PLUMBING SHOP

INTRODUCTION

Plumbing is concerned to join and repair the pipes that carry fluids and gases. In modern urban life water and drainage pipe, baths, toilets etc. have become integrated parts of any building. In industrial undertakings, pipe lines are used for supplying compressed air, gas, steam, water, oil, chemical fluids, refrigerants or any other item, capable of flowing through them. Previously clay pipes are used for drainage and sewerage works. A Babcock and Wilcox boiler contains many copper tubes (pipes) which transfer heat from furnace to the drum. Galvanized iron pipes supply water for household purposes.

As the pipes are supplied in standard lengths, these are joined, cut, bent, fitted to carry out the intended engineering functions. Certain accessories like taps, control valves, nipples etc. are also needed to control the flow of the liquid or gas to or from the container.

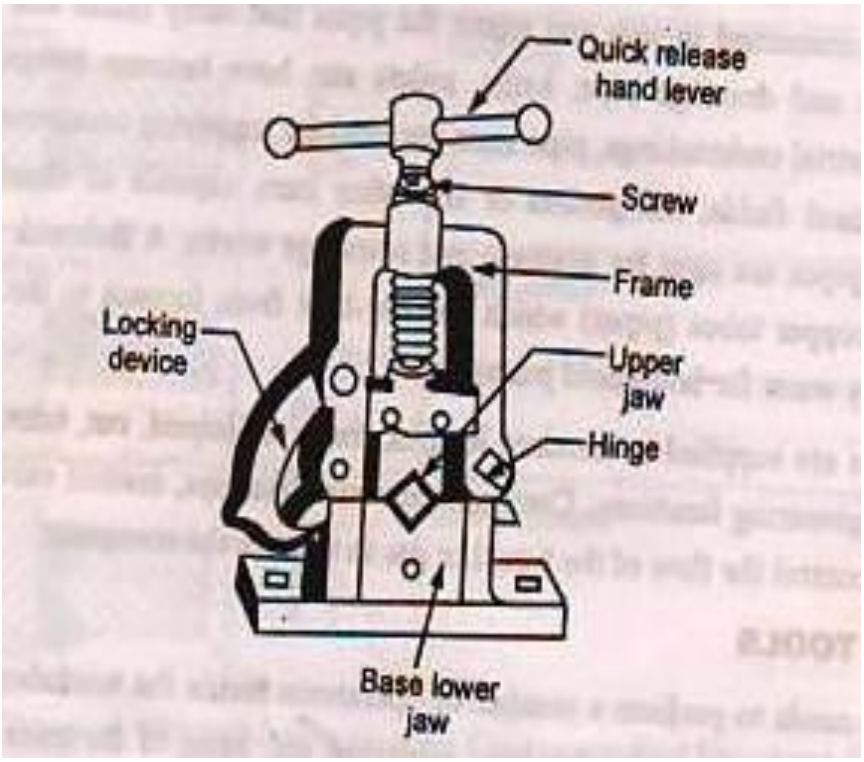
WORKSHOP TOOLS

A plumber needs to perform a number of operations inside the workshop or at site, such as pipe cutting, pipe threading, pipe bending, soldering, etc. Most of the tools are connected with fitting shop and have already been described in details in chapter. Some commonly required fitter's hand tools and instruments used in plumbing work include a fitters bench, parallel jaw vice, steel rule, hand hacksaw, centre punch, engineers try square, scriber, dividers, calipers, hand vice, hammers, files,drill bits and drilling machine,bench or pedastal grinder, taps with tap handles, dies with die stock, V-block with clamp, etc.

In addition to the above fitters tools and equipment a plumber needs anumber of other tools and equipment. These aremeant exclusively for pipework only. Prominent among these is a pipe vice. This vice is used for lholding the pipes in position during cutting, threading and similar other

operations done on pipes. These vices are available in different sizes and shapes to suit various types and sizes of pipes. However, the most useful form of these is a quick-opening type pipe vice shown in figure.

