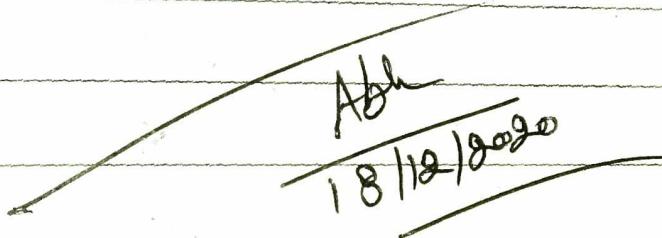
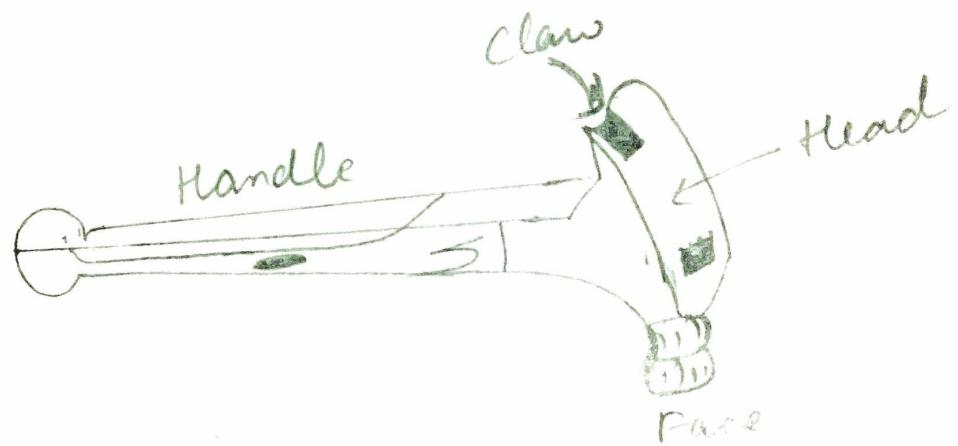


7. A fine finishing is given to the parts using rasp file
8. The parts are fitted to obtain a slightly tight joint.

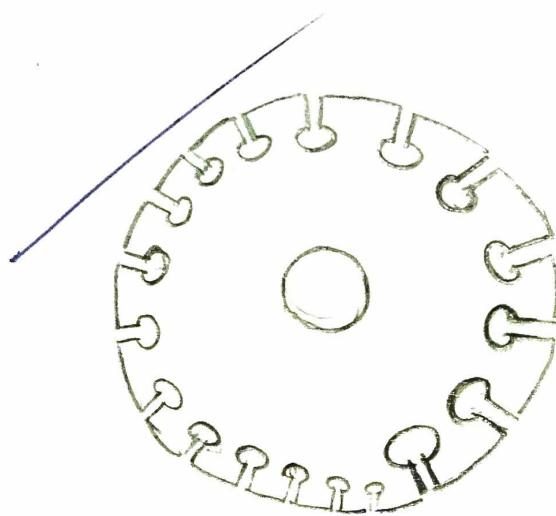
Result:- The T-lap joint is thus formed by following the above sequence of operations.



