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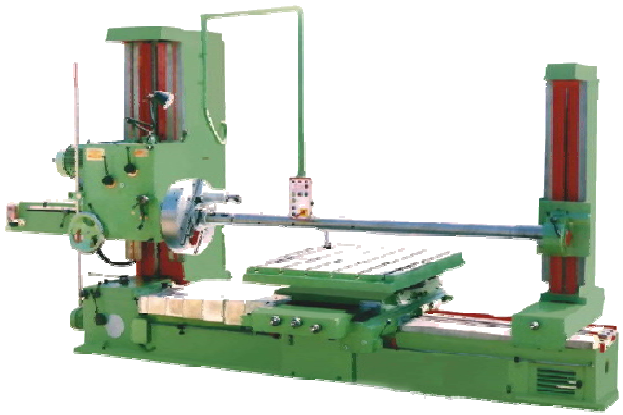
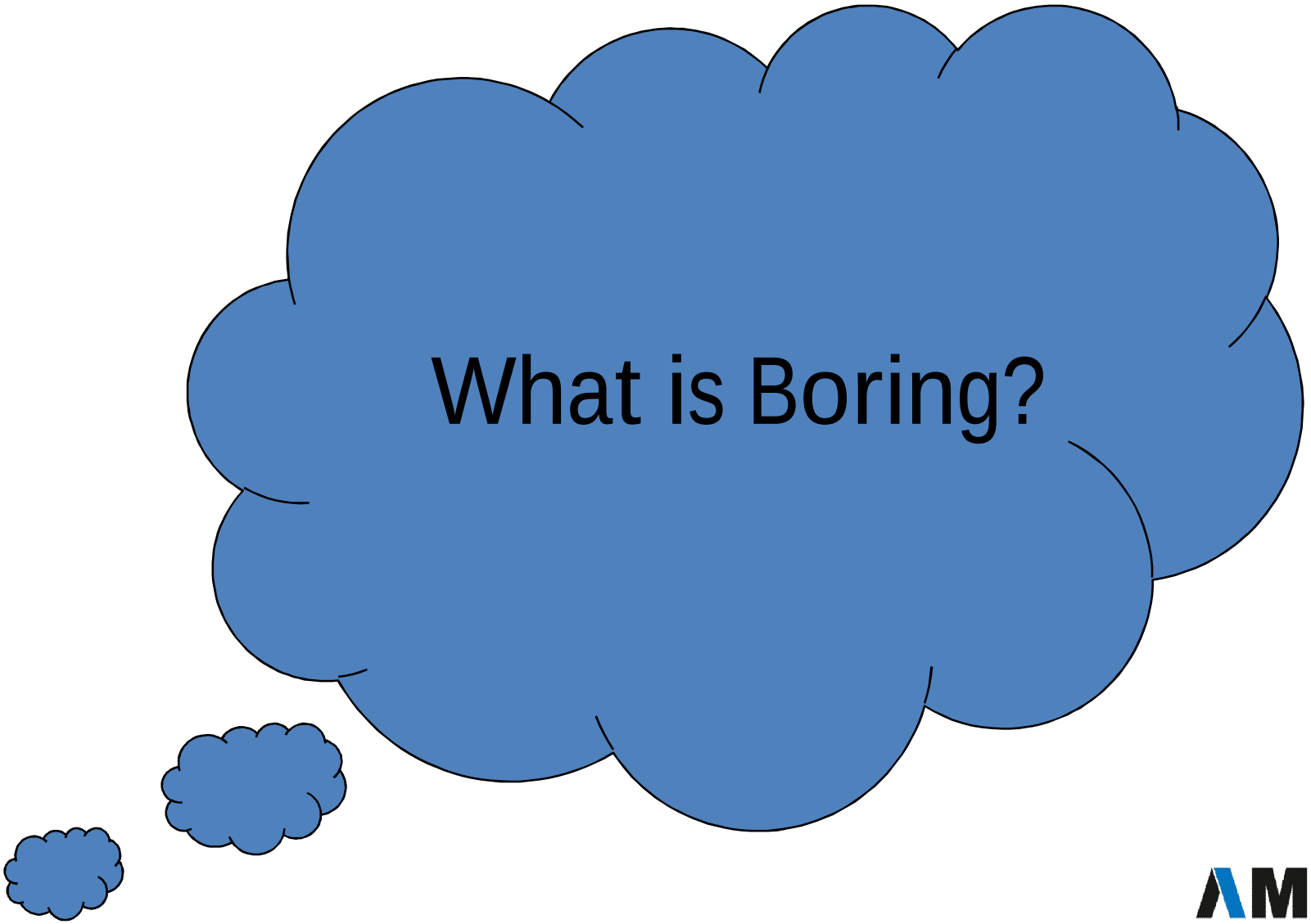
Ch-4
Boring Machine



Subject:- MP **Code:-3141908**	**Prepared by:** **Asst.Prof.Harin Prajapati** **(Mechanical Department,ACET)**	AMIRAJ COLLEGE OF ENGINEERING & TECHNOLOGY



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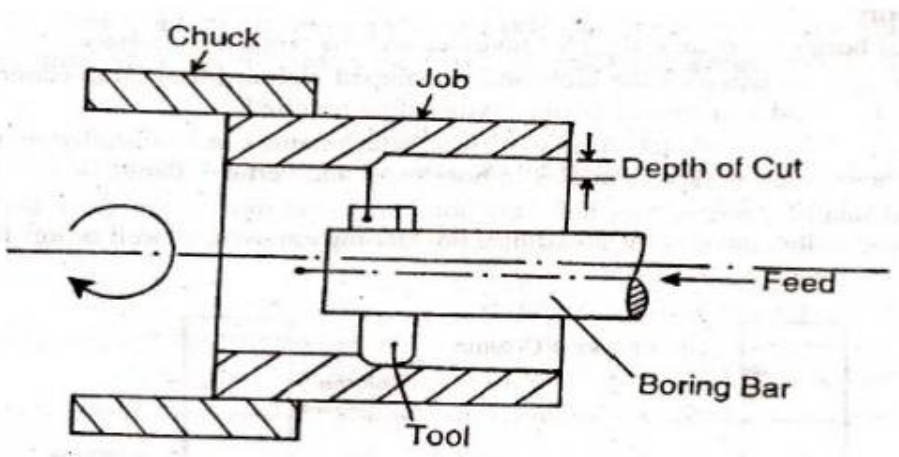
Introduction

- When internal surface of a hollow part is turned, a single point cutting tool is used for enlarging a hole, the operation is called **BORING**
- The bar on which single point tool is mounted is called **BORING BAR**



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Types of Boring Machines

- Horizontal Boring Machine (HBM)

1. Table type
2. Planer type
3. Floor Type
4. Multiple Spindle

- Vertical Boring Machine (VBM)

1. Standard vertical boring machine
2. Turret type boring machine

- Pecision boring machine
- Jig boring machine

1. Vertical milling machine type
2. Planer type

Horizontal boring machine:

- The work is supported on a table which is stationary and tool revolves in a horizontal axis.
- Can perform boring, reaming, turning, threading, facing, milling , grooving and many other operations with suitable tools.
- Work piece which are heavier and asymmetrical can be easily held and machined.
- Different types has been designed to suit the different purpose.

