

① The major saw material used in carpentry shop is wood.

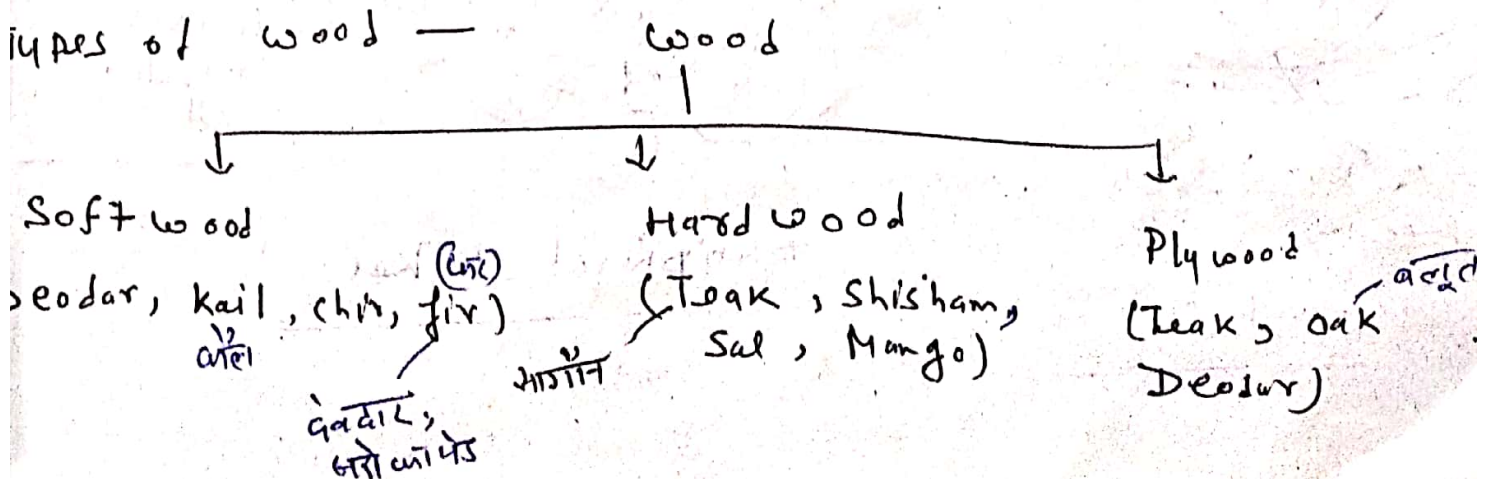
wood — wood is available in nature in the form of trees. Useful part of the tree is cut out is used for carpentry work.

Timber (तगल) — The wood obtained from fully grown trees is cut & is prepared for engineering purposes. This wood is known as timber.

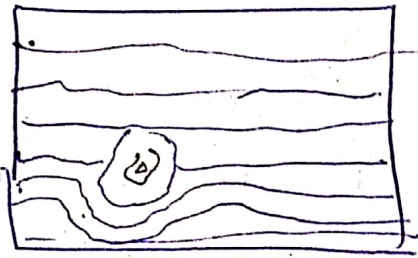
Timber has the following advantages over the other materials —

- 1) Easy to work on it. ✓
- 2) lighter in weight ✓
- 3) Low cost ✓
- 4) Good response to Polishing & Painting. ✓
- 5) very suitable for doors, windows & furniture work. ✓
- 6) Sound proof in nature.
- 7) Good strength. ✓

Types of wood —



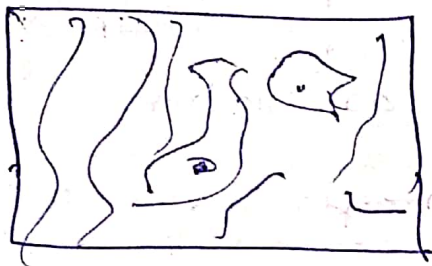
30/11-11  
Knot :- Knot is centre of irregular grown part of the tree  
 (गुँदा)



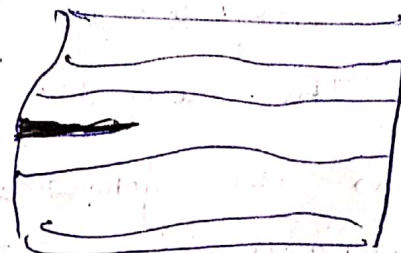
Circular knot



Oval knot  
 (डिस्टाक)



