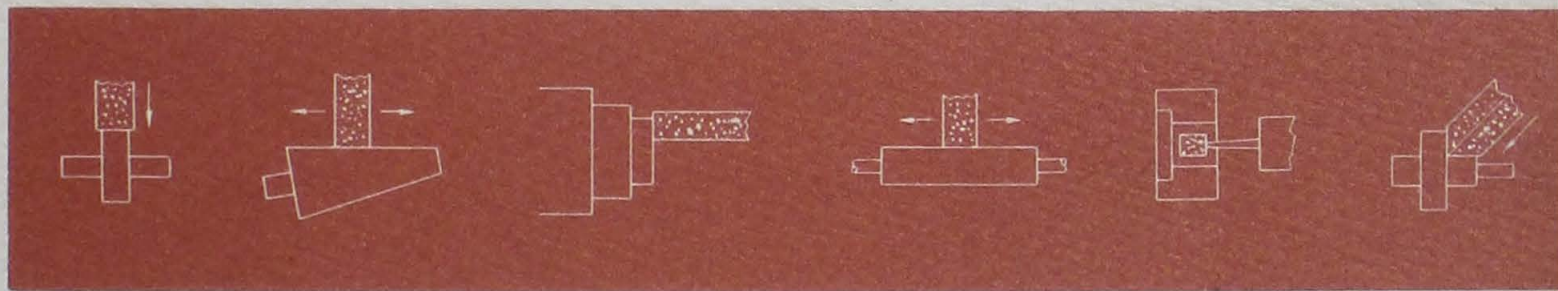


CINCINNATI[®]

Filmatic 10" Universal Grinding Machine

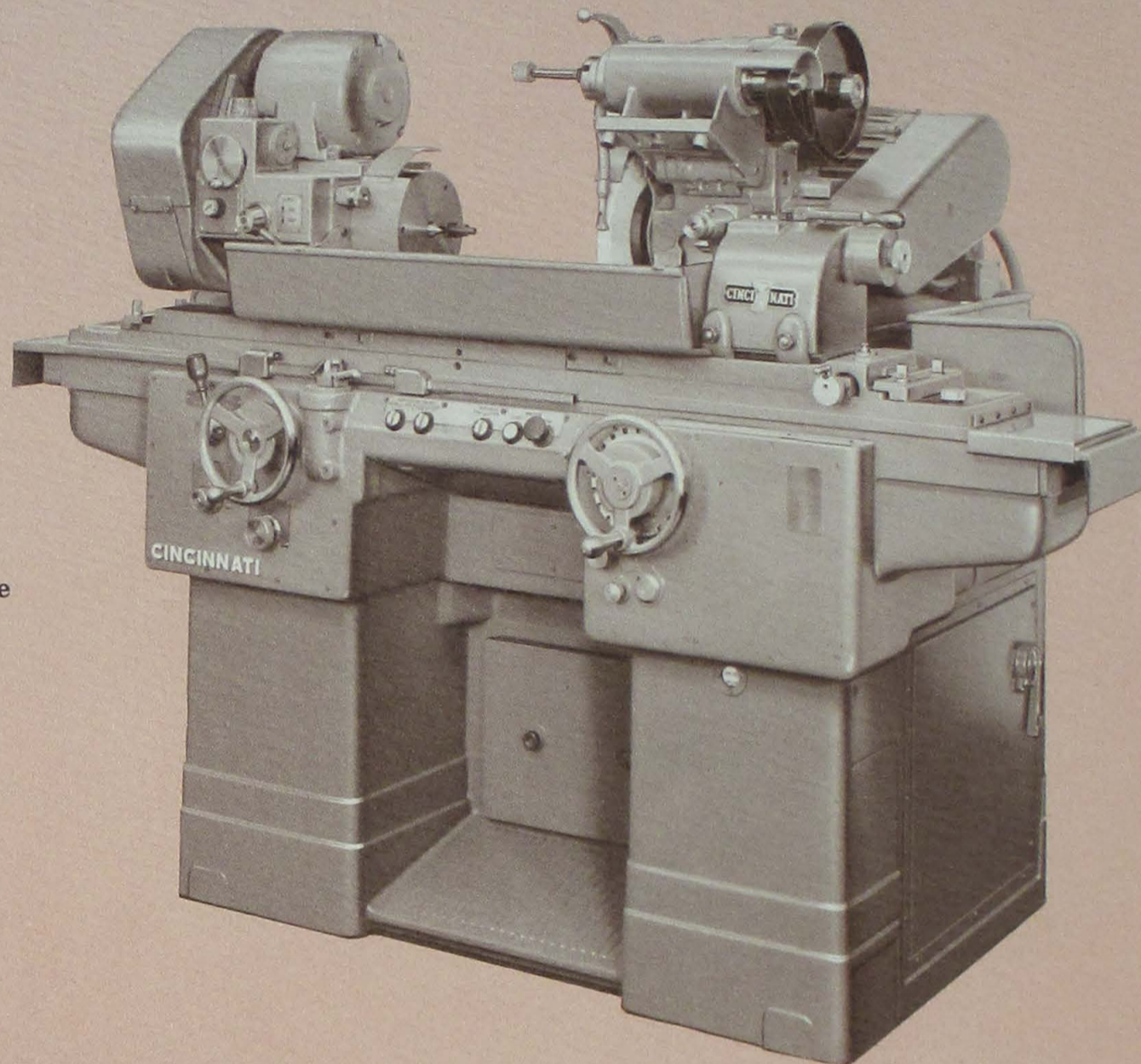


BASE MACHINE
\$ 16,810.00 DRESSER
EXPORT 15%

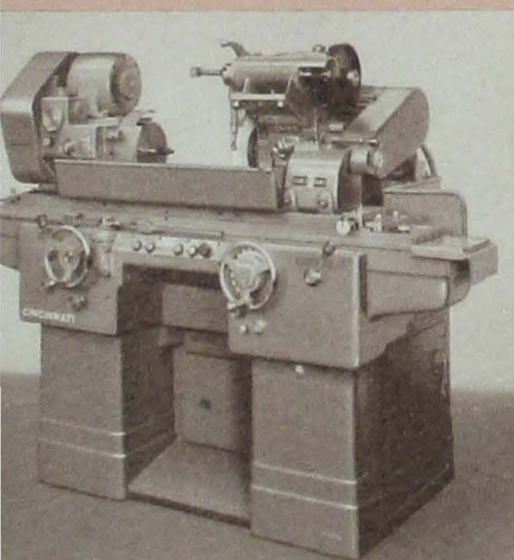


CINCINNATI Filmatic 10" Universal Grinding Machine

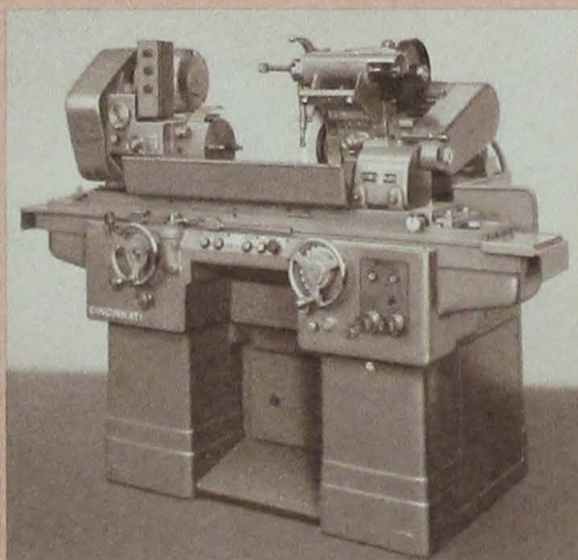
The Cincinnati® Filmatic® 10" Universal Grinder Provides



Standard Machine



With Hand Hydraulic Infeed
for Semi-Production Grinding



With Automatic Infeed for
High Production Grinding

The CINCINNATI® FILMATIC® 10" Universal Grinding Machine combines versatility and production features to perform both toolroom and production precision grinding operations.

This machine is designed to provide the ultimate in versatility, along with exceptional convenience and ease of operation, making it ideal for toolroom work. And when it is equipped with Acrafeed Dual Rate Automatic Infeed or Power Hand Hydraulic Infeed, these auxiliary features permit the CINCINNATI FILMATIC 10" Universal Grinder to perform a wide variety of high production or semi-production grinding operations. With Acrasize Automatic Air Electric Gage Sizing, consistent accuracy and high rates of production are insured.

Described herein are the outstanding features and attachments which make this machine truly universal—in production *and* in the toolroom.

Unlimited VERSATILITY and PRODUCTION

With These Outstanding PLUS Values . . .

FILMATIC Grinding Wheel Spindle Bearings—aids in producing fine finishes . . . self-adjusting for rough or finish grinding . . . long life with no maintenance.

Hinged Type Internal Grinding Head—can be swung into operating position instantly, reducing setup time . . . external and internal grinding may be completed in one chucking of the work.

Infinitely Variable Headstock Speeds—50 to 600 rpm . . . provides instant selection of the correct work speed from a single speed A.C. motor.

ACRAFEED Dual Rate Automatic Infeed—hydraulically operated for automatic plunge cut grinding . . . complete cycle automatically started by electrical push buttons . . . permits both toolroom jobs and large production runs to be done on the same machine.*

Power Hand Hydraulic Infeed—for hand infeed and traverse grinding . . . hydraulically operated with quick retraction to wheelhead . . . automatically controls headstock rotation and cutting fluid.*

ACRASIZE Automatic Air Electric Gage Sizing—for machines with Automatic Infeed . . . automatically retracts wheelhead when exact size is reached.*

Automatic Gap Eliminator—reduces infeed cycle time on machines with Automatic Infeed.*

GAGE-LINE Electronic Taper Correction—direct reading . . . accurately measures swivel table adjustment . . . eliminates trial and error in taper control.*

Infinitely Variable Table Traverse Rates—3" to 280" per minute . . . wide range of speeds for a variety of grinding operations.

Exceptionally Accurate Infeed Sizing Adjustment—increments as small as .000050" on work diameter . . . positive stop for repetitive hand infeed grinding.

Dog-controlled Table Reciprocation from 1/16" to Full Stroke—short stroke produces same effect as grinding wheel spindle reciprocation . . . table reversal accurate within .001"—important when traverse grinding next to shoulder.

Rapid and Visible Pick Feed Adjustment—direct dial readings . . . instantaneous selection.

Angular Feed Grinding Arrangement—permits high production angular feed grinding.

Single Lever Control—automatically starts and stops work rotation and cutting fluid flow . . . simplifies operation, saves time and reduces fatigue.

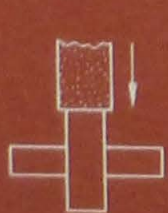
Double Swiveling Wheelhead—180° on upper slide and 220° on lower slide . . . affords extra flexibility.

Automatic Pressure Lubrication System for Table and Wheelhead Ways—oil is filtered to provide long way life.

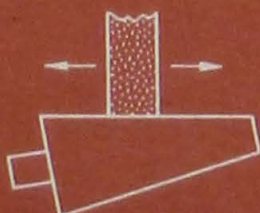
Lever Operated Footstock—quickly retracts center . . . saves valuable time loading and unloading.