Horizontal Boring Machine

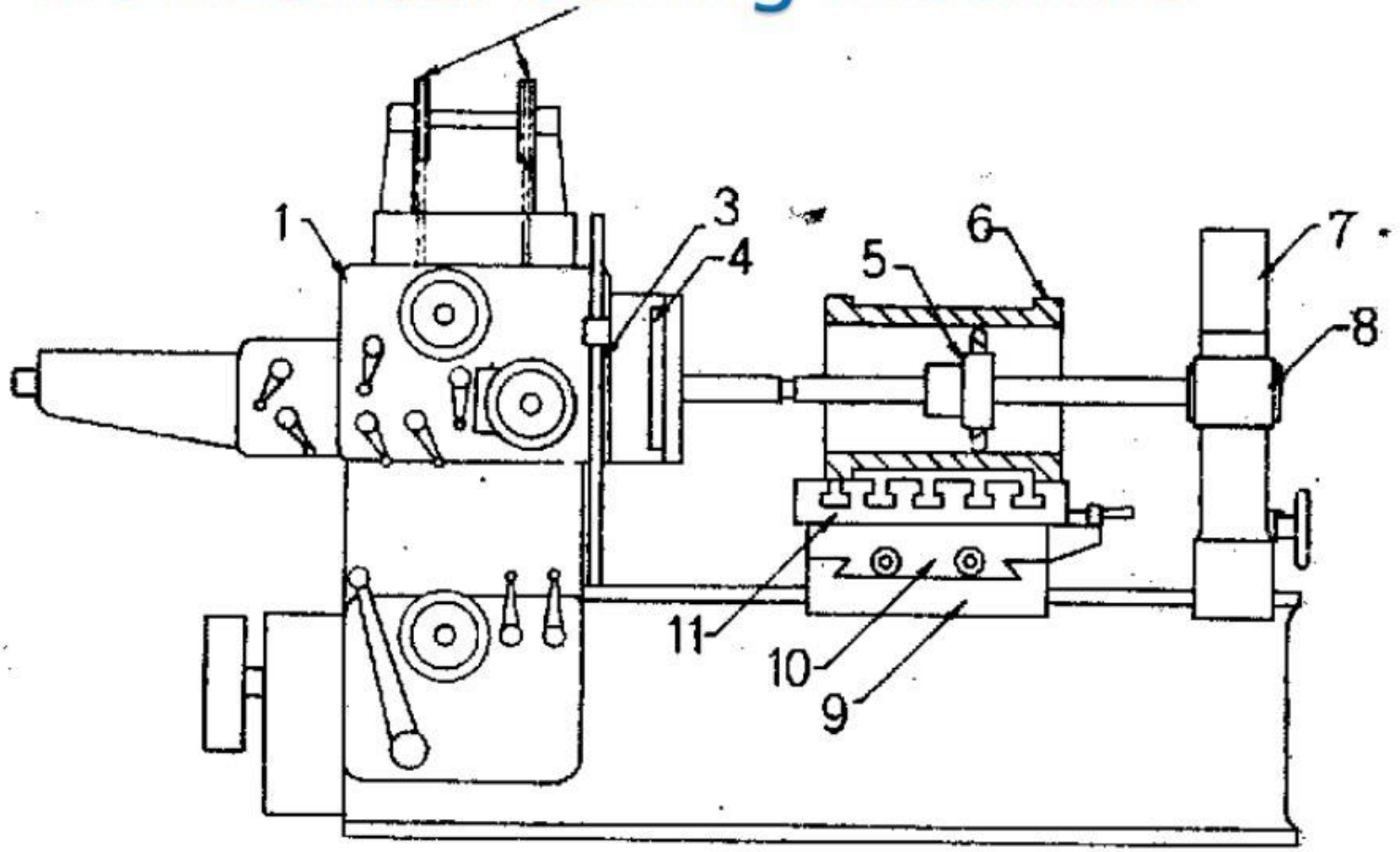


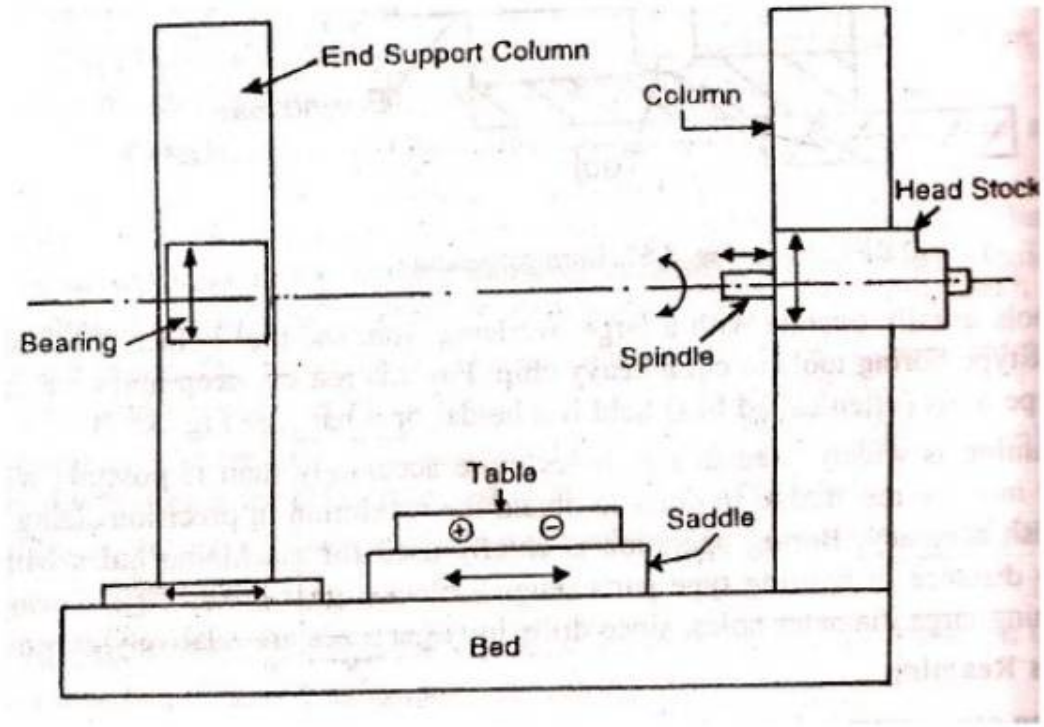
Fig. 6.1. Horizontal boring machine

1. *Headstock*, 2. *Pulley for counterbalancing weight of headstock*, 3. *Headstock elevating screw*, 4. *Boring head*, 5. *Boring cutter on boring bar*, 6. *Work*, 7. *End supporting column*, 8. *Bearing block*, 9. *Saddle*, 10. *crossslide*, 11. *Tab*

Table type horizontal boring machine

- The machine is designed for boring in heavy component like cylinder block , large gearbox bodies etc.
- Machines of this type can do beside boring, other allied operations like drilling,reming,threading,facing,grooving and milling on large work pieces.
- The size of these machine is specified by the diameter of spindle.