Irregular knot

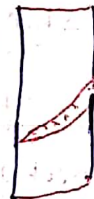


Line knot

live knots - these occur before <sup>फेलिंग</sup> felling of the tree

Dead knots - these occur after felling

Shakes - शेक (चूर)



Twisted shakes

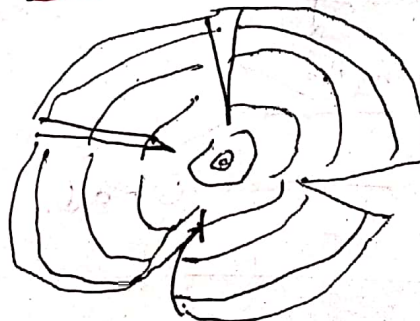


Ring shakes



Cavity at centre

Heart Shakes



Peripheral Shakes

because of wind, Internal or external diseases of tree, dead Cell



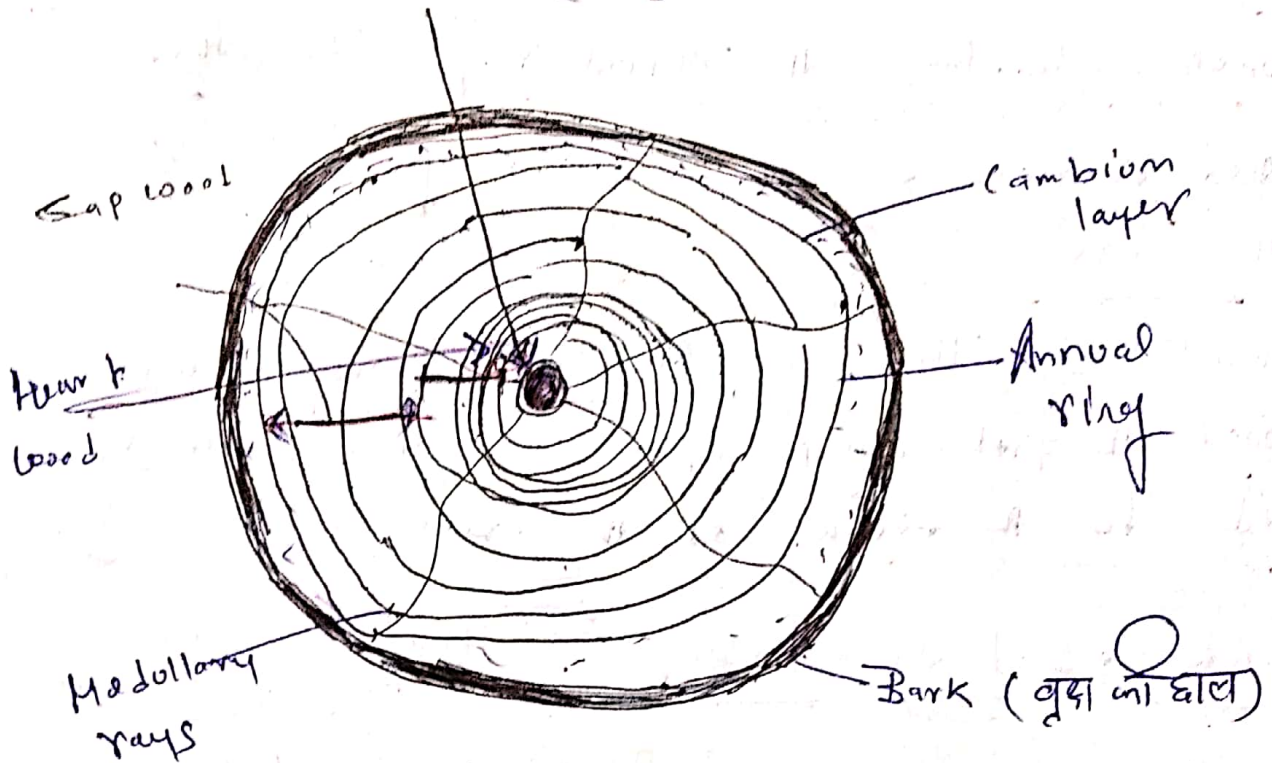
# Structure of wood:-

[03]

फ्रॉस्ट - 41011, 41012

Pith or

Medulla (मूला)



1) Pith - it is the central part of a tree, it feeds the Sap (रस) from roots to leaves. It has a dark colour.