Aim - To study various types of
electrical shop



Claw Hammer



Wire gauge

Practical No - 5

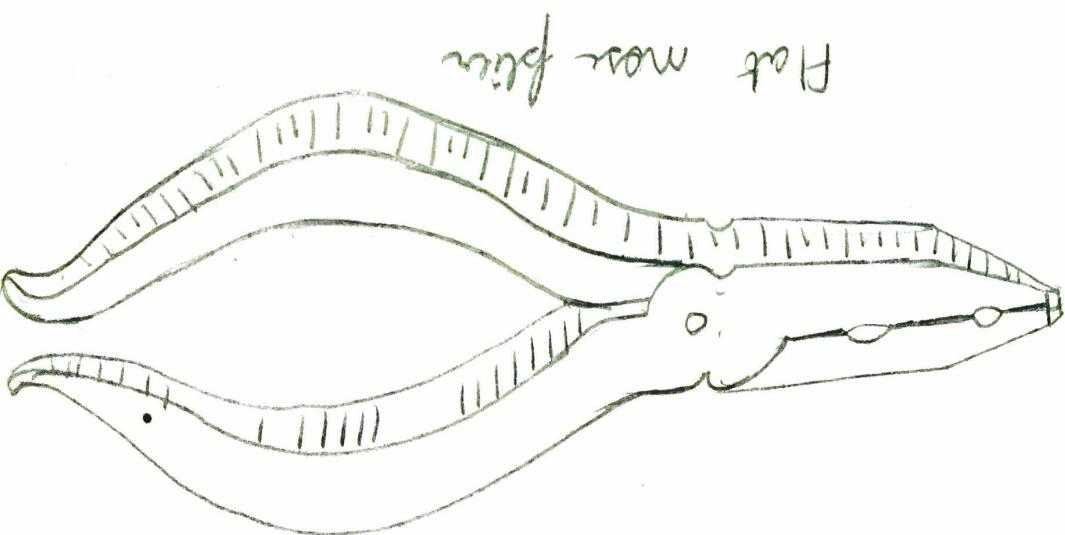
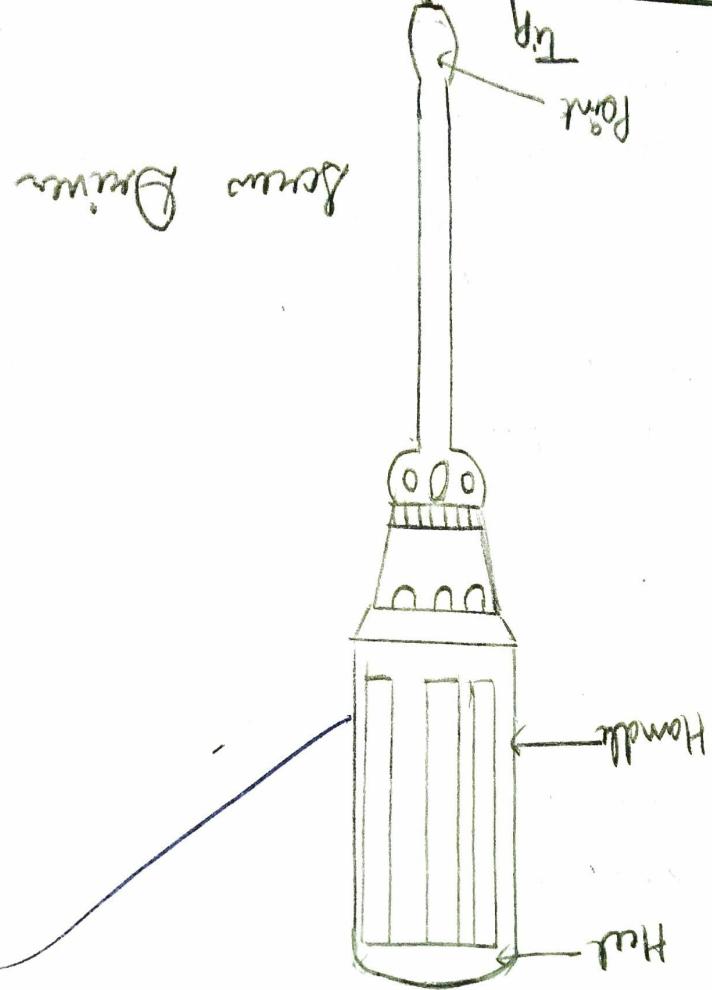
Aim - To study various types of materials used in electrical shop.

Types of electrical wires -

- 1 Lead Sheathed Wires - The lead sheathed wires are covered from outside with lead or lead alloy. These wires are used in snowfall areas.
- 2 Weather Proof Wires - The insulation of such wires is very high because they are generally used for outdoor or underground work.
- 3 P.V.C wires - These are covered with an insulated of Polyvinyl chloride. These are used for cleft wiring and conduit wiring.

Electrical Tools

- 1 Claw Hammer - Hammers are used for striking nails and punches for giving the force to the component for proper fitting.
- 2 Wire Gauge - Wire gauge is used to check the size of electrical wires. It consists of steel



disc having slots and holes in the circumference. The diameters of all the holes are different. The size of the wire is checked by simply inserting the wire into the slot.

3. Plier - Plier is used to perform the following functions :-

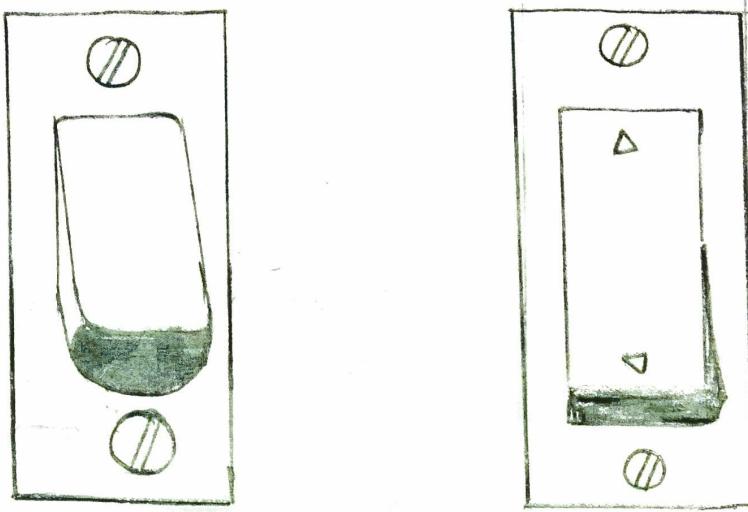
- (i) Cutting of wires
- (ii) Twisting pairs of wires.
- (iii) Loosening or tightening of nuts
- (iv) Holding purposes.
- (v) Removing the insulation of wires.

Flat plier has two jaws. It is used for holding, tightening or loosening of nuts.

