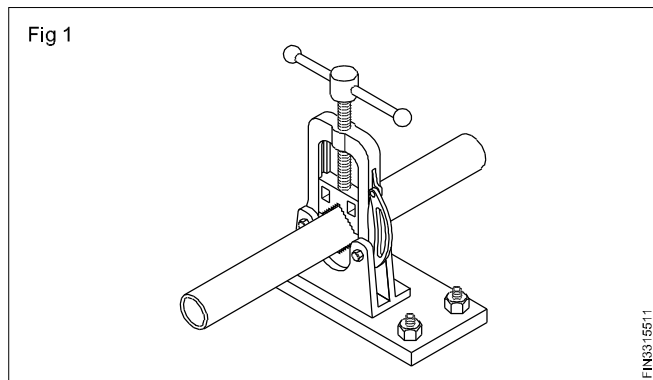


## Uses of pipe fitting tools

**Objectives :** At the end of this lesson you shall be able to

- name the different types of pipe vices
- state the uses of pipe vices
- name the parts of a pipe cutter
- compare the constructional features of a pipe cutter and a multi-wheel chain pipe cutter
- state the care and maintenance aspects concerning pipe cutters.

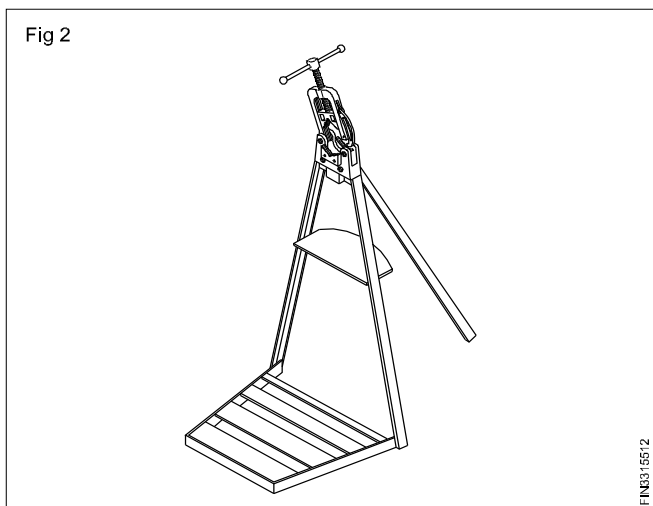
### Pipe vice (Fig 1)



The pipe to be cut/bent/threaded must be held steadily and it must be prevented from rotating by holding it in a pipe vice.

It is a device used for holding and locating pipes. It can be used to hold pipes up to 63mm diameter.

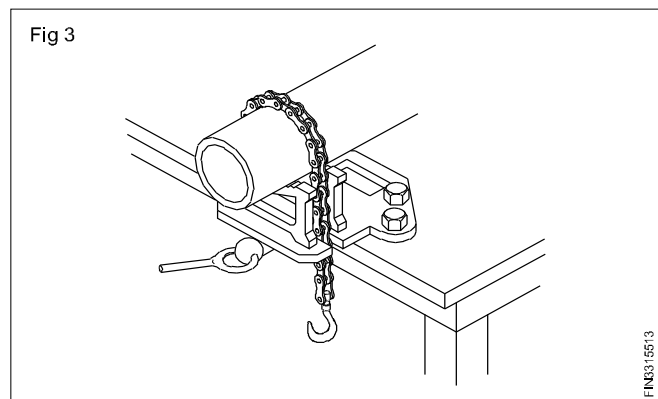
### Portable folding pipe vice (Fig 2)



This vice can be folded and carried easily to any working place. This is similar to the quick-releasing type pipe vice.

