

Piano Technicians Journal

December 1979





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Piano Technicians Journal

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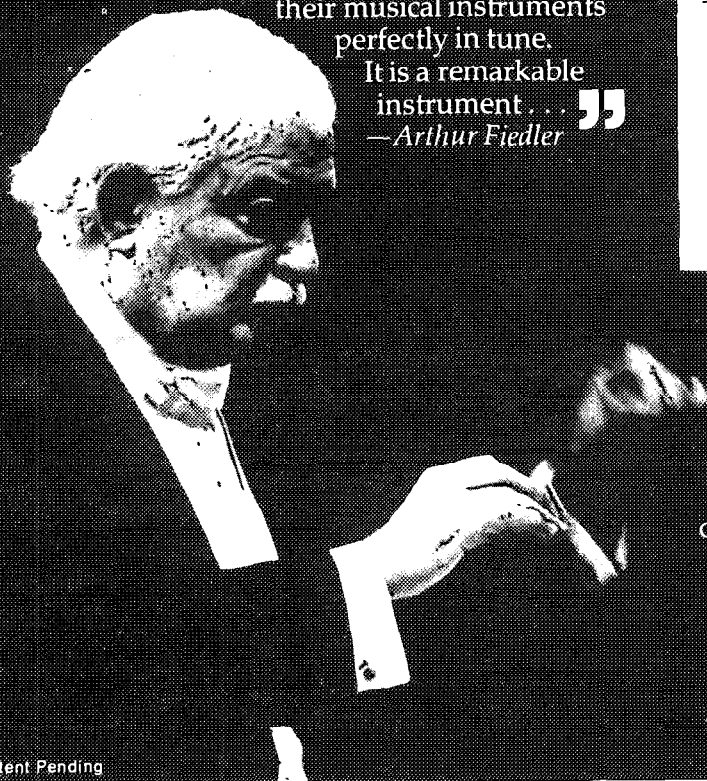
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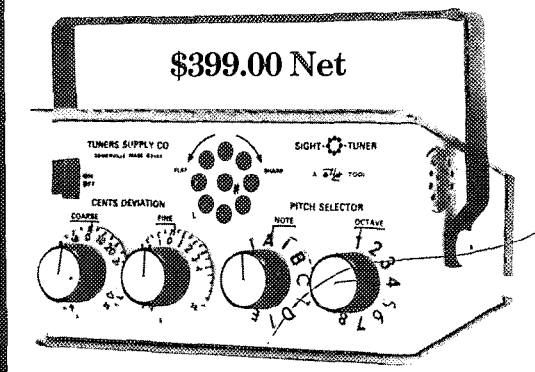
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EDITORIAL

Here it is again: that time of the year when we take a personal inventory in terms of accomplishments during the past 300 and some days. It is time to be thankful for those things which we have reason to be thankful about. It is time to look back and see if we have made some positive strides in terms of personal progress.

I have had the pleasure of working with "volunteers" during my entire adult life and have always made my living as a professional relating to those who donate their time, effort and money for nothing in the way of personal gain or goods. I have always functioned under a board of directors and have never held a conventional-type job where I reported to a single boss, a specific place each day or in the performance of a specific task. I don't know whether this is an advantage or not, but it certainly puts me in a unique position.

One aspect of this situation is that I have developed a great deal of admiration for those many people who sacrifice their time so willingly to the causes of their choice. Whether it is working on behalf of a school for severely damaged children, a local youth group, a professional society or a social welfare agency, it is all the same. It usually is purely a sacrificial act of love and dedication to others.

Were it not for these wonderful people, how many others would be suffering from want? How many would be struggling to survive in an extremely competitive world and even living in substandard conditions.

How many men and women have served on the board of our Guild, in local chapter leadership positions and/or have worked diligently on vital committees over the many years of our organizational life? How many have accepted jobs as officers which require the greatest sacrifice of all? I am sure it numbers

into the thousands. How many hours were spent away from home, family and pleasure? Many hundreds of thousands, I am sure. What is this worth to an organization? It is impossible to compute, but these hours sacrificed make it possible for such organizations to exist. Only about one-third of any given membership in any particular group really makes things move. Only about 5% of that one-third is willing to take on major responsibilities, such as holding office. Thank God for those people who make it possible for you and I (you as a member of the Guild and I as a professional serving it) to exist within this viable, healthy industry.

We recently received a letter from our good friend Chuck Burbach who says it in a most effective way from both experience and from the heart. I bring it to your attention in this editorial since it needs to be said and is long overdue.

"It has come to my attention, through a recent conversation with a member of the board, that some members and nonmembers are under the impression that board members of the Guild are 'salaried.'

"I think it is important that the record be set straight on this matter, and that is the purpose of this letter. The remuneration that a board member receives consists solely of travel expense and office expense (telephone and postage), all of which must be verified by vouchers and approved before reimbursement is made. Please believe me, and if you don't, contact any present or previous member of the board and they will attest to the fact that service on the board was a financial liability rather than an asset.

"I am speaking as a *person who has been there*, having served nine years on the board (And I want to add loud and clear that I don't regret a minute of it!). I also want to make it clear that I do not want to discourage anyone from running for office;

it is an experience of a lifetime, and one that has many rewards, far and above any financial remuneration could be realized.

"Our bylaws specifically deny the right of any member of the board to advertise his or her position, so there is no incentive for a board member to 'toot his own horn.' No, my friends, the only reason that one of our members allows himself to become a candidate for office is a sincere desire to do something to further the cause of the Guild.

"When I recall the untold sacrifices of past officers of the Guild, it makes me ill to hear that some members think their efforts were done for personal financial gain. If anyone reading this feels that you can 'get rich' serving on the board, please get in touch with me and we'll put your name in nomination and I'll guarantee you an education!"

Charles Burbach, Chairman,
Nominating Committee



It has come to our attention that the official Guild logo and emblem are being used by people who are not craftsmen members of the Piano Technicians Guild.

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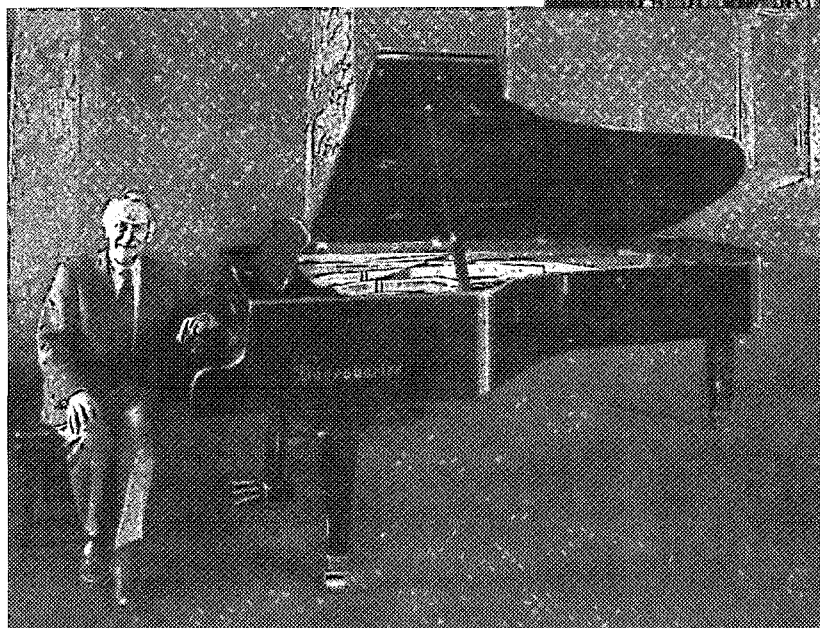
It cannot be used by any individual or firm unless they are fully qualified and accredited by this guild through proper competence testing procedures. Any illegal use of this emblem should be reported to the home office immediately for proper action.

A man and his piano: Yehudi Menuhin & Bösendorfer

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PRESIDENT'S MESSAGE

I'm sure it is obvious to many of you that I thoroughly enjoy teaching at seminars and conventions. I find these experiences most rewarding, knowledgeable and fun. Friendships and sharing are a very important part of everyone's life. We need these two qualities to be a total human being.

In our profession there are many times when we are working alone, hence we need to enjoy the company of other piano technicians to be complete, and the Guild offers many such opportunities. It seems that in our homes, our calendar revolves around Guild seminars, conventions and meetings. We look forward to the challenge of preparing and presenting interesting and informative classes . . . sharing new ideas with others . . . and gaining knowledge from other technicians through their interesting questions and class participation.

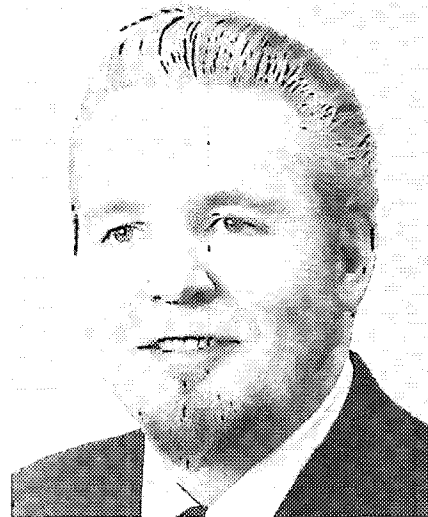
But just as important to us is renewing friendships and developing new friends. It is fun to discuss the many similar experiences we have, stories and/or situations,

such as animal experiences, teddy bear time, interesting 'finds' inside the piano (candy bars, coat hangers and even snakes), and the many interesting people we tune for.

We also discuss different types of pianos and how we service them. Yet the important thing that stems from these discussions is that we all share the same experiences of a job well done . . . freedom of work . . . ability to work hard or easy as YOU desire . . . and pride in the finished product.

We also share the same problems: customers who demand the impossible . . . customers who are not at home . . . pianos that are never as good as they were in the 'good old days' (I wonder who they complained about before Cristofori?). No matter where we go and who we are with we all share the same problems and joys.

We belong to a fine profession, and after talking with people from all over, I am convinced that we are truly blessed. It is important that we take pride in our great profession and appreciate it.



Happy holidays to everyone and may I wish all of you a very prosperous new year.

Bob Russell



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THE TUNER-TECHNICIANS FORUM

ACTION CENTERS

Our discussion of easing tight centers in the August issue prompted a couple of interesting letters, the first of which goes like this:

"... You mention alcohol and water for shrinking centers, which is fine, but as an ex-pharmacist I would make a few comments about alcohol. Methyl alcohol has very little water, sometimes as low as 3%. Denatured is grain alcohol that is usually denatured with methyl. Rubbing alcohol can be either ethyl or propyl, with a water content of about 35%. Grain alcohol from the drugstore can be anywhere from 25% to 75% water, and 100 proof whiskey or vodka is half water.

"In my opinion, most of the failures in treating centers are caused by the wrong choice of alcohol. In most cases the water content is unknown. For several years I have used 100 proof vodka for treating centers. It is colorless, odorless, and I know exactly that it is half water. . ."

It is really difficult to resist the temptation to offer a wisecrack comment or two at this point, but I will try. I will not talk about whole families of mice standing in line to lick centerpins, for example, nor will I advise technicians to complain righteously to their spouses about the sudden rash of tight centers when their liquor bills escalate. Above all, I will avoid mentioning the advisability of carrying extra "shrinking solution" for the purpose of celebration when it works, or sorrow-drowning when it doesn't. Such wisecracks could tend to undermine the serious nature of the technical advice given, and we certainly wouldn't want to do that. The only cautionary remark I will offer is that the technician might be well advised to transfer the solution to another container to avoid leaving the customer with the wrong impression.

Our next correspondent is a member of the Guild, and since I intend to argue in opposition to some of his points, I will leave his name out:

"Concerning your segment in the August Journal about tight action centers, I have always thought it strange that one would treat moisture-swollen bushings by adding more water. Quite frankly, though, I have never tried your alcohol and water method because I have a better method. Simply saturate the bushing with naphtha and the center will instantly free up. No waiting is necessary and since it evaporates so quickly it can be applied liberally right in the piano and any spillage will disappear in seconds. The stuff to get is Benzine V.M.P. Naphtha, I believe. It is often hard to find but it is worth the effort. And, yes, it also works on verdigris. Basically what it is is drycleaning fluid and, while I'm no chemist, I assume what it does is clean the felt and evaporate, taking the water with it. I'll admit that it is a petroleum distillate, but it is so volatile that I really don't feel it leaves enough behind to cause any problems. It has permanently cured sluggish actions in many pianos over the years for me without a single callback or adverse side effect. One caution, though, don't smoke! In fact if an entire action must be treated it is best done outside. Then you can literally pour the stuff on the action and the action will still be dry enough to put back in the piano within ten seconds. . ."

The idea of using water with the alcohol is that the water will shrink the bushing cloth, thus providing more clearance between centerpin and bushing. The only reason for using any alcohol at all is that it dilutes the water for a controllable mixture to avoid over-shrinking; and, of course, the alcohol acts as an effective vehicle to get the water

all the way into the center. Wood alcohol by itself acts only as a cleaning agent and temporary lubricant. Experiments conducted by the Cincinnati Chapter a few years ago showed that such cleaning agents or lubricants were permanently effective only in cases where the centers were just marginally too tight to begin with.

On one occasion several years ago, members of the chapter were asked to bring in their favorite shrinking solution for comparison with other solutions in a scientific test of effectiveness. Willard Sims brought 30 or 40 upright butts and flanges which were too tightly pinned, and an action rail on which to mount them. The flanges were screwed to the rail by chapter members during the meeting, and the resistance of each butt was carefully measured with a gram resistance meter. Each butt was checked twice to be sure the reading was accurate, and the resistance reading was marked on the action rail next to the flange.

All of the centers were too tight, but some were considerably tighter than others. When it was determined that there were five different solutions to be tested, the butts and flanges were remounted in five spaced groups along the action rail. The markings on the rail were changed accordingly, and the gram resistance was checked a third time. Each group was marked with the name of the technician who would treat that group of centers, and then the solutions were applied. One man used alcohol, another used Renuzit, a third used an unspecified concoction, the fourth used either benzine or lighter fluid, and Cliff Geers used the alcohol/water/Ivory soap formula described in the August issue.

After all five members had applied their solutions to a group of centers, gram readings were taken again. No heat had been used, and it was too soon for Geers' solution to have

evaporated, so his group of centers got even tighter while the other four immediately got looser. An hour or so later, after the meeting, we checked them again. By this time the Geers solution had started to work, and his centers were noticeably freer than they had been. The other four groups of centers were still free. We put the rail away for a month to see what would happen.

At the next meeting we checked the gram resistance readings on all five groups of centers. The results were a mixed bag, but it was immediately evident that the Geers solution was the winner, hands down. His group of centers had stabilized to readings that were uniformly freer than before the test began. Some of the other groups contained a random center here or there that was still acceptably free, but we found a recurrence of tightness in most of the centers in the other four groups.

These findings prompted me to believe that the only reliable way to permanently reduce friction in a tight center is to increase the clearance between the pin and the bushing. Whether this clearance is increased by shrinking, reaming or scorching, I now believe that pin clearance is the reliable solution, not lubrication. I do not present this as the last word on the subject, because there is no such thing as the last word. Someone may prove me wrong tomorrow. I present this argument only as the current state of the art as I see it right now.

NEWSLETTER TECH REPRINT

I noted a particularly intriguing technical tip in a recent issue of *The Keybed*, the newsletter of the Connecticut Chapter. Clayton Shufelt is the editor, and Frank Stopa is the author:

TIPS FOR INSTALLING REPLACEMENT KEYS IN KEYBOARD

1. Pull the front and balance pins out and plug the holes with hardwood.
2. Place the replacement key into position, using a small straight-edge at the front and centering

the key between adjacent keys.

3. Insert the balance rail pin in the key balance hole and tap the pin with a hammer to mark the drilling point.
4. Remove the key and drill the balance rail hole.
5. Drive the pin and install the key to check its alignment.
6. Make a front caul out of wood to fit the front bushing hole (see **Figure 1**).
7. Insert the caul in the front bushing hole (mortise).
8. Replace the key, center the head and carefully tap it by hand to mark the pin location in the front rail.
9. Remove the key and drill a hole for the pin.
10. Drive the pin and replace the key. You should have a perfect key fit.

BIRDCAGE PIANOS

A member at large from Hants, England, writes:

"I read with interest your article on birdcage pianos prompted by John Wiley's request for information in the July issue of The Journal. It was your comment at the end of the article, 'if he sets his fee on the basis of results, he could starve working on a birdcage,' that prompted me to lift my pen and contribute my ten-penny-worth.

"I became a Guild member in 1973, having been trained by Mr.

Herbert Wood of Providence, Rhode Island, shortly thereafter returned to Portsmouth, England, where, to my surprise and consternation, I was being called to tune more and more of these odd pianos with wires at the front as well as at the back of the action. In fact, they were causing me so much heart-ache that I at one time seriously considered selling my house and moving lock, stock and barrel back to the United States where Mr. Wood assured me he had come across only one birdcage in 30 years. It is now some years later and you must believe that 90% of my work is carried out on old birdcage or overdamper pianos, as they are known here. In short, if I didn't work on them, I would starve.

