



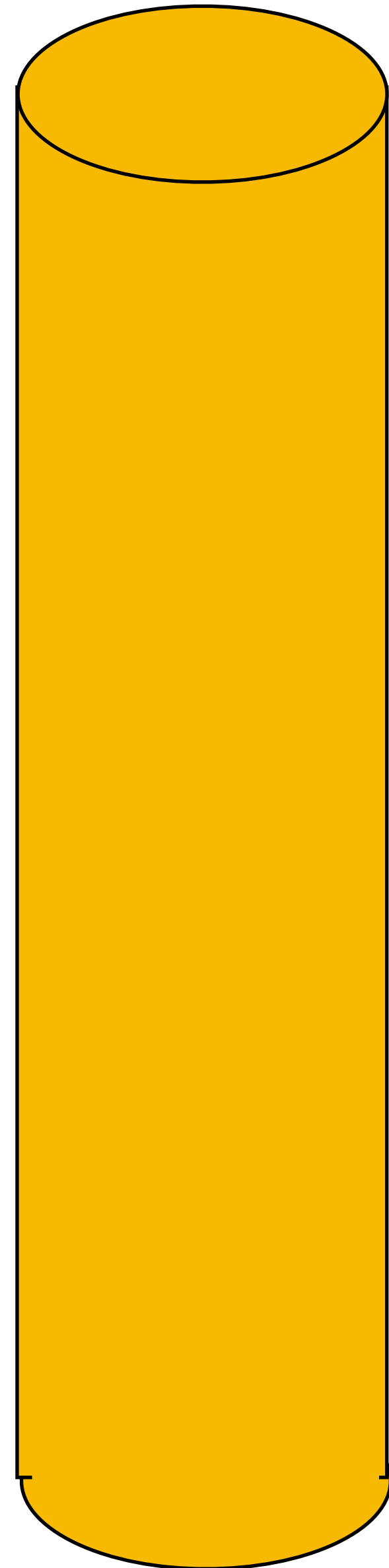
**How to Tune Pianos**  
The Hobby, Skill, and Career of Piano Tuning

# Voicing Techniques

Mark Cerisano, RPT, B.Sc.(Mech.Eng.), Dip.Ed.



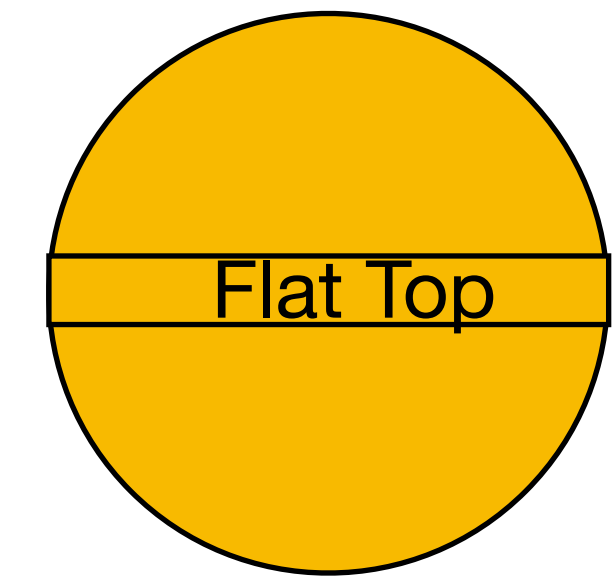
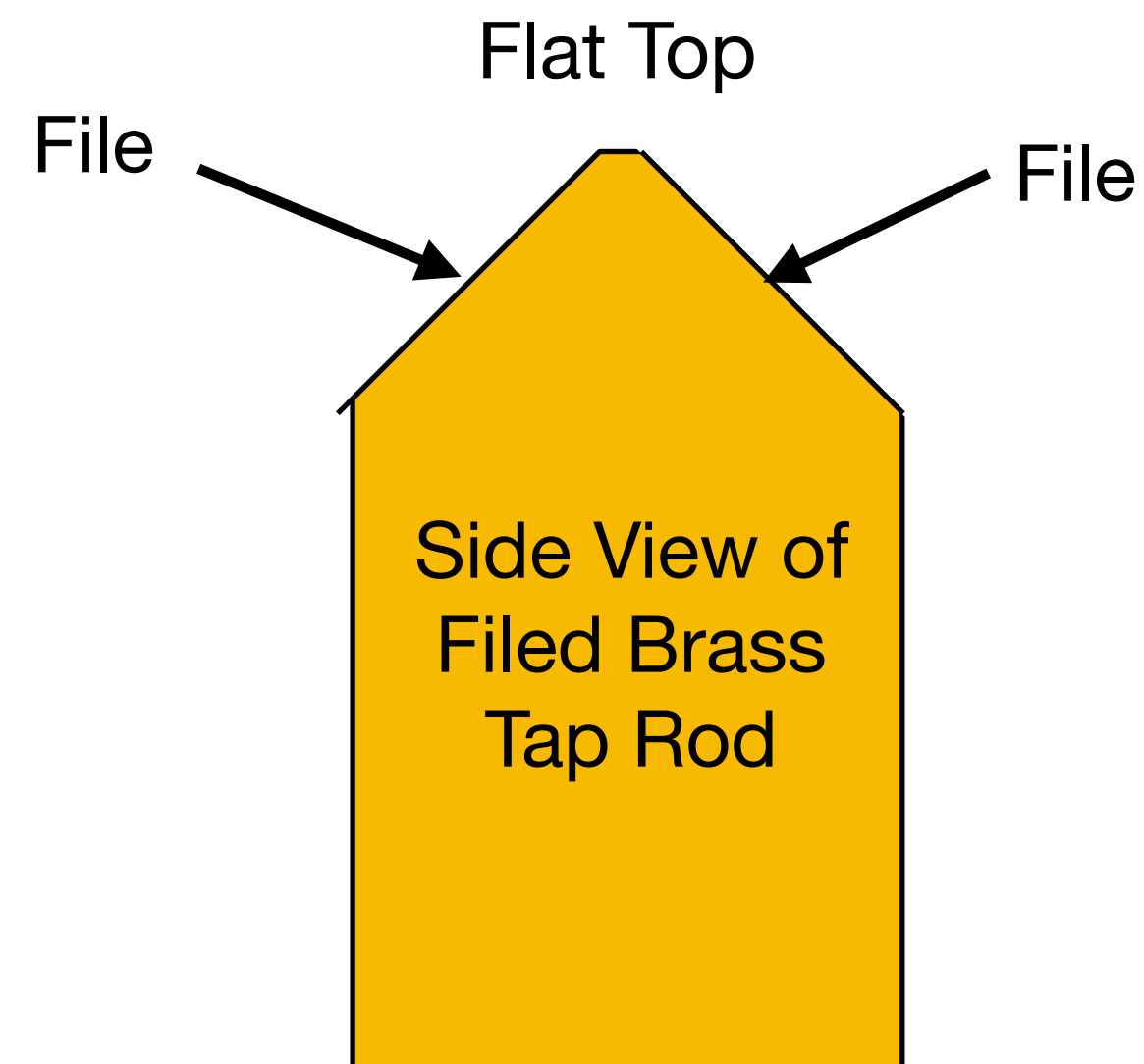
3/8" Dia.



12" long

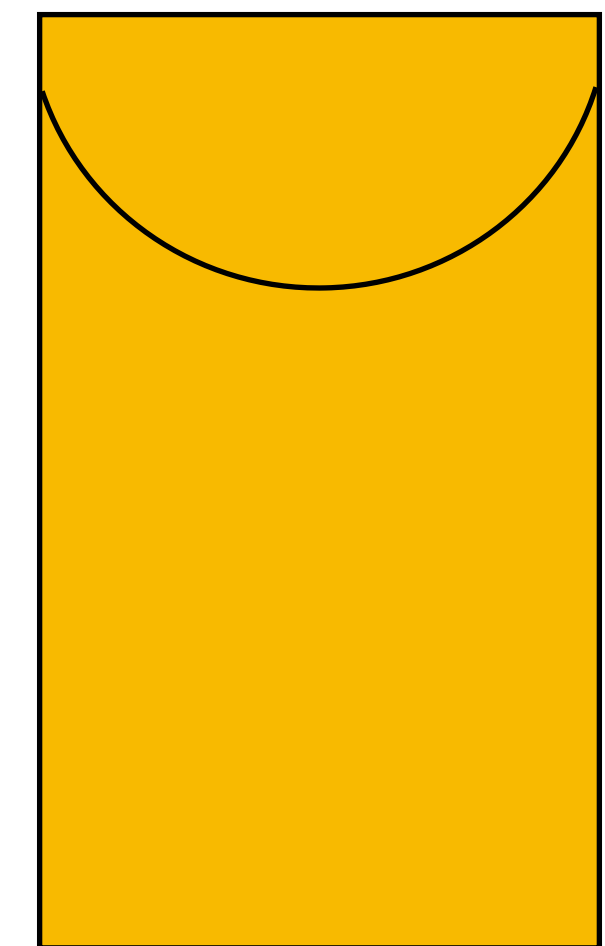
### Making a Brass Tap Rod

1. Take a brass rod about 3/8" diameter and 12" long.
2. Use a grinder or file and make a flat point. Leave a flat top.

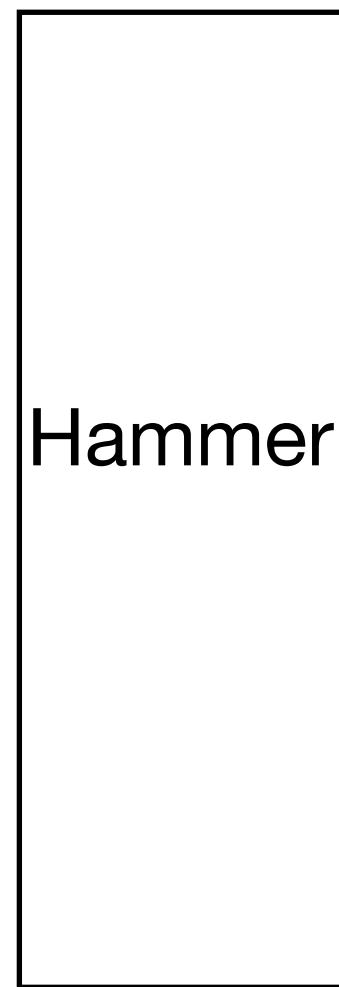
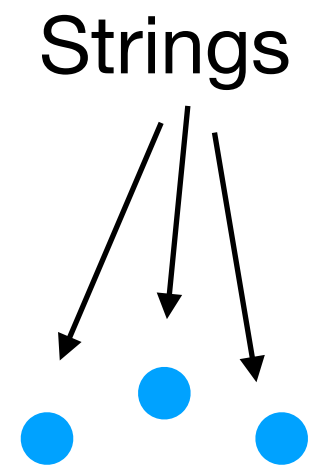


Top View of  
Filed Brass Tap  
Rod

Front View of  
Filed Brass Tap  
Rod



## Checking Hammer Mating by Pressing Hammer Against Strings



Hammer at rest.  
2nd string is high.



Lightly pressing  
hammer against  
strings.  
2nd string rings.  
Others are blocked.

### Upright.

Using your right hand, hold the hammer against the strings.  
Using your left hand, lift up the whippen and hold the back check against the catcher.

### Grand.

If Let Off is set well, you can reach into the action and press up on the jack, not the toe, but just under the body of the jack. The let off button felt will compress enough to prevent Let Off and the hammer will block against the strings.

Or, you can remove the action, lift up all the hammers, place a strip of thin action felt over the jacks, replace the hammers, and replace the action.

Now Let Off will not occur; each hammer will block against the strings when the key is all the way down.

### Procedure.

Pluck each string with the hammer pressed against the strings.  
By pressing hard, all strings can be made to block.  
By pressing lightly, all strings can be made to ring.

Try to find the right pressure that allows some strings to ring while others are blocked. There shouldn't be any.



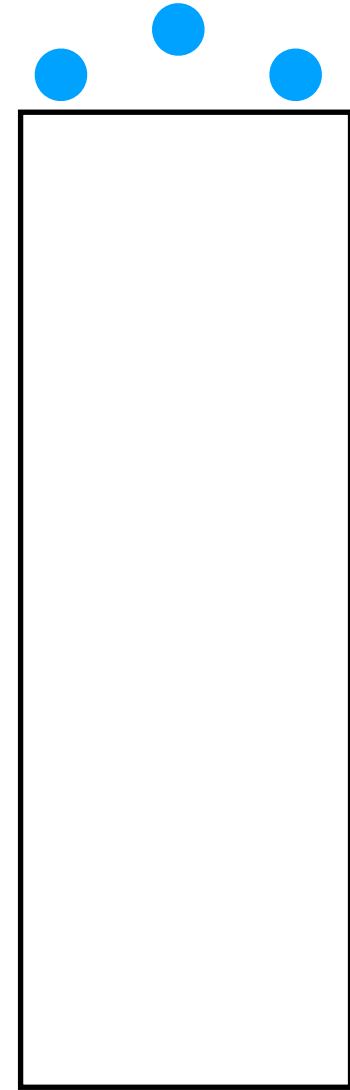


# How to Tune Pianos

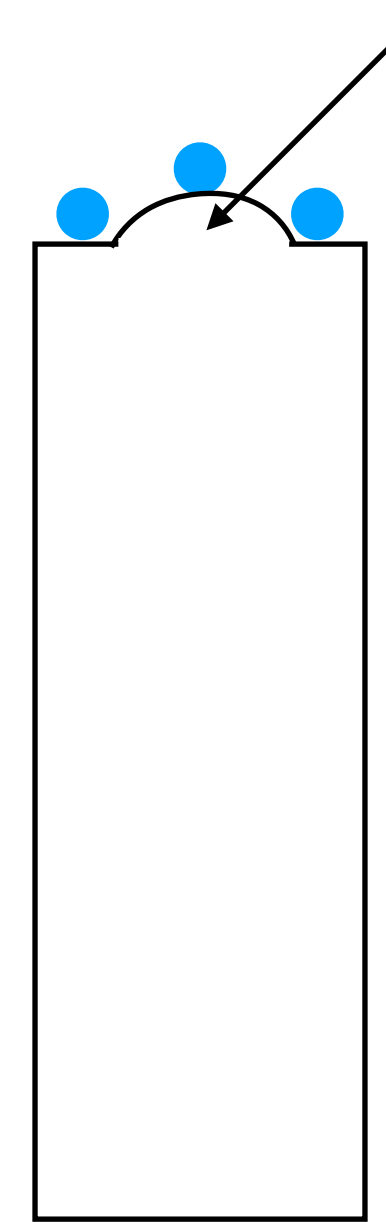
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## Use Needles to Fluff Up Ringing Groove.



