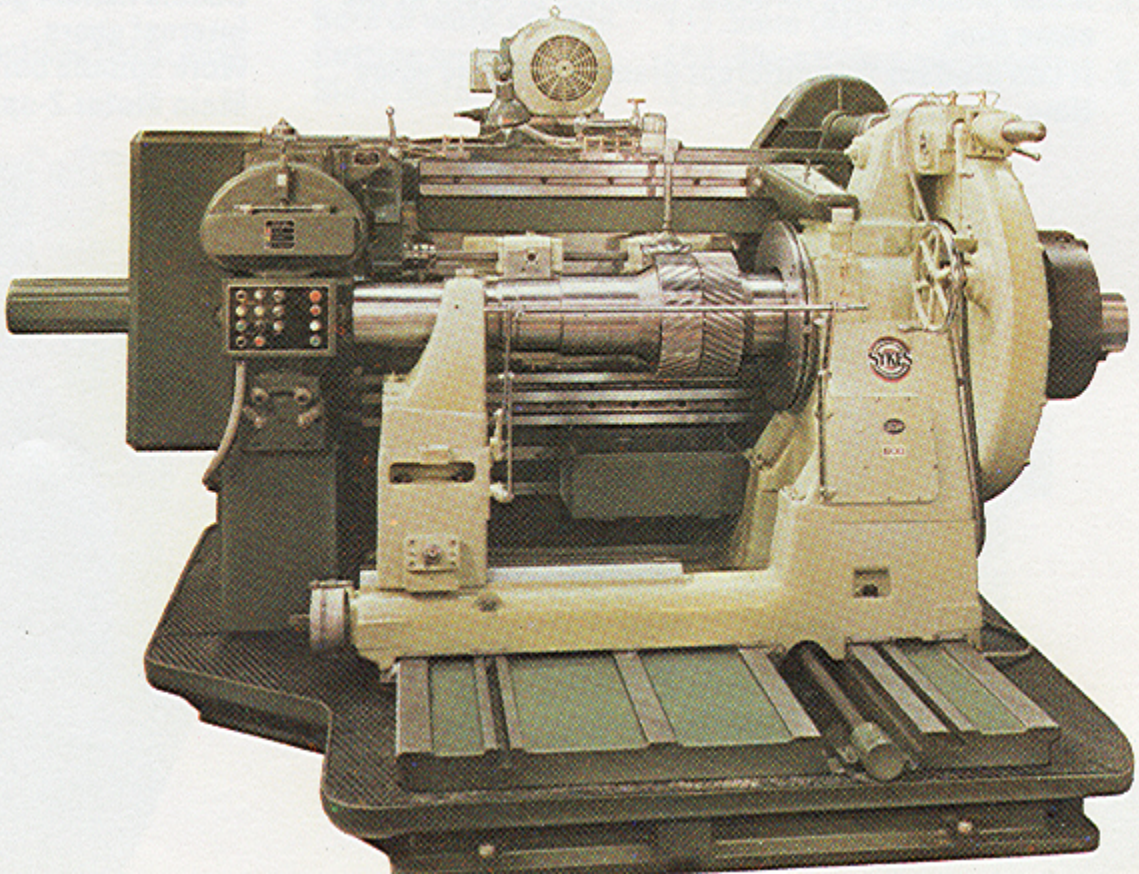
SYKES 1600H HORIZONTAL MULTI-CUTTER GEAR GENERATOR

Sykes Horizontal gear shaper Model 1600H operates on the generating principle using pinion-type cutters. Two separate, independent adjustable cutter heads are used simultaneously, one cutter head operates on the forward direction, the other on the return stroke.
Many unusual profiles can be produced with great accuracy by specially designed cutters, large segment type gears can be cut economically by the use of the built-in feed reverse clutch.
A range of eight cutting speeds from 15–120 strokes per minute are obtainable. Four generating feeds may be selected from the built in gear box and an auxiliary feed reverse box enables the direction of the feed to be changed.

The 305mm (12in.) bore of the work spindle enables large shafts to be passed through the spindle. The machine is ideally suited for a wide range of work which is often found impractical or uneconomical to produce on other machines. Chain sprockets and other special forms involving large areas of metal to be removed can be machined, utilising high production rates.

