9.12 COMMON TOOLS USED IN CARPENTARY SHOP

Commonly used tools to shape wood for various types of joints by driving in and driving out nail involve cutting and smoothening of wood surfaces. A broad classification of tools used in the wood working or carpentry shop are measuring and marking tools, supporting and holding tools, cutting tools, striking tools and miscellaneous tools. Most of commonly used tool and measuring devices as mentioned above are in chapter of fitting and sheet metal work also. Other some important such tools and instruments are discussed as under.

9.12.1 Marking and Measuring Tools

Marking in order to make wooden components of the required size or the marking of exact dimensions on the wooden piece is essential to produce quality jobs. A number of marking and measuring instruments namely Rules, Try Square, Combination Set, Bevel Gauge, Marking Gauge, Mortise Gauge, Cutting Gauge, Spirit Level, Trammel and Compass are commonly used for this purpose. Some of commonly used marking and measuring instruments are discussed as in chapter of fitting and sheet metal work under.

Rules

Rules are straight edge of wood or steel engraved in millimeters- centimeters or in inches-foot or in both. Theses are used to mark, measure the length, widths and thicknesses of wood part. Figs. 9.4.-9.6 show steel rule, folding rule and flexible steel rule. These rules are available in different sizes and designs. Metallic taps bearing sizes 6", 12" or 18" are used for general measuring work. For example 24" folding tape and 5" or 6" steel tape are used measuring larger dimensions. An important small instrument in any shop is a good quality straight-edge bench rules. These rules are manufactured of either metal or wood. They are used to check for straightness and to measure and mark straight lines. The bench rule may be graduated in inches, millimeters or both. The length of the bench rule may be 12", 24" or 36". The 36" rule is called yardstick. Another type of rule is folding two-foot rule which is more convenient than a straight 24" rule. The zigzag rules are used to measure longer stock when exact measurements are not so important. One of These rules, when open may be of usually 6 or 8 feet long. The push pull steel tape or tape rule is a very compact metal rule that comes in lengths of 6, 8 or 10 feet. There is a hook at the end to slip over the edge of the bold. It is flexible to bends easily and can measure curved surfaces too. It is very good for measuring the inside depth of the hole of components also.

Try Square

Try square is generally utilized for measuring and checking of squareness, perpendicularity, dimensions, testing of finish of planned surfaces and drawing parallel and perpendicular lines.

The steel blade and metallic or wooden handle of try square are at right angles to each other. Try square is used for testing the level, edge and square ness of the wooden surfaces. It is also used for marking lines across the face or edge of wooden block. There are graduations along the blade of the rule that are used for measuring and marking purposes on the wooden jobs. The blade of try square is made of hard tempered steel of non rusting kind. It is seldom used for hammering work.

Fig. 9.4 Steel rule

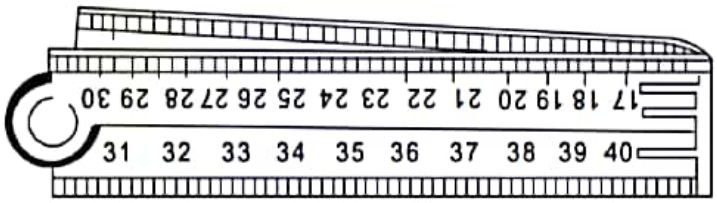

Fig. 9.5 Folding rule

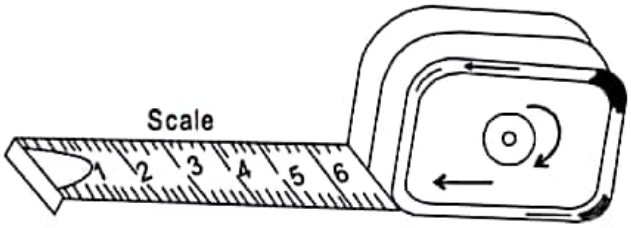

Fig. 9.6 Flexible steel rule

Combination Set

Combination set is frequently used in the carpentry shop for different kind of measurements. It consists of blade and a head. The blade has a groove cut along its length so that it can slide into the head. One side of the head makes a 90° angle with the blade and the other side a 45° angle. It can be making, measuring and setting different angle. It also acts as a try square, angle gauge to set 45° angles, a depth gauge and level checking tool.

Bevel Gauge

Bevel gauge is also known as an adjustable bevel which is mainly used for marking, measuring and inspecting angles from 0 to 180 degree. Its blade can be adjusted and set to any desired angle.

Marking Gauge

The marking gauge is made of wood which is important tool utilized to make lines at a uniform distance from the edge of a board or piece of work and is used principally when preparing wooden components to size before jointing. The marking gauge like the mortise gauge and cutting gauge in use should be positioned correctly. For marking purposes, the gauge is drawn towards the body or pushed away from it but in either case, if the spur does not trail. It will tend to jump and run with the grain. Thumb screw of the marking gauge locks the stock at any position. The spur made of hardened steel should be ground to a fine point. And for ease of working, it should not project too far from the face of the stem. It is

commonly used to mark or scribe line parallel to and at any desired distance from a finished edge or face of a surface

Cutting Gauge

Cutting gauge is similar in construction to the marking gauge but having a knife in place of the marking pin or spur. It can be utilized for gauging and marking deep lines across the grain of wood in thicker sections. It is also used for setting out the shoulder-lines of lap dovetails and similar joints, as well as for trimming veneers parallel to the edge of surface before laying a cross-band. Cross banding is the laying of a strip of cross-grained veneer around the edge of a surface for example the edges of a table top, box lid or drawer front. This gauge is very useful for making very small rebates to receive inlay lines and may be used in place of marking gauge. Inlay lines are thin strips of wood which can be glued into a rebate cut around the edge of a veneered surface.

Mortise Gauge

9.7 shows a mortise gauge. This is an improved form of marking gauge which consists of main components as fixed pin, sliding pin, brass strip, stem, rose wood stock and thumb screw. The fixed pin of the gauge is attached to a short brass strip which is screwed to the stem. The sliding pin is fixed to a long brass strip or slider is adjusted by means of a thumbscrew. The threaded portion of which engages in a cylindrical nut which is embedded in the stem. The stock is locked in position by a metal set screw. This gauge is used for marking out of the parallel sides of a mortises or tenons and other similar joints.