"Some years ago I wrote to the technical editor and mentioned that I had developed a simple method of tuning these old pianos. As I received no reply I felt there was no interest, and so did no more about it. As the subject has come up again, I feel perhaps the time has come to pass on a few tips that will make life easier for John Wiley and anyone else who has to deal with these pianos on a regular basis.

"Before attempting to tune an overdamper piano it is wise to remove the felted wooden bar operated by the soft pedal. This pedal is often wrongly referred to as the 'sostenuto' but could just as easily be called the exercise pedal. to remove the bar, simply unclip the action at the wooden standards (no

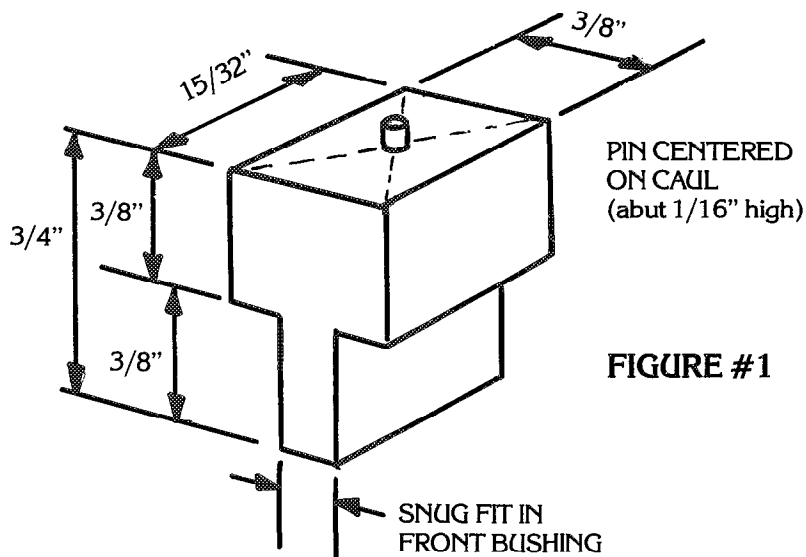



FIGURE #1 

metal was used here), lean the top of the action toward you and, placing the hands behind the action, remove the bar from its notches. In some cases the bar is glued to the vertical trapwork sticks, in which case the action must be removed for easy access to the screws. Observation will indicate the best direction to lift out the action as sometimes there can be an obstructing projection, but otherwise it is straightforward.

"The method used by most other tuners when tuning birdcage pianos cannot be done with the rubber-ended treble mutes used in the United States. The trick is to use either a Papp's spring-loaded tuning wedge, or a single leather-tipped thin wooden stick, one end for unison muting, the other for note muting. They are very narrow and will pass through the action at an angle and then can be placed between unisons or notes for selected muting, making sure that unisons are tuned before moving on to the next note. I personally find this a tedious, laborious and time-con-

suming method, and have therefore developed a method of tuning which makes the overdampers as easy to tune as an underdampers piano. It requires some time spent on making a lot of special mutes, constructed of thin section bamboo with leather tips, thick enough to pass between each set of strings, just as in strip muting. Experimentation is necessary to achieve the desired size. As the bass strings always extend above the damper bar, the normal rubber mute can be used there, but it is now a simple matter to poke all the mutes right through the action, taking no more time than strip muting, passing the mutes between the hammer shanks, until the whole tenor and part of the treble section is covered. The treble beyond the damper section can be dealt with as easily as any other piano.

"After preparing, which takes only a few minutes, the piano can be tuned as if it were strip muted and the unisons tuned simply by removing the mutes one at a time. I believe as long as the principle is under-

stood, it is not necessary to go into any great detail. . ."

— Bert Blackhurst

Our thanks to Mr. Blackhurst for this thorough discussion of muting techniques. He goes on to say that he will send in some information on regulating birdcage actions if we are interested. Are we?

CLEANING YELLOWED IVORY

Gary Doudna of Charleston, Illinois, recently sent in a clipping from a jeweler's magazine regarding clearing ivory. According to the clipping, one tablespoon of whiting (precipitated chalk) should be mixed with one-half ounce of acetone, one-eighth ounce of wood alcohol, and about ten drops of fusel oil. This mixture is to be rubbed briskly over the ivory surface with a saturated cloth. The ivory is then rubbed dry and polished with a soft cloth. The whiting is available at paint stores, and the other ingredients seem common enough except for "fusel oil," whatever that is. At any rate, we would be interested in hearing the results of the use of this or any other mixture that our readers may have tried. Doudna goes on to say:

"... I wonder if you might include in your Forum sometime an article on ivory — types of, best way to clean, how much yellow we can expect to clean, how to scrape, how to buff, more on the use of white epoxy in the repair of chipped ivory, etc. I'm sure we would find such an article educational and beneficial."

I'm going to have to ask for help on this one. I've done about as much ivory work as the next technician, which is like saying I avoid it whenever possible. Ivory experts, let's hear from you. I agree with Gary that this topic would be very beneficial, especially now that ivory is practically irreplaceable.

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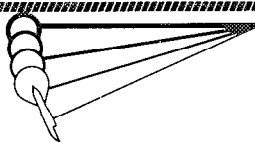
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REPAIRING CRACKED PLATES

Here is an interesting letter with a new twist on an old problem from a member in Australia:

"I want to thank all concerned for all articles printed in the Piano Technicians Journal. I am an affiliate member of the Guild, and have been getting The Journal for the past 20 years. It is rather astounding to me, though, that as far as I know not one article has been written on hammer recovering procedure or on bass string making. We in Australia are not as well off regarding repair houses as you good folk in the U.S.A., so in consequence we often have to do these jobs ourselves. No doubt there must be technicians here and there who do this work themselves — how about some latest news on these subjects?"

"Now a word about cracked piano frames. We here down under in Australia have a couple of firms named Metalock and Metal-Stitch who specialize in repairing cracked cylinder blocks and heads and, believe it or not, cracked piano frames. To repair a cracked piano frame takes about one hour at a cost of \$30 or so. During my 30-odd years of piano servicing, I have had six or seven frames repaired in this manner and all to my knowledge have been satisfactory.

"Briefly, their method is this: Tension is lowered in the cracked area, holes are drilled along the whole length of the crack, and the holes are threaded with a tap. The holes are filled with threaded rod which is then broken off at the top of the plate. Then, at right angles to the crack, larger holes are drilled to take a strong metal clip which is inserted with a pneumatic hammer. The clips protrude about one half inch on either side of the crack. That's all there is to it. . ."

Arthur C. Mau

I don't know of any technicians in this country who wind their own bass strings or recover hammers, which is why we haven't had articles on these topics. The relatively low

price of mass-produced hammers and strings makes occasional production economically unfeasible, even if the technician already owned expensive hammer pressing and string winding machinery. The average technician here makes his living primarily on his time, not on manufacturing parts. It comes down to the price and availability of parts; if an item is available for a dollar and it would cost you five or ten dollars worth of your time to make the item yourself, you can't afford to make your own. On the other hand, if you live in a country where parts are not readily available, you have the opportunity to learn a lot about pianos.

This plate repair method is unusual, to say the least. Apparently it works, though, at least in some instances as reported by Arthur Mau. I can't help but wonder how it would work in the case of a strut broken through the middle, or how the protruding clips could be tolerated in the hitchpin or tuning pin panels. It would be interesting to see a photograph of such a repair; Mau did send a sketch, but I may have misunderstood the intent of the drawing. The strong metal clips looked like strips of armadillo skin, or strings of pop-tops from beverage cans. Arthur, we look forward to seeing a photograph and hope you will send one.

TECHNICAL TIPS

Bill Pealer of Alexandria, Virginia, who at 72 qualifies as an "old timer," has three tips to share with us this month. The first is a device to aid in leveling sharps (see Figure 2). The gauge is cut carefully so the tongue

fits neatly between adjacent sharps, and is 7/16" thick. Normally the sharp height should be 1/2" above the naturals, and this extra thickness is accomplished by the addition of layers of masking tape to the bottom of the gauge. These shims add a measure of flexibility to the tool in cases where the height would be set to some other dimension. With the gauge in place it is a simple matter to check the height of the sharps by feeling crosswise from sharp top to gauge with a finger.

Pealer's next tip involves the use of a special gadget which makes tuning pin coils (see Figures 3 and 4). I will quote Bill's notes:

"When replacing broken strings, most technicians back out the tuning pins about three turns and then turn them back in when putting on the new string coil. I find that some of the torque is lost on these pins. To prevent this reduction of torque, turn the pin back only about 90 degrees, pry out the becket and remove the old coil. Now wind the new coil on a separate 'prepared' pin, slip the coil from the prepared pin and put it on the pin in the block. Ah, there's the rub—the words 'slip' and 'prepared.'"

"Prepare the tuning pins (1/0 size preferred) by slotting them as illustrated. Place the string end in the slot all the way down to the becket hole, leaving the tip just peeking through the pin; put the bight of the string under the screw head, and turn on three full turns with your tee hammer or stringing crank. If you have used the vertically slotted pin, the coil will slip right

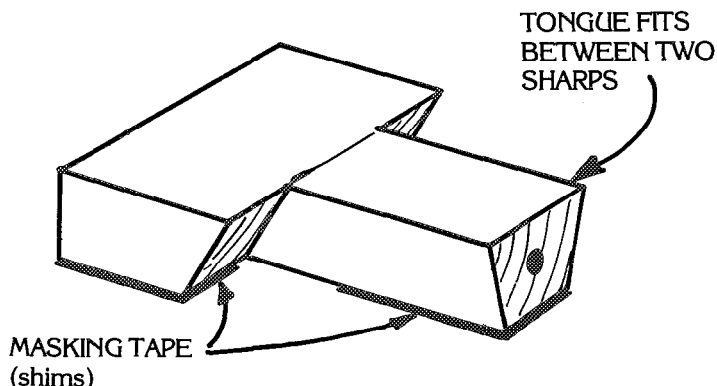


FIGURE #2 *Jr*

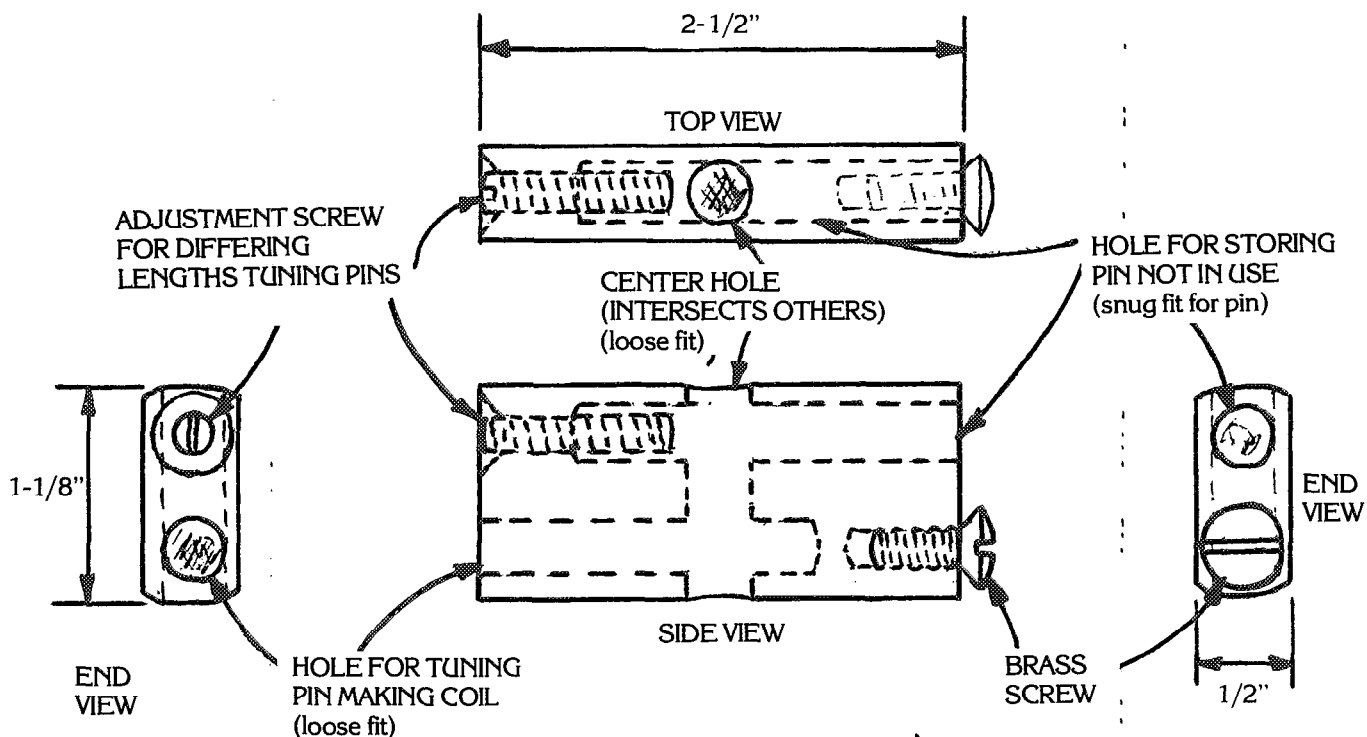


FIGURE #3 Jc

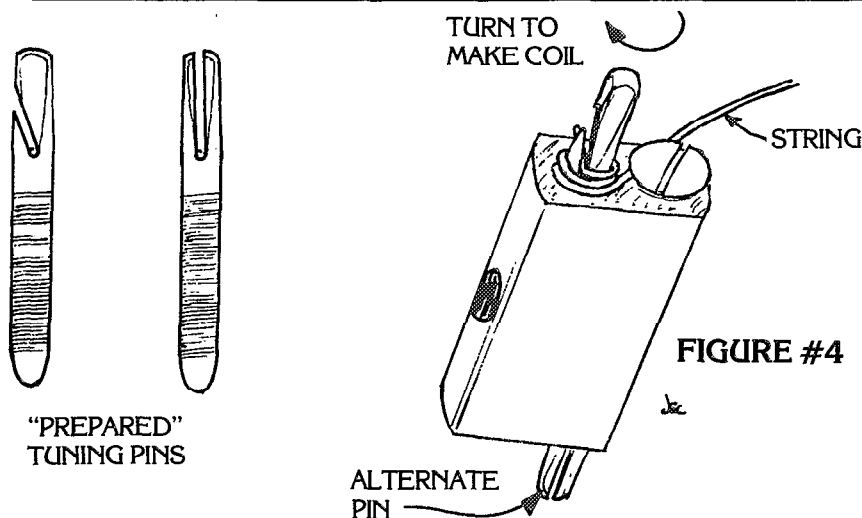


FIGURE #4 Jc

off the pin. If you have used the diagonally slotted pin, remove it from its hole, insert it in the hole in the side of the tool, tap it on through, and the coil will pop right off the pin, ready to be placed on the pin in the block. When cutting the slots please note that they are cut about three degrees clockwise from being parallel to the becket hole."

TIP OF THE MONTH

Some of the best technical tips are those that make use of common shop tools and supplies to make an uncommonly useful tool for piano work. such is the case with our featured tip, which utilizes a piece of coat hanger wire, a brass damper insert and a centerpin. This tool takes very littel space in the technician's toolbox; better still, it weighs next to nothing and does a superb job of installing plain end bridle straps. Bill Pealer describes it this way:

"The bridle strap inserter is made of a piece of coat hanger, a brass insert and set screw from a damper head, and a #18 centerpin. The insert is bored on through with a #56 drill bit and the centerpin is soldered into this drilled hole (see

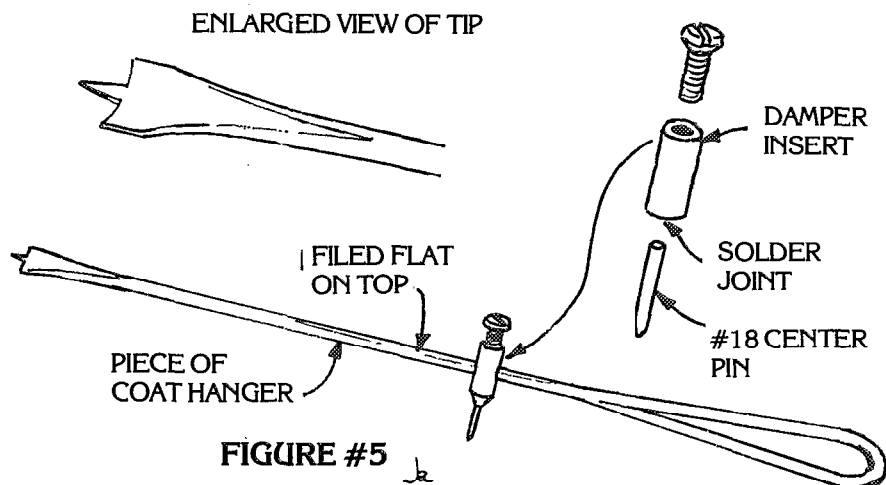


FIGURE #5 Jc

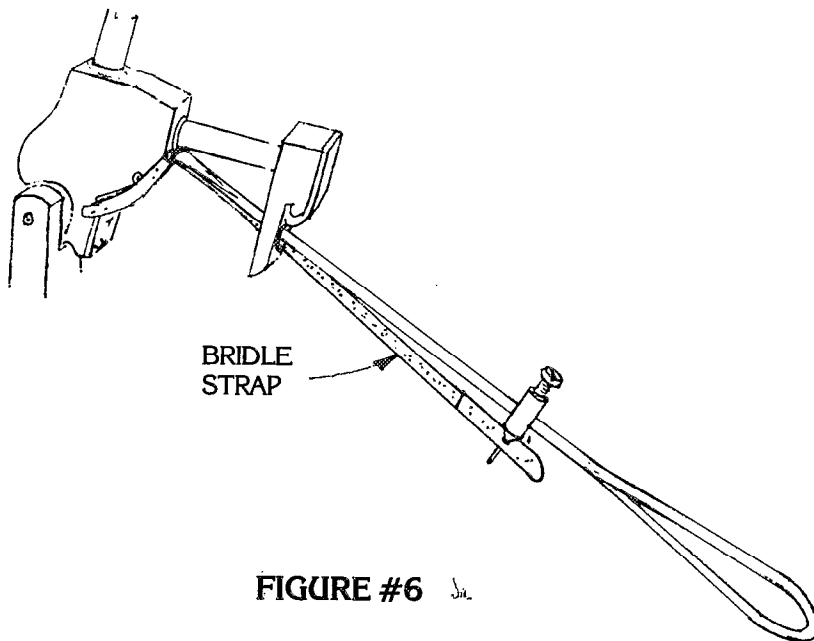
Figure 5). The coat hanger wire end is flattened and swaged on an anvil and then filed to shape. The brass insert is slid onto the wire, and the other end of the wire is bent to form a handle. The top surface of the wire is filed flat to keep the insert vertical and to provide a better grip for the set screw.