Table Type HBM



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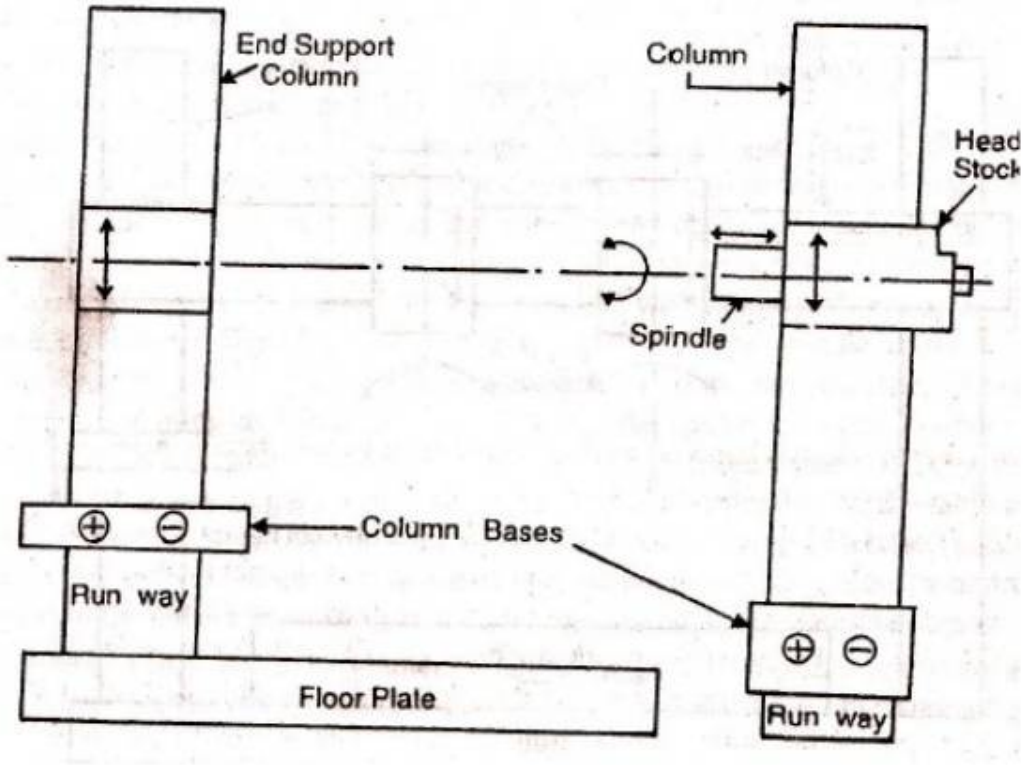
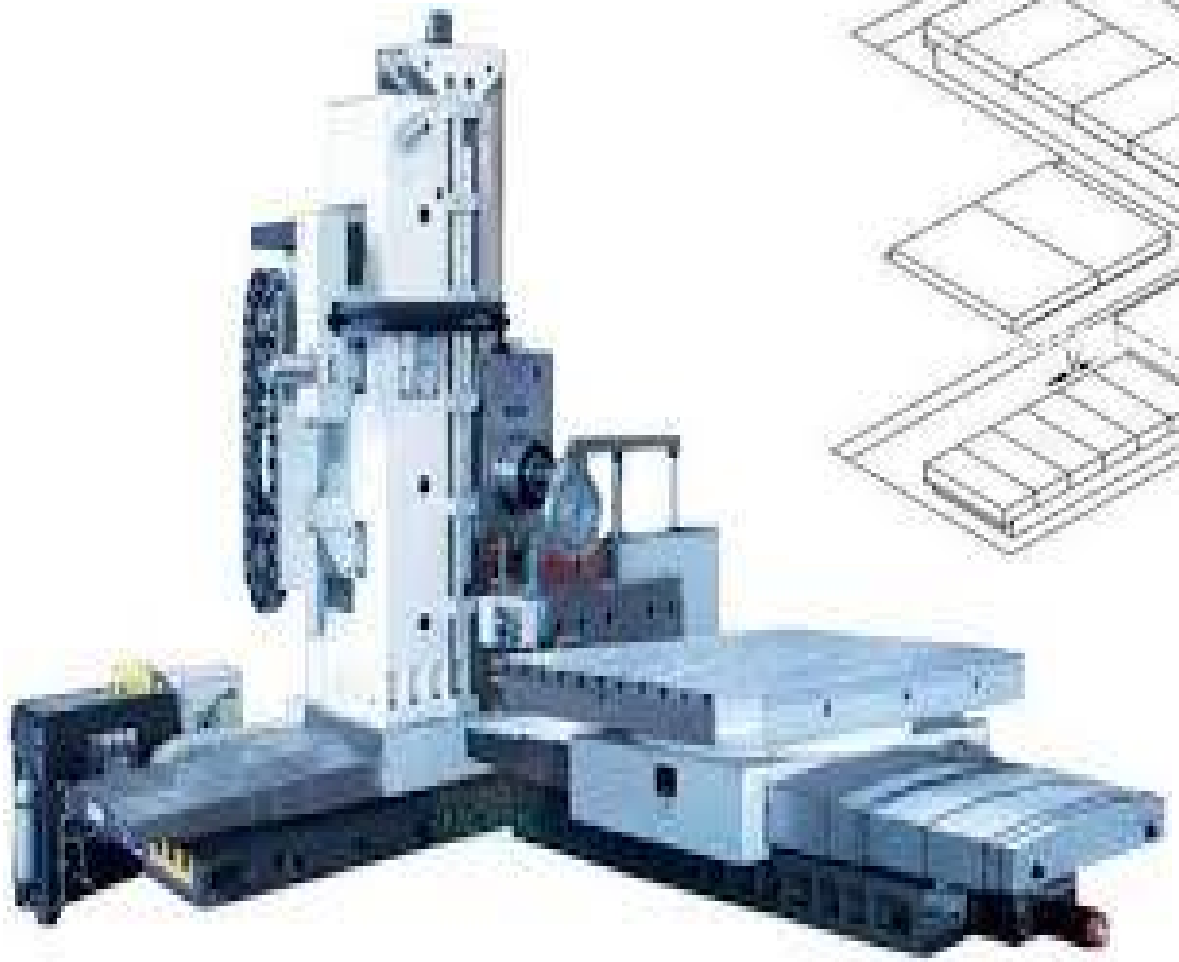
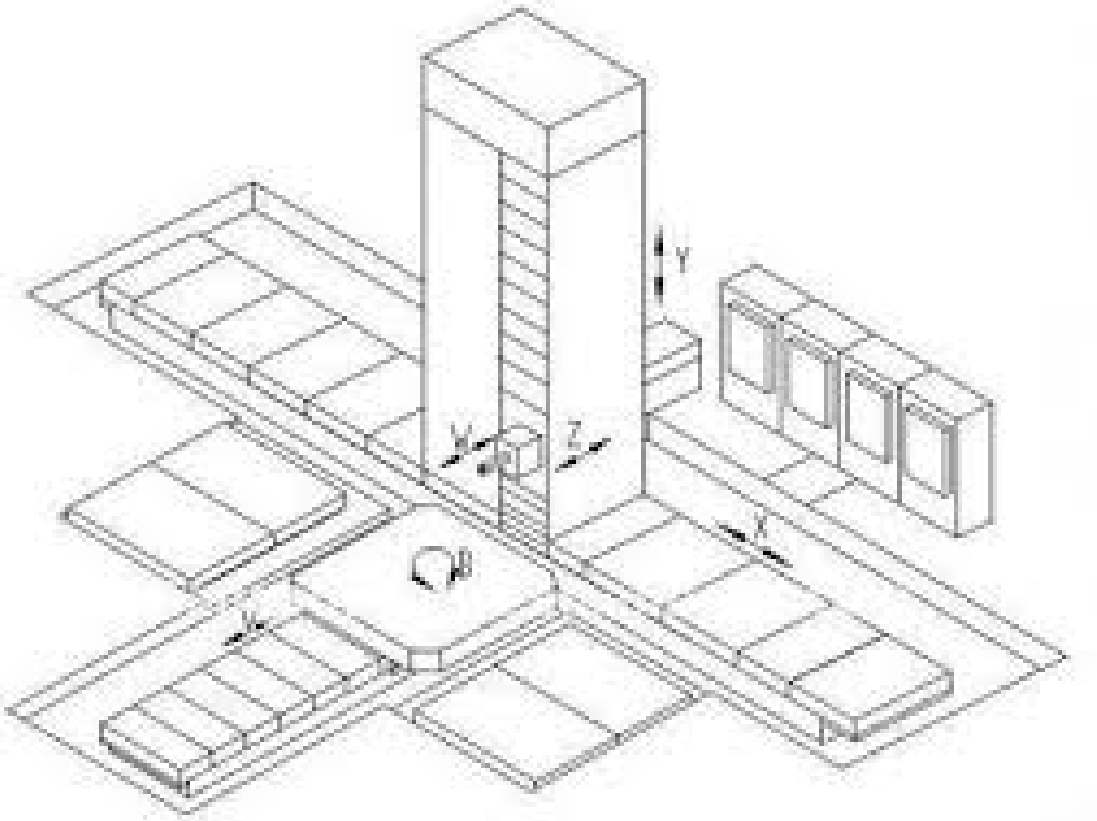
Floor type horizontal boring machine

