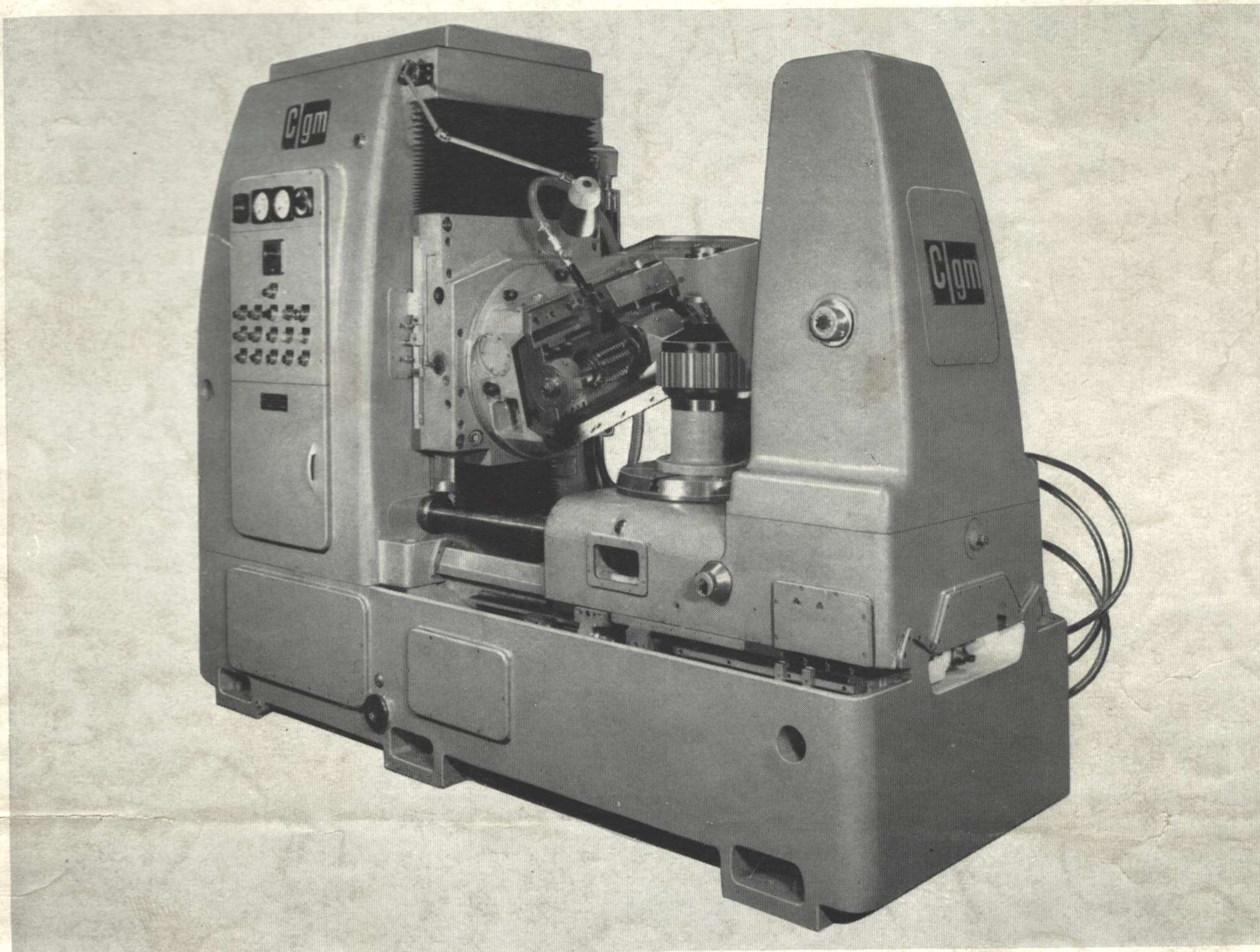


CHURCHILL UNIVERSAL HOBGING MACHINES

PROVIDE AS STANDARD EQUIPMENT . . .



Fully automatic machine cycle.

Push button operation to worktable, vertical

slide and hob slide for setting-up purposes.

Automatic lubrication to all moving parts.

Hydraulic actuation of tailstock.

Provision for semi-automatic or fully automatic loading devices.

CHURCHILL UNIVERSAL HOBBERS

PROVIDE ALL THESE BUILT-IN FEATURES . . .

Extreme accuracy allied to maximum rigidity.

Simplest possible transmission for long life.

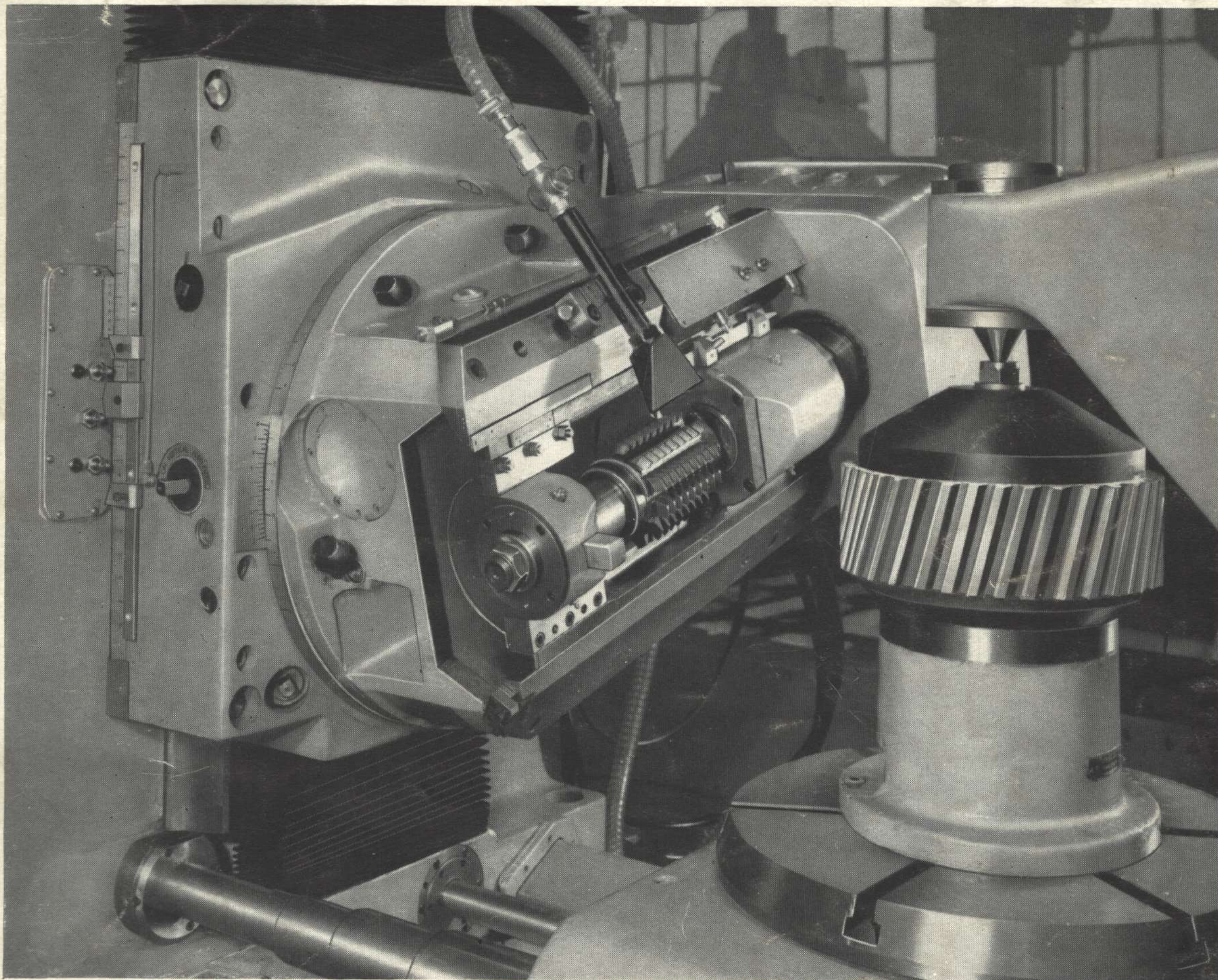
All round accessibility for set-up-adjustment, control and maintenance.

Index and differential gears located in one enclosure.

The choice of manual, continuous or intermittent hob shifting movements in addition to tangential feed (all provided in one hob head assembly).