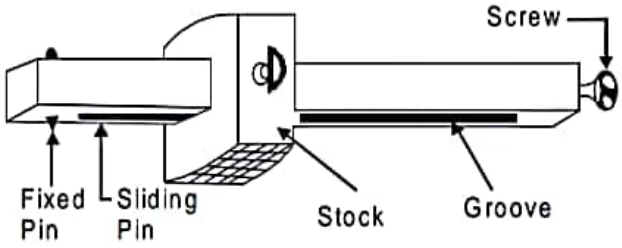

Fig. 9.7 Mortise gauge

9.12.2 Holding And Supporting Tools

Sometimes it is desirable to support and gold a wooden board in a special manner while the work is being carried out. For these purposes, various supporting and holding devices are needed some of which are discussed as under.

Work Bench

Every carpenter generally needs a good solid bench or table of rigid construction of hard wood on which he can perform or carry out the carpentry operations. Work bench should be equipped with a vice for holding the work and with slots and holes for keeping the common hand tools. One jaw of the vice is tightened to the table and is kept moveable for holding the articles Work benches are built solidly with good heavy tops for providing a good working surface for cutting, as well. The vice on the bench is equipped with an adjustable dog that is, a piece of wood or metal can be moved up and down in the outside jaw of the vice.

Carpenter Vice

Carpenter vice (Fig. 9.8) is very important tool in wood working shops for holding wooden jobs. There are several varieties of vices, each possessing its own particular merit.

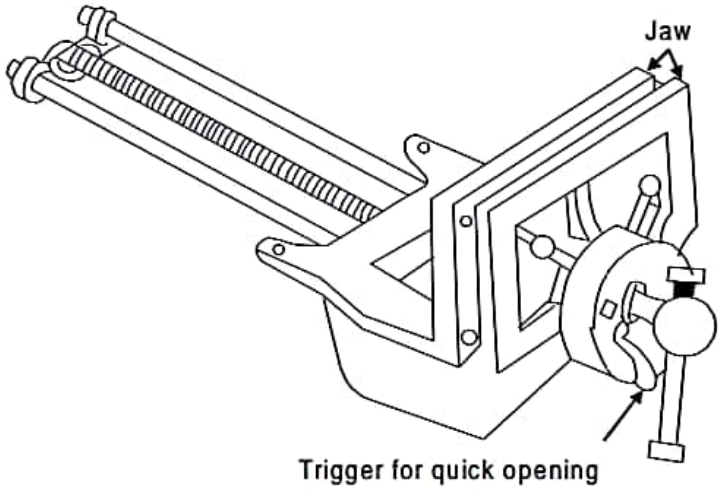

Fig. 9.8 Carpenter vice

Clamp

Clamps are commonly used in pairs in gluing up operations at the final assembly of wood joinery work. These clamps can provide pressure required to hold joints together until they are secured due to the setting of glues. Clamps are of two types namely plain rectangular bar type and T-bar type. The former is made of mild steel and is usually rectangular in section. The later may be of T-section, which can easily afford greater rigidity under stress. The coarse adjustment jaw may be located in any position on the bar by means of a steel pin which fits into any of the holes drilled at intervals along the bar. The fine adjustment jaw of the sash clamp is moved along the bar by a square threads screw which passes through a special nut fixed to the end of bar. Considerable pressure can be applied by turning the screw with the Tommy bar for holding a wooden job. Both jaws of the sash clamp are generally made of malleable cast iron which is tougher and less brittle than ordinary cast iron. There are other similar types of such clamps named as rack clamp, screw clamps, light duty parallel clamp, adjustable bar clamp (Fig. 9.9), G or C-clamp (Fig. 9.10), and double bar clamp which are useful for holding different sizes and shapes of wooden jobs.

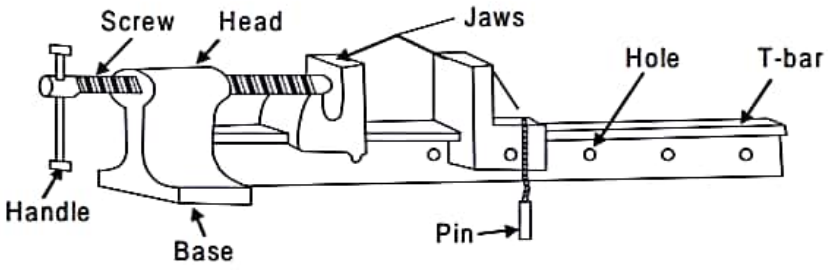

Fig. 9.9 Bar clmap

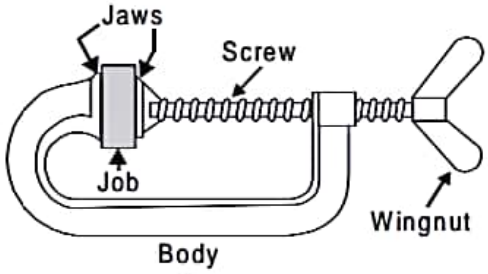

Fig. 9.10 G or C-clamp

9.12.3 Cutting Tools

Various kinds of cutting tools namely various kinds of saws, planes, chisels, scraper, files, and rasp adze and axe and boring tools such as brace and bits, bradawl, auger, gimlet are used in the carpentry shop. Few important types of cutting tools are described as under.

9.12.3.1 Saws

Saws are wood cutting tools having handle and a thin steel blade with small sharp teeth along the edge. They are utilized to cut wood to different sizes and shapes used for making the wooden joints that hold parts together. They can be further classified into three major types namely hand Saws (Rip, Cross-cut, Panel, Keyhole and, Pad saw), Snuff Saws (Tenon

and Dovetail) and Frame Saws (Coping, Bow and Fret). Few important types of saws are shown in Fig. 9.11. Some of them are described as under.

Rip Saw

The rip saw is shown in Fig. 9.11. It is used for cutting timber along the grains. The teeth of rip saw are chisel-shaped and are set alternately to the right and left. A 24″ long point saw is a good for sawing work. Depending upon whether the saw is designed to rip or cross-cut, the shape of the teeth will also vary. In the case of a ripsaw, the teeth are shaped like chisels.