2) Heart wood - The portion surrounding the pith is called heart wood. The percentage of moisture is less in it than the central part.

3) Sap wood!- The part of trunk b/w the heart wood and cambium layer is known as Sap wood. it is light in weight, softer and weaker part it is generally used as fuel wood.

4) Cambium layer!- The ring adjacent to the bark are known as cambium layer. फ्रॉस्ट (86, 41011)

5) Bark!- The outer surface of the tree which acts as a cover for the inner portion is known as bark. It protects the tree from insects and frosts.

Medullary Rays! - These are radial layers starting from pith up to the cambium layer. Their function is to bind the annual rings together.

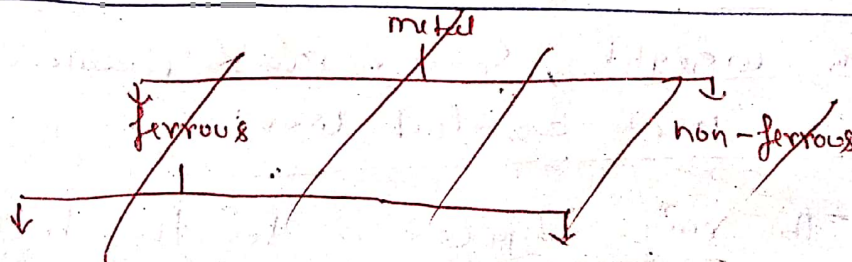
→ Also carries sap to various portions of the tree.

Annual Ring! - These are concentric layers of wood around the pith. Every year one such layer is added to the trunk of the tree.

Qualities of Good timber!



- 1) It should be free from all types of defects
- 2) It should have regular annual ring
- 3) durable & heavy
- 4) dark colour
- 5) give a clear sound while striking
- 6) give light surface while rubbing
- 7) easy to fix.
- 8) It should be easy to work.



→ if the percentage of carbon in Fe is up to 2.0% then this is called steel and if ~~the~~ 2.0 - 4.5% C then it is called cast iron.



# Carpentry tools:-

[05]

$$1\text{cm} = 0.394\text{inch}$$

$$1\text{m} = 100\text{cm}$$

$$1\text{cm} = 10\text{mm}$$

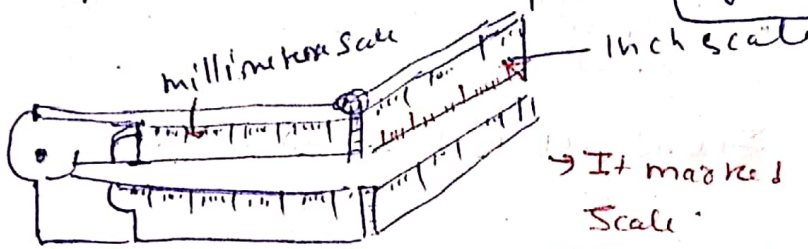
$$1\text{m} = 3\text{feet } 3\text{inches}$$

$$1\text{foot} = 0.305\text{m}$$

$$1\text{m} = 39.37\text{inch}$$

## ① Measuring tools

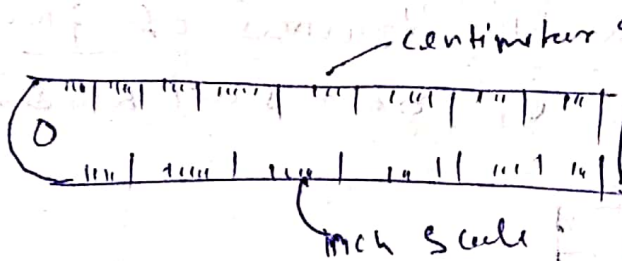
### ① four fold Box wood Rule:-



→ It marked with inch & millimeter scale.

→ It can fold, and material of rule is wood.

### ② Steel Rule:-



→ It is made up of stainless steel.

### ③ inch tape



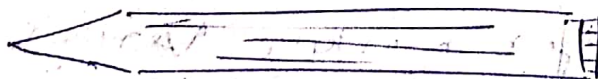
→ It is made up of a flexible thin steel strip.

→ It folded around a center pin attached with a small handle.

