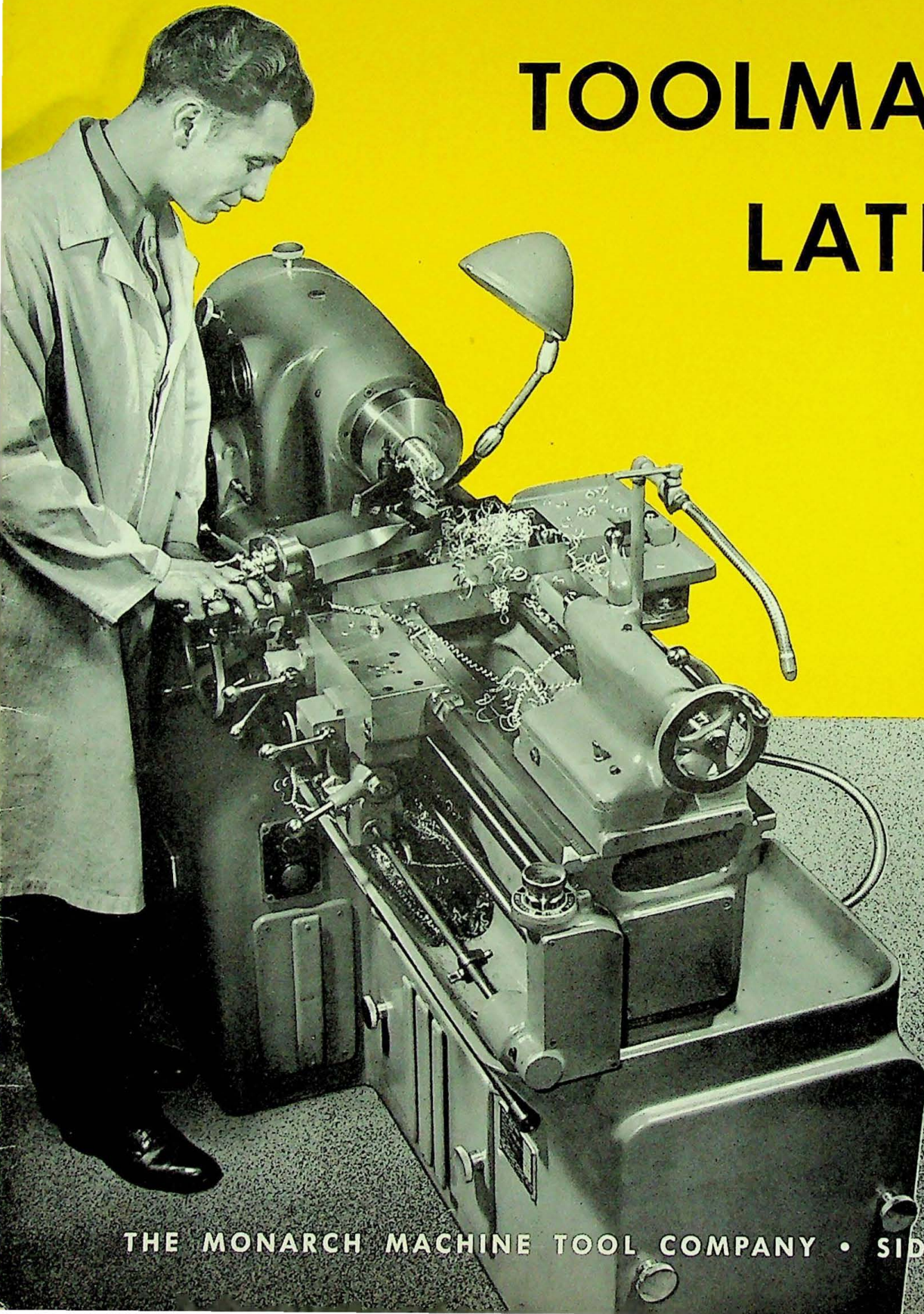


The Monarch 10" — Model EE

SENSITIVE PRECISION

TOOLMAKER'S

LATHE



THE MONARCH MACHINE TOOL COMPANY • SIDNEY, OHIO

ENGINEERING AND OPERATING FEATURES COMBINE TO PROVIDE EXTREME ACCURACY AND LONG SERVICE



ENGINEERING FEATURES PROVIDE—

- 1—Almost unlimited range of gearless, stepless spindle speeds.
- 2—Wide range of threads and feeds, through totally enclosed, quick-change gearbox, operating in oil bath.
- 3—Carriage held in secure alignment to the non-wearing hardened and ground bed ways by four self-aligning ball bearings which are mounted on eccentric studs.
- 4—Anti-friction bearings used throughout.
- 5—Automatic lubrication to carriage, apron and bed ways.
- 6—Three point bearing on floor, insuring accurate alignment.
- 7—Separate threading gear train; hardened, alloy steel gears with tooth contours ground or shaved; induction hardened and ground precision leadscrew.

8—Endless belt used for all feeds from spindle to gearbox, thus preserving the gear train solely for thread chasing.

9—Pleasingly streamlined appearance.

10—Wide range of extra equipment available to increase productivity and broaden scope of operations which may be performed.

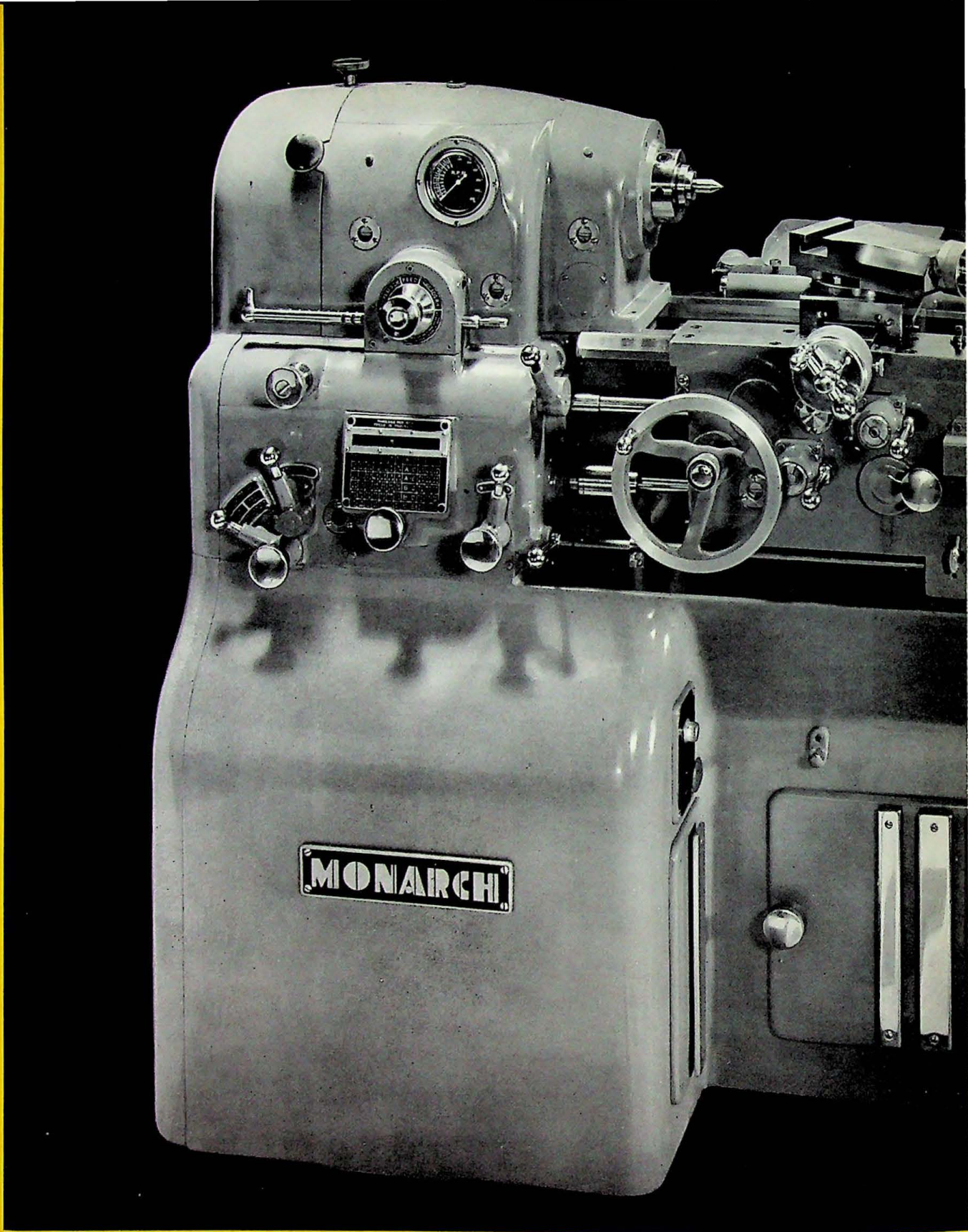
OPERATING FEATURES PROVIDE—

1—Bench precision lathe accuracy in a 3 or 5 hp, 2900 pound small toolmaker's lathe.

2—Controls easily accessible for all classes of work, from either sitting or standing position.

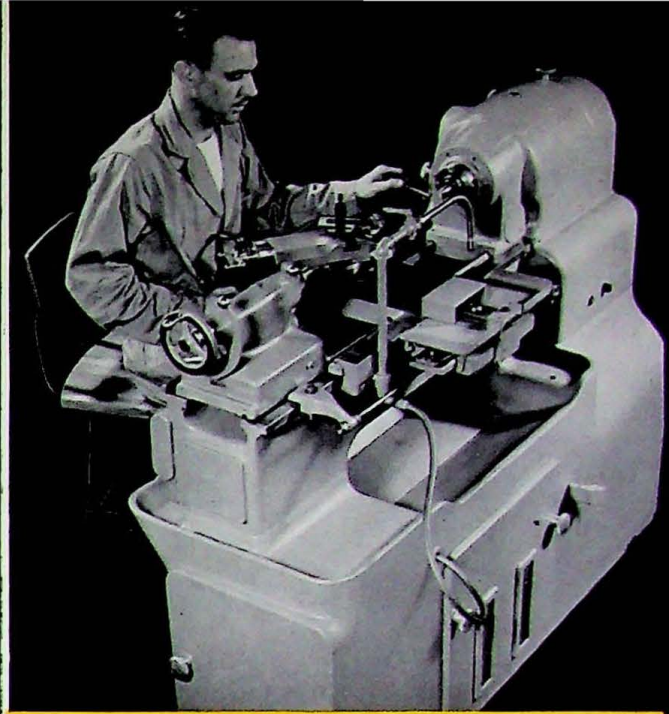
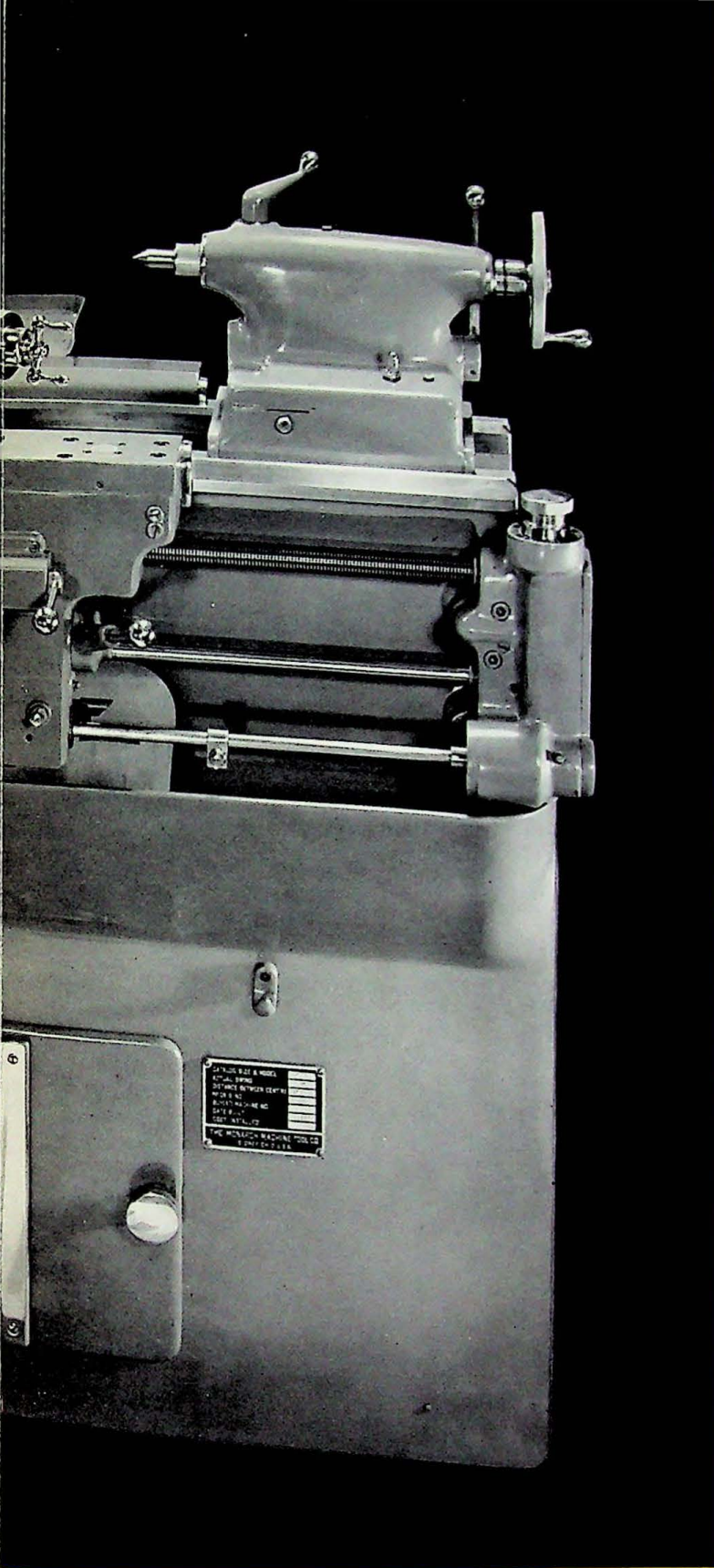
3—Bigger days output of higher quality work because of less operator fatigue.