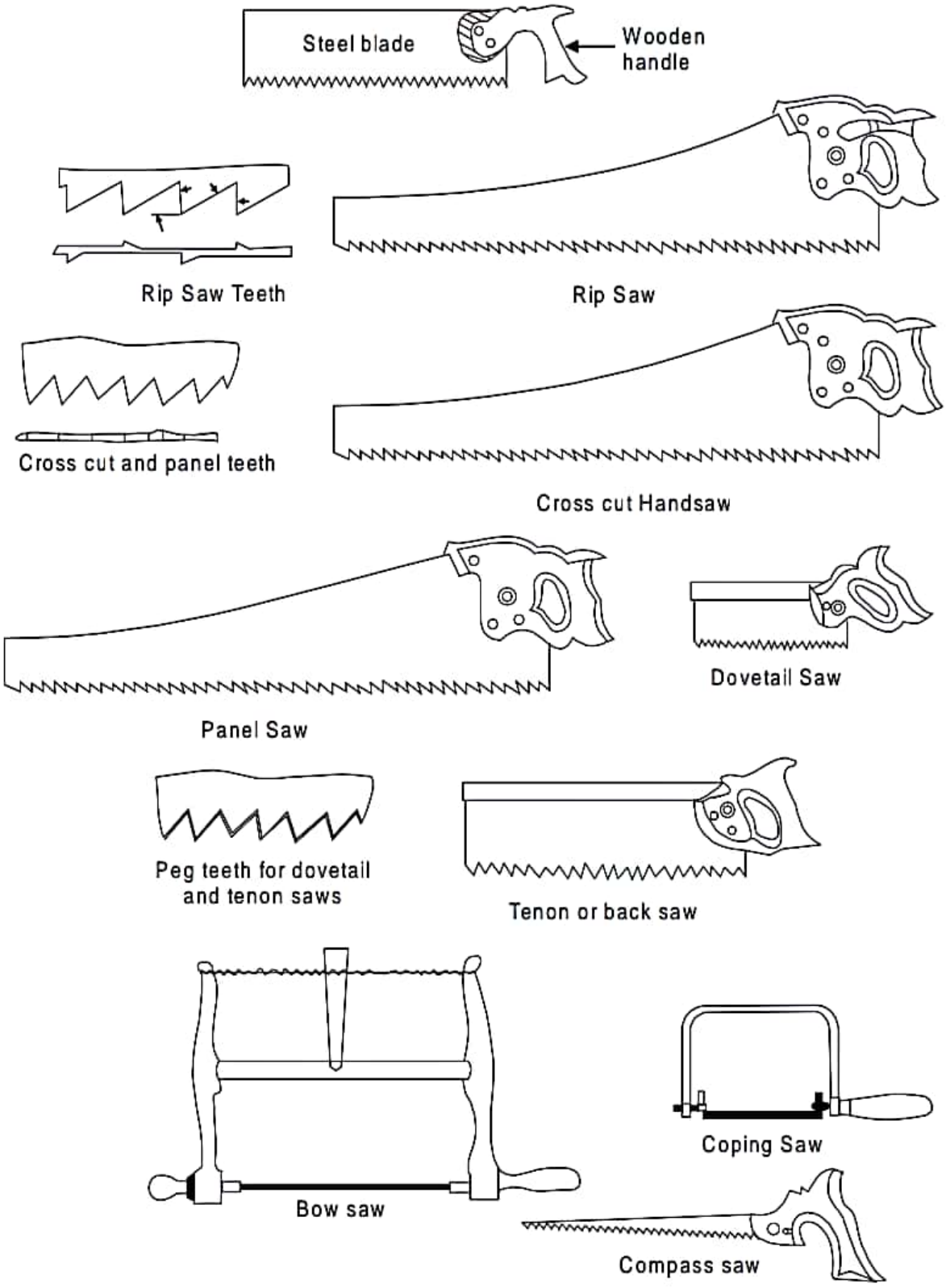

Fig. 9.11 Few important types of saws

Crosscut Saw

Cross cut saw is shown in Fig. 9.11 which is similar to rip saw in shape. It is primarily designed for cutting across the grains of wood. The teeth are knife shaped and bent alternately to the right and left for making the saw to cut wider than the blade. The saw cut is called the kerf. Since the kerf is wider than the blade, the blade will not stick as the sawing is done. The saw teeth may be coarse (with only 4 or 5 teeth per inch) or fine (with ten or twelve teeth per inch). A jaw for general purpose cutting should have about eight or nine points per inch (there is one more point than teeth per inch) and should be about 24 inches long.

Turning Saw

The turning saw is similar to the copying saw which is designed for cutting curves, scrolls and roundings on wooden jobs. It is used chiefly on heavier work where long fast stroke and less accuracy of cutting are required. The thin blade of the turning saw is removable. This saw can be pivoted between the handles. The saw generally cuts in the pulling stroke.

Dovetail Saw

Dovetail saw is shown in Fig. 9.11 which is little and is closely similar as related to the backsaw or tennon saw. It is lighter and however possesses a thinner blade and finer teeth. The handle is round, to provide a delicate grip for fine cutting. This saw is used where absolutely finer and delicate cutting is required in wood work.

Compass Saw

Compass saw carries a tapered blade which is long as shown in Fig. 9.11 which is one of the special saw having thin, narrow and flexible blade. With a blade resembling the beak of a swordfish, this type of saw is commonly used for making cutouts on the inside surface of a piece of work. A hole is first bored inside the portion which is to be cut out and the pointed compass saw is pushed into the hole to start the sawing operation. Its blade contains about 12 teeth per cm length

Keyhole Saw

The keyhole saw is used in the same manner as the compass saw. For this reason it is generally employed for fine internal and intricate work where the compass saw would be too big and clumsy for the carpentry job.

Hacksaw

Hacksaw is shown in Fig. 9.12 which consists of steel frame and a hacksaw blade. While essentially designed for cutting metal, this tool comes in for a variety of uses in the wood working shop. The frame of hacksaw is designed in different ways, some with pistol grips, others with handles similar to those used on a conventional saw and others with turned handles. Blades of hacksaw are detachable and can be obtained with teeth of varying coarseness.

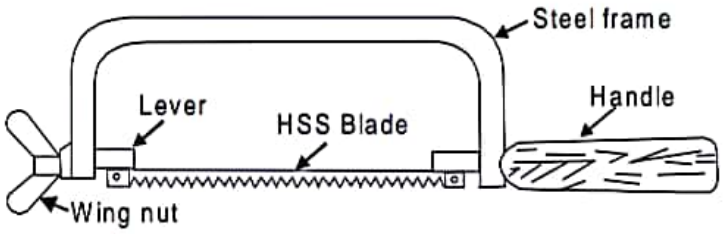

Fig. 9.12 Hacksaw

9.12.3.2 Planes

A plane is a special tool with a cutting blade for smoothing and removing wood as shavings. It is just like a chisel fixed in a wooden or steel body. Fig. 9.13 shows a simple plane. The modern plane has been developed from the chisel. They can also be classified as jack plane, smooth plane, jointer plane, trying plane, rabbit plane, circular plane and fore plane. Few important planes are discussed as under.

