

1.1 Introduction

Carpentry means working with wood. The timber is the basic material used for carpentry and joinery work. Timber is the name given to the wood obtained from exogenous trees by cutting these trees after their full growth, and made suitable for engineering or building purpose by sawing and converting into various commercial sizes.

1.2 Aims and objects of the Carpentry shop

Following are the aims and objects of the carpentry shop.

1. To acquaint the trainee with the names and uses of various tools, instruments, machines and materials required for working in this shop.
2. To develop sufficient practical skill and knowledge to handle job independently.
3. To enable the trainees to become a true technicians.

1.3 Activities involved in the Carpentry Shop

The carpentry deals with the constructional work such as making roofs, floors, partitions, staircases of a building, making shipbuilding and also for making railway compartments by means of wood with the help of carpentry tools. The carpentry also deals with joinery work. The term joinery is used for connecting the wooden parts with the different joints such as making of doors, windows, stairs, cupboards, dressers, and all the interior fitments. for a building.

1.4 Carpentry Material

The timber is the basic material used for carpentry and joinery work. When the tree is a living one the timber is called stationary timber, after felling the rough timber and after sawing into suitable market size it is known as converted timber. Other auxiliary materials used in carpentry shop are nails, screws, paints and varnishes.

1.5 Advantages of Timber

The timber has a number of advantages over other materials used in constructional work. A few important ones are as follows.

1. It is easily available
2. It is very easy to be worked on with tools to give it a desired shape and size.
3. It is lighter and stronger than most of the materials used in construction work.
4. Structural connections and joints can be easily made in timber.

5. It has less cost of construction.
6. It responds very well polishing and painting etc.
7. It has a fairly resale value.
8. It is a non-conductor of heat.

1.6 Classification of Timber

The timber trees can be broadly classified according to the manner of growth as

1. Outward growing or Exogenous
2. Inward growing or Endogenous.

Exogenous trees grow outward from the centre adding almost concentric layers of fresh wood every year, known as annual rings.

The exogenous trees are classified as

- (i) Conifers or evergreen trees
- (ii) Deciduous or broad leaves trees.

Evergreen trees or the conifers give soft woods and the broad leaves trees or the deciduous give hard woods. Examples of exogenous trees are Sal, Teak; Pine, Deodar etc.

Endogenous trees are those trees which grow inwards. In these types of tree every fresh layer of sap wood is added inside instead of outside. Examples of endogenous trees are cane, bamboo, coconut etc.

1.7 Structure of a timber tree

Fig. 1.1 shows the cross-section of an exogenous tree.

1. Pitch or medulla

It is the dark central part of the tree. In its early age it feeds sap from the roots to the growing tree. Every year the annual rings are added around this.

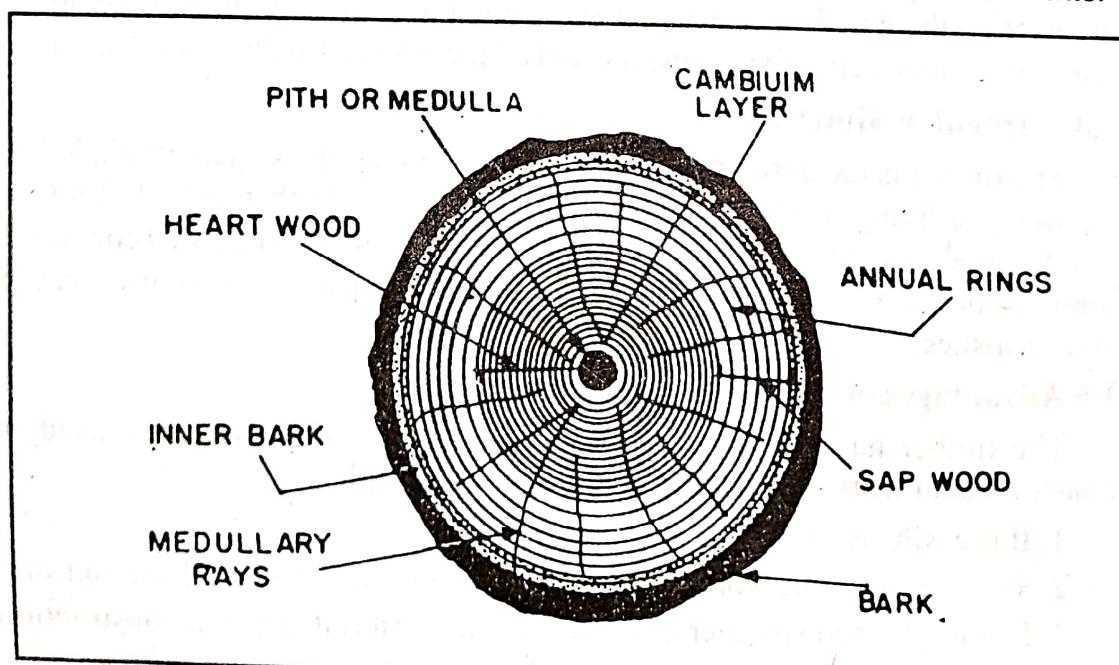


Fig.1.1 Cross-section of exogenous tree.

2. Heart Wood

Heart wood is that portion of wood which is near and around the pith. It is darker in colour, harder and stronger than the remaining wood in the tree.

3. Sap wood

Sapwood is that portion of wood of a timber which stay between the cambium and the heart wood. It is soft weak and light in colour. It carries a very high percentage of moisture content. So the chance of decay is more in it. It is used as fuel wood.

4. Cambium layer

Cambium layer is the annual ring just under the bark.

5. Bark

It is also called cortex. It is a short of anchor sheet on the outside surface of the tree. Bark protect the cambium layer from the attack of insects and frosts.

6. Annual rings

Annual rings are concentric layers of wood all around the pith. They are known as annual rings because one such layer is added every year.

7. Medullary rays

The radial rays running between the pith and cambium layer are known as medullary rays.

1.8 Types of timber

The timber is mainly of two types, namely soft wood and hard wood.

Soft Wood : The soft wood is obtained from trees having needle shaped leaves or conifers. They contain turpentine and resinous matters in their cells. They are light in weight and light coloured. They have distinct annual rings but no visible medullary rays. The colour of the sapwood is not distinctive from their hard wood. Soft wood can not resist any kind of stress developed across their fibres and the timber gets splitted easily. Pine, Deodar are examples of soft wood.

Hard Wood : The hard wood is obtained from trees having broad leaves of deciduous. They do not contain any resinous matter. The annual rings of hard wood are more compact, thin and less distinct. The medullary rays of the hard wood are visible in most. These woods are darker in Colour, comparatively heavy; compact, properly bounded and often very straight. The fibres of hard wood are fine grained and can resist any kind of stress. Sal, Teak, Mahogany, Oak, etc are the examples of hard wood. It is widely used for doors, furnitures, joinery etc.

1.9 Varieties of Indian Timber

Sal : The wood is of dark brown colour. It is hard, Close-grained, heavy, resistant to white ants and durable. These trees grow abundantly in the forest at the foot of the Himalays in U.P., Bihar and Assam. It is also grow in central India, and South India. It is used the manufacture of beams, posts, roofing, railway sleepers, doors, windoes etc.

Teak : The wood is brown in colour, straight-grained and is fragrant when freshly cut. It has extreme durability and long lasting quality. The wood is moderately hard, yet light and easily worked. It is oily and takes a beautiful polish. They are available in large quantities in Burma, Malabar and central India. Teak available in Central India is known as C. P. Teak.

Sissu : The colour of the wood is dark brown. It is rough, strong and durable. It has well-marked coarse grains. It is not affected by insect. It takes very good polish. This is one of the costliest and best timber in India. this wood is extensively used for joiner's work i.e. furnitures. Cricket bats other spot accessories are made from this wood.

Mahogamy : The colour of the wood is red brown. It is not affected by insects as it contains resinous oil. It takes a high polish. It is very tough and strong. It is used for making costly furniture. It is also used for pattern-making. These woods are available in the Himalayas.

Deodar : The colour of the wood is whitish yellow. The fibers of this wood is compact. It takes a good polish. It is used for making roofs, bridges, railway sleepers and furnitures. This timbers are available in Himalayan region, Punjab and Assam.

Sundari : The colour of this wood is deep red. This wood can absorb shock and is very strong. Posts, shafts and carts are made from this wood. This timbers are available in the sunderban of West Bengal.

Mango : The colour of this wood is deep grey. It is a inferior quality wood and not at all strong. It is used in making planks, door panels etc. It is largely found all over India.

Siris : The colour of the wood is whitish yellow. This wood is strong and durable. House building, tool handles, cart wheels and agricultural tools are made from this wood.

Simul : The colour of the wood is raddish white. It is a inferior quality wood. It is light in weight and breaks easily. Match sticks, match boxes, packing boxes etc. are made from this wood. It is available in West Bengal, Bihar, Orissa, U.P. and M.P.

1.10 Difference between Soft wood and Hard Wood

Following are the difference between soft wood and hard wood.

Soft wood	Hard wood
<ol style="list-style-type: none"> 1. It is light in colour. 2. It is light in weight. 3. It can be easily worked. 4. It carries straight fibers but not compact. 5. It does not last long. 6. The annual rings are quite distinct in it. 7. It is a resinous wood and have a fragrant. 8. It split readily. 9. It catches fire readily. 10. It can not bear shock and vibration. 	<ol style="list-style-type: none"> 1. It is dark in colour. 2. It is heavy in weight. 3. It can not be easily worked. 4. The fibers are close and compact. 5. It lasts long. 6. The annual rings are not distinct in it. 7. It is a non-resinous wood and have good amount of acid. 8. It does not split readily. 9. It does not catch fire readily. 10. It can bear shock and vibration.

1.11 Seasoning of Timber

Object of Seasoning : The main object of seasoning of timber is to reduce the moisture contained in the wood. Seasoning is done so as to make it suitable for various purpose. If the unwanted amount of moisture is not taken out of the wood, it will render the wood unsuitable due to uneven shrinkage, warping or twisting.

Advantages of seasoning : Following are the main advantages of seasoning the wood.

1. The wood becomes hard.
2. The wood can be easily worked with tools to give it any size and shape.
3. The wood becomes more durable.
4. Defects like twisting, bowing and splitting do not occur.
5. After seasoning the wood does not warp.
6. Joint in structural construction can be easily made.
7. Its ability for taking up polishing and painting is improved.
8. After seasoning shrinkage does not occur.
9. It does not easily affected by fire.
10. The wood becomes suitable for making sound proof construction and also for any decorative work.

1.12 Methods of Seasoning

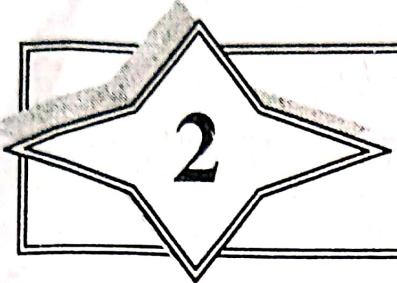
The following main three methods are commonly used for seasoning of wood.

1. Natural or air seasoning : In natural or air seasoning method, the blocks of timber are stacked in a shed. So they are not directly exposed to sun and rain.

A free circulation of air takes place through them. For free circulation of air a platform which is perfectly levelled at the top, is constructed on the ground. The platform is about 30 to 40 cm high from the ground. To prevent the effect of moisture on the wood from the bottom, a layer of cinder ash or sand is put over the levelled floor. There should be a proper arrangement of drainage. The shed is erected over this platform. The timbers are stacked on the cinder ash or sand of the platform which is under the shed. The timbers are then allowed to undergo various temperature changes by keeping them under this shed for a long period. The excess moisture content in the wood is evaporated due to the circulation of free air through the stack timbers. Thus the wood gets dried. This method is cheapest and give the best seasoned wood. Only one disadvantage in that it takes too much time such as 1 to 5 years.