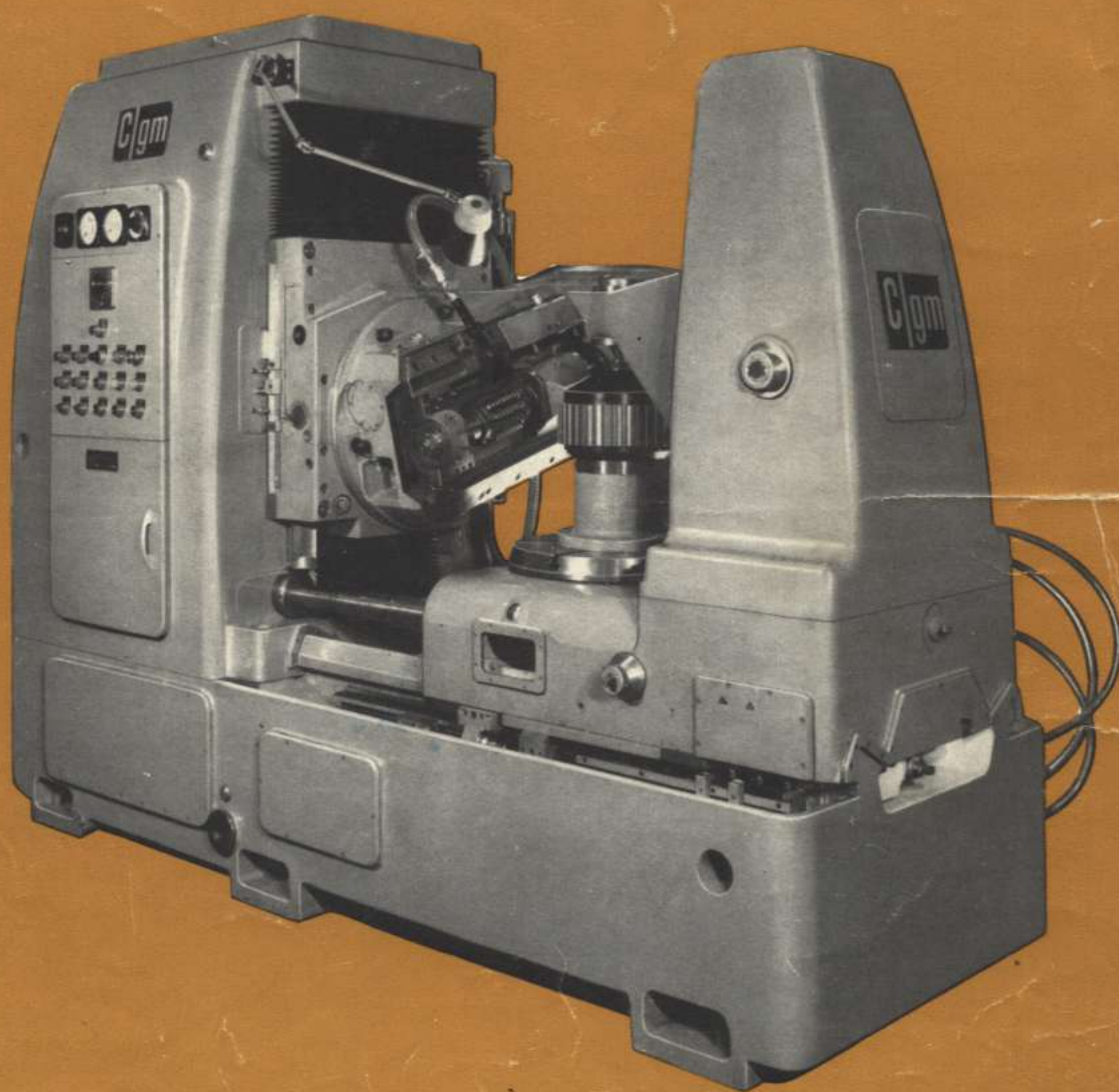
Alternative main drive systems. Either a P.I.V. unit, a Ward Leonard control unit or a single speed drive unit with interchangeable pulleys.

Alternative feed drive system. Either a P.I.V. unit or change gears.



C gm

CHURCHILL 24" & 36" UNIVERSAL HOBBING MACHINES



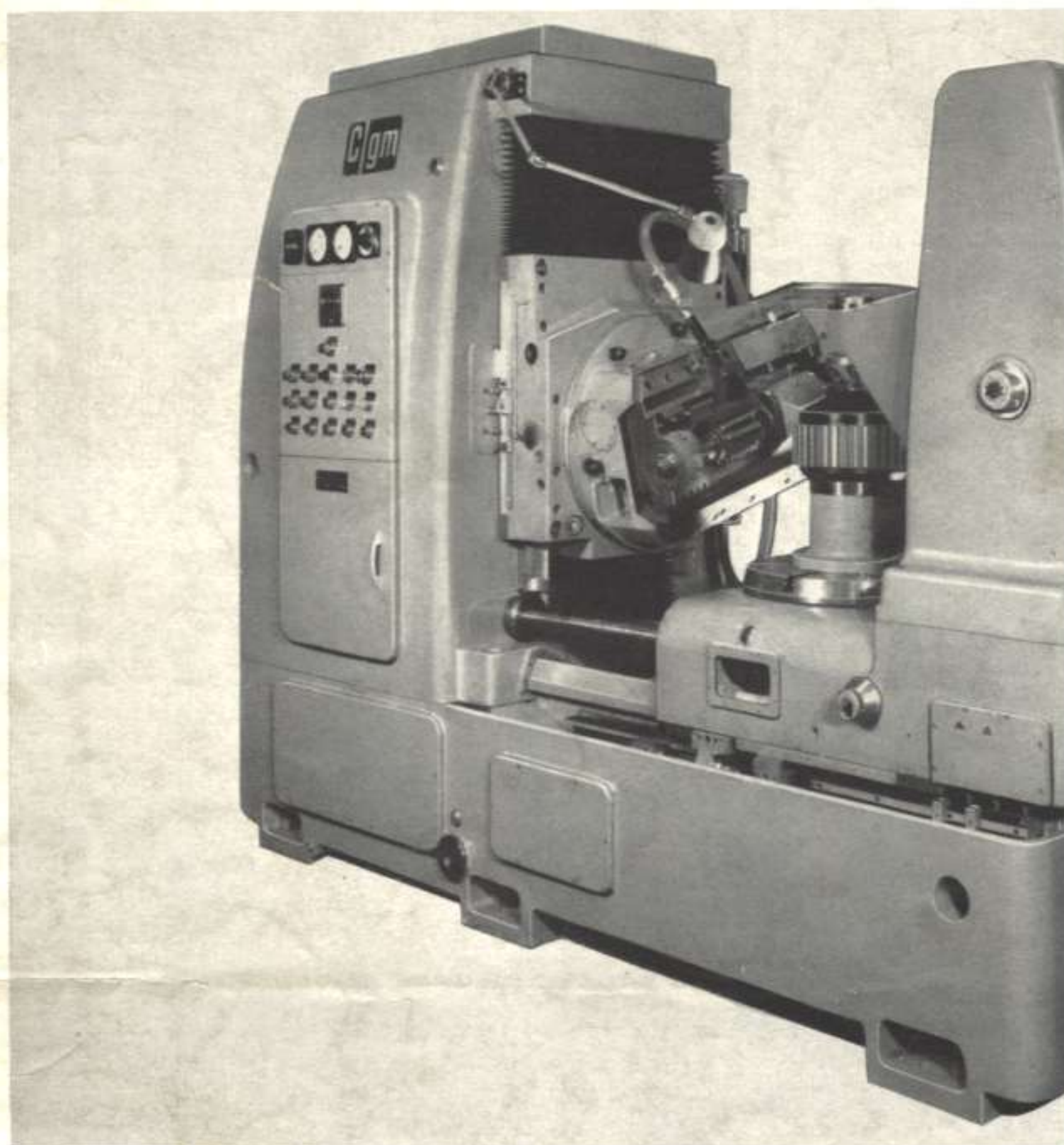
CHURCHILL GEAR MACHINES LIMITED a company of the **Charles Churchill Group**
Blaydon-on-Tyne, Co. Durham, England

*Manufacturers of Gear Hobbing Machines up to 48" capacity—Gear Shaving Machines up to 30" capacity—Gear Forming Machines
Gear Sound Testing Machines—Hard Gear Honing Machines—Gear Chamfering Machines—Gear Tooth Rounding Machines*

CHURCHILL UNIVERSAL HOBGING MACHINE

PROVIDE AS

EQUIPMENT



Fully automatic machine cycle.

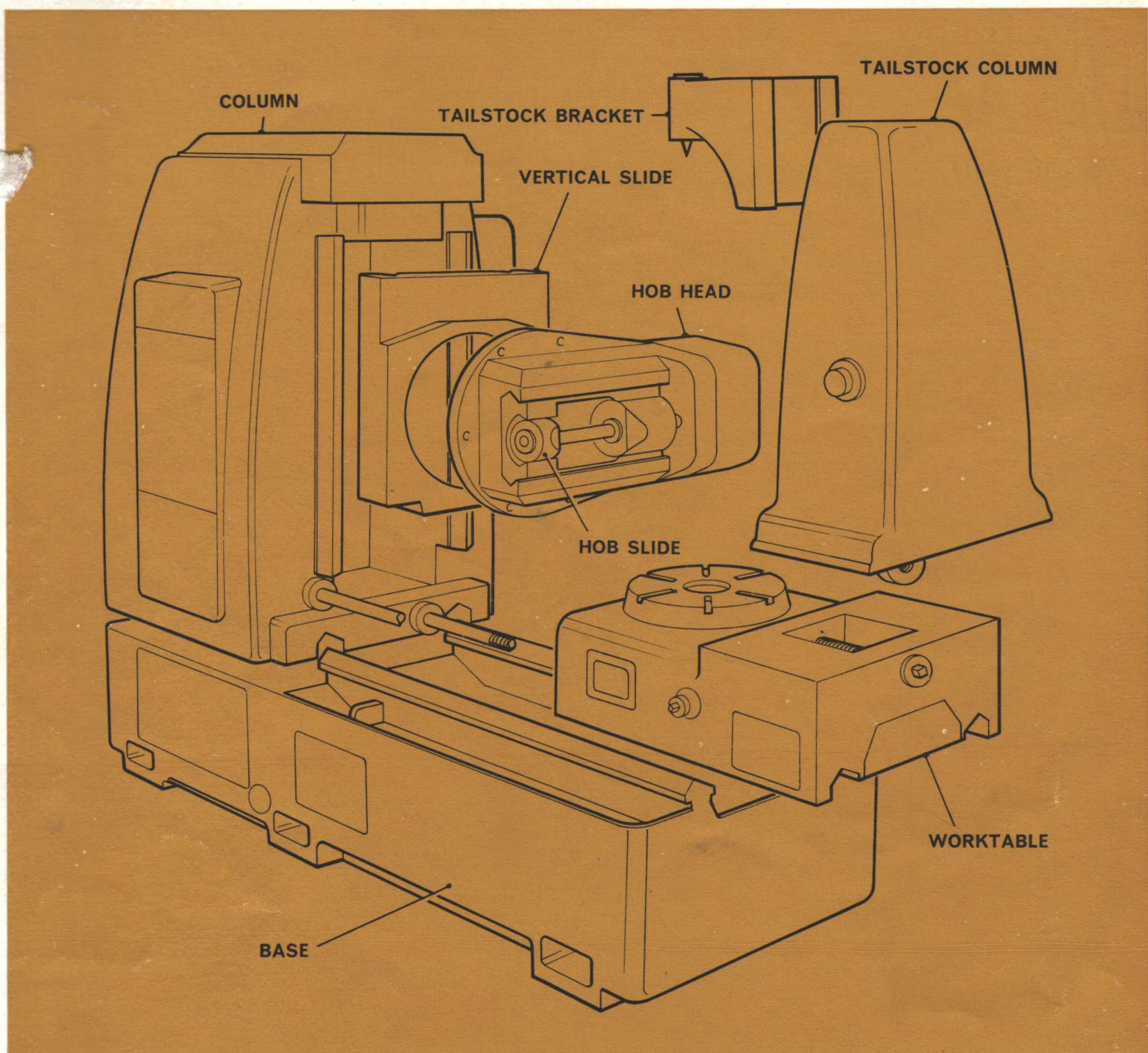
Push button operation to worktable, vertical slide and hob slide for setting-up purposes.

