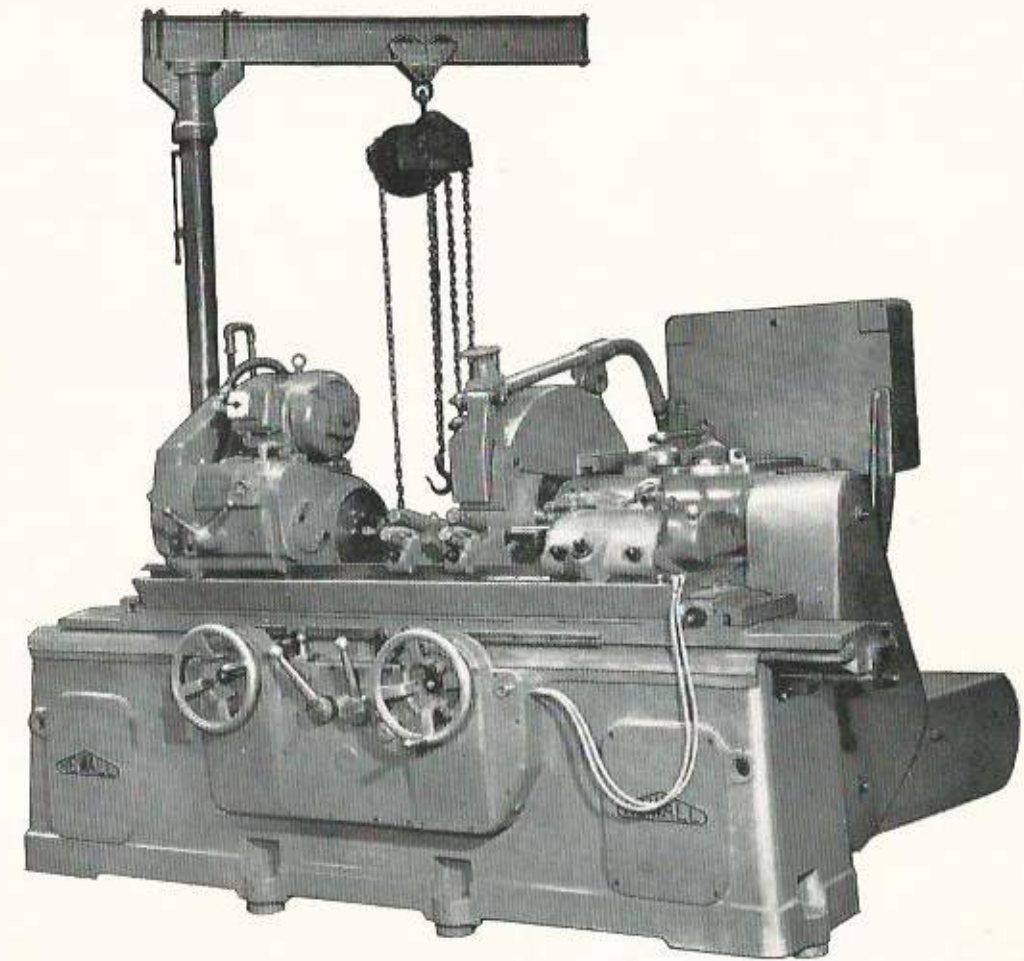


# NEWALL GROUP SALES LTD.

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GRAMS: "PRECISION" PETERBOROUGH

**PETERBOROUGH**  
ENGLAND



**NEWALL GROUP SALES LTD**  
**PETERBOROUGH**  
NORTHANTS

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Grams: "Precision," Peterborough

Designed and produced by Rooster Publicity Limited, Peterborough, London and Newcastle. Printed in England.

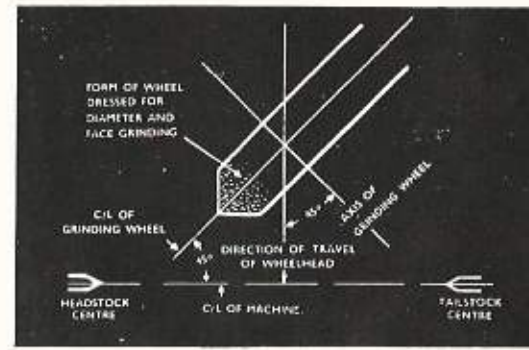
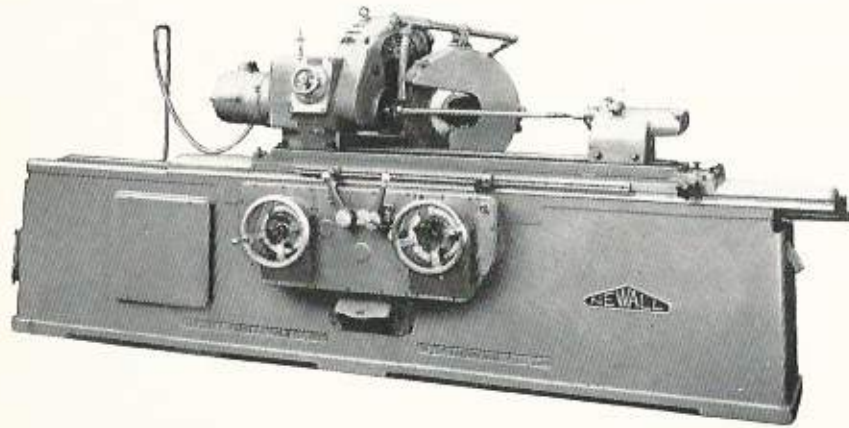


PRODUCTION CYLINDRICAL GRINDING MACHINES  
UNIVERSAL GRINDING MACHINES  
INTERNAL GRINDING MACHINES  
THREAD GRINDING MACHINES  
CRANKSHAFT GRINDING MACHINES  
LAPPING MACHINES  
JIG BORING MACHINES  
OPTICAL MEASURING EQUIPMENT



## ANGULAR HEAD GRINDING MACHINE

As will be seen from the illustration, the wheelhead of this machine is at 45° to the table ways to allow the finish on the face of a component to be equal to that produced on the diameter. The machine is equipped with hydraulically operated table traverse, run back and return of wheelhead, and plunge out feeds. Wheel size is 20" diameter x 2" wide. The geared workhead gives six work speeds of 18 to 265 r.p.m.