Draw-in Collet Mechanism for Headstock—for production work requiring rapid accurate chucking of workpiece . . . hand-wheel or lever types available.*

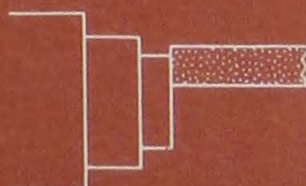
*Extra Cost



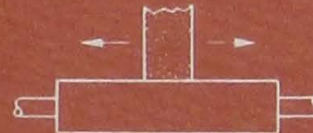
Straight Plunge



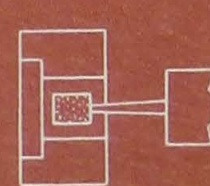
Taper



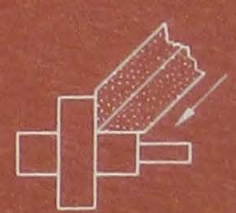
Face



Traverse



Internal



Angular Feed

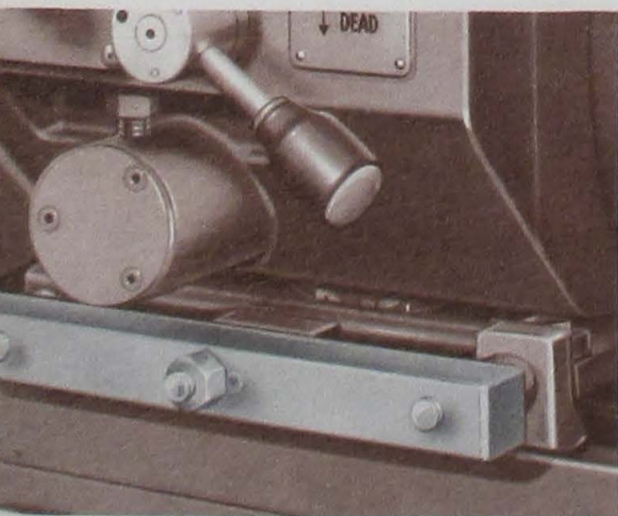


UNIVERSAL HEADSTOCK • A Wide Range of Speeds

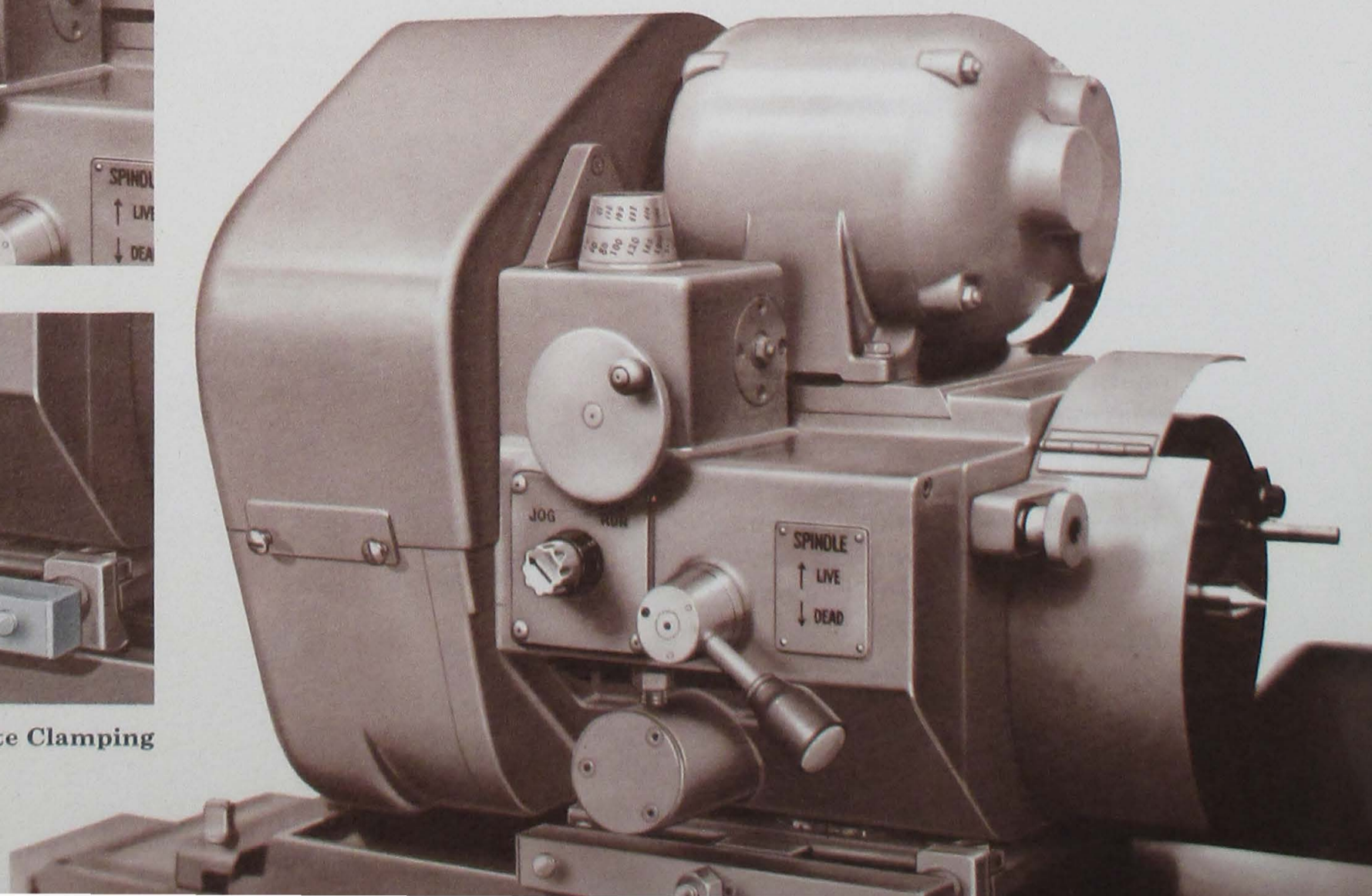
The headstock is equipped with a standard precision $\frac{3}{4}$ hp A.C. motor and a variable speed drive, providing constant horsepower—high torque for large diameter work. Spindle speeds are infinitely variable from 50 to 600 rpm in two ranges, allowing large diameter work to be ground accurately without excessive cutting speed. An easy-to-read dial indicates the rpm of the spindle, while a built-in "jog" button provides radial positioning for easy loading and unloading of the workpiece. By setting the range selector knob to the "neutral" position, manual indexing of the work or face plate is facilitated.

A No. 5 American Standard Lathe Spindle Nose permits a chuck and face plate to be quickly interchanged. Extremely rigid setups are made possible by reduced spindle overhang. Either "live" or "dead" spindle operation can be selected by means of a convenient lever, and because of a unique spindle lock for dead spindle grinding, deflection of the headstock spindle is practically eliminated.

Convenient Work Speed Controls



Fast, Accurate Clamping



For Versatile Production

Infinitely Variable

Wide Range

Instant Speed Selection

The infinitely variable headstock drive is accomplished by a variable pitch pulley with a two-speed transmission. High and low speed ranges and a neutral position are controlled by a selector knob at the left end of the headstock. Spindle speeds in each range are selected by a conveniently located handwheel, permitting selection of the *exact* speed required for efficient grinding of any job.

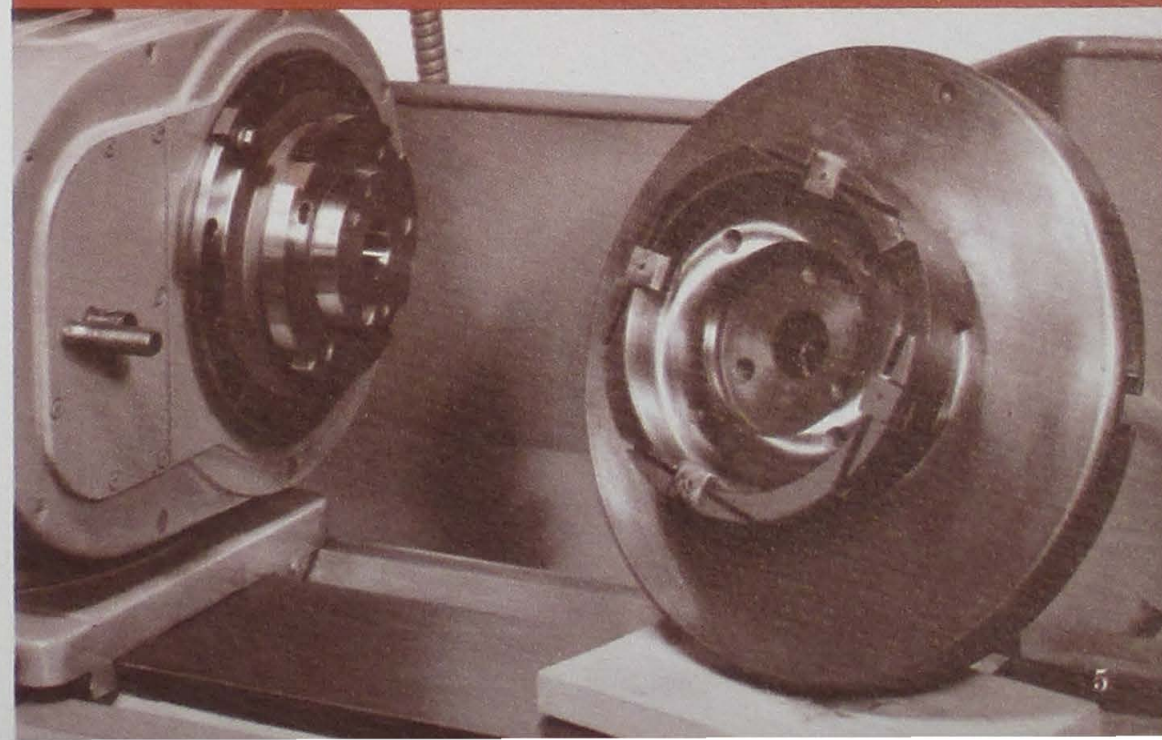
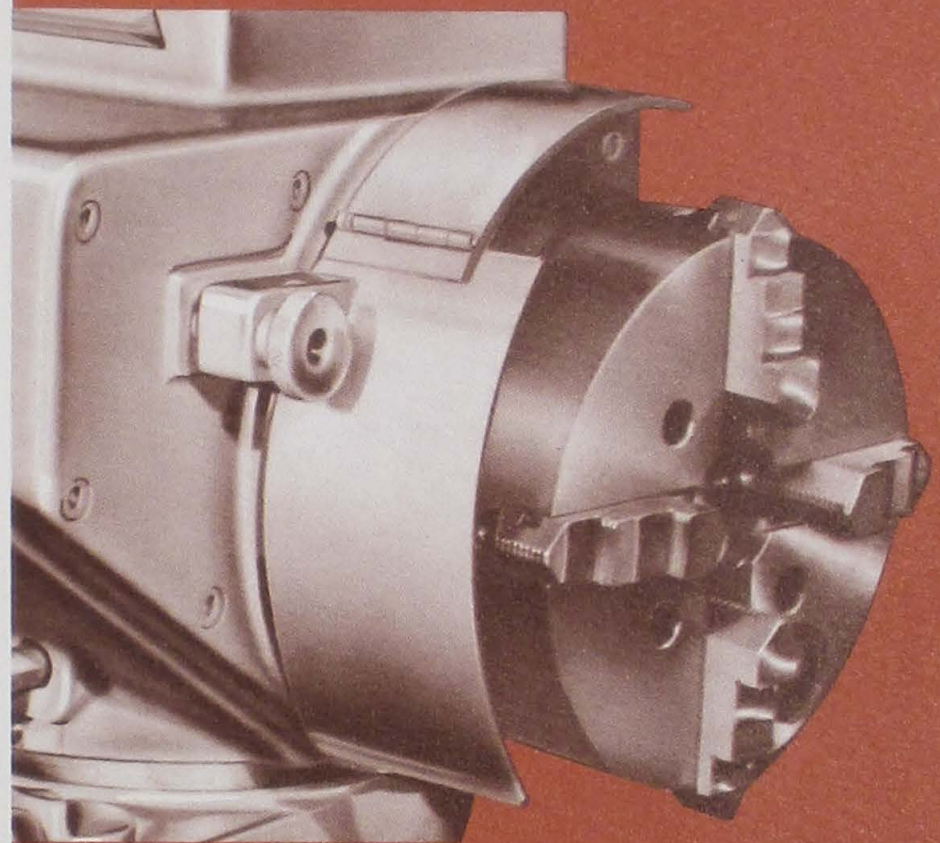
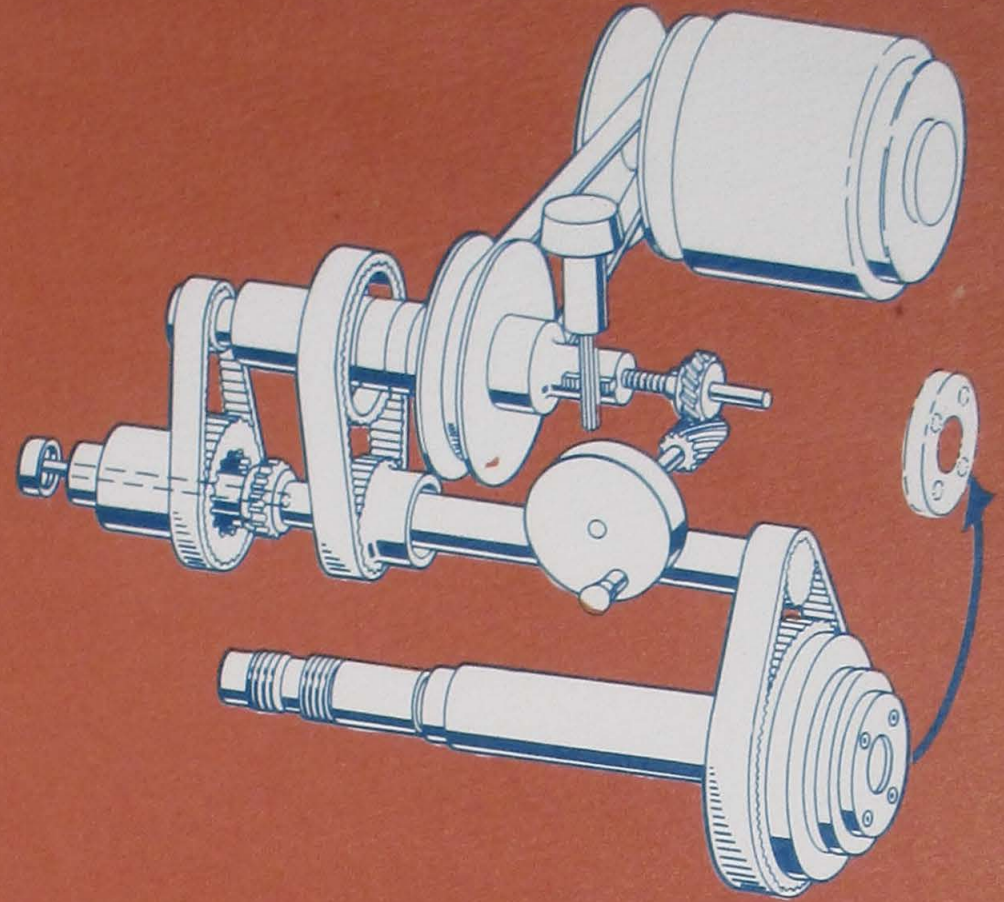
Chuck* For Live Spindle Operation

No. 5 Lathe standard spindle nose permits rapid mounting of standard chuck directly on the spindle without the need for adapters.