2. Water seasoning : In this process the balks of timber are immersed in flowing water for a period for 2 to 3 weeks. During this time the flowing water drives away the sap of the wood with it. The timber is then taken out of the water and air seasoned in the usual way. This method takes less time but the strength of the wood is reduced.

3. Artificial Seasoning : In this process the timber balks are stacked over large trolleys. These trolleys are then driven into the hot chambers. The temperature and humidity inside of the hot chamber are controlled from outside for nearly a fortnight or so. Hot air and dry steam is pushed into the hot chamber for rising the temperature gradually. So drying and evaporating of moisture from wood is increased according to the rise in temperature in the hot chamber. This process is the quickest of all the commonly used process for wood seasoning but the quality of the wood is inferior to that seasoned through natural seasoning.



WOOD WORKING TOOLS

2.1 Carpentry Tools

Carpentry tools may be classified in the following main groups :

1. Marking and measuring tools

- | | |
|------------------------------------|------------------------|
| (i) Four fold rule | (v) Combination square |
| (ii) Try-square | (vi) Marking gauge |
| (iii) Bevel square | (vii) Mortise gauge |
| (iv) Marking awl and marking knife | |

2. Cutting Tools

- (i) Saw—Rip saw, Cross-cut saw, Tennon Saw, Dovetail Saw, Compass Saw.
- (ii) Chisels—Fimer chisel, Bevelled edge firmer chisel, Mortise Chisel, Socket chilse and Gourges.
- (iii) Axe and Adze—Axe, Side axe and adze

3. Planing Tools

- | | |
|-----------------------|--------------------|
| (i) Wooden Jack Plane | (vi) Plough plane |
| (ii) Metal Jack Plane | (vii) Router plane |
| (iii) Trying plane | (viii) Block Plane |
| (iv) Smoothing plane | (ix) Spokeshave |
| (v) Rebate Plane | |

4. Boring Tools

- | | |
|-----------------------|-----------------------|
| (i) Bradawl and Gimle | (iii) Braces and bits |
| (ii) Auger | |

5. Striking Tools

- | | |
|-----------------------|--------------|
| (i) Claw Hammer | (iii) Mallet |
| (ii) Wrrington Hammer | |

6. Holding and Supporting Tools

- | | |
|-------------------|-------------------------------|
| (i) Work Bench | (iv) Sash cramp or Bar cramp. |
| (ii) Bench Vice | (v) G-cramp |
| (iii) Bench Stop. | (vi) Hand Screw cramp. |

7. Miscellaneous Tools

- | | |
|---------------------|-------------------|
| (i) Screw dirver | (iv) Oil stone |
| (ii) Pincer | (v) Saw set |
| (iii) Rasp and file | (vi) Glass paper. |

✓ 2.2 Marking and Measuring Tools

1. Four-fold rule : It is a wooden scale and consist of four pieces each 15 cm long hinged together by means of pins. When opened out, its total length measures 60 cm. and on being folded it measures 15 cm. Centimeter divisions are subdivided into millimetres.

Specification (i) Material—wood

(ii) Length—15 cm × 4 Nos.

(iii) Unit—M. K. S.

Use—It is mainly used for measuring and setting out dimensions.

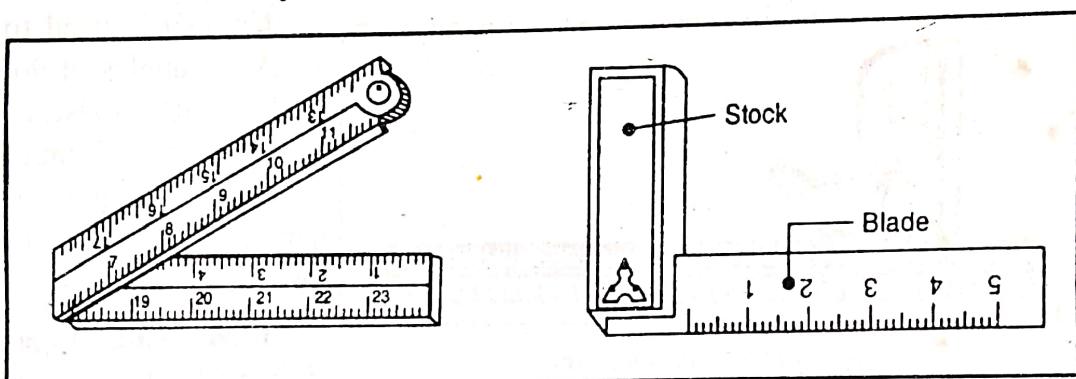


Fig.2.1 Four-fold rule.

Fig.2.2 Try-square.

2. Try-Square : It consist of a steel blade fixed at right angles to the edge of a machine stock made of M. S.

Specification—Try-square is specified by its material and length of blade.

Available sizes are 100 mm, 150 mm and 300 mm.

Use—It is used for drawing and testing right angles, checking flat surfaces and edges.

3. Bevel Square : It consist of a wooden or metallic stock fitted with a slotted blade. The blade can be adjusted at any point along the slot and at any angle from 0° to 180° with respect to the stock. The screw of the bottom is used for tightening the blade in position after it is set.

Specification—It is specified by its length of the blade.

Use—It is used for setting, duplicating, testing and comparing angles and bevels.

4. Marking awl and Marking Knife : Marking awl is a steel Rod with wooden handle. The rod have a sharp point at the end. Marking knife is a metallic blade with wooden handle. The blade has sharp edges.

Pitch of teeth—3 to 5 teeth per 25 mm

Use—Rip saw is used for cutting along the grains of wood.

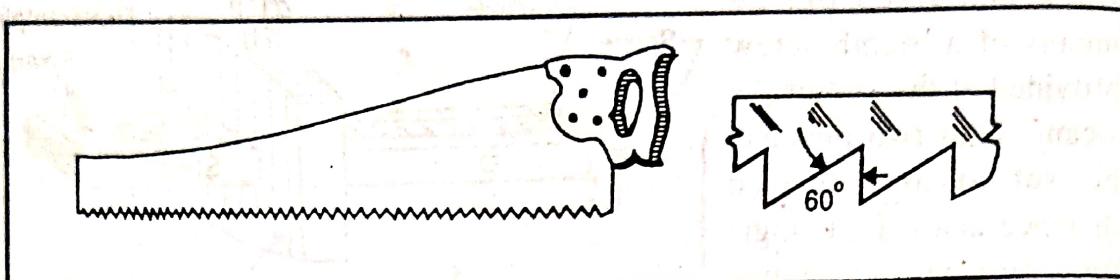


Fig.2.9 Rip saw.

Crosscut Saw : The another name of the crosscut saw is hand saw. The action of the teeth of this saw is that of a series of knives which sever the fibres and force out the waste wood in the form of sawdust. A blade with finer pitch is preferred for hard wood ant that havintg coarse pitch for soft wood. The teeth of the crosscut saw have a good bevel on the front edge and are inclined to the line of cut to enable them to cut easily through the fibres.

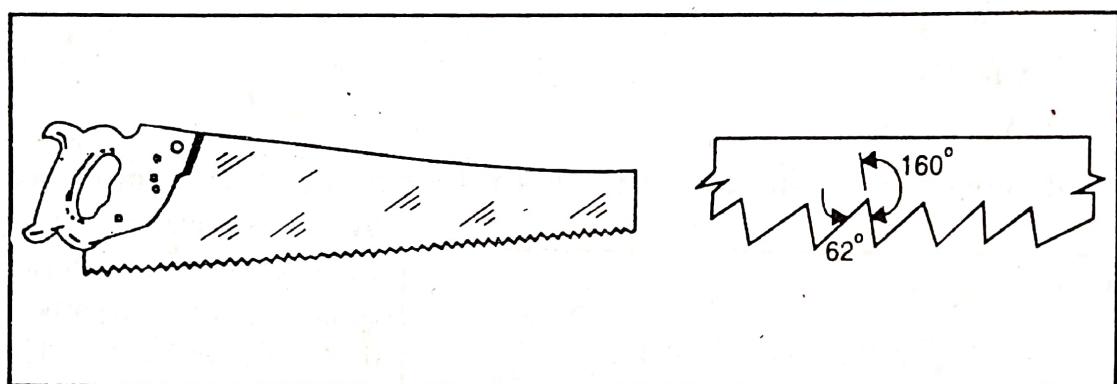


Fig.2.10 Crosscut saw.

Specification—Length of blade—500 to 650 mm.

Pitch of teeth—8 to 100 teeth per 25 mm.

Use—This is used for cutting across the grain of wood but it is also used with the grain and for general sawing.

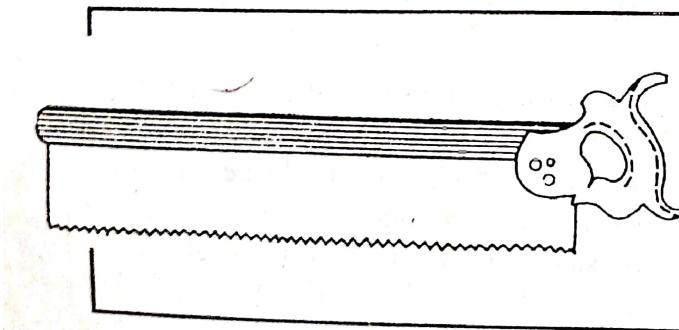


Fig.2.11 Tenon or back saw.

Tenon or back saw : The blade of this saw is very thin. For this reason its blade is stiffened by means of a double strip of iron which is pressed tightly along the top edge of the saw. The teeth of these saws are shaped in the form of an equilateral triangle and are called 'peg' teeth.

Due to the back iron its blade does not bend during the operation and a straight cut is obtained.

Specification—Length of blade—250 to 400 mm.

Pitch of teeth—10 to 12 teeth per 25 mm.

Use—This saw is used for cross-cutting when a finer and more accurate finish is required. The main use of this saw is in taking short straight cuts, such as for tenons.

Dovetail saw : In appearance it is just a small tenon saw. It's wooden handle is of open type to allow a free motion.

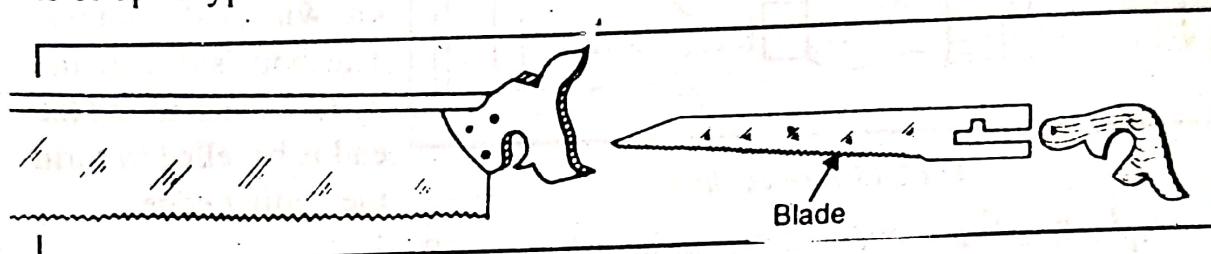


Fig.2.12 Dovetail saw.

Fig.2.13 Compass saw.

Specification—Length of blade—200–300 mm.

Pitch of teeth—12–18 teeth per 25 mm

Use—It is used for very fine work and where the greatest accuracy is needed such as for forming dovetail joints in drawers and cutting shoulders on narrow rails.

Compass saw : It carries a tapered blade which is long but narrow. The blade is quite flexible.

