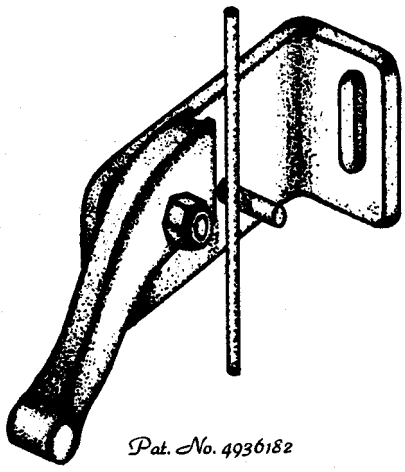
LOVELAND BRAND SHARPING LEVERS



GENERAL INFORMATION

Sharping levers are used on folk harps to facilitate key changes. Installing a lever over a string allows you to raise the pitch of that string one-half step by engaging the cam handle against the string. Thus an F-string can be raised to F# by a simple flick of the lever. Similarly, a B-string may be tuned to Bb so that the lever will raise it to a B-natural and release it back to a B-flat, as needed

Most folk harp players set the key signature (sharps or flats) on the harp before starting each piece of music. For the key of G, you would engage the levers on all the F strings to produce the F# needed for that key (making sure all other notes on the harp are natural). If the following piece were then to be played in the key of F, you would then release the levers on all the F strings to produce F-natural, and also release all the B-string levers to produce Bb.

You may install a lever over every string on the harp, but if you think you may never use all of them, it would be more cost-effective to select which keys you think you are most likely to use, and then install only the levers necessary for those keys:

KEY OF E:	requires F# and C# and G# and D#
KEY OF A:	requires F# and C# and G#
KEY OF D:	requires F# and C#
KEY OF G:	requires F#
KEY OF C:	requires no sharps or flats
KEY OF F:	requires Bb
KEY OF Bb:	requires Bb and Eb
KEY OF Eb:	requires Bb and Eb and Ab

Parts List:

Sharping Lever
Cap Screw, 3/4" #6X32
Paper Template (if available)

Recommended tools:

Ball-end Allen driver
Drill bit #36
Tap bit #6 X 32
Electric drill (reversing)
Awl or Ice Pick
Hammer, pliers
1/4" end wrench
Electronic tuner

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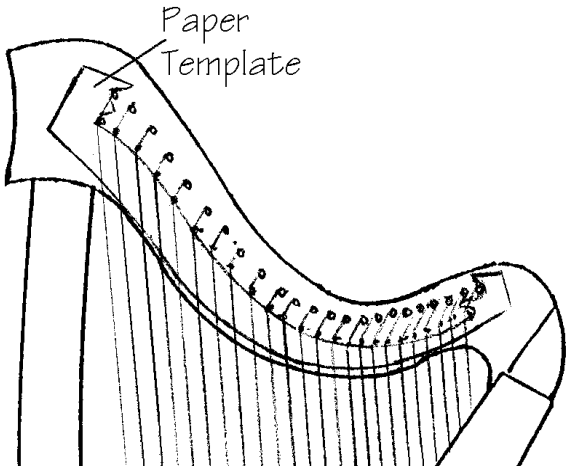
INSTALLATION INSTRUCTIONS:



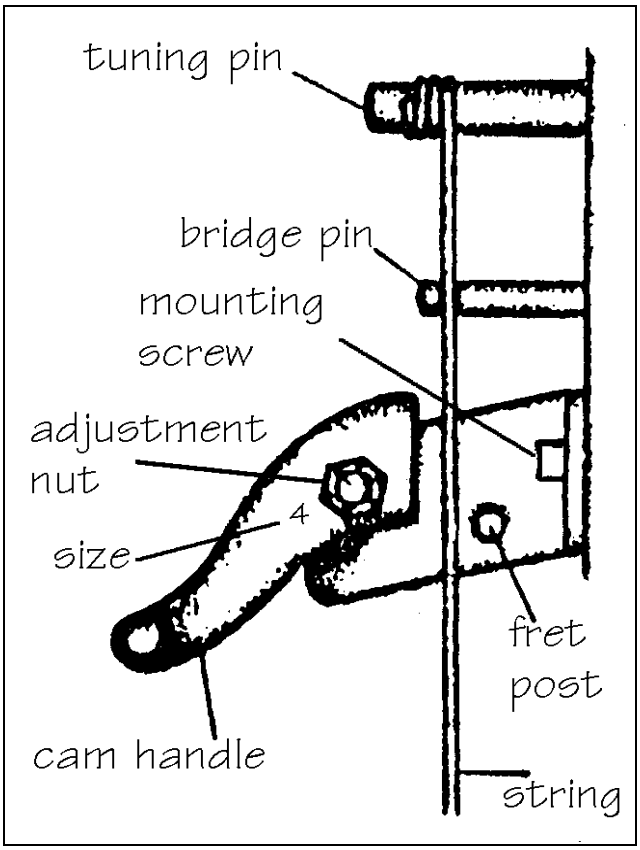
1. Your harp must be strung and tuned before you can mount the sharping levers on the neck. If you are installing levers on a Musicmaker's Harp, you should have received a paper template to assist you in positioning the levers on the neck. Cut out that template and place it under the strings as indicated, using a few pieces of tape to prevent it from slipping out of position.