## Marking tool:-

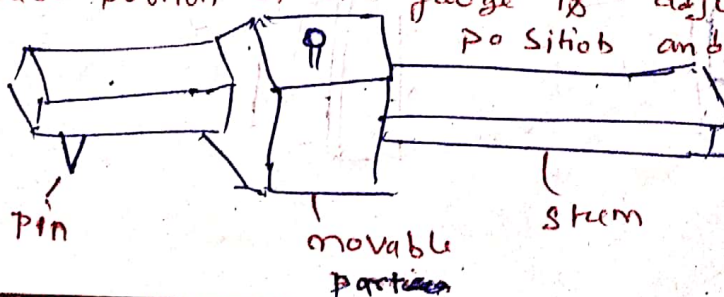
Pencil — Lead pencil is generally used for marking purposes.

Scriber — It has sharp conical edge used to mark on even hard surfaces. It made up of carbon steel.



④ Marking gauge → It is used draw parallel lines:

→ The movable portion of the gauge is adjusted to suitable position and is tightened on to stem.



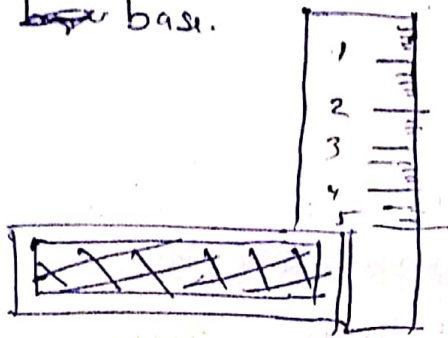
① Mortise Gauge - it is used to draw two parallel lines. It looking is similar to marking gauge except it has two sharp edges.



→ One fixed & second adjustable or fixed.

② Try Square:-

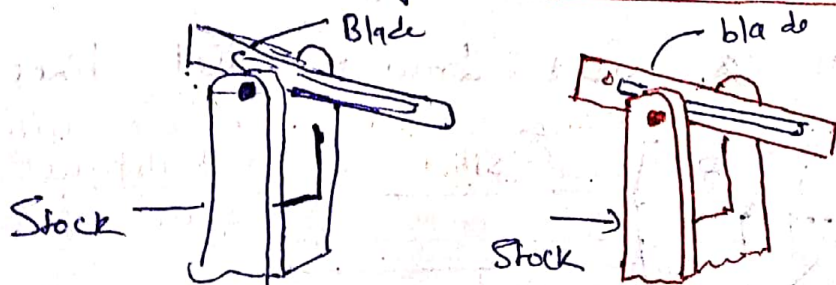
It is used to draw lines at right angle, parallel or to check the trueness of planed surfaces. It is made up of a steel blade with heavy base.



Try Square

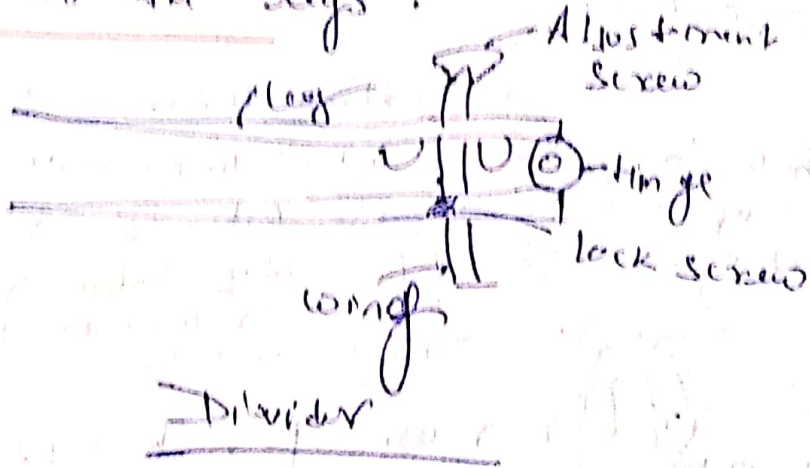
③ Bessel - It consists of a wooden handle fitted with an adjustable blade as shown in the figure. The blade can be rotated by  $180^\circ$  with respect to handle.

→ It is used for marking various angles.



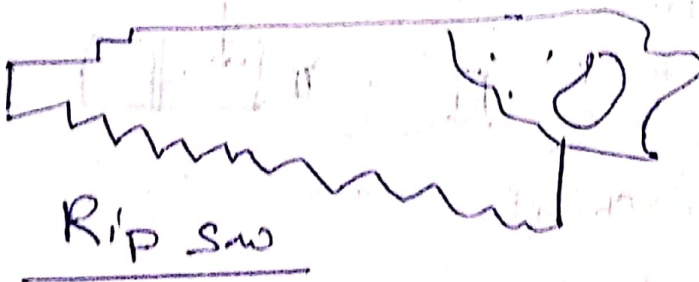


- used for dividing equal number of parts and for drawing arcs & circles.
- it consists of two legs with a spring on the top of the legs.