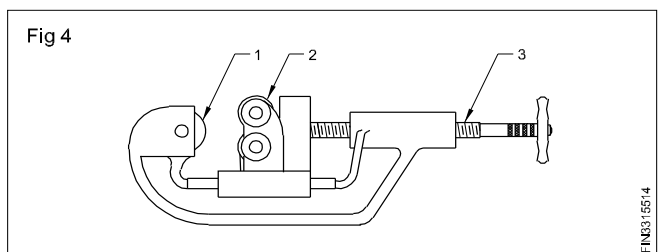
### Chain pipe vice (Fig 3)

This vice is used to hold larger diameter pipes up to 200mm diameter. The pipe is gripped by means of a chain and the serrations provided on the vice jaws.



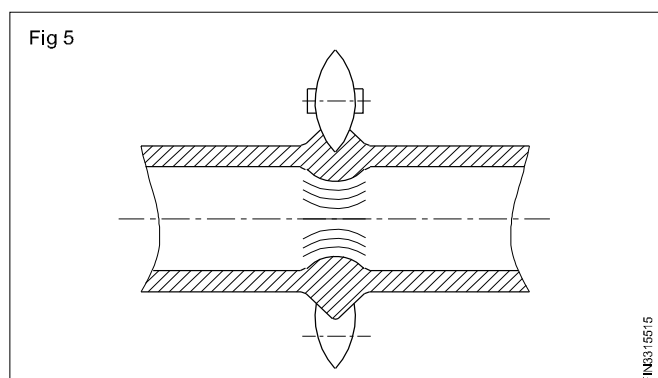
### Pipe cutter

The wheel pipe cutter is used to make a square cut on the pipe. It consists of (1) a cutter wheel, (2) two guide rollers and (3) an adjusting screw. (Fig 4)

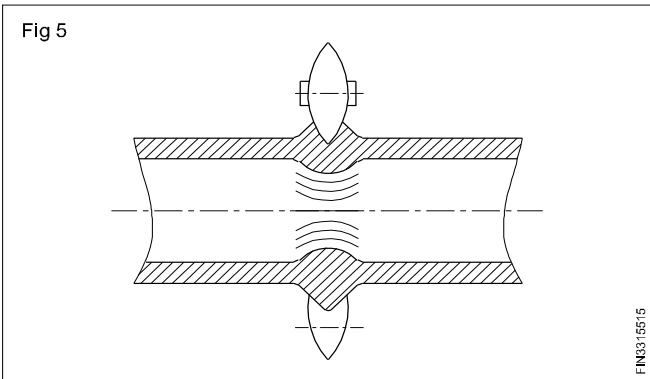


The cutter wheel tends to crush rather than cut the pipe. If it is blunt, it needs replacement.

This type of pipe cutter does not remove any materials but the cutter squeezes the metal and forces it ahead of the cutter until the pipe is cut through the wall thickness. (Fig 5)

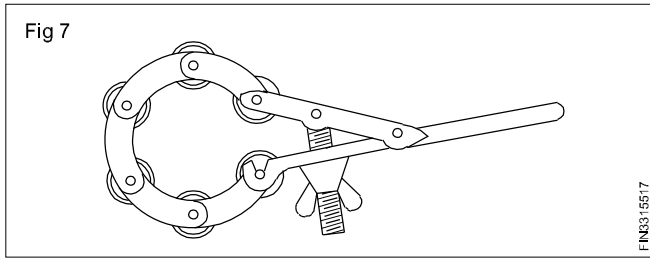


This type of cutting leaves a large ridge on the inside of the pipe which would obstruct the flow. (Fig 6) The pipe must be deburred or reamed by a pipe reamer.

