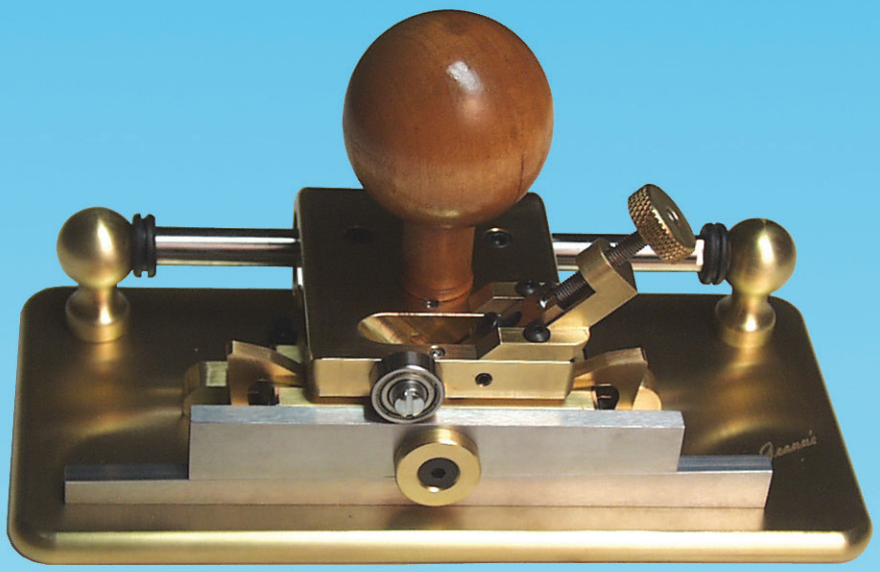
Jeanné

Gouging Machine Assembly and Setup



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Introduction

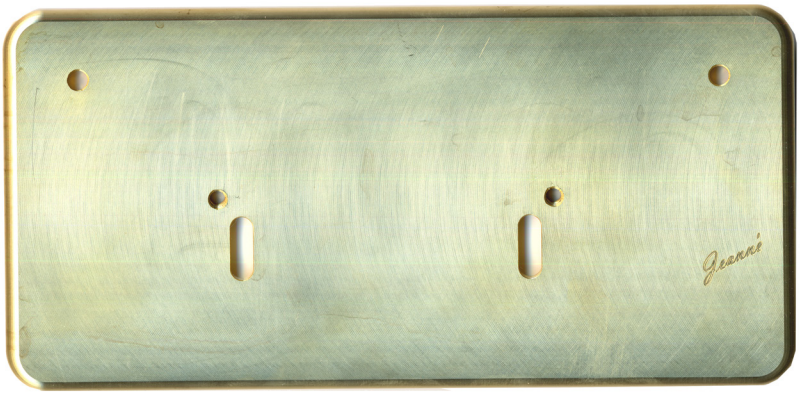
To Marcel Tabuteau the gouge was probably the most important aspect of reed making, influencing the performance characteristics of the finished reed. John Mack told many stories of Tabuteau's pursuit of the perfect gouge and the box of blades that Tabuteau had that were ground down beyond a useful point. He told of one instance where Tabuteau had a gouge that he particularly liked. John took it upon himself to gouge ten pieces of cane on this machine and set it aside. After thirteen weeks, suddenly the reeds would no longer seal. Had the machine been changed? John gave Mr. Tabuteau the ten pieces of cane from the first week. They also produced reeds that would not seal. Nothing had changed over those thirteen weeks other than the climate. This story illustrates how much the gouge can be influenced by climate change.

After almost thirty years of working on gouging machines, I still find it fascinating. Every gouge gives different results. I always try to have several machines setup for my own use. I have some gouges that work better in winter and some that work better in summer. I use a different gouge for orchestral playing versus playing solo or chamber music recitals. I find that I need a different gouge for my AK Royal oboes versus my regular AK oboes. When I am on concert tours, I take cane from different gouging machines with me, not knowing what will work best in each locality. I would not expect a gouge that works well in New Orleans to work equally well in Denver. I always use the same shaper tip, since it is the shape that has more control over pitch placement. The gouge is the one aspect of reed-making, where I like to experiment. It makes no sense to me that anyone would not want to have the ability to control the one aspect of reed making that probably has the most influence.

Today, the gouge is probably the least understood aspect of oboe reed making. While the shape controls pitch placement, the gouge affects the overall stability of the reed as well as its response, timbre, dynamic flexibility and tip opening. Being able to control the gouge allows you to take your reed making to a new, higher level. You probably have tried many gouges over the years and have some idea of what you want. By the time you decide to invest in a gouging machine, you should have already selected a shaper tip that you like. In general the narrower the shaper tip that you are using, the heavier the sides of the gouge should be. Don't be afraid to experiment.

Valarie Anderson

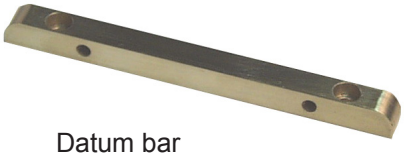
GOUGING MACHINE PARTS



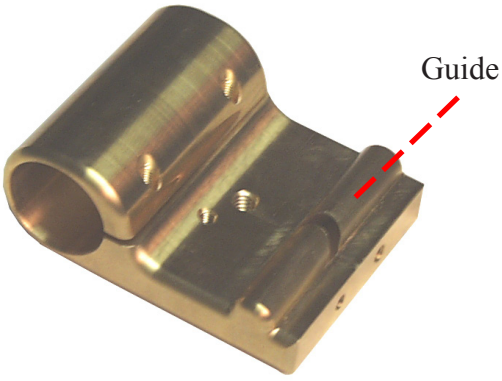
Gouging machine base

Bearing rod support set
(left and right side)

Gouging machine bed



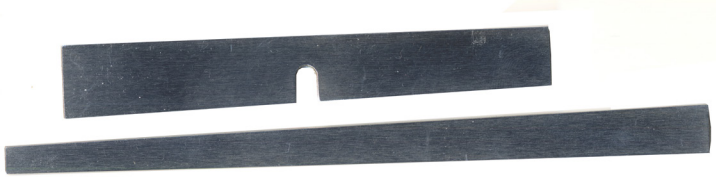
Datum bar



Gouging machine carriage

Bearing rod

Blade adjustment
bracket



Parallel bar set

Eccentric bearing assembly
(contains 3 pre-assembled parts:
2 linear ball bearings inside an eccentric insert with 2 retaining rings)

GOUGING MACHINE PARTS

Eccentric wrench

Radial ball bearing

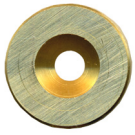
Grommet (2)

Blade

Cane clip (2)

Cane stop (2)

Eccentric Wrench clip



Parallel lock washer

Knurled knob

Gouging machine handle

Brass cylinder (2)

Screws (actual size)

10-32 x 1″ socket head (2)

8-32 x 7/8″ socket head (2)

10-32 x 1/2″ socket head (4)

8-32 x 1/2″ socket head (2)

8-32 x 3/8″ socket head (1)

10-32 x 3/4″ flat head (1)

10-32 x 1/2″ slotted fillister (1)

6-32 x 3/8″ button head (2)

4-40 x 1/4″ button head (4)

10-32 x 1/4″ set screw (2)

8-32 x 1/4″ set screw (2)

drive screw (1)

Washer (2)

Extension spring

Blade depth adjustment screw

Blade adjustment pin

Cane clip mounting pin (2)

Tools and items that will be needed in the assembly and setup but are not included:

6 Hex keys:
1/16″, 5/64″, 3/32″, 1/8″, 9/64″, 5/32″

Hammer

Nail punch

Slotted screwdriver, 1/4”

Needle nose pliers with wire cutter

Needle file (5″, 0 cut)

Super glue, gel type

Flat equalling file (5″, 4 cut)

#400 Wet-or-Dry sandpaper

Norton emory paper #3/0 (A621)

Radius gauges (6mm, 4.5mm)

Small level

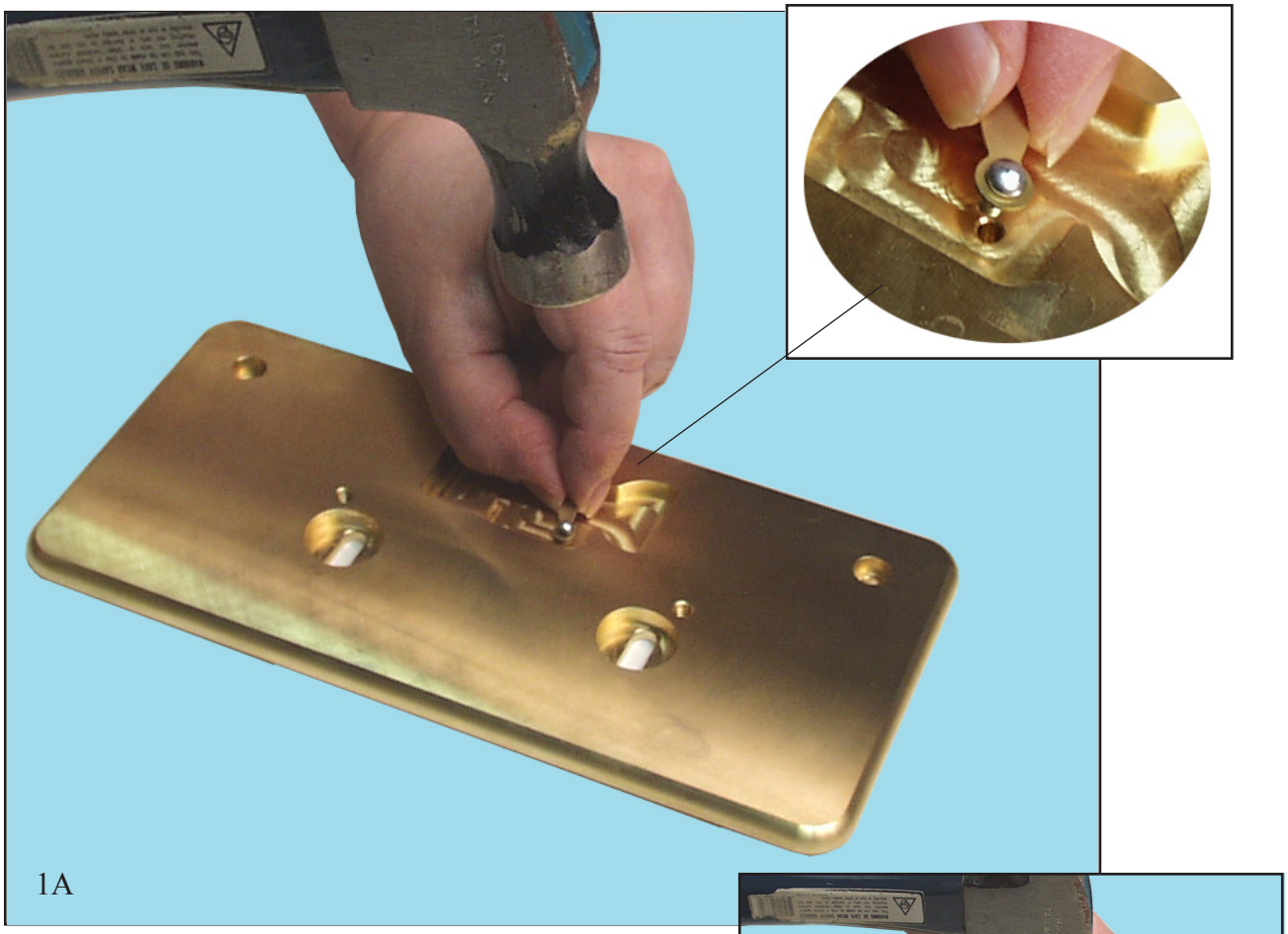
Metric ruler

ASSEMBLING THE GOUGING MACHINE

The Jeanne gouging machine is manufactured primarily from brass, which has a tendency to discolor over a period of time. For cosmetic purposes, some brass parts may be cleaned before assembly with a product such as Brasso®.

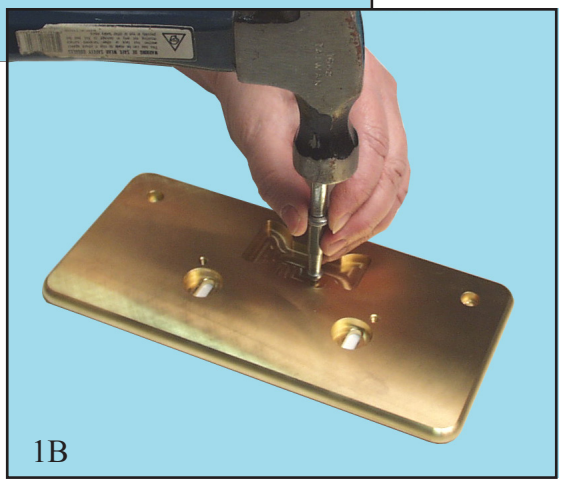
1. Installing the **eccentric wrench clip** on the bottom of **base**: The point of the brass clip has been bent upwards, which enables the clip to be moved over the wrench with more ease. To install, place the **drive screw** through the hole of the clip, ensuring that the tip flap is pointed upwards. While holding the point of the clip, line the screw up to the hole, as shown in "Detail View of 1A," pictured below. Lightly tap the screw in with a hammer.

Detail View of 1A



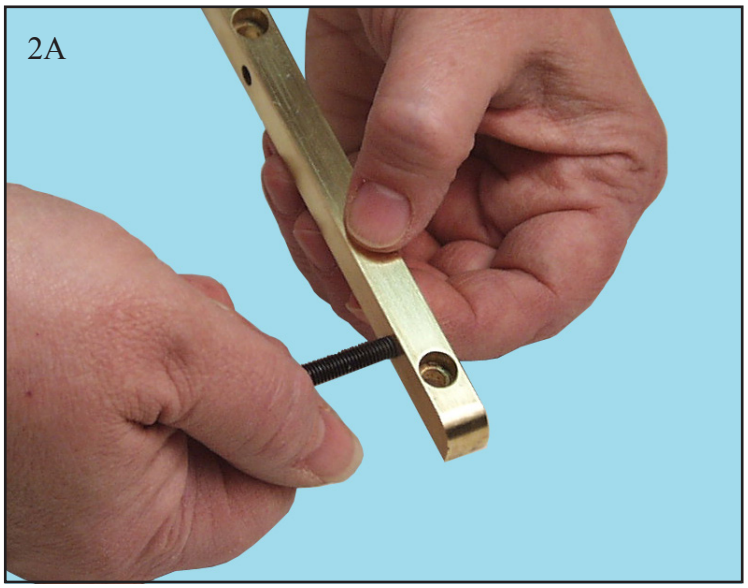
1A

Once the drive screw is partially inserted, use a nail punch set over the head of the screw, as shown in example 1B and hammer it in until it is tight. You should be able to move the clip with some resistance.

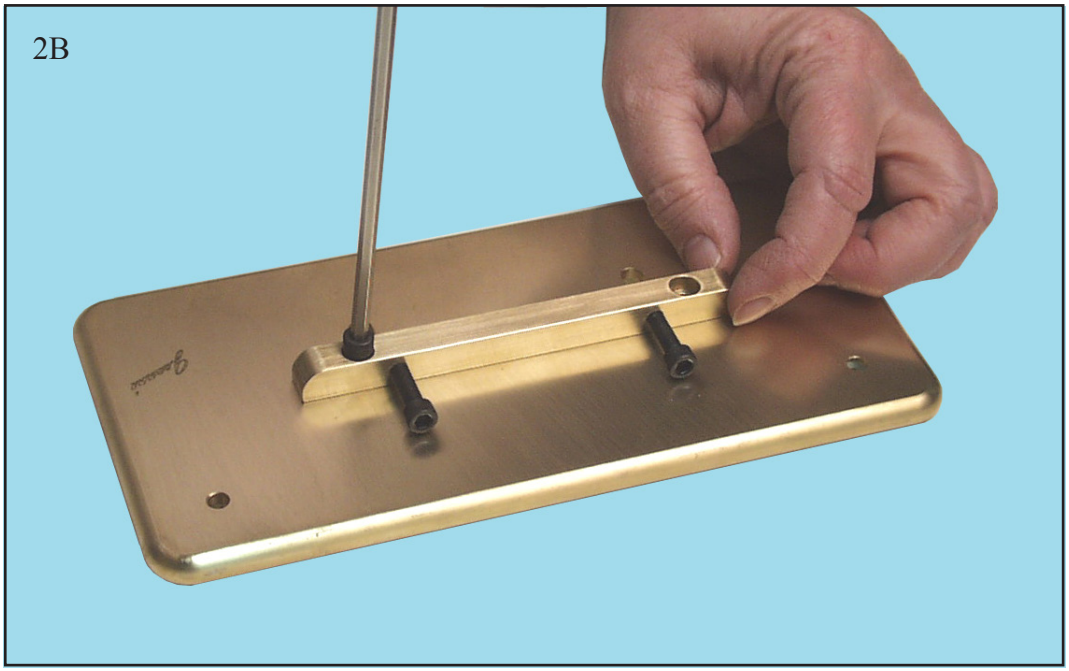


1B

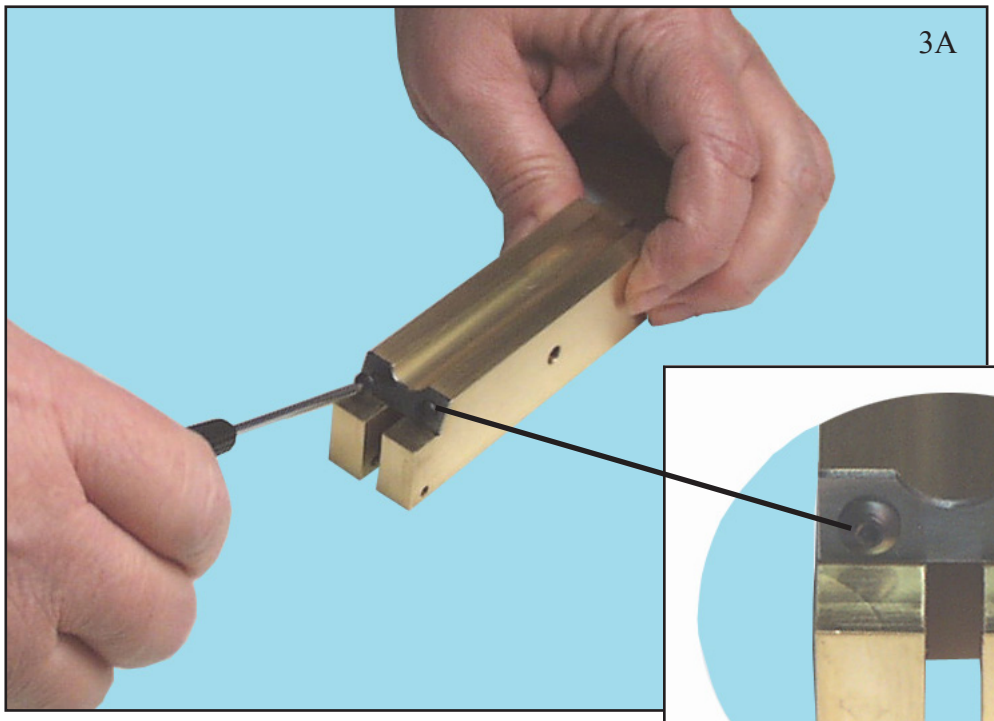
2. Installing the **datum bar**: Insert the two **10-32 x 1″ socket head screws** into the side of the datum bar, as shown in example 2A, far enough that they just clear the other side. Both sides of the datum bar are the same. Therefore, it does not matter from which side you start, as long as both screws are starting on the same side of the datum bar.

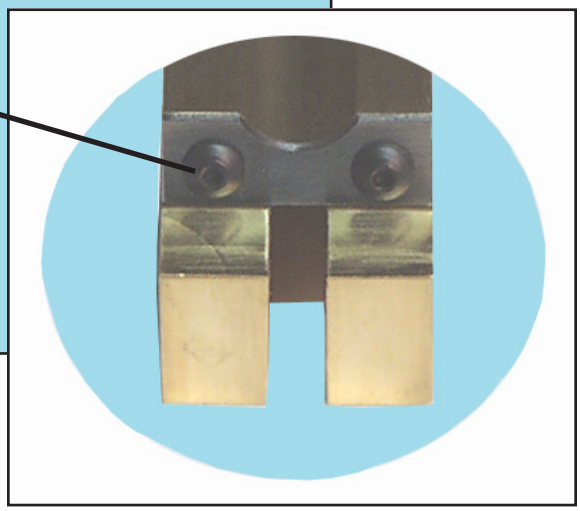


Next, place the datum bar on the top of the base, lining up the holes as shown in example 2B below. Ensure that the cap end of the screws are opposite the slotted holes on the base. Securely attach the datum bar using two **10-32 x ½″ socket head screws**. You will be using the 5/32″ hex key in this step.

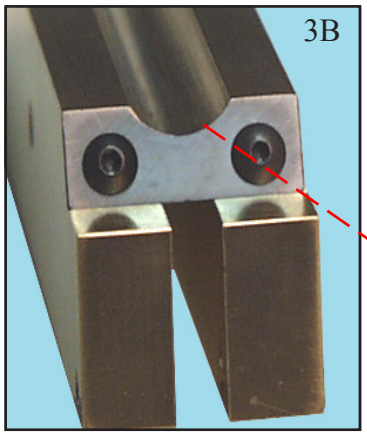


3. Mount the **cane stops** onto the **bed** using the four **4-40 x ¼″ button head screws** and 1/16″ hex key. It is essential that the beveled edge of the cane stops be to the outside, as shown in the "Detail View of 3A" pictured below.





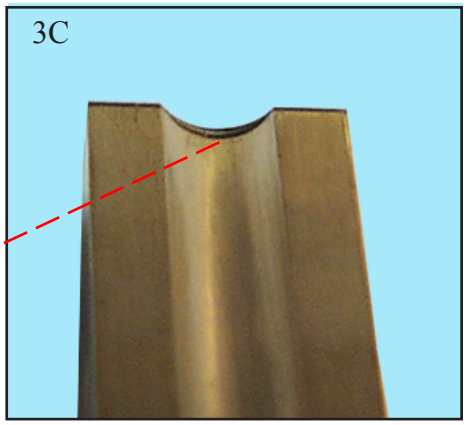
Detail View of 3A



Incorrectly mounted cane stop

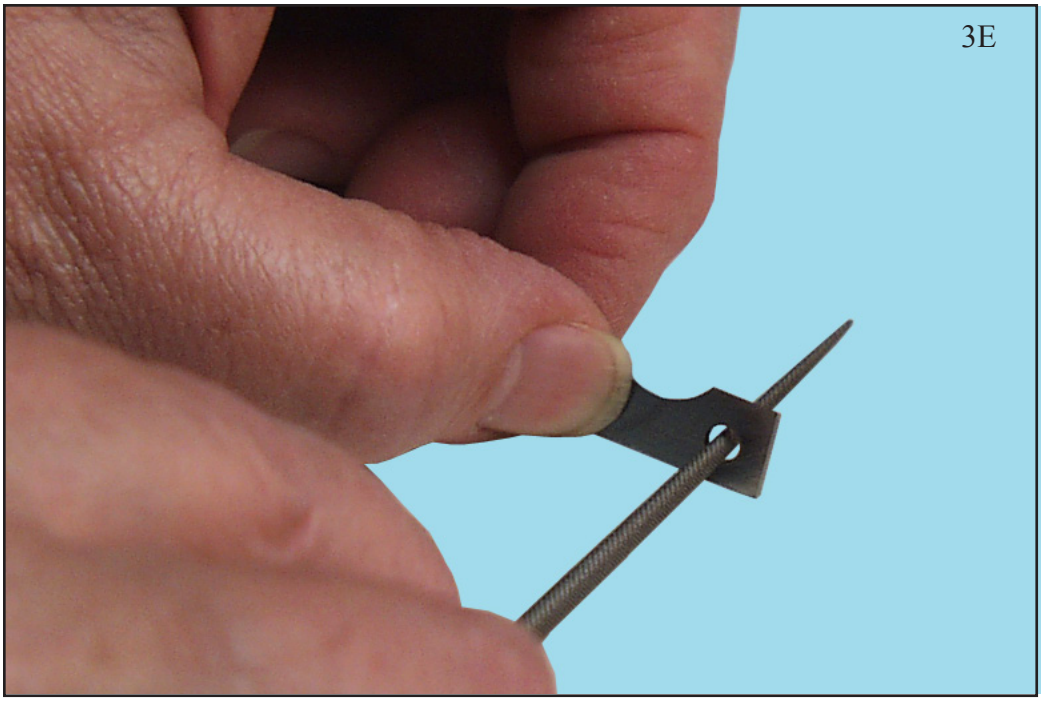
The cane stop will show above the bed well as a crescent, as pictured to the right in 3C. It must be positioned high enough that the cane does not flip out of the bed, but low enough that the blade will easily clear the top edge of the stop. Center the cane stop and securely tighten the screws.

