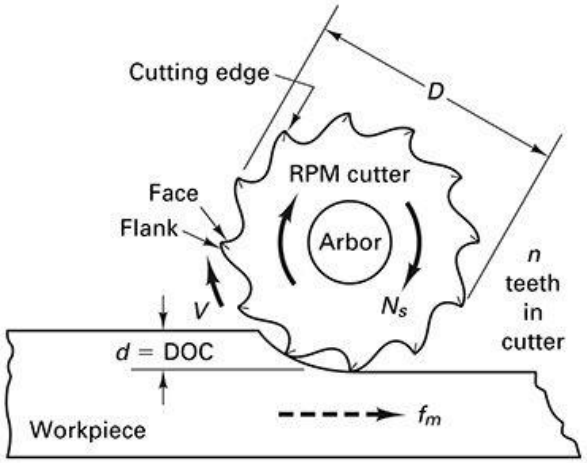
Milling

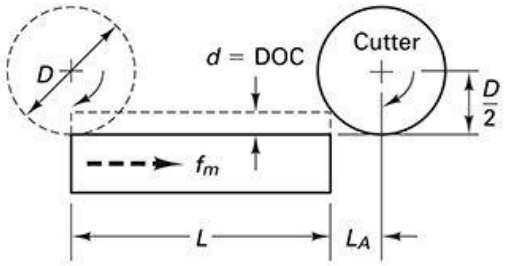
Watch Video Here

Watch Video Here

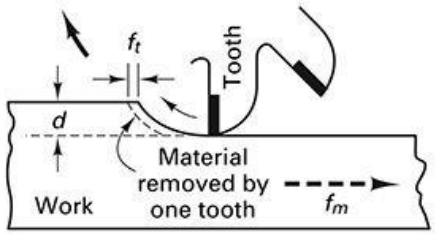
Peripheral (Slab, Side) Milling



(b) Slab milling—multiple tooth

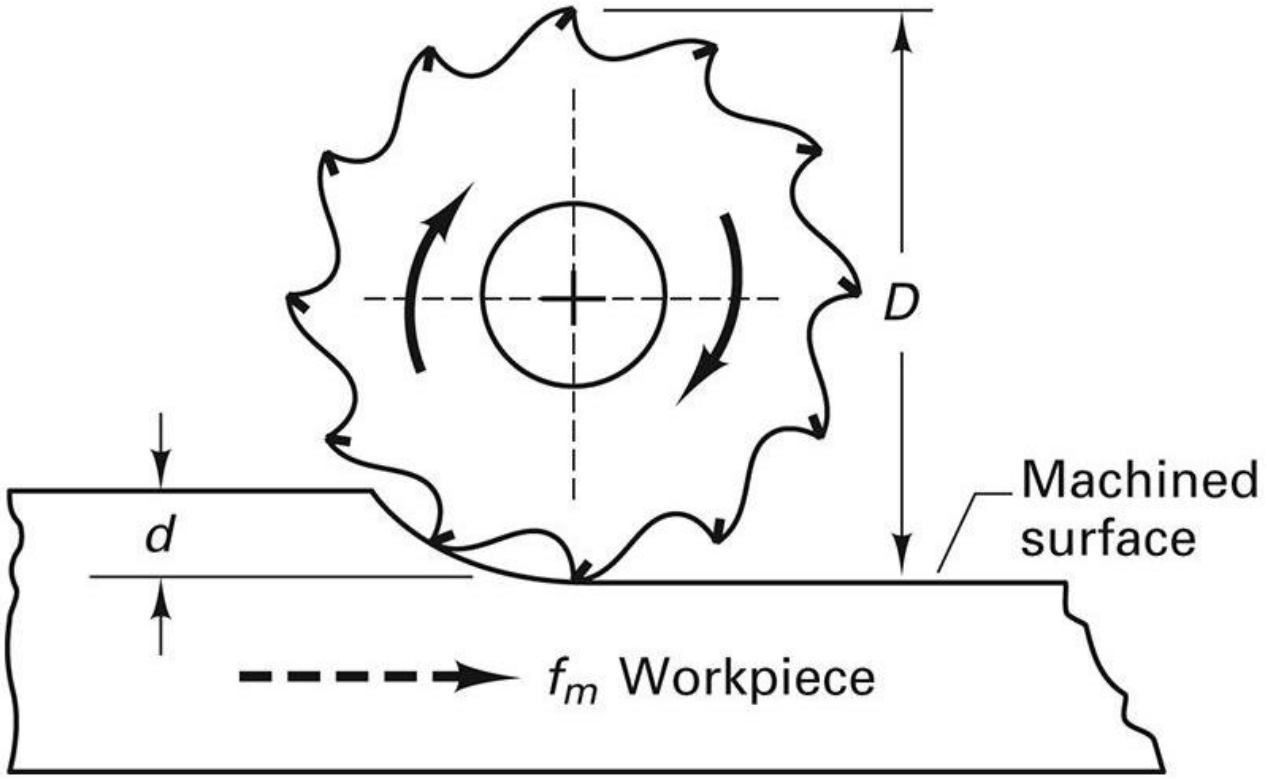


(c) Allowances for cutter approach



(d) Feed per tooth

Peripheral (Slab, side) Milling
Cutter rotation is for Up Milling



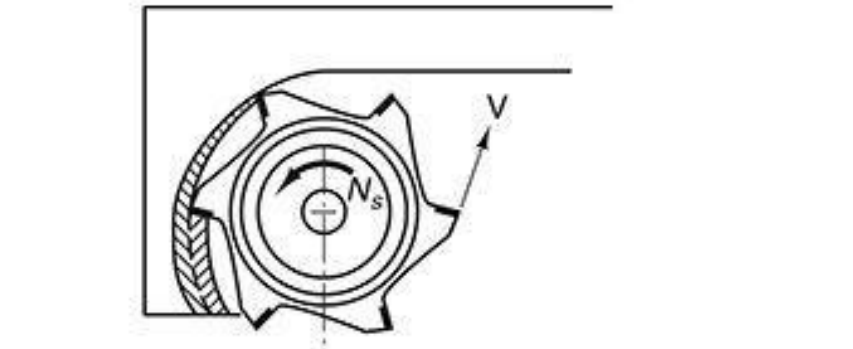
Cutting Parameters: surface parallel to axis of cutter

- Cutting speed, $V = {}^{\pi DN}/_{12}$ (ft/min)
- Table feed rate, $f_m = f_t\, N\, n$ (in/min)
- Material removal rate, MRR

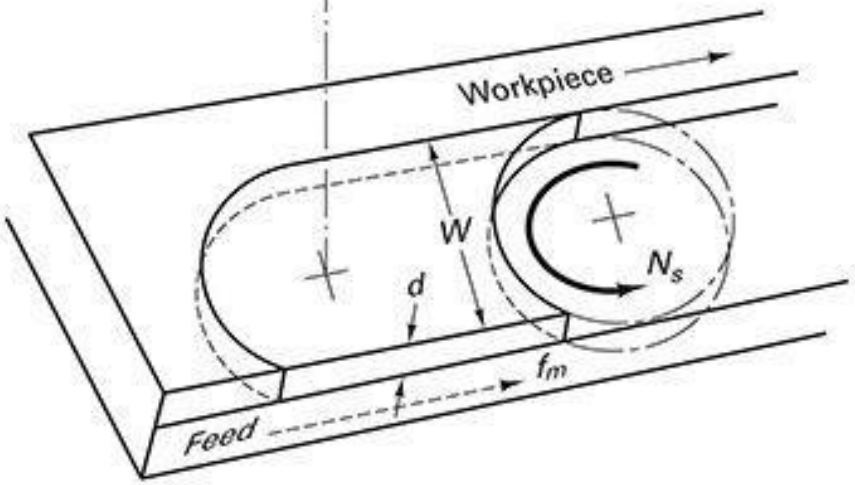
  $MRR = {}^{LWt}/_{T_c}$ or $MRR = Wtf_m$