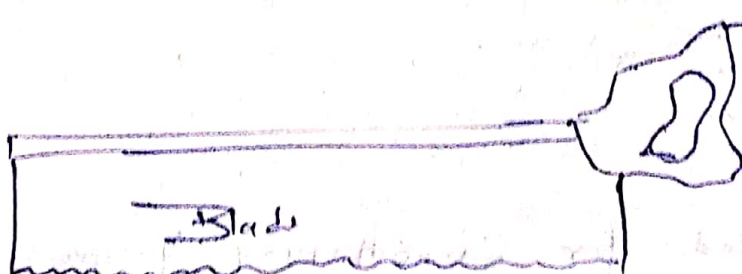


Cutting tool! — Saw & Chisel are used as cutting tools in carpentry shop.

Saw! — A saw is a multi tool made up of thin sheet attached with a wooden handle.



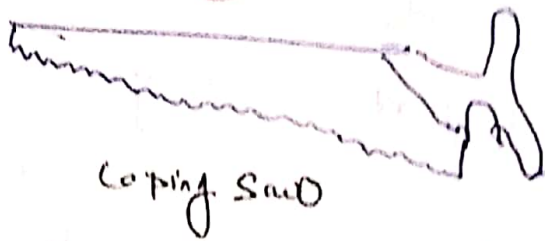
- it is hand saw from 30 cm to 75 cm long.
- contains one to one and half teeth per cm.
- high grade tool steel.



Tenon Saw

- it is thin saw
- 20 cm to 40 cm in length
- supported by back of wrought iron or brass
- hence it is also called back saw
- it contains about 4 teeth to a cm.

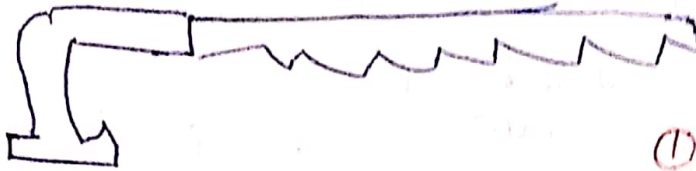
(2) Length 20-130mm



Coping Saw

(1) It is used for cutting quick or sharp curves like a hand either internal or external

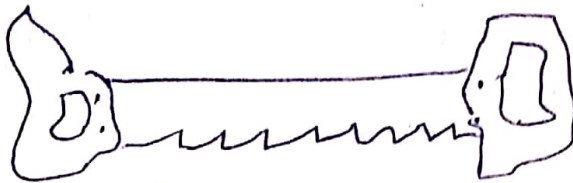
(3) Most coping saw have 11 to 15 teeth per inch.



Keyhole Saw  
or  
Pal Saw

(1) thick internal curves where impossible to use other saws

(2) Blade length range from 5 to 15 inches & there are 5 to 20 teeth per inch.



Cross cut saw

(1) used for heavy timber

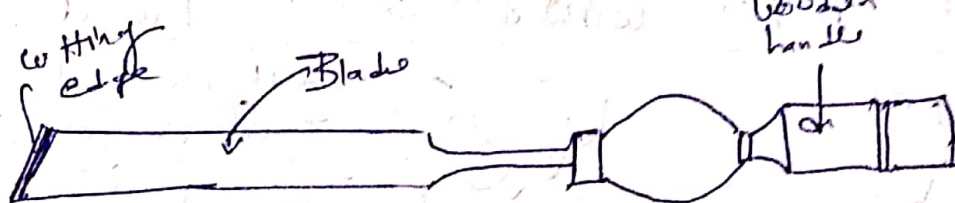
(2) Saw length from 3 to 6 feet

(3) Two person saws were made in length from 4 to 12 feet

(4) Cross saw have 8 to 15 pointed teeth per inch.