Hint: Use a piece of gouged cane as a reference.

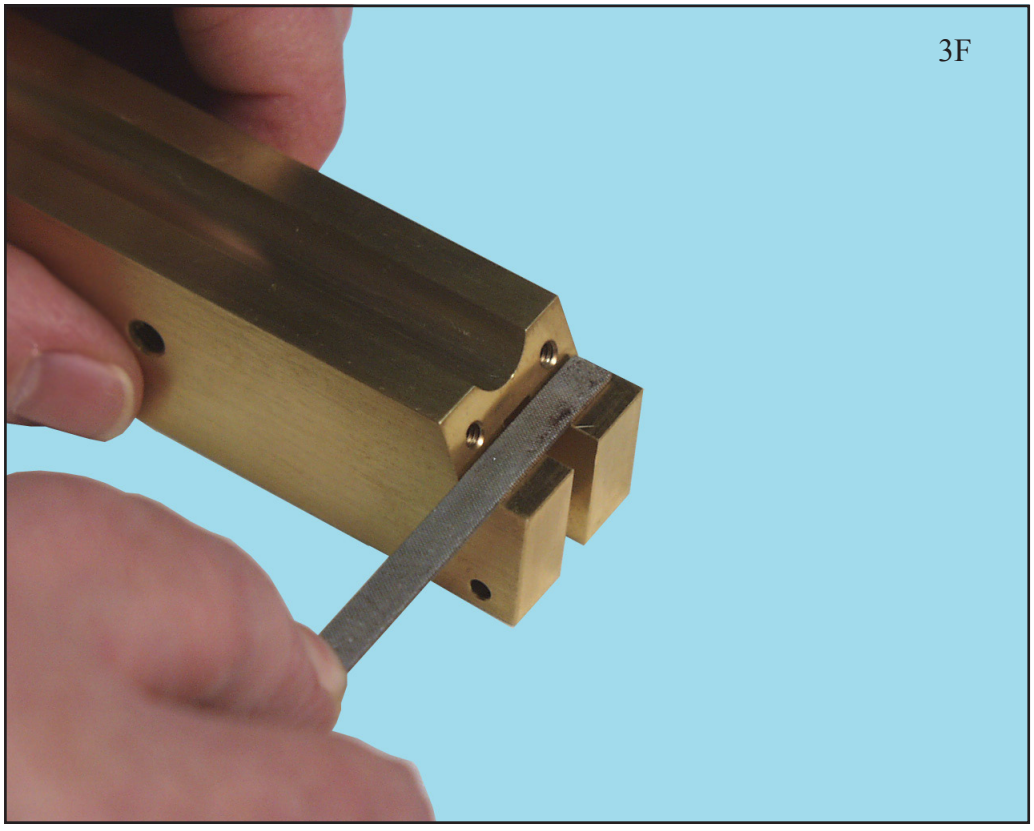


Cane stop appears as a crescent

If there is not enough of the crescent showing, it may be necessary to adjust the cane stop. If needed, extend the bottom edge of the holes in the cane stop using a needle file, as shown in example 3E. This will enable you to raise the stop higher. If the cane stops are not high enough, the cane will flip out of the machine as you are gouging.

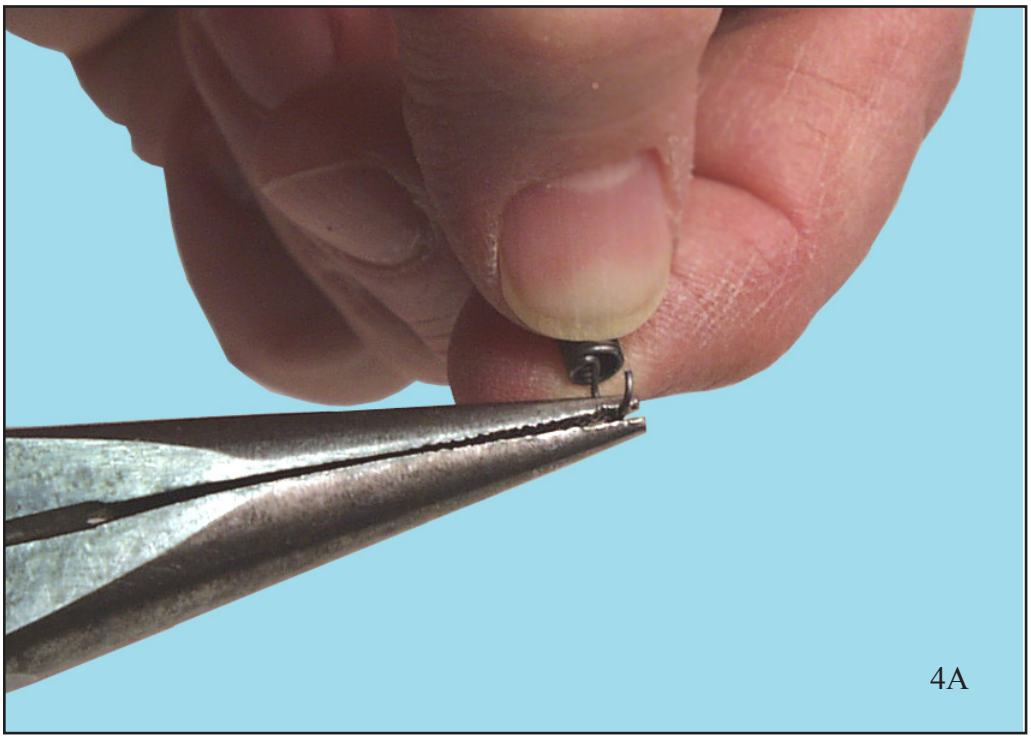


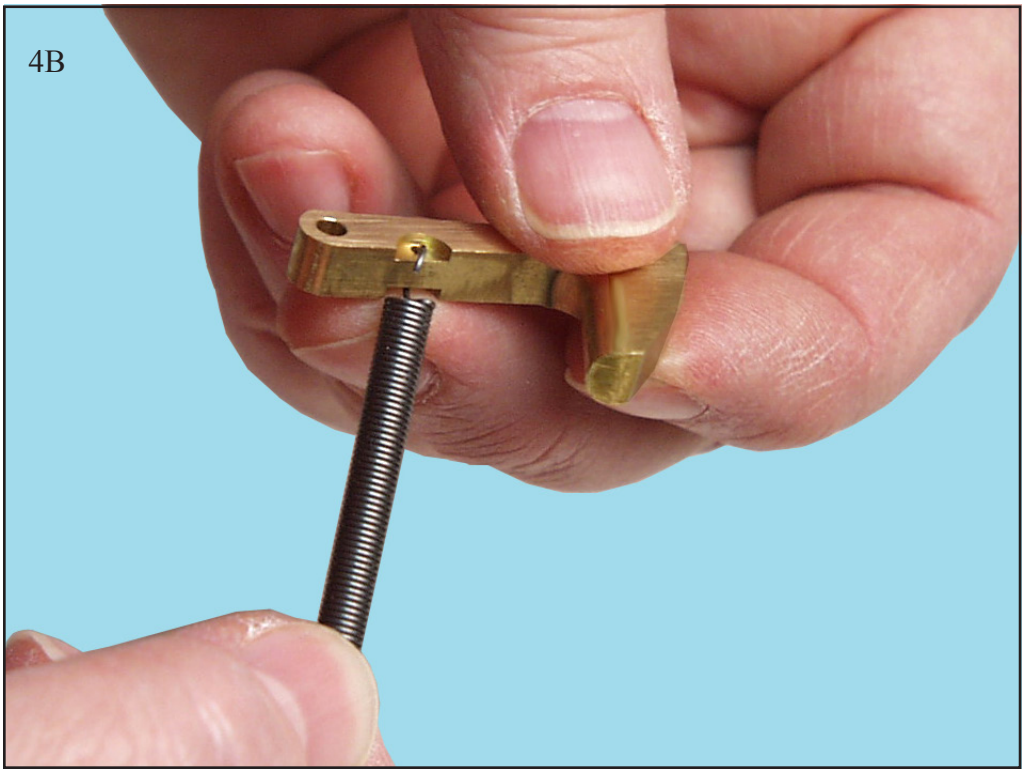
However, if the cane stops are too high, you run into the danger of chipping the blade on the stops. To lower the cane stops, you can file the base of the bed as shown in example 3F below. You would then enlarge the top edge of the holes in the cane stop, allowing you to move the cane stop to a lower position.



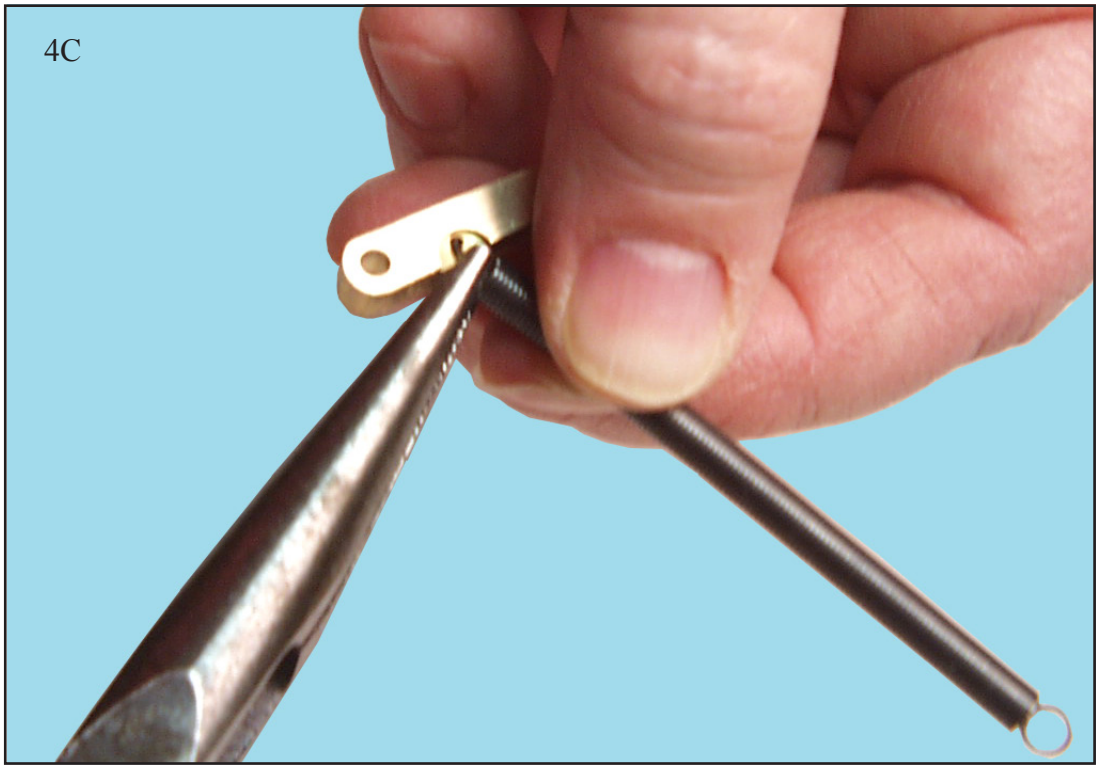
4. The **extension spring** controls the amount of tension with which the **cane clips** move while you are gouging. The cane clips are machined with a radius on the tip, the apex of which hits the center of the bed. This serves to stabilize the cane, keeping it in the center of the bed while gouging. The cane clips do not hold the cane in the bed and should not be overly tightened. Too much spring tension will only produce a sluggish machine action and will cause unnecessary wear on the **guides**. However, too little spring tension will make the cane clips ineffective.

Attach the spring to one of the cane clips. Using needle nose pliers, bend open the end loop as shown in example 4A and insert through the small hole on the inside of the cane clip as shown in example 4B.



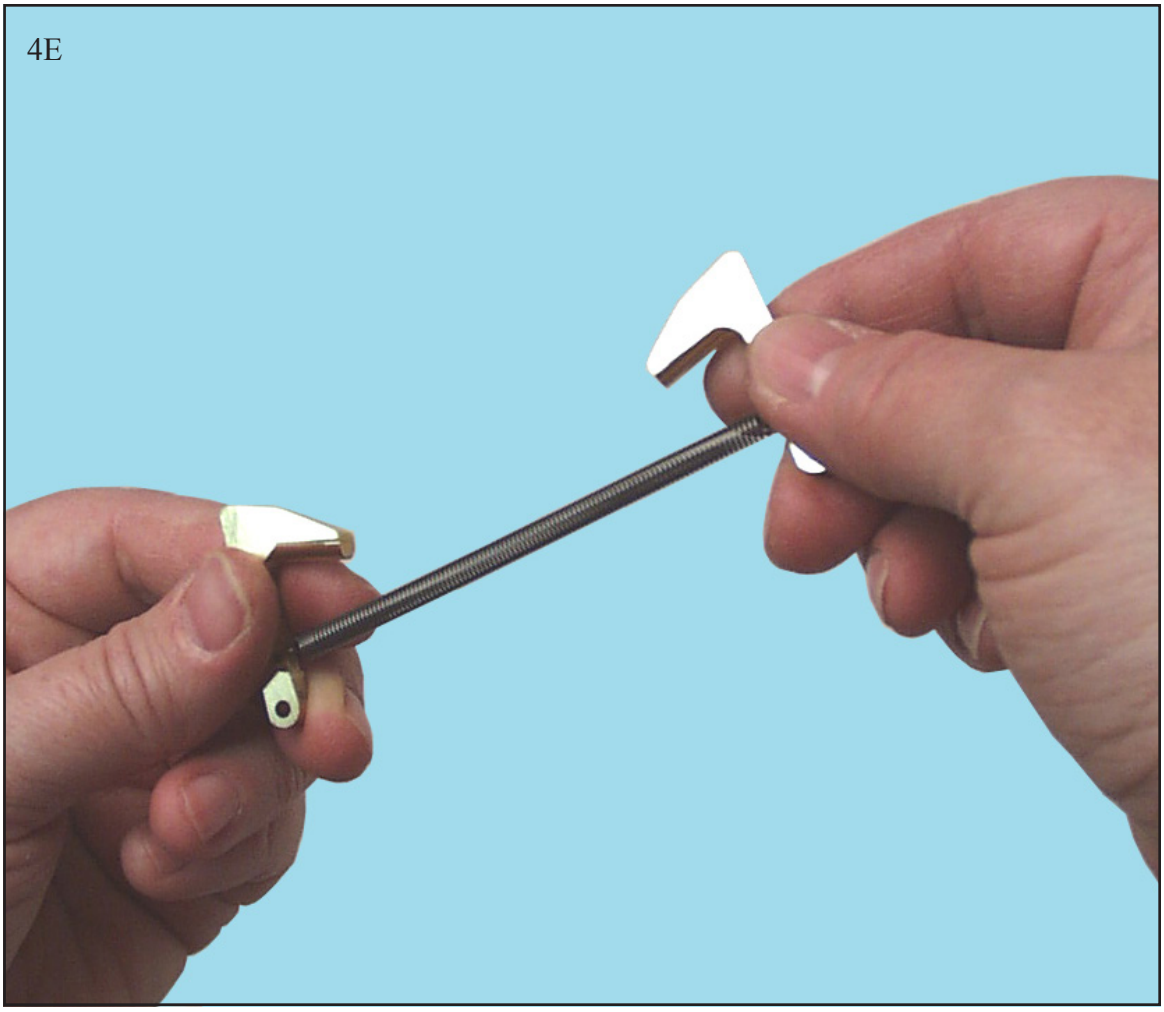


Next, close the loop so that the spring is secure.



The closed loop must be narrower than the width of the cane clip. This will ensure that the clip moves freely through the bottom slot of the bed.

Open the loop on the other end of the spring and insert into the second cane clip. Before securing this side, stretch the spring by pulling the two cane clips apart, taking care not to over extend the spring. The extension spring in a relaxed position should be slightly less than the distance between the two pin holes on the bed (approximately 3 inches for oboe or 3.5 inches for English horn, as shown in example 5A). You will notice that after stretching the spring, the 2nd clip may have a tendency to fall in the opposite direction. Simply slip off the spring and realign before closing the loop and securing the spring to the second cane clip. Once again, the closed loop must be narrower than the width of the cane clip.

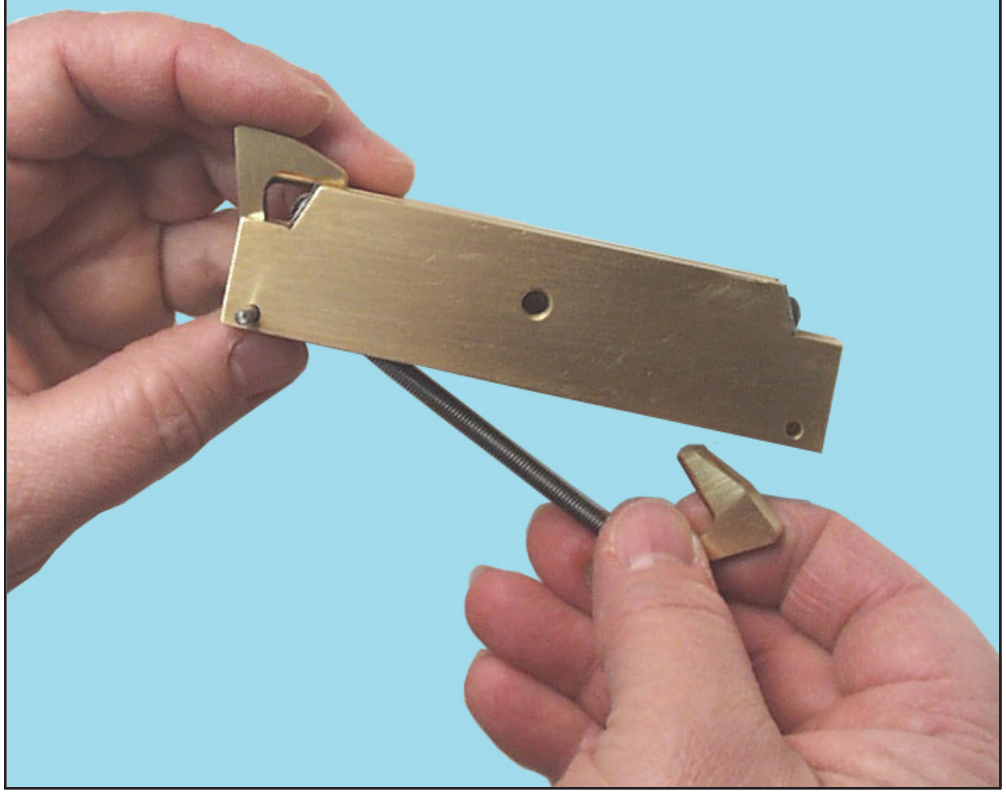


If the spring has been stretched too far, it will be necessary to shorten the spring. Observe how the loop has been formed, as you will need to duplicate this by crimping the wire. Determine how much of the spring needs to be removed to make the length approximately 3 inches. Then cut off that portion of the spring, form a loop and attach it to the cane clip.

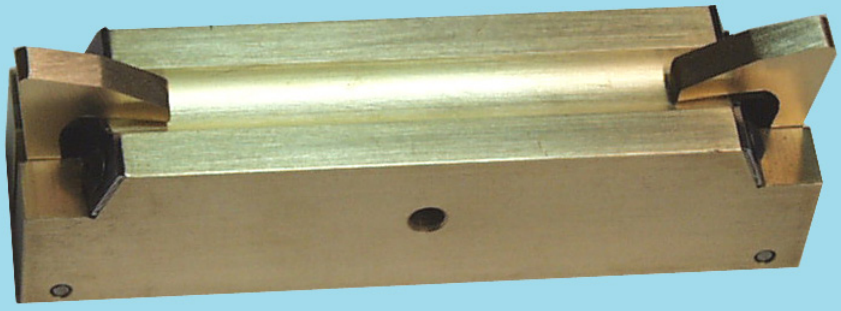
5. Attach the clips and spring assembly to the **bed**, using the two **cane clip mounting pins**. The spring will go through the bottom slot of the bed. Secure one side, lining up the hole in the bed with the hole in the clip, and then insert the pin.

Hint: It is easier to let the other side of the assembly hang down until you get one side secured. Holding the parts over a white surface, while positioning the cane clip is helpful.

