# FITTING

## SAFETY PRECAUTIONS

The following are some of the safe and correct work practices in bench work and fitting shop, with respect to the tools used

1. Keep hands and tools wiped clean and free of dirt, oil and grease. Dry tools are safer to use than slippery tools.

2. Do not carry sharp tools on pockets.

3. Wear leather shoes and not sandals.

4. Don't wear loose clothes.

5. Do no keep working tools at the edge of the table.

6. Position the work piece such that the cut to be made is close to the vice. This practice prevents springing, saw breakage and personal injury.

7. Apply force only on the forward (cutting) stroke and relieve the force on the return stroke while sawing and filing.

8. Do not hold the work piece in hand while cutting.

9. Use the file with a properly fitted tight handle.

10. After filing, remove the burrs from the edges of the work, to prevent cuts to the fingers.

11. Do not use vice as an anvil.

12. While sawing, keep the blade straight; otherwise it will break

13. Do not use a file without handle.

**14.** Clean the vice after use**.**

## INTRODUCTION

Machine tools are capable of producing work at a faster rate, but there are occasions when components are processed at the bench. Sometimes it becomes necessary to replace or repair a component which must fit accurately with another component on reassembly. The assembly of machine tools, jigs, gauges, etc.,

### FITTING TOOLS

1. Holding tools
2. Marking and Measuring tools
3. Cutting tools
4. Finishing tools
5. Miscellaneous tools

### 1. HOLDING TOOLS

**Bench Vice:** The bench vice is a work-holding device. The vice body is made of cast iron which is strong in compression but fractures under shocks and therefore should never be hammered.

### 2. MARKING AND MEASURING TOOLS

**Steel Rule:** It is used to measure or mark the lengths. It is usually available in lengths of 150 mm and 300 mm, graduated both in mm and inches, and is made from tempered rust free steel or stainless steel.

**Try-Square:** It is used to mark and check the right angles. (180®. 90°). The blade of the try-square is made of hardened steel.

**Scriber:** A scriber is a slender steel tool, used to scribe mark lines on metal work pieces.

**Punch:** It is used in bench work for marking.
There are three types of punches: dot, center and prick punch.

**Ball- Peen Hammer**
A ball peen hammer has a flat face which is used for general work and a ball end, particularly used for riveting.

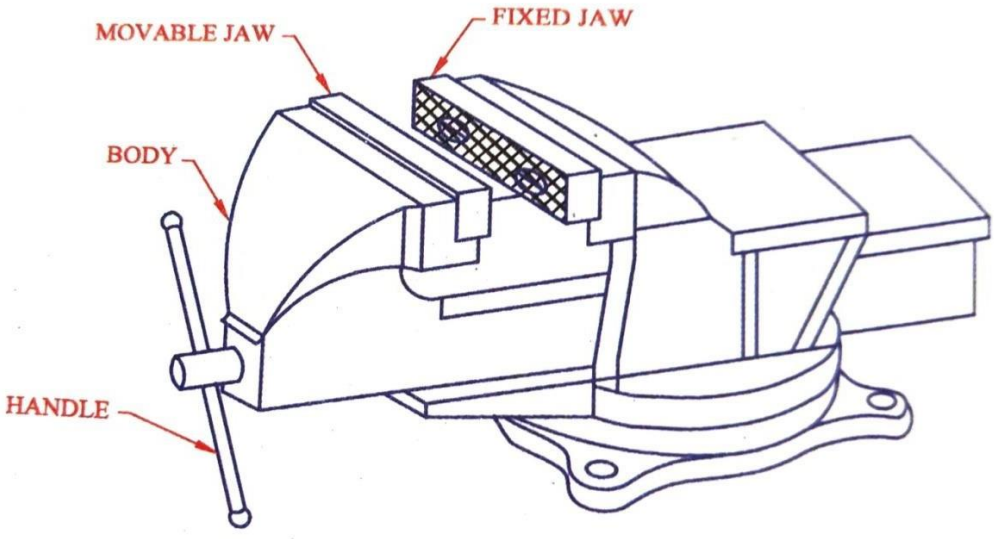
**Jenny Caliper:** It is used to find out the Centre of round bars or to draw lines parallel to a straight edge of the work piece.

**3- CUTTING TOOLS**

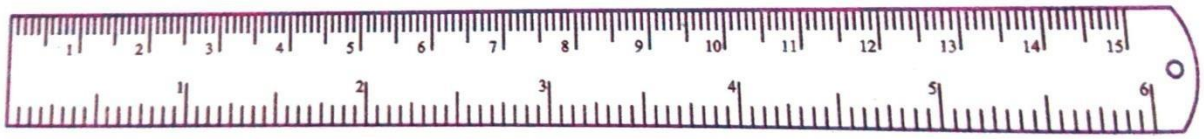
**Hacksaw:** The hacksaw is used for cutting metal by hand. It consists of a frame which holds a thin blade, firmly in position. Hacksaw blades have a number of teeth ranging from 5 to 15 per centimeter.