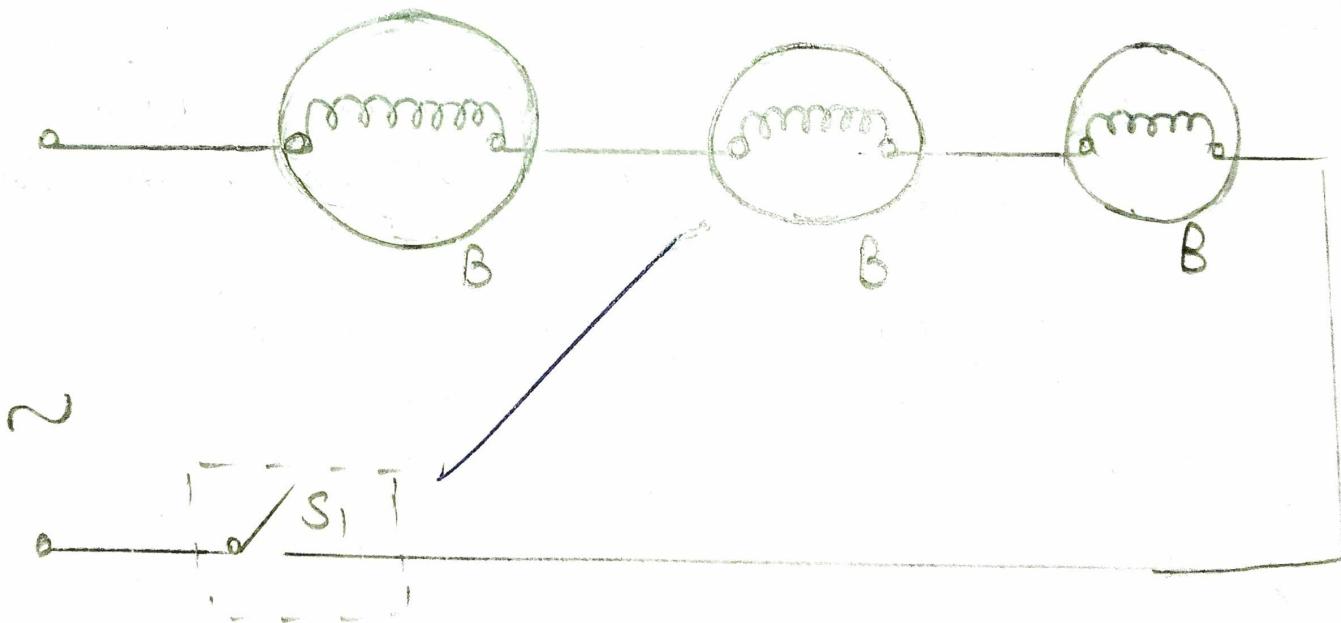
4. Hacksaw - The hand hacksaw is used to cut the pipe, wooden board, batten or strips.

5. Screw drivers - A screw driver has a plastic handle, semi round heel, tip and blade of tempered steel and chrome plate. A number of screw drivers in different sizes & shapes are required.

6. Electric switch - This is a device that makes and breaks or changes the course of electric circuit. It consists of two or more contacts.



Electric Sketch



Series Circuit

Akh
30/12/2020

mounted on an insulating structure and arranged such that, they may be moved into and out of contact with each other by a suitable operating mechanism.

Wiring Methods

A circuit is a path along which electric current flows from the negative side of the power source to the positive side.

There are three types of electrical circuit that are used for connecting devices or controls to the power source viz series circuit, parallel circuit and combination of two.

- (i) Series circuit - The series circuit, provides a single, continuous path through which current flows.
- (ii) Parallel circuit - In parallel circuit, the devices are connected side by side so that, current flows in a number of parallel paths.

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Practical No - 6.

Objective - To study various types of materials used in sheet metal shop



Solid Punch



Round cutting chisel



Straight snip

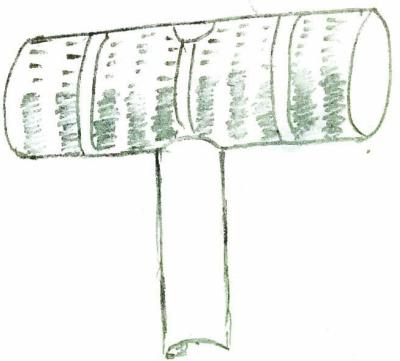
Practical No-6.

Objective - To study various types of materials used in sheet metal shop.

Introduction - The sheet metal shop is important for every engineering concern. It deals with the working of metal sheets. The various operations performed in a sheet metal shop are cutting, shearing, bending etc.

Tools used in sheet metal work:-

1. Solid Punch - It is one piece rod-shaped tool made of metal designed to be struck by a hammer. They are typically used to drive objects such as pins or to form impressions on a work piece.
2. Chisel - It is flat thick piece of tool used, whose one edge is ground to form a cutting edge and the other is provided with a wooden handle.
3. Straight snip - Straight cutting snips cut in a straight line and wide curves. Left cutting



Mallet



Plier

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snips will cut straight and in a tight curve to the left.