"The old tape is cut neatly from the butt with an Exacto knife while gently pulling on the strap with a large pair of tweezers. The brass insert is adjusted into position along the tool for correct strap length. The strap tab is placed on the pin and the strap is lightly stretched and impaled on the tip of the tool. The tool tip and strap are dipped into some aged and tacky Titebond and inserted through the catcher hole. It is then pressed up into the junction of the catcher shank and butt. The end of the strap is flipped off the centerpin and the tool is removed (**see Figure 6**). The only time I use clip or cork type straps is when there is no hole in the catcher, or for single strap replacement."

CENTERPIN SIZES

QUESTION: "What size centerpins are used in which piano parts, and why do they use different sizes? What, if anything, is the effect of putting larger size pins in an action? Is it possible, as I have been told by an otherwise reliable source, for a pianist to notice the difference in touch if a few of the shanks are pinned with oversize centerpins?"
— Charles Huether

ANSWER: The larger the pin, the greater will be its surface area. This gives it increased load capacity, but carries the penalty of greater friction because of its larger rubbing surface. This added friction can be compensated for by increasing the clearance between the pin and the bushing, to some extent at least. An illustration of this load capacity/friction principle would be the automobile engine; large, powerful engines require crankshaft journals that are maybe two inches in diameter to handle the torque load, while small engines can use journals half that size. I don't know what percentage of our readership is familiar with automobile engines, so I'm not sure



how far to go with this analogy. Let's just say that if the powerful engine were fitted with the small journals, the bearings would wear out quickly even if the crankshaft didn't break, as it likely would; and a small engine saddled with the added friction of oversize journals would be inefficient and even less powerful.

So much for theory. Unlike the automobile crankshaft, which moves through 360 degrees and keeps spinning, piano action centers move back and forth through only a few degrees of the circle. Center loading factors in a piano action are actually critical on only two centers anyway, the hammer flange and the jack. All other centers are really over-engineered in the sense that they are probably twice as large as they need to be to handle the required loading. They could be made smaller, but in most cases they are simply bushed with greater clearance for freedom of operation. We have all seen innumerable instances of hammer flange bushing failure due to heavy playing, but can you remember the last time you saw a worn-out underlever bushing? I don't think I ever have.

The net effect of putting larger pins in the action will be negligible in my opinion, so long as the torque in the center remains the same, and I would defy any pianist to be able to feel the difference while playing the piano. If you had very loose centers

and repinned some of them with pins several sizes larger without reaming, then naturally the torque would rise dramatically in those centers. This could increase the friction sufficiently so that the resistance might be felt by the pianist, but if you had a #21 centerpin in a flange next to one containing a #20 pin and both had the same torque value, the feel would be identical from one to the other. The pianist cannot know that the larger pin is installed in a particular center, because the clearance has been increased so that

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neither center is tighter than the other. Added friction feels like added weight, but in this case there was no added friction or weight; hence no difference in feel.

COIN WEIGHTS

Several years ago I was told that ordinary U.S. coins could be used to check downweight and upweight, and that the approximate weights were: Dime, 2½ grams; penny, 3 grams; nickel, 5 grams; and quarter, 6 grams. This information came from an old-timer, and seemed useful if reasonably accurate. Just how accurate was the big question, especially when one considers the fact that the metallic composition of many coins has changed in recent years. The good old silver quarter, for example, now has orange coloring around the edge just like the new dime. One would suspect that the overall weight might have changed, as it surely has. The 2½-gram silver dime lost over a quarter of a gram when it was gutted, and now checks in at a slim 2.2325 grams.

The quarter was another big loser, now weighing only 5.5941 grams, the nickel weighs 4.9732, and the penny tips the scales at 3.0672 grams, according to noted piano engineer Robert Cutshall. He also weighed two different sets of gram weights sold by piano supply houses and found them to be only fairly accurate. Some of these weights were quite close to where they should have been, but others

were not.

For those who would like to use modern coins to check downweight, the following chart may be useful. I have tried to come up with coin combinations which would come close to whole number gram values between 45 and 60. Please note that the weight should be centered over the front rail pin, as that is the point where touch weight is measured.

THE PREPARED PIANO: ANOTHER VIEW

As you may remember, Thomas Brady wrote an article on the piano industry's view of the "prepared" piano last June and included statements from manufacturers as to the effects of such "preparation" on their warranties. Each manufacturer's response was slightly different, but most seemed to me to be saying in effect that if the piano owner choses to experiment with the instrument in ways not intended by the manufacturer, he should not expect the manufacturer to pay someone to repair any damage that he caused. One of our readers has other ideas about that, and here is his letter:

"The historic background for the 'prepared' piano . . . could be extended back to the harpsichord. The pressing of felt against the strings at the nut to produce a harp-like tone was one method of chang-

ing the color; having an alternate set of jacks to pluck the strings at the nut was another. In our own century we should not neglect to mention Henry Cowell, who might as often be found inside the piano as at the keys. My purpose in writing is to point out that these alternative ways of playing and using the piano are not meant to abuse the instrument but to achieve 'colors' that cannot be obtained in the conventional way. String and wind instruments also use a variety of mutes and bowing and blowing techniques to alter the tone color of their instruments. I would like to suggest an alternate approach to this problem than that suggested by the Vancouver Chapter and the piano industry.

"In the same issue of The Journal an article by Jim Ellis that examines the development of some 18th century actions contains this description:

'The interaction that existed between makers and musicians is obvious. Musicians were seriously turning to the piano because of its potential; and piano makers were seriously making improvements in order to win more acceptance. Each group motivated the other.'

"Certainly this is not the situation today when it seems that most piano builders take a negative and even punitive attitude towards the composer. Composers using the prepared piano are not trying to

Weight in Grams	1st choice		2nd choice	
	45	18 dimes + 1 nickel = 45.1582	8q = 44.7528	
	46	2 quarters + 7 nickels = 46.0006	15p = 46.008	
	47	8 quarters + 1 dime = 46.9853	2q + 16d = 46.9082	
	48	5 quarters + 9 dimes = 48.063	2q + 12p = 47.99	
	49	16 pennies = 49.0752	2q + 17d = 49.1407	
	50	5 quarters, 4 nickels + 1 dime = 50.0958	10n = 49.732	
	51	2 quarters + 13 pennies = 51.0618	2q, 4n + 9d = 51.1735	
	52	10 nickels + 1 dime = 51.9645	17p = 52.1424	
	53	5 quarters, 9 dimes + 1 nickel = 53.0362	8q, 2p + 1d = 53.1197	
	54	7 quarters + 3 nickels = 54.0783	3q, 7n + 1d = 53.8272	
	55	7 nickels + 9 dimes = 54.9049	7q + 7d = 54.7862	
	56	10 quarters = 55.941	5q, 9d, 1n + 1p = 56.1034	
	57	5 quarters + 13 dimes = 56.993	7q + 8d = 57.0187	
	58	6 quarters + 11 dimes = 58.1221	5q + 6n = 57.8097	
	59	10 quarters + 1 penny = 59.0082	7q + 4n = 59.0515	
	60	2 quarters, 4 nickels + 13 dimes = 60.1035	1q + 11n = 60.2993	

abuse it, they are trying to use it in new ways. What they need from builders and technicians is not a reprimand and threats about void warranties, but sound advice on how to proceed without damaging the instrument. A simple pamphlet of do's and don'ts drawn up by a technician knowledgeable in this area and in consultation with composers working with these techniques ought to be made available to them." — Norman Henry

So there we have it, two clear-cut opinions in opposition to one another. Or are they? Maybe the industry ought to try to encourage the experimentation of composers in the area of new tonal effects, but just cannot sanction it because of the occasional nut who tries to "play" the piano with an axe or wonders how it will sound under water. These are extreme cases, of course, but they actually have occurred. The average prepared piano probably suffers little or no damage as a result of the preparation, but there are plenty of exceptions.

Henry has made a good point in suggesting a pamphlet of advice, but I wonder whether it would do the job. The composer is presumably trying for a unique sound, and anything that is already covered in a pamphlet of do's and don'ts has obviously been tried before, or at least considered. His creative mind could lead him into possible experiments that the writer of the pamphlet hadn't even thought of, and so hadn't posted a suitable warning. If the manufacturer wanted to be really thorough and caution the owner against every possible abuse of the instrument, he might include statements like "Do not saw the piano in half, as this is likely to cause irreparable damage." Then if someone cuts a piano into thirds, it would presumably be covered under the warranty because the manufacturer failed to caution the owner not to do it. That pamphlet could get pretty thick and still not do the job.

When you think about it, warranties are really insurance policies. Warranty service costs money and that is part of the manufacturer's overhead. Overhead is one factor that is included in the price of the product, so each buyer pays a little

more for his new piano than he would pay if there were no warranties. As with any insurance policy, the insured pays more than he is likely to receive in benefits to avoid the possibility of a large loss. If the average piano buyer wanted a warranty that would cover the cost of repairing damage caused by his own experimental alterations to the piano as well as defects in materials and workmanship, he could have it. He would simply have to pay a higher price for the piano because his share of the extra expense would be added on by every manufacturer that wished to remain in business. Since most piano owners don't want or need that kind of coverage, nobody gets it.

On the other hand, if experimentation with unusual tonal effects were to become really widespread, I imagine the industry would adapt to the situation by making pianos with built-in rattles, squeaks, clanks and buzzes — it wouldn't be all that hard to do, when you think about it.

Readers may contribute material to the "Forum" by writing Jack Krefting, Technical Editor; 6034 Hamilton Avenue; Cincinnati OH 45224.

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Calculating Technician Part IV

Last month, we illustrated the calculation of tension in a wound piano string. Since a longhand calculation takes about 6-10 minutes, whereas an electronic calculator can cut this down to a few seconds, perhaps now is a good time to say something about these space-age marvels.

There are many electronic calculators for the calculating technician: (1) the simple four- or six-function variety; (2) basic scientific calculators; (3) key-programmable scientifics; and (4) card-programmable scientifics. Some of these may have a built-in or optional printer.

The 4-function variety can perform the four basic arithmetic functions, which are $+$, $-$, \times , \div . In addition, they may also be able to do percentages and square roots, which makes them 6-function calculators. The 4- and 6-function units are the most common and usually cost from \$5 to \$20, depending on features. Printing versions cost more.

One feature to consider is the type of display, usually LED with bright red numbers or LCD, which has dark numbers on a light-colored background. the LED (Light Emitting Diode) display is brighter but, for some people, uncomfortable to look at and causes enough electrical drain on the batteries that you might be replacing batteries several times a year. I would advise not getting a unit with an LED display unless you can get an AC adapter which allows you occasionally to run the calculator from a standard wall outlet while recharging the batteries. In this case, the batteries should last for several years.

An alternative is to get an LCD (Liquid Crystal Display) version. This display has less contrast, but usually is of larger size and uses so little power that the battery should last more than a year.

Another feature to consider is *memory*, which is a place to store (at the touch of a button) some intermediate result you've calculated

while you do some additional calculating. The 4- and 6-function calculators usually have just one memory, but they may differ in the ease with which the intermediate result is recalled out of that memory or combined with some other result you've calculated in the meantime. At any rate, these calculators are very easy to use and are adequate for an occasional scientific calculation, as long as the formula requires nothing more than the four to six functions that the calculator is capable of performing. The tension formula described last month falls into this category, but this will not always be the case.

The basic scientific calculator does everything the 4- or 6-function unit does, plus such functions as y^x (raise any number y to any power x) \sqrt{x} (square root), x^2 (square), $1/x$ (reciprocal) and \log or $\ln x$ (logarithm of a number). We'll get into why some of these functions are nice to have as this series of articles proceeds. Basic scientific calculators vary in price from \$10 to \$50 and the comments made earlier regarding display, AC adapters and memory apply here as well. The more expensive units have more memory and other convenience features and perhaps an AC-adapter at no extra charge.

For the technician who wishes to do calculations on a regular basis, especially if he or she wishes to do identical calculations for each of several unisons in the piano, then the key-programmable scientific calculator is the minimum route to go. Such a calculator is used in a manner similar to that of the basic scientific unit; however, its unique feature is that while you are performing some calculation for the first time, it "remembers" what sequence of buttons were pushed on the keyboard to arrive at the answer. Then, for the next unison, you have only to "key-in" numerical values for speaking length, wire diameter or whatever is required, and the calcu-

lator will automatically carry out all the calculation steps which you did manually the first time through. Also it will do this faster than you could do it yourself, usually in a second or two.

These units vary in price from \$35 to \$150, reflecting different amounts of "program memory" (i.e., how many different formulas can the calculator remember at one time) and "storage memory" (i.e., how many places are there to store input numbers such as wire lengths, etc., and also intermediate results during the course of the calculations). The price spread may also reflect overall quality and attention to detail, such as the "feel" of the keyboard buttons. Some even "remember" the formulas after you've turned them off (continuous memory), so that you don't even have to go through the initial (first-time-through) manual calculation the next time you use the calculator, assuming you want to continue with the same type of calculation. If not, you can instruct the calculator to "forget" those formulas.

Finally, there is the card-programmable scientific calculator (\$230 and up). These are also key-programmable but, in addition, the formulas (or programs) can be stored on a small magnetic card which the calculator is capable of "reading". If you want to do some particular type of calculation, say tensions, you just insert the appropriate magnetic program card in a special slot, key-in numerical values of wire length, diameter and pitch for a particular unison, and press a "run" button. In a second or two the answer (tension) will be displayed. What could be simpler? You don't even have to understand a thing about arithmetic or formulas if someone else makes up the program for you.

I mention this because I believe there is a growing number of calculating technicians out there eager to share knowledge of this sort. Per-

haps we could occasionally devote a page of The Journal to programs which other technicians have worked out for calculating different quantities of interest on different kinds of key and card program-

mable calculators. This has recently become popular in other professional trade journals. Why not write to your Technical Editor, Jack Krefting, especially you Texas Instrument and Hewlett-Packard calculator

owners, and tell him what you think of the idea.

Next month we'll discuss some calculator brands and models, and then it's back to calculating as usual, so stay tuned to this column. . . .

Dave Roberts

Calculating Technician Part III

Since there is an error in the basic calculation of the example equation, we are reprinting the Part III of the Calculating Technician in its entirety.

Last month we described how to calculate the quantity $(PLd/K)^2$, which was part of a longer expression for the tension T in a wound string, namely

$$T = \left(\frac{PLd}{K}\right)^2 [1 + A \left(\frac{D^2}{d^2} - 1\right)]$$

This month, we want to describe how to calculate the expression in square brackets, namely

$$[1 + A \left(\frac{D^2}{d^2} - 1\right)]$$

We remarked last month that once we figure out the individual quantities $(PLd/K)^2$ and $[1 + A(\frac{D^2}{d^2} - 1)]$,

we simply multiply these two quantities together to get the pounds tension in the string.

There are different ways to approach the calculation of the quantity in square brackets. This may depend on personal preference or on whether you have a calculator to help you or even on what kind of calculator you might have. For now, let's first figure out the quantity in

parentheses, i.e., $(\frac{D^2}{d^2} - 1)$, then

multiply this result by the constant A and finally add 1. In order to calculate the quantity in parentheses, re-

call from last month the rules for "squaring" and also for dividing one number by another number written under it. For example, suppose $D=8$; then D^2 is 8 times 8 which is 64. Likewise, if $d=4$, then d^2 is 4

times 4 which is 16. Therefore $\frac{D^2}{d^2}$

(sometimes written D^2/d^2 or $(D/d)^2$ in order to save space) is just 64 divided by 16 which is 4. Since the parentheses surround both D^2/d^2 and the number 1, this implies that we must first subtract 1 (as indicated) from D^2/d^2 before we can multiply by A . For example, if A is $\frac{1}{2}$,

then $A(\frac{D^2}{d^2} - 1)$ is just $\frac{1}{2}$ times $(4-1)$

or $\frac{1}{2}$ times 3, which is 1.5. Finally, we have to add this result to the number 1 (as indicated) to complete the quantity in square brackets, so $[1+1.5]=2.5$. Now we can multiply this result for the value of the quantity in square brackets by the quantity $(PLd/K)^2$, which in last month's example was calculated to be 144. Therefore, 2.5 times 144 is 360; i.e., the string tension in this example is 360 pounds.