Diagrammatic layout of grinding wheel in relation to the wheelhead infeed movement and travel of the machine table.

### SPECIFICATION

Maximum grinding diameter and length with new wheel	10" x 18", 36", 48"
Height of centres	5 1/2"
Work speeds	18, 30, 52, 80, 155 and 265 r.p.m.
Table speeds	3" to 240" per min. (indefinitely variable)
Maximum included angle at which table can be swivelled	10°
Feed range	.001 to .001
Rapid wheel withdrawal	2"
Capacity of steadies	1 1/2" to 3"
Power required for wheelhead motor	7 1/2 h.p.
Power required for workhead motor	2 h.p.
Power required for hydraulic pump motor	1 h.p.
Power required for coolant pump motor	1 h.p.
Floor space required	90" x 57" x 120" x 57" 144" x 57"

## KEIGHLEY "KU" UNIVERSAL GRINDING MACHINES

The Keighley "KU" Grinding Machines are fully universal with the wheelhead mounted on compound slides with large turntables, with the usual facilities for swivelling the workhead and table. Table traverse is hydraulically operated with provision for dwell at each end of the stroke, and for intermittent wheelhead infeed. Features of the machine: the "Conclear" bearings, the ability to mount the wheel at either end of the wheel spindle and the ability to change the workhead drive from live to dead centre operation in a few seconds. The internal grinding head is permanently mounted on the wheelhead casting and hinged to allow it to be swung out of position when the machine is used on external grinding. A wide variety of internal grinding spindles can be supplied. Table-mounted attachments are manufactured for Radius Dressing, Centre Grinding, Form Dressing and Angular Wheel Dressing. Three ranges are manufactured: the Standard range from 12" x 24" to 12" x 60"; the Medium Heavy range from 16" x 24" to 16" x 60", and the Heavy Duty range 18" x 24" to 24" x 96". The capacity of the machine illustrated is 18" x 72".

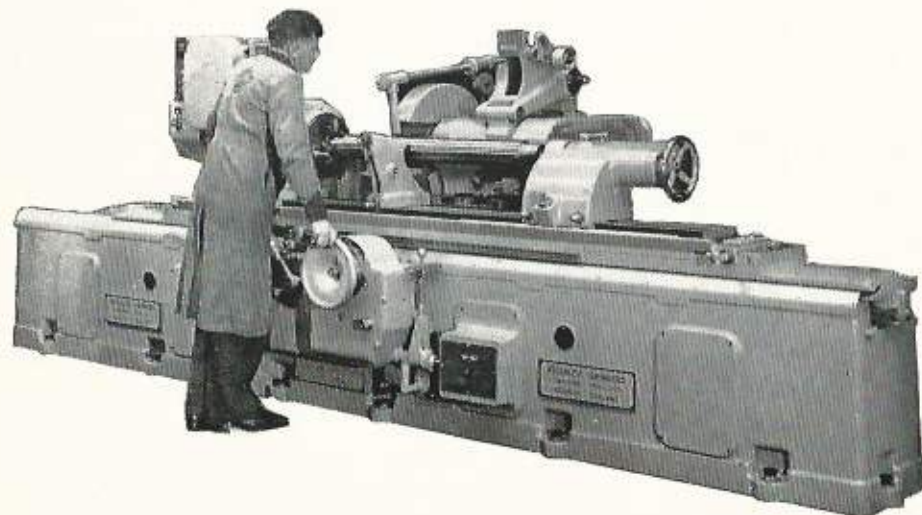


Table-mounted attachments are manufactured for Radius Dressing, Centre Grinding, Form Dressing and Angular Wheel Dressing. Three ranges are manufactured: the Standard range from 12" x 24" to 12" x 60"; the Medium Heavy range from 16" x 24" to 16" x 60", and the Heavy Duty range 18" x 24" to 24" x 96". The capacity of the machine illustrated is 18" x 72".

## KEIGHLEY "KSE" INTERNAL GRINDING MACHINE

This precision internal grinding machine is equipped with hydraulically operated wheelhead feed; variable both in regard to the amount of stock removed, and the time taken. It has a mechanically operated table travel and hand controlled wheel truing device, and is supplied complete with rectifier controlled D.C. workhead, internal spindle, quick action chuck and full equipment.



### SPECIFICATION

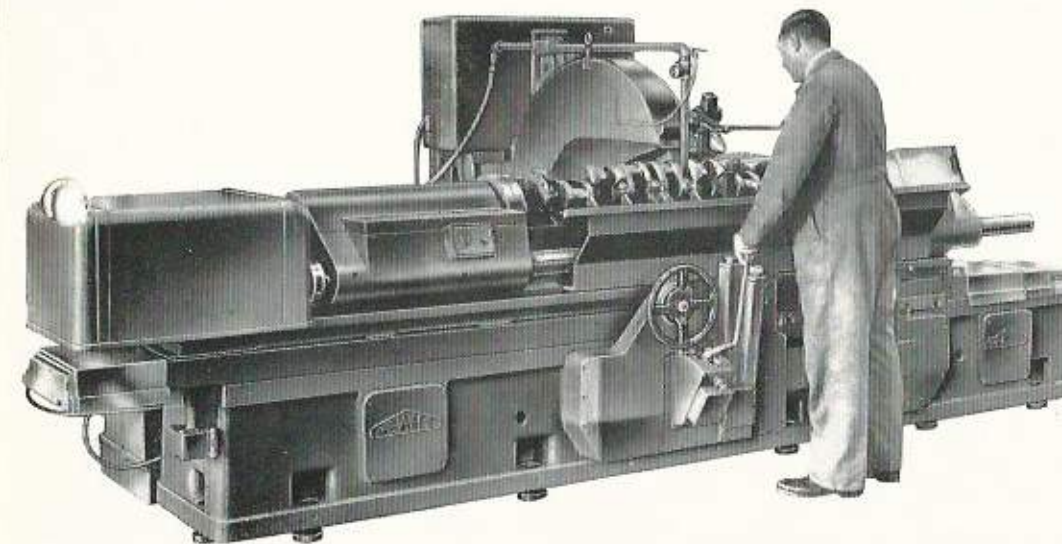
Minimum bore ground	5"
Maximum bore ground	12"
Maximum swing inside guard	4"
Height of workhead centres	4 1/2"
Bore through workhead spindle	1.1-16"
Morse taper in spindle	No. 4
Number of workhead speeds	6
Range of workhead speeds, instantaneously selected	368, 488, 870, 710, 875 and 1100 r.p.m.
Workhead swivels	18°
Maximum automatic table traverse	2 1/2"
Minimum automatic table traverse	1"
Hand traverse of table	7 1/2"
Number of table speeds	4
Table speeds (strokes per minute)	28, 50, 85 and 135
Hand adjustment of cross-slide	2 1/2"
Power required for table traverse motor	1 h.p.
Power required for workhead motor	1 to 1 1/2 h.p. (3000, 1900 r.p.m.)
Power required for wheelhead motor	1 h.p.
Maximum speed of internal grinding spindle	27,500 r.p.m.
GS 183	27,500 r.p.m.
Floor space required (approximate)	58" x 42"