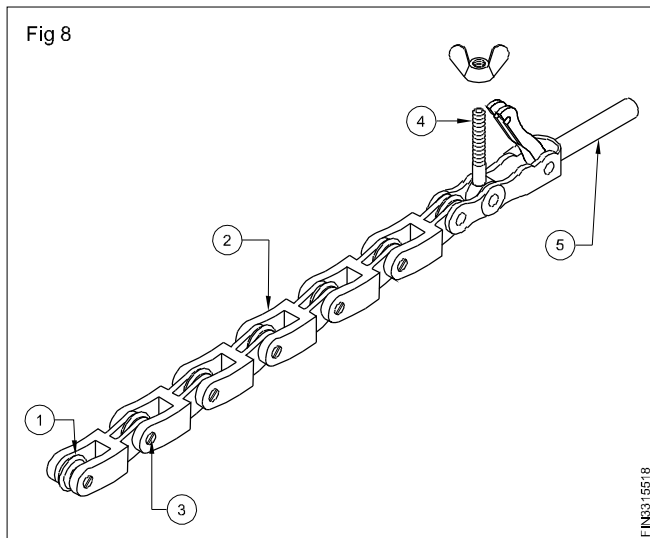


### Multi-wheel chain pipe cutter

A multi-wheel chain pipe cutter can be adjusted to cut any diameter of pipe by adding on extra wheels and links. (Fig 7) The type and the size of the cutter is selected according to the diameter of pipe to be cut.



It consists of the following parts. (Fig 8)



- 1 Hardened cutting wheels
- 2 Links
- 3 Screw for joining links and wheels
- 4 Tension adjustment screw
- 5 Cutter handle

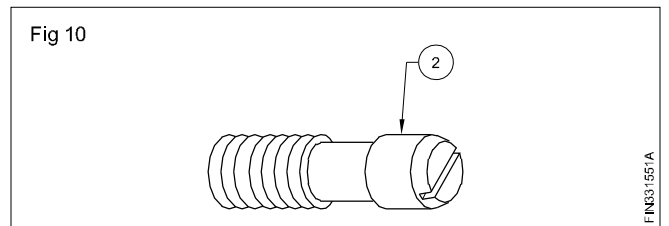
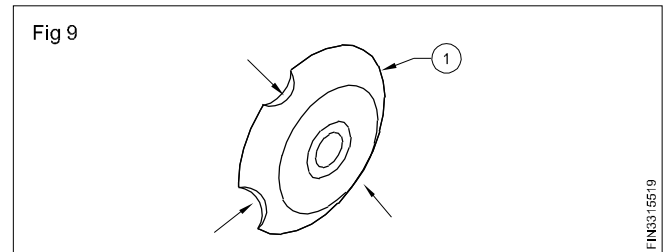
### Care and maintenance of pipe cutters

Before using the cutter check the wheels, pins and links for any damage.

Replace the wheels, pins and links if damaged.

As the wheel revolves around the pin, any wear on the pin will cause the wheel to wobble and the cut will not run square to the pipe. This may result in a:

- chipped wheel (Fig 9)
- worn out pin. (Fig 10)



During pipe cutting, small flakes of metal break away and clog up the links and cutting wheels. Clean the links and wheels using a wire brush and soak the cutter in paraffin or kerosene to wash out the small particles of dirt and flakes.

After cleaning, apply a light oil on all moving parts, links and wheels for easy cutting operation and to prevent rust forming on the tool.

Store the cutter and protect the wheels from possible damage when not in use.

# Plumbing tools - Pipe wrench and chain pipe wrench

**Objectives :** At the end of this lesson you shall be able to

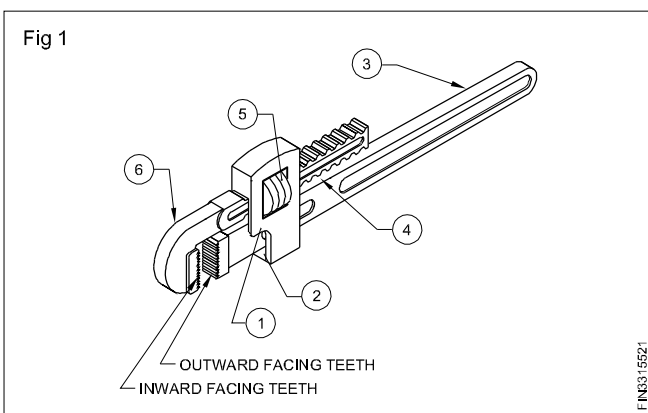
- name the elements of a pipe wrench and chain pipe wrench
- state the uses of pipe and chain pipe wrenches
- state the care and maintenance of pipe wrenches.