Quick Change Adapter*

This useful extra provides a means for quickly replacing the face plate or chuck.

**Extra Cost*





PRECISION-BUILT WHEELHEAD

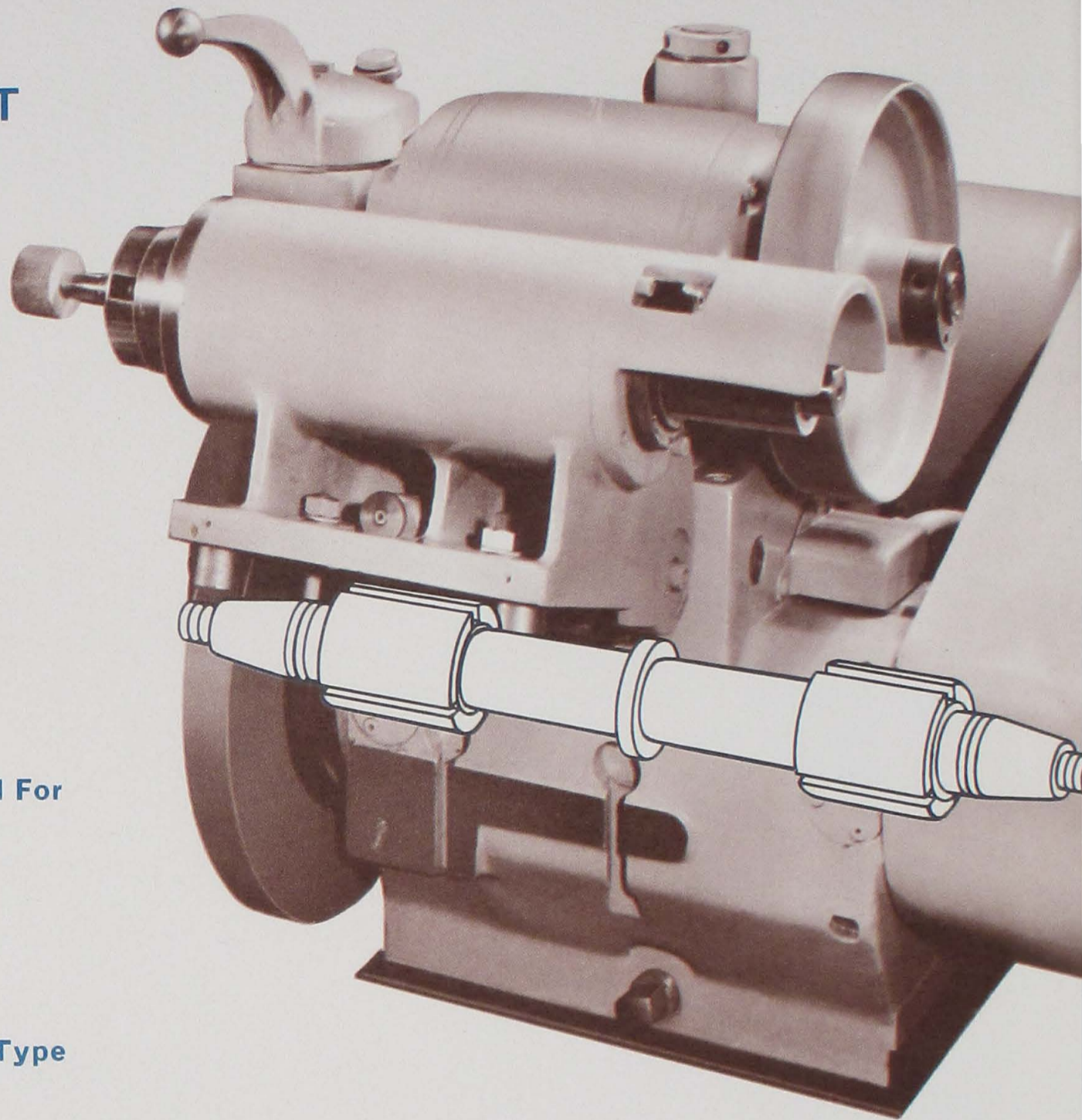
**Automatic Pressure-
Lubricated Slideways
And Spindle Bearings**

**Double Swiveling For
Extra Wide Range**

**Reversible Grinding Wheel For
Angular Feed Grinding**

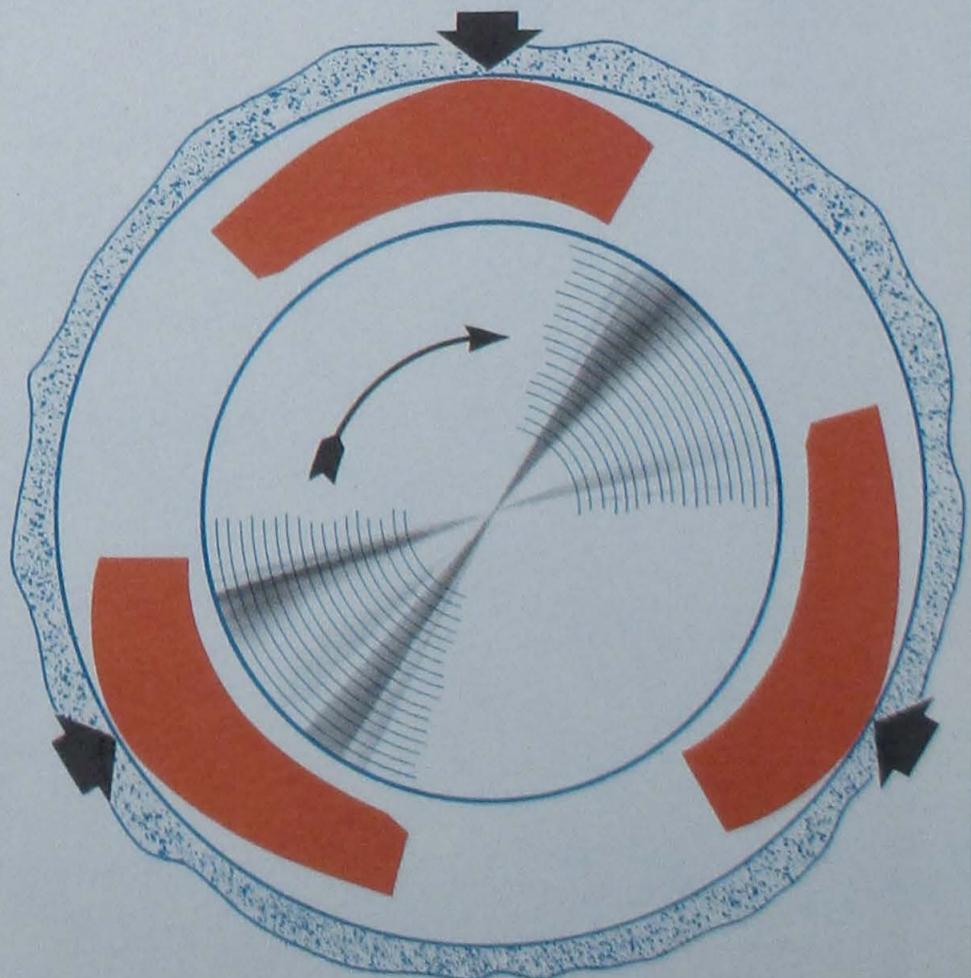
**Powerful 2 HP
Wheelhead Motor**

**Rigidly Mounted, Hinged Type
Internal Grinding Head**



CINCINNATI FILMATIC 10" Universal Grinding Machines employ exclusive FILMATIC grinding wheel spindle bearings. These bearings are self-adjusting for varying grinding conditions and rates of stock removal, and require no maintenance. The two FILMATIC assemblies—one at each end of the spindle—are completely submerged in oil. Each assembly consists of three shoes or segments which can "rock" slightly. Rotation of the spindle draws oil under the shoes, forming a high pressure wedge-shaped film between each shoe and the spindle, "locking" the spindle on the center of rotation.

Regardless of the direction or force of load, FILMATIC bearings "lock" the spindle on a *constant* center of rotation, eliminating spindle flutter—so precision grinding results are assured. Furthermore, FILMATIC bearings outlast the depreciation life of the machine.

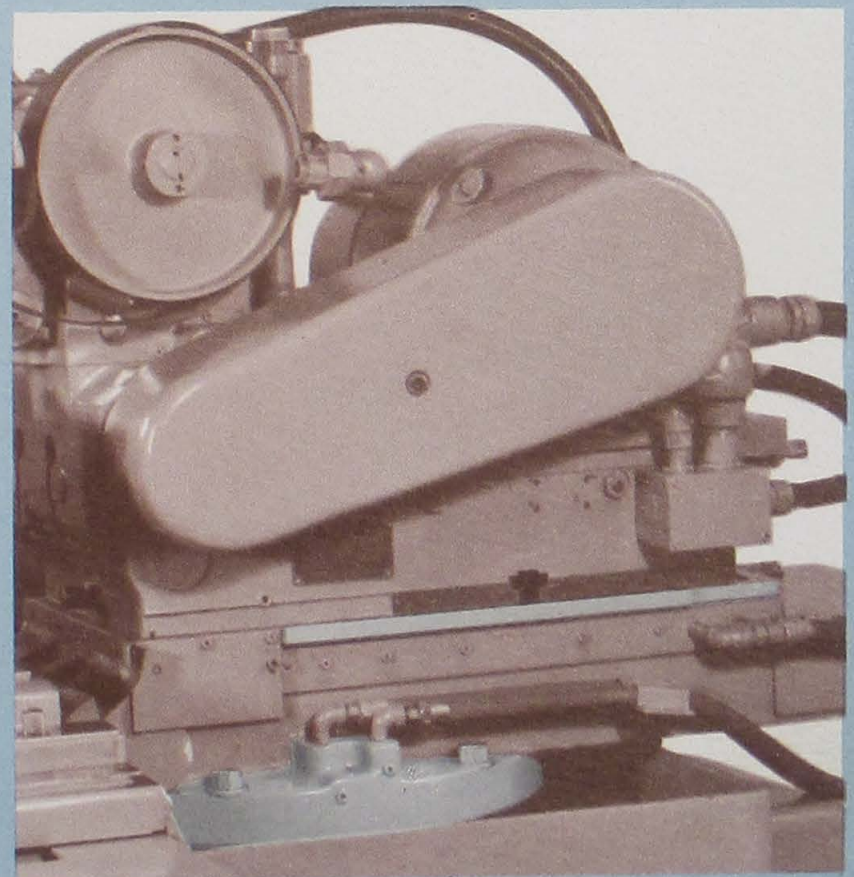


Precise Movement For Superior Grinding Results

Precise wheelhead movement and extremely fine increment compensation are provided by Cincinnati's universal wheelhead. This unit is mounted on precision, hand-scraped, pressure lubricated slideways, assuring extreme accuracy. The grinding wheel spindle, mounted between Cincinnati's exclusive FILMATIC bearings, is driven by a powerful 2 hp precision balanced motor and multiple V-belts. Two spindle speeds are obtainable, permitting selection of the correct rotational speed for various wheel diameters; a built-in safety device prevents overspeeds. The grinding wheel—*up to 1½" wide*—and driving sheave are located exceptionally close to the front and rear bearings, respectively, providing maximum rigidity. And both shoulder and straight plunge grinding operations can be performed with equal efficiency, because of an automatically adjusted grinding wheel spindle end thrust arrangement which is self-aligning in the direction of the grinding load.

Precision craftsmanship and rigid quality control standards assure that superior grinding results are yours with a Cincinnati.

Extra wide range for a variety of tool-room and production setups is provided by Cincinnati's double swiveling wheelhead. The swivel range is 90° left and right on the wheelhead housing and 110° left and right on the wheelhead slide swivel—making rapid setups possible on even the most difficult face grinding jobs. And when the reversible grinding wheel guard arrangement is used, highly productive angular feed grinding operations can be performed by swiveling the wheelhead.





