Piano Technicians Journal

July 1983

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Editorial

Don L. Santy
Executive Editor

As everybody who reads these editorials knows, there are three segments of society I like to pick on. The first, of course, is the government. The second is organized labor and the third is unfair competition.

Although I have plenty of examples, I would like to write about a few that affect our activities in the Guild.

When we first came on board one of the first directions I was given was to get our name and logo copyrighted for protection. This sounded simple enough and there was a good file on the subject so Jim Burton had obviously taken a stab at it. I gathered all the forms and information, studied them carefully, prepared the documents and sent them in along with examples of everything the Guild produced with our logo affixed.

We waited, and waited and waited. The board grew restless, I grew restless and the government couldn't have cared less. I decided that I had nothing to lose so started calling various agencies trying to locate our material. I finally made contact with a beaurocrat and he was testy, short, evasive and arrogant. He half promised he would try to locate it and call me back. I waited and waited and waited.

Finally I called him back and he said yes, he had found it and it was well down the pile. I asked how far down and he said way down and it will go a lot farther down if you continue to bug me. At this point in time I began to put some credence in the old saying, "you can't beat the system," especially if it's in the government.

I had several alternatives. I could bribe him but government officials seldom take bribes over the telephone. I could go over his head, but knowing how they stick together and protect one another, I knew this would get me nowhere. Then the simple solution came to me. Hire a lawyer. Lawyers have a code they adhere to (among others), and that code has to do with dealing only with other lawyers in all adversarial situations. Since the government hires more lawyers than anyone else — and, in fact, is largely made up of lawyers — it seemed reasonable to assume that only a lawyer could get through that maze of indifference. That, of course, turned out to be the solution. It took a lawyer no time at all to get the thing through and we were promptly copyrighted and protected. Now enforcing that protection is another matter, and one in which lawyers are also required. I'm beginning to believe that old adage that laws are made "by lawyers for lawyers." They seemed to have developed a system that makes them absolutely indispensable.

We have a regular system to deal

with violators of our logo and good name but nothing seems to have teeth in it until a lawyer gets involved. When one does get involved it gets expensive for everyone except the lawyer. He is the only one that comes out ahead. So, I would like to add another "vexation" to my list: lawyers!

Getting back to the arrogant attitude of the Washington bureaucrat . . . the post office is the best example to come to mind. Now I know that the best people to blame when things go wrong are the government bureaucrat, the insurance commissioner and the computer operator. The government bureaucrat who takes the most heat is the post office employee. That's probably because they usually deserve it.

It all starts with the man on the route. He can stash your copy of the *Journal* in some obscure bin and wait for days before he feels like getting around to delivering it. After all, it's only bulk rate. It doesn't really rate in his book. Have you ever stood in line at the post office working your way up to the counter an inch at a time, only to be treated like a member of the Mafia when you get there? You'd think coming to the counter was a downright inconvenience to the guy who is working there. Courteous, friendly treatment is as rare as a flasher in a nudist colony.

The higher up the ladder you go the more arrogant they often get. I think they get arrogance lessons. I read about an incident in New York recently where a bunch of Cub Scouts were stuffing mail boxes with invitations to sing Christmas Carols at people's homes, with an offer to deliver their Christmas cards free. The Post Office officials accused the youngsters of committing a federal crime, fined them $38.25 in postage for the flyers and held a $76,000 fine over their heads until some Good Samaritan came to their rescue.

The United States Post Office doesn't have a monopoly on inefficiency and arrogance. Our Canadian associates tell me that they believe their post office is even worse. Recently an explanation from a United States Post Office official said in effect, "Our postal rates are still the lowest in the civilized world except Canada, where the government heavily subsidizes the mail."

The post office, of course, doesn't have an exclusive right to arrogance. Other agencies have their own particular brand. Here is an article I ran across some time ago, reported by the National Tax Payers' Union as an example of sheer idiocy.

"Illinois bureaucrats sent out form letters to deceased welfare recipients, informing them that their benefits had been cut off because they were dead. Thousands of copies of such letters have been mailed out, reading: 'Your assistance benefits will be discontinued: Reason: It has been reported to our office that you have expired.'

"The Illinois Welfare Division says it is merely following HEW regulations, which require notification of recipients who lose their benefits. 'The regulations,' they say, 'make no exceptions for the dead . . . and we're required to notify deceased persons of the cessation of their benefits. Recipients who want to dispute Welfare Division decisions are allowed an appeal.' "

Texas State Convention and Seminar

October 14, 15, 16, 1983
Holiday Inn, Downtown
Wichita Falls, Texas

Contact: Jimmy Gold
2101 Walnut St.
Duncan, Oklahoma 73533

President's Message

Ernie Preuitt
President

One of the many good things about being a member of the official board of the Piano Technicians Guild is receiving newsletters from all sections of the country. There are so many good thoughts expressed in them that it seems a shame that they cannot be shared with everyone.

Following is such a message that appeared in "The Tuning Pen," the newsletter of the Madison, Wisconsin, chapter. This was written by Bob Hohf, their president, and is reproduced here with his permission.

Discretion in Guild Affairs

The great majority of our monthly Guild meetings are characterized by an atmosphere of relaxation and agreement. Discussions can be carried on in a relatively loose fashion and business is usually decided unanimously by a voice vote. Normally an air of fraternity is dominant and an observer might mistake the Guild for a social rather than professional organization.

However, there are basic differences between the Guild and other organizations which are primarily fraternal or service oriented. Guild members are also competitors, and if this were not the case, a large part of our Constitution and bylaws would be little more than extraneous paperwork. More important than fraternity, the Guild provides its member-competitors with a forum for the discussion and hopefully the settlement of issues where the feelings of the membership are not unanimous. Procedures and rules of order may seem laborious at times but they provide a format for working out group problems in a way which is fair to all involved. They may seem arbitrary at times, but have been established through years and even centuries of use and experience.

Guild meetings should be used to work toward settlement of difficult issues among members when they occasionally occur. The advantage to using meetings this way is that discussions and even the most heated arguments can be conducted out of view of the public eye. Within our industry, no one benefits when the public becomes aware of our disagreements.

Discretion comes into play when each member must decide what use to make of information gained at the monthly meetings. The most valuable information is, of course, technical information which members can use to improve their skills and increase business. Information gained concerning conflicts and issues within the Guild are best kept within the Guild. Indiscreet or unethical use of such information is counterproductive and negates one of the most essential functions of a professional organization.

This is a most graphic example of what the Guild is and what it does at the national level, but especially so at the local level. The only way to become known and respected nationwide is to become effective locally.

Our thanks to Bob Hohf for sharing his thoughts with us.

The International Scene

Fred Odenheimer, Chairman
International Relations Committee

Every Piano Technicians Guild committee at the beginning of the year — the one that starts with the election of officers in July — is charged with some duties to perform and some goals to reach. All of us try to progress, although I imagine we seldom really accomplish everything we set out to do, no matter how motivated we may be. Then as we go along there are some tasks that crop up which we had no inkling that we would have to perform. As we are ready to leave in a few days for Japan, loaded with presents for dignitaries of JPTA, we hope we made the right choices, have the right inscriptions on the plaques, and have the blessings of the official givers as well as the receivers in Japan.

It all started with a budget that was not to be exceeded. We made some discreet inquiries to find out who would receive Piano Technicians Guild presents and what would be most proper to give. We found out that American art or handicrafts would be most appreciated and, with no idea where to look, we proceeded. I will not bother you with the trials and tribulations of somebody looking for presents for 14 officials of JPTA and a plaque for the organization and its members, but we got it all together, including some personal presents for our friends over there. In a way, it was interesting, enjoyable, and a learning experience.

Five plaques were made with suitable inscriptions and Piano Technicians Guild logo; there are ten pen sets with inscriptions and logo; in addition, there are ten Indian sand paintings, the larger ones for the higher dignitaries; 2 vases; a container for business cards out of myrtlewood; and a painted and signed clay bowl. Although not all of the bills are in yet, we hope we stayed within the budget. (Probably just barely.)

Before our departure we intend to take some pictures which perhaps can be reproduced in the *Journal.* If there is any criticism about the selection of the presents and the inscriptions on the plaques, do not be too harsh. We just tried to do the best we could.

Special thanks go to Richard Davenport whose artworks, consisting of a "tuning hammer" and "tuning forks" out of cobobolo wood, were mounted on some of the plaques.

THE TECHNICAL FORUM

Jack Krefting,
Technical Editor

Now and then we hear of technicians who have, for whatever reasons, built their own instruments at some point in their careers; and although some are undeniably more successful than others in such a venture, one has to admit that anyone who has persevered to the point of making a complete instrument is one who has had to solve a lot of problems that most of us will never face. Some of the better-known technicians who have also been builders are people like Steve Jellen, Sheldon Smith and Ernie Juhn; but our recent article about cutting down uprights has apparently opened a new can of something, because suddenly we are hearing of all sorts of previously unknown makers.

One such maker is Ernest Hansen, who celebrated his 90th birthday last January 25. Bill Allen of the Arkansas Chapter has sent us the following account of Hansen's work:

"January 25, 1983 Ernest Hansen, with the help of his church brothers, celebrated his 90th birthday. Seventy-two years ago in Salem, Oregon he bought a used square grand piano for practice tuning. In 1918, he went to work for the Schwain Piano Company in Portland, Oregon and stayed until the owner's demise eighteen years later. He then started to buy, sell, cut down and service pianos in his small shop at his residence. With the experience he gained from 'cutting off' upright piano plates at the bottom to make smaller, more marketable used pianos, he built his first new 'Hansen' piano from scratch.

"No cast iron plate here. Shipyard steel and an electric welder were enough to cut and brace a plate. Mr. Hansen built fifty pianos during his life with no blueprint or plans. His 50th piano shown here features a 'floating' sounding board at the bottom and about eight inches up the sides. The back assembly is simply six pieces of welded steel. The pinblock is faced with steel with extra build-up above the upper bass bridge to accommodate the overlapping bass strings. Bass string length is enhanced by a radical angle horizontally as shown. What amazes the writer is how action location, hammer striking point, bass and treble upper and lower bridges, hitch pin location, etc. were simply figured out as Mr. Hansen built his pianos.

"Piano #50, his last, resembles a Steinway console and is finished in hand-rubbed ebony lacquer, including a bench which he also built. Action and keys were furnished by a common piano supply company such as you and I would order from. The key dip is a standard 3/8" including good after-touch. The tone of the bass is exceptionally warm with good sustaining power. The writer takes his hat off to Mr. Ernest Hansen for resourcefulness and persistence seldom seen in the profession. As for my opinion, he is a pure creative genius with a lovely wife, Vessie, who has supported him throughout his career."
Eugene B. Allen, RTT
Arkansas Chapter

Bill Allen was kind enough to send photographs, five of which we share here. **Photo 1** shows the cabinet styling of the Hansen, and **photo 2** illustrates the tuning pin arrangement and string scaling, unusual to say the least. Note the extreme overstring angle between

Photo 1

Photo 2

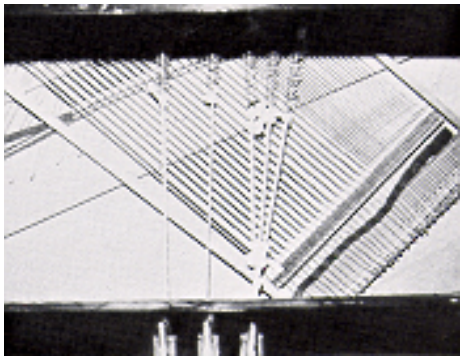


Photo 3

Photo 4

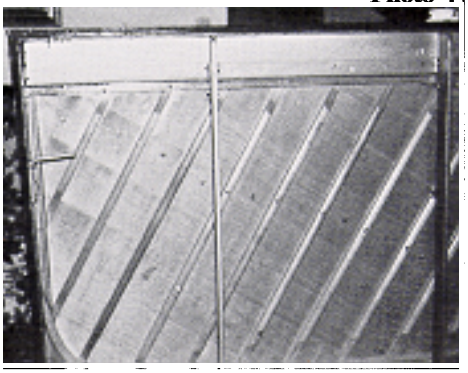


Photo 5

tenor and bass, and the strike point modifications, especially at the treble break. **Photo 3** shows the pedal return apparatus and bass bridge, and **photo 4** illustrates the floating (or semi-floating) soundboard and steel frame. Note also the shape of the treble bridge as outlined by the soundboard buttons — most designers would have preferred to make it a bit less longlegged at the treble break. Finally, we see Allen congratulating Hansen in **photo 5**. Our thanks to both for this interesting story.

Vertical Rebuilding

We now return to where we were last November, before our foray into the area of soundboards and bridges. Having drilled the new pinblock, it is important to pin it as soon as possible to avoid any jumpiness that may be caused by exposure to contaminants in the air.

Select a set of tuning pins, usually 2/0 × 2 3/8" to start with, and with a standby set of longer pins if the torque is low; another standby set of shorter pins to be used if the initial torque is too high would be an excellent idea also. A pin driven to its proper depth should immediately record a torque of around 185 inch-pounds; less than about 150 would indicate the need for longer pins, and more than 220 would suggest shorter ones. Measure the pins, at least on a spot basis, for diameter and roundness as well as consistency in diameter from top to bottom in the threaded area.

No single set is likely to contain 250 pins that are absolutely uniform, even in diameter; so unless the technician is prepared to throw a lot of pins away he must face the prospect of using pins of various diameters. 2/0 pins are usually between 0.281" and 0.282", and I would suggest saving the larger ones for the bass, particularly the low bass where more torque is needed. The reason the torque tends to be generally lower in that range probably has as much to do with the way the pin moves because of the stiffness of the wire as the fact that those three fat coils on the pin don't allow quite as much penetration into the block. The former problem is compounded, in my opinion, by tuners using the two to three o'clock position with the tuning hammer, which springs the pin to the point of bending it sometimes.

If the old block is being re-used, select a set of pins one or two sizes larger than the originals — if the old pins were firm, go up only one size, but if they were loose go up two — but be cautious about using anything over 4/0 because of the difficulty of getting accurate tuning with such big pins. An occasional 5/0 might be all right in the bass, but in general if it takes that big a pin to get holding power, the piano needs a new block.

If there is any hint of jumpiness when the first pins are driven in, it may be wise to use a driving fluid or varnish. Don't dip the pins, because the surface of the block will simply wipe off the varnish, but swab the inside of the hole with a special tool made from a spinet hammershank and a piece of bushing cloth as shown in **figure 1.** Dip the swab in ordinary indoor varnish and slowly twirl it in each hole, thus coating the sides of the holes. Don't overdo it, though, because if it is puddled up in the bottoms of the holes the pressure of driving pins could split or delaminate the block.

As a right-handed person, I find it convenient to string from left to right; so on grands I usually start in the low tenor and work on up to 88, then to note 1 and on to the top of the bass. Conversely, because a vertical scale appears backward when lying in stringing position, I start at note 88 and work on down to the bottom. The reasons are purely arbitrary, however, and certainly any system that works is fine.

There are exceptions, too. In the case of grands, sometimes when a new soundboard has been installed there will be interference between some of the bridge pins and a plate strut, making it necessary to string a few unisons on either side and pull up some tension. As a matter of fact, at least one manufacturer recommends that his grands be strung in a certain order for that very reason.

Another reason to vary the usual order, in the case of an old board, would be the presence of flat spots; these seem to occur most commonly in the mid-treble in the vicinity of A61 and in the top of the bass. I prefer to string such an area last in hopes that the compression elsewhere will help to prevent further loss of crown and bearing at the flat spot. Such techniques are of little value in the modern vertical piano, however, unless the technician is willing to go to all the trouble to string with the pressure bar in place.

Still another reason for a particular stringing order has to do with the contamination of wound strings. In general, it is a good idea to wipe a thin film of petroleum jelly on the plain wire strings after installation to prevent rust; but even the tiniest amount of such a contaminant on a wound string can cause it to immediately and irrevocably go dead, so if there are wound strings in the tenor it would be better to leave them in their wrapper until all the plain strings are in place, rustproofing added, and the stringer's hands washed.

Domestic piano wire is available in ¼-lb., ⅓-lb., 1-lb. and 5-lb. coils, and the amount to order would obviously be dependent on how many pianos will be

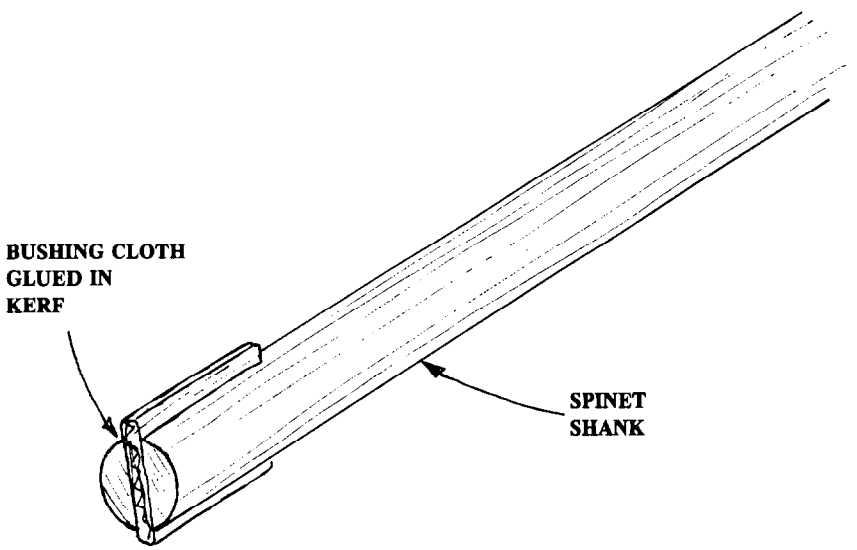


Figure 1

strung in the near future, as well as the number of feet of a particular size wire which will be needed in those particular scales. In a typical small shop which averages one completed rebuild per month, the following stock seems about right:

¼-lb. or ⅓-lb. coils	sizes 12, 12½
1-lb. coils	sizes 13, 13½, 14, 14½, 18½, 19½, 20½, 21½, 22, 23
5-lb. coils	sizes 15, 15½, 16, 16½, 17, 17½, 18, 19, 20, 21

Whenever replacement coils arrive, it is a good idea to immediately check them for diameter — they will occasionally be mislabeled — and for brittleness. Make a sharp 90° bend in the end of the wire with a plier and examine the outer part of the bend for any sign of splintering.

I made a spool to hold the 5-lb. coils as shown in **figure 2.** Large shops frequently have one of these for every size of wire, which makes good sense, especially if the shop is stringing more than, say, 30 or 40 pianos annually. The base plate is made of ordinary plywood, as is the upper plate. The ½" dowels were slit with a hacksaw at the bottom for a nice, tight fit in a 15/32" hole. They are glued into the base plate, which also receives a caster socket which serves as its center of rotation. Almost any kind of pin clamped in a vise can be the axis, and if a brake is needed to prevent backlash, a trap spring works nicely — just mount it on the bench so that it drags on the base plate. The upper plate has larger holes so that it slides down the dowels of its own weight, keeping the coil from springing upward.

