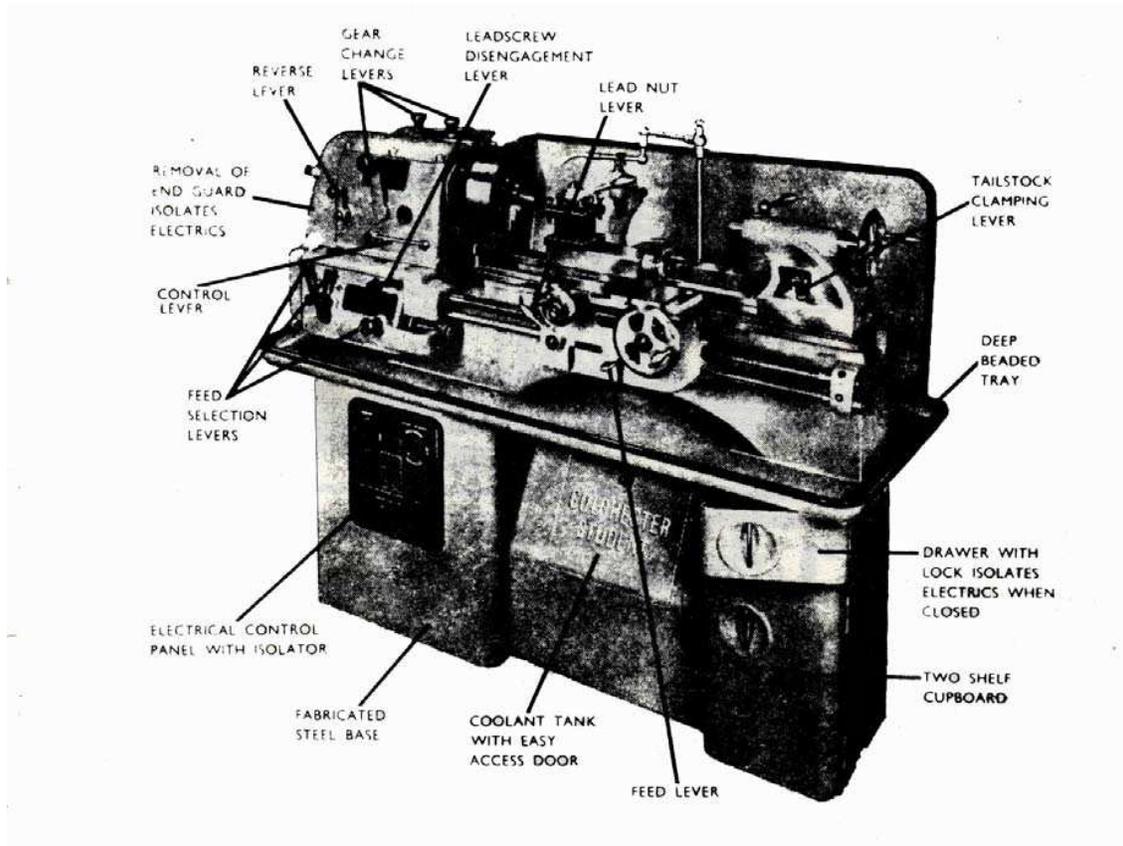


CLAUSING-COLCHESTER 13" ALL-GEARED HEAD LATHES

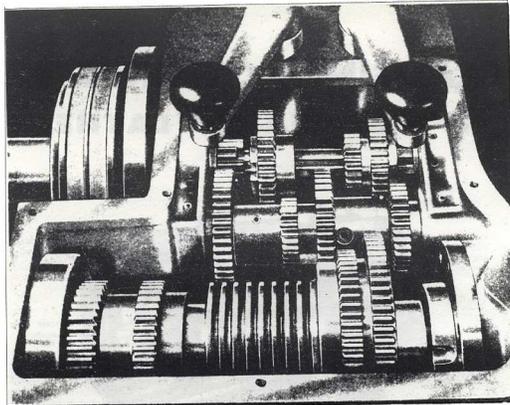


INTRODUCTION

The Clausing-Colchester Machines are the result of almost half-a-century of concentration on the manufacture of lathes. The keynote of Clausing-Colchester machines is efficiency combined with simplicity. Our lathes are to be found working in all corners of the world and while essentially precision tools intended for the production of accurate work pieces; their simple design, robust construction and simplified controls make them very suitable for tooling for production work. All castings are naturally aged for at least six months to avoid any possible future distortion. Jigs and special purpose machines are used extensively in our manufacturing operations to ensure interchangeability of components, and care is taken in all processes in all departments to ensure your satisfaction.

This Manual supplies specific information relative to the Clausing-Colchester 13" Swing Lathes. A thorough understanding of the information contained in this handbook will aid in securing the most satisfactory operating results from your machine.

At the time of issue, this handbook is completely up to date however improvements in design are continuously being made and it is possible that some information included in this book may vary from the machine delivered to you. This indicates that the design changes have been so that the machine will better fulfill your needs, and we therefore reserve the right to alter the design or specification at any time without notice.



The Headstock

CLAWSON
COLCHESTER
ATLAS PRESS CO KALAMAZOO MICH. U.S.A.

DO NOT CHANGE SPEED WHILE RUNNING

SPINDLE SPEEDS PULLEY 1290 R.P.M.

LEVERS ON TOP				
LEVER AT FRONT	1000	445	192	86
	610	272	118	52

USE SHELL TELLUS OIL 33
OBTAINABLE FROM SHELL OIL COMPANIES THROUGHOUT THE WORLD

THE COLCHESTER LATHE CO LTD ENGLAND

Speed Chart using Single Speed Motor

CLAWSON
COLCHESTER
ATLAS PRESS CO KALAMAZOO MICH. U.S.A.

DO NOT CHANGE SPEED WHILE RUNNING

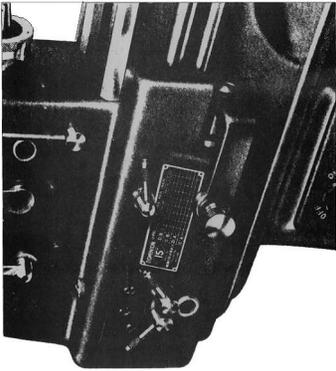
SPINDLE SPEEDS PULLEY 1935 & 968 R.P.M.

LEVERS ON TOP				
LEVER AT FRONT	HIGH SPEED			
	1500	667	288	129
FRONT	LOW SPEED			
	915	408	177	78
	750	334	144	65
	457	204	88	39

USE SHELL TELLUS OIL 33
OBTAINABLE FROM SHELL OIL COMPANIES THROUGHOUT THE WORLD

THE COLCHESTER LATHE CO LTD ENGLAND

Speed Chart with 2 Speed Motor



The Quick Change Feed Box

LEVERS

		Threads per Inch									
		Sliding Feed in Inches – Surfacing Half Sliding									
	D	B	112	104	96	92	88	80	76	72	64
			.0017	.0018	.0019	.002	.0022	.0024	.0025	.0027	.003
	C	B	56	52	48	46	44	40	38	36	32
			.0033	.0035	.0038	.004	.0043	.0047	.005	.0053	.006
	D	A	28	26	24	23	22	20	19	18	16
When Using 36 Driver Gear			.0065	.007	.0075	.008	.0085	.0095	.010	.0105	.012
	C	A	14	13	12	11½	11	10	9½	9	8
			.013	.014	.015	.016	.017	.019	.020	.021	.024
	C	A	7	6½	6	5¾	5½	5	4¾	4½	4
			.027	.029	.031	.032	.035	.038	.040	.042	.048
Fill with Shell Tellus Oil 33 to Mark on Sight Glass											
Oil obtainable from Shell Oil Companies throughout the World											

QUICK CHANGE FEED BOX

The feed box forms a totally enclosed oil bath and provides 45 thread pitches and 45 feeds (as shown on the Screw Cutting and Feed Chart). Changes are accomplished, without any wheel changes being necessary, through a train of heat treated gears carried on high tensile heat treated splined shafts running in phosphor bronze bearings.

The feed box, while simple, is very effective and robust, and is controlled by means of three selection levers at the front of the box. A fourth lever operates the leadscrew disengagement.

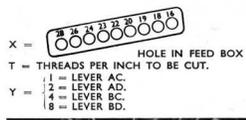
Change wheels for cutting Metric pitches are only furnished at extra cost. Should the removal of any part of the feed box become necessary, the dismantling procedure will be clear if the oil is drained,

the tumbler arm removed and the front cover taken off, but in case it is necessary to take down the tumbler shaft the following sequence of operations is recommended:

Removal of Tumbler Shaft

1. Drain oil.
2. Remove Tumbler Arm plug.
3. Take out 1/4" grub screw.
4. Release grip of arm and remove.
5. Remove front cover.
6. Remove tumbler gear.
7. Remove circlip.
8. Remove three 3/16" Cap screws in flanged bearing
9. Slide shaft out in direction of tailstock.
10. Withdraw flanged bearing.
11. Remove tumbler bearing.

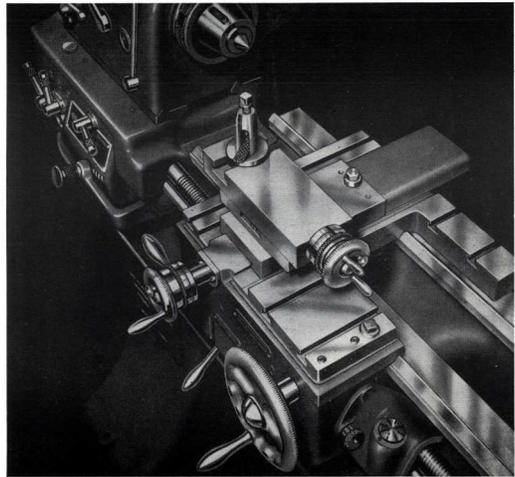
Formula to obtain Gears for special threads



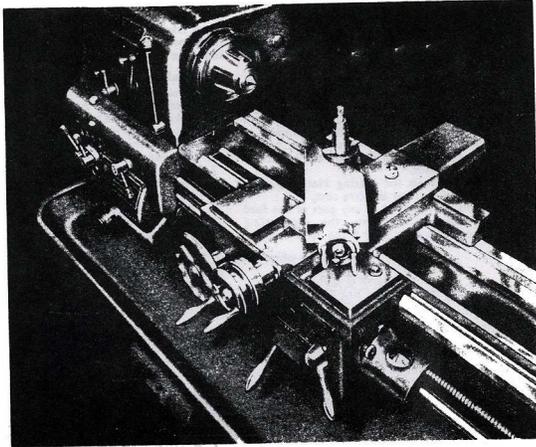
X =
 T = THREADS PER INCH TO BE CUT.
 Y = 1 = LEVER AC.
 2 = LEVER AD.
 4 = LEVER BC.
 8 = LEVER BD.

$$\text{Thread to be cut} = \frac{3 \times X \times Y}{10 \times T} = \frac{\text{Driver}}{\text{Driven}}$$

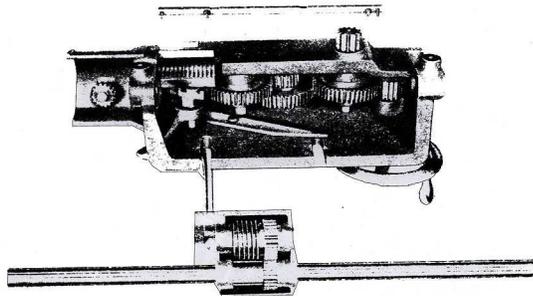
EXAMPLE
 21 threads required to be cut
 $\frac{3 \times 28 \times 2}{10 \times 21} = \frac{4}{5} = \frac{28 \text{ Driver}}{35 \text{ Driven}}$



Gap Bed Carriage
 7



Straight Bed Carriage



Carriage Apron

SADDLE

The Saddle, of adequate proportions, mounted on vee and flat surfaces on the bed, is of the American Wing type on the straight bed machines and fitted with a very robust compound slide.