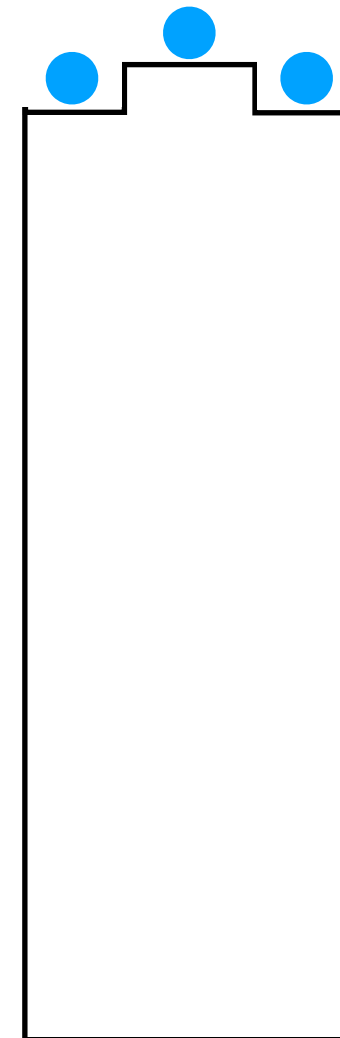
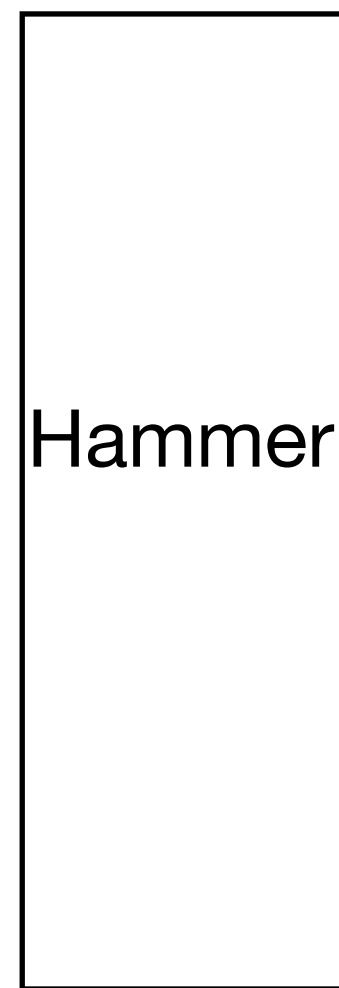
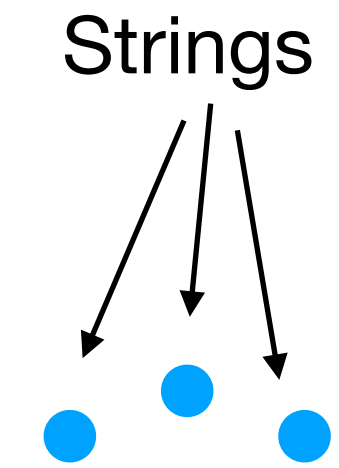
Lightly pressing  
hammer against  
strings.  
2nd string rings.  
Others are blocked.



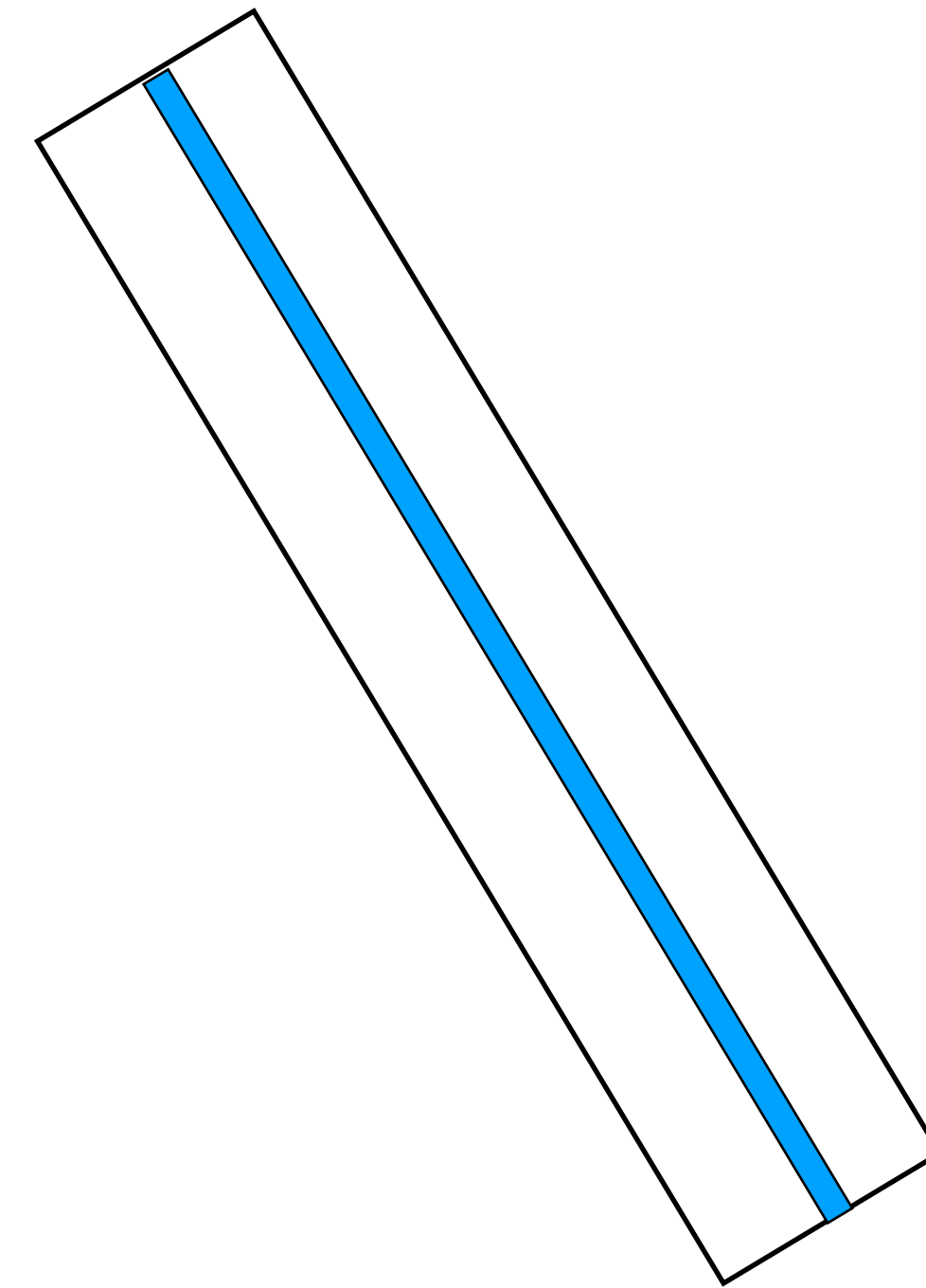
Use needle to fluff felt  
by plucking and/or  
inserting needle very shallow.

Gently fluffing  
felt under 2nd  
string can help  
mate hammer.

## File the High Grooves



Use a filing tool to file down the blocking areas.  
Do NOT try to file at an angle. File horizontally.

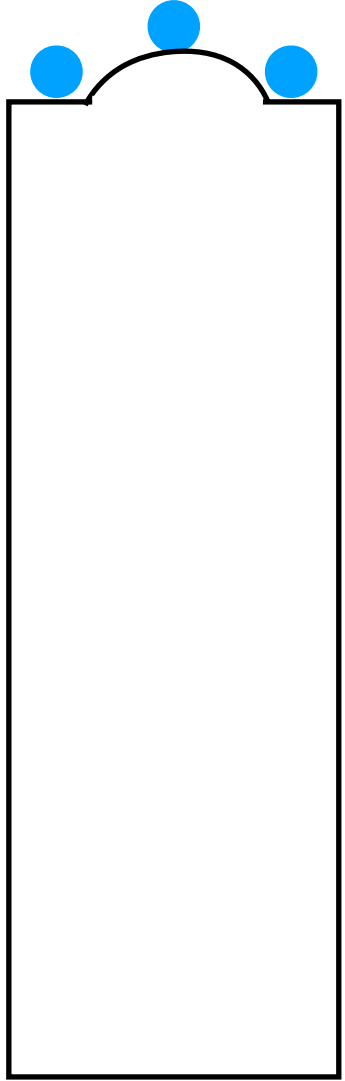


A plexiglass bar with a sandpaper strip.  
Allows tech to see through the filing bar  
so they know where they are filing.

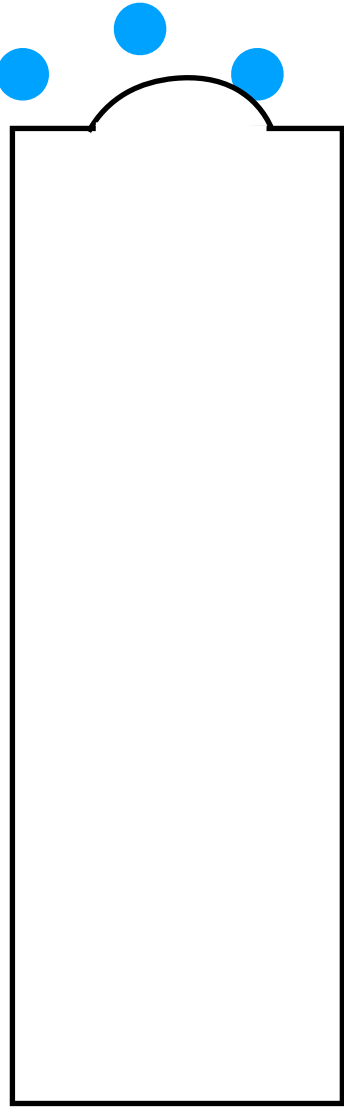
Hammer at rest.  
2nd string is high.