4. Mallet - It is used to strike the chisels that have wooden handle. It is made up of hard wood.

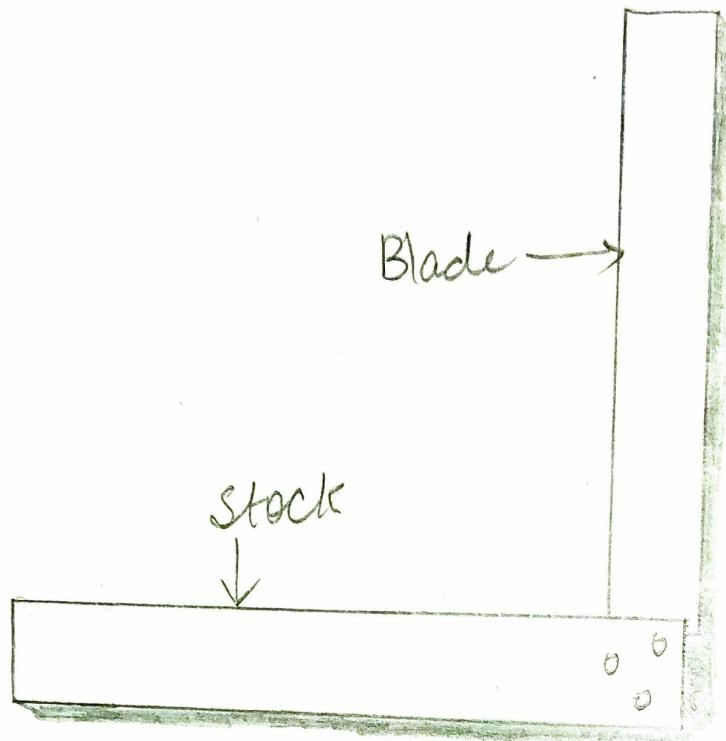
5. Plier - Pliers are a hand tool used to hold objects firmly, possibly developed from tongs used to handle hot metal in. It is also used for bending and compressing a wide range of materials.

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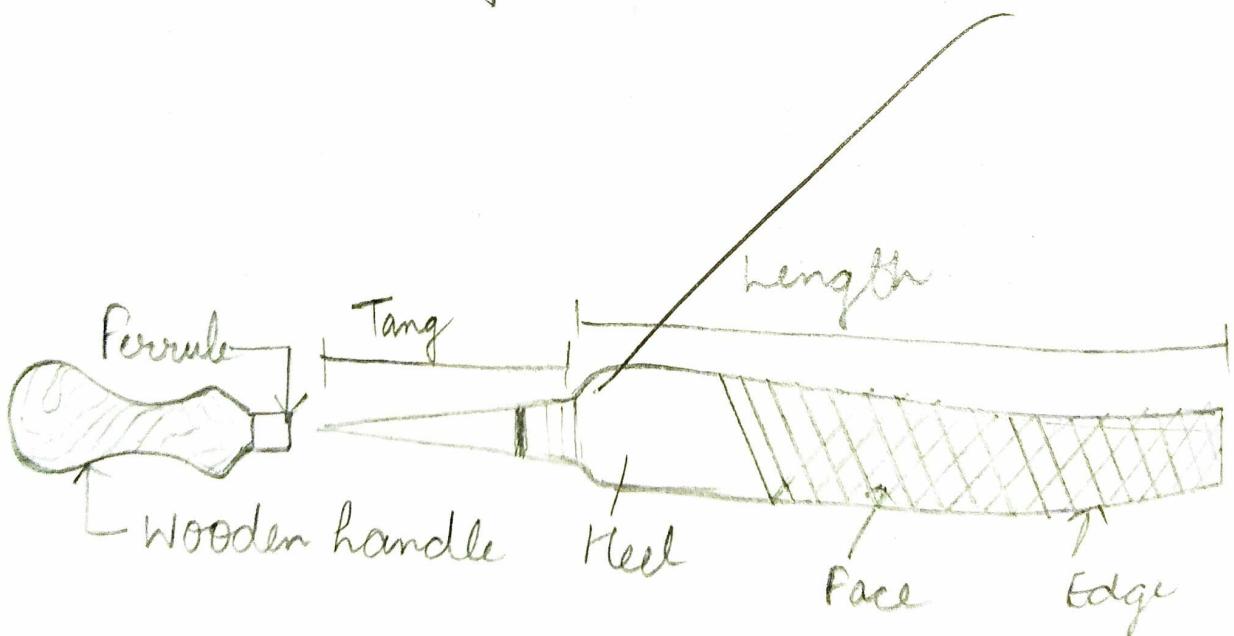
16/02/2021

Experiment No. 1

Aim - To study different types of fitting making tools used in a fitting shop.



Try square



Nomenclature of File

flatness, trueness of surface. It consists of a blade which is made up of steel attached to the base at the right angle.

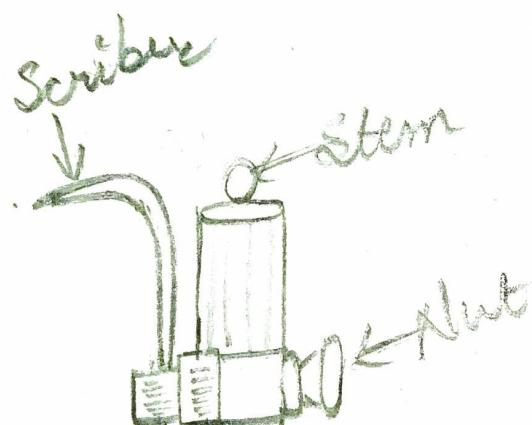
Bench Vice - It is firmly fixed to the bench with the help of nuts & bolts. It consists of cast iron body and cast iron jaws. The holding surface of the jaw plates is knurled in order to increase the gripping. One jaw is fixed and other jaw is movable with the help of handle.

Hack Saw - It is used for cutting rods, bars, pipes, flat etc. It consists of a frame which is made of mild steel. The blade is made up of high carbon steel or high speed steel.

