
# More about Hand Tools
## Workbenches, Chisels and Saws

Cabinet maker's and Restorer’s Meeting

9 June 2018

# Why do you need a Workbench?

- A good workbench is a **fundamental tool**
  - So why is this often not a priority when setting up a workshop?
- Basic design features:
  - A strong base which does not rack or slide
    - Critical for any accurate handwork
  - A thick flat top
    - Ideal for assembly
  - Well positioned vises aligned to dog holes in the top
    - Versatile clamping options
  - The bench is the right height for the user
- Many designs available
  - Better late than never!!

# 40 years too late, but not a single regret!!

# 2017 – Addition of tool storage cabinets

# Tools are safe and available at the bench

# Some examples of different ways of holding work pieces

- Wide use of bench dogs
    - Many other hold-downs and devises available for use with dog holes
- Special modes, such as the Lowboy cabriole legs during shaping

# Chisels

- One of the oldest tools used by woodworkers
  - Many types developed for specific uses
    - Butt chisels
    - Bevel-edge Chisels
    - Paring chisels
    - Firmer Chisels
    - Mortise chisels (Sash, Registered, Millwright, Bolstered)
    - Specialty chisels ( Gooseneck, Corner, Cranked, Skewed, Dovetail)

# Bevel-edge chisels

Most tool chests house a few bevel-edge chisels, whose angled sides ease working in tight quarters. There is some loss of strength, which doesn't affect, for example, a carpenter's butt chisel that mainly cuts out hinge gains, or a paring chisel that shaves with the push of a hand. Bench chisels will tolerate light mallet blows. Firmer chisels are slightly heavier versions of bench chisels.




# Mortise chisels

These heavy-duty chisels are designed to chop out mortises without any predrilling.