These engineering and operating features make the Monarch 10" Sensitive Precision Toolmaker's Lathe—Model EE a modern, efficient, dependable tool for all who demand the ultimate in lathe performance.



The Monarch 10" Model EE Sensitive Precision Toolmaker's Lathe

The Monarch 10" Model EE Sensitive Precision Toolmaker's Lathe is built for precision work.



From a sitting position, operator can chase a thread easily. Carriage is reversed by turning shifter knob with left hand, or electric leadscrew reverse can be provided. Notice convenient placing of each operating handle and lever.



sitive Precision Toolmaker's Lathe

It to the highest possible standards to provide many years of exacting service.

SPECIFICATIONS

GENERAL

Swing over bed	12 $\frac{1}{2}$ "
Swing over cross slide	7 $\frac{1}{4}$ "
Distance between centers	20"
Distance, spindle center to floor	43 $\frac{1}{2}$ "
Floor Space	29" W x 64" L

HEADSTOCK

Hole through spindle	1-13/32"
Center Morse taper	No. 2
Spindle bearings, ball	Precision
American Standard Camlock spindle nose	3"-DI
Optional spindle speeds (range No. 1 furnished unless otherwise specified on order).	

A.C. Supply	Open Belt	Speed Reducer
Range No. 1	30 to 3000 rpm	5 to 500 rpm
Range No. 2	40 to 4000 rpm	6.5 to 650 rpm

GEAR BOX

Leadscrew diameter and threads per inch	1"—8 thd.
Range of threads	3 to 184
Range of feeds through endless belt	.0005" to .016"
Number of thread changes	60
Number of feed changes	50
Actual threads cut	3, 3 $\frac{1}{4}$, 3 $\frac{3}{8}$, 3 $\frac{1}{2}$, 3 $\frac{3}{4}$, 4, 4 $\frac{1}{2}$, 5, 5 $\frac{1}{2}$, 5 $\frac{3}{4}$, 6, 6 $\frac{1}{2}$, 6 $\frac{3}{4}$, 7, 7 $\frac{1}{2}$, 8, 9, 10, 11, 11 $\frac{1}{2}$, 12, 13, 13 $\frac{1}{2}$, 14, 15, 16, 18, 20, 22, 23, 24, 26, 27, 28, 30, 32, 36, 40, 44, 46, 48,

52, 54, 56, 60, 64, 72, 80, 88, 92, 96, 104, 108, 112, 120, 144, 160, 176 and 184.

TAILSTOCK

Tailstock spindle diameter	1 $\frac{1}{4}$ "
Tailstock spindle traverse	3 $\frac{1}{2}$ "

STEADY REST

Steady rest opening	3"
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CARRIAGE AND COMPOUND

Carriage length	20 $\frac{1}{2}$ "
Carriage bridge width	5"
Compound rest top slide travel	2"
Size of lathe tool	3/8" x 7/8"

BED

Width of bed	10 $\frac{1}{2}$ "
Depth of bed	10 $\frac{1}{4}$ "

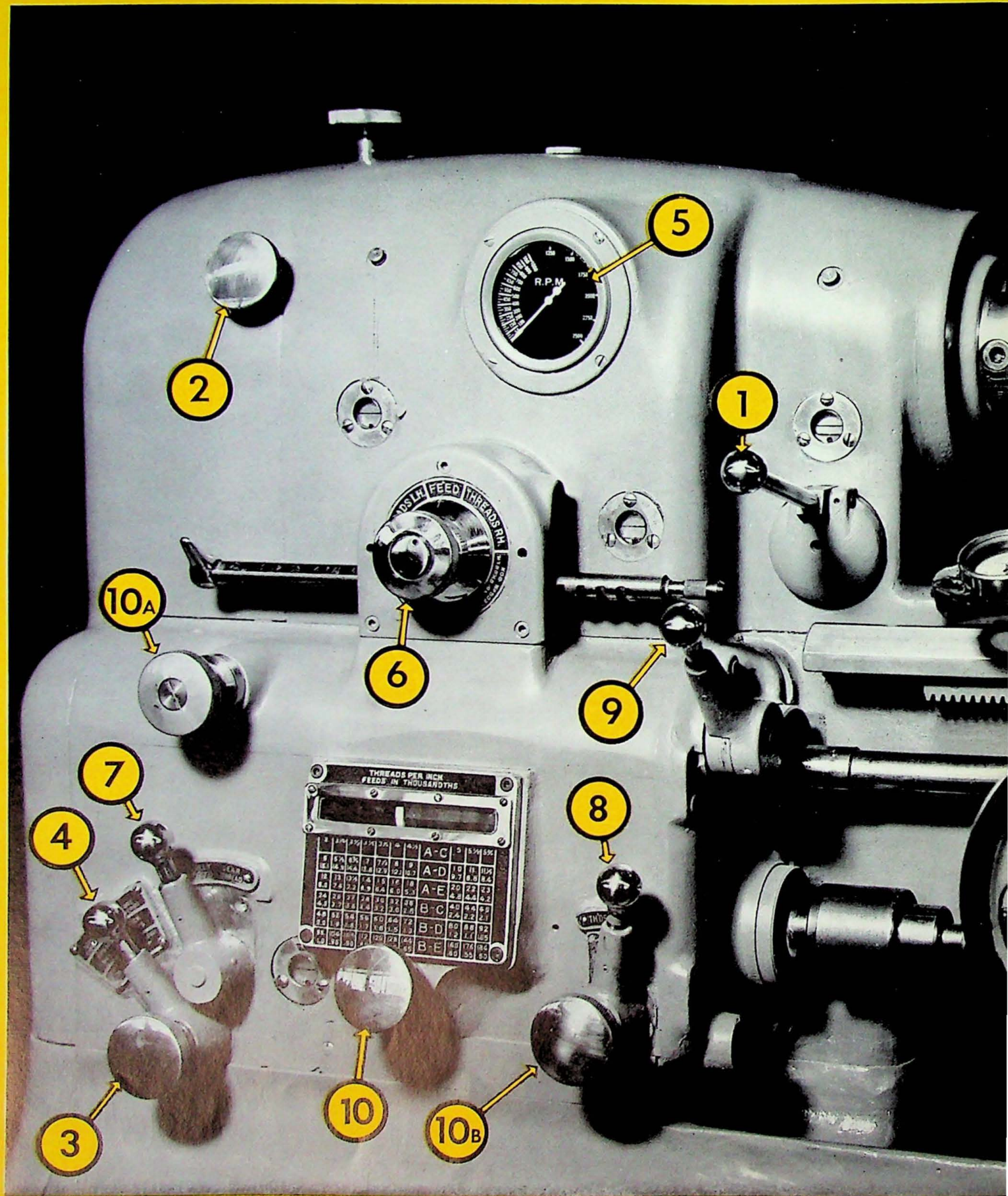
MOTOR DATA

Motor size	3 or 5 hp
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SHIPPING DATA

Net weight, with regular equipment only, (including electrical equipment)	2900 lbs.
Domestic shipping weight, as above	3250 lbs.
Export shipping weight, as above	3750 lbs.
Cubic content—boxed for export, as above	105 cu. ft.

REGULAR EQUIPMENT INCLUDES—3 or 5 hp. 100 to 1 variable speed electric drive with magnetic switch with start and stop push button station, built-in leadscrew reverse operated from headstock, built-in oil pan (reservoir type), cabinet base, large (T-slotted) face plate, dog plate, compound rest, steady rest, precision dial type indicator carriage stop, chasing dial, chasing stop, tool post, centers and wrenches.



MODERN, CENTRALIZED HEADSTOCK CONTROLS

SPINDLE

- 1—Hand lever controls start, stop or reverse of headstock spindle at any operating speed. In stop position it permits spindle to be turned easily by hand.
- 2—Spindle lock knob for locking spindle when it is necessary to tighten collets.

SPEED CHANGE

- 3—Knob for selecting any desired spindle speed in almost unlimited range.
- 4—Selector lever for six to one reduction in the output speed of the driving motor. Thus, a very slow spindle speed can be obtained with the maximum horsepower of the motor.
- 5—Tachometer. This indicates any spindle speed within the entire stepless range.

FEED AND THREAD CHANGE

- 6—Shifter knob which engages end gearing for either right or left hand threading. In feed position it leaves end gearing idle.

7—End gearing or feed belt engaging lever.

8—Leadscrew or feed rod engaging lever.

9—Tumbler gear engaging lever.

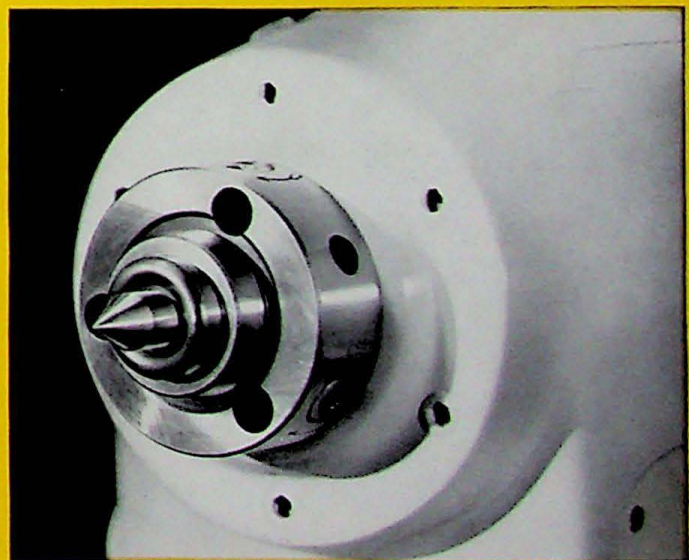
10, 10A, 10B—Knobs for selecting any desired range of feeds or threads.

All operating parts in this unit are mounted on anti-friction bearings, the main spindle being mounted on precision type ball bearings. Interlocking features protect both the operator and the machine in the event controls are not manipulated in the proper sequence. Mounted on the bed convenient to the operator, but not showing in the illustration to the left, is the push button station for the main drive motor, with green light showing when motor is running.

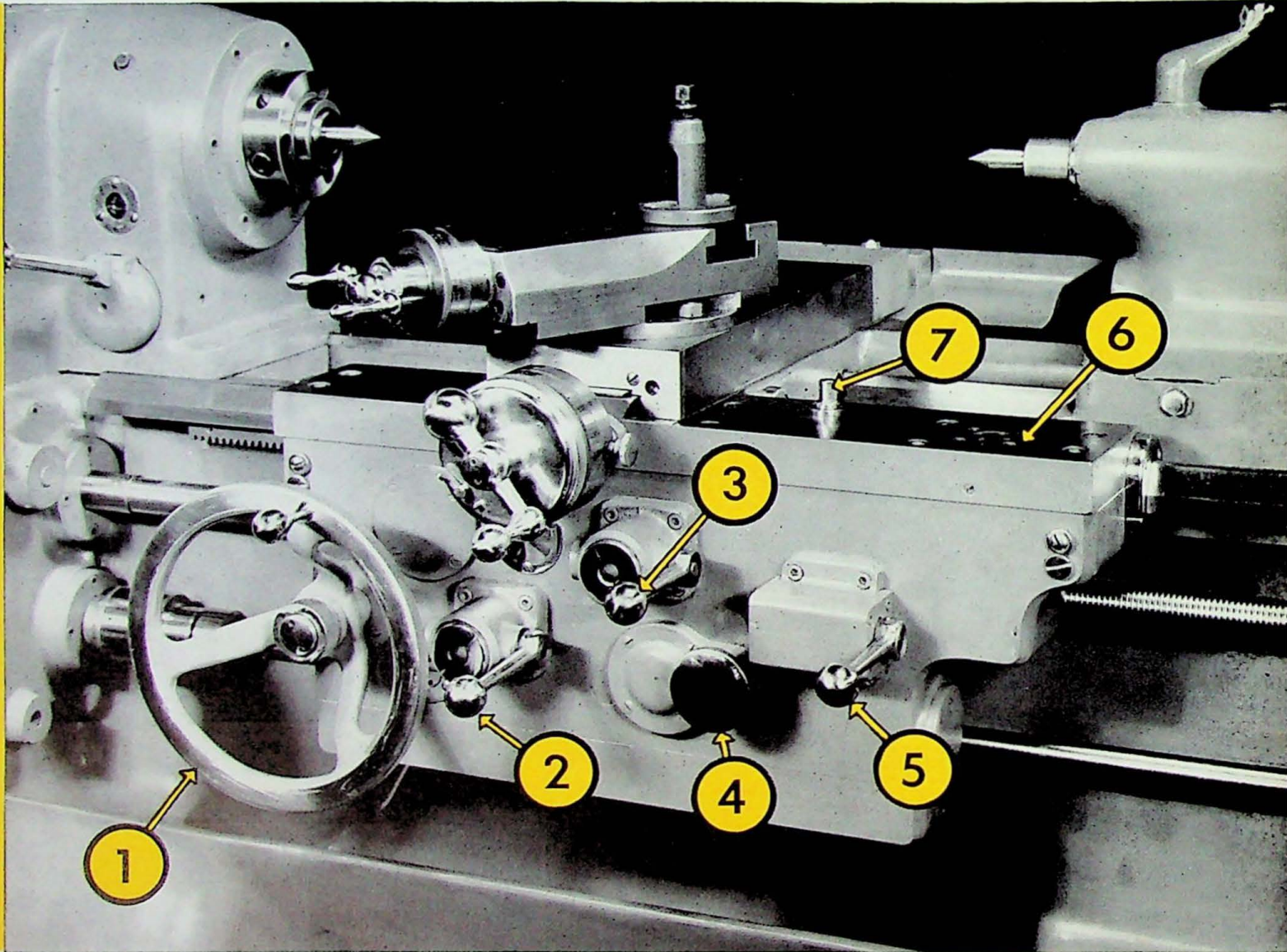
Among a number of recently added new features are two electrical interlocks for machine protection. One of these makes it impossible for the operator to start the main drive motor with the spindle lock knob engaged. The other prevents engagement of the speed reducing unit above a spindle speed of 250 R.P.M.