Files - Files are multi point cutting tools. It



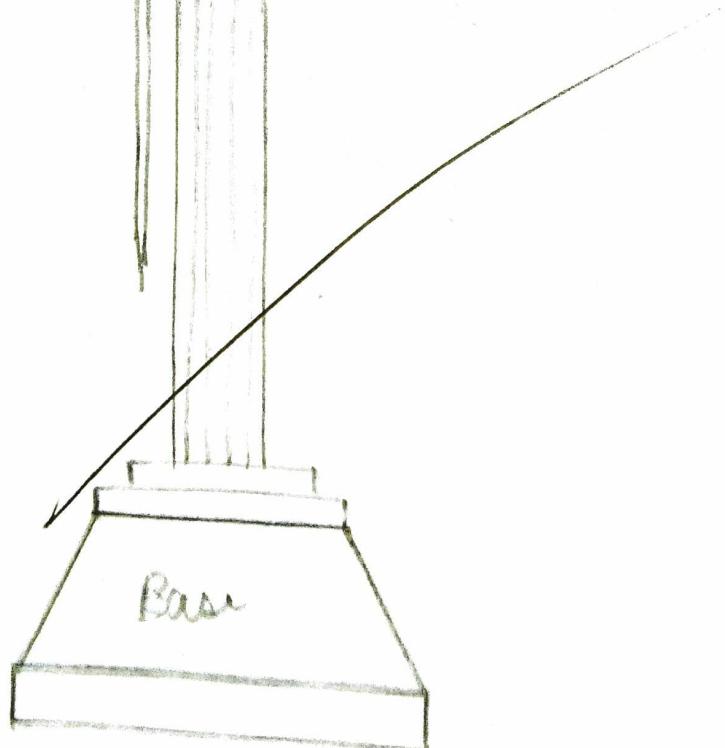
flat file



Scriber

stem

nut



Scriber

is used to remove material by rubbing it on metal. Files are available in a number of sizes, shapes & degree of coarseness.

Flat file - It is rectangular in section and is slightly tapered towards the point in both width and thickness and has double cut teeth. Both edges are cut.

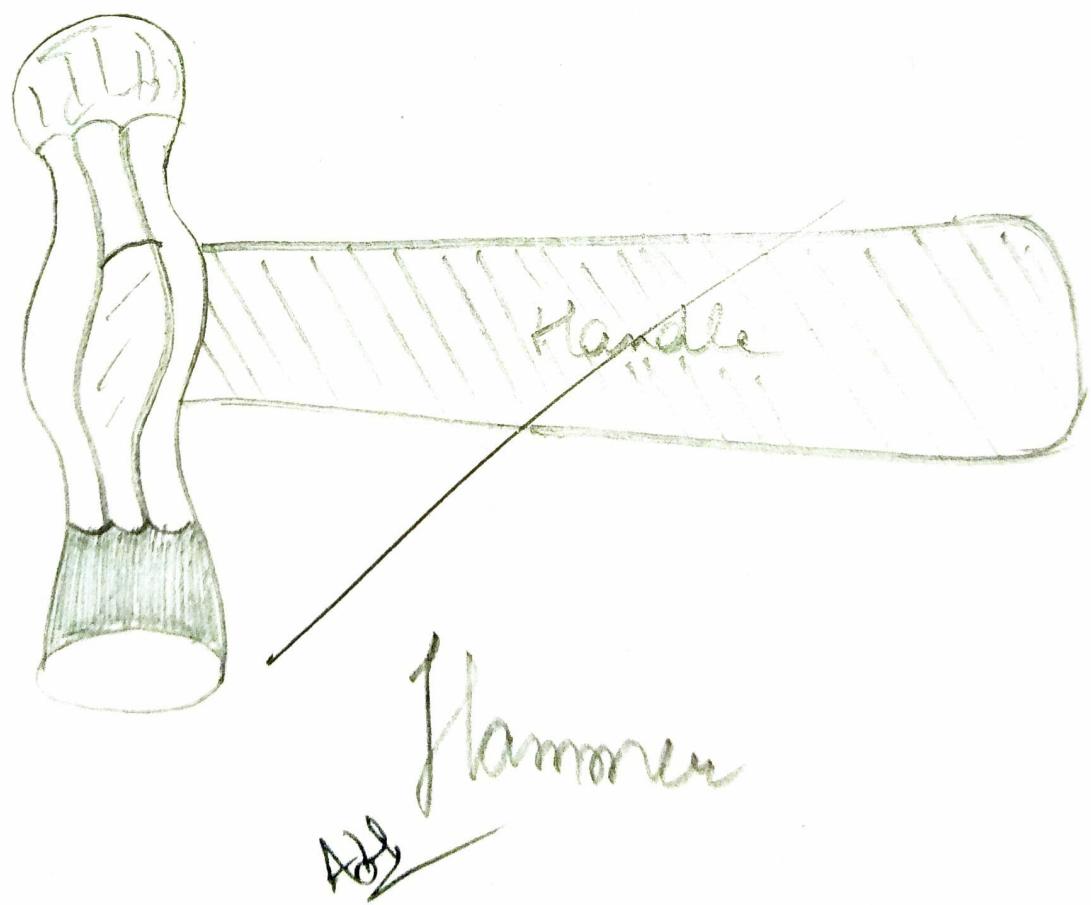
Triangular file - Tapers towards the point and is usually single cut.

Surface Plate - It is used for testing the flatness & trueness of the surfaces. It is made up of cast iron and graphite. It is covered with a wooden cover while not in use.