## NEWALL AUTOMATIC HEAVY DUTY CRANKSHAFT GRINDING MACHINE, TYPE "HAC"

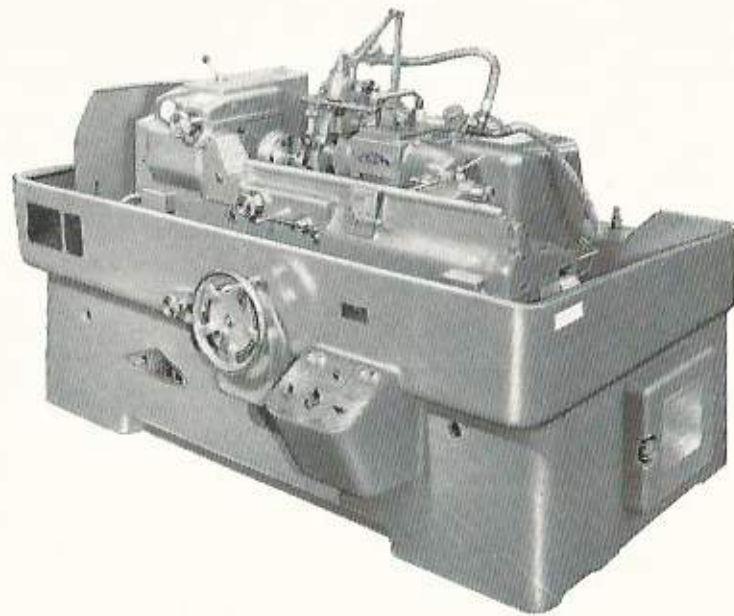
The Newall Automatic Heavy Duty Crankshaft Grinding Machine, type "HAC," has a 5" quick approach of wheelhead; with four automatic variable infeeds, one for face grinding and three for diameter grinding, giving in effect a diminishing feed. The machine is complete with multiple automatic hydraulic steadies with quick approach; hydraulic table traverse, with automatic location for table positioning, and automatic hydraulic throw blocks; all controls suitably interlocked and controlled by single joystick lever with the exception of hydraulic clamping. The tailstock is adjustable to cover a range of crankshafts.

### SPECIFICATION

Maximum length between faces of workhead and tailstock spindle	60" or 48"
Minimum length between faces of workhead and tailstock spindle	47 1/2"
Work centre height	19"
Maximum diameter of new wheel	42"
H.P. of wheelhead motor	2 1/2
R.P.M. of wheelhead motor	1,000
H.P. of hydraulic motor	2
R.P.M. of hydraulic motor	1,500
H.P. of workhead motor	3
R.P.M. of workhead motor	960
Starters	Automatic type built into the bed of the machine
Table speed	Indefinitely variable from 3" to 180" per minute
Plunge cut feed	Indefinitely variable
Quick run back of wheelhead	5"
Hydraulic steady withdrawal	4"







## "NL" THREAD GRINDING MACHINE

- "A": FOR HIGHEST QUALITY GAUGES, MICROMETER SCREWS, ETC.
- "B": THE UNIVERSAL TOOL ROOM MACHINE.
- "C": QUANTITY PRODUCTION OF TAPS, HOBBS, MILLING CUTTERS, FORM TOOLS, ETC.
- "D": PRODUCTION COMPONENT GRINDING.

EACH IN TWO SIZES —

- "SHORT," 16" BETWEEN CENTRES, 10" GRINDING LENGTH.
- "LONG," 32" BETWEEN CENTRES, 20" GRINDING LENGTH.

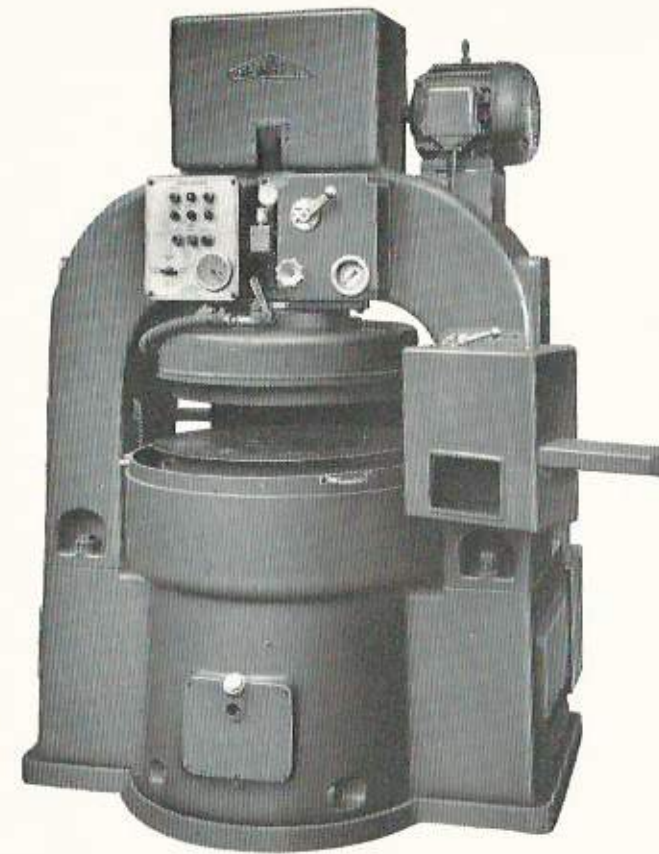
BOTH SIZES SWING 10" DIA. UP TO 4" LONG.  
8" DIA. UP TO MAXIMUM CENTRES.