AND THE CAMLOCK SPINDLE NOSE FOR MAXIMUM PERFORMANCE

The Camlock spindle nose is the most perfect known means of quick, accurate and secure mounting of chucks, plates or fixtures. The chuck may quickly be slipped on the spindle nose and a quarter turn of the wrench on each locking cam locks it snugly in place. There is perfect centralization and squaring of the chuck plate or fixture; quick changeability and the utmost in rigidity with the minimum overhang. Final inspection limit is .0001" for spindle nose run-out with the average error being less than that figure.



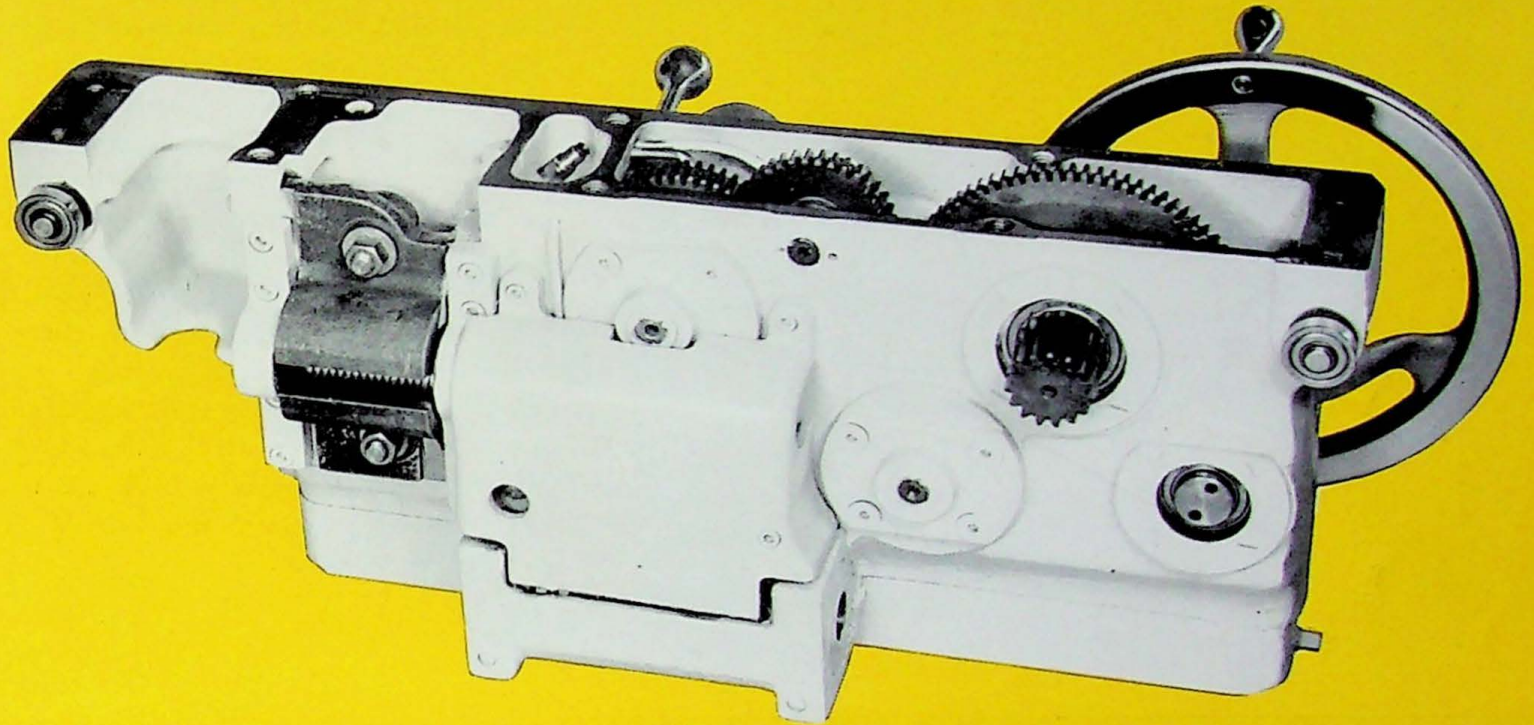
CONVENIENT APRON AND



Years of satisfactory service are built into the Monarch Model EE apron. Hardened alloy steel parts are used throughout as well as anti-friction type bearings. Lubrication is automatically supplied under pressure by a pump which also furnishes oil through copper tubes and metering pins direct to the bearing surfaces of the carriage and the cross slide.

Placement of the chromium plated controls adds measurably to the convenience of operation. Their functions are (1) apron handwheel, (2) longitudinal feed lever, (3) transverse feed lever, (4) feed directional control knob, (5) half nut lever, (6) chasing dial and (7) carriage binder clamp.

CARRIAGE CONTROLS . . .



The above rear view of the apron emphasizes the neat, compact design of this unit. Note the generous size lead-screw half nut to the left.

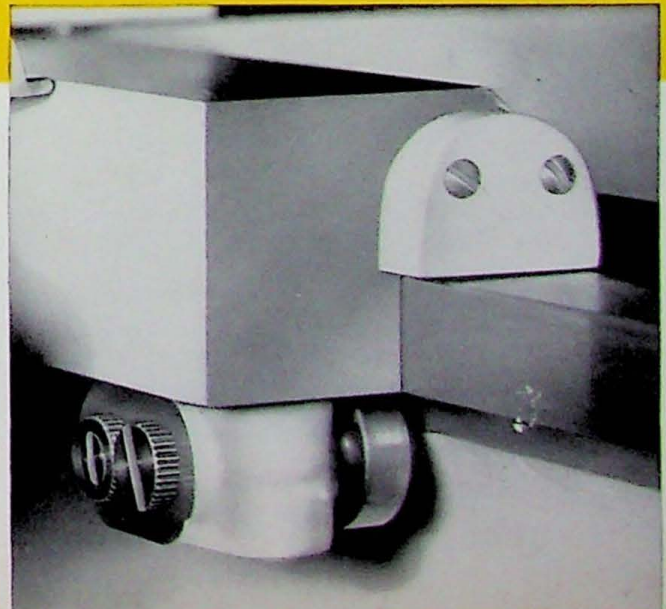
Feed is through a worm and worm gear. An automatic inter-lock prevents simultaneous engagement of the longitudinal feed and the half nut. The Monarch patented

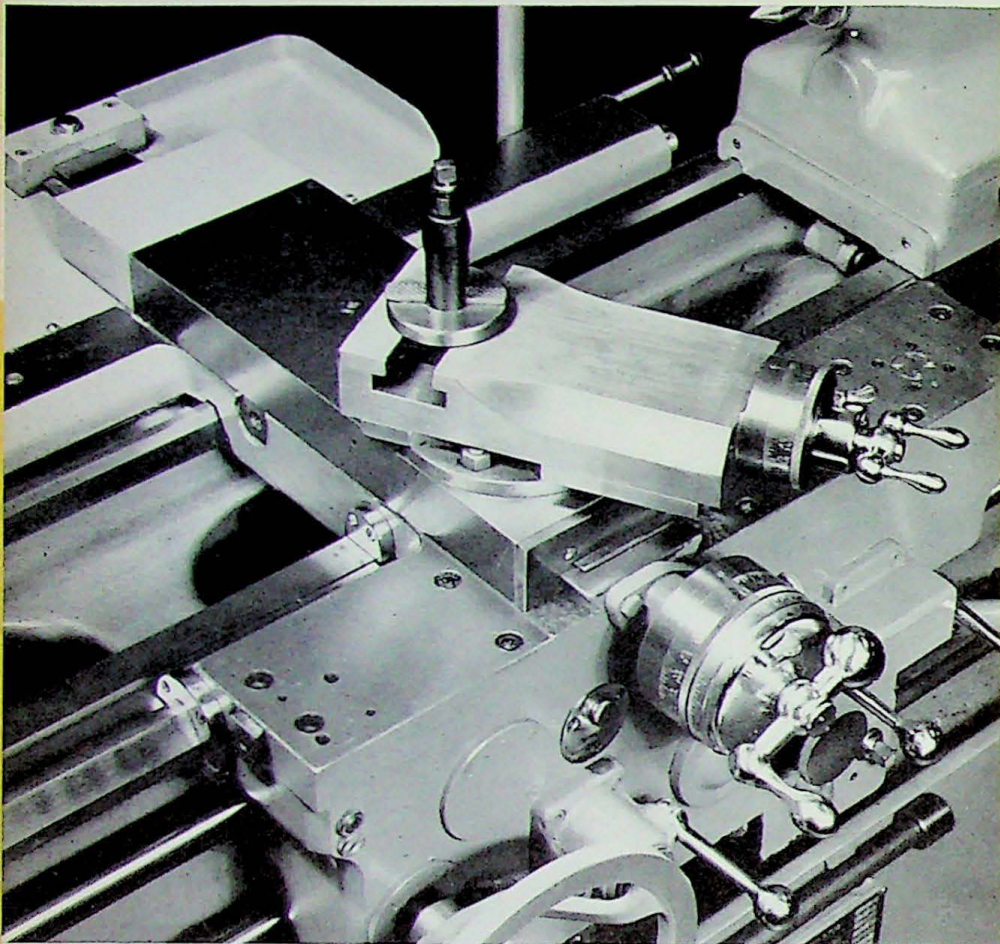
eccentric-operated, friction longitudinal feed and transverse feed add further to the ease of operation and to continuous satisfactory performance.

The carriage has a bearing $20\frac{1}{2}$ " long on the flame hardened and ground bed ways. Accurate alignment is maintained by the acute 65° V angle of the carriage.

ANTI-FRICTION BEARING CARRIAGE GIB

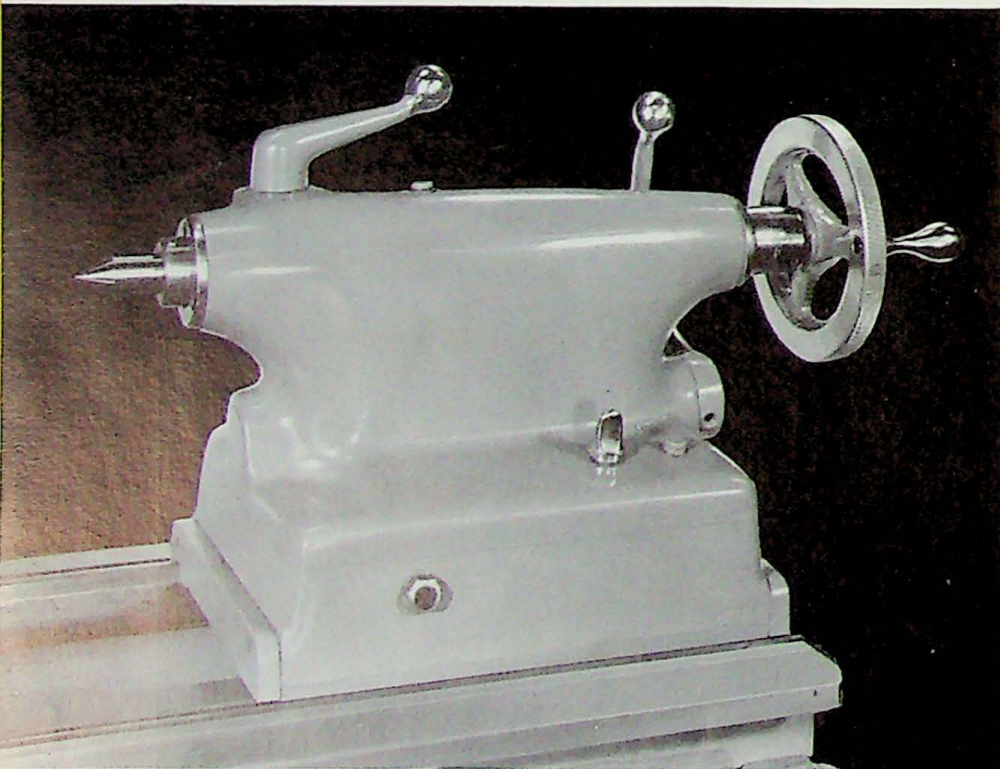
Flame hardened and ground lathe beds, with their almost complete resistance to wear, make possible the use of anti-friction bearing carriage gibs. These entirely remove the tendency of carriage lift or climb from the bed way surfaces. Illustrated is one of the four permanent, oil-sealed, self-aligning, ball bearing, eccentric mounted, carriage gibs directly under the carriage wing.





COMPOUND and CROSS SLIDE

Compound and cross slide dials are large and easy to read. They are graduated in thousandths of diameter (not radius). Swivel graduated 180° either side of zero. Standard equipment includes quick thread chasing stop. Compound and cross feed screws induction hardened and ground. Full length taper gibs in top block and cross slide are provided with double screws for adjusting. A time-saving feature is the cross feed adjustable chasing stop. When chasing threads the outer cross feed dial is locked to inner dial which, in turn is locked to chasing stop. For final tool adjustment outer dial may be unlocked and tool repositioned for finishing thread without disturbing original set-up.



THE TAILSTOCK

The hardened tailstock spindle is graduated and is supplied with graduated micrometer feed. The base forms an oil reservoir, with wipers for feeding the oil to the bed ways. Eccentric clamping of the tailstock to the bed is quickly accomplished. The spindle binder lever is offset to the rear so as to clamp the tailstock spindle against the thrust of the tool.