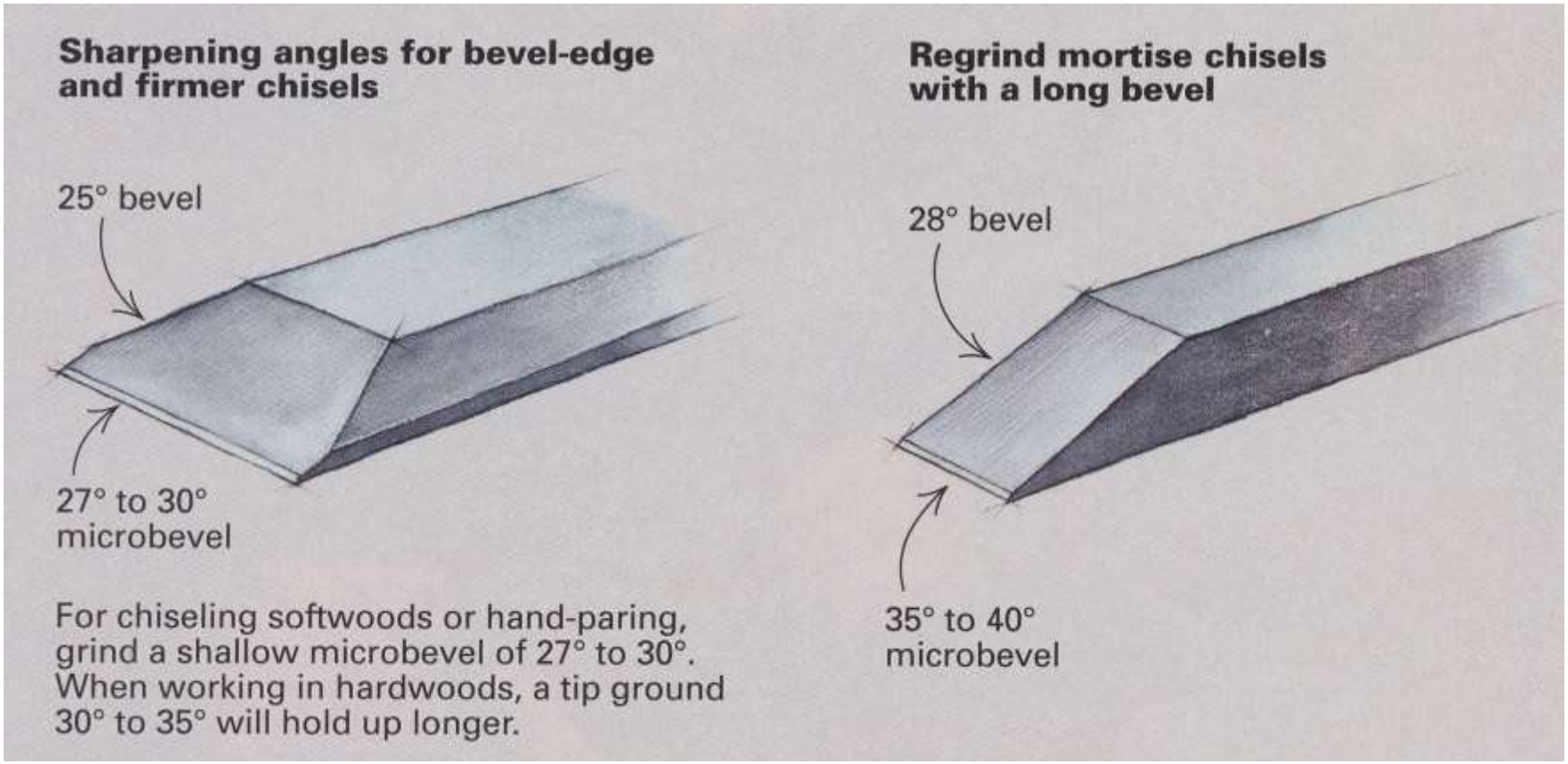

# Specialty chisels

**These chisels perform specific tasks, generally for advanced craftsmen whose work requires those tasks often enough to justify the purchase of a special tool. Most of the tasks can be performed adequately, but not as efficiently, with common bench and mortise chisels or other tools in the shop.**

# General Use

- Most woodworkers have a set of 4 of standard bevel-edge chisels
  - Used for all purposes: mortising, dovetailing and paring
    - May also be used for scraping off glue, etc.
  - These applications may be incompatible
    - What profiles for sharpening?
    - Mortising may place severe strains on the chisel edge
    - Moving from one use to another with the same chisel may not be optimum
- Limited availability of top quality chisels in SA
  - Quality costs more but looked after, can last a lifetime
  - New steel types give better edge retention e.g. Veritas claim PM-V11 better than A2 or O1
  - Read up before buying top range chisels
    - For example, FWW reviews NAREX chisels as of excellent quality, reasonably priced and available in SA

