

Carving Tools - What to Buy, Where to Get and How to Make Them

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(by Janel) Really hard wood, when carved with small tools the right size for the details and cuts, will amass a very little pile of chips or shavings by the day's end. It is sculpture on a very small scale. I like to think that the only things missing is the rap of the mallet on the chisel and the dancing one might do around a large and fixed in place piece of wood. Oh, and the big pile of wood shavings and chips generated by the big tools on the big piece of wood...

Soft wood carves more easily and is favored by whittlers and other wood carving enthusiasts. I choose the hard woods for the detail and for durability which was necessary for netsuke when they were being used in every day life in Japan. Choosing the hard woods will make the work progress more slowly with hand tools, so I would say yes to your statement about "whether the difficulty is typical". Also being newer to carving is likely to add to the feeling of difficulty too, but with each day's work, you will learn, ask questions and find solutions, which will build upon itself. By the time you are done with the first piece, you may be thinking about the next piece, and what you might try to accomplish. You might use the experiences from the first piece as a guide for growth and departure, and it goes on from there.

Remember to keep the tool edge sharp. Hard wood dulls the blade enough to make clean cuts not so easy. There are topics in the archives about whet stones, strop use for some tools, or handy pieces of paper/cardboard (cereal boxes or the like) and honing compound for the in between touch up strokes. Several of my favorite tools are self-made. Others are commercially made and some of those are altered to fit my smaller hands (made for guy's most likely).

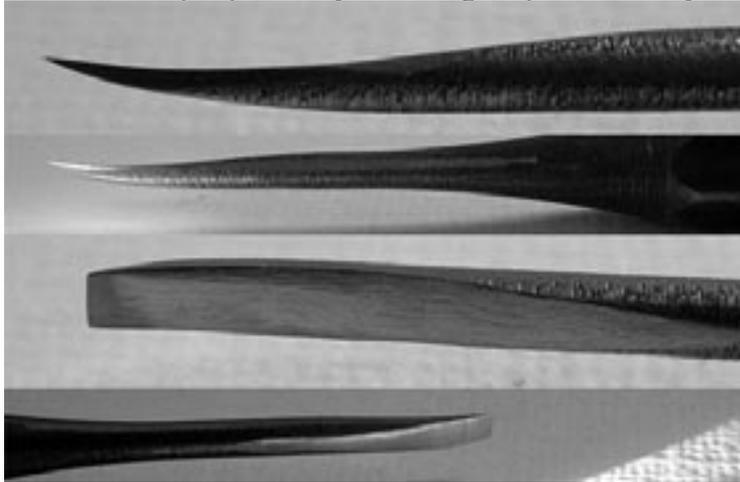


An assortment of my tools.

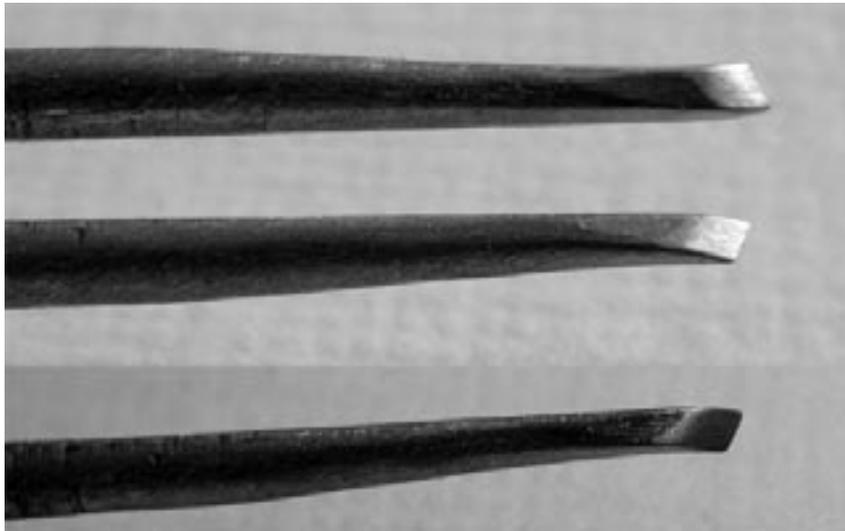


Another group of favorite tools.