THE ELECTRONIC DRIVE

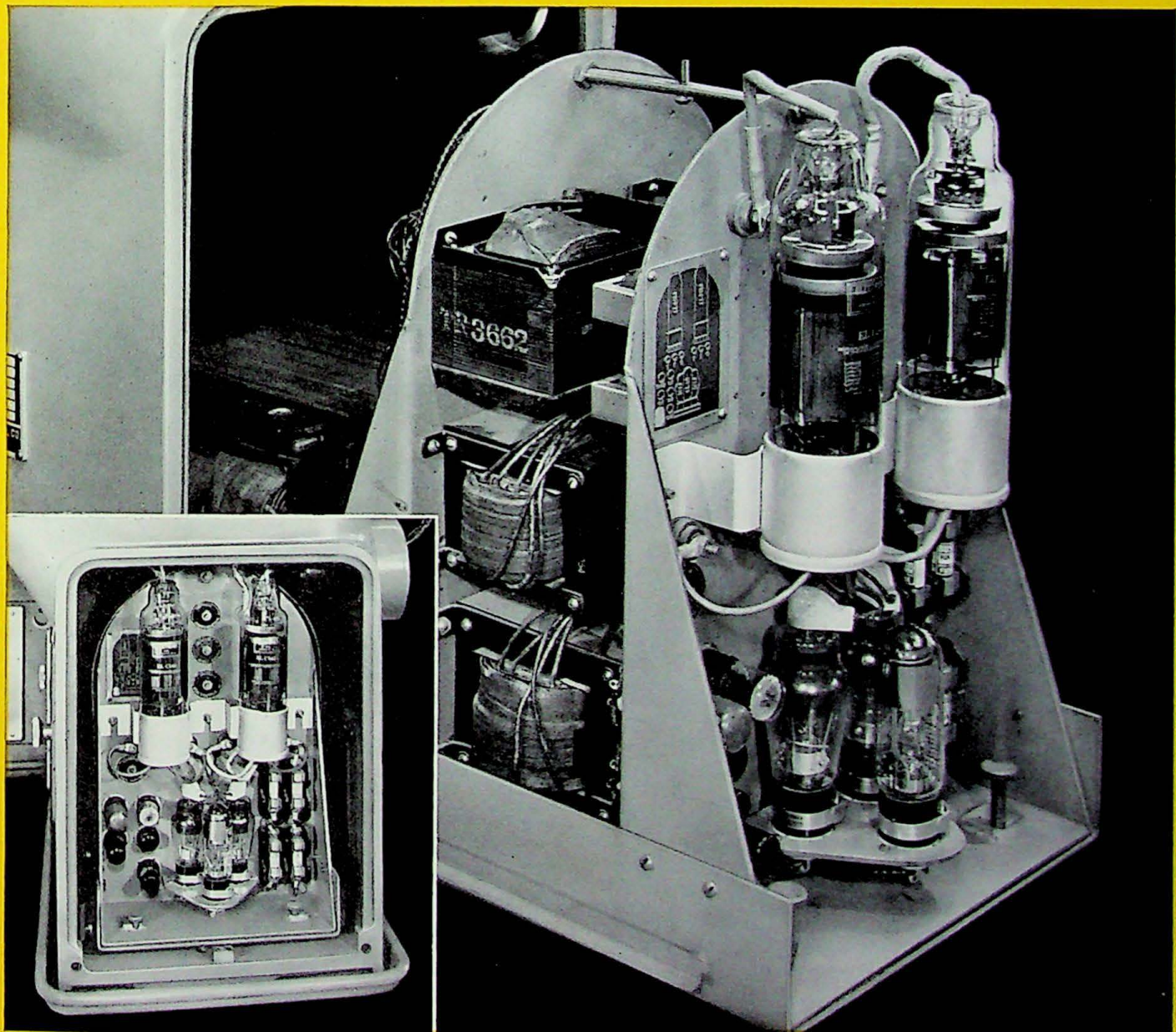
The Model EE is supplied with an electronic drive as standard equipment. The main drive motor secures its power through an electronic unit which utilizes almost any source of A.C. current.

Numerous benefits are inherent in this type of drive. Vibration at all speeds is minimized by the absence of revolving equipment in the power supply to the driving motor. Noise is practically eliminated.

There is improved speed regulation regardless of load, and torque is better maintained at the lower speeds. This is of particular importance when it is

necessary to take heavy cuts on large diameter work. Another advantage is the increased reserve power for normal overload operations which must often be performed intermittently. The tubes have extra long life because they are selected for their great reserve capacity.

The illustrations below indicate the accessibility of the electronic unit. Removal of one cover at the left hand end of the cabinet base exposes the tubes while the entire unit may be pulled out of the base for inspection or servicing.



Basic Machine

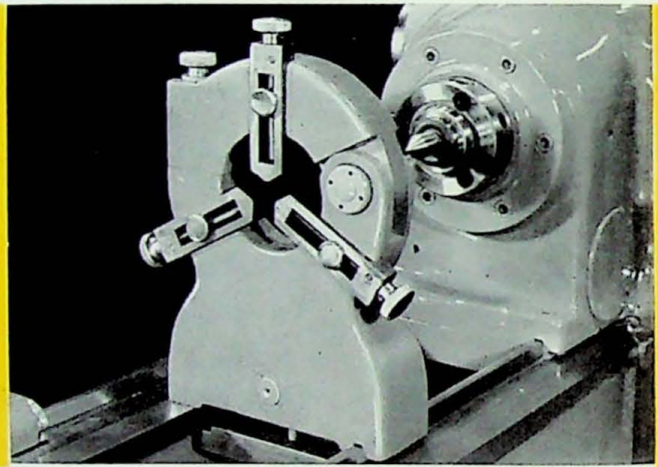
\$ 9020.00

\$ 734⁰⁰ Freight

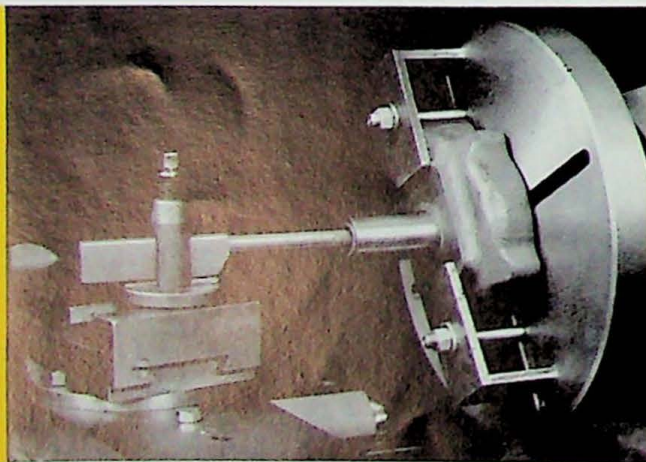
-AND THIS
Standard
EQUIPMENT



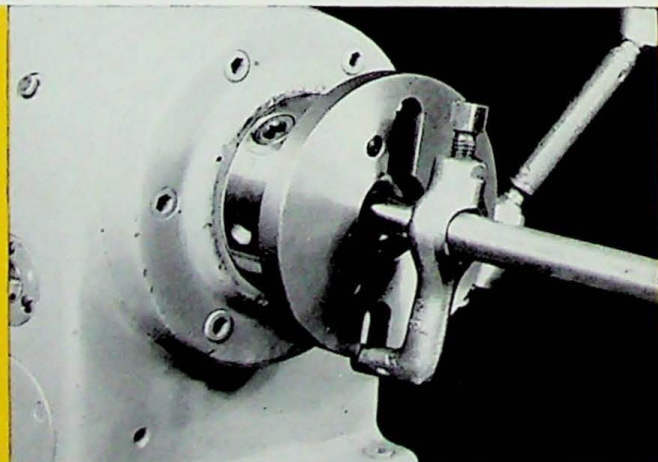
INDICATOR CARRIAGE STOP—Used when a facing or shoulder cut must be held within close limits. Precision type dial indicator, graduated in thousandths.



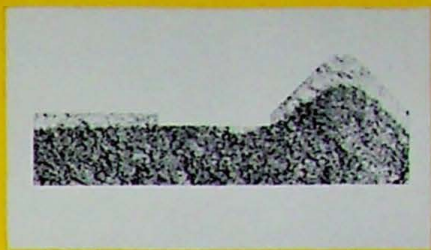
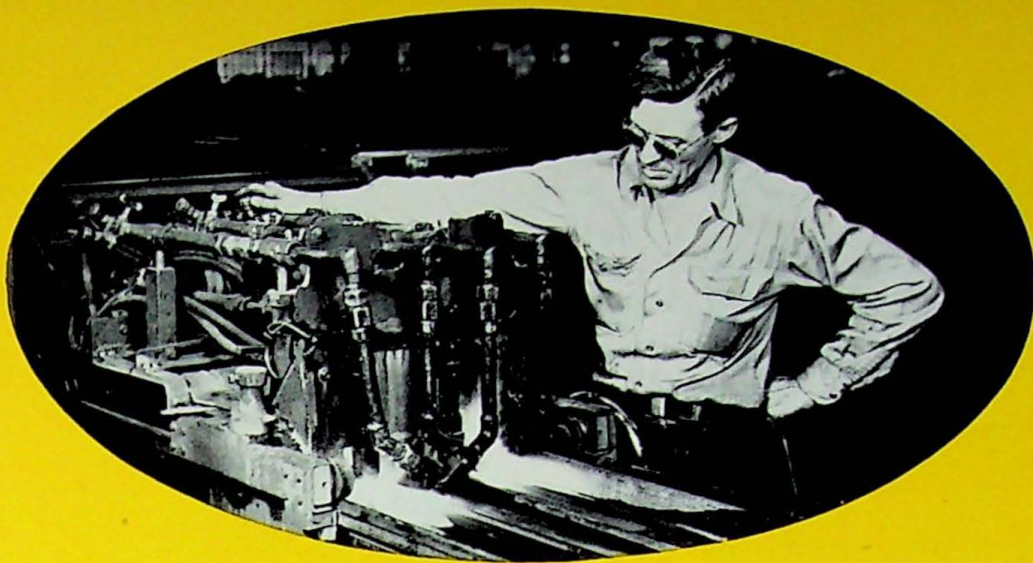
STEADY REST—The steady rest is a three jaw type with a capacity of 3". Jaws are bronze with knurled screw adjustment. Steady rest top has the friction type hinge.



T-SLOTTED FACE PLATE fits the Camlock spindle nose with minimum overhang. Diameter 11", with four milled T-slots.



DOG PLATE, like the T-slotted face plate, fits the Camlock spindle nose for easy interchangeability. It is provided with two driving slots.



Unretouched photograph of fracture of flame hardened bed way.

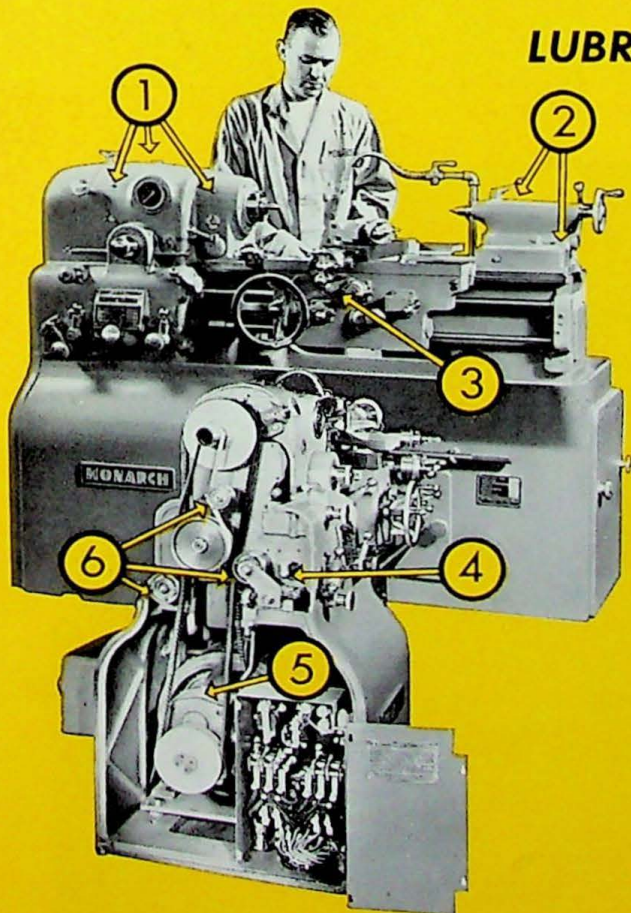
FLAME HARDENED AND GROUND BED WAYS

Much of Monarch's reputation for long-time accuracy and precision springs from the exclusive flame hardening process applied to all Monarch lathe beds. Hardened to a penetration of at least $\frac{1}{8}$ " and to a test of 70 to 72 Shore, Monarch lathe bed ways are then precision ground to a tolerance of .0005" overall. As a result, users of Monarch lathes are benefitting from a maintenance of original bed accuracy not ordinarily associated with machine tools of any kind.



Bed ways are as hard as hardened steel . . . 70 to 72 Shore.

LUBRICATED FOR EFFICIENCY AND LONG LIFE!



1. HEADSTOCK . . . Lubrication system provides ample quantity of oil with easily read sight gauges to show oil level. Spindle bearings individually oiled to insure good lubrication.

2. TAILSTOCK . . . Spindle lubricated to make advancing and withdrawal of tailstock center easier. Reservoir in base feeds oil to bed ways.

3. APRON . . . An oil pump in apron automatically supplies lubrication to apron bearings, bed way surfaces and compound rest bottom slide. Large sight gauge enables operator to keep a check on oil level.

4. GEAR BOX AND END GEARING . . . These two mechanisms run in oil. Level of oil may be checked at front of machine. Drains provided to completely drain reservoir when necessary.