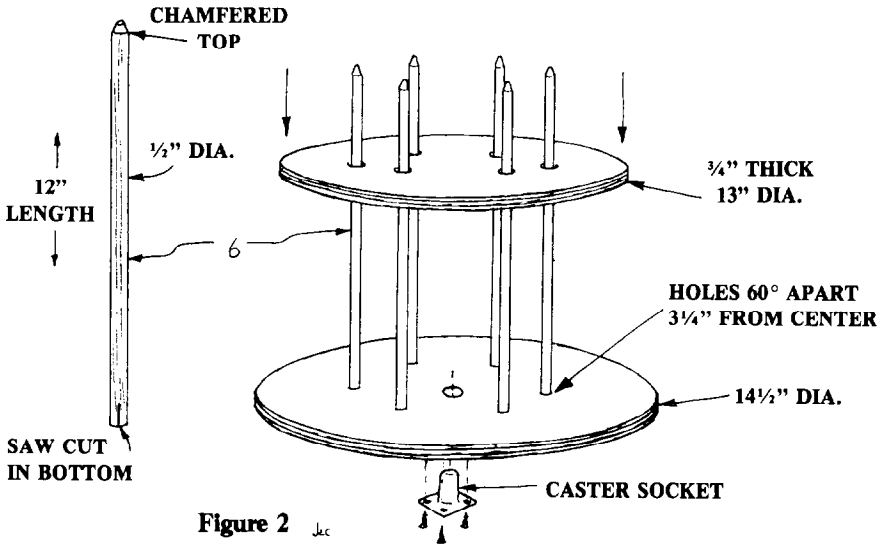


Figure 2

I have tried all of the available spools for smaller coils of wire, and have concluded that the metal canister illustrated in **figure 3** is the best. It dispenses the wire easily and reliably, *provided the inside end is started out the opening* with no possibility of backlash. I understand that these are available in the 5-lb. size as well, but my experience is confined to the size that holds a pound of wire. The canisters can be hand-held, or they may be pivoted on a roofing nail (or pedal prop, anything with a large head because the hole in the bottom of the canister is about ¼" in diameter) held in a vise. Another advantage of the canister is that no brake is ever needed because the wire naturally drags against the opening in the top, which is considerably smaller in diameter than the coil. The wire suddenly reduces its radius, and that provides the needed friction. The design is as simple as possible, with no moving parts to need adjustment. I use canisters for all 1-lb. coils.

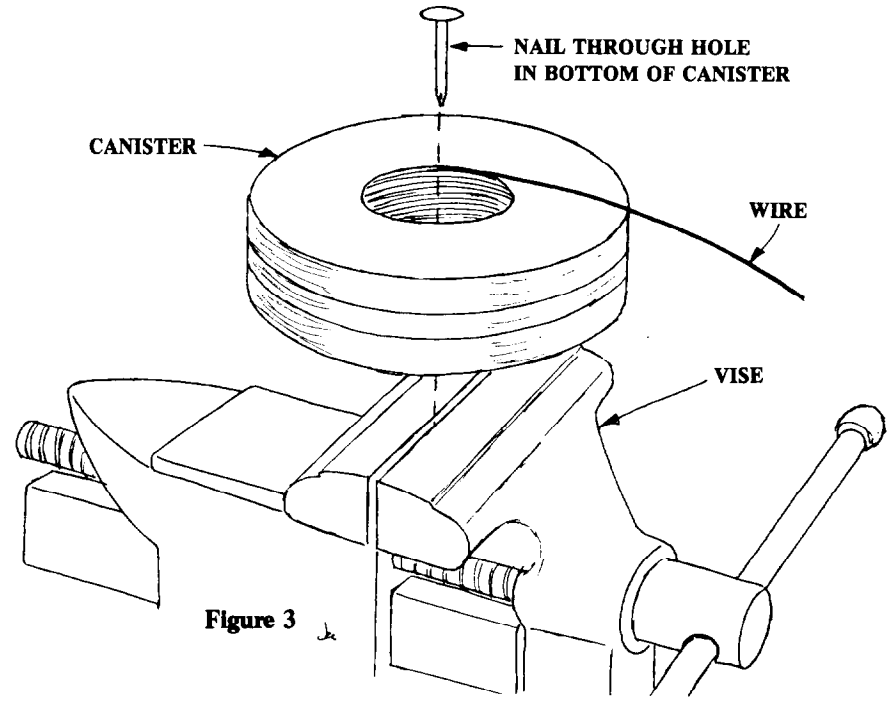


Figure 3

Some technicians cannot string a piano without gloves due to the chemistry of the skin, which can act as a corrosive agent against the pins as well as the wire. Others find gloves unnecessary, but keep their hands dry and clean by wiping them periodically on a towel. Still others use talc or rosin to keep dry and/or to increase pin torque,

which reminds me of the only time I tried it. The rosin made the pins so tight that about a dozen of them broke when I tried to dress the coils; tuning that piano later wasn't a whole lot of fun, either, so if the pins are already tight I would suggest forgetting about the rosin.

Those with tender skin may prefer to use a leather thumb protector on the left thumb, which takes the brunt of the force when making the beckets. My own method is to hold the pin horizontally in the left hand, head of the pin toward the right, and feed the wire into the becket hole from below. When it is observed to be flush with the other side of the pin, pinch it in position with the left thumb and engage the head end with a stringing crank. Make three quick clockwise 360° turns, holding pin and wire firmly for a nice sharp becket. When the pin is released, the springiness in the wire will cause it to unwind about half a turn; this is demonstrated in **figure 4,** where the coil has relaxed away from the pin and appears to have just 2½ coils. This is fine, because by the time the pin has been driven into the block and the tension placed on the wire there will be about three coils once again on the pin.

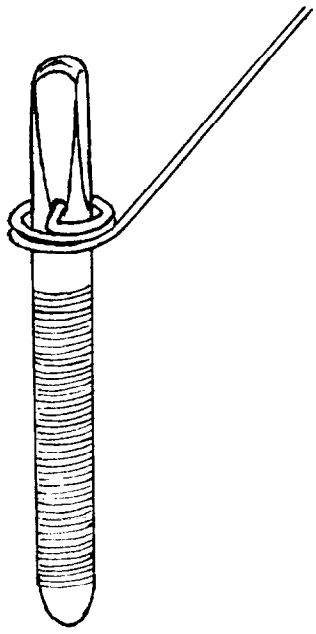


Figure 4

What is the right number of coils? It is my feeling that the minimum is about 2½, the maximum 4, and the ideal in the range of 3 to 3½. Some of the best stringers are able to cut the wire so that when the piano is at pitch all of the beckets point in the same direction, a feat that is more than merely a cosmetic nicety; every technician who subsequently tunes that piano will be able to do a better job because the tuning hammer will fit on each pin at the same angle.

Avoid the practice of "walking the pins in," which means driving them when they are not lined up straight with the hole. They start crooked and eventually are forced to straighten out to fit into their hole, but in the meantime a lot of damage is done to the hole. Some manufacturers allow their stringers to drive two or even four pins at once with a wide-headed stringing hammer, and it is little wonder that the resultant torque readings are so inconsistent. Avoid this by driving one pin at a time, at least until each is safely started in a straight line with its hole. The pins should be driven to a depth that allows a gap of about 1/8" to 3/16" between the bottom of the dressed coil and the top surface of the plate web. If the pins are left too high, tuning will be difficult because the pins will tend to "flagpole" or spring too much for reliable setting. Conversely, if the string is dragging on the plate it will break at that point sooner or later.

This is difficult to estimate on a vertical, because we can't pull up tension or dress coils until all the treble strings are installed and the pressure bar is in place. A suggestion would be to pull just the first pair of strings to enough tension to at least dress the coils, and then tap the pins down until the correct height is obtained. Then make a wooden block that is just the thickness of the height of the tuning pins above the plate. This can be used for the rest of the job, and no other coils need be lifted until the pressure bar is installed. The one pair of strings that was tightened can be loosened for pressure bar installation with a minimum of lost time, and with this method the pins will be level.

To remind the stringer to change wire sizes at the correct point in the scale, Cliff Geers suggests the use of golf tees. These are simply inserted into the hole in the block where each change is scheduled; it is as near to a foolproof system as has been devised, because one cannot drive a pin where there is no hole.

Next month in this space we will discuss the installation of the pressure bar and chipping.

Question: "I'm attempting to restore an old Cable-Nelson Upright Grand which appears to be a well-made piano. However, it is found to have about .075" negative crown at the center of the board, also about .110" negative down-bearing at the center of the treble bridge and about .080" negative d-b at the center of the cantilevered bass bridge, with strings removed.

"Since I am new at this operation I have only your articles on shimming in the January, February and March 1983 *Journals.* Perhaps restoration of crown and down-bearing were covered previously. If so could you let me know what issues to ask for; and, if possible, refer me to other treatises, if any, on such restoration in upright pianos. Is there a possibility of lowering the plate to gain bearing without changing the soundboard?"

Richard Seaman
Deerfield, Illinois

Answer: You cannot restore a crown if it's already negative — the piano needs a new board, period. There are ways of propping it up, all of which fall into the highly questionable category, utilizing automotive valve springs, kerfing the bridge, and so on; these "repairs" merely mask the symptoms rather than correcting the problems, much on the order of the shady used car dealer who puts sawdust in a transmission to quiet it down long enough to sell the car.

If you add downbearing you will only make the problem worse, because then the board will curve backward that much further. The bearing gained in the middle will be lost, while that at the ends of the bridge will be increased so much that the tone will be killed there too.

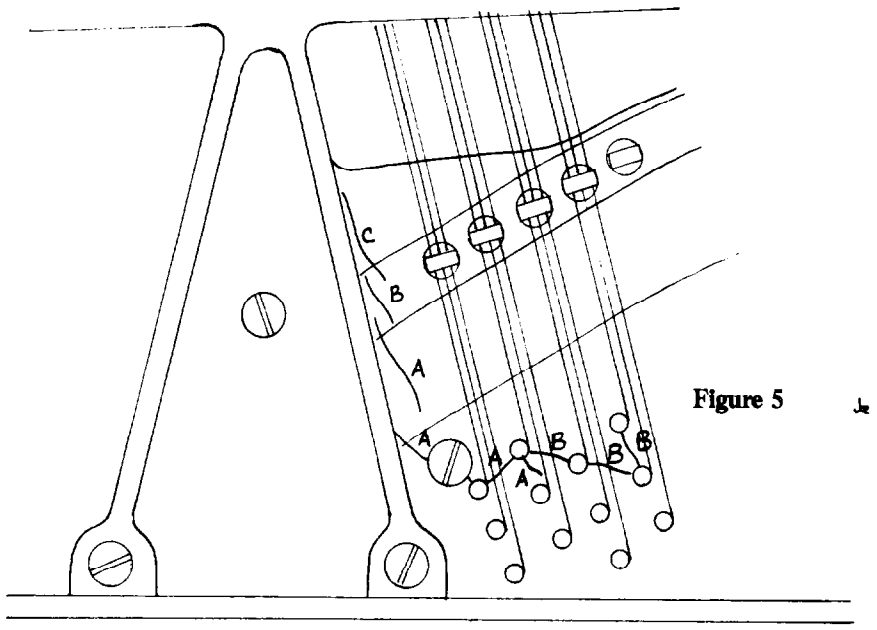


Figure 5

If the piano is not already torn down, my advice would be to inform the owner that the tone cannot be restored without a new soundboard, and that it would be pointless to install new strings and action parts unless the board is replaced also. If the piano is already dismantled and the owner has been promised a full restoration of tone, you might have to bite the bullet and replace the board without extra charge to the customer; that would depend on the terms of the estimate.

Question: "I service a seven foot grand built in 1960 that has some hairline cracks in the plate. I have seen the 'cooling cracks' in plates, particularly in the tuning pin area, in other pianos, and am aware that it is not at all a serious situation. However these cracks seem to be growing and spreading toward a more alarming area. I have drawn an illustration (see **fig.** 5 — ed.). The letters by the crack are referred to as follows: cracks marked 'A' were present when I started servicing the piano 7 years ago. Cracks 'B' appeared 2½ years ago. Crack 'C' appeared 4 months ago. The piano undergoes the usual humidity variations found in school buildings. A few cracks have appeared in the soundboard and the tuning pins are getting sloppy. The rim bolts are tight and plate screws are secure. There is no sagging of the pinblock, and there is no cabinet damage that might indicate handling problems that could have contributed to the cracking of the plate.

"The piano is going to require restringing and new pinblock within five years. Do you have any suggestions for preventing any serious plate damage either at the present time or when rebuilding is being done?"

Marty Hess, RTT
Wichita Chapter

Answer: First of all, if these are tension cracks we must assume that the tail and bentside of the plate has been pulled down when the plate was set, after the fitting of the block to the plate and case. The result is cracking, which will most likely continue until the tension is removed from the upper part of the web by one means or another. The plate has not yet cracked across a strut, but when it does there will be a major structural failure.

I would try to move the rebuilding schedule forward so that the cause can be determined before the plate is beyond repair. So far, I don't feel that is the case. With the strings and tuning pins removed, the cause of the cracking will likely be found when the plate screws are loosened. Either the plate will be rocking in a fore/aft plane, or in a side/side plane on the top face of the pinblock, if there is any validity to my theory. The solution, in that case, would be to remove and repair the plate, possibly using the Metalstitch method outlined in our issues of June 1980 and April 1981. Then fit a new block to the plate, being careful to fit it to the web as well as the flange, and then to install the new block so the plate can be bolted down without stressing it in any direction. Be sure the nosebolts are merely supporting the plate and not pulling it down in the center, another possible cause of this condition. Those who glibly refer to nosebolts as "plate bearing screws" often have little idea of the damage that is caused when brittle cast iron is forcibly bent, and it is a safe bet that these same people won't be eager to accept responsibility for breakage when it occurs; but the fact is that it does occur and that is one of the reasons for it.

Finally, it occurs to me that this particular model has a horn wedge which just might have fallen out and become lost. If so, lower tension in the area around the break at least and replace the steel wedge.

Technical Tips

Our first tech tip this month is from Sally Jameson of the North Carolina Chapter, who offers a tip on hammer filing. In certain situations, such as when hammers need traveling anyway, or when you need to repin anyway, or when the hammers are in a very uneven and worn condition but still have enough felt to voice, it is advantageous to be able to gang-file the bass and tenor hammers which are hung at an angle. Obviously they cannot be gang-filed while the flanges are attached to the rail, but if they are unscrewed and clamped together as shown in **figure 6** they can be filed with greater uniformity and precision than would otherwise be possible. Gang-filing produces sharper, cleaner edges, too.

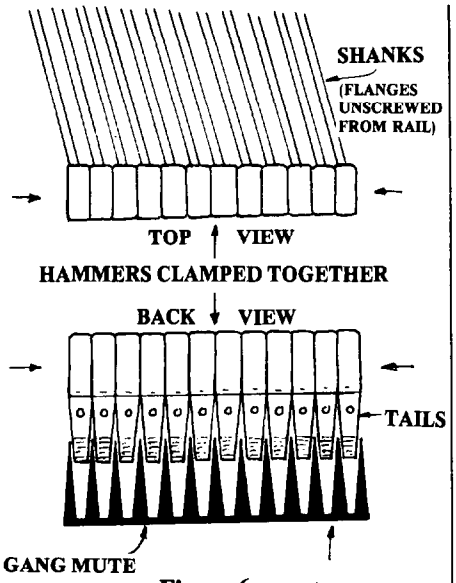


Figure 6

Sally suggests lining up a group of hammers with a straightedge on the felt underneath the staple if necessary, and clamping them together so the tails rest on a flat surface. To allow for the tapered tails, a gang mute may be inserted to maintain the spacing. One can lose money on this in certain situations, warns Jameson, but in others it works very well; in fact, if a set has really been badly filed before, or filed with a power tool, this may be the only way to restore the set.

Our next tip is from Mark Peele, who has found a new use for a household item:

". . . here is a drawing of a standard necktie rack (see **figure 7** — ed.). *If the hangers are removed, they become excellent grand action pulling tools. They snap in between front rail pins. Using two of these clips makes pulling any grand action a snap."*

Mark Peele
Tucson, Arizona

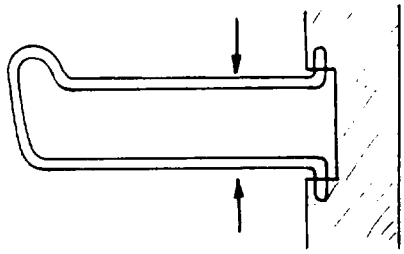


Figure 7

Newsletter Tech Reprint

The San Francisco Chapter's *In Tune,* which has been featured quite a few times in these pages because of Susan Graham's incisive writing, is back again for the same reason:

Upright Jacks

When you get right down to it, the jack is a very important part of an action and one with not a lot of leeway before problems develop.

The three most common functional problems which can occur are lost motion, sluggish centers, or failure of the jack flange/wippen glue joint. The lost motion should be very slight between the jack tip and the butt, although lost motion is necessary in compact or drop actions. The center must be free enough for the jack to fall of its own weight when the wippen is tipped. The flange must be glued tightly into the wippen and must be aligned so the jack lies directly and squarely under the butt. This is worth checking any time you have an action out for reconditioning, since it is a nuisance to fix when the action is in place.

If the jack is functioning properly, then it may very well make noise. On its way out, it can squeak on the butt leather, or it may "rasp" on the way back in. This may be helped by slightly increasing the lost motion. If the butt leather is misshapen, it can sometimes be "burnished" back to a better shape (in extreme cases it may need bolstering or replacement). Gentle sanding or wire-brushing can remove some of the hard scale from the leather, and eliminate some noise. Lubrication, either with Slipspray (on teflon coated) or DAG or soapstone (on older actions) of the jack tip can help also.

Clicking sounds can come from many places. Likely sources are excessive glue or hardness of the butt felt, a drop of glue on the jack tip or the underside of the bridle strap, or sloppy gluing of the jack spring. The spring must also be set in its circular groove (underneath the jack tender). Check also the let-off button; it should be tight on its screw and in the rail, properly positioned over the tender, and the punching should be glue-free and reasonably soft. It can be

worthwhile to lubricate the tender as well.

These are common trouble spots; of course there are many more unusual troubles. Since the jack action is so important, it is worth the time to seek out and solve as many problems as possible.
Susan Graham, RTT
San Francisco Chapter

Repair Procedure Outline

The following was submitted by Paul Bergan of the Houston Chapter. The topic is "Repair of Pinblock Separation in Upright":

Upright pianos have a pinblock out in front but connected to softer wood extending to the rear of the piano. Sometimes the lag screws do not hold, a crack appears at the top and the piano will not stay in tune — in fact the cast-iron plate *leans* toward the front.