If you cannot obtain a template for lever placement on your harp, or you already have some levers mounted on the neck so you cannot use the template, make sure the instrument is perfectly tuned and stable before installing levers. You will rely on the pitch of the strings to determine the exact location of the levers. Read through to special instructions on next page.

POINT OF INTEREST

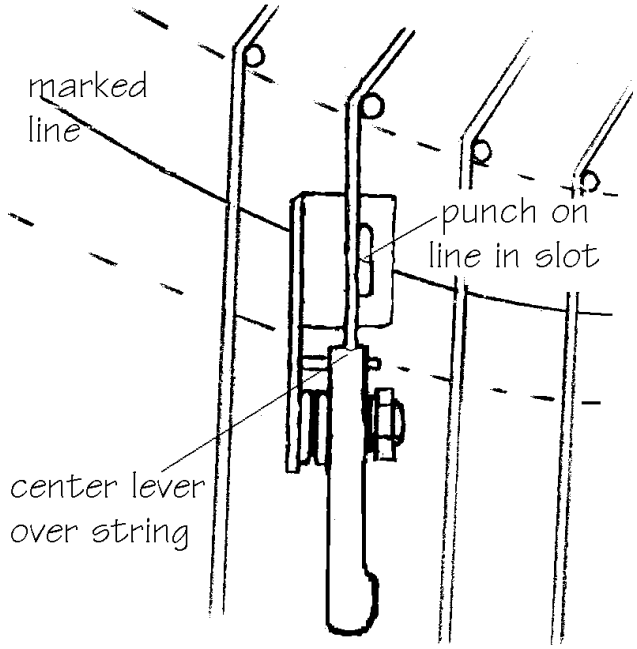
Many people ask us why we cannot pre-punch or even pre-drill the lever positions on the neck ahead of time for customers. The reason is that the levers must be aligned precisely to the strings, and the string positions may vary slightly from one harp to the next, depending on the fit of the soundboard and the back of the neck. There is also some potential for variation among sharping levers, so it is safer to fit each harp individually.

2. Please note that the sharping levers come in different sizes. There is a tiny number stamped into the plastic cam handle of each one. Carefully line up your sharping levers in order by number, and refer to your stringing chart to see which numbers are for which strings. Note that the #00 levers do not have fret posts. This size lever raises the pitch by simply having the end of the handle touch the strings.



3. Start with the largest lever (biggest number) for one of the longest strings, as these are the easiest to install.

a) Hold the lever up to the string, below the brass bridge pin, as shown. The string should pass between the little metal FRET post and the plastic CAM handle (don't worry if the string rests on the FRET or touches the CAM for now - you'll adjust the string height later).



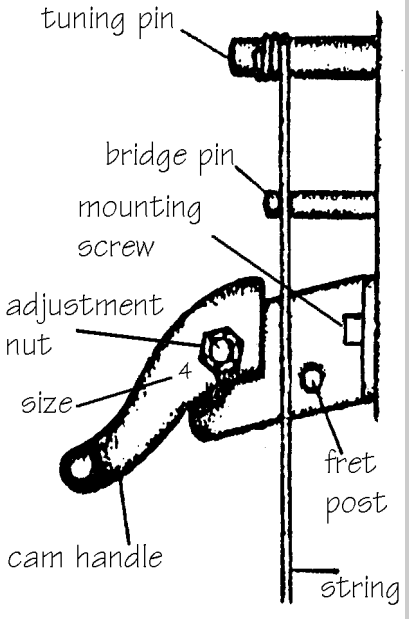
b) Center each lever on the proper string so the marked line appears in the slot of the lever bracket, as shown. Make sure the lever is straight and centered over the string.

c) Use an awl or ice-pick to punch through the paper into the wood on the line in the middle of the slot. BE CAREFUL NOT TO SLIDE THE PAPER AS YOU PUNCH. This will mark the position of the mounting screw.

d) Repeat steps b & c for every individual lever, proceeding in order up the scale of the harp until all the mounting holes are punched. DO NOT USE THE SAME LEVER TO MARK ALL POSITIONS! There are several different sizes of levers, so you must position each one individually.