5. GEAR REDUCTION UNIT . . . Runs in oil to assure quiet and continuously satisfactory operation.

6. BELT IDLERS . . . All idlers mounted on oil-seal type ball bearings which never require attention.

Extra EQUIPMENT

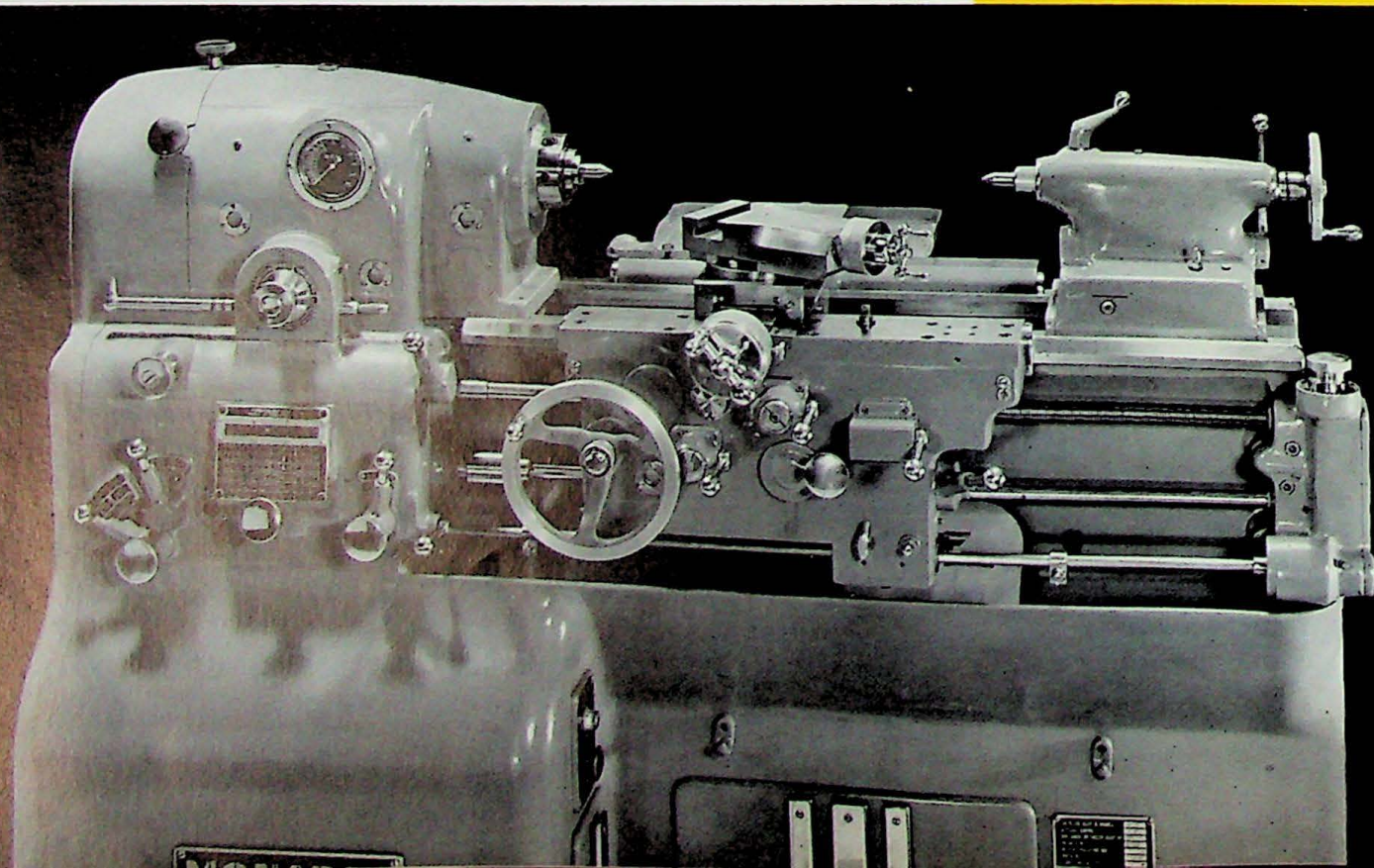
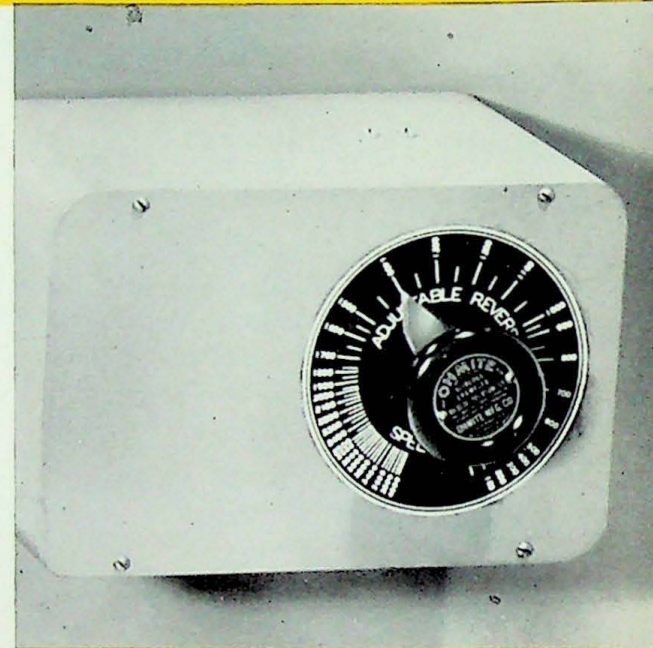
The Monarch 10" Model EE Sensitive Precision Toolmaker's Lathe is a versatile machine. However, on many classes of work the addition of one or more special Monarch attachments will greatly increase the speed and accuracy of production. A careful study of the following pages will reveal one of the reasons why the 10" Model EE is being used for the widest variety of work which has ever been entrusted to a toolmaker's lathe.

\$ 330⁰⁰

ELECTRIC LEADSCREW REVERSE—The Monarch electric leadscrew reverse is used when chasing either external or internal threads, being particularly valuable for the internal threading of blind holes. Work rotation stops automatically at the end of each cut. The mere twist of a convenient knob adapts the mechanism for either a right hand or a left hand thread or makes it inoperative for greater operator safety when gaging or changing work. Automatic stops are provided in both directions of travel. Use of the mechanism results in the quicker chasing of more accurate threads largely because the operation of one lever reverses the entire machine for the return of the cutting tool to its starting position for the next cut, thus retaining perfect timing between the tool and the work.

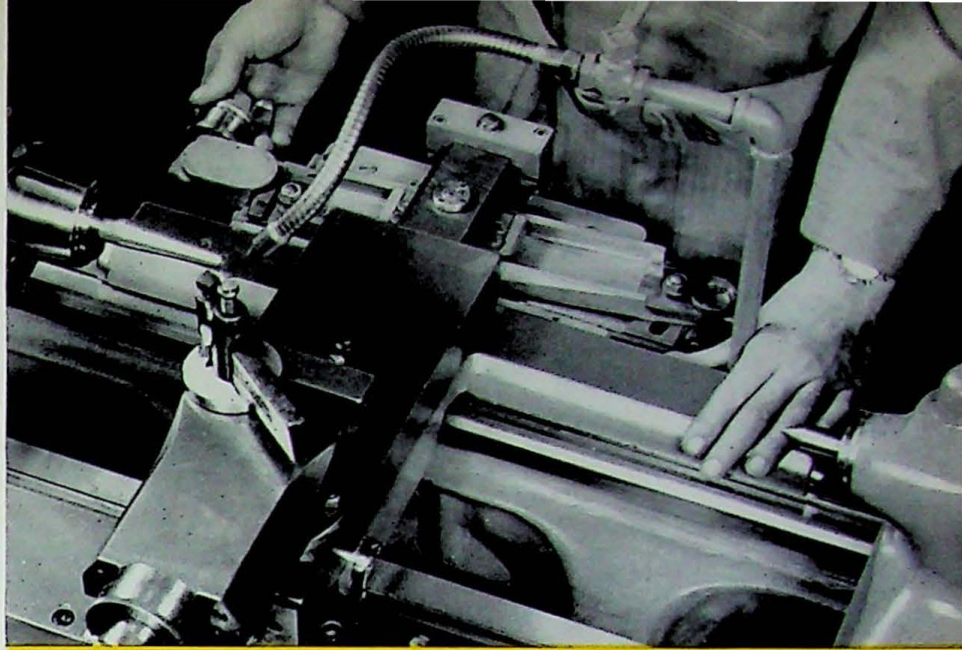
\$ 360⁰⁰

VARIABLE REVERSE SPEED CONTROL should always be used in connection with the electric leadscrew reverse. It permits the operator to preset the reverse speed of the driving motor so as to greatly accelerate the return of the threading tool to the start of the next cut. On longer threads, it has been known to reduce the total threading time as much as 50%.



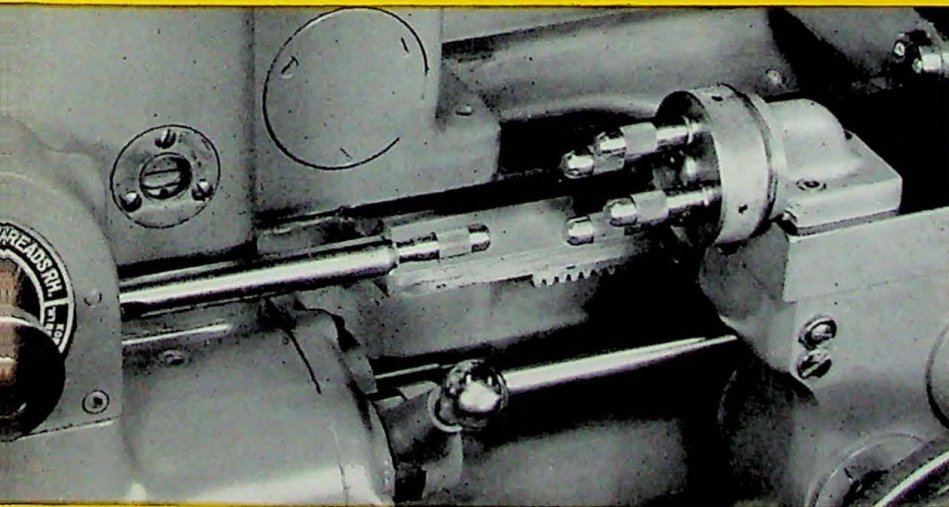
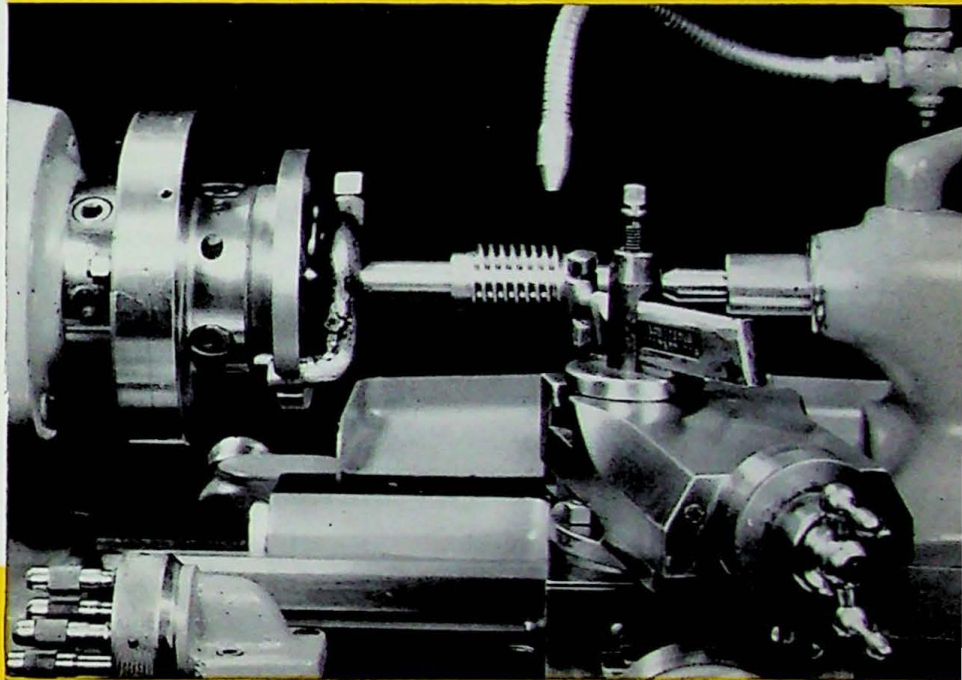
\$410.00

TAPER TURNING ATTACHMENT of Monarch patented ball bearing construction throughout. Turns up to 6" length at one setting and 15° included angle. Provided with vernier setting at one end. At other end, graduations in both degrees and inches per foot protected by glass cover with lucite magnifier. Accurate settings easily and quickly made.



