

## BRADAWL

### WHAT IS IT ?

A bradawl is a woodworking tool with a wooden handle and a metal pointed end.

### WHAT IS IT USED FOR ?

A bradawl is used to make it easier to insert screws into wood.

Once the position for the screw has been decided and marked, the bradawl is used to produce a small hole in exactly the right place, just deep and wide enough to help the screw thread to start.

The small hole is produced by placing the metal point on the centre, holding the handle vertically upright and applying just enough pressure to break the surface of the wood. The handle should then be twisted slightly to increase the size of the hole.

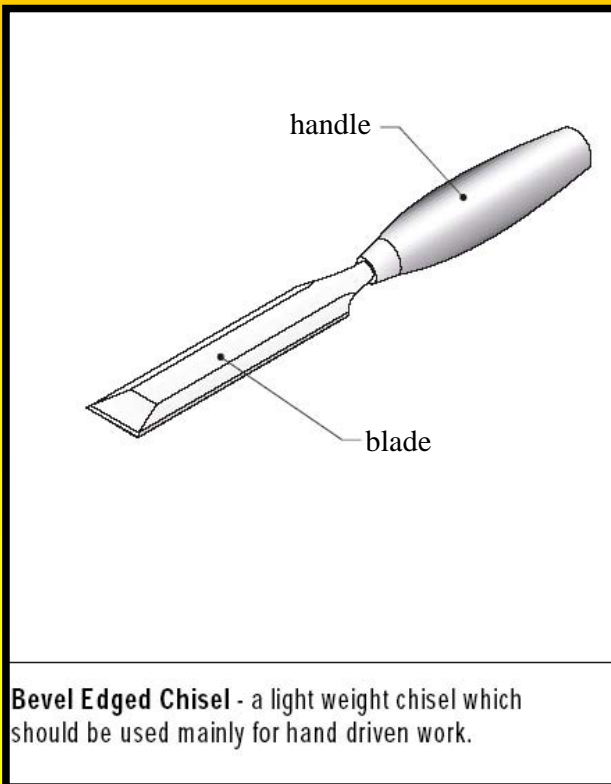


## CHISELS



### WHAT IS IT ?

A chisel is a woodworking tool used to shape wood. It has a wooden or plastic handle and a metal body with a point which has been hardened and ground to a razor edge. There are many kinds of chisels. Two common ones are shown in the drawings below.



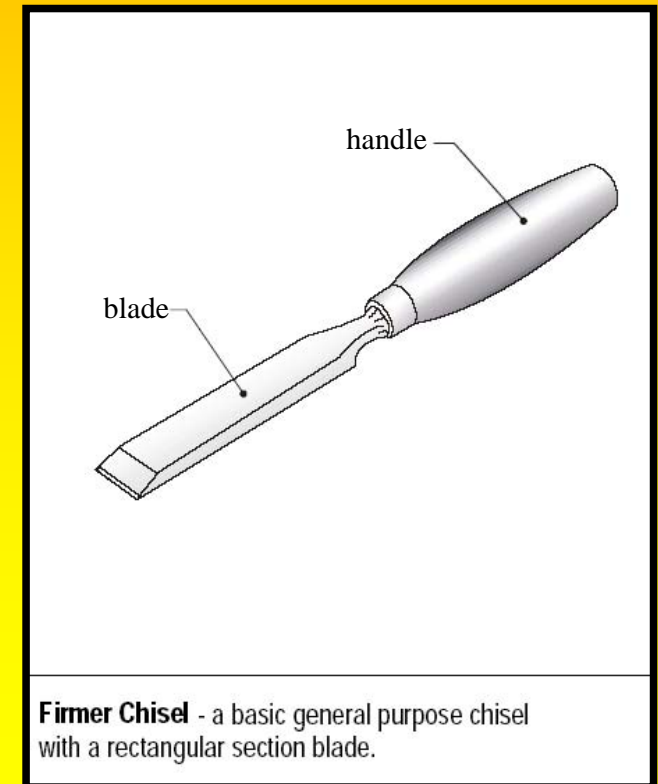
**Bevel Edged Chisel** - a light weight chisel which should be used mainly for hand driven work.

### WHAT IS IT USED FOR ?

Chisels have many purposes, all to do with the shaping of pieces of wood.

When cutting joints, the shaping of the end of the piece of wood will often be done with a chisel.

