



EXPT. No.

SHEET METAL Shop.

DATE

## INTRODUCTION :-

Sheet metal work is generally regarded as the working of metal from 16 gauge down to 30 gauge, with hand tools and simple machines into various forms by cutting, forming into shape, and joining. It has its own significance as a useful trade in engineering works and also for our day to day requirements. Common examples of sheet metal work are hoppers, canisters, gards, covers, pipes, hoals, funnels, bends, boxes, etc. Such articles are found less expensive, lighter in weight, and at many places they easily replace the use of the castings or forgings.

In sheet metal work the knowledge of geometry, mensuration and properties of metal is most essential since nearly all patterns come from the development of the surface of a number of geometrical models such as cylinder, prism, cone, and pyramid. A good pattern properly drawn means saving of time and money.

Metals used in sheet metal work:-

The following metals are commonly used in sheet metal work.

(1)

1 to 8 pages

(1)



### Black iron sheet :-

It is probably the cheapest of all the metal used for sheet metal work. It is bluish black in appearance and is used generally in ~~form~~ form of uncoated sheet. It can be easily rolled into the desired thickness. Since it is uncoated it corrodes rapidly. Hence to increase its life it can be painted or enameled. This metal is generally used in the making of roofs, food containers, stove pipes, furnace fittings, dairy equipments, tanks, cans and pans, etc.

### Galvanized iron [G.I.] :-

It is popularly known as G.I. sheets. It is ~~soft~~ soft steel coated with molten zinc. This coating resists rust formation on surface and improves appearance and water resistance. Articles such as pans, furnaces, buckets, cabinets, etc. are made from G.I. sheet.

### Stainless steel :-

It is an alloy of steel with nickel, chromium and small percentages of other metals. It has good corrosion resistance. It is costlier but tougher than



G. I. sheets. It is used in kitchenware, food processing equipments, food handling articles tools and instruments for surgery work in hospitals and components of chemical plants etc.

Other metal sheets used for sheet metal work are made up of copper, aluminum, tin, and lead.

### Sheet Metal Tools:-

The following tools are commonly used for sheet-metal work:

- ① Hand shears or snips
- \* ② Hammers
- ③ stakes and stake holder
- ④ Cutting tools
- ⑤ measuring tools
- ⑥ Miscellaneous hand tools such as chisels, groovers, seamers, rivet sets and hand punches.

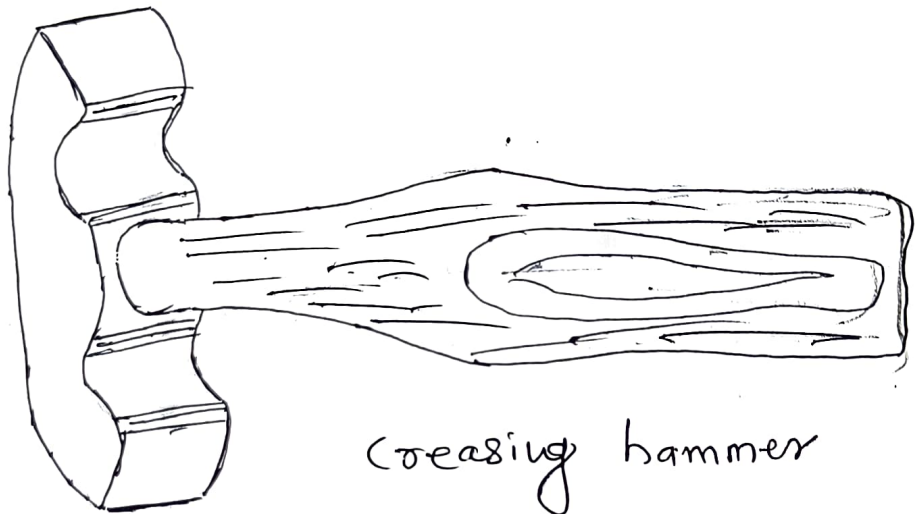
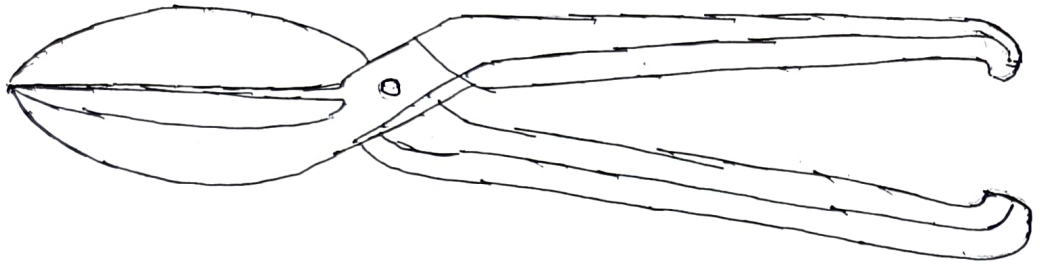
Some of the important sheet metal tools are described as under.

