

MACHINE DRAWING.

FOR B-TECH

II-MECH.

PREPARED BY

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DEPARTMENT.

Machine Drawing

*Machine drawing may be defined as the representation of a machine component or machine by lines according to certain set rules.

*A machine drawing generally gives all the external and internal details of the machine component from which it can be manufactured.

*The machining symbols, tolerances, bill of material, etc. are specified on the drawing.

*The relative position of the different components and to make assembly drawing are also specified. IS: 696—1972 is the BIS Code for Machine Drawing

▪

****Assembly Drawing--**

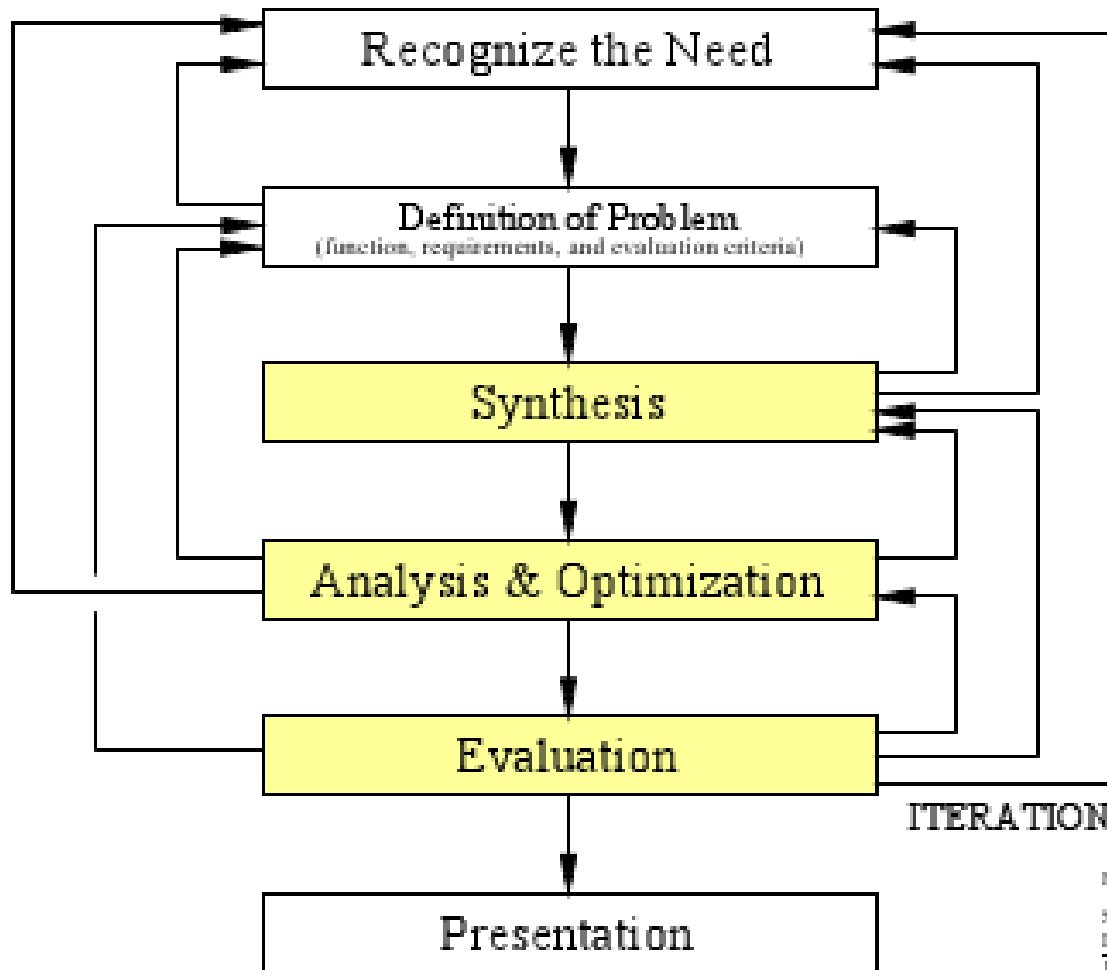
An assembly drawing shows all the complete drawing of a given machine indicating the relative positions of various components assembled together.

****Assembly Drawings** : A complete assembly drawing is presentation of the product or structure put together, showing all parts in their operational positions. The separate parts come to the assembly department after their manufacturing processes are finished and in this department they are put together according the assembly drawings.

****Assembly drawings** should include reference letters and numbers representing the different parts. These part numbers usually enclosed by circles with a leader pointing to the piece .

Phases of Design

Phases of Design:
(similar to Mott, F 1-11)



From:
Shigley, Mechanical Engineering Design, 1st Ed, McGraw-Hill, 1972

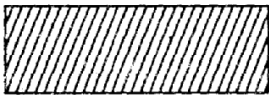
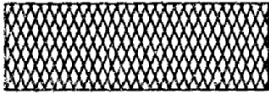

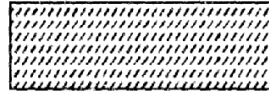
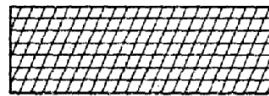
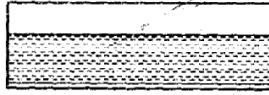


PART DRAWINGS--- 1

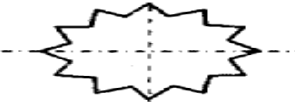

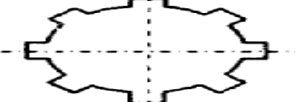
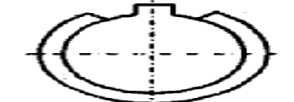
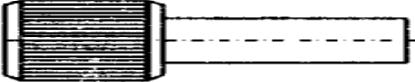
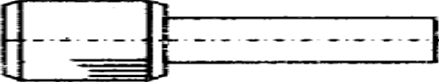
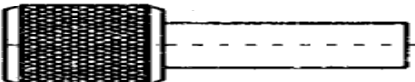
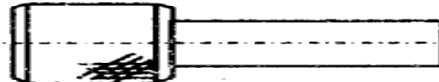
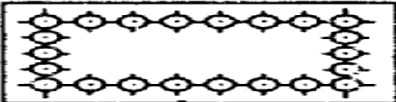
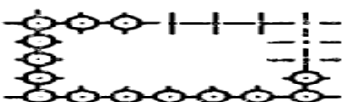
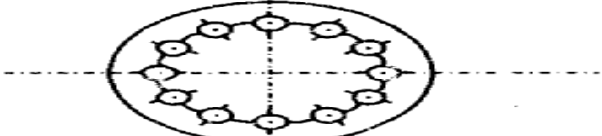

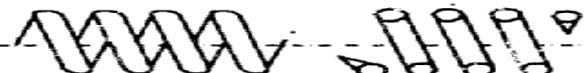
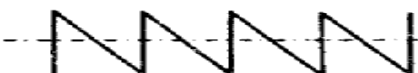
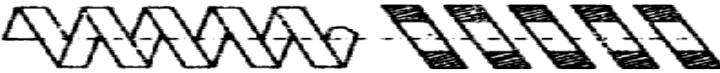
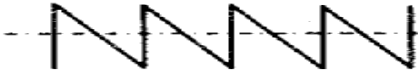

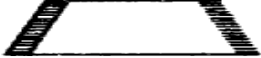
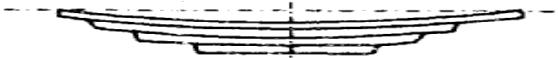
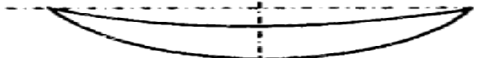
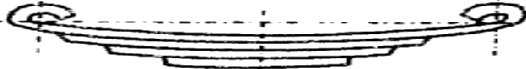
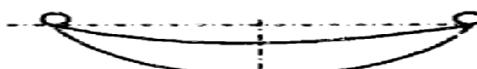
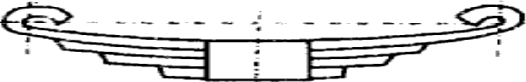
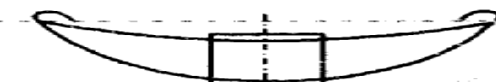
UNIT 1


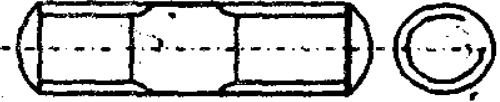
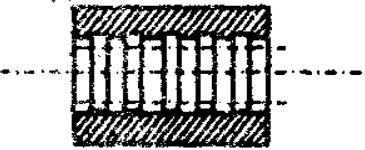
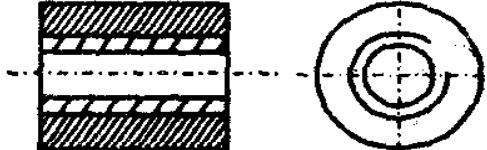
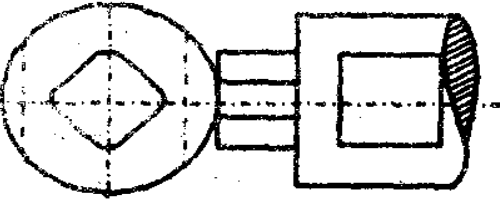
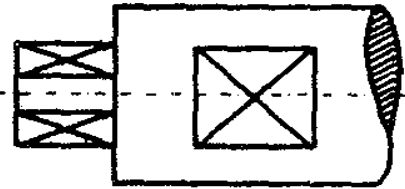
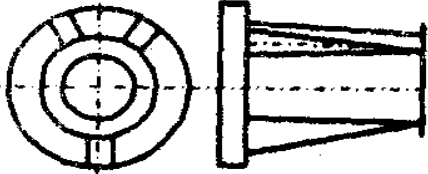
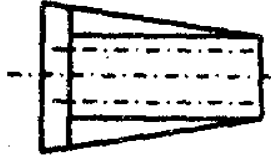
I. Drawing of Machine Elements and simple parts

- Selection of Views, additional views for the following machine elements and parts with every drawing proportions.
- Popular forms of Screw threads, bolts, nuts, stud bolts, tap bolts, set screws.
- Keys, cottered joints and knuckle joint.
- Riveted joints for plates.
- Shaft coupling, spigot and socket pipe joint.
- Journal, pivot and collar and foot step bearings.
- Conventional representation of materials, common machine elements and parts such as screws, nuts.

CONVENTIONAL REPRESENTATION OF MATERAILS

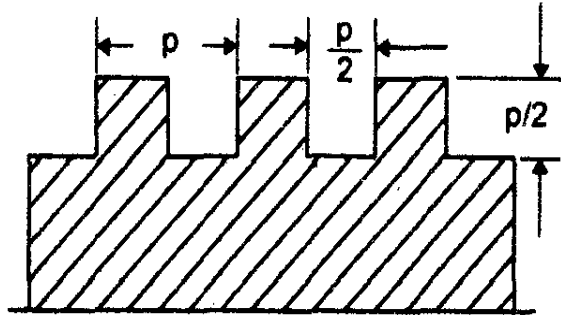
Type	Convention	Material
Metals		Steel, cast iron, copper and its alloys, aluminium and its alloys
		Lead, zinc, tin, white metal
Glass		Glass
Packing and insulating materials		Porcelain, stoneware, marble, slate
		Asbestos, fibre, felt, synthetic resin products, paper, cork, linoleum, rubber, leather, wax, insulating and filling material
Liquids		Water, oil, petrol, kerosene
Wood		Wood, plywood
Concrete		Concrete

TITLE	ACTUAL PROJECTION	CONVENTION
Serrated Shaft		
Splined Shaft		
Straight Knurling		
Diamond Knurling		
Holes on linear pitch		
Holes on circular pitch		
Compression spring with circular section		
Compression spring with square section		
Disc spring		
Leaf spring without eye		
Leaf spring with eye		
Leaf spring with eye and centre band		

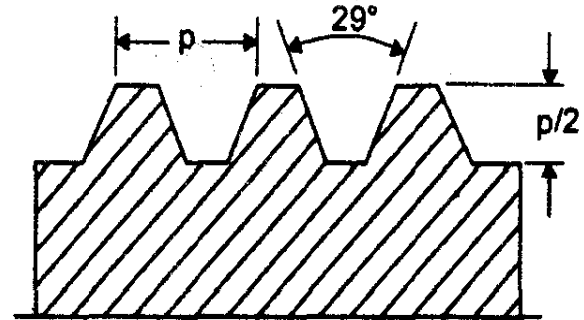
TITLE	ACTUAL PROJECTION	CONVENTION
External thread		
Internal thread		
Square end and flat		
Radial ribs		



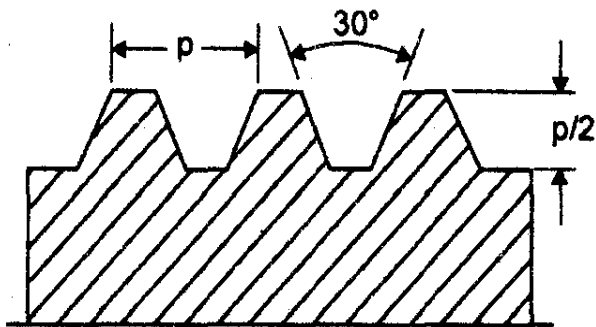
NUTS, BOLTS AND SCREWS



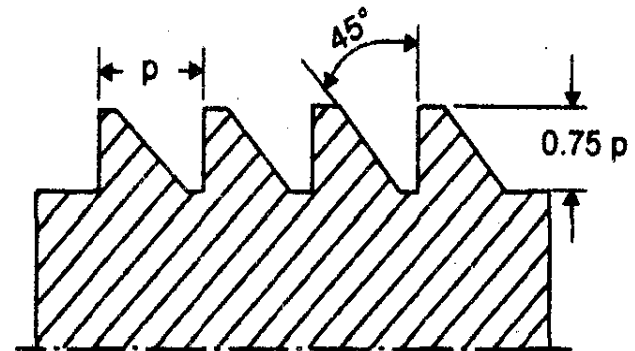
(a) Square Thread



(b) Acme Thread



(c) Trapezoidal Thread



(d) Buttress Thread

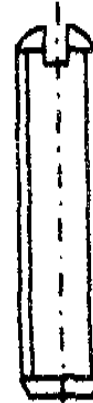
Fig. 5.39 Forms of square threads.



**(h) Slotted set screw
with full dog point**



**(i) Slotted set screw
with cone point**



**(j) Slotted set (grub)
screw with cup point**



**(k) Slotted CSK
flat head tapping
screw**

Fig. 5.31 Types of screws.