Use—Can be used easily for taking straight or curved cuts on outside or inside of the wood. For internal cutting a hole is first drilled and then the saw blade inserted in it is commence the cut.

Specification—Length of blade—250–400 mm.

Pitch of teeth—12 teeth per cm length.

2. Chisels : Chisel is a flat thick piece of tool steel, whose one edge is ground to an accurate level to form a cutting edge and the other end is provided with a wooden handle.

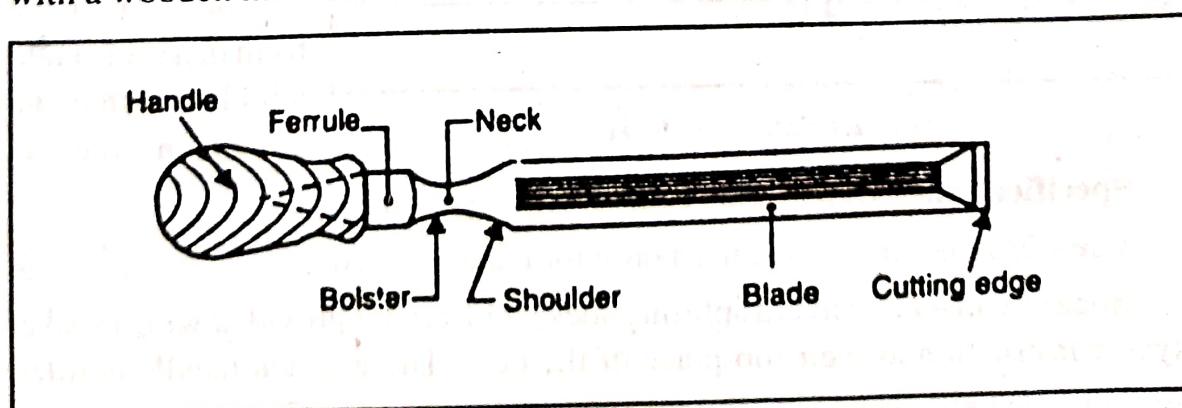


Fig. 2.14 Parts of a chisel.

Specification—The chisel is specified by the width of the blade and type of chisel.

Use—Chisels are used for fitting, shaping and surface decoration.

The common types of chisels used in the carpentry shop are the following.

Firmer Chisel : The blade has a rectangular cross-section whose longer side is known as width and smaller side is known as thickness.

The both sides of the body are planed and the end is bevelled to form the cutting edge.

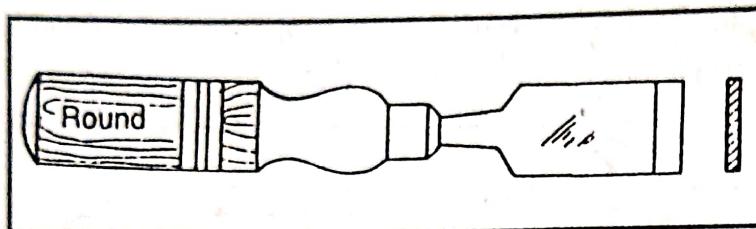


Fig.2.15 Firmer chisel.

Specification—Width of the cutting edge—5–50 mm.

Use—It is used for general work, taking wider cut and finishing flat surfaces inside the grooves.

Bevelled edge firmer chisel : It is like firmer chisel but with a bevelled back as shown in the figure. The bevelled shape enables reduction of blade thickness on the sides due to which it can enter sharp corners to finish them.

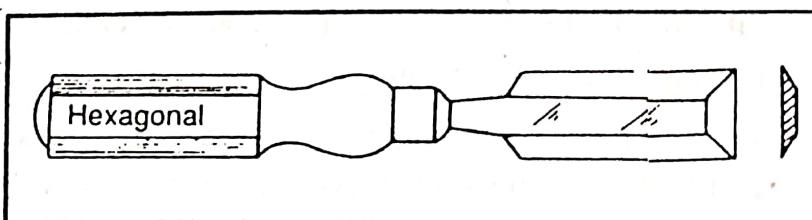


Fig.2.16 Bevelled edge firmer chisel.

Specification—Width of the cutting edge—5–50 mm.

Use—This chisel is used for cleaning out trenches and grooves or while dovetailing.

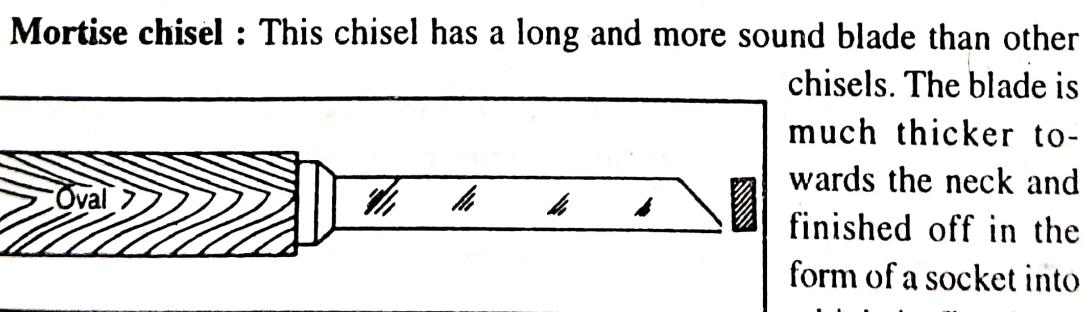


Fig.2.17 Mortise chisel.

This chisel has a long and more sound blade than other chisels. The blade is much thicker towards the neck and finished off in the form of a socket into which is fitted the wooden handle.

Specification—Width of the cutting edge—3–18 mm.

Use—Mortise chisels are used only for making mortises.

Socket Chisel : To avoid splitting socket chisels are provided with a socket type construction at their top place of the tank. The wooden handle is fitted into this socket instead of the tank entering the handle. The both sides of the chisel is plane and the end bevelled to obtain a cutting edge.

Specification—Width of the blade—20–50 mm.

Use—This chisels are used for heavy work and also may be used for general cutting work.

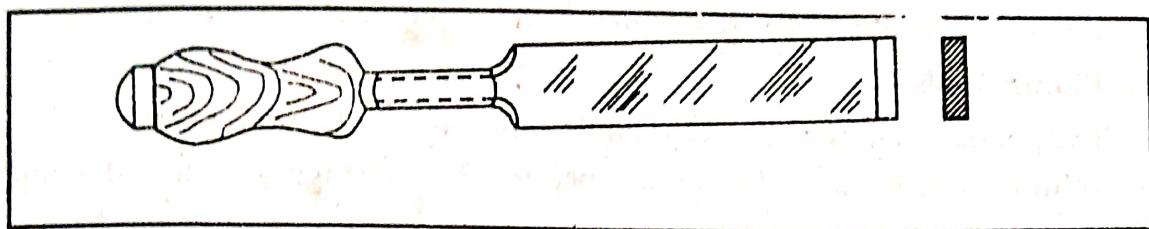


Fig.2.18 Socket chisel.

Gouges : Gouges are chisels with a hollow shaped blade for scooping or cutting round holes. There are two kinds of gouges. Outside ground gouge and Inside ground gouge.

Specification—

The gouges vary in size from 5 m to 25mm.

Use—The gouges are mostly used for wood turning. Inside ground gouges are used for inside curved edges and outside ground gouges are used for carving hollows.

3. Axe and Adze

Axe : The axe is a cutting tool made of carbon steel. The both side of the axe bevelled to form a cutting edge.

Use—It is used for splitting wood along the grains for rough work.

Side axe : The side axe has one side plane and the other is bevelled to form a cutting edge.

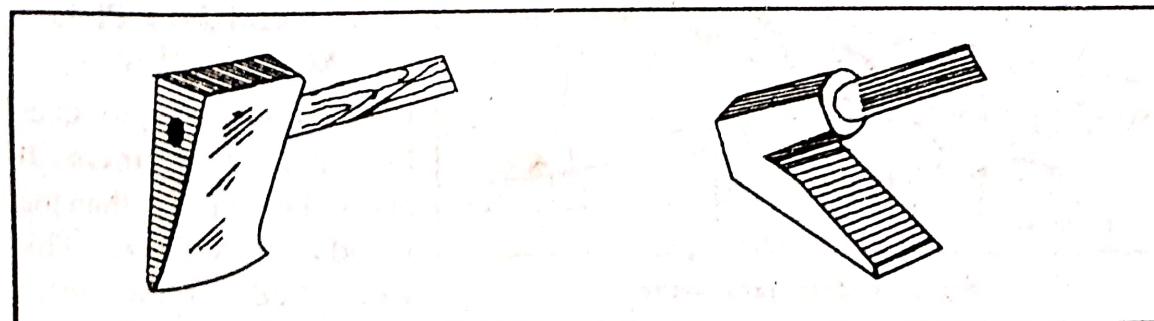


Fig.2.20 Axe.

Fig.2.21 Side axe.

Use—It is used for making the surface roughly plane.

Adze : An adze has outer face convex, inner face concave and edge is bevelled to form a cutting edge

Use—it is used to chop inside curves and to produce concave surfaces.

2.3 Planing Tools

The planing tools are such kind cutting tools which are used for shaving or smoothing plane surfaces. Planes are specified by the length of sole and width of the cutting edge.

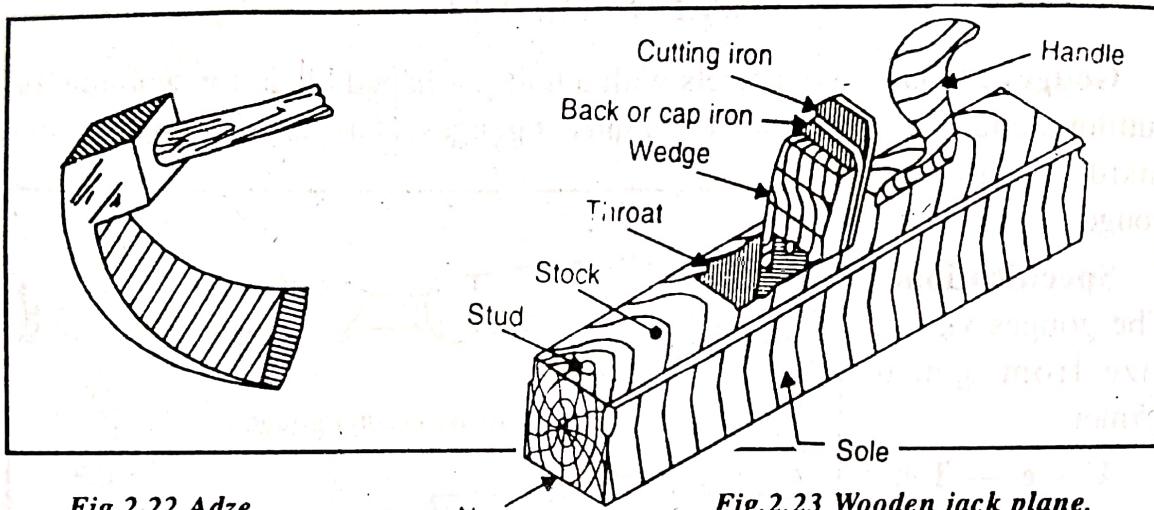


Fig.2.22 Adze.

Fig.2.23 Wooden jack plane.

Following are the various types of planes.

1. Wooden jack planes : A wooden jack plane consist of a body or stock, a wooden handle, a wooden wedge, a cap iron or back iron and a cutter or blade made of crucible cast steel. The bottom face is called sole. The back iron helps to support and strengthen the cutting blade and to turn the shavings upwards. The iron are fixed in the plane at an angle of 45° to the sole by means of the wedge.