NOTE: If you are installing only a few levers now but anticipate adding more later, you might want to punch-mark the location for all lever positions now. You'll be unable to place this template under the strings again once there are some levers in the way. Be sure to use the correct size lever in each position. Do not drill these extra marks! Just mark the positions for future drilling and mounting.

INSTRUCTIONS FOR POSITIONING LEVERS WITHOUT A PAPER TEMPLATE



a) Pluck the string to be sure it is at the correct pitch (use an electronic tuner to assure accuracy).

b) Engage the CAM against the string by lifting the lever handle.

c) Hold the lever firmly against the neck of your harp and pluck the string again. You want the pitch to be exactly 1/2 step above that of the open string. If it is too high, then slide the lever upwards toward the brass bridge pin and try again. If it is too low, slide the lever downward in the direction of the soundboard and try it again.

d) When you find the correct pitch, hold the lever very carefully in place, taking care that you are not displacing the string to one side or the other as you hold the lever. Use a sharp nail or awl to punch a hole in the neck of your harp, WITHIN THE SLOT of the lever bracket.

NOTE: We have found it best to locate this punch mark at or above the center point of the slot, to allow for some distortion of the pitch as the lever pinches the string. On the bass strings, we put the punch mark right at the top of the slot.

When you mark the position of several levers in a row, you'll notice that these marks will begin to form a natural arc, similar to the curve made by the tuning pins and bridge pins. If you find yourself with one or two marks that are out of alignment with the rest, you'll want to double- check those positions and the ones adjacent to them to be certain of the accuracy

Please note that the sharping levers have room for some final adjustments after they are installed, so your punch mark can be off a little and still be within adjustment distance.

4. Now you can remove the paper template and drill the holes for the mounting screws at the positions marked. HINT: Lift the strings off the bridge pins so they are out of the way of the drill (you may need to loosen the tension of some strings).

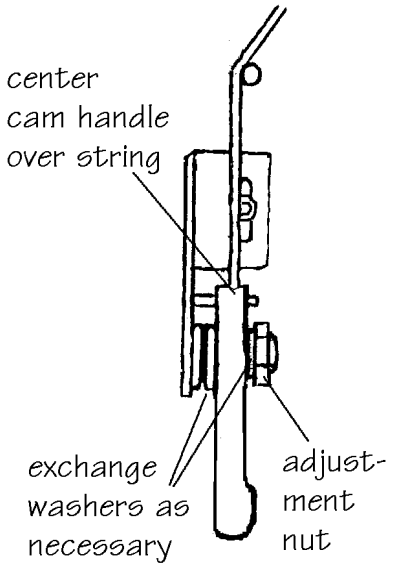
a) Use a #36 machinist's drill bit to bore holes in the harp neck, at least 3/4" deep, to match the length of your mounting screws. Mark the proper depth by wrapping masking tape around your drill bit for consistent hole depth.

b) Use your reversing electric drill to thread the hole with a #6 X 32 tap, to a depth of about 5/8". BE CAREFUL not to let the tap reach the bottom of the hole, as it will strip out the threads in the wood. Reverse the drill to unscrew the tap.

CAUTION!

HOLD YOUR ELECTRIC DRILL VERY STEADILY SO AS TO AVOID BREAKING THE TAP. If you happen to break the tap in the neck of your harp, don't panic. It has happened to the best of us! Just leave the broken piece in the wood and drill a new hole above or below the old one. Go to the hardware store and purchase a replacement #6 X 32 tap, and you'll be back in business. Probably more careful, too....

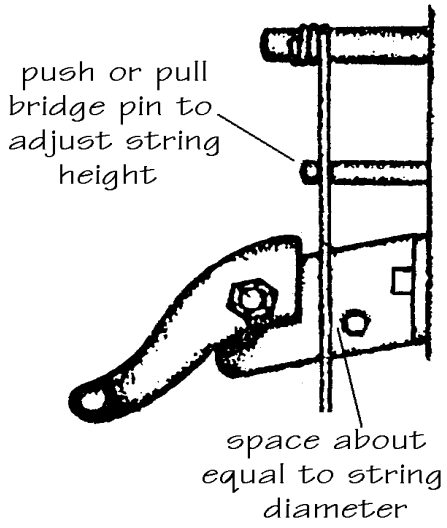
5. Use a Ball-End Allen Driver to insert the cap screw through bracket into the harp neck. A regular allen wrench will not work, because you must be able to hold the wrench at an angle. Leave the levers a little loose at first so you can slide them around somewhat.