The Saddle is secured to the bed by means of keeps in front and rear and can be locked on the bed at any position. All surfaces are precision machined. Large diameter micrometer dials reading in .001" are fitted to both slides and can be set to zero and clamped for easy operation. Operating screws and slides are covered in all positions. A standard American pillar toolpost is fitted, but special and automatic indexing square turret toolposts can be accommodated and fitted at extra cost.

When the Clausing-Colchester Coolant unit is ordered, the coolant supply pipe is bolted to the back of the carriage at the tailstock end, and moves along the bed with the carriage. The supply pipe is only furnished with the coolant unit. The standard tool size for the American Toolpost is 9/16" X 1 1/8"

The cross slide is radially graduated 360° for easy and accurate setting of the compound slide. A 24-tooth gear and dial indicator for screwcutting is fitted as standard, and is clearly visible from the natural operating position. The dial has 4 numbered divisions and 4 sub-divisions.

To cut an even number of threads such as 12 T.P.I., the leadscrew may be engaged at any division on the dial, and for an odd number of threads, such as 13 T.P.I., the leadscrew must only be engaged at numbered divisions. To cut fractional threads such as 11 1/2 T.P.I., the leadscrew must be engaged only at division 1 on the dial.

The dial indicator cannot be used for metric threads. For these the nut is closed on the leadscrew, and the machine reversed by means of a finger tip reversing switch, mounted through the main control lever on the headstock, after each cut and tool withdrawal, bringing the tool back to starting point, the nut remaining engaged until the thread is completed. The switch is only supplied as extra equipment.

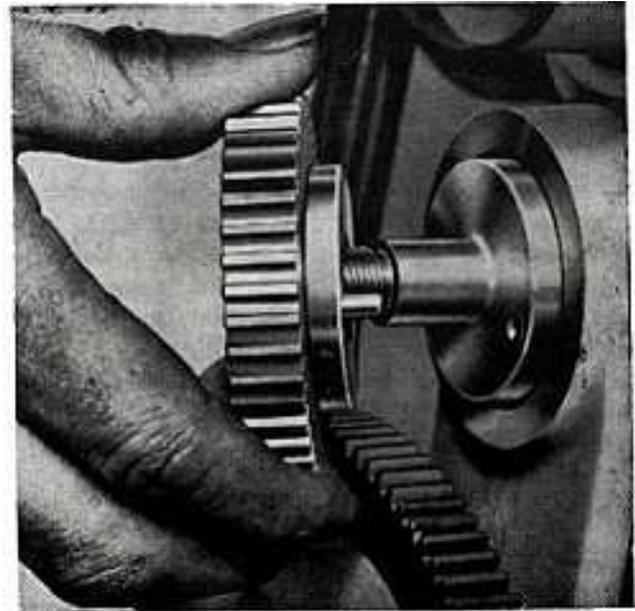
APRON [Back to Index](#)

The apron is a double-walled casting accurately machined and all shafts are arranged to have two bearing points.

Feed and screwcutting controls are inter-locked to prevent simultaneous engagement and longitudinal and cross feeds are engaged by a positive single lever control action.

Power for both longitudinal and cross feeds is taken from a separate shaft incorporating a simple slipping clutch arrangement at the feed box end which effectively guards against possible damage through careless operation and is equally effective in taking care of the heaviest cuts.

Similarly when screwcutting, a shear pin device in the gear train obviates damage, the pin being easily replaced by first removing the gear, and then the serrated sleeve from the shaft. This will allow the broken pin to be tapped out of the sleeve from the opposite side to the serrations, also if the shaft is revolved until the broken pin in it comes opposite the slot in the housing, it can be knocked straight through and will then drop out through the housing slot. The new pin can then be inserted.



Shear Pin device

The precision leadscrew (6TPI ACME) is used for screw cutting only and the whole apron arrangement is effectively guarded to comply with Factory Safety regulations and requirements. Direction operating instructions are clearly shown on the metal plates on the apron.

TAILSTOCK



The Tailstock is of rigid design with a large diameter spindle and screw, and is mounted on independent vee and flat surfaces on the bed. The hole in which the spindle slides is honed to very close limits of accuracy.

The spindle, bored No. 3 Morse Taper, is graduated in inches of travel and is locked in position by a hand lever.

Provision is made for the ejection of centers when the spindle is wound right back, and set screws are fitted to enable the tailstock to be set over for taper

turning. A zero setting line simplifies resetting.

Rapid locking of the tailstock to the bed is by means of a detachable ring spanner.

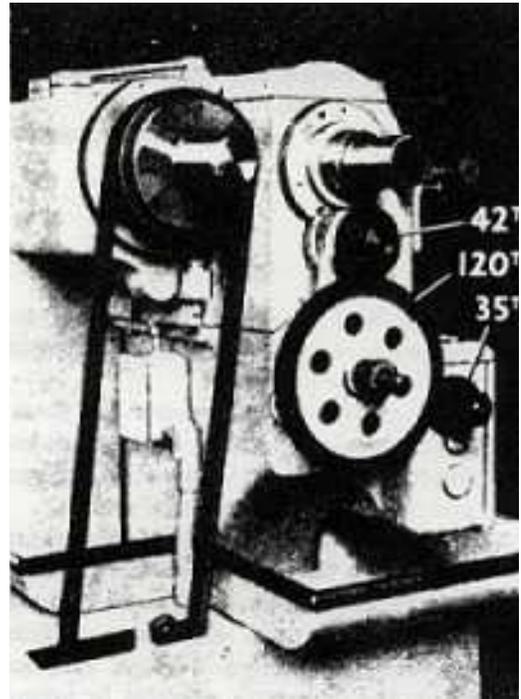
THE MOTOR DRIVE

The motor drive is totally enclosed within the cabinet base and therefore avoids all possibility of motor failure due to chips or coolant splash.

The drive is taken to the main drive pulley on the headstock by two 1/2" vee belts enclosed in a light alloy end guard. In order to avoid electrical shocks when adjustments are required to be made to the switch panel, it has been arranged so that the removal of this will completely isolate the supply. To prevent unauthorized use of the machine the locking of the cabinet drawer will also isolate the motor and starting gear controls.

The standard motor is a 1/2 H.P. 2-Phase or 3-Phase, but D.C. and Single Phase motors are fitted to order at extra cost, the additional cost being dependent on the type of motor and starting equipment required.

Provision for motor belt adjustment is provided by a swinging platform clamped with two bolts which is accessible when the back cover of the cabinet is removed.



COOLANT UNIT

The cabinet base has been designed so as to house the coolant pump and supply. This is situated in the center of the cabinet and is easily accessible by a door at the front of the machine for cleaning, filling and attention to the pump. There is provision in the chip tray for a return of the coolant through a filter gauze to the supply source. The pump and coolant unit is furnished to order only at extra cost.

The Coolant piping supplied is fully universal,

Feed Box Drive

with telescopic piping for feeding the coolant in any position. Spring loaded glands are employed which require no adjustment. A patented ball type shut-off valve permits easy control of the volume of coolant. The whole unit is designed to eliminate the leakages which are usually associated with coolant systems.

The Clausing-Colchester unit has a capacity of 5 1/2 gallons.



THE LATHE BED

The Bed is an exceptionally strong casting of the inverted vee type, with elliptical cross ribbing providing great rigidity.

All bed castings are rough machined and naturally aged before finish grinding of all working surfaces.

Once or twice a week the bed surfaces should be wiped with a rag soaked in paraffin to prevent oil stains, and then thoroughly covered with a good grade machine oil to prevent rust formation.

Never use air lines for cleaning the chips from the lathe bed. Their use causes the chips to lodge under sliding members and in openings around moving parts with possible damage to the machine.

A strong air stream will also blow off the protecting oil film and cause rust formation.

On gap bed lathes the removal of the gap block is an easy matter. Simply release and take out four Alien type screws, and the block is then free to be removed. No dowels are fitted.

To replace Gap. Thoroughly clean both block and gap Location. This is most important. Replace block and locate screws. Bring saddle up to give rough alignment and tighten screws down lightly.

If the location faces are clean the block can then be re-aligned with a few taps in the required direction with a hide or non-ferrous hammer.

STANDARD EQUIPMENT

- One 12' Direct Mounting Face Plate.
- One Direct Mounting Catch Plate.
- One Traveling Steady Rest.
- Two Spanners.
- Two Centers (one hard. one soft)
- One Center Bush.
- One Splash Guard.
- Five Keys (Hollow Screws).
- One "C" Key (Spindle Nose Collar)

The above standard equipment also applies for the 13" machine supplied without a feed box and in that case 14 loose change wheels are also included.