Automatic lubrication to all moving parts.

Hydraulic actuation of tailstock.

Provision for semi-automatic or fully automatic loading devices.

MACHINE CONSTRUCTION



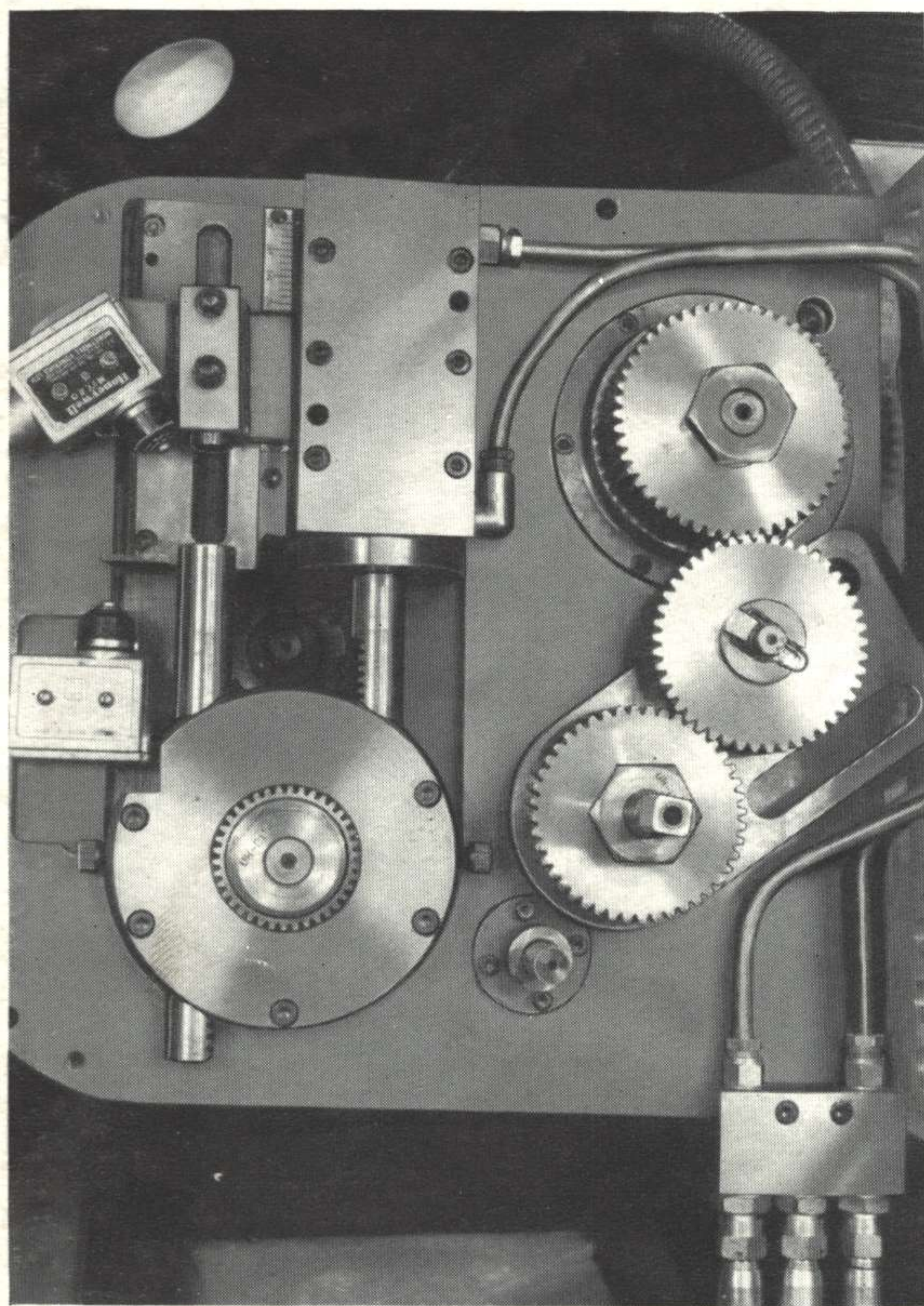
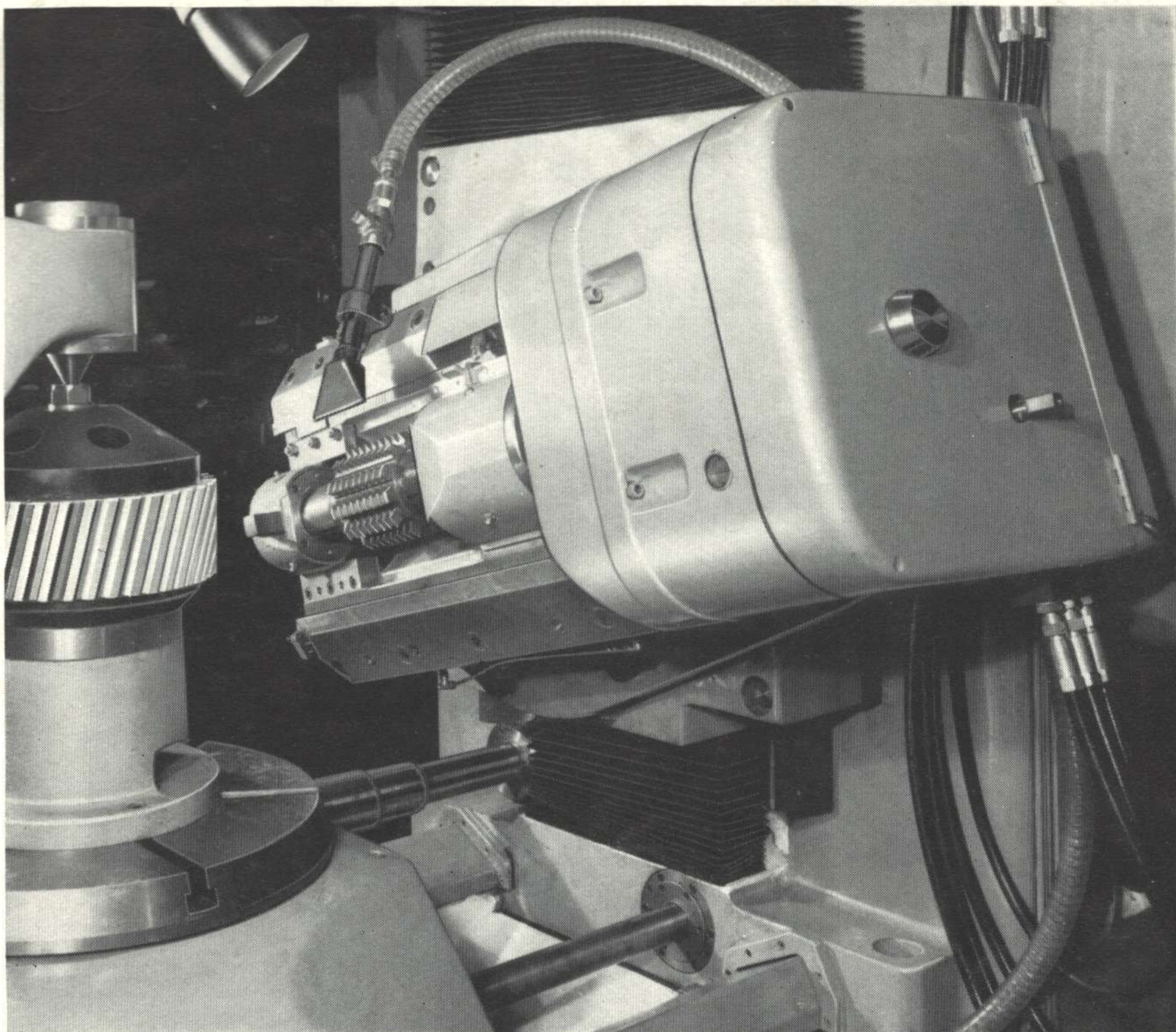
The base is a substantial iron casting forming a rigid support for the column and the worktable slide complete with the tailstock column. The worktable slide is carried on accurately ground Vee-type slideways and can be clamped by locking pads in any required position. The base also forms a sump for the coolant and provision is made for removing swarf, either by a swarf chute or a scraper type conveyor.

The column is rigidly keyed and bolted to the base and houses the main drive and vertical feed equipment. Accurately ground, Vee-type slideways carry the vertical slide which is retained by heavy gib straps and firmly clamped by locking pads. The hob head is designed for maximum rigidity and accommodates a robust hob slide for carrying large hobs. The hob slide is fitted in slideways, also accurately ground, and retained by heavy gib straps.

The worktable slide supports the tailstock column which can be manually retracted 4 in. by means of a lead screw and nut to accommodate extra large gears on the worktable. The worktable spindle is a close-grained iron casting and is hollow to accommodate workpiece end sections.