Now that we've done a sample calculation using simple numbers, let's do a more realistic calculation using real (rather than make-believe) numbers. In the real world, the constant K in our tension formula has a value 20833. Also, the constant A in the real world depends on what material is used to wrap the wound string: if the wrap is copper, then A has the value 0.89; if it is iron, then A is 0.79; and if the wrap is aluminum, then A is 0.27. In order to calculate the tension in pounds with

the formula we've given, it is necessary that we express the quantities P , L , d and D in the proper units. In this case, we should express speaking length L in inches and pitch P in cycles-per-second (sometimes abbreviated Hertz or simply Hz); core diameter d and overall diameter D should be expressed in "mils", which is short-hand jargon for "thousandths-of-an-inch". Just for fun, let's calculate the string tension for the lowest F (F_1) in a certain Bechstein concert grand: this copper wound monochord has $L=75$ inches, $P=43.7$ Hz., $d=63$ mils and $D=145$ mils. Therefore, the tension is

$$\begin{aligned} T &= \left(\frac{43.7 \times 75 \times 63}{20,833}\right)^2 [1 + 0.89 \left(\frac{145^2}{63^2} - 1\right)] \\ &= \left(\frac{206,483}{20,833}\right)^2 [1 + 0.89 (5.3 - 1)] \\ &= (9.91)^2 [1 + 0.89 (4.3)] \\ &= 98.2 \times 4.83 \\ &= 474 \text{ pounds} \end{aligned}$$

This is one of the highest string tensions I've come across in a piano scale. The lowest string tension you are likely to find in a modern piano (around 100 pounds) is usually at the bottom end of the treble bridge in small pianos with no wound treble unisons. You can calculate the tension in a plain string by noting that the quantity in the square brackets is just 1 for a plain string because $D=d$ when there is no wrap. Therefore, if the example Bechstein string had no wrap on it, the tension would be just 98.2 times 1 or 98.2 pounds in order to sound at the correct pitch, F_1 .

Next month we'll discuss electronic calculators, so stay tuned to this column. . . .

PIANO ACTIONS — From Cristofori to Erard

(This is the first of a three-part series on the history of the piano.)

INVENTION OF THE PIANO IN ITALY

In 1693, Bartolomeo Cristofori, a 38-year-old harpsichord maker of Padua, was hired to service the harpsichords and other musical instruments of Prince Ferdinand de' Medici in Florence, Italy. An inventory of 1700 discovered recently listing "piano e forte" instruments is evidence that Cristofori had originated his invention prior to this early date.¹

One of our main sources of knowledge on Cristofori's early pianos is an article published in 1711, "*Nuova invenzione d'un gravicembalo col piano e forte*" — (New Invention of a harpsichord with the soft and loud) by Maffei Scipione, in an Italian quarterly magazine, *Giornale d' Letterati*. The 15-page article, including an action diagram, described the three instruments Maffei had seen in his 1709 visit with Prince Ferdinand.²

Cristofori made improvements as he experimented with the new instrument, along with his other work, until his death in 1731. Harding³ lists several of his pupils that may have set up their own shops or moved to work in shops in Germany. Loesser⁴ reports five Florentine pianos delivered to the court of Spain in the 1730's, but piano making in Italy appears to have terminated soon after Cristofori died.

There are today three Cristofori pianos still in existence. We are fortunate to have one in the United States dated 1720, the oldest

known, at the Metropolitan Museum of Art in New York.⁵ A later instrument, dated 1726 and numbered apparently to indicate it was the twentieth built, is in the Neues Grassi Museum in Leipzig. The third instrument is at the Musea Strumenti Musicale in Rome.

EARLY DEVELOPMENT OF THE PIANO IN GERMANY

For almost 30 years after Cristofori's death, Germany was the only country in which there was an interest in piano making and it remained the leader in this field until near the end of the century. There is little documentation on early piano making in Germany and historians do not agree on the events they speculate.

Much debate has centered around Gottfried Silbermann, born in 1683, one of the more colorful figures in piano making history.⁶ As a young man he was frequently in trouble because of his pranks and practical jokes and he had to move several times to avoid the local authorities. He finally settled down with a shop in Freiburg and became a successful builder of organs and other musical instruments. He gained the added reputation of an eccentric bachelor, great entertainer, liberal spender and man of the world.

There are two main questions concerning Silbermann:

(1) *What were his sources of information on piano design?*

Silbermann had had some experience building and repairing several pantaleons — dulcimers with 200 strings which were struck with two double-ended hammers. This instrument had been designed and was played in performances by Panteleon Hebenstreit. Some historians believe that this, coupled with the information made available in the translation of Maffei's article on Cristofori's piano appearing in

1725⁷ in the German publication *Musikalische Kritik*, was the main basis for Silbermann's piano designs. It is not known if he had an actual Cristofori piano to work from. He built his first two pianos about 1730.

Another German whose interest in the new type of instrument paralleled Silbermann's was Gottlieb Schroeter,⁸ music educator. In 1717 he built models of action designs he originated, and in 1721 he submitted them to the Saxon court. Unfortunately, he could not get any financial backing to build an instrument until many years later.

As the years passed, and Cristofori and Silbermann and their instruments gained in fame, Schroeter became bitter. In 1738 and later he sent letters, which were published in German journals, claiming to be the originator of the principles of hammer action design.⁹ He stated the differences in Cristofori's and Silbermann's actions from his were due to their misunderstanding his designs. Schroeter's claim has not been accepted by all historians. Some believe he had little or no influence on Silbermann.^{10,11}

(2) *Did anyone build pianos in Germany before Silbermann?*

Dolge¹² reports a piano to have been built in Germany in 1724, but Loesser differs and states Silbermann's pianos were "the first — as far as we know — to have been built in Germany."

There are no known early Silbermann pianos still in existence. He destroyed the two pianos he showed to J. S. Bach in 1736 after the unfavorable comments they received. Silbermann was the type of person who used an ax to destroy unsatisfactory klaviers he had just finished. He was also known to have smashed church windows to locate an offensive rattle while working on a church organ.

Silbermann's pianos improved as



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he continued building them. J. S. Bach was more favorable to the later Silbermann pianos he played in 1747 at the Potsdam palaces of the King of Prussia, Frederick II. There are still two Silbermann pianos remaining in the Potsdam palaces. The only other remaining instrument, evidently moved from Potsdam, is in a museum in West Germany. These pianos were very similar to the 1726 Cristofori piano now in Leipzig.¹³

Very little is known about Silbermann's contemporaries in piano making but there are some existing German pianos which were built before the Silbermann Potsdam pianos. These include several vertical pianos believed to have been built in 1735-40, and the oldest known square piano, a 1742 instrument built by Johann Söcher. Söcher was one of the group of craftsmen that had established shops in the Bavarian region by the middle of the century.¹⁴ Many of the Bavarian instruments were built with a fundamentally different action design than the Cristofori-type actions of Silbermann and others in the Saxony region.

After Silbermann died in 1753, his business was taken over by his nephew, Johann Daniel Silbermann, but one of his other pupils, C. E. Frederici, became the foremost builder of keyboard instruments in Germany, building grand, square and vertical pianos.¹⁵ The oldest known piano with diagonal stringing is a fine 1745 Frederici vertical piano in a Brussels museum. This piano contains a modified Cristofori action but superficially resembles the vertical harpsichord (clavicytherium) in the Metropolitan Museum of Art.

ZUMPE AND THE SPREAD OF LOW COST PIANOS

Another of Silbermann's pupils who gained fame was John Zumpe, one of the 12 piano craftsmen who migrated to England around 1760. After working for five years in the harpsichord shop of Burkhardt Shudi in London, he started his own business. He was the first builder of pianos in England and was very successful financially with a small

inexpensive square piano. It had many faults but was purchased by people who could not afford better instruments.¹⁶ Within 10 years, piano making was started by men in France and the United States who copied the simple, low cost Zumpe design.

John Behrent built a Zumpe-type piano in Philadelphia in 1775, and the Smithsonian Institution has a 1770 Zumpe piano.

JOHANN ANDREAS STEIN AND THE GERMAN ACTION

By the early 1770's, Johann Andreas Stein had achieved a position of importance in German piano making, highlighted by praise from Mozart. Stein began his career after training in organ building by Johann Andreas Silbermann, another nephew of the famous Gottfried. Stein opened a shop in Augsburg in 1750 and soon began building fine pianos. Stein started with the Bavarian type of action, then he added escapement and checking and other refinements to give a sensitive responsive action, but lacking in power. Stein's action became known as the German or Viennese action as it was adopted by other makers in these localities.

DEVELOPMENT OF THE ENGLISH GRAND ACTION

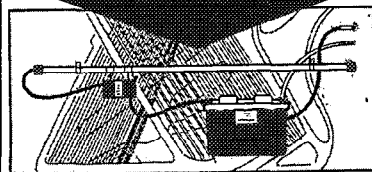
Action design followed a different path in England where modifications of the Cristofori-Silbermann principles were in use.

A Dutchman, Americus Backers, was one of the men in England who worked to improve the Cristofori action. He received assistance from John Broadwood and apprentice Robert Stodart in developing the English Grand Action patented in 1777 and introduced in the pianos of John Broadwood and Sons. The patent was issued in the name of Stodart. This action, adopted by other manufacturers in England, produced a heavier blow but was slower because it required a heavier and deeper touch than the Viennese action.^{17,18}

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principles of Stein's action were preferred in Austria and Germany, the English Grand Action was preferred in England.¹⁹

ORIGIN OF THE MODERN GRAND ACTION

The next major advance in action design was achieved by a brilliant French piano maker, Sebastien Erard, with assistance from his brother Jean Baptiste and nephew Pierre.²⁰

Erard started making square pianos in Paris in 1777. His business prospered and he moved to England in 1789 to establish a branch while his brother continued the Paris business. Sebastien acquired a knowledge of English design and returned to Paris in 1796 and the Erards adopted English designs and started to build grand pianos. Erard pianos soon became the favorite of many concert artists.

Sebastien then undertook the goal of designing an action with the solid accurate blow of the English

action, the light responsive touch of the Viennese action, and rapid repetition. He retained the basic mechanism of the English Grand Action but added additional levers and springs. The first Erard design patented in 1808 was not considered satisfactory and development continued until the acceptable design patented in 1821. Production model Erard pianos with this action were then introduced. The superiority of the Erard design led to its adoption, with some modifications, by other manufacturers of grand pianos in France, England and, finally, in Germany and Austria. Today all modern grand actions are based on the Erard principles.

OTHER DESIGN CHANGES

Several other changes in piano design were necessary before the full benefits of the Erard action could be achieved. In 1826, another French piano maker, Henri Pape, first patented the use of felt for covering hammers,²¹ replacing the use

of leather coverings. He also patented the use of tempered steel wire for stringing pianos.²² These made it necessary to reinforce the structure of the piano to withstand higher string tension and heavier hammer blows. Cast iron plates to strengthen the framework patented by Babcock²³ in 1825 and 1830, Chickering²⁴ in 1843, and Steinway²⁵ in 1859 and 1872, were additional important steps which led to the basic design of the grand piano, still in use today.

1. Helen Rice Hollis, *Smithsonian Institution's Collection of Pianos* (Washington, D.C., Smithsonian Institution Press, 1978), pp. 4-5. This publication is supplied with a set of 33 slides and a cassette with recorded performances on a 1795 piano with a German or Viennese action and a 1794 piano with an English Grand Action.

2. Rosamunde E. M. Harding, *The Piano-Forte* (New York: Da Capo Press, 1973), pp. 5-6. This book contains many pictures, drawings, and technical data and is almost indispensable for anyone making a thorough study of the development of piano design.

3. *Ibid.*, p. 29.

4. Arthur Loesser, *Men, Women and Pianos* (New York: Simon and Schuster, 1954), p. 35.

5. Emanuel Winternitz, *The Cristofori Piano, 1720* (New York: Metropolitan Museum of Art, 1978). Liner notes for recording MMA L1803-Guistini Sonatas performed by Mieczyslaw Horowitz, the oldest music written for piano, published in 1732.

6. Loesser, pp. 36-41.

7. Harding, p. 29.

8. *Ibid.*, pp. 18-21.

9. William Leslie Sumner, *The Pianoforte* (New York: St. Martins Press, 1966), p. 41.

10. Harding, pp. 21-22.

11. Loesser, pp. 37-39.

12. Alfred Dolge, *Pianos and Their Makers* (New York: Dover Books, 1972 — Reprint of 1910 edition), p. 45.

13. Harding, p. 37.

14. David S. Grover, *The Piano* (New York: Charles Scribner's Sons, 1978), p. 76.

15. Loesser, pp. 42-45.

16. Dolge, pp. 47-48, 172.

17. Grover, pp. 84-87.

18. Harding, pp. 57-58.

19. Hollis, cassette recording.

20. Sumner, pp. 54-56.

21. Harding, p. 179.

22. *Ibid.*, p. 183.

23. *Ibid.*, p. 204.

24. *Ibid.*, p. 206.

25. Grover, p. 142.

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HAMMER FILING

Good hammer filing is a skill that is developed with lots of practice and experience. A steady hand, a good eye and the ability to concentrate on the job until it is done are the basic requirements one needs. However, there are some general guidelines to keep in mind, otherwise the job could not turn out as well as you would like.

The main purposes of filing used hammers are to restore the hammers' shape and to recreate new striking surfaces. Worn hammers show grooves which are the result of the wearing away of felt. A flat surface on top of the hammer is created and a somewhat harsh, strident tone is found to result. It is difficult to voice this harshness away with accepted needling techniques. A flat grooved surface also means that the contact time between the hammer and string, when the hammer strikes the string, is increased, therefore dampening many of the higher partials in the string which are desirable for good piano tone.

Before we file to restore the original shape of the hammers, remember that the shape varies from bass hammer to middle range hammer to treble hammer. The bass hammer is more rounded at the crown and a bigger surface can strike the string. In the middle range, the crown starts to take a more pointed shape. In the treble, the surface of the hammer establishing the striking point gets progressively more critical and the crown becomes much more pointed. An interesting and hilarious illustration of this is to put a bass hammer someplace in the treble and see how it sounds. Then put a treble hammer in the bass section and see what a twang you get! This shows the role hammer shape and mass play in producing overtones.

Worn hammers that are "flat" on top must be filed more on the shoul-

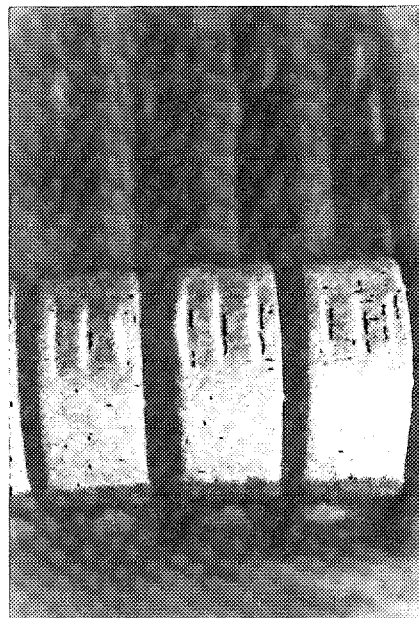
ders so that the hammer shape is restored. Keep in mind that the more hammers are filed, the smaller they get in size and length. The length of the hammer from the boring point to the striking point on the crown decreases and the weight of the hammer also decreases slightly. Because of this change in hammer length, a regulation should always be done afterwards. Filing used hammers should be consistent from hammer to hammer so that the hammers are in a nice straight line.

A new set of hammers — if not already filed or sanded by the manufacturer — needs to be filed to eliminate the "cupping" that occurs when tension is released by the cutting of the hammers in the manufacturing process. The filing of new hammers is simply filing an even layer of felt off the entire surface of the hammer. In new hammer filing, we are neither reshaping them nor creating a newly shaped striking surface. Proper shape and correct striking surface should already be present in new hammers. Even if a new set of hammers is misshaped by being slightly larger on one side or the other as viewed from the side, we can try to correct that by filing. It is important to keep the striking point of the hammer directly above the point of the wooden molding.

One more point we would like to mention is the kind of sandpaper file we use. We glue 60 grit sandpaper on both sides of a piece of wood 1" x 6". This makes a good file that does the job well. Almost any kind of paddle-sandpaper file that works for you is acceptable. Other paddles with finer grits of paper can be used to smooth down the felt and enhance the appearance: 100, 220 and 400 grits can be used.

The following series of photographs presents one out of many acceptable methods of filing hammers. Some people use this method and then add variations to it such as "shoe shining" the hammers with a

strip of finer sandpaper to give a clean smooth surface. Here we will stick to the basic procedure and point out some pitfalls to watch for.