- This boring machine does not have a table and uses stationary floor plate having T slots to locate the work piece.
- The head stock and end supporting columns are mounted on runways placed at right angle to the spindle axis.
- During the operation the work is stationary and the spindle end support is traversed along the runway past the work.

Floor Type HBM







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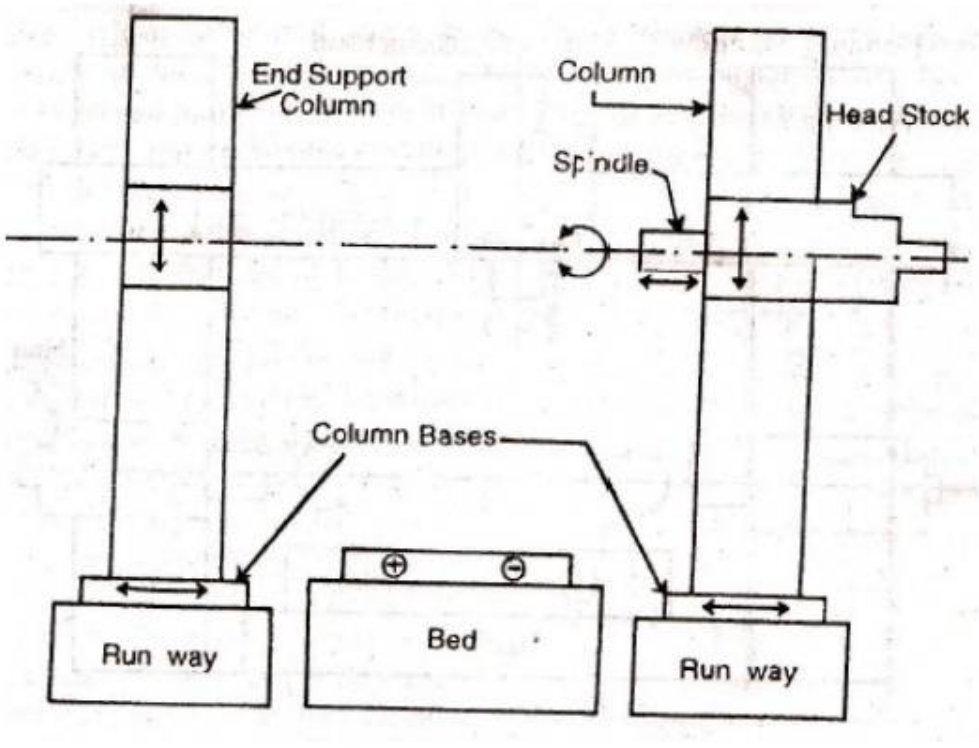
Planer type horizontal boring machine

- In this case the table slide directly on a bed and reciprocates like a planer.
- The end supporting column and headstock supporting column can be adjusted toward or away from the table to accommodate jobs of different width.
- The machine is suitable for long job.