Vertical slideways on the tailstock column carry the tailstock bracket which houses the work centre. The complete centre unit runs in high precision bearings and can be removed, leaving an accurately machined bore for accommodating special workpiece fixtures.

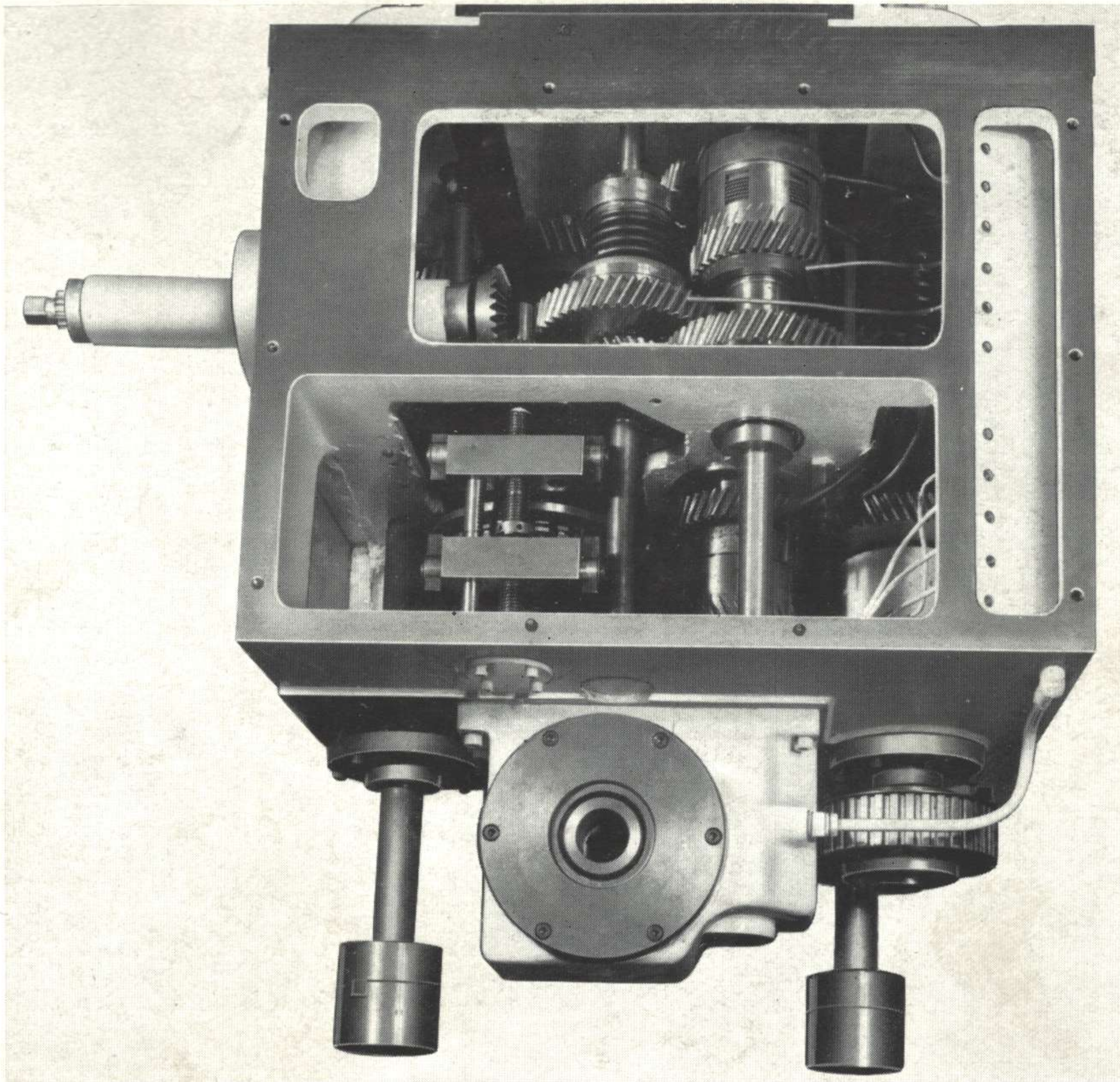
The extreme accuracy obtainable on the Churchill Universal Hobbing Machine is achieved by utilizing substantial, well-ribbed main castings, the accurate mating of major components and the precision machining of all bearings and sliding surfaces.



The hob head, which is of robust proportions to ensure maximum rigidity when hobbing optimum capacity gears, is designed to incorporate in one assembly any combination of the following motions to the hob slide.

Manual shift
Continuous shift
Intermittent shift
Tangential feed

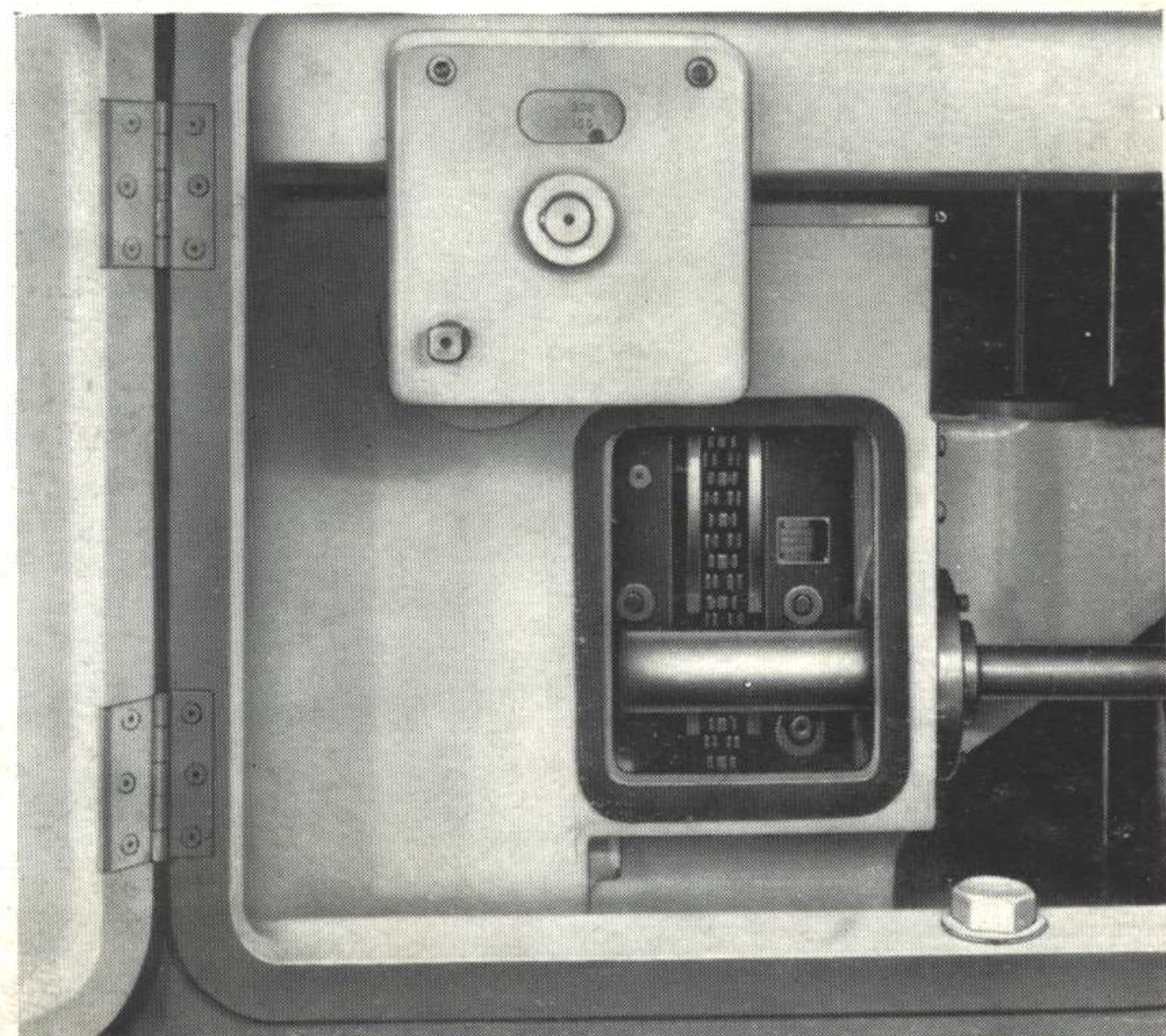
Change gears can be easily fitted and varied to produce the desired rate of hob shift or tangential feed.