- t - depth of cut
- N - RPM
- D - dia. of cutter
- f_t - feed per tooth
- n - no. of teeth
- L - length of cut
- W - width of cut
- T_c - cutting time
- V - surface ft/min

Face (End) Milling

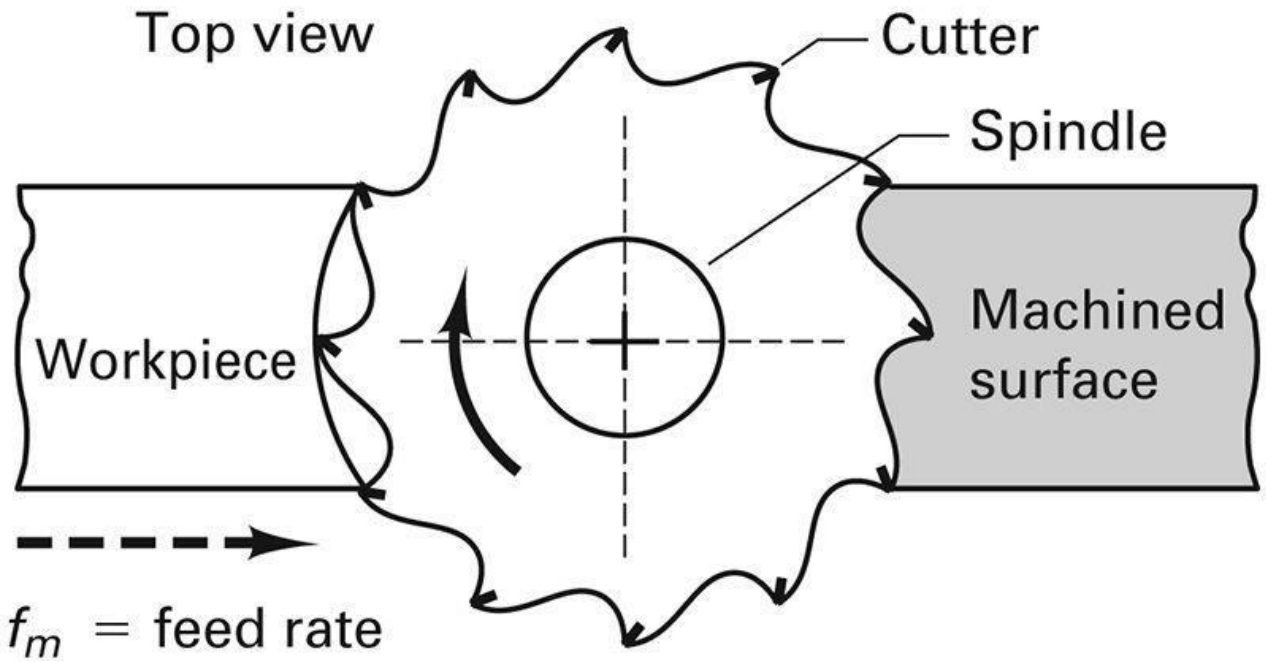


Six-tooth face mill

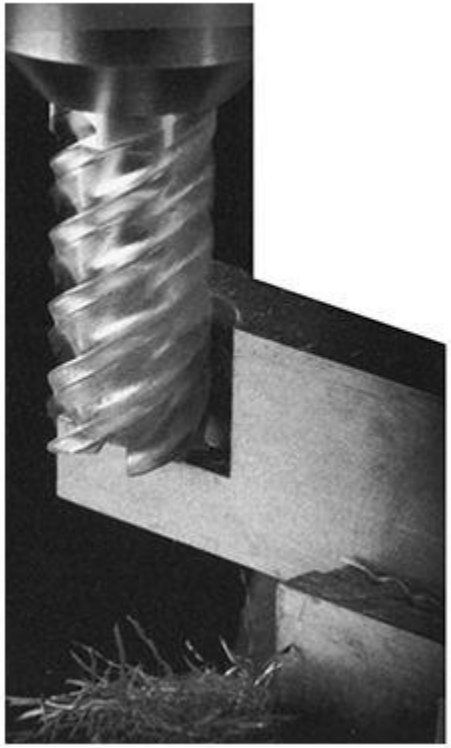


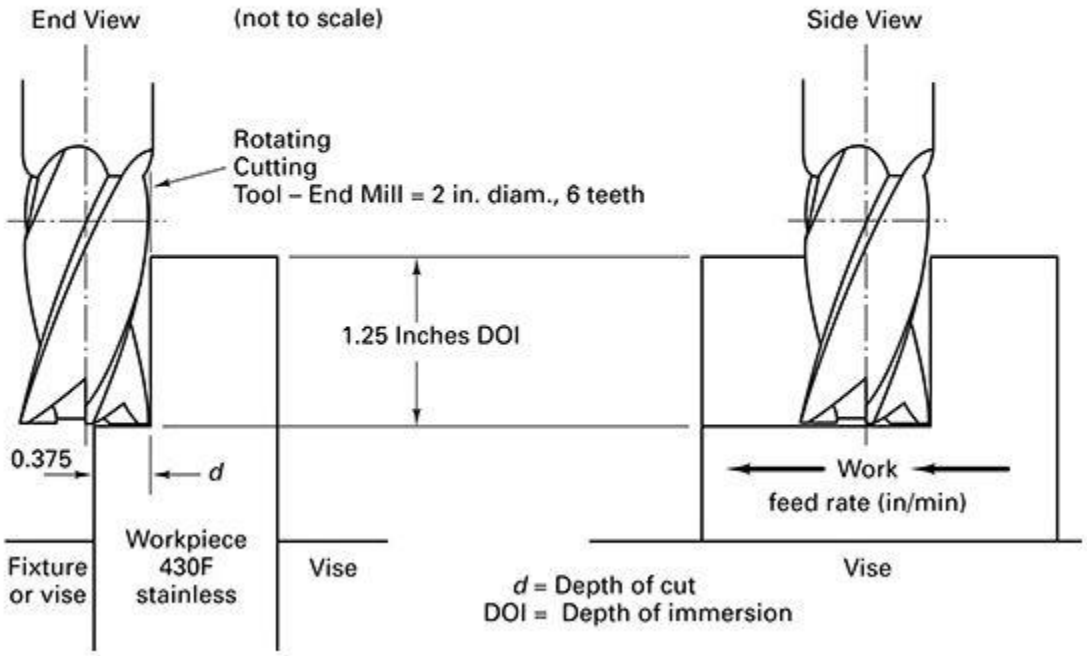
Face milling over part of surface

Face Milling (from above)