5A

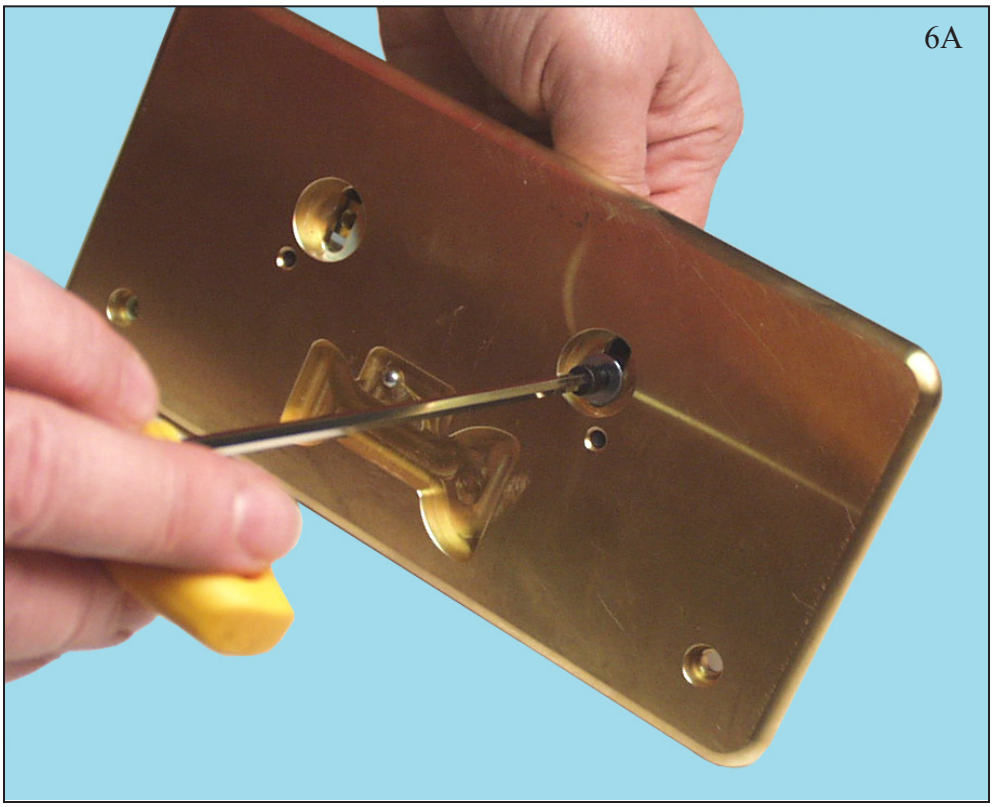


5B

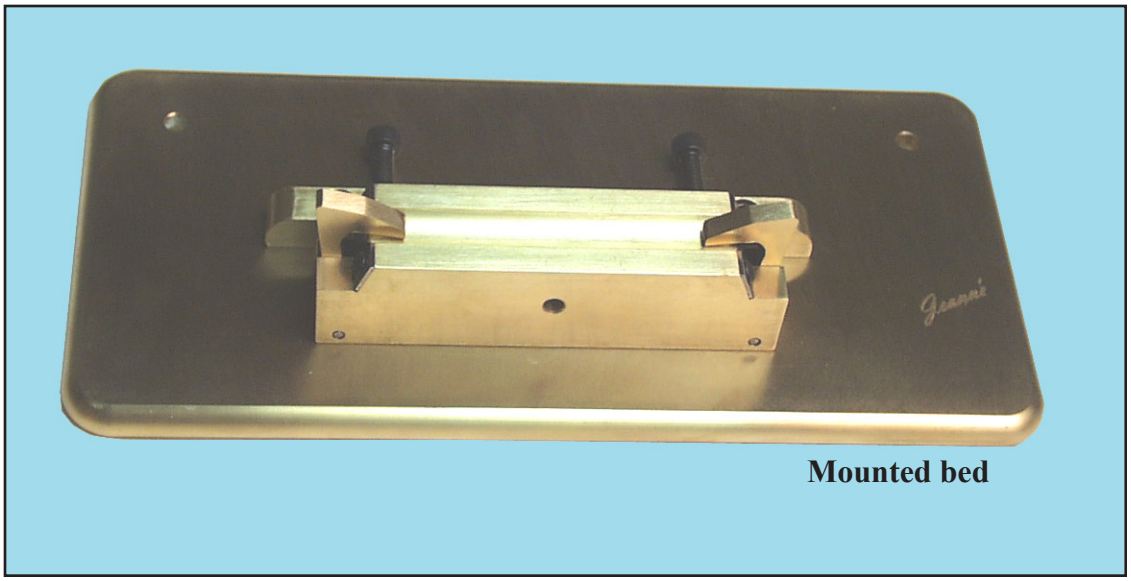


Completed bed assembly

6. The bed can now be mounted to the base, using the two **8-32 x ½″ socket head screws** and two **washers**. You will need the 9/64″ hex key for this step. Note that the bed must be installed so that the single screw hole in the center of the bed faces the front, opposite the datum bar. Attach through the two slotted holes, as shown in example 6A. Position the bed so that it is parallel to the datum bar and then lightly secure in place. Do not excessively tighten the screws until later, when the alignment is complete.



6A

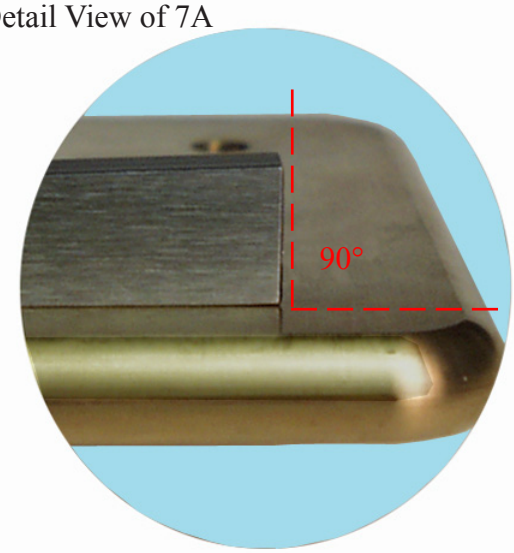


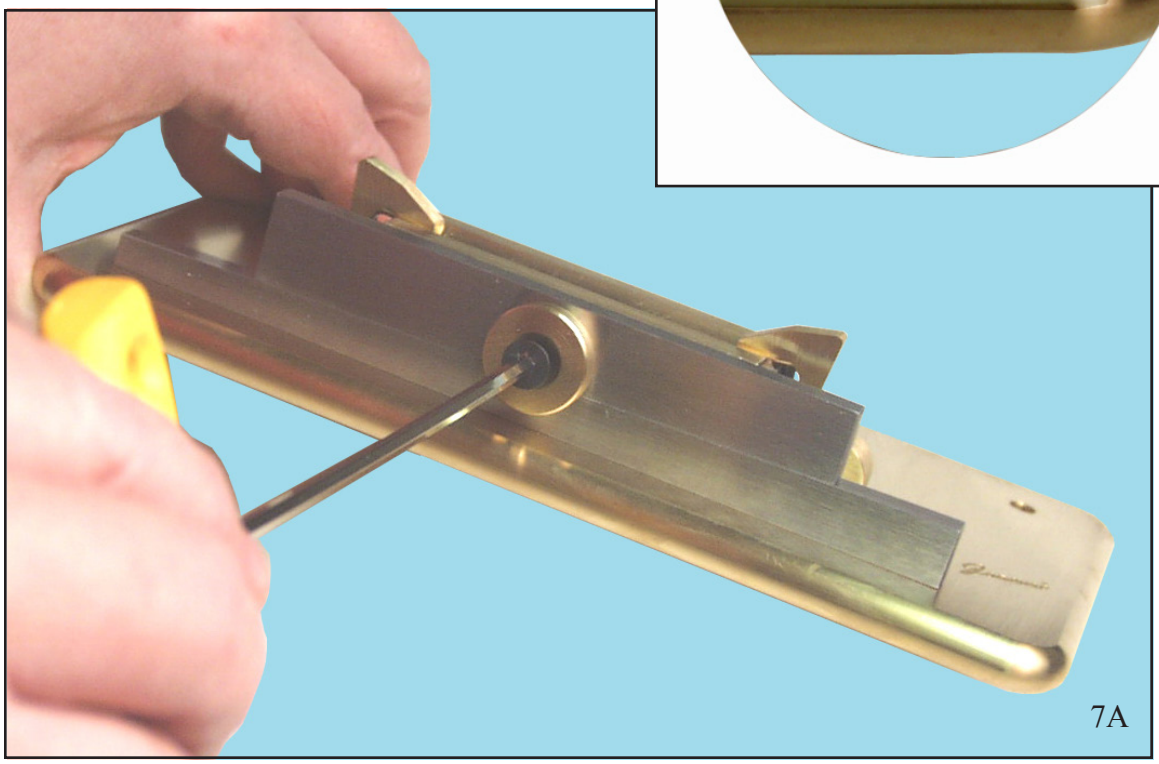
Mounted bed

6B

7. Mount the **parallel bars** to the front of the bed. Make certain that the larger end of the lower bar is to the right and is perpendicular to the base, as shown in "Detail View of 7A." The larger end of the upper bar will go to the left. Attach the parallel bars, using the **10-32 x ¾″ flat head screw** and the **brass parallel lock washer**. You will need the 1/8″ hex key for this step. The parts should be secure but do not tighten the screw excessively. For a good starting position, set the lower bar 10-15mm (20-25mm for EH) from the left edge of the machine.

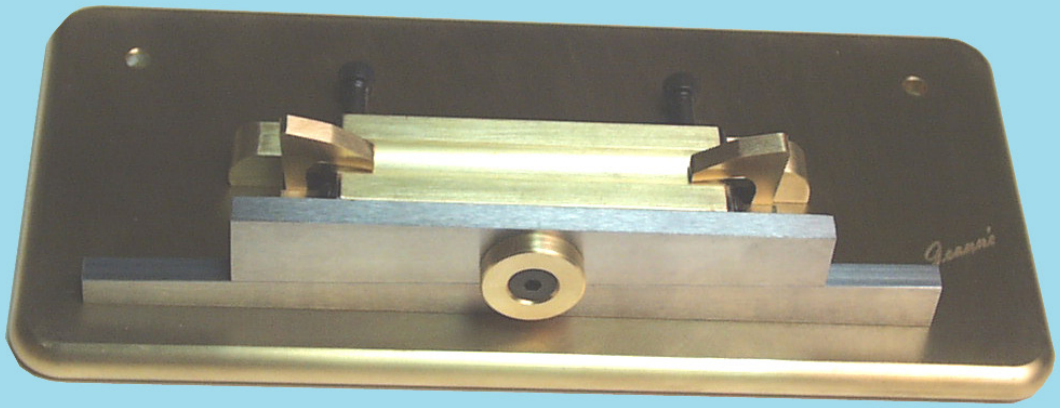
Detail View of 7A





7A

7B

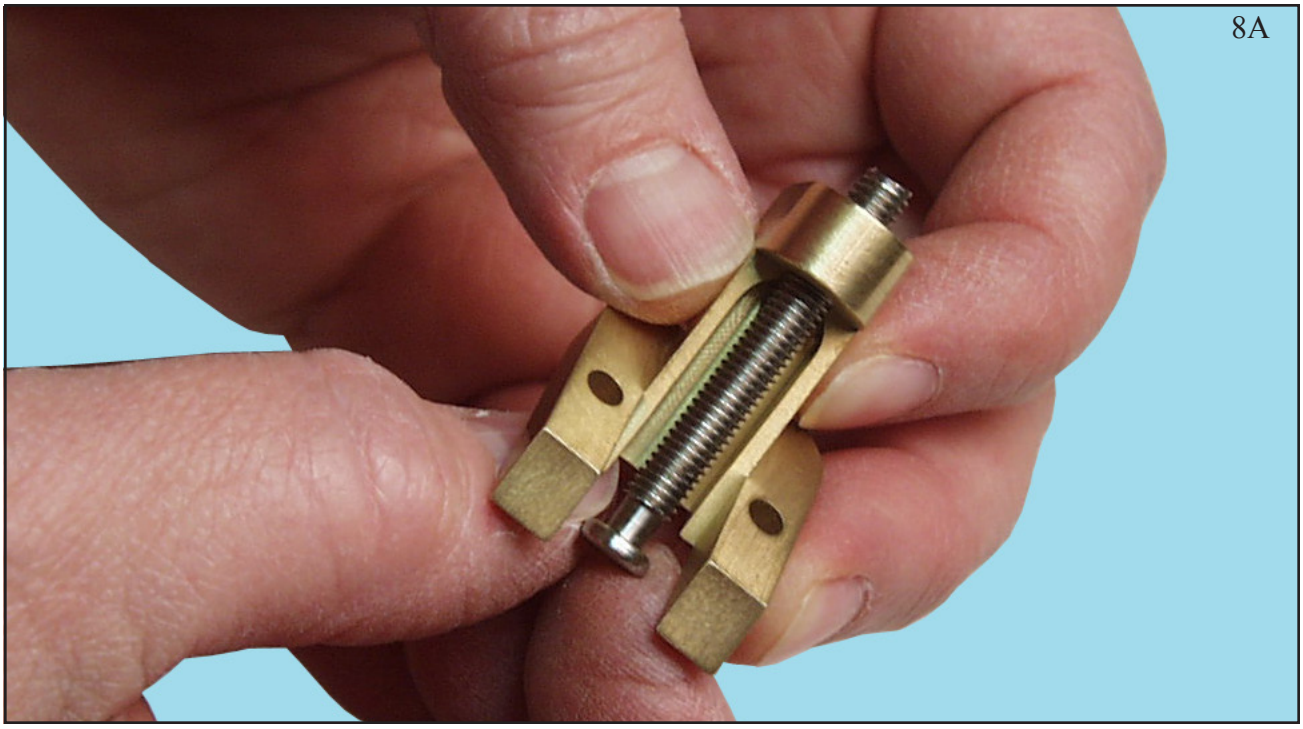


Attached parallel bars

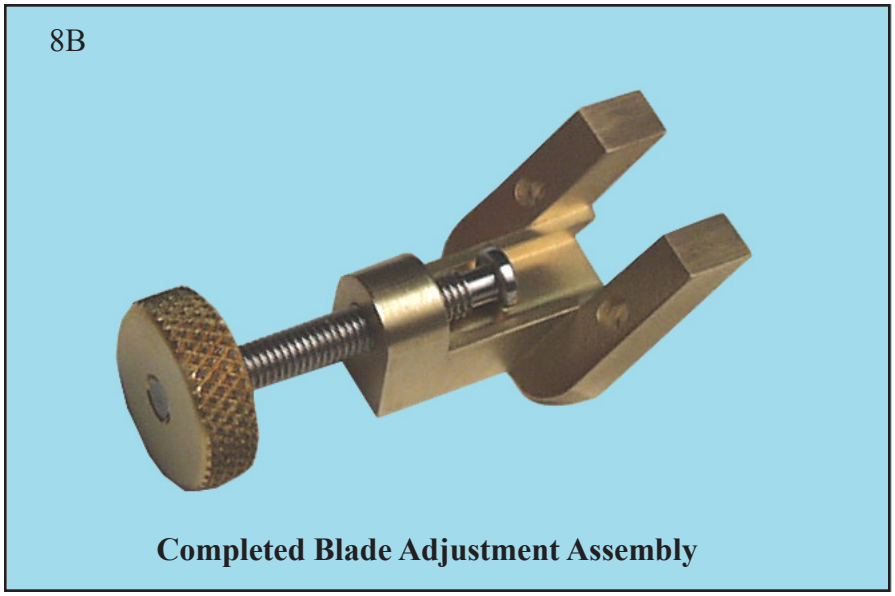
8. Blade adjustment assembly

Making certain that the cap end of the screw is on the bottom, thread the **blade depth adjustment screw** into the **blade adjustment bracket,** as shown in the picture 8A. Continue until the threaded end of the crew is approximately one inch past the top side of the bracket.

Hint: Once the screw has cleared the top of the bracket, it may be easier to grasp the threaded end of the screw to continue turning.

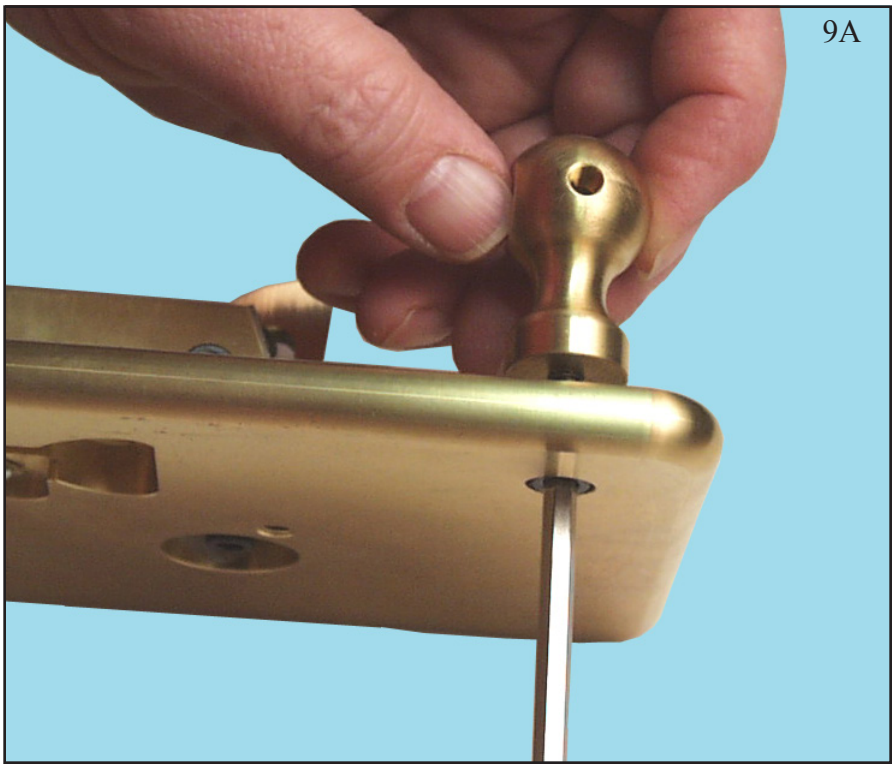

8A

Using super glue gel, place a small amount of glue around the last ¼ inch of the screw threads. Next, attach the **knurled knob**. The end of the screw should come right to the top of the hole so that it is flat with the upper surface of the knob. Since this glue has a short set time, you will need to do this step quickly. Put the blade adjustment assembly aside to allow the glue to set.

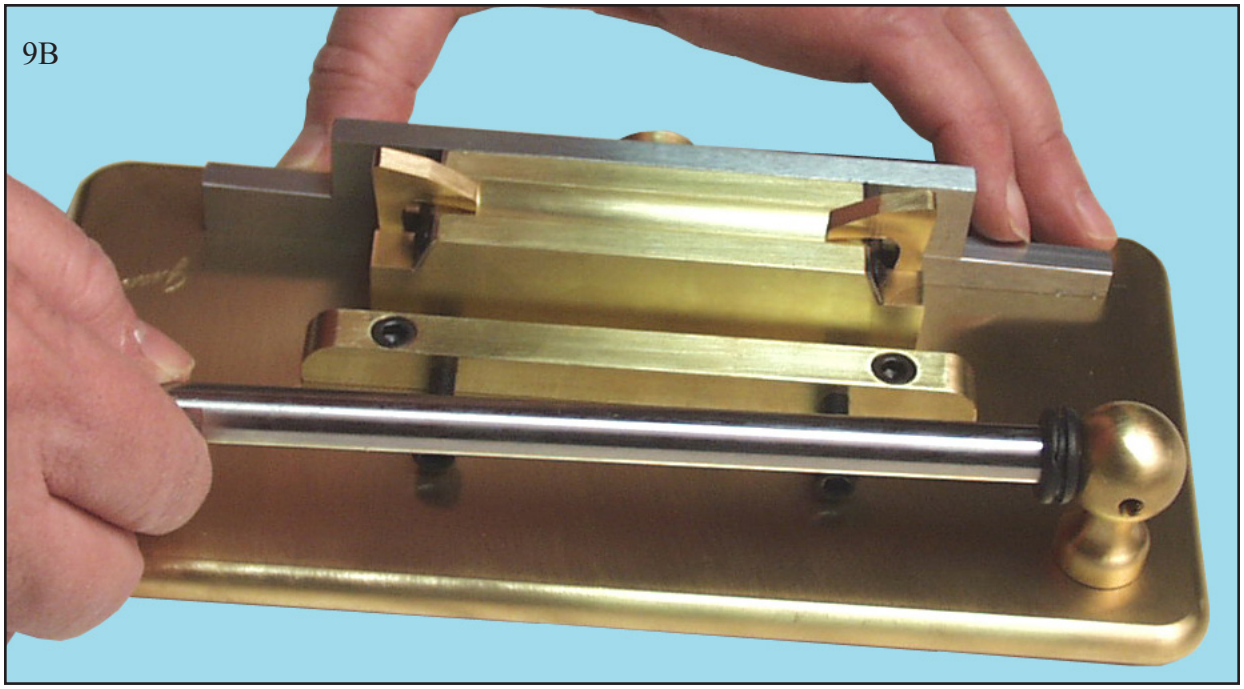

8B

Completed Blade Adjustment Assembly

9. Mount the **left bearing rod support** , as shown in the picture, using a **10-32 x ½″ socket head screw** and 5/32″ hex key. To ensure you have the correct part, make certain that the small screw hole of the support points to the back of the machine and the flattened surface points toward the center. Do not tighten excessively until you do the final alignment.

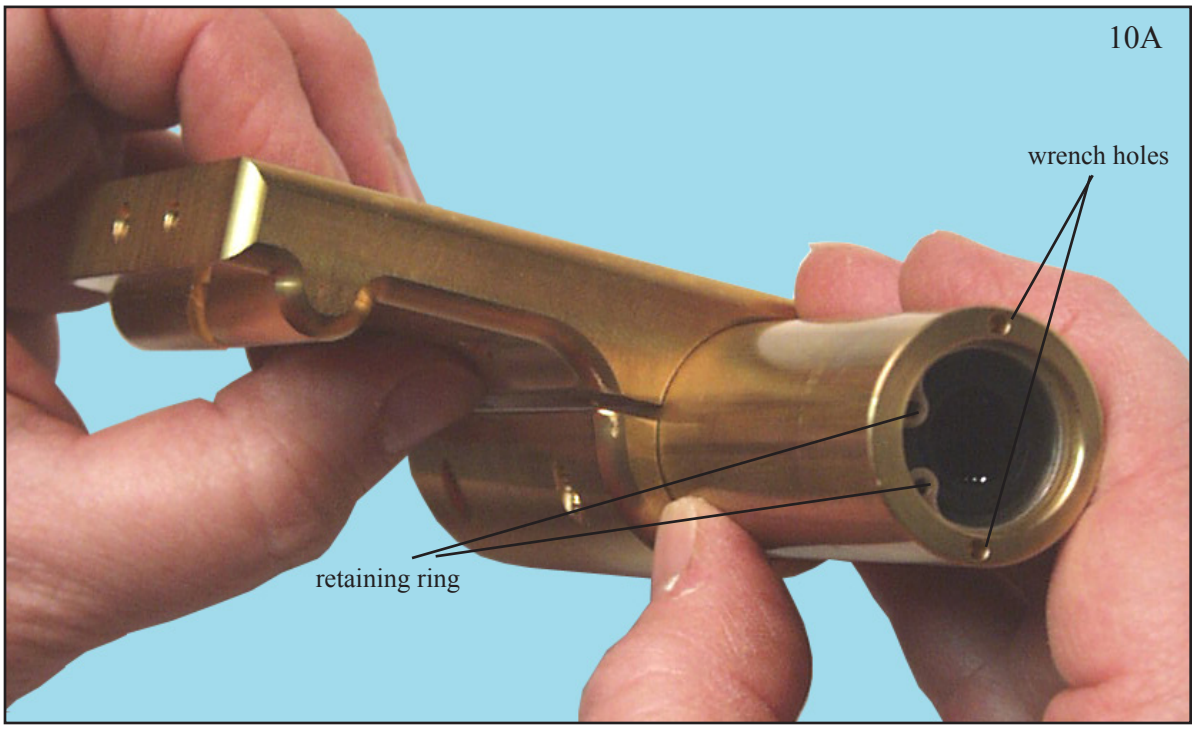


Slip one of the rubber **grommets** over the non slotted end of the bearing rod. The grommet must go onto the larger diameter of the rod. Insert this same end of the bearing rod into the left bearing rod support. Secure the rod in place using one of the **10-32 x 1/4 " set screws** and 3/32" hex key**.** At this point, set the machine aside.