The Newall N.L. Thread Grinding Machine incorporates many outstanding features which make it applicable to the production department or the toolroom. It is built in two sizes, both of which will swing and grind 8" diameter at any point within the length capacity, and a diameter of 10" up to a distance of 4" from the spindle nose. The "Long" machine has a capacity of 32" between centres and a grinding length of 20", and the corresponding figures for the "Short" machine (as illustrated) are 16" and 10". Each machine is available in four types, namely, A, B, C and D. Type A is designed specifically for the grinding of highest quality thread gauges, micrometer screws, etc. Type B is the high precision toolroom machine. Maximum workhead speed of A and B is 30 r.p.m. Type C is particularly suited to the quality production of taps, milling cutters, etc., and has a workhead speed of 60 r.p.m. Type D is designed principally for grinding components, and as this is usually done by the plunge cut method, the workhead speed is lowered to 20 r.p.m.

Types B, C and D are fitted with a form relieving attachment and can be supplied with internal and hob grinding attachments to allow special cutting tools such as relieved milling cutters, gear hobs, spline hobs, circular form tools, thread rolling dies, etc., to be ground, and a surface grinding attachment for die head chasers, rack type gear tooth cutters, template gauges, etc.

For external grinding a 350 mm. diameter wheel is used, the maximum width being 40 mm. ( $1\frac{1}{8}$ " for types B, C and D, and 14 mm. ( $\frac{9}{16}$ " for type A.

Wheels can be dressed by the Newall 15 to 1 or 4 to 1 Pantograph dressers for single or multi-ribbed wheels, or the "Universal" and "Profile" dressers for single-ribbed wheels. The "Profile" dresser will also generate complex profiles up to 40 mm. wide. A wheel crushing attachment for mounting at the rear of the wheelhead is also supplied. A feature of extreme importance is the wheelhead spindle and bearings, which are of special design to allow the spindle to run with a clearance of only .0001 with a temperature rise of less than 10° centigrade.



## "RIGIDLAP" UNIVERSAL LAPPING MACHINE

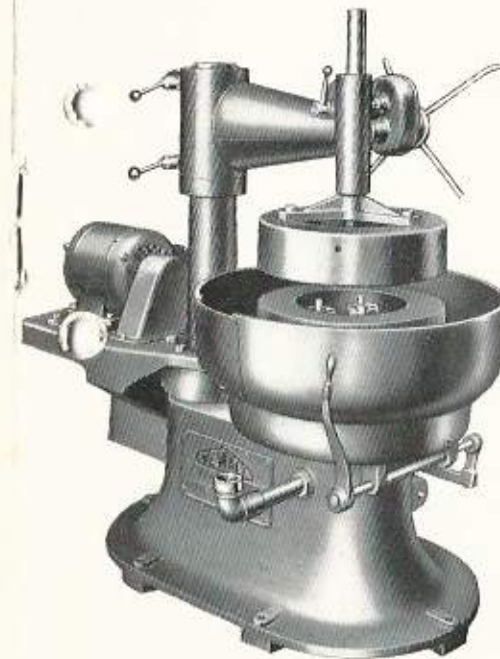
A machine for the rapid production of flat and cylindrical components, using contra-rotating abrasive lapping wheels, and with hydraulic power for raising and lowering the upper lap; and for dressing the laps.

### SPECIFICATION

Capacity for flat work	2½" thick × 5" square (63 × 127 mm.)
Capacity for cylindrical work	2½" dia. × 5" long (63 × 127 mm.)
Capacity for flat work with oversize laps	2½" thick × 7" square (63 × 178 mm.)
Capacity for cylindrical work with oversize laps	2½" dia. × 7" long (63 × 178 mm.)
Standard abrasive laps	24" o.d. × 14" i.d. (609 × 356 mm.)
Maximum diameter of workholder using maximum throw	28½" (718 mm.)
Total throw of workholder	1½" (44 mm.)
Workholder driving bushes for flat work	3
Standard speed of lower lap (looking at face of lap—clockwise)	117 and 78 r.p.m.
Standard speed of upper lap	109 r.p.m.
H.P. of upper lap motor	3 h.p.
Speed of upper lap motor	1,440 r.p.m.
H.P. of lower lap motor	4 h.p.
Speed of lower lap motor (2 speeds)	1,440 and 960 r.p.m.
H.P. of hydraulic pump	1 h.p.

## 10-U AND 2-F UNIVERSAL LAPPING MACHINES

These machines are suitable for flat or cylindrical components, and are equipped with cast iron laps, the top lap being stationary while the lower lap rotates. Workholders are manufactured for each individual component, and are driven by a mechanism in the centre of the bottom lap. They are supplied complete with standard equipment.



2 F LAPPING MACHINE

	2 F	10 U
Capacity, flat work	8" × 8" × 3" thick	3" × 3" × 1½" thick
Capacity, cylindrical work	3" dia. × 3" long	1½" dia. × 3" long
Diameter of standard laps	28½"	14"
Diameter of special laps	28"	16"
Throw of workholder (flat work)	2½"	1½"
Throw of workholder (cylindrical work)	1½"	1½"
Speed of lower lap	60 r.p.m.	60 r.p.m.
H.P. of driving motor	3 h.p.	1 h.p.