It consists of a cast iron base and a cast iron frame. The frame is made in two parts. The upper part is hinged to the bottom part on one side. The botton part is cast integral with the base. The base carries holes on both sides for accommodating the bolts to secure it to the work bench. The vice carries two jaws, between which the pipe is gripped. Both these jaws carry serrations at their gripping faces in order to ensure a positive grip. One of these jaws, the lower jaw is fitted to the lower part of the frame while the other jaw (upper jaw) is fitted to the bottom of the vertical screw of the quick release hand lever. A locking device is provided on the left side of the frame. In operation, the pipe is placed on the lower jaw, the upper frame moved about the hinge and brought in position and locked and then by tightening the screw of the hand lever pressure is exerted by the upper jaw on the pipe. Thus, the pipe is tightly gripped between the two jaws.



SPECIAL TOOLSP

1. Ring Spanner

A ring spanner, shown in figure, is a 12 point box wrench type tool, use for threaded water fining carrying a hexagonal shaped body.

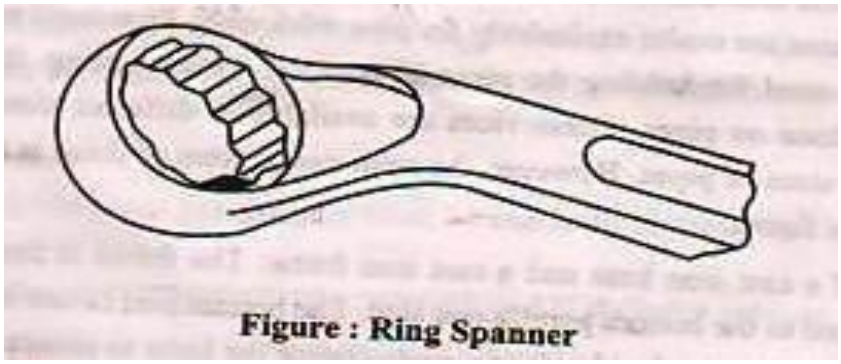


Figure : Ring Spanner

2. Water Pump Plier

A water pump plier shown in figure is an adjustable type of plier to suit different of objects. Ie can also be used for screwing and unscrewing threaded pipe fitting.

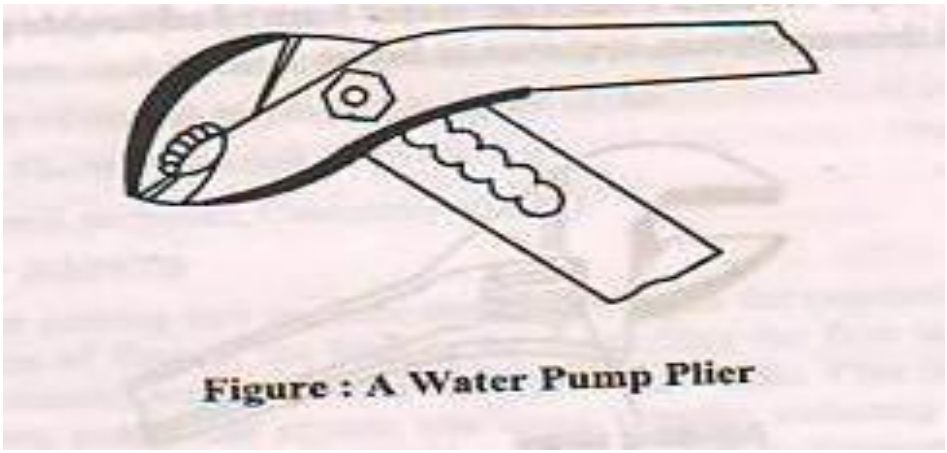
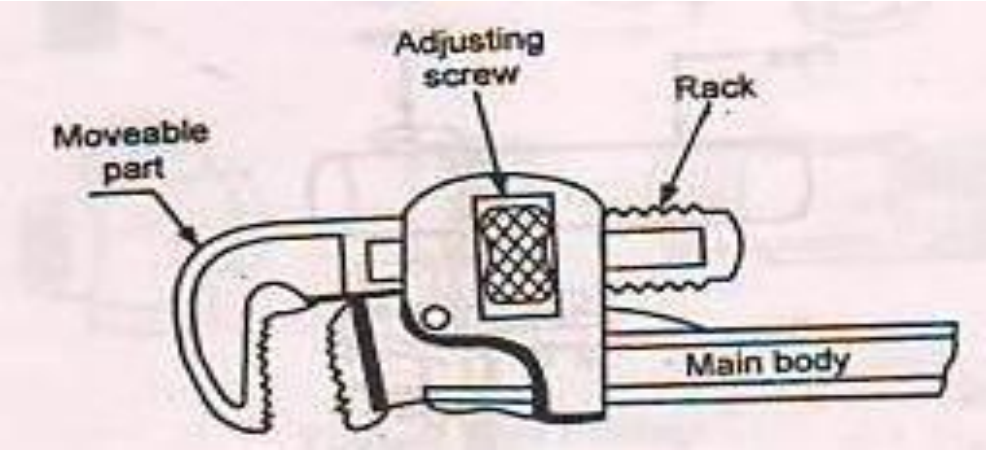