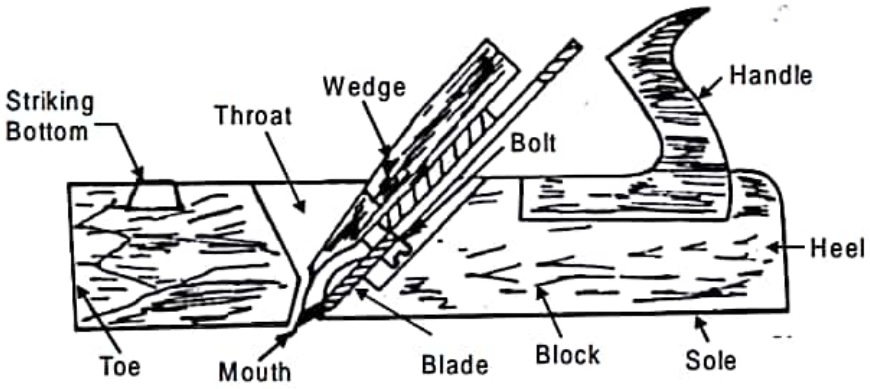

Fig. 9.13 Simple plane

Jack Plane

Jack plane is most commonly used plane which is shown in Fig. 9.14 which comprises of its body about 40 cm long, blade 5-6 cm wide and handle. It is good for rough surfaces that require a heavier chip. It is ideal for obtaining a smooth and flat surface. There are actually forty-six different parts of jack plane, the carpenter needs only acquainted with the working or regulating parts. The main working parts are the cutting blade or plane iron. The adjusting nut is operated to raise or lower the blade and the adjusting lever which regulates the blade so as to make possible an even or slanted cut. The cutting blade of the jack plane is guarded with a metal cap which is adjusted on top of the blade to within about 2.4 mm of the cutting edge. The metal cap of the jack plane eases the cutting action by curling and breaking off the wood shavings evenly, thus preventing splitting or splintering of the wooden part.

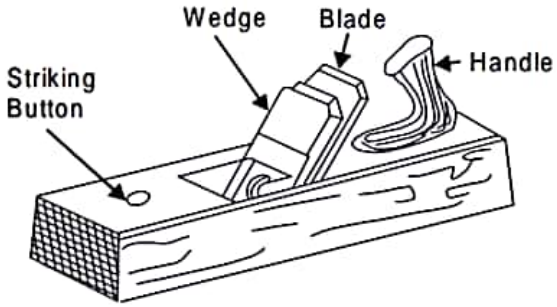

Fig. 9.14 Jack plane

Smoothing Plane

Smoothing plane is shown in Fig. 9.15 which is somewhat smaller than the jack plane, measuring between 6 and 10 inches in length. It is a fine utility tool, especially useful for planning end grain, chamfering, and other edge shaping of wooden part. This plane is also used for cleaning up after gluing and assembly, but owing to its short length should not be used for producing very true surfaces.

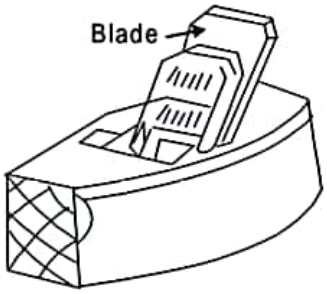

Fig. 9.15 Smoothing plane

Jointer Plane

When a fairly long board is to be planed absolutely straight and square along the edge, it is easier to obtain a straight and level surface with the jointer plane in comparison to any other type of plane. This plane is made up in various sizes but the most popular type of jointer plane is 24 inches in teeth.

Trying Plane

The wooden trying plane is shown in Fig. 9.16 which is similar in construction to the jack plane except that its blade is wider and much longer than jack plane. Its mouth is also narrower than that of the jack plane.

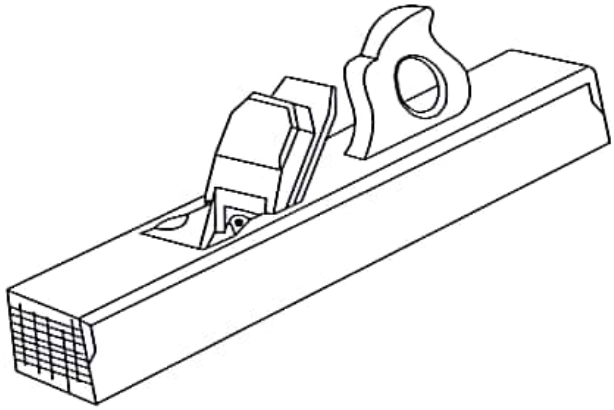

Fig. 9.16 Trying plane

Rabbet Plane

Rabbet plane is shown in Fig. 9.17 which is used for sinking one surface below another and shouldering one piece into another. If the edge of a piece of wooden board is to be rabbeted, this plane is being generally used. The side guide and the cutting blade of the rabbit plane may be adjusted so as to cut rabbets of varying widths and depths. The plane is useful for various types of edge shaping. Rebate or rabbet means a recess or step cut into the edge or end of a wooden board.

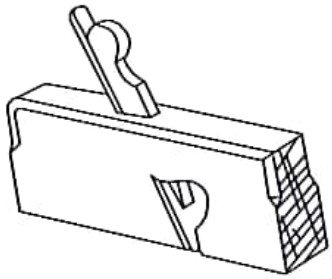

Fig. 9.17 Rabbet plane

Circular Plane

The shape of circular plane adapts it for planning either convex or concave surfaces and for shaping round edges. This plane may be adjusted so that the flexible bed will conform to circles of various sizes.

Fore Plane

This plane may be said as a junior jointer plane. It is slightly shorter than the conventional jointer plane. It is mainly used for planning edges of medium length.

9.12.3.3. Chisels

A Chisel (Fig. 9.18) is a strong sharp edge cutting tool with a sharp bevel edge at one end. Its construction is composed of handle, tang, ferrule, shoulder, and blade. Chisels are generally **made up of high carbon steel.** They are used to shape and fit parts as required in joint making.

A gouge (Fig. 9.19) is a curved chisel. It may be outside or inside ground. Outside ground gouges are called firmer gouges and inside ground gouges are called scribing gouges. The scribing gouges are made long and thin, they are known as paring gouges. Several varieties

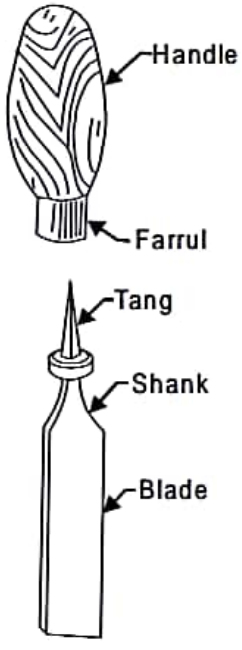

Fig. 9.18 Chisel

of chisels are available, each having special characteristics which fit it for its special use. There are two types of construction employed in the making of chisels named as tang and socket types. The tang chisel is made with a ranged or pointed end which pierces into the handle. The socket chisel reverses the process by having the handle fit into the socket collar on the blade.