## Pipe wrenches

These are adjustable pipe wrenches with different shapes. They are used for:

- holding and gripping pipes
- assembling and dismantling of pipes and fittings.

The Stillson pipe wrench (Fig 1) is designed as a heavy duty tool to withstand rough handling and heavy work. The jaws give an immediate and positive grip.



It may be used for all pipes with 15 mm to 50 mm diameters. Pipe wrenches are selected according to the pipe size.

### Parts (Fig 1)

The Stillson pipe wrench consists of the following parts.

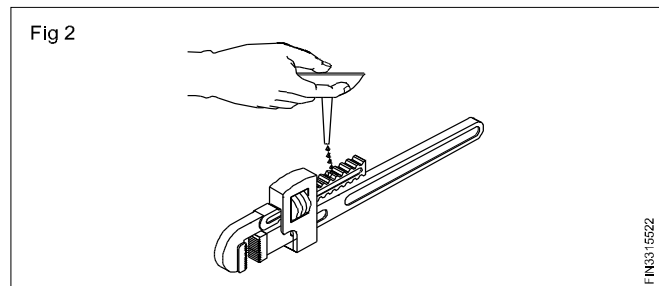
- 1 Pivot
- 2 Spring
- 3 Handle or lever
- 4 Spring
- 5 Adjusting nut
- 6 Moveable jaw

While using this pipe wrench, the jaws must be placed over the workpiece to their full depth and tightened by means of the adjusting nut.

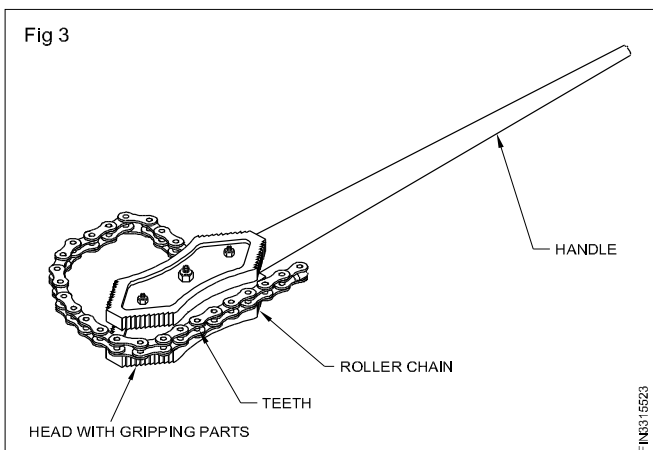
### Care and maintenance

The ability of the pipe wrench to grip the pipe is directly related to the condition of the teeth.

- Cleaning the teeth and sharpening them with a triangular file can restore some wrenches to useful condition.
- Oil should be applied to the adjustment nut periodically to prevent rusting. (Fig 2)



## Chain pipe wrench (Fig 3)



Chain pipe wrenches are used for pipes with diameters of 50 mm to 150 mm. They may be used for gripping cylindrical or irregular objects.

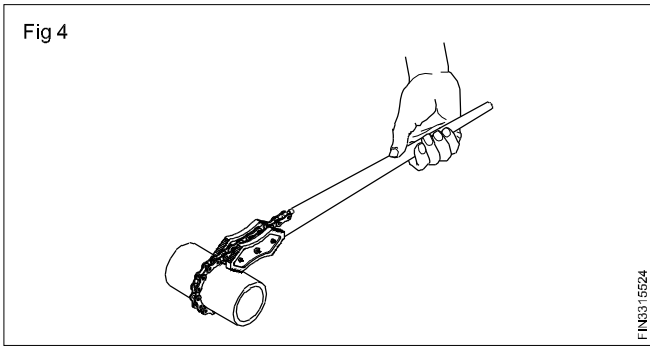
### Application of chain pipe wrench

To use a chain pipe wrench, the head is placed on the pipe and the chain pulled round the circumference of the pipe. The chain is then engaged with the large teeth in the centre of the head.