# Sharpening




For Paring Chisels - 15-20 deg cutting edge bevel

- Never use a mallet but only hand operation

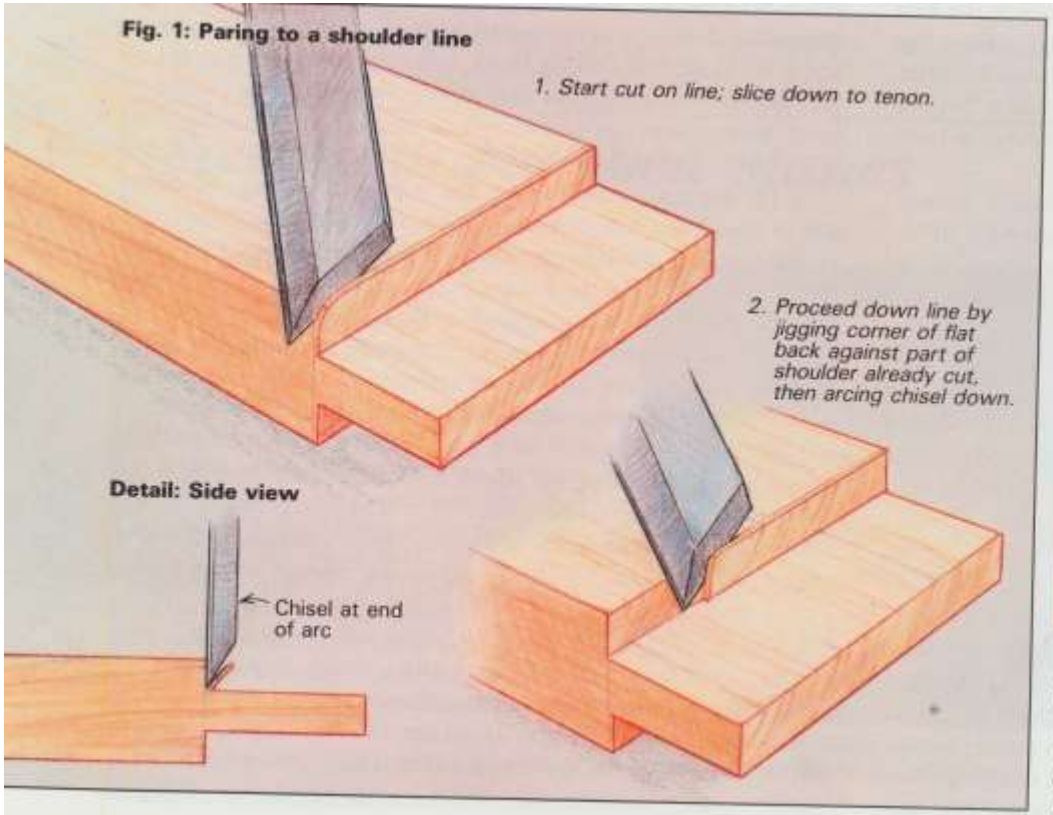
# Some uses in fine joinery

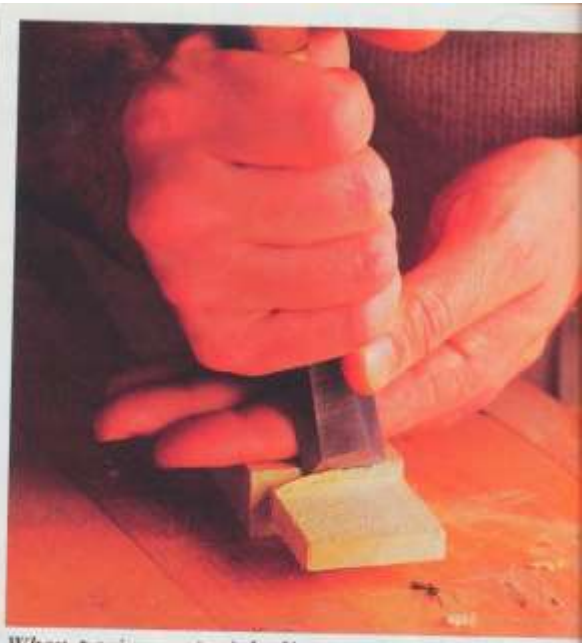
- Mortising
  - Most woodworkers tend to use plunge routers and jigs to make mortises
  - If not, remember your bevel chisels is not designed for heavy mallet blows (especially in harder woods)
- Dovetails
  - Can use router jigs but often limited layout or sizing
  - Bevel chisels are essential for hand-made dovetails
- Paring
  - Most likely general use for cabinet makers
  - Works well with well honed chisels or chisels reserved for this application

*A mortising chisel, top, cannot get into tight corners because of its square sides; the paring chisel, above, has no problem because of its side bevels, which can be ground to almost a knife edge. Taking this thought one step further, the author modified a small parer's cutting edge to form a double-skew chisel, right, for slicing into dovetail corners. In all these cases, the right hand powers the cut, while the left rests against the work and grips the tool for control.*

# Paring a shoulder line

- Need a good marking gauge to scribe a clear line cross-grain



*When paring a straight line, such as this tenon shoulder, the left hand backs up the tool for control, while the right hand pivots the cutting edge down. With a series of cuts (see drawing), the flat back of the chisel can jig itself along the length of the shoulder that has already been cut, as well as along the scribed shoulder line.*

# Hand saws

- As with chisels there are many types of handsaws
  - Panel saws (Rip and Cross-cut)
  - Western Back saws
    - Dovetails saws (Rip)
    - Gents Saws (Rip)
    - Carcase saws (Rip and Cross-cut)
    - General purpose saws (Combination sawtooth geometry)
  - Japanese saws
  - Coping saws
  - Fret saws
  - Bow saws
  - Flush cutting saws
  - Hack saws
  - Mitre saws

# What do you have?

- For most, when buying hand saws do we look for or specify:
  - The main use
  - Type of handle
  - Blade thickness, length and cutting depth
  - Teeth per inch (TPI)
  - Rip or Cross cut saw tooth geometry
  - Set
- If it was a power tool we would know all the required specifications and probably study reviews
- If hand work and specifically fine joinery is part of your plan, then we need to understand more
  - And what about sharpening of a hand saw?
    - Do we know what we want?