The underside work required the making of a couple of new tools. I think a couple more would be helpful, I will wait and see. When I find myself picking up and putting down tool after tool, not finding the feel or angle to be just right for the next cuts, then I know that I need to devise a new tool. These new tools were cold ground with a slow rotary tool/water cooled, and whet stones. The blanks were the Craftsmen Sears pin punch style, the higher priced variety.



1/16" Craftsman Pin Punch



3/32" Craftsman Pin Punch

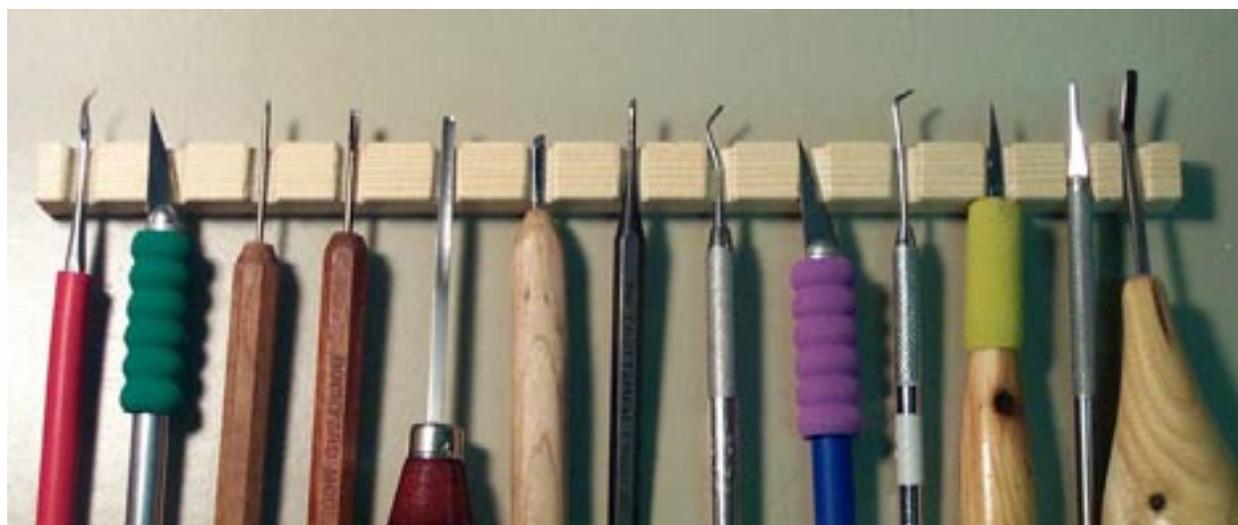


The pin punches

(by kwinn) I recently posted a carving (see “Mouse on Cheese” in the new work forum). Several people (including Janel) asked what kind of tools I used, especially for the undercutting. So, I’m posting a picture of my favorite small-scale tools. Some of these are primitive, but they work. I’m always looking for more tools and finding ways to re-use or reshape tools that gone by the way-side.

These are not all the tools I use -- I use a Foredom rotary power tool and a number of more traditional-sized hand carving tools for rough shaping.

Another simple but useful idea demonstrated in this picture is the tool rest made from a long piece of wood cut with evenly-spaced round notches. This really helps keep control over a cluttered workbench, and keeps the blades from banging into each other (which can mean another trip to the sharpening stone).



Numbered from left to right, they are:

1. SCRAPER. Purchased from Woodcraft in their “small scrapers” set. Very nice for cleaning out those deep or undercut areas.

2. SCRAPER made from a standard Xacto knife blade. The edge is ground and polished perpendicular to the face of the blade and is about 0.5mm wide. There is a slight curvature lengthwise along what used to be the cutting edge, so I can scrape with just the tip without worrying about the heel doing any damage elsewhere. This tool is very useful for smoothing in tight corners where sandpaper just won’t reach. This isn’t useful for scraping larger areas, however, because the blade is so thin it tends to chatter if pushed too hard.