(1) Groove in hammers before filing-flat striking surface.

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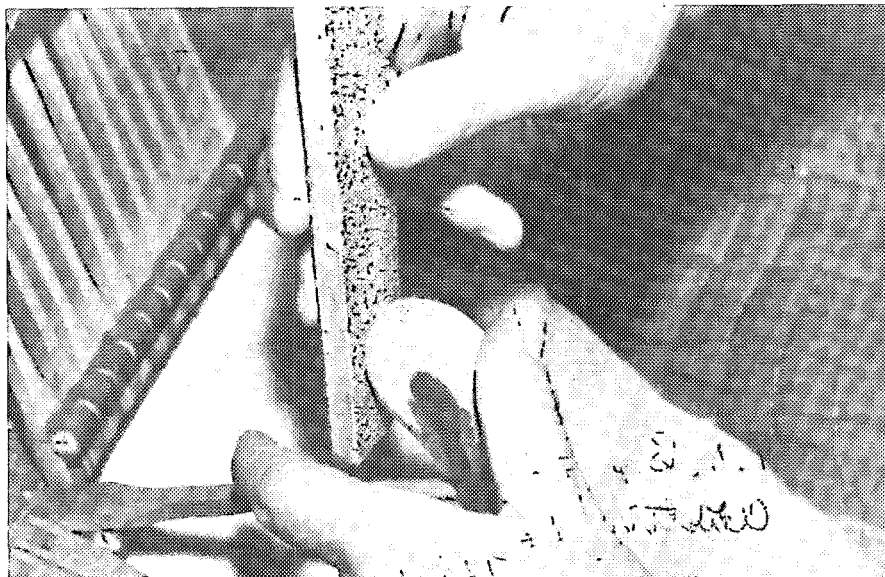
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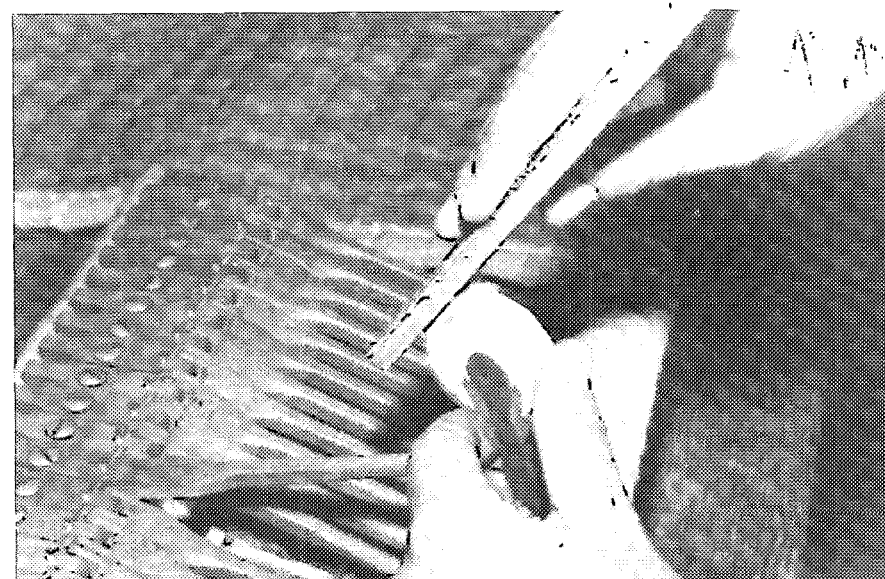
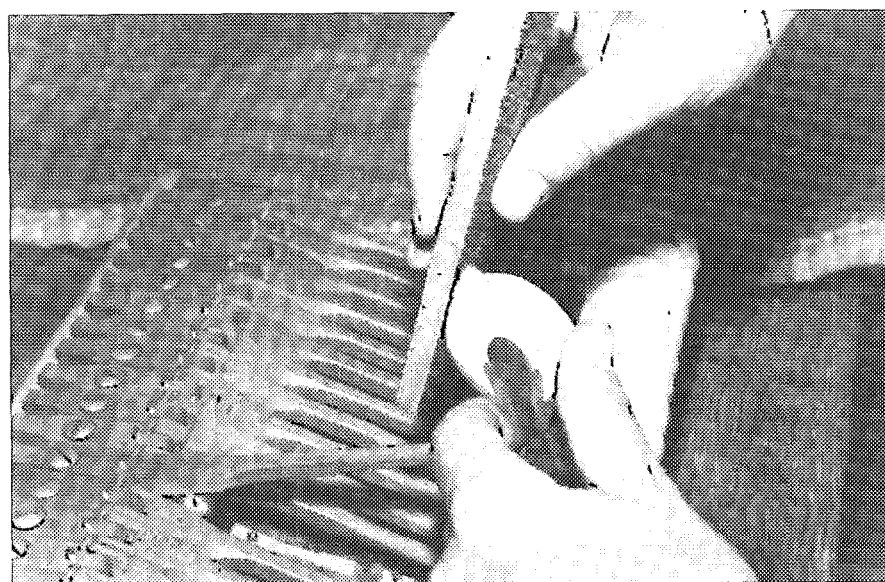
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(2) Filing shoulder of hammer. Note right and left hand position supporting file and hammer.



(3-4) Change of file positions so tuft of felt is "pulled" over shoulder to crown.



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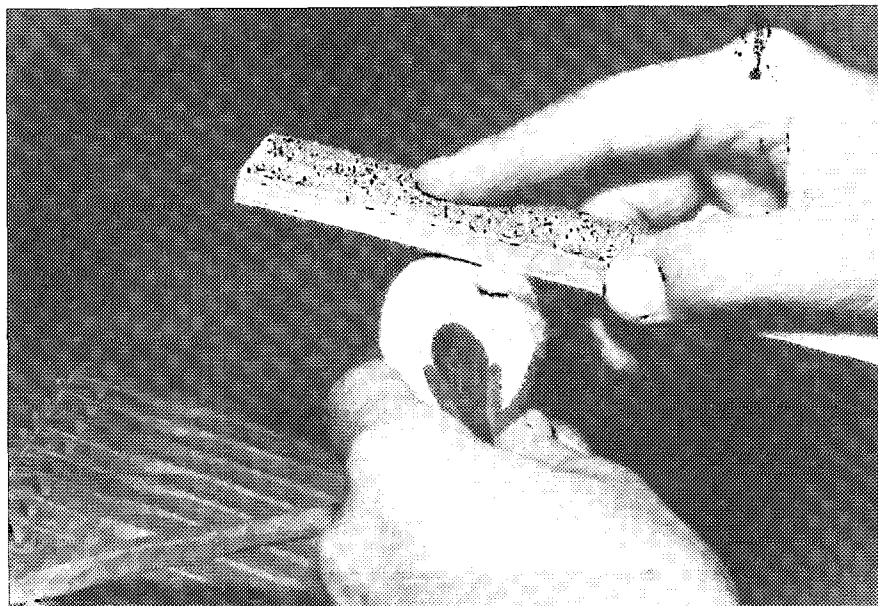
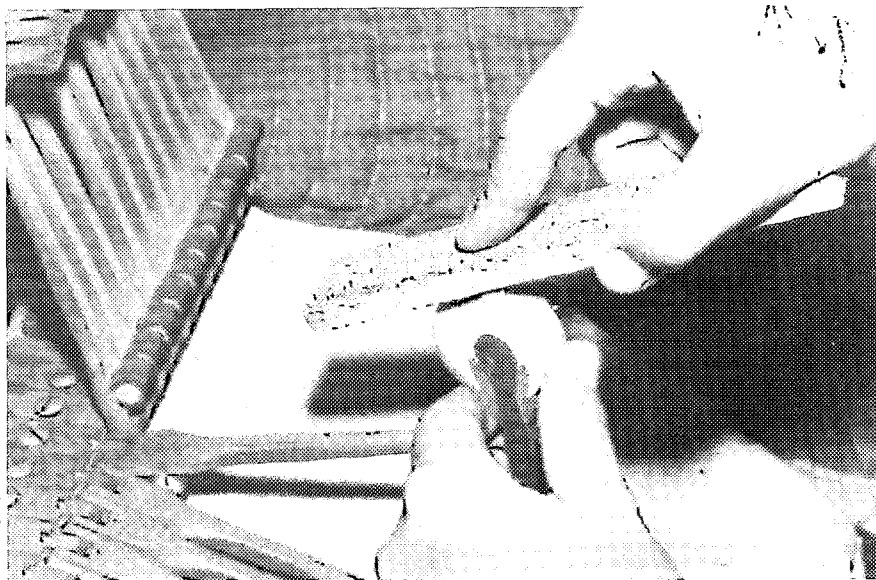
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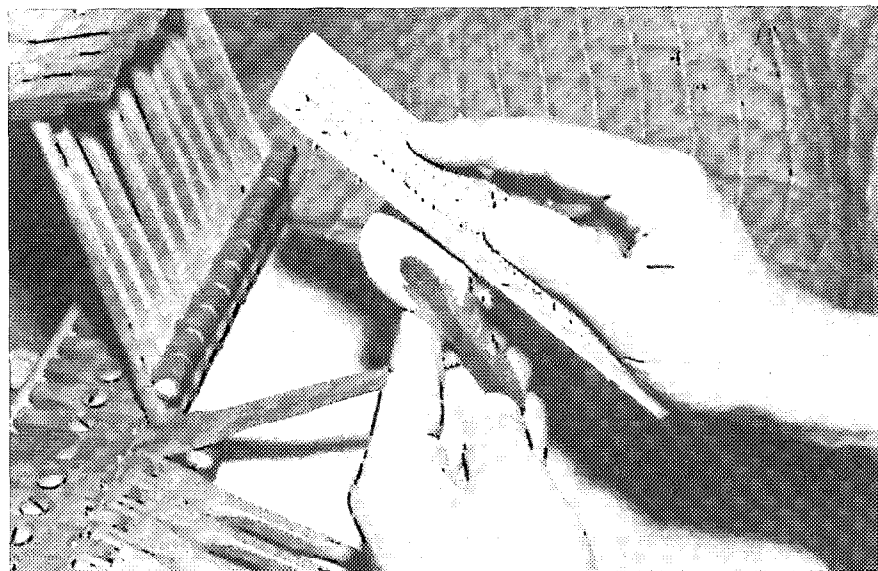
(5) Tuft of felt just before it is pulled across crown.

(6) Change of hand position and file position. Felt is filed across and over crown.



(7) New striking surface. Felt is "pulled" or filed across crown to other side of hammer.

(8-9) Filing felt on other side of hammer. Note support of left hand.



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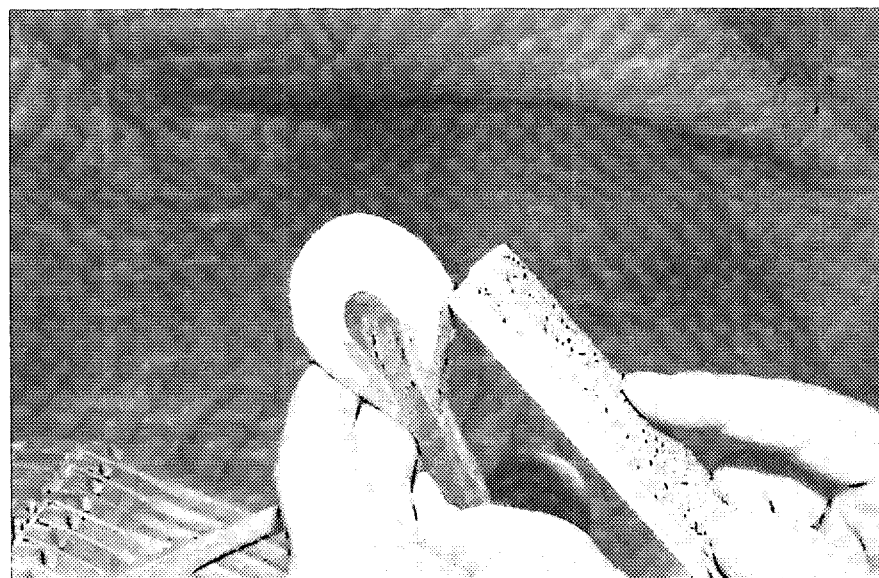
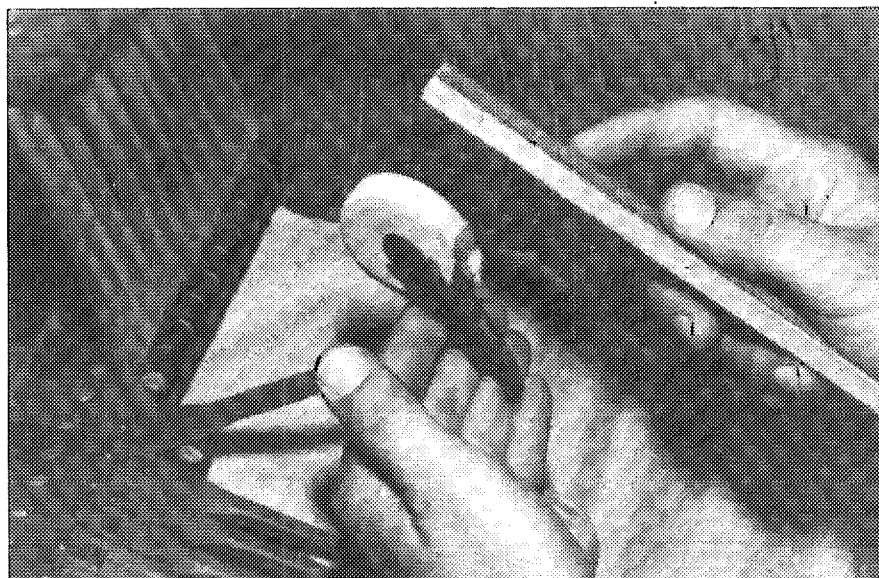
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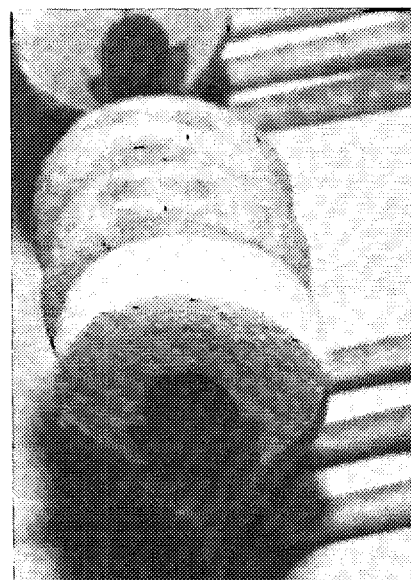
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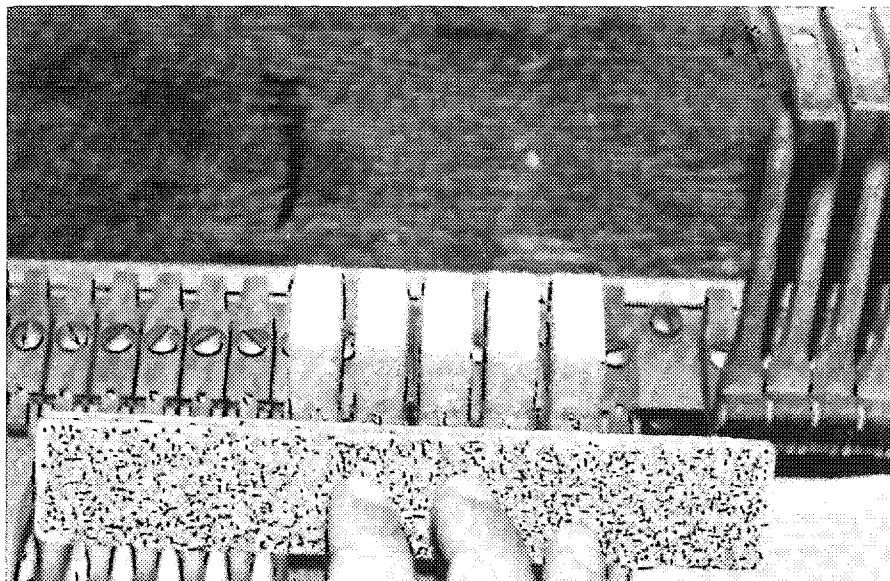
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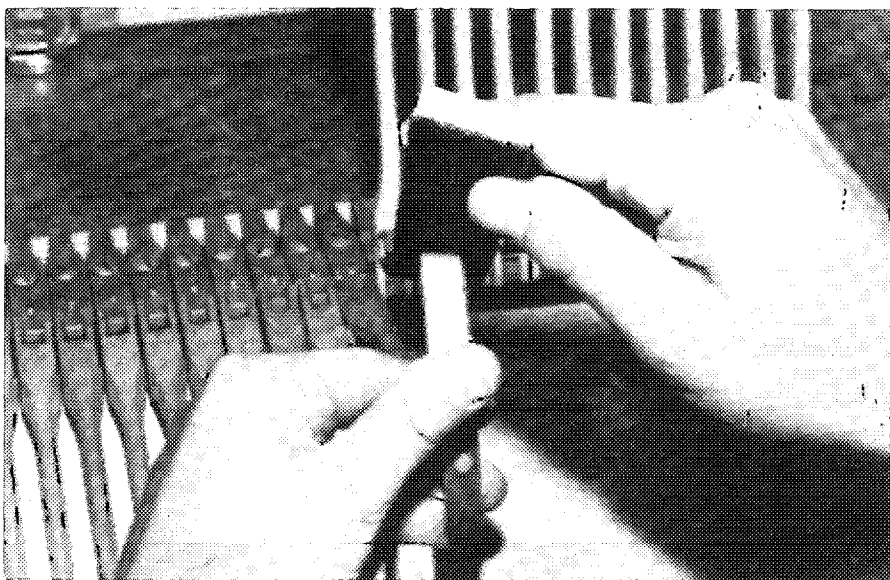
(10-11) Analyze the situation. Blend in the newly filed surface with the existing layer. Keep in mind that the hammer should be balanced or symmetrical.