# Back Saws

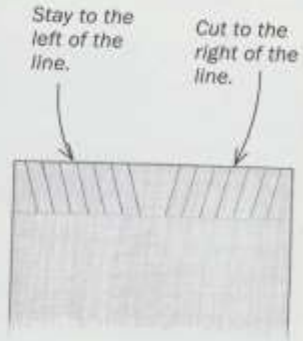
- Probably the most common for all woodworkers
  - Traditionally, the prime use was cutting dovetails and tenons which are both rip cuts ( i.e. with the grain)
    - Generally a back saw with rip saw tooth geometry will also cross cut acceptably
    - Some manufacturers are now using a ‘hybrid’ saw tooth geometry
    - If you plan cutting tenons – need a 300mm long saw with 14 tpi and about 50-60 mm cutting depth
    - If for dovetail work, then there are smaller saws with finer rip geometry teeth, e.g. 15-20 tpi
  - And then there are Japanese pull saws which have there own saw tool geometries and characteristics
- Accurate cutting, even with the best saw, requires the correct posture as well as practice to develop muscle memory
  - Once experienced, hand work can be quicker than setting up jigs and power tools, especially for limited runs

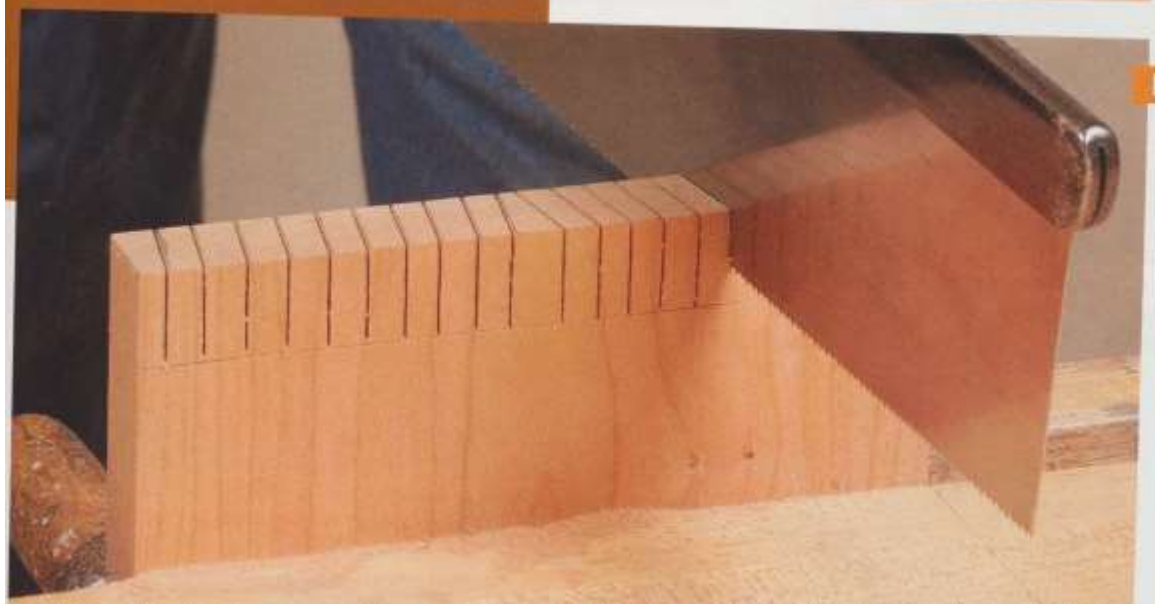
# Conquer dovetails one cut at a time

**Repetition of good technique is the key to good joinery because it creates muscle memory. Don't worry about complete joints at first. Instead, spend time practicing the individual cuts that make up a tail and pin.**

## TAILS

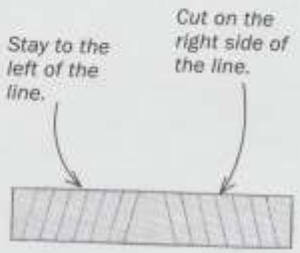
***Practice should simulate the real thing.*** *Lay out both sides of the tail on the same board. For the cuts right of center, always cut to the right (waste side) of the layout line as you would on real dovetails. On the left side, do the opposite.*