Tools Needed:

Three large, strong clamps
Glue
3/8" drill bit for wood and drill
4-3/8" thick stove bolts with nut and washers long enough to go through thickness of top
Hammer
Crescent wrench (or other) to remove lag bolts in the plate

Repair Procedure:

1. Remove the action.
2. Remove the top.
3. Remove thin wood covering crack location.
4. Loosen strings a bit.*
5. Adjust the three clamps and wood supports against plate in front and back; tighten one at each end and the one in the middle so the crack is well closed.
6. Remove one lag bolt, possibly center one.
7. Use same hole and drill through the soft wood, the drill coming out in the back.
8. Remove other lag bolts and drill.
9. Now loosen clamps evenly allowing crack to re-open and apply glue; re-tighten clamps evenly.
10. Put in the 3/8" stove bolts from the back with washers and nut in the front. The bolt in the rear will become embedded in the wood and won't turn when you tighten nuts in front. It is assumed you have cut the bolts to a good appearing length so they won't stick out too far beyond the nut.
11. Have one man at each clamp to tighten slowly, thus putting even tension over the plate.
12. Tighten clamps and nuts, completely returning plate to its proper place.
13. You may wish to leave tightened clamps on overnight to dry.
14. Pull up strings and re-tune.

*Sometimes it's not necessary to loosen strings. If you do you'll have to re-tune this piano like a brand-new one — several times. This question is controversial!

Gadget of the Month

Bob Erlandson, a twenty-year Guild member who has many technical achievements to his credit, including the design of the Baldwin service school course and erstwhile directorship of the Western Iowa Tech piano course, has submitted the following:

Here is the tool that I made to measure and cut stemmed hammers to proper length when installing hammer butts, shanks and hammers. Once that shank length on note 88 is determined, tubing length is adjustable and fixed allowing for shank nipper and all shanks may be cut to length. It works well particularly on on-site *operations.*

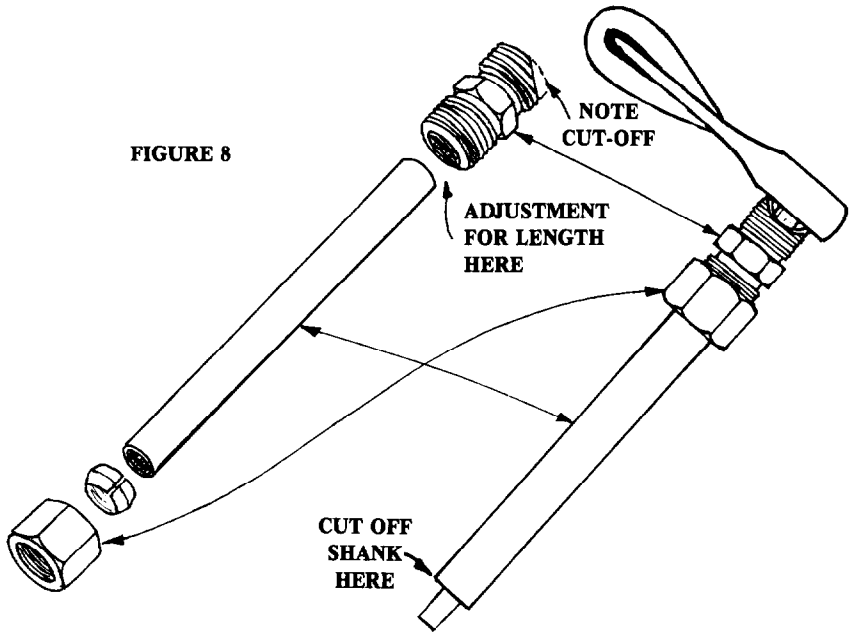
Note that the threaded coupler must be drilled through for maximum adjustment. Shorter tubes may be used to measure shanks for compressed actions (see **figure 8** — ed.). *The collet is cut through with a saw cut to prevent a permanent squeeze on the tubing. Also make note of the bevel cut to the center of the coupler and its purpose . . .*
Bob Erlandson, RTT
Nebraska Chapter

Thanks, Bob. The bevel cut, incidentally, is to allow for the fact that some hammers are hung at an angle, but still the centerline of each hammer should be in a straight line.

Reader Comment

Recently I acquired an Erard 6 foot grand. I wonder whether any of your readers have had experience with the Erard action and could give me some tips on regulation measurements? The instrument is numbered 100142. I would be pleased to exchange information, tips and experience by correspondence with interested readers. I have rebuilt a Bechstein, a 100-year-old

FIGURE 8



Steinway and a Broadwood barless grand . . ."

S. Ch'in
4398 Sherbrooke Street
Westmount, Montreal
Canada H3Z1E1

Dear Jack,

After spending some time over the holidays catching up on my reading of the Journal, I read a few things in the magazine which bother me some. The first one is recently someone published an article saying how tuning has improved so much over the last thirty years. Perhaps I missed something of what he was trying to put across. I'm afraid that I'm still trying to do what I was taught over thirty years ago. I think though the thing that really bothers me is the article referring to purposely tuning unisons a bit out for color or whatever. I think that just a very short amount of time will very well take care of this situation. How many of us have gone out to pull in a new string which we had replaced a week or ten days ago only to find some out-of-tune unisons which we could not believe possible. How could they have gotten out that far? Well, we know many of the obvious reasons but we spend a little extra time to pull them back in. Still leaving the home a bit disheartened we go to the next appointment to find an instrument which we tuned six months or a year ago not too bad. That helps.

In closing, I've been told that you can't teach an old dog new tricks and I suppose I would have to pretty much agree with that adage. However, may I say a lot of tricks can be learned from an old dog.

Jack Sprinkle, RTT
Northern Virginia Chapter

In Conclusion

Let's keep the multi-purpose tool ideas coming — we will start featuring them as soon as we have enough of a representative sample of serious as well as humorous entries. Mail them, and/or any other technical articles, questions, tips or comments for publication, to me at this address:

Jack Krefting, Tech Editor
2337 Royal Drive
Ft. Mitchell, KY 41017

It's The Little Things That Count!

Gerald F. Foye, RTT
San Diego Chapter

Fallboard Installation

A famous general was well known for his motto: "When in doubt, attack!" The general was ultimately done in by a two-foot-tall, 300-pound midget who tied the general's boot laces together just before his infamous downhill attack.

For years I used this same philosophy to replace those stubborn brand fallboards which have keyblocks hanging loosely on pivot pins with nothing to retain them. (I suspect the reason for the name "fallboard" is derived from the fact that the keyblocks generally fall off just before you get the mechanism in place, necessitating a re-start!) I found the general's plan somewhat effective by stepping back several feet, holding the fallboard at the proper height, giving a karate scream and charging forth hoping the keyblocks would not dislocate themselves before I engaged the fallboard in place. This method was also the reason I carried a great deal of refinishing supplies.

However, a recent revelation has shed new light on this problem. With the fallboard on the floor, or work surface, and keyblocks in place, grasp the fallboard on each end with a finger placed over each of the pivot pins. Let the keyblocks dangle freely. Gently slip the fallboard in place. Once inside the piano case the keyblocks can no longer dislocate and the job becomes very simple. (See photo.)

While on the fallboard topic there are some uprights (spinets and consoles) that fall in the "difficult-to-deal-with" class. Those are the ones with one or more stamped sheet metal components that comprise the pivoting mechanism and are attached to the inside of the piano case with screws. Getting them out can be difficult but getting them back in can be frustrating. Don't hesitate to draw a sketch as to location of components; or, as some technicians do, outline the stationary bracket, in the casing, with an awl to relocate exactly.

Also, as a time saver, on many pianos with this arrangement it may not be necessary to remove the key cover for key service. Rather, raise the fallboard (key cover) in a vertical position (remove music board mounts or brackets for clearance if needed); remove the keystrip and you have quick access to the keys for leveling, easing, etc.,

The secret to success in installation of grand fallboard with loose keyblocks is placement of finger over pivot pin which allows keyblock to dangle freely without possibility of falling off. (Finger marks, gouges, etc. courtesy of students where this particular piano is located!)

Sound Background

Jack Greenfield, RTT
Chicago Chapter

English Virginals, Music and Tuning

Social Importance

The first extensive development of the composition and performance of secular solo music for keyboard stringed instruments occurred in England beginning in the final decades of the sixteenth century. This was encouraged by the interest in the instruments shown by the English monarchs, starting with King Henry VII (reigned 1485-1509), whose wife Elizabeth played the virginal. Other royal players later included Henry VIII (reigned 1509-1547), his first wife Catherine, Mary Tudor, Queen Elizabeth and Mary Stuart. Henry VIII composed songs, ballads, and individual pieces. Elizabeth was vain about her ability as a virginalist. Following the example set by royalty, playing the virginal became a desirable social skill. Shakespeare took notice of the fashion by writing his sonnet (XXVIII) "Sonnet to a Lady Playing the Virginal."

English Instrument Making

It should be noted that the English used "virginal" as a generic term for all jack-action stringed instruments during the sixteenth century and into the first part of the next; consequently, English "virginal music" is authentic for harpsichords and spinets also. Contrary to what might be expected from the scarcity of surviving English instruments made during this period and other evidence, it appears that the majority of instruments were imported from Italy and Flanders. One of the few documents now available with information on sixteenth century instruments, a 1553 inventory of instruments at Westminster owned by Henry VIII, listed twenty-two instruments as virginals but the descriptions indicate that some were harpsichords and spinets of Italian and Flemish origin.

From a review of scattered documents, Hubbard found brief references to a total of sixteen virginal makers in sixteenth century England, four of whom had Flemish training. Only one sixteenth century English instrument is still in existence. The earliest surviving seventeenth century harpsichord was built in 1622 by John Haward, a member of England's first important keyboard instrument making dynasty. The records show three Johns, two Thomases, and one Charles but the exact family relationship of the men is unknown. Most of the surviving Haward instruments, possibly twelve or thirteen including only one harpsichord, were built by Charles from 1683-1687. The Hitchcocks, another family of fine instrument makers, were active for over a century beginning from about 1660, with Thomas followed by his son Thomas and then John in the third generation. The Hitchcocks were noted for high quality spinets.

Typical characteristics of early seventeenth century English harpsichords were: a single manual, two choirs of eight-foot strings — four foot strings were rare — and a lute stop, an extra row of jacks that pluck the eight-foot strings very close to the front bridge producing tone with a nasal quality. At first instruments were constructed in the light, elegant Italian form. Later, there was a gradual change to the heavier Flemish style but the short treble scaling of the Italians was continued.

Most of the surviving seventeenth century English instruments are either rectangular virginals built during a forty year period beginning about 1640 or spinets built after the middle of the century. There are about seventeen dated virginals similar in design resembling Flemish instruments except for shorter Italian treble scaling and placement of the plectra closer to the front bridge. Russell considers the tone bright and resonant. Hubbard disagrees, describing the tone as thin, unresonant and nasal with the "basses sour and the treble feeble."

In the second half of the seventeenth century and continuing into the next, spinets became the most popular of the English-built instruments. These were usually small — about four and one-half feet long, curved "leg-of-mutton" shaped instruments with single sets of strings and jacks spanning a range of four and one-half or five octaves beginning from G1. The restrictions by the size of the instrument on the scaling and the soundboard had adverse effects on tone quality. The relation of these spinets to full-size harpsichords was generally the same as the present relation of the "mini-grands" to full-size grand pianos.

Clavichords were in use in England during the first half of the sixteenth

century but interest in the instrument dwindled rapidly. The few that were used later were imported.

English Virginal Music and Composers

The music of "The English Virginalists" written from about 1580 to 1650 was the first to make full use of the resources of keyboard stringed instruments, establishing a true keyboard style followed afterward in other countries. English virginal music is an important segment of present-day piano as well as harpsichord repertoire. These compositions were written for single manual instruments incapable of dynamic contrast. Instead, interest was added by such devices as rhythmic figures, broken chords, scale passages, tremolo, repeated note figures and others. Since accents were impossible, rhythm depended on phrasing, note values, harmony and ornamentation. Many of the compositions have a relatively simple musical structure consisting of a basic dance or song melody replayed in variations. Written music is now available for a total of about six hundred compositions ranging from short simple pieces to long pianistic works requiring advanced technique.

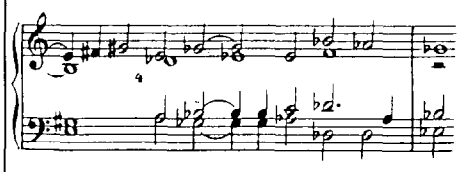
William Byrd (1543-1623), whose church and secular choral music is also held in high esteem, was the pioneer composer who did much to establish the style. John Bull (1562-1628), a highly skilled virtuoso, wrote longer compositions containing technical difficulties usually thought of as originated by later composers such as Scarlatti or Clementi. The music of Giles Farnaby (1565-1598?) is also of special interest because it sounds more "modern" today than the music of his contemporaries. In addition to the preceding, at least a half dozen other composers wrote pieces of some musical value. The later keyboard music of England's outstanding composer of the late seventeenth century, Henry Purcell (1658-1695), and other composers of his time, are different in style from the earlier music of the virginalists. Purcell had started his career as a choir-boy. At about fourteen when his voice began to change, he became a tuner-technician servicing pipe organs and other instruments. Later, he went on to become an organist and composer.

The opportune introduction of the printing of keyboard music made it possible to distribute the English virginal compositions much more widely than before, when written manuscripts were used. *Parthenia,* published in 1611, the first virginal music ever printed, contains twenty-one pieces by Byrd, Bull and Orlando Gibbons, another prominent contemporary composer. The most comprehensive collection, *The Fitzwilliam Virginal Book* (FVB), compiled around 1620, contains over one hundred pieces by Byrd and Bull plus almost two hundred more by other virginalists. The FVB and several other collections are now available in modern editions from Dover and other publishers.

Tuning for Virginal Music

There are several references on tuning by contemporary English writers but their systems were not presented for virginals. Thomas Morley (1557-1602), a prolific composer of church, vocal and instrumental music including compositions for Shakespeare's plays, as well as virginal music, discussed the Pythagorean monochord pattern. John Dowland (1562-1626), the most prominent lutanist of his age whose enormous earnings were comparable to those of present popular music stars, offered a modified Pythagorean system for lute tuning that had some pure fifths and some thirds almost pure.

Recent studies on virginal tuning have been based on analysis of the music for range of modulation. Most other keyboard music of the period contains no accidentals outside a twelve-note meantone tuning chain, usually E^{b}-$F^{\#}$ or B^{b}-$C^{\#}$. However, the *Fitzwilliam Virginal Book* contains some pieces with accidentals beyond a twelve-note compass suggesting the possibility they were written for some temperament with mean or equal semitones. Bull's "Ut, re, mi, sol, la" (FVB, Vol. 1), the most extreme composition, contains enharmonic modulation with accidentals ranging from C^{b}-$A^{\#}$, overlapping a twelve-note tuning chain by six notes (see example).



Enharmonic Modulation from "Ut, re, mi, fa, sol, la" by John Bull (Measure 12)

Other pieces also contain chromatic modulations more advanced than the modal cadences of older music. Barbour's discussion indicates that while Bull and some other individual composers may have tuned in equal temperament, their compositions are not evidence of the use of *exact* equal temperament in Elizabethan England. Other temperaments later known as "well-tuned" or "equally-beating" would also have been more suitable for the chromatic progressions than meantone temperaments.

According to Jorgensen, although probably known earlier, well-temperaments were not mentioned much in the writings of theorists until around 1690. For English keyboard music from the early 1500s to 1695 (*Piano Technicians Journal,* January, 1978, p. 19), Jorgensen recommends the temperament first published by Grammateus in 1518 and mentioned again by Juan Bermudo in 1555 for tuning the lute. The Grammateus-Bermudo temperament, basically a Pythagorean diatonic scale with mean semitones, is considered an alternative to equal temperament.

The diatonic notes with 0 exponents are tuned in a series of pure fifths. The chromatic notes with the exponents $-\frac{1}{2}$ for sharps or $+\frac{1}{2}$ for the enharmonic flats at exactly the same pitch form their own series of pure fifths. The connecting fifths $B^{b-\frac{1}{2}}-F^0$ and $B^0-F^{\#+\frac{1}{2}}$ are $\frac{1}{2}$ diatonic comma (12¢) wider than pure fifths. For comparison, the bottom line shows figures for $\frac{1}{4}$ comma meantone. Jorgensen's *Tuning the Historical Temperaments by Ear* gives several different aural systems for the Grammateus temperament.

Grammateus Temperament — Pythagorean with Mean Semitones
(Cents and Exponents Shown by Barbour)

						$F^{\#}-\frac{1}{2}$						
C^0	$C^{\#}-\frac{1}{2}$	D^0	$E^{b}+\frac{1}{2}$	E^0	F^0		G^0	$G^{\#}-\frac{1}{2}$	A^0	$B^{b}-\frac{1}{2}$	B^0	C^0
0	102	204	306	408	498	600	702	804	906	1008	1110	1200
(0)	(76)	(193)	(310)	(386)	(503)	(759)	(697)	(773)	(890)	(1007)	(1083)	(1200)

ON PITCH

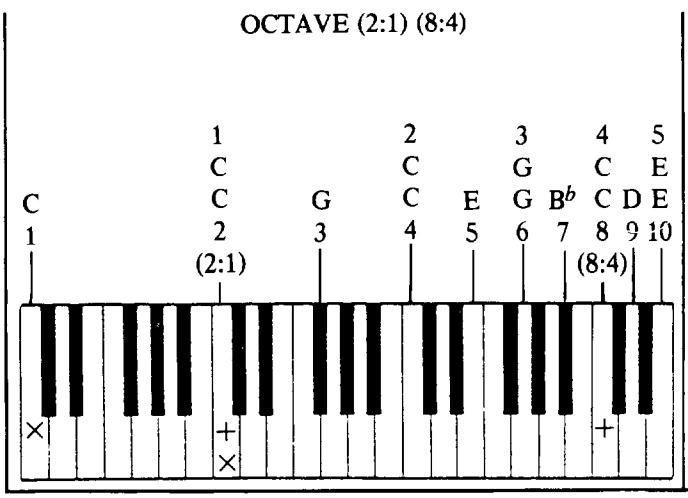
A Series of Articles Dealing With the Integration and Equation of Aural and Electronic Tuning Techniques

No. 2

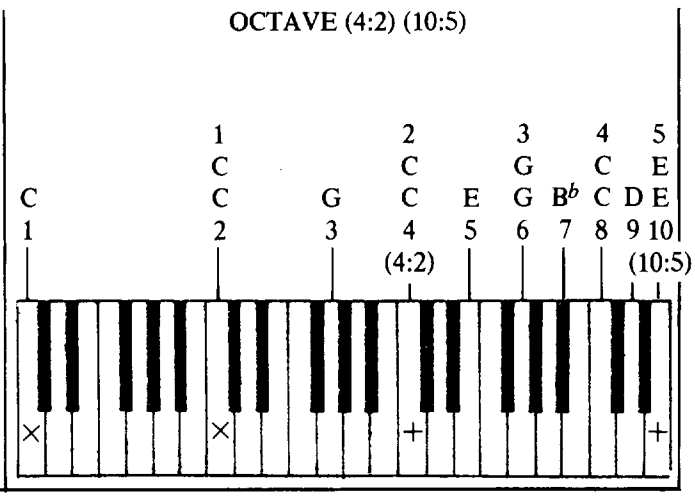
Rick L. Baldassin, RTT
Utah Valley Chapter

Last month, we discussed the advantages and disadvantages of both aural and electronic tuning. The overtone series was discussed, and methods were presented to prove the presence of overtones both aurally and electronically. The overtone series frequencies of a harmonic double bass string were compared to those of an inharmonic piano string. We noted that the higher the partials of the piano string series were, the more deviation there was from the harmonic string. Intervals were then discussed, and the coincident partials for various intervals were located. Methods to prove the existence of coincident partials were given, both aurally and electronically. Finally, listening to beat rates aurally was equated to measuring the cent width of an interval electronically.