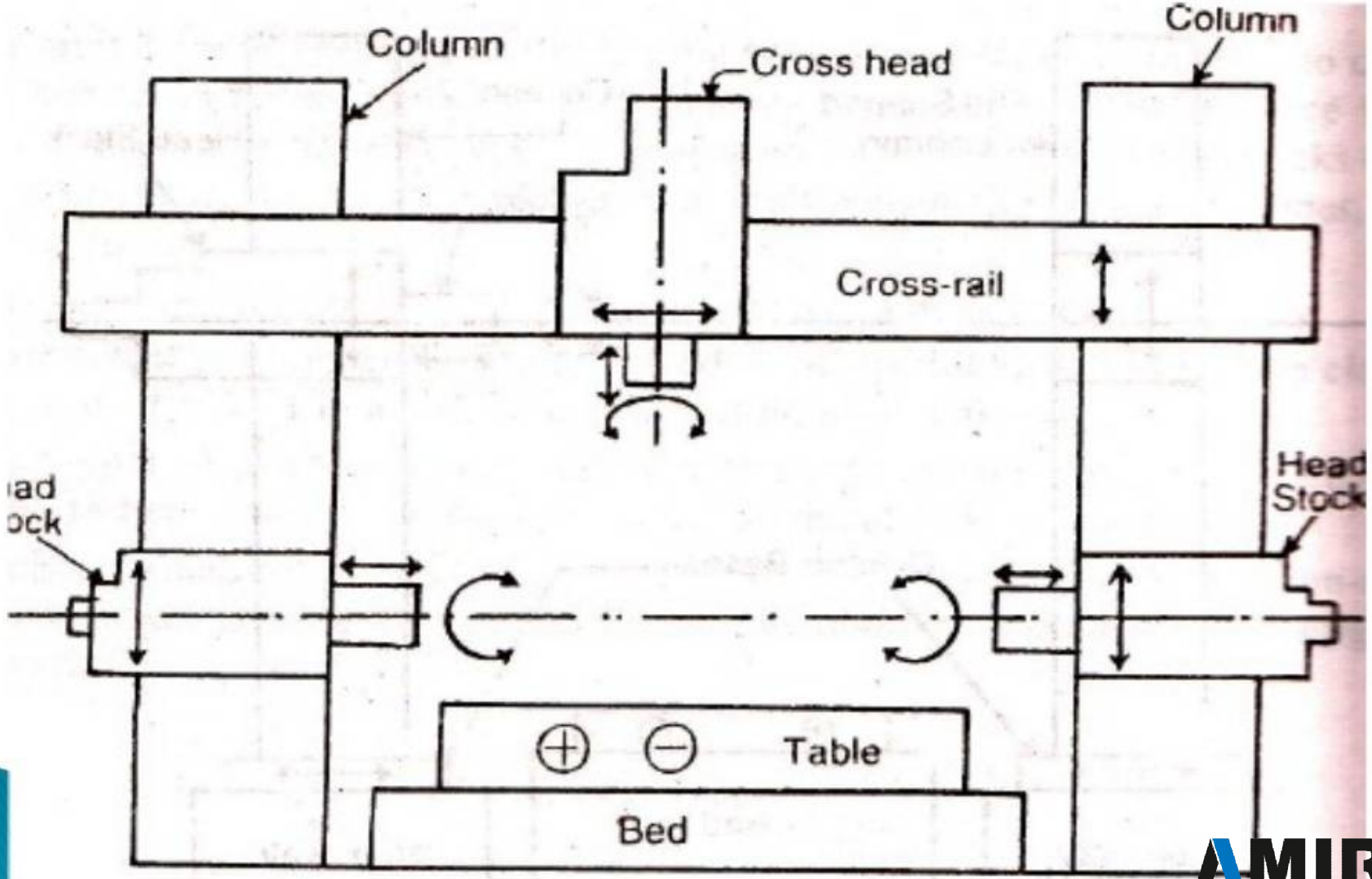
Planer type HBM



Multiple head type horizontal boring machine

- This machine is resembles a plano miller.
- It may have two,three or four head stocks which may be swivelled for angular cut.
- This type of machine can be used both for horizontal as well as vertical boring.
- The machining operation can be performed simultaneously at different faces of the work piece.

Multiple Spindle HBM



Vertical Boring Machine:

- The work rotates on a horizontal table about a vertical axis and the tool is stationary except for feed.
- Machine may look like a vertical lathe.
- Larger diameter and heavy work pieces, can be set up more quickly than in lathe.
- Multiple tooling may be adapted with its turret type tool post, increasing the rate of production.

Vertical Boring Machine

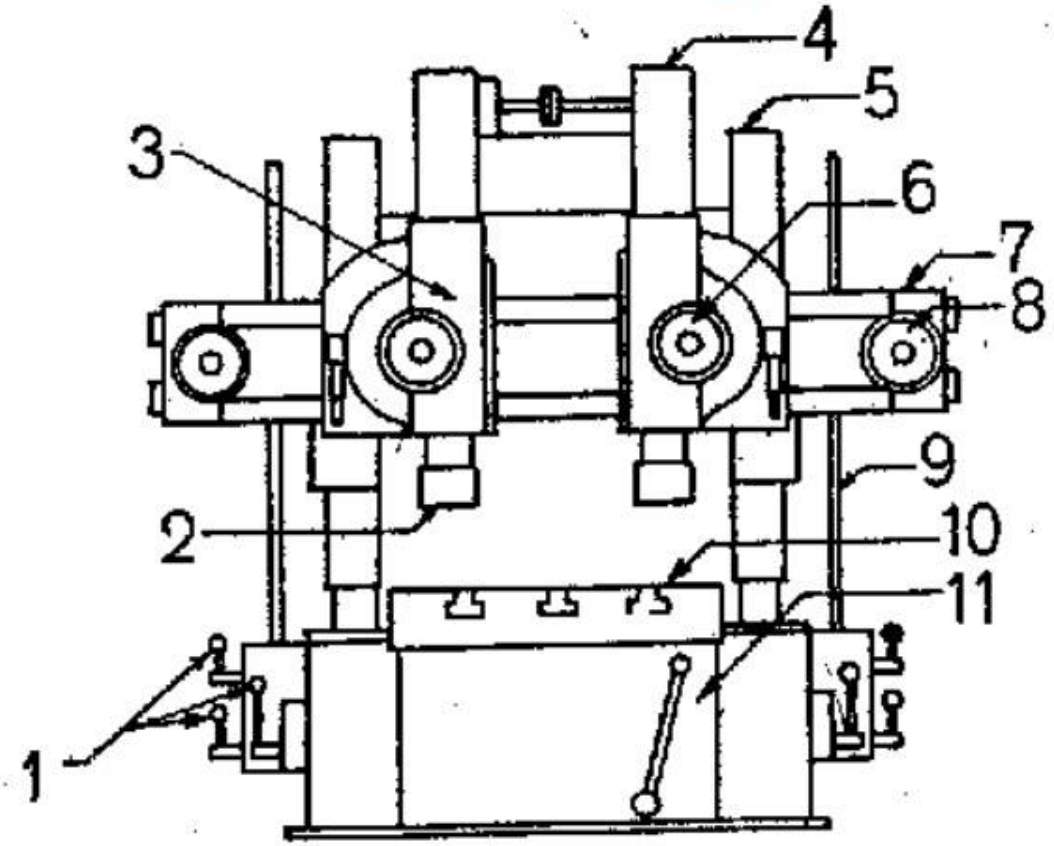


Fig. 6.16. Vertical boring machine

1. *Feed adjusting levers,* 2. *Tool box,* 3. *Tool head assembly,* 4. *Ram,* 5. *Housing,* 6. *Handwheel for ram adjustment,* 7. *cross rail,* 8. *Fine hand adjustment for ram,* 9. *Crossrail elevating screw,* 10. *Table,* 11. *Bed.*