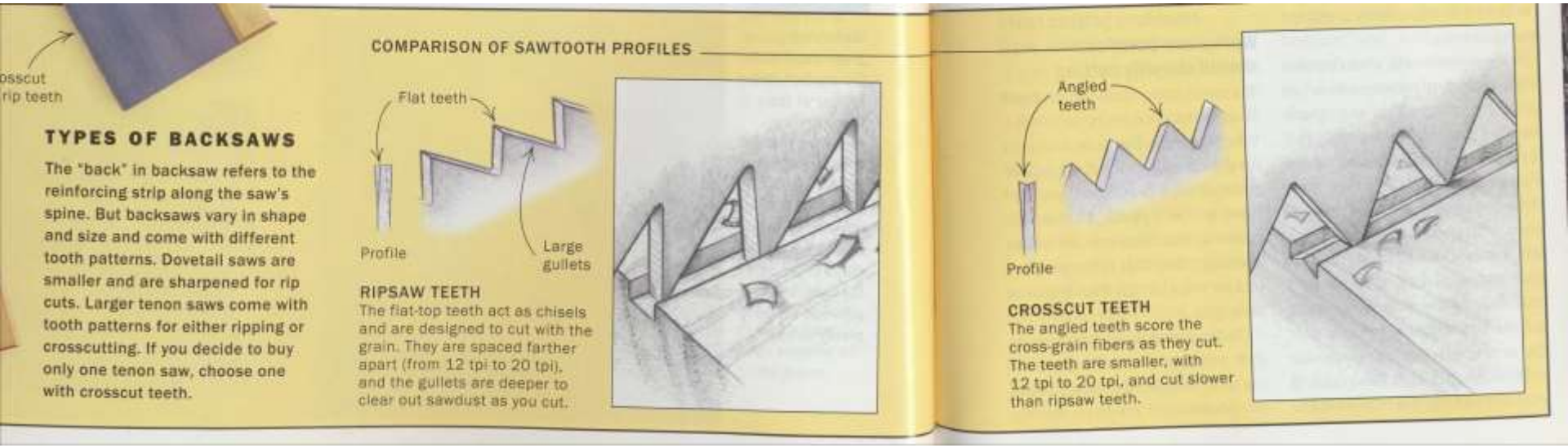
## PINS

***Same goes for pins.*** *Lay out both angles on the same board and cut to the right of the line on the right half and the left of the line on the left half. Line up your body with the angled cuts.*



# Different sawtooth profiles

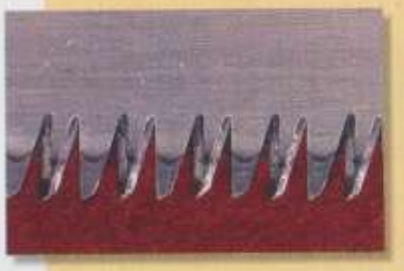
Western Back Saws



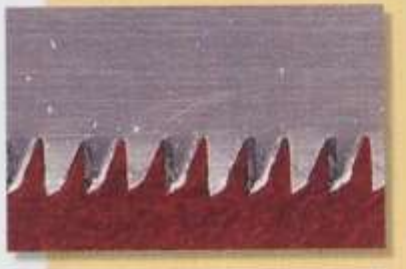
# Japanese pull saws have different tooth styles

## CHOOSE WISELY

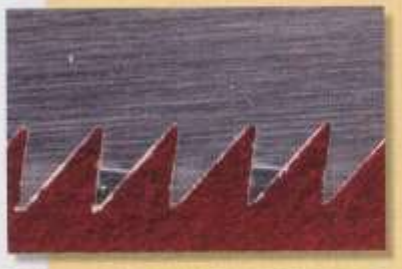
**There are four types of tooth pattern on the saws that I looked at, two crosscut and two rip variations. While dovetail cuts are ripping cuts, you might want a saw that also crosscuts cleanly.**



**CROSSCUT** This pattern is typical on dozukis. The teeth are long and narrow, sharpened at an angle to the blade. These make very good crosscuts and rip cuts, though they rip more slowly than saws with a true rip pattern.



**IKEDA CROSSCUT** In the Ikeda tooth pattern, a set of normal crosscut teeth is followed by two raker teeth, which have less set and are slightly lower in height. The goal is to clean out the chips more efficiently, but the ones I tested had a rougher action than the conventional crosscut pattern.



**RIP** Ripsaws have teeth shaped very similar to Western-style saws, although with thin blades and the pull-stroke action, of course. These saws make the fastest dovetail cuts, but I wouldn't ask them to do any crosscutting.

**MODIFIED RIP** Modified rip teeth look similar to crosscut teeth in profile, with the secondary bevel. However, they are sharpened as rip teeth, that is to say, straight across the blade. They rip very decently and can crosscut in a pinch, although with a rather rough action.