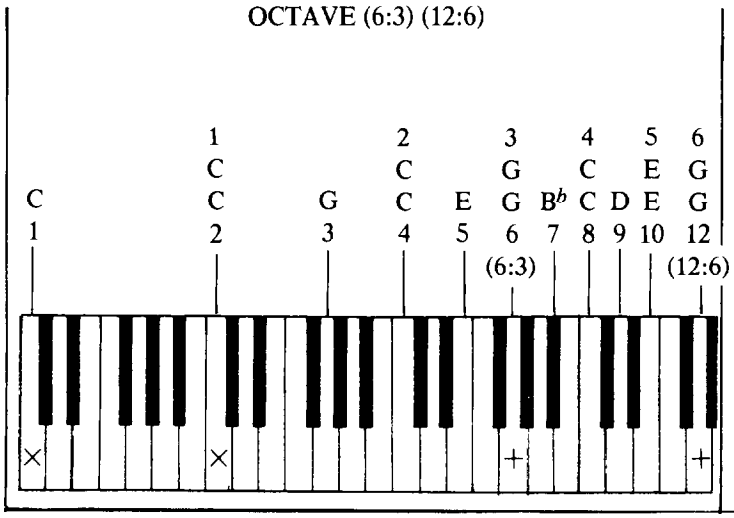
This month our discussion will include various types of octaves and double octaves. You may recall from last month that when two notes are played simultaneously, they create an interval. Each note of the interval sets up its own overtone series, and at some point they have at least one pair of coincident partials. Octaves and double octaves have several sets of coincident partials. This is due to the fact that the overtone series of each octave note is so similar to the other. In fact, octaves have at least six sets of coincident partials which are readily heard in different areas of the piano. The following charts illustrate the location of the coincident partials for the octave and double octave. The ratio numbers indicate the partials of the octave and double octave notes which coincide. For example, a 2:1 octave would be an octave where the second partial of one note matched the first partial of the other note. Because of inharmonicity in the piano, rarely can more than one set of coincident partials be matched at a time. Since the partial series increasingly deviates from theoretical the higher the partials get, the higher the ratio number of partials being matched the more "stretched" the fundamental frequencies of the octave and double octave will be. The "x" represents an octave note, and the "+" represents a coincident partial.



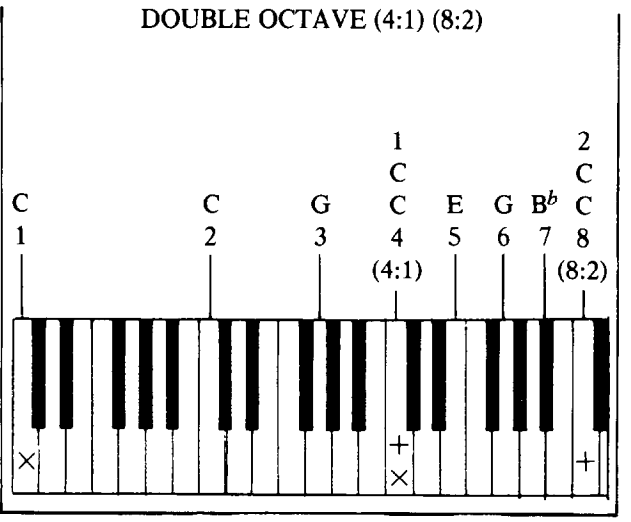
This chart shows both the 2:1 and 8:4 coincidence of the octave. The 2:1 coincidence is the top note of the octave, and the 8:4 coincidence is two octaves above the top note.



This chart shows both the 4:2 and 10:5 coincidence of the octave. The 4:2 coincidence is located an octave above the top note, and the 10:5 coincidence is located two octaves and a major third above the top note.



This chart shows both the 6:3 and 12:6 coincidence of the octave. The 6:3 coincidence is located an octave and a fifth above the top note, and the 12:6 coincidence is located two octaves and a fifth above the top note.



This chart shows both the 4:1 and 8:2 coincidence of the double octave. The 4:1 coincidence is the top note of the double octave, and the 8:2 coincidence is located an octave above the top note.

To prove that the octave and double octave do coincide at these locations aurally, hold down the octave or double octave notes without playing them. (In the case of the 2:1 octave and 4:1 double octave, only the bottom note may be held down.) Strike the notes marked as a coincident partial with a staccato blow, and listen for the tone which remains. This tone may be steady or beating slightly, depending on whether the octave or double octave is in tune at this level. Knowing where the coincident partials for the octave and double octave are located enables the tuner to know "where to listen" when tuning octaves and double octaves in different areas of the piano.

To prove that the octave and double octave do coincide at these locations electronically, set the tuner on the note and octave setting of any of the coincident partials for the given octave. Play the octave notes one at a time, and observe that there is a pattern present when each note is played. If the pattern stops when each note is played, the octave or double octave is in tune at this level. If the patterns are different for each note, the octave or double octave is either expanded (wide) or contracted (narrow) at this level. Knowing where the coincident partials for the octave and double octave are located enables the tuner to know "where to measure" when tuning octaves in different areas of the piano. A more in-depth discussion of this subject will appear in future months.

From the above, it is evident that octaves and double octaves have several sets of coincident partials. Since generally only one set can be in tune at a time, the tuner must be selective as to where to tune which type. This brings up questions as to how the types can be distinguished, and where to tune them.

Next month aural checks and setting instructions will be given for each type of octave and double octave.

PIANO APPRAISALS

A Pretty Sticky Wicket

Joseph Anthony Meehan, RTT
Maine Chapter

III. THE APPRAISAL FORM

In this article you'll see a copy of my professional appraisal form. Admittedly, some things have been left out and perhaps some should be added. However, it gives the appraiser a thorough look at the piano.

I hope the Piano Technicians Guild will one day adopt an official appraisal form based along these lines. At one point I was using the Piano Technicians Guild billing form but found it lacking because it was not intended for this purpose. From a professional standpoint I urge tuners to use this type of form.

Condensed at the top is the standard information, make, model, etc. In doing an appraisal I usually refer to Pierce's Atlas (8th ed.) to determine the year of manufacture and other pertinent information available about a particular brand. If the year is not listed, then I venture an educated guess based on case styling, type of plate, etc. If I'm guessing I say so (1925?).

Working from an appraisal form rather than just taking notes results in a more routine and accurate job.

Condition of Piano

Get thee to the guts foremost. Let's face it — if the piano has a cracked plate, and/or bad pinblock, or treble bridge, etc., you might discount the piano earlier on and save a lot of time analyzing action problems.

My code of evaluation is about the same thing that numismatists (coin collectors) use. In reality it's more of a sliding 0 to 5 scale with anything less than a 3 (good) needing some sort of attention. My interpretation is thus:

5.E. Excellent — Exactly as intended by the factory. Nothing needed.

4.VG. Very Good — showing some use like a five-year-old instrument but doing well and needing nothing.

3.G. Good — it works, it performs its function. Work can be seen on the horizon.

2.F. Fair — examples: hammers need resurfacing, keys need leveling, case needs refinishing.

1.P. Poor — examples: hammers need replacing, new keytops, etc.

0.NWR. Not Worth Repair — just what it says.

The last two categories are tricky. Sometimes the case is really beato (NWR) but the piano still ain't too bad (G). Sometimes the soundboard is filled with crack after crack but the tone is still good. Sometimes I simply seek help trying to decide the right thing to say (more on getting help coming up).

If something is blatantly out of kilter in the regulation, I go through each item. Otherwise, I draw (parenthesis) and give an overall rating of the regulation.

Appraising vs. Estimating

Since we are appraising rather than estimating, I don't place a great deal of emphasis on the cost of material and labor on each and every repair. Since,

PROFESSIONAL
PIANO
APPRAISAL

Joseph Anthony Meehan
Route 5A - Box 319
Gardiner, Maine 04345

Registered Piano Technician

DATE_____

Client: _____ Piano: _____

Address: _____ Model: _____

Serial No. _____

Tel. No. _____ Built _____

CONDITION OF PIANO

Structure
Pinblock ____
Soundboard ____
Plate ____
Support Beams ____
Ribs ____
Bridges:
Treble ____
Bass ____
Strings ____
Tuning Pins ____
Pin Torque ____
Pedals: L ____
M ____
R ____
Case ____

Tuning
Stability ____
Pitch ____

Regulation
Keydip ____
Hammer blow ____
Jack (hgt) ____
Jack/Knuckle ____
Let off ____
Drop ____
Check ____
Rep springs ____
Capstans ____

Action
Hammers ____
Dampers ____
Whippens ____
Jacks ____
Butt felts ____
Springs ____
Bushings ____
Keybed felt ____
Keys ____
Key tops ____
Bridles ____
Key rails ____

Market value of piano as is: _____
Estimated work advised: _____
Projected value of piano: _____

Code: E - Excellent VG - Very Good G - Good F - Fair P - Poor NWR - Not worth repair

in this phase, the two go hand in hand, I will circle small numbers (costs) alongside an item or procedure which will indicate the cost thereof. In general, my figure on the work advised line is on the high side to protect me in case (a) something was missed, or (b) I end up doing the work at a later date and costs have risen. In any case, it does create a nice image to be able to come in near or under the original estimate. So it's a ball park figure, but not without some deliberation.

In a nutshell, then, use a written appraisal form (yours or mine until the day comes when we have one standardized) and it will result in a better organized, more complete and certainly a quick, totally professional appraisal.

Next time out — *What the Hell's an Antique Piano?*

Coming Events

UPCOMING CONVENTION
THE PIANO
TECHNICIANS GUILD

1983 July 4-8
New Orleans
New Orleans Hilton & Tower

September 16-18, 1983
ANNUAL WISCONSIN DAYS
University of Wisconsin at Madison

Contact: Bob Hohf
431 N. Main St.
Lodi, WI 53555
(608) 592-3731

October 2-4, 1983
FLORIDA STATE CONVENTION
Sheraton, Jacksonville Beach Resort Inn
Jacksonville Beach, FL

Contact: Barney J. Johns
3546 Oleander St.
Jacksonville, FL 32205
(904) 786-0868

October 15, 1983
Ohio State Seminar
Mount St. Joseph College
Cincinnati, Ohio

Contact: Barry Heismann
8317 Beta Ave.
Cincinnati, OH 45231
(513) 522-6451

October 14-16, 1983
TEXAS STATE ASSOCIATION CONVENTION
Downtown Holiday Inn
Wichita Fall, Texas

Contact: **Jimmy Gold**
2101 Walnut
Duncan, OK 73533
(405) 255-5804

October 20-23, 1983
NEW YORK STATE CONFERENCE
Executive Hotel
Buffalo, New York

Contact: Charles Erbsmehl
4165 Ransom Road
Clarence, NY 14031
(716) 759-6126

String Formulas

Steve Fairchild, RTT
Cristofori Brotherhood Chapter

You may consider this an addendum to the "Calculating Technician" articles previously written by Dave Roberts, who is no longer with the Piano Technicians Guild. Along with Dave Roberts, I would like to thank Al Sanderson, the Piano Technicians Guild's resident genius, for some of the material contained herein. I believe he is one of the few doctors that will still make a house call. These formulas are a mix of Fairchild, Roberts, and Sanderson. Like Dave Roberts, I use an HP-41CV programmable calculator. My formula revisions have improved calculating efficiency by 30%.

S=the amount of inharmonicity in cents of the steel wire or core wire

S+Bf3=the amount of inharmonicity in cents of a single wound bass string

S+Bf3+Bf4=the amount of inharmonicity in cents of a double wound bass string

To find the amount of inharmonicity in cents at a given partial, where n=the partial number and Ic=inharmonicity constant, execute $Ic(n^2-1)$.

The longer the unwound portions of the speaking length of a bass string (L1+L2), the higher the inharmonicity goes.

Example: for a single wound bass string with
L=37.5 m=10 D=178 d=55
L1=.75 L2=.75
the Ic=.48 cents
but if we change L1 and L2 to 1.5" each
the Ic=.93 cents (almost double)

This may not seem like much, but at the 8th partial an Ic of .48 (30 cents) compared to an Ic of .93 (59 cents) is a 94% jump in inharmonicity.

Dave Roberts and I had always wondered why some double wound bass wires were more inharmonic than others. Well, Al Sanderson came up with the answer. It seems the longer the L3 and L4 segments of the bass string were, the higher the inharmonicity went.

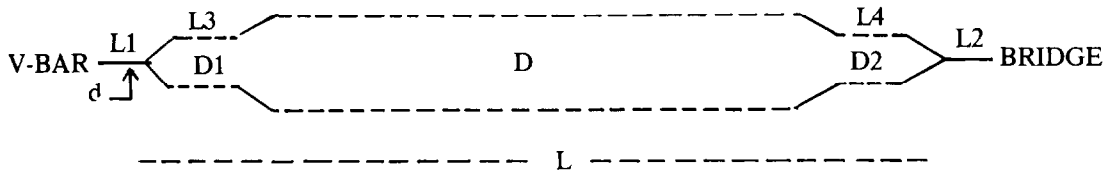
Example: m=1 L=43 d=55
D=250 D1=205 D2=205 L1=.5
L2=.5 L3=.5 L4=.5
then the Ic=.39
if you change L3 and L4 each to 1.5
then the Ic=.63 (a 60% jump in inharmonicity)

The ideal bass string should have L1 and L2 at .5 inches, and L3 and L4 at .625 inches or less (although the string maker may object if you ask for L3 and L4 at less than .625 inches).

Please note the tension, volume and Ic formulas for bass strings use the (1+B) factor. B is computed differently than Roberts or Sanderson, although the answer is essentially the same.

I have used these formulas along with my super scale formulas to create a new scale for the Story & Clark Piano Co. This new piano will be out in mid-1983.

For a more in-depth study of some of the other formulas see the November, 1980 issue of the *Piano Technicians Journal,* page 28, and all the other issues which include the Calculating Technician articles.



All lengths are in inches. All diameters are in mils (inches × 1000).
T=tension in pounds. N=number of strings per note. m=note number (1 to 88).
L=speaking length. sin=sine of number in radians. π = (3.141592654).
L1=unwrapped wire by V-BAR. L2=unwrapped wire by BRIDGE.
L3=length of D1. L4=length of D2. Ic=inharmonicity constant.
D1=small copper diameter near V-BAR.
D2=small copper diameter near BRIDGE. D=large copper diameter.
d=diameter of steel wire.

$B=.89\,((D^2-d^2)/d^2)$. $Bx=.89(D^2-(D1\,D2)/d^2)$

$S=d^4/81\;T\;L^2=Ic$ for steel wire.

$S+Bf3=Ic$ for single wound bass strings.

$S+Bf3+Bf4=Ic$ for double wound bass strings.

$$Bf3=.287\,(B/1+B)\left(+\begin{array}{l}(4\sin\frac{4\pi L1}{L}-\sin\frac{16\pi L1}{L})\\(4\sin\frac{4\pi L2}{L}-\sin\frac{16\pi L2}{L})\end{array}\right)$$

$$Bf4=.287\,(Bx/1+B)\left(+\begin{array}{l}(4\,\mathrm{Sin}\frac{4\pi(L1+L3)}{L}-\sin\frac{16\pi(L1+L3)}{L}-4\sin\frac{4\pi L1}{L}+\sin\frac{16\pi L1)}{L}\\(4\sin\frac{4\pi(L2+L4)}{L}-\sin\frac{16\pi(L2+L4)}{L}-4\sin\frac{4\pi L2}{L}+\sin\frac{16\pi L2)}{L}\end{array}\right)$$

$T=2^{(m/6)}(Ld)^2/644164$ steel wires. Elongation$=L\,T/d^2/23.26$

$T=2^{(m/6)}(Ld)^2(1+B)/644164$ bass strings. Hammer contact time$=N\,T/(L/8)$.

Volume$=\sqrt{N\,T\,d^2}$ steel wires. Breaking point percent$=T/.93\,d^{1.667}$

Volume$=\sqrt{N\,T\,d^2\,(1+B)}$ bass strings.

STEP BY STEP

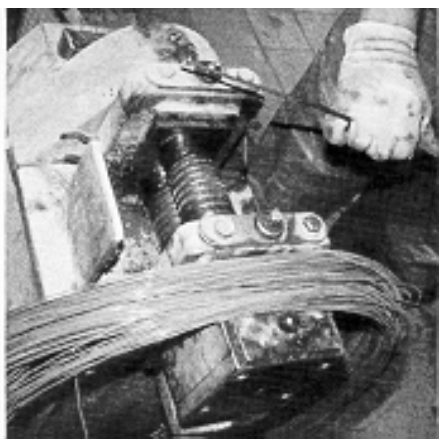
A Series of Photo Essays

Martin B. Tittle, RTT
Detroit — Windsor Chapter

Piano String Manufacture Part II: Wire Drawing

To get prepared wire rod started in a die, the end must be swaged down so it can be passed through the die and secured to the take-up reel. This swaging is done on the machine pictured in **photo 1** by two rollers with opposing half-round grooves.