# Possible Problems with Needling or Filing Hammer to Mate with Strings.

Fluffing Felt

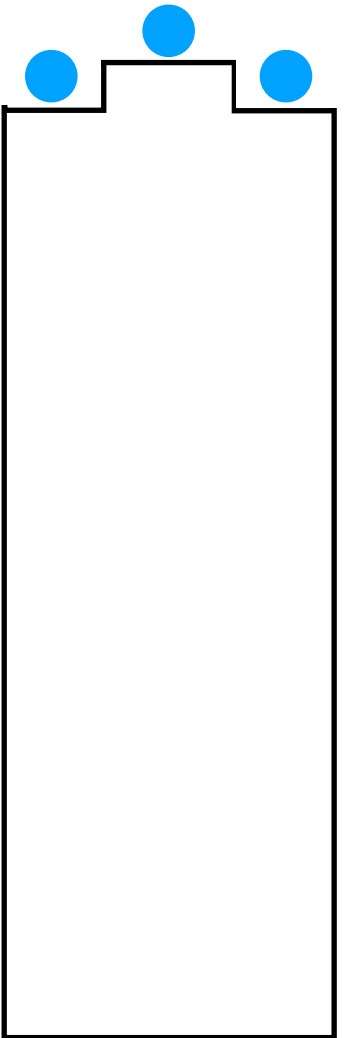


No Una Corda Pedal

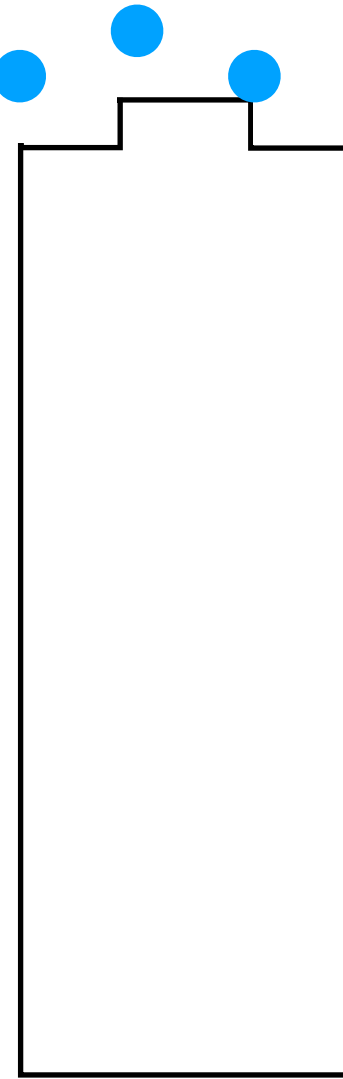


Una Corda Pedal Pressed

Filing Felt



No Una Corda Pedal

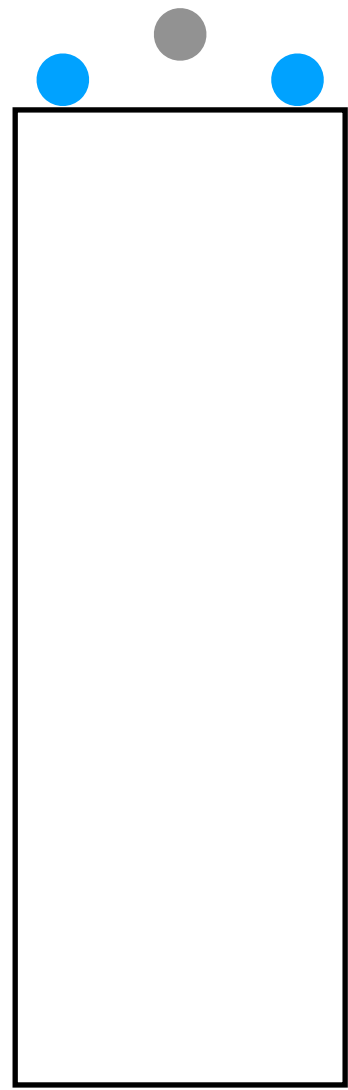


Una Corda Pedal Pressed

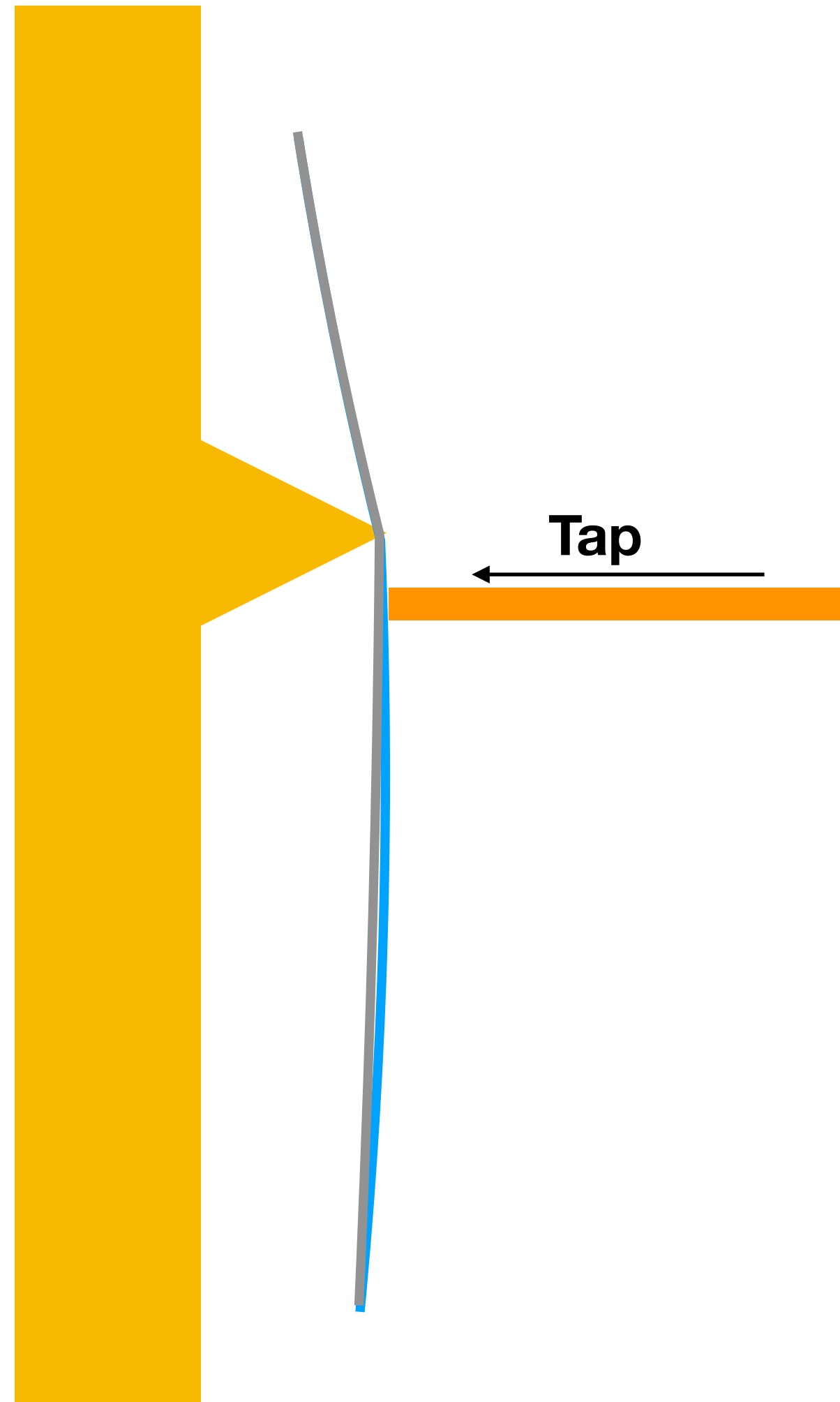
*Note that when the una cord pedal is pressed, it may ruin the hammer mating.*

*The preferred approach in this case is to level the strings.*

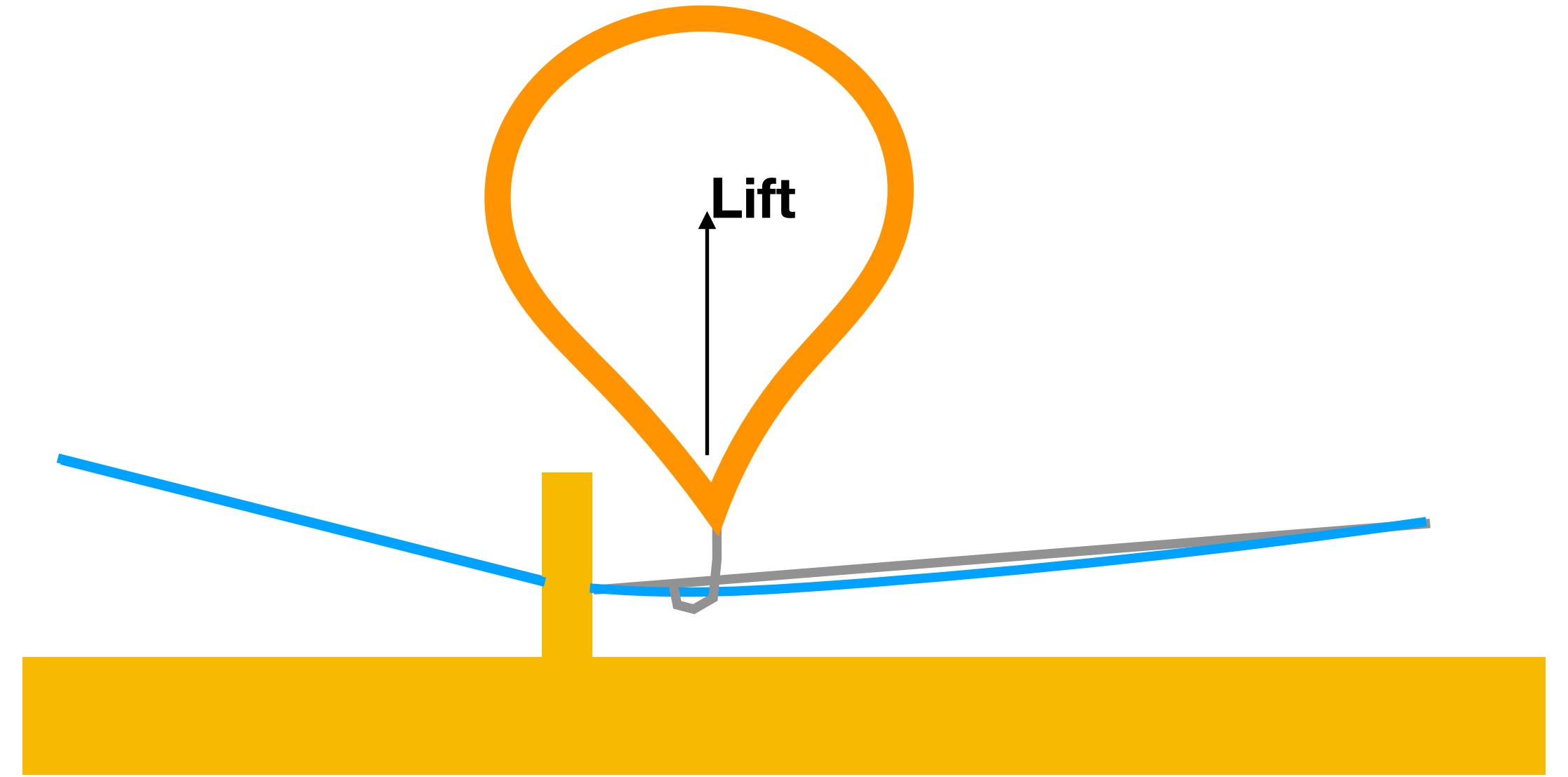
# Levelling Strings



2nd string is ringing.



Upright? Tap down the blue (high) strings.



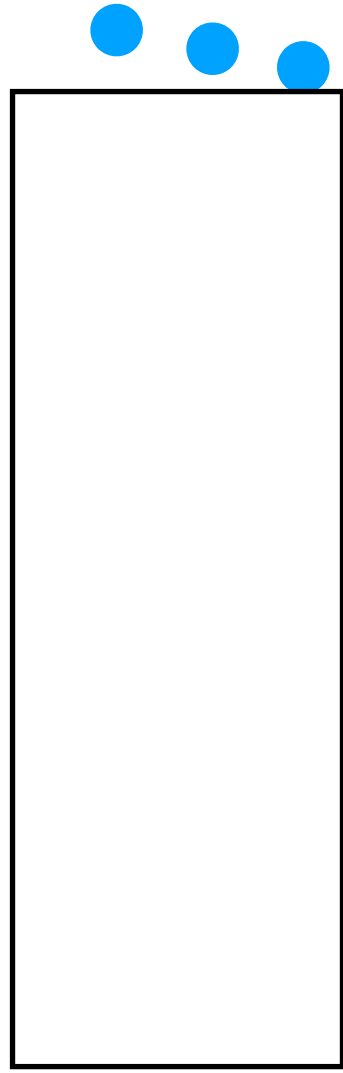
Grand? Pull up the blue (lower) strings.

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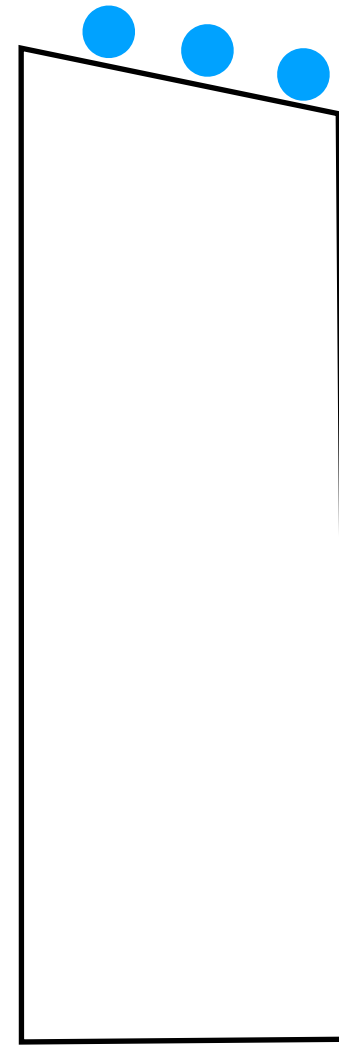


## Strings Need to Be In-Line, Not Necessarily Level



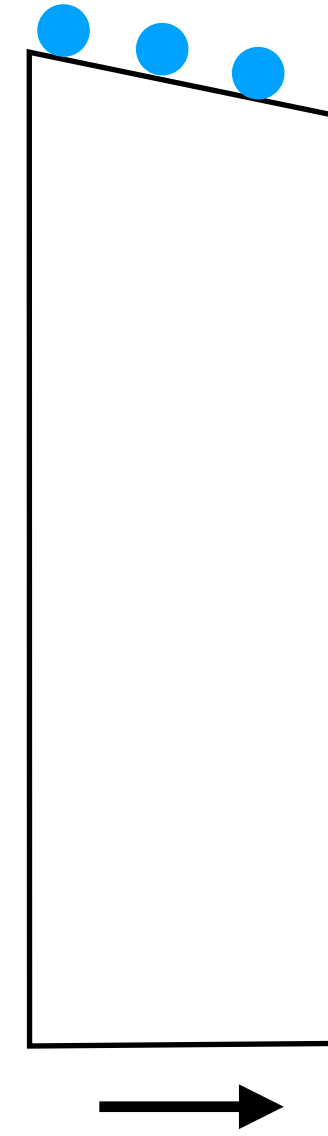
These strings are in-line,  
but not level.

Also, the left and centre string ring.



Because the strings are in-line,  
we can just file or needle the hammer  
to mate it with the strings.

*This is exaggerated and not  
recommended if the angle is this bad.*



When the una cord pedal is used,  
the hammer mating is preserved.



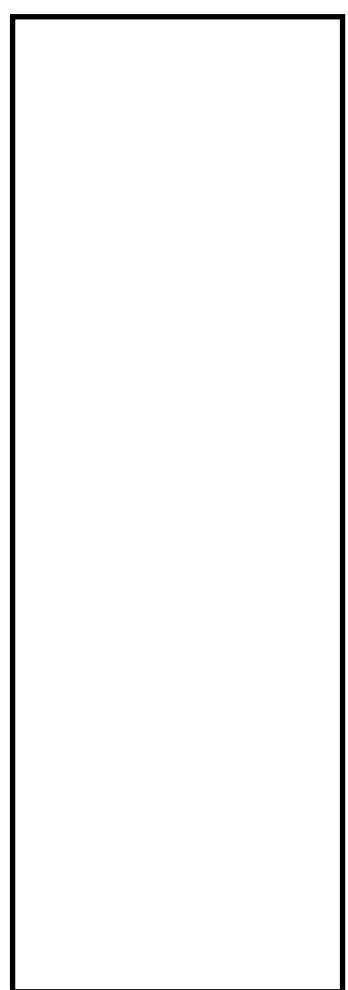
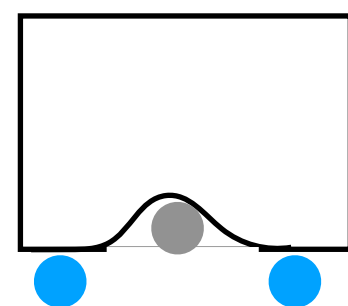


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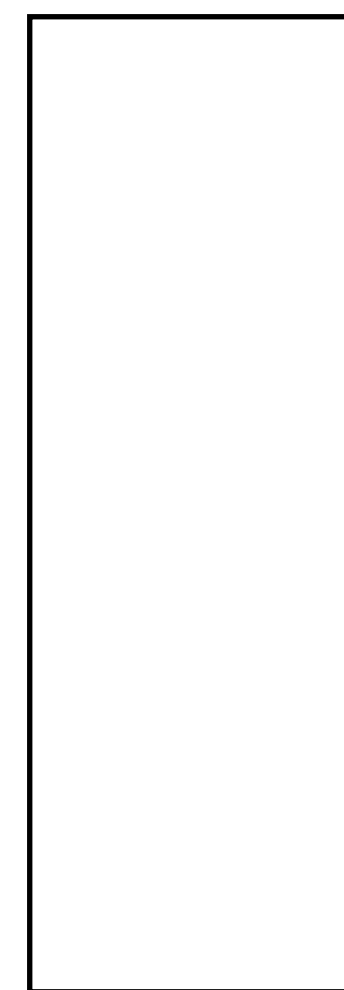
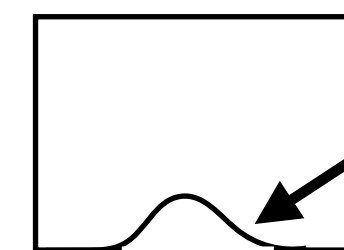
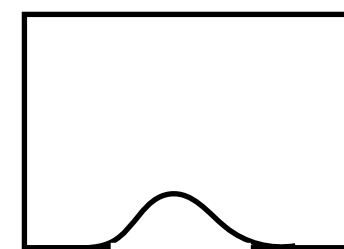
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## The Problem with Levelling Strings

2nd string is higher and not mated with the hammer, but the damper has fitted to the string heights.