EASILY ACCESSIBLE, INSTANTLY RESPONSIVE

Cincinnati's centrally grouped operating controls are designed for ready accessibility and accurate control—cut costs by reducing setup time and operator fatigue. The electrical control buttons are grouped together, and can be reached without moving a step from the operator's normal working position. A simple movement of the start-stop lever controls the starting and stopping of the table traverse, work rotation, and cutting fluid flow.

And with Cincinnati's "built-in skill", all controls are instantly responsive. The exceptionally accurate cross feed control permits adjustments as small as .000050" on work diameter. And the automatic pick feed permits work diameter reductions of from .00025" to .005" at each table reversal, and is engaged by merely pushing a button. Table reversal itself is accurate within .001", so that grinding next to a shoulder can be done confidently, without fear of spoiling the work.

Controls for the infinitely variable table traverse rates—3" to 280" per minute—and table tarry are conveniently located for a wide variety of grinding applications. The tarry control provides an adjustable "dwell" just prior to reversal of the table, resulting in improved finish and sizing at the ends of taper work and when grinding next to shoulders. Table reciprocation—variable from 1/16" to full stroke—is controlled by easily adjusted dogs.

For smooth, sure control, and ease of operation, the CINCINNATI FILMATIC 10" Universal Grinder is sure to meet your most exacting demands.



Dog-controlled table reciprocation



Electrical control buttons

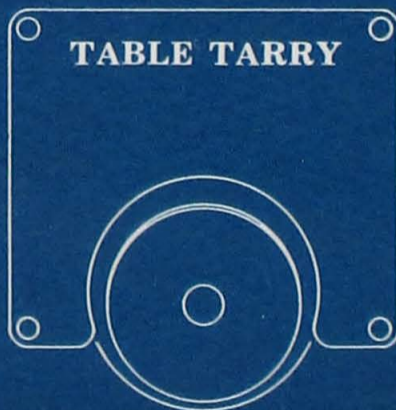
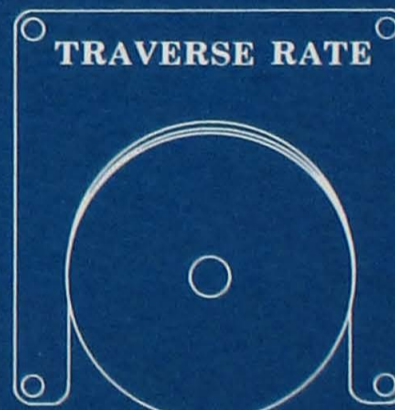


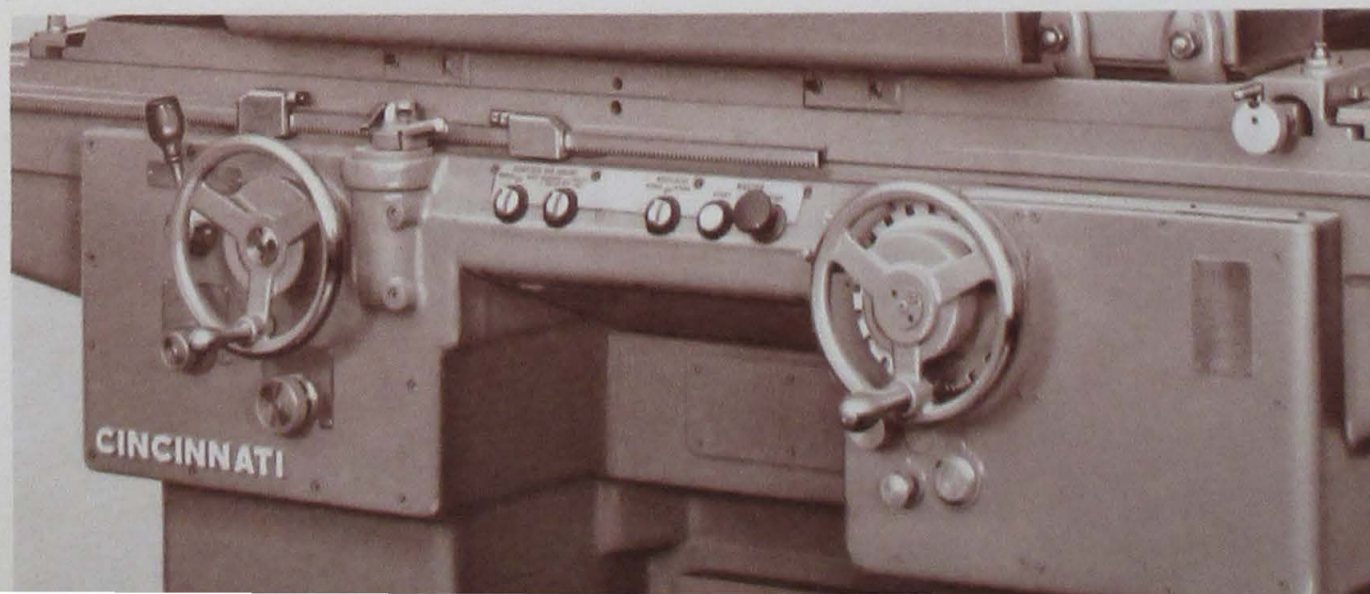
Table tarry control



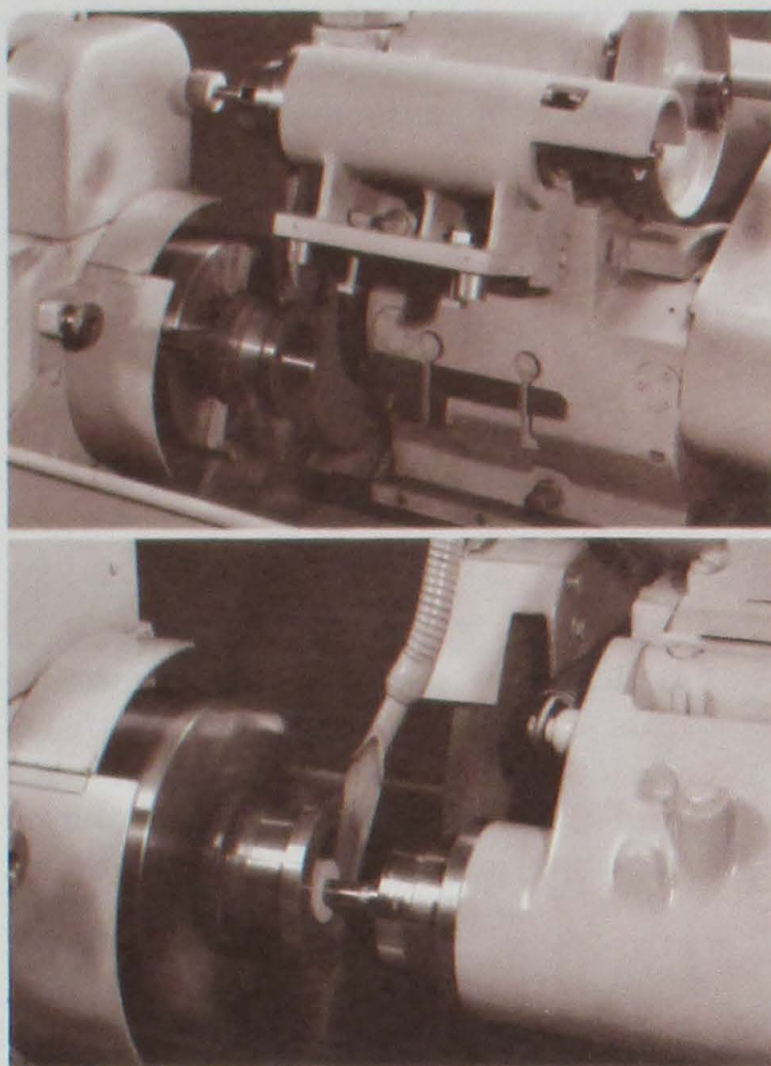
Infinitely variable table traverse rate



Accurate cross feed control .000050" on diameter



CONTROLS • For Convenient Setup and Operation



Hinged Type Internal Grinding Head

Your internal grinding operations can be performed with a minimum of setup time using Cincinnati's hinged type internal grinding head. This unit is very conveniently located on the wheelhead, so that it can easily be swung up out of the way when changing over to conventional grinding operations. The wide, heavy mounting bracket assures maximum rigidity.

In many cases parts may be ground both externally and internally with a single chucking—and without otherwise disturbing the setup. This feature is especially important where absolute concentricity of external and internal diameters is required.

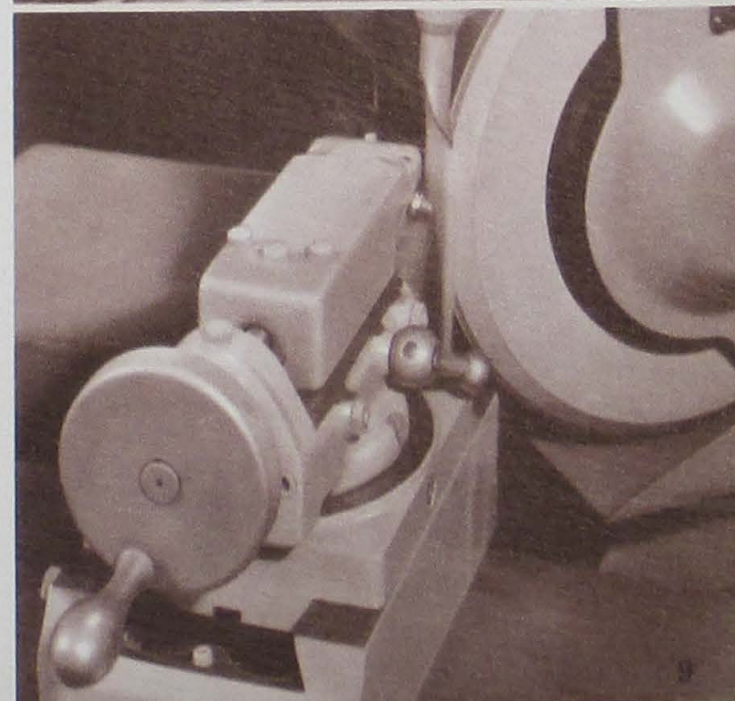
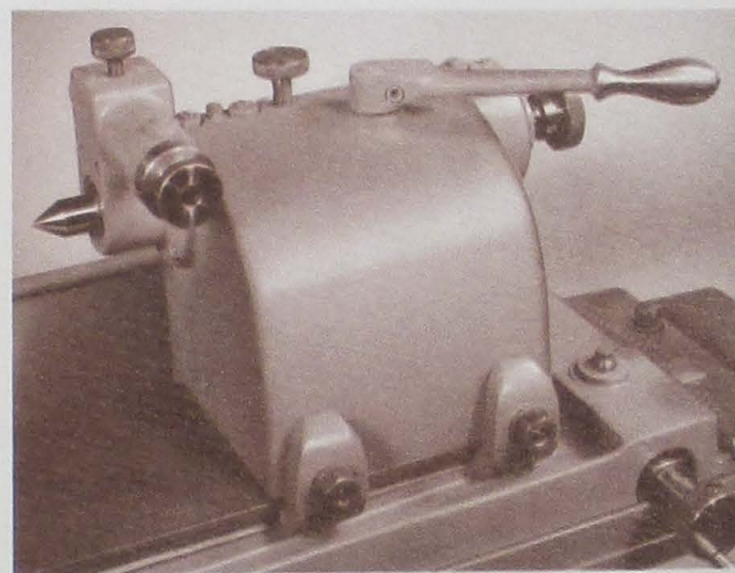
Rigid Durable Footstock

Cincinnati's rugged footstock insures solid support for the workpiece. Quick action retraction is controlled by a spring-loaded lever, and a knurled knob at the rear of the spindle permits adjustment of spring tension for proper center pressure for the size and weight of work being ground. An adjustable diamond truing bracket is mounted directly on the footstock, so the operator can true the wheel while the work is held between centers. The built-in accuracy of this rugged footstock assures accurately ground parts.