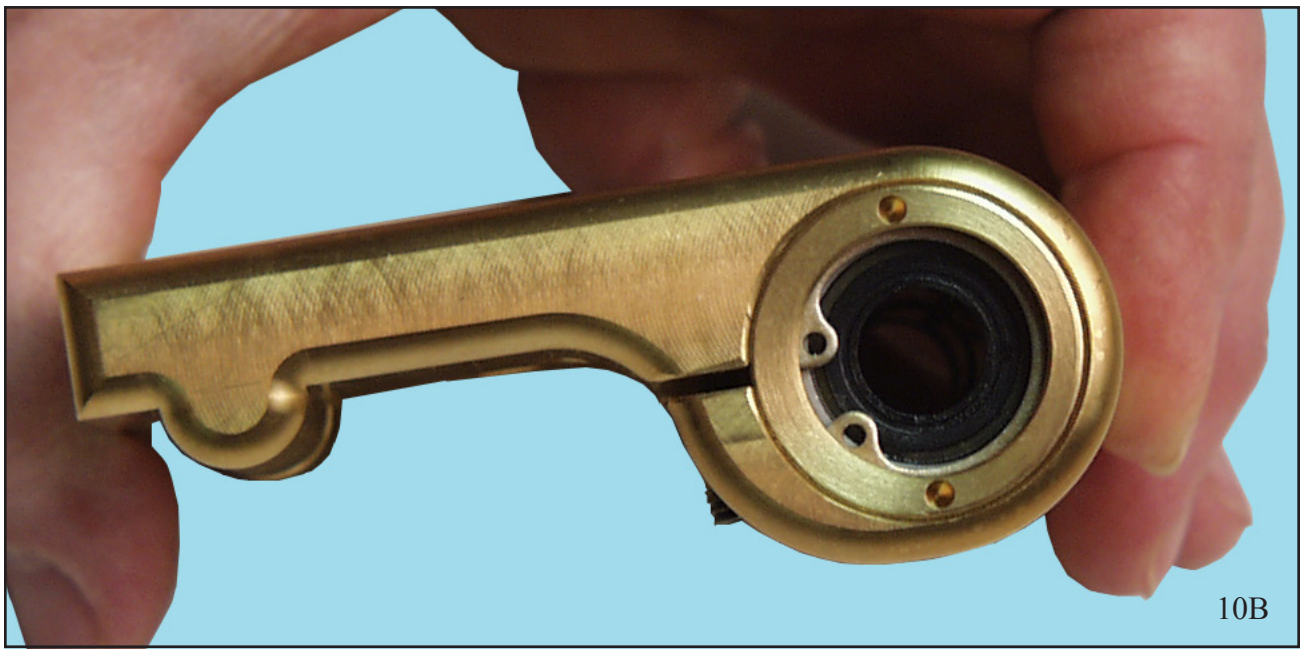


10. Slide the **eccentric bearing assembly** into the **carriage**. Note that the wrench holes will be on the top and bottom of the circle as shown below in example 10A. The **retaining ring** may not be positioned exactly as shown.

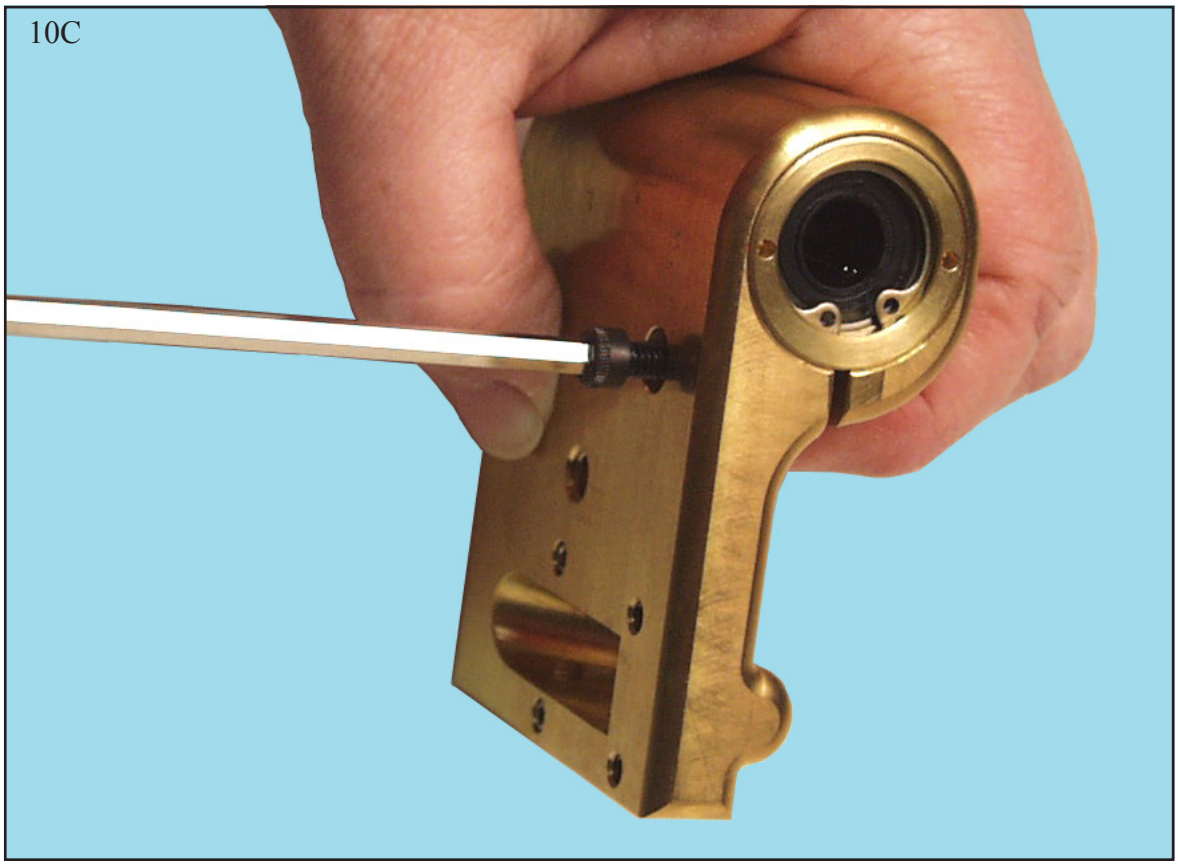
Caution: Since the guide is so critical to the end results of the machine, be careful that it is not inadvertently damaged during the machine assembly process.



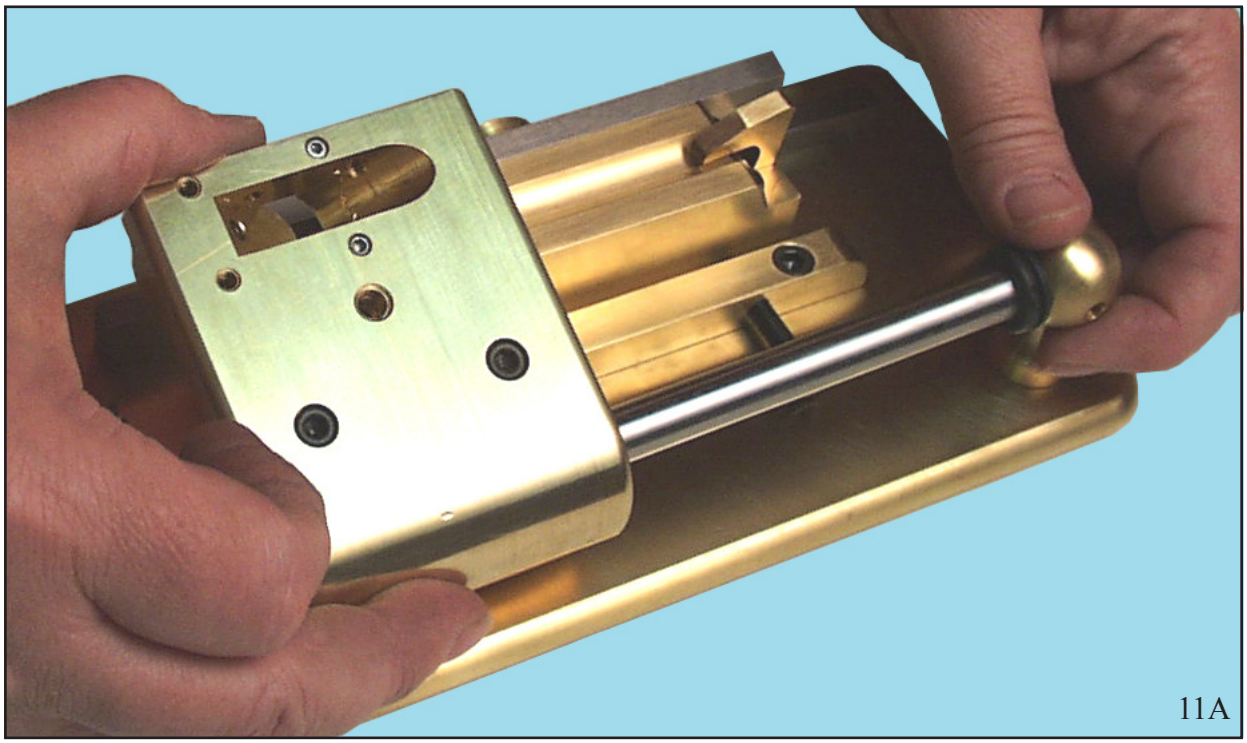
Notice that one side of the insert is thicker. The thicker side should be towards the guide as a starting point for setup as shown in example 10B.



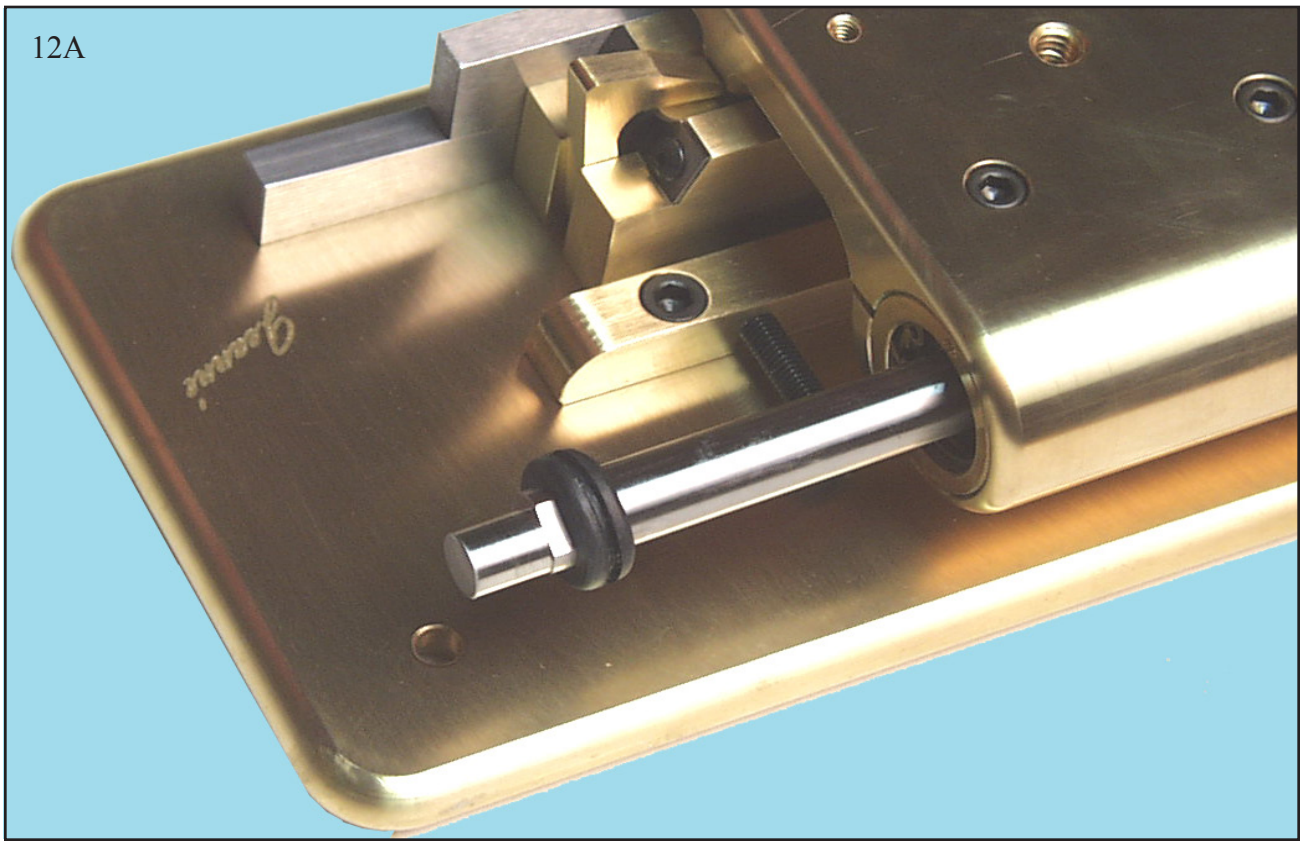
Secure the eccentric bearing assembly in the carriage using the two **8-32 x 7/8″ socket head cap screws** and 9/64″ hex key.



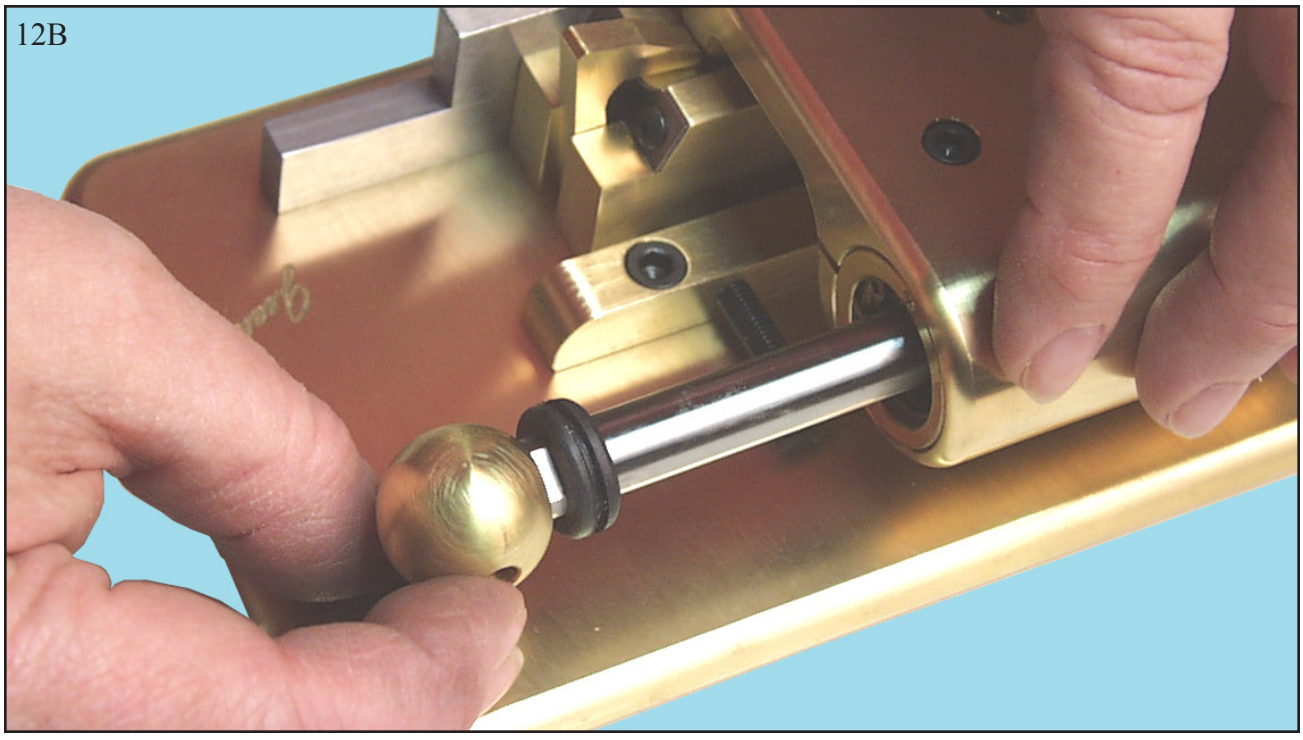
11. Slide the carriage onto the bearing rod, being careful not to hit the guide on any surface. Place a piece of felt or cotton into the bed to protect the guide



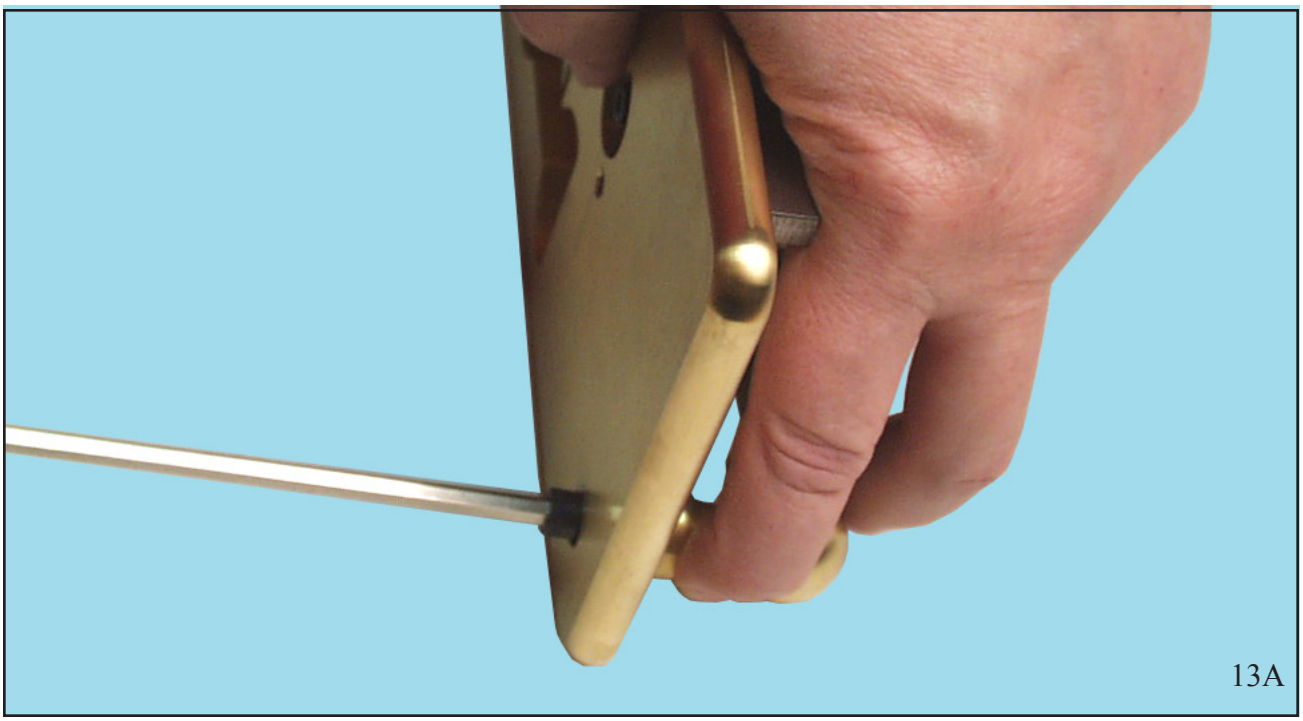
12. Slip the second **rubber grommet** onto the large diameter portion of the rod, as shown in example 12A.



Slide the **right bearing rod support** into place, as shown below in example 12B

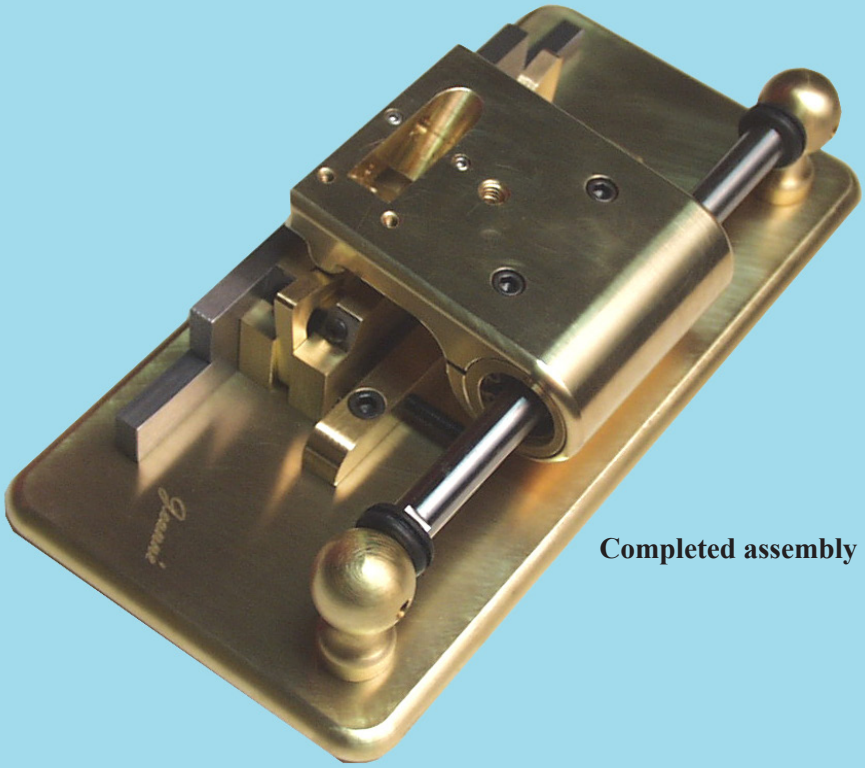


13. Secure the **right bearing rod support** with a 10-32 x ½″ socket head cap screw using the 5/32″ hex key. It may be necessary to slightly loosen the screw for the left support until you get the right support in place. Then securely tighten both screws.