Figure : A Water Pump Plier

3. Pipe Wrench

Pipe wrenches are made in several designs. But the most commonly used types are adjustable pipe wrench and chain pipe wrench.

(a)Adjustable Pipe Wrench : The adjustable pipe wrench has a definite range through which its jaw opening can be adjusted. This opening depends upon the length of rack provided on the movable part of the tool. The overall length of the wrench will depend upon the diameter of lthe pipe to be tightened.



Abjustabal pipe wrench

(b)Chain Pipe Wrench : the chain pipe wrench, shown in figure provides wider range of adjustability to different sizes of pipes and a relatively more positive grip, specially in case of large size pipes.

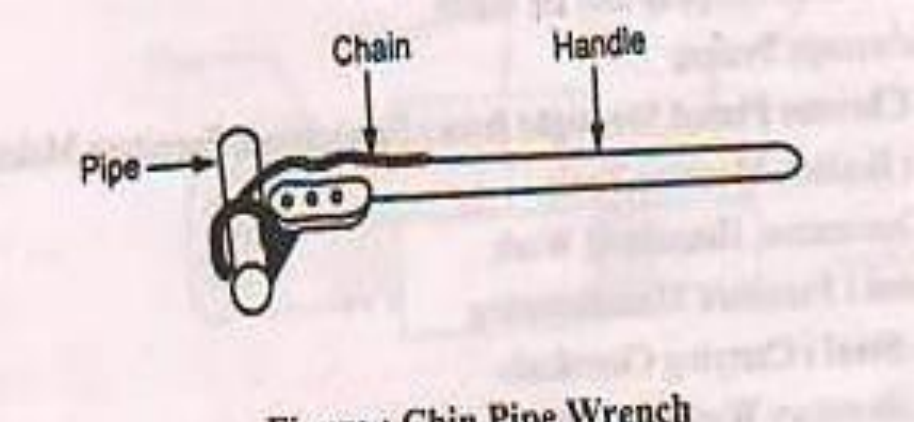


Figure : Chin Pipe Wrench

(c) Adjustable Pipe Wrench : Another useful form of adjustable pipe wrench, suitable for smaller and thinner objects, is shown in figure.

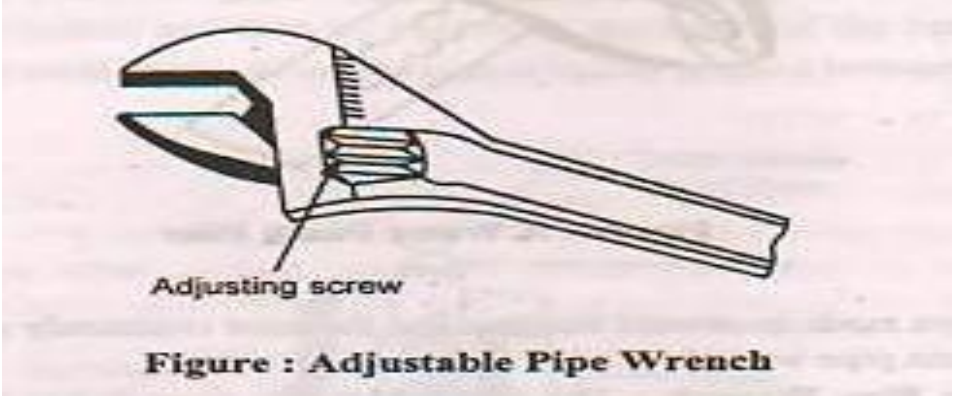


Figure : Adjustable Pipe Wrench

4. Chain Vice

Chain vice shown in figure. It is a very compact and light unit. It is so small and handy that it can be easily carried by a plumber in his tool bag. It can be easily fitted anywhere on a bench at site to grip the pipe kand performthe required operation on the pipe.