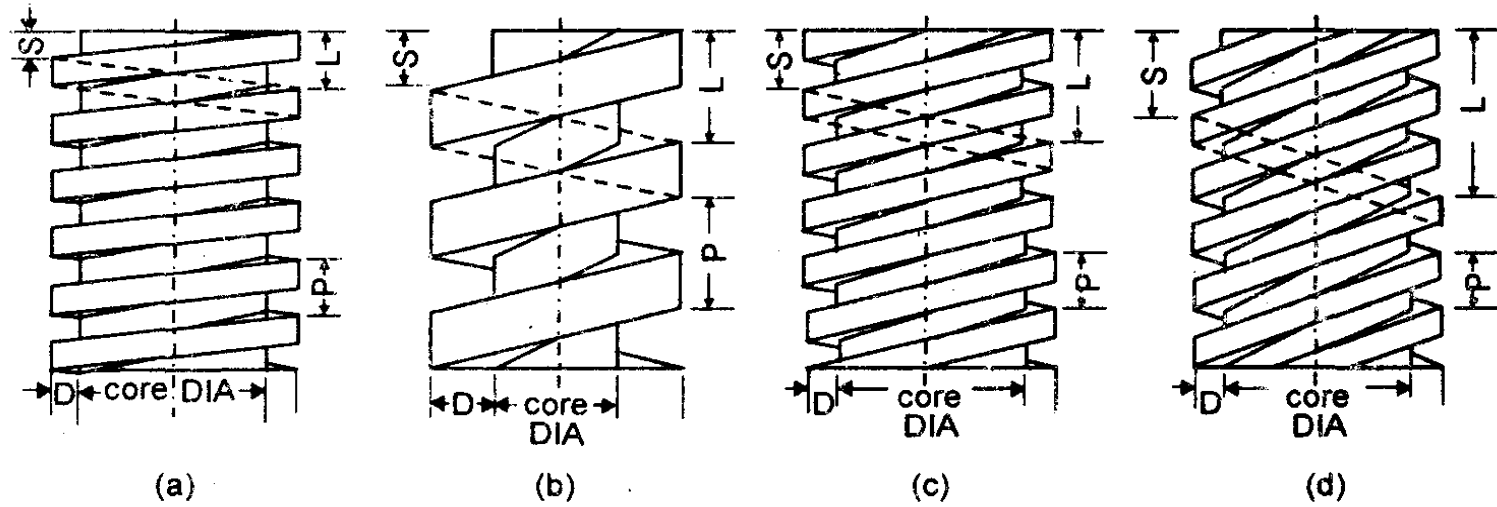


Fig. 5.17 Single-start and multi-start threads.

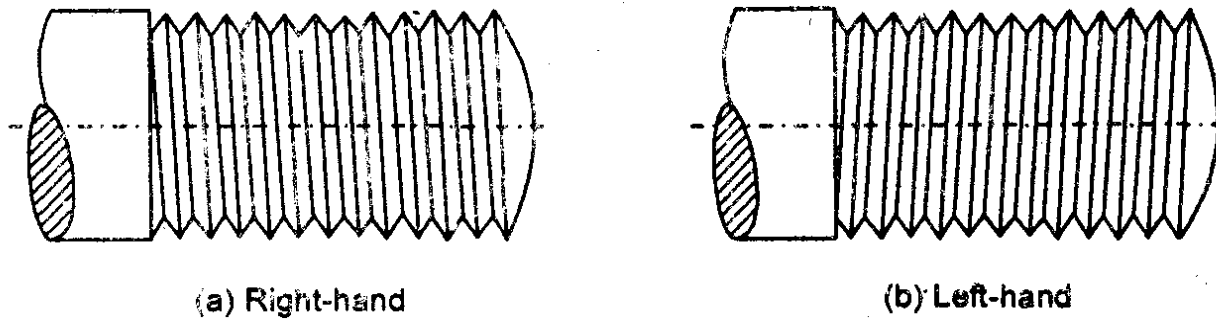
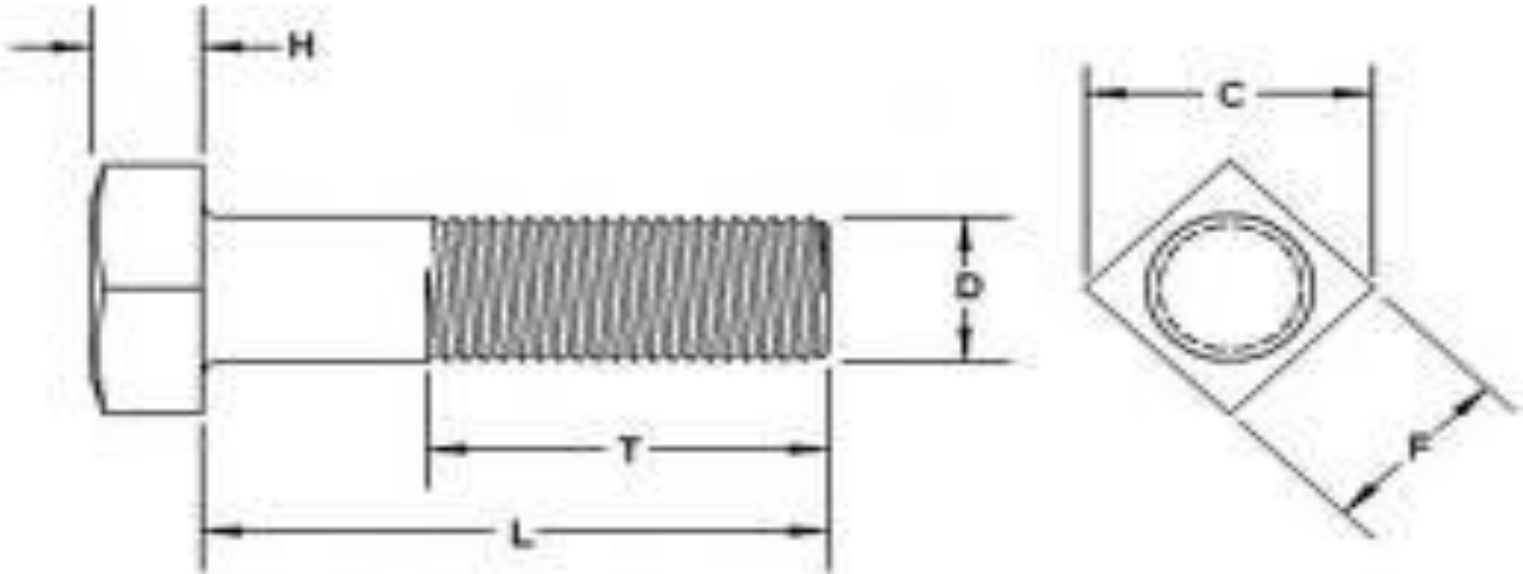
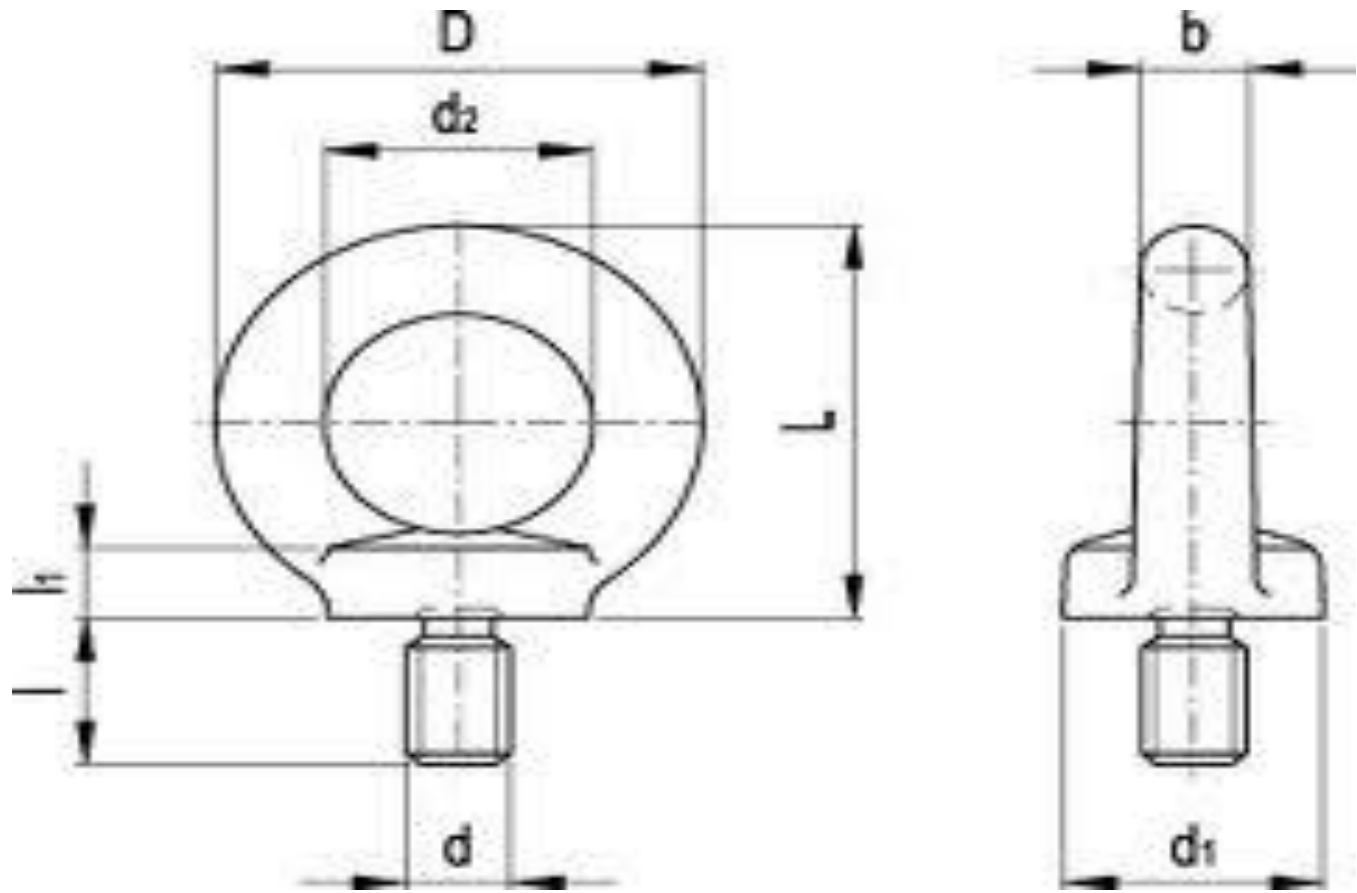


Fig. 5.19 Right hand and left hand threads.