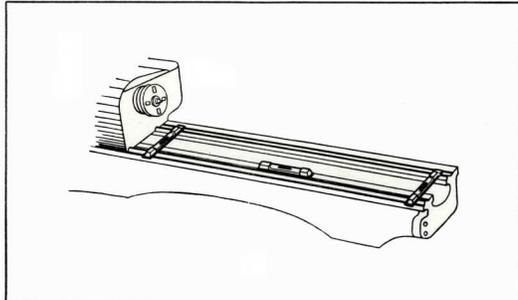
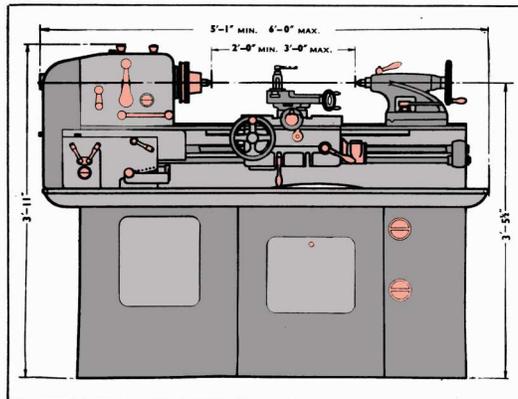


Diagram illustrating method of Levelling



Main Dimensions

INSTALLATION

Installation & Location

To obtain the full accuracy, which has been built into the Clausing-Colchester Lathe, it is essential that it should be placed on a solid level foundation, which is free from vibration. The best practice is to place the machine on a reinforced concrete base. A wooden floor is not recommended because the swelling and shrinking of the wood, due to atmospheric conditions, causes distortion of the alignment of the machine.

If a wooden floor site cannot be avoided, a section of flooring should be removed, and a concrete base built up to the wooden floor level. Holding down bolts should be inserted in this base at proper intervals to fit the drilled holes in the machine legs.

If setting the machine above ground floor level, or on a balcony, cannot be avoided, a reinforced concrete floor is necessary to obtain best results and it is recommended that the Headstock be set as close to supporting -walls and pillars as possible.

The machine weighs about 2,000 pounds and proper equipment for handling this weight should be available.

After your machine has been unloaded, it should be left on its shipping skids while it is moved to its location in the machine shop. In certain cases an eyebolt is supplied ready fixed on the bed of the machine, and this should then be used for lifting purposes.

When the eyebolt is not supplied, it is recommended that the machine be lifted by means of an adequately strong rope sling inserted through the bed openings. The machine should never be lifted by means of a sling round the outside of the lathe bed; otherwise the lead screw and feed shaft may be distorted.

Cleaning

Before moving any of the slides of your lathe, all machined surfaces should be thoroughly washed with kerosene to clean off the slushing compound used to protect these surfaces, together with any dust or dirt that may have accumulated in transit. This operation is very important as it prevents dirt from working under the sliding members and avoids subsequent undue wear. Care must be taken to ensure that the kerosene is not allowed to remain on the slides and all surfaces must be thoroughly covered with a good grade of machine oil to prevent the formation of rust.

After the machine has been thoroughly cleaned, surfaces lubricated and installed on its foundation, it is ready for leveling and wiring.

Technical Department

Our Technical Department is at your disposal, and always pleased to discuss your particular problem. Our aim is to ensure maximum satisfaction with your Clausing Colchester Lathe.

Chuck Mounting

By the use of the American Long Taper Key Drive spindle nose, the danger of chucks and other work holding fixtures becoming loose whilst rotating has been eliminated, but care must be taken to ensure that chucks, etc., are driven home firmly by means of the special key provided with the standard equipment. Both chuck and spindle tapers must be thoroughly cleaned before mounting. It is most important to avoid damaging any part of the spindle nose or chuck taper, as burrs will prevent the chuck being fully tightened.

Leveling

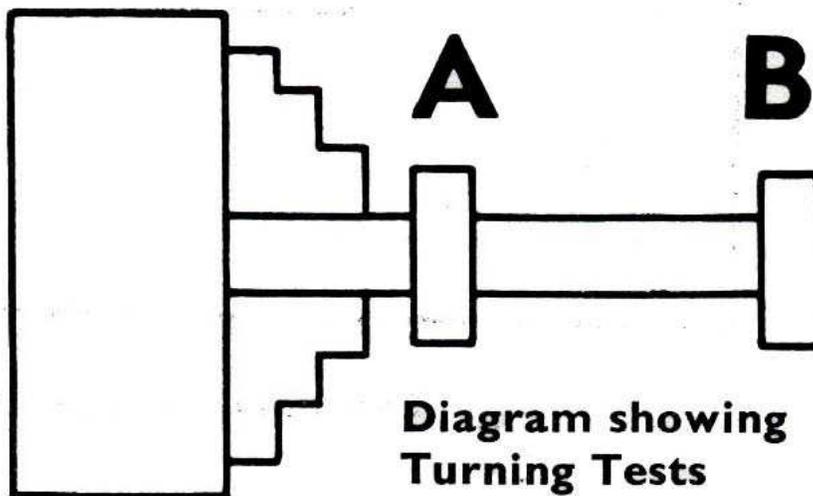
Leveling is more satisfactorily carried out by means of steel wedges inserted where necessary underneath the leading edge of the cabinet base. Care must be taken not to raise any part of the base unnecessarily high but if this condition is evident due to unevenness of floor surface, wedges should be inserted to ensure complete contact between edge of cabinet base and floor. Following correct leveling, the lathe should then be bolted down and grouted in if necessary.

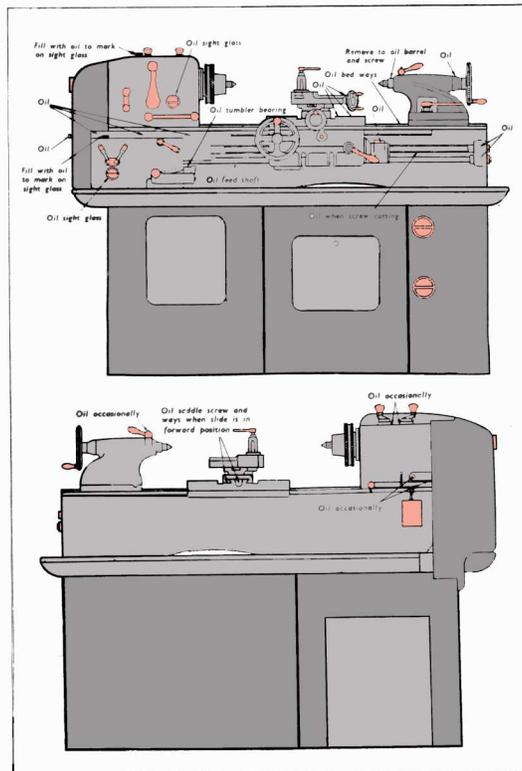
Turning Tests

The leveling procedure will put the machine into accurate alignment for all normal work, but sometimes turning tests are taken to check alignment and to establish a greater degree of accuracy when the machine is to be employed on Toolroom work.

These turning tests must be taken with keen tools taking a very light cut.

At our plant these tests are taken on two discs held 12" apart in a chuck and as shown in sketch. A very light cut is taken on Disc A and B. Micrometer readings of the two discs should be the same. Similarly a bar can equally well be used for this test. Any discrepancy can be corrected by adjusting the leveling screws until half the difference between the collar diameters has been eliminated on a dial indicator reading. Check by repeating the test.





The above diagrams show Lubrication Points requiring regular attention

LUBRICATION [Back to Index](#)

The accuracy and very life of the machine depend on correct lubrication.

The chart on the opposite page provides information regarding the points which require frequent attention, and it cannot be too strongly stressed to the operator to the daily attention is necessary to ensure efficient functioning of the machine.

When a machine leaves our plant, the Headstock and Feedbox are filled to the proper oil gauge level with the recommended lubricant. Shell Tellus oil 33, a hydraulic type of lubricant conforming to the following specification:

Gravity 60°F.876
Flash Point Closed ..	410°F.
Pour Point	— 20°F.
Viscosity Red. No. I ..	70° 750 Sec.
	140° 112 „
	200° 52 „

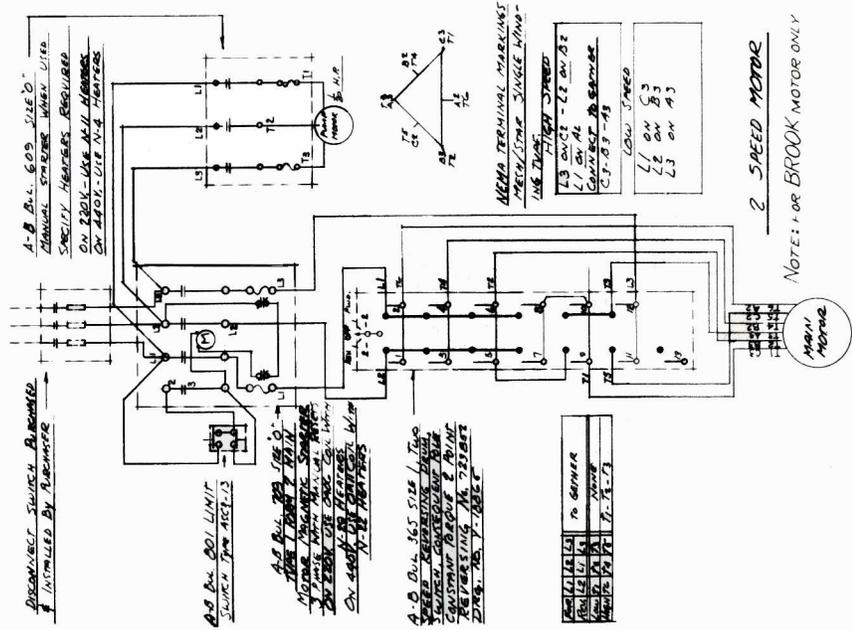
and containing inhibitors against oxidation, frothing and corrosion.

Always stop the machine when checking the oil levels to give the oil an opportunity to settle so that a true reading may be taken. If this is not done overfilling may take place resulting in excessive heat and waste of oil by leakage.

Oil levels should be checked weekly. Thirty days after the machine goes into operation the Headstock and Feedbox should be drained flushed with clean flushing oil and refilled with the recommended oil to the proper levels. The motor bearings should be checked periodically to see that they are packed with grease of the grade recommended by the manufacturers of the motor on your machine. The Coolant Pump motor bearings should be checked periodically to see that they are packed with water repellent grease.