Photo 1



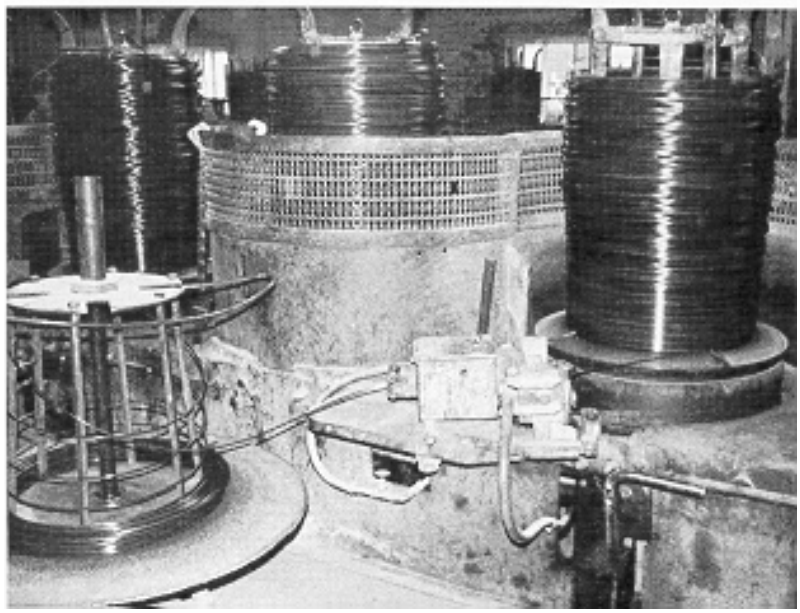


Photo 2

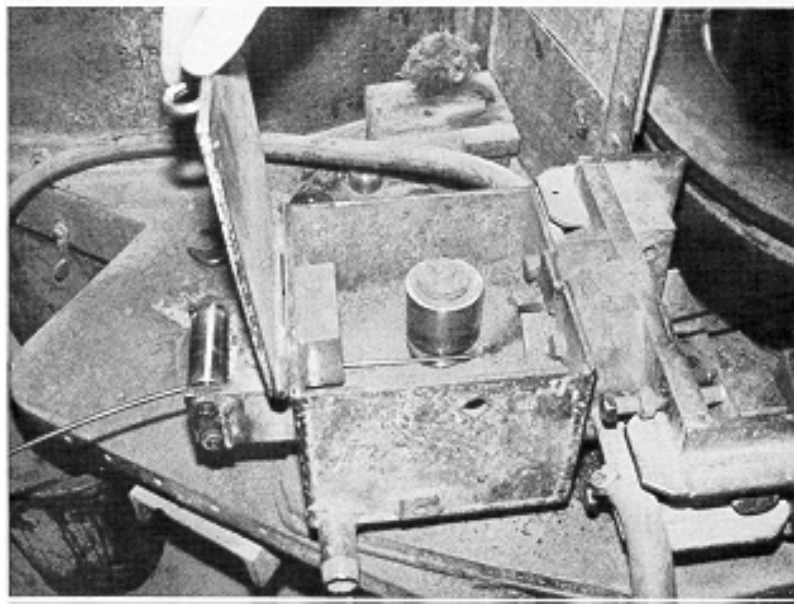


Photo 3

Photo 4

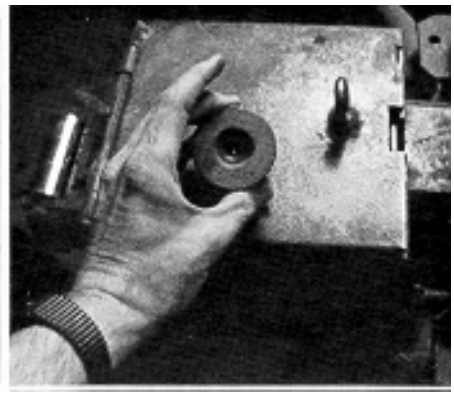


Photo 2 shows wire being drawn through a single die.

Photo 3 shows the interior of the box the die lies in. The die itself is at the extreme right, just under the curved extrusion with the slot in the top. The cylinder in the center has a groove in it to make sure the wire is pulled straight through the die.

Photo 4 shows the die removed from the box. This dry drawing process is used for piano wire until the wire is ready for its final drawings.

Then wet drawing machines, in which the wire may be passed through seven dies in succession, are used (**photo 5**). The drums you see sticking up through the soapy lubricating solution are the drawing drums which pull the wire through the separate dies. Since the wire is getting smaller and longer with each die it passes through, these drums must operate at progressively faster speeds to keep the wire flowing smoothly. **Photo 6** shows a close-up of one die and its corresponding drum, and **photo 7** shows the die with the wire running through it pulled up out of the water and removed from its housing. You can easily see the filings from the wire on the housing and the die.

This cold drawing effectively "cold works" the wire, making it both stronger and harder than the original hot-rolled rod. After a certain number of drawings, however, the wire has become so hard that the tension involved in further drawing would fracture it. Then the wire is sent back to the patenting furnace for another heat treatment, pickled again, coated with "bonder" and chalk, and returned for further drawing.

This process might have to be repeated several times depending on the final diameter of the finished wire, but it does not have to be done between each drawing. It is never done after the wire has reached its final diameter, so the cold working of the final drawings has much to do with the strength of the finished wire. This being the case, it is easy to see why smaller gauge wire, having been drafted more times, is stronger, or has greater tensile strength, than larger wire. (Its breaking strength, conversely, is lower than the larger gauges because it has less cross-sectional area than they do.)

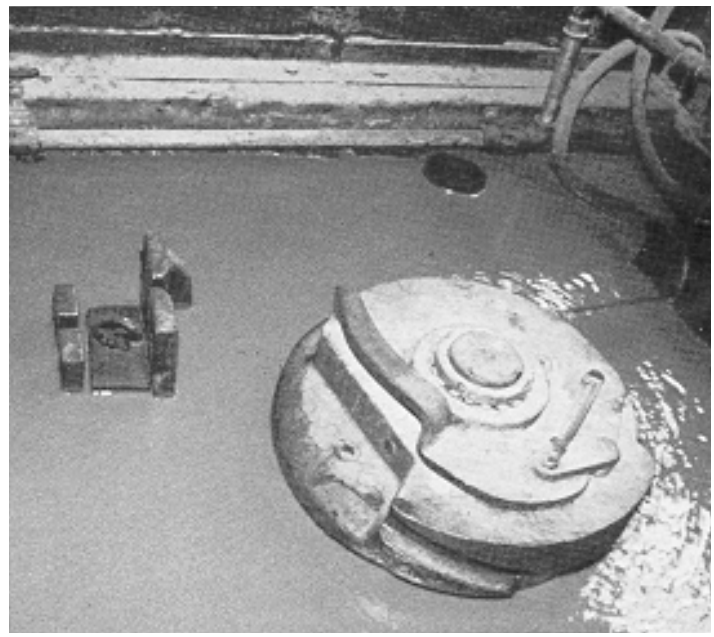


Photo 6

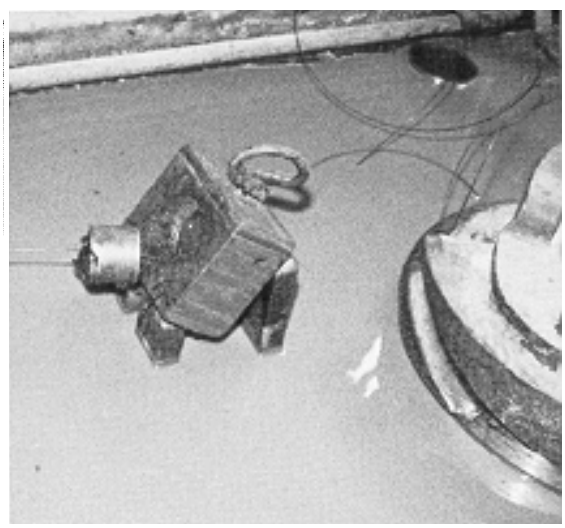


Photo 7

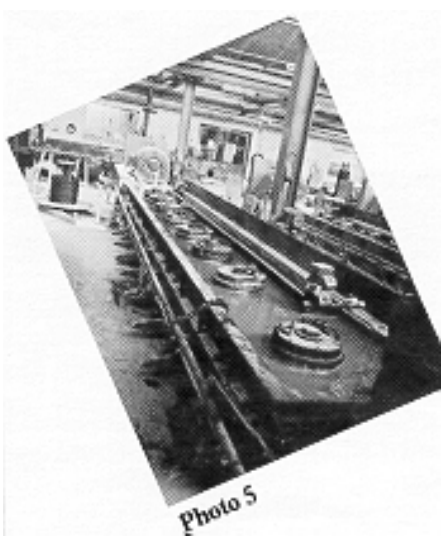


Photo 5

Final drawn piano wire is rather black, so it must be mechanically polished for cosmetic acceptability. This is done by drawing the wire first through a long, open box containing oil and wood ashes, and then through a

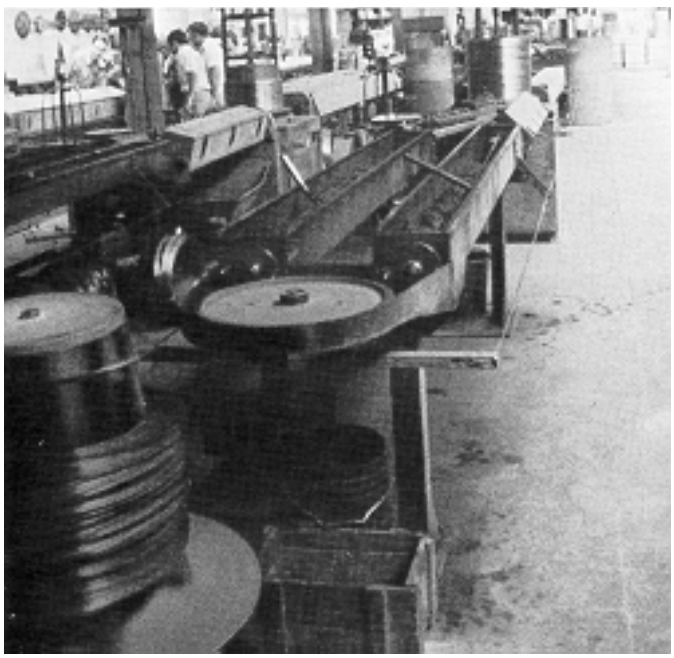


Photo 8

Photo 9

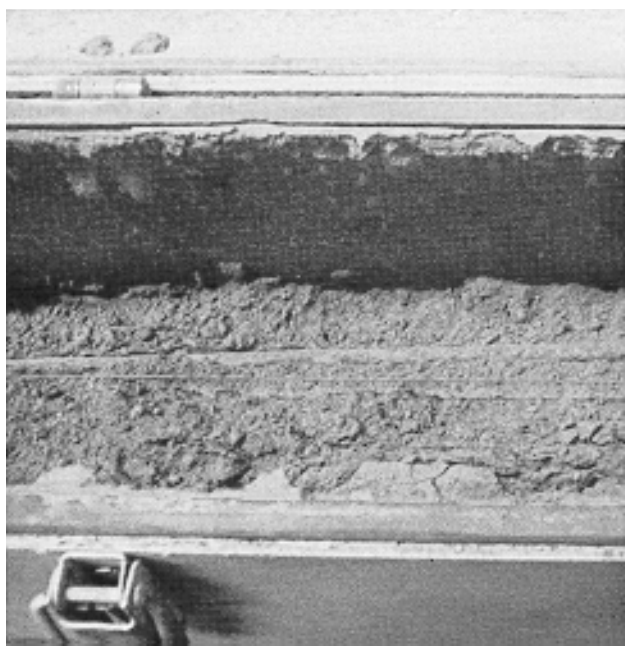


Photo 10

closed rotating box containing only dry ashes. **Photo 8** shows the mechanical polishing set-up, with the dark final drawn wire on a spool in the left foreground, the open box of oil and ash, the rotating closed box which was caught in this picture at a 45° angle to the open box, and the shiny polished wire accumulating on a large spool at the end of the two boxes. **Photo 9** shows the interior of the open box where the wire enters, and **photo 10** shows the interior of the closed box.

This completes the necessary procedures for piano wire manufacture, but if the customer has ordered tinned piano wire, this process can be added on now. Hot tinning, rather than

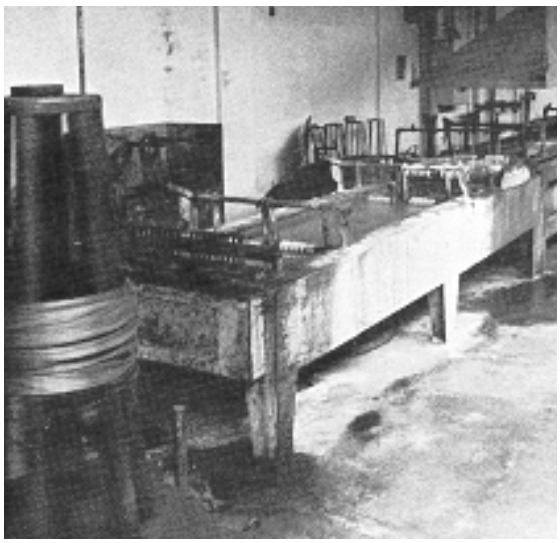


Photo 11

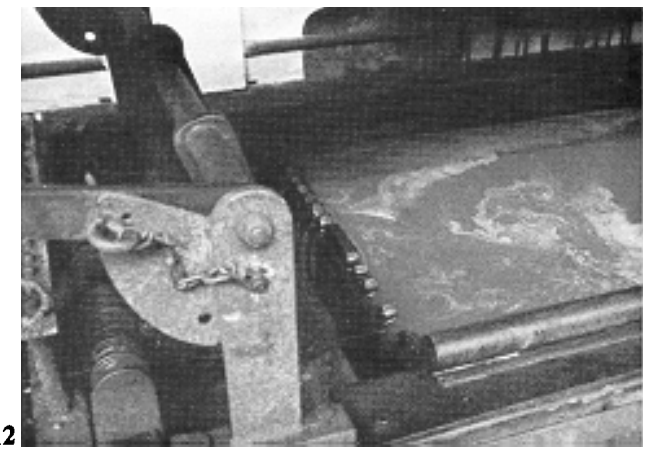


Photo 12

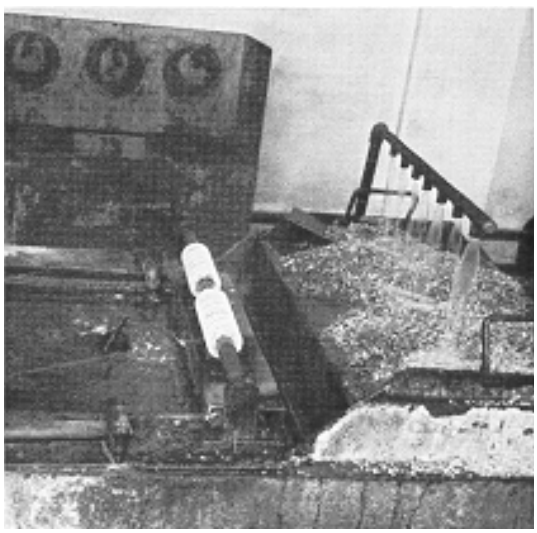


Photo 13

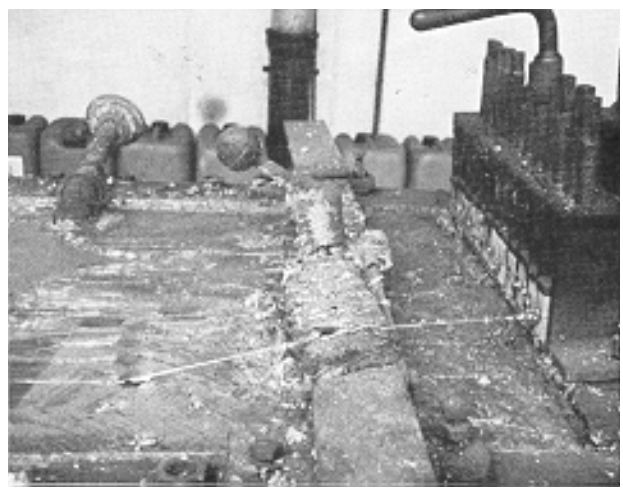


Photo 14

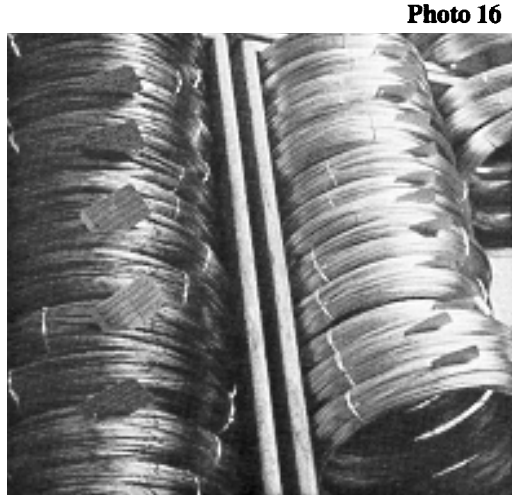
galvanizing, is used to apply a coating of tin .002-3 mm. thick to the wire as follows. First the wire is set up and run through a hydrochloric acid bath (**photos 11 and 12**), then it is rinsed off in a water spray bath (**photo 13**), and finally it is pulled through molten tin which is squeegeed off the wire by cork blocks (**photo 14**).

Photo 15 just shows the entire line with the finished coils of tinned wire being wound in the foreground. For comparison, **photo 16** shows coils of finished, mechanically polished wire on the left, and coils of finished tinned wire on the right, both ready for shipment.

Acknowledgments: I am grateful to Stahl- und Draht-Werk "Roslau" GmbH for permission to make and publish the photos used here, and to their manager, Herr Hans-Joachim Kruger, for reading and approving the manuscript.

Photo 15

Photo 16



The Eclectic's Notebook

Christopher S. Robinson
Connecticut Chapter

Moderato

This month's offering begins with the introduction of two fellow eclectics whom the reader should know. The very fine photographs which are included with this article are the patient work of Ray Zeiner, RTT, a colleague and good friend. Since I did not think that you would be interested in pictures of the pavement, the ceiling, or the inside of a lens cap, I decided to prevail upon Ray's considerable talents to provide pictures for some of these essays.

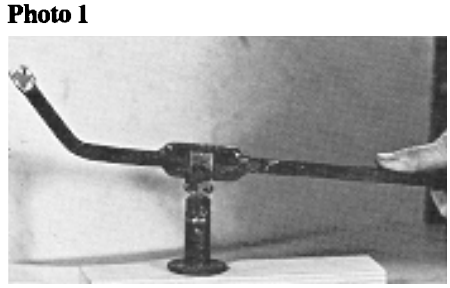
Those of you who do not know Norman Neblett, RTT, should make an effort to meet him. Norman's prodigious skill as a master tuner and tone regulator are widely known to those who are active within the Piano Technicians Guild, not to mention a select group of very demanding professional clients who regularly use his services. A substantial amount of the material presented in this month's article is composed of information that he suggested. The results of these techniques are perceptible and indisputable, and often so dramatic in their very simplicity as to amaze the technician who employs their use.

Simplicity is something that every one of us ought to keep in our minds as much as possible. Too often in the search for complicated solutions to complex problems we overlook the obvious. We allow simplicity to elude us. Problems have a way of providing their own solutions after they have been broken down, part by component part, with every basic detail attended to in each essential operation. Let's begin here where we left off last month. Suppose that the piano in question does *not* emit greater VOLUME or DECAY when the string on any given note is plucked than when it is struck with the hammer. What is indicated here? Patently, the piano superstructure is not capable of emitting any more tone than the hammer is already exciting. Therefore, the hammer is not the culprit; the superstructure is. The very first thing which is engaged along this "chain of command" is the string itself, which has been called the "oscillator." You may recall that Robin Hood's bowstring was referred to in the last article, and how unpredictable the behavior of the arrow might be if it were to change in tension or length just as the arrow was released.

So it is with piano tone.

As a beginning to our process of Voicing or Tone Regulating, then, *it is imperative to assure the straightness and firm, unvarying termination of the music wire.* Please note that any bends in the wire will cause a "springy" or lost motion effect which is highly inefficient in its conservation of energy. Energy which is not conserved is given off more quickly than that which is saved. Energy saved produces long DECAY. Energy spent produces quick DECAY. Please look at the peculiar device depicted in **photos 1 and 2.** Don't be nonplussed; it is basically a sophisticated substitute for a stringing hook. It is merely a steel bar bent at 45 degrees mounted on a swivel yoke with a nylon roller at its tip. **Photo 2** shows it placed in the keybed of a grand piano. **Photo 3** is a PLAN picture of the tool placed under a sample trichord; and **photo 4** shows the same trichord being stretched, leveled, and straightened by the tool in one operation. This is precisely what many of you have been taught to do with a stringing hook, which has the disadvantage of being able to do only one string at a time, and the additional drawback of possibly kinking the string(s). The primary purpose that we are attempting here, of course, is to eliminate the slow bend that the string takes as it leaves the agraffe. *Warning: the piano must be in good tune at standing pitch before this operation begins!!!* Furthermore, if you attempt to perform this operation in a piano with properly regulated dampers, the liberty rail must be released so that the damper may travel upward freely.