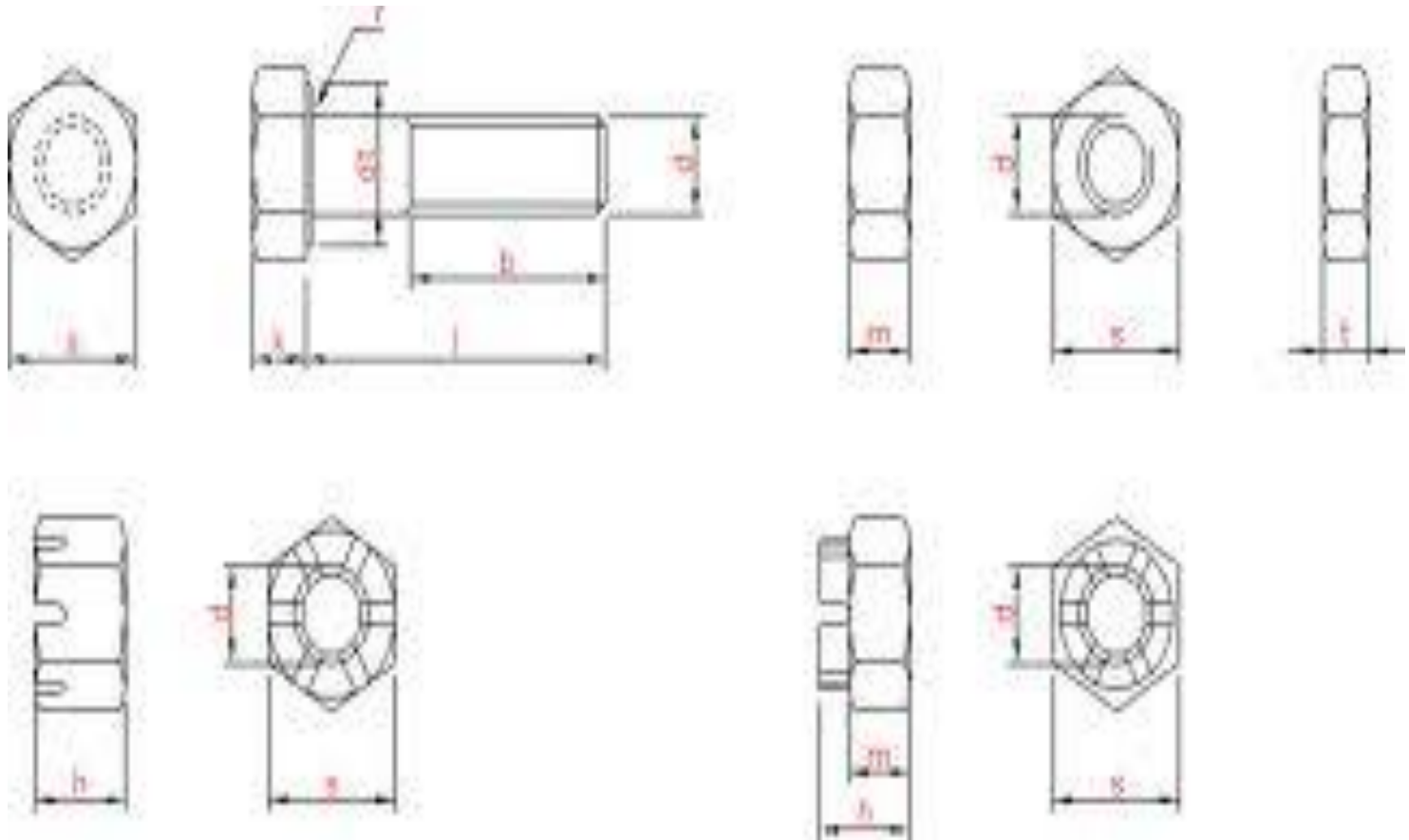
SQUARE BOLT



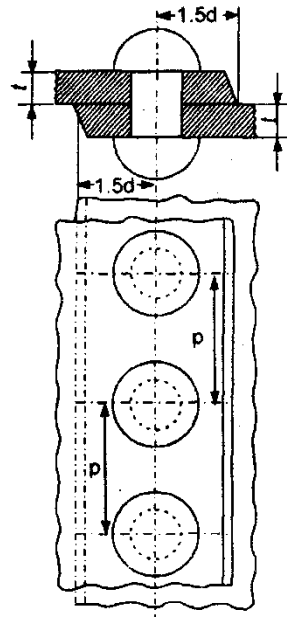
EYE BOLT



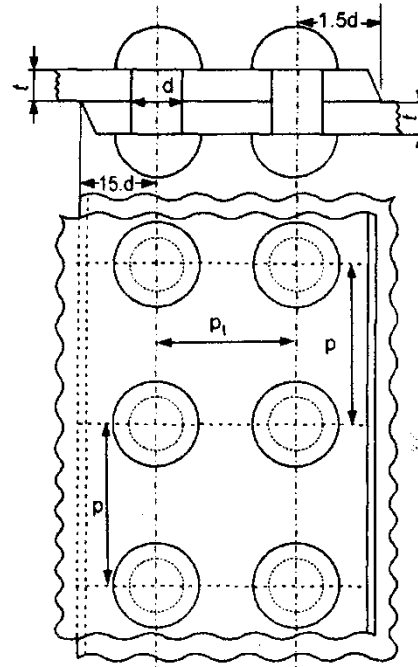
HEGONAL BOLT NUT WITH WASHER



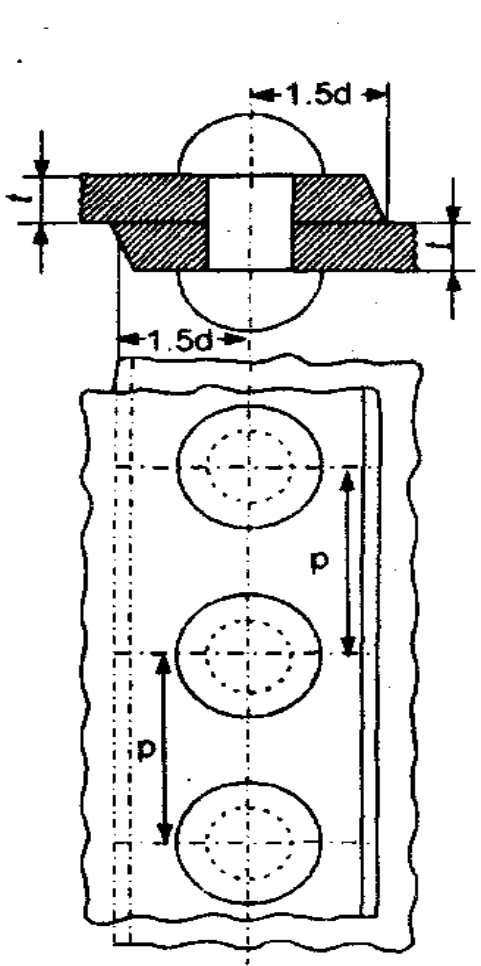
RIVETTED JOINTS



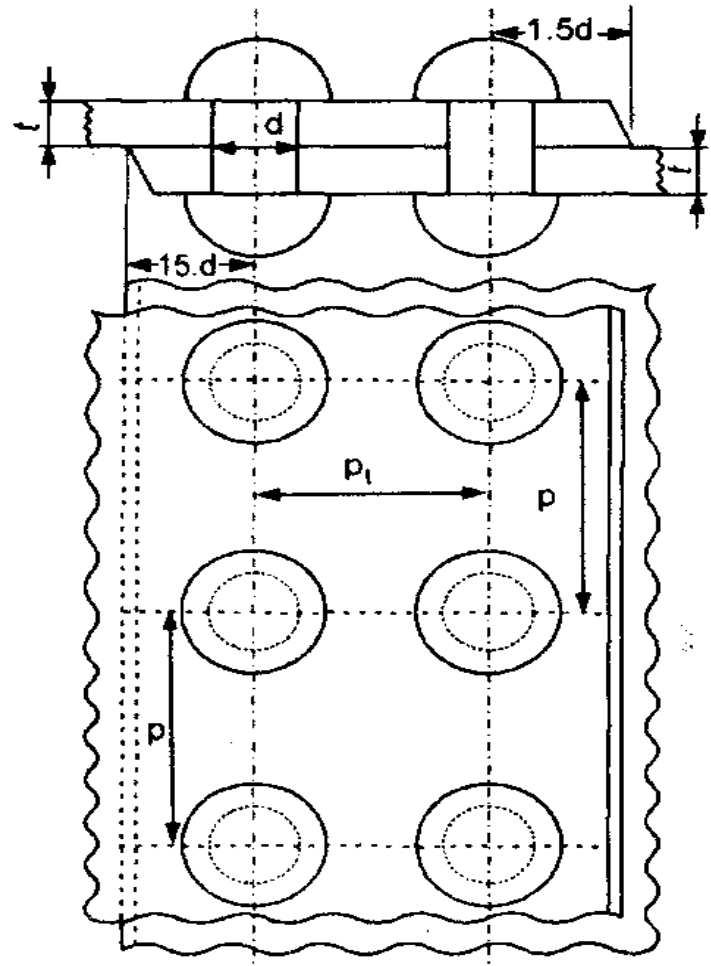
(a) Single riveted lap joint



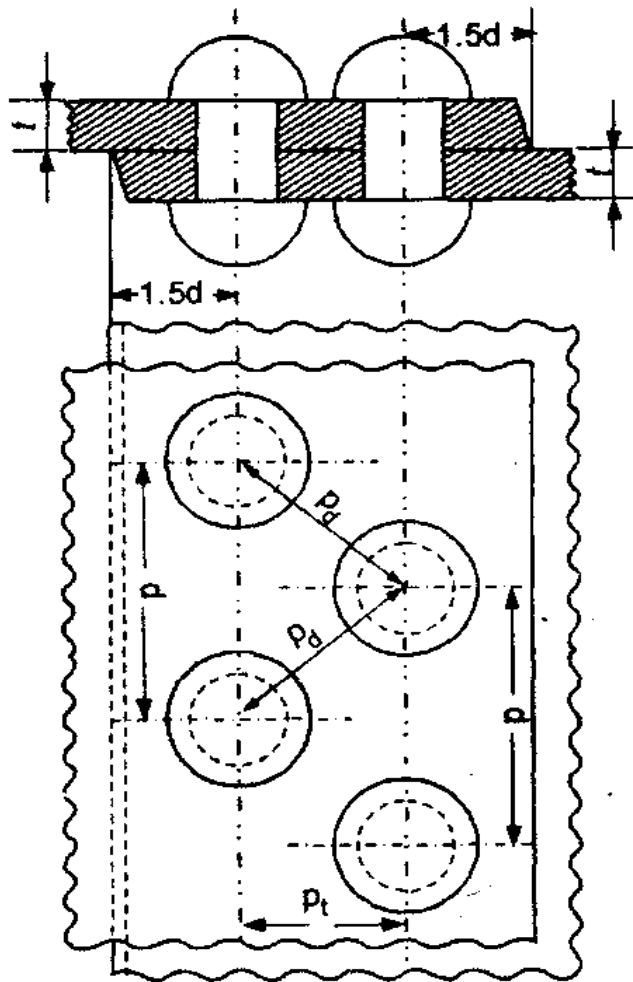
(b) Double riveted lap joint (Chain riveting)



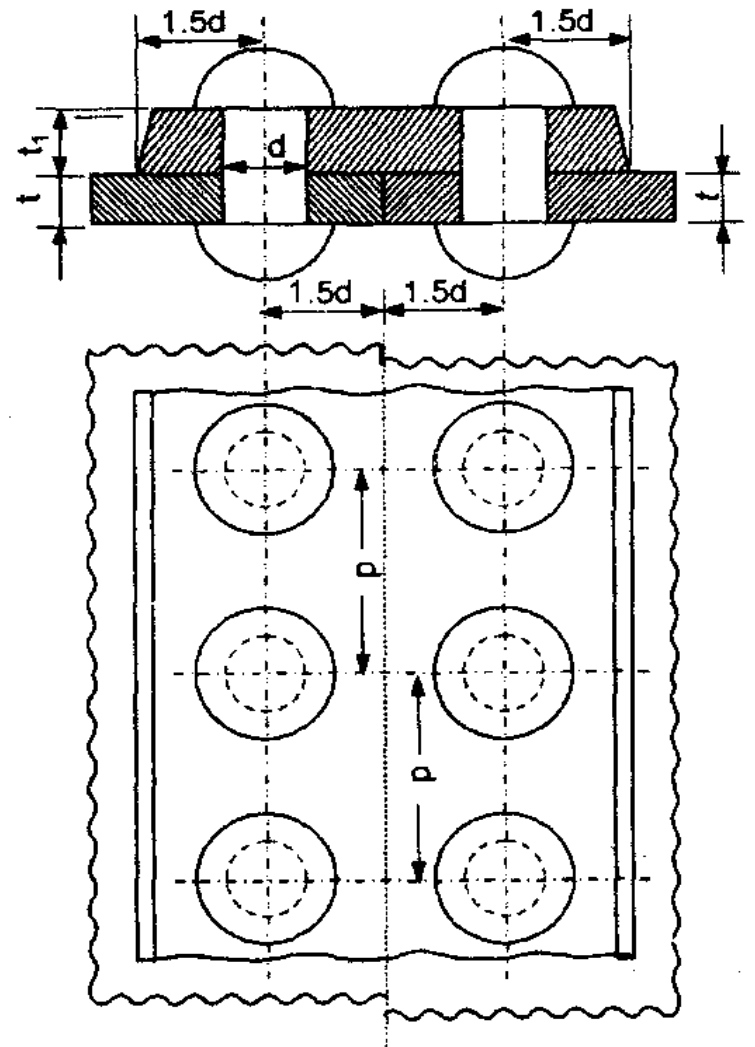
(a) Single riveted lap joint



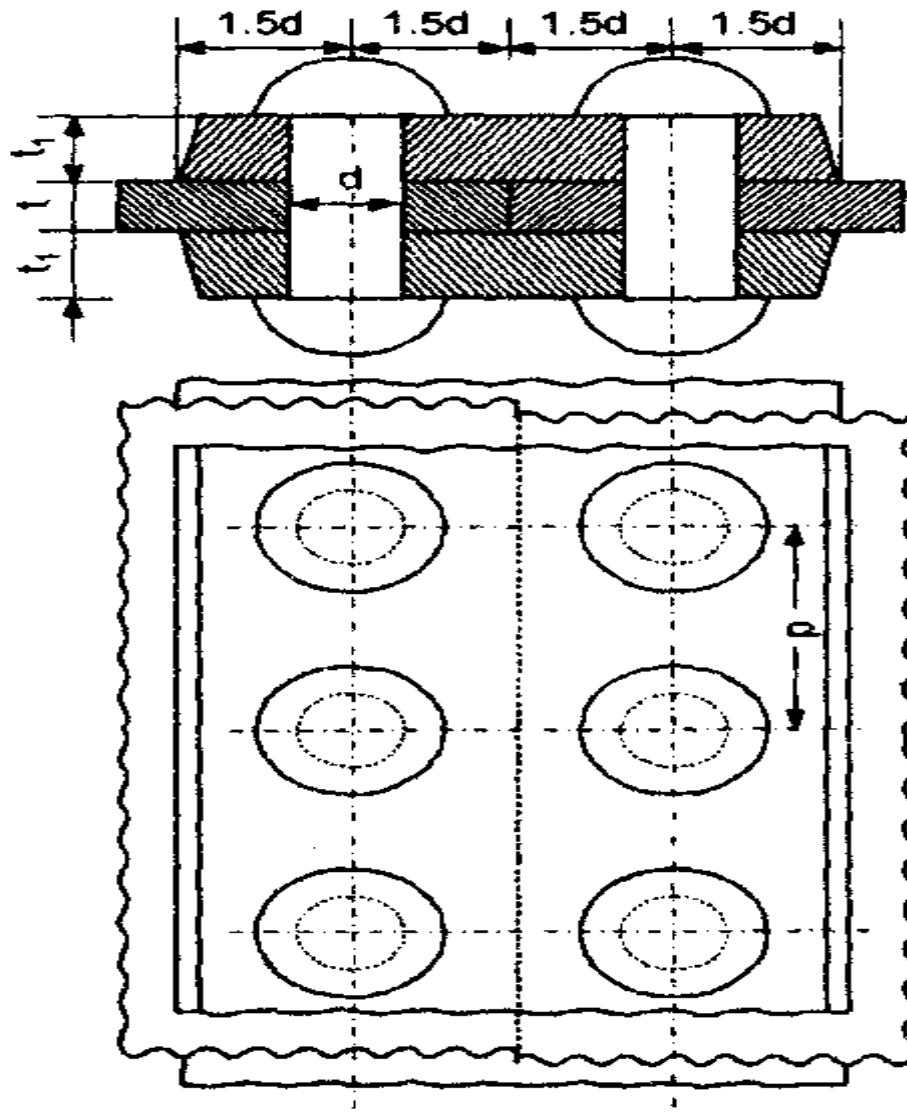
(b) Double riveted lap joint (Chain riveting)



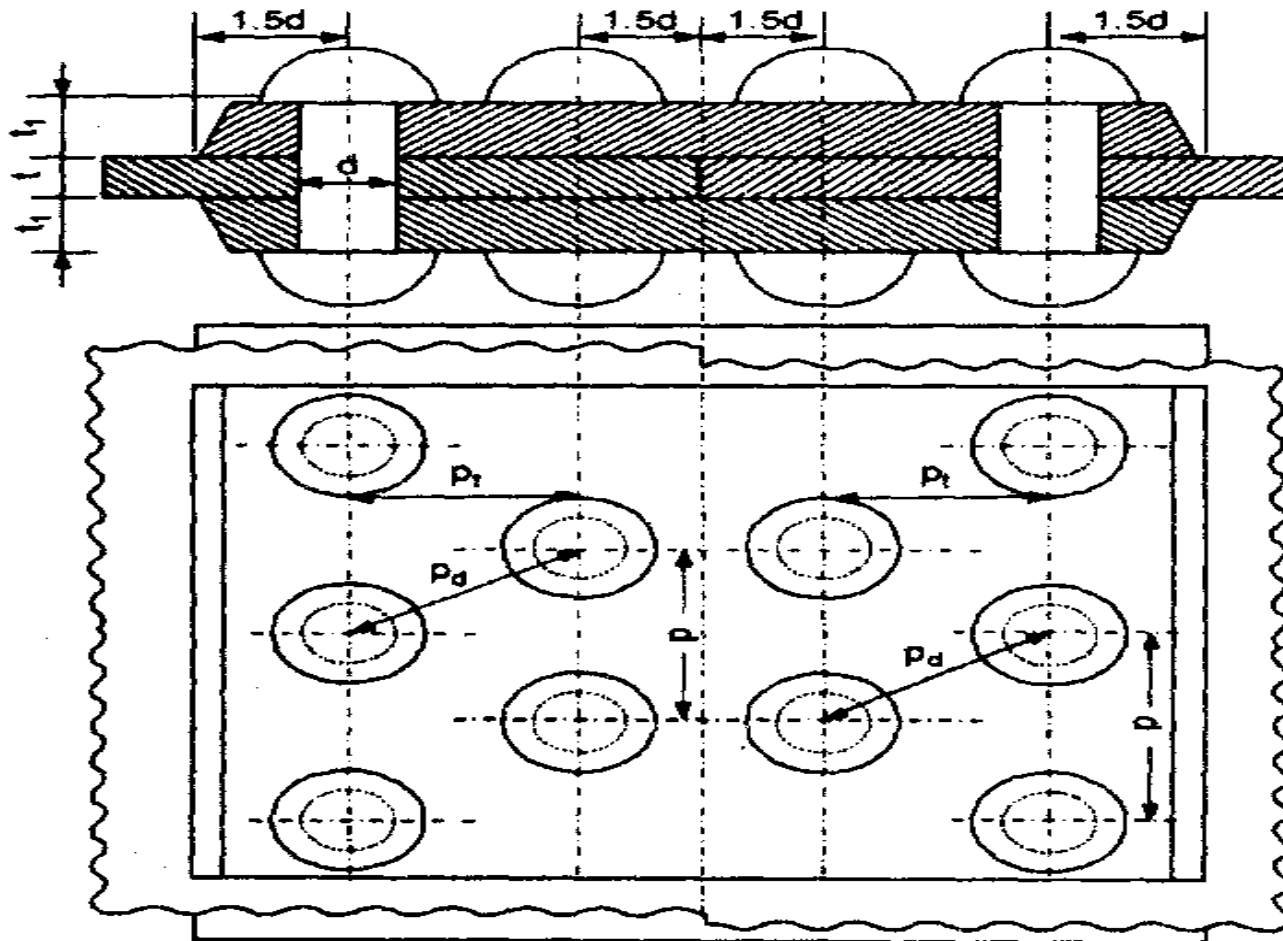
(c) Double riveted lap joint (zigzag riveting)