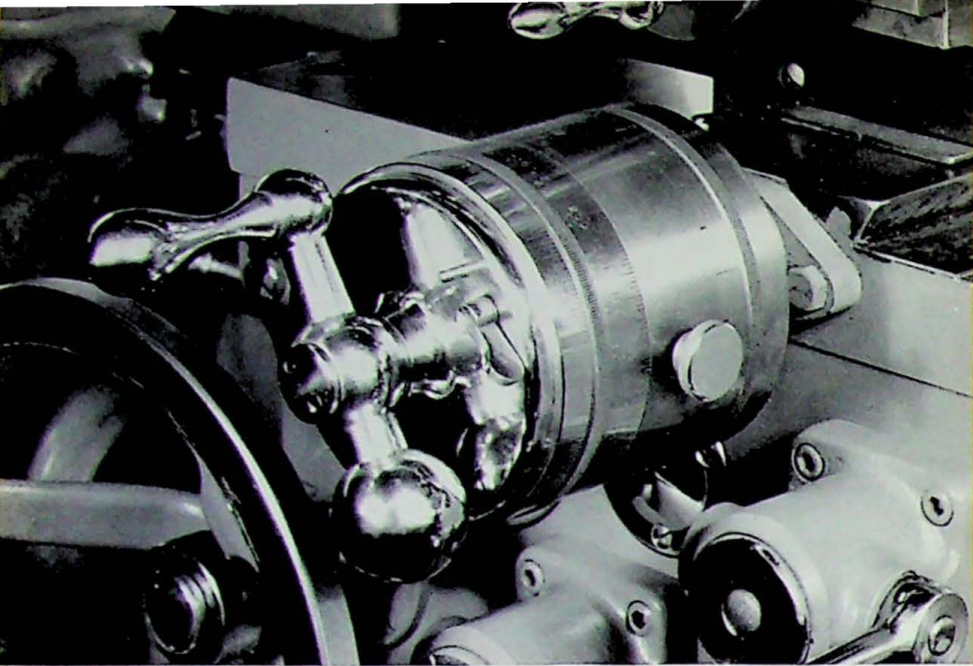
MULTIPLE INDEX FACE PLATE quickly mounts on Camlock spindle nose. Indexing plate graduated for engaging teeth of index gear for 2, 3, 4, 6 and 8 multiple start threading.

This attachment provides for Camlock holding of driver plate for outside threading or chuck for inside multiple threading. All chucks, plates and fixtures interchange readily for 3" Camlock spindle of the lathe itself to the Camlock nose of the multiple index face plate.



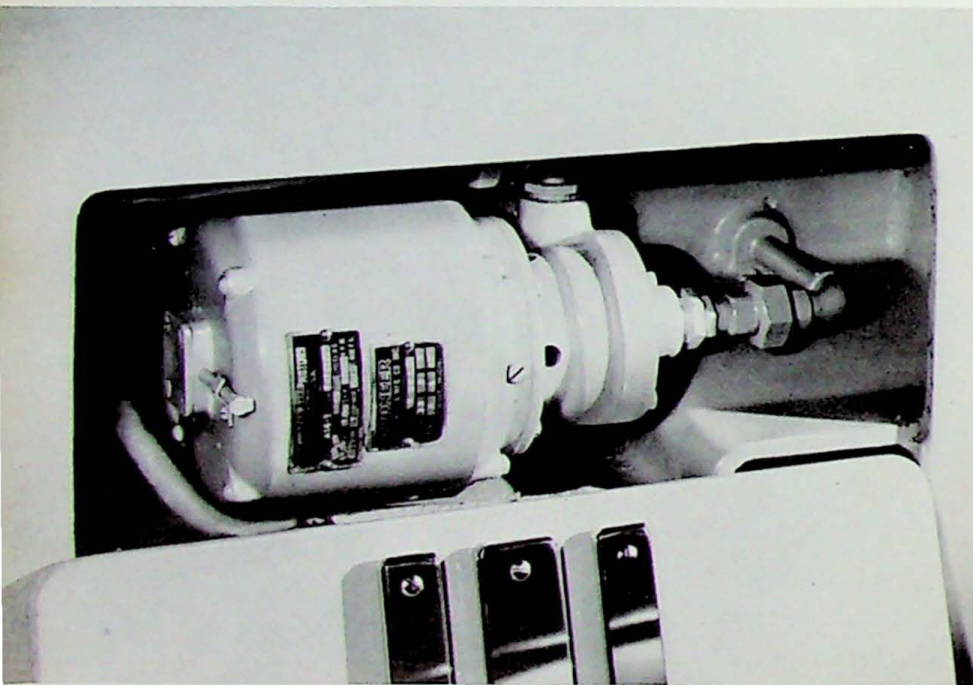
MULTIPLE POSITIVE LENGTH STOP

This mounts on the left-hand wing of the carriage. It has four positions and four micrometer heads for fine adjustments. These contact the micrometer head of the stop bar, as illustrated.



\$ 120⁰⁰

MICRO-GAGING DIAMETER DIAL—This attachment is mounted on the cross-feed screw and consists of a large diameter cross-feed dial with graduations reading in thousandths of diameter (not radius). The inner dial, graduated in thousandths, is geared to the outer dial. Both these dials can be quickly set to zero. The outer dial has two sets of numbers; one for turning, the other for boring. Thus direct diameters may be read without calculation.

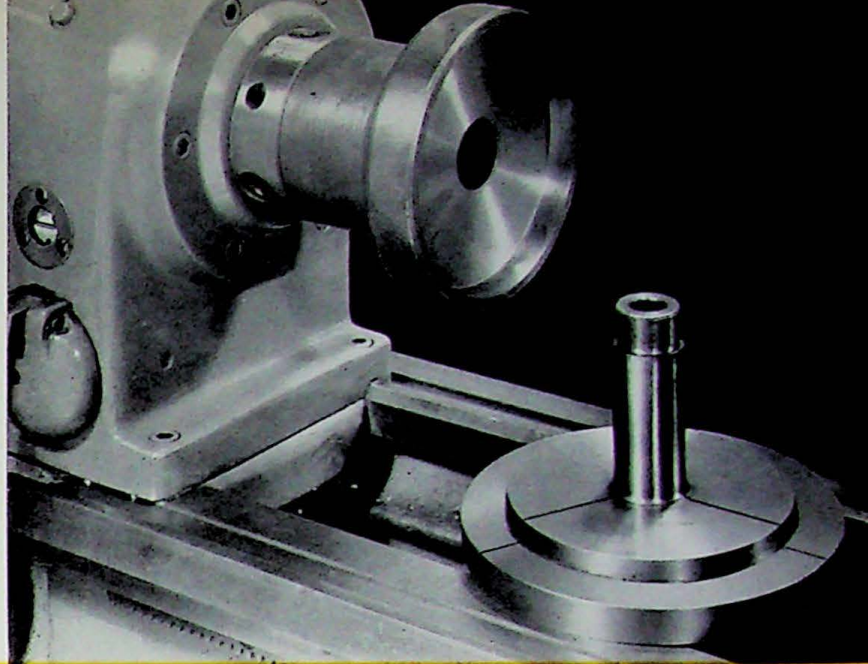
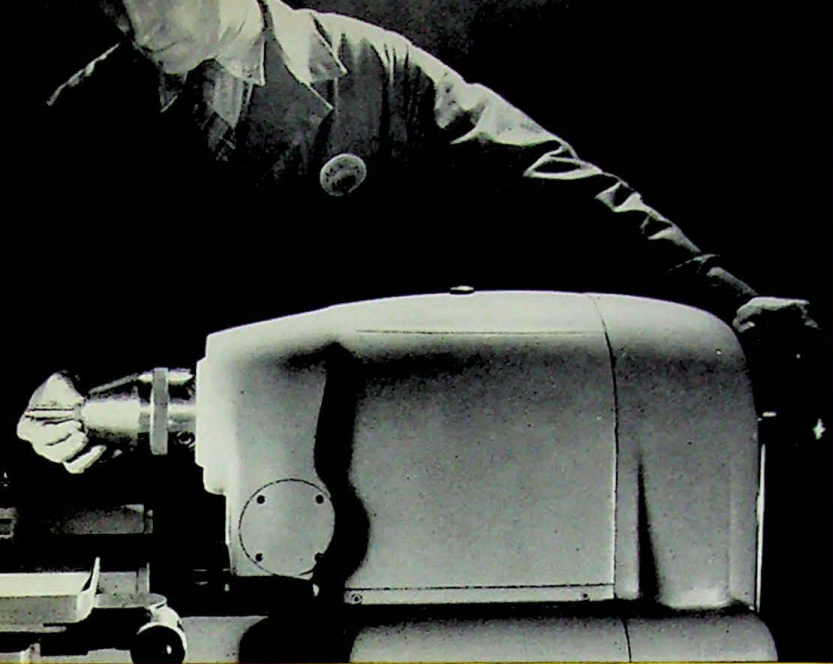


\$ 245⁰⁰

MOTOR-DRIVEN COOLANT PUMP, of the impeller type, is mounted in its compartment which is shown with the cover plate removed. The compartment is part of the integral cast base, furnished with all 10" Model EE Lathes. Ventilating slots are placed in the cover.



SJOGREN HANDWHEEL TYPE COLLET CHUCK fits directly on the Camlock spindle nose, and provides a maximum collet capacity to $1\frac{3}{8}$ ".



\$ 76⁰⁰

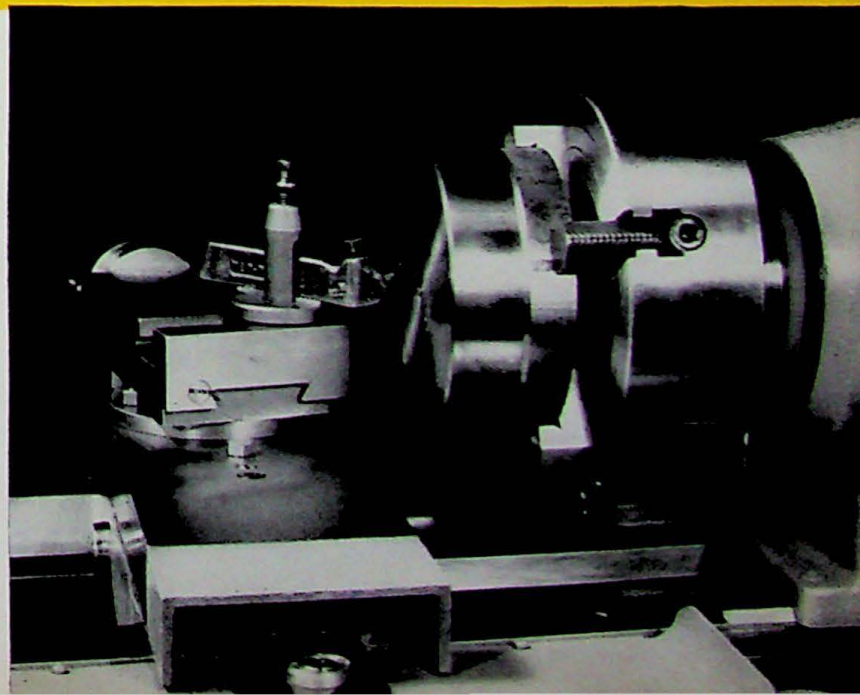
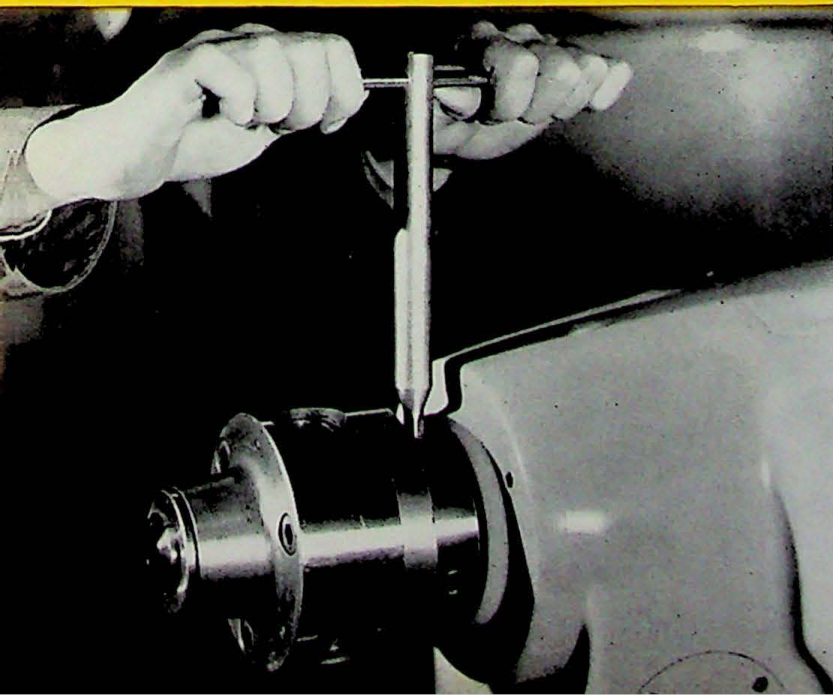
DRAWBAR TYPE COLLET ATTACHMENT—The 1-13/32" hole through the spindle of the lathe permits a 1" round maximum collet capacity in the drawbar type. The collet closer fits on the spindle nose and accurately centralizes the precision collets.

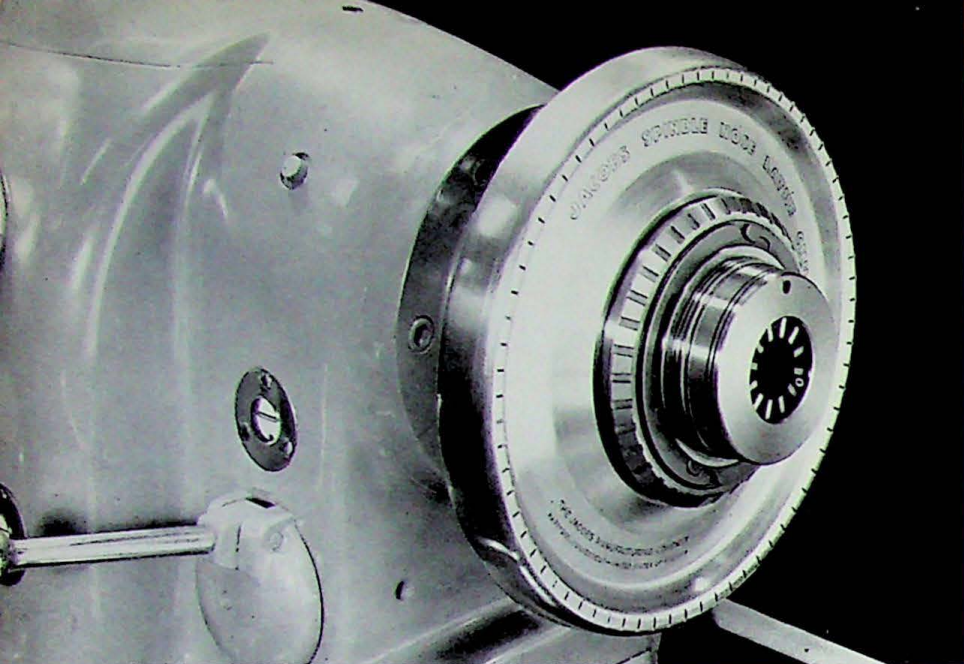
STEP CHUCK AND CLOSER—Available with 3", 4", 5" or 6" capacity. Attaches directly to Camlock spindle nose. May be used with a drawbar type collet attachment or with a simple handwheel type drawbar.