Photo 1



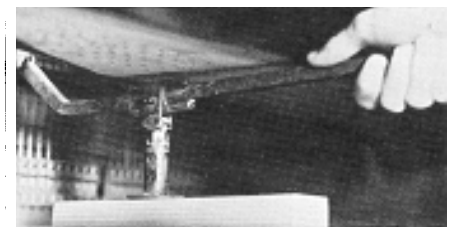


Photo 2

Photo 3

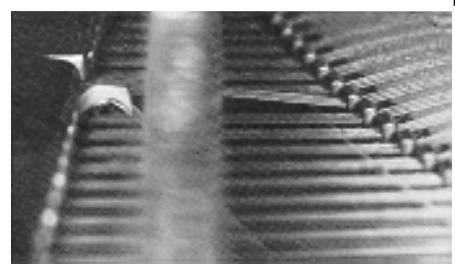


Photo 4

The technician in **photo 5** is holding a small ball-peen hammer and a brass drift. The brass drift is made from some thin, rectangular brass stock. Brass is softer than steel, and so it will damage before the steel will. The operation depicted in **photo 5** is the straightening of the wire as it passes over the front duplex or metal riser. Again, we are eliminating BENDS in the wire just as we see once more in **photo 6,** where the string is being straightened over the back duplex.

When the operations described above are complete, it is necessary to render the strings tightly to the bridge, so that the music wire oscillates at the same length along its X-axis as it does along its Y-axis. In **photo 7,** the technician drives the piano string tightly to the back of the bridge. Upon completing this operation, he/she then drives the string tightly to the front of the bridge, thus finally establishing the speaking length of the string. Some readers may wonder why the drift is placed on the open span of wire rather than directly over the bridge body. The reason is that the wire cannot be positively terminated to the bridge body unless the pressure is exerted beyond the dual X-axis and Y-axis termination point. Whenever the pressure is applied within those points, there is the great likelihood of an unequal X/Y completion. Refer to **photo 8** for a view of the last process in the tone regulation of the oscillator, or music wire.

Photo 5

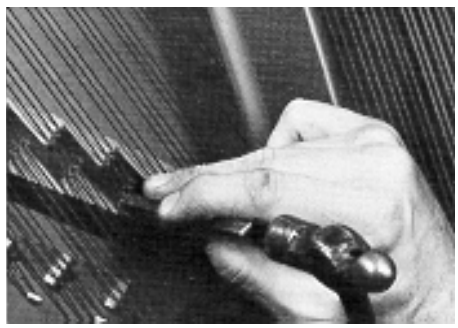


Photo 7

Photo 6

Photo 8

There are more than a few instances when the above-described operations will result in a piano which is acceptably voiced. After the technician has completed all of the described processes in setting the string(s), the music wire should again be plucked with the tuning chip to determine where the inadequacy, if any remains, is located. Next month we shall continue to pursue the often elusive entity of piano tone.

A Brief Study Of String Tension

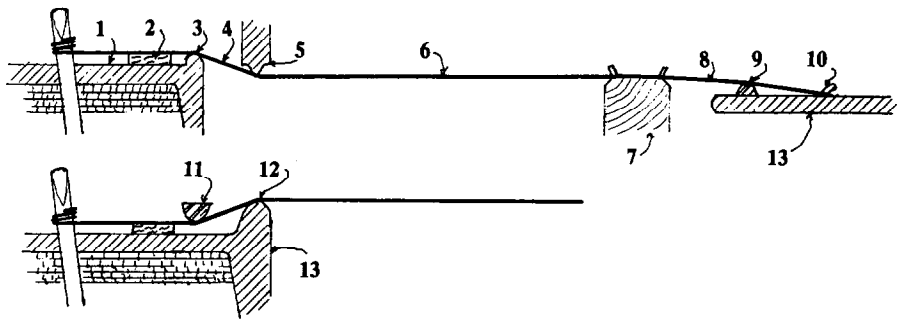
Dan Evans, RTT
Los Angeles Chapter

While a student of piano tuning, I often heard the statement from old timers that if one was to have a solid tuning, the tension in the various segments of a string must be equal.

This first made sense to me, but on further thought, it occurred that the tension in the speaking length was not constant, but would increase under a fortissimo blow. It seemed to me that the tension on each side of the speaking length must be at least as great as the maximum in the latter, in order to hold.

In the 1976 annual edition of the Japanese Piano Tuners' Association Journal, there is a comprehensive article on the effect of pulling a piano wire over a V-bar, and under a pressure bar, and similar deviations from a straight line pull. This graphically illustrated the amount of friction which was developed.

Several years later I attended a National Piano Technicians Guild Convention class given by Jim Hayes on the behavior of strings. In passing, may I recommend that you attend one of Jim's classes. These are most informative, thought-provoking, and very entertaining. Jim came up with the same theory — that string tensions should not be equal but "balanced!"



1. Plate Web
2. Counter bearing felt
3. Bearing bar
4. Front Duplex
5. Capo d'astro bar
6. Speaking length
7. Bridge
8. Rear duplex
9. Duplex bar or aliquot
10. Hitch pin
11. Pressure bar
12. V-bar
13. Plate

Figure 1

Figure 1 illustrates the course of a typical string through its various pressure and friction points. It is commonly known that when a string is set into transverse vibrations, longitudinal vibrations are also set up. Consider the harp. Although the strings are plucked sideways, there is no bridge to transfer the vibrations to the soundboard. There may be a little movement in the soundboard due to the angle the string makes with the board, but it is mainly the longitudinal vibrations which pull the soundboard up and down. And, of course, there is the old tin can telephone, where a string tied through a hole in the middle of the can bottom transmits sounds by longitudinal vibration in the string. I have found no accurate manner of measuring the additional tension in a piano wire upon receiving a hard blow with a hammer, but one can get a good idea of it by the amount the tone will drop when the friction through the V-bar/pressure bar combination is low.

Measuring Friction

Figure 2 illustrates a device I made to measure the friction through these parts. It is made from an old pinblock. Two tuning pins are installed near each end. In the exact center, two tuning pins are installed ¾" apart, in such a position that a wire stretched between the two outer ones and offset between the center ones makes an approximate 17° angle. The two long sections are equal, in this case 15¾" each. Number 16½ gauge wire, .038" diameter, was used. The long sections were each tuned to A=440. The right section was then muted, and the tension on it increased until a slight rise in the pitch of the left section was observed. The mute was then removed, and the pitch of the right section measured by a strobe tuner. The difference in tensions indicates the friction at the central offset. Let's see how this works. With each section tuned at A49=440

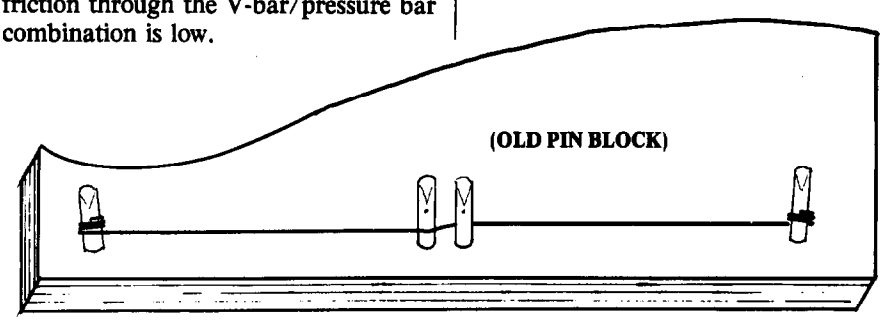


Figure 2

$$T = \frac{P^2L^2W}{675{,}356}$$

Where T= tension in pounds
P= number of vibrations per second
L= length in inches, and
W= the weight of the string in grams per inch.

Here P= 440 and can vary
L= 15¾
W=2.27

L and W in this case are constants, as is the denominator, and can be combined to

$$T = \frac{P^2(15\frac{3}{4})^2 2.27}{675{,}356}$$

$T=P^2\ (.0008337)$
$T=(440)^2\ (.0008337)=161$

In four tries when the right side was pulled up until a change in the pitch of the left side was noted, the average pitch on the right was $A^{\#}$ + 50¢, or 479 hertz.

Now, $T=(479)^2\ (.0008337)$
$T=191.3$

a difference of about 30 pounds tension. This, then, is the amount of friction in this offset. In a similar experiment, but in reducing the tension instead of increasing it, I obtained a difference of about 25 pounds. This is less than in raising the pitch, due to less tension. In engineering, we use the Greek letter μ (Mu) to represent the coefficient of friction, and I shall continue its use here.

There are several conditions which affect the value of μ, such as rough or rusty surfaces, size of wire, sharpness of bends, and amount of tension. The angle is probably most influential, as illustrated in **Figure 3.**

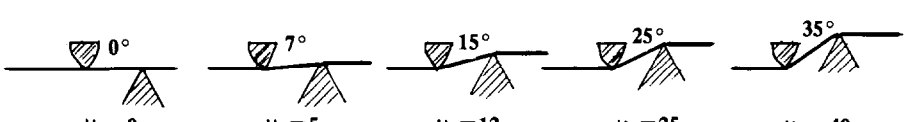


Figure 3

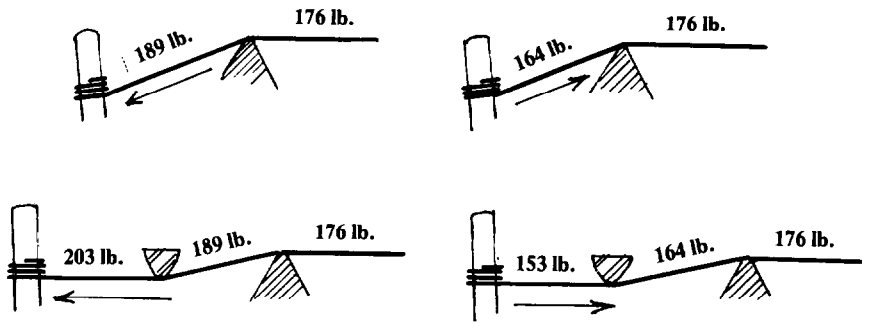


Figure 4

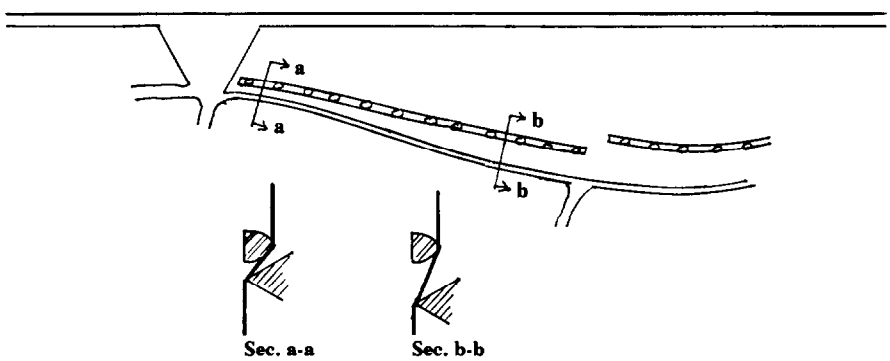


Figure 5

If, when a key was struck, the increased tension in the speaking length was, say, 12 pounds, the friction between the speaking length and the tuning pin would have to be considerably more than that. I have often heard that in tuning, one should bring the pitch slightly sharp, then carefully let it down to pitch. This would result in an unstable condition, where there was more tension in the speaking length than by the tuning pin. The string, when set into vibration, would create a condition of sliding friction instead of more stable static friction. It's just like when Ernie Preuitt gives the hose a shake if it is snubbed around a rosebush. The opposite occurs if the string is brought up to pitch and left. I recommend pulling up to pitch, and then releasing a very small amount of tension, so that the friction can hold both ways. The increased tension in raising pitch, and the reduced tension in lowering pitch, is illustrated in **Figure 4,** at a point where the tension in the speaking length is *just ready* to change. These figures were taken from the previously mentioned Japanese article. While discussing μ at the tuning end, let's discuss some conditions found here.

I was called to tune an upright which another technician had given up on tuning. No matter where I set the pin, pulling up or letting down, the pitch would drift. Most of us have had this experience. The solution was to pull the pressure bar down to give enough friction to support the tuning.

Figure 5 illustrates a common problem in small uprights. Because of lack of space, the left end of the pressure bar is placed very close to the V-bar, and if pulled down the same amount as the other end, sharp bends and high restriction in the wire will result.

The same condition existed in a

grand which I serviced. The plate string bearing in the bass was very high to raise the overstrung section, but the web was low, and tuning pins were placed very close to the string bearing bar, resulting in a steep climb of the string. After two strings broke, I raised the pins so the coil could be raised higher above the plate. I had really been pulling downward on the string, rather than back.

This problem occasionally appears in the bichord section of the bass where the tuning pins are arranged in four rows as illustrated in **Figure 6.** Note that the string from the upper pin passes the lower pin so near its top that it prevents the tuning hammer tip from seating firmly. A well known Japanese manufacturer aligns the strings by setting the upper coil very low, and the others progressively higher. I have experienced no difficulty in tuning these pianos, and they certainly look neat!

I service a grand piano of European origin, which has a very wide counterbearing felt over a long arch. The friction in this part is so great that it is most difficult to make small changes in tuning.

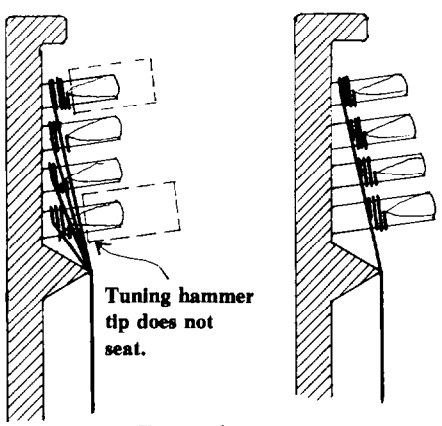


Figure 6

String Breakage

When strings break while the piano is being played, the break usually occurs at the agraffe or V-bar. This is probably caused by the motion of the strings being stopped at a firm point, so that the wire bends back and forth, instead of bending in its otherwise smooth wave form. Breakage during tuning occurs at the tuning pin. If the pitch is being raised, and the string is pulled up to 50% or 60% of its breaking strength, the segment at the tuning pin is under extreme tension. There is an additional stress in the outer curve of the wire as it coils around the tuning pin. This combination is the cause of strings breaking at this point during tuning!

Practically all of the activity of tuning is a result of movement of the string at the tuning pin segment. There is little or no movement or change of tension in the segment between the bridge and the hitchpin. When a new string is installed, or a raise in pitch is made, this segment will have less tension than any of the others. There will be some adjustment at first, but finally, after several tunings, this section will attain a tension which will consistently hold, and need not cause further trouble. That there is increased tension in this segment when a string is pulled up can be demonstrated by plucking the rear duplex and noting the change in pitch. If the segment from the bridge to the hitchpin is short, say two or three inches, equilibrium will come quickly. The longer it is, the more it can stretch and give. I once restrung an old barrel piano. The hitchpins were all in a straight row at the bottom of the plate. The treble bridge, of course, was way up near the V-bar. The high strings were 2-3" long, but the bottom section was 18-20" long. Every time I tuned it, the high treble was very low, due to the give in the hitchpin section.

Friction across the bridge is relatively small, probably from 6 to 12 pounds. Let us say the friction at the bridge of a particular piano is 8 pounds. In a 12" section of the bridge, there are about 45 strings. If the pitch is raised, and each string resists moving by 8 pounds, the total tension on the speaking side of the bridge is 45×8, or 360 pounds! This is certainly enough to cause the bridge to "roll," a condition with which we are all well familiar. After loud playing, the strings will render as noted above, and permit the bridge to return somewhat to its natural position. After installing a new string, or raising pitch, I recommend depressing the string in the speaking section with a "string stretcher" wheel. There may be some stretching in this operation, and some does happen, I'm sure. But the string is also pulled across the bridge to create more tension in the end section, thus holding the string firmly, and permitting the bridge to straighten up.

Conclusion

The purpose of this article is to help us understand what occurs along the string length as the tuning pin is turned. Under ideal conditions the end sections should have enough tension to hold the speaking length steady. There must be enough friction to restrict unwanted movement, and the tension at the tuning pin must not be at either side of the friction limit. I prefer to pull the pitch slightly sharp, and strike the key smartly to permit movement across the bridge. This will establish good tension at the hitchpin. Then I back off to pitch, and finally add a little tension, but not enough to change the pitch. This takes little pressure on the handle of the tuning hammer, because the mechanical advantage of this tool is about 70 to 1. Therefore, when a pull of, say, three pounds is placed on the handle ten inches from the tip, the resulting force at the coil is over 200 pounds!

Note that I am not discussing hammer technique. That is another subject, and concerns hammer position, tip size and condition, impact or steady pull, removing the twist in the pin, etc.

I trust that a clearer understanding of the physics of tension and friction will help achieve more stable tunings.

1982-1983 MEMBERSHIP/BOOSTER CLUB

Membership Is Everybody's Business

Charles Huether
Vice President

Many years ago the Piano Technicians Guild Inc. asked members and interested industry people to comment on their personal experiences belonging to and with members of the organization. The replies were interesting and inspiring. We are reprinting a few of them. Keep in mind that they are about twenty years old.

Is the Piano Technicians Guild An Asset?

. . . About 16 years ago I was a lonely wolf, a high priced technician who hesitated to join the then tuner organization. When I finally did my only motive was fellowship. I did not think I could gain anything, but how wrong I was. I joined a group of about 8 or 9 men, all technicians. Within a year everyone in the group had increased his income. From then on it became a joint venture and today every tuner can enjoy a decent standard of living — thanks to the Piano Technicians Guild. (We can still do better and we will.) Membership in the Piano Technicians Guild has helped us to lose our fear . . .

. . . A full time piano technician is a businessman today and the Piano Technicians Guild men act as such — Thanks to the Piano Technicians Guild, through our Journal, our Chapter meetings, Technical Seminars and National Conventions, we have made Piano and Businessmen out of the once necessary evil. In the meetings, men who know the piano give freely to raise the standard of those who are striving to become good piano men. The serious student usually becomes a good technician . . . Sixteen years ago I thought I knew it all technically but, again, I was wrong. Already the exchange of ideas and experiences among the men in our group opened my eyes . . .

. . . But, to me, the greatest advantage and joy is the fellowship. I have gained so many good friends all around that all the money and time spent for the Piano Technicians Guild was the best investment I have made in my 45 years in the piano business.

Take it from an "Old Timer" who has seen the ups and downs in the piano business, the Piano Technicians Guild is the best thing that ever happened to the Piano Technician.
Erwin Otto

Piano Technicians Guild Has High Standards

The fine, responsible leadership and excellent craftsmanship shown by the members of the Piano Technicians Guild is deeply appreciated by our company and its dealers.