Specification—Length of sole—300–460 mm.

Width of the cutting edge—50–75 mm.

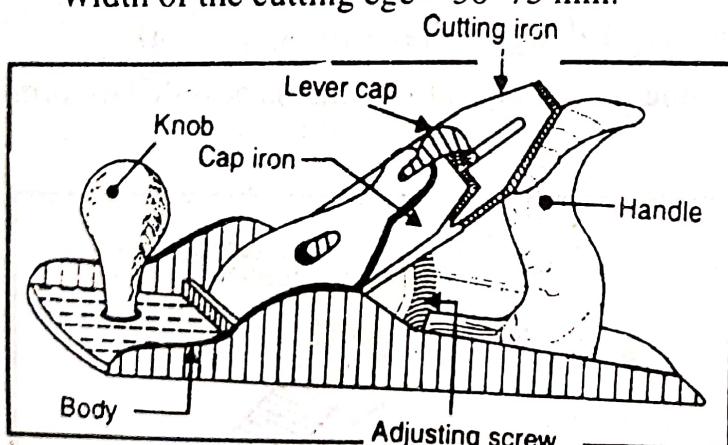


Fig.2.24 Metal jack plane.

Use—It is used for planing up a rough piece of wood.

2. Metal Jack Plane : The Metal jack plane is more durable and produces high degree of finish. It gives a better finish than the wooden jack plane. The whole body of the metal

jack plane is made of cast iron. It is provided with a wooden handle at the back and a wooden knob at the front for holding it by both hands. The iron cutter,

the cap iron, the lever cap, the frog and the adjusting screw are fitted with the body of the metal jack plane. A lever is used for adjusting the blade at right angle. Adjusting fine screw controls the depth of cut of the cutter.

Specification—Length of sole—125 mm to 250 mm.

Width of the cutting edge—30 mm to 60 mm.

Use—It is used for planing up a rough piece of wood with a better finish.

3. Trying Plane : The Trying plane is nothing but a longer Jack Plane excepting for the handle which is closed type :

Specification—Length of sole—500 mm to 750 mm.

Width of the cutting edge—60 mm.

Use—It is used after the surface has been planed by a Jack Plane.

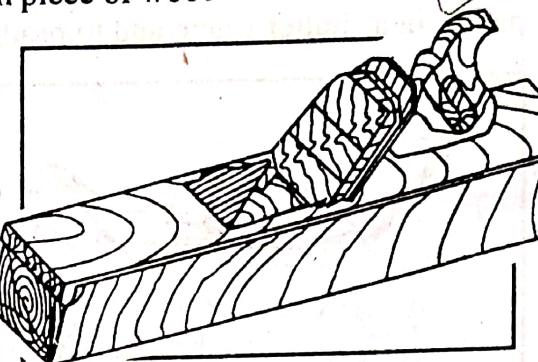


Fig.2.25 Trying plane.

4. Smoothing Plane : It is a small size wooden jack plane without handle. Its stock itself is held in both hands during operation. It is set to cut a much thinner shaving as its cutter has a straight cutting edge.

Specification—Length of sole—200 mm to 250 mm.

Width of the cutting edge—70 mm.

Use—It is used for providing better finish and smoothness to the surface already planed by a jack plane. It is specially used in that place where lack of space will prohibit the use of a jack plane.

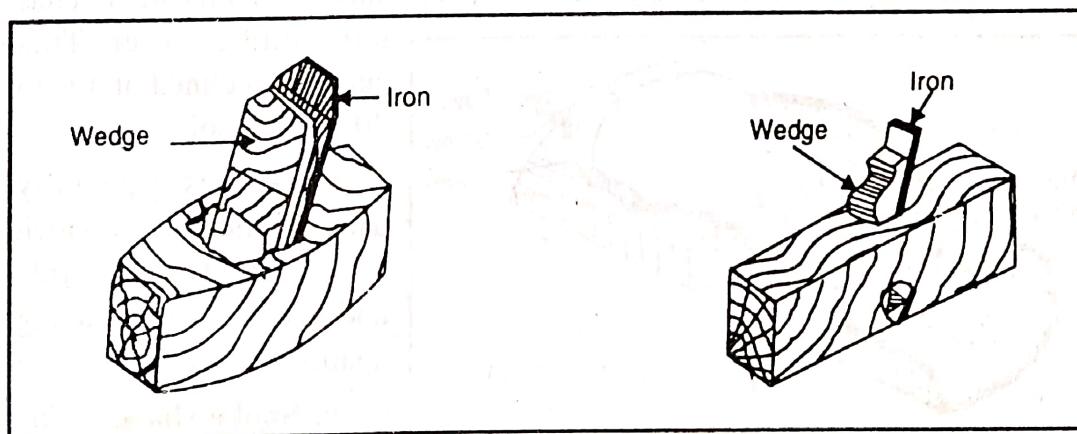


Fig.2.26 Smoothing plane.

Fig.2.27 Rebate plane.

5. Rebate Plane : A Rebate is a recess along the edge of a piece of wood. It has only a single iron which is fixed by a wedge. The blade is open at both sides of the plane and it is perfectly straight at the cutting edge.

Specification—Width of the cutting edge—12 mm to 50 mm.

Use—It is used to cut the edge of a board or plank into the form of a step so that it may fit into another board or plank similarly cut.

6. Plough Plane : Where a panel is needed in a door, it is used to fit it into grooves which is cut by plough plane. The depth of groove is controlled by a depth gauge which is fixed on the body of the plane and operated by a thumbscrew.

Specification—Width of the cutting edge—3 mm to 15 mm.

Use—A plough plane is used to cut channels of various shapes to fit the panels in a shutter frame and to produce grooves for tongue and groove joint.

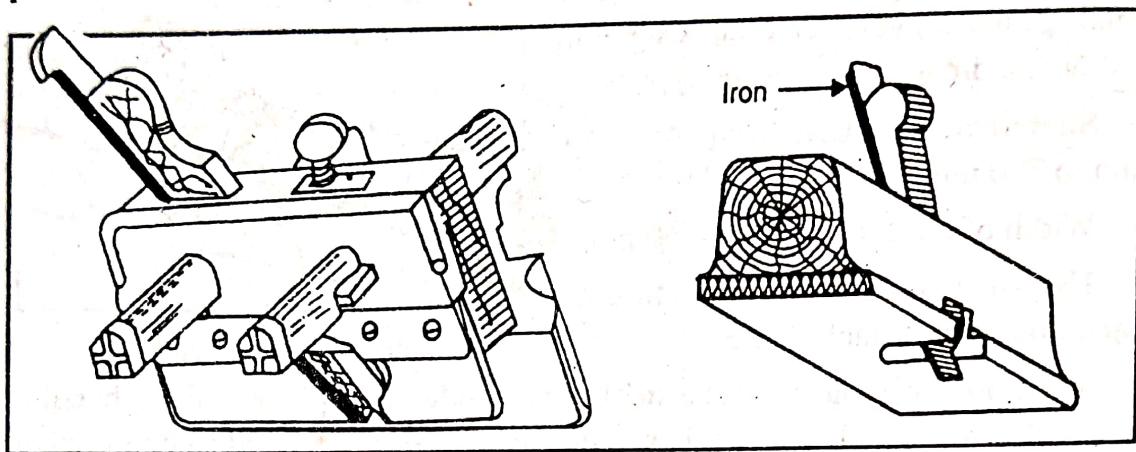


Fig.2.28 Plough plane.

Fig.2.29 Router plane.

7. Router Plane

Specification—Width of the cutting edge—3mm to 15 mm.

Use—A router plane is use for increasing to a uniform depth grooves formed previously by another tool.

8. Block Plane : Due to its small size this plane can be easily handled. It has only single cutter. This cutter is inclined at 12° to 20° with its sole.

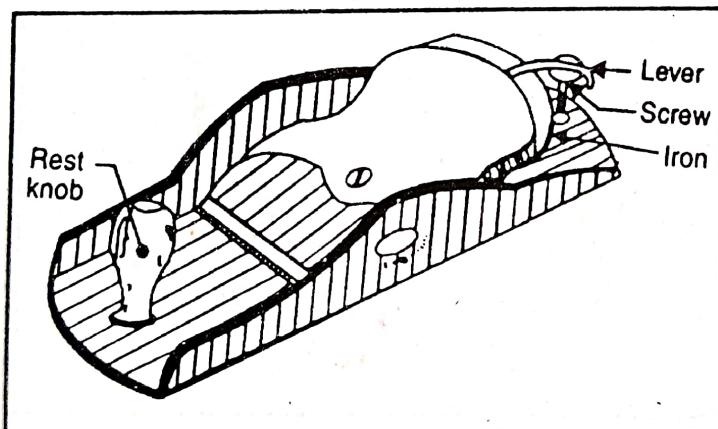


Fig..2.30 Block plane.

Use—It is especially used for small work which is not readily accessible and also used for planing against the grain.

9. Spoke shave : The spoke shave is held in both hands and is moved along

the work in the same direction as the grain. It is made of iron and have a screw adjustment for the amount of cut.

Use—It is used for planing circular work having quick curves.

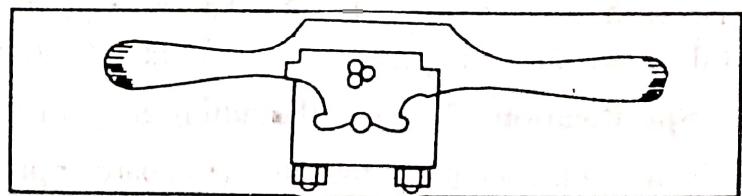


Fig.2.31 Spoke shave.

2.4 Boring Tools

1. Bradawl and Gimlet : The Bradawl and Gimlet may be worked by hand pressure or by a mallet.

Use— Both are used for boring small holes such as for starting a screw or large nail.

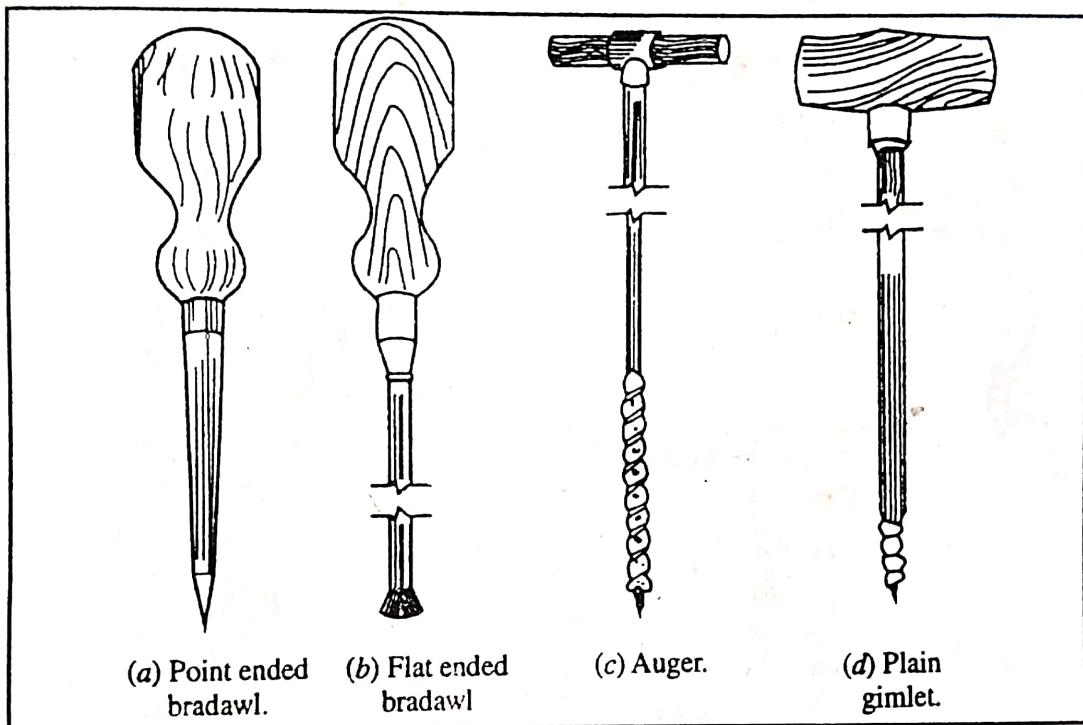


Fig.2.32 Bradawl (up) and Gimlet (Dn.)