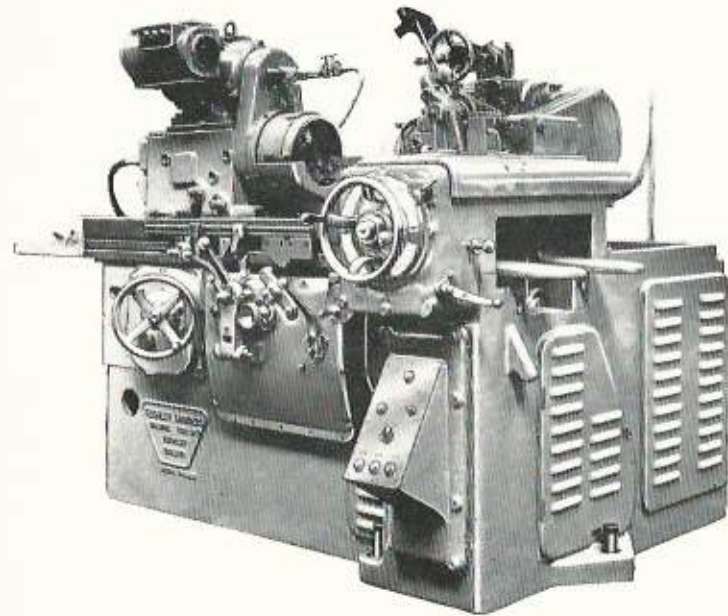


10 U LAPPING MACHINE



## KEIGHLEY "KN" INTERNAL AND FACE GRINDING MACHINE

A fully hydraulic internal grinding machine equipped with a facing head which is invaluable when a bore and face must be square to each other. It has electrical drive to workhead, wheelhead and hydraulic and coolant pumps, with hydraulically operated traverse, crossfeed, and safety interlock to hand motion. An internal spindle of 1,500 r.p.m. is supplied as standard equipment; and spindles from 5,000 to 28,000 r.p.m. can also be supplied.



### SPECIFICATION

Maximum swing over table	... 15" (381 mm.) dia.
Maximum length of work when face grinding	... 6" (152 mm.)
Work speeds	... 155, 235, 310 and 470 r.p.m.
Swivel of workhead	... 15° left, 30° right
Maximum stroke of table	... 24" (610 mm.)
Table speeds	... Infinitely variable to 30 ft. per min. (91.44 mm.)
Intermittent feed range	... .002 to .0002 (.05 to .005 mm.) on dia.
H.P. of internal spindle motor	... 1½
Approximate weight	... 2½ tons (2,704 kilos)
Floor space required	... 107" x 67" (2,718 x 1,782 mm.)

A wider variety of chucks, face planes, dressers, etc., can be supplied.

## NEWALL 2436 VERTICAL JIG BORING MACHINE

This machine incorporates the Newall Patented Roller System of table location which guarantees settings to .0001". Specification is given below, and the machine can be supplied with special boring equipment, depth measuring attachment, etc. All machine ways are protected by telescoping slides.

### CAPACITY

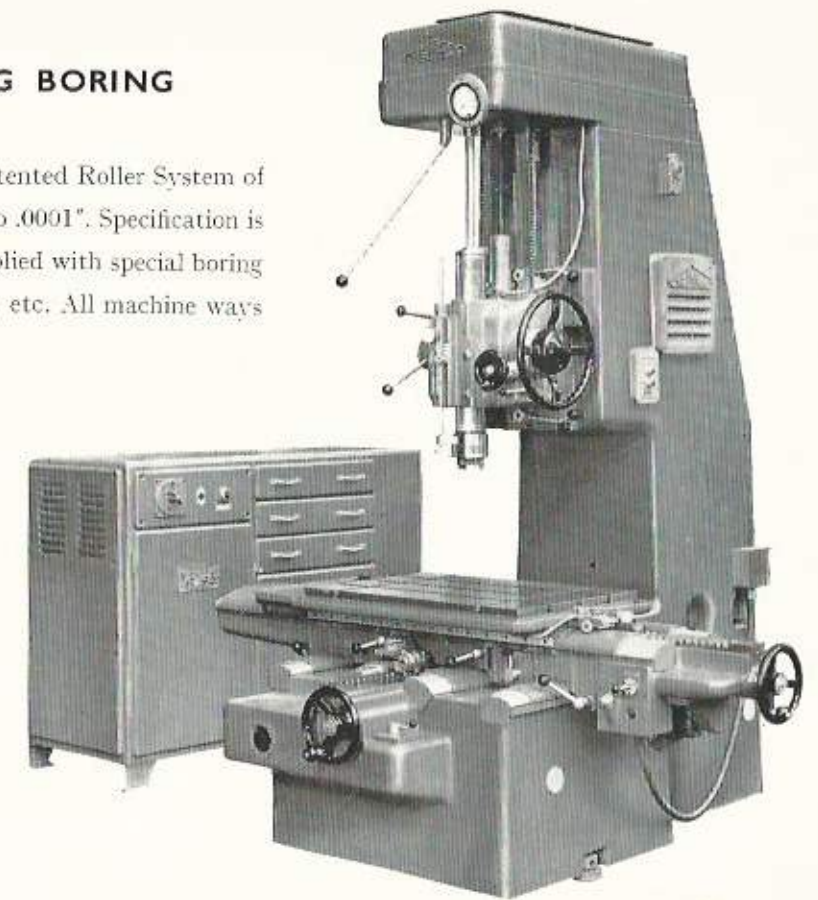
Dimension of table surface	... 24" x 36"
Longitudinal traverse of table	... 24"
Cross traverse of table	... 18"
Vertical feed motion of quill	... 9"
Vertical adjustment of quill head on column	... 14"
Maximum distance, spindle nose to table	... 32"
Minimum distance, spindle nose to table	... 9"
Distance from spindle centre to column ways	... 12½"
Distance from spindle centre to column throat	... 24"
Vertical distance from table to column throat	... 30½"
Table settings to	... 0.0001"

### SPINDLE

(Double row cylindrical roller bearing type)	
Morse taper in spindle collet	... No. 3
Diameter of spindle in lower bearing	... 2½"
Diameter of quill in head	... 4"
Spindle speed range, steplessly variable	
D.C. drive through 3-speed gearbox	... 49 to 2,400 r.p.m.
Spindle speed for setting up purposes	... from 0 r.p.m.
Spindle motor h.p. (see detail below)	... 1.1 to 4½
Maximum drilling thrust	... 3,000 lb.