SPECIFICATION

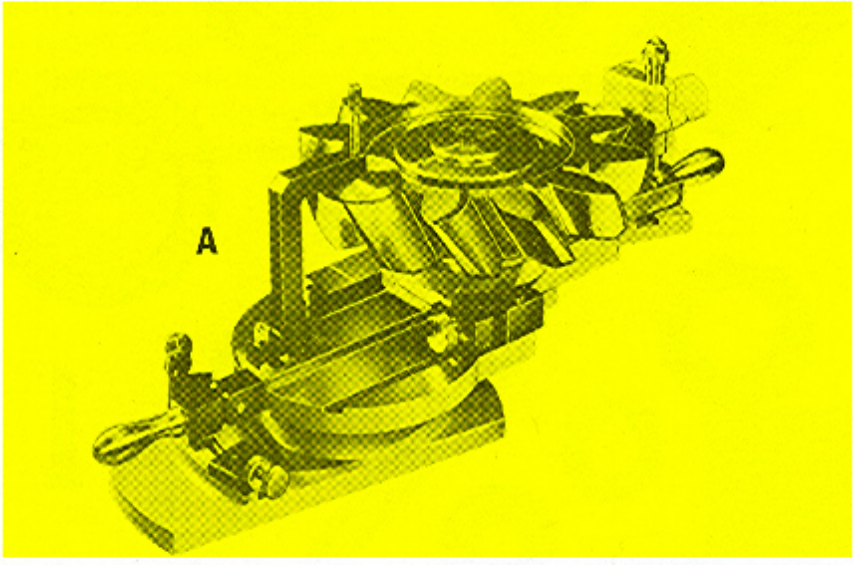
Number of cutting speeds	8
Number of feeds	4
Pitch range	16–1½ D.P. (1.6–17 Mod.)
Blank diameter (external)	1660mm (63in.)
(internal)	1676mm (66in.)
Work spindle bore	305mm (12in.)
Face width—double helical	0–457mm (0–18in.)
spur or single helical	0–254mm (0–10in.)
Two speed main motor	7.5Kw (10 h.p.)

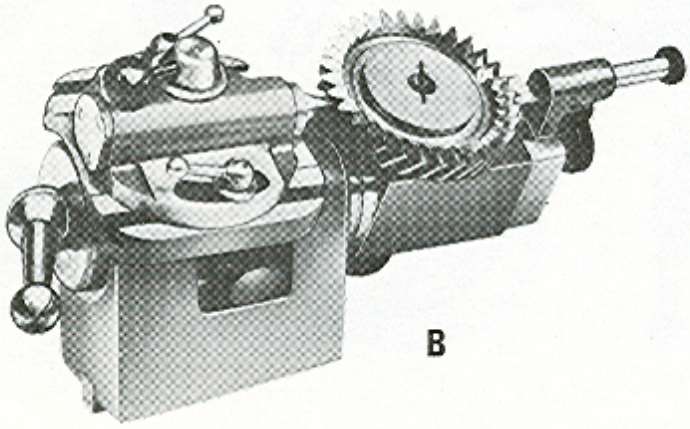


SYKES CUTTER SHARPENING ATTACHMENTS

(A) TYPE DCA
For producing cutting edges on gear shaper cutters of the Sykes helical and double helical types where the cutting edges on both sides of the teeth are in the same or parallel planes.

(B) TYPE NCA
Type NCA is for producing cutting edges on gear shaper cutters where the teeth are sharpened in a plane normal to the helix.