(d) Single riveted butt joint with single cover plate



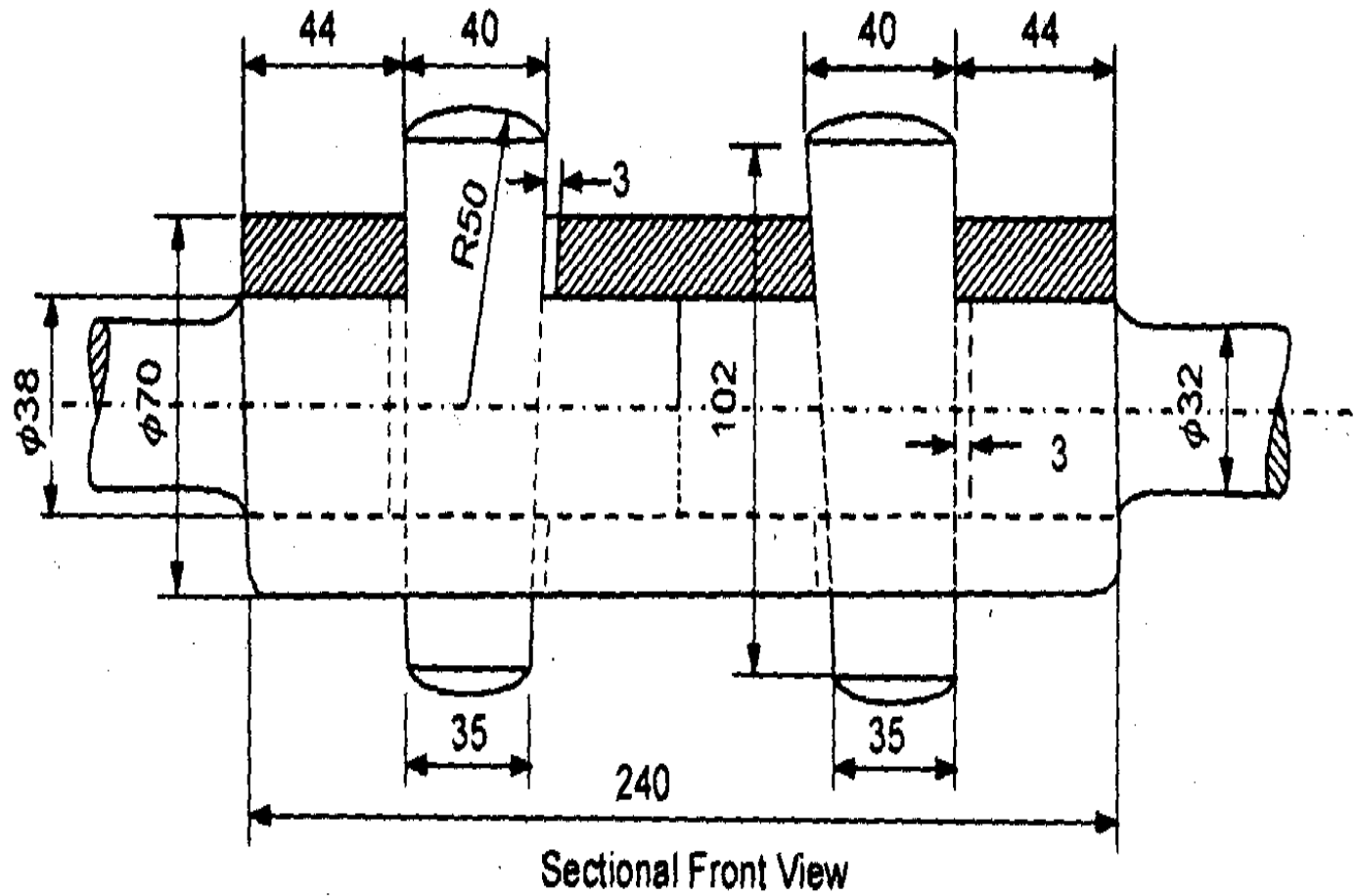
(e) Single riveted butt joint with double cover plates.



(f) Double riveted butt joint with double cover plates.

Fig. 6.2 (a)–(f) Types of riveted joint.

cotter joint with sleeve



MUFF COUPLING

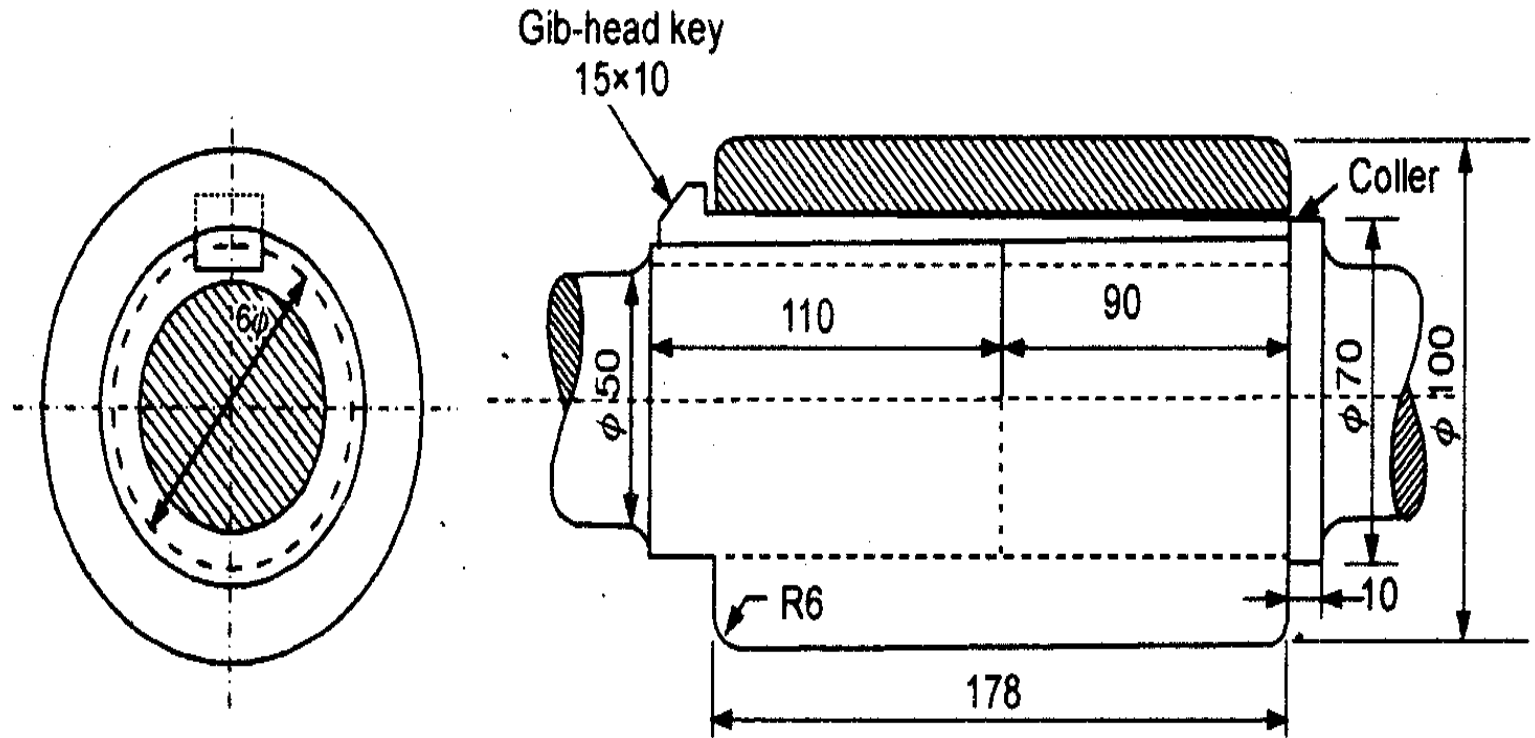


Fig. 8.4 Muff coupling

PROTECTED FLANGE COUPLING

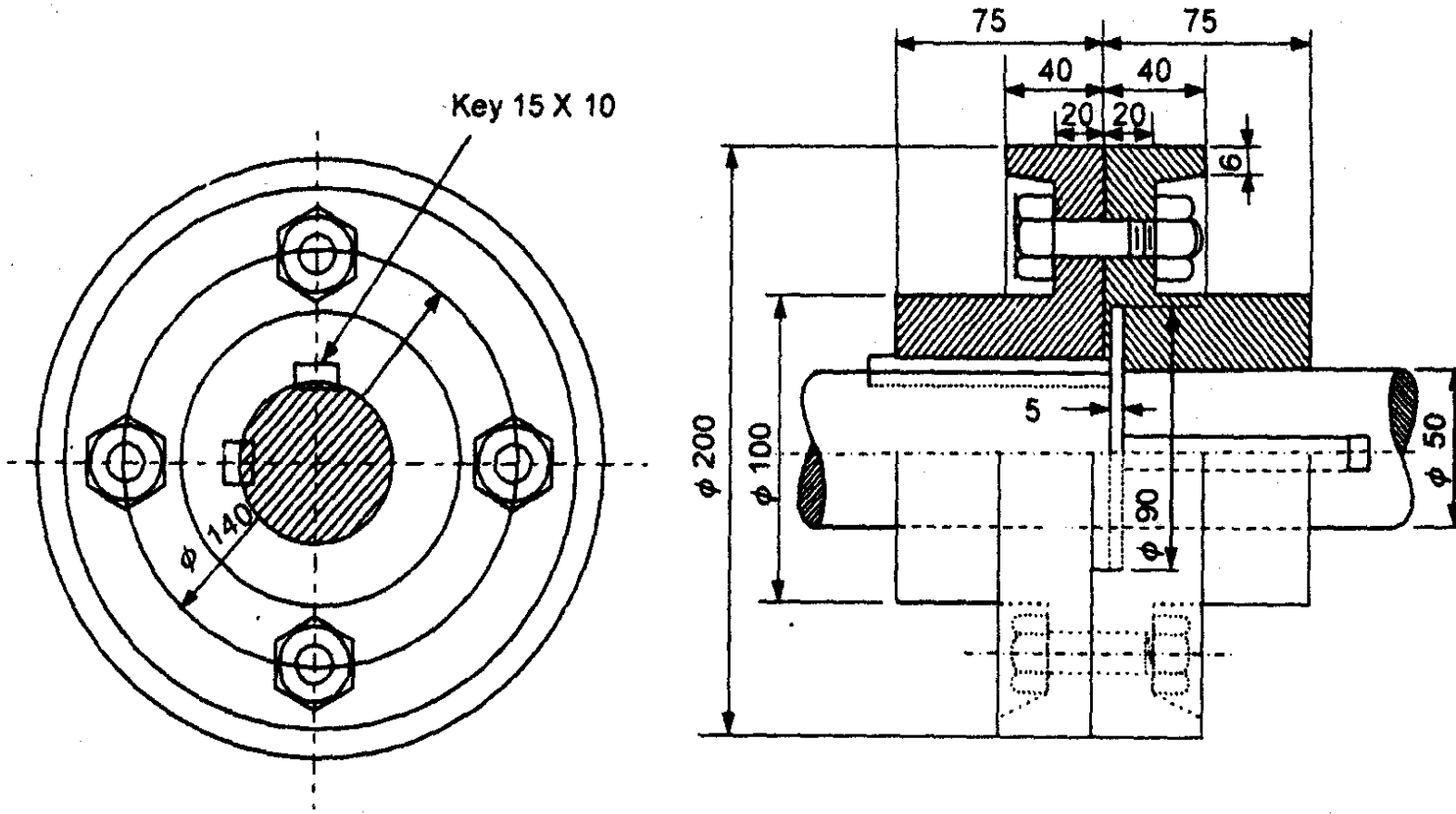


Fig. 8.2 Protected type flange coupling

UN-PROTECTED FLANGE COUPLING.