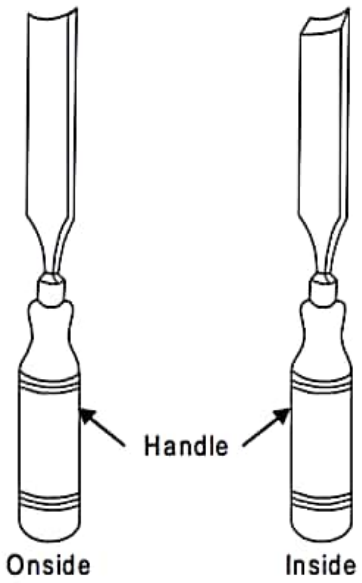

Fig. 9.19 Gouge

Firmer Chisel

Firmer chisel is shown in Fig. 9.20 which possesses a blade of rectangular section. It consists of the following parts blade made of cast tool steel and it is used for general bench work. The shoulder of the chisel prevents the tang from being driven farther into the handle when the chisel is struck with a mallet. The ferrule is short length of brass tube (mild steel tube in the case of some mortise chisels) which fits tightly over the lower end of the handle, and helps to prevent its splitting by the tang. The tang is not hardened as to fit in the handle. The handles turned from ash or beech wood as these timbers are resistant to splitting.

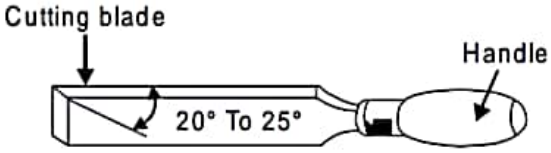

Fig. 9.20 Firmer chisel

Beveled edge firmer chisel

Beveled edge firmer chisel (Fig. 9.21) is identical to the firmer chisel except that the edges of the back of the blade are beveled. This enables the chisel to be used for cutting right into the corner of acute-angled wood work such as the base of a dovetail.

Fig. 9.21 Beveled edge firmer chisel

Paring Chisel

Paring chisel (Fig. 9.22) has a longer and usually slightly thinner blade than firmer chisel. It may be obtained with a blade of rectangular or beveled edge section and is used in

pattern making and where long accurate paring is required. The paring chisel should not be struck with a mallet. This chisel is intended for manipulation by hand only, and not for driving with a mallet like a firmer chisel for cutting of wooden jobs.

Fig. 9.22 Paring chisel

Mortise Chisel

Mortise chisel (Fig. 9.23) is designed for heavy work. A mortise chisel has a blade which is very nearly square in section and so may be used as a lever for removing chips and will withstand heavy blows from a mallet. Various types of handles are fitted to mortise chisel depending upon use. Mortise chisel has an oval beech handle, whilst the heaviest type of all has a socket handle. This socket replaces the ferrule and affords greater resistance to splitting when used for very heavy work. The leather washer acts as a shock absorber.

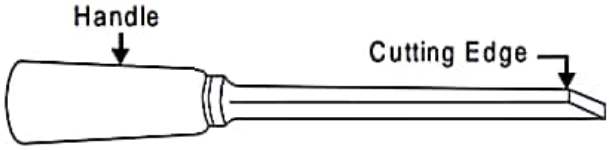

Fig. 9.23 Mortise chisel

9.12.3.4. Scraper

The scraper for wooden work is used in carpentry shop. It is used after planning to obtain a smooth surface before final glass papering. Where the grain in wood is particularly twisty so that even a finely set plane tends to tear it, a sharp scraper will be found most useful to tackle this problem. It is also used for cleaning up veneered work as its curved edges are used for cleaning up large molding of concave section and other similar work. The scraper is held as the thumbs being positioned low down and pushed forward to curve the blade so that the center of the edge rather than the outer corners comes into contact with the surface of the wood. A sharp scraper will produce fine shavings on wooden surfaces.

9.12.3.5. Files and Rasps

Files and Rasps are shown in Fig. 9.24. They are of used for maintaining other wood working tools and equipment. They are made of hardened tool steel which is tempered and they should never be dropped as they are very brittle to break. They are of various types depending upon their size, shape, cuts and degree of their coarseness.

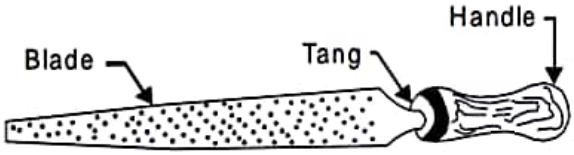

Fig. 9.24 Rasps

9.12.3.6. Adze

An adze (Fig. 9.25) is used for rough cutting, squaring, to chop inside curves and to produce concave surfaces. Its outer face is convex, inner face concave and edge is beveled to form a cutting edge. It is made of carbon steel.

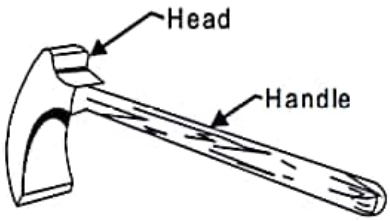

Fig. 9.25 Adze

9.12.3.7. Axe

An axe is used for splitting the logs and for removing bark from the wood. It is made of carbon steel and both sides are beveled to form a cutting edge. Its one side is plane and the other is beveled to form a cutting edge. It is used to make the surface roughly plane.

9.12.3.8. Boring Tools

Boring is cutting a hole in wood with a tool called a bit. Holes of 6 mm size or larger are bored. Holes of 6 mm size or smaller are drilled. Boring is the first step in making any kind of shaped opening or making holes. The commonly used boring tools bits are discussed as under.

The center bit

The center bits (Fig. 9.26) are available in sizes ranging .from 4 mm to 50 mm and are useful for boring holes through thin wood. They are not recommended for deep boring as it has a tendency to wander or drift as a result of varying grain texture and direction in wood. The screwed center of the improved center bit helps to draw the bit into the wood and therefore requires less pressure to obtain a cutting action.

Fig. 9.26 Centre bit

Auger bits

The auger bits (Fig. 9.27) are also known as twist bit. They are the most commonly used hole making tools used in wooden wood. They may possess a single twist auger bit or a double-twist auger bit. These bits are more costly than center bits. They can produce holes easily and accurately from 5mm to 35 mm in diameter in wooden jobs. The hollow features are important in both types of auger bits, because the parallel sides of the bit help to prevent drifting. And the twisted form of the body of the bit helps in the removal of cuttings. Both these bits have two cutters and two spurs as well as a screw center for quick and clean boring action in wood work.