Pressure can be applied to the handle either by hand or with a wooden mallet – depending on the type of work and kind of chisel being used.



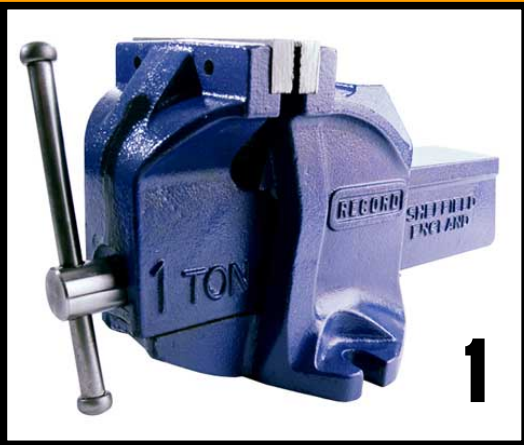
**Firmer Chisel** - a basic general purpose chisel with a rectangular section blade.

## CLAMPS etc.

### WHAT ARE THEY ?

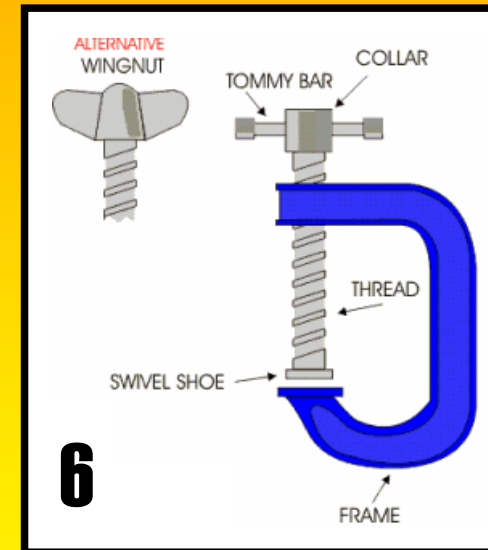
When working in the workshop, you will often have found that you did not have enough hands to do everything you wanted to do. Some operations require both hands which leaves you with the problem – how to secure the material while you are working on it.

There are a wide variety of clamps for a wide range of situations



### WHAT ARE THEY USED FOR ?

- 1 METALWORK VICE – Very strong, used to hold metal while it is being cut at a workbench
- 2 WOODWORK VICE – Mounted on a workbench, this vice holds wood in place when being cut
- 3 SASH CRAMP – These are used to hold furniture etc. together while being `glued up`
- 4 SPEED GRIP – Lightweight, these are used for convenience as an extra pair of hands for small jobs
- 5 MACHINE VICE – Used to hold pieces of wood and metal while they are drilled etc. Sits on the machine table
- 6 G CLAMP – General purpose clamp, mainly used for clamping items to the bench



## COLD CHISEL

### WHAT IS IT ?

A metalwork tool which is struck with a hammer. It has a tip which has been ground to a precise shape (see photo). The tip has been specially hardened so that it stays sharp longer.

### WHAT IS IT USED FOR ?

In the same way that wood can be chiselled, metal can be also. It is a much tougher process but the idea is much the same. The metal to be chiselled is held in a vice securely and the chisel is struck with a heavy hammer. The removal of material is much slower when chiselling metal but it can still be done.

The metal being chiselled need not be heated up to soften it, hence the name – Cold Chisel.



## DRILLS & CENTRE DRILL

**WHAT ARE THEY ?** Sharpened steel devices for creating holes in solid objects

**WHAT ARE THEY USED FOR ?**

Drills are placed securely in the chuck of drilling machines and rotated at speed. Because of the hardness of their tip and the exact angles that the tips are ground at, the drill will begin to bore a hole into most materials. The type of drill shown in fig. 1 is designed to drill into wood and metal.

As you can see in fig. 2, drills come in a vast range of sizes. When the drill is being secured in the chuck of the drilling machine, it is tightened using a chuck key, usually like the one shown in fig. 3.

To ensure the hole starts at exactly the right place, a centre drill can be used – see fig. 4. These are more sturdy than ordinary drills and can start the hole without the need for a centre punch mark.



## FILES

● ROUND FILE



▬ FLAT FILE



◌ HALF ROUND FILE



▲ THREE SQUARE FILE



RASP



### WHAT ARE THEY ?

Files have wooden or plastic handles with a metal body. On the metal body are thousands of tiny teeth. In smooth files, these teeth are small. In rough files, these teeth are larger.