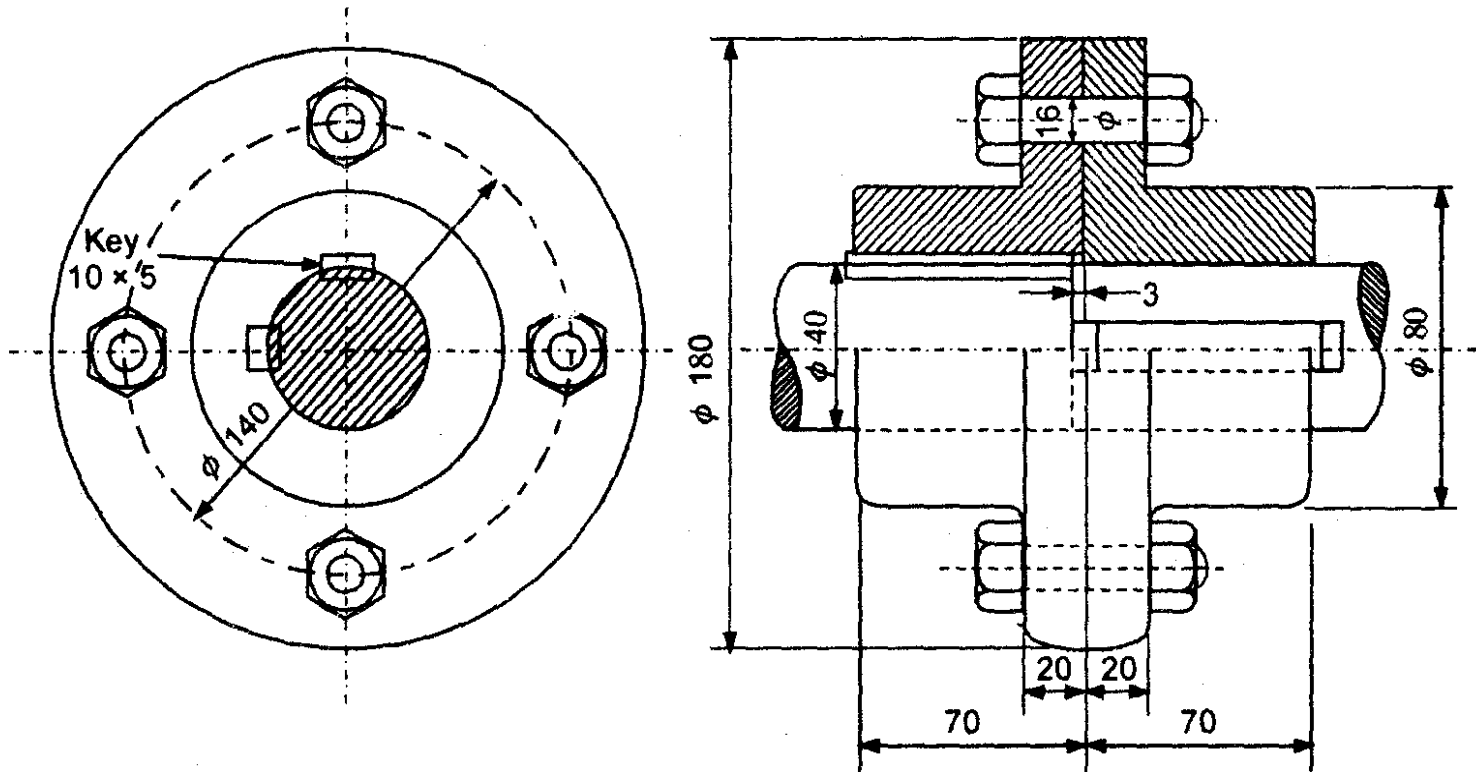


Fig. 8.1 Rigid unprotected type flanged coupling.

ASSEMBLY DRAWING

UNIT 2

Assemble view of Lathe Tail stock

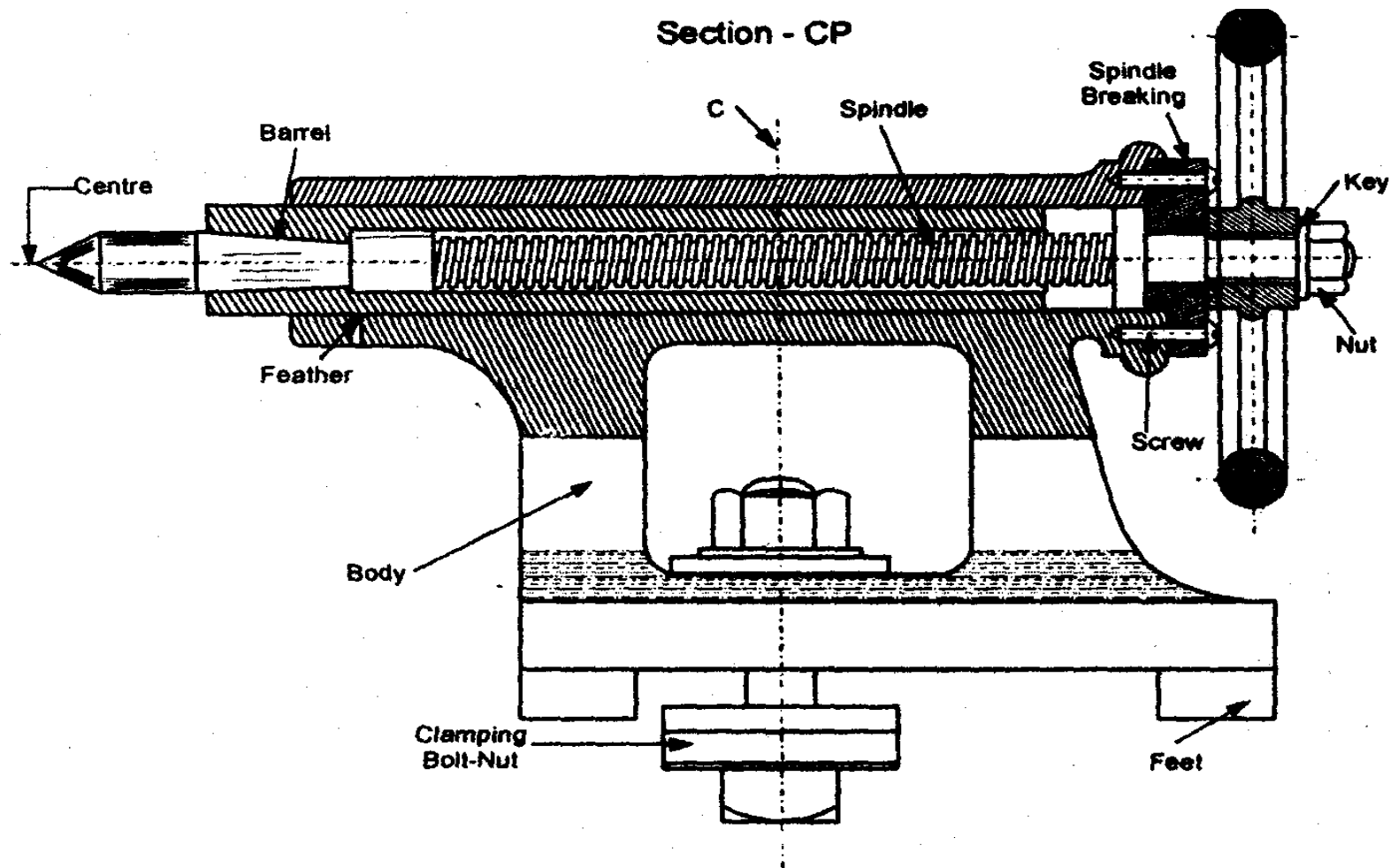
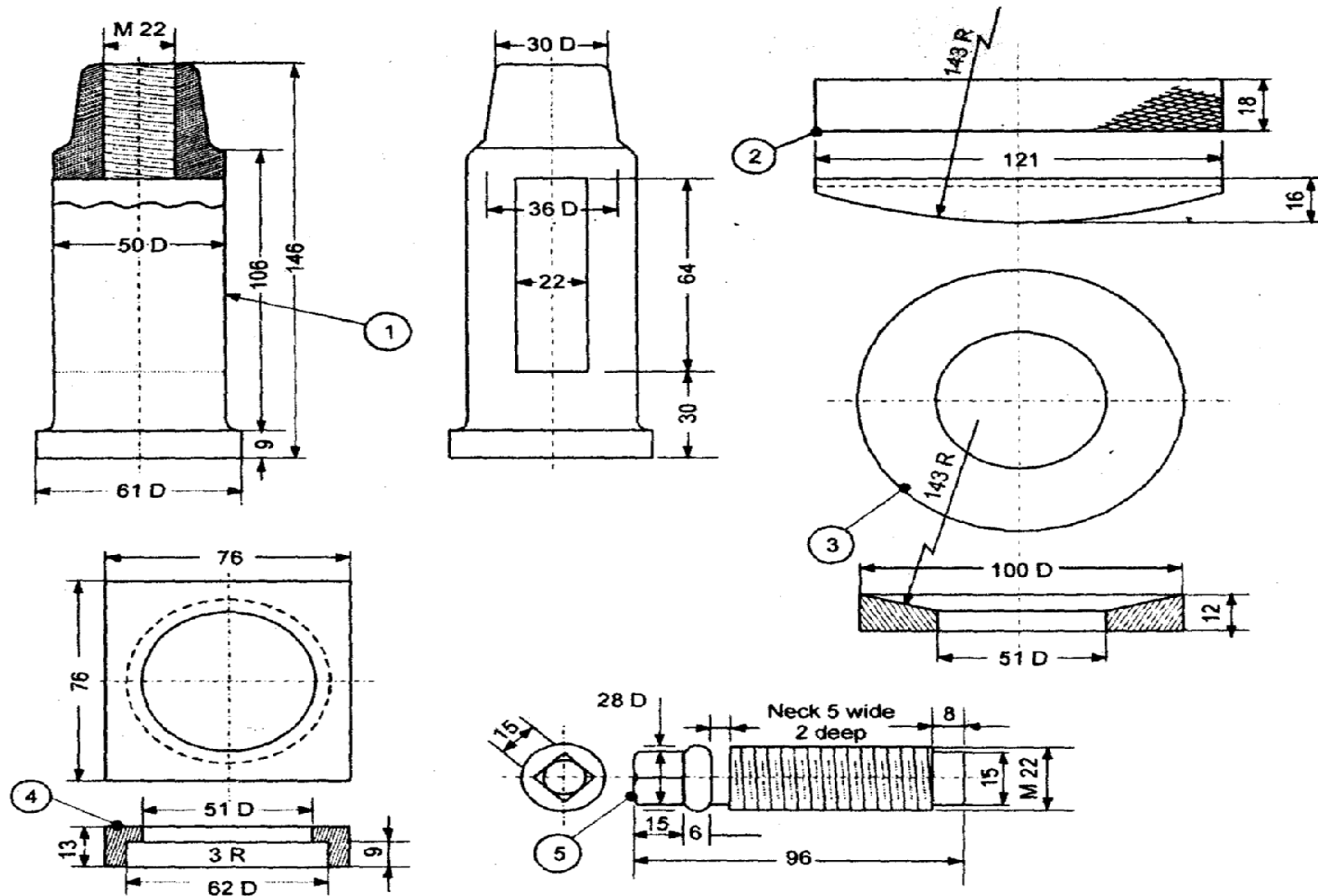
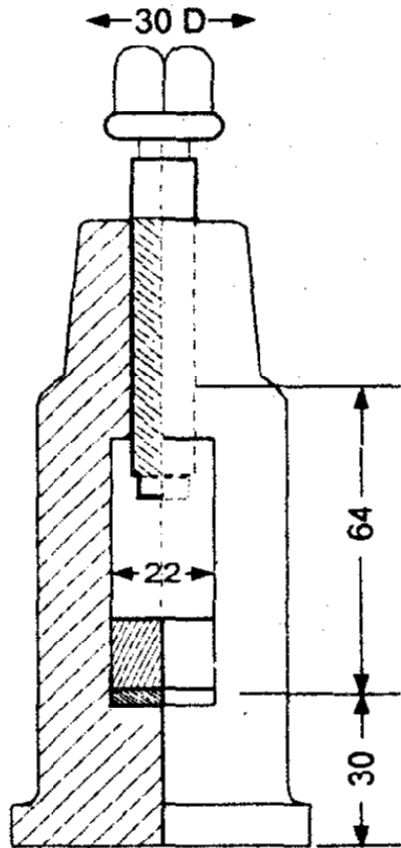


Fig. 14.18 General arrangement of lathe tail stock.

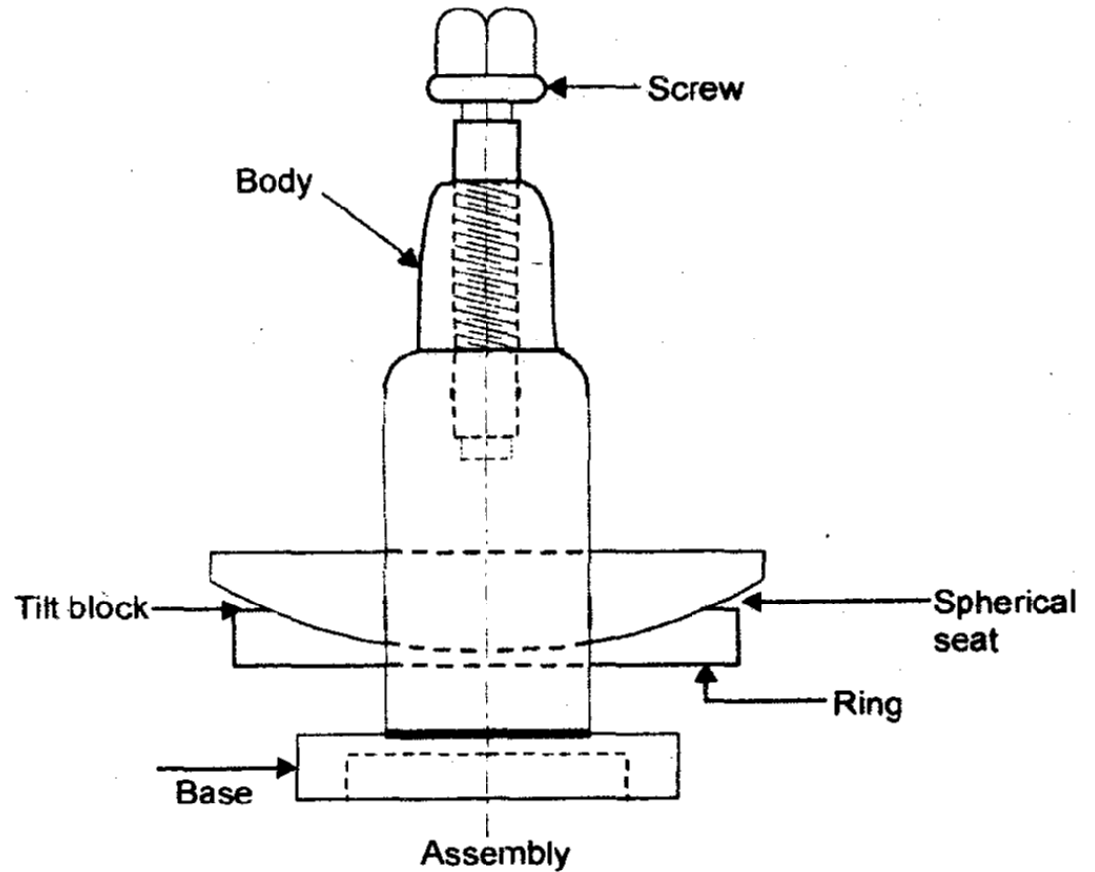
Draw the front view and side of the lathe tool post



Assemble view of Lathe Tool Post



(c) Right-end view left hand in section



(a) Front View

Draw the Sectional front view of the stuffing box.