The magnificent technical training sponsored by the Piano Technicians Guild, together with the qualifications for membership, is outstanding. The writer's father was a piano tuner for fifty years; and I like to think, as I review our industry, that every member of the Guild is a fine gentleman. However, the thing that impresses me most about the Piano Technicians Guild is its unusually high standard of ethics. The integrity and honesty of Guild membership produces much good for all of the piano manufacturing and supply industry.
Gordon Laughead, President
Gordon Laughead Company

Qualified Service Essential

We frequently receive requests such as "Where can I send a qualified man to learn to become a tuner-technician?" or "How can I go about helping my tuner become a better technician?" or "Do you know of a qualified technician in my area, or one who would like to come into my area where I can guarantee him $X00 a month in regular tuning alone?"

In almost every reply, we recommend that they contact the Piano Technicians Guild; and whenever possible, we enclose one of our extra copies of the Piano Technicians Journal.

We find that piano owners who have come to realize and appreciate the talents, skills, and training required of the qualified piano technician do not object to paying a reasonable price for these services, and they learn that the quality of tuning and attention is even more important than the frequency.

Everyone at Story & Clark is very much "sold" on the importance of the qualified piano technician and the vital part he plays in our industry. We, therefore, support the Piano Technicians Guild and its program to upgrade the profession, to see that proper training standards are set and followed, and to offer proper training facilities.

The Guild should move ahead without hesitation in its newest program to develop and train newcomers, as well as to help member tuner-technicians become as wholly qualified as is possible in all phases of piano tuning and repair.
T. H. Krumwiede
Story & Clark Piano Co.

The enthusiastic response of long ago encourages us to ask for letters today. If you would like to write telling of your experiences concerning benefits of belonging to the Guild we would be most appreciative. Send your letters to: Membership, c/o Editor, *Piano Technicians Journal.*

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GRUBB, Eric D.
P.O. Box 519
Rising Sun, MD 21911

Associate

Mississippi Gulf Chapter
McCLAIN, William S.
108 Fifth St. S.
Columbus, MS 39701

Student

Detroit/Windsor
GAREE, Anne E.
451 Thurstin Ave. #319
Bowling Green, OH 43402

Houston Chapter
RATHBUN, Lawrence, L.
3004 Louisiana
Houston, TX 77006

SUTTON, Bobby G.
2815 Lighthouse Dr.
Houston, TX 77058

Lansing Chapter
TEETSELL, Kathy K.
19753 16 Mile Road
Marshall, MI 49068

North Central Wisconsin
HOFFMAN, Michael T.
2462 Fair Avenue
Marquette, MI 49855

Pocono NE Chapter
FOLEY, Joseph D.
458 Oak St.
Scranton, PA 18508

LIGHT, Dorothy J.
57 Main Street
White Mills, PA 18473

Puget Sound Chapter
JOHNSON, Ronnie
306 E. 10th #6
Olympia, WA 98501

STOCKER, David J.
2015 Fir S.E.
Olympia, WA 98501

Toronto
MASSA, Pat M.
Bexhill Crt. Bg. C #14
Islington, ON M9A 3A8
CANADA

PULSIFER, Bruce
225 Arris Cres.
Mitchell, ON N0K 1H0
CANADA

Tucson
FOSSDAL, Chris E.
2320 N. Camino Castile #802
Tucson, AZ 85715

Washington D.C. Chapter
BAILARD, Douglas D.
702 Mt. Alban Dr.
Annapolis, MD 21401

GRAY, Harry A., Jr.
2800 Spindle Lane
Bowie, MD 20715

Member-At-Large
YEAGER, Michael W.
Austin College Box 1552
Sherman, TX 75090

Auxiliary Exchange

President's Message

Dear Friends and Members of the Auxiliary,

By the time most of you read this a new president of the Auxiliary will have been elected and installed in office. I would like to thank all of you who have worked with me during my two terms as president of the Auxiliary. It has been a very pleasant experience for me to hold a position of leadership with this organization. I have met many very interesting people. I have learned a lot about the way conventions are planned. I have learned a lot about the Piano Technicians Guild and its Auxiliary and about Auxiliaries in general.

Now I am looking forward to working with the Auxiliary's new leadership for a smooth transition. I am also excited about the fact that next summer's convention will be held in Indianapolis, our home town. You can be sure that you'll be hearing from me often through this column; I'll be introducing you to our great city and urging you to come visit us in July 1984.

The Auxiliary will always be a special organization for me, as I hope it is for you. I think we do many good things for ourselves and others through our association with this organization. I hope you will join with me in giving it your continued support.

Sincerely,
Julie Berry

The Advantage of Knowing Your Competitors

Sometimes our customers are surprised that we know the other technicians in town. In fact, we not only know most of them, but we are quite good friends with some of them and we go places together in public. Occasionally a non-Guild technician will live in this town for years without associating with the other technicians. I think it must be lonely for such people, because I am very much aware of the good things that come our way thanks to our association with the other technicians in town. Through the Auxiliary we have a chance to meet the wives and husbands of the other technicians also. This facilitates the friendships among technicians and makes it fun to get together socially.

Our competitors carry on their separate businesses and charge their separate prices, but the fact remains that they are doing the same kind of work as we do (or as my husband does) day in and day out. When one technician runs into a troublesome situation that has him/her technically baffled, another technician can be called in to consult. When one technician needs a part in a hurry another technician often has the part in stock and can help to meet the emergency need.

There are certain kinds of customers who cause just as many problems for our competitors as they cause for us. In a small town, in fact, the same troublesome customer may go from technician to technician until he/she has made the rounds. It helps depersonalize such problems for a technician to realize others run into the same difficulties.

Sometimes it would seem that the FTC would like for us each to function in a vacuum and have no interaction at all with our competitors; but, of course, most people in the FTC don't know what it is like to be a skilled craftsman operating an independent service business. There are many good interactions that can take place among competitors that don't jeopardize anyone's standing with the FTC. After all, the Guild itself is built on positive interactions among competitors who have a lot of technical information to share with each other. Who cares about sharing financial information . . . it is the shared technical information and the resulting individual expertise which makes a technician successful, anyway.

It's Volleyball Time In Indiana

Many Auxiliary chapters get involved in the social activities they jointly plan with the Guild chapter. Christmastime is usually a good time for Guild members and Auxiliary members to have a social gathering and enjoy each other's company. Another good time of the year is summertime. In Indiana the big summertime event for Guild and Auxiliary members has become volleyball. That doesn't mean any of us play volleyball very well, but we certainly enjoy thinking about playing it well and making plans for the annual match with the Cincinnati chapter.

Many of you have probably heard about the great volleyball invitational. Some of you in Indiana, Ohio, Kentucky, and Illinois have even been

known to drive for half a day to attend the match. This tournament began several years ago and has become more of a tradition with each passing year. The site of the tournament and picnic alternates between Cincinnati and Indianapolis with each team trying to find a location that gives the home team a court advantage. The Indianapolis team had special "Indy 440" team shirts printed up a few years ago. The Cincinnati team always brags a lot and tries to bribe the line judges. The Central Illinois people (Also known as "The Champaign Boys") are just getting into the spirit; they still think a team has to practice in order to win. The Indianapolis team, I must admit, usually loses. We even lost the year we smuggled real volleyball players onto our team.

Most of you are too far from Indianapolis or Cincinnati to drive over for our annual volleybout, but perhaps there is a chapter near yours who would enjoy getting together with you in the summertime. It gives you a chance to expand your friendships in the piano world beyond the confines of your own chapter. It gives the Auxiliary and Guild chapter a productive common project to work on together. And it can be lots and lots of fun whether you play volleyball or not. Why don't you suggest a get-together at your next meeting?

A Speedy Recovery To . . .

. . . Ginny Russell, who is recuperating from surgery done in May.
. . . Ruby Discon, who is recuperating from surgery done in March.
. . . the others of you who are also recuperating and getting back on your feet after surgery or illness.

An Answering Machine Can Bring Harmony To Your House

Although you may not like to leave messages with phone answering machines, such a machine can bring a lot of harmony to your house if you live with a business in the home. In addition to catching the messages that come your way while no one is at home, the phone machine can give you some breathing space for those times when you don't want the business to intrude on your personal life: like when you are taking a bath, when the family has just sat down to dinner, when you want to work outside without having to dash back into the house to catch a phone call, etc.

If you have a phone machine to answer your calls at certain times it can actually be doing your customers a favor. Who really wants to talk to you when you are in the middle of a fight with your spouse or when you have just gotten out of the shower to answer the phone? If you catch some of your calls with a machine you are able to call your customers back when you are composed and ready to give them your undivided attention.

Remember that what you probably dislike about the phone machines you have encountered is not the machine itself but the way it made you feel. Who among us has not felt intimidated by a stoic voice which admonishes us that we only have 20 seconds to speak. If you design your message with a personal touch and you try to speak in a natural, relaxed and unhurried tone, you will find people feel much more comfortable leaving a message on your machine. If you take the messages off the machine promptly and return the calls faithfully your customers will get used to being able to call and leave a message. They will only have to think about it one time because after that it will be your responsibility to get back in touch with them.

Nobody should have to jump up every simgle time a telephone rings. We need to appreciate our customers for calling and be glad they come to us with their business, but we also need to remember few businesses are open twenty-four hours a day. If you manage your phone machine carefully and work to minimize its negative aspects you will find it can bring more peace and harmony to your home and help you derive more enjoyment from your technician's business.

Do You Want To Join The Auxiliary?

I know that some of you would like to join the Auxiliary because you know it is a neat organization, but you just aren't sure how to go about it. It's simple to join. We just need your name and address, the name of the Piano Technicians Guild member who is sponsoring you, and a check (payable to the Piano Technicians Guild Auxiliary) for $8. Send this to Ginny Russell, Treasurer, 1414 Lander Road, Mayfield Heights, OH 44124.

You Can Help A Technician's Self-Image

If they were bankers they would have a positive image of themselves which they would get from going to work each day with the other bankers, everyone dressed in his/her business attire, everyone making prestigious financial transactions and working his/her way to the top in the banking world. If they were corporate executives their business associates would pat them on the back, give them promotions and raises, and help them to perceive themselves as part of the big corporate picture.

They are not bankers or doctors or lawyers or employees of big corporations (except for a few exceptions where technicians live in two worlds). They go forth in the world and meet customers on a one-to-one basis, but the customers don't give them raises or promotions. Instead, people say things like, "Are you still tuning pianos?" or "What else do you do?" We know, of course, that they are still tuning pianos, that they love tuning pianos, and that they will probably still be tuning pianos when they are seventy years old. We know it is silly to ask what else they do because most of them tune and work on pianos so much of the time that there is little time left to do other things.

Therefore, since we understand what they do and the outside world doesn't always seem to, and since there aren't a lot of other people around to pat them on the back and give them a promotion, then it is up to us to help the technicians keep their self-images in good shape. We need to let them know they are special people because of the skills they possess. We need to remind them of how important they are to their customers because they take such good care of people's pianos. We need to let them know how important they are to the music industry and to peoples' enjoyment of music in their homes and schools. We need to let them know they are very versatile because many of them run their businesses single-handedly.

Most Piano technicians don't have a corporate structure set up to tell them when they are successful or when they deserve a promotion. Isn't it great they have us to be there and do the same thing?!

Classified Advertising

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FOR SALE: PIANO SERVICE BUSINESS. Outstanding full-time business available in Denver, Colorado for a well qualified tuner-technician. Service entails primarily Steinway pianos and includes much prestigious concert work. Business produces a high annual income; ample work always available. Sale price: $20,000. Inquiries: **Dennis Wenzel, 57 Grant St., Denver, CO 80203. Phone (303) 778-1509.**

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TO BE SOLD TO HIGHEST BIDDER August 15th, 1983 with reserve Mason Hamlin model RBB, 7' grand #44514 with model B Ampico Player. This is in exceptional restorable condition, to be sold as is or restored. **Richmond Piano, Richmond, VA 23221. (804) 358-1929.**

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WANTED: OSLUND KEY TRIMMING MACHINE. Write or phone, **P. Alley, 35327 Annapolis, Wayne, Mich. 48184. (313) 721-6419 after 4 pm.**

TUNERS NEEDED. Anchorage Alaska desperately needs qualified tuners due to rapid growth. Work in beautiful setting where you're minutes from the mountains and moments from the salt water. Several people needed to serve in rural Alaska, also. For information or assistance write or call: **The Piano Shop, Inc., P.O. Box 110818, Anchorage, AK 99511. (907) 562-2267**

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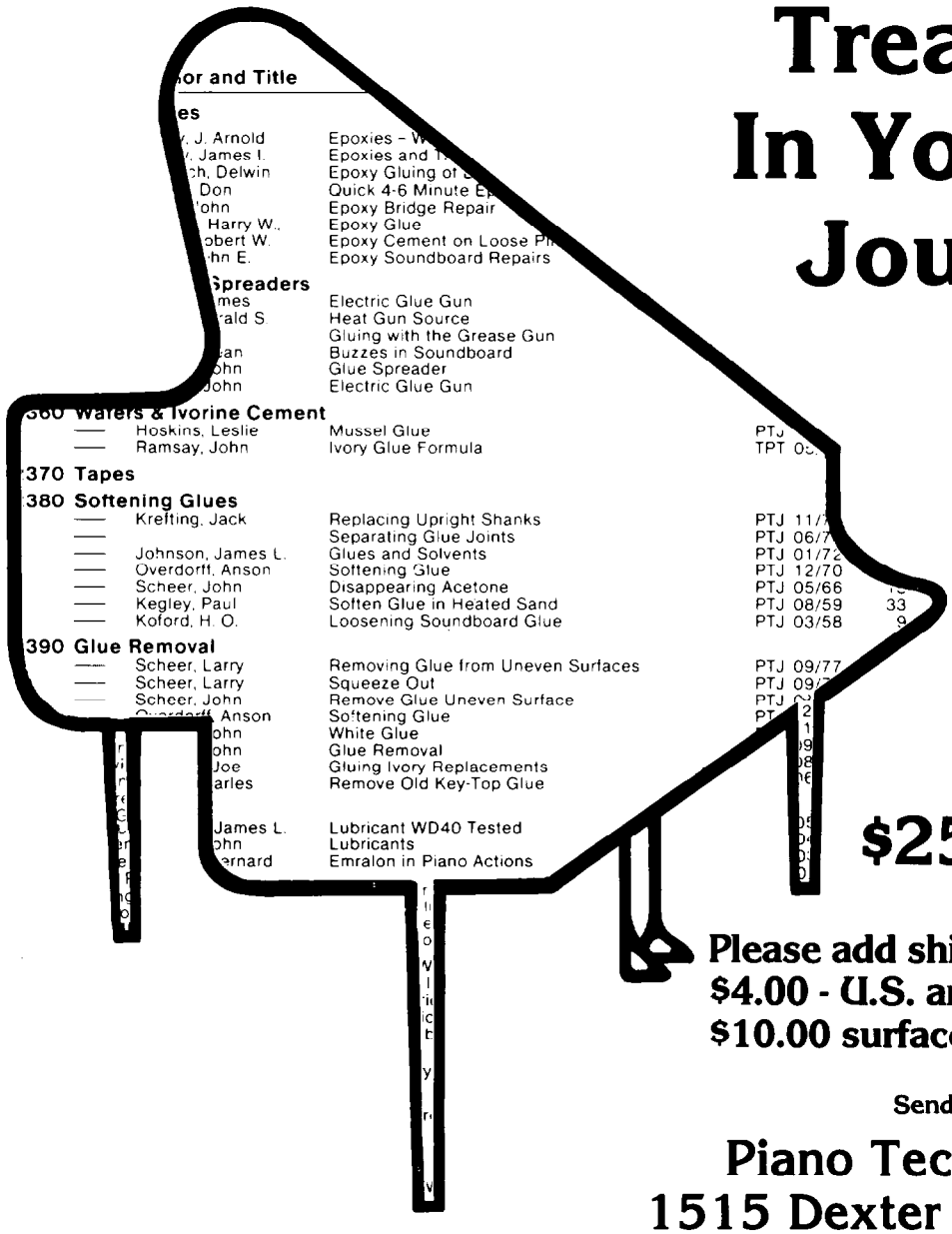

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Now, you can find the information you need — quickly and easily. It's all here in the "Classified Index to Published Piano Technology." This 293-page index can guide you to any one of the thousands of articles that have appeared over the years in the **Piano Technicians Journal** and four other publications related to piano technology.

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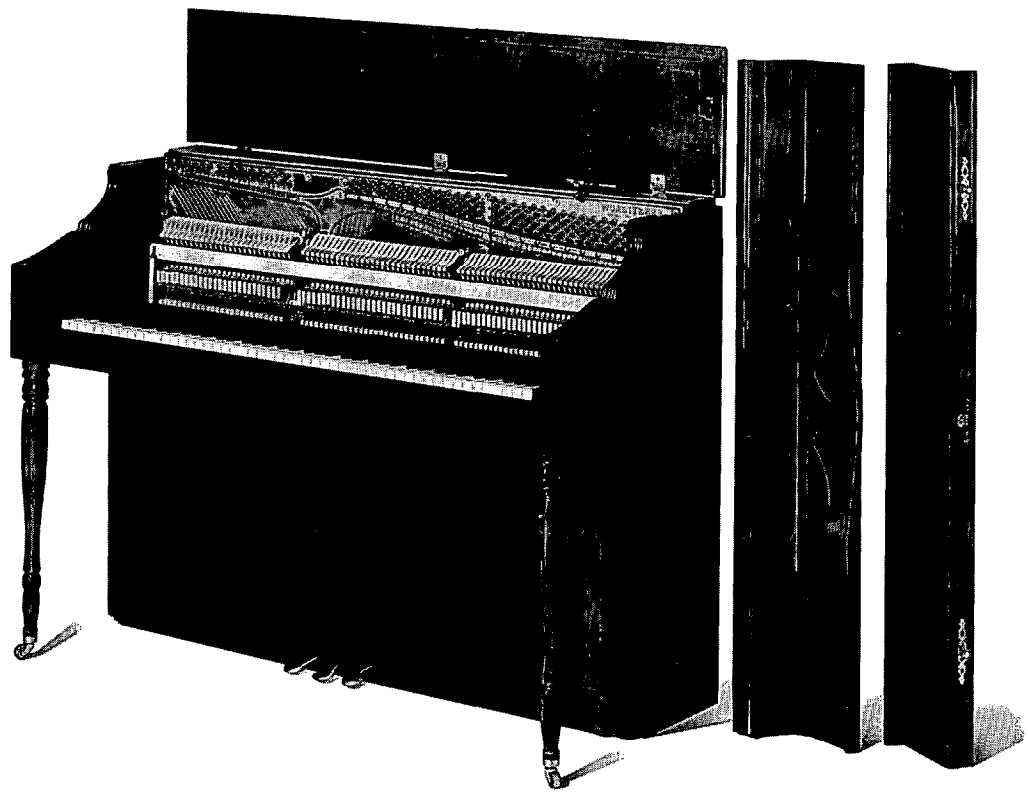
Not Just Another Pretty Piano



Wurlitzer Pianos are pretty, of course ... beautiful, in fact. But they're more than that. They're fine instruments designed, engineered and built to perform over a lifetime with ease of upkeep and maintenance. That's because they're designed and built with the technician in mind.

