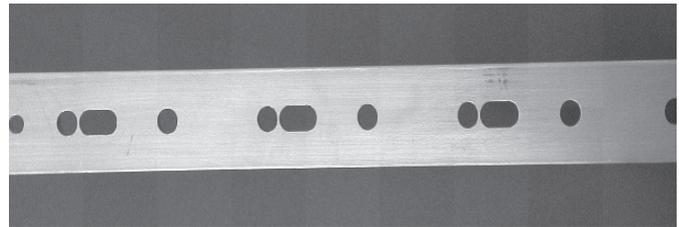


ALUMINUM ANGLE AND BASE MOUNTING INSTRUCTIONS

Your bench should be solid and substantial enough so that when you are milling strips the bench will not deflect with the downward pressure you apply. The Hand Mill base is mounted on top of an aluminum angle that is fastened to your bench. This mounting method improves the setting accuracy of tapers since the quality of the bench surface doesn't affect taper results. It also increases the speed of taper setting and anvil changing.

The aluminum angle that I provide is 2" by 2" by 3/8" and is 75" long. The top has holes drilled to access the anvil screws, slots for adjusting the push/pull screws and holes for attaching the base. (Photo 1.) On the Hand Mill base there are also seven tapped holes for bolts to fasten it to the angle: one on each end and five spaced evenly along the middle. These attaching points will insure that the aluminum angle and the base are held tightly together along their entire length.



HOLES DRILLED TO ACCESS ANVIL SCREWS AND SLOTS FOR PUSH PULL SCREWS (photo 1.)

Normally the Hand Mill aluminum angle and base would be mounted at bench height. However, for those of you who are taller, we have found that if it is mounted so the base is approximately belt high it's more comfortable and easier on your back. We made a box to mount ours higher. (Photo 2.)



BED MOUNTED ON BOX (photo 2.)

The aluminum angles are powder coated to provide a durable and attractive finish.

Ideally there should be at least 18" of clearance on both ends of the base. If you have less space you may cut down on the clearance on the right side.

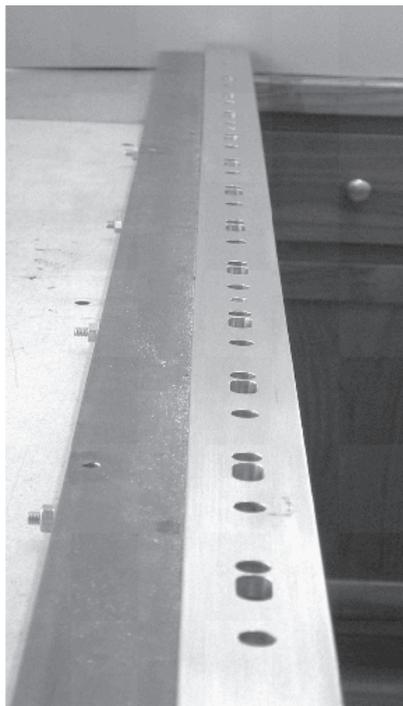
The vertical face of the angle has seven 5/16" wide slots on 12" centers approximately centered on the face. (Photo 2.) You can use the angle to accurately layout your holes either on your bench or on your mounting surface.

The aluminum angle is 2" wide, the holes are centered, and the Hand Mill base is only 1 3/4" wide so the base top can be even with or below the surface of the bench. You will have to determine the best location to mount your angle.

The angle is mounted to the face of a workbench using 1/4" lag screws or bolts, with washers under the heads, depending upon your installation. I don't supply these since I don't know which you will need.

If you are making a permanent installation where you don't want to frequently remove the Hand Mill base lag screws work well. My experience with lag screws is that you should predrill the holes with a drill approximately the diameter of the shank at the

bottom of the threads. The lag screws should not be longer than 1 1/2" in most cases. I would also recommend lubricating the lag screws with bar soap to make them screw in easier, particularly in hard wood.



**ALUMINUM ANGLE MOUNTED
ON STEEL BAR** (photo 3.)

If you need to frequently remove your aluminum angle so as to use your bench for other purposes bolts would be a better alternate. An alternative method of using nuts on the bolts would be to mount a permanent nut assembly on the backside of the bench. These units can be purchased at a hardware store.

However, this could present a problem if the bolts go through the face of your bench and hit the top or it doesn't allow enough space for nuts. It may also be necessary to mount the aluminum angle differently if the bench is not designed to mount something to the front. An alternative method of mounting the aluminum angle would be to fasten it to a separate stable board or cold rolled steel bar on top of the bench. If this way is chosen the angle should be even with the front of the bench. This method of mounting would allow for quick and easy removal from the bench. In some cases, it may also provide a better working height for the

Hand Mill. I have also shown the angle mounted on a steel bar. (Photo 3.)

It's important to make sure that the aluminum angle is level from side to side. When you attach the Hand Mill base to the angle if it's not level you can twist the base resulting in the Hand Mill plane not sitting level on the base. This could cause inaccuracies when milling strips. Therefore, before installing the aluminum angle make sure that the front of your bench is flat where you are going to mount it. If necessary you can shim the front of the bench or other mounting surface to make sure that it is flat and straight.

The next step is to install the aluminum angle with a slight upwards bow in the middle. Once you have the aluminum angle fastening holes drilled attach the angle loosely using washers under the bolt heads. Tighten **only** the two end bolts securing the aluminum angle to your bench. Pushing up by hand raise the middle of the aluminum angle approximately 1/8" and tighten the middle bolt. You can check the amount of bow by stretching a string tightly from end to end under the angle and measuring the amount of bow with a caliper. Once you have the proper amount of bow fasten the other five bolts securely attaching your aluminum angle to the bench.

Fasten the base and adjustable bed assembly to the angle using the seven 5/16"-18 button head screws that are provided from the bottom into the tapped holes in the base.

Some users have questioned why I recommend putting a 1/8" bow into the aluminum angle. The reason is you don't want the angle/bed assembly to have a dip so the plane might touch only on the ends. When you bolt the two assemblies together they will almost always be flat but having the bow makes sure there won't be a problem.

You can now check whether or not the base is level by setting the plane on the base and trying to "rock" it sideways by pressing on alternate corners as you slide it down the base. The plane should feel solid everywhere along the base. If the base is not level you can loosen the bolts in the area that attach the angle to your bench and install shims between the angle and bench until it is true.

You can use an electric screwdriver to put your anvil screws in and out when changing anvils as this saves considerable time. However, if you choose to use this method be sure to use a screwdriver with a variable tension adjustment set on the lightest setting so that the screws are not over-tightened. I provide you with an extra long hex driver to go through the aluminum angle and base.

When you adjust your tapers they will remain precisely where set. Using the aluminum angle the Hand Mill base never has to be removed either when setting the taper or changing anvils. This in itself saves considerable time both setting tapers and in changing anvils during strip cutting. Nonetheless, some users prefer to remove the bed assembly, tip it on its side, and then change anvils.

This idea of using this "aluminum angle mount" was invented and shared by John Miller, a Hand Mill owner. The sharing of ideas helps fulfill my hope that bamboo rod making and the further development of the Hand Mill be a collaborative effort among its users.

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