Now that the strings have been levelled and mated to the hammer, the damper does not dampen efficiently anymore.



*When levelling strings to mate hammers because changing hammer surface would affect hammer mating when the una cord pedal is used, you may have to change the dampers as well if the new string heights affect dampening.*

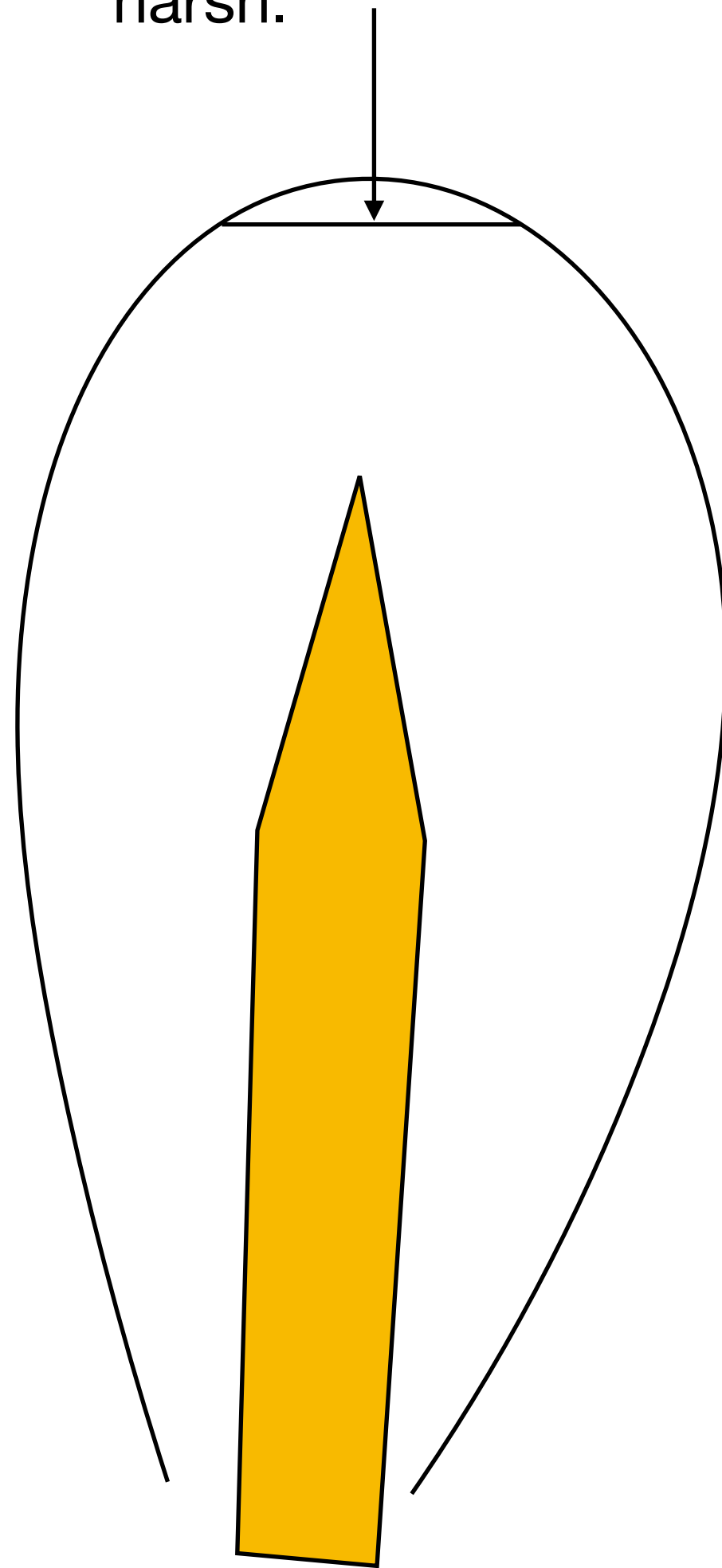


Aural Piano Tuning

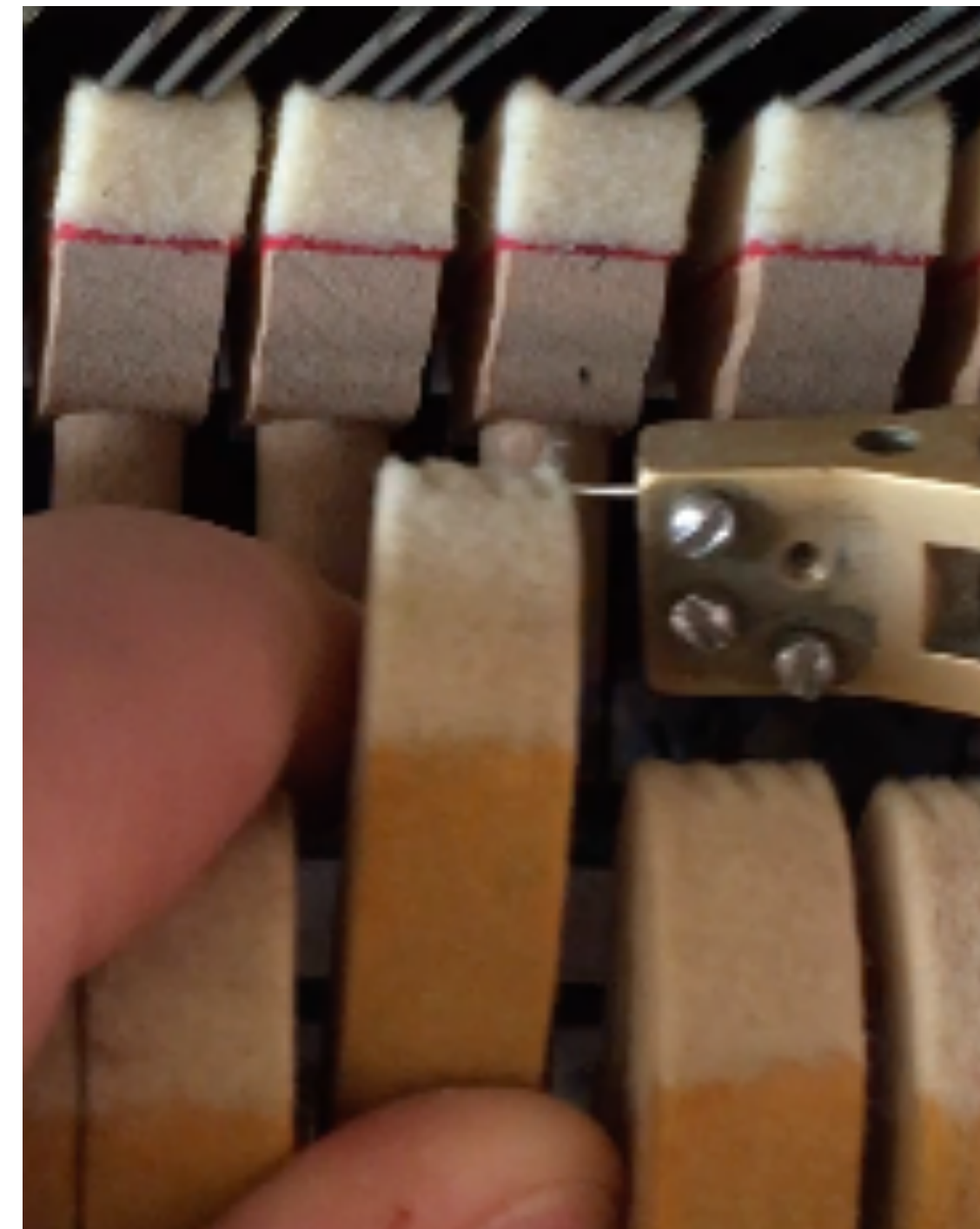
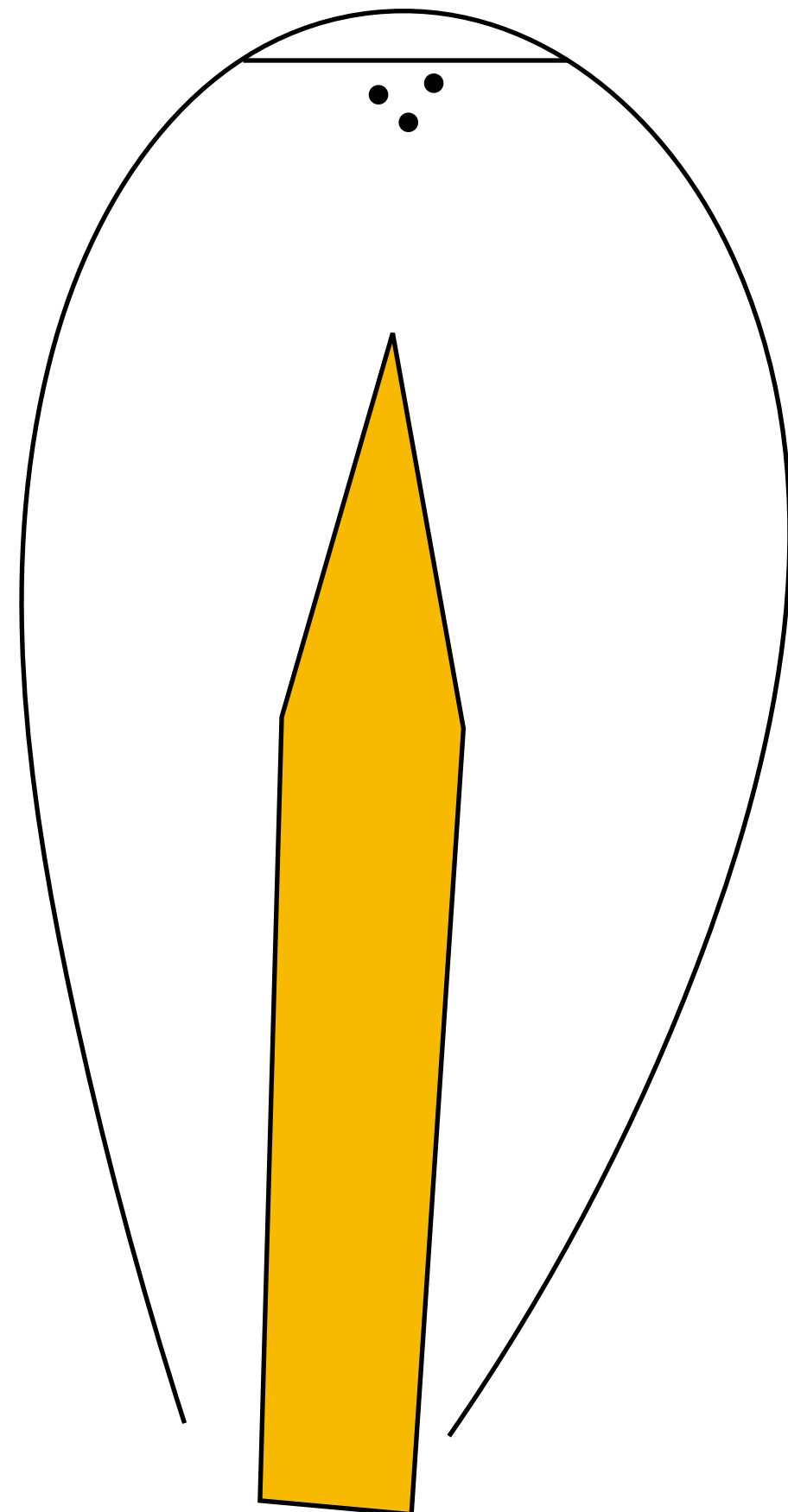
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## Side Needling