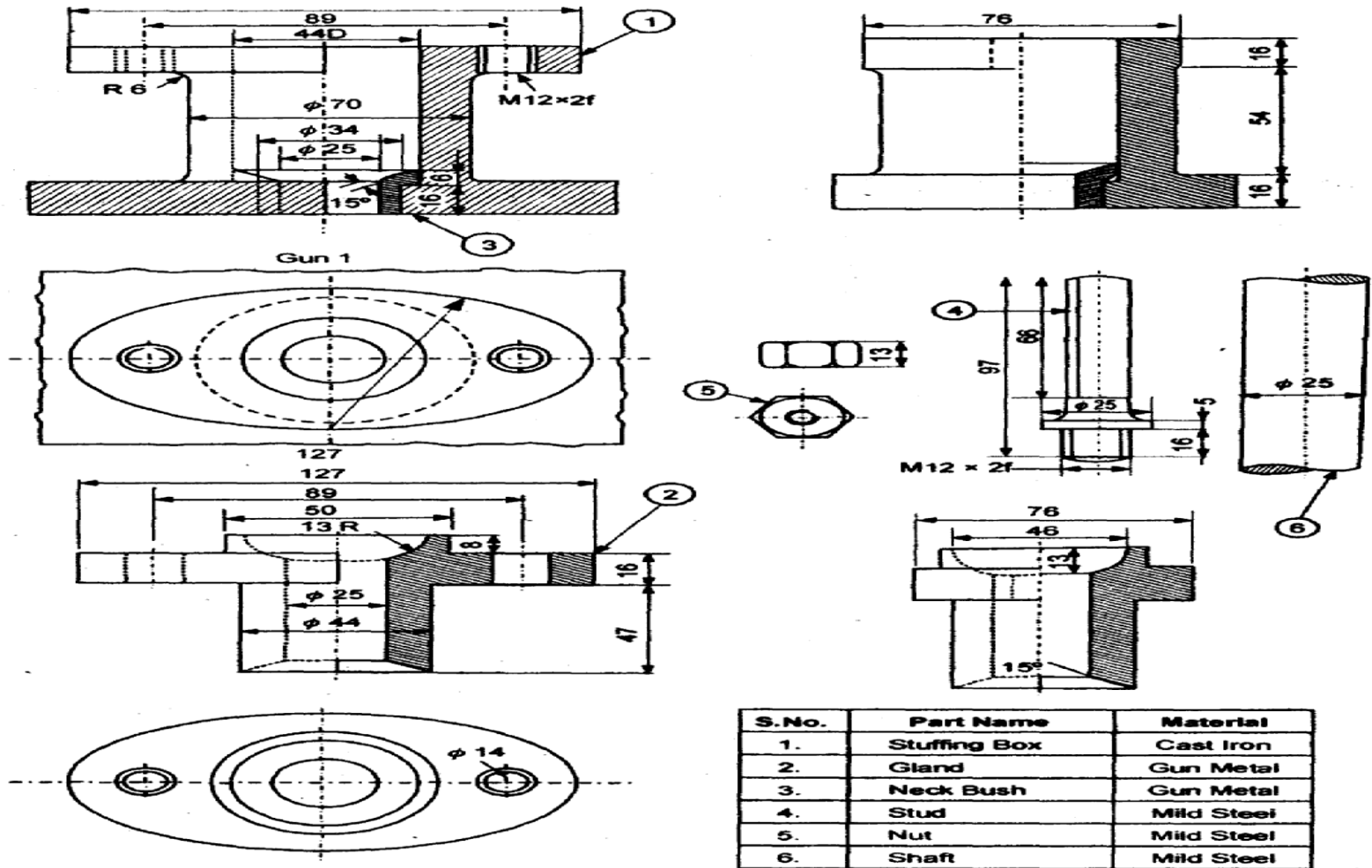
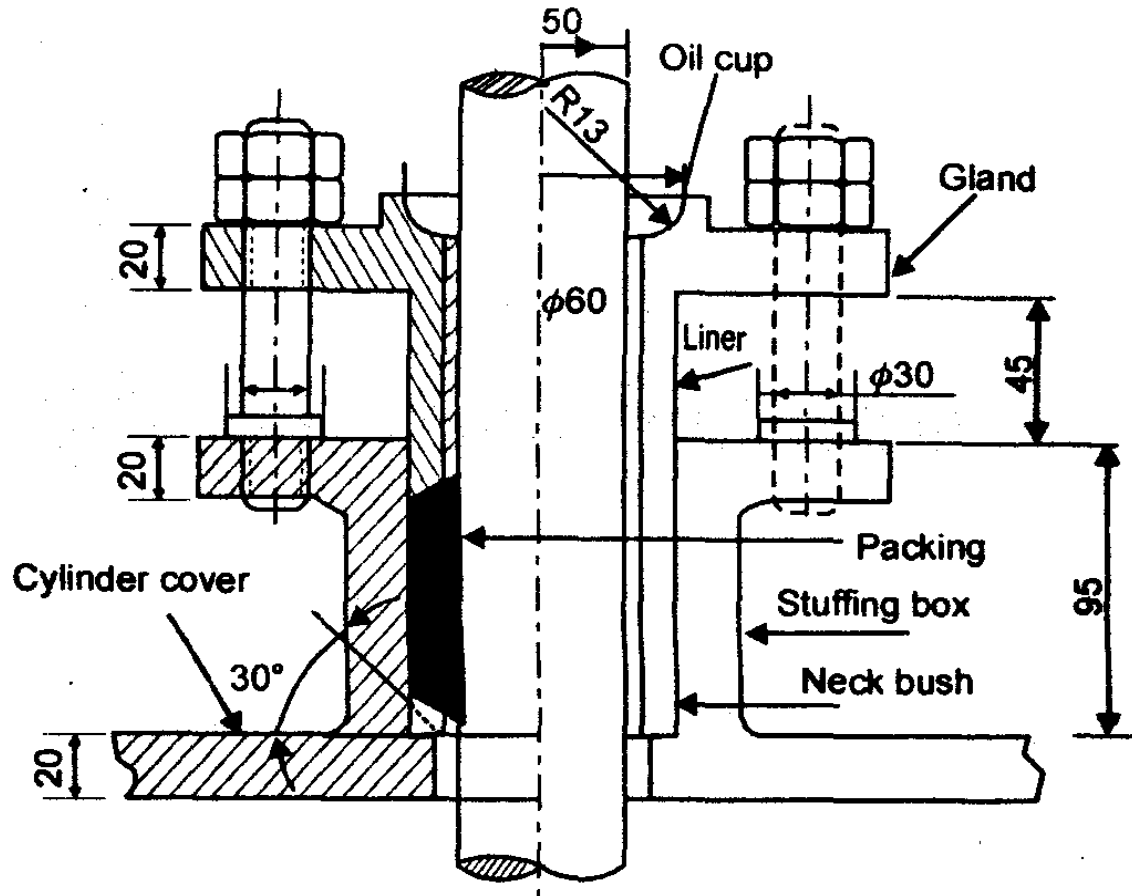


Fig. 14.11 Details of a stuffing box.

Assemble view of Stuffing Box



Front view left half in section

Assemble view of Screw Jack

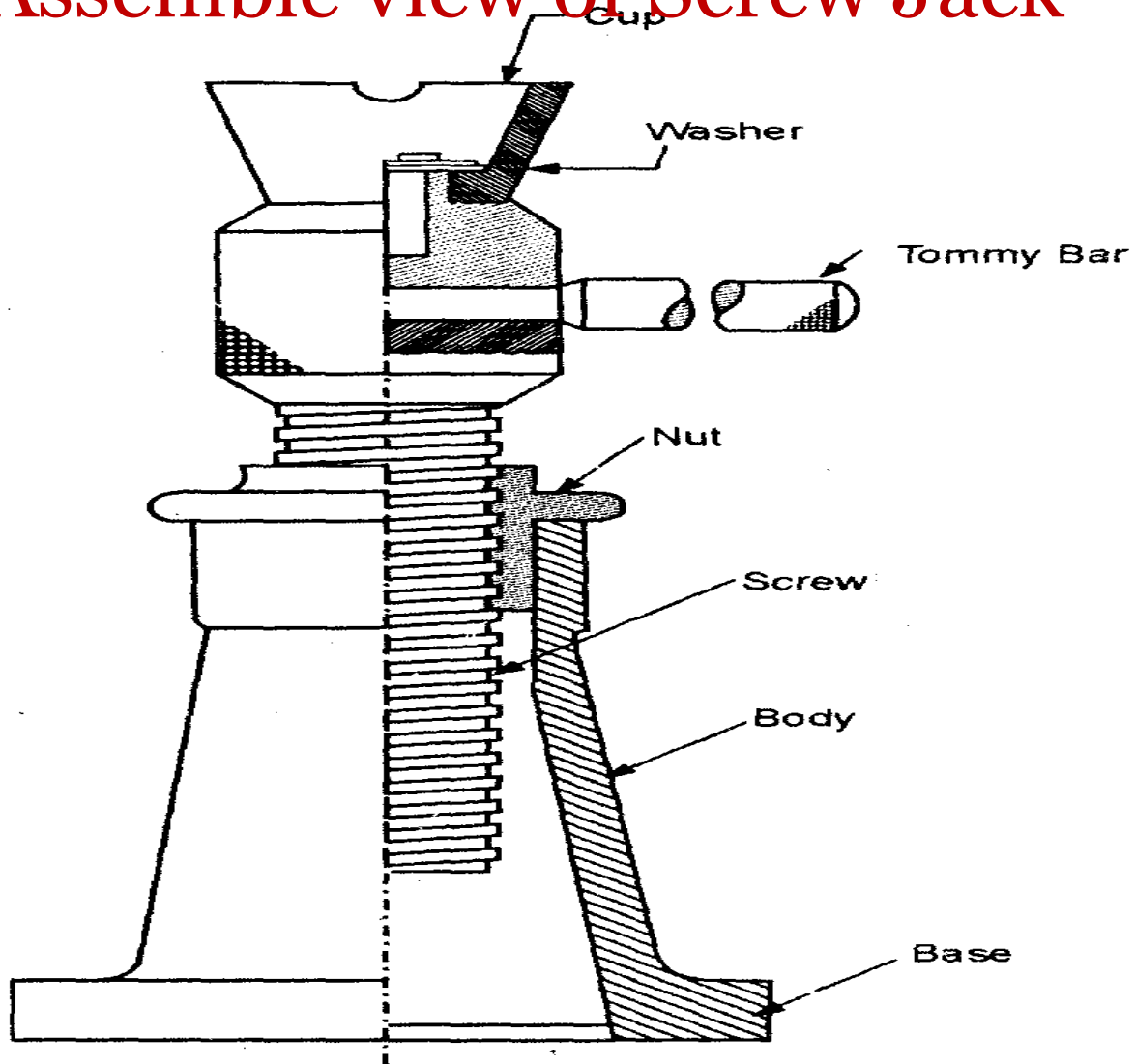


Fig. 14.1 Screw-jack.

PRACTICE DIAGRAMS

Draw the front view and side of the plummer block.

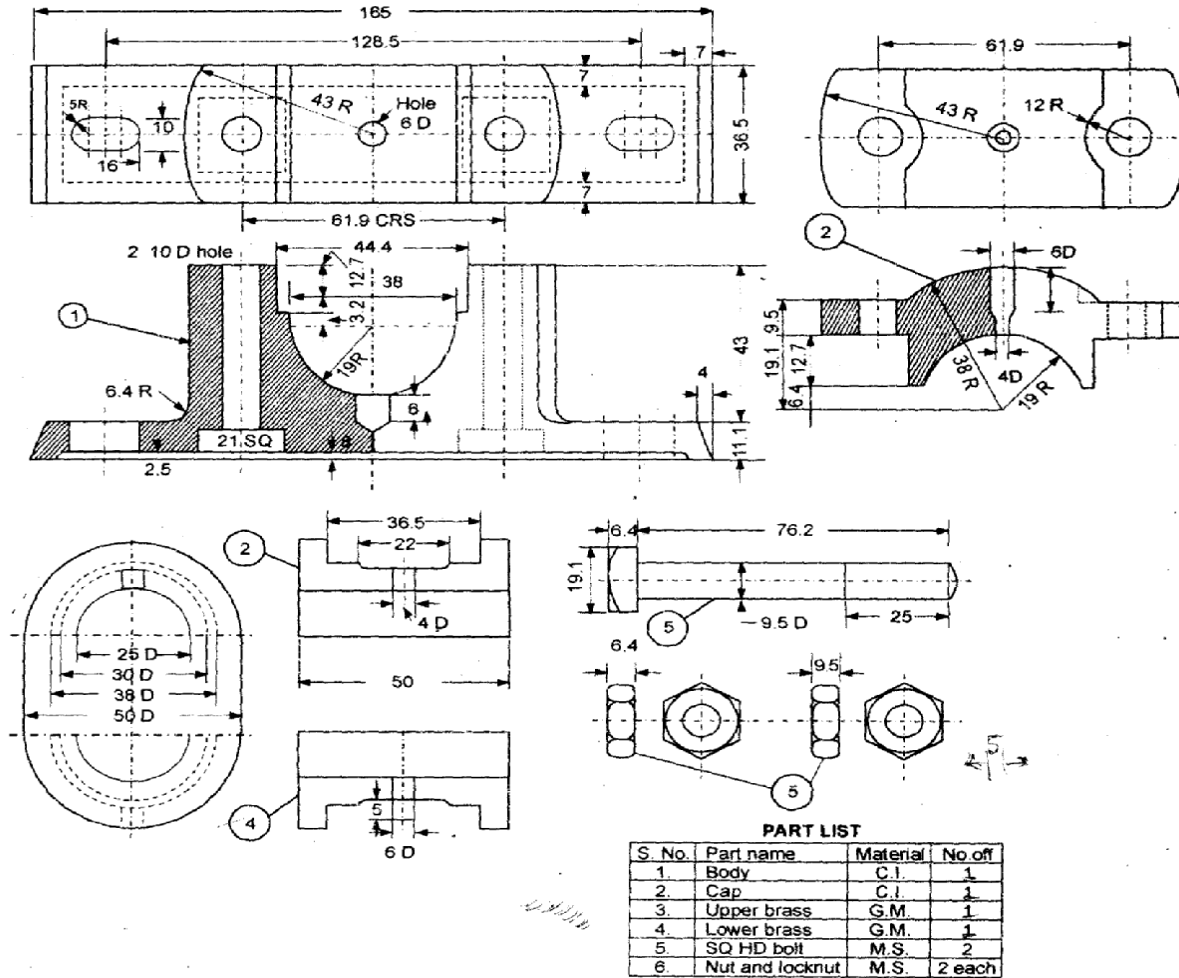


Fig. 13.7 Details of plummer block.

Draw the front view and side of the piston of petrol engine.