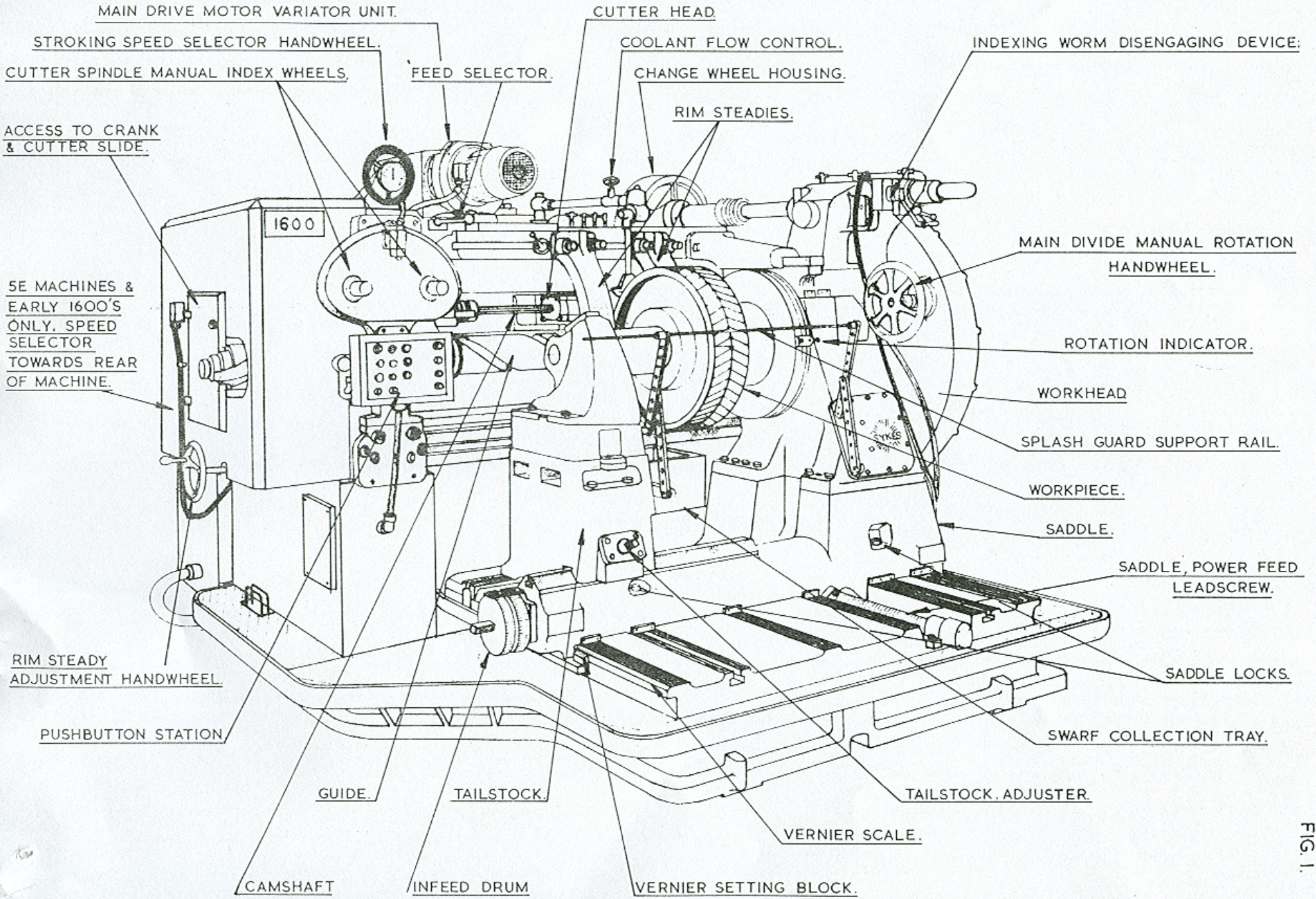
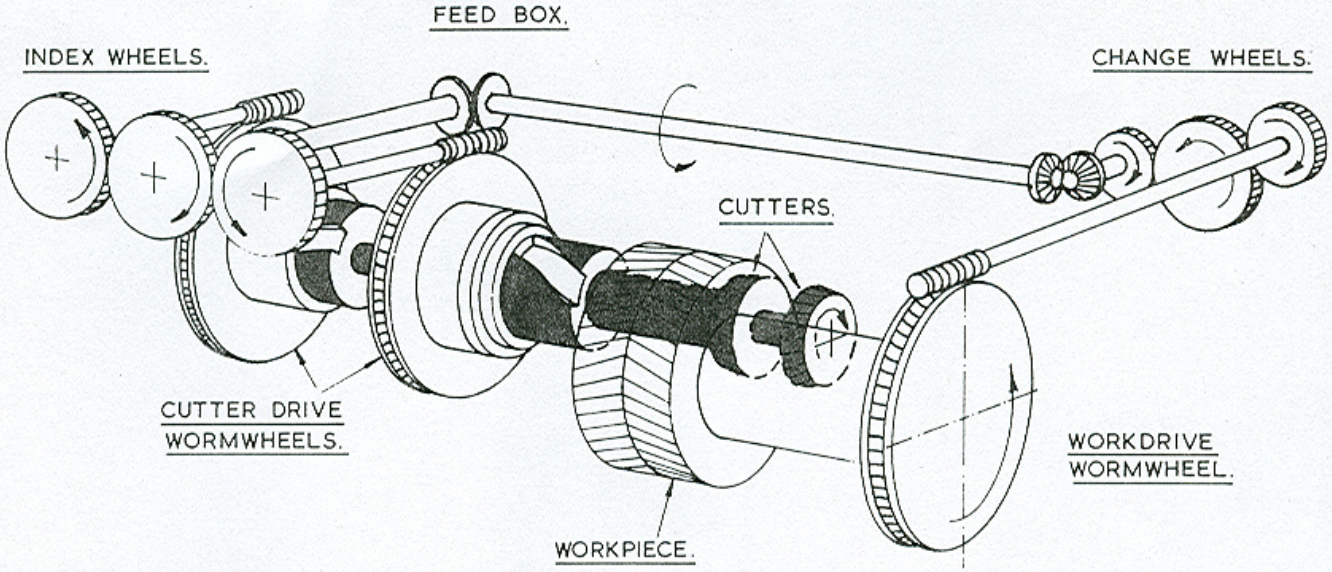