### FEED AND TRAVERSE RATES

Rapid (electric) traverse rate of—	
Table	... 120" per minute
Cross slide	... 90" per minute
Quill head on column	... 50" per minute
Spindle down feeds (3) in thousands of an inch (and .001 mm.) per spindle revolution	... 1, 2 and 10 (25, 51 and 254)

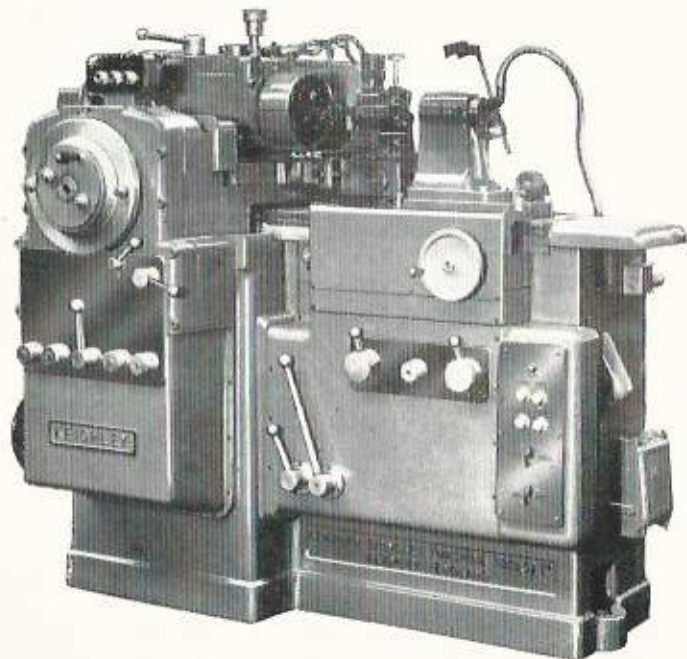


### GENERAL DIMENSIONS

Height of table surface above floor	... 33"
Overall height of machine	... 102"
Floor space required for machine only	... 104" x 85"
Floor space required for control cabinet	... 48" x 28"
Nett weight	... 9,500 lb.

## KEIGHLEY AUTOMATIC INTERNAL GRINDING MACHINE, TYPE "KH"

This machine is manufactured in two models, the KHA, which is the "Autosize" machine and on which the finish bore size is controlled by the feed dial, which is pre-set to zero, and the KHB, "Gaugesize," machine, on which an appropriate gauge is mounted in the workhead, and when this gauge enters the bore being ground it automatically causes the grinding wheel to withdraw, and the table to return to its initial position. Both machines are fully hydraulic and use high frequency internal grinding spindles.



### SPECIFICATION

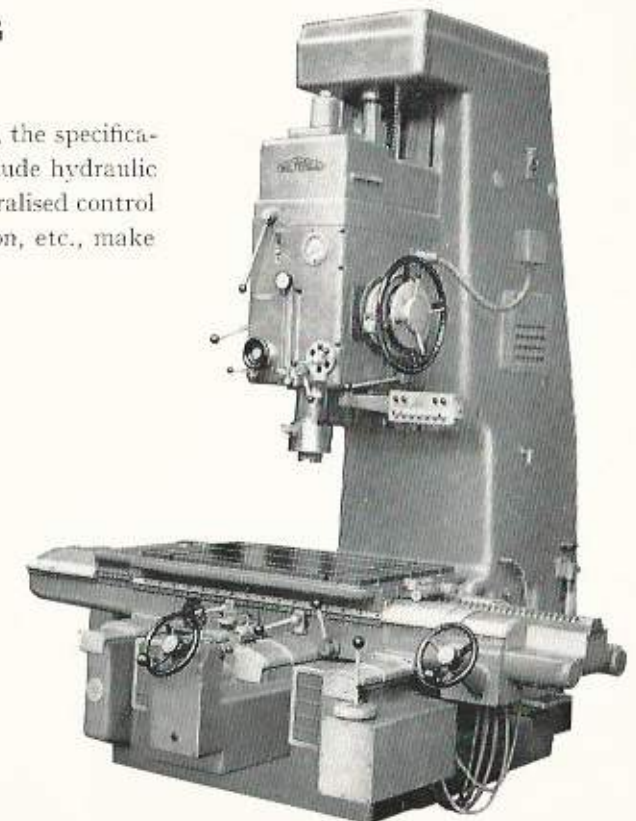
Maximum diameter of bore ground in standard chuck	... 2½"
Minimum diameter of bore ground in standard chuck	... ½"
Workhead spindle speeds	... 6 (400 to 1,200 r.p.m.)
Maximum included angle ground	... 60°
Total movement of wheelhead slide	... 15"
Swing over wheelhead slide	... 15°
Maximum number of strokes of wheelhead	... 200 per minute
Maximum wheelhead traverse speed	... 30" per minute
Minimum grinding stroke	... 1.32 per minute
Automatic feed (variable and independent of wheelhead slide)	... .0001" to .0003" on dia.
Hand or automatic wheel wear compensation	... .0002" to .0012" on dia.
Standard grinding spindle speed	... 28,000 r.p.m.
Floor space required	... 80" x 45"
Approximate total weight	... 4,480 lb.
Power required for workhead motor D.C.	... 1 h.p.
Power required for wheelhead motor	... 1 h.p.
Power required for hydraulic pump	... 2½ h.p.
Power required for coolant pump	... 1.10 h.p.