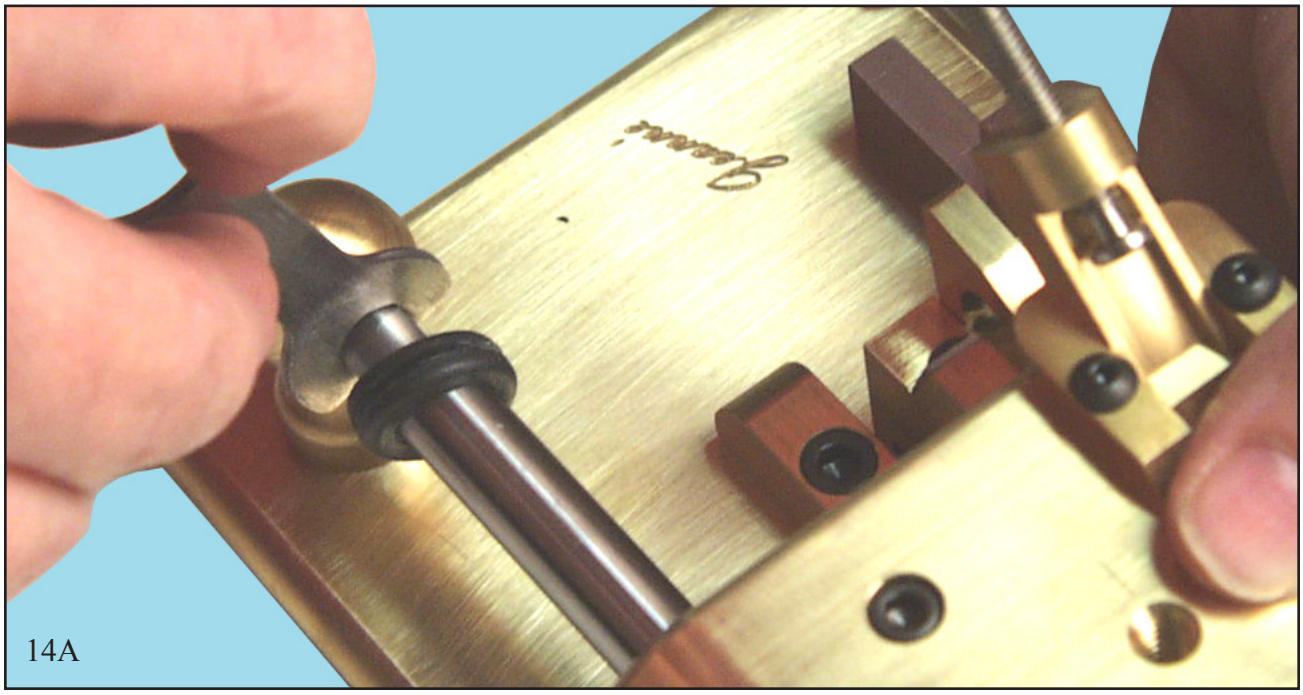
13A

13B



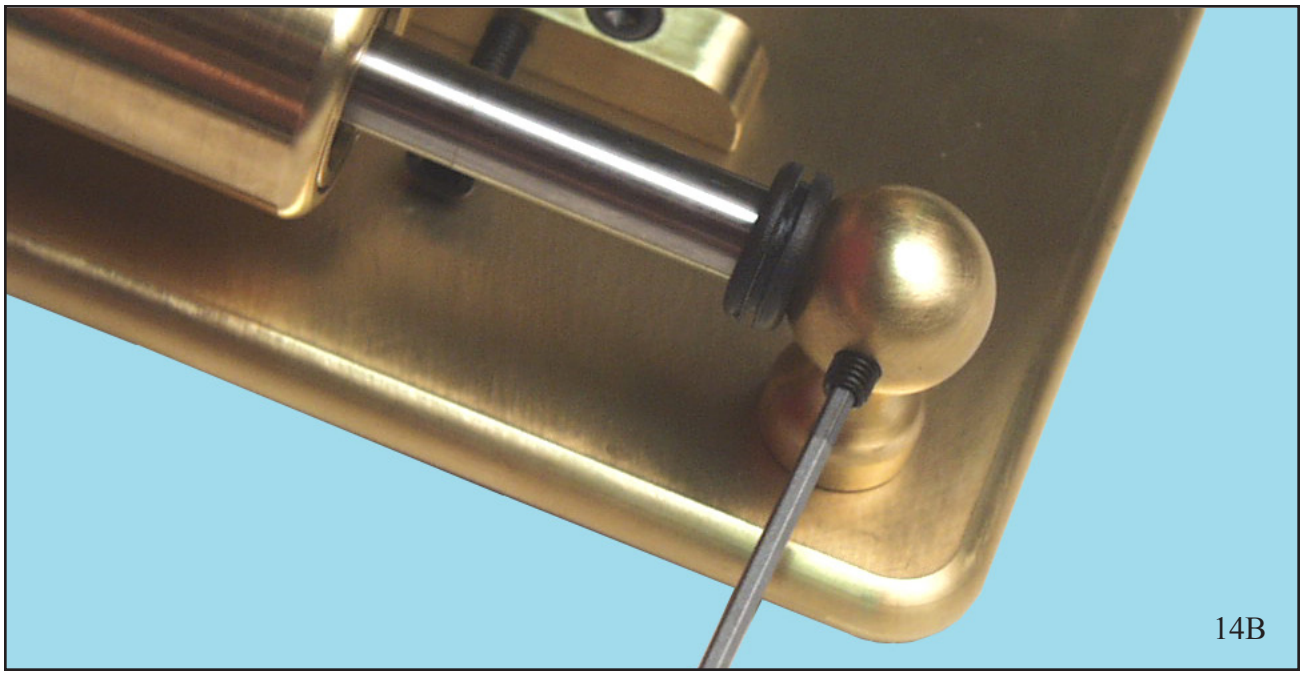
Completed assembly at this point

14. Using the slotted end of the **eccentric wrench**, position the bearing rod. First, loosen the set screw in the left bearing rod support. Hold the machine so that you are looking toward the carriage. As you move the wrench to the right, away from the bed, watch how the carriage moves in a clockwise motion. Move to a position where the wrench is 10 degrees past the highest point of the circle. This is a good starting position which may be changed later as you begin the actual setup of the machine.



14A

Once the bearing rod is in position, lock it into place, by tightening the set screw in the left bearing rod support. Insert the second **10-32 x 1/4 " set screw** into the right bearing rod support and tighten securely. You will need the 3/32″ hex key for this step. Push the two grommets tight against the supports.

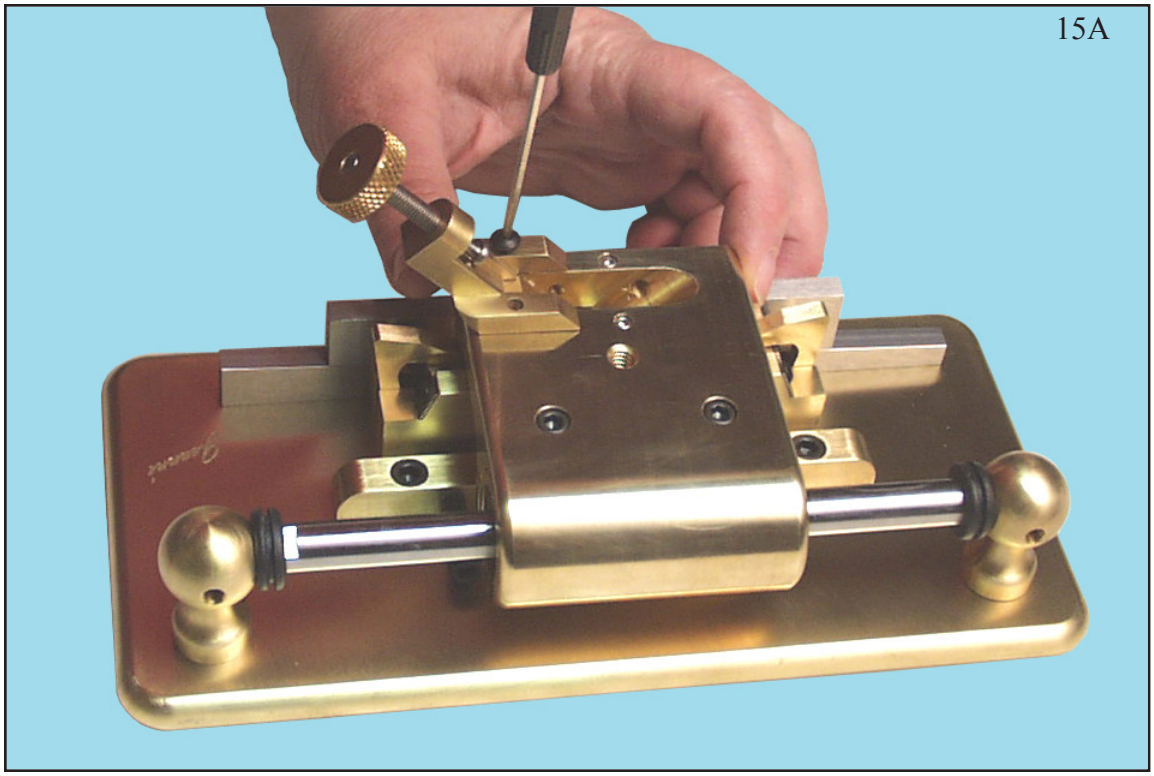


14B

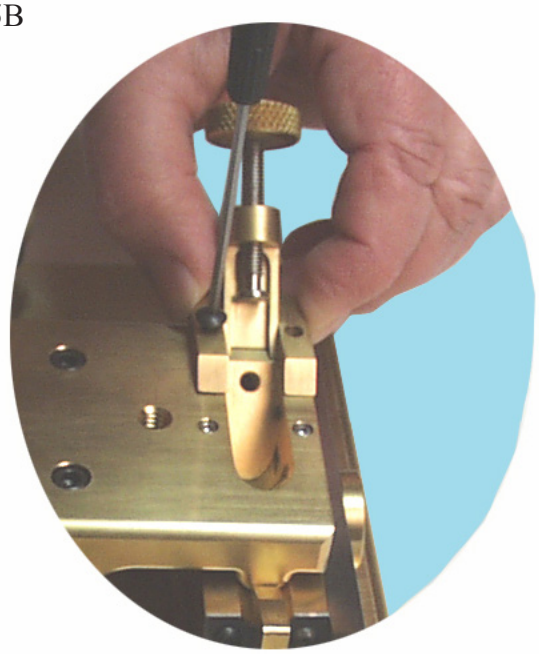
At this point, you can reposition the bed. When doing this step, make sure that you have cotton or felt in the bed to protect the guide. Slightly loosen the bed screws on the bottom of the machine and carefully position the bed so that the guide gently falls into the bed. Then retighten the screws.

15. Installing the **blade adjustment assembly**: If the glue has had time to set, mount the blade adjustment assembly to the top of the carriage, as shown in example 15A. Use two **6-32 x 3/8″ button head cap screws** and 1/16″ hex key.

15A



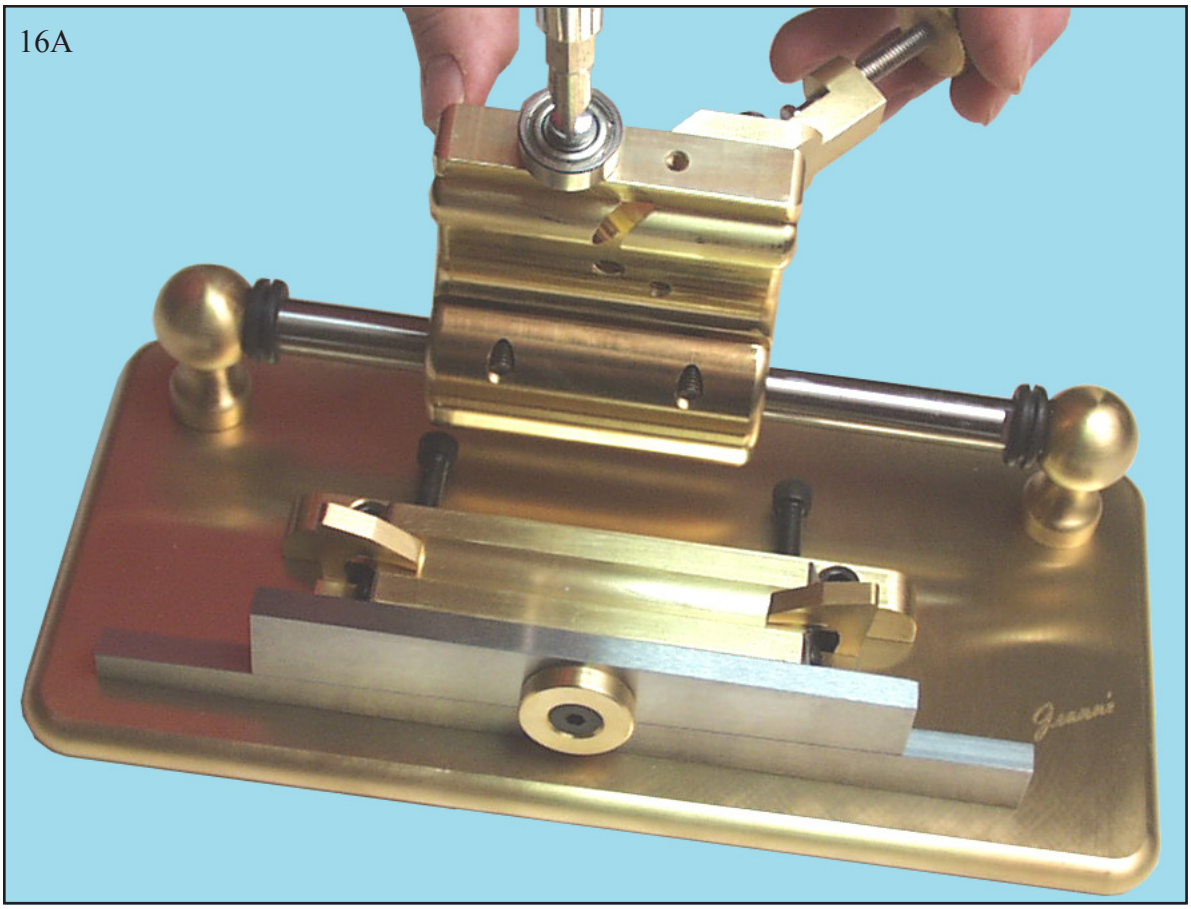
15B



Close-up view

16. With the carriage slightly raised, mount the **radial ball bearing** with the **10-32 x 1/2″ slotted fillister screw**. Check to see that the bearing turns freely. If not, remove the bearing and turn it over so the opposite side is against the carriage. Secure it in place as before and check the motion.

16A

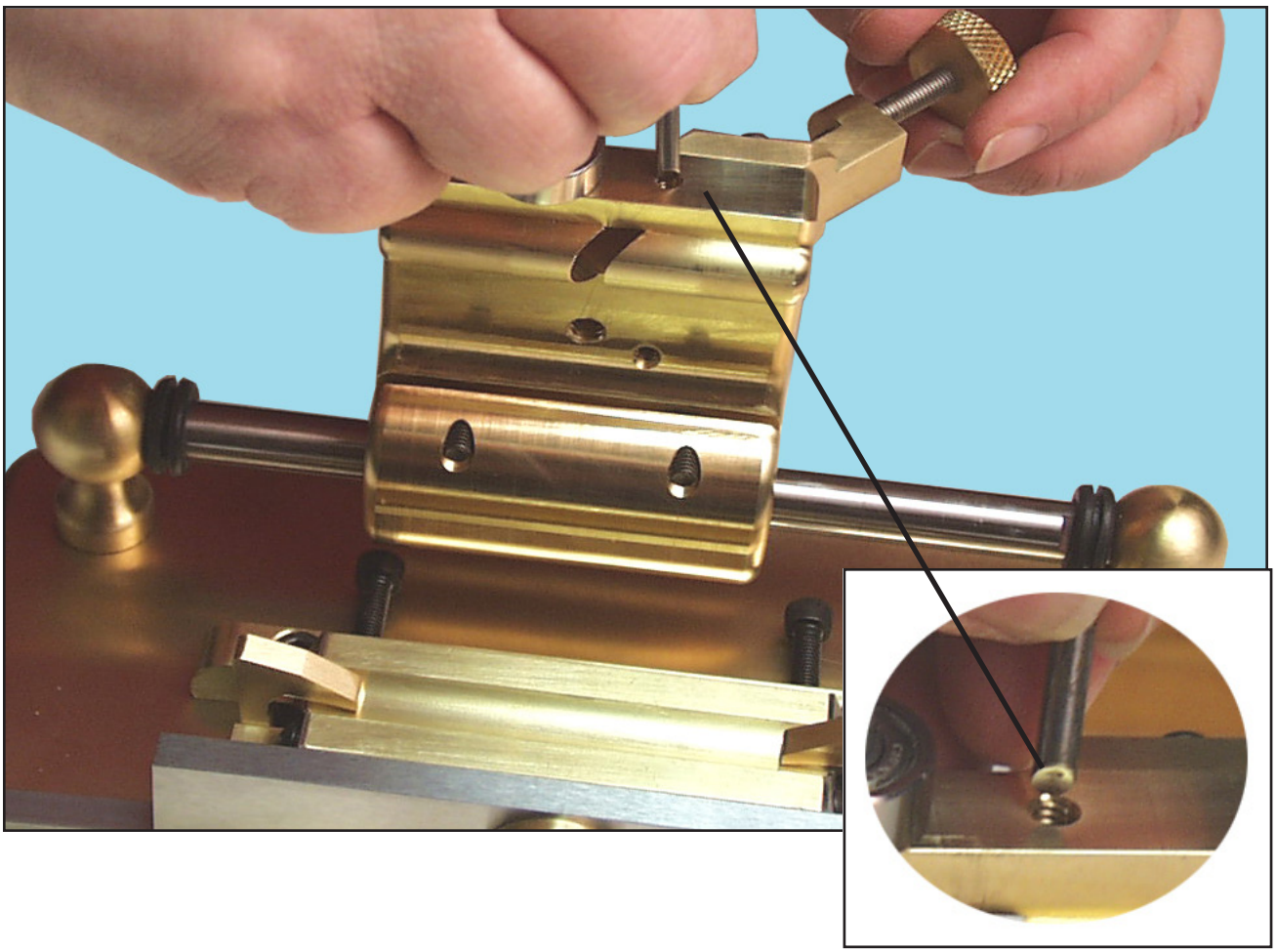


16B

Close-up View

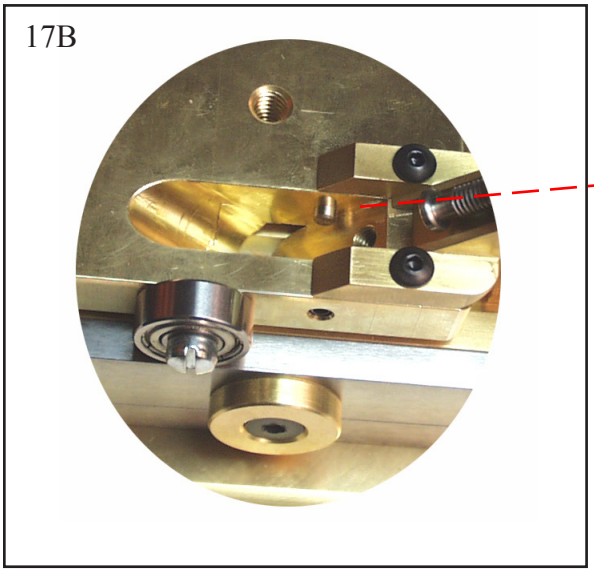
17. Insert the **blade adjustment pin** with the beveled side of the pin going in first and facing toward the bottom of the carriage (Close-up view of 17A). Push all the way into the next hole, leaving approximately 1/16 inch showing (Close-up view 17B).