WIRING TO POWER SUPPLY

WIRING TO POWER SUPPLY



A-B D.V.L. 603 SIZE 0
MANUAL STARTERS WHEN USED
SPECIFY HEATERS REQUIRED
ON 220K - USE N.W. HEATERS
ON 420K - USE N.W. HEATERS

DISCONNECT SWITCH A-B 603
INITIALIZED BY REVERSE

A-B D.V.L. 601 LIMIT
SWITCH FROM A-B 603

A-B D.V.L. 365 TYPE 2
MOTOR CONSTANT TORQUE
CONSTANT TORQUE & LIMIT
REVERSING MOTOR
ON 420K - USE N.W. HEATERS

A-B D.V.L. 365 SIZE 1 TWO
SPEED MOTOR CONSTANT
TORQUE & LIMIT
REVERSING MOTOR
ON 420K - USE N.W. HEATERS

TO GANER	

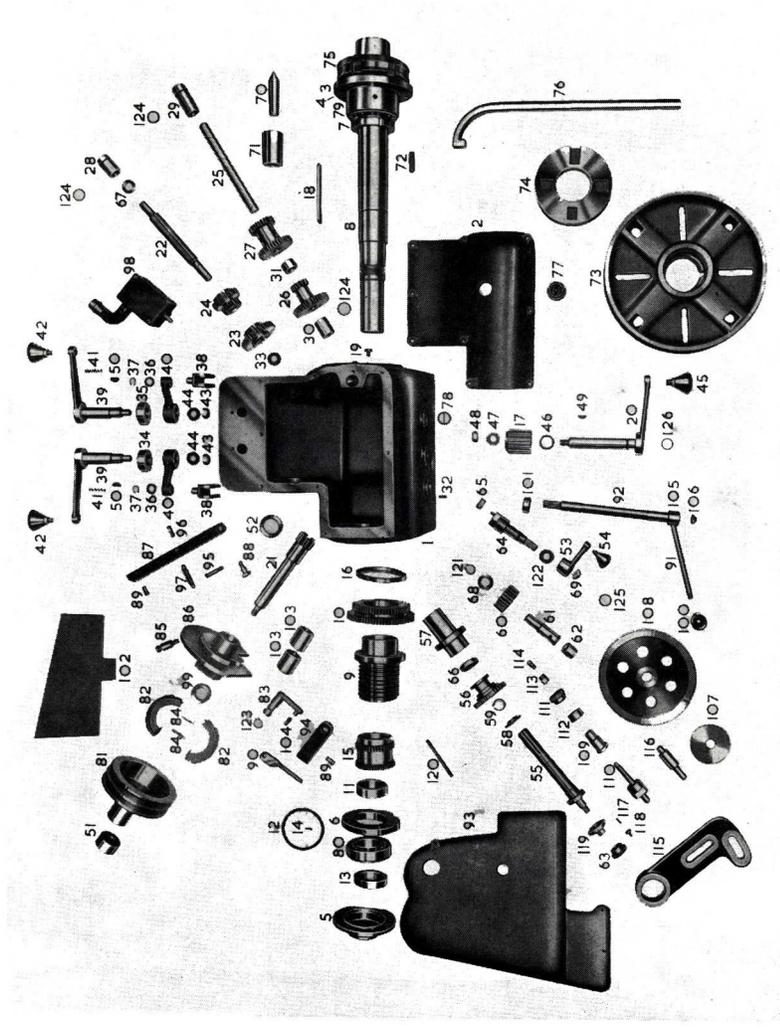
MEMO TERMINAL MARKINGS
TWO LINE SINGLE PHASE
USE TWO LINE SPEED

L1 ON A1	
L2 ON B3	
L3 ON A3	

2 SPEED MOTOR

NOTE: FOR BROOK MOTOR ONLY

○ - FRONT TERMINAL
○ - REAR TERMINAL

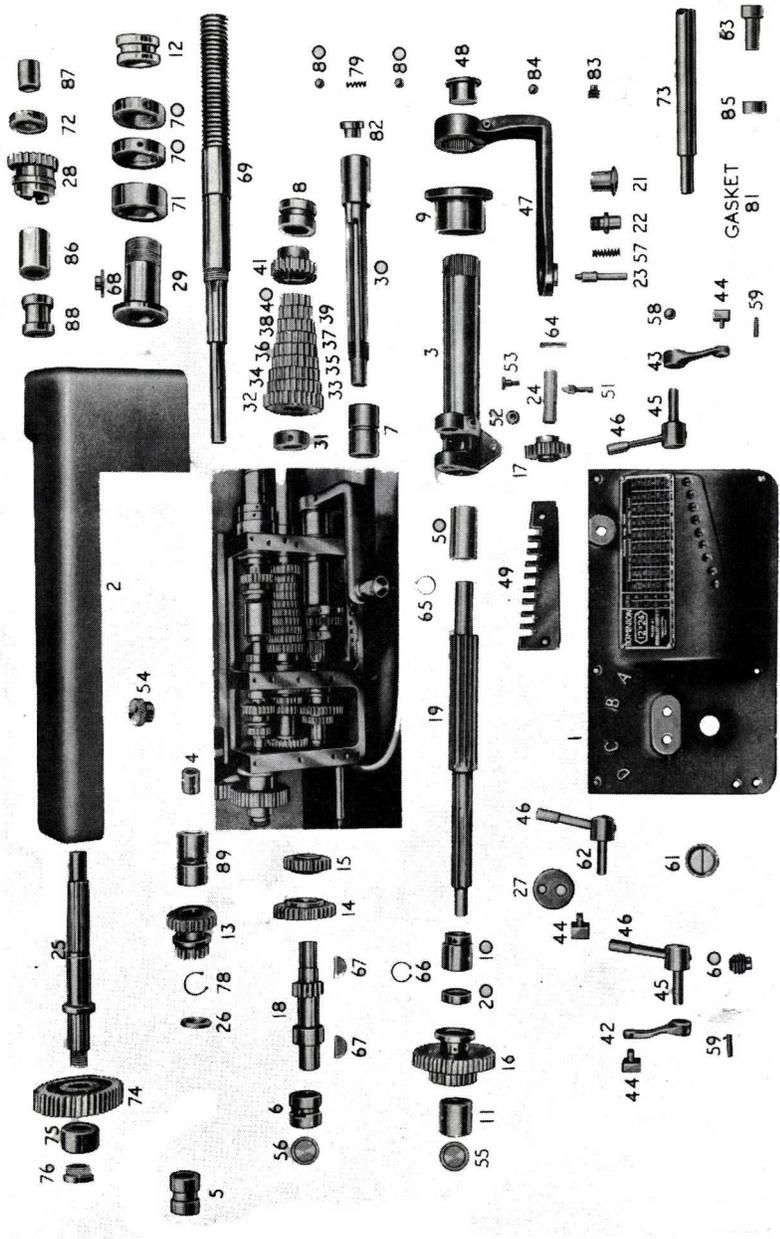


The Headstock

SPARE PARTS HEADSTOCK

No.	Name of Part	No.	Name of Part
1	Headstock	58	Reverse Shaft Washer
2	Cover	59	" " Circlip $\frac{1}{2}$ "
3	Front Bearing Outside Cover	60	Intermediate Reverse Shaft Gear 28T/14P
4	Front Bearing Outside Cover Gasket	61	Intermediate Reverse Shaft
5	Back Bearing Outside Cover	62	Intermediate Reverse Gear Bush
6	Back Bearing Inside Cover	63	Reverse Shaft Knurled Nut
7	Inside Screwed Collar	64	Gear Shifting Ecc. Shaft
8	Spindle	65	Gear Shifting Ecc. Shaft Pad
9	Sliding Sleeve	66	Reverse Shaft Oil Seal
10	Double Gear on Spindle 61T/70T/14P	67	Driving Shaft Washer
11	Back Bearing Spacer Collar	68	Inter Reverse Shaft Washer
12	Back Bearing Spring Thrust Ring	69	Domed Washer for Reverse Handle
13	Screwed Collar on End of Spindle	70	Centre
14	Back Bearing Springs	71	" Bush
15	Reverse Gear on Spindle 42T/42T/14P	72	Spindle Nose Key
16	Front Bearing Shield	73	Faceplate, 12" dia.
17	Pinion for Sliding Sleeve 17T/10P	74	Catch Plate
18	Key for Sliding Sleeve	75	Spindle Nose Draw Nut
19	Peg for Front Bearing	76	" " " " Key
20	Spindle Gear Shifter Hand Lever	77	Filler Plug " " " Key
21	Driving Clutch Shaft 18T/14P	78	Oil Sight
22	Driving Shaft	79	Front Roller Bearing 113060X/113101 XH
23	Driving Shaft Gear 41T/14P	80	Back Roller Bearing 111050/111090
24	Driving Shaft Gear 21T/33T/14P	81	Driving Pulley
25	Second Shaft	82	Clutch Ring
26	Second Shaft Gear 41T/18T/14P	83	" Expanding Lever
27	Second Shaft Gear 40T/28T/14P	84	" Ring Spring
28	Driving Shaft Bush	85	Fixing Stud
29	Second Shaft Bush	86	Flanged Bearing
30	" " " "	87	Switch Operating Lever
31	" " Spacer	88	Switch Operating Lever Stud
32	Reverse Lever Stop Pins	89	Locking Piece
33	Driving Shaft Thrust Washer	90	Link for Expanding Lever
34	Backshaft Hand Lever Collar (L.H.)	91	Operating Handle Stem
35	Backshaft Hand Lever Collar (R.H.)	92	" Shaft
36	Backshaft Gear Shifter Washer	93	Belt and Change Gear Guard
37	Backshaft Gear Shifter Circlip	94	Brake Lever
38	Backshaft Gear Shifter	95	Long Return Spring Pin
39	Backshaft Gear Shifter Hand Levers	96	Short " " "
40	Backshaft Gear Shifter Levers	97	Return Spring " " "
41	Backshaft Gear Shifter Levers Springs	98	Electric Switch
42	Backshaft Hand Lever Knob	99	Oil Seal for Flanged Bearing
43	Backshaft Hand Lever Nut	100	Plastic Knob (Red)
44	Backshaft Hand Lever Washer	101	Collar on Operating Handle Shaft
45	Spindle Gear Hand Lever Knob	102	Belt and Change Wheel Guard Plate
46	Spindle Gear Hand Lever Leather Washer	103	Bushes for Flanged Bearing
47	Spindle Gear Hand Lever Washer	104	Screwed Pin for Link
48	Spindle Gear Hand Lever Nut	105	Operating Handle Stem Collar
49	Spindle Gear Hand Lever Key	106	Operating Handle Shaft Plug
50	Backshaft Hand Lever Key	107	Change Wheel 42T/16P
51	Driving Clutch Shaft Collar	108	" " 120T/16P
52	Driving Clutch Shaft Thrust Collar	109	" Gear Sleeve
53	Reverse Handle Lever	110	" " " Stud
54	" " Knob	111	" " " Nut
55	Reverse Shaft	112	" " " Spacer Collar
56	" " Gear 42T	113	Change Gear Sleeve Stud Nut
57	" " Bush	114	Change Gear Sleeve Stud Oiler
		115	Swing Frame
		116	" Fixing Stud
		117	Change Wheel Shear Pin
		118	Change Wheel Shear Pin Sleeve
		119	Shear Pin Bush
		120	Belt & Change Wheel Guard Stud
		121	Inter Reverse Shaft Circlip
		122	Gear Shifting Ecc. Shaft Washer
		123	Expanding Lever Circlip
		124	Cord Ring for Shaft Bushes

When ordering spares please give Serial No. of machine, name of unit and Part No.