### WHAT ARE THEY USED FOR ?

Files are used for removing material from either metal, wood or plastic. Sometimes the material is being removed to create a smooth edge. Sometimes to create a new profile (shape).

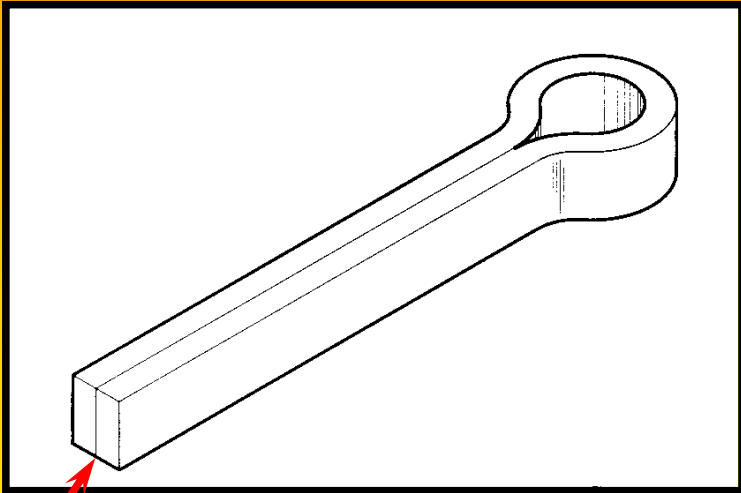
The material being filed should be secured in a vice.

Files come in a wide range from very rough (to remove a lot of material quickly but leave a rough finish) to very smooth files (to remove small amounts of material but leave a very smooth finish).

Files come in a range of cross sections for different jobs. Files can be Flat, Round, Half Round and Three Square.

A Rasp is used when a lot of material needs to be removed quickly but the quality of the finish is not important. Its' extremely large teeth achieve this.

## FOLDING BARS



Jaws of the folding bars

### WHAT ARE THEY USED FOR ?

When bending and folding sheet metal, very often the hardest part of the task is not the actual bending but how to hold the sheet metal while it is being bent.

Folding bars can often help here. The sheet metal is scored with a scribe along the bend line. The sheet metal is then sandwiched between the two jaws of the folding bars. The bend line is then lined up with the top of the jaws and the whole arrangement is held in a vice while the sheet metal is bent.

## HAMMERS & MALLETS

### WHAT ARE THEY USED FOR ?

Obviously, hammers and mallets are used for hitting things but there are certain situations which demand a particular type of hammer or mallet be used.

### HAMMERS

Inserting and shaping metal rivets is done using Cross Pein and Ball Pein hammers. A Claw hammer is a good general purpose hammer although it has a claw specifically designed for the removal of bent nails from wood.



CROSS PEIN HAMMER



NYLON MALLET



CLAW HAMMER

### MALLETS

When materials need to be driven in or knocked together and they are soft enough to be easily damaged, the solution is usually to use a Mallet instead of a Hammer. There are a wide range of materials used to make the heads of Mallets ; Rubber, Plastic (Nylon), Wood, Copper etc. The most common type of Mallet found in the workshop is a Hide (Leather) Mallet.