The movement of the lever in the direction indicated by the arrow in the figure causes the serrated edges of the head to wedge firmly against the pipe giving a firm grip. (Fig 4)

**The chain pipe wrench is a heavy gripping tool and should not be used for pipes with less than 50 mm diameter.**

**Apply oil or grease on the cutting edges when not in use.**



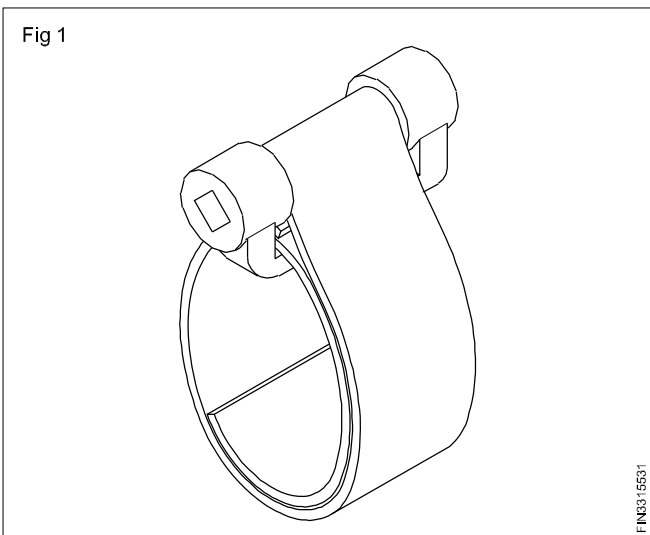
## Pipe wrenches

**Objectives :** At the end of this lesson you shall be able to

- state the different types of pipe wrenches - strap wrench and foot print wrench
- state the uses of each type of wrench.

### Strap wrench (Fig 1)

Strap wrenches are used on finished tubular surfaces to avoid marking or damaging. These wrenches have metallic straps by which the surfaces can be tightly gripped.



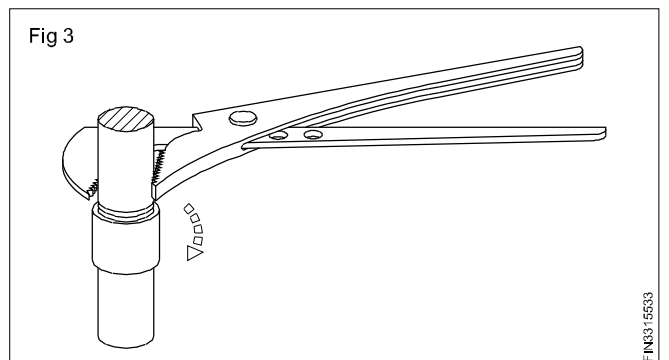
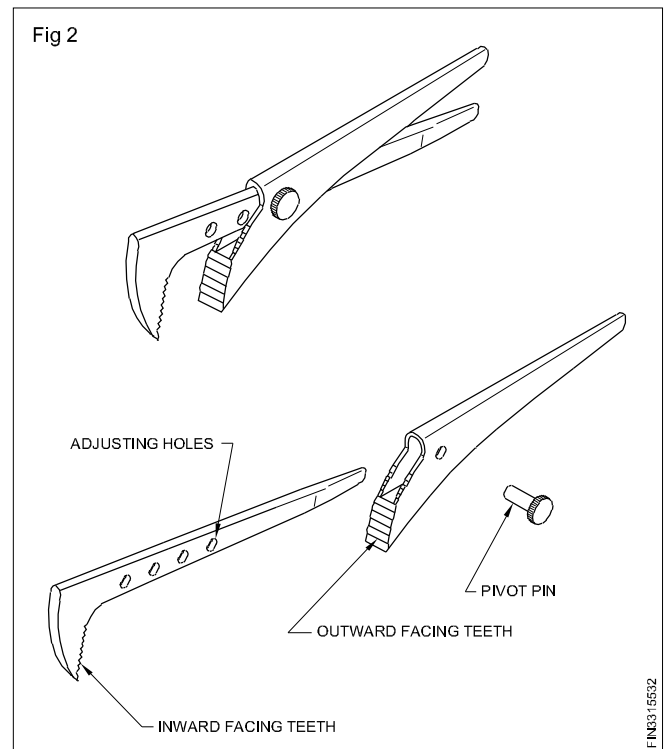
### Footprint wrench (Fig 2)