**4. FINISHING TOOLS**

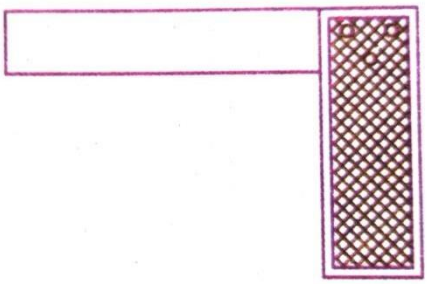
**Files:** Filing is one of the methods of removing small amounts of material from the surface of a metal part. A file is a hardened steel tool, having slant parallel rows of cutting edges or teeth on its surfaces.



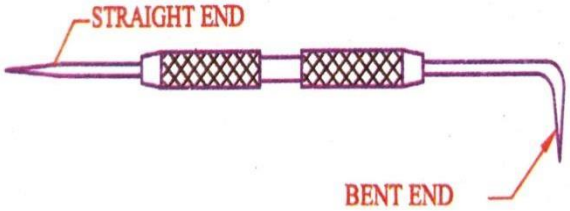

BENCH VICE



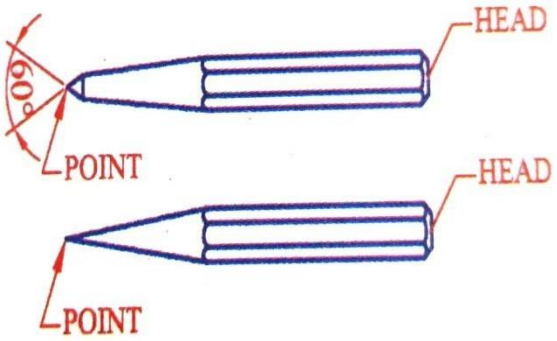
STEEL RULE



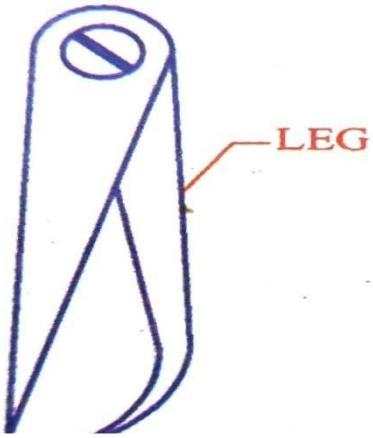
TRY SQUARE



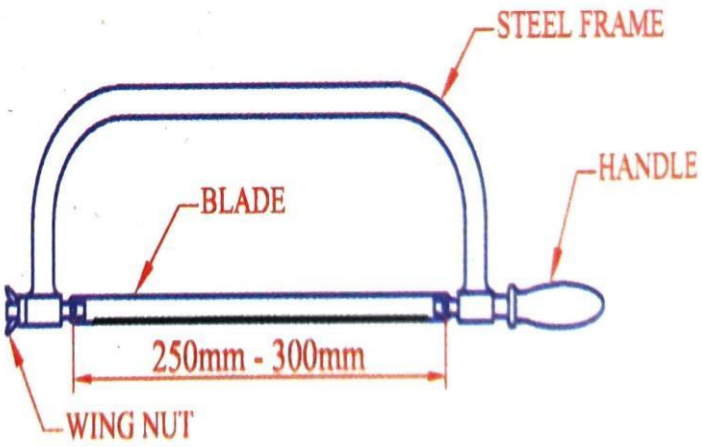

SCRIBER



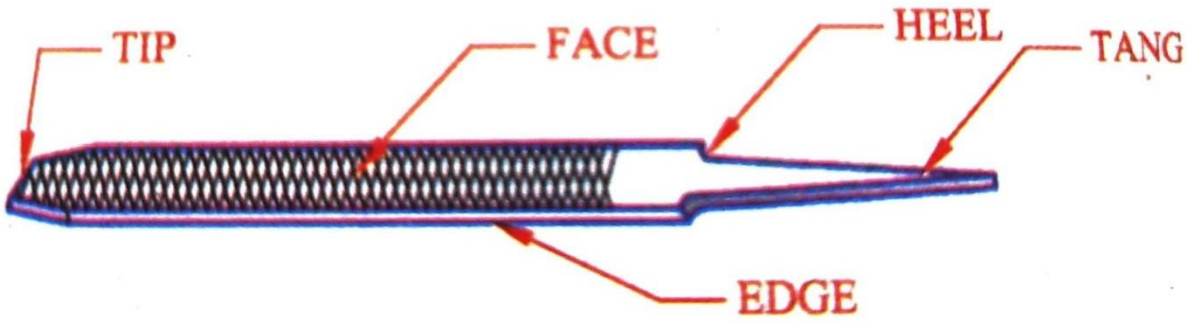

PUNCH



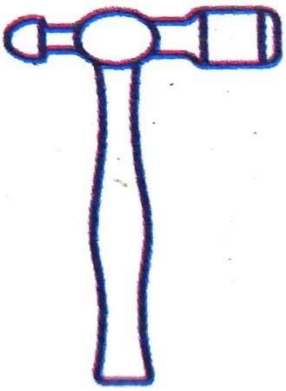

JENNY CALIPER




HACK SAW




FILE



HAMMER

# SQUARE FILING

## AIM

To make a square filing from the given workpiece.