Fig. 9.27 Auger bit

Countersink bits

Countersink bit (Fig. 9.28) is used for countersinking the predrilled holes to placement of heads of screws.

Shell and spoon bit

Shell and spoon bits are the traditional kinds of bit which are now superseded by the carpenter's twist drills or bits.

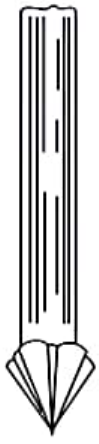

Fig. 9.28 Countersink bit

Expanding bits

These are commonly used forms of screw center bit which are adjustable for cutting holes of from 15 mm to 75 mm in diameter. The two combined cutter-spurs are provided in each case to cover the range of hole sizes.

Forstner bits

These are used for boring clean sided stopped holes of flat bottom kind.

Snail bits

The snail bits have only one cutter which gives a clean cutting action.

Rose bits

The rose bit tends to scrape rather than cut. It is generally used on soft metals in addition to wood.

Bradawl

Bradawl is used for making fine holes, especially nail holes in soft woods. The cutting edge of the blade, which is sharpened equally from both sides, is placed across the grain so that the wood fibers are severed and not merely forced outwards. The blade is forced into the wood and it is then allowed to twist for enlargement of the diameter of the hole being bored and then finally removed. The cutting edge of the blade of bradawl is flared out to give clearance to the body of the blade which is fixed to the handle by means of a square-tapered tang. A brass ferrule is fitted to prevent the tapered tang splitting the handle when being pushed into it. The blade of bradawl is shouldered to prevent its being forced further into the pear-shaped handle which is usually turned from ash, box or wood.

Auger

The auger (Fig. 9.29) is a carpentry hand tool (made up of steel bar) and is used to make holes in the wooden jobs. It possesses a screw point to center the tool at the point where hole is to be produced in the wooden part. Fluted body of the auger is to allow removal of wooden chips from wooden jobs using handle to apply pressure to rotate the auger for making the hole. Holes up to 25 mm diameter can be produced.

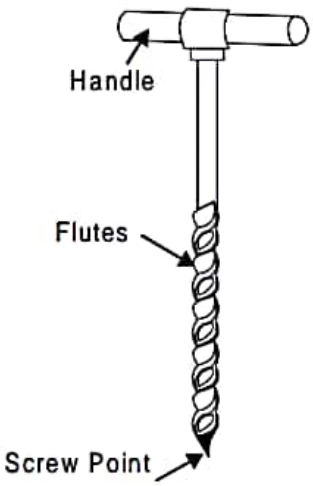

Fig. 9.29 Auger

9.12.4 Striking tools

Mallets and various types of hammers are generally used as striking tools in carpentry shop. A hammer delivers a sharp blow, its steel face being likely to damage the chisel handle whereas the softer striking surface such as mallet will give better result. Some of important such tools are discussed as under.

Mallet

A mallet is a short handled wooden hammer with a large head as shown in Fig. 9.30. It is used to strike a chisel for heavy cutting waste wood, from joints such as mortises and halving joints and also for removing unwanted, wood on shaped work etc. Mallet is frequently also used to tap parts of a project together during the assembly process.

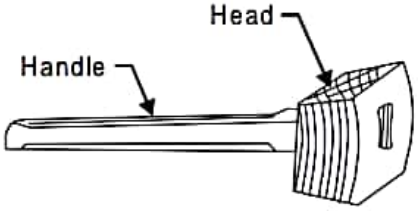

Fig. 9.30 Mallet

Hammers

Warrington, peen and claw hammers are generally used by carpenters. They are described as under.

Warrington Hammer

Warrington hammer (Fig. 9.31) is used for knocking in nails, assembling joints and setting wooden plane blades. The head is forged from tool steel and is obtainable in various weights. The face of hammer is hardened, tempered and ground slightly convex. The center part of the head is not hardened as a precaution against breakage in use through its being to brittle. The handle is made of wood and is oval in cross-section to have a comfortable grip. The end of the handle fits into a hole in the head and is held in position by wooden or metal wedges which open out the grain, thus securely locking the two parts together.

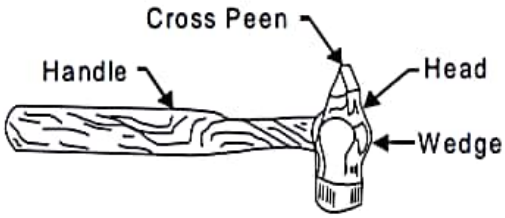

Fig. 9.31 Warrington hammer

Peen Hammer

The peen hammer is used for striking nails where the use of the face is impracticable. The peen hammer is very light and is used for driving the panel pins and fine nails.

Claw Hammer

The claw hammer is shown in Fig. 9.32. One of its end possesses curved claw which is used for extracting nails in order to provide the extra strength needed for this levering action. The other end is used for light striking work. A strong handle on claw hammer is always necessary for carrying out the task.

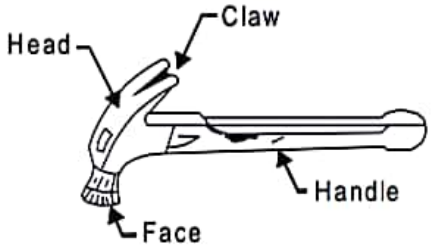

Fig. 9.32 Claw hammer

9.12.5 Miscellaneous Tools

Other some miscellaneous carpentry hand tools that are also used in carpentry shop include screw driver, pincer and fasteners which are discussed as under.

Screw Driver

Screw driver (Fig. 9.33) is used to drive the screws into the wood. The tip of screw driver should be slightly hollow-ground so that it will fit accurately in the slot in the screw-head. The blade of a screwdriver is made of hardened tempered tool steel so that its tip can withstand the great strain put upon it while screwing. The tang of screw driver is not hardened. It is wide and rectangular in section so that it will restrict the twisting action put upon it during use. The ferrule is slotted to receive the tang and to hold it firmly in place in the handle. The handle, if made of wood, is usually pear-shaped or if made of unbreakable plastic, is generally of a fluted cylindrical shape. Some screwdrivers are fitted with a ratchet device used for clockwise anti-clockwise turning.