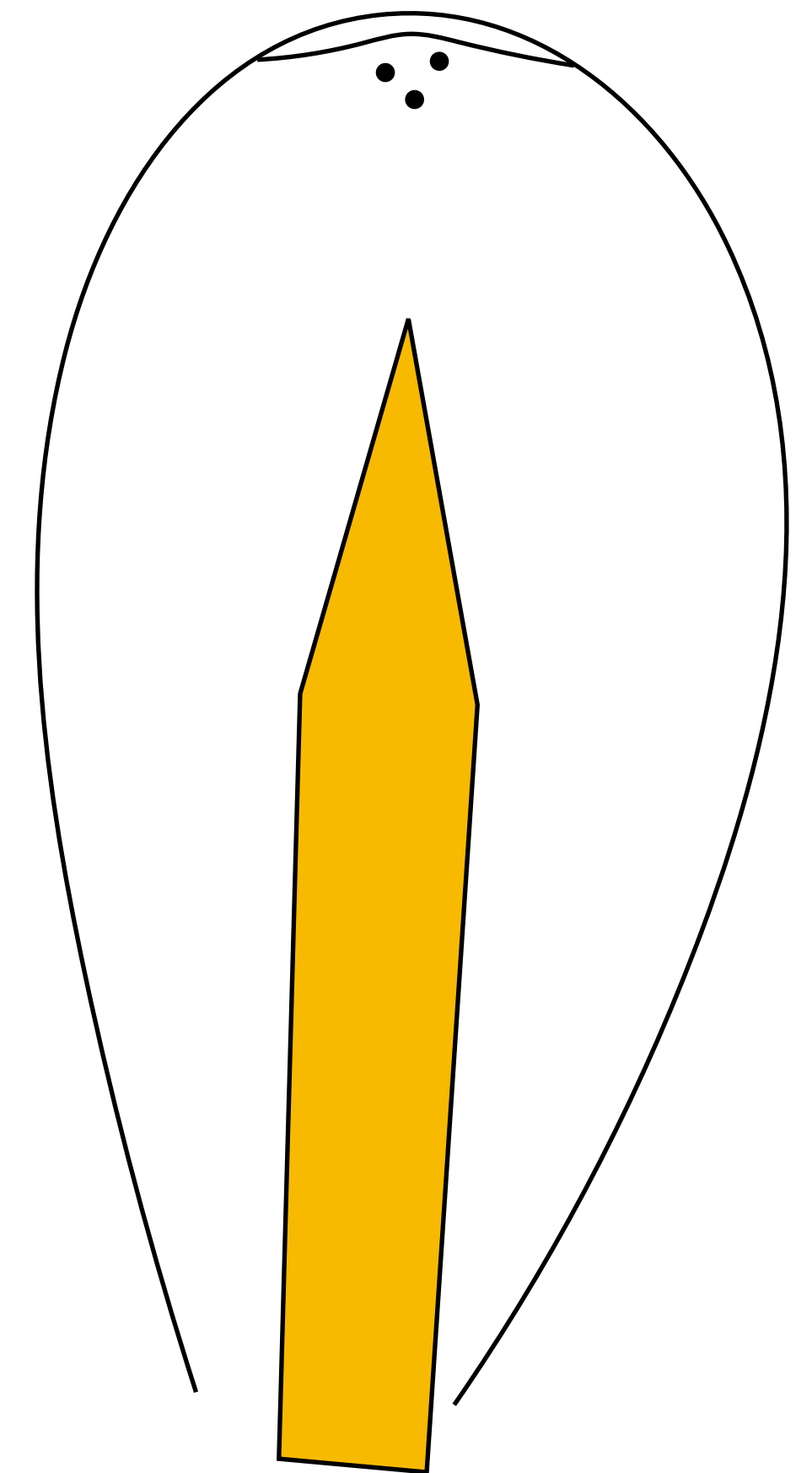
Grooves have a flat bottom.  
The flatness "slaps" the  
string making the tone  
harsh.



Side needle right under  
the strike point to improve tone.



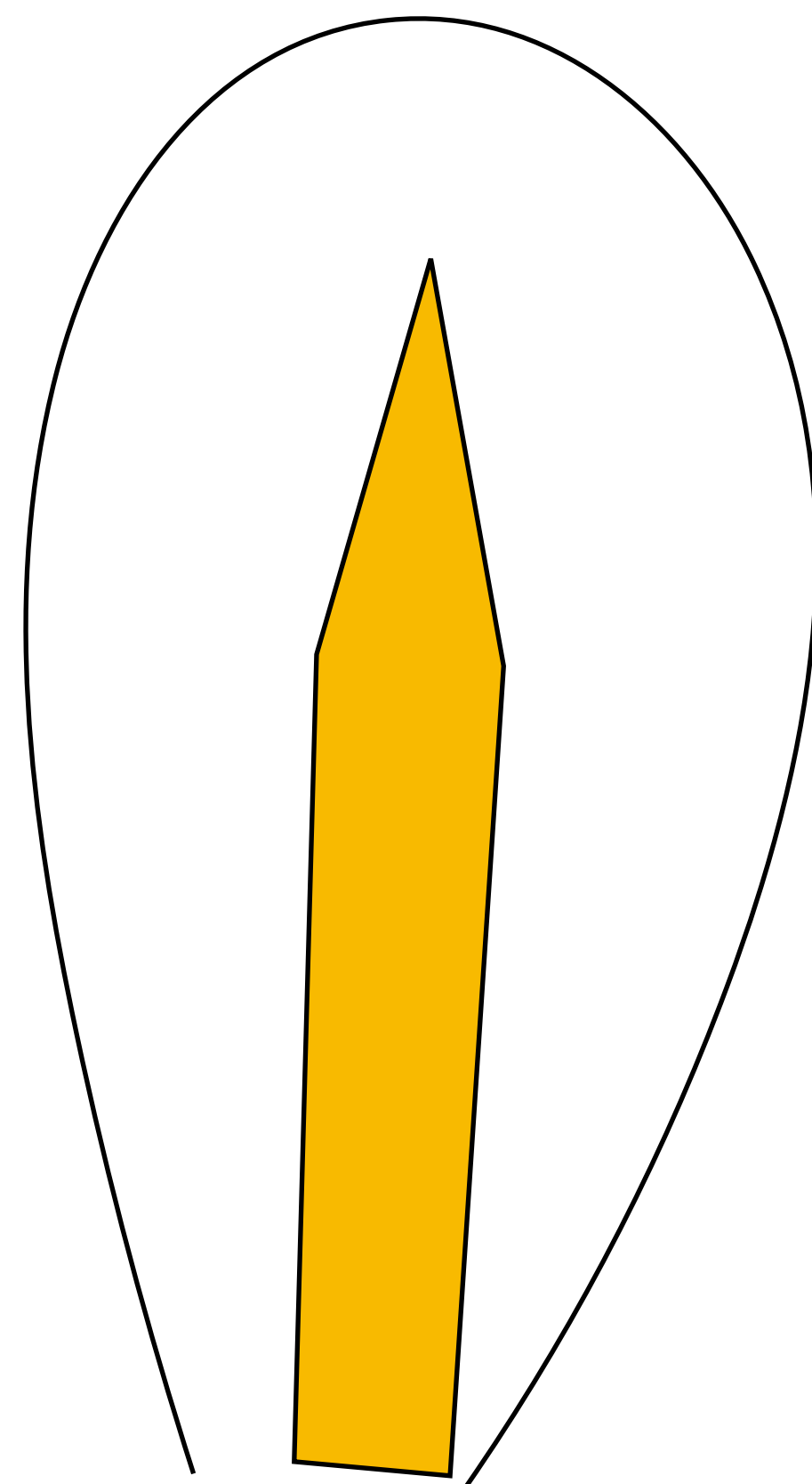
The needling raises the felt  
right at the strike point and the  
flatness is destroyed. The  
rounder surface tames the  
tone.



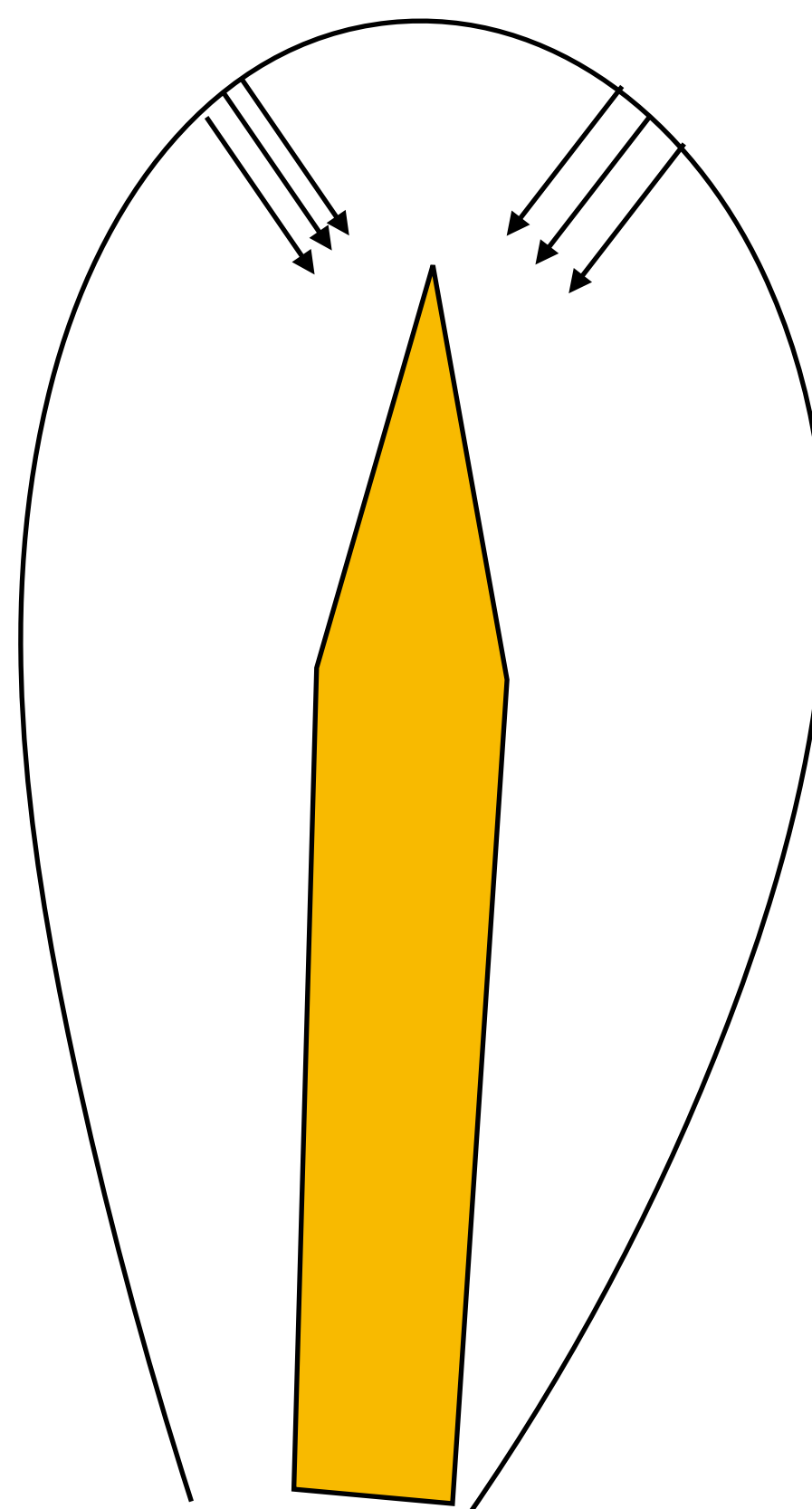


## Shoulder Needling

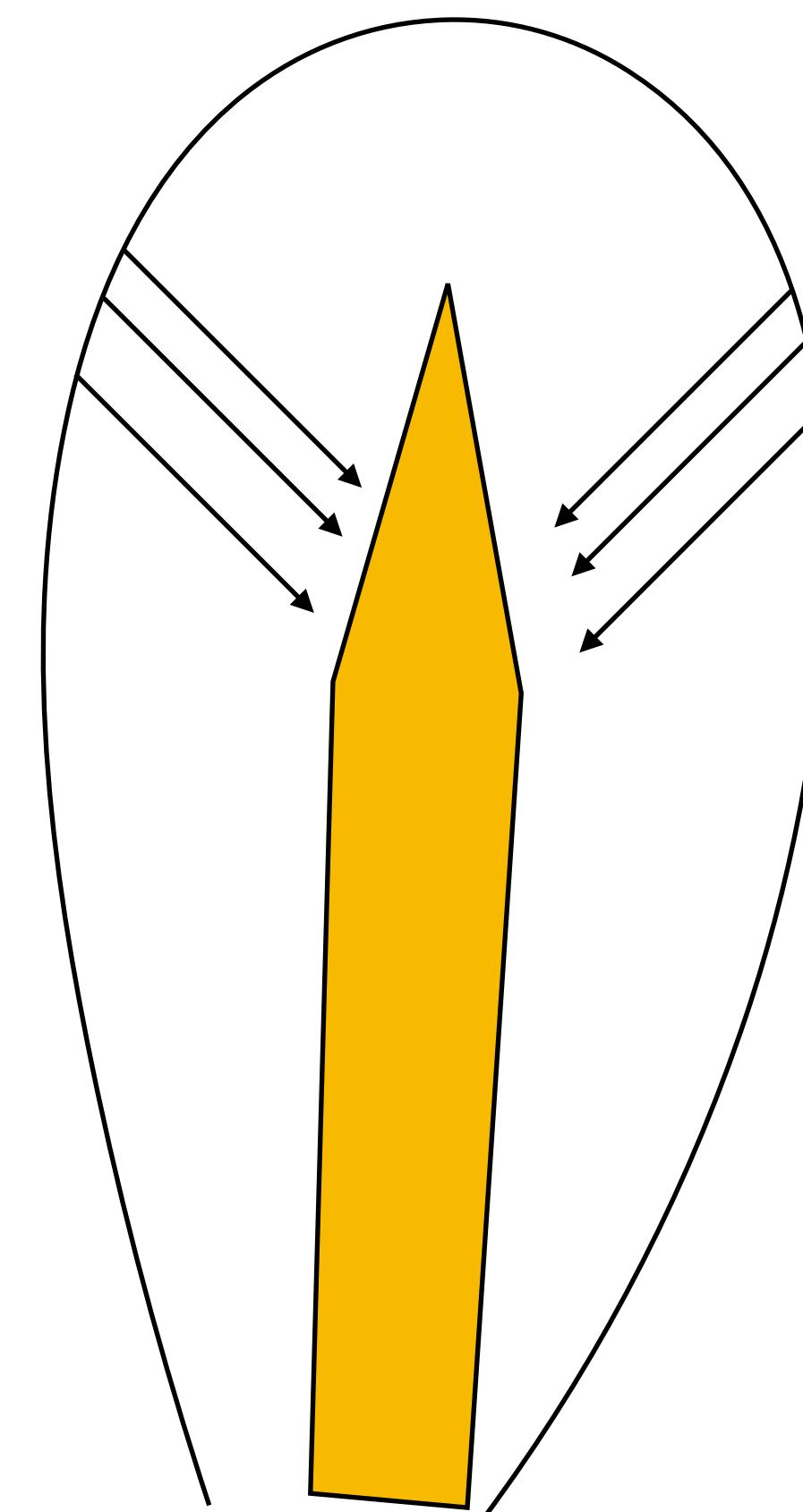
Sometimes, the tone is good on pianissimo playing, but begins to spread on mf or f playing.