Table Type Angular Truing*

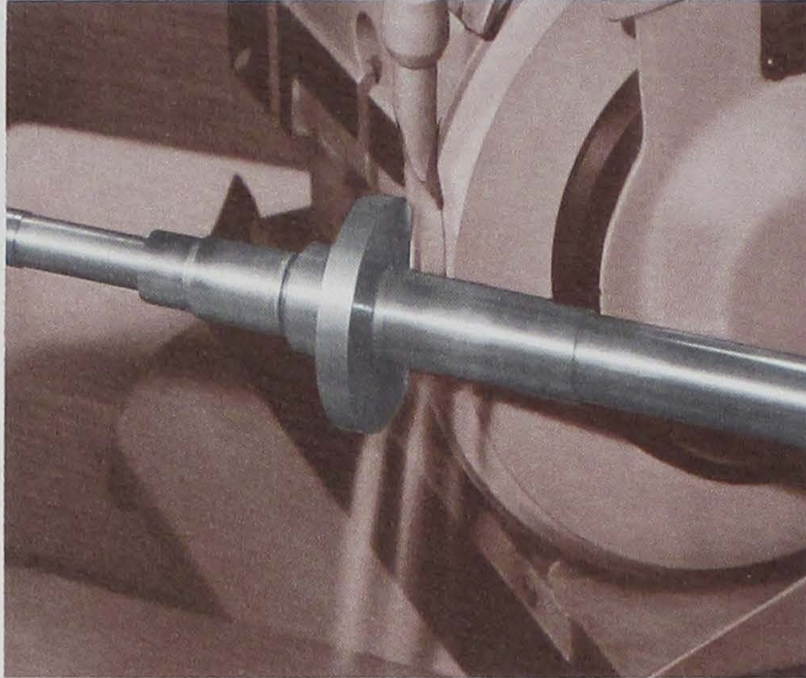
Here is an attachment which greatly simplifies the truing and dressing chore. With this unit both angular and straight truing can be performed—without the bother of swiveling the wheelhead. When truing the wheel for bevel grinding operations, or when using the angular feed arrangement, the angular truing unit is a real time saver. For ready adaptability it can be swiveled 360 degrees on its easy-to-read graduated base.

*Extra Cost



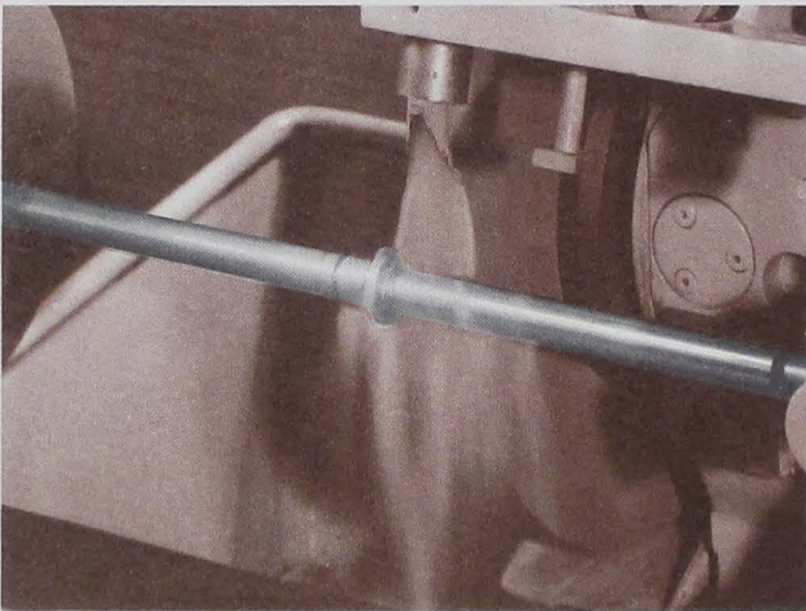


BUILT-IN VERSATILITY



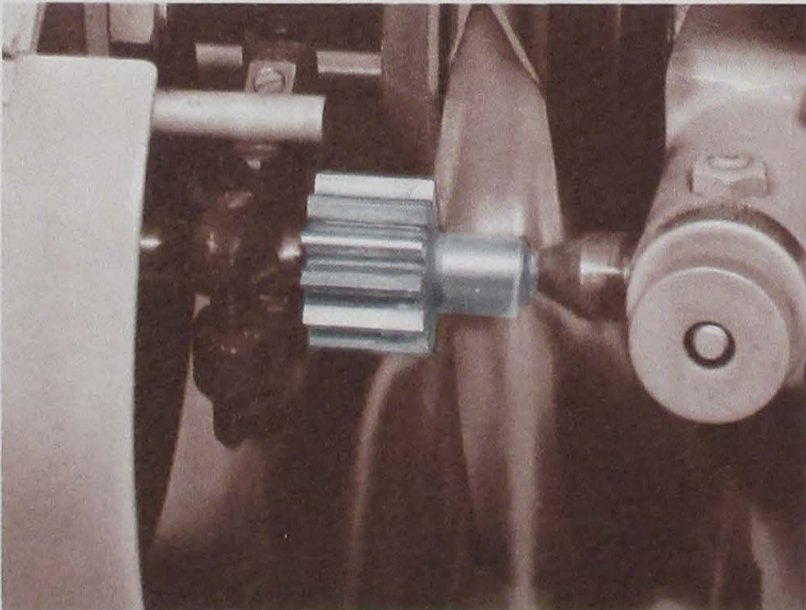
Angular Feed Grinding

Grinding a diameter and adjacent shoulder simultaneously in a single automatic infeed cycle is a "natural" for the CINCINNATI FILMATIC 10" Universal Grinder. With the reversible wheelguard and interchangeable drive and grinding wheel, the grinding wheel may be placed on the right side of the wheelhead. This permits the machine to be used for high production angular feed grinding.



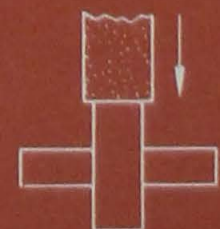
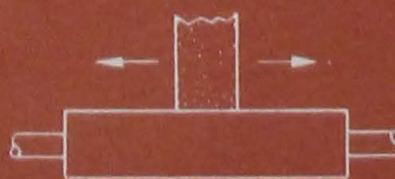
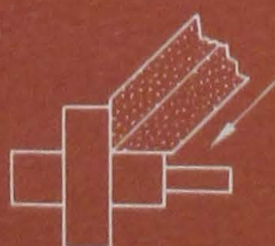
Traverse Grinding

This slender shaft is traverse ground extremely close to a shoulder without danger of spoiling the workpiece, because table reversal is accurate within .001". Traverse rates range from 3" to 280" per minute, and are infinitely variable.



Straight Plunge Grinding

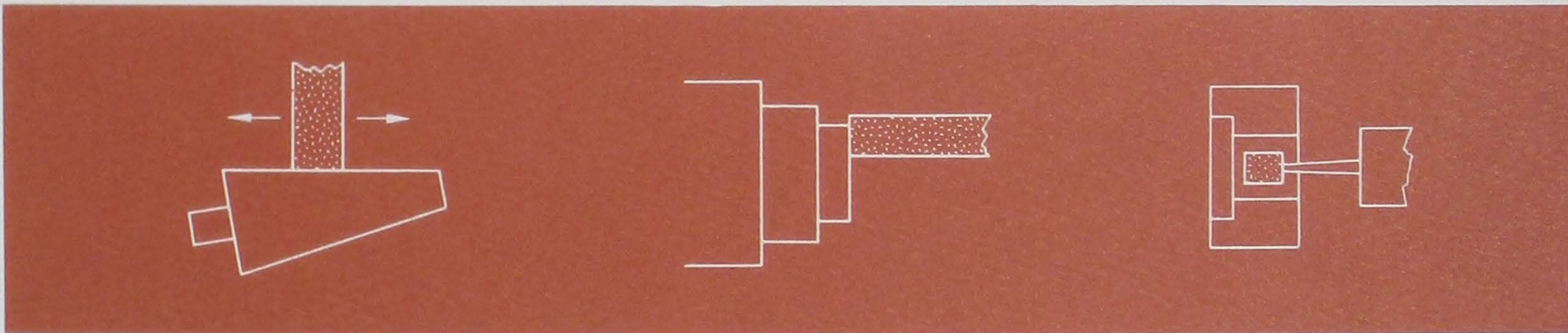
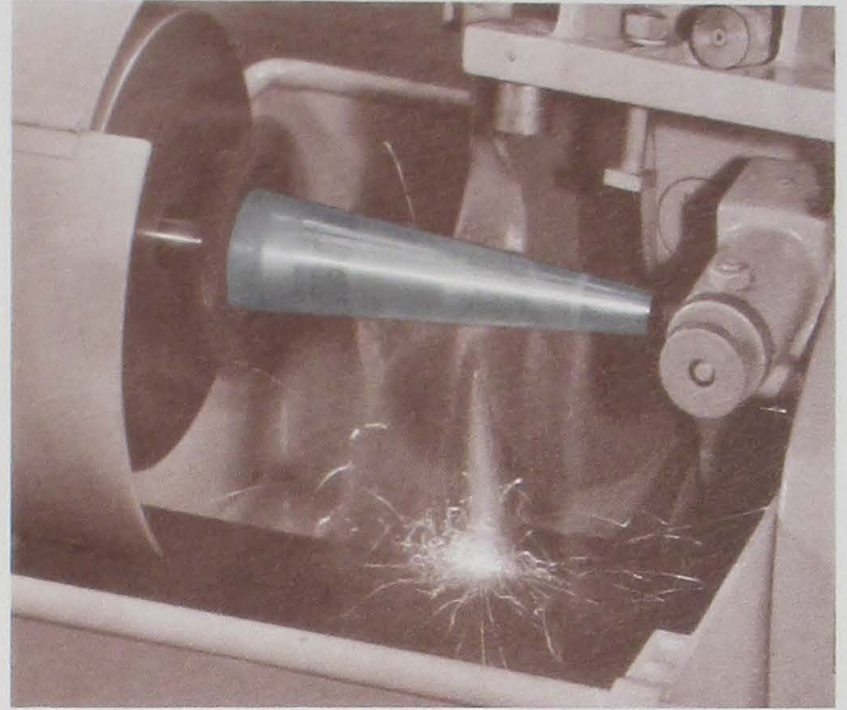
Here is a typical production setup employing the use of Acrafeed Dual Rate Automatic Infeed for plunge grinding pinions. The automatic infeed cycle increases production rates on operations of this type. Precision results at high production rates obtainable with this machine can reduce your production grinding costs.



For A Wide Variety of Operations

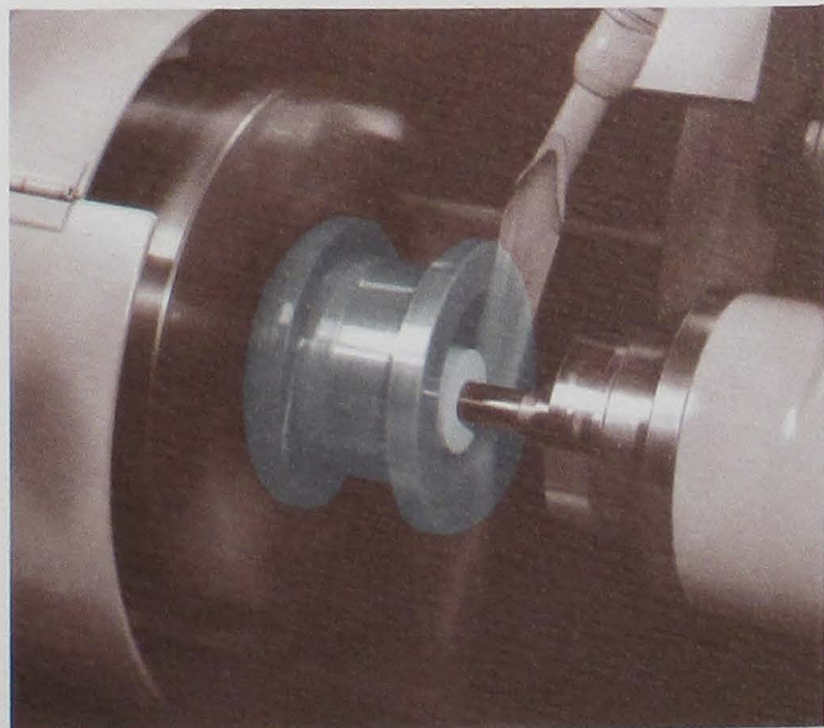
Taper Grinding

For grinding this tapered workpiece the upper table has been swiveled. Maximum swivel of $4\frac{1}{2}$ " per foot in one direction and 2" per foot in the opposite direction provide added versatility. With the table tarry control sizing and finish at the ends of taper work are aided, so highly accurate results with excellent finish are produced.