3. Small chisel, made by Dockyard. I have and use a couple of sets of Dockyard tools, but only pictured a couple here.
4. Small dockyard gouge.
5. Small palm-gouge. It has a slight curvature (probably a #3).
6. Small knife made from an Xacto stencil knife blade set in a maple handle. It's not pretty, but the steel seems to hold up well, and is easy to reshape as needed.
7. SCRAPER made from a nail punch. The face is an oval shape. Used by holding at a high angle (maybe 70 degrees or more) and then dragging away from the face. Nice for smoothing very small concave areas that are difficult to reach with sandpaper. I have a couple of others of different sizes. (Thanks to Janel for teaching us how to make these scrapers).
8. Small knife made from a flat dental pick. This end shown is sharpened only on the end, which makes a small blade (about 1mm wide) that can reach into tight areas. The other end of this tool is sharpened along the inside edge, which helps make undercuts in hard-to-reach areas.
9. Standard run-of-the-mill Xacto blade. The end of the blade extremely thin, so it can go into undercuts that other blades can't. You have to be very careful using Xacto blades in hard wood, however, as the tip breaks easily if any sideways pressure is applied.
10. Another re-commissioned dental pick. The sharpened edge is aligned 90% with respect to the handle, so it can reach in and undercut where other blades won't reach.
11. Detail knife made by Gil Drake of Drake Knives (www.drakeknives.com). The blade is about 23mm in length, but is made from thin high-speed tool steel, so it's pretty tough blade. I use this knife quite a lot for detailing.
12. Miniature scalpel purchased through a woodcarving catalog. The cutting edge extends down along the side of the blade, so sometimes this blade can reach where others can't.
13. Bent gouge made by Drake Knives. Although I think this is technically a gouge, the edge has no curve to it (which makes it a #1 gouge). This shape is nice for making deep undercuts.

(by Janel) Thank you! What a useful array of tools! The tool rest is a fine idea! The foam pencil grips are a clever addition too. How is your #1 scraper shaped. I cannot quite see it, and could not find it at Woodcraft tools, though I gave up looking after a while. Lots of nice tools at that site!

My favorite undercutting tools are the tiny three-sided nail-punch tools. These images have appeared here before, I think, but I'll post them in this new topic. I see that the tips of the three-sided tiny tools are not easily seen, but resemble the larger three-sided tool, just wee in size.



The array of tools is a selection, not the entire group which I choose from.

The three-sided tools are related to the tools made by Stephen Myhre, which were inspired by the stone carving tools of the indigenous people of New Zealand.

(by Janel and Ford Hallam) Ford and I have just started talking about tool sharpening, actually over a couple different places in TCP, so here is a place for topical comments about our techniques and theories.

I'll repost Ford's response to my initial inquiry about using a strop...

Hi Janel,

I think sharpening chisels and the like is made a bit over complicated at times. Before you begin, the potential of the tool is established by the actual angles of the cutting faces. This, of course, is dictated by the material to be cut and I would suggest, to a certain extent by the shape of the tool. For instance, a scraping tool will judder (tech' term) if the tool is too thin, not a great example perhaps but you probably get the idea.

Actual sharpening is simply the process of creating an accurate, and smooth interface of 2 or more planes. While shaping these planes, steel molecules are effectively rubbed up and over the edge, thus creating the burr, once all the planes have been honed through that point the burr ought to be removed as it can interfere with the cutting action. Also, to create a slightly more resilient cutting edge it is in effect actually minutely blunted by the stropping action.

I may be wrong but I get the impression that you periodically strop your chisels while working, perhaps this will dull the edge over the course of the day. From my experience stropping is something that you do after you've actually sharpened the tool on a stone. As I mentioned earlier (on another thread), in the jewelry trade I was taught to simply stab the side of the bench (only if wood) to remove the burr, after sharpening a graver. I rarely, if ever feel the need to strop but will touch the edge to the stone whenever I feel it is not biting as I expect.

I don't know if any of this is of any help but perhaps it might stimulate an exploration of the process for everyone on the forum. I'm pretty certain there are all sorts of variations on the theme.

As always,

Ford

p.s. looks as though I've made it as clear as mud, 2 minutes to demonstrate and half an hour to write about it."

Thanks Ford!

I've had advice from another field of wood carving (larger, less art related), that encourages touch-

ing up with honing compound on cardboard between whet stone sharpening. The whet stone (from what ever degree of coarse to fine stones) sets or corrects the plane and angle of the cutting edge/surface, followed by the strop, or in the case of tools of the size I use, the cardboard/honing compound strop. Between the more aggressive metal removal of the stones the cardboard strop was recommended to keep the edge sharpened until the next whet stone episode is needed. The strop, in this scenario, produces a “micro-bevel”, which must be the same blunting that you refer to above.