Fig.2.33 Auger.

2. Auger : The Auger is a steel bar. It has an eye at one end to fixt the handle and has a screw point at the other end.

Specification—Diameter —upto 25 mm, Depth—upto 150 mm.

Use—It is used to bore holes in wood.

3. Brace and bits : A brace is an appliance which holds different types and sizes of bits for producing holes in wood. It is a holding and turning tool for a bit.

Ratchet Brace : The Ratchet brace consists of a crank made of steel, provided with a wooden hemispherical head at the top, a wooden handle in its middle and a chuck at the bottom end. This chuck holds the bit. A ratchet arrangement is provided with the brace just above the chuck. The function of the ratchet is to rotate the bit only one direction. If the crank rotates in reverse direction the bit does not rotate.

Use—It is used for holding and turning a bit for making holes.

Wheel Brace : The Wheel brace is provided with a wheel which is rotated by a lever attached to its centre. If the wheel rotates the chuck together with the bit rotates by means of gear arrangement.

Use—The wheel brace is used for drilling small holes.

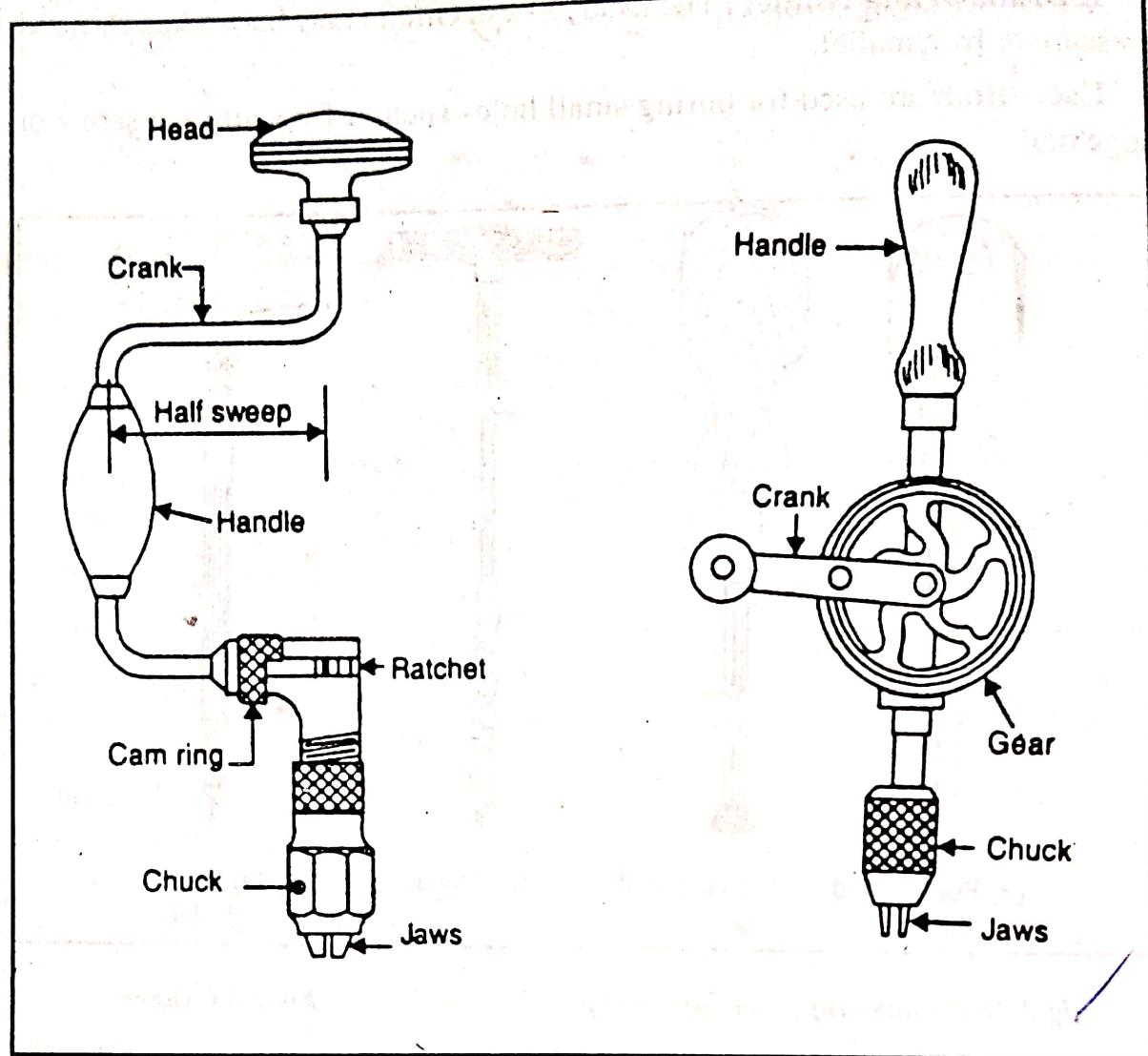


Fig.2.34 Ratchet Brace.

Fig.2.35 Wheel Brace.

Bit : The common type of bits used in conjunction with a brace are the following.

(a) **shell bit :** It is used for boring holes upto 12 mm diameter and which do not require a high degree of finish.

(b) **Auger bit :** It is a fluted body having two cutting lips and a screw point at its bottom. Its available sizes are from 6 mm to 35 mm diameter. It produces a long, clean and accurate hole either with or across the grain.

(c) **Expanding bit :** The main cutter on this bit can be adjusted to varying diameter between certain limit. It is fixed to the desired mark on the scale and clamped in position by the plate and screw. Expanding bits are available from 12 mm to 35 mm diameter.

(d) **Centre bit :** It is used for boring shallow holes across the grain. It is available from 3 mm to 35 mm diameter These bits produce accurate and clean holes.

(e) **Counter sink bit :** It is used for making a hole to fit the head of a countersunk headed screw.

(f) Reamer bit : It is used for enlarging holes. These are tapered bits shaped from about 12 mm to a point.

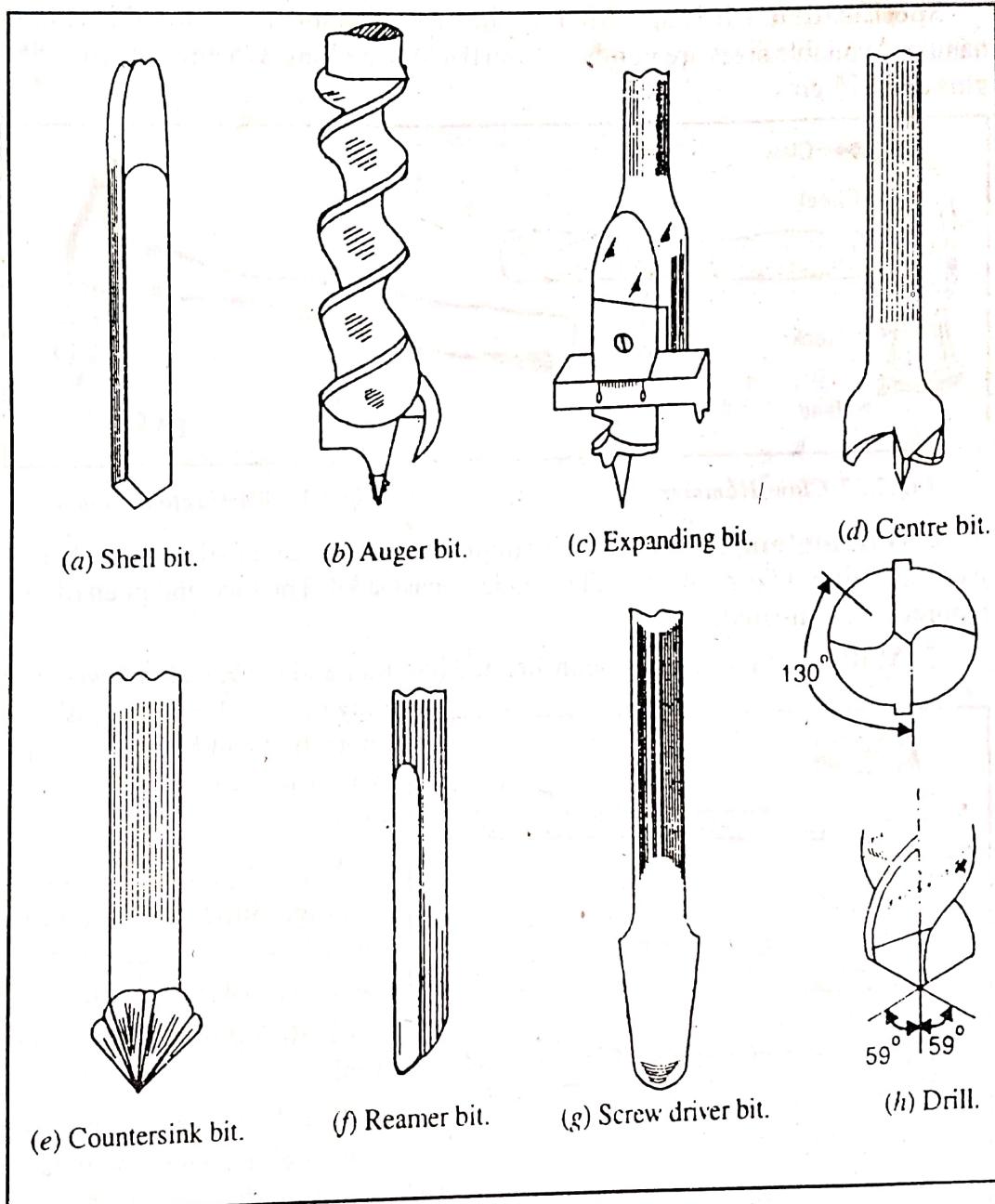


Fig. 2.36 Types of bits.

(g) Screwdriver bit : It is employed to force in screw when the pressure on the ordinary screw driver is inadequate.

(h) Drill : Morse drill are use for making holes with a wheel brace. This is used for drilling holes when wood working bits would be spoiled.

2.5 Striking Tools

Hammers and mallets are striking tools because these are used for striking large nails or few cutting tools such as chisels.

1. Claw Hammer : A carpenter uses claw hammer frequently. It is made of steel and has head at one end and the claw at the other end. The

head is used for driving nails and the claw is used for pulling out nails from the wood.

Specification – It is specified by the size of number and weight without handle. Available sizes are numbers from 0 to 4, weighing 375 gm, 450 gms, 550 gms and 675 gms.