MAIN DRIVE MOTOR VARIATOR UNIT.
STROKING SPEED SELECTOR HANDWHEEL.
CUTTER SPINDLE MANUAL INDEX WHEELS.
FEED SELECTOR.
CUTTER HEAD.
COOLANT FLOW CONTROL.
CHANGE WHEEL HOUSING.
RIM STEADIES.
INDEXING WORM DISENGAGING DEVICE.
ACCESS TO CRANK & CUTTER SLIDE.
1600
MAIN DIVIDE MANUAL ROTATION HANDWHEEL.
5E MACHINES & EARLY 1600'S ONLY. SPEED SELECTOR TOWARDS REAR OF MACHINE.
ROTATION INDICATOR.
WORKHEAD
SPLASH GUARD SUPPORT RAIL.
WORKPIECE.
SADDLE.
SADDLE, POWER FEED LEADSCREW.
RIM STEADY ADJUSTMENT HANDWHEEL.
SADDLE LOCKS.
PUSHBUTTON STATION
SWARF COLLECTION TRAY.
GUIDE.
TAILSTOCK.
TAILSTOCK. ADJUSTER.
VERNIER SCALE.
CAMSHAFT
INFEED DRUM
VERNIER SETTING BLOCK.

FIG. 1.

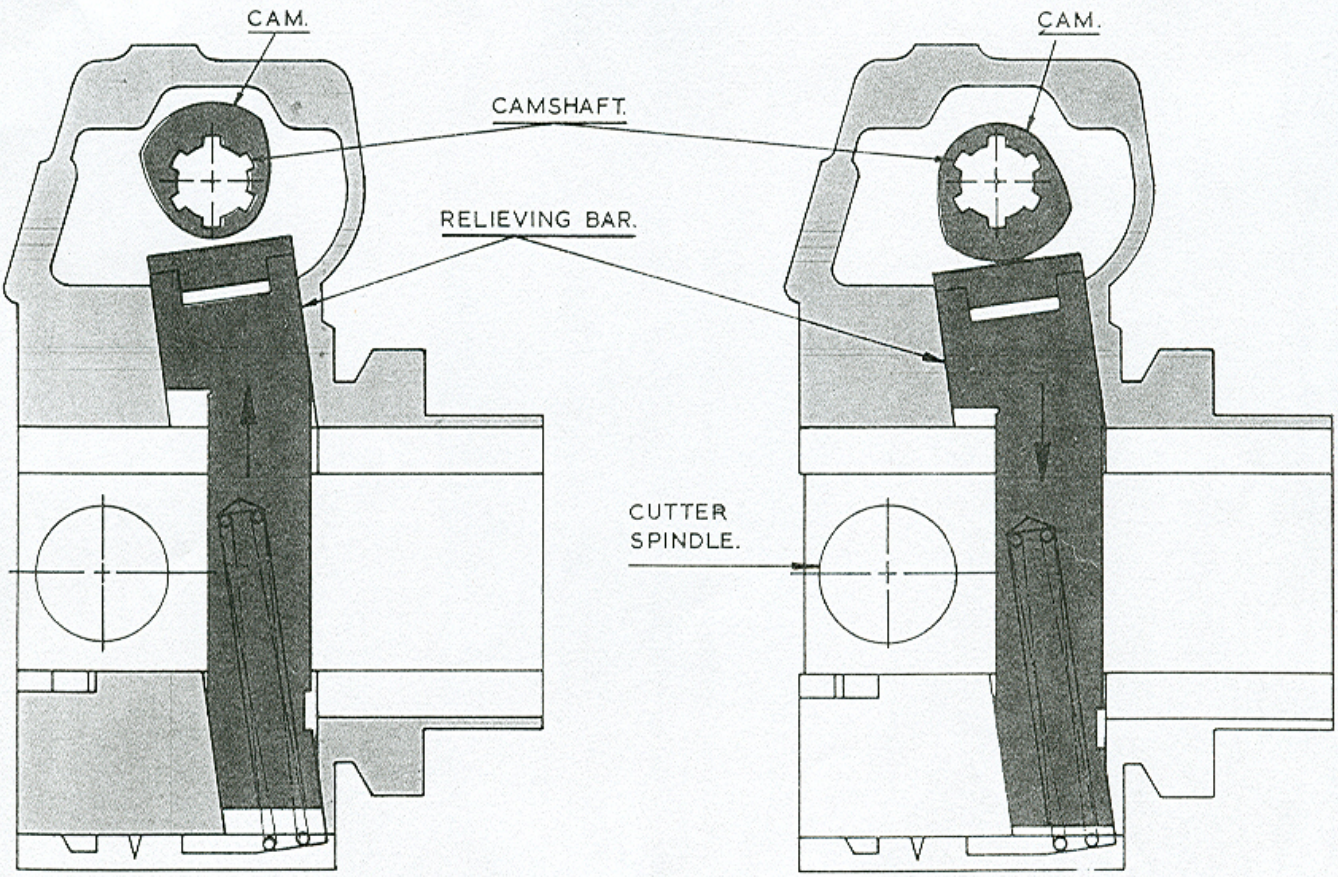
FIG. 2.



BASIC KINEMATICS.

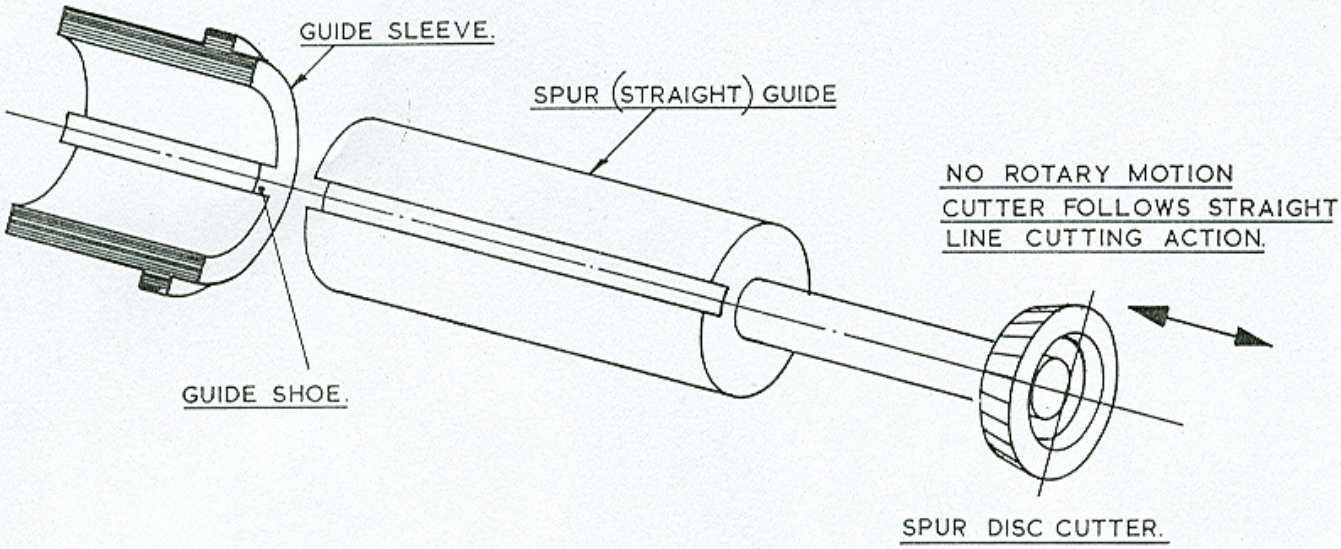
RELIEF MECHANISM.