About the judder, I understand what you mean. My tools range from thin angle to wide angles, and I reach for the one that feels right for the job. If it judders, I reach for a different one, or take time to sharpen the edge if that is what is needed. Some tools are left or right oriented to accommodate the direction of the grain in the wood, so another bit of experience adds to the flow of activity when the judder is felt.

To wring a little more out of the judder, Komada Ryushi demonstrated a technique which depends upon a judder occurring deliberately, to give texture to the surface of the ivory being carved. (Used also in clay surface texturing, but I won't go further...)

Today I will try your approach and use one of my fine stones.

Question: (by Janel) You said: “...will touch the edge to the stone whenever I feel it is not biting as I expect.” Does that mean you touch the angle at which the angles meet, the cutting edge, to the stone... or ... does one touch the plane(s) of the tool to the stone to create a new edge? (Watching is better than words, but we only have words here.)

Answer: (by Ford Hallam) I don't put micro-bevels on any of my chisels, I simply try and keep the cutting face as flat as possible. Too many angles and I get confused. Interesting to hear that you can utilise the judder to good effect, devilishly clever, those Japanese, aren't they?

(by toscano) Not sure how helpful this all will be seeing as y'all are more experienced in the dark arts of carving and sharpening, but generally daiku (Japanese carpenters) sharpen their chisels and other such 'blades' by creating two flat surfaces at an angle (which depends on the use), without any microbevels. This is achieved with 'coarse' waterstones. The resulting burr is generally removed by honing on a very smooth stone (high grit). Fairly standard stuff really. For myself these grits are 2000 and 8000 respectively. You'd think that a 2000 grit stone is nowhere near 'coarse' but for surfaces that don't require a lot of material removal it's very good (at least this particular brand).

I was somewhat surprised to hear that the burr is 'broken off' by stabbing the chisel point on a wooden surface (which sounds like a great ending to the sharpening of a chisel). Surprised not be-

cause I know this to be bad, but because all the things I have read/heard about sharpening Japanese chisels states that breaking the burr leaves the edge rugged... Hmm... I think next time I sharpen a chisel I'll try both methods and judge for myself.

(by Ford Hallam) Stabbing the chisel into wood to remove the burr, is a "trick" that I've only ever used on hand held gravers or burin. This would appear to only apply to metal cutting gravers. As Robert got his start under a German master as did I, my guess is that it is common practice in the European trade.

As you describe, the sharpening of Japanese chisels is both simpler but at the same time more refined, Certainly the result is just so satisfying.

Making and Using Gravers

I use a modified type of heel that is a sweeping curve instead of an angle. I can sharpen this without a jig just by eye. I know this is impossible for someone who doesn't know what the #*ll we're talking about to picture so I'll post a drawing and photo of the tool. It's going to have to be later though.

I mostly use two general types of shaped gravers: 1) line engravers and 2) chisels that are either flat or curved. Within both of these categories there are a lot of varieties, and everyone will develop their own preferences.

For simplicity, starting out, I would recommend using hardened high-speed steel (HSS). This allows you to get a very hard and tough tool without having to learn heat-treating right out of the gate. I use either 3/32 or 1/8 round HSS drill rod (I'll mention sources Later). I use the round rod because it fits into my power handpiece well, or can be fit to a palm handle or mounted for use with a hammer.

First I'll show how I shape a round rod to make a line graver. I'm going to show this using a wood dowel as it will photograph better showing the planes without reflection. This is a general use shape and can be varied, especially to width depending on application. I do all this shaping without the use of jigs, which I always found cumbersome and slow, although I did use them at first and some will find them helpful, I'm sure. Doing most of my engraving in non-ferrous, my gravers stay sharp a long time.



This first shot shows the face angled at about 55 degrees (could be 45-60).



The next step is to grind the top down to reduce the size of the face and make it a more useful shape.



Next the sides are shaped to bring the bottom of the face to a point. This is where you have a lot of discretion, to make the face fit the function. The angle at the point can be very wide (45 degrees or even wider, or quite narrow. It depends on if you want to cut a wide , bold line or a thin shading type line. As always, form follows function. I've chosen to show a fairly narrow face which could be called an onglette. This step takes some care to retain symmetry side to side as you want the line on the bottom (behind the point) to go straight back behind the point, not to one side.