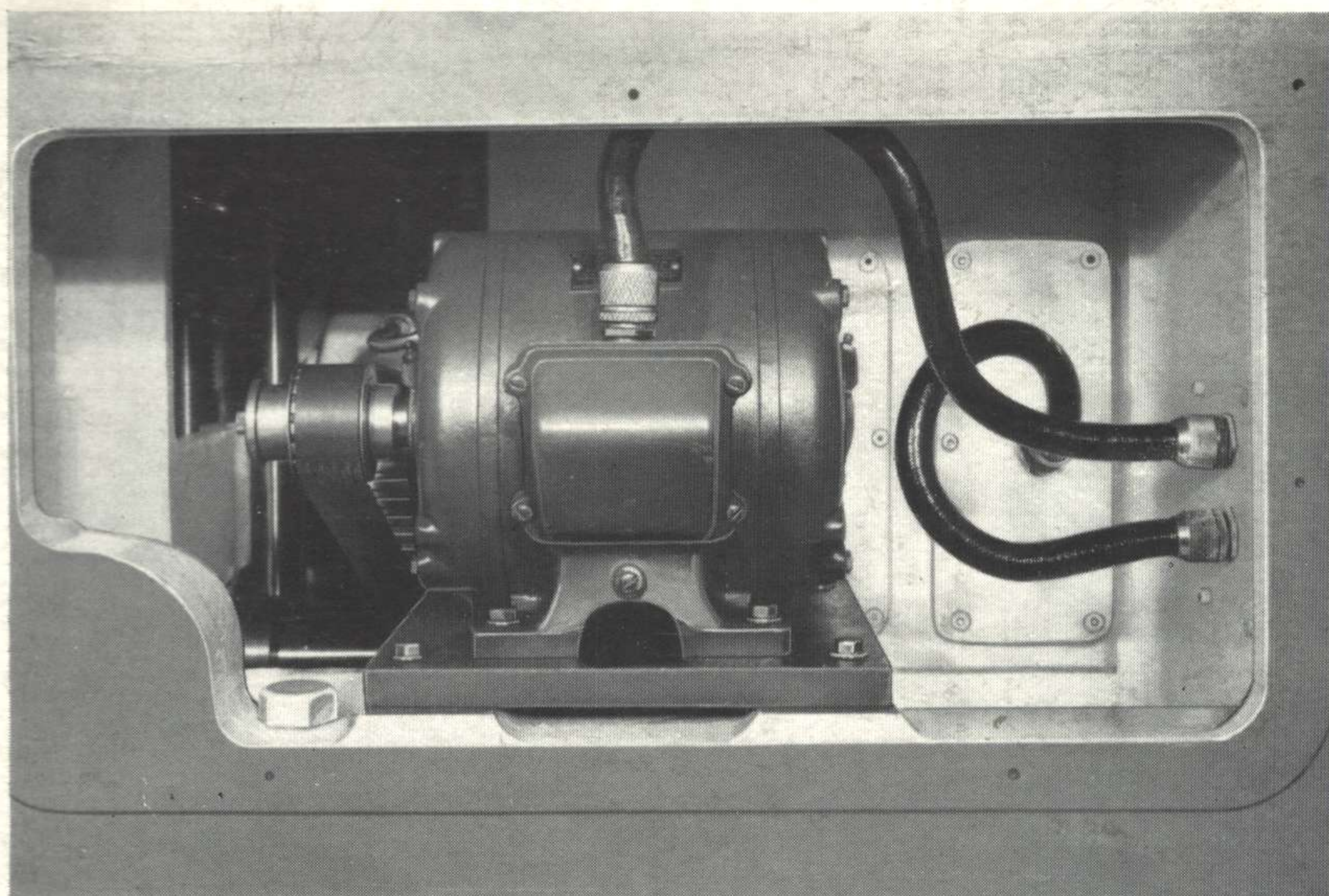


The feed gear box is housed at the bottom of the column as a complete sub-assembly so that it can be withdrawn for maintenance purposes. Electro-magnetic clutches, gearing and bearings can be easily inspected through detachable front covers.

The feed rates can be obtained from either a P.I.V. unit, which gives variable feed rates up to 20:1, or from a change gear system giving 20 rates of feed. For high production machines, where simplified transmission is desirable, the differential unit may be omitted.

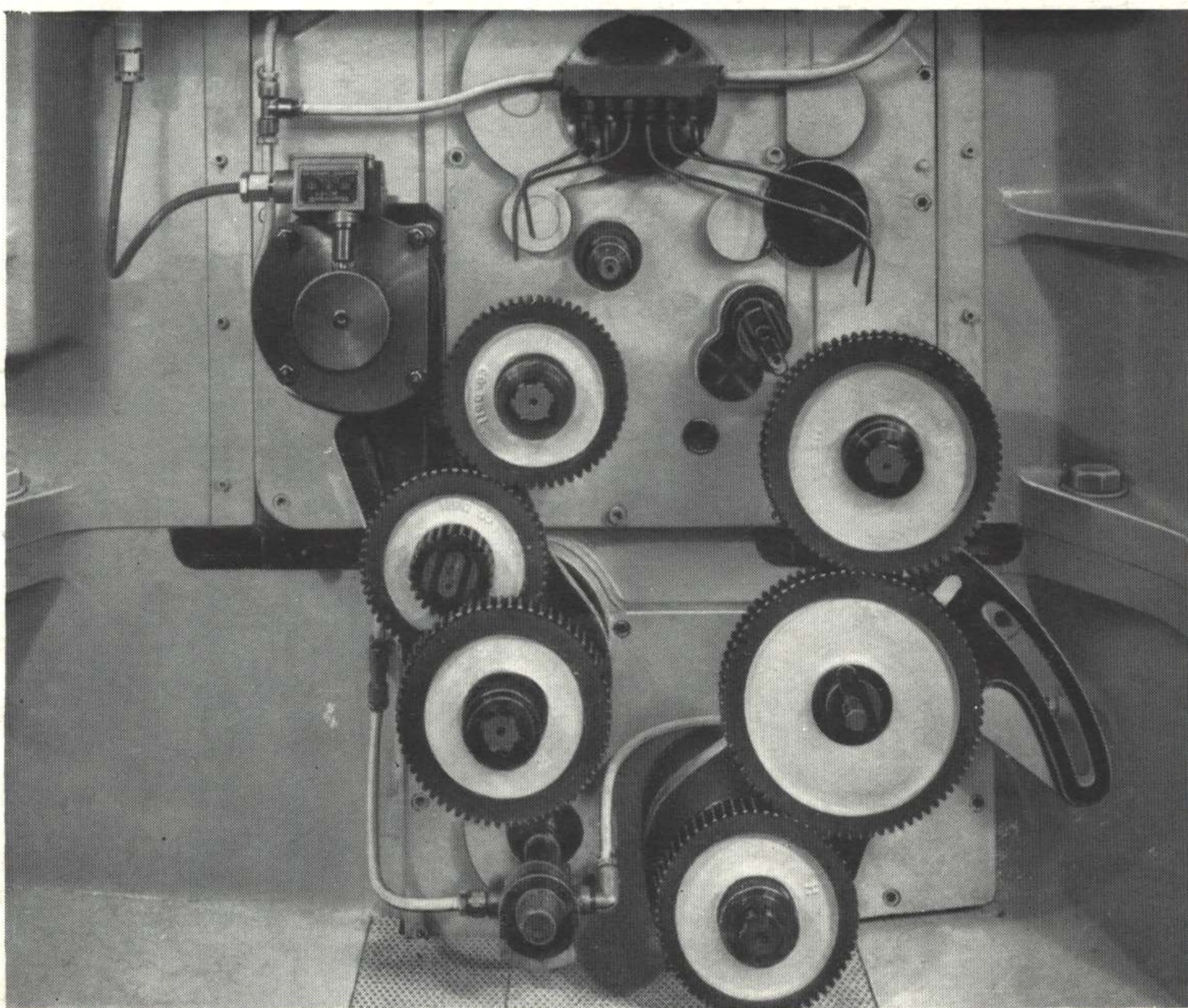
An anti-backlash device is incorporated in the feed drive to the worktable slide which can also be moved manually on the slideway.