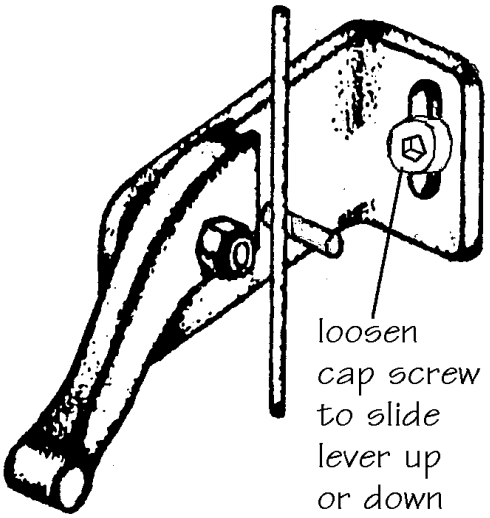
6. Replace the harp strings on the bridge pins. We use the ball-end allen driver for this too. It has a small groove at the end which helps you pull the string over the bridge pin.

7. Now you can tighten the levers to the neck, lining them up as straight as possible over the strings. If the cam handle is a little too far to the right or left of the string, you may exchange some washers from one side of the handle to the other by removing the adjustment nut. Check to make sure the cam handle operates easily but firmly. Use your 1/4" end wrench to tighten or loosen the handle to your liking.

8. Pull the bridge pins outward or push them inward until the strings pass through each bracket without touching the CAM or the FRET post. (A pair of pliers or a side-cutter can be used for the pulling. Use a thin scrap of wood or an adjacent tuning pin as a fulcrum for good leverage. A hammer works well for gently tapping the pins inward.)



IMPORTANT: The best height for the string is to be as close to the fret as possible without causing a buzz or rattle. A good rule of thumb is to have the space equal to the thickness of the string being adjusted. Test the string by plucking it several times.



9. Re-tune each string and test the pitch when the lever is engaged. You want the pitch to be exactly 1/2 step above that of the open string (* see non-musicians' note note below). You still have some adjustment possible by sliding the lever up or down in the mounting slot. Use your allen driver to loosen the mounting screw slightly so you can slide the lever bracket. If the levered pitch is too sharp, then slide the lever upwards toward the brass bridge pin and try again. If it is too low, slide the lever downward in the direction of the soundboard and try it again.

**** SPECIAL NOTE TO NON-MUSICIANS: There is no such note as E-sharp or B-sharp! When engaging the lever on an "E" string, the electronic tuner reading should jump from "E" to "F". Likewise, lifting the handle on a "B" string should make the tuner read "C". This is one of those quirks in music theory. What can we say...? The best use of levers on these strings is to tune the open E string to E-flat and the B string to B-flat. Then you will use the lever to raise the pitches to E-natural and B-natural, respectively.***

TROUBLESHOOTING

Occasionally we run into a troublesome lever that cannot be adjusted to the proper pitch. If this happens to you, here are some options (no, throwing in the towel is not one of them!):

a) If the levered pitch is too sharp, even when the bracket is positioned as high on the neck as possible, then try tapping the brass bridge pin just a little deeper to lower the string height a tad. This gets fussy, because you don't want the string to touch the fret when the lever is open, but you can come surprisingly close without causing a buzz.

b) If step “a” does not solve the problem, you may want to exchange levers for the next smaller size.

c) If the levered pitch is too flat, even when the bracket is positioned as low on the neck as the slot permits, then try pulling the brass guide pin outward a little to raise the height of the string. This causes the string to be stretched more when the lever is engaged, thus raising the pitch higher.

d) If step “c” does not solve the problem, sometimes we just need to drill a new mounting hole for the lever because we miscalculated its position the first time. You can fill the old hole with a bamboo barbecue skewer from the kitchen (toothpicks are too small), and nobody will ever know.

e) Buzzing or rattling can occur when the sharping lever is OFF if the string is too close to the fret or the cam. Adjust the height of the bridge pin to correct for this problem.

f) If a string sounds funny (buzzy or weak) when the lever is ON, then the lever needs to be tightened more firmly against the wood. Use your ball-end allen driver to tighten the mounting screw.

CONGRATULATIONS!

You have just accomplished the pickiest, most patience-testing surgical operation ever imagined for amateur harp-makers. Pour yourself a glass of champagne and drink a toast to your perspicaciousness. You deserve three cheers and week’s vacation!

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