CUSHMAN SPINDLE NOSE TYPE COLLET CHUCK attaches directly to Camlock spindle nose with same wrench used to operate the collet chuck. May be provided with collets up to 1 1/8" round capacity.

4-JAW INDEPENDENT CHUCK—Both 4-jaw and 3-jaw chucks, with steel bodies, are made to fit directly to the Monarch 3", type D-1 Camlock spindle nose, without an adapter plate. Chuck illustrated is a 6" size. Light 4-jaw independent chucks of 8" size may be used where this larger size is required.

*8" 4jaw \$ 188⁰⁰
5" 3jaw \$ 166⁰⁰*

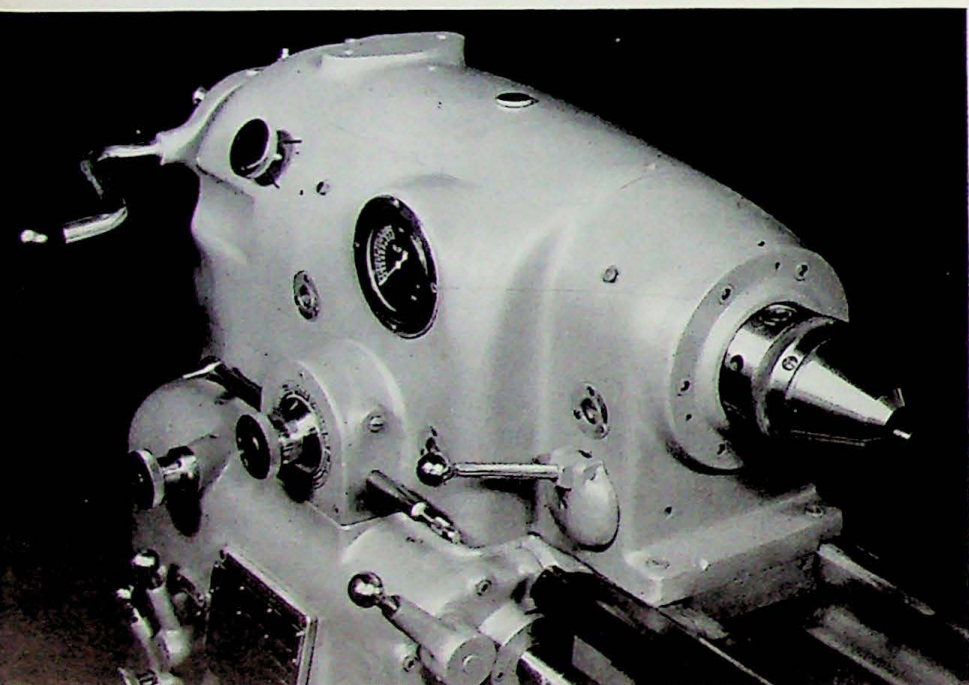




\$ 399.50 with collets

JACOBS SPINDLE NOSE CHUCK

The Jacobs spindle nose lathe collet chuck using Jacobs rubber-flex collets is an exceedingly accurate, handwheel type which mounts directly on Camlock spindle nose. Each collet handles a wide range of work diameters, the standard set of eleven taking all diameters from $1/16''$ through $1\ 3/8''$.



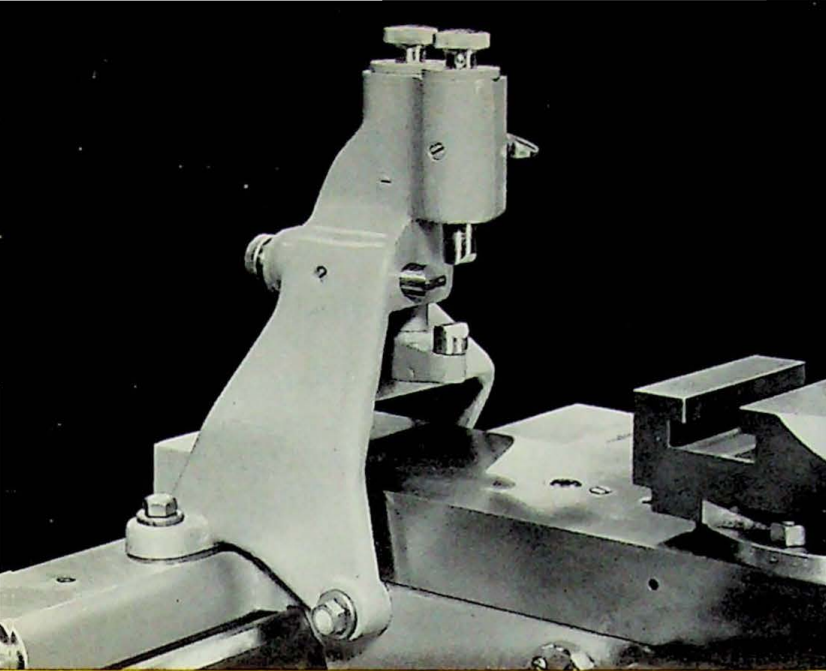
LEVER-OPERATED COLLET CHUCK ON HEADSTOCK

This type of draw-in attachment is a great timesaver when used for manufacturing operations. A simple push releases the work and a pull tightens the work in the collet.



TOOL CABINET

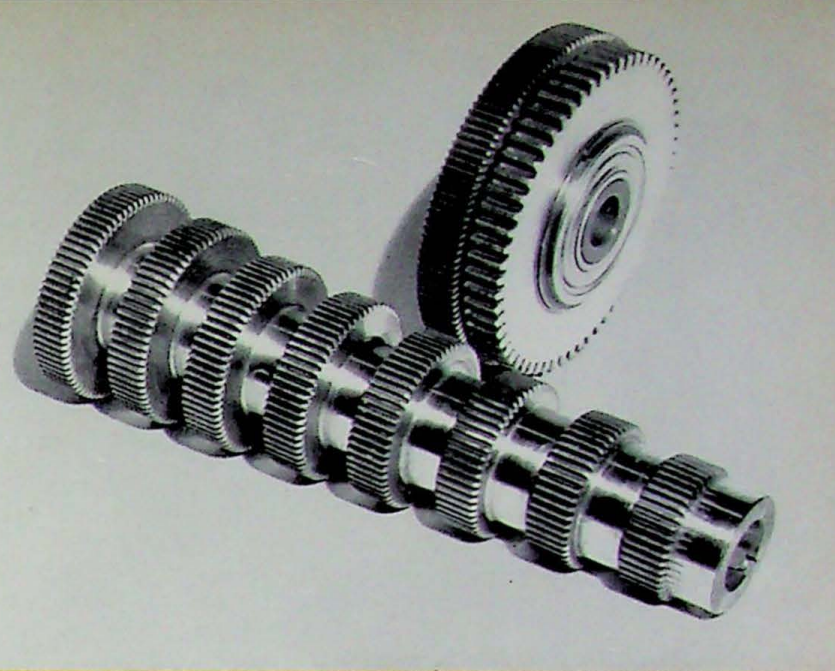
This sturdy steel cabinet, which can be located at any point convenient to the operator, provides plenty of storage space for chucks, rests, plates, wrenches, collets and tools.



FOLLOW REST

\$175⁰⁰

Recommended when thread chasing and turning between center work requiring support opposite tool during entire cut. Has three renewable tip jaws with a capacity of 1/4" to 2".



METRIC TRANSPOSING GEARS

These can be furnished for chasing Metric threads with a minimum pitch of .225 mm. to a maximum pitch of 4.0 mm.

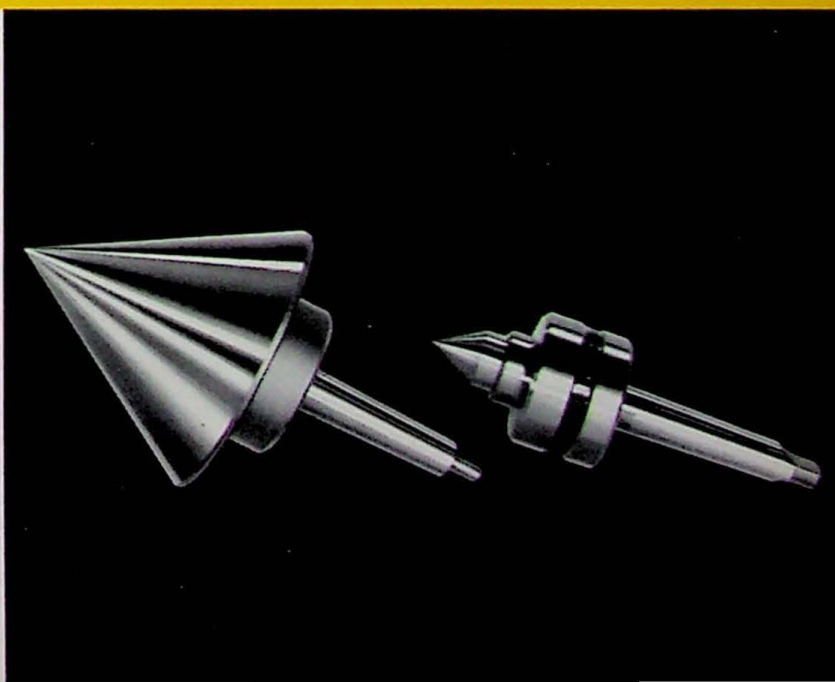
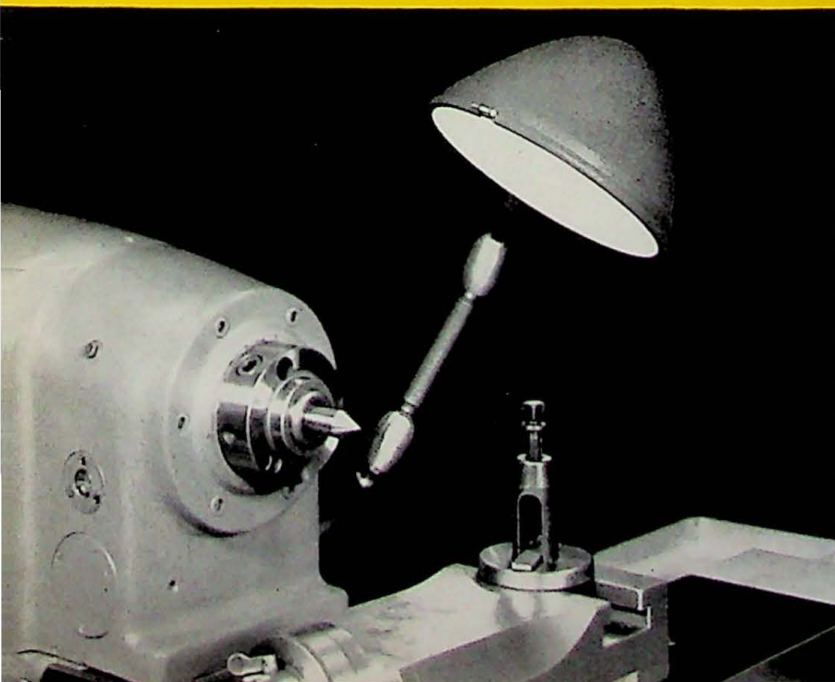
WORK LIGHT MOUNTING

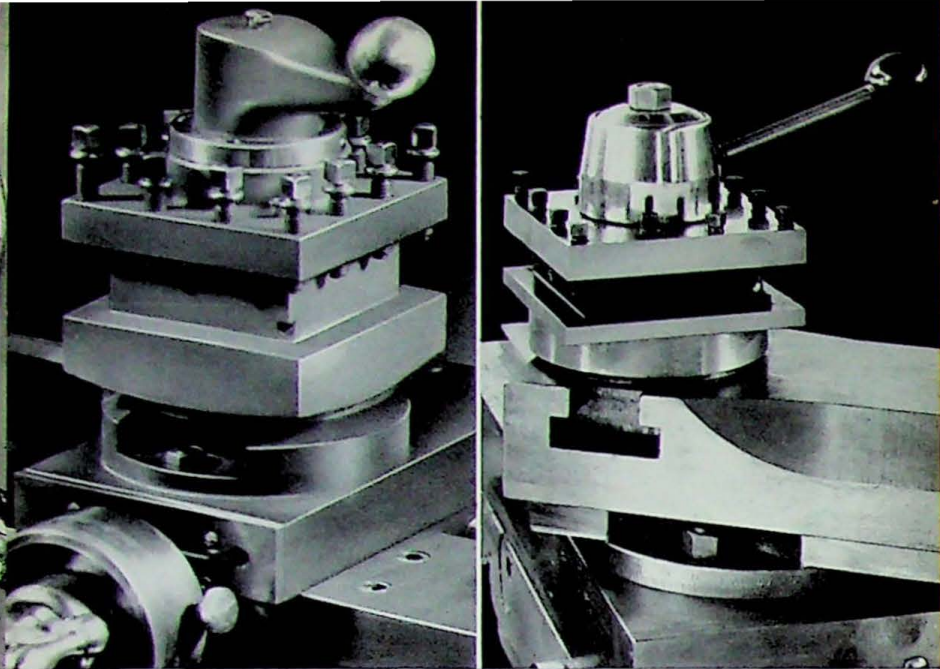
\$38⁰⁰

This mounting is furnished with a universal hinged feature which enables operator to position work light in the desired location.