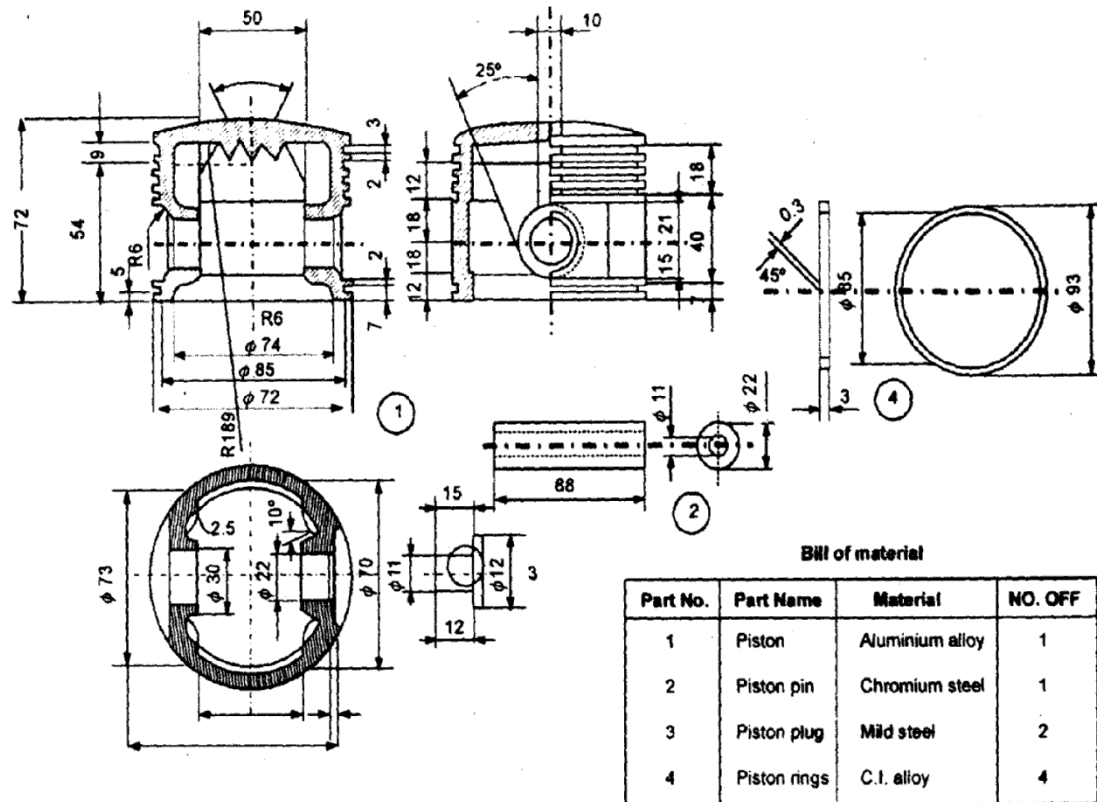


Fig. 11.2

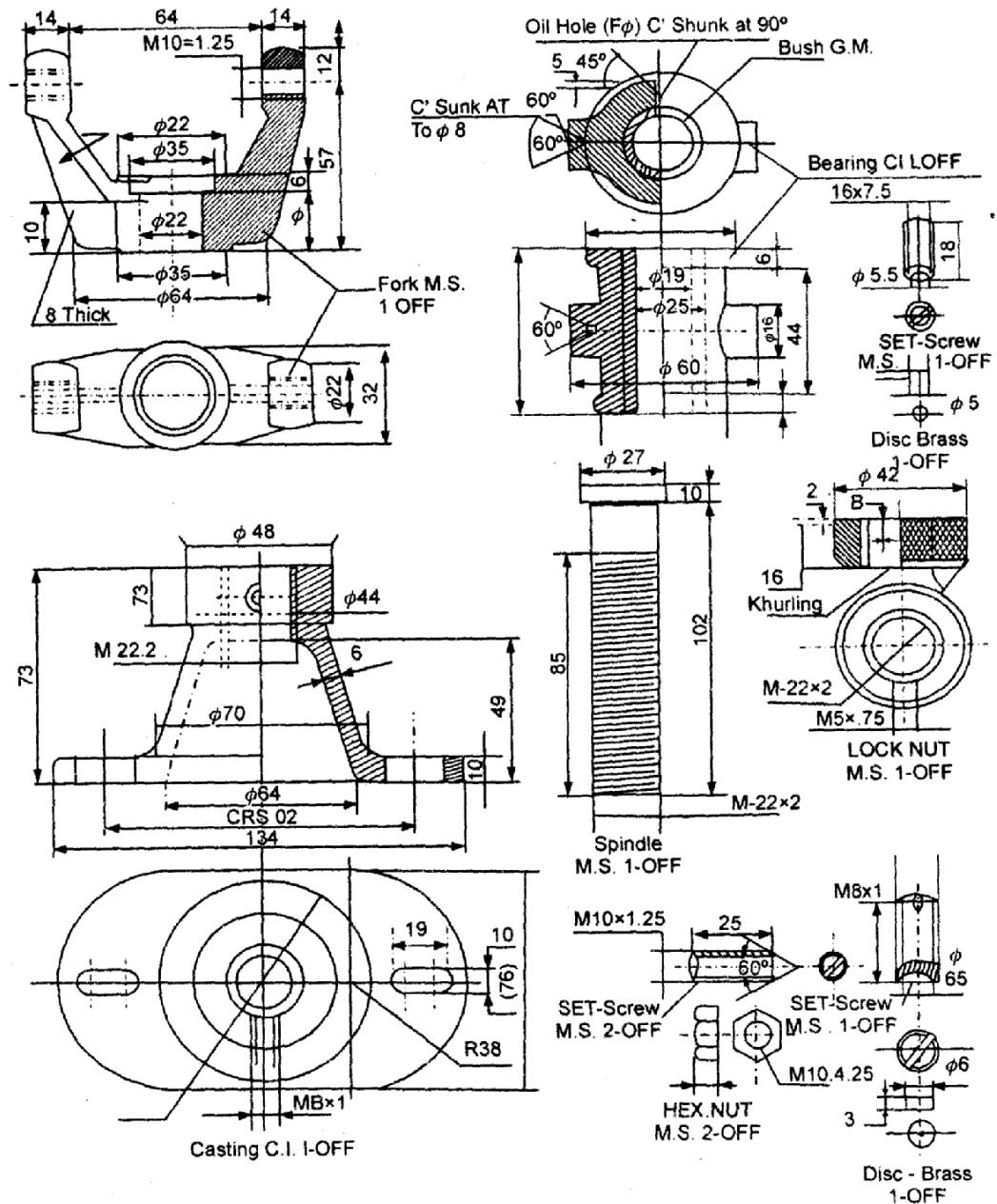


Fig. 13.13 Details of a Swivel Bearing.

Draw the front view and side of the eccentric.

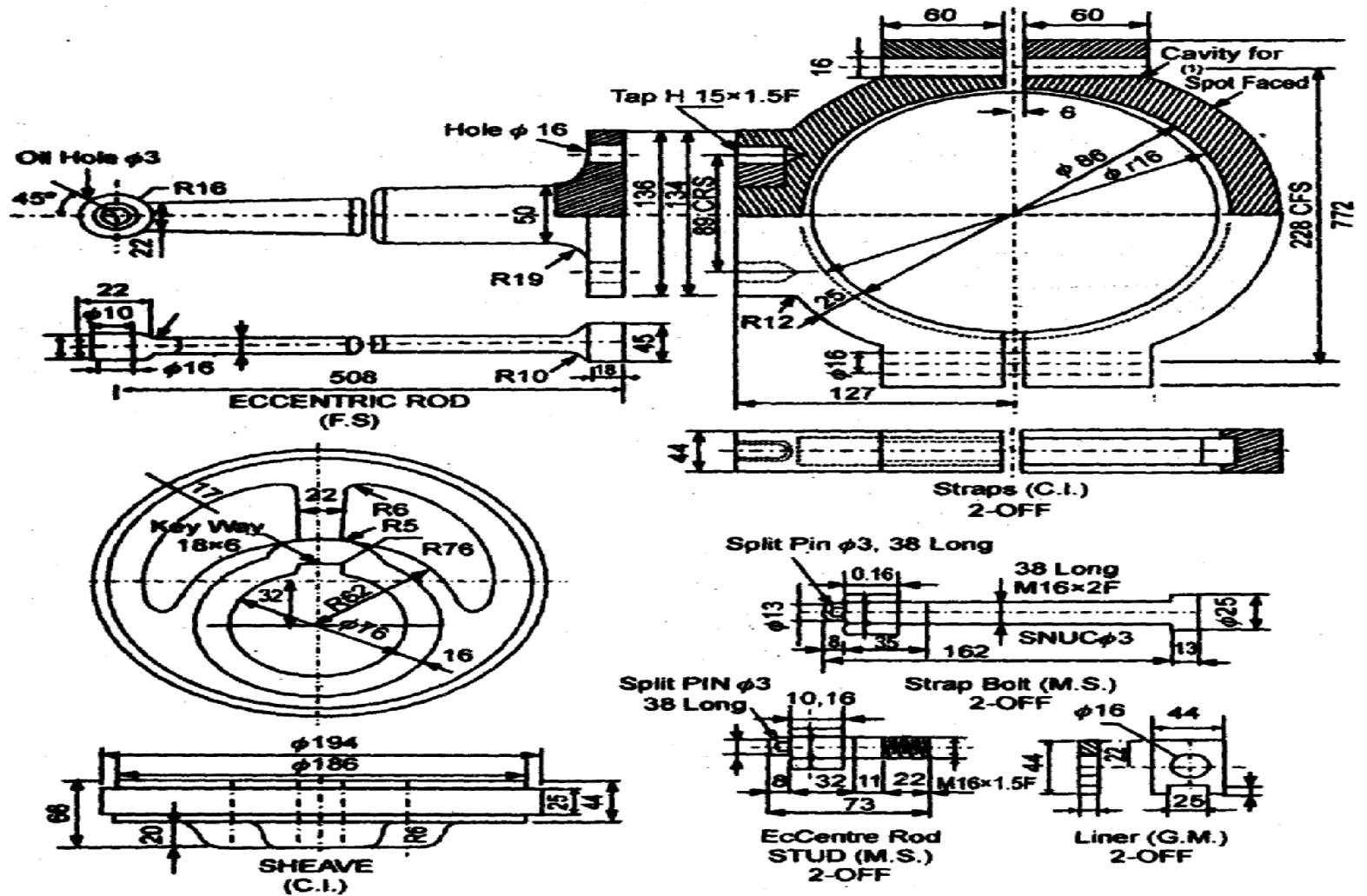


Fig. 14.15 Details of an Eccentric.