## NEWALL 2442 VERTICAL JIG BORING MACHINE

This Jig Boring Machine is manufactured in two models, the specification of each being given below, and features, which include hydraulic clamping of the quill head, hydraulic table traverse, centralised control spindle design, and spindle feeds, automatic tool ejection, etc., make this one of the fastest production machines obtainable.

### SPECIFICATION

	L.2442	H.2442
Dimensions of table	... 42" x 24"	42" x 24"
Longitudinal traverse of table	... 36"	36"
Cross traverse of table	... 24"	24"
Vertical travel of quill	... 19"	19"
Vertical adjustment of quill head	... 17½"	17½"
Maximum distance, spindle to table	... 31½"	48"
Minimum distance, spindle to table	... 4"	29½"
Taper to spindle collet	... No. 4 Morse	No. 4 Morse
Floor to table surface	... 33"	33"
Distance spindle centre to column ways	... 17"	17"
Distance spindle centre to column throat	... 25½"	25½"
Distance (vertical) table to column throat	... 18½"	35"
Table settings to	... 0.0001"	0.0001"
Spindle speed range, infinitely variable	... 40 to 2,000	40 to 2,000
Feeds (8) per spindle revolution	... 0.0005" to 0.012"	0.0005" to 0.012"
Floor space required	... 170" to 108"	170" to 108"
Maximum height of machine	... 134"	150"
Nett weight	... 147 cwt.	150 cwt.







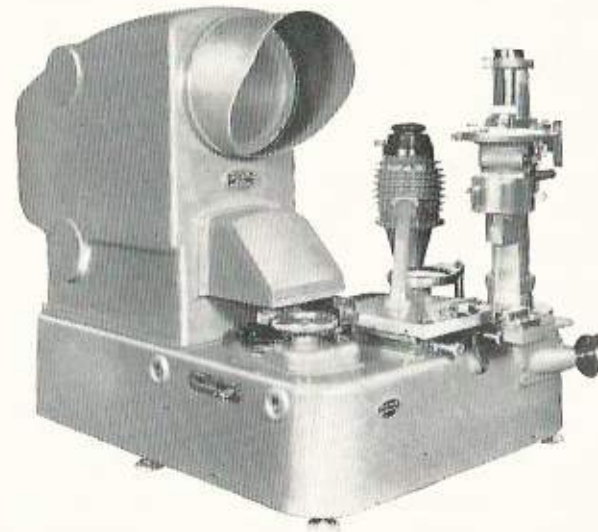
### O.M.T. TOOLMAKERS' MICROSCOPE

For the rapid and accurate inspection of thread forms, form tools, plate gauges, etc., at magnifications of  $10 \times 30 \times 60 \times$  or  $100 \times$ , with a capacity of  $6'' \times 2''$ . Work may be viewed through an eyepiece or the image can be projected on to the  $6''$  diameter screen. Tamplet oculars for all thread forms, radii, etc., and a full set of equipment can be supplied.

CAPACITY			
Capacity	English	Metric	Reading direct to
Longitudinal traverse	8"	203 mm.	.0001"
Transverse traverse	2"	50.8 mm.	.0001"
Maximum height of work profile above table	8 1/2"	215 mm.	---
Diameter of worktable	11"	279 mm.	---
Worktable rotation	360°	---	0° 3'
Tilt of column to right and left	12°	---	---
Depth of throat	6 1/2"	165 mm.	---
Centre cradle capacity, under 1 1/2" diameter	12 1/2"	317 mm.	---
Centre cradle capacity, under 3/4" diameter	10"	254 mm.	---
Maximum diameter carried by vee blocks	3 1/2"	89 mm.	---
Maximum capacity between vee blocks	2 1/2" dia., 6" long	---	---
Thread templet angular scale	7"	---	0° 10'
Field of view diameter with 30x magnification and templet ocular	1"	25.4 mm.	---
Field of view diameter with 30x magnification and protractor ocular	2 1/2"	63.5 mm.	---

### O.M.T. PROJECTION PANTOMETER

This instrument has been designed for the inspection of three-dimensional contours, such as the turbine blades used on jet aircraft engines. A magnification of  $30 \times$  is used, and blades  $3''$  wide  $\times$   $8''$  long can be inspected for size accuracy of radii, thickness at various points, and the squareness of the blade to its root fixing.



### O.M.T. 16" PROJECTION TYPE

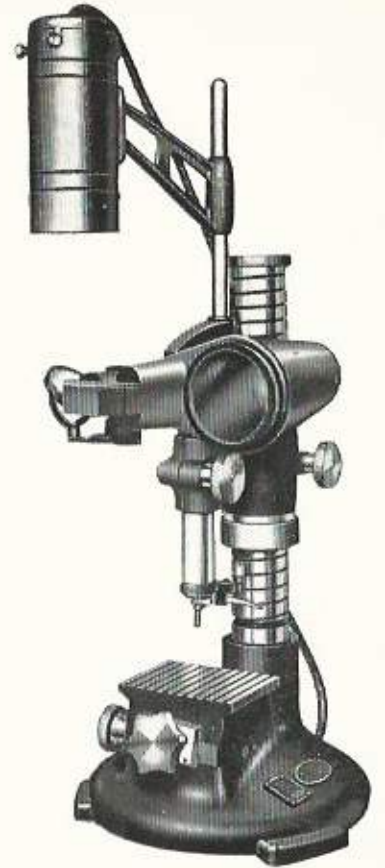
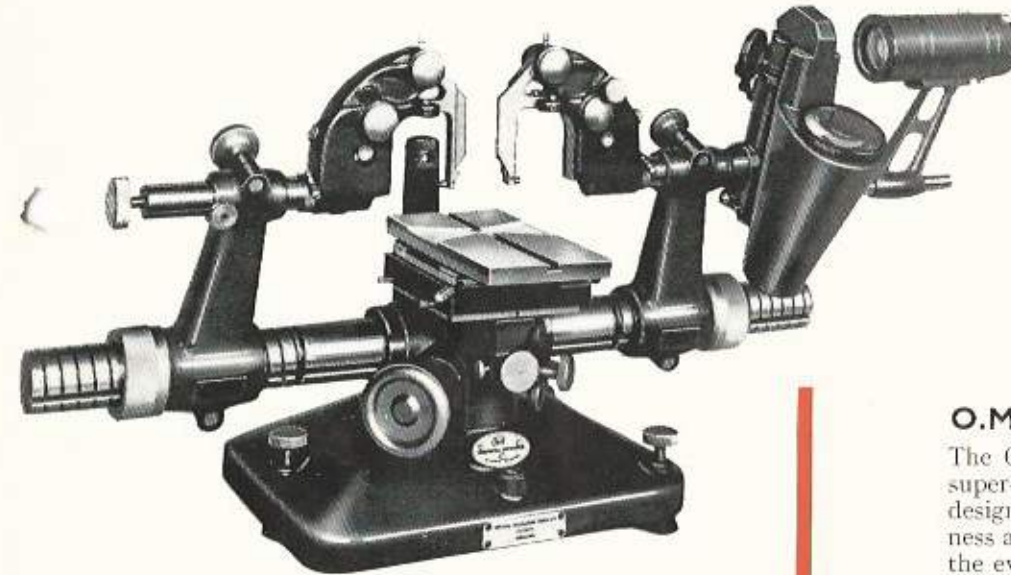
For use on machines where accurate rotary indexing is required. The table is  $16''$  diameter, and angular readings direct to 2 seconds of arc are projected on to the screen. A plug accurate to  $.0001''$  is supplied to fit in the centre of the table for ease of setting. A  $30''$  diameter table, reading direct to 1 second and with power operated rotary movement is also manufactured.



