner can break a plate. My understanding is that plates are designed to withstand much more tension than exists in any piano. I have never heard any credible account of a piano tuner breaking a plate. I was never taught nor do I teach any technique or method designed to prevent a plate from breaking while tuning. Tuning methods that emphasize raising pitch evenly do so for the purpose of achieving a good tuning, not for preventing the plate from breaking.

*The author of The Piano Book, Larry Fine, weighed in with an opinion that even contributed a touch of humor to the situation:*

“There are only two ways I know of that a tuner can break a piano plate that is not defective while servicing a piano in the home. One way is to excessively tighten the nose bolt that supports the plate in the center area of the piano. This is an adjustment not normally made outside of a piano rebuilding shop. The other way is to take a sledge hammer to it. In other words, it is virtually impossible for a piano tuner to break a plate during the normal tuning and pitch-raising of a piano unless the plate is already defective and ready to break, in which case any tuner, regardless of skill or method of tuning, will be the unwitting agent of such breakage by fate alone. Even in a worst-case scenario, in which a tuner sought to sabotage a piano by stretching all the strings far above standard pitch, chances are that the strings would break long before the plate would. Tuners are sometimes blamed for plate breakage by understandably distraught piano owners, but in every such case the blame is misguided and completely unjustified.”

In expectation that the lawsuit would come to trial, Marnie Squire asked Jim Ellis to look at the piano and to render an opinion from his background as an engineer. After examining the piano, Ellis wrote a formal analysis (included in this issue of *PTJ*) proving that the plate was poorly designed. “What I couldn’t understand,” he said, “is why the plate hadn’t broken when the piano was first strung in the factory.”

*Enter Paul Monachino, who had worked for the now-defunct Aeolian Corporation during the years when the subject piano was manufactured. Delivering the death-blow to the plaintiff’s case, Monachino wrote:*

“This problem is nothing new in this style piano. I have seen this particular plate cracked in the same place *many, many* times. The fault lies in the construction of the plate and *not* in the tuning of the piano.” (Monachino’s emphases —SB)

The night before the case was scheduled for trial, the piano owner’s “expert” witness backed out, leaving the prosecution with no case at all. The shame of the whole story is that Marnie Squire had been placed in such a position to begin with. Besides having to spend hundreds of dollars in attorney’s fees, she was “a nervous wreck” for the year that passed before resolution. The silver lining to this cloud is that, because of what she went through, and the unanimous opinions provided by the real experts, this kind of nightmare — a lawsuit obviously without basis in fact — should not have to be suffered by any piano technician again.