Scriber - It consists of a cast iron base on the centre of which a steel rod is fixed vertically. Scriber is made up of high carbon steel & is hardened from the front edge. It is used for locating the centres of round bars or for marking off.



Flat Chisel



lines.

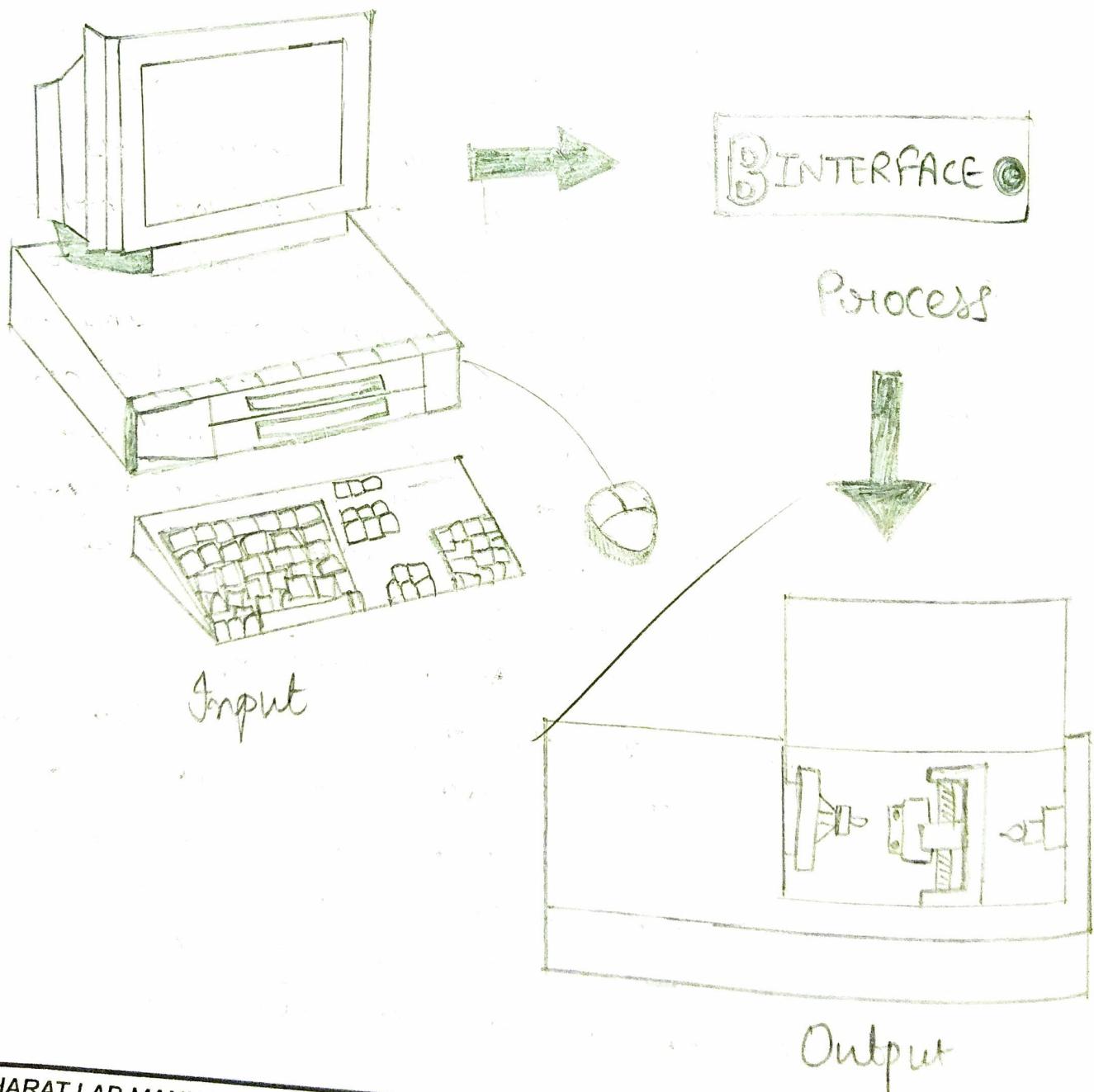
Chisel - These are used for chipping away the material from the workpiece. These are made up of high carbon steel. Commonly used forms of chisels are flat, cross cut, half round and diamond pointed chisels.

Hammer - Hammer are the only tool used for striking in a fitting shop. A hammer consist of a heavy iron body with a wooden form 0-25 to 2kg. The parts of the hammer are pen, eye neck face and a handle.

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22/03/2021

Practical No - 8

Aim :- To study the CNC machine, CNC control panel, setting up the cutting tool to the correct length, CNC lathe and CNC programming.



Practical No-8

Introduction - The design is loaded into the computer which is attached to the CNC machine. The computer changes the design into a special code that controls the way the CNC cuts and shops the material. The material to be shaped is taped on to a block with double sided tape this must be done carefully.

CNC Machine - Input, Process and Output.

Input - The computer is used to input the design Tech software is used to draw the design. The computer connects the interface

Process - The interface processes the signals from the computer to a form that the CNC machine can use the interface is connected to the CNC machines.

Output - The signals from the interface controls the movement at the cutting tool. The design to manufactured on the CNC machine.

CNC control panel - A CNC machine is normally controlled by a computer and software. However, most CNC machines have a range of controls manual use when a CNC machine is used manually.