17A



Close-up view 17A

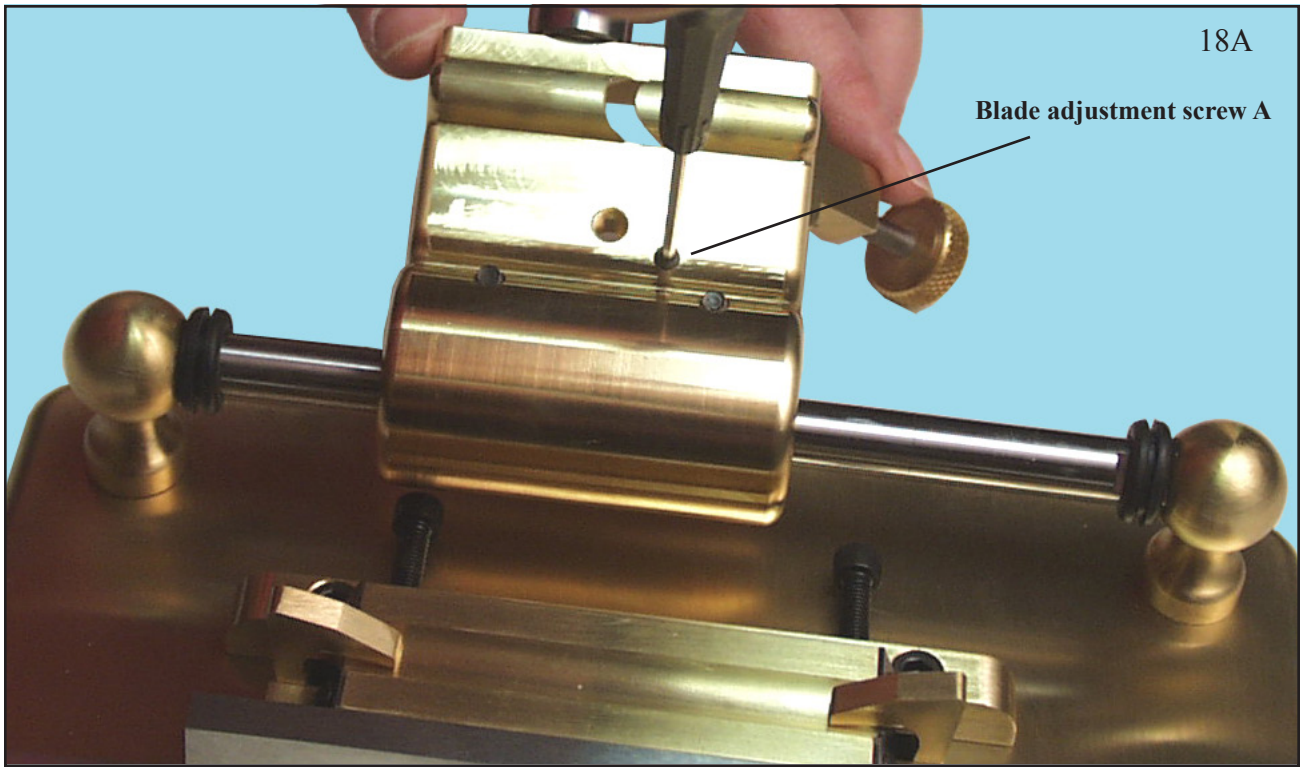
17B



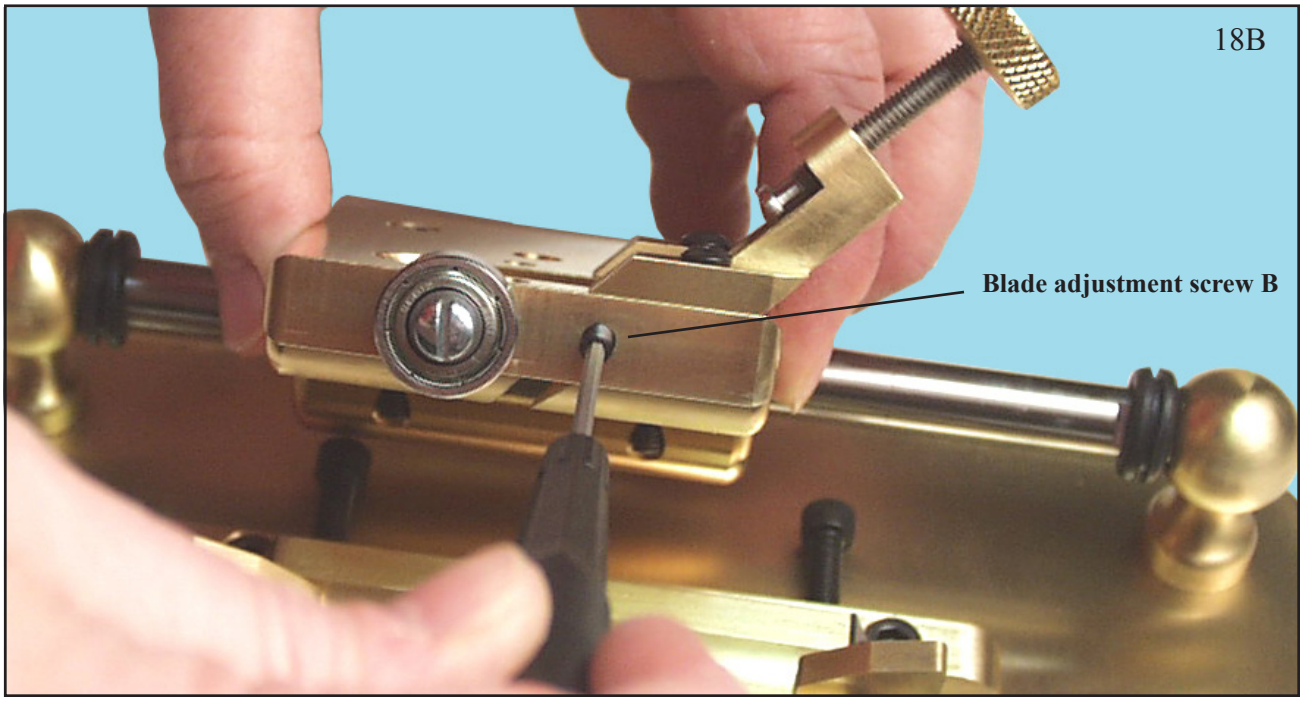
Inserted blade adjustment pin

Close-up view 2

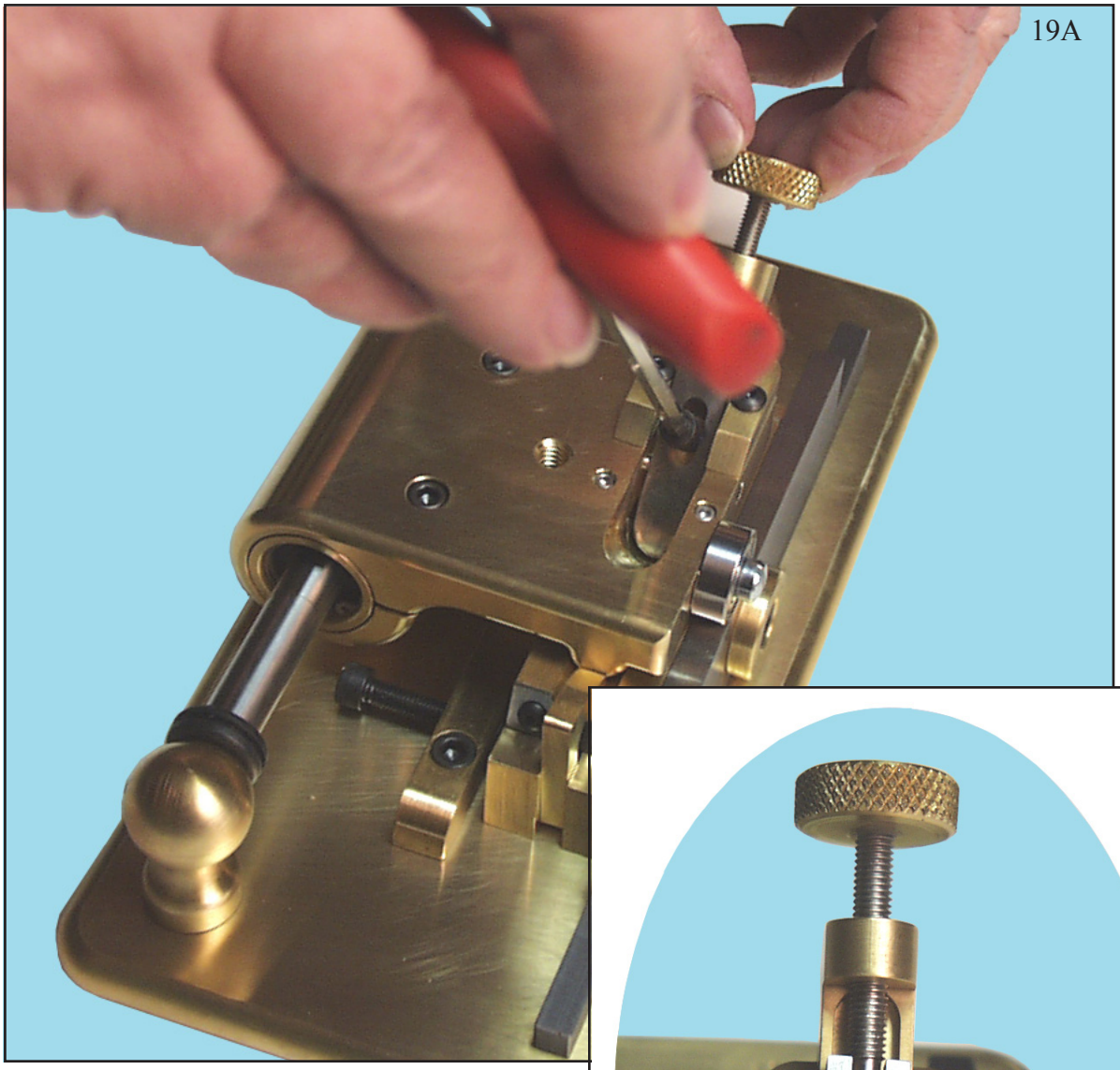
18. Insert the **blade side adjustment screws (8-32 x 1/4″ set screws)** using the 5/64″ hex key. Install the screw on the bottom of the carriage first, as shown in example 18A. This will later be referred to as blade side adjustment screw A. Test to make certain that the pin moves back and forth. Position the carriage so that you can see the pin from above. Place a finger over the blade pin. As you move the screw in and out, you should also feel the pin moving in and out.

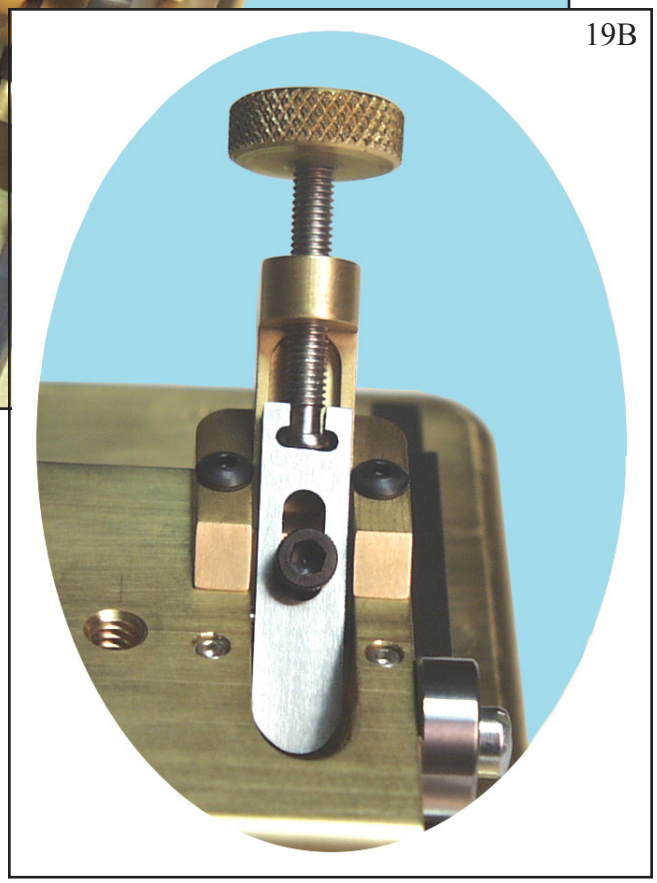


Next, install the second blade side adjustment screw into the front of the carriage as shown in example 18B. This will later be referred to as blade side adjustment screw B. It should be screwed to the point that it just begins to clear the other side of the hole.



19. Slip the slotted end of the **blade** over the cap of the blade depth adjustment screw. The flat side of the blade should be facing upwards, as shown in example 19B. Secure using the **8-32 x 3/8″ socket head screw** and the 9/64″ hex key. Note: We are showing this step as part of the machine assembly. However, the blade will not be installed until the final stages of the setup.





Close-up of blade installation

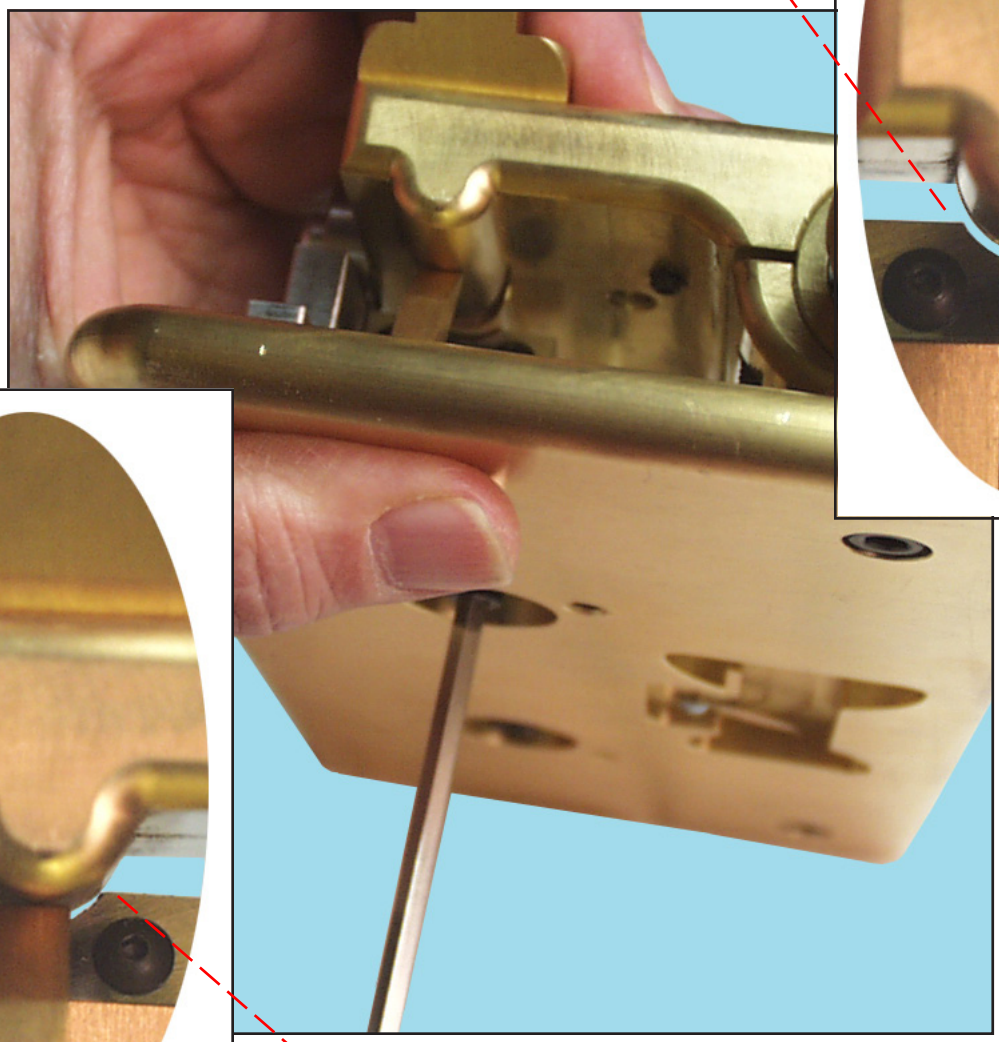
Congratulations! Your Jeanné Gouging Machine is now assembled and ready for final setup.

20. Centering the carriage in the bed:
As you begin the setup procedure, first make certain that the carriage is moving freely and is centered in the bed. With the carriage lowered into the bed, turn the machine so that you can eye the carriage as it moves through the bed from one end to the other. Check this from each end of the machine and, if necessary, adjust the position of the bed, in order to center the carriage. It is easiest to move one side at a time. As you are looking down the bed, pull the carriage all the way towards yourself, as shown below in example 20A. Loosen the bed mounting screw on the bottom of the machine, nearest the end from which you are looking down the bed. Move the bed to a position which allows the carriage to be centered and tighten the screw. Then do the same from the other side. Check each side again to ensure that you have the carriage centered in the bed.

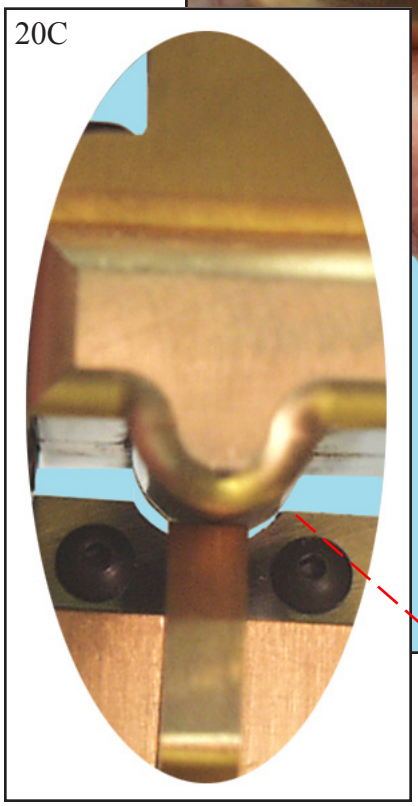
20B

Correctly centered carriage

20A



20C



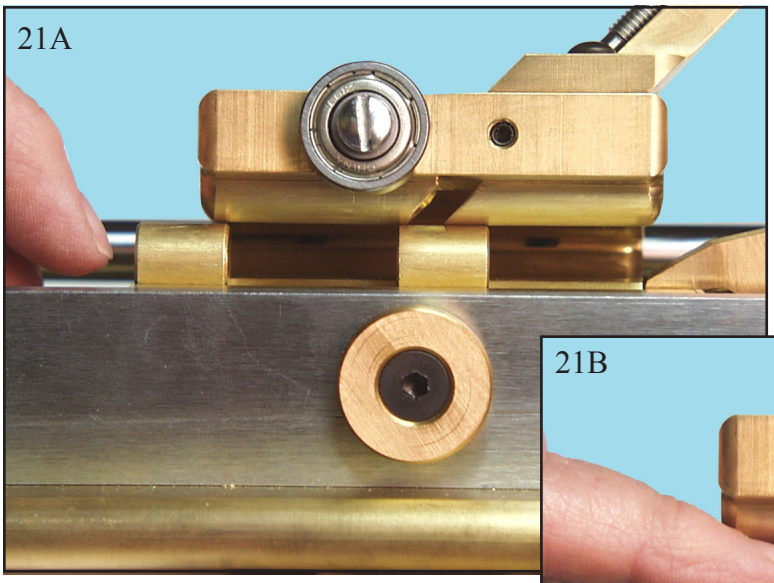
Incorrectly centered carriage

21. Adjusting the guide:

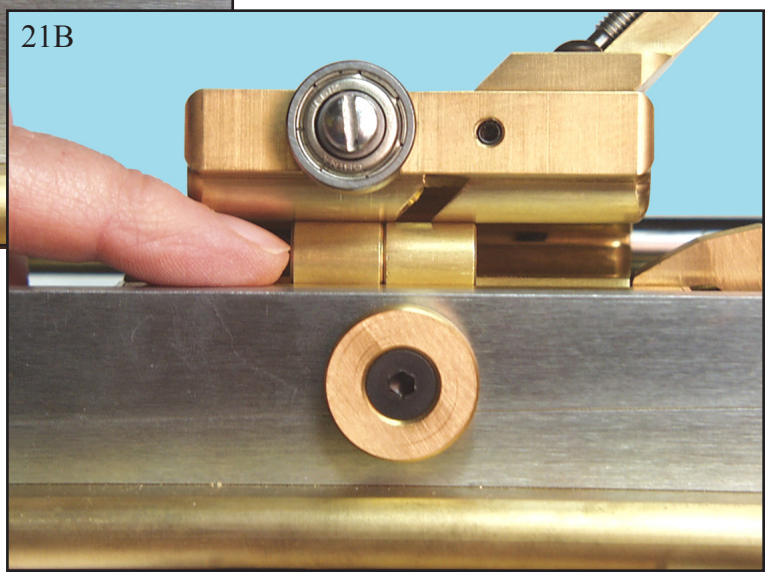
The positioning of the guide and its shape (or curve) are critical. My ideal curve for the guide, which is not a true radius, was developed over a number of years of working on gouging machines. It is a modified diameter of slightly less than 12mm (14mm for EH), which tapers on the sides to allow for clearance as it moves through the bed. The guide has been machined with this curve as well as an incline going upwards from the center to the outside edges. The guide should touch the cane at the lowest point, immediately in front of the blade. It may be necessary to slightly adjust the position of the eccentric bearing insert, as well as shape the back guide. Since the curve of the front guide is critical, any hand shaping should be done on the back guide, as will be explained later.

First, check the position of the eccentric bearing insert which controls the position of the guide. You will need two brass cylinders (11mm for oboe or 13mm for EH) to check the positioning of the guide. Place one cylinder, with the left side of the cylinder under the lowest end of the front guide (the right side nearest the blade opening). Place the second cylinder with the right side touching the outside edge of the front guide, as shown in example 21A. To check that there is proper clearance, slide the left cylinder forward until it touches the right one, as shown in example 21B. If the cylinder does not move forward freely, it will be necessary to adjust the eccentric bearing.

To adjust, loosen both of the 8-32 x 7/8" socket head cap screws that are securing the eccentric bearing insert. Loosen the screws to the point that you feel some friction when moving the eccentric insert with the wrench. During the assembly process, the eccentric bearing insert was positioned with the widest part of the circle towards the guide and with the two eccentric wrench holes in a vertical position. (N.B. Refer to pages 16 & 17.) Moving the eccentric bearing counterclockwise from this position will raise the outside edge of the front guide giving more clearance. Make small adjustments, continually checking the placement of the guide with the brass cylinders. You will need to lightly secure the eccentric bearing each time so that it is not moving inadvertently. You may not be able to finalize this position without doing some shaping on the back guide.

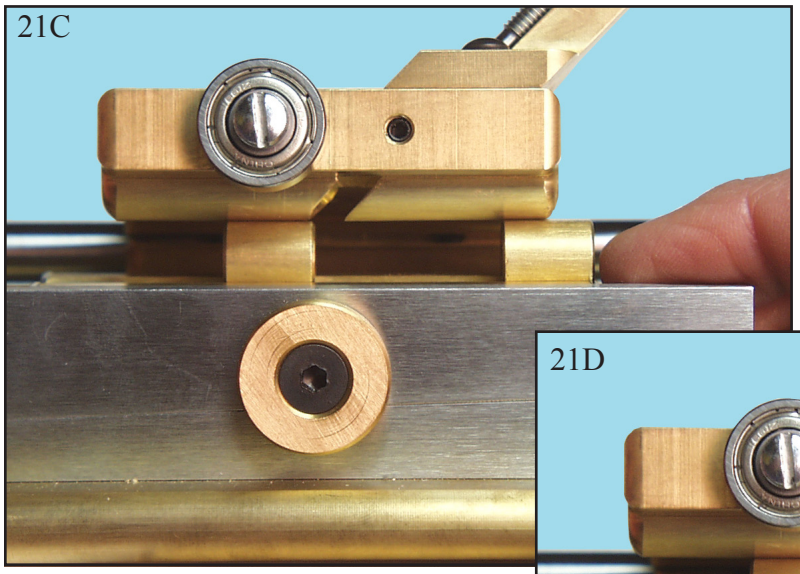


Example showing right cylinder placed at lowest end of the front guide and the left cylinder to the outside edge.

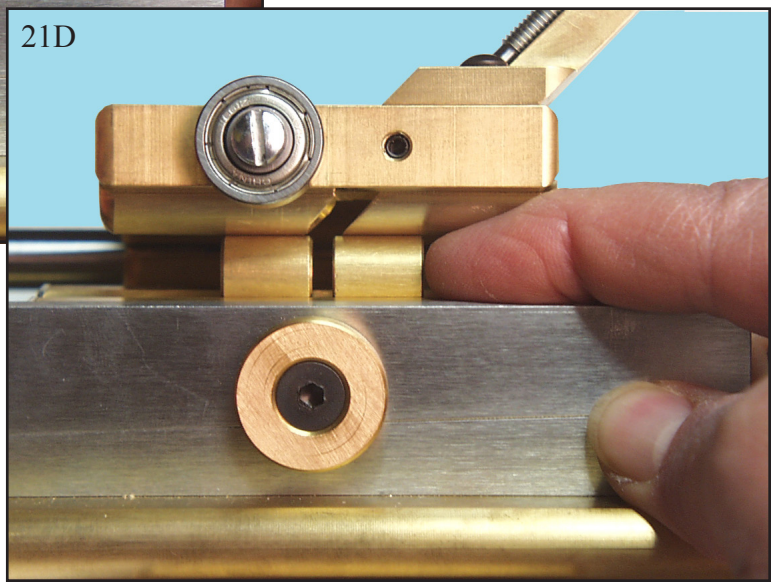


Example showing how left cylinder can easily slide forward

Next, place the right side of one cylinder at the lowest point of the front guide. Place the left side of the other cylinder under the outside edge of the back guide, as shown in example 21C. The right cylinder should easily slide forward clearing the back guide, as shown in example 21D.

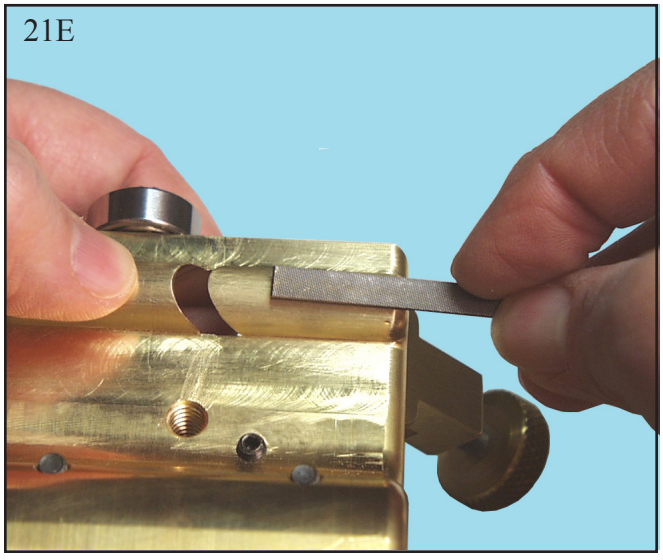


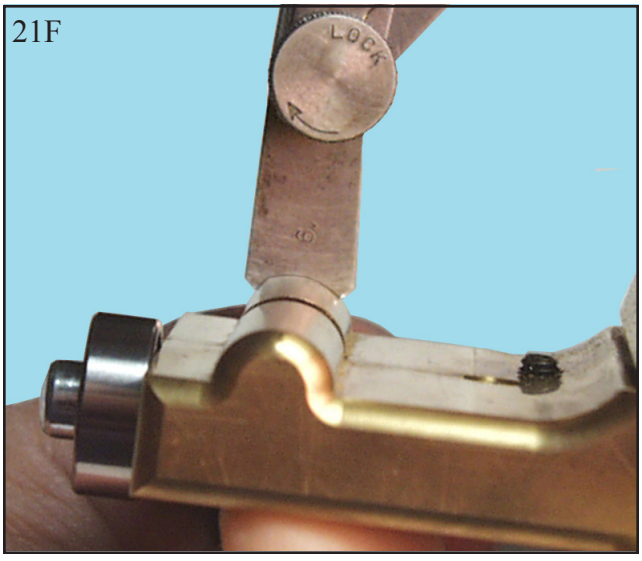
Example 21C shows the left cylinder placed at lowest end of the front guide and the right cylinder at outside edge of back guide.