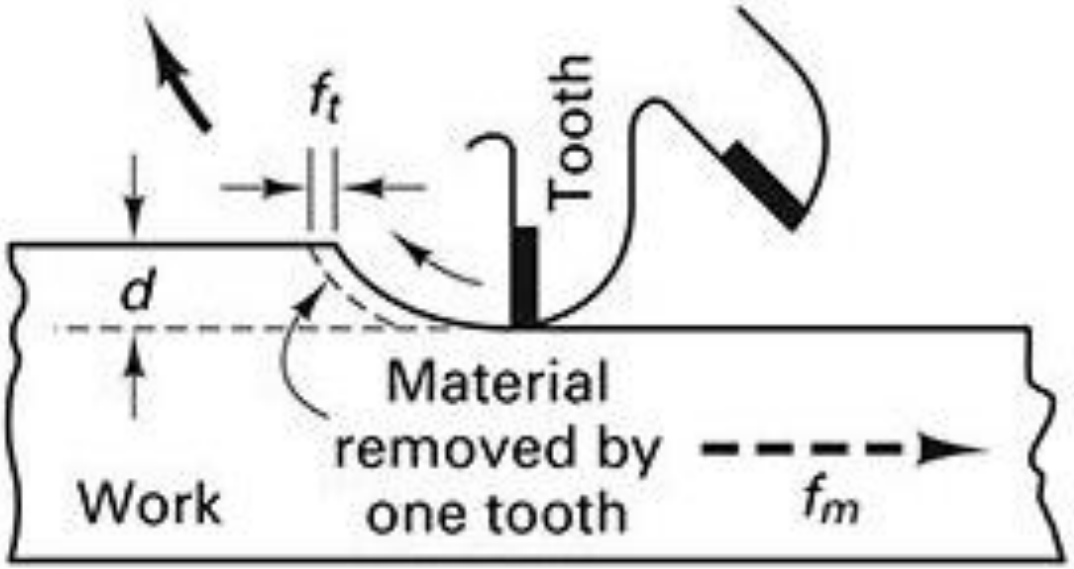


End Milling

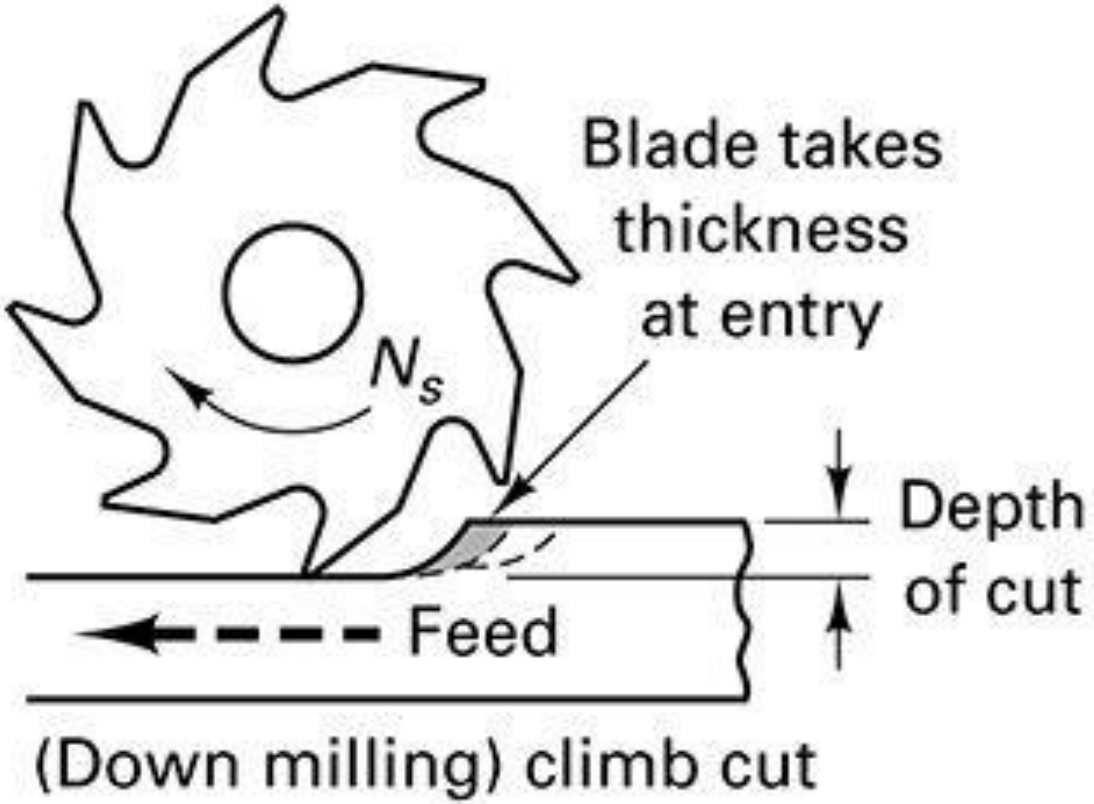



End View
(not to scale)
Side View
Rotating
Cutting
Tool – End Mill = 2 in. diam., 6 teeth
1.25 Inches DOI
0.375
d
Work
feed rate (in/min)
Workpiece
430F
stainless
Fixture
or vise
Vise
Vise
d = Depth of cut
DOI = Depth of immersion

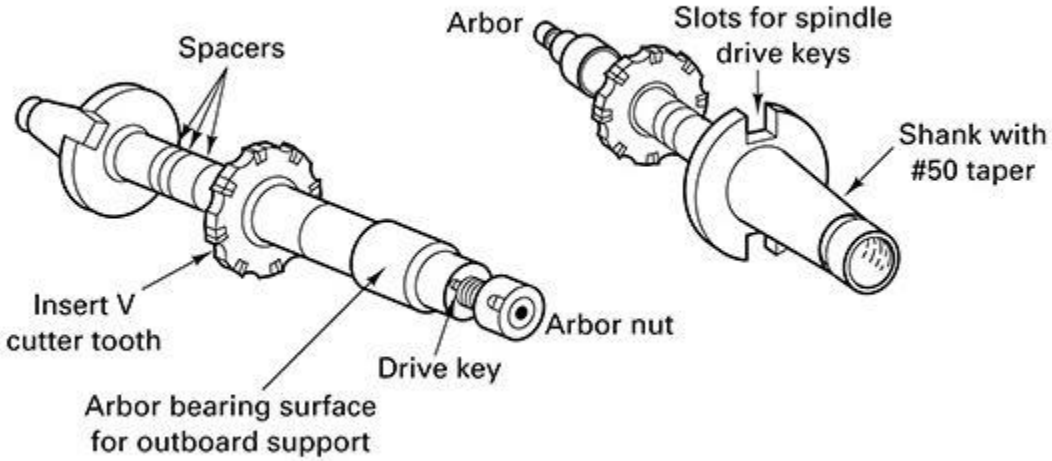
1st Milling Method – Up Milling Conventional Milling