Reset Button - The most important control button is usually the reset button. When the CNC machine is turned on, the reset button is pressed by the machine operator.

Manual control - The cutter can be controlled although this is rarely needed. The 'X' & 'Y' buttons control the movement of cutter & 'Z' buttons control depth.

Stop Button - This helps to stop the machine very quickly.

Speed and Feed - On some CNC machine it is possible to manually vary the speed & feed of the cutter.

Working of CNC Lathe
Controlled by G and M codes

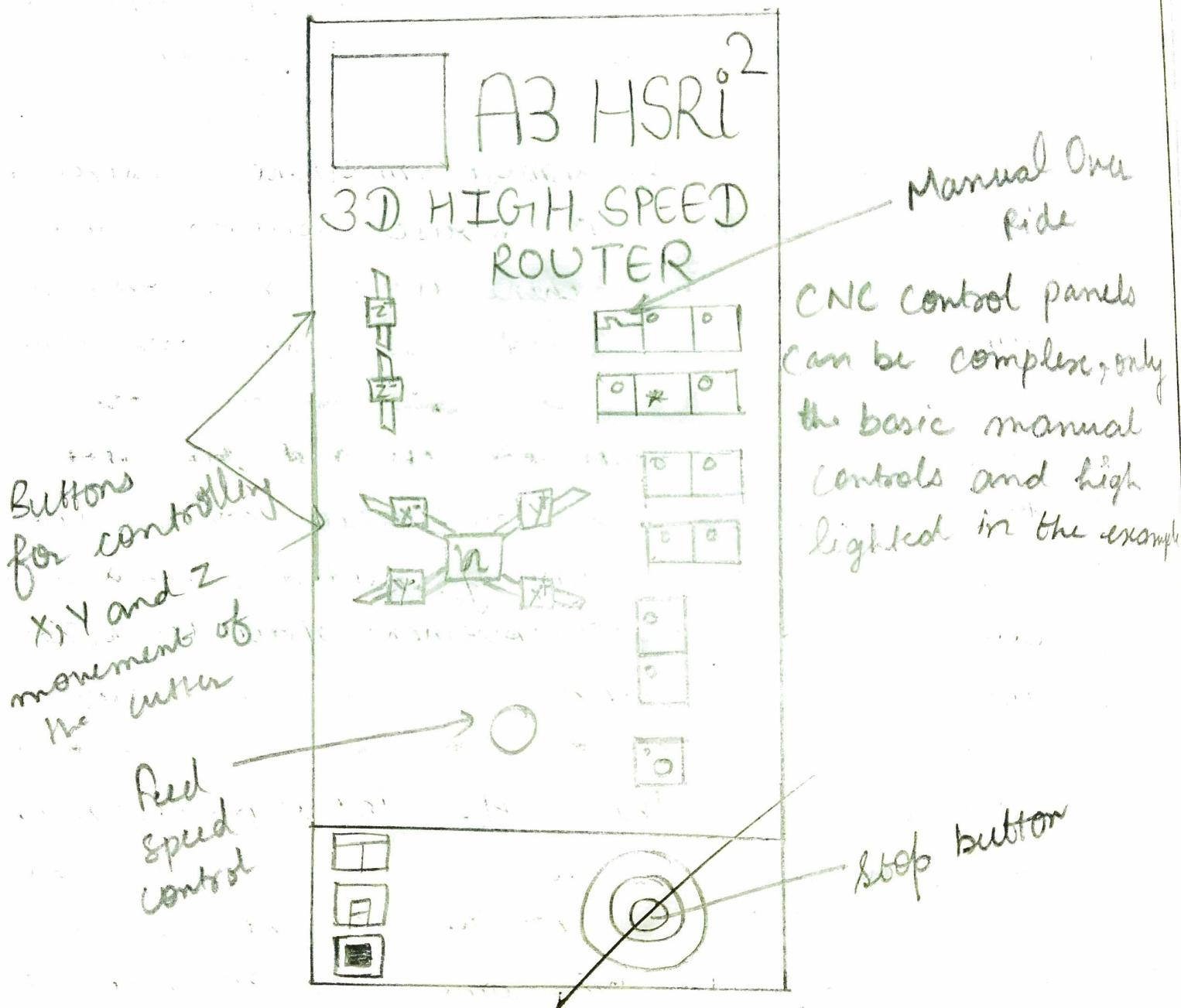


fig:- Typical CNC control Panel

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- Each number or code is assigned to a particular operation.
- Typed in manually to CAD/CAM by machine operators.
- G & M codes are automatically generated by the computer software.