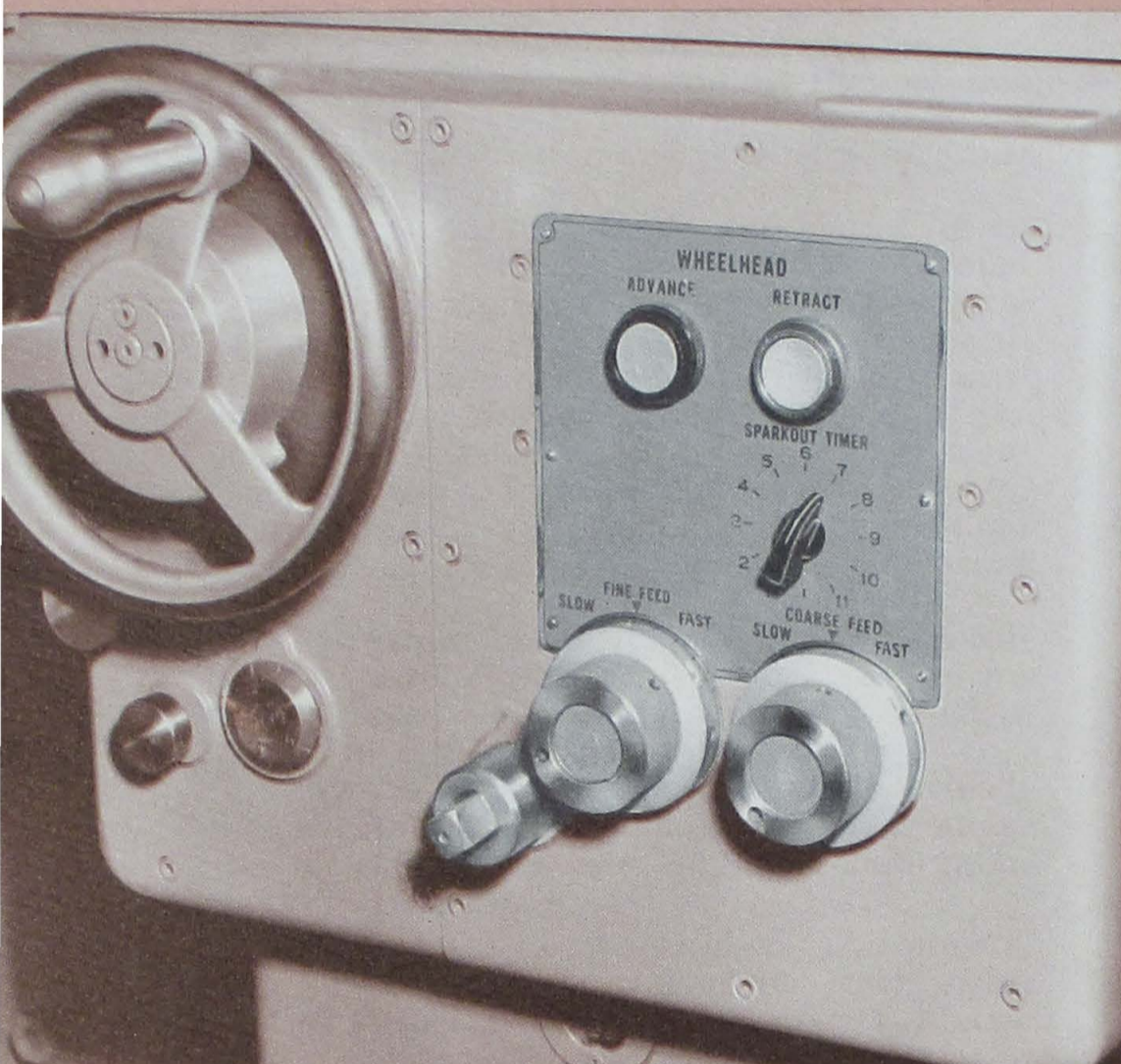
Internal Grinding

The handy internal grinding head is shown in operation here. This type of operation is performed at low, low cost on the CINCINNATI FILMATIC 10" Universal Grinder. Various types of jobs and internal diameters can be accommodated by a wide assortment of quills.





INCREASED PRODUCTION EFFICIENCY



ACRAFEED Dual Rate Automatic Infeed*

A touch of a push button starts Cincinnati's fast, accurate automatic infeed grinding cycle. The results are increased production and reduced operator fatigue.

Two individually adjustable grinding feed rates—coarse feed for rapid metal removal, and fine feed for precision and accuracy—are provided. The complete automatic infeed cycle includes: rapid advance, rapid approach (Gap Eliminator*), coarse feed, fine feed, adjustable spark-out to size, and rapid wheelhead retraction. The rapid wheelhead advance has a total stroke of 1"—allowing plenty of room for loading, unloading, and inspection of the workpiece. Your requirements can be met by CINCINNATI'S ACRAFEED Dual Rate Automatic Infeed, through added versatility and consistently high production.

And ACRASIZE Automatic Air Electric Gage Sizing*

CINCINNATI ACRASIZE Automatic Air Electric Gaging System assures consistently high quality of both sizing and finish. During the grinding cycle, exact sizing is continuously signaled to the automatic wheelhead retraction unit by the light, sensitive touch of the air probe unit. Then, at the exact instant correct size is reached, the wheelhead is automatically retracted, assuring consistent dimensional quality. And because manual adjustments after the initial setup are eliminated, operator responsibility is greatly reduced.

Together with Acrafeed Dual Rate Automatic Infeed, CINCINNATI ACRASIZE Automatic Air Electric Gage Sizing can increase your production efficiency by insuring accurately ground, high quality work.

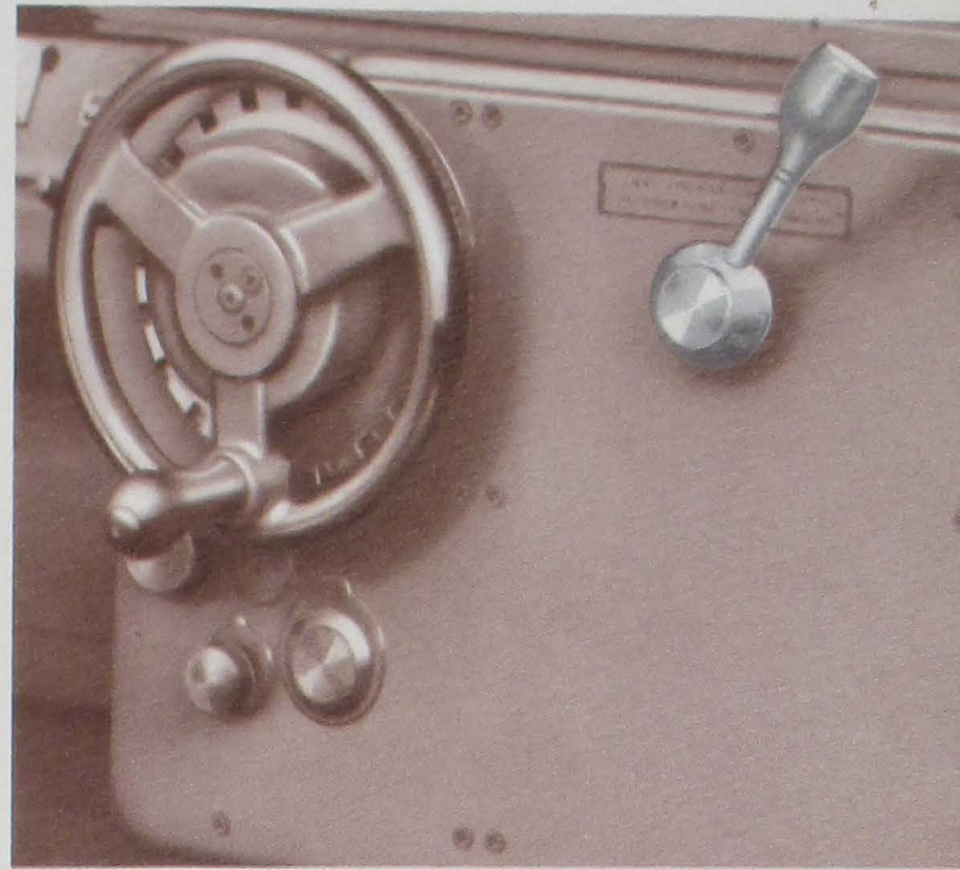
Through Consistently Accurate, Automatic Operation

Power Hand Hydraulic Infeed*

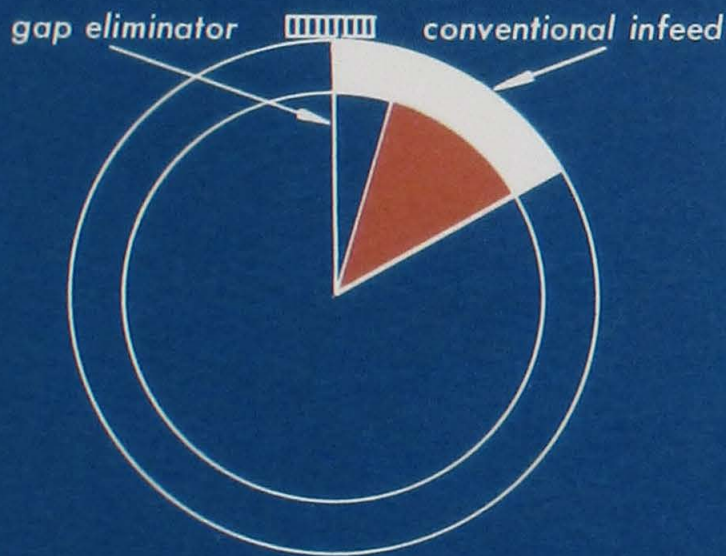
Cincinnati's Power Hand Hydraulic Infeed transforms the 10" Universal Grinder into a dual-purpose machine—ready for both toolroom and semi-production grinding operations.

With Power Hand Hydraulic Infeed, partial rotation of the cross feed handwheel initiates the rapid advance and retraction of the wheelhead. The wheelhead stroke is adjustable between $\frac{3}{8}$ " and 1", to permit easy loading, unloading, and inspection of the workpiece.

With CINCINNATI Power Hand Hydraulic Infeed, both traverse and hand infeed grinding operations can be performed more efficiently.



time required to contact work at grinding rate



brown area indicates time saved with Gap Eliminator

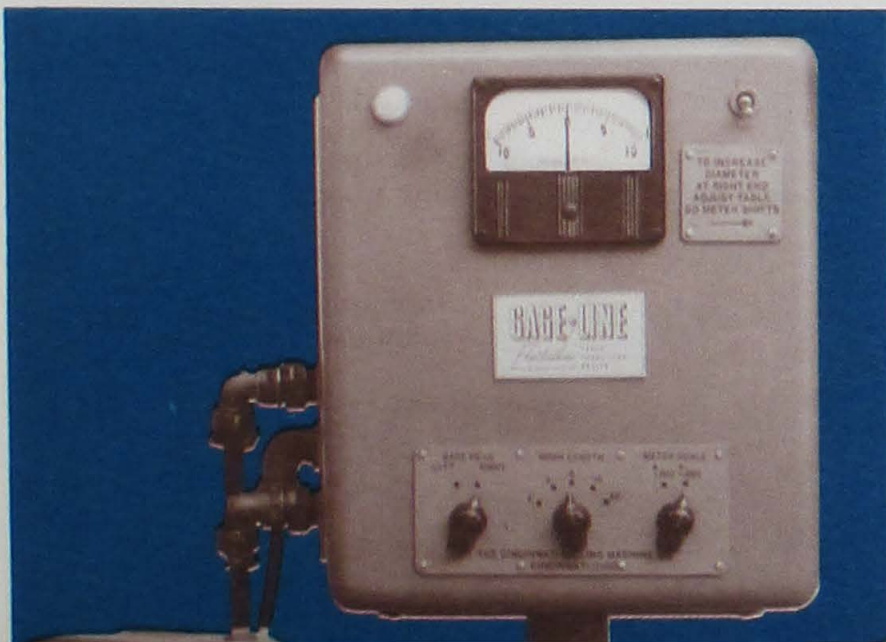
Automatic Gap Eliminator*

Much of the time wasted in "cutting air" is eliminated by the CINCINNATI Automatic Gap Eliminator. This unit reduces the automatic infeed grinding cycle time by providing a rapid approach rate until the grinding wheel actually contacts the workpiece. At this instant the normal feed rate is initiated, and the cycle continues to completion. The Filmatic 10" Universal Grinder with Gap Eliminator can reduce your infeed grinding costs while increasing production.

GAGE-LINE Taper Correction*

Here's how to eliminate the "cut and try" method of correcting taper. It's Cincinnati's Electronic Gage-Line Unit, which measures swivel table adjustment, replacing trial and error with the accuracy of an electronic brain. When the swivel table is adjusted, a signal from a gage head at each end of the table is translated into a graduated meter, where each can be read directly for amount of movement and length of workpiece. Gage-Line eliminates uncertainty, speeds setup time, and improves accuracy—reducing costs, and saving valuable running time.