These are used for gripping and turning pipes and round stocks in confined places.

The required size is adjusted by placing the pivot pin in the different holes of the solid handle.

The grip is obtained by squeezing both the solid handles together. (Fig 3)

The selection of hole should be such that the handles are not too far as this may result in uncomfortable holding of the handles.



# Pipe bending machines

**Objectives :** At the end of this lesson you shall be able to

- identify the three most common pipe benders
- differentiate their constructional features
- name the parts of bending machines
- state the uses of bending machines.

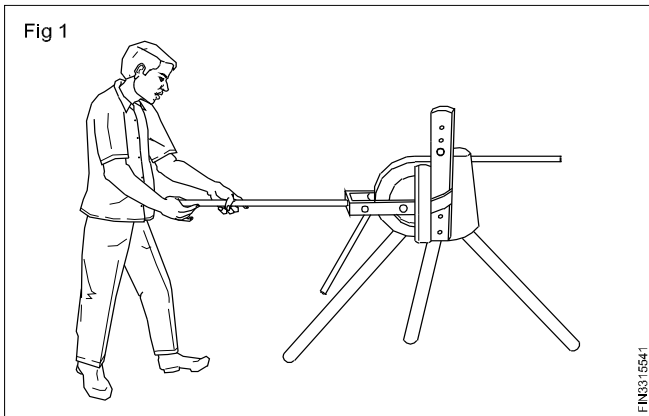
There are some situations in plumbing jobs, where it is preferable to bend a pipe rather than use a pipe fitting.

The most common pipe benders are listed here.

## Portable hand operated pipe bender (Fig 1)

The portable hand-operated pipe bender consists of the following parts

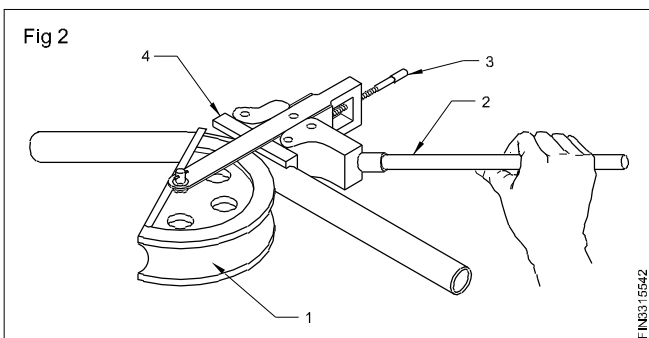
- 1 Tripod stand
- 2 Pipe stop lever
- 3 Handle or lever
- 4 Inside former