If that happens, try deep needling on the shoulders, near the strike point, but NOT on it.



Sometimes, the tone is good on pianissimo, and mf-f playing, but begins to spread on ff or fff playing.

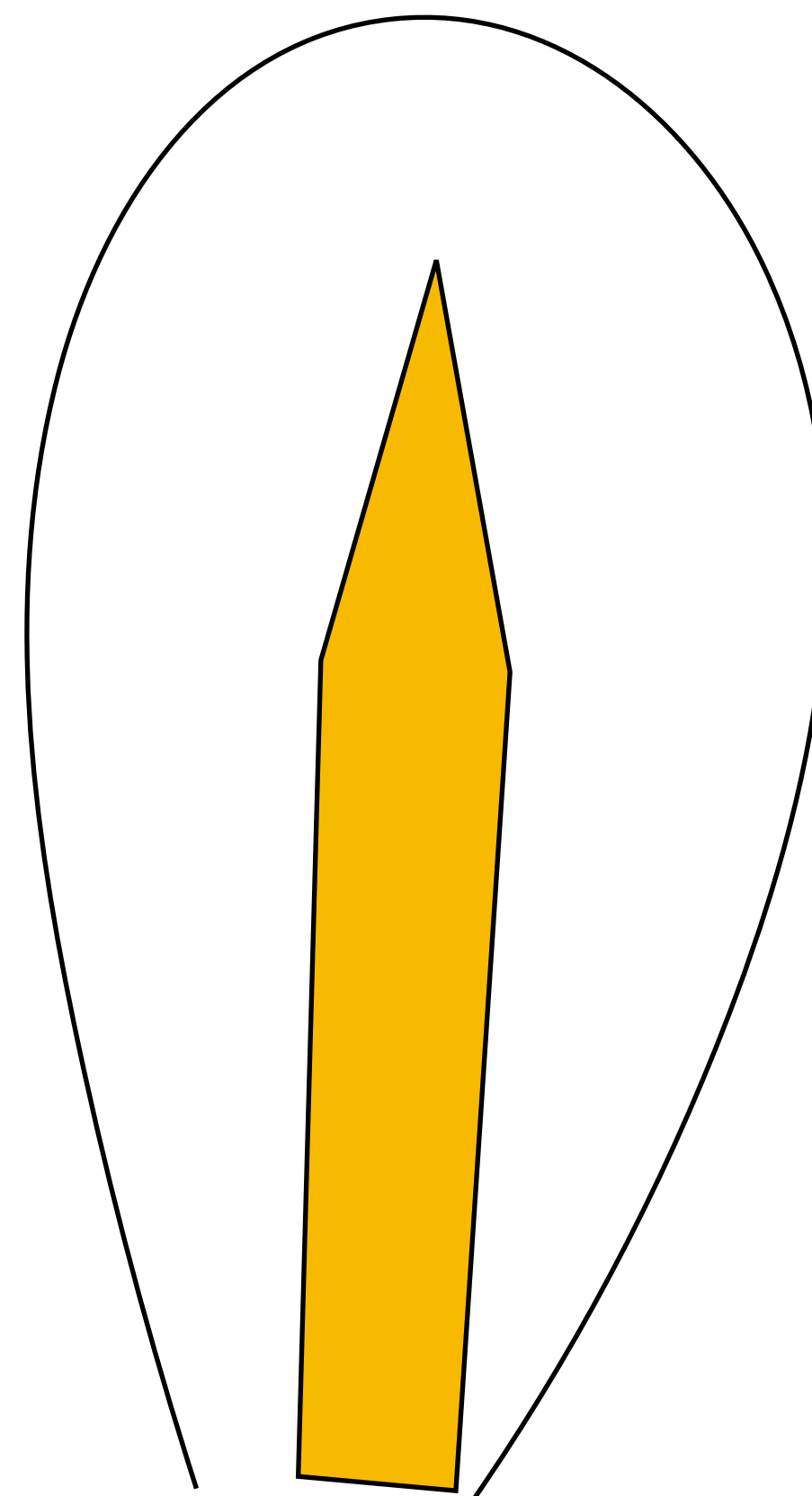


If that happens, try deep needling on the shoulders, farther down.



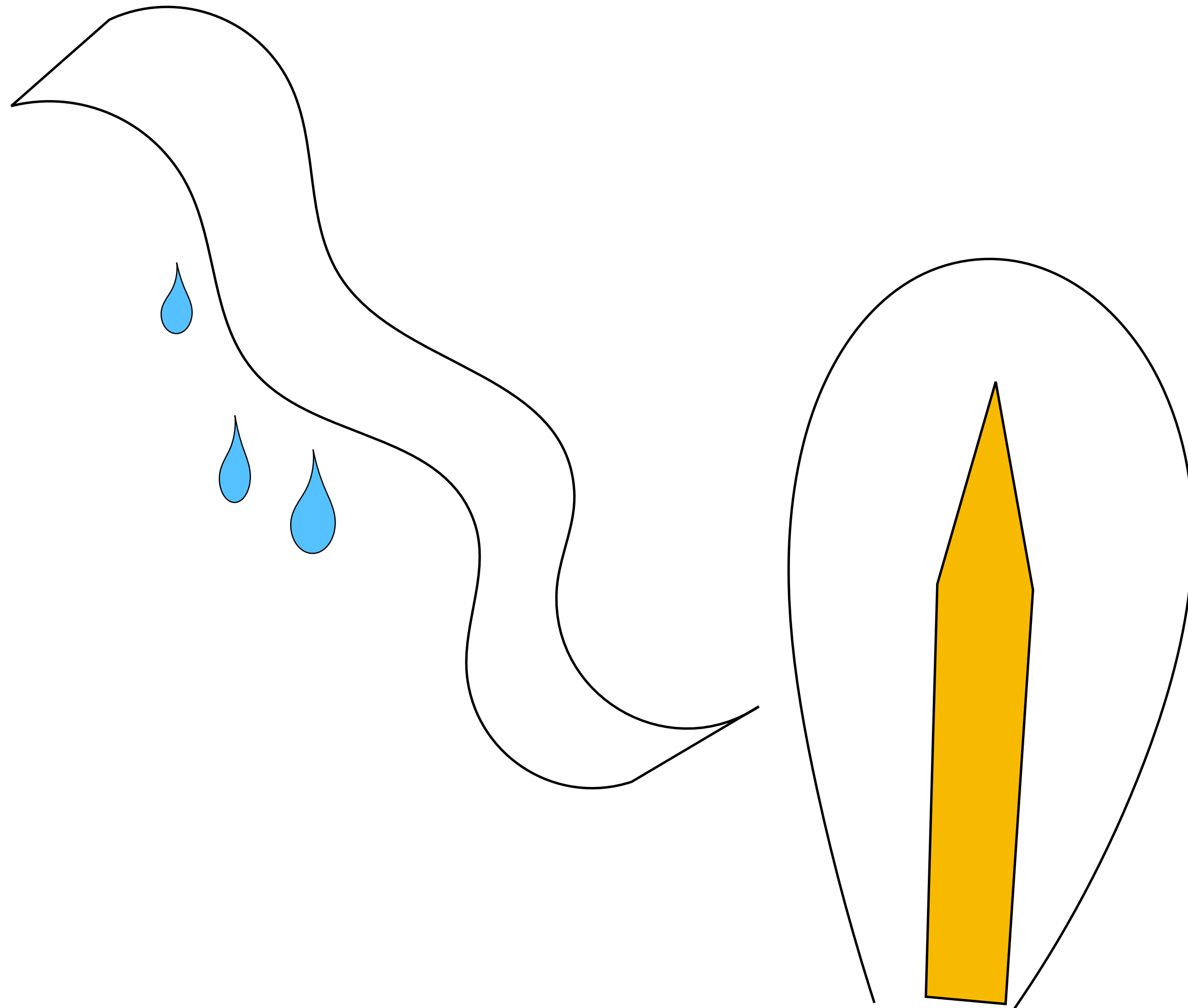
## Steam Voicing

Sometimes harsh tone can be tamed with steam.

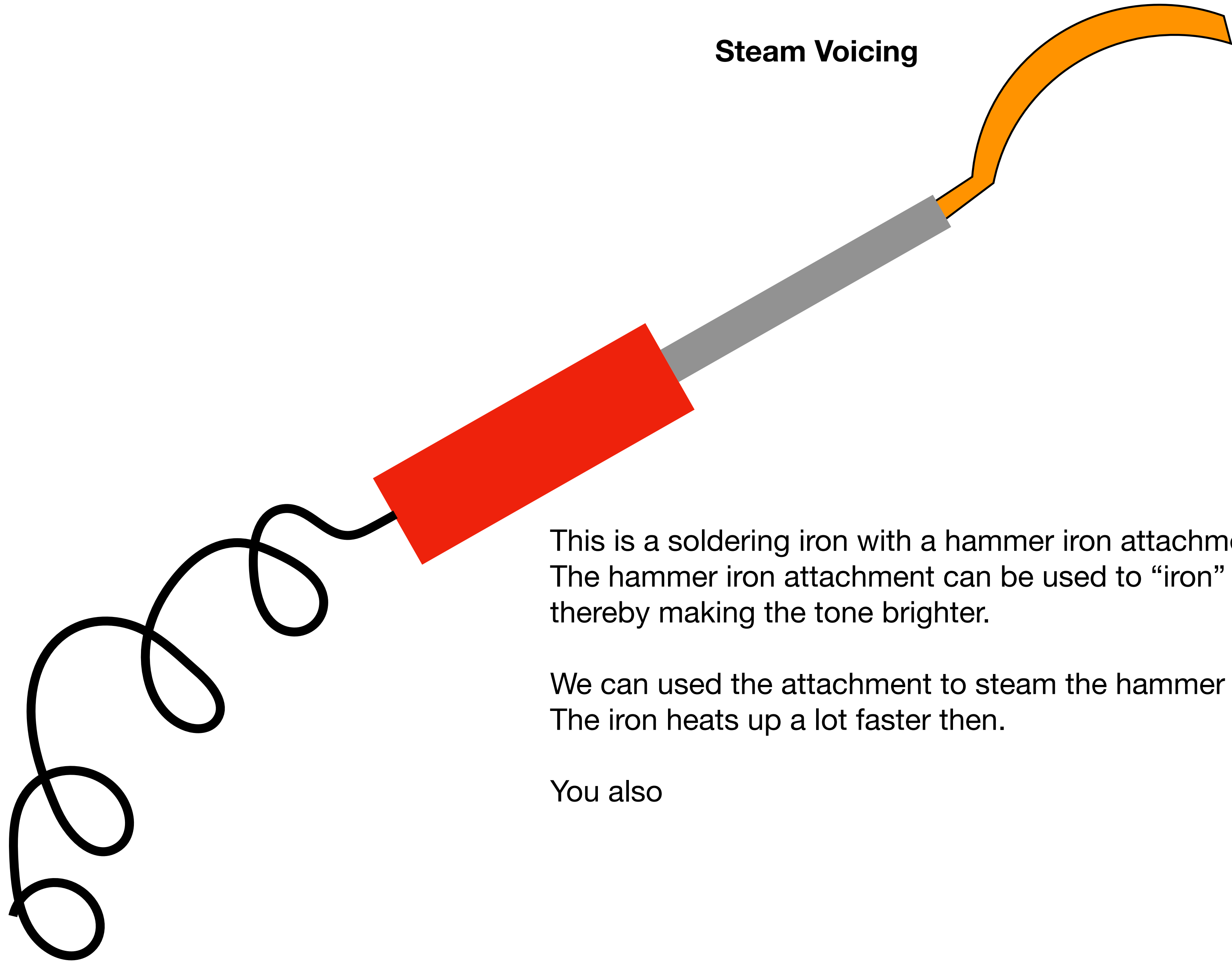


## Steam Voicing

Take a strip of bedsheet. Wet it and ring out all the water.



## Steam Voicing



This is a soldering iron with a hammer iron attachment. The hammer iron attachment can be used to “iron” hammer felt, thereby making the tone brighter.

We can use the attachment to steam the hammer but I prefer to remove it. The iron heats up a lot faster then.