### 1) straight hand shear:-

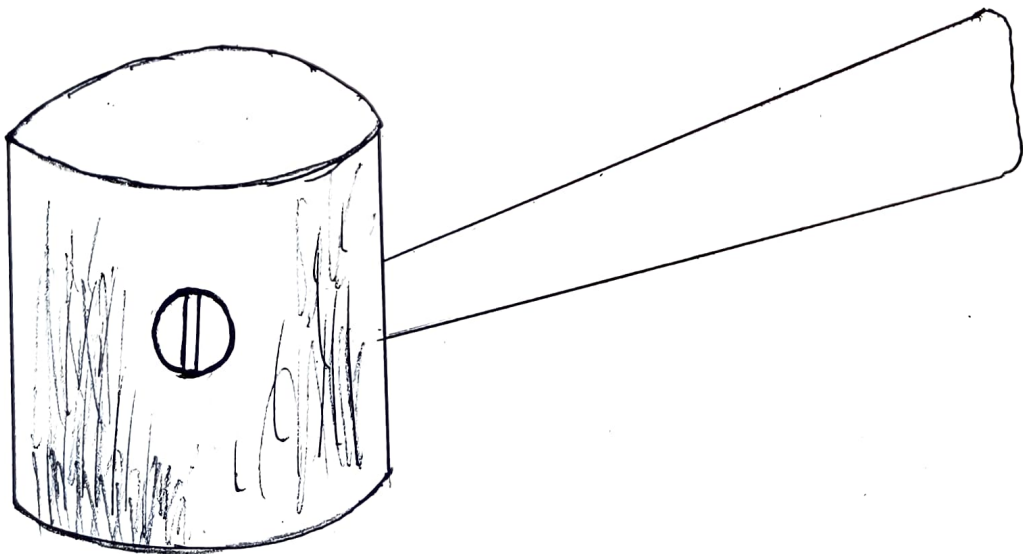
It is used for general purpose cutting, making straight cuts and trimming away extra metal.