The Quick Change Feed Box

SPARE PARTS

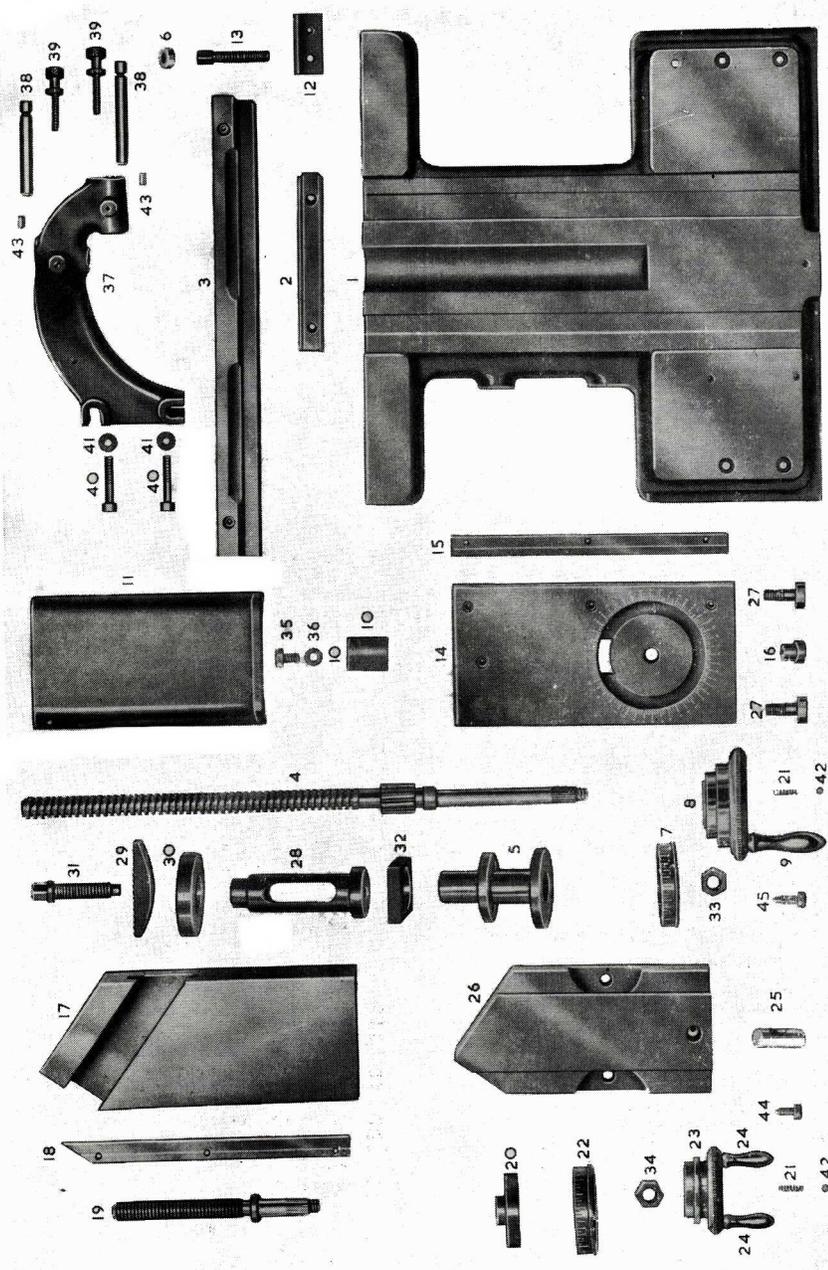
HEADSTOCK—continued

No.	Name of Part	No.	Name of Part
125	Cord Ring for Ecc. Reverse Shaft		Reverse Shaft Inside Collar Grub Screw $\frac{1}{4}$ " x $\frac{3}{8}$ "
126	Cord Ring for Spindle Hand Lever Shaft		Double Reverse Gear Shaft Grub Screw $\frac{1}{4}$ " x $\frac{3}{8}$ "
	Headstock Cover Screws $\frac{1}{4}$ " x 1" Cap Head		Backshaft Lever Balls $\frac{1}{2}$ "
	Headstock Cover Screws $\frac{1}{4}$ " x $1\frac{1}{2}$ " Cap Head		Reverse Shaft Bush Screws $\frac{1}{4}$ " x 1" Cap Head
	Headstock Cover Screws $\frac{1}{4}$ " x $\frac{3}{4}$ " Cap Head		Hand Lever Key No. 9 Woodruff
	Spindle Double Gear Screws $\frac{3}{8}$ " x $1\frac{1}{2}$ " Cap Head		Spindle Nose Key Screws
	Headstock Fixing Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap Head		Clutch Bearing Screws $\frac{1}{4}$ " x $1\frac{1}{2}$ " Cap Head
	Headstock Fixing Screws $\frac{3}{8}$ " x $1\frac{1}{2}$ " Cap Head		Driving Clutch Shaft Collar Screw $\frac{1}{4}$ " x $1\frac{1}{2}$ " Cap Head
	Spindle End Collar Grub Screw $\frac{3}{8}$ " x $\frac{3}{4}$ "		Locking Piece Fixing Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap Head
	Spindle Inside Collar Grub Screw $\frac{3}{8}$ " x $\frac{3}{4}$ "		Switch Adjusting Screws $\frac{3}{8}$ " x $1\frac{1}{2}$ " (Hex)
	Front Housing Outside Cover Screws $\frac{1}{4}$ " x $\frac{3}{8}$ " Cap Head		Brake Lever Adjusting Screw Nut $\frac{1}{2}$ " (Hex) U.N.
	Back Housing Outside Cover Screws $\frac{1}{4}$ " x $\frac{3}{8}$ " Cap Head		Switch Adjusting Screw Locknut $\frac{3}{8}$ " (Hex) U.N.
	Back Housing Inside Cover Screws $\frac{1}{4}$ " x 2" Cap Head		End Guard Plate Screw $\frac{3}{8}$ " x $\frac{3}{8}$ " Cap Head
	2nd Shaft Gear Grub Screw $\frac{1}{4}$ " x $\frac{3}{8}$ "		Electric Switch Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap Head
	Headstock Bearing Bush Grub Screw $\frac{1}{4}$ " x $\frac{3}{8}$ "		Quadrant Fixing Stud Nut $\frac{3}{8}$ " (Hex)
	2nd Shaft Bush Plug Screw $\frac{3}{8}$ " x $\frac{3}{8}$ " Cap Head		Quadrant Fixing Stud Washer $\frac{3}{8}$ "
	Reverse Shaft Domed Washer Screw $\frac{1}{4}$ " x $\frac{3}{8}$ " Cap Head		Change Wheel Stud Nut $\frac{1}{2}$ " (Hex)
			Change Wheel Stud Washer $\frac{1}{2}$ "

QUICK CHANGE FEED BOX

1	Feed Box Cover	43	Gear Shifting Lever (Bottom)
2	" " Top Cover	44	" " Pads
3	Tumbler Bearing	45	" " Shaft
4	Driving Shaft Bush	46	" " Handle
5	" " " "	47	Tumbler Shifting Arm
6	Inter Shaft Bush	48	" Bearing Plug
7	Cone Shaft Bush	49	" Locating Strip
8	" " " "	50	" Shaft Brush
9	Tumbler Bearing Bush	51	" Locating Pin
10	" Shaft Bush	52	" Roller
11	" " " "	53	" Roller Pin
12	Leadscrew Bush	54	Oil Filler Plug
13	Driving Shaft Gear 16T & 24T	55	Plug for Tumbler Shaft Bush
14	Inter Shaft Gear 32T	56	" " Inter
15	" " " 24T	57	Tumbler Handle Spring
16	Tumbler Shaft Gear 24T & 42T	58	Leadscrew Gear Shifting Lever Shaft Spring Washer $\frac{3}{8}$ "
17	Tumbler Gear 27T	59	Gear Shifting Lever Pins $\frac{3}{8}$ " x $\frac{3}{4}$ " Mills
18	Intermediate Shaft 14T	60	Drain Plug
19	Tumbler Shaft 15T	61	Oil Sight
20	" " Washer	62	Leadscrew Gear Shifting Lever Shaft
21	" " Handle	63	Feed Shaft Bearing Bush
22	" " Socket	64	Tumbler Gear Pin $\frac{3}{8}$ " x $\frac{3}{8}$ " Mills
23	" " Plunger	65	Tumbler Shaft Circlip
24	Tumbler Gear Shaft	66	" " " "
25	Driving Shaft	67	Keys for Inter Shaft
26	" " Washer	68	Key for Leadscrew
27	Leadscrew Gear Lever	69	Leadscrew
28	" " 24T	70	Leadscrew Locknuts
29	" " Bush	71	" Plain Collar
30	Cone Gear Shaft	72	" Screwed
31	" " " Collar	73	Feed Shaft
32	" " 28T	74	Change Wheel 35T
33	" " 26T	75	Spacing Collar on Driving Shaft
34	" " 24T	76	Knurled Nut
35	" " 23T	78	Driving Shaft Circlip
36	" " 22T	79	Feed Shaft Friction Clutch Spring
37	" " 20T		
38	" " 19T		
39	" " 18T		
40	" " 16T		
41	" Shaft Pinion 24T		
42	Gear Shifting Lever (Top)		

When ordering spares please give Serial No. of machine, name of unit and Part No.