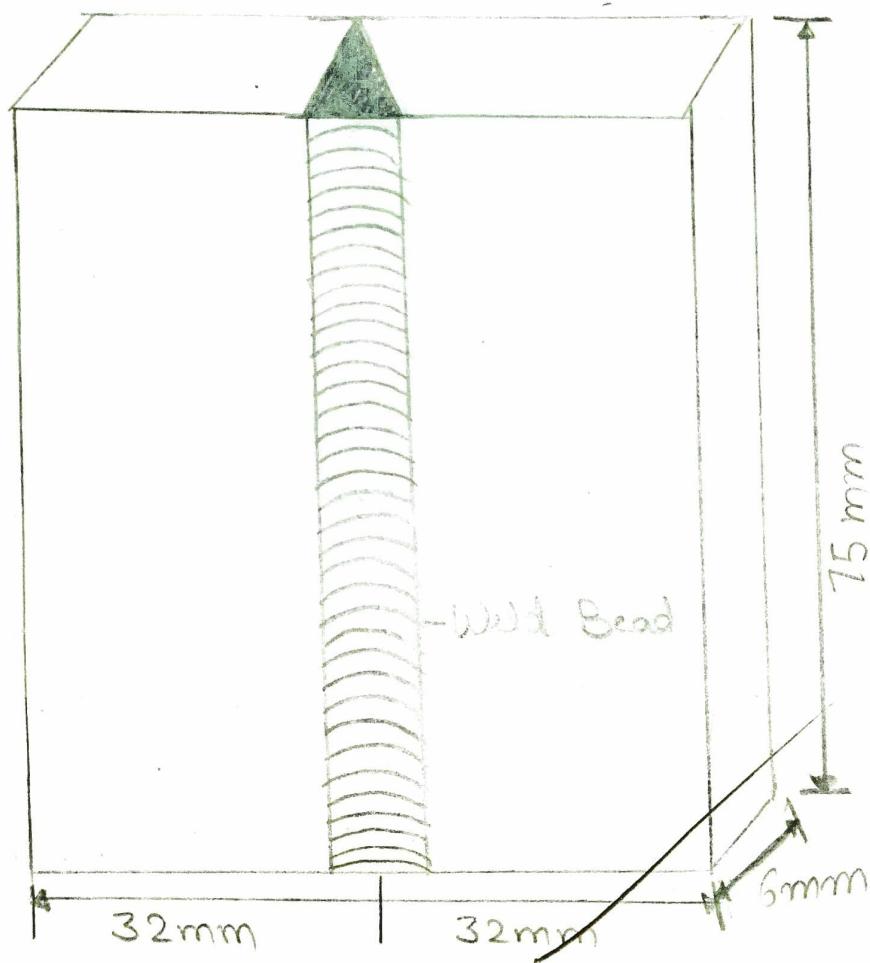
Commonly Used Codes

- N-code - It is a program line number. Eg:- N3 (sequence number).
- G-code - Preparatory function. The G-code indicates that a given control function such as G01, linear interpolation is to be requested.
- X, Y and Z codes - Coordinates. They give the coordinate positions of the tool.
- F-code - Feed rate. It specifies the feed in the machining operation.
- S-code - Spindle Speed. The S code specifies the cutting speed of the machining process.
- T-code - Tool selection. The T code specifies which tool is to be used in a specific operation.

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Practical No - 9.

Aim - To study various types of tools used in welding shop.



Practical No - 9.

Date.....

Introduction - Welding is a process of joining two similar or dissimilar metal by fusion with or without the application of pressure and with or without the use of filler metal. The fusion of metal takes place by means of heat. The heat may be obtained from electric arc, electric resistance, chemical reaction, friction or radiant energy.

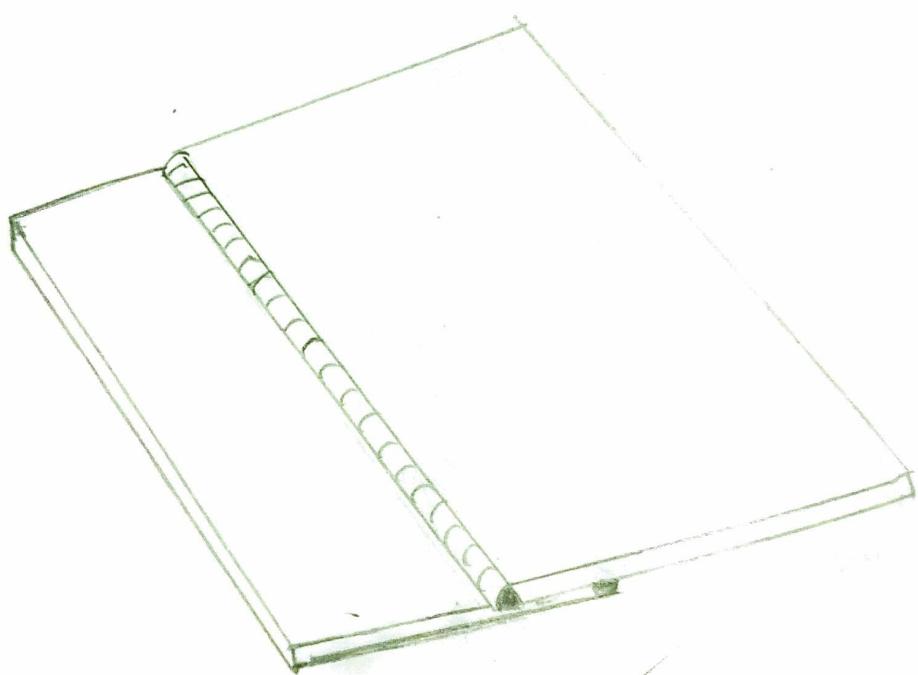
Types of welding joints

Lap joint - The lap joint is obtained by overlapping the plates & then welding the edges of the plates.

Butt Joint - The butt joint is obtained by welding the ends or edges of the two plates which are approximately in the same plane.

Corner Joint - The corner joint is obtained by joining the edges of two plates whose surfaces are at an angle of 90° to each other.

T joint - It is obtained by joining two



Lap Joint