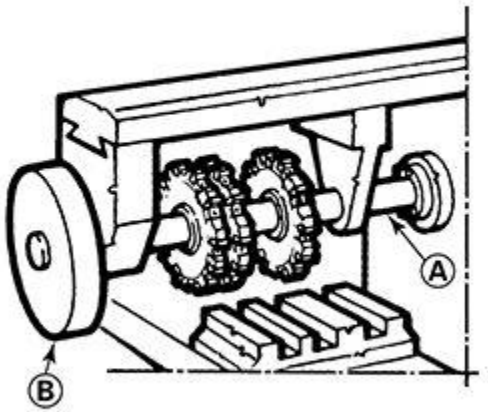


2nd Milling Method – Down Milling
Climb Milling

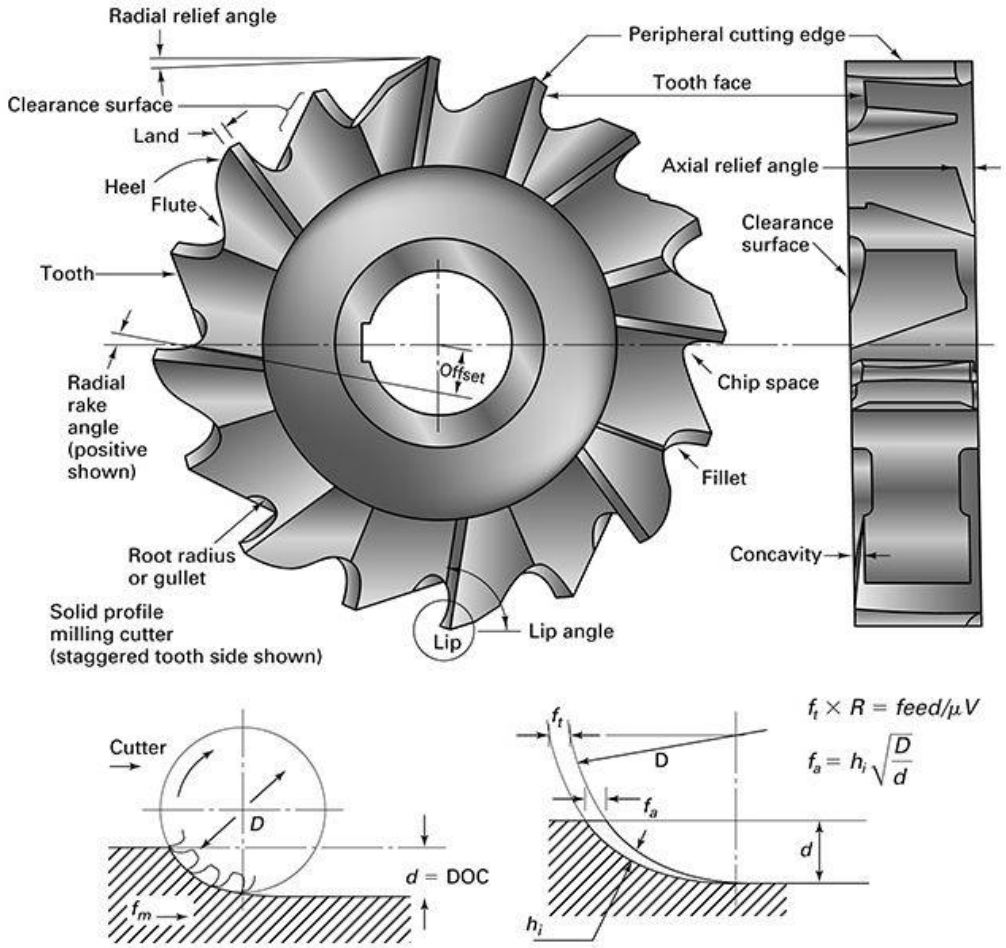


Arbor-type Cutters

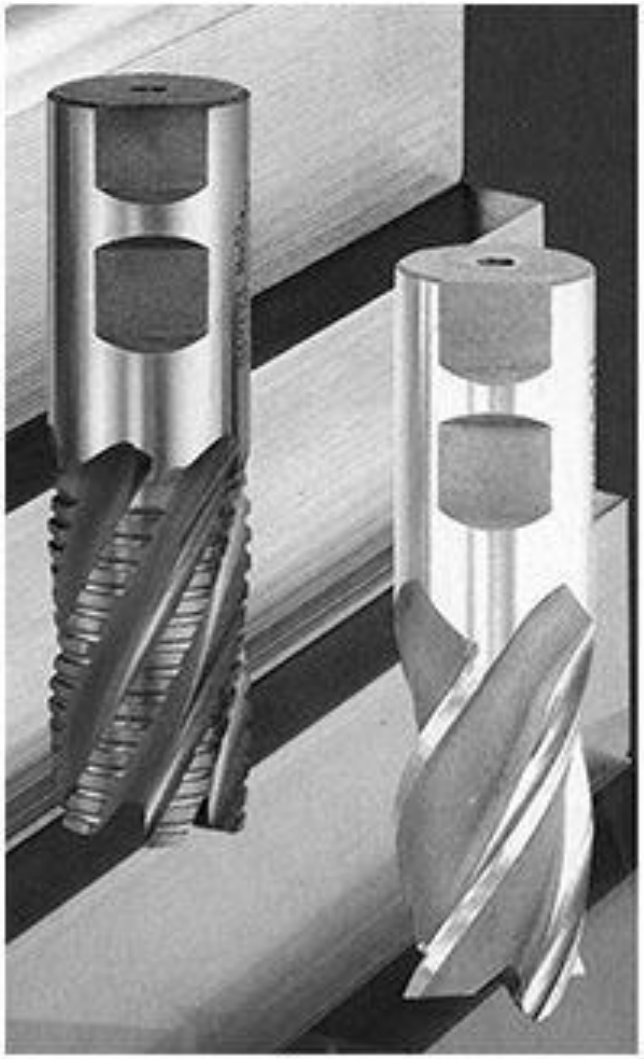




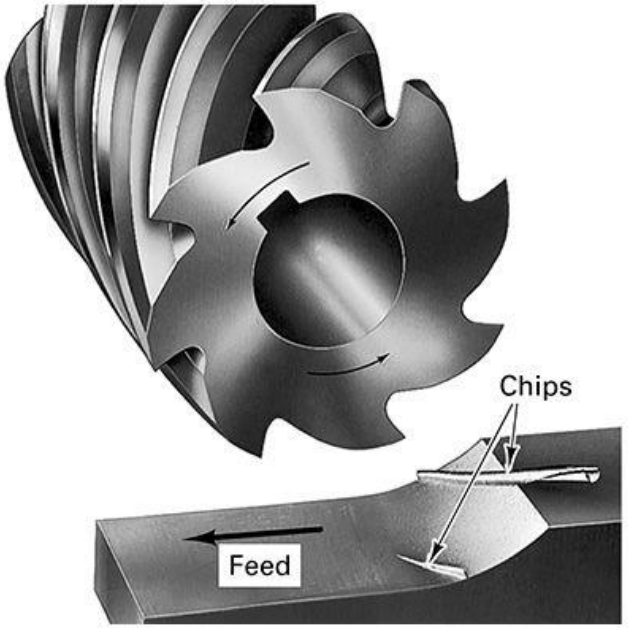
Arbor-Mounted Side Cutter

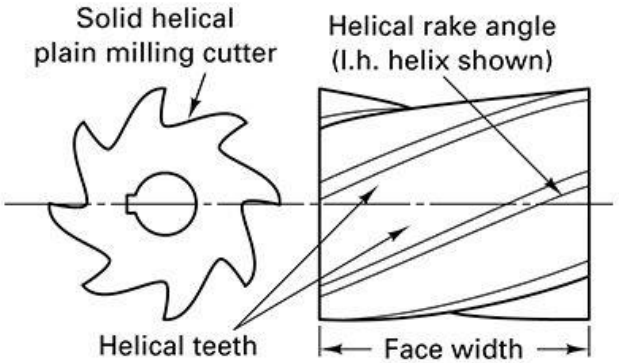