The Straight Bed Carriage

SPARE PARTS

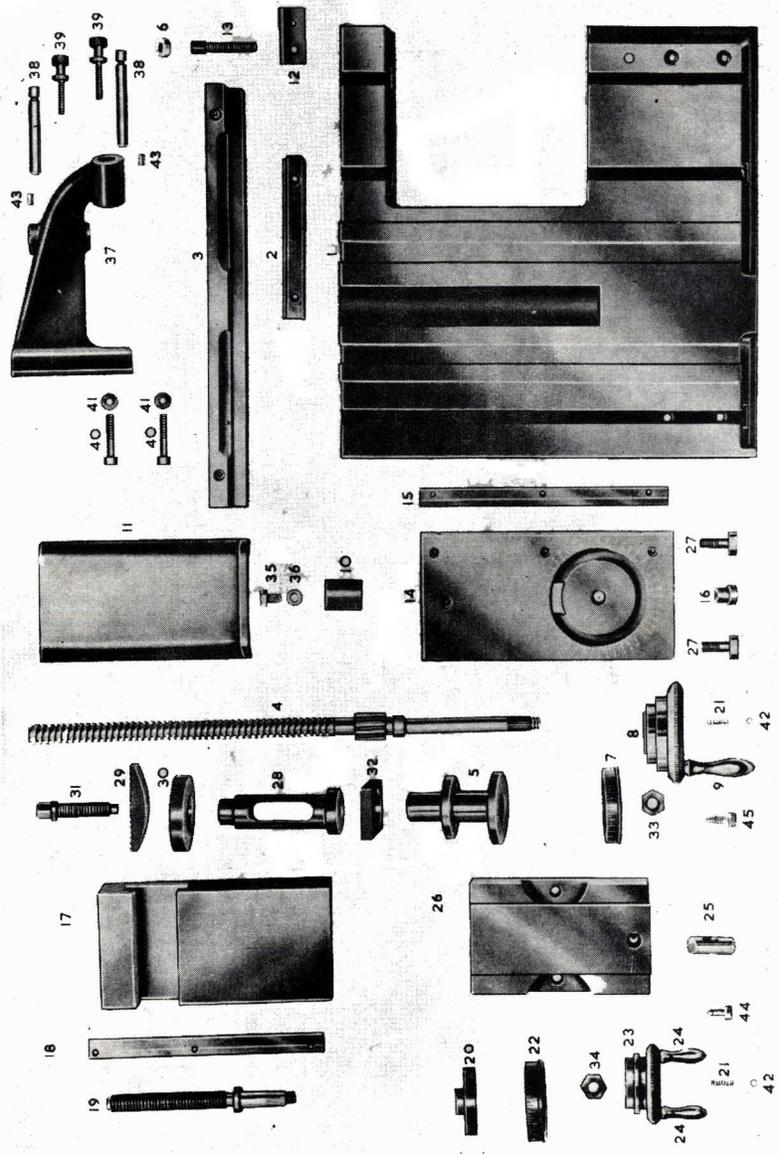
QUICK CHANGE FEED BOX—continued

No.	Name of Part	No.	Name of Part
80	Feed Shaft Friction Clutch Ball $\frac{1}{2}$ " dia.		Front Cover Pins $\frac{1}{4}$ " x 1"
81	Gasket		Tumbler Bearing Bush Screw $\frac{1}{4}$ " x $\frac{1}{2}$ " Cap Hd.
82	Feed Shaft Friction Clutch Bush		Tumbler Arm Screw $\frac{1}{2}$ " x $1\frac{1}{2}$ " Cap Hd.
83	Feed Shaft Friction Clutch Peg		Gear Box Bush Locating Grub Screws $\frac{1}{8}$ " x $\frac{1}{2}$ " Cap Hd.
84	Feed Shaft Friction Clutch Ball $\frac{1}{2}$ " dia.		Leadscrew End Collar Grub Screw $\frac{1}{4}$ " x $\frac{1}{2}$ "
85	Feed Shaft Collar		Locating Strip Fixing Screw $\frac{1}{4}$ " x $\frac{1}{2}$ " Cap Hd.
86	Leadscrew Spacer Bush		End Plug Grub Screw $\frac{1}{8}$ " x $\frac{1}{4}$ "
87	Leadscrew Metric Gear Bush		Feed Shaft Collar and Bush Screws $\frac{1}{2}$ " x $\frac{1}{2}$ "
88	Leadscrew Metric Gear Collar		Cone Shaft Collar Grub Screw $\frac{1}{4}$ " x $\frac{1}{2}$ "
89	Leadscrew Bush		Locating Strip Adjusting Screws $\frac{1}{8}$ " x $\frac{1}{2}$ " Dog Point
	Locating Pin Nut $\frac{1}{4}$ " Std. Hex.		Locating Strip Adjusting Screws $\frac{1}{8}$ " x $\frac{1}{2}$ " Dog Point
	Leadscrew Gear Lever Pin $\frac{1}{4}$ " x $1\frac{1}{2}$ " Mills		Locating Strip Locking Grub Screw $\frac{1}{4}$ " x $\frac{1}{2}$ "
	Leadscrew Gear Lever Grub Screw $\frac{1}{4}$ " x $\frac{1}{2}$ "		Inter Shaft Gear Grub Screw $\frac{1}{4}$ " x $\frac{1}{2}$ "
	Gear Shifting Lever Balls $\frac{1}{2}$ " dia.		Tumbler Handle Pin $\frac{1}{4}$ " x $1\frac{1}{2}$ " Mills
	Gear Shifting Lever Springs		Tumbler Bearing Bush Oil Seal Ring
	Gear Shifting Lever Grub Screw $\frac{1}{4}$ " x $\frac{1}{2}$ "		Oilers
	Top Cover Screws $\frac{1}{2}$ " x $\frac{1}{2}$ " Cap Hd.		
	Front Cover Screws $\frac{1}{2}$ " x $\frac{1}{2}$ " Cap Hd.		

STRAIGHT BED CARRIAGE

1	Carriage	38	Follow Rest Fingers
2	.. Front Gib	39	.. Screws
3	.. Back Gib	40	Follow Rest Fixing Screws $\frac{1}{4}$ " x 2" Cap Hd.
4	.. Screw	41	Follow Rest Fixing Screw Washers
5	.. Keep	42	Balls for Index Rings
6	Carriage Locking Screw Washer	43	Follow Rest Finger Inserts
7	Carriage Screw Index Ring	44	Topslide Index Locking Screw
8	.. Handwheel	45	Carriage Index Locking Screw
9	.. Ball Handle		Topslide Gib set-up Grub Screws $\frac{1}{4}$ " x $\frac{1}{2}$ "
10	.. Nut		Topslide Gib Retaining Screws $\frac{1}{4}$ " x $\frac{1}{2}$ " Cap Hd.
11	.. Guard		Bottom Slide Gib set-up Screws $\frac{1}{4}$ " x $\frac{1}{2}$ "
12	.. Locking Gib		Bottom Slide Gib Retaining Screws $\frac{1}{4}$ " x 1" Cap Hd.
13	.. Screw		Travelling Steady Finger Fixing Grub Screws $\frac{1}{4}$ " x $\frac{1}{2}$ "
14	Bottom Slide		Back Carriage Gib Screws $\frac{1}{4}$ " x $1\frac{1}{2}$ " Hex.
15	.. Gib		Front Carriage Gib Screws $\frac{1}{2}$ " x $1\frac{1}{2}$ " Cap Hd.
16	Spigot for Swivel Slide		Carriage Locking Gib Pin $\frac{1}{4}$ " x 1" Mills
17	Topslide		Apron Fixing Screws $\frac{1}{2}$ " x $1\frac{1}{2}$ " Cap Hd.
18	.. Gib		Carriage Keep Fixing Screws $\frac{1}{4}$ " x $\frac{1}{2}$ " Cap Hd.
19	.. Screw		Carriage Screw Guard Screws $\frac{1}{4}$ " x $\frac{1}{2}$ " Cap Hd.
20	.. Keep		Swivel Bolt Nuts $\frac{1}{4}$ " Hex.
21	.. Index Ring Springs		Topslide Nut Fixing Screw $\frac{1}{4}$ " x $\frac{1}{2}$ " Dog Point
22	.. Ring		Topslide Keep Screws $\frac{1}{4}$ " x $\frac{1}{2}$ " Cap Hd.
23	.. Handwheel		Trav. Steady Finger Locking Pads
24	.. Ball Handle		Oilers
25	.. Nut		
26	Swivel Slide		
27	.. Bolts		
28	Tool Holder		
29	.. Swivel Piece		
30	.. Collar		
31	.. Screw		
32	.. Clamp Plate		
33	Carriage Screw Locknut		
34	Topslide Screw Locknut		
35	Carriage Screw Nut Fixing Screw		
36	Carriage Screw Nut Fixing Screw Washer		
37	Follow Rest		

When ordering spares please give Serial No. of machine, name of unit and Part No.



