Punch:-

It is also called a Centre punch. It is made of hard steel rod of diameter upto 15mm. The top end is kept flat at the top while the main working end is pointed gradually. the body of a Punch is knurled to provide proper grip

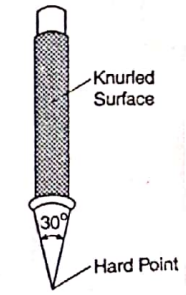

Fig. 6.9 Centre Punch

Two types of punches are used in bench working one which has included angle of 30°. the punch marks produced by it are deeper and smaller. other Punch has included angle of 60° which produces larger marks with a greater blow of hammer.

Surface Gauge:-

Surface gauge consists of a cast iron base, a vertical steel rod with a scribe mounted in an adjustable screw supported device.

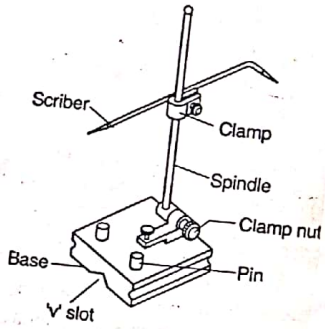

Fig. 6.10 Surface Gauge

the adjustable device has a facility that the length of scriber out of the nut can be varied and the scriber can rotate about the nut and it can be fixed in any position by tightening the nut.

This tool is used for accurate marking in metal working operations by keeping it on the marking table or surface plate.

CHIPPING :—

The operation used for cutting or removing thick layers of metal by means of cold chisels, is known as chipping.

Chipping operation is carried out as follows:—

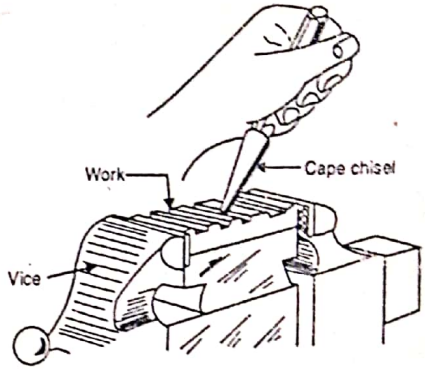

Fig. 16.11. Method of chipping.

(1) The work is firmly held in a vice.

(2) The chisel is firmly gripped in the left hand leaving some distance above the thumb of hand.

(3) The hammer is grasped near the end of the hammer in the right hand. In operation it should be brought upto the shoulder to ensure more power in the blows.

THREADING OR THREAD CUTTING :—

The operation is used for cutting external or internal thread by means of Die, ~~and~~ tap or lathe type tool respectively is known as threading.

Thread may be produced basically by forming or cutting. Turning operation are capable of forming threads on round stock. when thread are cut internally with a special threaded tool called tap, the process is called tapping and when cut Externally with a tool called die, the Process is called diering.

SAWING:-

It is the cutting and slotting operations. Sawing operation is carried out as follows:-

1. The work is held tightly in the vice.
2. A suitable blade is fixed with its teeth facing towards so that it cuts the material in the forward stroke. The blade is tensioned sufficiently by a wing nut.

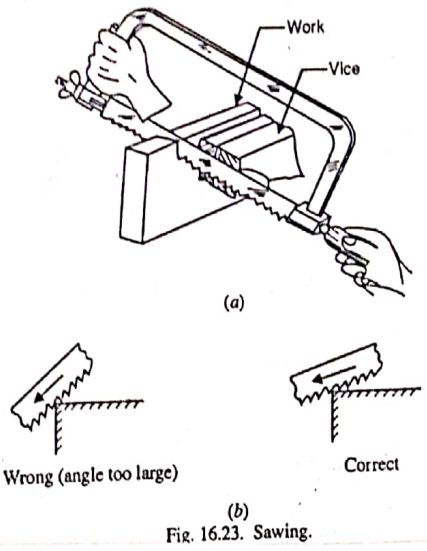

Fig. 16.23. Sawing.

3. The course of the desired cut is marked by a guide line on the work and notch is made with a file.
4. The frame of hacksaw is held.
5. Now the cutting is started at the nick by keeping the blade slightly inclined to the horizontal. The pressure is applied during the forward stroke and it should be relieved during the return stroke.

FILLING :-

Filling is required after chipping operation to remove burr and clean the face of the cut and to finish the final shape of the work piece. It may be noted that not more than 0.6mm should be left for filling.

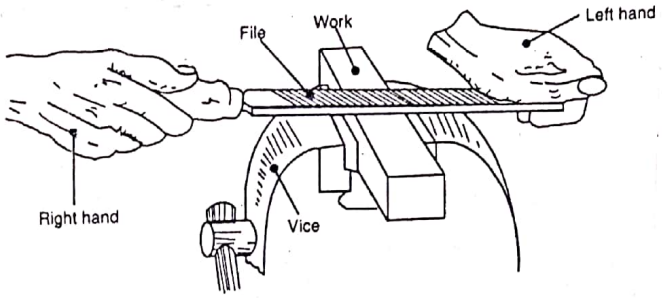

Fig. 16.15. Filing operation.

Filling operation consists of the following steps :-

1. The work should be held firmly in the vice with the minimum amount of projection and with the surface to be filed truly horizontal.
2. The file handle is grasped in the right hand and the end of the file handle pressing against the palm of the hand. The pressure on the work is applied by holding the end of the blade with the left hand. The worker should take his/her position on the left side of the vice with the feet firmly planted, slightly apart.
3. A stroke should be made by a slight movement of the right arm from the shoulder and by a sway of the body towards the work, each of these movements being about equal.
4. The file remains horizontal throughout the stroke with pressure only applied on the forward motion.
5. The file on the return stroke remain in contact with the work but the pressure is relieved from it.