ASSEMBLY DIAGRAMS

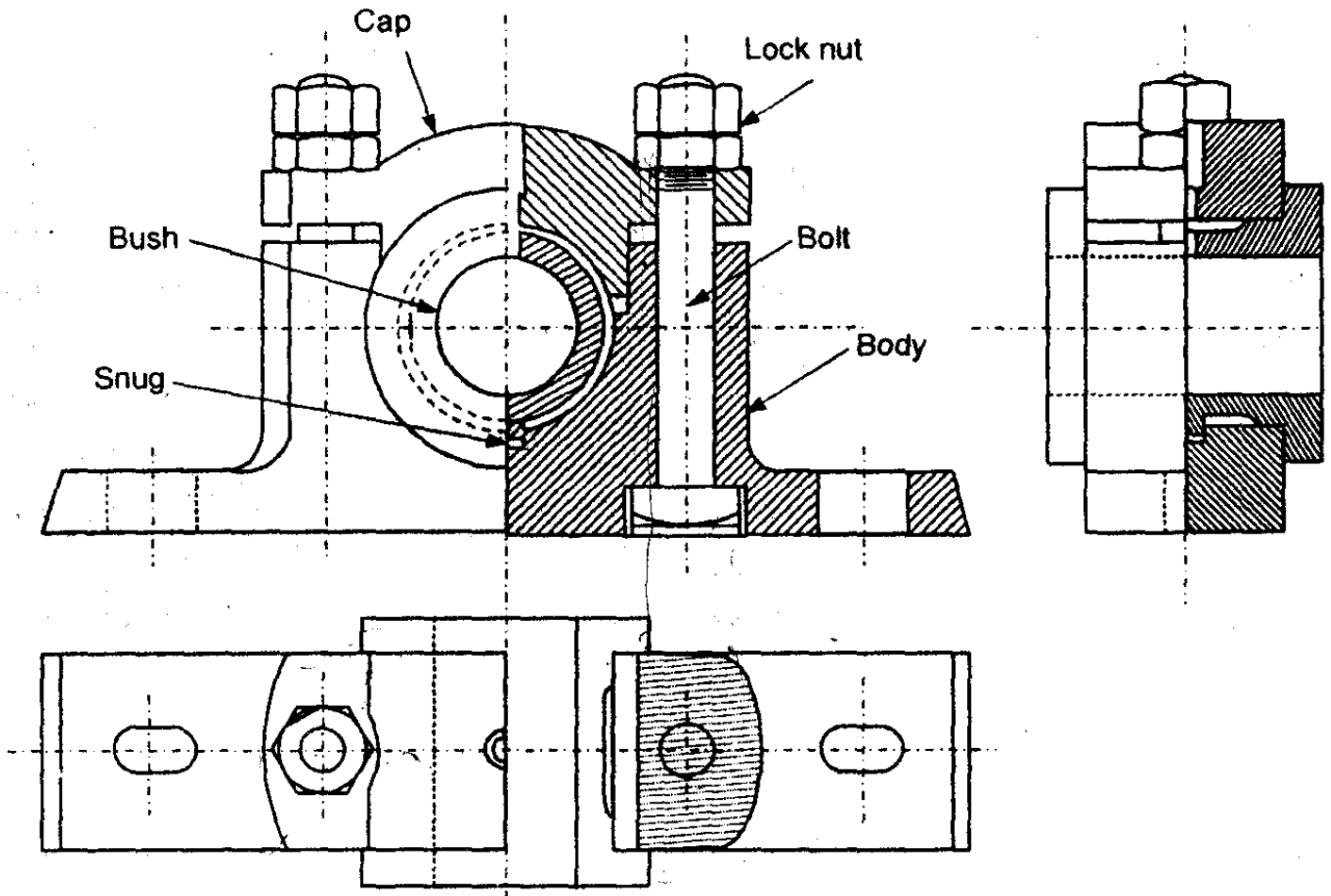
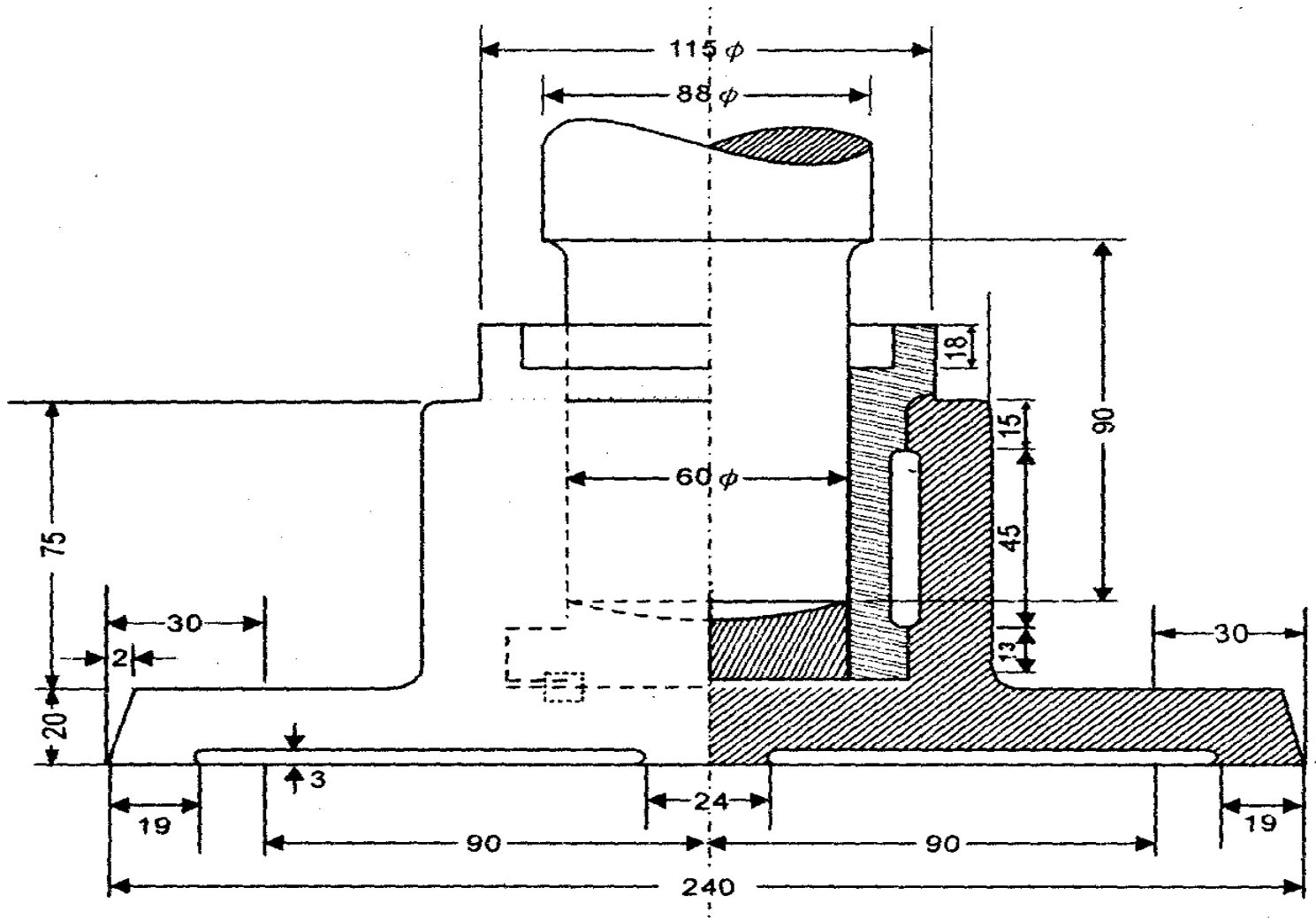
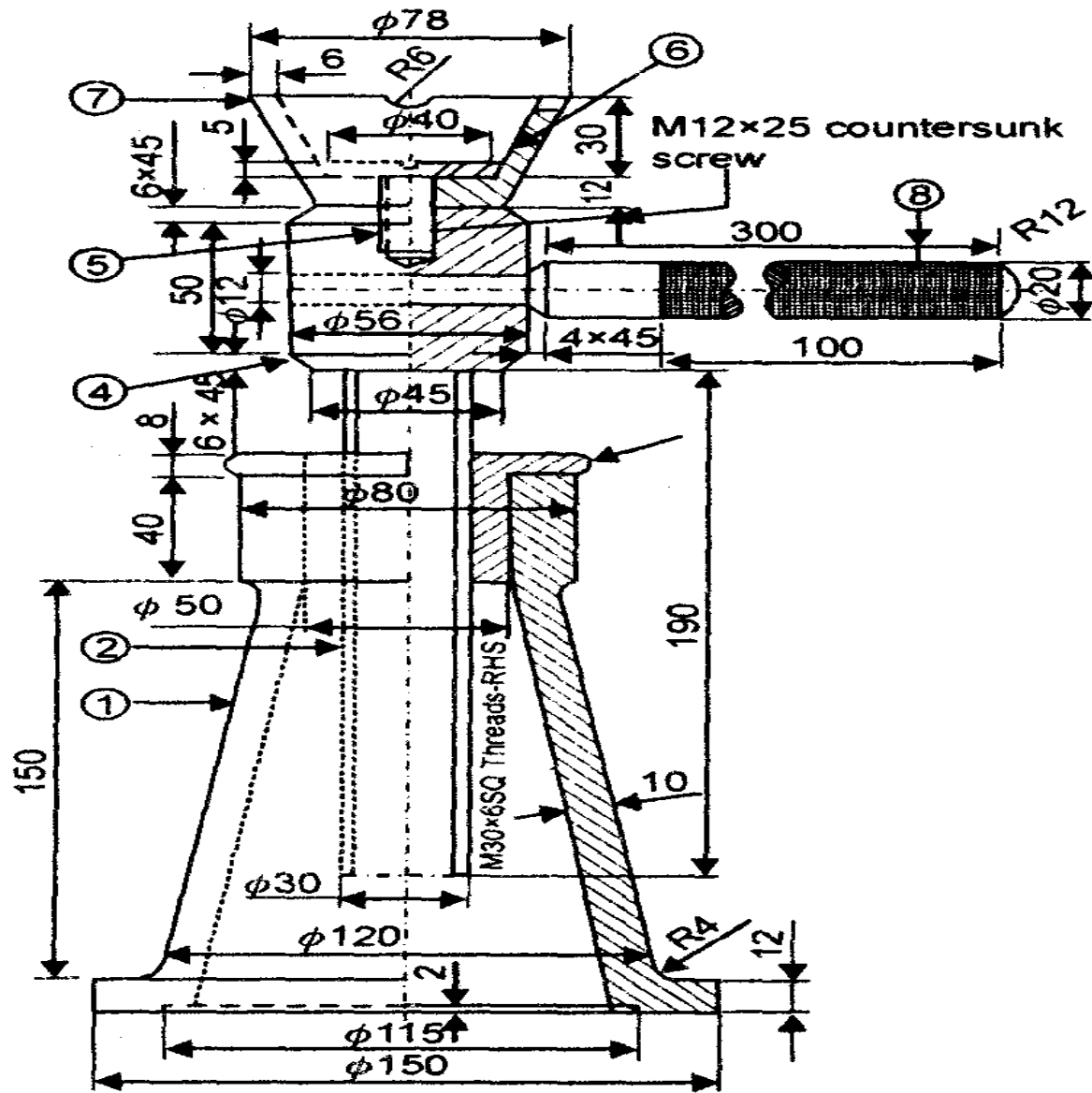


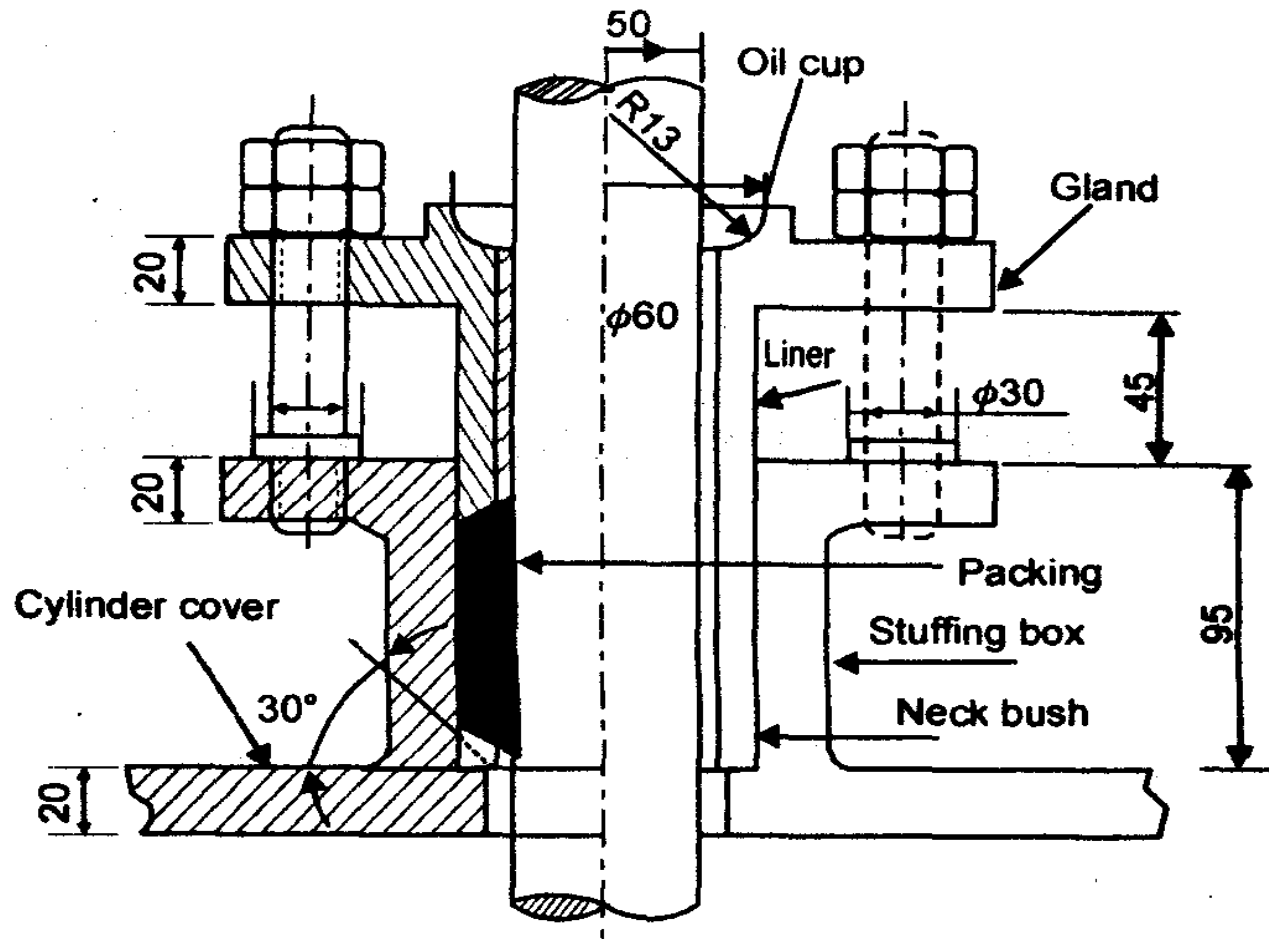
Fig. 13.4 Plummer blocks.



Front view right half in section



(a) Front view—right half in section



Front view left half in section

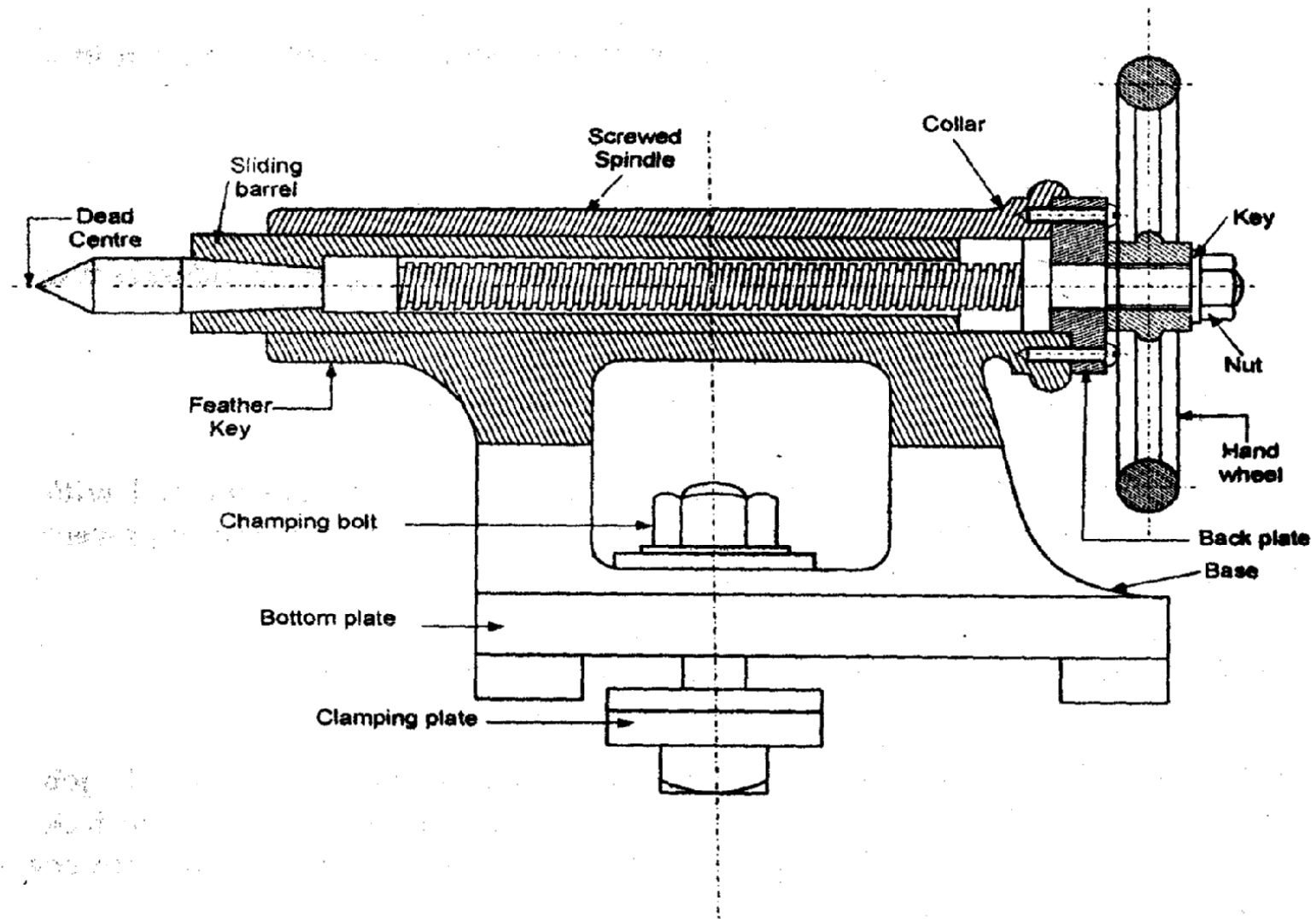


Fig. 14.3 Tail-stock

THE END