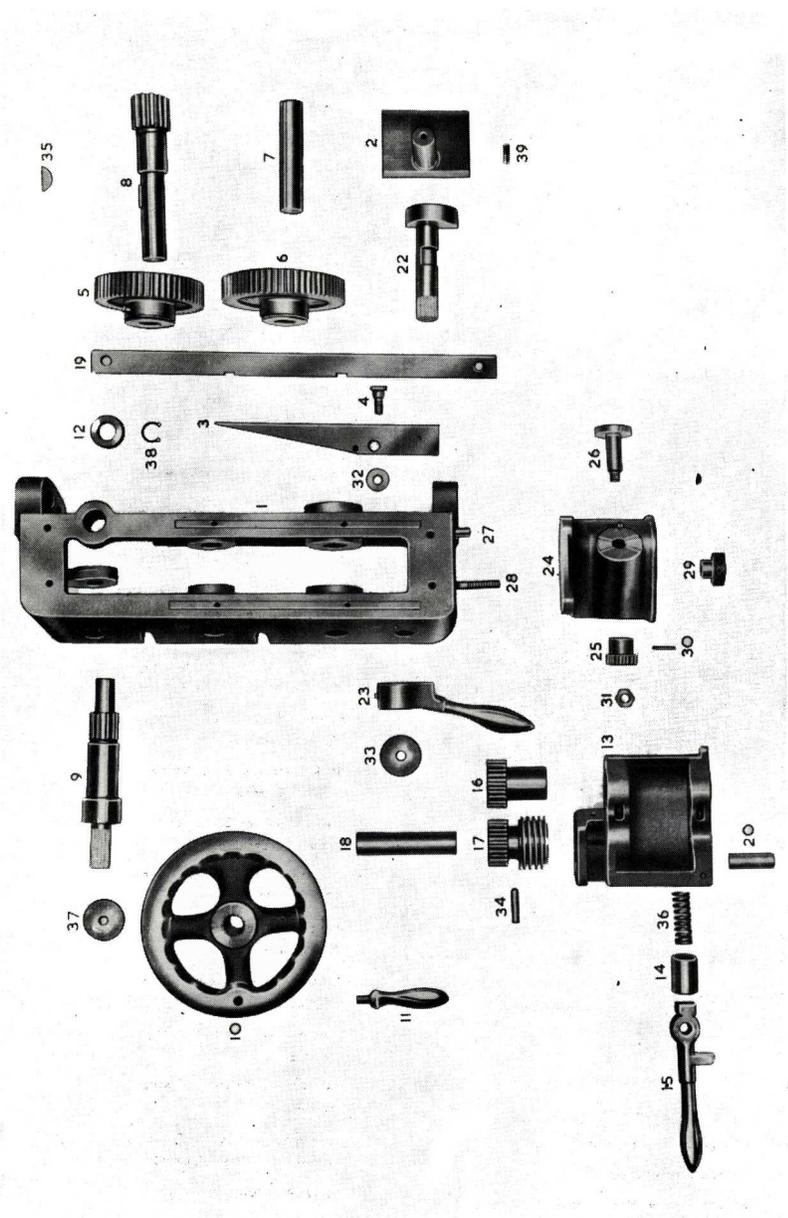
The Gap Bed Carriage

SPARE PARTS

GAP BED CARRIAGE

No.	Name of Part	No.	Name of Part
1	Carriage	39	Follow Rest Screws
2	.. Front Strip	40 Fixing Bolt
3	.. Back Strip	41 Fixing Washers
4	.. Screw		$\frac{1}{2}$ "
5 Keep	42	Balls for Index Rings
6	Carriage Locking Screw Washer	43	Follow Rest Finger Inserts
7	Carriage Screw Index Ring	44	Topslide Index Locking Screw
8 Handwheel	45	Carriage Index Locking Screw
9 Ball Handle		Topslide Strip Set-up Grub Screws $\frac{3}{8}$ " x $\frac{1}{2}$ "
10 Nut		Topslide Strip Retaining Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap Hd.
11 Guard		Bottom Slide Strip Set-up Grub Screws $\frac{3}{8}$ " x $\frac{1}{2}$ "
12	.. Locking Strip		Bottom Slide Retaining Screws $\frac{3}{8}$ " x 1" Cap Hd.
13 Screw		Follow Rest Finger Fixing Grub Screws $\frac{3}{8}$ " x $\frac{1}{2}$ "
14	Bottom Slide		Back Carriage Strip Screws $\frac{3}{8}$ " x 1 $\frac{1}{2}$ " Hex.
15 Strip		Front Carriage Strip Screws $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " Cap Hd.
16	Spigot for Swivel Slide		Carriage Locking Strip Pin $\frac{3}{8}$ " x 1" Mills
17	Topslide		Apron Fixing Screws $\frac{3}{8}$ " x 1 $\frac{1}{2}$ " Cap Hd.
18	Topslide Strip		Apron Fixing Screws $\frac{3}{8}$ " x 1" Cap Hd.
19	.. Screw		Follow Rest Fixing Bolt Nuts $\frac{1}{2}$ "
20	.. Keep		Carriage Keep Fixing Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap
21	.. Index Ring Springs		Carriage Screw Guard Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap Hd.
22 Ring		Swivel Bolt Nuts $\frac{3}{8}$ " Hex
23	.. Handwheel		Topslide Nut Fixing Screw $\frac{3}{8}$ " x $\frac{1}{2}$ " Dog Point
24	.. Ball Handle		Topslide Keep Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap Hd.
25	.. Nut		Oilers
26	Swivel Slide		
27	.. Bolts		
28	Tool Holder		
29	.. Swivel Piece		
30	.. Collar		
31	.. Screw		
32	.. Clamp Plate		
33	Carriage Screw Locknut		
34	Topslide Screw Locknut		
35	Carriage Screw Nut Fixing Screw		
36	Carriage Screw Nut Fixing Screw Washer		
37	Follow Rest ..		
38	.. Fingers		

When ordering spares please give Serial No. of machine, name of unit and Part No.



The Apron

SPARE PARTS

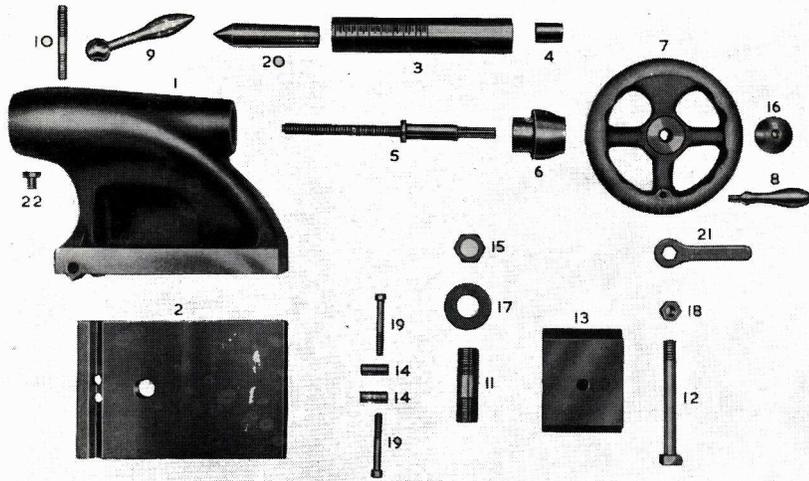
APRON

No.	Name of Part	No.	Name of Part
1	Apron	31	Chasing Dial Nut
2	Leadscrew Half Nut	32	Safety Strip Stud Washer Stand
3	Safety Strip	33	Domed Washer for Leadscrew Nut Handle
4 Stud	34	Pin for Worm and Pinion
5	Sliding Worm Wheel 54T	35	Rack Pinion Shaft Key No. 9 Woodruff
6	Cross Feed Worm Wheel 63T	36	Worm Box Plunger Spring
7	Cross Feed Worm Wheel Shaft	37	Domed Washer for Handwheel
8	Rack Pinion Shaft 12T	38	Racking Shaft Circlip
9	Racking Pinion Shaft 13T	39	Lead Nut Pin
10	Handwheel		Lead Nut Handle Ball $\frac{1}{4}$ " dia.
11 Handle		Lead Nut Handle Spring
12	Racking Pinion Shaft Washer		Lead Nut Handle Screw $\frac{1}{4}$ " x $\frac{3}{4}$ " Cap Hd.
13	Worm Box		Racking Shaft Domed Washer Screw $\frac{1}{4}$ " x $\frac{3}{4}$ " Cap Hd.
14 Plunger		Worm Box Handle Pin Grub Screw $\frac{1}{8}$ " x $\frac{1}{2}$ "
15 Handle		Worm Box Stop Bar Fixing Screw $\frac{3}{8}$ " x $\frac{1}{2}$ " C/Sunk
16 Pinion 18T		Worm Box Stop Bar Pin $\frac{1}{4}$ " x 1" Mills
17 and Pinion 23T		Safety Strip Stop Screw $\frac{1}{4}$ " x $1\frac{1}{4}$ " c/sunk
18 Shaft		Sliding Worm Wheel Grub Screw $\frac{1}{4}$ " x $\frac{1}{2}$ "
19 Box Stop Bar		Leadscrew Nut Handle Stop Screws $\frac{1}{4}$ " x $\frac{3}{4}$ " Cap Hd.
20 Handle Pin		Surf. Worm Wheel Shaft Grub Screw $\frac{1}{8}$ " x $\frac{1}{2}$ "
22	Leadscrew Nut Ecc. Cam		
23	Leadscrew Nut Ecc. Cam Handle		
24	Chasing Dial Guard		
25 Gear 24T		
26	Chasing Dial		
27 Guard Pin		
28 Stud		
29 Knurled Nut		
30	Chasing Dial Gear Pin $\frac{3}{8}$ " x $\frac{1}{2}$ " Mills		

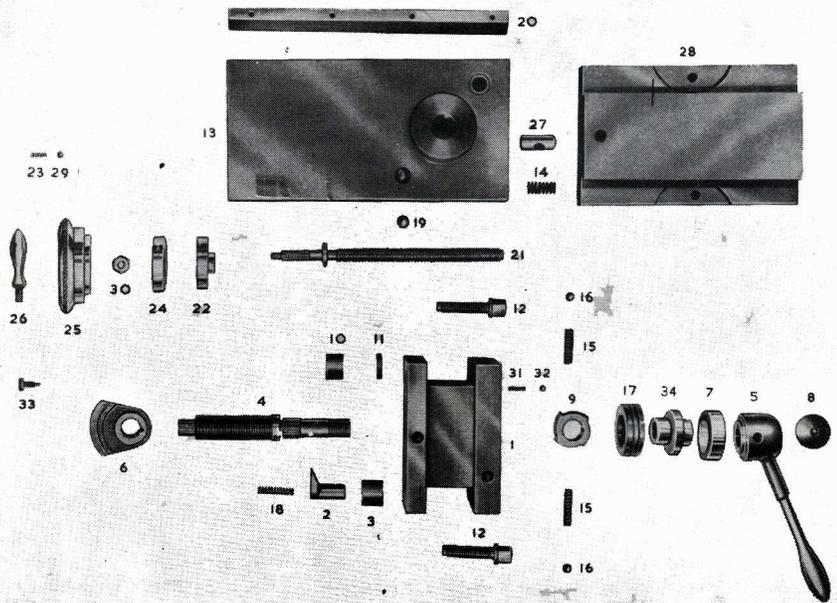
BED

Bed	Screws $\frac{1}{4}$ " x $\frac{3}{4}$ " Cap Hd.
Cabinet Base	Coolant Delivery Bracket
Motor Plate	Screws $\frac{1}{4}$ " x 1" (Hex.)
Rack (Long)	Drain Pipe Filter
Rack (Short) Plug
Rack Screws $\frac{3}{8}$ " x $\frac{1}{2}$ " Cap Hd.	Control Panel
Rack Dowel Pins 5/32" x $\frac{1}{2}$ "	Leadscrew Tail End Bush
Cabinet Fixing Bolts $\frac{1}{2}$ " x $1\frac{1}{2}$ " Cap Hd.	Spline Shaft Tail End Bush
Cabinet Fixing Bolt Washers (Rubber)	Splash Guard
Electric Control Panel	Motor Anti-vibration Bolts
Screws $\frac{1}{4}$ " x $\frac{3}{4}$ " Cap Hd.	Micro Switches
Jacking Bolts $\frac{1}{2}$ " x $1\frac{1}{2}$ " Hex.	Motor
Jacking Bolt Washers Starter & Electrical Controls
Coolant Pump	Motor Pulley
Coolant Delivery Assembly	7 $\frac{1}{2}$ " 3-Jaw Chuck Long Taper Nose
.. .. Bracket	10" 4-Jaw Chuck Long Taper Nose
Coolant Delivery Bracket	

When ordering spares please give Serial No. of machine, name of unit and Part No.