(2) Chisels:- It is a general purpose chisel to

- (1) Firmer chisel
- (2) Hooked chisel
- (3) Gauge chisel



Firmer chisel

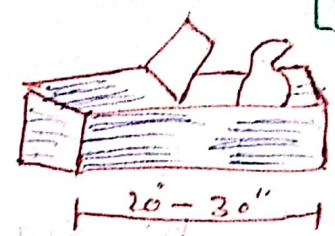
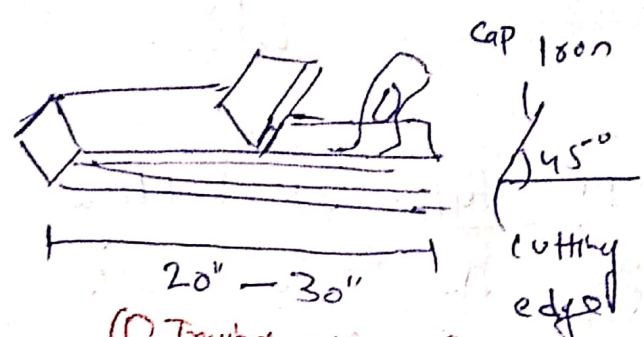
finish inside grooves. Chisel is used for chiseling.  
→ Width varies from 5 to 35mm.

Planing tool:-

Planers:-

Planing tools are used for Smoothing purposes, preparing proper sizes and for forming curved wood strips



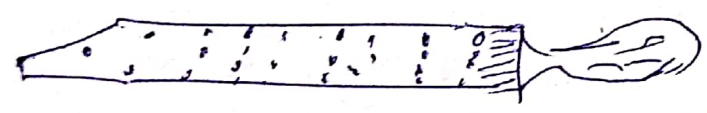


- ② Rasp file:-
- ① Tryng plane
  - ② Smoothing plane
  - ③ Jack plane
  - ④ Rubbing plane
  - ⑤ Moulding "Hollow"
  - ⑥ Plough plane
  - ⑦ Space Shaver

→ It is a finishing tool used to make the wood surface smooth, remove sharp edge, finishing fillets and other interior surfaces.

→ Sharp cutting teeth are provided on its surface for this purpose.

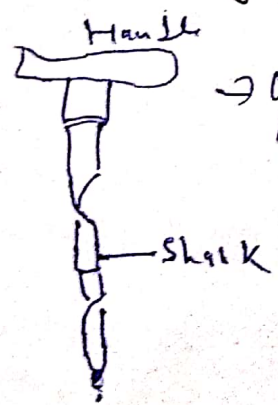
→ This file is used in wood-work only.



Rasp file

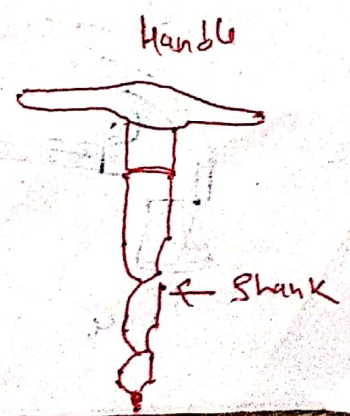
(hardened steel)

① Drilling & Boring tools Gimlet drill is very simple type of drill tool.



→ Gimlet is made from a long twisted bar.

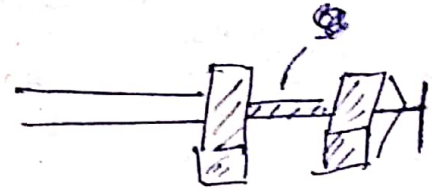
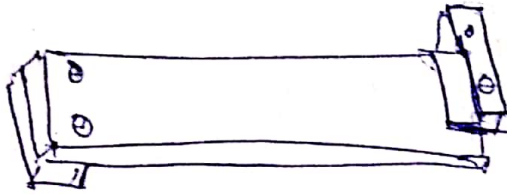
Gimlet drill



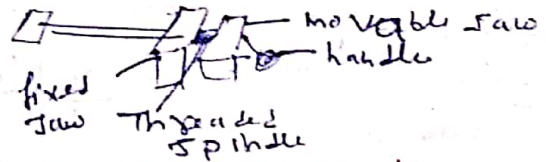
## Holding tool

[10]

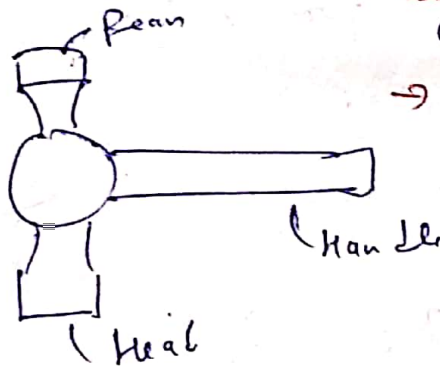
Bench Hook It is a simple type of holding tool used for supporting the wood while working on it.