Main Components

- Bed
- Table
- Housing
- Cross rail
- Tool-head Assembly

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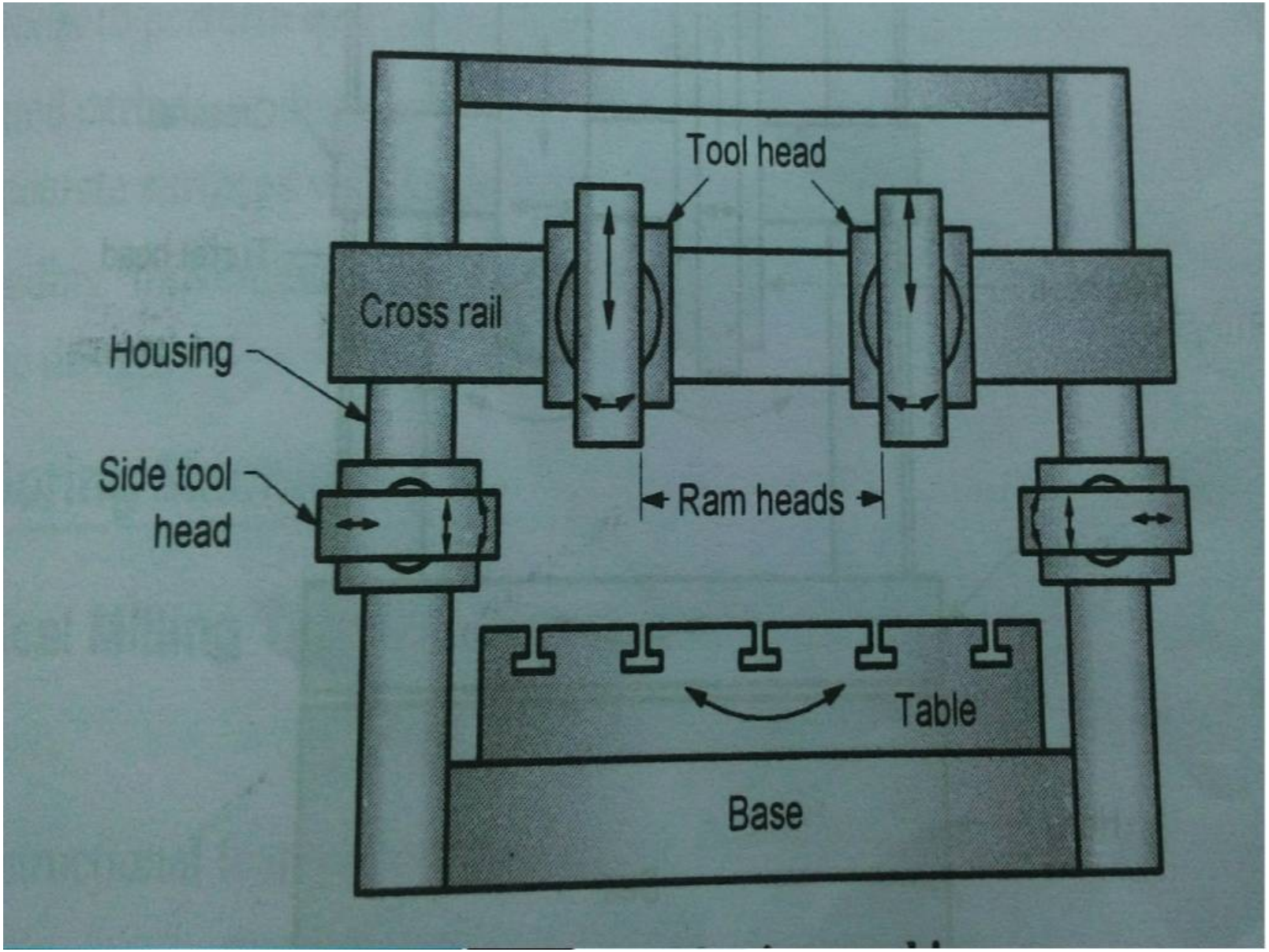
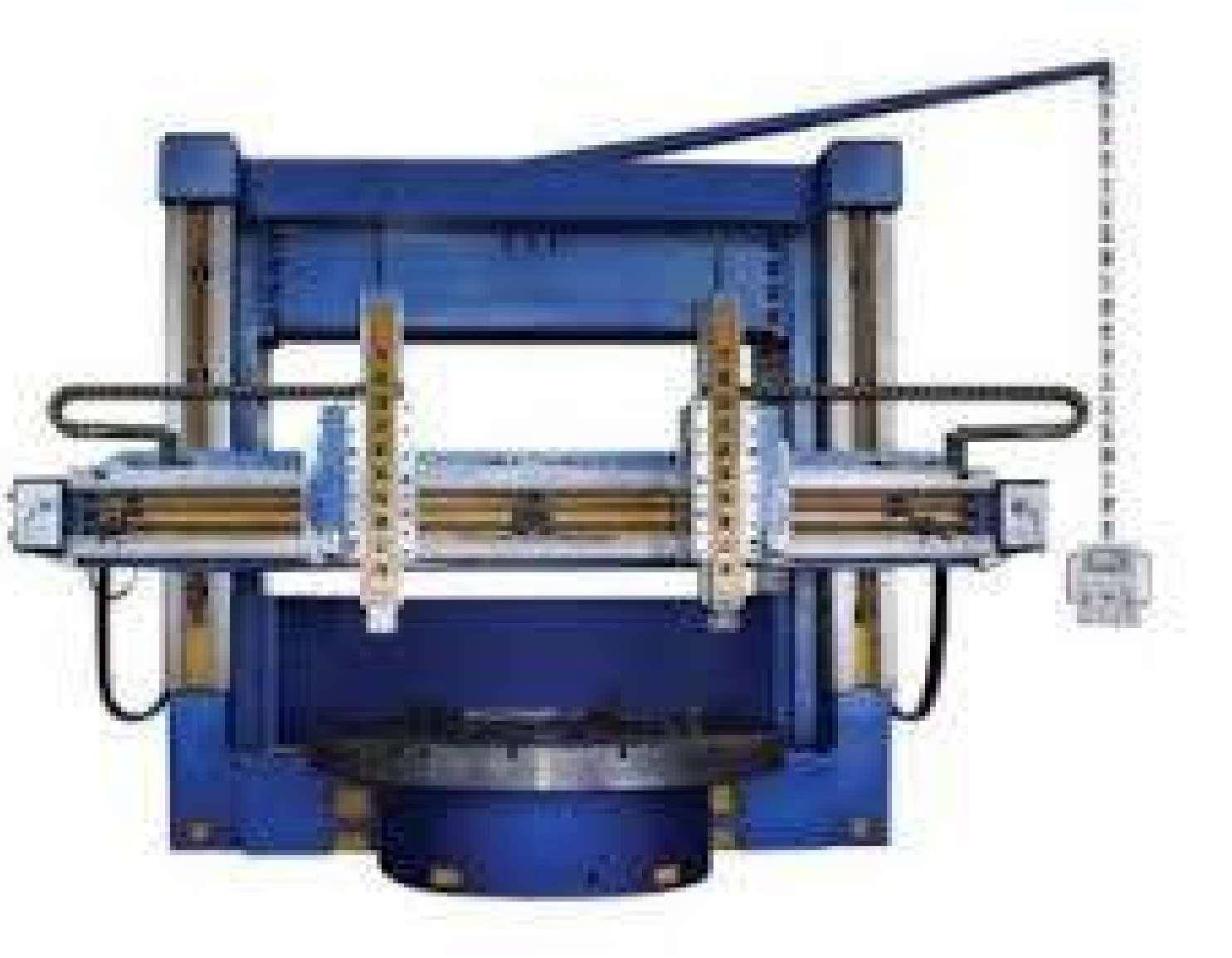
Standard vertical boring machine