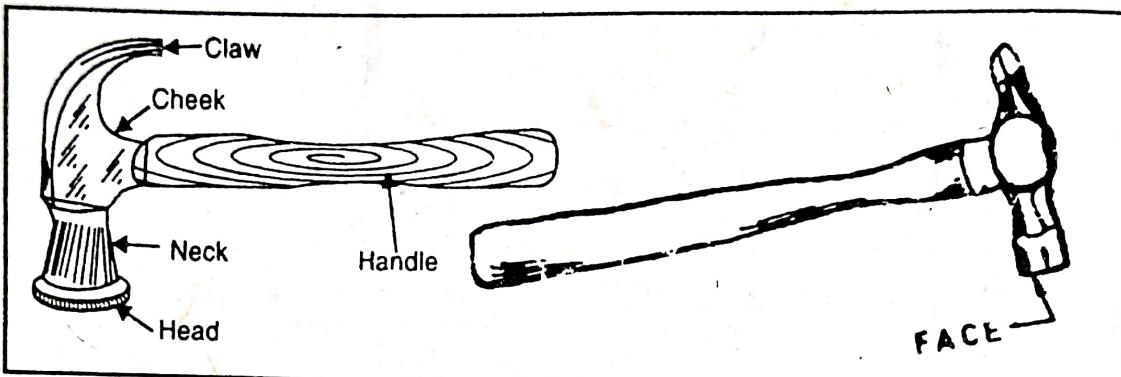


Fig.2.37 Claw Hammer.

Fig.2.38 Warrington Hammer.

2. Warrington Hammer : Warrington hammers are mostly used in bench work and all light jobs. The head is made of cast steel. The face and peen of this hammer are tempered.

3. Mallet : Mallet is a wooden-headed hammer and made of hard-wood. It may be round or rectangular in shape. Its head has an eye into which the wooden handle is fitted.

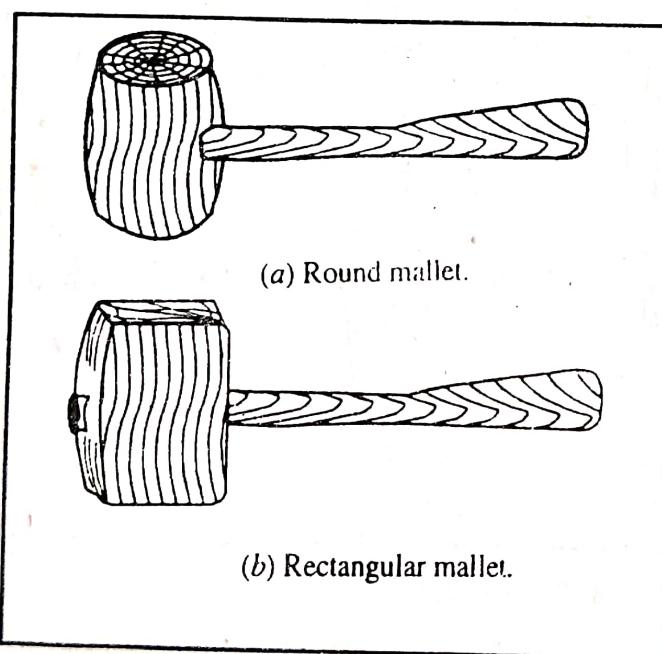


Fig.2.39 Mallet.

Use—A mallet is used to give light blows to the cutting tools having wooden handle such as chisels and gouges.

2.6 Holding and Supporting Tools

Holding and supporting tools are those tools which are used to hold or support or for both the job during operations. Following are the common holding and supporting tools.

1. Work bench

It is a heavy table made of hard wood. It is about 1500 mm to 1800 mm length and 900 mm width. Generally two carpenter's vices are fitted on opposite sides for holding the job during operation. One jaw of the carpenter's vice is secured to the table and the other is kept movable. Wooden liners are fitted inside the jaws of the vice to prevent damaging of the job surface when it is clamped in between the jaws. One or two bench stop may also be fitted on the table top. Middle part of the top is stepped down for supporting the job during chiselling or filling operation.

Specification—Available sizes for maximum opening between the jaws 150 mm to 350 mm.

2.7 Miscellaneous Tools

There are many other tools used in wood work, which do not fall in any of the above categories. These tools are called miscellaneous tools. A few commonly used of miscellaneous tools are the following

1. Screw driver : The screw driver is used for driving the wood screws into the wood and unscrewing them. These are available in various sizes and shapes. Figure shows two types of screw driver (a) Simple screw driver (b) Ratchet type screw driver.

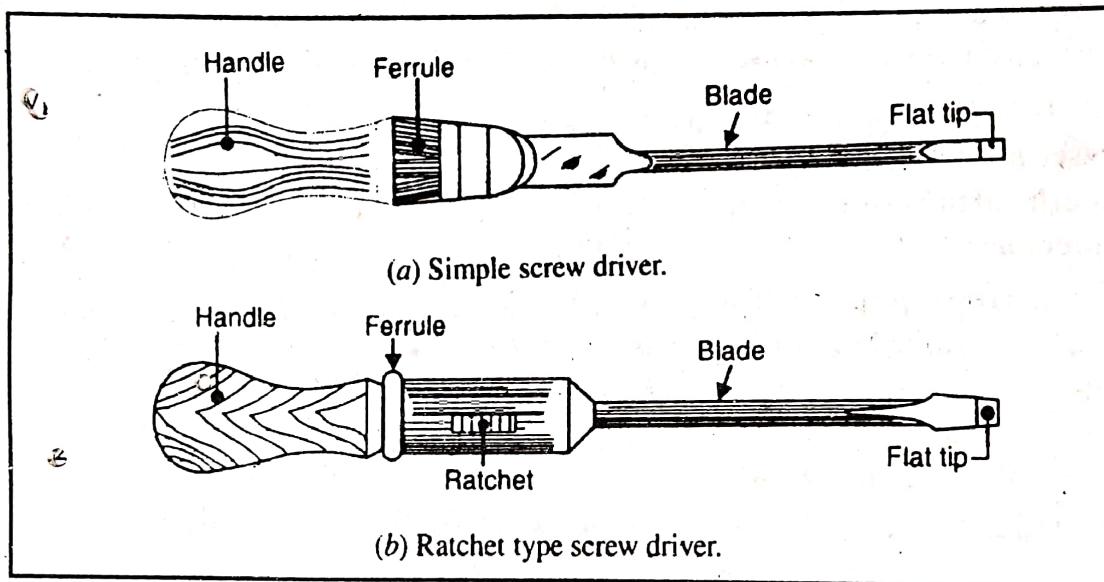


Fig. 2.46 Screw drivers.

2. Pincer : It is made of steel having a hinged joint. Its two jaws are bevelled inside. It has two forged steel arm.

Use—The Pincer is used for pulling out nails from wood.

3. Rasp and files : The rasp has sharp cutting teeth on its surface. It is a finishing tool. It is used to make the wood surface smooth and removes sharp edges. It is also used for finishing fillets and other interior surfaces. The file is used for removing rasp marks.

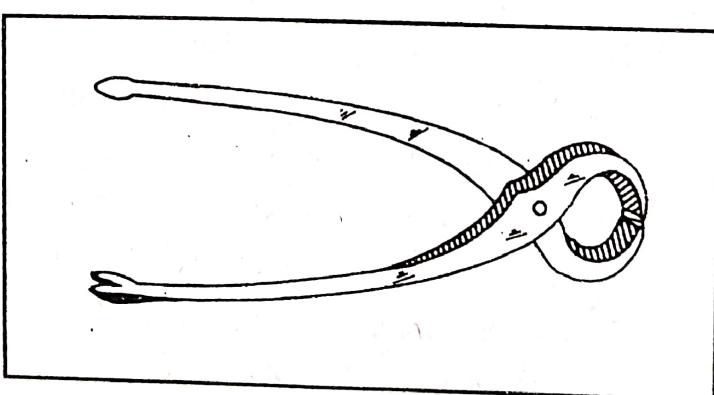


Fig. 2.47 Pincer.

4. Oil stone : Oil stone is an essential tool of a carpentry shop. It may be artificial or natural stones. The best artificial stones are carborundum and India.

7.2 Job No. 2 Make the Cross Halving joint as per drawing.

Material : Good Quality Soft Wood.

Size : 205 mm x 50 mm x 25 mm

Drawing : Fig 7.2

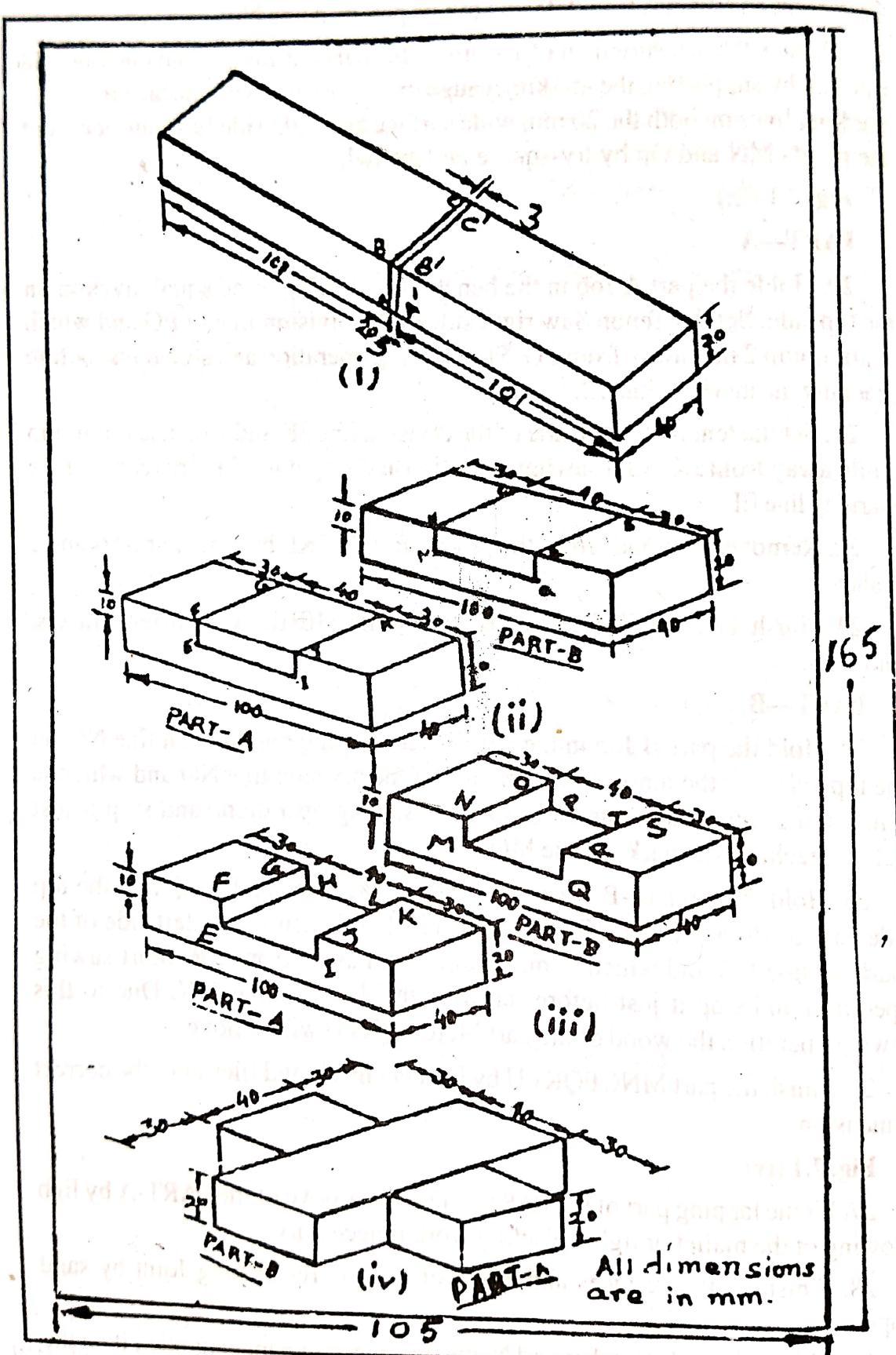


Fig. 7.2

7.3 Job No. 3 Make the Mortise and Tenon Joint as per drawing.

Material : Good Quality soft wood.