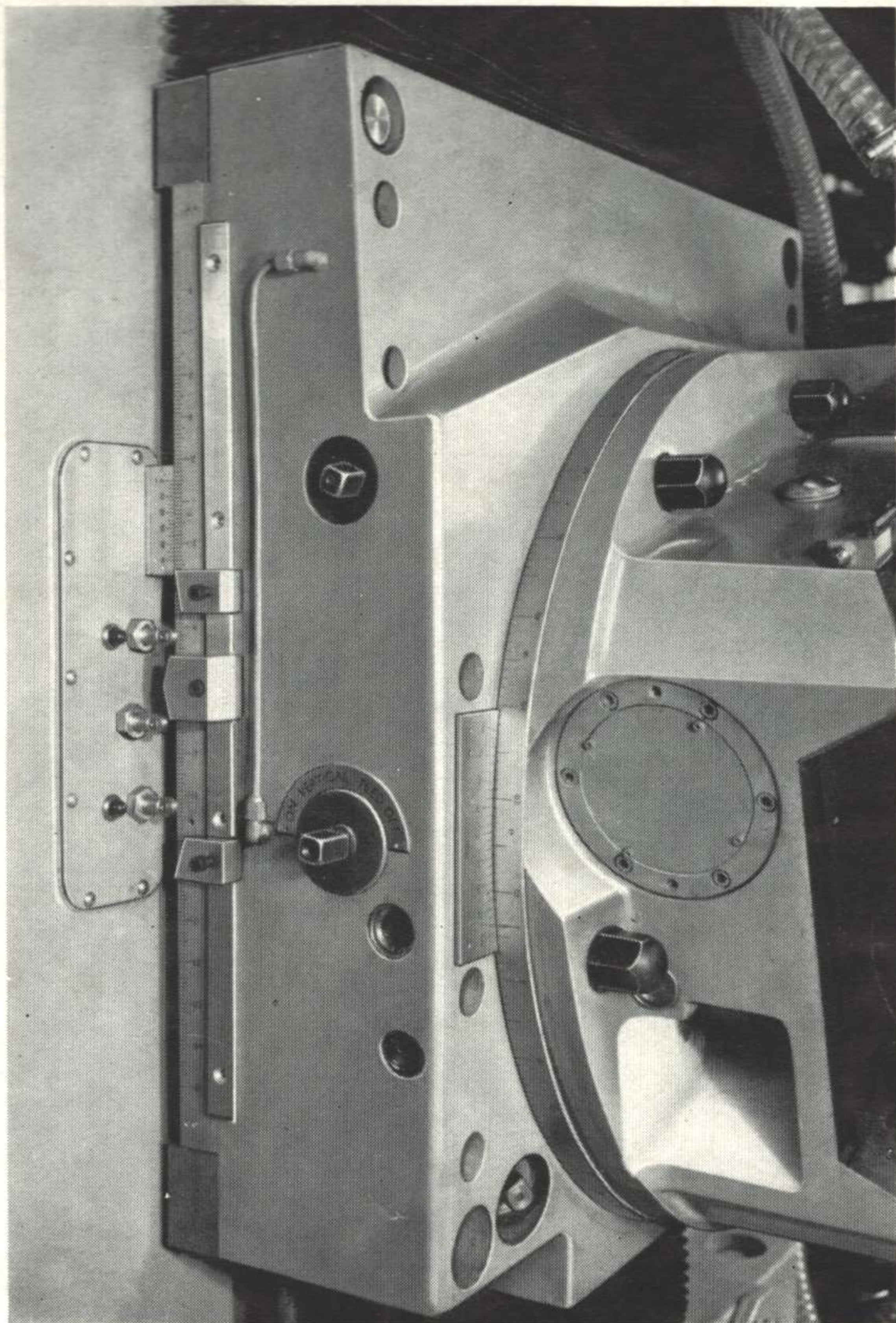




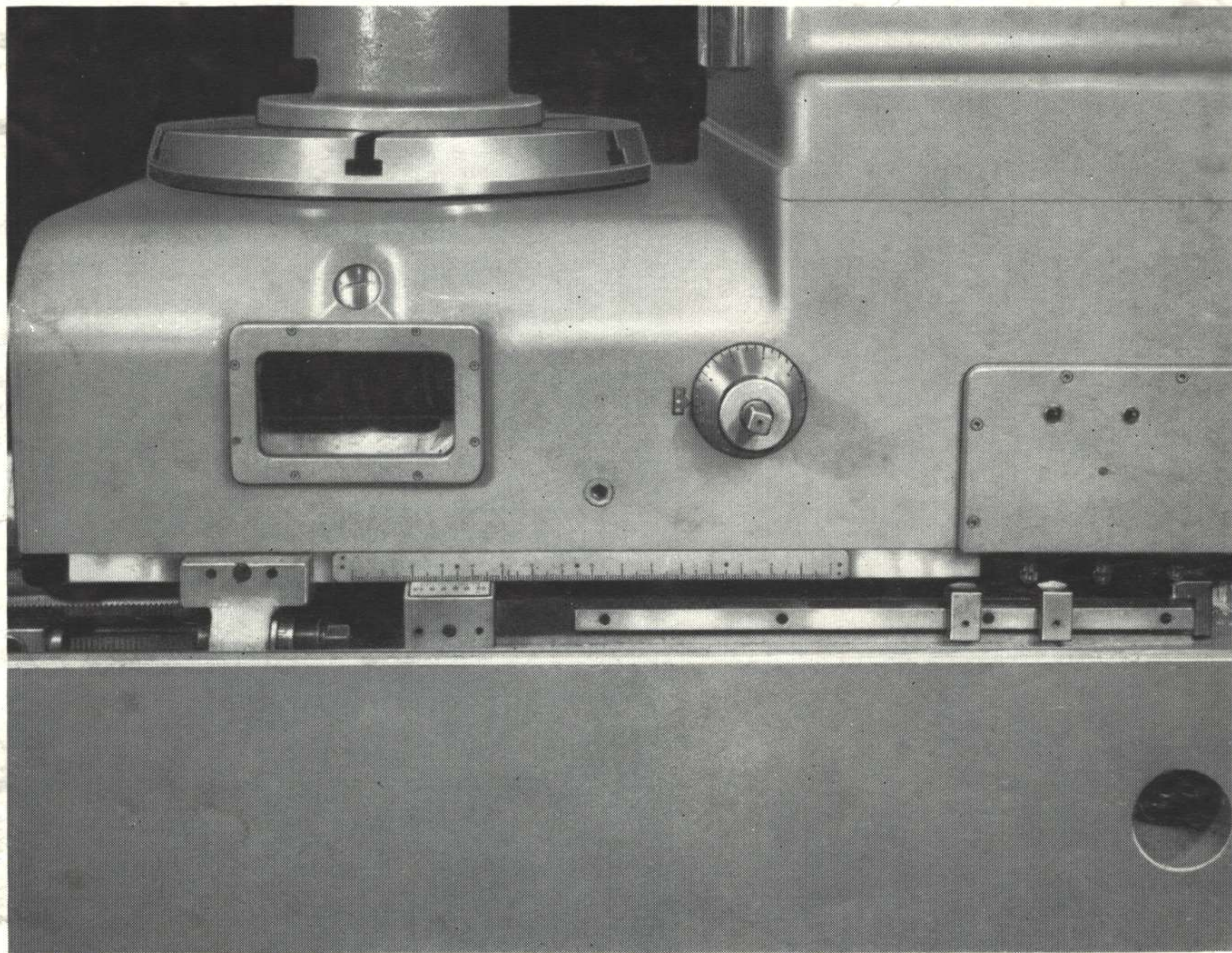
Independent 3 h.p. foot mounted rapid traverse motor drives through toothed belts and pulleys to the feed gear box.

Access to the change gear box is easily obtained through a pair of hinged doors at the end of the machine. Index and differential gears are interchangeable.

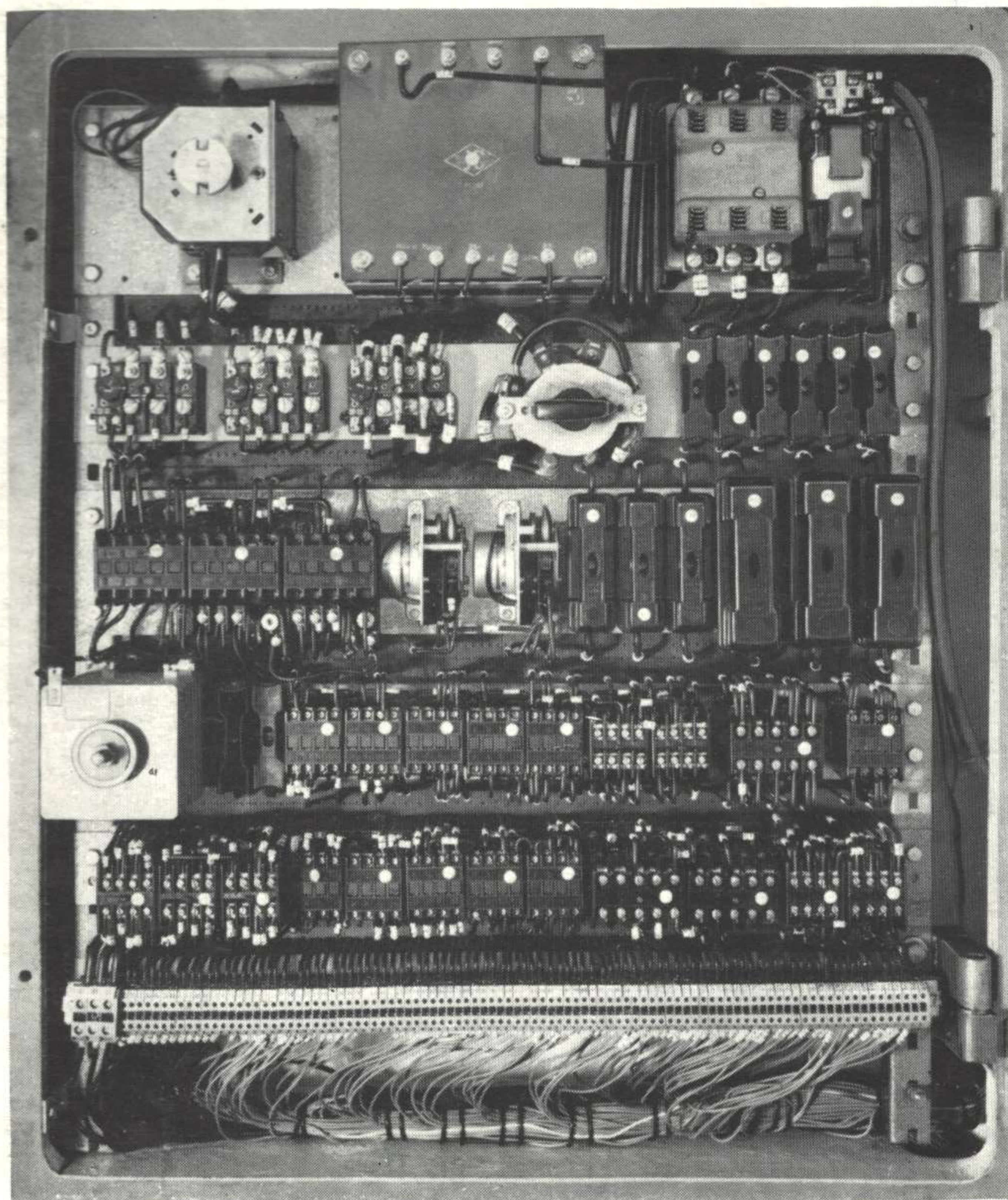




The vertical slide, hob slide and worktable slide are fitted with verniers and scale indicators. Micro-switches and trip-dogs are fitted to govern the limits of travel and sequence of operation on automatic cycle.