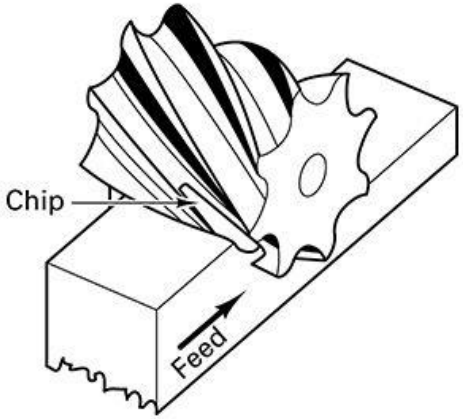
Shank-type Cutters



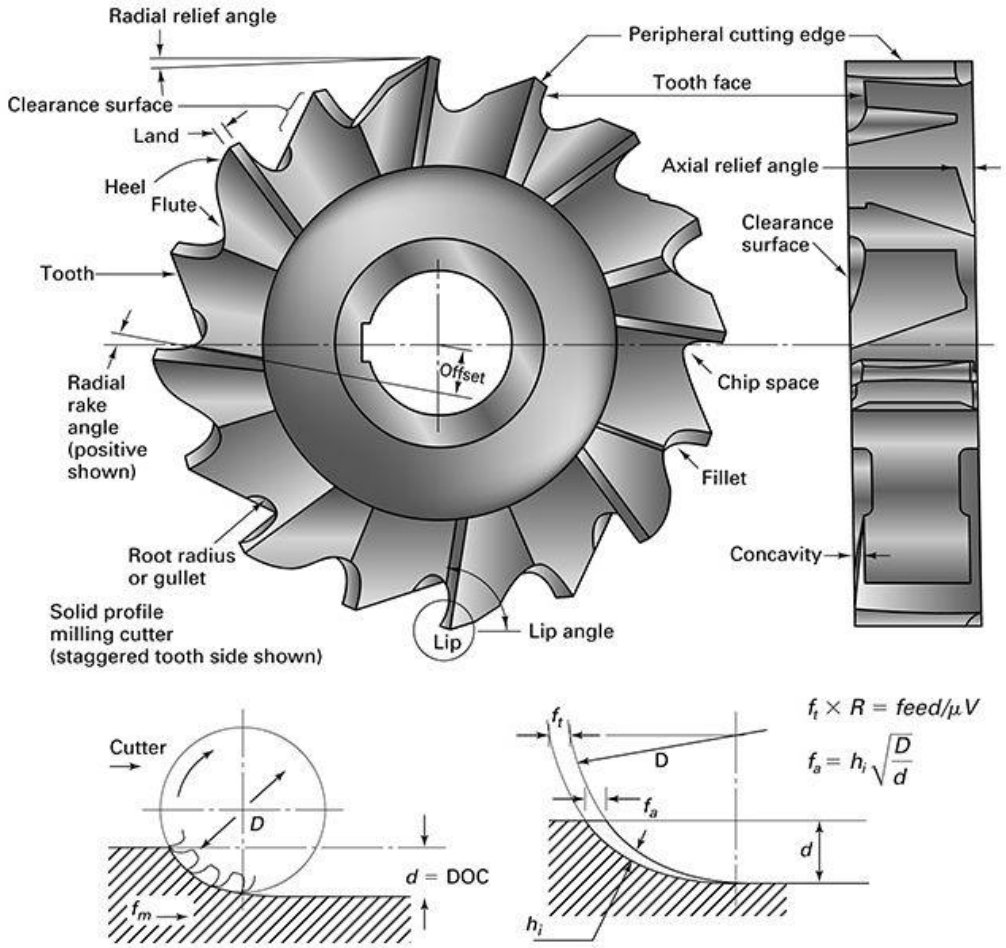
Plain Milling Cutters



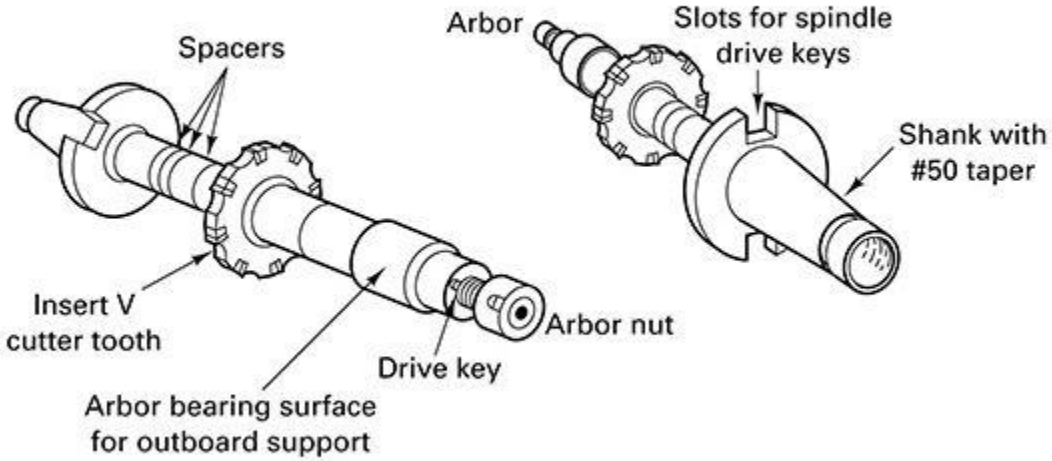


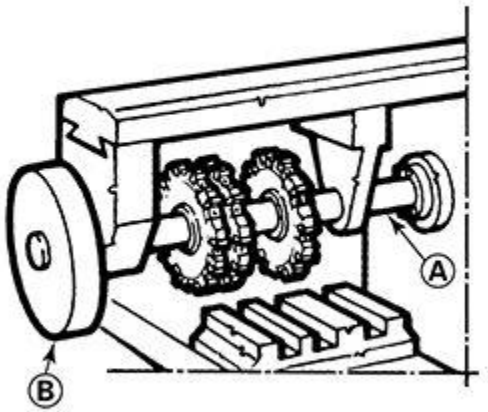


Side/Staggered Milling Cutters



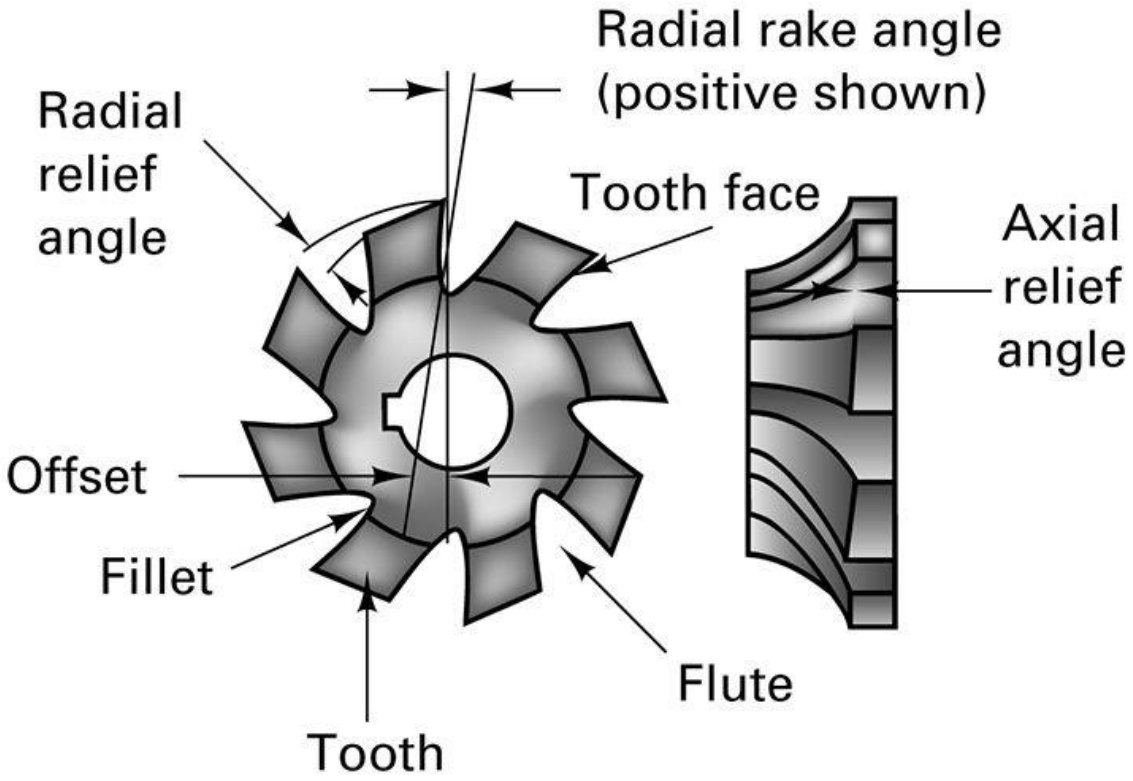