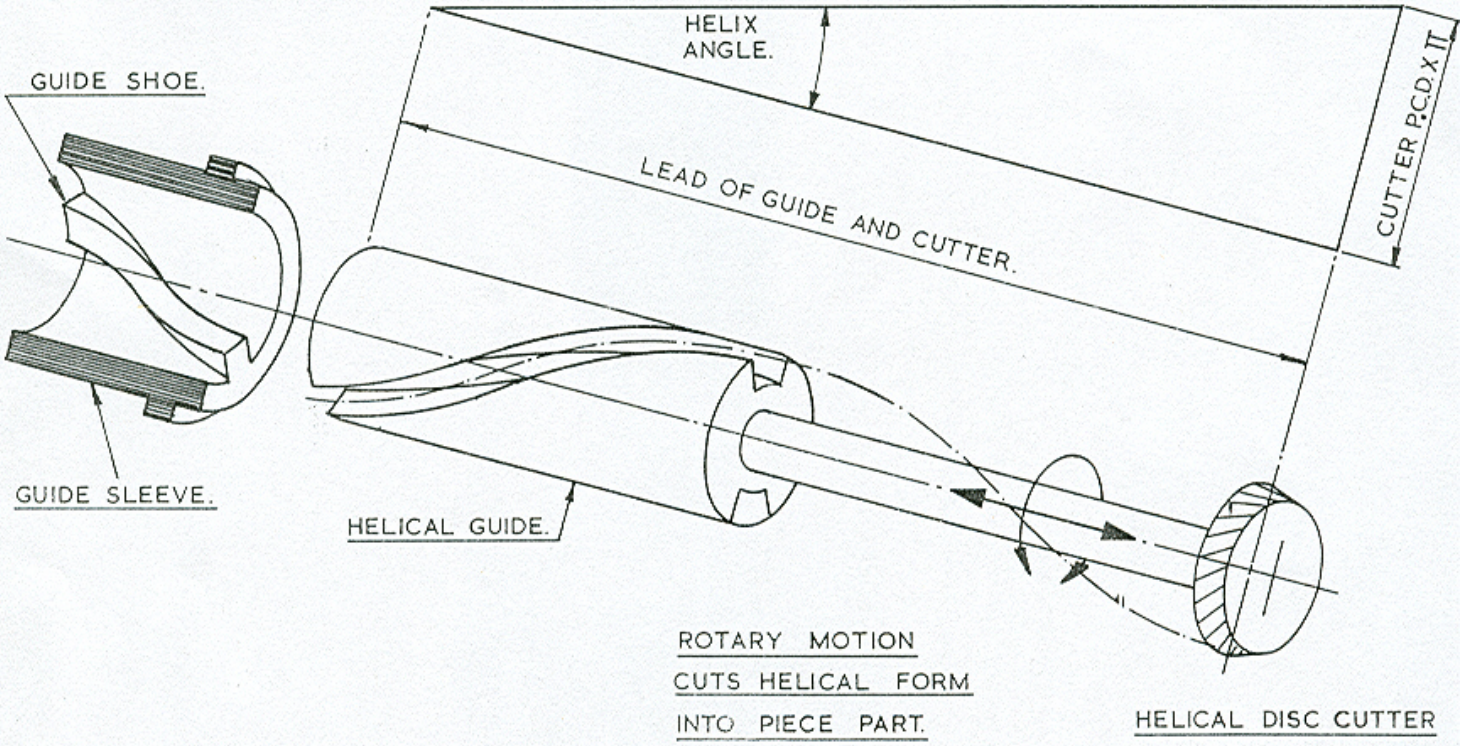
FIG. 3.