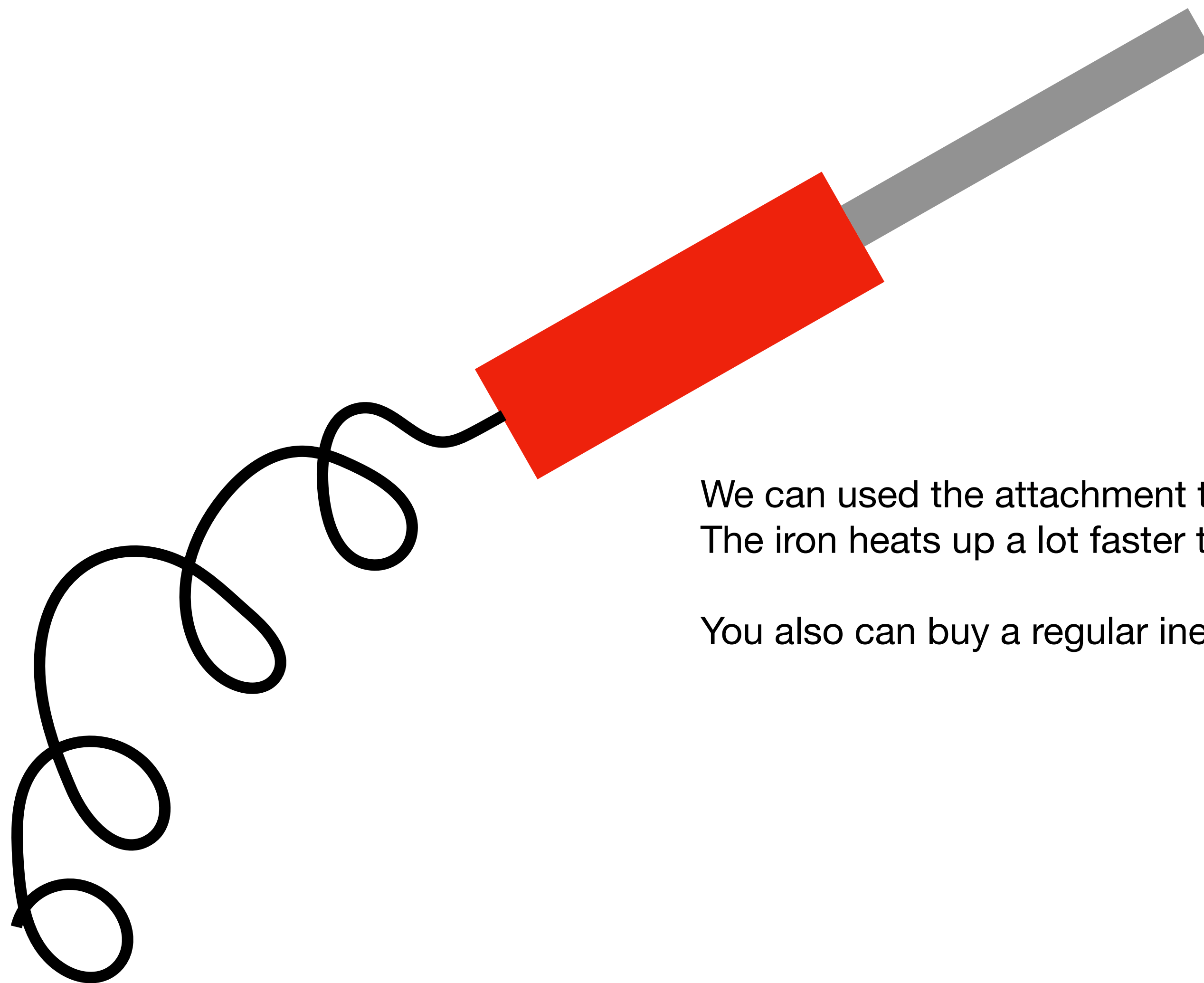
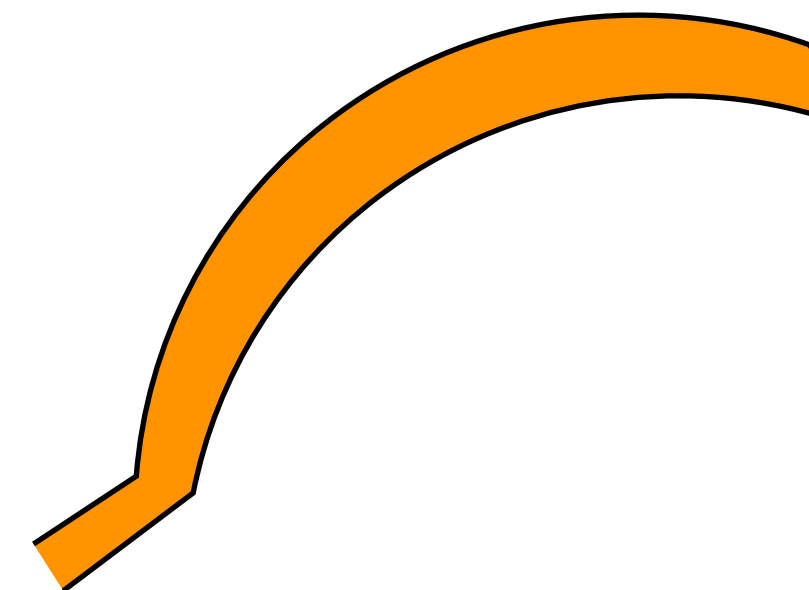
You also



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## Steam Voicing



We can use the attachment to steam the hammer but I prefer to remove it. The iron heats up a lot faster then.

You also can buy a regular inexpensive soldering iron. They do the same job.

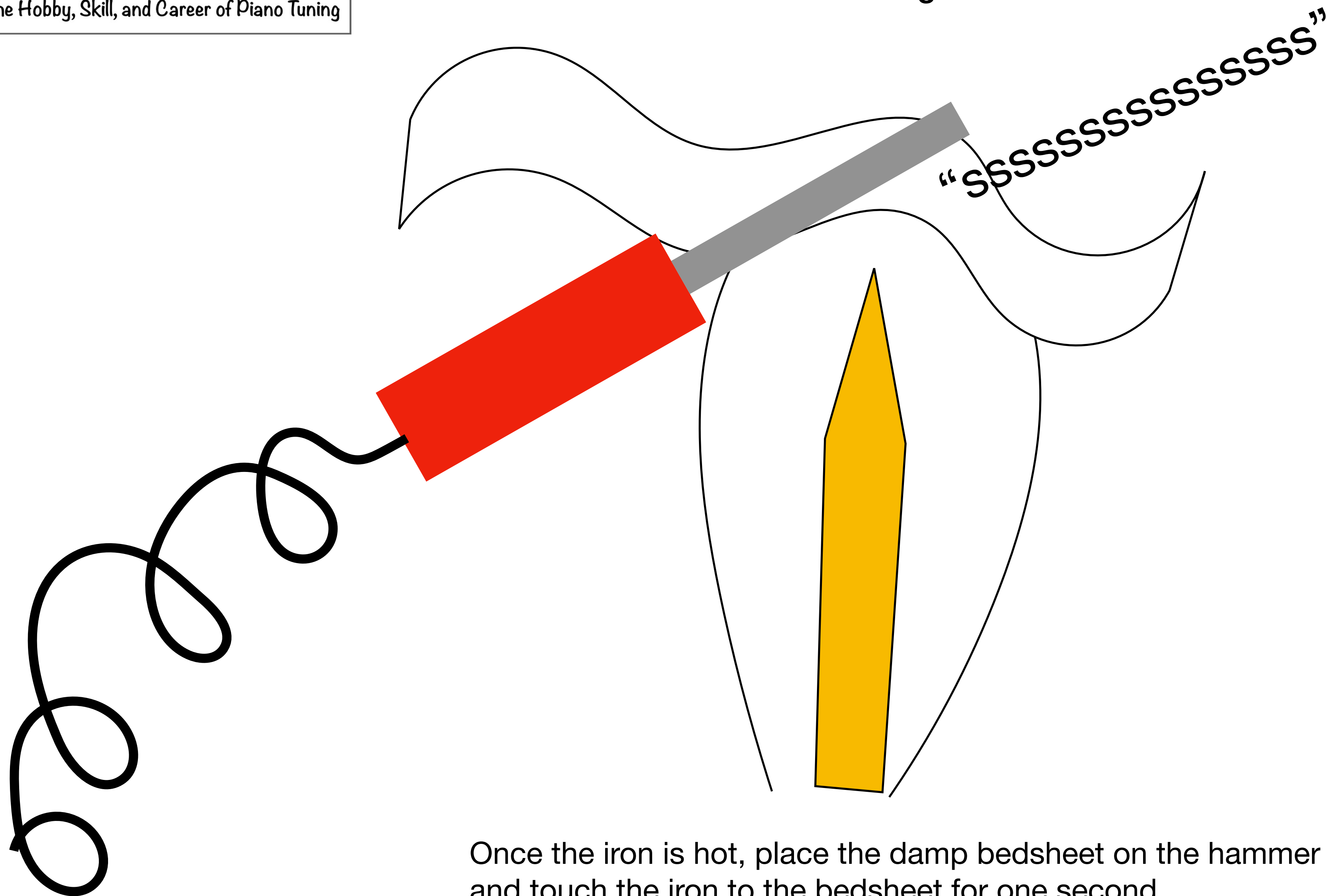




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## Steam Voicing



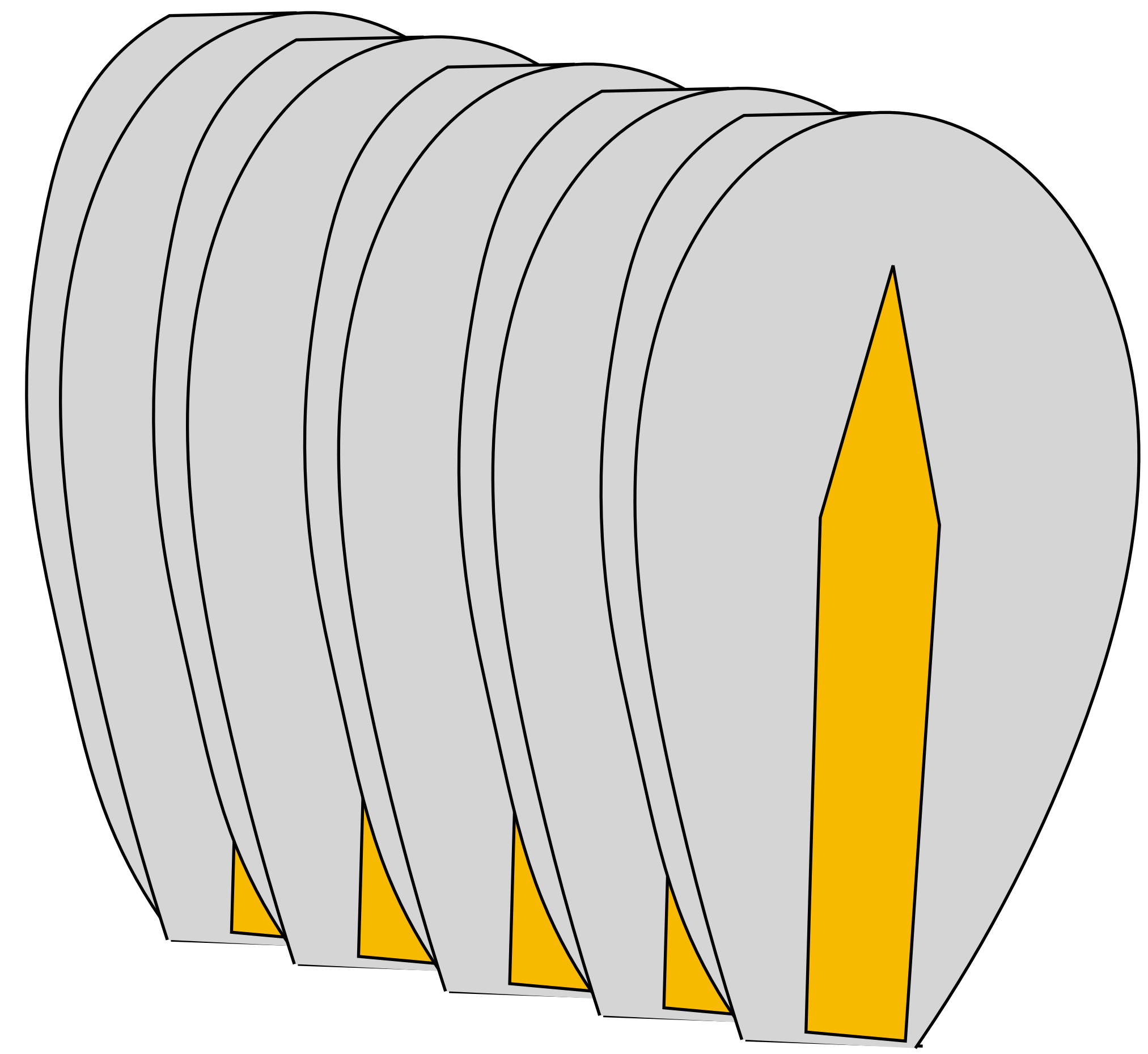
Once the iron is hot, place the damp bedsheet on the hammer and touch the iron to the bedsheet for one second.





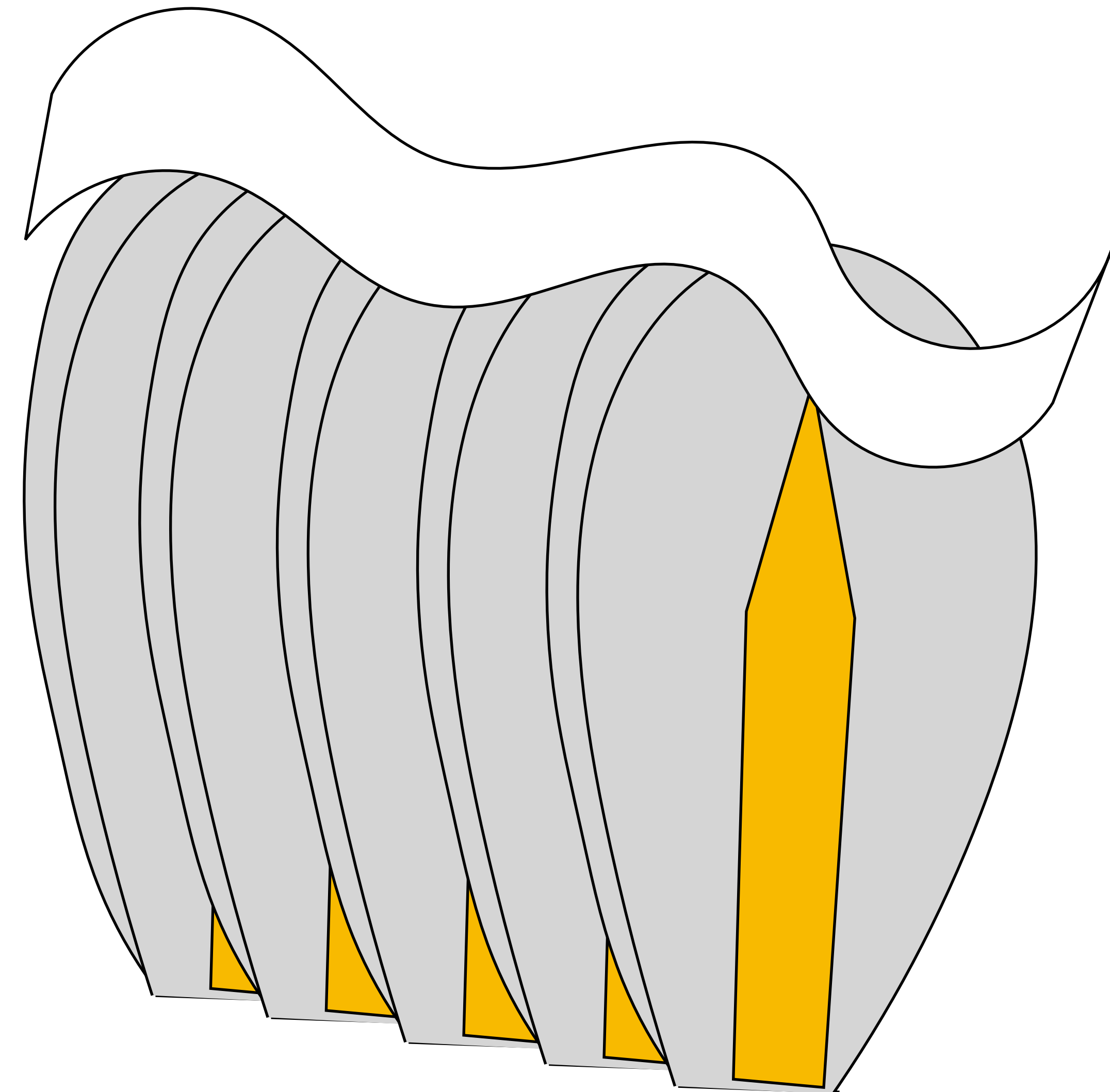
## Gang Steam Voicing

You can steam voice a whole row of hammers at once



## Gang Steam Voicing

Just place the bedsheet over a row of hammers.