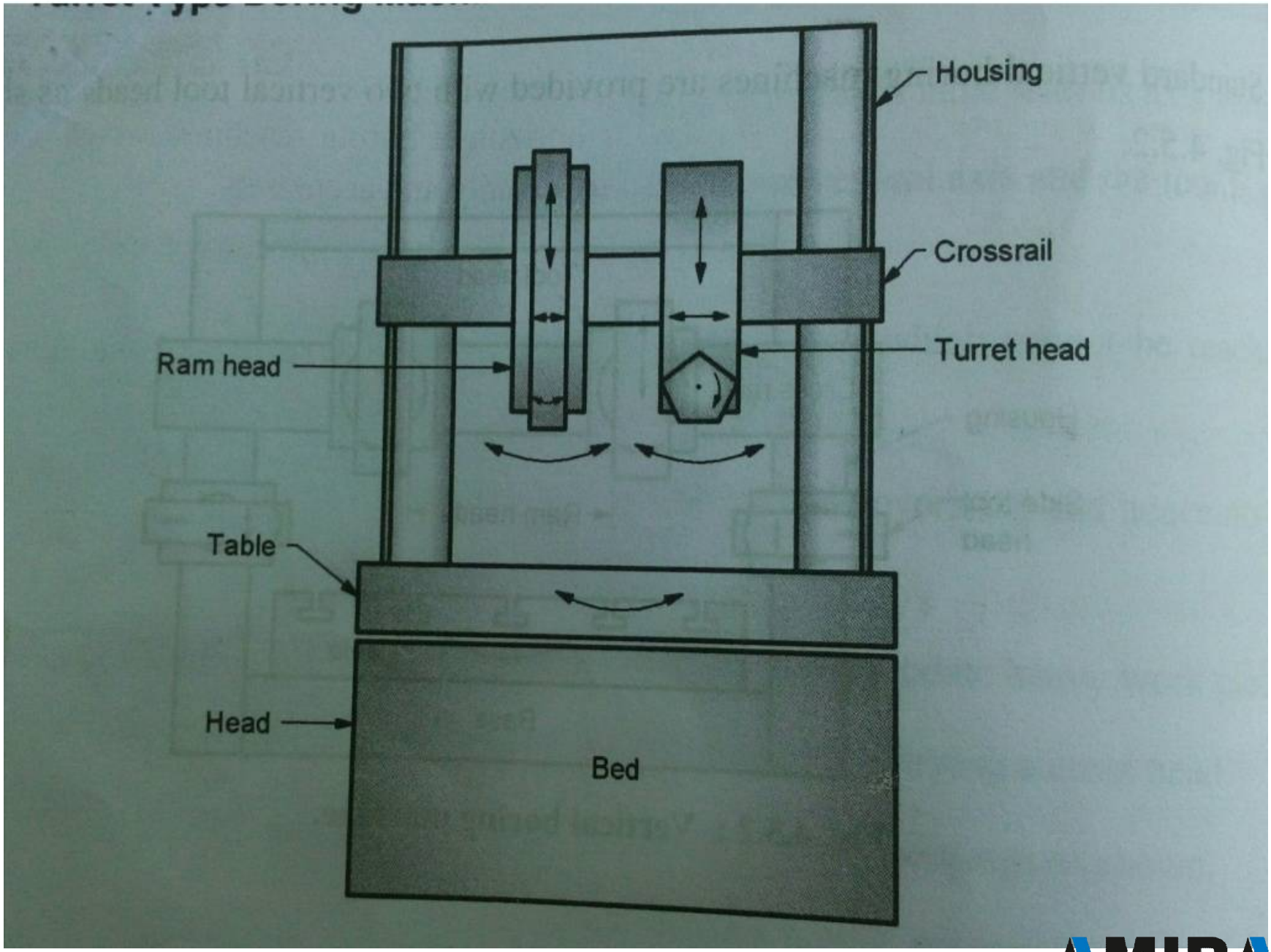
- This boring machine are provided with two vertical tool head.
- The tool head assembly consist of the saddle,ram and tool post.
- Modern vertical boring machine are sometimes equipped with numarical control.
- This facilitates tool setting and adjustment of cutting parameter as well as reduce time of the machine leading to increase production rate.



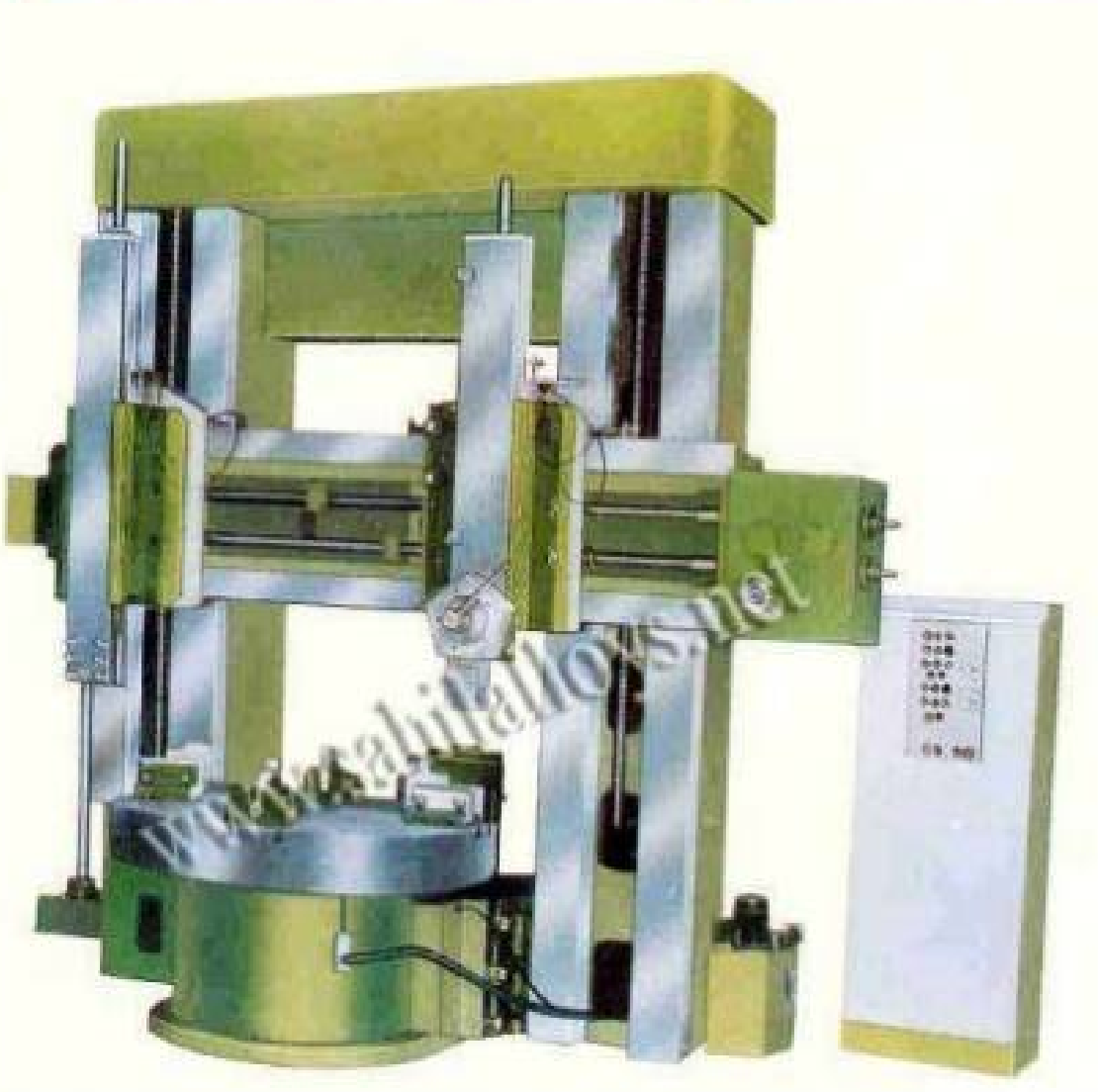


Turret type boring machine

- In this boring machine the vertical to holder in the form of a turret.
- The tool head can be move up and down or left and right.
- The movement of the may be by hand or power.
- A four square turret may also be mounted on the side head which facilitates operation like turning,facing etc.