Bench vice → It is a holding device - mostly used in carpentry & fitting shop. It's one end is clamped to the table while the other is kept movable. It made up of cast steel.



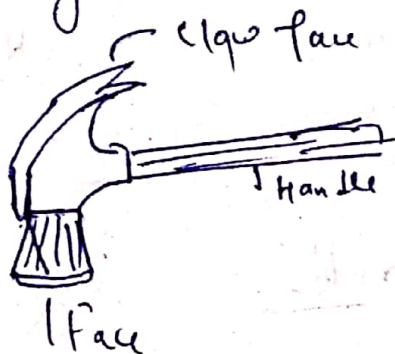
Cross Pean Hammer → It has a cast steel body & wooden handle. Cast steel



→ body has two parts face & pean

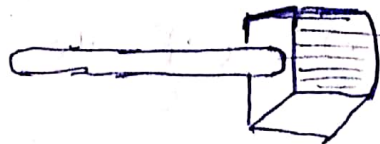
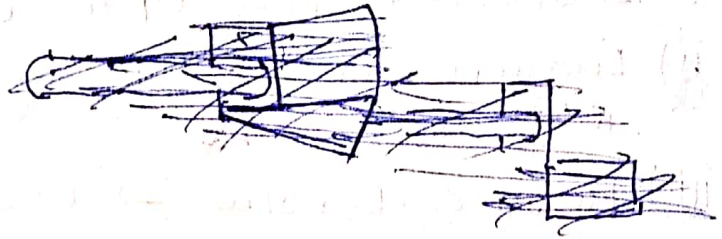
Claw hammer

It is used for striking as well as for pulling the nails from the wood.