Size : 205 mm x 50 mm x 37 mm.

Drawing : Fig 6.3 (i), (ii), (iii) and (iv)

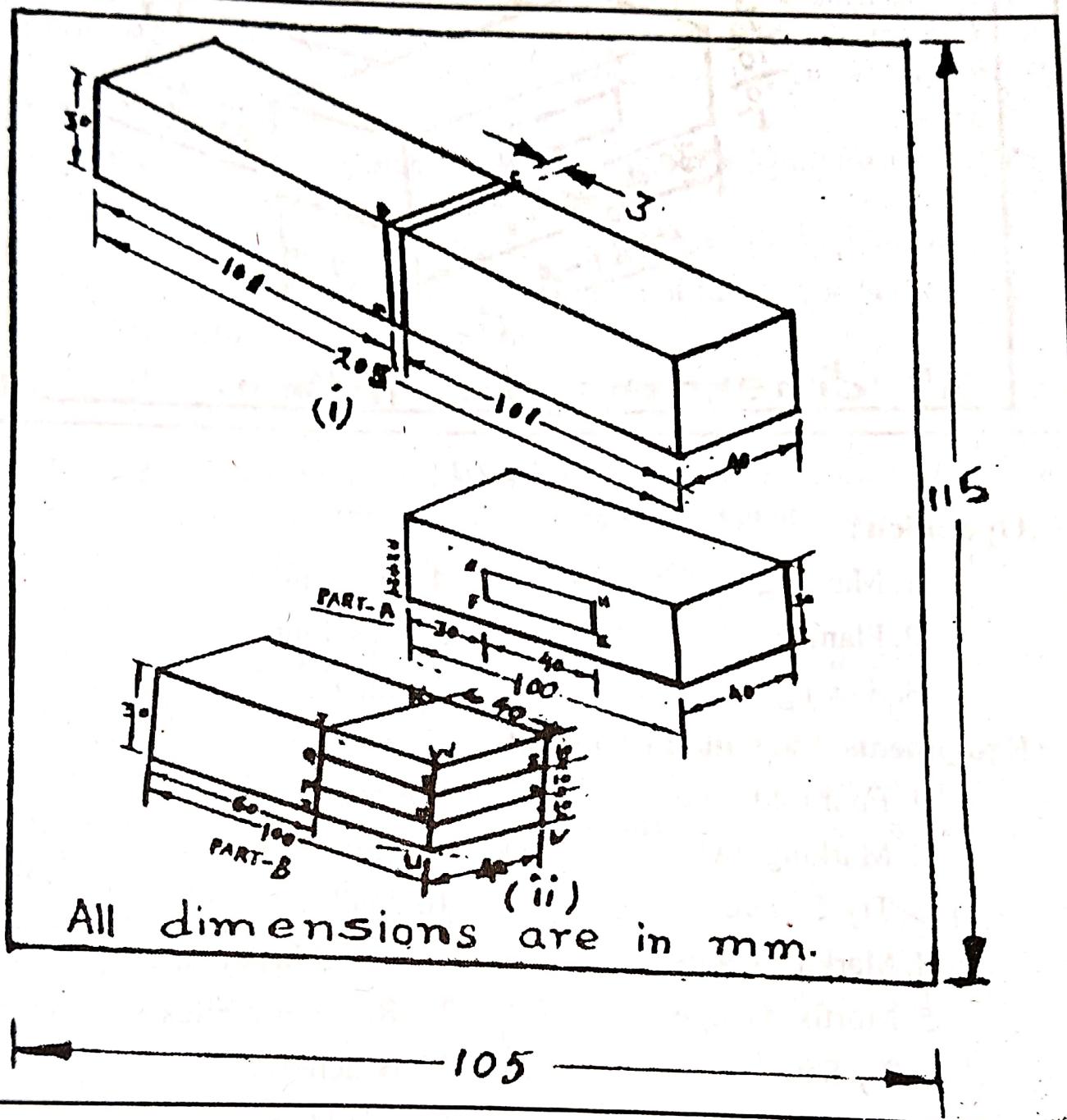
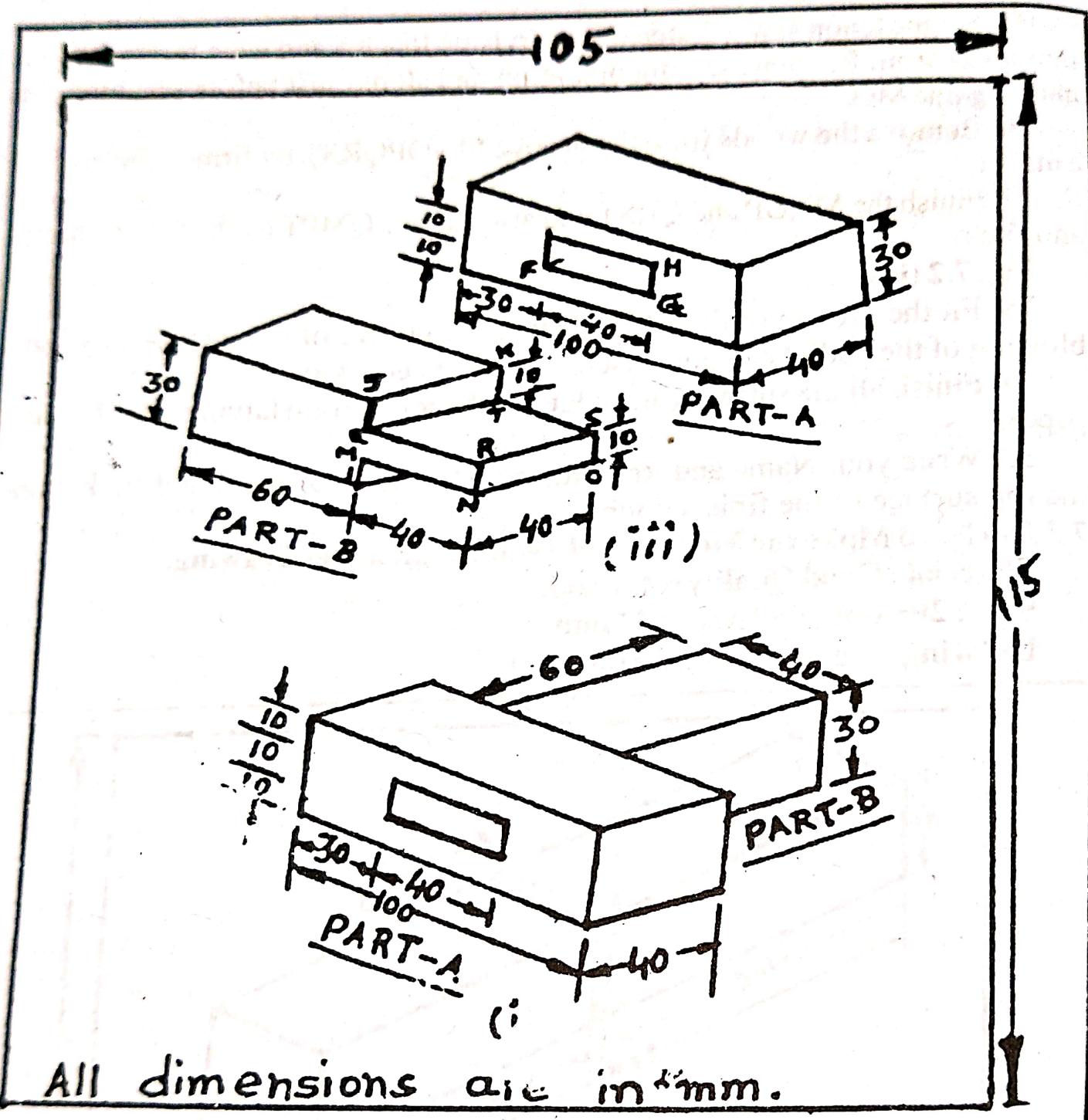


Fig. 7.3

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All dimensions are in mm .

DOODA JUG YOGA.

Size : 205 mm x 50 mm x 37 mm

Drawing : Fig. 6.4 (i), (ii) and (iii), (iv).