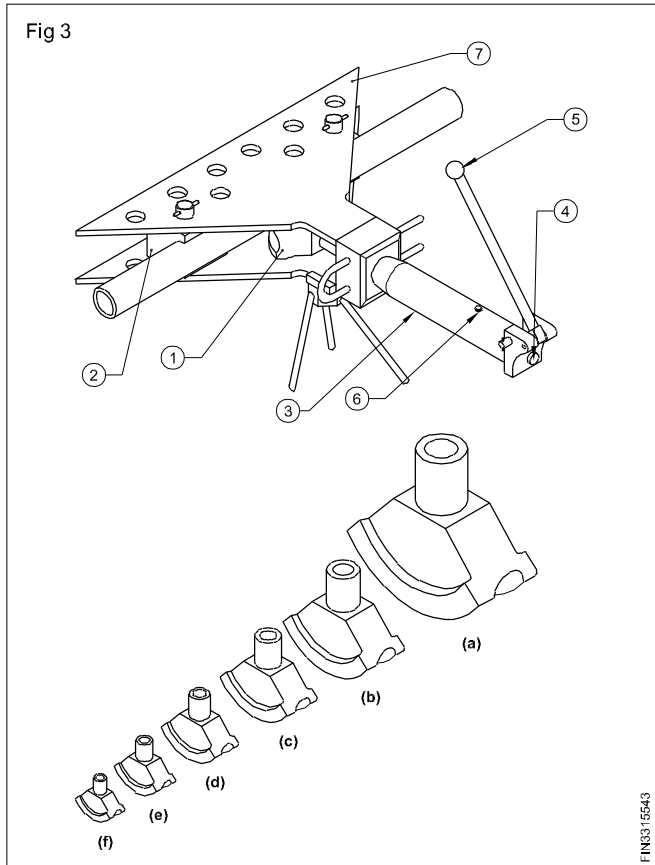
## Bench type hand operated pipe bender (Fig 2)

This consists of the following parts. It is used for bending galvanized iron and steel pipes.

- 1 Inner former
- 2 Lever or handle
- 3 Adjusting screw with lock nut
- 4 Pipe guide



## Hydraulic bending machine (Fig 3)



This machine can be used for bending G.I and M.S.pipes without sand filling to any direction.

It consists of the following the parts.

- 1 Inner former
- 2 Back former
- 3 Hydraulic ram
- 4 Pressure release valve
- 5 Operating lever
- 6 Bleed screw
- 7 Base plate

Inner formers are interchangeable and are able to bend pipes up to 75 mm diameters. (Figs 3a, b, c, d, e & f)

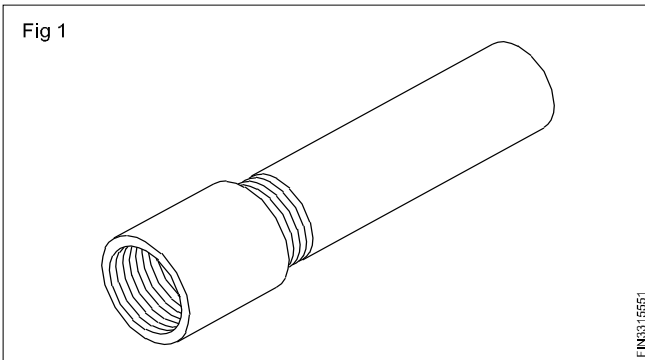
# Pipes, dies, die stocks and taps

**Objectives :** At the end of this lesson you shall be able to

- identify die sets, die stocks and pipe taps
- name the parts of a die stock
- state the method of checking pipe threads.

## Pipe dies

Most of the G.I. pipes that plumbers install are threaded at both ends. The pipes are available in lengths of 6 metres and it will be necessary to cut the pipe to the required length and thread it. (Fig 1)