RUBBER MALLET



## KNIVES & CUTTERS



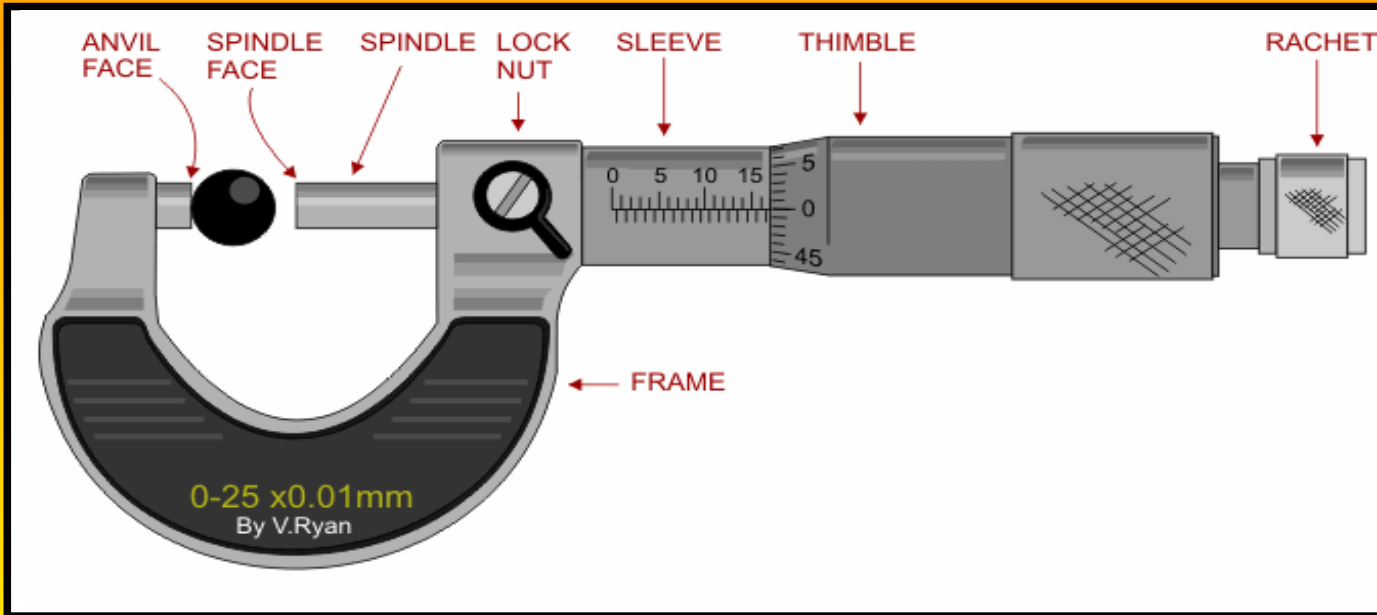
### WHAT ARE THEY USED FOR ?

The type of knife shown has a retractable blade. That means the blade can be slid back to a safe position inside its body when not being used.

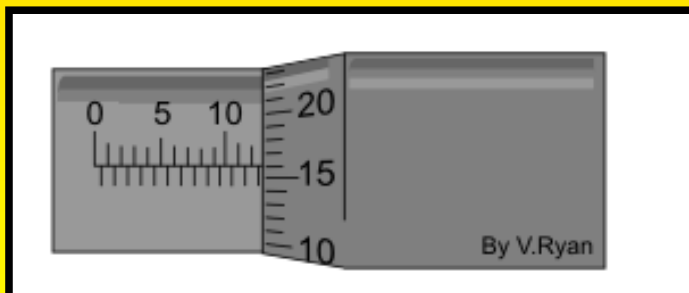
The blade is razor sharp and can cut through light plastic and wood. It is commonly used for marking out the initial cuts in wood prior to cutting joints.

They are commonly made by the Stanley tool company and are therefore often known as Stanley Knives. More correctly, they should be called Craft Knives.

# MICROMETER

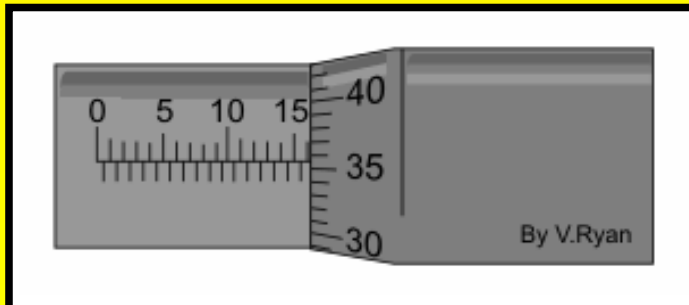


The micrometer is a precision measuring instrument used by engineers. Each turn of the ratchet moves the spindle face 0.5mm towards the anvil face. The object to be measured is placed between the anvil face and the spindle face. The ratchet is turned clockwise until the object is 'trapped' between these two surfaces and the ratchet makes a 'clicking' noise. This means that the ratchet cannot be tightened any more and the measurement can be read.



## Example 1

SLEEVE READS FULL mm	=	12.00
SLEEVE READS ½ mm	=	0.50
THIMBLE READS	=	0.16
<b>TOTAL MEASUREMENT</b>	<b>=</b>	<b>12.66mm</b>



## Example 2

SLEEVE READS FULL mm	=	16.00
SLEEVE READS ½ mm	=	0
THIMBLE READS	=	0.355
<b>TOTAL MEASUREMENT</b>	<b>=</b>	<b>16.355mm</b>



## NAIL PUNCH



### WHAT IS IT ?

A woodwork tool, made from metal with a small dimple on the pointed end. It gets struck with a hammer.