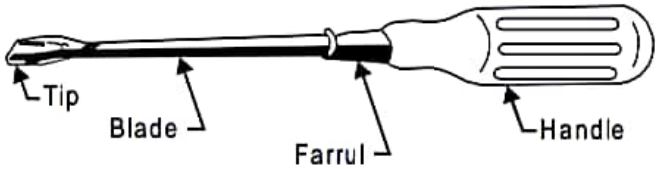

Fig. 9.33 Screw driver

Pincer

Pincers are commonly used for withdrawing nails. They are made of cast steel, the jaws being hardened. The end of one of the arms is shaped to form a claw for removing nails. The nail head is firmly gripped between the jaws as the long arms permit considerable pressure to be exerted by them. The nail is extracted from the wooden body by a leveling action, using the curved side of one of the jaws as a fulcrum. A small block of wood placed between the steel jaw and the work prevents damage to the surface of the wood.

Various types and sizes of screws are available in different sizes from 6 mm to 150 mm and are sold in market by numbers. A hole is drilled before putting the screw and then same is driven into former by means of a screw driver.

Bolts and nuts are used only where very heavy components are to be fastened together viz., wooden roof trusses and folding type furniture etc. The standard B.S.W. mild steel bolts and nuts are used.

9.13 COMMON WOOD JOINTS

All wooden objects whether doors, windows, furniture, pattern, core boxes, handicrafts, toys, cots, etc., are all assembled with joints. The various common used wood working joints are given through Fig. 9.34 to Fig. 9.41.