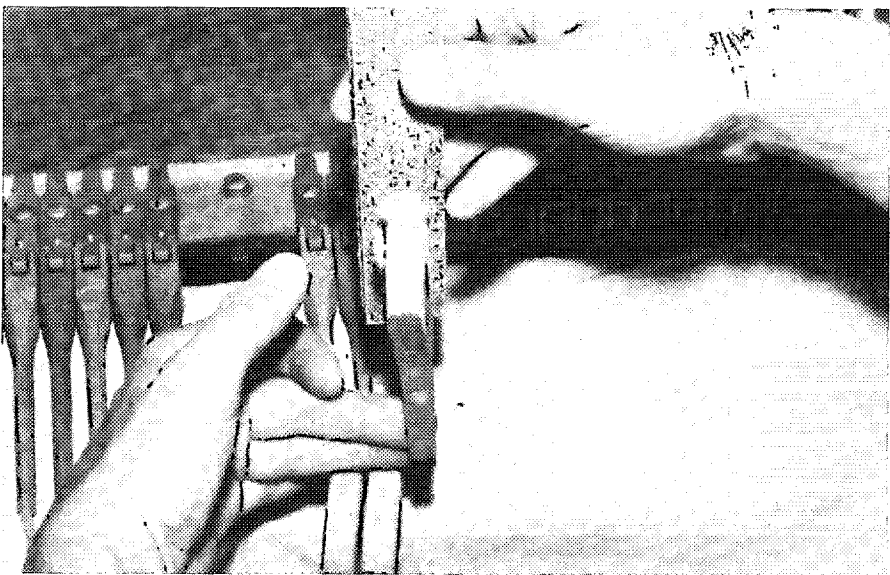
(12) Close-up of filed hammer in comparison to unfiled hammer. Note that the shape is maintained and a new rounded striking surface is created.



- (13) Check your work. The tops of the hammers as shown in this photo should be parallel with the hammer flange rail.



- (14) **A pitfall!** File is slanted and not flat on surface of hammer. Top of hammer will not be parallel with hammer flange rail and may not strike all three strings.



- (15) **Another pitfall!** No support of hammer with left thumb. Hammers will break off shanks very easily!

CHIPS OFF THE OLD BLOCH

A letter I received sometime in July from William Noel Brooks, an affiliate member of the Guild in New Zealand, has started off a subject again. He writes:

"Among my collection of grands I have a 185cm Bechstein Model A #63822 in original condition. The roadmakers have not had a go at it, the pinblock is in sound condition, the soundboard has no cracks or compression ridges, but the tone is sharp and brittle due to loss of crown. Bechsteins usually have a round tone due to high crown. I had thought of banging in some new ribs, then I remembered you wrote about adding crown by heat and wedges. I have never 'cooked' a soundboard, and I would be grateful to you for your comments.

"Last year Bechstein sent me the enclosed bearing and specifications for the grand. Do you think it is possible to approximate their measurements with your method?

"How much heat and for how long?

"Wedges for screw cramps? The gap between braces and rib is 10mm.

"What is your philosophy behind this 'cooking'? Do the tapped-in wedges stop the soundboard dropping when the heat is applied? The soundboard has to shrink with the head; does the soundboard recrown up when the heat is cut off and the normal atmosphere gets at it?"

According to Bechstein, the Model A Grand Piano left their factory on the 18th of July, 1903, and was delivered to a piano dealer in Buenos Aires. Now let's look at some of the specs sent from Bechstein:

First treble	2.8mm
Second treble	2.8mm
Middle long treble bridge	5.5mm
End long treble bridge	3.5mm
Bass-side next to treble	4.0mm
Bass-side next to end	3.0mm

Anyone who passes himself off as an expert on putting back crown on an old soundboard immediately entitles himself to suffer as much abuse as a "men's room wall." I lay claim to no such title.

When a new soundboard is put in the belly room at the factory, they have a different bearing requirement than we do, unless you are also putting in a new soundboard. The soundboard that we are repairing has already had downbearing on it and has crushed the grains of the wood some. That is why, in articles earlier, we have talked about stretching a string tight from the

agraffe (or pressure bar) across the bridge (but not staggered) and touching a dime, nickel or quarter lying on the plate at the hitch pin, at the same time it touches the bridge.

This method of reading downbearing has been used for some time. That is reading how high we are from the plate at the hitch pin when the string touches the coin.

In the next issue I hope we can finish answering the questions, and bring up some old answers to new questions. I hope the readers really enjoy reading this kind of piano stuff — I sure do!

Old Bechsteins: Bechstein Flügel Model A (1900-1934)

Bass			Treble	
Number of string	Steel	Copper	Plain Steel	Unisons
1	23	50-180	14	2
2	23	50-170	14½	2
3	23	50-160	15	6
4	23	50-150	15½	6
5	22	40-140	16	9
6	22	40-140	16½	4
7	22	35-130	17	11
8	22	35-120	17½	6
9	21	35-110	18	4
10	21	35-100	19	6
11	21	35-95	20	2
12	21	35-90	21	2
13	21	35-90		
14	20	90		
15	20	90		
16	20	85		
17	19	80		
18	19	75		
19	18½	70		
20	18½	65		
21	18	60		
22	17½	55		
23	17	50		
24	16½	45		
25	16	45		

Auxiliary Exchange

It is with profound sadness that this writer must tell you what many of you already know, that **Paul Cheatham**, husband of our beloved Dessie, was killed in an automobile accident on October third.

Paul was keenly interested in the Auxiliary, always ready to help in any way he could. He was as keenly interested in the Guild, having served as Central West Regional Vice President from 1971 to 1975. He was a great believer in the value of conventions and seminars, saying often, "If I learn just one new thing, it has been a successful meeting for me." His passing is a great loss to all of us.

Dessie will be some time recovering from her physical injuries and we know she would appreciate hearing from her many friends. Her address is 724 East First, McPherson, Kansas 67460. Let's remember her in our thoughts and meditations.

The Auxiliary has also lost another devoted member in the person of **Evelyn Fuller**, of the Twin Cities Chapter. Though her illness kept her out of the mainstream of recent Auxiliary happenings, she never lost interest. We shall miss Evelyn.

Here's a message from President Jewell: "With all the warmth of love, the joy of giving, the anticipation of receiving, and the blessing this season of seasons brings to all, I send you my best wishes.

"I am, of course, writing this in the middle of September and the past weekend I attended the planning meeting for the 23rd Annual Convention of the Guild. It promises to be another great to add to all our past greats.

"Philadelphia is like a butterfly going through many changes before emerging into the beautiful insect it is. The area has had many changes from the time it was home to the Delaware Indians. The first white men to settle there were a group of

Swedish people who built a small church which is still standing. Today the city is undergoing another metamorphosis, reconstructing a modern city but maintaining and restoring the vast history this city has witnessed.

"The hotel Benjamin Franklin is an old institution emitting dignity, culture and history, located in 'America's Most Historical Square Mile'. The Auxiliary hospitality room during the convention will be the Jefferson Room, situated on the second floor. It is a large room which can be divided for classes and still have other functions. It is easily accessible, close to some classrooms, yet away from the main flow of the convention. The hotel is following the request of President Carter in maintaining the air conditioning at 78 degrees. Therefore we are encouraging you to bring cool comfortable clothing and good walking shoes. The weather in Philadelphia can be very hot, with occasional rain showers.

"During the planning tour we were given the choice of three rooms. Guild President Russell saved the one we chose until last, telling us all along the best was yet to come. When we saw the Jefferson Room we agree with him, and even accused him of coaching from Ginny. He replied, 'Not so, I always look out for the Auxiliary.' I'm sure you will agree that he made an excellent choice.

"We are going to try something new this year by offering three walking tours per day. The first day the tours will be offered during the afternoon and then early morning for the next two days. This will give everyone a chance to take all three tours at your own leisure. Tour #1 will be of the mint, Tour #2 will be of Independence Square, and Tour #3 will be of the Gallery. There is shopping as well as many other points of interest close by, and most are free. There is excellent city bus service to

places outside walking distance.

"President Russell and the Philadelphia Chapter are planning something really spectacular to coincide with the Flea Market. Have you started to work on your items for sale?

"Present at the planning meeting were **Bert Sierota, Shirley Felton, Agnes Huether** and **Celia Bittinger**. We had very little time to discuss plans, but we accomplished quite a lot.

"As this year passes into a new one, let us all resolve to work and plan to attend another good time together in July 1980, when you will be *Welcome to Where It All Began*. Sincerely, Jewell."

Both **Treasurer Dessie Cheatham** and **First Vice President-Membership Chairman Julie Berry** have sent a list of new members of the Auxiliary received at and since the convention. We welcome these new members:

Mary Beauchamp (Gerald)
306 West 5th Street
Wells MI 49894
Member at Large

Joanne Beckman (Art)
1222 Cedar Lane
Dyer IN 46311
Chicago Auxiliary

Judy Blanton (Tom)
R.R. 2 Box 471-B
Pottsboro TX 75076
Dallas-Ft. Worth Auxiliary

Ruth Corkins (Maurice)
908 West Clark
Urbana IL 61801
Member at Large

Margaret Geers (Cliff)
6667 Werk Road
Cincinnati Ohio 45211
Cincinnati Auxiliary

Dorothy Gill (Mike)
5006 Woodlawn Avenue
Seattle WA 98103
Seattle Auxiliary

Betty Helbing (Thomas)
R.R. 2
Puerz MN 56364
Twin Cities Auxiliary

Jean Huffman (Keith)
304 Tippet Avenue
Morehead KY 40351
Cincinnati Auxiliary

Patricia Johnson (James)
313 Jefferson
Carneys Point NJ 08069
Member at Large

Doris Kelley (Annen F.)
59 Cnahhel Drive
Agawam MA 10110
Member at Large

Valerie Kerber (Walter)
615 Lafayette Court
Sarasota FL 33577
Member at Large

Ella Martin
2112 Clark
Ames IA 50010
Member at Large

Shirley Martin (Gene)
20 Scott Drive
Hampton VA 23661
Member at Large

Betty Maxwell (Robert)
1224 South Michigan
Davenport IA 52802
Member at Large

Marge Meyerman (Henry)
108 East Sutton Place
Wilmington PA 19810
Philadelphia Auxiliary

Mary Agnes Shoenberger (Arthur)
3100 Belfoot Avenue
New Orleans LA 70119
New Orleans Auxiliary

Joann Smaha (Jack)
602 West 29th Street
Kearney NE 68847
Member at Large

Alpha Tolbert (J. B.)
2167 Washington Avenue
Redding CA 96001
Member at Large

Patricia West (Richard)
109 North 32nd
Lincoln NE 68503
Member at Large

We hope to see ALL of you next summer in July! Make it a fun time and join the Auxiliary in our activities of sharing and aiding one another and the Guild!

Notice that the list contains two names of Nebraska ladies. Membership Chairman Julie Berry is launching a campaign to organize a chapter in Nebraska. Since the beginning of last summer she has made this much headway. Let's all help her by encouraging these fine Nebraska helpers to join and organize!

Rose Zena Siewert of the Phoenix Chapter writes of being asked by **Corresponding Secretary Anges Huether** to be the correspondent in the Western Region. She requests assistance from Western Region members by the following note:

"Hear ye-Hear ye! Chapter presidents of the Western Region.

As your correspondent for good cheer, please inform me of condolences, anniversaries, congratulations or special happenings in your chapter which would merit sending cards. This would be helpful to me in fulfilling my service."

Faithfully,

*Rose Zena Siewert
15613 105th Drive
Sun City AZ 85351*

Second Vice President Kathryn Snyder has a greeting for us this month.

"'Once in a while you find a friend who'll be a friend forever.' That quote was on a beautiful card I received several days after coming home from the great convention in Minneapolis. We've made many friends in the Guild and Auxiliary. We always look forward to seeing them at the seminars and conventions. Our next seminar here is at the Pennsylvania State Convention

in Altoona next April. We hope to see many of you there, and in the City of Brotherly Love in July.

"Our captain of the ship 'Welcome' is making great plans for next year's convention. Jewell is not only going to re-educate us in the history of our country, but she's also thinking of our health. Being a nurse, she's going to have us walk a lot!

"One of the duties of second vice president is keeper of the Auxiliary stationery. I am also keeper of the 'Easy Does It' Idea book. How about giving one to a friend or slipping one in with your gift to a new bride? In case you weren't at the convention and didn't get to see the book, it's a book of helpful hints. It sells for four dollars. Please include postage. For either stationery or the Idea book, write to me at 79 Furnace Street, Robesonia, PA 19551.

"Here's a recipe to guarantee a happy Holiday Season! Mix together one part joy, one part peace, two parts love. Mix with lots of cheer and serve warm. Happy holidays to all, Kathryn."

This month we will share with you some of the activity reports of the year. Between Bert and me we're sorta late with this. It seems she had trouble with the glue on the government postage stamp once and it was returned to her. Then she tried again and the same thing happened, only this time they left a postage due notice in my mailbox. Being the procrastinating type, I waited too long to go up to our local boondocks to see what it was, and she got it back again! However, she is the persistent type, so I finally received it (Heard the other day about a T-shirt which says "Tomorrow I'm going to stop procrastinating." Think I'll get one — next week, maybe.).

In looking over the reports, I have decided to share some of the highlights of what different chapters have been doing. Usually, you will find the most active chapters where there has been planning for a conference or seminar. This past year these included Cleveland, Indianapolis, Daytona Beach, Twin Cities, Los Angeles, Philadelphia, South Central Pennsylvania and one which did not take credit for convention planning (but we know they

were a tremendous help last July), the Minnesota-North Iowa Chapter. Most of the reports are factual only and do not begin to list the tremendous amount of work and planning which has gone into these activities. To all of these chapters, a great big THANK YOU.

Minnesota-North Iowa's report did say, "Have great fellowship! At the Christmas meeting we donate a \$10 gift to a charity of Auxiliary members' choice."

Some chapters, such as the Hutchinson, Kansas group, meet once a year for a family picnic and meeting. We know, however, this doesn't mean they are not in touch with one another the rest of the year.

Reading-Lancaster reported under "projects" that they made Mr. & Mrs. Snowmen for Christmas. Sounds like fun.

A couple of chapters, like Wichita, Kansas, meet regularly for social periods.

One or two secretaries dutifully sent in reports which stated "no interest-no meetings."

One chapter, the Richmond, Virginia group, has a special project of maintaining a historical scrapbook of the Richmond Chapter Guild and Auxiliary, from its organization up to date. Mabel Hiatt, their secretary, continues under REMARKS: "We continue to be very good friends — sharing joys and sorrows with each other. We gladly respond to requests from the Guild in any way that we can. They rely on us for organization of picnics, special parties, etc. We made a donation of \$35.00 to them this month.

"We do not have any money-making projects. Our local dues are \$5 a year and we find that we usually have enough money in our treasury to help the Guild or take care of sick folks."

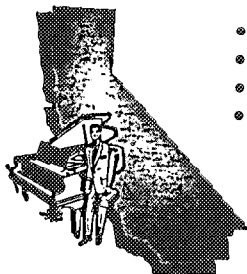
Maybe some of you who are wondering how to arouse interest could find some help in the foregoing comments.

At this Holiday Season, may you continue to Live, Laugh and Love, and to enjoy the health and happiness which comes through hard work and commitment to the basic goals of life.

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Production of Röslau Steel Wire for Music Strings

Edited by Don Morton.

About 40 members of the Guild from the United States, Canada and New Zealand visited numerous European countries in June 1979 to become acquainted with the manufacture of pianos in Europe. The trip started in England at the Knight piano factory, then to visit Bluethner, Petrof, Bösendorfer and Wiener Neustadt. They visited trade schools in Switzerland and West Germany, and Röslau Wire Works and the Euterpe piano factory in Stuttgart. This is the first report from their trip.

Since its foundation in 1882, Röslau Wire Works has manufactured steel string wire by the cold drawing process.

Wire drawing means the reduction of the diameter by the application of stress in tension. Therefore, the wire is "pulled" at normal temperature (that is why we say "cold") through a die with a round bore hole, in order to reduce the cross section area.

The quality needed for an excellent final steel string wire is the result of selection of the best raw materials without surface defects and with the right chemical analysis. Quality is further the result of an exact heat treatment of the wire rod or pre-drawn wire and, last but not least, the result of a special drawing process.