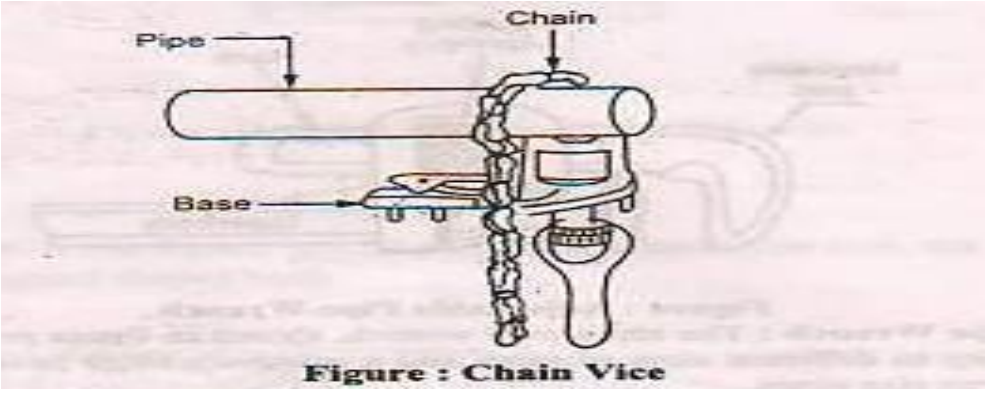


Figure : Chain Vice

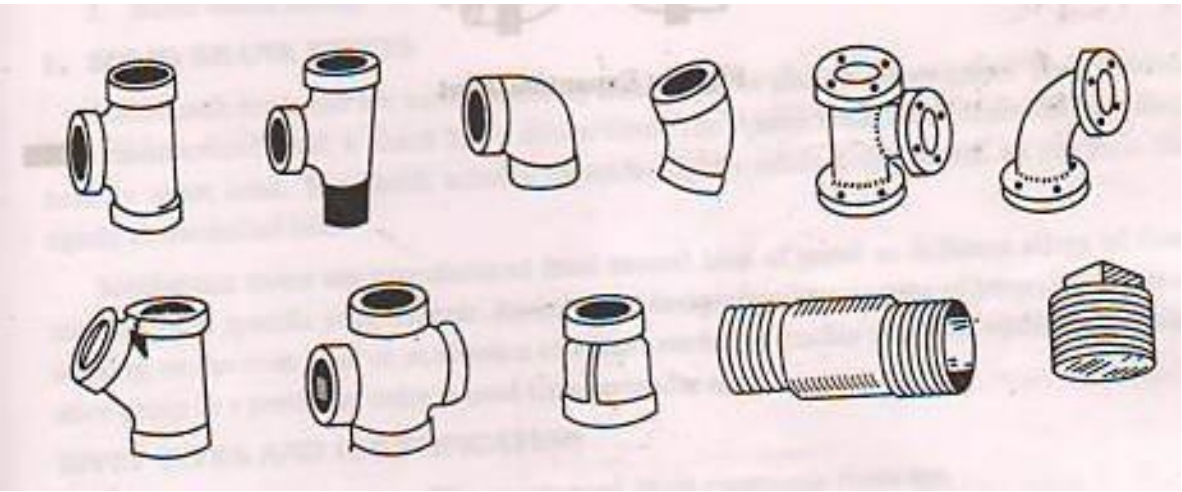
DIFFERENT PIPES AND THEIR USES

1. Galvanized Iron : Supply line for water
2. Clay : Sewerage System
3. Steel or Chrome Plated Wrought Iron : Fabrication, Furniture Making
4. Copper : Boilers, Machine Tools

5. Brass : Decorative, Household Work
6. Aluminium : Furniture Manufacturing
7. Stainless Steel : Carrying Chemicals
8. Glass : Laboratory Work
9. Cast Iron : Drainage Work, Main Water Pipe Lines
10. Cement Concrete and Asbestos Cement : Sewerage Work
11. PVC (Flexible) : General purposes for water, oil etc.
12. PVC (Hard) : Electric Conduit
13. Rubber : General purposes, Connector to LPG.