Interlocking Slotting Cutters





Angle Cutters

Form Cutters



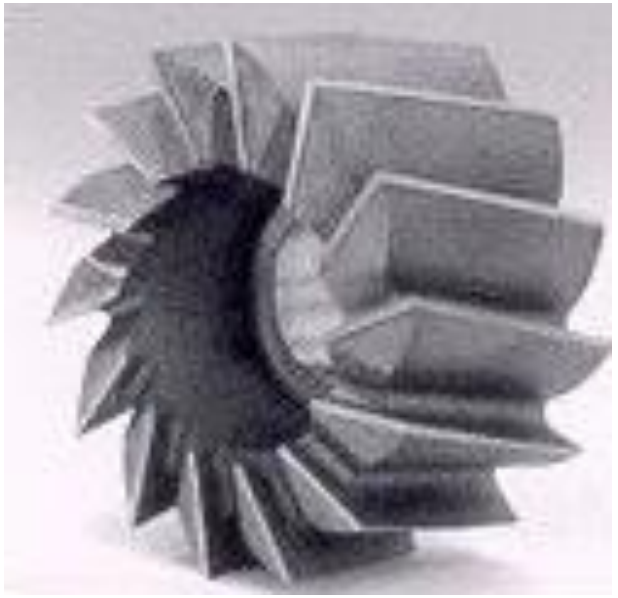
Solid form
relieved milling cutter

Insert-type Cutters

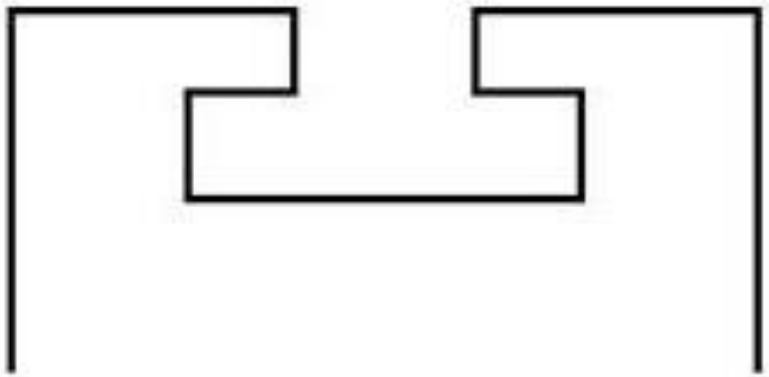
Face mill

End Mills

Shell End Mills

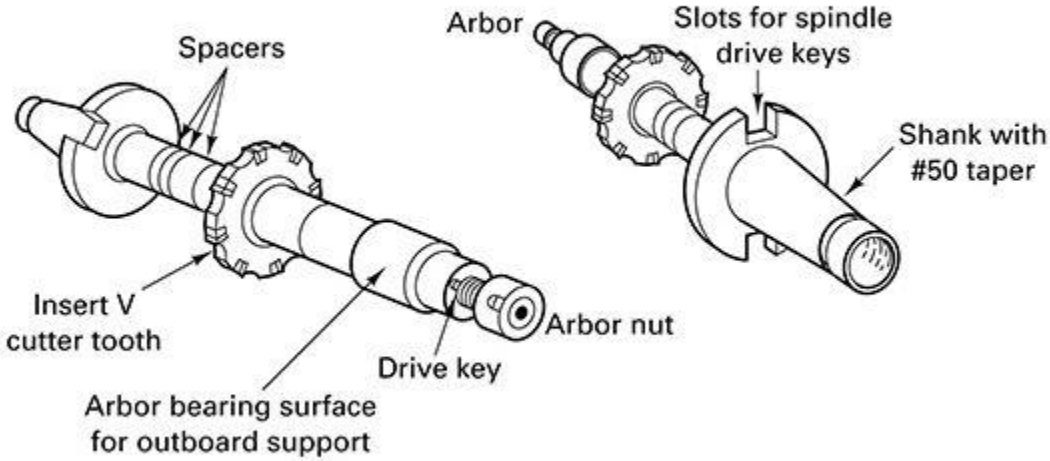