If I'm using hardened drill rod, it's too hard to hacksaw so I use thin cut-off wheels made by Dremel in my flex-shaft. It's not necessary to cut all the way through. I usually make a deep score all the way around then snap it off in a vise (wear goggles!). Clean up on the grinder. The major shaping can be done with whatever grinder you have available, could be a bench grinder or even mizzy wheels on the flex-shaft. I use rubberized abrasive in the flex-shaft to refine the shapes and put a nice finish on the tools. I usually only stone the face and wherever else the graver will make contact with the work. I can make a tool very quickly this way without having to spend a lot of time using a jig or stoning. The main thing is to have the geometry correct and a nice finish "where the rubber meets the road".



Speaking of geometry, next I'll show the heel that we were talking about earlier. In the photo above, you can see that on the bottom of the graver going back from the point is just a straight line. If you use the tool like this, it will be very difficult to maneuver as it will tend to just dig in and drag going around corners, and you will have to hold it at a very low angle to the work. Robert has a method I have never seen, but I'm intrigued to see. Anyway, if you look at the photo below you will see a sweeping curve behind the point. The general rule is, for me, the straighter the cut the less curve you need. Going around a tight radius, you need a more exaggerated lift.

The heel that a lot of engravers use is a more complicated approach really requiring a jig, at least starting out and is more like putting facets on the bottom of the graver. This method I use is really easy and quick. Like anything it will take experience to see your needs and what it takes to get there. I learned this method from Leonard Francolini about 25 years ago.



Here's a view of the point from the bottom, showing a straight line back from the point, which blends into the round bottom.

Question: (by Janel) Where does one find the HSS hi speed stock? I have used the smooth end of high speed drill bits, is that the same kind of material?

Answer: (by Jim Kelso) I got a bunch years ago that I'm still working on from Latrobe Steel of Koncor Industries. I did a search and it looks like you should call and get a local dealer who will sell a small quantity. 603-329-0101

I'm going to look at some other possibilities. I think Don will also have some ideas when he's back.

The HSS drill bits are the same family although no doubt there are many different alloys. For our purposes, the most general duty type should work fine.

(by Robert Weinstock) I'll add my two bits for what it's worth. Everything Jim said is valid, and is probably the best way to go for someone with no experience. It also jives with what most engravers do, more or less. The curved heel is intriguing. I've never seen that before. When I do work with a chisel, whether it's with a hammer, or with some form of reciprocating handpiece (I use a

magnagraver, but it would apply to a Gravermax too), I grind a heel on my tool, but when I use hand gravers, as I said before, I don't use any heel. The difference is that I'm carving, not engraving. I carve to a much greater depth. I can still go around tight corners. I do pretty small scrolls with an onglette. It just takes lots of practice. I'm not making the cut in one push. It takes several times over the same curve to get the depth I want. I'll show some more tricks soon. I use carbide for chisels in my handpiece. It stays sharp much longer than hss. For handmade gravers, I use lathe cut-off tool bits made of 5% cobalt hss. I get them from MSC. They are pricey, about \$5 each, but they hold an edge, and last a long time.

A good way to see what different kinds of gravers look like, look at a catalogue like Gesswein jewelry supplies, or Otto Frei. They have lots of useful tools.



Here is a picture of a tool I use a lot. It's a type of fulcrum for my gravers. It works best with flat or round gravers, but not well with onglettes and knives. I hold the tool with my left hand, and rest the graver on it right behind the tip. The graver rides on the ring, and enables me to get great control, and lots of power. I can scrape small amounts of metal, or large amounts depending on how