The manner of this process is decisive for the physical properties of the final string wire such as tensile strength, elasticity, elongation, uniformity and so on.

The raw material for our cold drawing process is always hot rolled wire, produced in rolling mills. Normally hot rolling can be done only down to a minimum diameter of about .220 inches corresponding 5.5mm.

A carbon content of just about 0.80 to 0.85 percent is needed to produce a good string. For instance, the structure of a wire rod with 0.80 percent carbon is normally not good enough for cold drawing. Therefore,

the rod must be prepared for drawing by heat treatment.

This heat treatment of the wire rod or pre-drawn wire is called "patenting". The term "patenting" includes not only the heat treatment but also the carefully controlled cooling process of temperatures ranging above 900° to 1100° C (1652° to 2012° F), down to 500° to 550° C. To maintain an exact control over the temperature reduction, the wire is passed through a molten lead bath. The objective of this process is to develop a desired structure known as "sorbit" which is required for subsequent "drawing" to high tensiles for steel wire. Hot rolling and also lead patenting produce scale on the wire surface.

This scale, if allowed to remain on the wire surface, would destroy each drawing die. To remove this scale the wire is "pickled" in an acid solution. Röslau prefers hydrochloric acid for this process. This chemical treatment must be carefully controlled, otherwise the wire becomes "acid brittle" and the surface becomes rough. After the pickling, the wire is given a chemical carrier of zinc phosphate, well known under the name "Bonder". The carrier functions as a lubricating film in the subsequent drawing process.

Inside each drawing machine is another lubricating substance. For wet drawing, a special soap solution or a special oil, and for dry drawing, a special soap powder. It is very important to hold a continuous lubricating film on the wire, otherwise we would get an unround wire with spots and variations in tensile strength or in other physical properties. The exactly prepared wire is drawn either on single drawing blocks or on multiple drawing machines.

In each drawing die the wire becomes smaller and longer and, therefore, the speed of the different drawing drums of a multiple machine must be harmonized to the different reductions of the cross sec-

tion between the dies. The total reduction of the cross section (the diameter) by cold drawing, dependent on the initial hardness of the wire used, may not exceed a fixed percentage without fracture of the wire.

After a certain reduction of the cross section, for example from .220 inches to .085, the structure of the wire has been strengthened so that a new heat treatment is necessary before further reduction by "cold" drawing. The same operations explained above are repeated. After a new heat treatment (patenting) of the wire, which is now called pre-drawn wire, it is pickled, phosphated and then drawn again to thinner diameters. These operations must be repeated several times to obtain the smallest string wire. Before the finished product is tested for final acceptance it will go through a final straightening and surface refinement such as mechanical polishing or hot tinning.

After the manufacturing process is complete the string wire is ready for packaging. Most string wire is packaged in spoolless coils of 1 lb. or 5 lb. coils.

Wire production as a "production in miles" is a refining process with a double meaning. The *longer* means *finer*. That is, the more processing the better its physical properties. The trade of refining corresponds with the grade of reduction of cross sectional area. A guitar string of size .011 inches is about 400 times longer than the basic wire rod from which it has been drawn.

The following features characterize the quality standard of a high grade music string wire.

1. Carefully selected wire rod of highest chemical purity with regard to a lowest content of phosphor, sulphur, copper and nitrogen. The material must be melted in a special melting process with ores. This is generally possible only in Sweden.

2. First-class rolling on the billet in order to avoid all defects in the wire rod surface.

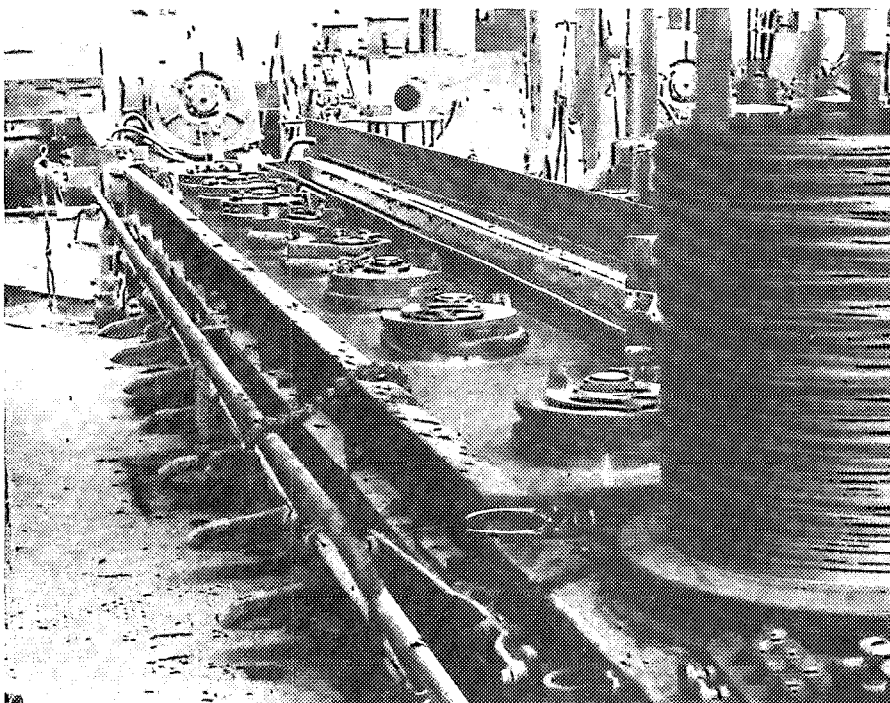
3. Best uniformity by supervision and continuous testing during the whole manufacturing while patenting, pickling, drawing, polishing or plating, or during the production of the different drawing dies. Another important item is an effective cooling system for the dies and drawing drums.

4. Determination of the most favorable reductions of the cross sectional area per die and per total from one heat treatment to the other, depending on melt analysis and other points.

5. Careful final control, admission for high quality "Röslau" String Wire only according to our special mill instructions.



Röslau executives Fred Odenheimer (who is chairman of the Guild's International Relations Committee), Wener Dietel, President Herman Scherzer, Manager Hans-Joachim Krüger, and Guild Immediate Past President Don Morton.



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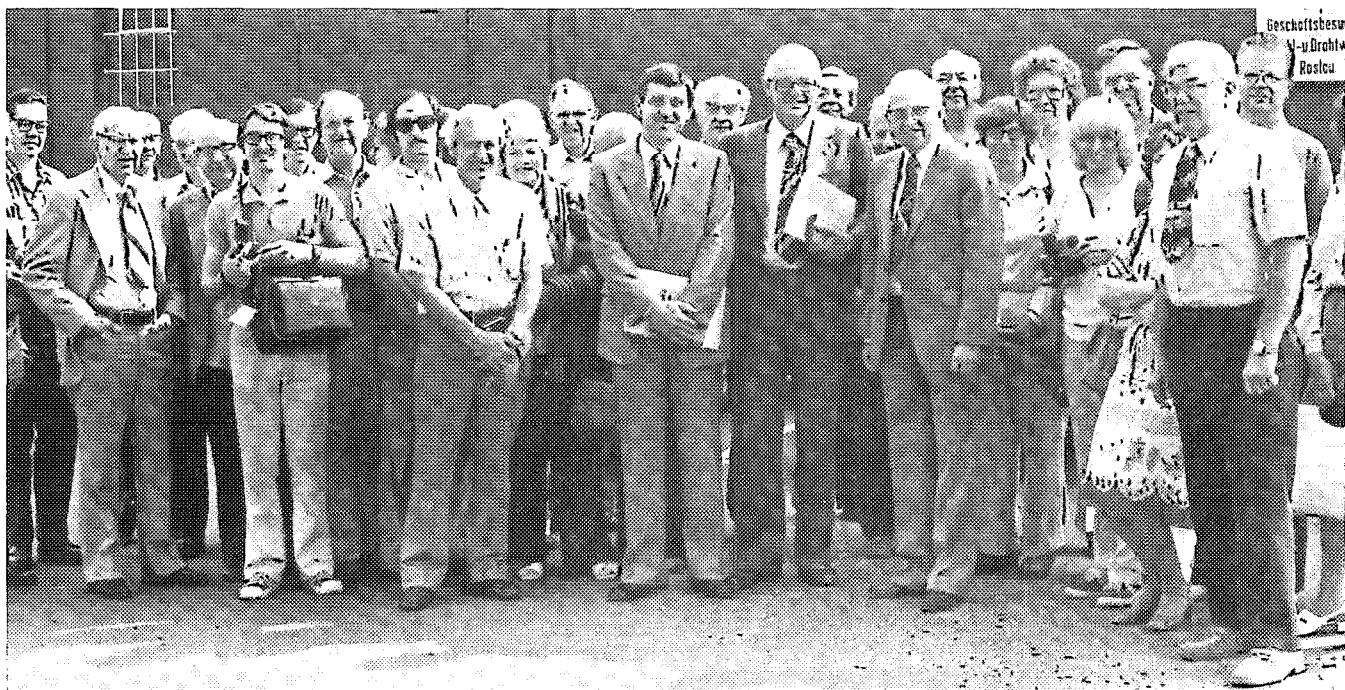


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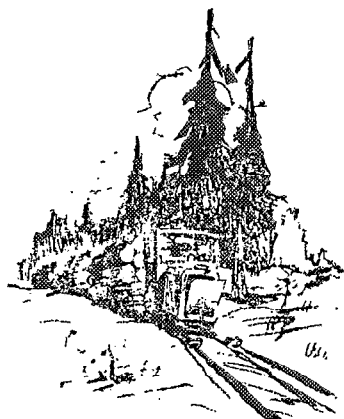
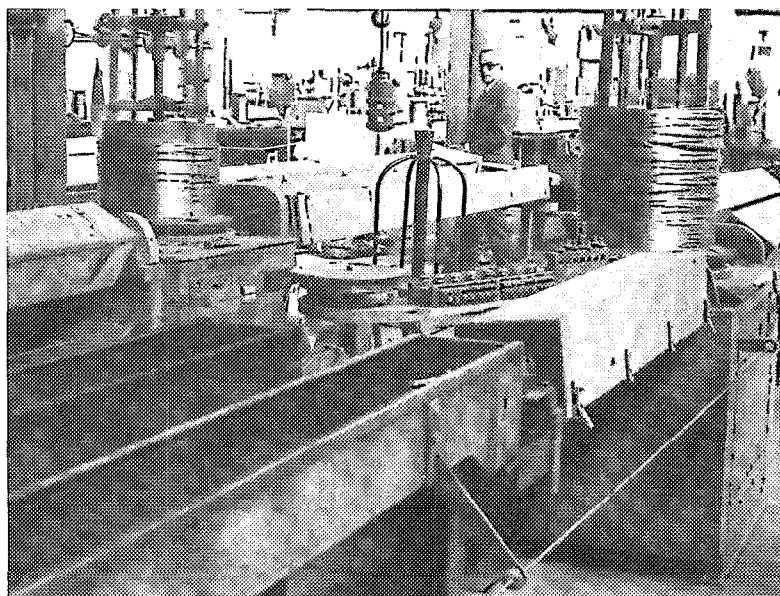
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IN THE FIELD....

Several years ago a customer of mine fell in love with an old ebony Model "O" Steinway grand. Its original owner had it refinished in a "decorator" finish complete with gold stripes around the fall board and music desk, and my customer bought it right out of the decorator's show room. She had it moved to her home where she placed in between her Baldwin "F" in the living room and her Baldwin "G" in the solarium.

As older pianos go, it wasn't a bad instrument. Its tuning was stable, the tone was pleasant, in spite of slightly worn hammers, and the action was well regulated. It did have one annoying characteristic, however. The key release was terribly noisy. When the keys returned to the rest position after being struck, they did so with a "klop" that could be heard across the room. It was very distracting. She mentioned this problem to her German piano teacher one day when he was at her home and he promptly diagnosed the difficulty as being "im die fultz" (in the felts). He assured her that the correction was simple and he would undertake it at no cost to her. It was an offer she couldn't refuse. He returned a few days later, removed the action and stuffed narrow strips of flannel under the keys at the backrail. It cured the problem. The keys didn't "klop" anymore. But he also raised the hammers halfway to the strings, depressed the keys and made the piano unplayable. She called me for help.

I have relayed this story as an extreme example of misdiagnosis and an even more blatant case of incompetent repair. The problem is one that does occur frequently and is often ignored, or responsibility for the noise is placed in some other part of the action.

Correct diagnosis is important. Most often the noise is thought to originate from the impact of the back of the key hitting the backrail felt. Another misconception is that it

comes from the impact of the hammer rest felts characteristic of Steinway pianos. Compacted and dimpled whippen heel felt that comes in contact with the capstan is the culprit. The easiest way to recreate this offensive "klop" is to raise the hammer shank up out of the way and hold the key at rest position with one hand. With the other hand, raise the whippen off the capstan and let it drop.

Repairs can vary, depending upon the circumstances. Once, just before a concert, I removed the stack, turned it over and slid the blade of a pocket knife between the felt and the whippen heel and gently pried the felt cloth back to a more rounded shape. It lasted for most of the concert and made the artist more comfortable in the beginning when she was suffering from a case of nerves anyway.

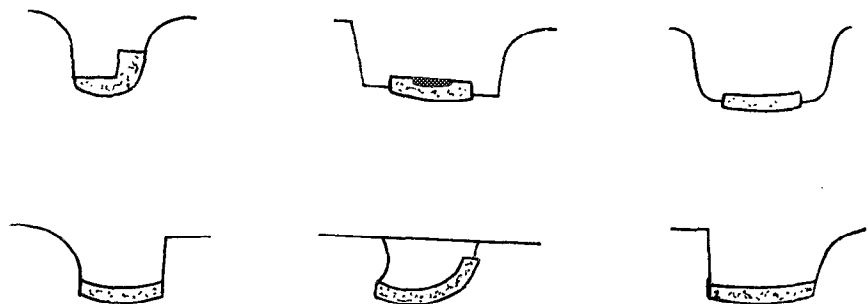
A little more substantial correction can be made by threading a quarter-inch strip of bushing cloth under the main piece of action cloth that is the heel felt. This gives a little bit of new cushion to the whippen but does little to restore any resiliency to the dimpled part of the felt.

The best way to correct the problem is to replace the entire heel felt (and underfelt if there is one). Remove the stack and turn it upside down on a bench or table. Work very carefully and remove the old heel felt and underfelt. Be sure to get all

the old felt and glue cleaned out of the grooves. Select the proper thickness of underfelt if the whippens are so equipped. It is not necessary to cut individual pieces of felt. The simplest way is to cut strips as long as each section of whippens in the action, put a dot of glue in the center of each whippen mortice, and lay the strip down in one piece. Make sure that the felt makes good contact with each whippen. When the glue has dried, take a razor or very sharp knife and trim them apart.

The same technique can be used on the main felt. Select the proper thickness of action cloth, cut it in strips that are wide enough to bow slightly over the underfelt and still touch the sides of the mortice, and long enough to run the length of a section of whippens. Glue this felt into the whippen by putting glue only at the edges of the mortice. The felt is not glued to the wood at the point where the capstan makes contact. When the glue is dry the whippens can be cut apart as before. Quality of workmanship is important here. If the felt is too wide, a bulge will occur in the felt and this will affect the stability of the hammer line. Too narrow a felt is difficult to anchor to the edge of the mortice.

When the repairs are completed and the stack is turned over and placed back on the keyboard it will be necessary to reset the hammer line.



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What an exciting time of the year! The anticipation of Christmas and the beginning of a New Year! Yet a time of reflection on the year just ending!

Have we time to do a few of the items we **promised** ourselves we would accomplish in 1979? Let's get with it!

We have until the last business day in December (check in your area — the 28th or 31st) to establish our retirement plan. Tax sheltered savings (we can pay ourselves a part of what we are paying Uncle Sam in taxes) work to increase earnings, i.e., taxable income for a married person in the \$16,000 to \$20,200 (24% bracket), 4% return \$5.26 is equal to 8% 10.53, the income required to save \$1.00 is \$1.32. For a single person in the taxable income of \$15,000 to \$18,200 (30% income tax bracket), 4% return is equal to 8%; however, income required to save \$1.00 is \$1.43!

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start our retirement plan is an Individual Retirement Account — we don't have to pay until tax time — but we do have to "set it up." The **ONLY** guaranteed lifetime income plan is an annuity!

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Why buy annuities? We look forward to retirement counting on the monies we have saved, inherited (not many of us have "rich, unknown uncles") some receive pension funds, sale of property or business interests. We buy because the annuity is the **ONLY** means — thus far — devised by man of guaranteeing a fixed lifetime income.

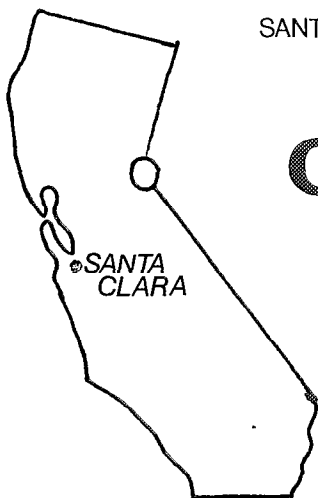
It is mind boggling to imagine how

much greater the returns could be — what with the prime interest rates today! The figures given are authentic — they don't lie! Do it today!