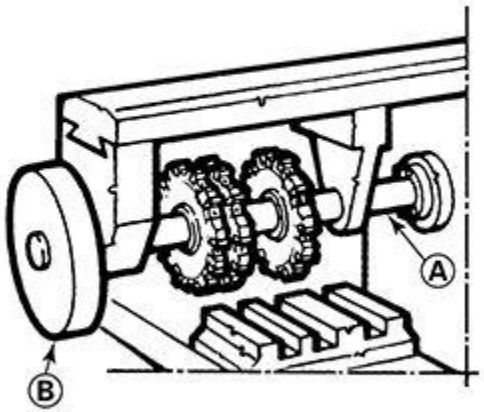
T-slot



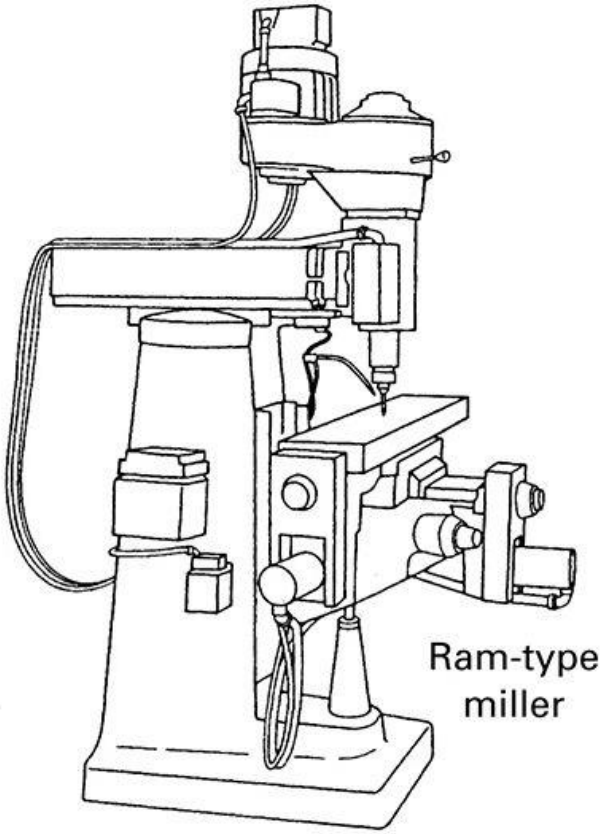
T-slot

Horizontal Milling Machine



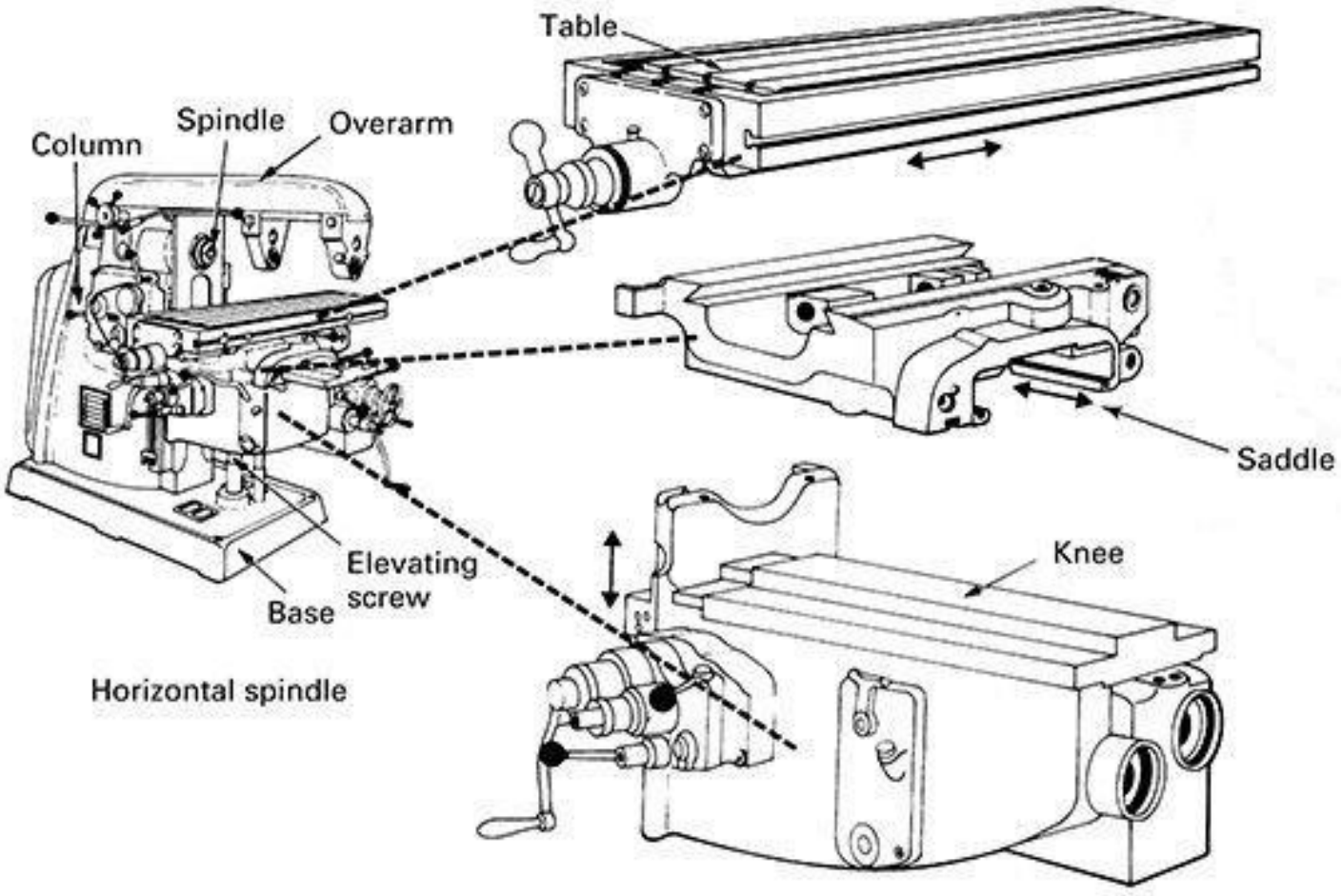


Vertical Milling Machine

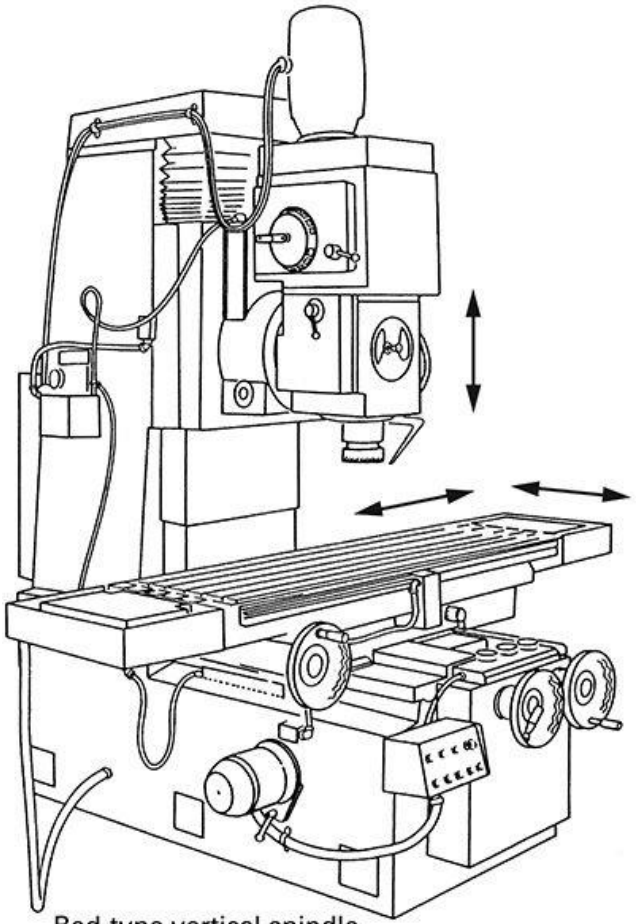


Vertical spindle ram-type

Plain Column and Knee