PIPE FITTING AND JOINTS

Fittings are used for ljoining two or more sections of pipes for required length, for changing the diameter or direction of flow of the line, or for controllig the flow in the line. Fittings are usually rated as low-pressure, standard, extra-heavy, and hydraulic. Pipe fittings in common use are bend, spring, elbows, round and square, tee, cross, coupler, reducing socket, cap, plug and nipple. Some of these are shown in figure. Fittings are specified by the nominal sizes of pipes for which they are used as a 20 mm elbow or a 30 mm tee.



Pipe fittings

Screwed Joints

Screwed joints (shown in figure) are made with standard pipe threads, and are very similar to one made by coupling. Water, gas and air pipes of small diameters are frequently joinedby screwed socket or couplers. This joining consists of a short sleeve with an internal standard pipe thread at each end.

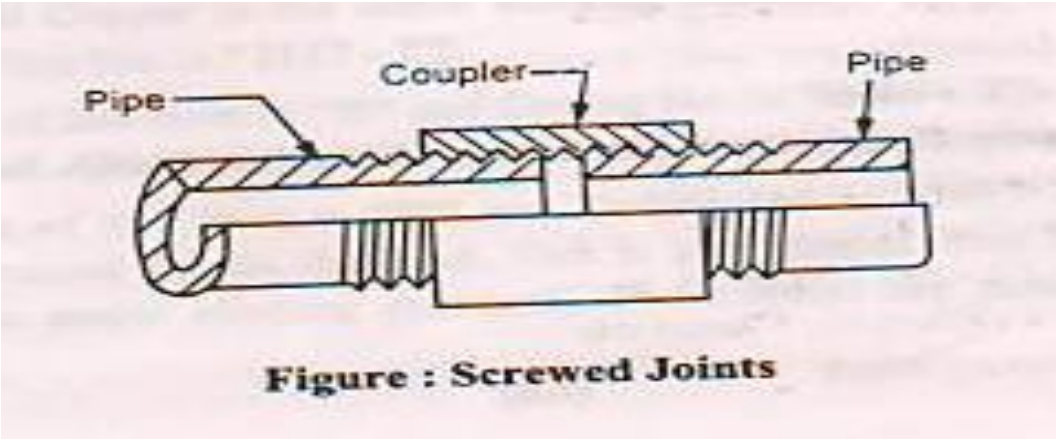


Figure : Screwed Joints

Expansion Joints

Expansion joints are used to provide for the alternations of length and change that may happen due to varying temperatures in steam and hot-water pipes. The smiplest form of expansion joint consists of a length of copper pipe (or of lap-welded or weldless steel pipe, with riveted flanges) bent in the form of a horse-shoe, which may take the place of a short length in a pipe. It offers little resistance to the ends being moved closer together or futher apart by expansion and contraction.

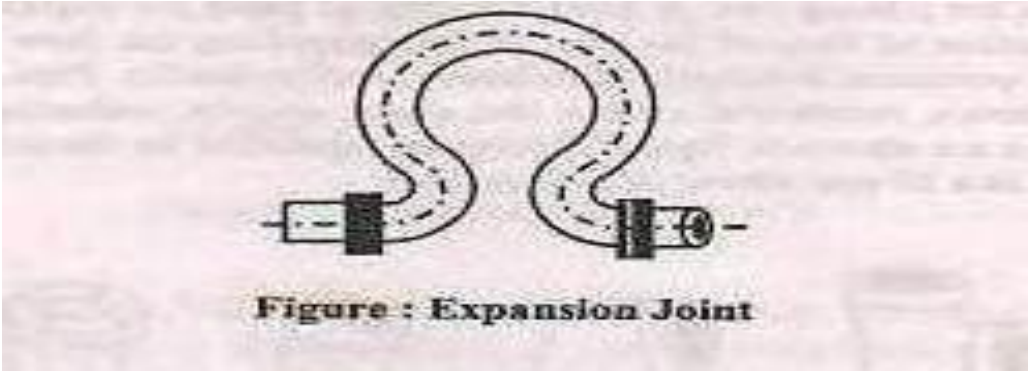


Figure : Expansion Joint