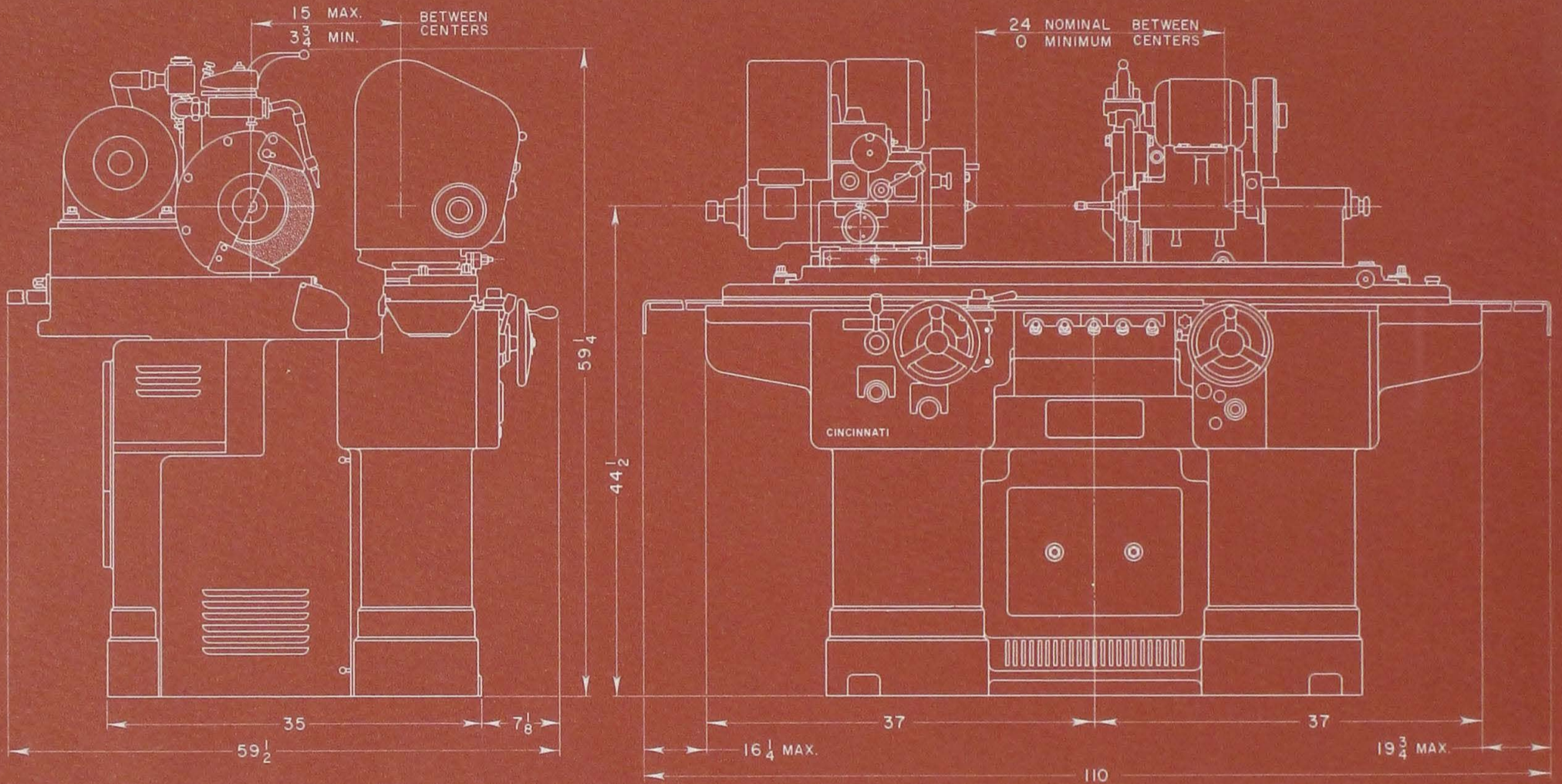
*Extra Cost





CINCINNATI Filmatic 10" Universal Grinding Machine

GENERAL SPECIFICATIONS



CAPACITY

Maximum swing over table.....	10" x 24"
Maximum diameter machine will grind with full size wheel (12" diam.)	10 ¹⁵ / ₁₆ "
Minimum diameter of grinding wheel.....	10"
Minimum diameter of grinding wheel for grinding 0" diameter of work	7 ¹ / ₂ "
Between centers.....	9 ¹ / ₂ "
Work held in chuck.....	7 ¹ / ₂ "
Nominal distance between centers.....	24"
Swivel table graduated to an angle of	{ toward wheelhead..... 8° away from wheelhead..... 3°
toward wheelhead.....	
Swivel table graduated taper per foot	{ toward wheelhead..... 4 ¹ / ₂ " away from wheelhead..... 2"
toward wheelhead.....	

GRINDING WHEELHEAD

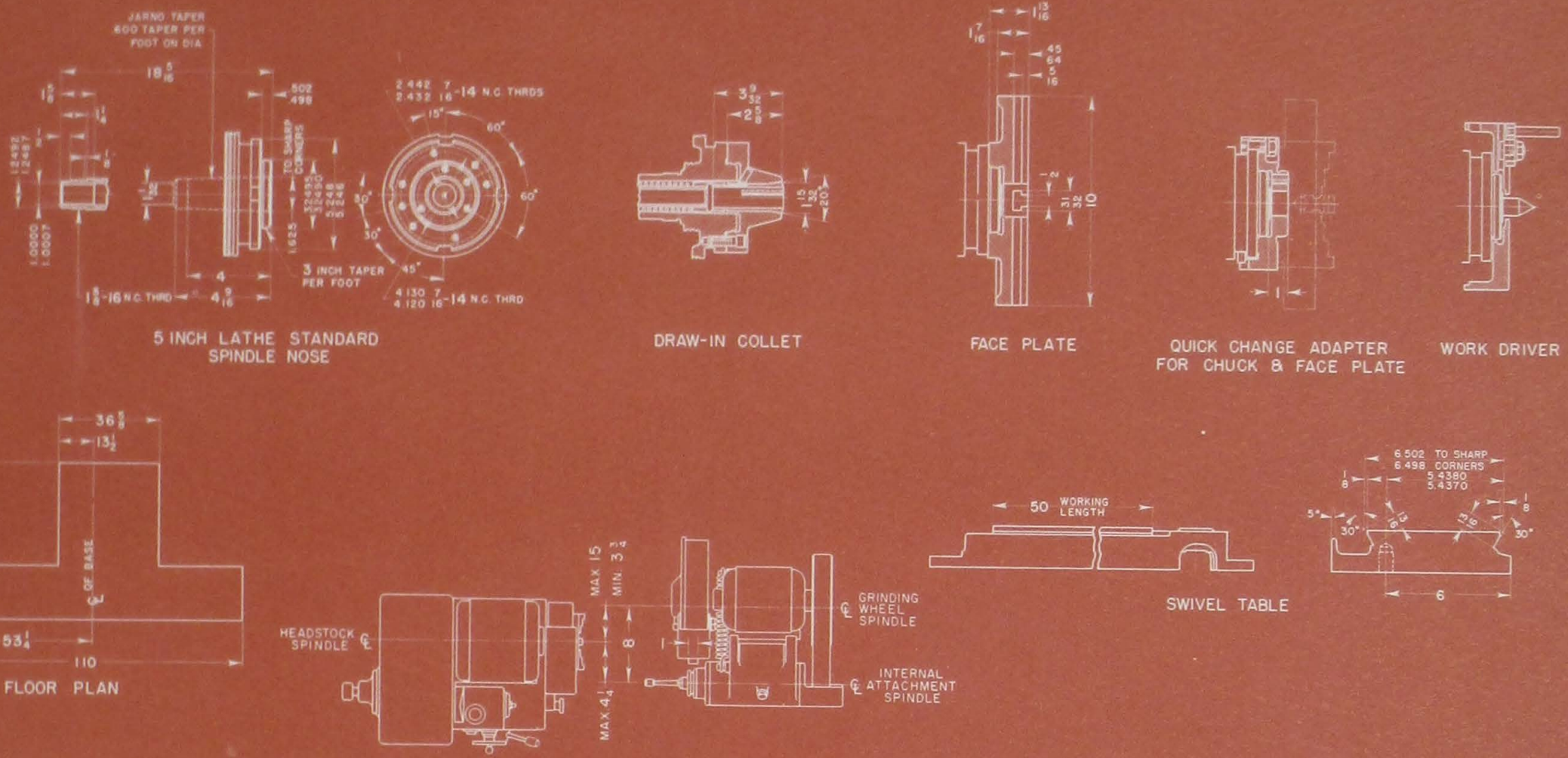
Distance between inner edge of wheel and front edge of front bearing.....	1"
Grinding wheel regularly supplied (diameter, face, and hole).....	12"x1"x5"
Swivel range { lower swivel, right and left.....	110°
{ upper swivel, right and left.....	90°
Grinding wheel spindle speed.....	2060 rpm

HEADSTOCK AND FOOTSTOCK

Headstock and footstock center taper.....	Jarno No. 7
Number of work rotation speeds.....	Infinite
Range of work speeds.....	50 to 600 rpm
Headstock spindle nose—American Lathe Standard.....	5"
Headstock swivel range { toward wheelhead.....	90°
{ away from wheelhead.....	30°

POWER REQUIREMENTS

Wheelhead motor.....	2 h.p.
Internal grinding attachment motor.....	1 h.p.
Hydraulic pump motor.....	3/4 h.p.
Headstock motor.....	3/4 h.p.
Cutting fluid pump motor.....	1/4 h.p.



MISCELLANEOUS

Number of table traverse speeds.....	10" x 24"
Range of table traverse speeds (inches per minute).....	Infinite
Accuracy of table reversal at all traverse rates.....	3" to 280"
Table tarry adjustment—infinite.....	.001"
Mechanical hand table traverse—rate per revolution at handwheel {rapid.....	0 to 5 sec.
Distance from floor to work centers.....	1"
Automatic infeed at table reversal (diameter reduction) {minimum.....	1 1/10"
Minimum movement necessary to reverse the table.....	44 1/2"
Wheelhead movement per revolution of infeed handwheel (diam. reduction).....	.00025"
Wheelhead movement per revolution of infeed handwheel through index mechanism (diameter reduction).....	.005"
Minimum infeed increment in terms of diameter reduction.....	1 1/16"
	.100"
	.0005"
	.00005"

FLOOR SPACE REQUIRED..... 59 1/2" x 110"

INTERNAL GRINDING HEAD..... Included
 Hole diameters (with standard quill)..... 3/4" min.
 Maximum depth of hole (with standard quill)..... 2 1/2"

SHIPPING DATA *

Net weight.....	4900 lbs.
Domestic shipping.....	6100 lbs.
Export shipping.....	6900 lbs.
Approximate size of case.....	120" x 60" x 62"
Approximate volume of case, cubic feet.....	258

CODE NAME

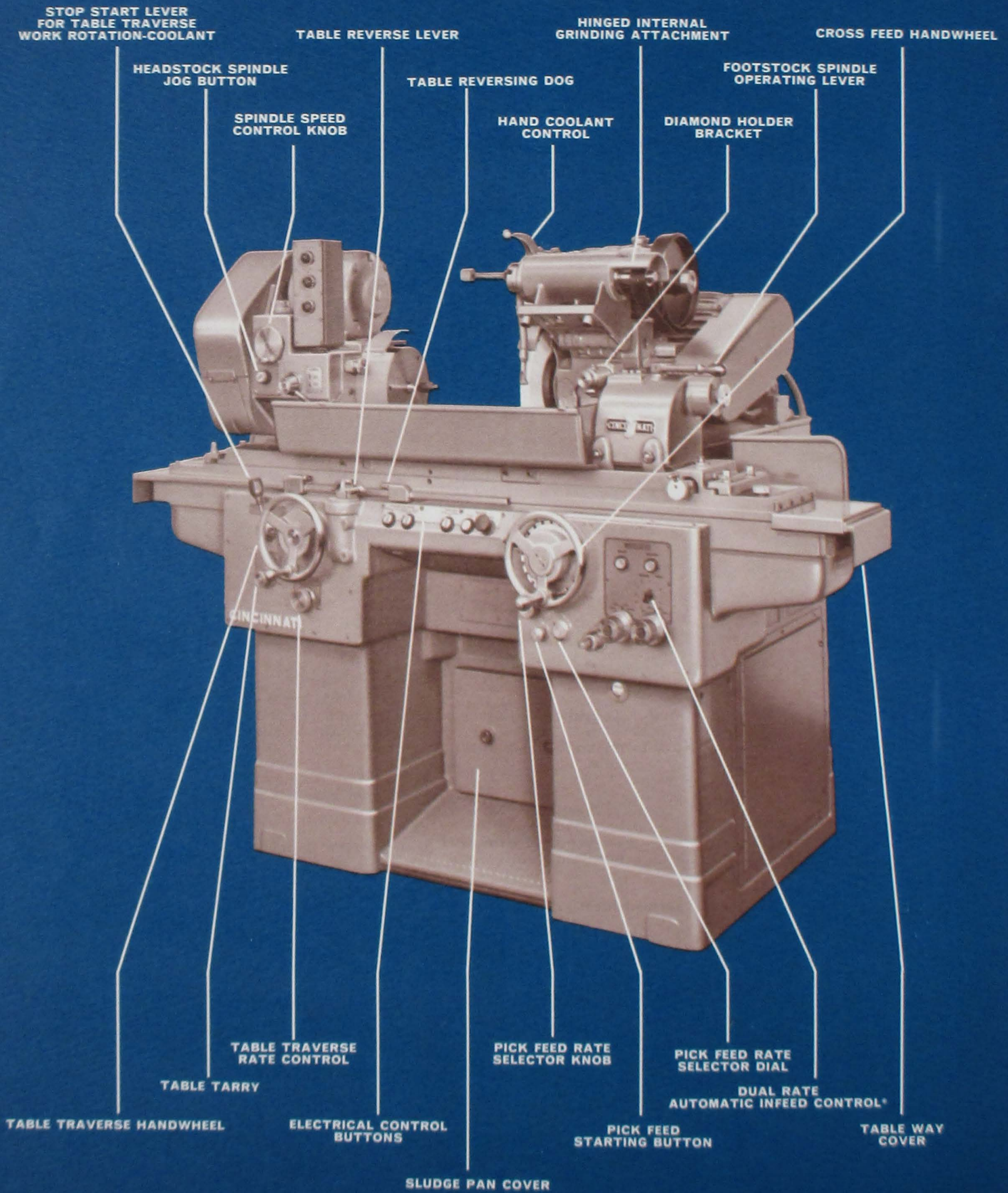
A. C. Equipment.....	OLGAC
D. C. Equipment.....	OLGDC

*Varies with equipment supplied with machine



CINCINNATI Filmatic 10" Universal Grinding Machine

FUNCTIONAL DIAGRAM



STANDARD EQUIPMENT

Headstock—Swivel base, combination live and dead spindle, having 5" Lathe Standard Spindle Nose with modified No. 13 Jarno Taper. Motor driven, including motor and controls. Includes adapter and No. 7 Jarno center.