## Other Voicing Techniques



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**Hammer Filing** - To remove grooves and improve tone.

When strings enter the grooves, sometimes they travel straight to the bottom of the groove without impedance and “slap” against the flat bottom. The tone is harsh.

Sometimes the strings rub against the sides of the grooves and lose some of their energy, and the tone is muted.

A chromatic scale may sound something like: ding - dang - dong - dong - doong - dang - ding - dong - doong, etc. The tone is not even. A customer may be convinced to have their hammers filed if you can convince them that the tone will be more even after.

**Hammer Hardener/Softener** - liquids that can be applied to the hammer to make them brighter or softer in tone.

These can be powerful and must be used with caution.



### Spectrum of Tone

Imagine a spectrum of tone from bad to good.



**Bad**

**Good**



# Spectrum of Tone

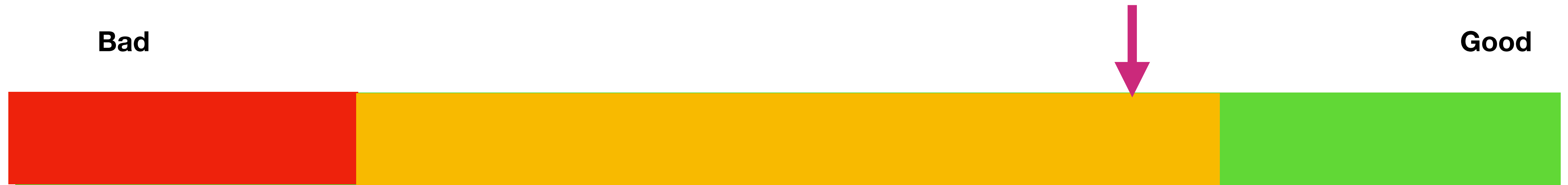
When you come to a hammer, you can make a judgement on where the tone is within that spectrum.



## Spectrum of Tone

But each hammer only has a small range of tonal possibilities based on felt quality, soundboard, bridge design, etc.

And when you find the tone of a hammer, you have no idea where it is in the actual hammer's potential.



# Spectrum of Tone

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And when you find the tone of a hammer, you have no idea where it is in the actual hammer's potential.

It could be here...





# Spectrum of Tone

But each hammer only has a small range of tonal possibilities based on felt quality, soundboard, bridge design, etc.

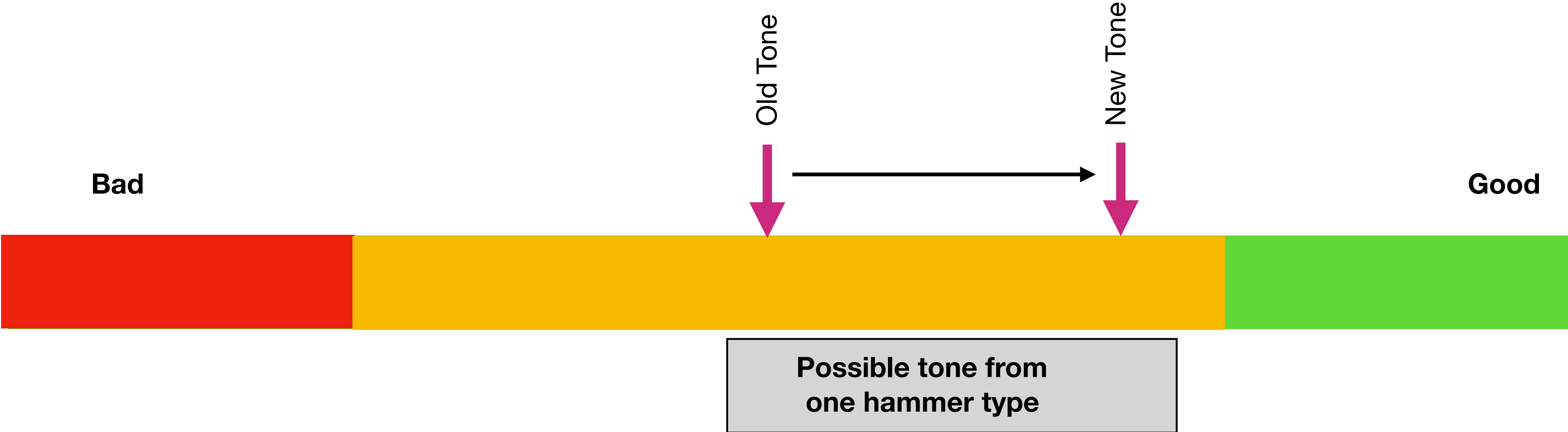
And when you find the tone of a hammer, you have no idea where it is in the actual hammer's potential.

It could be here...or here



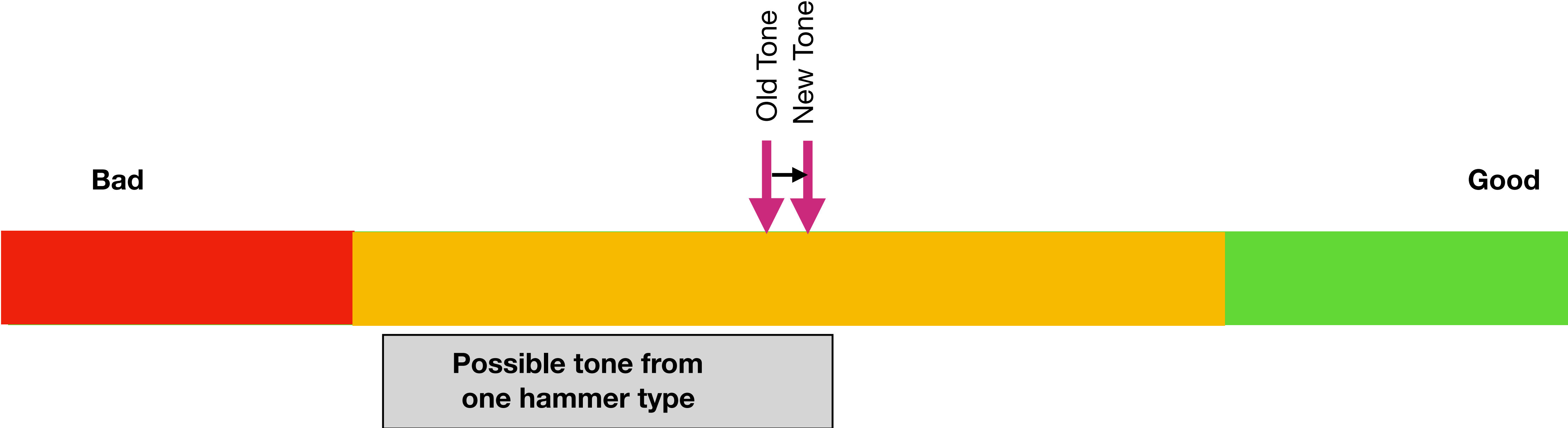
# Spectrum of Tone

Once you start trying to improve the tone, you may be very successful...



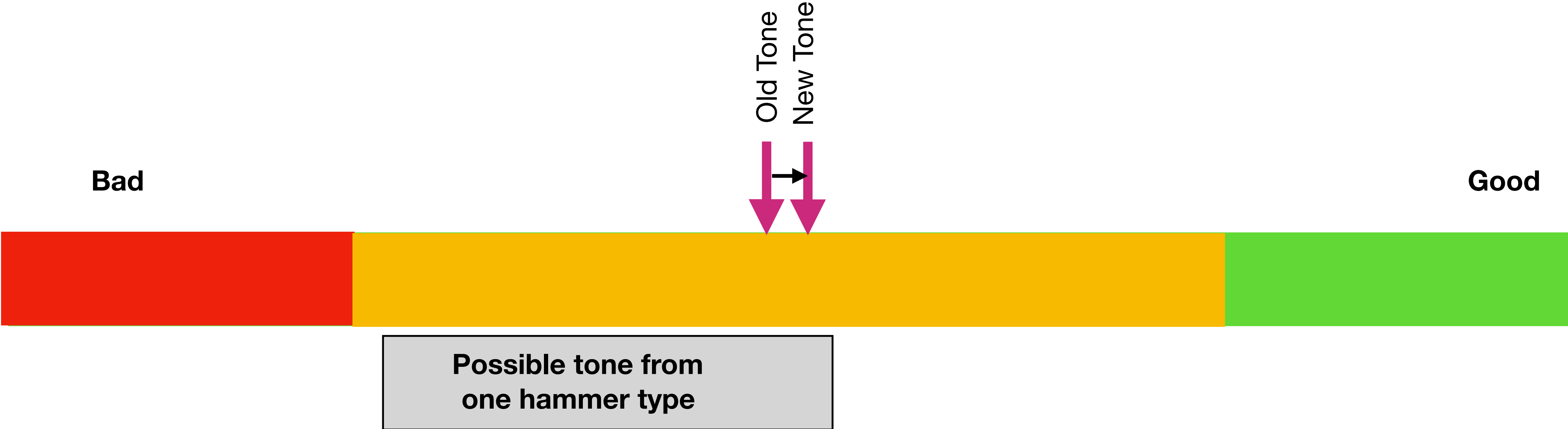
# Spectrum of Tone

Once you start trying to improve the tone, you may be very successful...or not



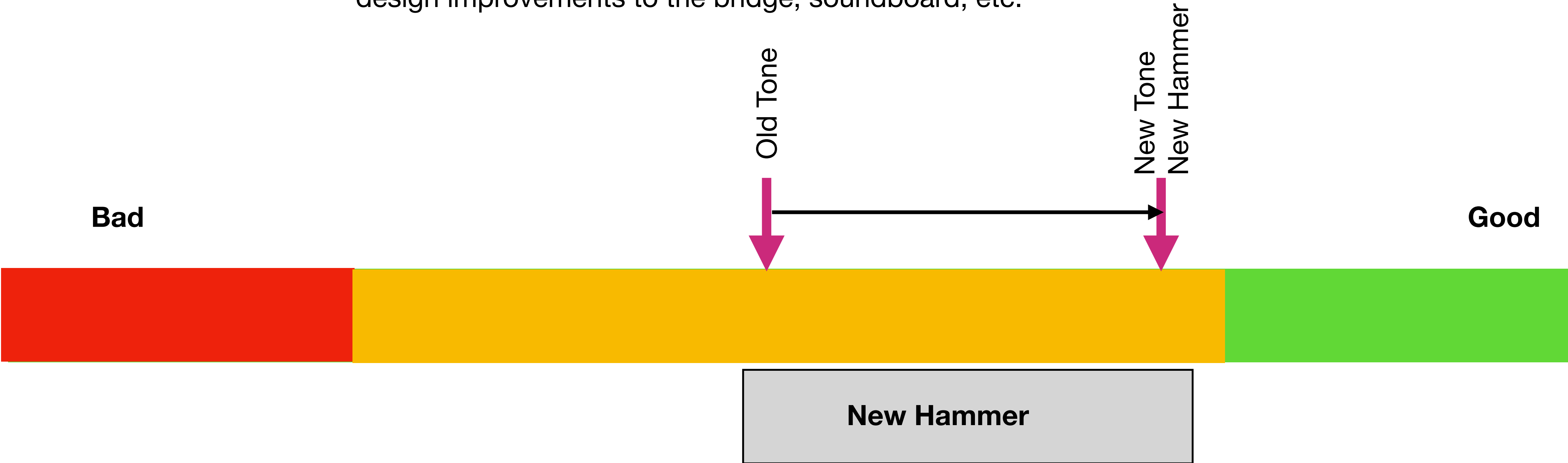
# Spectrum of Tone

It depends on where the tone is within the hammer's potential.



# Spectrum of Tone

If you can't improve the tone much, you may need to replace the hammers or do other design improvements to the bridge, soundboard, etc.



## CARDINAL RULE OF VOICING

When you try to improve the tone of a hammer, a small effort can result in a big improvement, or it can result in no improvement.

In either case, there should be no more effort made.

A little effort that makes a good improvement, will NOT make a bigger improvement if you do it more.

A little effort that makes no improvement, will NOT make an improvement if you do it more.

In both cases, more effort may hurt the tone.

*When trying to improve tone, try a bit of a technique and move on. Don't over do it.*

**Bad**

**Good**



**Possible tone from  
one hammer type**



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