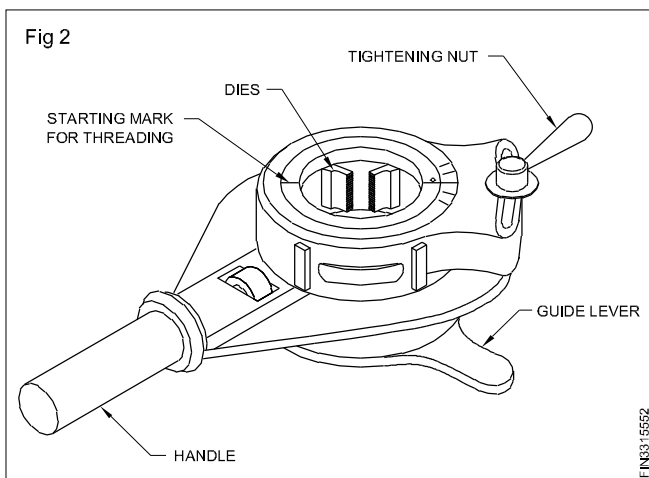


The threads on G.I. pipes and fittings for water supply systems are the standard pipe threads. External pipe threads are cut by pipe dies available in sizes from 1/4" to 4".

The dies must be sharp so that they will cut metal rather than push it around. Dies which push the metal around instead of cutting freely cause threads to break.

## Die stocks

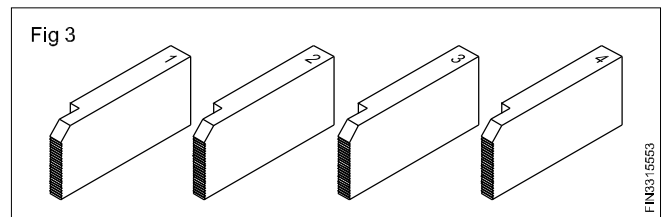
Die stocks are required to turn the dies. The ratchet type die stock is preferred because it permits the operator to use his body weight to rotate the die while standing to one side of the pipe. (Fig 2) Die stocks are adjustable.



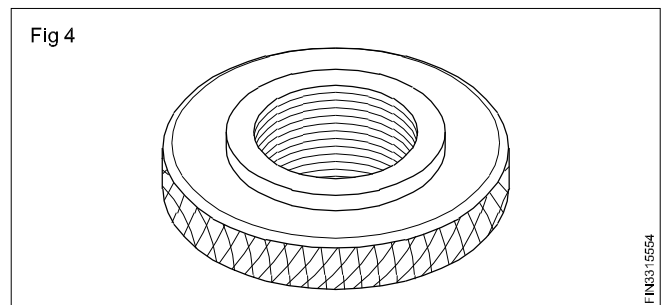
## Die sets

Each die is clearly marked with its type of thread and range of pipe for which it is suitable. Each die has an identification number, that is 1 to 4. Die sets are available in various sizes.

These dies must always be used and stored as a set. (Fig 3)



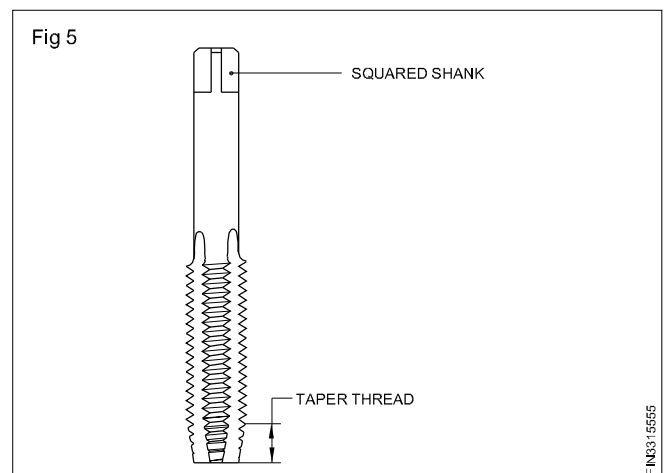
Pipe threads are usually cut with threading dies and can be checked by using the pipe ring gauge. (Fig 4)



## Pipe taps

Internal pipe threads are usually cut with standard taper pipe taps. (Fig 5)

In gauging internal pipe threads, the pipe plug thread gauge



In gauging internal pipe threads, the pipe plug thread gauge should be screwed tight by hand into the pipe until the notch on the gauge is flush with the face. When the thread is chamfered the notch should be flushed with the bottom of the chamfer. (Fig 6)