ELECTRICS

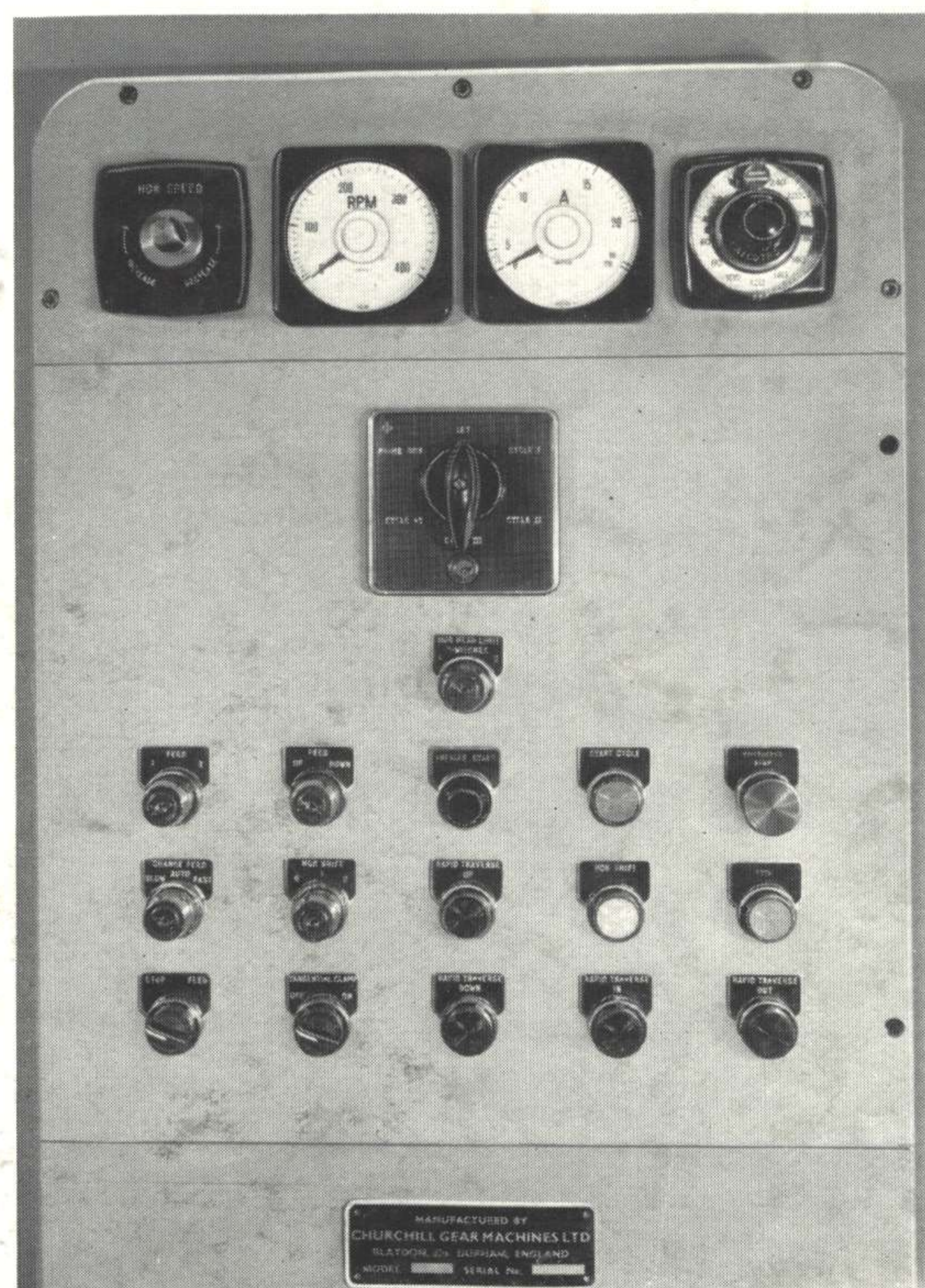


The electrical controls and relay panel are housed in a cabinet with self sealing door giving access to all relays and controls which are clearly marked for maintenance purposes. An isolating switch with interlock is built on to the cabinet.

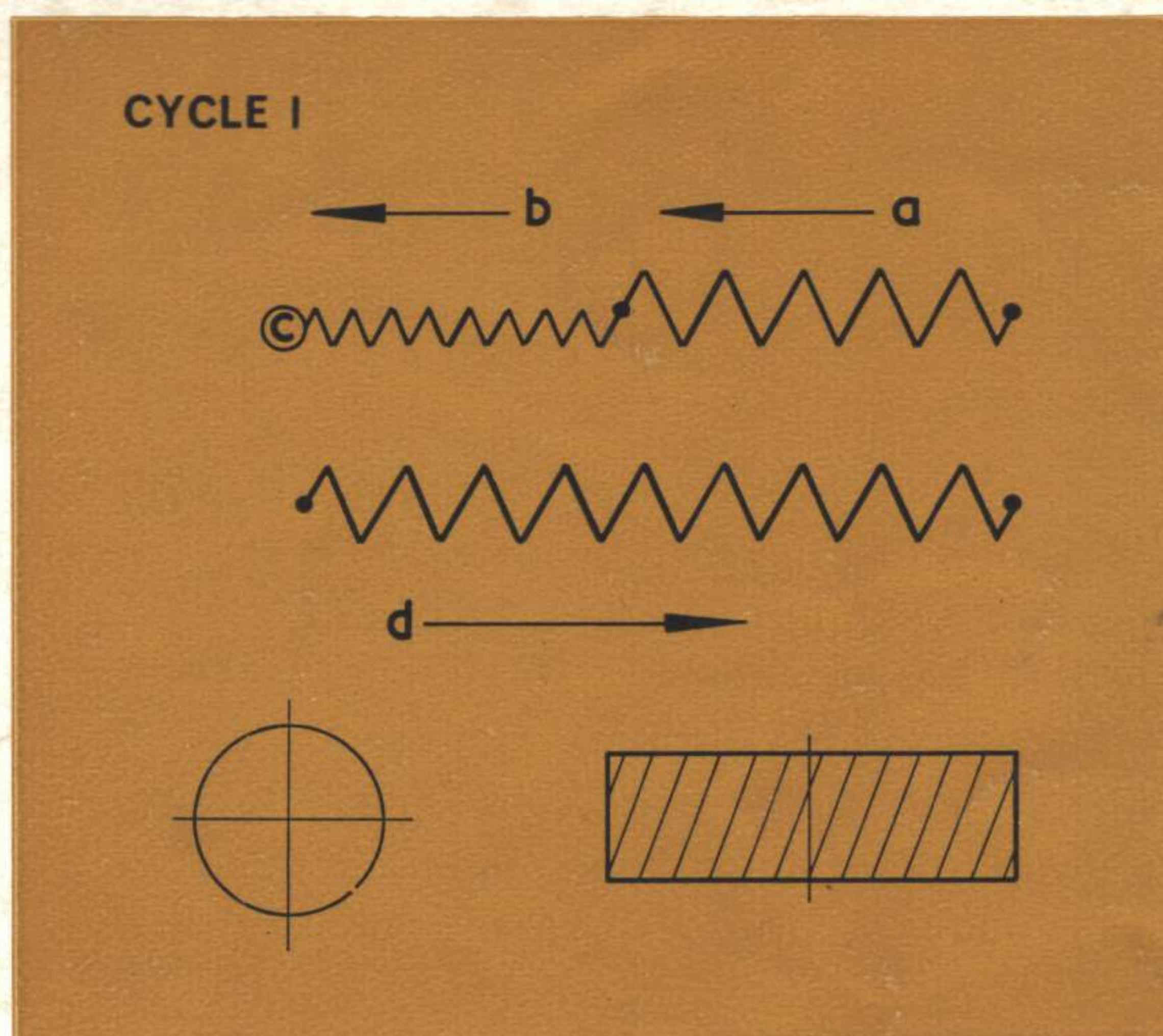
All push buttons and switches are readily accessible from the operators' position and afford full control of the machine for setting-up, cycle selection and emergency stop. Controls are provided for rapid traverse motion in either direction for the vertical slide and the worktable slide.

All machine functions are fully interlocked during a cycle operation. The cycle start button is inoperative when the selector switch is on 'Set' and, when the selector switch is on the appropriate cycle, there is no supply to the jog buttons.

For ease of maintenance the complete button panel hinges forward.