# Veritas Dovetail Saw Tooth Profiles

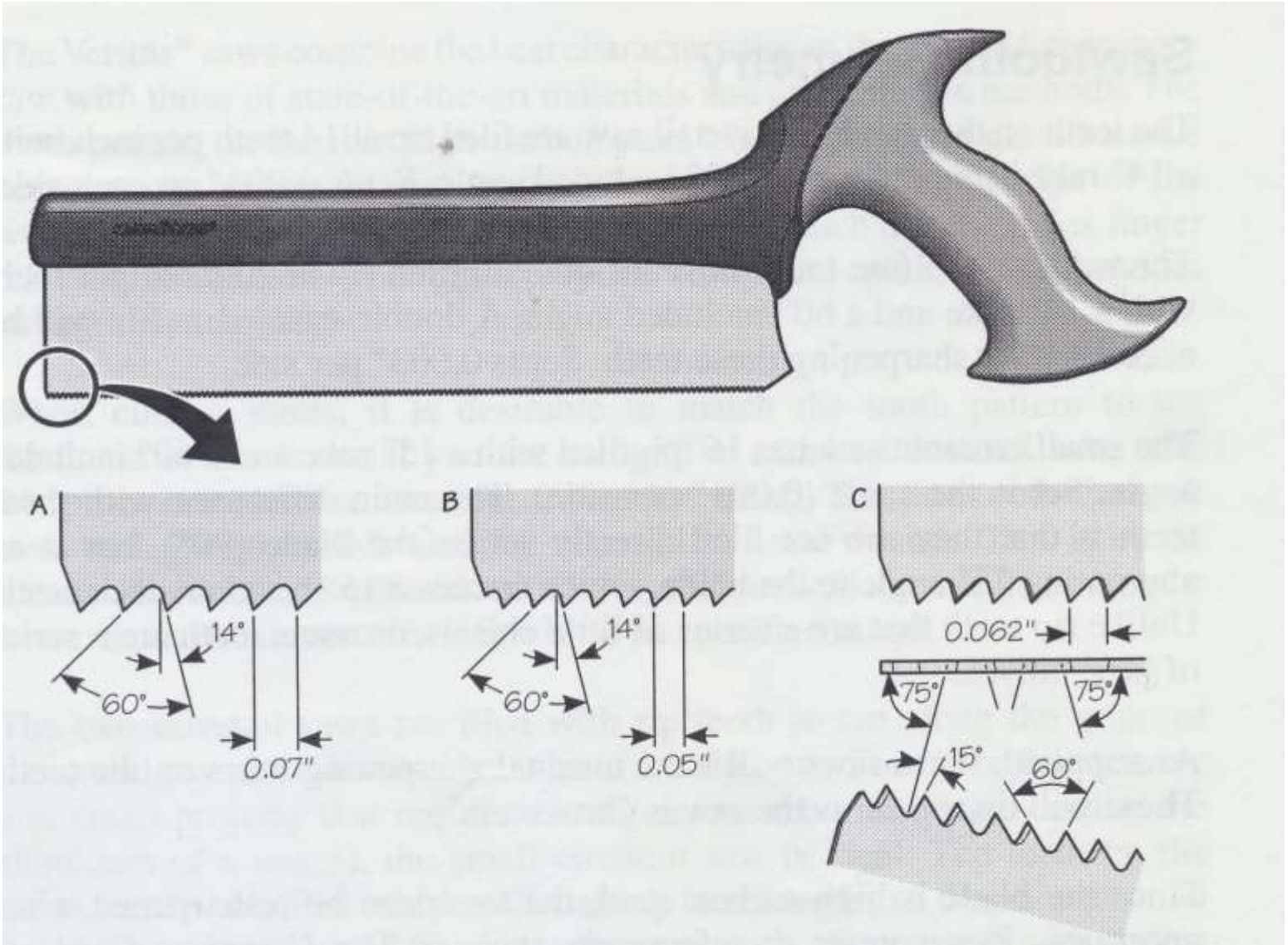
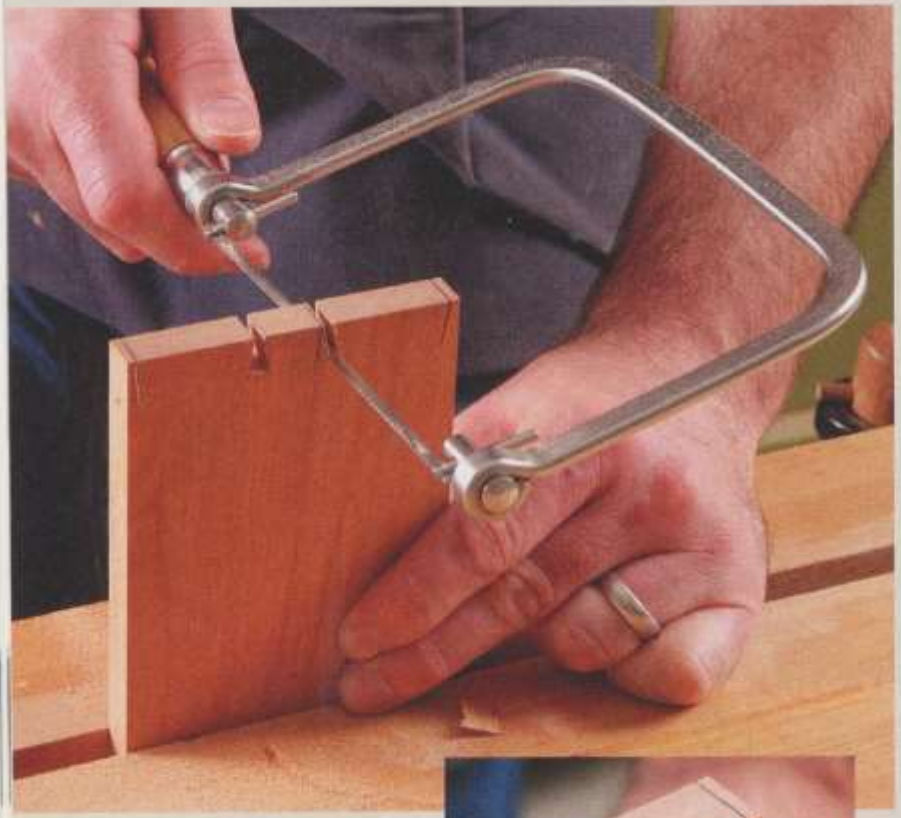
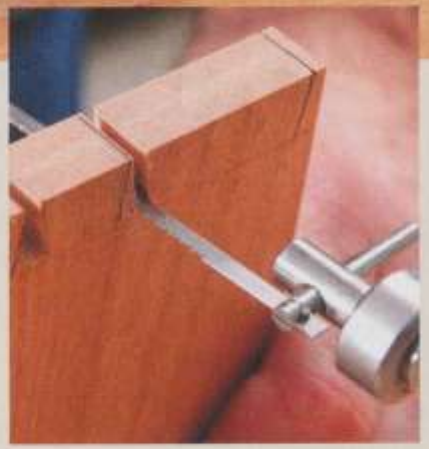