The Tailstock

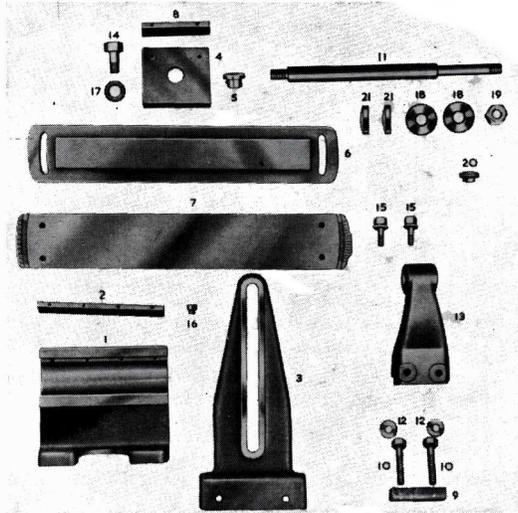


The Square Turret Toolpost

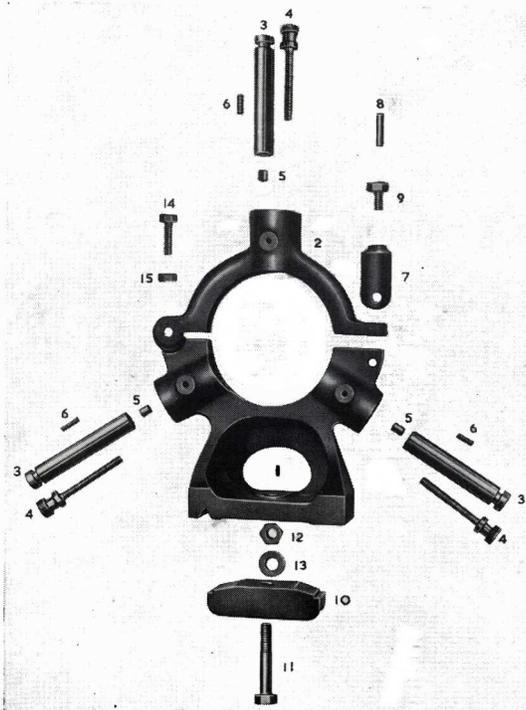
SPARE PARTS

TAILSTOCK

No.	Name of Part	No.	Name of Part
1	Tailstock	16	Handwheel Domed Washer
2	Base	17	Hollow Stud Washer
3	Graduated Spindle	18	Clamping Bolt Nut
4	Spindle Nut	19	Set-over Screws $\frac{1}{8}$ " x $2\frac{1}{4}$ " Cap Hd.
5	Screw	20	Centre
6	Keep	21	Ring Spanner
7	Handwheel	22	Spindle Tee Key
8	.. Handle		Keep Retaining Grub Screw $\frac{1}{8}$ " x $\frac{1}{2}$ "
9	Spindle Locking Lever		Set-over Nuts Retaining Grub Screws $\frac{1}{8}$ " x $\frac{1}{2}$ "
10 Stud		Domed Washer Screw Cap Hd. $\frac{1}{4}$ " x $\frac{1}{2}$ "
11	Hollow Stud		Spindle Nut Fixing Pin $\frac{1}{2}$ " x $1\frac{1}{8}$ "
12	Clamping Bolt		
13	Clamp Plate		
14	Set-over Nuts		
15	Hollow Stud Nut		



**The
Taper Turning
Attachment**



**Fixed
Steady
Rest**

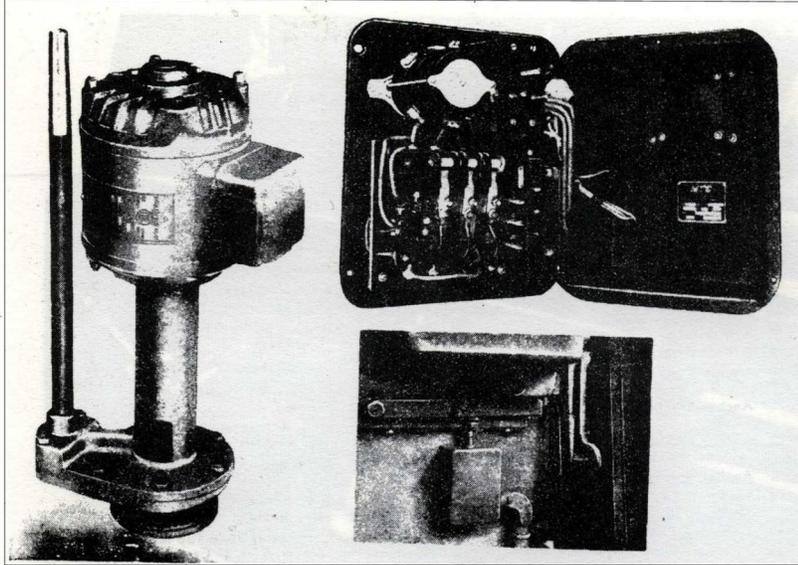
SPARE PARTS

TAPER TURNER

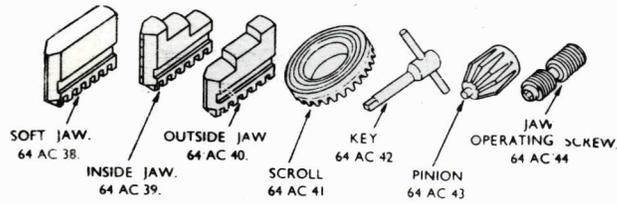
No.	Name of Part	No.	Name of Part
1	Bracket	18	Anchor Bracket Clamp Plate
2	.. Strip		Rod Washers
3	Connecting Slide	19	Anchor Bracket Clamp Plate
4	Slide		Rod Nut $\frac{1}{8}$ " (Hex.)
5	Clamping Thimble for Slide	20	Dust Cap for Nut Hole
6	Swivelling Plate	21	Anchor Bracket Spherical
7	Plate		Washers
8	Slide Strip		Bracket Fixing Screws $\frac{1}{8}$ " x 1"
9	Anchor Bracket Clamp Plate		Cap Hd.
10	Anchor Bracket Clamp Plate		Bracket Dowel Pins $\frac{1}{8}$ " x 1"
	Bolts (Hex.) $\frac{1}{8}$ " x $1\frac{1}{2}$ "		Bracket Set-up Grub Screw
11	Anchor Bracket Clamp Plate		$\frac{1}{8}$ " x $\frac{1}{2}$ "
	Rod		Strip Retaining Screw $\frac{1}{8}$ " x
12	Anchor Bracket Clamp Plate		$\frac{1}{8}$ " Cap Hd.
	Washer (Stand. $\frac{1}{8}$ ")		Slide Set-up Grub Screws
13	Anchor Bracket		$\frac{1}{8}$ " x $\frac{1}{2}$ "
14	Saddle Screw Nut Fixing		Slide Retaining Screw $\frac{1}{8}$ " x
	Bolt		$\frac{1}{2}$ " Cap Hd.
15	Swivelling Plate Screws		Connecting Slide Top Fixing
16	.. Spigot		Screw $\frac{1}{8}$ " x $\frac{1}{2}$ " Cap Hd.
17	Saddle Screw Nut Bolt		Connecting Slide End Fixing
	Washer		Screw $\frac{1}{8}$ " x $\frac{1}{2}$ " Cap Hd.

FIXED STEADY REST

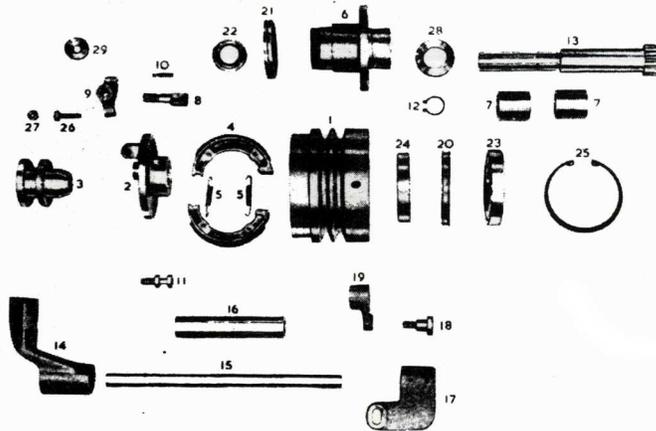
1	Steady Rest	9	Loop Screw $\frac{1}{8}$ " x $1\frac{1}{2}$ " (Hex.)
2	Top	10	Clamp Plate
3	Fingers	11 Bolt
4	Screws	12 Hex. Nut $\frac{1}{2}$ "
5	Finger Tips	13 Washer $\frac{1}{2}$ "
6	.. Locking Screws $\frac{1}{8}$ " x	14	Hinge Bolt $\frac{1}{2}$ " x $\frac{1}{2}$ " (Hex.)
	$\frac{1}{4}$ " Grub Screw	15 Nuts $\frac{1}{2}$ " (thin)
7	Loop		Finger Locking Screw Pads
8	.. Pin $\frac{1}{8}$ " x $2\frac{1}{4}$ "		



Electrical Equipment



Chuck Spares



Mechanical Clutch

SERVICE HINTS

After several years of use it may be necessary to give attention to various mechanisms and parts which have had extra hard wear and thus tend to cause minor troubles.

Should chatter take place the following points should be observed and given the necessary attention: —

1. See that all slide strips are properly adjusted.
2. Check that there is no lift in the saddle by ensuring that the front and back strips are bedding correctly.
3. Make sure that the Chuck is a good fit on the spindle nose and has not worked loose.
4. The tool should have a keen cutting edge and not be allowed to get dull: see that it is set correctly on the centerline.

FEED FAILURE

This may be due to the shearing of the shear pin. Which can easily be replaced (see page?) or through the slipping clutch which is housed at the right hand end of the feed box. To adjust this, first release collar on the inside of the tail end bracket and withdraw feed shaft, which will allow the screw in the end to be adjusted, usually a quarter of a turn will be found sufficient.

LATHE NOT CUTTING PARALLEL

The Lathe bed should be tested for level as described on page 15 and if necessary, the adjustments made. If the gap piece has been removed at any time and has not been correctly replaced this could also be a cause of the trouble when cutting at this end of the bed,

ELECTRIC FAILURE

Points to check:

1. See that the Starting switch at the back of the head is working correctly.
2. Check that the three fixing screws in the front of the panel are firmly screwed and that the three pin plug locates in its socket.
3. Panel not holding on, check auxiliary contact on main contactor and any loose connections.

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Clausing Colchester 13" All Geared Head Lathe

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- Sincerely; Machine Manuals

Technical support

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