straight hand shear

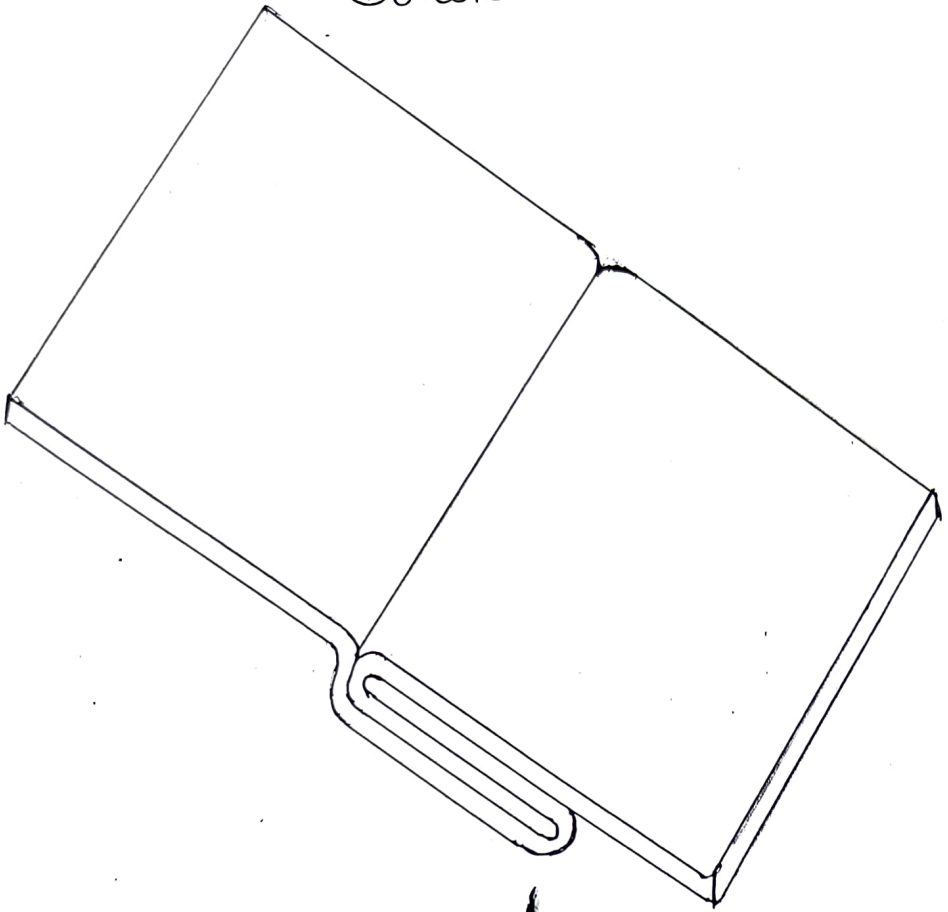


creasing hammer

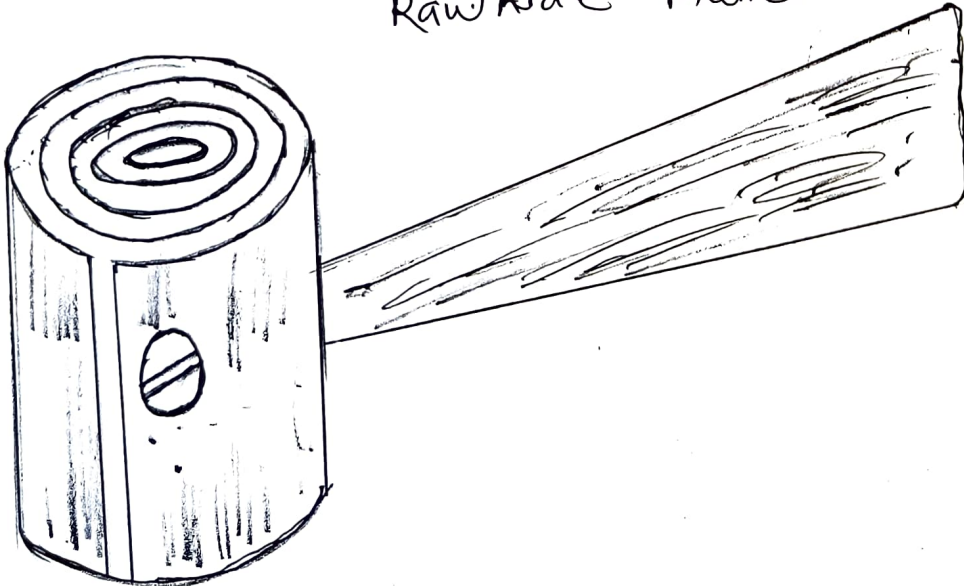


Tinman's mallet

Double hem or lockseam



Rawhide mallet





## ② Universal shear:-

Its blades are designed for universal cutting straight line or internal and external cutting of contours. It may be of right hand or left hand type, easily identifiable, as the top blade is either on the right or on the left.