For example, on most Wurlitzer Pianos you'll service, the music desk assembly and fall board are removable without tools... just lift off the music desk assembly and unsnap the fall board equalizer.

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How many times have you wished you could keep the key slip from touching the keys? With a Wurlitzer, it's easy... thanks to the key slip adjusting screws. And adjusting the pedal bolts is just as easy.

All of this, of course, makes for a more dependable piano that can make your job a little less frustrating.

Our continuing commitment to you, the technician, goes beyond product design. It's apparent in our ongoing willingness to teach and train. Our key technical people attend PTG meetings and conventions and conduct training sessions. Our service department continues its seminars. Our technical staff is at your service to provide any assistance you might need, just call 800/435-2930 toll-free between 8:00 a.m. and 4:30 p.m. For parts call Code-A-Phone 800/435-6954. In Illinois call 815/756-2771.

We recognize that a quality instrument must be well maintained. That's why Wurlitzer Pianos are designed, engineered and built with you in mind.

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Piano Technicians Journal
UPDATE
July 1983

Special Notice To All Chapters

The June Chapter Mailing contained important papers for each member!

1. The New Computer Printout of Chapter Members.

The Home Office is on a new inhouse computer system and this is the first printing of chapter membership.

As with most computer changeovers, there may be a few "glitches" in the system. We ask you to check your name, address and telephone number for accuracy. Make all corrections on the computer printout and return to the home office.

Return the printout, with or without corrections, no later than August 15.

The printout will be used to make the next directory so we need your help in obtaining accurate information.

2. The current issue of the CTEvening News with latest information on the Examinations and Test procedures.

. . . . . .

Cassette Tapes of the 1983 Convention Institutes

Watch for the order form for the cassette tapes of technical institutes given at the New Orleans convention.

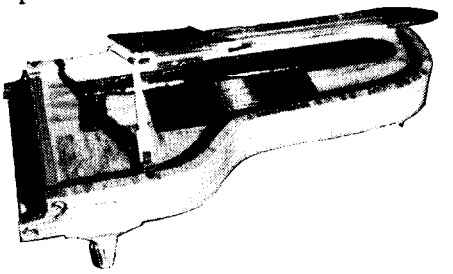
ALL TECHNICALS will be on cassette. Check your convention program and the previous *Journals* for listing of technical institutes.

. . . . . .

The Fabulous Golden Hammer

The 1983 Golden Hammer Award will be presented at the Awards Banquet. Each is handcrafted by William Smith of Seattle and each one is different.

The Golden Hammer presented to Stephen Jellen is shown here. The tuning hammer head is plated in 14kt gold and rests on a bed of scarlet felt. The award is crafted entirely from piano parts.



THE PIANO TECHNICIANS FOUNDATION

Donations may be sent in memory of one who is deceased, or in honor of a person who has been a special inspiration or made a significant contribution to the profession and/or to the Guild.

The Foundation has three categories:

The Steve Jellen Memorial Library
The Piano Technicians Fund For Research and Development
The Piano Technicians Scholarship Fund

All donations to the Foundation will be published in the *Journal* showing the name of the donor, the person honored and the category specified for the donation. A memory book, maintained at the Home Office, will be on view at the annual conventions and will show the names of those honored and the donors.

Donations should be made out in the name of the **PIANO TECHNICIANS FOUNDATION** and sent to the Home Office at 1515 Dexter Avenue North, Seattle, WA 98109. Please send the form below with your donation or a letter giving the same information.

I wish to honor _____ by making this donation _____

to the _____ category

OF THE PIANO TECHNICIANS FOUNDATION

signed _____ date _____

address _____

Chapter Notes

The May meeting of the **New York City Chapter** was held at the Third Street Music School. Chapter testing procedures were discussed and it was agreed that persons responsible for testing will offer three testing dates during the year, the better to accommodate new members and present members wishing to upgrade their standing.

Leopold Holder obtained a copy of the law requiring sellers of used merchandise to obtain a license, and discovered that the sale of used pianos is excluded from the license requirement.

The technical portion of the meeting, a film entitled "Fifty Minutes with Herman Koford," contained a great many useful tips for piano technicians.

After another sumptuous feast at the Redwood Inn in Decatur, the May meeting of the **Central Illinois Chapter** convened at Warnick's Music, just up the road from the Redwood. Ten members were present along with guests. After the usual committee reports and other business matters we were faced with the task of electing chapter officers.

Bob Morris presented our technical session, in which he played 30 intervals from thirds to sixths and we attempted to recognize them. This proved to be quite an interesting exercise (and somewhat embarrassing to many of us).

Approximately twenty of the **Atlanta Chapter** turned out for the May Meeting at Jim Scott's Skyland Store to be enlightened by Ray Reuter, National Service Manager for Kimball and his counterpart, Eric Johnson for Bosendorfer. When the group is still going strong at 10:30, you know everyone was interested.

We are doing further work on the project grand, including an analysis of the action (and this one is a bit different — brass flanges), and finishing up of the key covering operation. It is hard to realize that we started this project last November and here it is almost June.

Tips from the **Southwest Florida Chapter: "Sometimes It's Better Not To Get Paid..."**

Students, somewhere along the way you are going to take on a job that will turn out to be a completely losing situation. A piano that has extensive termite damage, or the action is so hopelessly worn or the strings are rusty and dead and tuning is impossible. At a time like this you will be better off to do the best that you can and get out. And DON'T ACCEPT ANY MONEY!!! Many times if you do you will be called back again and again and your reputation can suffer. If you haven't received any money, the customer has little reason to say anything against you, whether it is justified or not. It will be a costly lesson, but most of us have had to learn it at least once, the hard way.

The new **Pocono Northeast Chapter** held its first formal meeting on May 21, 1983 at the Orcutt Piano Service in Wilkes-Barre, PA. President Howard Yepson conducted the meeting, at which the chapter began the task of formal organization. Much of the discussion concerned our goals as a chapter and first steps to achieve them.

Our first major undertaking will be a program for local piano teachers in conjunction with the Pennsylvania State Conference Teacher Relations Committee. Plans are being prepared to offer this program in October at one or two of the colleges in Northeast PA. Members were encouraged to compile lists of the music teachers in their various territories so that we could reach as many as possible with publicity for this program as it is prepared. The members felt that this project was of great importance, since it would serve to educate the teachers and their students as to the existence of the Guild in this region and the benefits of employing Guild members on a regular basis.

The Pocono Northeast Chapter is a new group, covering a large portion of Northeastern Pennsylvania, from Williamsport on the West to the New Jersey line on the East, and from Hazleton in the South to the New York State line in the North. Presently we have six Craftsmen (two transfers from other chapters), one apprentice, two students, and two applications pending. We anticipate many more members as we make our presence known throughout our territory.

We would like to publicly thank the many Guild members who have worked hard to help us get our chapter off to such a fine start. Especially, we must thank Dick Bittinger, Sharla Kistler, Charles Huether, and Bob Smit, who have given so much of their time and effort on our behalf. Without their help and encouragement, there would be no Pocono Northeast Chapter. Those of us new to the Guild and all of us in the Pocono Northeast Chapter look forward to many years of fellowship and improvement in our affiliation with the Piano Technicians Guild.
Earl D. Orcutt

Chapter Newsletters 1983

Northeast Region

1. **Western Massachusetts Chapter — "Keynotes"**
   David Crowe — editor
   156 Maple St.
   Springfield, MA 01105
   Published monthly

2. **Boston Chapter**
   Tom Sheehan — editor
   56 Walnut St.
   Somerville, MA 02143

3. **Commonwealth Chapter — "The Sounding Board"**
   Jane Lepore — editor
   407 Broadway
   Somerville, MA 02145
   Published monthly

4. **New Hampshire Chapter — "The Granite Action"**
   Connie Chesebrough — editor
   P.O. Box 384
   N. Woodstock, NH 03262
   Published monthly

5. **Montreal Chapter**
   Marcel Carey — editor
   C—374 Cookshire
   Quebec, J0B 1M0

6. **Ottowa, Ontario Chapter — "Ottowa Chapter Newsletter"**
   Lee Harris — editor
   137 Nelson St.
   Carleton Place, ONT. K7C 1A3

7. **Connecticut Chapter — "The Keybed"**
   Vivian Brooks — editor
   376 Shore Rd.
   Old Lyme, CT 06371
   Published 10x yearly

8. **New York City Chapter**
   Nurit Tilles — editor
   312 East 9th St., Apt. 14
   New York, NY 10003

9. **Suffolk County Chapter — "Suffolk Soundboard"**
   Dave Tabachnick — editor
   20 Milburn Rd.
   Centereach, NY 11720
   Published monthly

10. **Syracuse, NY Chapter — "Pitch Fork Notes"**
    Bill Moonan — editor
    811 Amherst Dr.
    Rome, NY 13440
    Published monthly

11. **Southern Tier, NY Chapter — "Southern Tier Chapter PTG News"**
    Charles Mayer — editor
    Rte. 1, Box 201
    McDuffey Hollow Rd.
    Van Etten, NY 14889

12. **Buffalo, NY Chapter**
    Sandy Hartley
    50 Maple Ave.
    Fredonia, NY 14063
    Chuck Erbsmehl
    4165 Ransom Rd.
    Clarence, NY 14031

13. **South Central PA Chapter — "Perfect Pitch"**
    Dick Truax - editor
    RD#8, Box 40-E
    York, PA 17403
    Published bi-monthly

14. **Philadelphia Chapter - "The PTG News"**
    Ralph Onesti - acting editor
    6 Roxborough Place
    Willingboro, NJ 08046
    Published bi-monthly

15. **Reading-Lancaster Chapter — "Reading-Lancaster Action News"**
    Ruth Brown — editor
    P.O. Box 543
    Hatboro, PA 19040
    Published bi-monthly

Southeast Region

1. **Washington D.C. Chapter — "Alpha News"**
   Michael Travis — editor
   Box 303
   College Park, MD 20740
   Published 10x yearly

2. **Baltimore, MD Chapter — "7/0 Pin"**
   David Hughes — editor
   13228 Old Hanover Rd.
   Reisterstown, MD 21136
   Published monthly

3. **Northern VA Chapter**
   Steve Cunningham — editor
   133 Mayfair Dr.
   Leesburg, VA 22075

4. **Central NC Chapter**
   John Hatcher, Jr. — editor
   550 E. Massachusetts Ave.
   Southern Pines, NC 28387
   Published monthly

5. **Atlanta Chapter — "The Tuners Voice"**
   G. Timothy Reed — editor
   567 Grant St. SE
   Atlanta, GA 30312
   Published monthly

6. **Southwest FL Chapter**
   Duncan Ritchie — editor
   408 E. Flora St.
   Tampa, FL 33604
   Published monthly

South Central Region

1. **Dallas, TX Chapter — "The Piano Wire"**
   Leon Speir & Joe Lafuze
   7110 Forney Rd.
   Dallas, TX 75227
   Published monthly

Central East Region

1. **Cleveland Chapter — "Butts and Flanges"**
   Al Metz
   3239 Redwood Rd.
   Cleveland Hgts., OH 44118
   Published 11x yearly
   Janet Leary
   18817 Hilliard Blvd.
   Rocky River, OH 44116

2. **Cincinnati Chapter — "Cincinnati Newsletter"**
   Barry Heismann — editor
   8317 Beta Va.
   Cincinnati, OH 45231
   Published 10x yearly

3. **Indianapolis Chapter — "Indy 440"**
   Fred Rice — editor
   5504 W. Rinehart Ave.
   Indianapolis, IN 46241
   Published 10x yearly.

4. **Indiana Chapter**
   John Portersfield — editor
   321 E. Bradford St.
   Marion, IN 46952

5. **Western MI Chapter — "Western Michigan Chapter Newsletter"**
   Charles Gibson — editor
   8289 Kraft, SE
   Caledonia, MI 49316
   Published monthly
   Will Hahnenberg — asst. ed.
   54540 Orchard Ln.
   Paw Paw, MI 49079

6. **Madison WI Chapter — "The Tuning Pen"**
   Joel Jones — editor
   5914 Tolman Terrace
   Madison, WI 53711
   Published 10x yearly

7. **Waukegan Chapter — "Waukegan Chapter Newsletter"**
   Richard Quint
   916 North Ave.
   Waukegan, IL 60085
   Published monthly
   Frank R. Lord
   2821 N. Elmwood
   Waukegan, IL 60087

8. **Chicago Chapter — "Wippenpost"**
   Fred Tremper — editor
   810 North 2nd Ave.
   Maywood, IL 60153
   Published 10x yearly

9. **Central IL Chapter — "A Chord"**
   Jerry Eagles — editor
   815 Sunset Dr.
   Lincoln, IL 62656
   Published 9x yearly

Central West Region

1. **Central Iowa Chapter**
   Robert Espenscheid — editor
   Box 52
   Lamoni, IA 50140

2. **Twin Cities Chapter — "Soundboard Buttons"**
   JoAnn Bruner — editor
   3401 Colfax Ave. S.
   Minneapolis, MN 55408
   Published 10x yearly
   Christi Mickel — tech. ed.
   3333 23rd Ave. S.
   Minneapolis, MN 55407

3. **Montana Chapter**
   Richard A. Dightman — editor
   89 Oakwood Ln.
   Helena, MT 59601
   Published 2 or 3 times yearly

4. **St. Louis Chapter — "The Gateway Tuner"**
   Elizabeth Baker — editor
   2615 Texas Ave.
   St. Louis, MO 63118
   Published monthly

5. **Wichita Chapter — "The Voicing Tool"**
   Marty Hess — editor
   4031 N. Harding
   Wichita, KS 67220

6. **Nebraska Chapter — "The Action"**
   Richard West — editor
   1934 South 33rd St.
   Lincoln, NE 68506
   Published bi-monthly

7. **Denver Chapter**
   John Bloch — editor
   1584 S. Broadway
   Denver, CO 80210
   Published monthly

8. **Boulder Chapter**
   Richard Capp — editor
   3350 Loyola Court
   Boulder, CO 80303
   Published monthly

Western Region

1. **Utah Valley Chapter**
   Jack Reeves — editor
   486 North 3rd St. West
   Orem, UT 84057
   Published quarterly

2. **Fresno Chapter — "Fresnotes"**
   Don Moore — editor
   513-C East Myrtle Ave.
   Visalia, CA 93277

3. **San Francisco Chapter — "In Tune"**
   Dana Huff — editor
   462 Ulloa St.
   San Francisco, CA 94127

4. **San Francisco East Bay Chapter — "The Latest Pitch"**
   Ralph Nelson — editor
   16846 Meekland Ave.
   San Lorenzo, CA 94580
   Published monthly

5. **Santa Clara Valley Chapter**
   Bob & Diane Hofstetter — co-editors
   3690 Valera Dr.
   Soquel, CA 95073
   Published monthly

6. **Sacramento Valley Chapter — "The Valley Technician"**
   Fern Henry — editor
   3574 Cantelow Rd.
   Vacaville, CA 95688
   Published 10x yearly

7. **Combined Southern California Newsletter** *(Santa Barbara Chapter, Los Angeles Chapter — "Soundboard," San Diego Chapter, Pomona Valley Chapter, South Bay Chapter)*
   Paul Seabern — editor
   P.O. Box 515
   San Dimas, CA 91773
   Published monthly

8. **Seattle, WA Chapter**
   Don Galt — editor
   9229 15th St. NE
   Seattle, WA 98115
   Published monthly

Can Your Idea Pass the Test?

Like any large organization, the U.S. Navy is on constant alert for new ideas. Try their check list on your bright idea.

Will it increase production or improve quality?

Is it a more efficient utilization of people?

Does it improve operation, maintenance or construction?

Is it an improvement over present tools or equipment?

Does it improve safety?

Does it reduce waste?

Does it eliminate unnecessary work?

Does it improve present office methods?

Will it improve working conditions?

If your idea rates at least one yes, then you probably have a constructive idea, according to the Navy.

Copyrights

We have received requests from chapters and members to make copies of Guild films. Please note that all films and tapes have been copyrighted and may not be duplicated without Guild permission.

The PTG Journal on Cassette

The PTG *Journal* on cassette, read by George Defebaugh, is sent free of charge to all members who are listed as visually handicapped on the Guild records and who have requested the tapes.

Chapters are asked to check that their visually handicapped members are aware of this and encourage them to send in the request for the cassette.

Your Membership Investment

When you pay your Guild dues, you are making an important investment in your business and your life.

The Guild is working for YOU — and your dues payments keep the Guild in business!

How To Kill An Enterprise:

1. Do not go to meetings.
2. If you go, arrive late.
3. Criticize the work of the organizers and members.
4. Get mad if you are not a member of the committee, but if you are, make no suggestions.
5. If the chair asks your opinion on a subject, say you have none. After the meeting say you have learned nothing, or tell everyone what should have happened.
6. Don't do what has to be done yourself, but when the members roll up their sleeves and do their very best, complain that the group is run by a bunch of ego-trippers.
7. Pay your dues as late as possible.
8. Never think of introducing new members.
9. Complain that nothing is ever published which interests you but never offer to write an article, make a suggestion, or find a writer.
10. And if the enterprise dies, say you saw it coming ages before.

(Jean-Charles Terrassier, founder of the French Society for Gifted Children, who listed these suggestions in Quipos, *the international French journal.)*

"The typical situation is that the motorcycle doesn't work. The facts are there but you don't see them. You're looking right at them, but they don't yet have enough *value* . . . This often shows up in premature diagnosis, when you're sure you know what the trouble is, and then when it isn't, you're stuck. Then you've got to find some new clues, but before you can find them you've got to clear your head of old opinions.

". . .Slow down deliberately and go over ground that you've been over before to see if the things you thought were important were really important and to . . . well . . . just *stare* at the machine. There's nothing wrong with that. Just live with it for a while. Watch it the way you watch a line when fishing and before long, as sure as you live, you'll get a little nibble, a little fact asking in a timid, humble way if you're interested in it . . .

"Inner peace of mind isn't at all superficial to technical work. It's the whole thing. That which produces it is good work and that which destroys it is bad work . . . You can see it in skilled mechanics and machinists of a certain sort, and you can see it in the work they do. To say that they are not artists is to misunderstand the nature of art. They have patience, care, and attentiveness to what they are doing . . . The material and the craftsman's thoughts change together in a progression of smooth even changes until his mind is at rest at the exact instant the material is right."

— Zen and the Art of Motorcycle Maintenance by Robert M. Pirsig
from New York City Chapter Newsletter

Where Do You Stand?

. . . Suppose you had to "run" for PTG membership as candidates run for office. Would you win or lose?

. . . Suppose membership was good for only one year and re-election depended upon the service you had given to the Guild during that time. Would you be re-elected?

. . . Suppose you were called upon to state why you felt PTG should keep your name on the membership roll. Have you a record to offer in support of your claim?

. . . Suppose every member of PTG did just as much as you are doing now. Would the Guild be an active and progressive organization recognized for its integrity and standing in the community? Or would it disappear into obscurity?