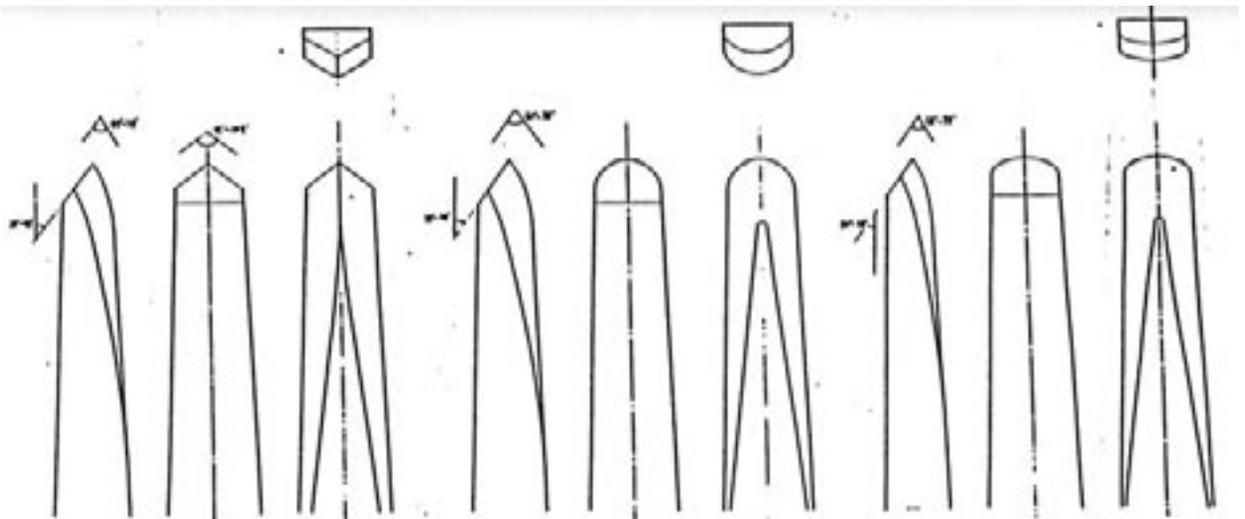
much force I use. The ring is 1/8 inch drill rod, but you could use brazing rod, or even copper if you are concerned about marring your work. I use it frequently with a flat graver I have that's 1/4 inch wide to flatten out an area. It works well on large surfaces, but I've used it to great advantage on small areas as well.



Here's another picture of some of my gravers, and my little helper.



Here is a picture of a couple of my chasing hammers. They are some of my most precious tools



(by Jim Kelso) Here's a graphic of three Japanese chisels with four views of each. You have a front view of each above and then top, bottom and side of each below. The side views show the same type of sweeping heel I use.

I've found an online source for hardened round stock for gravers. <http://www.toolanddie.com/>

At the home page do a search for "hardened ground round" and click that same subject when it comes up in the search results. When you open the drop down menu for sizes you'll see 3/32 and

1/8 among others. I've used M2 but probably any of the alloys will be fine.

Also GRS sells graver stock in a variety of shapes. They only have rounds in carbide which I don't use as I find it tedious to sharpen and unnecessarily tough for cutting non-ferrous metals.

<http://www.grstools.com/>

Question: (by Jim Kelso) Robert, that's an interesting approach using a fulcrum. Did you develop that on your own, or is it used historically too? How do you control the chisel/fulcrum if you're using a hammer to drive the chisel?

Answer: (by robert weinstock) No, I didn't develop it on my own. I'm not that smart. I learned to cut dies (and carve and chase) from an old German master who studied in Fortzheim (Germany) just after WW1. He was way better than me. I think he learned it as an apprentice. There are lots of tricks I learned from him.

When I use a hammer and chisel, I don't use the ring tool. My chisels do have a heel. But I only use chisels for removing excess metal. I do all my detail work with push gravers, and only use the ring with them.

(by robert weinstock) With high speed steel, a little coloring shouldn't be a problem, but having a bucket of water nearby so you can regularly quench the tool is essential, especially with regular tool steel, but even with HS, it's a good idea.

For me, square stock, or rectangular stock works much better than round, because with round, you can't pick up the graver and know without looking which way is up. It's too hard to position the point properly. I use so many gravers, and am switching from one to another so often, that I don't need another complication in the process.

With a tool that's 2 3/4" long, you'll need a fairly long handle to hold it even like a graver. I start out with a short, stubby handle, and switch to a longer handle when it gets too short. With a square bottom on the tool, you can shape it to any shape you want. I would use the tools you have, and you'll find out what works for you.

Tool Holder



(by sergey_osipov) I use the piece of foam plastic for placing my chisels. This very comfortable to stick chisels. There is no need to have the special place for each chisel, possible just stick the chisel in any place. Besides this saves tools from desharpening.

Favorite Tools

(by Doug Sanders) Here's a picture of a tool that is not necessarily my favorite, but I love the simplicity of it.



It's more or less a Japanese x-acto knife, primarily used for stencil cutting (for textile dyeing) I believe.

It's just a blade and two bamboo splints. It came with a flimsy thread wrap to hold everything together, so I applied some whipping with a waxed linen thread and tied a reef knot at the bottom for extra stability.

It's beveled on both sides, and I tend to use it for 'kebori' - or fine line cutting for surface decoration where needed, like for the water lines on this wooden kozuka copy.