## ③ Curved hand shear:-

It is used for cutting circular or irregular curved shapes ranging from 20 to 35 cm.

## Measuring Tools:-

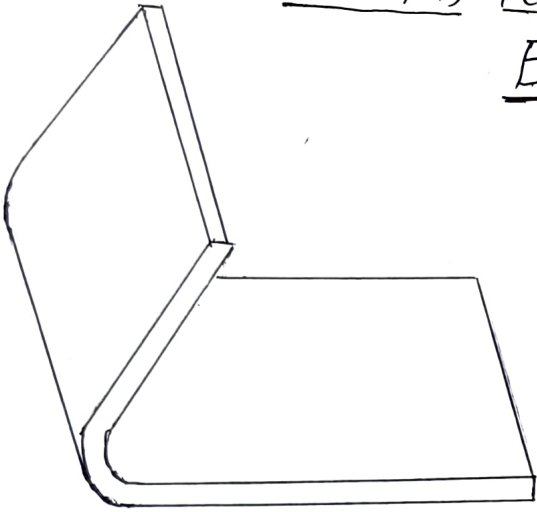
- ① steel rule, ② Vernier caliper
- ③ micrometer ④ Thickness Gauge,
- ⑤ sheet metal gauge, etc.

## \* Hammer's:-

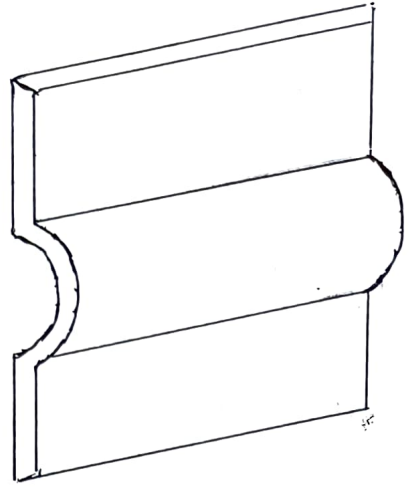
The various types of hammers used in sheet metal work for forming shapes. The uses of different kinds of these hammers,

- ① smoothing hammer, ② stretching hammer,
- ③ creasing hammer, ④ Hollowing hammer,
- ⑤ leveling hammer, ⑥ planishing hammer,
- ⑦ soft hammer or mallets.