Vertical boring machine



Precision Boring Machine

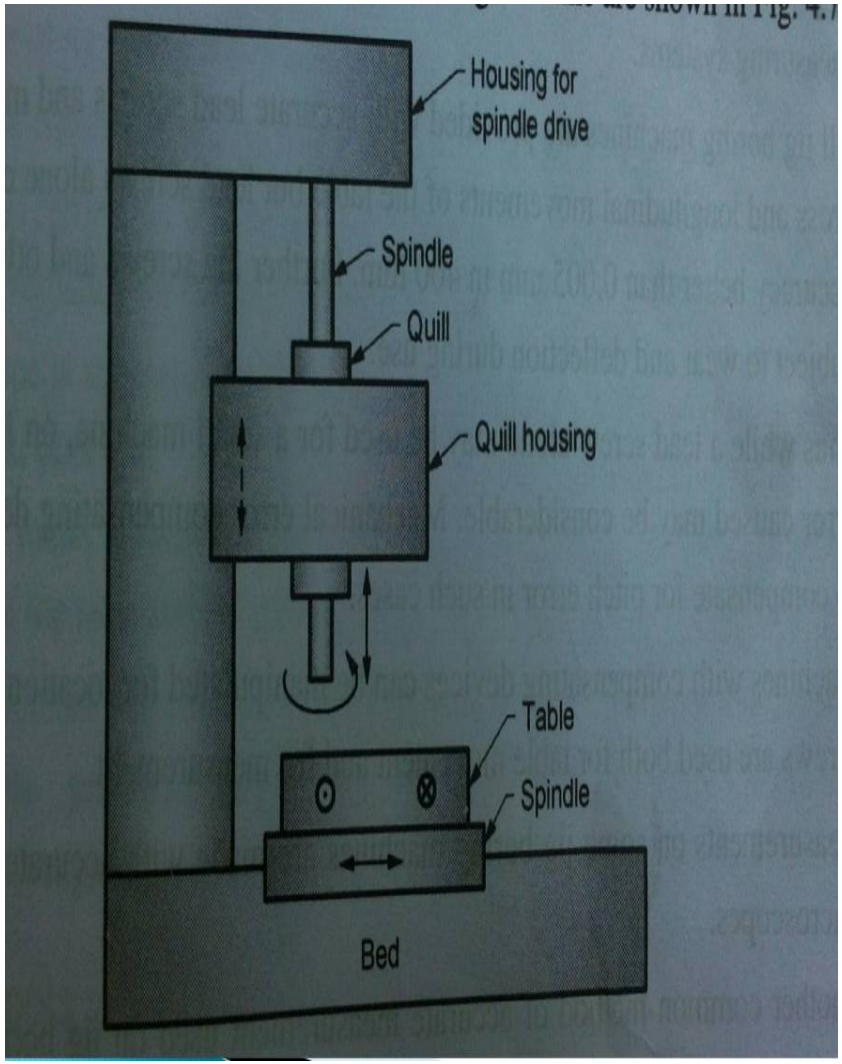
- It uses a single point cutting tools to machine surfaces rapidly and accurately.
- Cemented carbide and diamond tipped tools are operated at a very high cutting speed to produce accurately sized holes with fine surface.
- Jig boring machine is a precision boring machine, resembles to vertical milling machine in construction.
- The feeding movement may be provided to the tool or work depending upon the machine design.

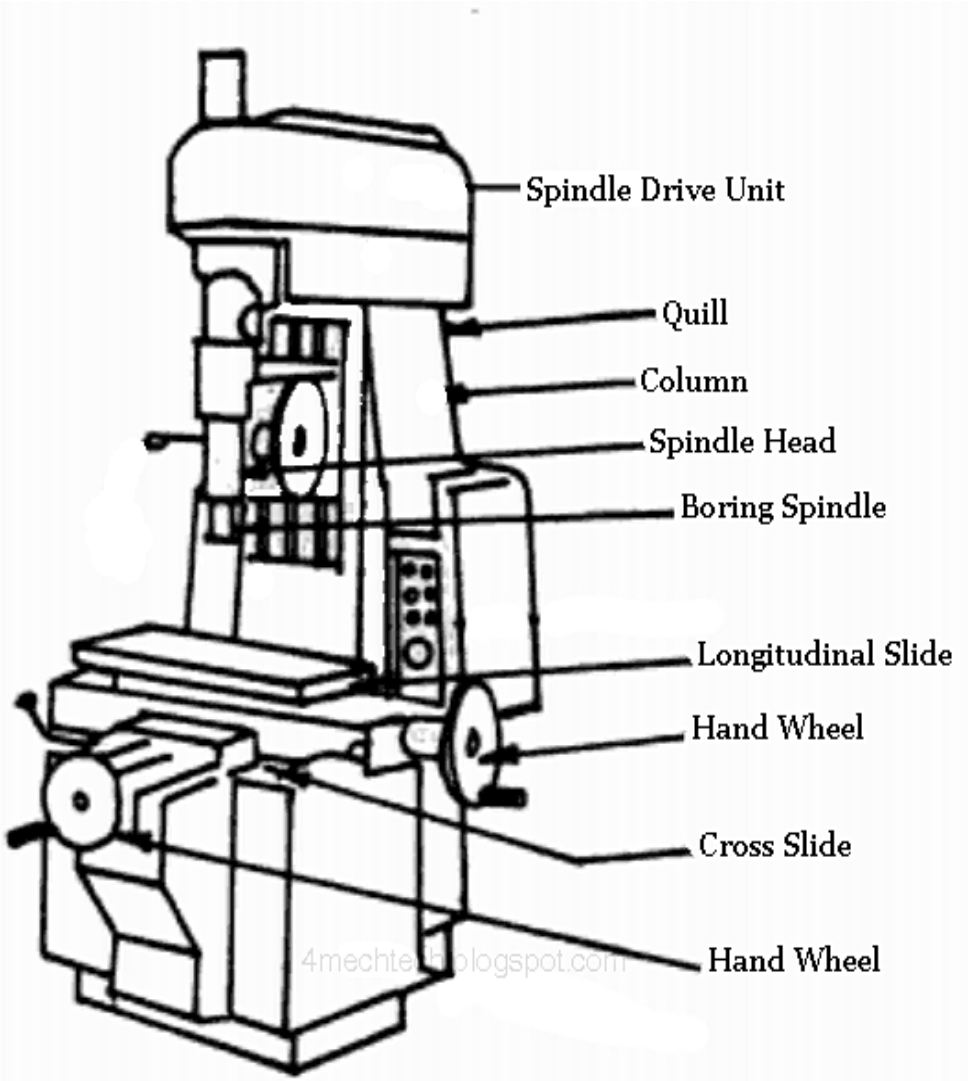
Precision Boring Machine

Jig Boring Machine

Jig boring machine

1. Vertical milling type jig boring machine.
- In general appearance this machine is resembles a vertical milling machine with a base or bed,a column and a vertical spindle.
- Jig boring machine is designed to ensure accuracy through built in rigidity use of low thermal expansion and provision to precise means of measuring movements.





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- Planer type jig boring machine
- This machine consist of two columns with cross rail like a planer.
- The cross rail carries the vertical spindle in its housing along the transverse axis and can be adjusted vertically on the two columns.
- Jib boring machine are also provided with accessories like centering indicators,plan and inclinable precision rotary tables and matched angle plate for mounting and locating workpieces.

QUESTIONS

1.Discuss Horizontal boring machine with a neat sketch.

2. With help of neat sketch explain vertical boring machine and stat function of its part.