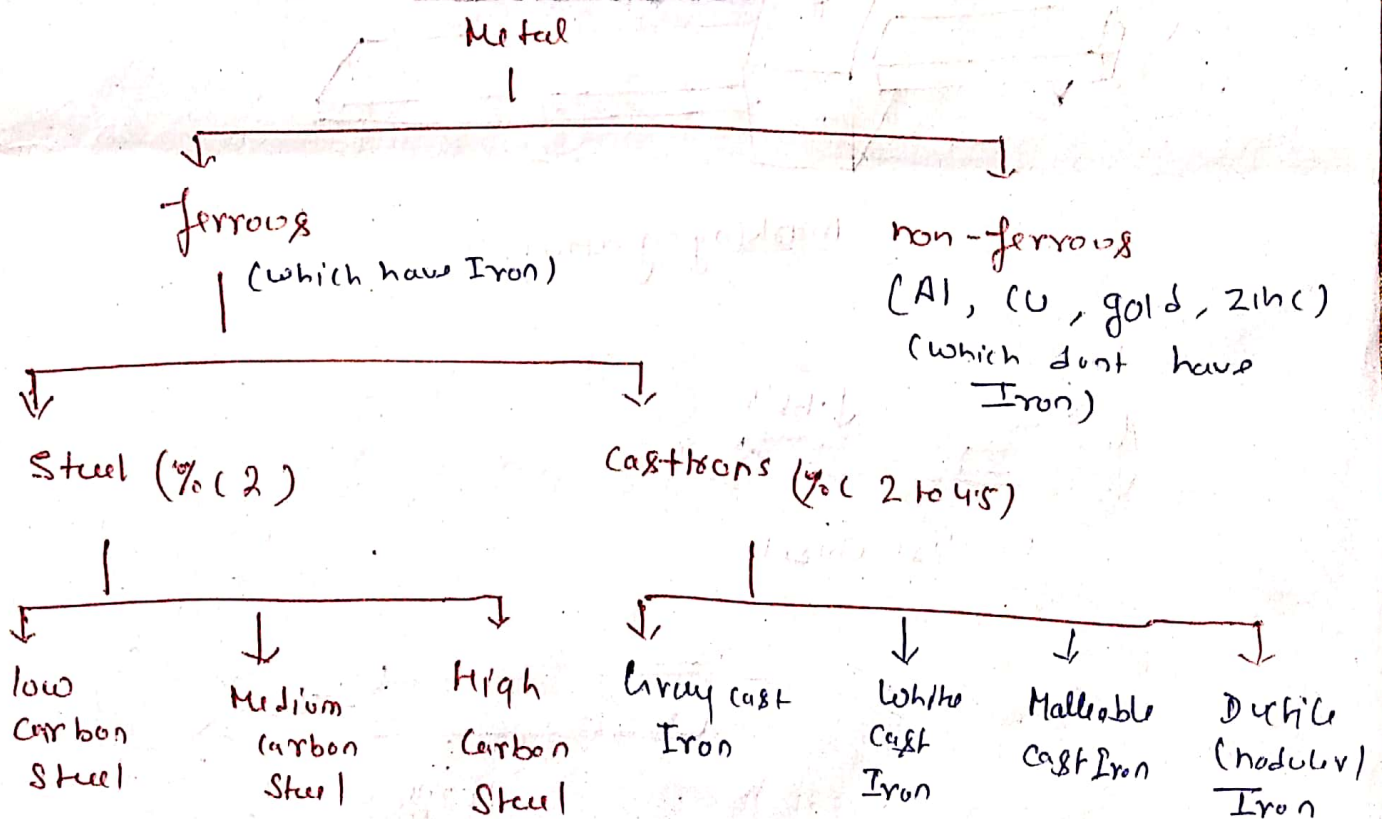




Mallet :- It is used to strike the chisels which have wooden handles [11]

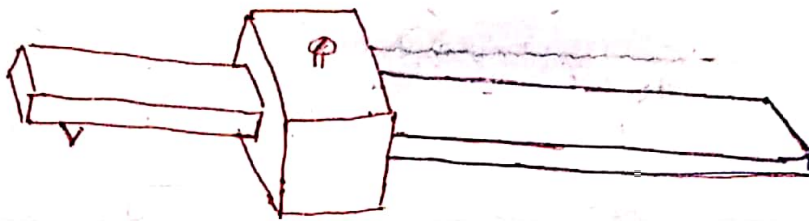


Mallet

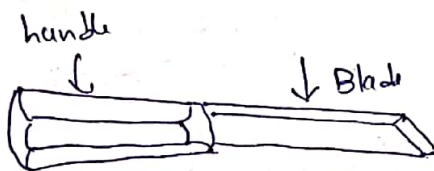


Classification of Steels Depending upon the carbon content.

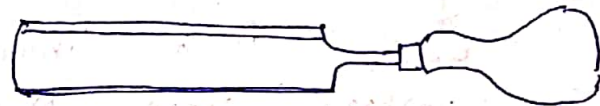
- (i) Dead mild Steel  $\rightarrow$  up to 0.15% carbon
- (ii) Low carbon or mild steel  $\rightarrow$  0.15 to 0.3% C
- (iii) Medium carbon steel  $\rightarrow$  0.3 to 0.8% C
- (iv) High Carbon Steel  $\rightarrow$  0.8 to 1.5% C



marking gauge



mortise chisel



Gauge chisel

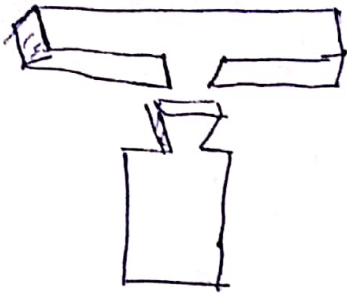
- ② mortise chisel :- It is used to make mortises.  
mortise chisel is used for heavy cuts.

The blade thickness varies from 5 to 12 mm.

- ③ Gauge chisel :- It is used to finish curved holes.  
Gauge chisels are of two types i.e. Inside & Outside.



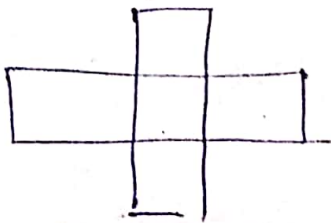
[13]



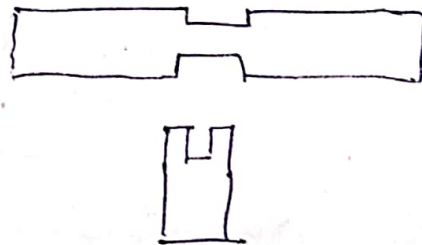
① Dovetail half Joint



Mortise & Tenon Joint



Cross lap Joint



T-bridle Joint