### WHAT IS IT USED FOR ?

In any finished model, you would want to hide the heads of any nails or pins which have been used to hold the parts in place while it is being glued.

After the nails have been driven in, a nail punch is used to drive their heads a few millimetres under the surface. The hole that is left can then be filled with wood filler so that there is no evidence the nail is there.

The small dimple on the end of the nail punch helps to avoid the punch slipping off the nail head when struck. This would damage the wood.

# PINCERS



## WHAT IS IT ?

A pair of Pincers, not unlike pliers, can be used in woodwork but are more often used in the metalwork room.

## WHAT IS IT USED FOR ?

Pincers are used for gripping, snipping, grabbing and nipping a range of things.

They can be used to shorten a range of things such as nails and rivets and they are often used to remove pins and nails which get bent as they are being driven into a piece of wood.

Their jaws open and close and are hardened and sharpened to a point. They also have a rounded neck so that they do not dig into the wood as they remove nails.

# PLANES

A large range of planes are available and they are used for different purposes. The body of a plane is made from high grade cast iron with the cutters being tungsten made from vanadium steel. The earliest known examples of planes are from the Roman era but even today they are used for the same purposes - to smooth rough surfaces or the plane down the thickness of a piece of wood to the required size.



**WOOD BLOCK PLANE:** Although this is a very old design they are still used today to remove a large amount of wood. This is due to the fact that they are lighter than steel planes and therefore they can be used comfortably for longer periods.



**JACK PLANE:** This is the steel equivalent of the wooden block plane. It has a steel body and because it is heavier than the wood block plane it is easier to hold down on the surface of the wood being planed. It is used to plane longer pieces of wood.



**SMALL BLOCK PLANE:** This is a small version of a wood block plane and it is used for light work such as producing 'chamfers'. It is normally held and used in one hand.



**BULLNOSE PLANE:** This is used to plain right into corners. The blade can be seen to go almost up to the end of the plane's body and consequently very little material is missed in a corner.



**SMOOTHING PLANE:** A shorter version of the steel jack plane. It is used for general work such as smoothing short pieces of wood. It is lighter and smaller than the jack plane.



**MACHINE PLANE:** This is favoured by DIY enthusiasts as it saves time. A blade revolves at high speed and as the machine plane is pushed across the surface of the wood - it is planed. A big disadvantage of these planes is that they are potentially very dangerous if misused. Also, sometimes the finish to the surface is not as smooth or precise as a hand held plane being carefully used.

## SAWS



**COPING SAW:** a coping saw is used to cut through thin pieces of wood and plastic. The thing that the coping saw can do better than most other saws is cut curves and corners.



**JUNIOR HACKSAW:** this saw is designed to cut through thin metal plate. The metal should be held in a vice and the line to be cut should be marked with a scribe.

**HACKSAW:** a much stronger, tougher version of the junior hacksaw, this saw can cut through much thicker metal and is designed to be used two handed.



**TENON SAW:** because of the stiffness of the blade, a tenon saw can only cut straight lines although it can do so very accurately if used properly. The wood should be held either in a vice, a sawing board or in a mitre box (as shown above).

## TINSNIPS

### WHAT ARE THEY ?

A metalwork tool which basically behaves like a very tough pair of scissors

### WHAT ARE THEY USED FOR ?

Tinsnips are used to cut thin metal sheet into a variety of shapes. If you imagine drawing out a fancy shape in card then cutting it out using scissors, the process is much the same for sheet metal. This time though you would mark the shape with a scribe and cut the shape out with tinsnips.

The pair of tinsnips shown below right, have a slight bend in their jaws. This is to make the cutting out of round shapes slightly easier.



## TONGS



### **WHAT ARE THEY ?**

A metalwork tool used to allow you to handle hot things without putting your fingers at risk.

### **WHAT ARE THEY USED FOR ?**

While using the forge, the metal which you are heating up will then be bent or hammered into shape. While shaping the metal, you will have to hold it securely. Clearly it is too hot to hold so tongs allow you to grip the metal tightly in one hand while hammering or bending or twisting with the other hand.

The very long handles make them safer to use as they allow you to keep your fingers well away from the heat and the hammering etc.