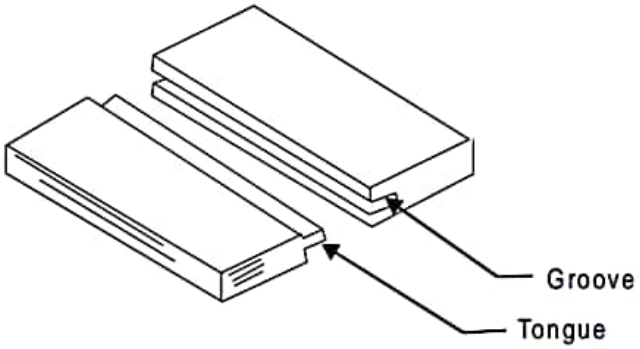

Fig. 9.34 Groove and tongue joint

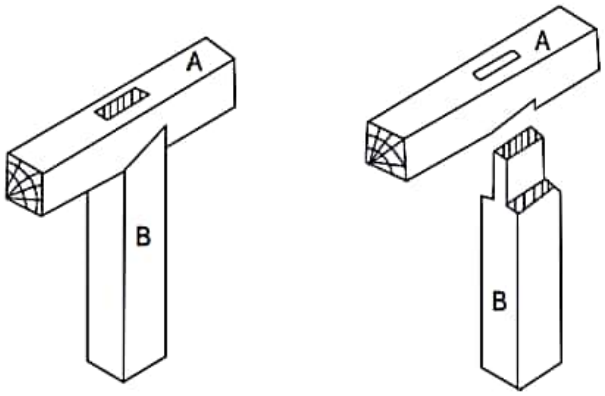

Fig. 9.35 Mortise and tennon joint

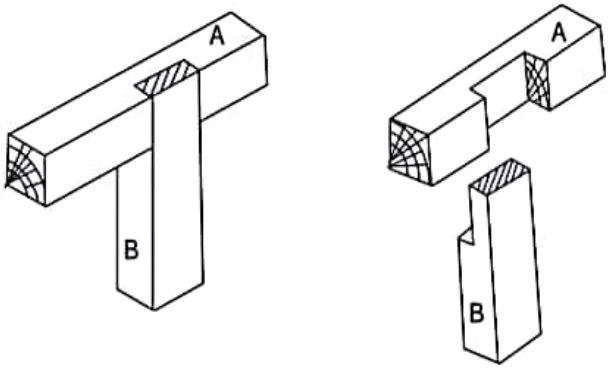

Fig. 9.36 T-lap joint

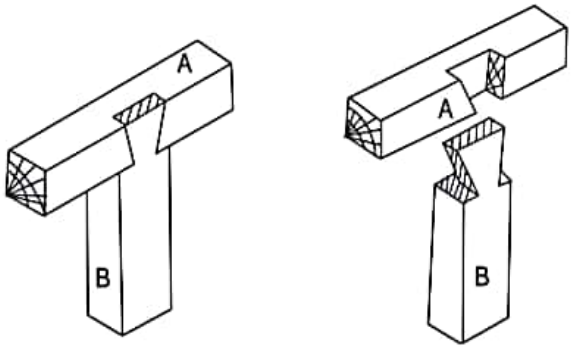

Fig. 9.37 Open or through dove-tail joint

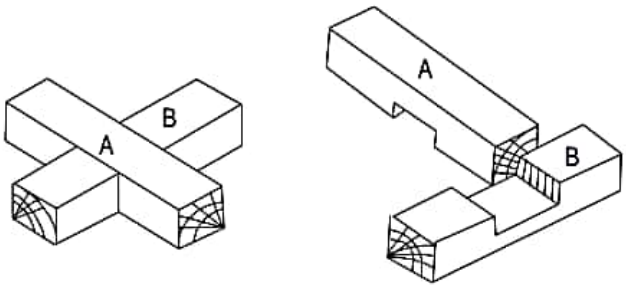

Fig. 9.38 Cross-lap joint

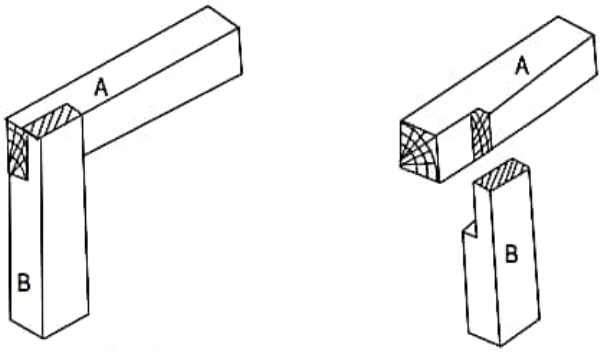

Fig. 9.39 Corner-lap joint

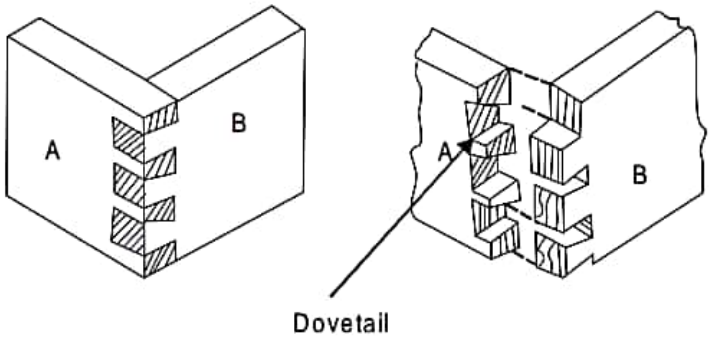

Fig. 9.40 Dovetail joint

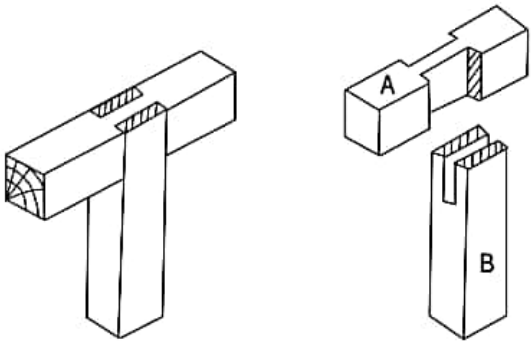

Fig. 9.41 Briddle joint

9.14 CARPENTRY MACHINES

Wood working machines are employed for large production work. These possess the following advantages over the hand tools.

1. The carpentry machines help to reduce fatigue of carpenter.
2. The carpentry machines are used for production work.
3. The carpentry machines save time and are used for accuracy work.
4. They are used for variable job variety and more designs are possible.

Different machines are needed to save time and labor in carpentry work for various quick wood working operations especially for turning and sawing purposes. The general wood working machines are wood working lathe, circular saw and band saw. These machines are discussed as under.

1. Wood Working Lathe

A general wood working lathe is shown in Fig. 9.42 which resembles roughly to an engine lathe. It consists of a cast iron bed, a headstock, tailstock, tool rest, live and dead centers and drawing mechanisms. The long wooden cylindrical jobs are held and rotated between the two centers. The tool is then fed against the job and the round symmetrical shape on the jobs is produced. Scrapping tool and turning gauge are generally used as a turning tool on a woodworking lathe.

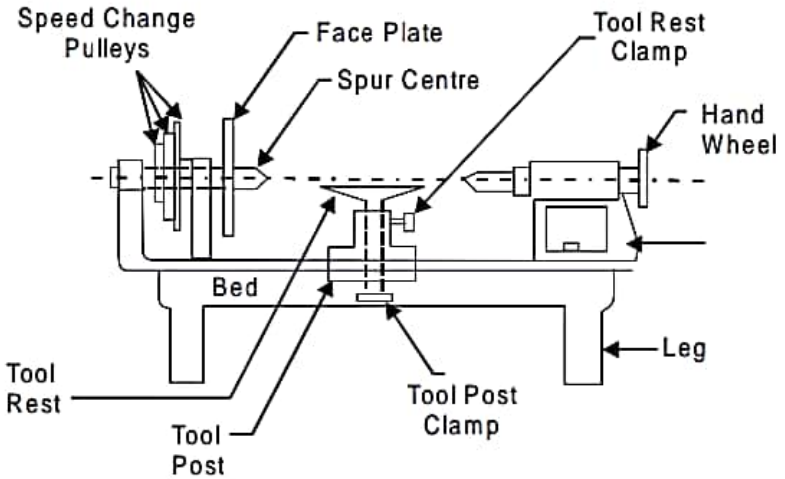

Fig. 9.42 Wood turning lathe

2. Circular Saw

A circular saw is shown in Fig. 9.43. It is also called as table or bench saw which is used to perform various operations such as grooving, rebating, chamfering etc. It consists of a cast iron table, a circular cutting blade, cut off guides, main motor, saw guide, elevating hand wheel, tilting hand wheel etc. The work is held on the table and moved against the circular saw to perform the quick and automatic sawing operation and other operation on wood as said above. The principal parts include the frame, arbor, table, blade, guides for taking cuts, guards and fencing.

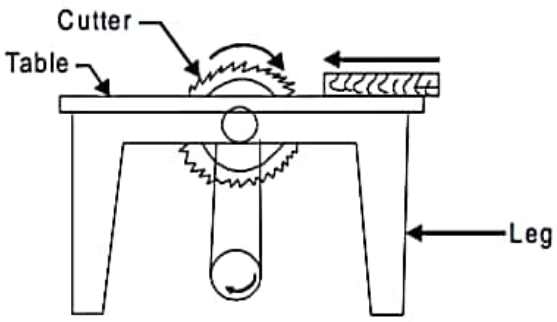

Fig. 9.43 Circular saw

3. Band Saw

Band saw is shown in Fig. 9.44 which generally used to cut the heavy logs to required lengths, cutting fine straight line and curved work. It consists of a heavy cast bed, which acts as a support for the whole machine, a column, two wheel pulleys, one at the top and other at the bottom, an endless saw blade band, a smooth steel table and guide assembly. It is manufactured in many sizes ranging from little bench saw to a larger band saw mill.

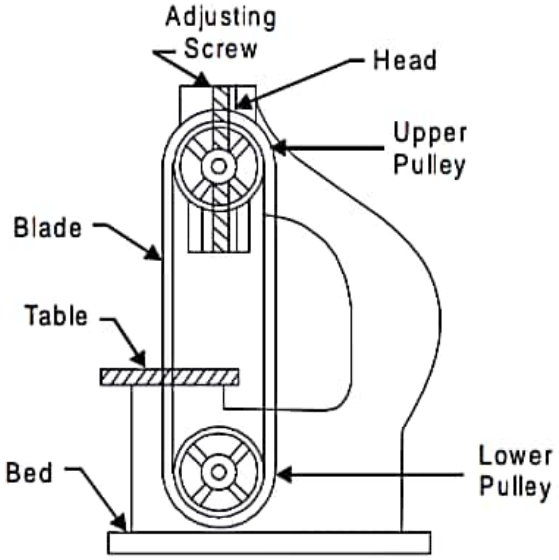

Fig. 9.44 Band saw

9.15 COMMON SAFETY IN CARPENTRY SHOP

There are some general safety precautions to be taken care of while working in carpentry shop. Some of which are discussed as under.

1 Before starting any wood working machine, it should be ensured that all the safety guards are in proper places and secured well.

2 While working on a circular saw, one should not stand in a line with the plane of the rotating blade and always keep your fingers always away from the reach of blade.

3 The wooden pieces should not be fed to the sawing machines faster than the cutting speed of the machine.

4 While working on wood lathes, the job should be properly held.

5 One should not use defective or damaged carpentry tools while carrying out carpentry work.

6 Nails, screws should be properly kept in a box for proper house keeping.

7 Sufficient safety precautions are to be taken for preventing fire in the carpentry shop.

8 No carpentry tools should be thrown for saving time in handling.