CHURCHILL HOBBERS OFFER THREE TYPES OF AUTOMATIC MACHINE CYCLE

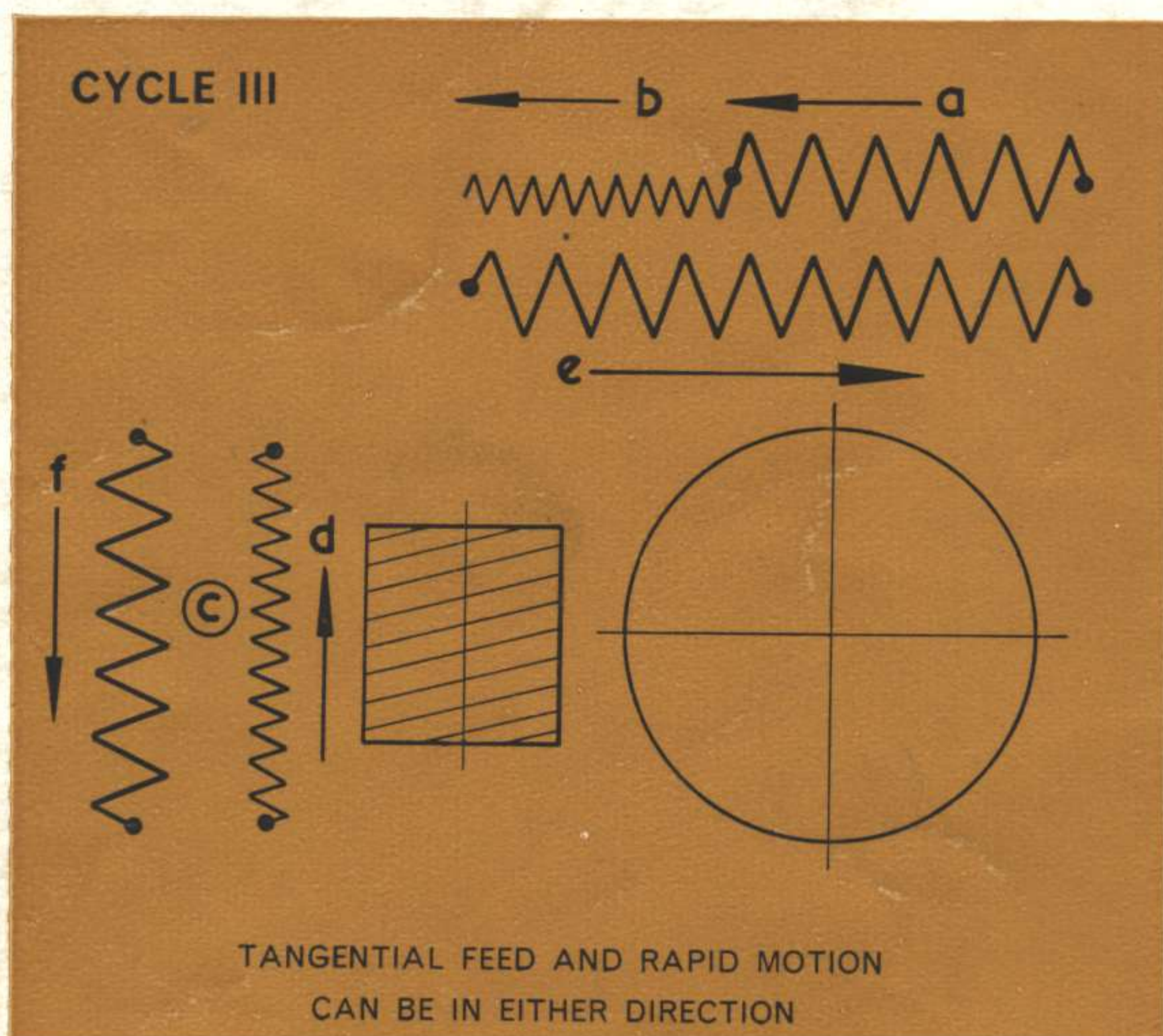
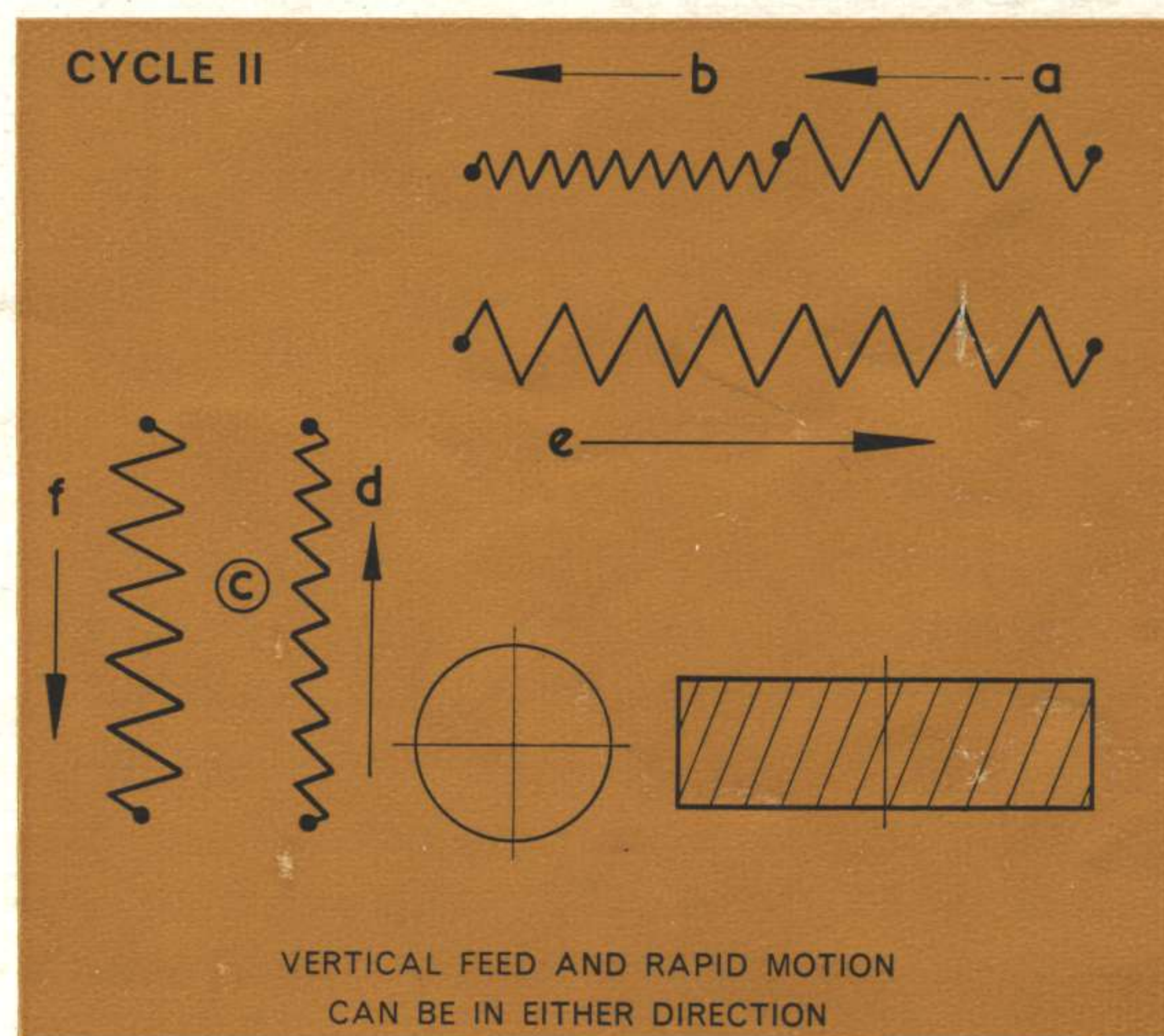


Radial infeed

- (a) On depression of start button, the workhead feeds forward rapidly.
- (b) Fine radial infeed takes control and carries on to a dead stop position.
- (c) The workhead is held in this position for one complete revolution of the workpiece.
- (d) The workhead returns in rapid traverse.

Radial and Vertical feed

- (a) The workhead feeds forward rapidly.
- (b) Fine radial infeed takes control and carries on to a dead stop position.
- (c) Axial feed is engaged and hob head feeds either up or down past workpiece.
- (d) The workhead is held in this position for one complete revolution of the workpiece.
- (e) As above.
- (f) A rapid vertical return occurs on the hob head.



Radial and Tangential feed

- (a) The workhead feeds forward rapidly.
- (b) Fine radial infeed takes control to a dead stop position.
- (c) Tangential feed of the hob is engaged (to the left or right).
- (d) The workhead is held in this position for one complete revolution of the workpiece.
- (e) As above.
- (f) The hob returns tangentially in rapid motion.

MACHINE CAPACITY CHART AND LEADING DIMENSIONS

| MODEL | U.2415 | U.3615 |
|--|---|---|
| Maximum Workpiece diameter (with Tailstock) | 22" | 34" |
| Maximum Workpiece diameter (without Tailstock) | 26" (3" dia. Hob) | 38" (3" dia. Hob) |
| Maximum Pitch (qualified by diameter) | 3 DP | 3 DP |
| Minimum Number of Teeth to be cut | 8 | 12 |
| Maximum Number of Teeth to be cut | 200 | 200 |
| (Special provision made for cutting prime numbers) | | |
| Minimum Horizontal Centre distance | 2" | 2½" |
| Maximum Horizontal Centre distance | 15" | 22" |
| Maximum Horizontal Feed travel | 13" | 19½" |
| Minimum Height Hob C_L to Worktable | 5½" | 5½" |
| Maximum Height Hob C_L to Worktable | 20½" | 20½" |
| Maximum Vertical Feed travel | 15" | 15" |
| Max. Height Worktable to Tailstock Centre | 30" | 30" |
| Worktable Face diameter | 20" | 29" |
| Worktable Bore diameter | 3½" | 3½" |
| Worktable Bore depth | 15" | 15" |
| Maximum Hob diameter | 7" | 7" |
| Maximum Hob length | 8" | 8" |
| Maximum Travel of Hob Slide (Tangential Feed) | 5" | 5" |
| Diameter of Hob Arbors (interchangeable) | 1¼"/1½" | 1¼"/1½" |
| (Special diameter Arbors or Solid Integral Arbors can be supplied) | | |
| Hob Spindle Speeds | 65/300 R.P.M. | 65/300 R.P.M. |
| (Infinitely variable by P.I.V. unit or supplied in any of 10 speed rates by belt/pulley change for high production m/cs) | | |
| Vertical Feeds | .01" to .20" per work rev. | .01" to .20" per work rev. |
| (Infinitely variable by P.I.V. unit or supplied in any of 20 feed rates by pick-off gears for high production m/cs) | | |
| Horizontal Feeds | .005" to .10" per work rev. | .005" to .10" per work rev. |
| Tangential Feeds (Wormwheel and Diag. Hobbing) | Any ratio from 1/2 to 1/1 × Vert. Feed | Any ratio from 1/2 to 1/1 × Vert. Feed |
| Intermittent Hob Shift (infinitely variable) | 0 to .3125" per cycle | 0 to .3125" per cycle |
| Continuous Hob Shift (6 rates) | .00005" to .0001" per rev. of Hob | .00005" to .0001" per rev. of Hob |
| Main Motor | 10 H.P. | 10 H.P. |
| Rapid Traverse Motor | 3 H.P. | 3 H.P. |
| Coolant Pump & Conveyor Motors | 1 H.P. each | 1 H.P. each |
| Floor Space × Height | 11' 8" × 7' 0" × 7' 0" | 13' 0" × 7' 0" × 7' 0" |
| Approximate Nett Weight | 7½ tons | 8 tons |

W O R L D A G E N C I E S

| | |
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| SWEDEN | AB MEKANIK, Regeringsgatan 85, Stockholm, Sweden |
| U.S.A. (Universal Gear Hobbing Machines only) | CLEVELAND HOBGING & MACHINE CO., 1311 Chardon Road, Cleveland, 17, Ohio, U.S.A. |
| WESTERN GERMANY AND AUSTRIA | HAHN & KOLB, A.B.T. 26, Savignystrasse 5, Frankfurt, a.N., W. Germany |

Manufactured by

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Blaydon-on-Tyne Co. Durham

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