CENTERS

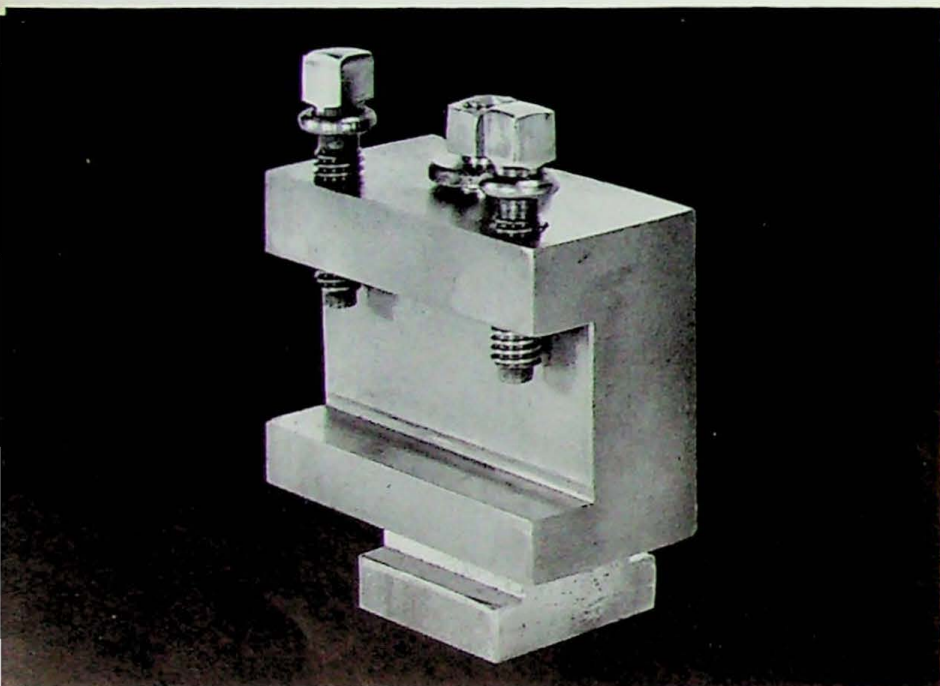
In addition to the regular work center, an anti-friction center and a pipe center are available. All are removable and interchangeable. The pipe center is of the anti-friction type and has a capacity of 0 to 4".





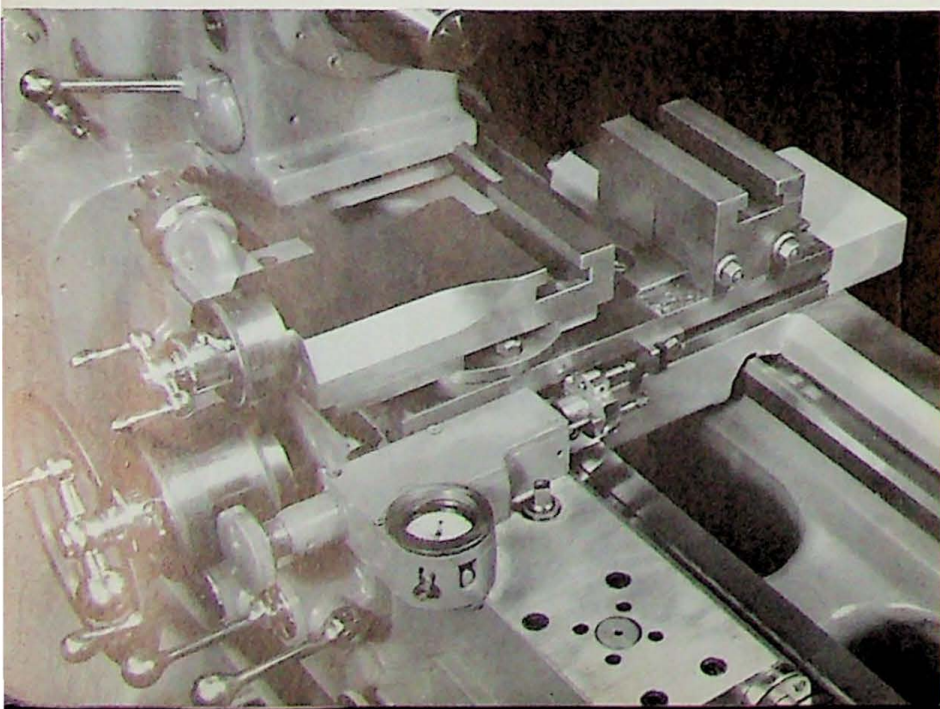
TURRETS

Left to right: Style "OL" turret and Monarch 4-way turret. Style "OL" is for continuous use and fits directly to bolt circle of regular bottom slide. Size of square $4\frac{1}{2}$ " ; maximum tool capacity $\frac{3}{4}$ " x $\frac{3}{4}$ ". Monarch 4-way turret is for intermittent use. Indexes very accurately and fits directly to compound rest. Size of square $3\frac{1}{2}$ " ; maximum tool capacity $\frac{3}{8}$ " x $\frac{3}{8}$ ".



HIGH-DUTY TOOL POST

High duty tool post should always be used when exceptionally heavy cuts have to be taken. Supplied as regular equipment on "Air-Gage Tracer" equipped machines.



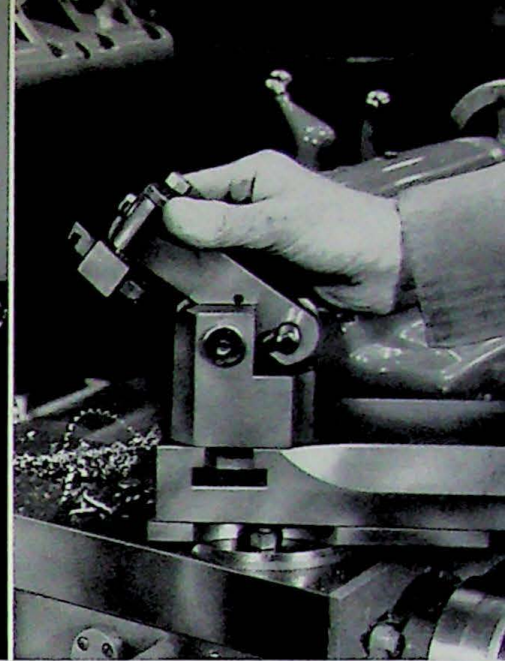
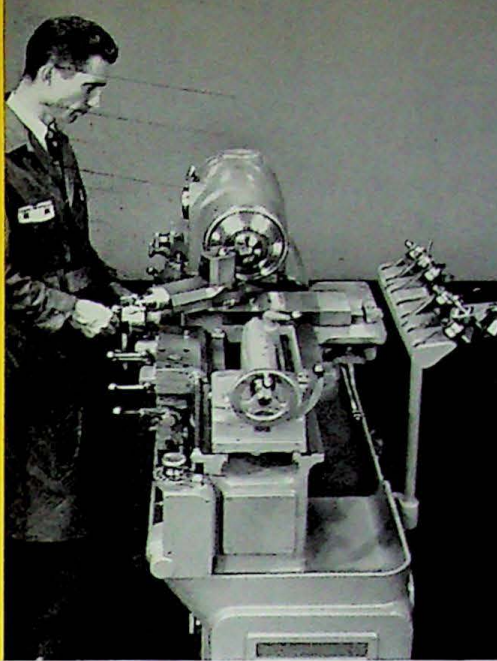
DIAL TYPE INDICATOR CROSS FEED STOP

Recommended for production operations on multiple diameter work. Provides four diameter stops which may be indexed by knob at front of carriage. Precision type dial indicator, graduated in ten thousandths, makes ultra-precision results possible. Adjustable stop dog clamped in tee slot at side of bottom slide. Frequently used in connection with a rear adjustable tool block as illustrated.

590⁰⁰

QUIK-TOOL BLOCK AND HOLDERS

Precision made tool block and holders that permit immediate tool changes for different operations without the need for lengthy set-up time. Tools are set up at beginning of run and automatically position themselves when slipped on a locating pin and swung into the slot of the tool block. Takes standard tools and gauges.



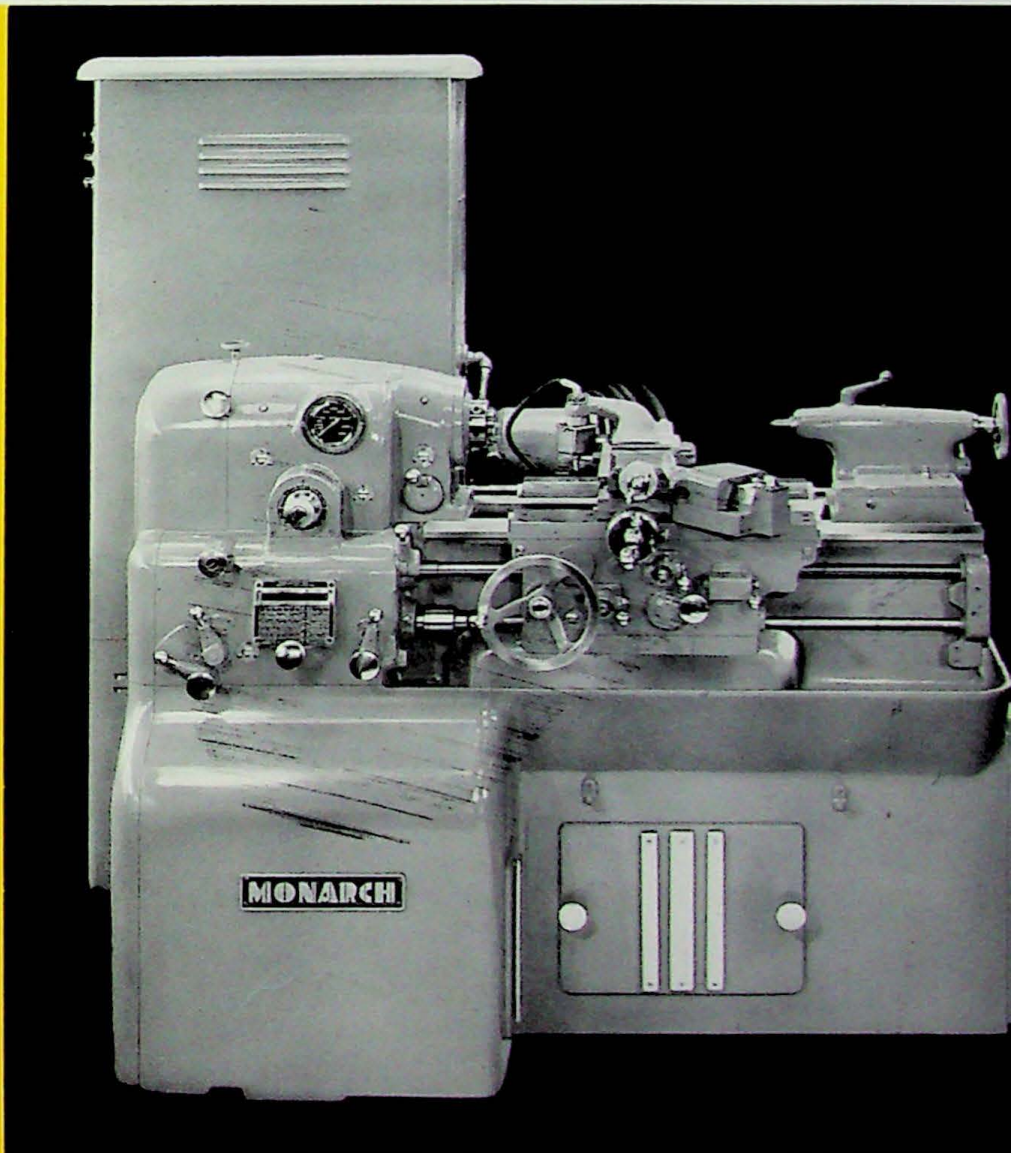
THE "AIR-GAGE TRACER"

The precision and accuracy inherent in the "Air-Gage Tracer" principle and design produce more accurate work than any other duplicating device. It permits the machining of practically any combination of diameters, tapers, bevels, forms, grooves, undercuts, shoulders, necks, radii and camfers in a single, continuous cut.

Applied to the Monarch 10" Model EE Sensitive Precision Toolmaker's Lathe, the "Air-Gage Tracer" provides a single cost-reducing production method for long or short runs. The "Air-Gage Tracer" is so designed that lathes equipped with it can be set up quickly for either conventional lathe operation or "Air-Gage Tracer" control.

Specifications with Type C Rigid "Air-Gage Tracer"

Actual swing over bed	12½"
Turning capacity over cross slide	5½"
Length of stroke	2¾"
Maximum diameter change at one setting of cross slide	3¼"



Front view of the Monarch 10" Model EE Sensitive Precision Toolmaker's Lathe equipped with the Type C Rigid "Air-Gage Tracer". Extreme sensitivity plus sturdy design throughout assure greatest possible accuracy.



Monarch

TURNING MACHINES



10" EE Toolmaker's Lathes

10" EE Precision Manufacturing Lathes

Series EE, Model 1000 Precision Lathes

Series 61 Engine and Toolmaker's Lathes
in a complete range of sizes

Series 62 Preselector Dyna-Shift Lathes
in a complete range of sizes

Models M, N and NN Heavy Duty Lathes
in a complete range of sizes

Series 80 Heavy Duty Dyna-Shift Lathes
in a complete range of sizes

Series 90 Heavy Duty Dyna-Shift Lathes
in a complete range of sizes

The Mona-Matics
for high production metal turning

The Speedi-Matic
a fast, precision hand screw machine

The Hydra-Slide
for high production chucking operations

Monarch-Keller Contour Turning Lathes

The Monarch "Motor-Trace"

The Monarch "Air-Gage Tracer"

The Monarch Roll Turning Lathes

Monarch 60" Right Angle Lathes

The Shapemaster Engraver

Special Turning Machines