### O.M.T. HORIZONTAL OMTIMETER (STANDARD)

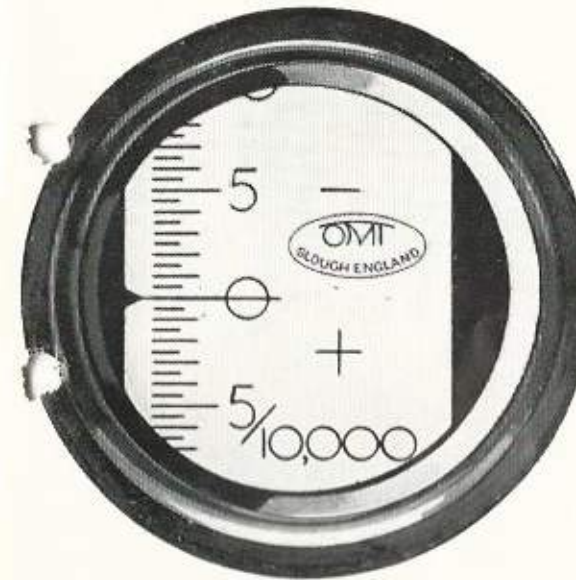
This instrument is used for the measurement of plain and screwed ring gauges, and plain plug gauges, end rods, etc. It is fully equipped with auxiliary tables, centres cradle, slip gauge holders, internal contact fingers, and stylus points. A larger instrument specification of which is given below is also manufactured.

CAPACITY			
Capacity	English	Metric	
Range of scale	$\pm .005''$	$\pm .120$ mm.	
Scale graduations	.00005"	.001 mm.	
Vertical movement of table	3 1/2"	89 mm.	
Maximum external diameter gauged	2 1/2"	63.5 mm.	
Maximum internal diameter gauged	1 3/4"	44.5 mm.	
Maximum external diameter of work when internal gauging	1 7/8"	47.6 mm.	
Minimum internal diameter gauged with light fingers	1"	25.4 mm.	
Minimum internal diameter gauged with heavy fingers	1 1/8"	29 mm.	
Minimum pitch diameter of threaded hole gauged	25/32"	39.67 mm.	
Maximum external diameter of threaded hole gauged	8 1/2"	215 mm.	
Maximum depth reached by light fingers	1"	25.4 mm.	
Maximum depth reached by heavy fingers	2 1/2"	63.5 mm.	



### O.M.T. VERTICAL OMTIMETER

The O.M.T. Vertical Omtimeter is a high-class super-precision measuring instrument specially designed for the measurement of length, thickness and diameter on all types of work found in the ever-increasing present-day requirements of the engineering trades. Measurements such as are required on standard end bars, slip and cylindrical gauges, precision steel balls, etc., and also a vast range of precision work can be carried out accurately and efficiently on the O.M.T. Omtimeter. A circular table  $3 1/4''$  diameter and a vee block assembly can be supplied with this instrument. The instrument will accommodate work  $7''$  high or  $6''$  diameter.



The optical head fitted to all the above instruments has a range of  $+$  and  $- .005$  (.120 mm.), graduated  $.00005$  (.001 mm.) and illumination is provided by a 6 Volt 36 Watt lamp. The above illustration is the actual size of the screen.

### MAJOR HORIZONTAL OMTIMETER

CAPACITY			
Capacity	English	Metric	
Range of scale	$\pm .005''$	$\pm .120$ mm.	
Scale graduations	.00005"	.001 mm.	
Maximum external diameter gauged	36"	915 mm.	
Vertical movement of worktable	App. 7.11.16"	180 mm.	
Maximum internal diameter gauged with light fingers	30"	760 mm.	
Minimum internal diameter gauged with light fingers	1"	25.4 mm.	
Maximum depth gauged with light fingers	1"	25.4 mm.	
Maximum internal diameter gauged with medium fingers	30"	760 mm.	
Minimum internal diameter gauged with medium fingers	1 1/8"	29 mm.	
Maximum depth gauged with medium fingers	2 1/2"	63.5 mm.	
Maximum internal diameter gauged with heavy fingers	27"	685 mm.	
Minimum internal diameter gauged with heavy fingers	2 1/8"	52 mm.	
Maximum depth gauged with heavy fingers	5 1/2"	140 mm.	
Minimum pitch diameter of threaded hole gauged	25/32"	39.67 mm.	
Maximum external diameter of threaded hole gauged	11 1/2"	292 mm.	
Minimum diameter taper hole gauged	2.3/16"	56 mm.	