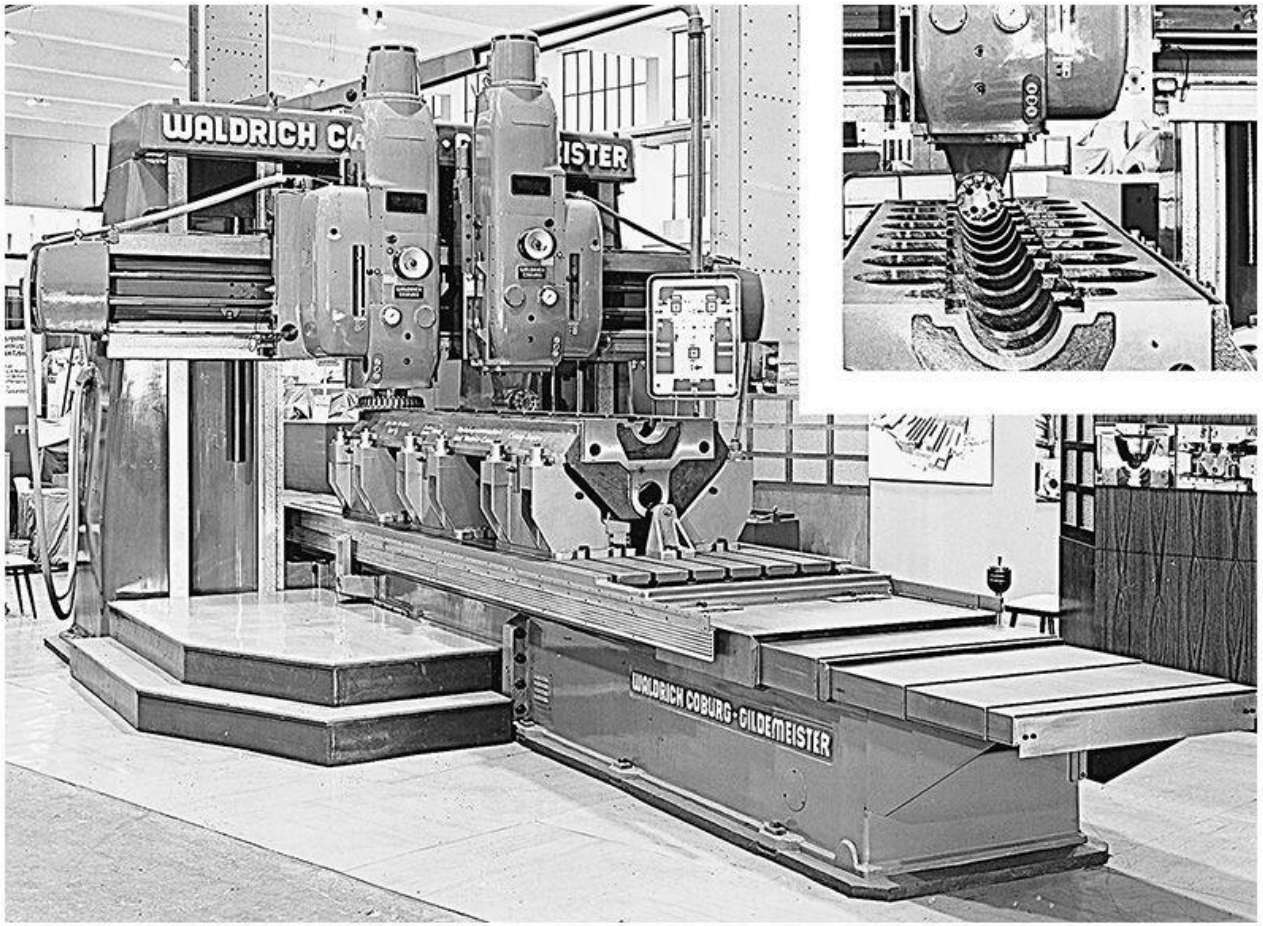


Bed-type Milling Machine

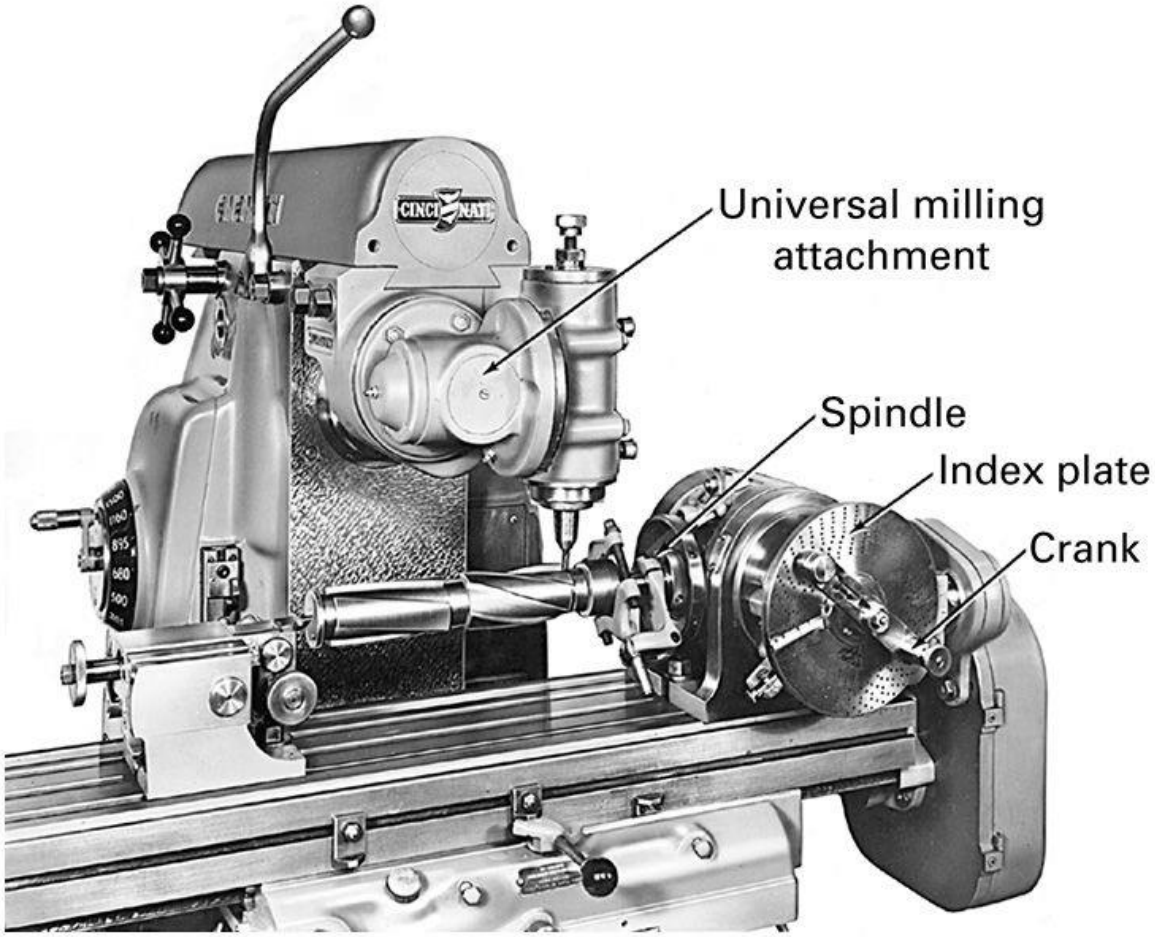


Bed-type vertical spindle

Planer-type Milling Machine



Universal Milling Attachment and Universal Dividing Head



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