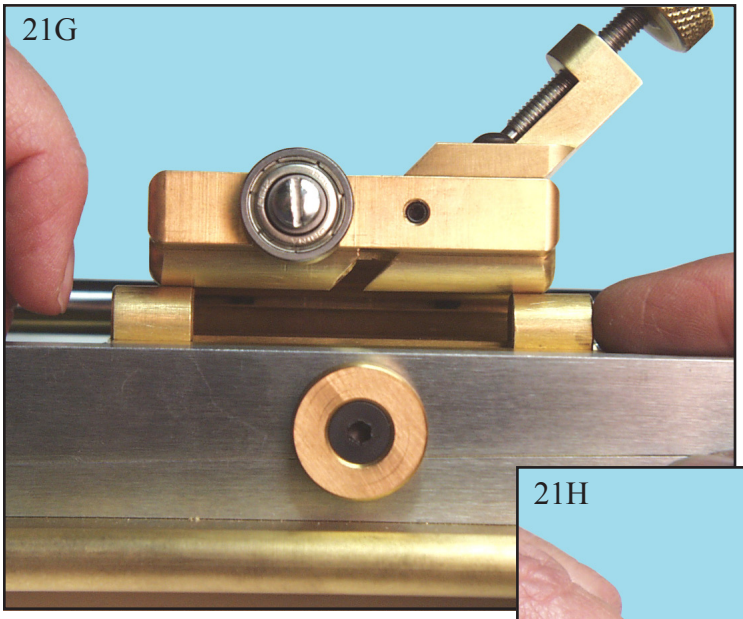
Example 21D shows how the right cylinder can easily slide forward clearing the back guide.

It will probably be necessary to make some adjustments to the back guide. Be careful to protect the front guide as you work, by either shielding it with your thumb or slipping a small piece of cardboard into the blade opening. Using a flat file, in the position shown in example 21E, start to shape the back guide being careful to maintain the incline. As you are working, try to maintain the original curve checking it frequently using a 6mm radius gauge (7mm for EH), as shown in example 21F. Check the incline positioning using your brass cylinders as described above. Once you have made the proper adjustments, smooth the surface of the back guide, first using 400 wet-or-dry sand paper and then fine emory paper.

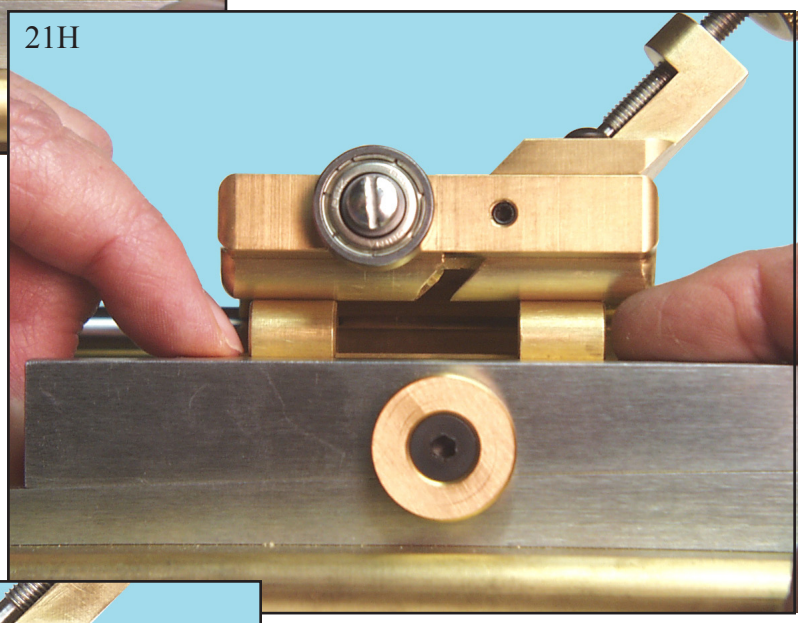




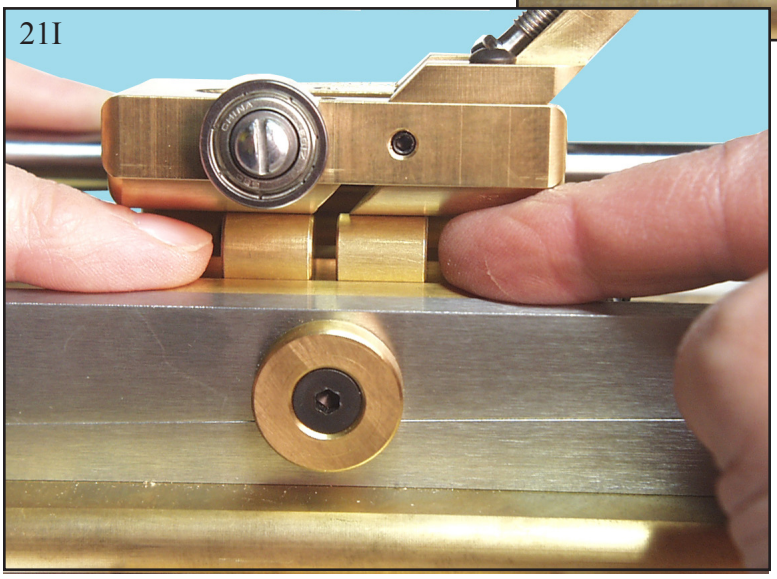
Compare both guides by placing the two cylinders to the outside edges (furthest from the blade opening) and slowly moving the cylinders inwards using little pressure. The cylinder on the back should always be slightly ahead of the front cylinder, as shown in example 21H. Positioning and shaping the guide correctly are critical to the end results of the gouge. If the guide hits the cane anywhere other than directly in front of the blade, the action will be impeded and the blade will not properly remove the cane.



Example 21G shows both cylinders placed to the outside edges of guides.



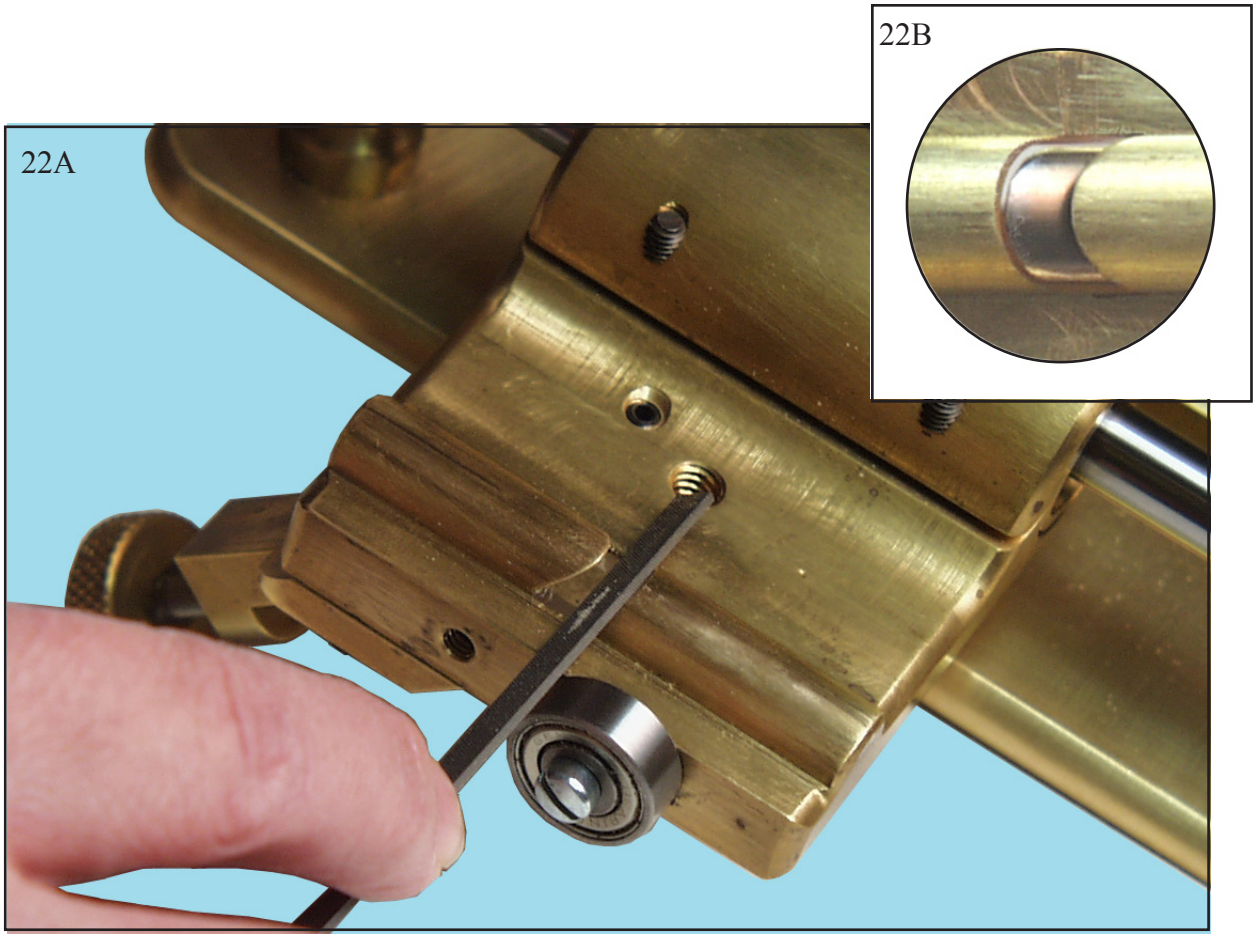
Notice in example 21H that the cylinder on the right has moved closer to the blade opening than the cylinder on the left.



Notice now that the right cylinder has cleared the back guide while the left cylinder still touches the front guide.

22. Adjusting the blade gap

Check the gap between the front guide and the blade. There should be approximately .012" distance between the blade and the guide, as shown in the close-up photo 22B. Temporarily insert the blade to check this and adjust if necessary by filing the front guide being careful to maintain the correct angle, as shown in example 22A. The guide should continue to follow the contour of the blade at an equal spacing. There needs to be just enough space for the curls to go through, as the cane is removed by the blade. Too much of a gap can lead to cane tearing problems.



23. Bearing rod eccentric adjustment

If the carriage is riding at an angle, it can push the cane up the side of the bed, resulting in an uneven gouge or tearing of the cane. The bearing rod eccentric is used to level the carriage. Normally, I have found that the position of the eccentric that was set during the assembly process (page 20) usually works with no further adjustment needed. During the assembly process, the parallel bars were set so that the lower bar is approximately 10-15mm (20-25mm for EH) from the left edge of the base. I have found this is frequently the optimum position of the parallel bars for a completed machine and, therefore should be used to check the bearing rod eccentric adjustment. Use a small level placed on the carriage, perpendicular to the rod, to check this position. (N.B. Make certain your table is level.) Move the machine to various positions to be sure you are getting consistent readings. If the bearing rod eccentric needs to be adjusted, loosen the two bearing rod lock screws and use the slotted end of the wrench to reposition the bearing rod eccentric (page 20, example 14A). When the carriage is level, tighten the lock screws to secure this position. Any adjustments to the bearing rod eccentric will change the position of the carriage, requiring it to be re-centered (See page 26). In addition, you should double check the positioning of the eccentric bearing insert and guide (described on page 29).

24. Shaping the blade

Before shaping the blade, one should understand the basic concepts of the "double radius" or "two-way gouge." With a double radius gouge, one has the ability to structure the gouge with a balance of strength between the center and sides by varying the rate of fall-off. If the sides of the gouge are too heavy in comparison to the center, the sides of the reed will leak and the reeds will have a tendency to be flat in pitch. If the sides of the gouge are too thin in comparison to the center, the reeds will have a tendency to close and they will lack resilience. A well balanced gouge will allow you to achieve pitch stability, dynamic flexibility, good response and the proper tip opening in your reeds. It will ensure that you have tight sides on your reeds and the structure that holds the reeds open and keeps the basic vibrations in the reed. When the gouge is structured properly, it is much easier to achieve the desired qualities in scraping the reed. In other words, you don't have to compensate for a poor gouge by altering the scrape.

The following diagrams show how the "double radius" gouge works. The diagrams are not a true representation of the actual gouge, but should be helpful in visualizing the concept.

A

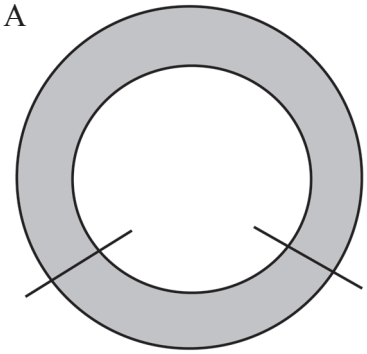


Diagram A represents a tube of cane with marks where the tube will be split. Depending on the shape of the tube, there will be from one to three usable sections.

B

Diagram B represents the section of cane after it has been pregouged.

C

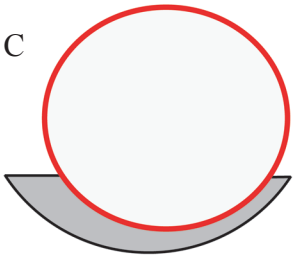


Diagram C shows how the first swipes of the offset blade, represented by the red circle, will cut from the inside edge of the cane.

D

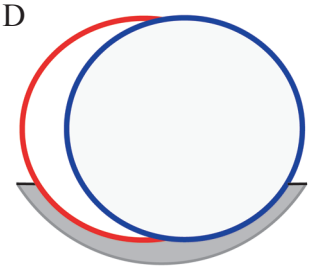
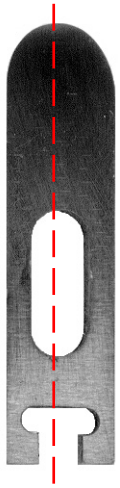


Diagram D shows the cane after it has been turned in the machine bed. The blue circle represents the blade intersecting with or "crossing over" the first cut. **By altering the position or radius of the blade, one can control the thickness in the center or on the sides of the cane.**

This gives a simple explanation of how the double radius or "two-way" gouge works. However, the blade curve that we use is far more complex since we are not dealing with one simple radius.

Shaping the blade will be a lot of trial and error. The curve of the blade should be approximately a 4.5mm radius (5mm for EH) and the apex of the blade should be slightly offset to the left as you are looking at the flat side. Observe in the picture (example 24E) that there is a short curve on the left side and a longer curve on the right side, with the apex slightly left of center. It is the long curve from the apex of the 4.5 radius (5mm for EH) to the right that you will be adjusting to obtain the desired gouge.

24E



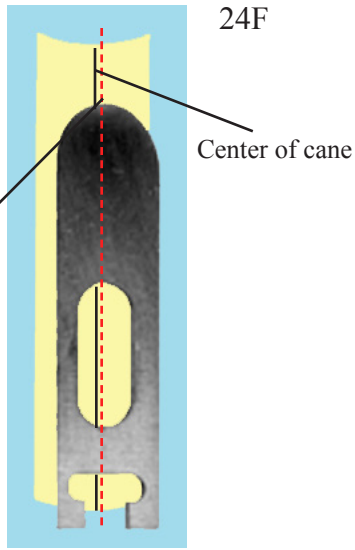
Finding the correct placement for the apex of the blade curve seems to be critical. If the apex of the curve is too far to the left of center, the gouge will produce reeds with less pitch stability and a tendency to go flat. In this instance it starts to act like a one-way gouge. If the apex is set too far to the right, the gouge will produce reeds that are inflexible (stiff and lacking vibrations).

In general, the more pointed the blade, or the faster the curve drops from the apex, the more stable the gouge will be. In extreme cases, this will produce reeds that are dark and dull, having little flexibility and no dynamic capabilities. The more rounded the blade is, or the slower the curve drops from the apex, the less stable the gouge will be. This will produce reeds that have more flexibility, but in the extreme, are bright and sometimes "wild." (N.B. This is sometimes called a "scooped" gouge.) The trick is to find the correct placement for the apex of the curve and the right amount of drop-off from the apex to the right side of the blade.

I prefer to make the gouge fall slowly from the center, gradually increasing the rate of fall-off and then slowing toward the sides, thus creating a similar structure in the gouge that is used in scraping the reeds. This helps to give the reed all the required structural elements for pitch stability and dynamic flexibility. Any sudden drop-off in the gouge should be avoided as it will adversely affect reed response.

When gouging, the apex of the blade curve should hit the cane slightly off-center to the inside or "rod side." Just as we have been taught not to scrape our reeds in the center, but to let the knife touch the center to remove cane, the same is true for the gouger blade. The illustration to the right represents how the blade is positioned in the machine to cut on the inside.

24F

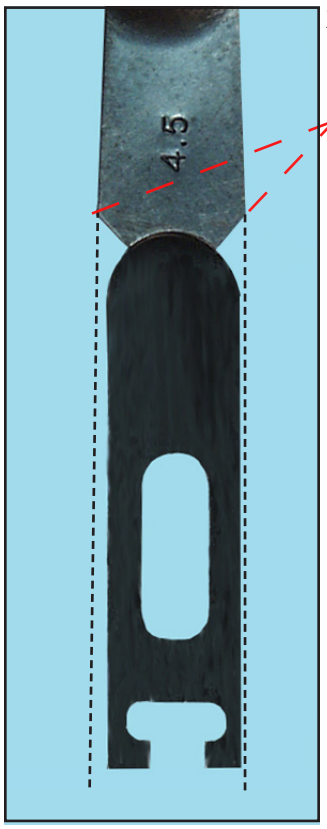


The red dotted line shows the apex of the blade curve, offset slightly to the left, as described earlier in example 24E, forming the long curve on the right side of the blade. The blade is then positioned in the machine so that the apex of the blade curve hits just to the right of the center line as illustrated. This would be to the inside or "rod side" as you are gouging.

You will need a 4.5mm radius gauge (5mm for EH), 400 wet and dry sand paper and 0/3 emory paper to shape the blade. You will also need a flat surface to work on with good lighting. In my workshop I have white Formica table tops with an adjustable arm lamp. The white surface makes it easier to see the blade curve.

Hold the radius gauge touching the blade tip, as shown on the right in example 24G, to determine where you want to remove metal. The apex of the blade should hit the center of the curve on the radius gauge. The radius gauge should be placed slightly left of the center of the blade, as you are looking at the flat side. This will create the long curve on the right side of the blade as previously discussed. Use the outside points of the radius gauge as a reference to help position the apex of the blade curve. Start by making the blade match the entire curve of the radius gauge, as shown. The amount of drop-off from the apex of the blade can be altered later as needed to obtain the desired curve.

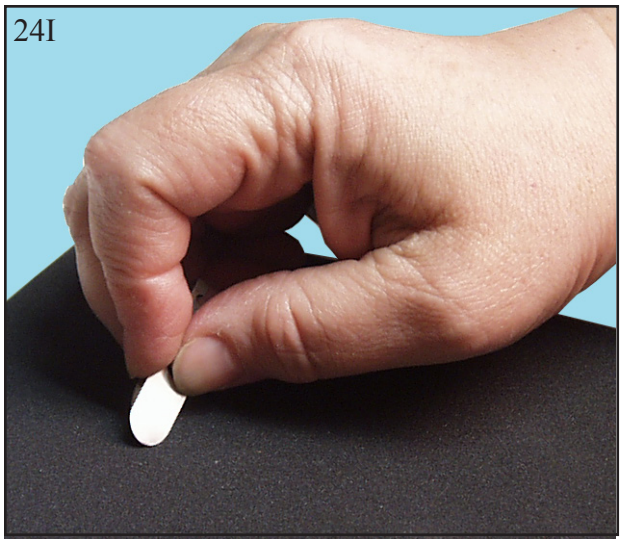
24G

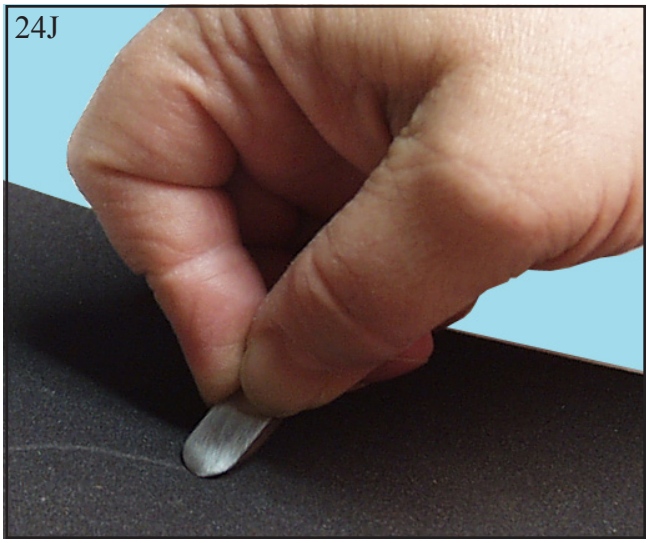


24H

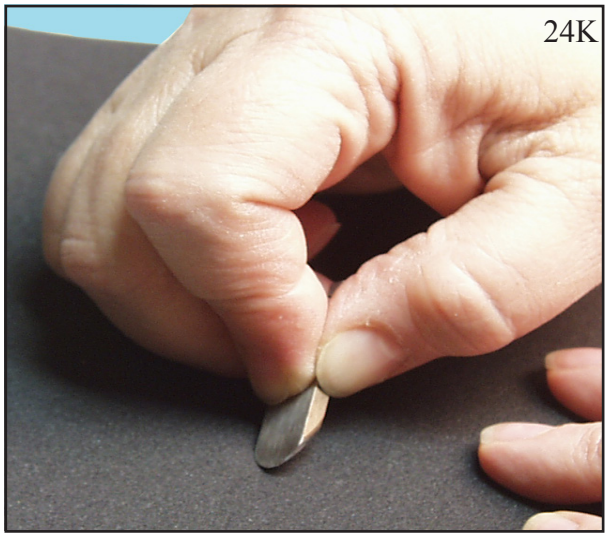
I use several different techniques when shaping the blade. To remove a lot of metal quickly, I hold the blade with my thumb on the flat side of the blade and index finger on the beveled side and rub the tip as shown in example 24H. This is usually the first step I do in shaping a new blade and I use this motion primarily to remove the edges at the bottom of the curve. This motion will dull the blade, so use it sparingly.

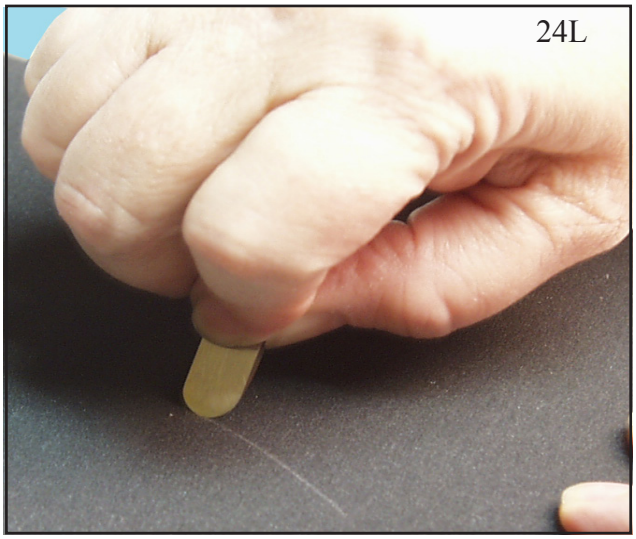
The next technique is a swiping motion. This is the technique that I use most often. The blade is held so that it can be rotated in the desired direction. If you wish to remove metal from the smaller curve on the left, or move the apex more toward the center of the blade, hold the blade with your index finger on the right side of the blade and the center of your thumb on the left edge, as shown in example 24I. With a slight clockwise rotation of your wrist, swipe the blade across the paper, starting from the left edge of the blade and moving toward the center. Hold the blade close enough to the tip to have control, but far enough back to allow yourself the necessary space to swipe across the paper, as shown in example 24J.