Footstock—Lever type with micrometer diamond holder bracket and diamond holder (without diamond or nib). Footstock spindle has No. 7 Jarno Taper. Center included.

Back Rests (Two)—Two-shoe, two-screw type maple wood shoes, $\frac{1}{8}$ " to 2" capacity.

Center Rest— $\frac{1}{2}$ " to 3" maximum work diameter.

Diamond Bracket—Table type for external and internal truing. (Does not include diamond or nib.)

Internal Grinding Head—Hinged type, including fitted bracket, one spindle and quill, two grinding wheels, motor pulley and driving belt, 1 hp motor, motor mounting and control equipment. (See page 19 for extra equipment.)

Chuck—6" four-jaw, independent (light pattern iron body with solid reversible jaws). Mounts directly on spindle nose.

Face Plate—10" diameter. Mounts directly on spindle nose.

Wheel Mount—Balancing type, for 5" hole wheels up to 1" web thickness.

Work Driving Dogs—Cam Action Type—one $\frac{1}{8}$ " to $\frac{1}{2}$ " capacity, one $\frac{1}{2}$ " to $1\frac{1}{8}$ " capacity—Reversible Type—one $1\frac{1}{8}$ " to 4" capacity.

Wheel Guard, Reversible—For wheels up to 12" diameter x $1\frac{1}{2}$ " face, with cutting fluid piping and nozzle.

Two-speed Hand Table Traverse.

Automatic Pick Feed.

Hand Mechanical Cross Feed Movement.

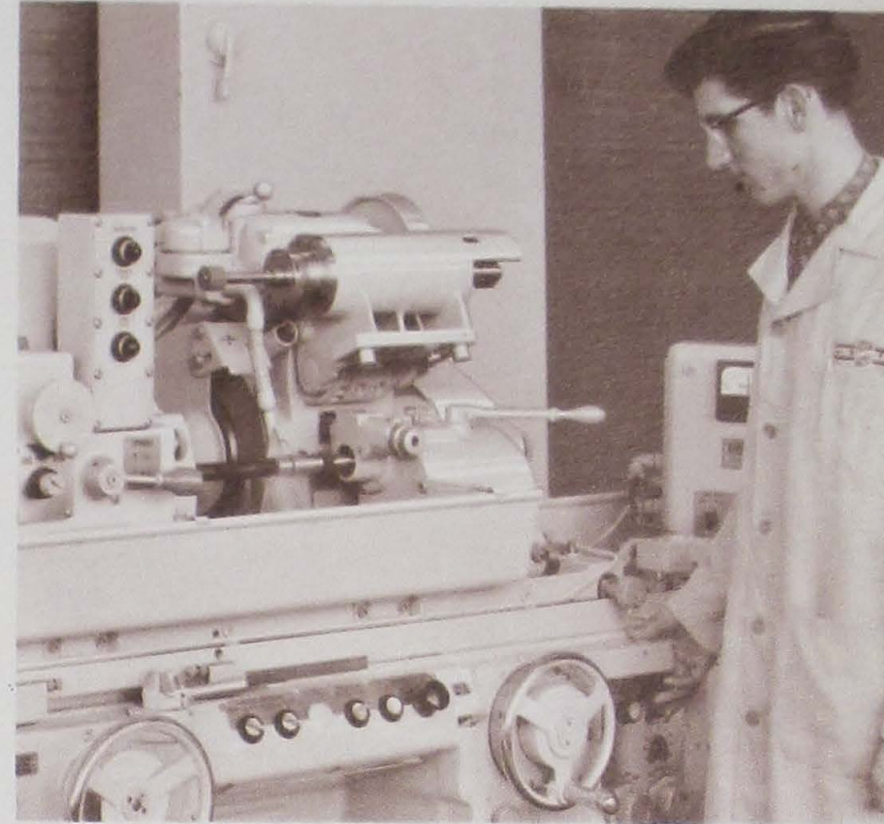
Grinding Wheel—One 12" diameter x 1" face x 5" hole.

Cutting Fluid Equipment—Either (not both) motor driven cutting fluid pump, including complete piping and diaphragm valve, or sewer connections and diaphragm valve.

Wrenches and Splash Guards.

Center Knockout Bar.

Complete Electrical Equipment for 50 or 60 cycle, 2 or 3 phase, 220 to 550 volts A.C. and wired in accordance with modified "J.I.C. Electrical Standards".





EQUIPMENT Supplied at Extra Cost

1. D.C. Electrical Equipment.
2. Power Hand Hydraulic Infeed Attachment—Hydraulically operated with quick retraction to wheelhead. Movement is 1" for loading and inspecting work. Useful for hand infeed and for traverse grinding. Its operation automatically controls starting and stopping of headstock rotation and cutting fluid. Must be built-in at factory.
3. Acrafeed Dual Rate Automatic Infeed Attachment—Electro-hydraulically operated for automatic plunge cut grinding. Complete cycle (rapid advance wheel to work, grind with coarse and fine feed rates, tarry and return) is automatic, started by one movement of the hand. Movement is 1" for loading and inspecting work. Includes mechanism for automatic starting and stopping of cutting fluid and headstock rotation. Must be built-in at factory.
4. Draw-in Collet Attachment for Headstock—Lever Operated—Includes adapter for spindle nose and any six collets tabulated in Item No. 6. Must be built-in at factory.
5. Draw-in Collet Attachment for Headstock—Handwheel Operated—Includes adapter for spindle nose and any six collets tabulated in Item No. 6.
6. Collets for Draw-in Collet Attachments. For lever operated attachment—Inch sizes: $\frac{1}{8}$ " to 1" inclusive, in $\frac{1}{16}$ " increments. Metric sizes: 1 mm to 26 mm inclusive, 1 to 10 in $\frac{1}{2}$ mm increments, 11 to 26 in 1 mm increments. For handwheel operated attachment—Inch sizes $\frac{1}{16}$ " to $1\frac{3}{8}$ " inclusive, in $\frac{1}{16}$ " increments. Metric sizes: 1 mm to 35 mm inclusive, 1 to 10 in $\frac{1}{2}$ mm increments, 11 to 35 in 1 mm increments.
7. Extra Headstock or Footstock Center—No. 7 Jarno Taper.
8. Half Center for Footstock—For $\frac{1}{4}$ " minimum work diameter; $\frac{3}{4}$ " length of flat.
9. Carbide Tipped Work Centers.
10. Permanent Magnetic Chuck with Adapter—7", 8" or 9" diameter.
11. Quick Change Adapter—For face plate or chuck, complete with special L-head bolts.
12. Magnetic Chucks—can be supplied for 115 or 230 volt D.C. If D.C. is not available, a rectifier can be supplied which will permit the use of alternating current. Collector rings, adapter plates, water guards and bracket, and demagnetizing switch for headstock motor included.

13. Rectifier—for magnetic chucks when D.C. is not available. Rectifiers can be supplied for 25, 50, or 60 cycle, 220/440/550 volts.
14. Positive Stop with $\frac{3}{8}$ " Micrometer Screw Adjustment—For accurately positioning the table when doing face or shoulder grinding operations.
15. Indicator Attachment—To assist in adjusting the taper of the swivel table when grinding taper work. Includes .001" dial indicator.
16. Gage-Line Attachment—Electronic device for accurately measuring swivel table adjustment. Useful for removing taper or for controlling the grinding of an accurate taper in a workpiece. (For factory installation only.)
17. Radius Truing Attachment—Submit prints of work.
18. Table Type Angular Truing Fixtures.
19. Cam Grinding Attachments—Made to order. Submit prints of work.
20. Diamond Nibs—

1.00 to 1.25 carat.	1.85 to 2.15 carat.
1.35 to 1.65 carat.	2.85 to 3.15 carat.
21. Double Shaft Motor—Should be supplied if wheel and guard are interchanged for face grinding work. Includes motor sheave guard, additional motor sheave, extra cutting fluid piping.
22. Extra Grinding Wheel Mounts—Separate wheel mount recommended for each wheel regularly used.
23. Balancing Arbor for Grinding Wheel—Size No. 4.
24. Balancing Stand for Grinding Wheel—Size No. 1 (20" swing, sensitive way).
25. Additional Quills, Spindles, Collets and Chucks—For internal grinding head. See page 19.
26. Automatic Gap Eliminator—Reduces infeed cycle time on machines equipped with Automatic Infeed Attachment. Must be built into machine at factory.
27. Acrasize Automatic Air-Electric Gage Sizing Attachment—For machines equipped with automatic infeed. Automatically retracts wheelhead when exact size is reached. Distance traversed and combination coarse and fine infeed rates are adjustable, and operate in conjunction with sizing gage. Moisture trap and one adjustable caliper included. (See item 28) Specify size desired. Must be built in at factory.
28. Adjustable Calipers—For item 27. Two ranges: $\frac{3}{16}$ " to $1\frac{1}{2}$ ", and 1" to 3".

Size No.	Face Diam.	Holding Capacity				Net Weight Pounds	Code Name
		Rings		Discs			
		Min.	Max.	Min.	Max.		
7-R	$7\frac{3}{8}$ "	$1\frac{5}{8}$ "	$6\frac{3}{8}$ "	$1\frac{5}{8}$ "	$7\frac{3}{8}$ "	50	ROCHU
8-R	$8\frac{3}{8}$ "	2"	7"	2"	$8\frac{3}{8}$ "	70	MACHU
10-R	$10\frac{3}{8}$ "	$2\frac{1}{4}$ "	$8\frac{3}{8}$ "	$2\frac{1}{4}$ "	$10\frac{3}{8}$ "	95	CHUCO



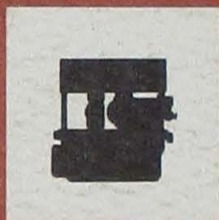
GRINDING MACHINE DIVISION

THE CINCINNATI MILLING MACHINE CO.

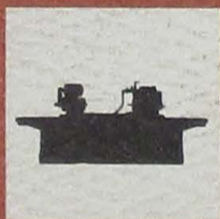
CINCINNATI 9 OHIO



PLAIN



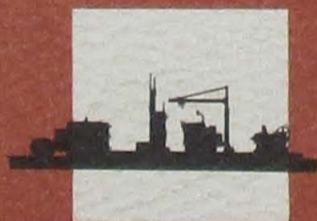
CHUCKING



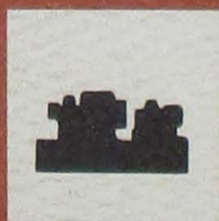
UNIVERSAL



MICRO-CENTRIC



ROLL



SPECIALS



CENTERLESS



LAPPING

Products of the Grinding Machine Division of The Cincinnati Milling Machine Co. are listed and symbolized here.

Products of The Cincinnati Milling Machine Co.'s other divisions include a complete line of knee type and bed type milling machines, die sinking machines, cutter sharpening machines, optical projection grinding machines, electrical machining equipment, heating machines, metal forming machines, broaching machines, special machine tools and complete production lines, special machinery, numerical control systems, tracing systems, gaging systems, hydraulic motors, hydraulic and electro-hydraulic valves and components, cutting fluids and precision grinding wheels.



GRINDING
MACHINES