CUTTING STROKE.
RELIEVING BAR. UP
← CUTTER FORWARD.

RELIEVING STROKE.
RELIEVING BAR DOWN.
CUTTER BACK. →



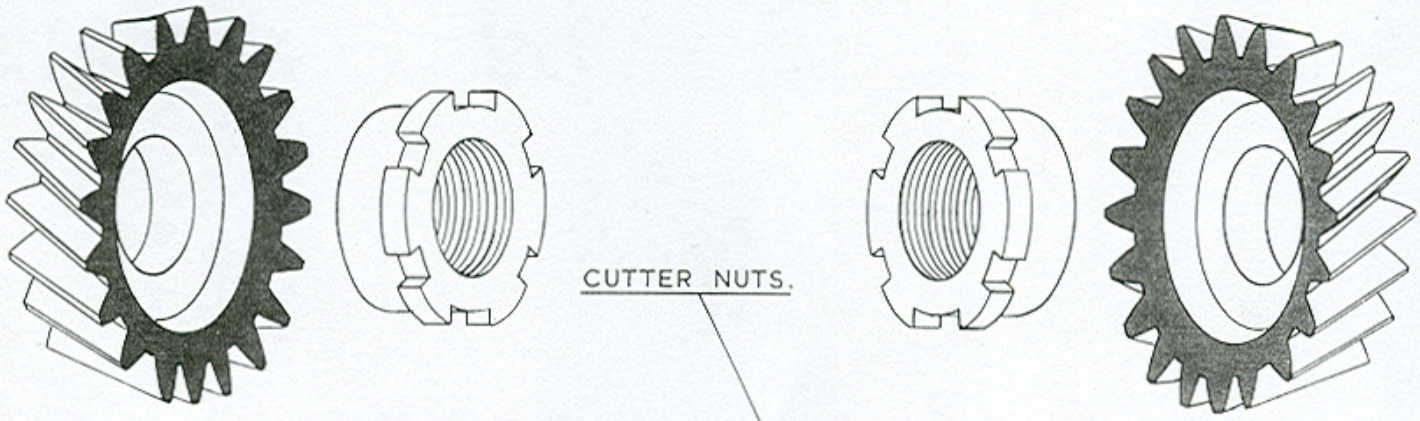


THE LEAD OF A GUIDE IS A FIXED QUANTITY, WHICH IS DEPENDANT UPON TWO FACTORS:-
THE HELIX ANGLE TO BE PRODUCED, AND THE SIZE OF CUTTER TO BE USED.
BOTH CUTTER AND GUIDE MUST HAVE THE SAME, IN ORDER TO PRODUCE THE REQUIRED GEAR.

EXAMPLE:- GEAR TO BE CUT.. 30° HELICAL, 2 C.D.P. (OTHER DETAILS NOT REQ'D TO CALCULATE LEAD)
CUTTER 6" P C D X 2 C D P X 12 TEETH.

$$\text{LEAD} = \frac{\text{P.C.D. OF CUTTER} \times \pi}{\text{TAN. OF HELIX ANGLE.}} = \frac{6'' \times \pi}{\text{TAN } 30^\circ} = 32.648''$$

THE GUIDE AND CUTTER WOULD BE DESIGNED TO SUIT THIS PARTICULAR LEAD ONLY, AND COULD ONLY BE USED TOGETHER AS A MATCHED SET.



CUTTER NUTS.

R.HAND HELIX,
DISC CUTTER.

L.HAND HELIX
DISC CUTTER.

CONNECTING SHAFT.

GUIDE SLEEVES.

CUTTER SLIDE SHOWN AT MID STROKE.

INNER.
CUTTER
HEAD.

OUTER.
CUTTER
HEAD.

INDEX BOX.

OUTER GUIDE.
L.H. HELIX.

INNER GUIDE.
R.H. HELIX.

RELIEVING
CUTTING

CUTTING
RELIEVING

WORKPIECE.

L.H. HELIX. R.H. HELIX.