## MATERIAL SUPPLIED

Mild Steel plate (one piece), I.w.t = 50 x 50 x 3 mm.

## TOOLS REQUIRED

1. Bench Vice
2. Steel Rule
3. Try Square
4. Files
5. Dot Punch
6. Hammer
7. Jenny Caliper
8. Hacksaw

## PROCEDURE

**1.** The given work piece is first checked for its size using steel rule. After that it is clamped in the bench vice and two adjacent sides are filed using a flat file so that workpiece is made at right angle.

**2.** Chalk is applied on the surface of the work piece for marking.

**3.** With the finished face as reference, the required dimensions are marked on the workpiece with the use of Jenny caliper and Steel rule. Then these markings are made clear by punching dots on it using dot 3 Punch.

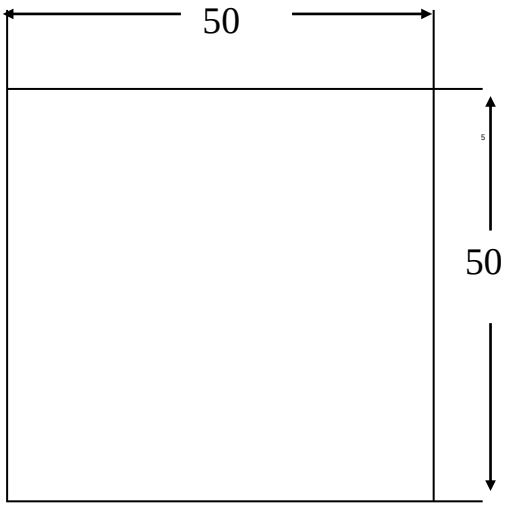
**4.** Then using Hacksaw, the square piece of 40 * 40 mm in cut and removed.

**5.** The cut faces are then smoothened and polished using smooth flat files.

**6.** Finally, the workpieces will be checked try square.

## RESULT

Thus, the required square cutted from the given workpiece.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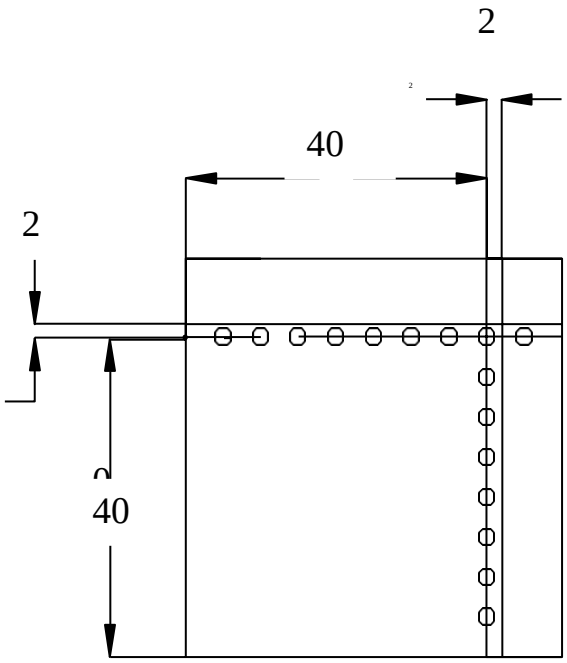
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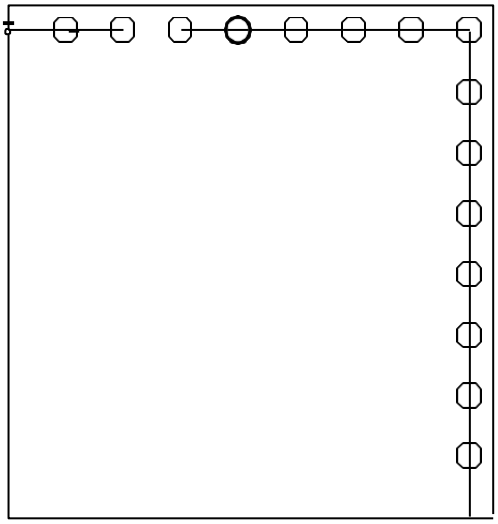

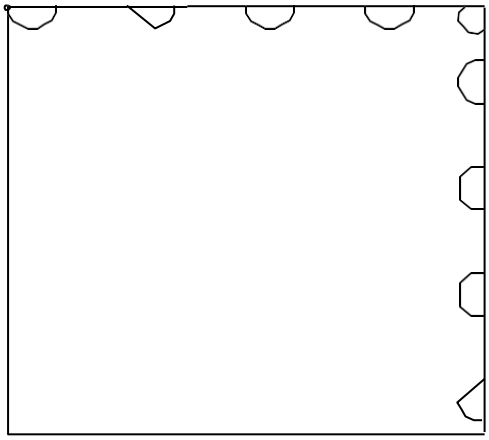

## 2. STEP CUTTING