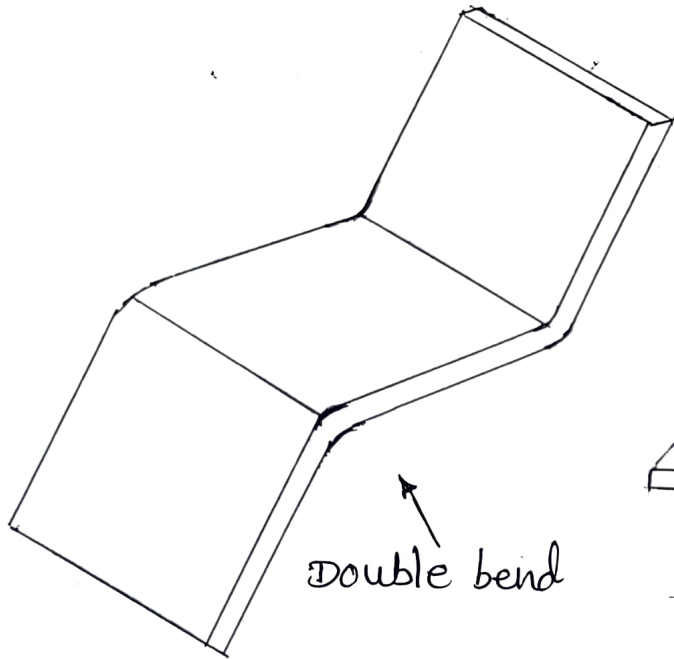
Common kinds of sheet metal  
Bend



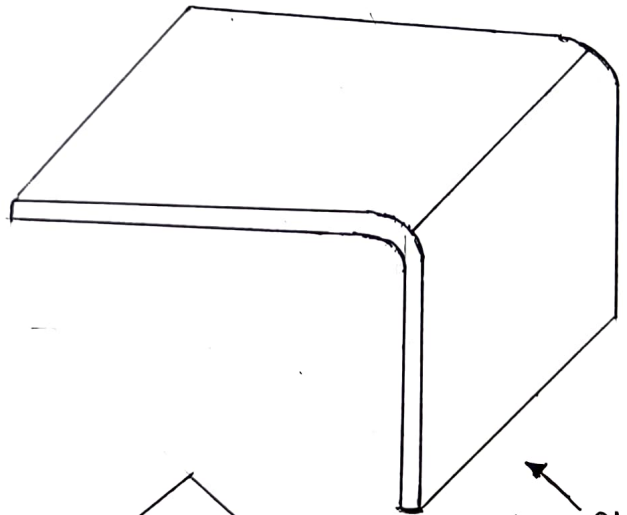
Single bend



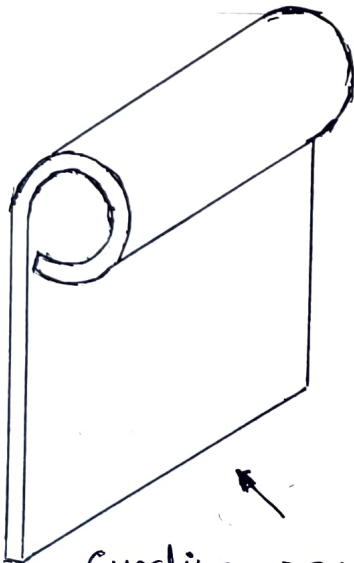
Beading



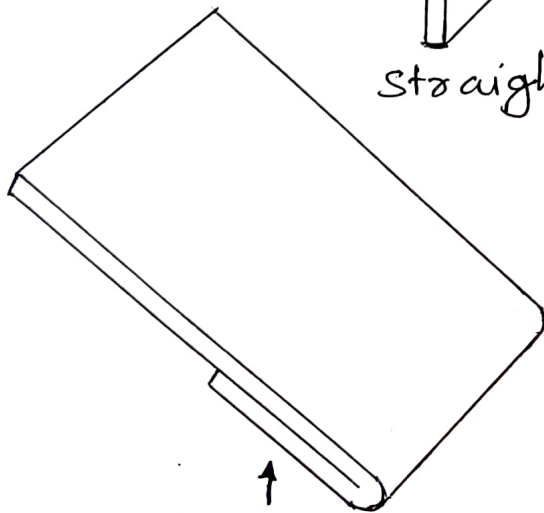
Double bend



straight flange



curling or wiring



Edge hem



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### \* Soft hammer or Mallets:-

Mallets are used during working with soft metal sheets. They may be of wood, rubber or raw hide. A mallet strikes a blow with the minimum damage to the surface. In sheet metal work, the commonly used mallets are bossing mallet, Tinman's mallet and Rawhide mallet.

### \* Sheet metal operations:-

- ① shearing
- ② Bending
- ③ Drawing
- ④ Squeezing
- ⑤ Joint making
- ⑥ Circle cutting etc.

### \* machines used in sheet metal shop:-

The various machines, which are in use to perform different operations on metal sheets, can be listed as follows.

- ① shearing machine
- ② Bending machine
- ③ Folding machine
- ④ Grooving machine
- ⑤ Peining machine
- ⑥ ~~bead~~ ~~beading~~ machine
- ⑦ swaging machine
- ⑧ Burring machine
- ⑨ Double seaming machine. etc.