To work the other edge of the blade, the long curve on the right side, rotate the blade so that your thumb is on the left side of the blade and your index finger on the flat side of blade, as shown in example 24K. Start with the right lower edge of the curve and use a counterclockwise motion of your wrist as you swipe the blade across the paper, as shown in 24L. With practice you will learn where to start and stop the swipe for the desired results in shaping the blade.



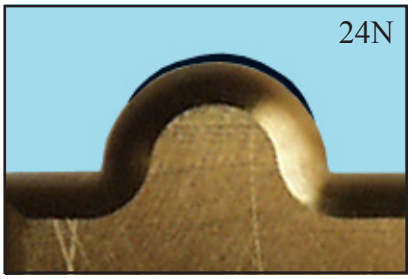


If you have a specific point that you want to remove, hold the blade as pictured to the right in example 24M, and push forward.

For the last type of blade adjustment, hold the blade as pictured in example 24M, and rotate the wrist back and forth. This motion will tend to take metal from both sides of the apex and can be used if you want to alter the curve, by increasing the drop-off from the apex of the blade, making the blade more pointed.

It is important that you maintain the bevel angle during the blade shaping process. The blade bevel has been machined at an angle of 27.5 degrees. If this angle has been altered, you may need to restore it using a fine diamond stone, being careful not to touch your blade tip curve.

Once you have the desired curve on the blade, set it into the machine and compare it to the guide. As you sight down the front guide toward the blade, it should appear as a crescent shadow above the guide, slightly offset to the right as shown in example 24N. This is the surface with which you will be gouging. Once you achieve the curve you want, do most of the sharpening on the flat side of the blade, in order not to change your curve. Use the emory paper to give a polished sharpened edge, using it both on the flat side and the beveled side. Use the two swiping techniques on the beveled side of the blade as previously described.



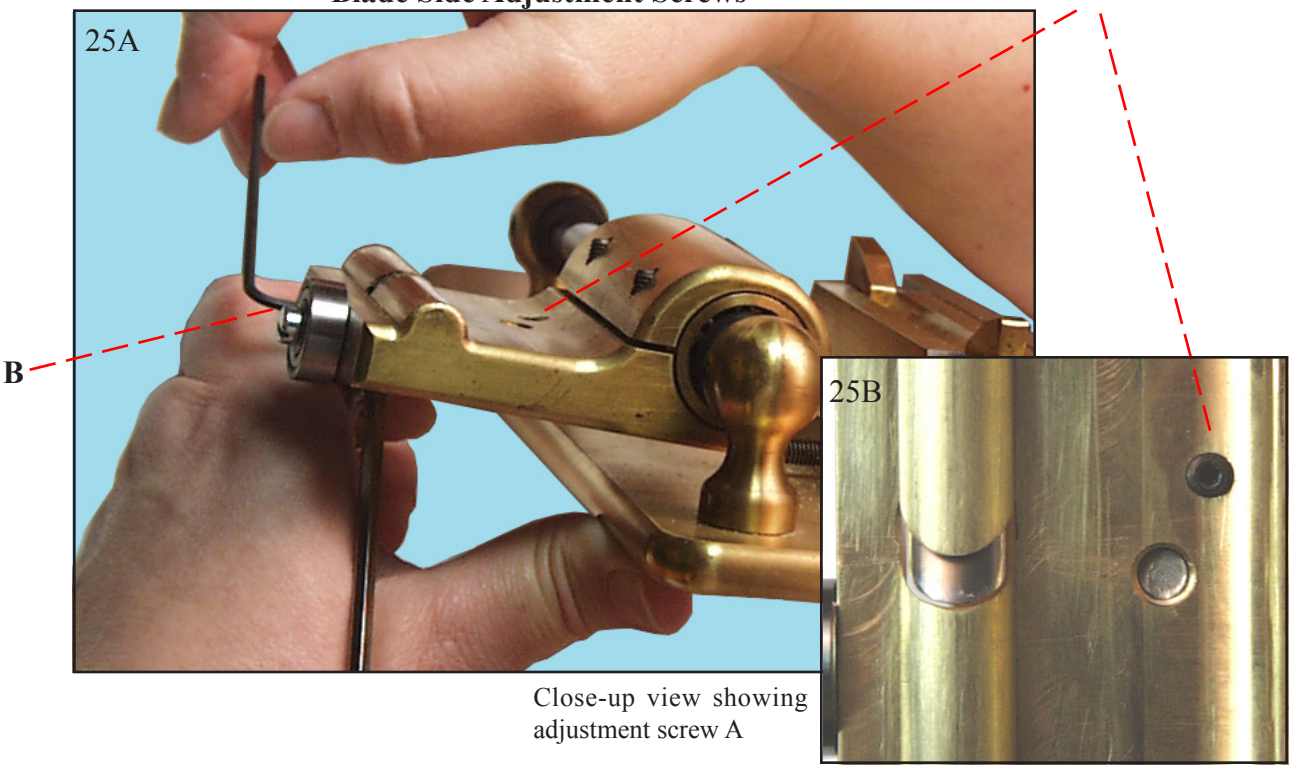
After sharpening the blade several times, it will be necessary to reset the edge, just as you do on your reed knife. To do this and any other major adjustments to the blade, you will need a fine grinding wheel.

25. Installing the blade and blade adjustments

Mount the blade as instructed in the assembly instructions on page 25. Lightly tighten the blade locking screw. The screw must be secure enough that the blade will remain in position, but light enough that you can easily adjust the position of the blade.

Turn the machine into a position which allows you to look towards the blade outlining the guide. The base will be resting on the far edge as shown below. I use my thumb to support the base. Move the carriage all the way toward yourself until it hits the bearing rod support. Wrap your fingers around the blade adjustment bracket to hold the carriage in position. Using the blade depth adjustment screw and the two side blade adjustment screws, position the blade so that it shows above the guide a crescent offset to the right, as shown in example 24N. The blade depth adjustment screw moves the blade up and down, controlling the amount of blade that is showing and the amount of cane that will be removed with each swipe.

Blade Side Adjustment Screws



Close-up view showing adjustment screw A

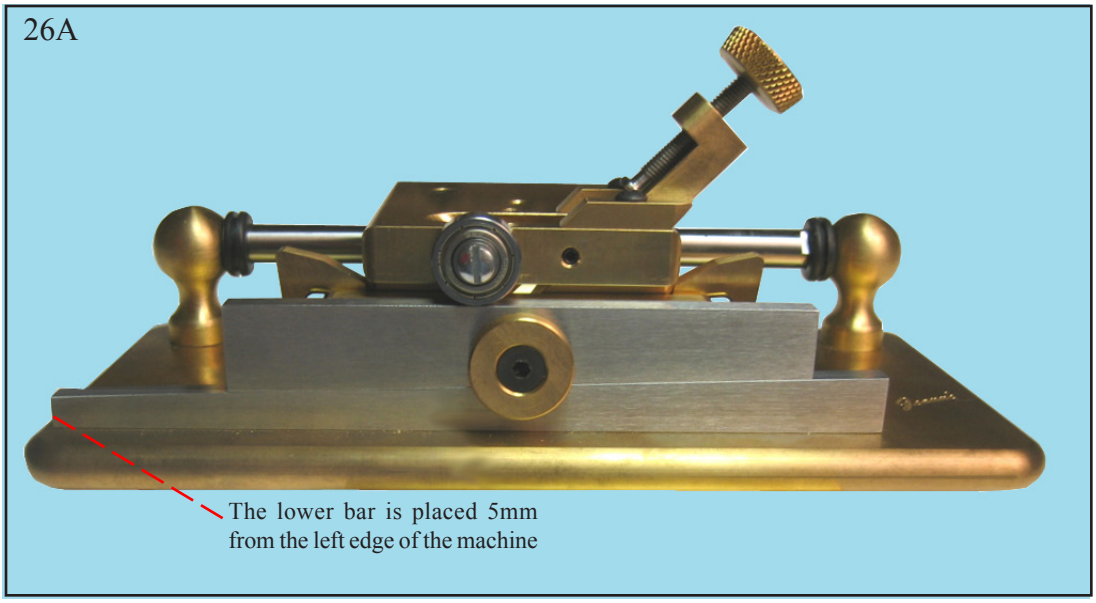
The blade side adjustment screws control the blade movement from one side to the other. By turning the blade adjustment screw "B" clockwise, as shown in example 25A, the blade will move to the inside, toward the bearing rod, making the sides of the gouge thinner. By doing so, the rate of fall-off to the sides of the gouge will usually be faster than when moving the bed to thin the sides. One must be careful not to go too far with this adjustment. If too much blade is showing on the inside there will be a tendency for the cane to move up on the sides of the bed and tear.

By turning blade adjustment screw "A" clockwise, the blade will move away from the rod, making the sides of the gouge thicker. If there is not enough blade showing the blade will not remove the cane properly.

Both side adjustment screws need to be snug against the blade to keep it from moving as you gouge. Once the blade is in position, tightly secure it with the blade lock screw.

26. Parallel Bar Adjustments

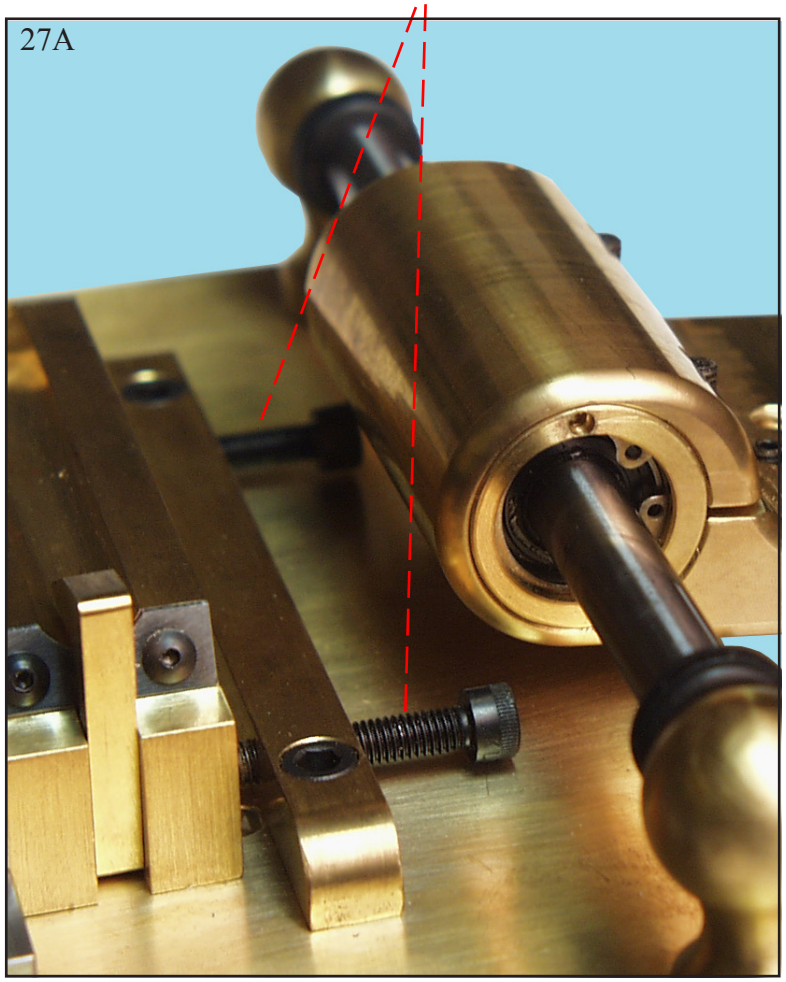
The overall thickness of the gouge can be adjusted by moving the parallel bars. For a good starting position, set the lower bar approximately 5mm from the left edge of the machine, as shown in the example below. This should raise the upper bar high enough that the blade will easily clear the cane stops. It is best to start out with a heavy gouge and then adjust it down. Moving the lower bar to the right will make the gouge thinner, while moving it to the left will make the gouge thicker. An adjustment of the lower parallel bar by 5mm will alter the gouge by approximately .05mm. Every time you lower the parallel bars, check to see that the blade clears the cane stops to ensure that the blade is not inadvertently chipped. Position the machine so you cane see the carriage moving through the bed, as in example 20A on page 26. Move the carriage slowly and watch to make certain that the blade is clearing the cane stops. You will need to check from both ends of the machine. Once you have the bars positioned properly, while pushing down on both ends of the upper bar, securely lock them into place with the parallel lock screw.



27. Bed adjustments

Adjusting the position of the bed in relation to the carriage is another way to control the rate of fall-off from the center to the sides of the gouge. To thin the sides, use the bed adjustment screws, as shown in example 27A. Turn each screw clockwise, one-quarter of a turn at a time, forcing the bed away from the bearing rod and datum bar. By thinning the sides of the gouge in this manner, there will be a slower rate of fall-off than when using the blade side adjustment screws.

To make the sides of the gouge thicker in relation to the center, back off the bed adjustment screws, loosen the bed mounting screws on the bottom of the machine, and slide the bed back toward the datum bar. It is easiest to move the bed beyond the desired position and then use the bed adjustment screws to position the bed. Move one side of the bed at a time. These adjustments have been explained earlier under "Centering the Bed."



28. Testing the gouge

Provided that all the adjustments are correct to this point, you should be able to start testing the gouge. As you start gouging, you need to check that you have the proper blade depth. Take off several swipes of cane and measure them. These curls should measure between .08 and .10mm at the heaviest point. Measure the curls from side to side, observing how they are coming off the machine. The right side of the curl, the inside edge, is generally thicker. This is due to the fact that you are gouging on the inside, with the blade touching the center of the cane less. If you have too much blade showing, there is a tendency to rip the cane. If you have too little, it makes it hard to gouge and you have to take more strokes. If necessary adjust the blade depth.

As you are gouging, you will notice that the inside edge (rod side) of the piece of cane in the bed is thinner than the outside edge. This is normal and will even out as you turn the cane around. Continue gouging the piece of cane, flipping it around every 4 to 5 strokes until no more cane comes off.

Measure the center of the piece of gouged cane at several points along the entire length from one end to the other. Turn the cane around and repeat this process to double-check your measurements. Ideally, all of these measurements should be identical with a thickness reading of .60mm (.70mm for EH). Adjust the parallel bars until you reach the correct measurement. When lowering the parallel bars, always check to make certain that the blade will clear the cane stops.

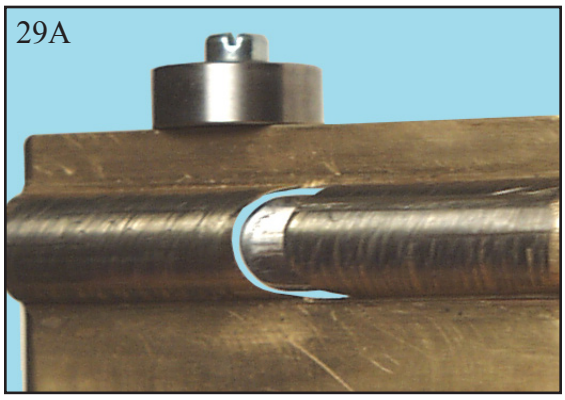
As you are measuring the center from one end to the other, a heavier reading in the middle implies the bed may not be lined up correctly. Measure along the side edge of the cane on both sides to determine if one end is

heavier. Try this on several pieces of cane to see if your measurements are consistent and then make adjustments to the bed as necessary. If one end is too light, move the corresponding end of the bed closer to the datum bar as previously described on page 37 under "Bed Adjustments."

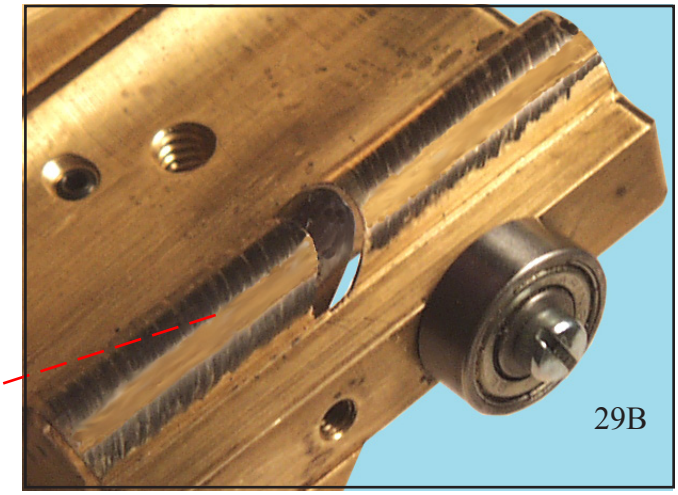
If you feel that the bed is positioned correctly and the center measurement of the gouge is still uneven, cut a narrow piece of cane about 4-5 mm in width and gouge only in one direction. Taking note of which end of the strip is on the right side as you remove it from the bed, measure the strip from one end to the other. If it is a straight decrease or increase in measurement, you can sometimes rectify this by using brass shims placed between the parallel bars.

An inconsistency of measurements can also be caused by the guide hitting the cane incorrectly. To check to see if the guide is rubbing, draw pencil marks across the guides, both front and back as shown in example 29A. Gouge a full width piece of cane, until no more cane is removed. Observe where the pencil marks have been removed. Redraw the marks on the guide and with the same piece of cane check again to see if the marks are removed from the guide as shown in example 29B. It may be necessary to adjust the guides to remove that portion that is rubbing the cane. Repeat this test several times and work carefully, removing only small amounts of material from the guides.

The position of the bed is also going to affect the way that the guide is hitting the cane. Often times, moving the bed away from the datum bar will allow the guide to clear without rubbing.



Shows rubbing of guide

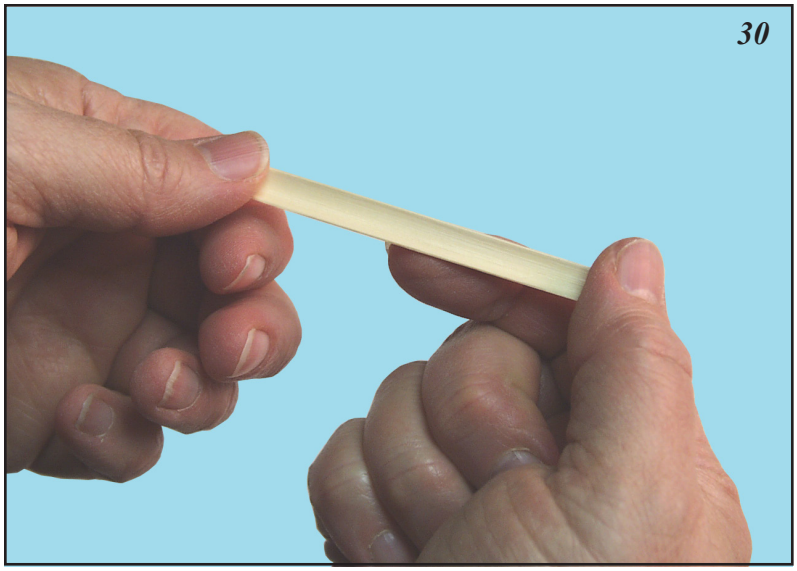


Once you get the center measurement correct, check the relationship of the center to the sides. As described earlier, you can adjust the sides by moving the blade position in the carriage or by moving the bed. You will discover, with experience, that each method will have a different effect. When you get to this point in testing your machine, you need to carefully prepare your cane. Use only straight pieces of cane, cut with the apex of the cane curve in the center.

Set the machine for the diameter of cane that you most frequently use. You will find that if you are using larger diameter cane, the measurements of the sides will be thicker than when using smaller diameter cane. You will also see some variance in the center measurements and the rate of fall-off. With smaller diameter cane the center will remain heavier than when using larger diameter cane. However, sometimes it can be an advantage to use different cane diameters, to compensate for climatic changes.

Although you can compensate for the blade curve by making these adjustments, sometimes you will have to go back to the blade shaping process.

One of the final tests, before actually making a reed on the gouge, is to break a piece of cane. Hold the cane bark side down resting on your index finger, as shown below. Your thumbs should be positioned on the ends of the cane on the gouged side. Push up in the center of the piece of cane with your finger.



When the gouge is good, the cane will always break down the center. This indicates that the gouge has an even rate of fall-off, away from the center, on both sides. Try this on several pieces of cane to determine if the results are consistent. Make certain that the cane has been prepared correctly with the apex of the cane curve centered. In addition, turn the cane in the bed frequently to get more consistent results.

Care and Maintenance

The Jeanné oboe gouging machine requires little special attention. After each use, brush away any loose cane with a soft bristle brush. Place a piece of cotton under the blade with a couple drops of oil and wipe the machine off with a soft cloth. The bearing rod requires little lubrication due to the steel ball bearings inside the carriage. If needed, a small amount of clock oil can be placed on the rod.

The carriage should always be lifted from the center, between the cane clips. Likewise, always lower the carriage in the center. The cane clips are designed so that if the carriage is accidently dropped, the blade will not be hit. However, you should be careful to protect the guide and blade at all times.

Troubleshooting

If the blade is removing cane from the outside, opposite the rod side:

1. The apex of the blade is too far to the left as you are looking at the flat side of the blade.
2. The blade is incorrectly positioned in relation to the guide.
3. The bed is too close to the datum bar.

If you notice a "line," or ridge of cane, down the center of the cane after gouging:

1. The apex of the blade is too far to the right so that it is not hitting the center of the cane.
2. The blade is too pointed in shape.
3. The bed is too far from the datum bar.

If the cane is tearing or pushing up the sides of the bed:

1. The blade is offset too far to the inside (rod side) on the carriage.
2. There is too much blade showing.
3. The blade shape is too rounded.

If the cane is flipping out of the machine:

1. The cane stops are not high enough.
2. The cane is not straight.
3. The cane has not been cut with a clean edge.

If the reeds are loose on the sides:

1. The most common cause of loose sides, provided that the reed has been tied on the tube straight, is that the gouge is not balanced. If there is not enough strength in the center to support the sides, the reeds will leak and have a tendency to be flat in pitch

If the measurements from center to side of cane are inconsistent:

1. The most common reason for inconsistency is that the cane has been cut incorrectly. As you are splitting the tube of cane, the apex of the cane curve should hit in the center of the radius gauge. If the apex is offset, you will get lighter readings on the side opposite where the apex hits, while getting heavier readings where the apex hits the radius curve. You will be able to compensate for these inconsistencies in shaping the cane and scraping the reed. However, one of the advantages of owning a gouging machine is that you can be more discerning in the preparation of your cane, which will give you more consistent results in your reed making.

If the cane does not come off easily and tears:

1. Provided that the blade is sharp, the blade depth is correct (as described earlier on page 37) and you have already checked to see if the guide is rubbing and that the blade is not set too far to the inside, one cause of the cane tearing or not coming off easily can be the cane itself. Sometimes if the cane is too soft or soaked excessively, the cane will not come off correctly.