**Figure 2: Sawtooth geometry for regular dovetail (A), fine-toothed dovetail (B) and small crosscut (C) saws.**

# Coping Saws





***The teeth face the handle.*** *This means the saw cuts on the pull stroke, which puts the thin, narrow blade under tension so it won't buckle.*

## 4. Coping saw

**With its thin blade and tall frame, the coping saw is adept at cutting curves. It was used in the past to cope molding to get perfect miters. But I use it when cutting dovetails. I was taught to chop out all of the waste with a chisel—a tedious job. When I tried sawing out the waste with a coping saw, it was a watershed moment for me and I'll never go back. You don't need a super-expensive frame, but don't go with a hardware store cheapy, either. I spent about $20 on mine and it's easy to tighten and adjust the blade. The handle is comfortable, too. As for blades, get ones with a fine cut. They cut slower, which means the saw is less likely to jump the kerf at the end of the cut and damage the tail or pin.**

# Other useful saws and jigs

- Flush cutting saw
  - Sat is only on one side
  - Great for trimming dowels or plugs

- Bench Hook
  - Used to be known by every school boy
  - Most useful to cut small pieces or trim parts
  - Can be made to act as a mitre jig for a back saw

# Lessons

- With hand tools, decide what you need to do
- Be careful of buying just anything in a DIY store
- Cheaper is not always wise, as tools last a lifetime if treated with respect
- Look up reviews of tools, such as in FWW
- We all need to find a really competent ‘saw doctor’ who can sharpen to a specification
- Practice, practice, practice  makes perfect
- Accurate hand work requires marking out of joints essential to have marking gauges or knives
- Hand tool woodwork can be even more enjoyable than everything done with power tools, once you start