Have you made payments for all possible tax deductible business expenses? Be sure to do it before December 31st! Tool and Bailee Customer insurance is a tax deductible business expense — have you paid the premium for the '79-'80 renewal? (Even applied?) By the way there is no longer any restriction of the amount of coverage for tools or your customers' property.

Did you add occupational coverage to your medical plan? Just a reminder, your expenses for "on the job" injuries are NOT automatically covered. Give us a call if you need further information or have questions!

Don't you feel tremendous — smug — Oh, Oh — there must be some items of your own, add them to your "doing it now" and end your year in a blaze of glorious satisfaction! With this momentum **WHAT A YEAR 1980 IS GOING TO BE!**



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Coming Events

January 11-12, 1980

ARIZONA STATE SEMINAR
Tempe, Arizona

Contact: Carl Bates
4112 West Caron Street
Phoenix, AZ 85021

February 18-19, 1980

CALIFORNIA STATE SEMINAR
Santa Clara, California

Contact: Bill Klein
219 E. St. John St. #3
San Jose, CA 95112

April 10-12, 1980

PACIFIC NORTHWEST
CONFERENCE CONVENTION
Vancouver, British Columbia

Contact: Al Seitz
1517 Medfra
Anchorage, AK 99501

April 11-12, 1980

NEW ENGLAND SEMINAR
West Lebanon, New Hampshire

Contact: George Wheeler
11 Cherry Hill
Springfield, VT 05156

April 18-20, 1980

PENNSYLVANIA STATE
Altoona, Pennsylvania

Contact: Fred Fornwalt
1333 Logan Blvd.
Altoona, PA 16602

April 26, 1980

LOS ANGELES ANNUAL
TECHNICAL SEMINAR
Los Angeles, California

Contact: Daniel A. Evans
4100 Beck Avenue
Studio City, CA 91604

April 29, 1980

MID-SOUTH SEMINAR
Nashville, Tennessee

Contact: Ronald Croy
3214 Jonesboro Drive
Nashville, TN 37214

May 2-4, 1980

MICHIGAN STATE CONVENTION
Southfield, Michigan

Contact: Calvin Champine
2145 Dalesford
Troy MI 48098

Classified Advertising

CLASSIFIED ADVERTISING RATES are 15 cents per word with a \$3.00 minimum. Full payment should accompany insertion request. Closing date for ads is the first of the month prior to publication.

Box numbers and zip codes count as one word each. Telephone numbers count as two words. Names of cities and states count as one word each.

Send check or money order (U.S. funds), made payable to the Piano Technicians Guild, to Classified Ads, THE JOURNAL, 113 Dexter Avenue North, Seattle, WA 98109.

HELP WANTED

HELP WANTED — Artist piano-rental company seeks trainee. Work with the greatest pianos and artists in the world. An apprentice or novice technician is sought for long-term training and employment in New York City. Must be willing to embrace with equal zeal the following: tuning, rebuilding, truck driving, refinishing, piano moving, regulating, voicing, road touring and sometimes late and unusual hours. Benefits: work with the world leader in concert piano preparation and provision, all types of artists, all types of music. As a reward for long-term loyalty, profit sharing or other bonus could apply. (212) 582-6798

URGENTLY NEED fulltime piano technician. Shop tuning and rebuilding only, no outside calls. Salary negotiable. Excellent working conditions. Only experienced rebuilders need apply. References exchanged. **Hall Piano Co., 709 David Drive, Metairie LA 70003 — (504) 733-8863.**

FOR SALE

FOR SALE — Conn Strobe-Tuner Model ST 6, in new condition with operation manual. \$150 — **Paul R. Herrmann, 339 E. French Ave., Orange City FL 32763.**

FOR SALE — Piano tuning and repairing serving all of Orange County (California). Over 500 customers, 25 teachers. \$12,000 terms. Evenings, 6 p.m.-9 p.m. call **John Nardine, 5052 Linda Circle, Huntington Beach CA 92649 — (714) 846-3512.**

PIANOS FOR SALE — Always on hand, 150 to 300 uprights! Plain case, art case and players. Also 50 to 150 grands at all times, as is or rebuilt. Excellent brand names — no junk! All set up for inspection. Lowest possible prices. Call for quotes: **Owen Piano Wholesalers, 2152 West Washington Blvd., Los Angeles CA 90018. Telephone (213) 883-9643**

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MISCELLANEOUS

TUNERDATA: (1) Mail reminders make money for you; (2) geographical files make money for you; (3) we'll do them both for you. Write **Ed Fesler, 11315 Rich Circle, Minneapolis MN 55437**

CASH PAID for used Steinway action parts; Chickering and Mason & Hamlin screw stringer parts. Send sample of discards for payment estimate to **Janson Piano Co., 299 Queen St. W. Room 200, Toronto, Ontario, Canada M5V 1Z9**

WANTED TO BUY — Mason & Hamlin Grand Piano. Want one that was a player. I have a player mechanism to install. Will pay handsome reward. **Brady, 4609 Crankbrook, Indianapolis IN 46250. (317) 259-4305, after 5 p.m. (317) 849-1469**



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Convention & Technical Institute**

July 14 - 18

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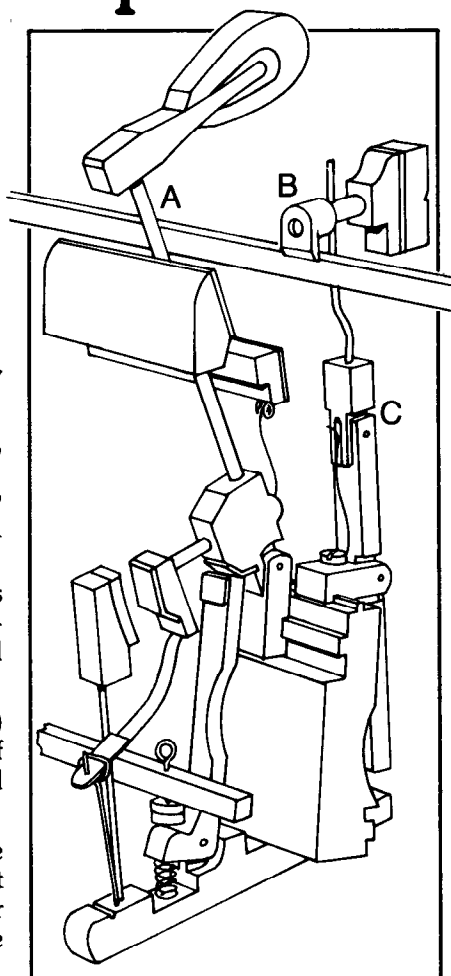
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A new all-spruce Duraphonic Multi-radial™ Soundboard improves tuning stability. In tests with up to 90% relative humidity, solid spruce expanded 5 times more than the new Wurlitzer design, causing more serious changes in string tension.

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As you continue to service our pianos, your comments will always be welcomed.

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DeKalb, Illinois 60115

PIANO TECHNICIANS GUILD

DECEMBER 1979 UPDATE

December Mailing To All Members

Early in December each member will receive a special mailing containing the following:

1. Brand new Membership Services Handbook containing information on Home Office services; the film, tape and book library; insurance options; business aids and supplies; Journal advertising rates, etc.
2. New price list of Guild supplies and business aids with order form.
3. Revised Guild Bylaws, Regulations and Codes.
4. All Registered Technicians, Apprentices and Allied Tradesmen will also receive their 1980 dues statements with return envelopes, and a special paper explaining the all-new 1980 dues plan adopted by the Council in Minneapolis last July.

Dual Membership?

The Bylaws provide that members may join more than one chapter. Each member must be recorded with the Home Office in one chapter only for the purpose of Journal mailings, correspondence and membership totals.

Membership in other chapters is considered "Dual Membership" and these memberships are not currently on record at the Home Office. We would like to maintain a list of those who are members of more than one chapter.

You are invited to send the information to the Home Office so that your membership records will be up-to-date.

Additions Guild Library

We are pleased to announce the addition of the following films to the Guild library:

REGULATIONS OF DAMPERS AND SPOONS

Filmed, produced and edited by Ernie Juhn, with Bob Hartz, narrator. This film was donated to the Guild by Ernie Juhn. (Super-8, 17 minutes)

BRIDGE REPAIR

Filmed and edited by Ernie Juhn with introduction by Bob Hartz. (Super-9, 47 minutes)

REMOVAL AND REINSTALLATION OF DROP ACTIONS

This film features Joe Sciortino and Steve Fairchild, with introduction by Bob Hartz. Produced and filmed by Ernie Juhn. (Super-8, 22 minutes)

UPRIGHT ACTION RESTORATION

Features Sid Stone and was made by Ray Garner. (16mm)

*
* *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! *
*

Everyone wants a chance to receive the prestigious President's Club award or to sport a Bell Ringers or a Restorers Club ribbon at the annual convention. To insure that every Bell Ringer point is credited to your "account," and that every Restorer of a former member is recognized, the Membership Department requests the following:

1. Please **PRINT** your name after your signature on the line "recommended by" when you wish to receive credit for bringing a new member into the Guild. Some signatures are difficult to read and we regret having to omit a name for this reason.

2. Please show your own chapter after your name. Some members sponsor a new member into a chapter other than their own.

3. If you wish credit for a **RESTORED MEMBER**, please write this fact on the application form. It is not always possible to trace a former member after a lapse of time.

4. If corrections should be needed in the records, please notify the Home Office promptly, as *The Journal* goes to print some weeks ahead of receipt.

The following points are scored for signing up the various ratings:

Craftsman—six points. Apprentice—five points. Allied Tradesman—four points. Associate—three points. Affiliate—two points. Student—one point.

When you have a total of 24 points you become a member of the President's Club; all others are Bell Ringers.

Sponsor a new member and win points in the Bell Ringers Club. Join the celebration at the 1980 convention in Philadelphia.

Ring the Bell

Bell Ringers Club

	Points
ABBOTT, William Jr.	6
ACH, Philip	3
BAIRD, John	1
BALIGIAN, Agnooni	11
BARRETT, Bruce	1
BERRY, Ronald	5
BIBLE, Dana	1
BITTINGER, Dick	10
CLARK, Peter M.	1
CLOPTON, John	4
COX, Merrill	1
CROY, Ronald	12
DANIEL, Pal	6
DROST, Michael	6
DRAINE, Robert	23
ERBSMEHL, Charles	1
FISHER, Allen	6
GOETSCH, Lawrence	12
HARRIS, Vaughn	6
HART, W. D.	6
HAWKINS, Marshall	6
HEINDSELMAN, Lois	17
HESS, James	9
HOHF, Robert	6
JOHNS, Barney	1
KERBER, Walter	12
KOFORD, Lyn	5
LINDEMAN, Doug	23
MACCONAGHY, Henry	6
MACKINNON, Karl	1
MARTIN, Barbara	1
MATTHEWS, John	1
MEEHAN, Joseph	14

MEHAFFEY, Francis	6
MOONAN, William	1
PEARLMAN, Sam	1
PETERS, George	12
PHILLIPS, Webb	5
REITER, Michael	6
RICHARDSON, James	11
RILEY, Martha	1
ROE, Eugene	6
SEABERN, Paul	4
SCHEER, Bob	6
SELLER, Marion	10
SERVISS, Kenneth	6
SEVERANCE, Davie	7
SHELL, Roger	6
SMITH, Arthur	1
SNYDER, Cecil	5
SORG, Herbert	6
STONE, Sid	6
SWARTZ, Vern	1
TAYLOR, Kendal	4
UPHAM, Russ	1
WALKUP, Kenneth	6
WHITTING, Ted	4
WICKSELL, Carl	1
WIGENT, Don	6
WILLIS, Aubrey	1
WINTERS, Kenneth	4
WOOD, Edwin	5

Restorers Club

BITTINGER, Dick
HAWKINS, Marshall
SCHEER, Bob

Chapter Notes



...SANTA CLARA CHAPTER had a demonstration on a new "high impact glass bead blaster" for cleaning the action. The equipment is supposed to clean wood like

new and polish all metal parts in one easy operation. The drawing accompanied the technical session announcement, along with the question...but will it file the hammers, set the let-off and adjust the dampers? ...

...MORE tips from the TWIN CITIES CHAPTER for using those handy little coasters from the 1979 convention -- use them to cover up the Pontiac medallions on your hubcaps or under furniture legs when you shampoo your carpets! ... They also offer a good tip for an easy way to glue a new butt felt square: *Disengage the bridle strap, push the hammer all the way forward, thus exposing the surface you want to glue very nicely. After gluing the new felt square, trip the jack and hold it tripped as you let the hammer fall back.* ...

...Jerry Peterson told the WESTERN MICHIGAN CHAPTER about his experience in 1954 when he and four others tuned 250 pianos for a concert in Grand Rapids. Jerry says he is the only one still tuning -- the others are all playing harps, according to Jerry. ...

...CONNECTICUT CHAPTER is celebrating its 25th anniversary and lovingly recalled an article about one of their founding chapter members, W. Dean Howell. Then they ended their chapter bulletin with another loving look at Dean, a story about a recent call he made. *The other day Dean Howell received a call from a lady saying that she had been bitten by something while sleeping and she was sure it must have been a snake. She was convinced that it had crawled into her old upright piano. Would Dean come and see if he could find it in there? Dressed in heavy gloves, armed with a vacuum cleaner, and backed up by the lady wielding a sledge hammer, Dean searched the piano thoroughly and apprehensively. He found only a tiny plastic toy bird! ...*

...Then to follow up next time, ORANGE COUNTY CHAPTER had a technical session with Edward Graf, a representative of the California State OSHA Department who spoke on the uses of solvents, adhesives cleaners, etc. He described the relative toxicities of many of the common solvents used by piano technicians...

...The BALTIMORE CHAPTER printed discount coupons promoting the chapter and the philosophy of the Guild, offering a 10% discount to users. After a report on the coupon publicity campaign, professional financial planner Richard Stoker spoke on Financial Planning for the Self-Employed in an Inflationary Economy...

...The camaraderie of the trade was evident in the CLEVELAND CHAPTER bulletin as the editors reminisced about the many hours the chapter has put into its project piano. Remarking that a factory stringer could do it faster: *"On the other hand, factory stringers surely don't laugh as much as we did, or have as much fun as they work. This is our project piano and we made a fun project out of it. The knowledge and skill we gained, and the fun we had doing it, are things that cannot be measured in terms of time and money."* ...

...RHODE ISLAND CHAPTER not only enjoyed a technical session in October, but shared an evening with noted art critic Edwin Safford of the Providence Journal...

...BOSTON CHAPTER includes a telephone number to call for those members interested in car pooling to their meetings. ...

...ORANGE COUNTY CHAPTER squarely faced the challenge of communicating between a technician and a company which SELLS pianos (emphatically SELLS). One of their own chapter members, Mike Evanko, spoke as the "opposition." Ended up with both the chapter members and Mike's company having a better understanding of each other's businesses...

...CHICAGO CHAPTER member Virgil Smith was a featured speaker this past summer at the Midwest Piano Teacher Convention. His topic? "How to Communicate With Your Piano Technician on Service Problems"...

...The Journal's very own JACK KREFTING has gone out and gotten himself an almost "regular" job with Baldwin. Seems he has also made a few discoveries, which he shared with his Cincinnati Chapter:

"Since taking on a new job with Baldwin last month, I have learned some interesting things which I want to share with you. Perhaps the most astounding thing about the job other than the fact that I haven't been fired yet, is that I am learning about an unusual thing called Getting Up Early."

"I have been required to learn some new terminology, too; rough terms such as 'morning,' 'breakfast' and 'a.m.' I already was familiar with the word 'early,' even though it meant a different time of the day to me."

"One of the biggest surprises for me was the phenomenon known as Morning Rush Hour. I had always thought that there was one rush hour in any day, around 5 in the afternoon. One a day is really all we would need, but in Cincinnati we have two."

"Another phenomenon that I have observed is that the sun really does rise in the east. That fact wasn't quite so startling because I had long been hearing such rumors; still, it is nice to be able to confirm it by first-hand observation. For all I knew, it could have popped out in the middle of the sky anytime before noon."

"Worst of all, that normally delightful beverage made from hops and grain just doesn't taste good in the morning, with or without breakfast. Its morning counterpart is an ugly, dark brown instead of a beautiful light yellow, and hot instead of cold. Eventually I may even get used to it, but I seriously doubt that it will become one of my favorite things."

From the Piano Technicians Guild Sales Department



PIANO PARTS AND THEIR FUNCTIONS

Having trouble describing a particular part and its function? Studying for an examination? *Piano Parts and Their Functions* is a comprehensive book of common nomenclature and identification for piano servicing. It is generously illustrated with line drawings keyed to part names. No technician should be without one! The book was compiled by Dr. Merle Mason and his Guild Nomenclature Committee after many years of research. It is essential to your library.

Member prices: \$14 hardcover — \$10 softcover
Nonmember prices: \$18 hardcover — \$14 softcover

GUILD KEY RING

This popular convention souvenir is now a sales item. This Guild logo is laminated into a hard plastic case with a gold-colored ring. You won't lose your keys with this key ring.

Prices: 1/\$1.50-3/\$4-6/\$7.50



Piano Technicians Guild, Inc.

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