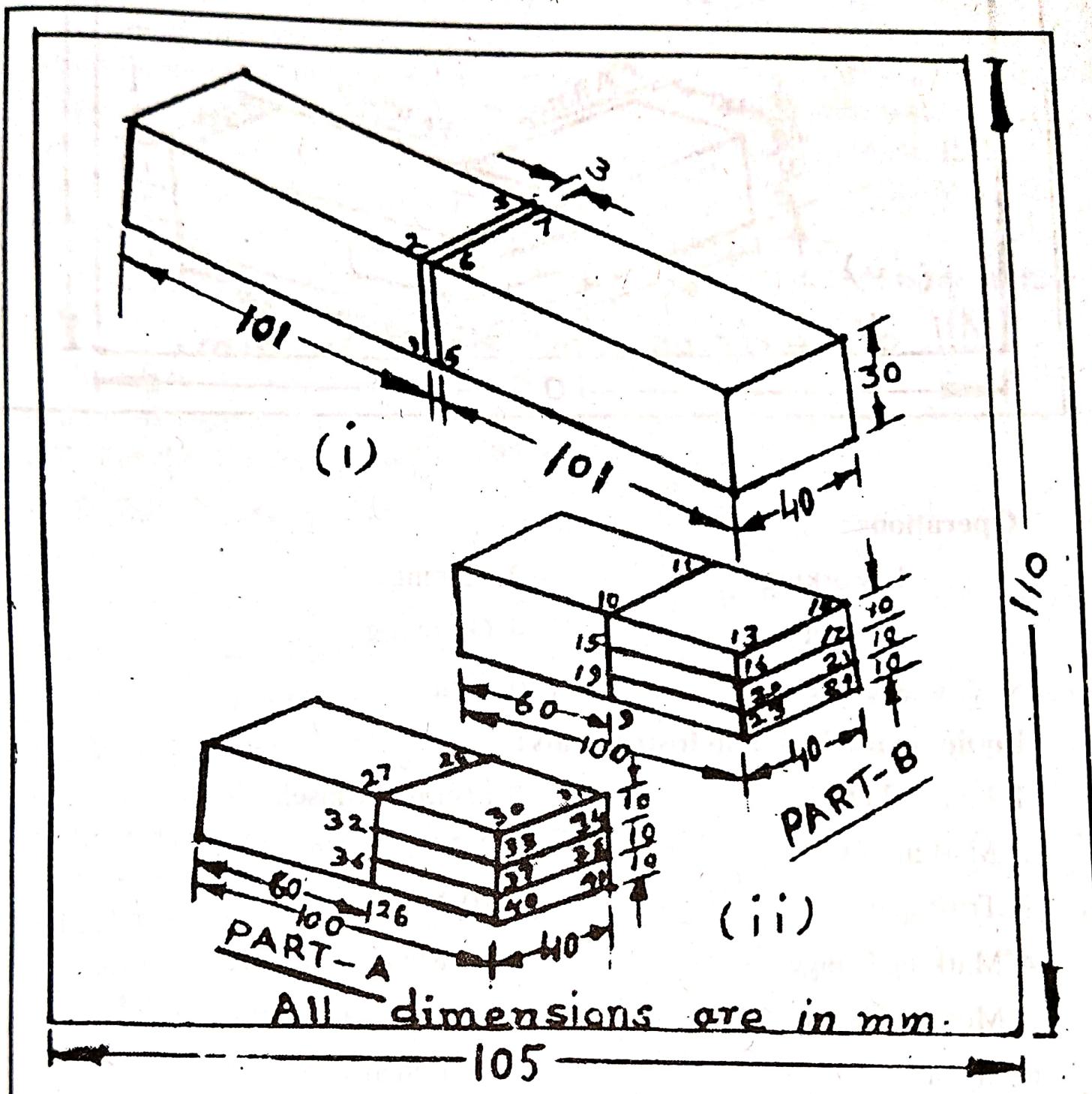
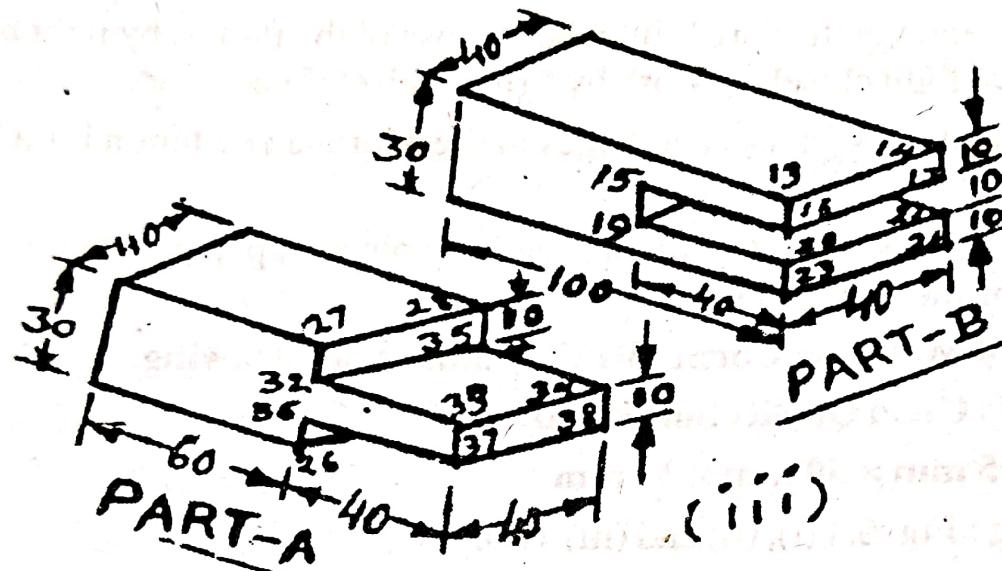
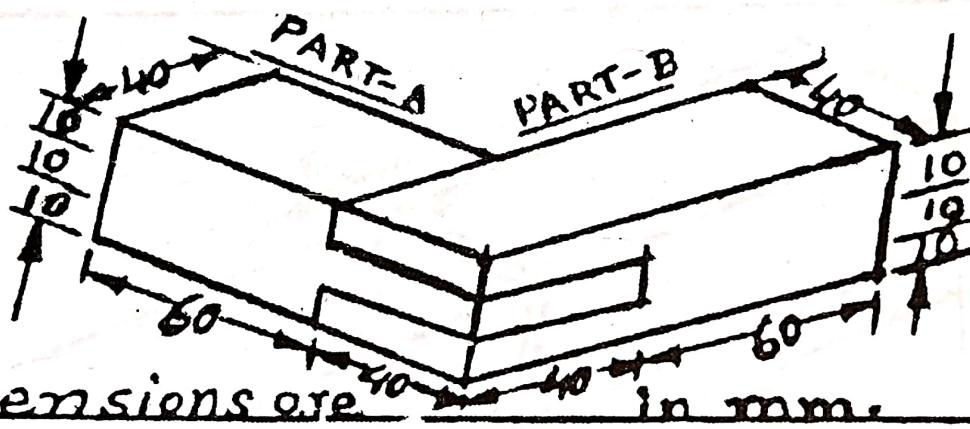


Fig.7.4



三



All dimensions are

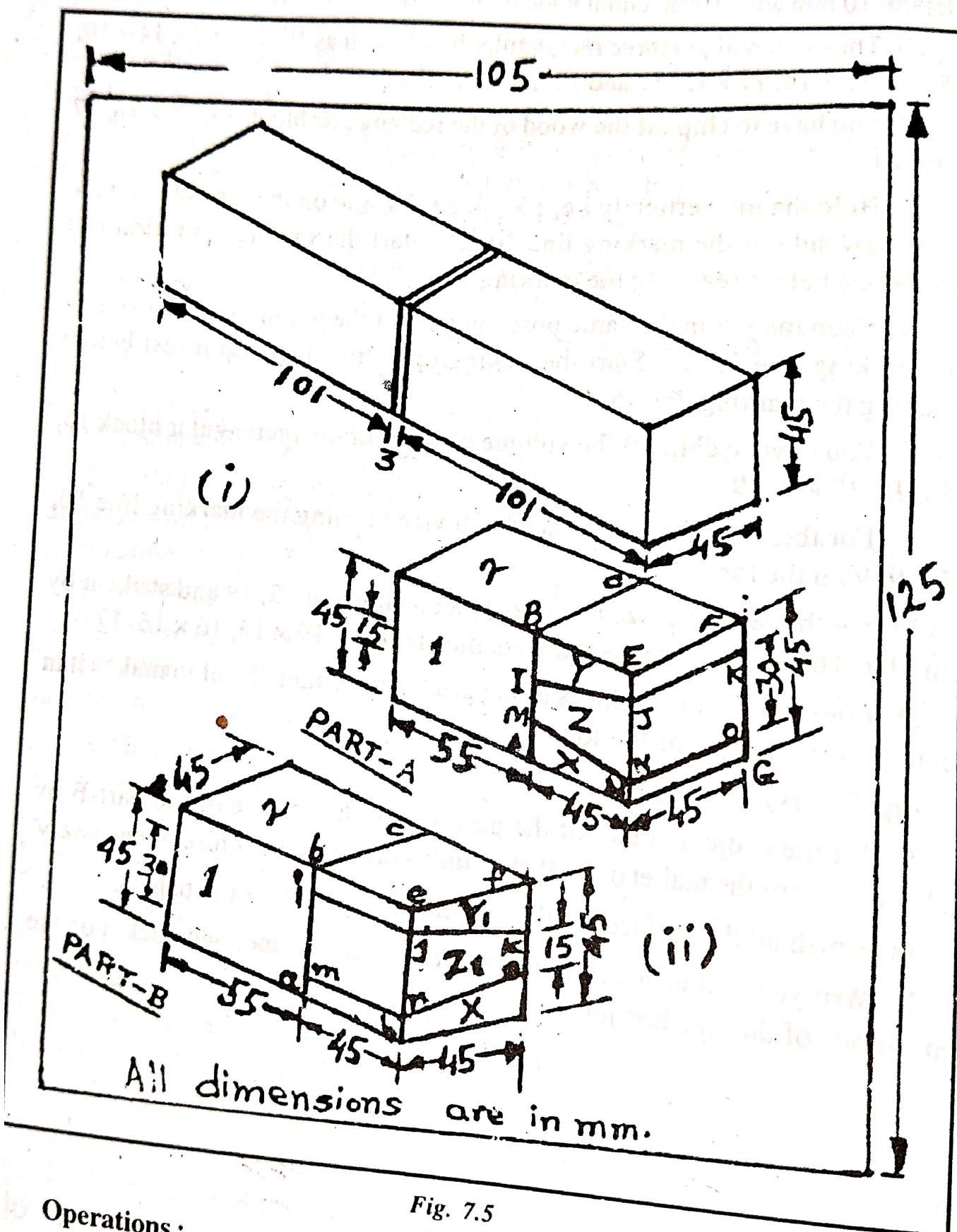
in mm.

7.5 Job No. 5 Make the Dovetail Joint as per drawing.

Material : Good Quantity Soft Wood.

Size : 205 mm x 50 mm x 50 mm.

Drawing : Fig 6.5 (i), (ii) and (iii), (iv)



Operations.

1. Marking
 2. Planing
 3. Boring
 4. Grooving

Fig. 7.5

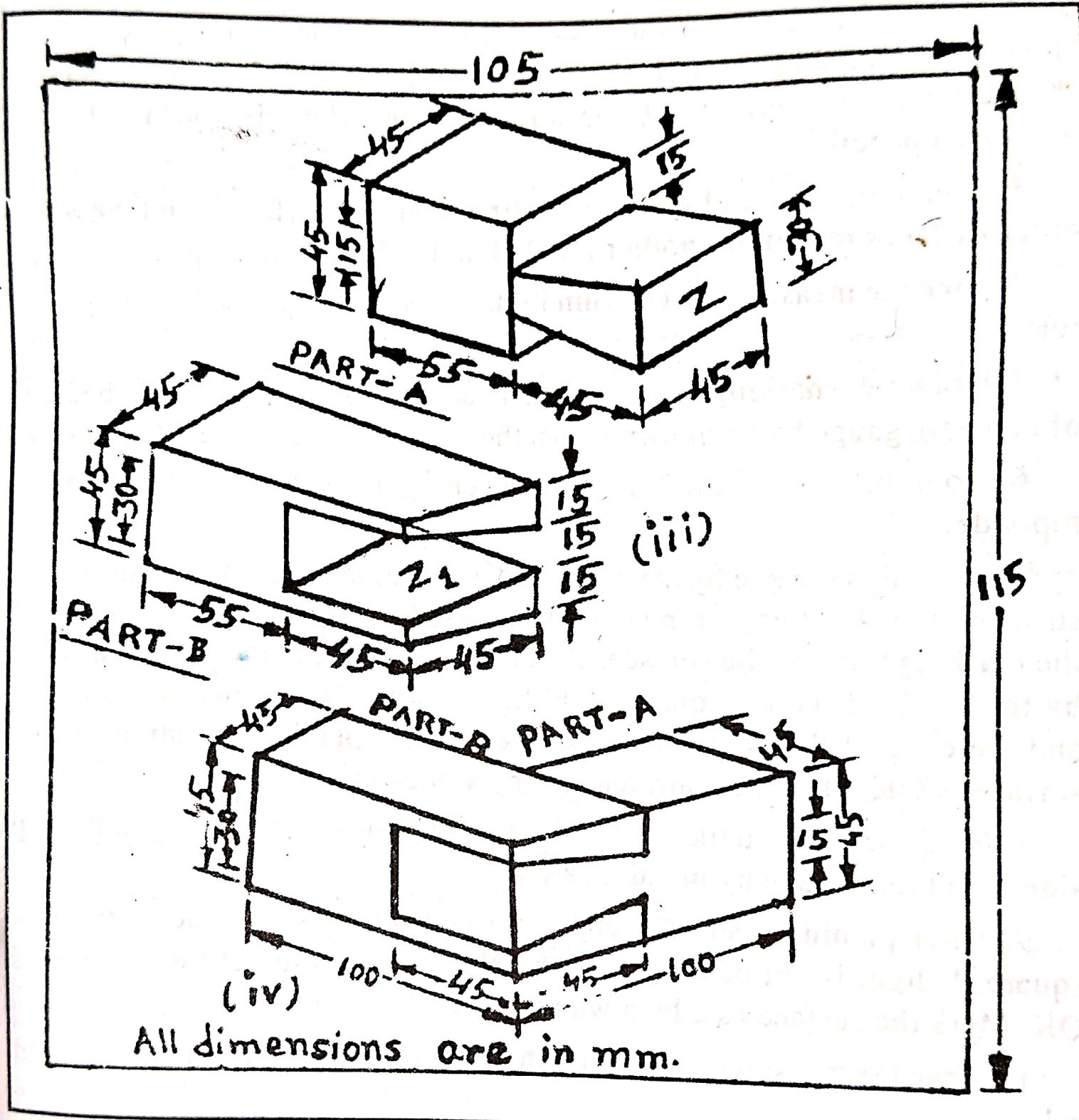


Fig. 7.5