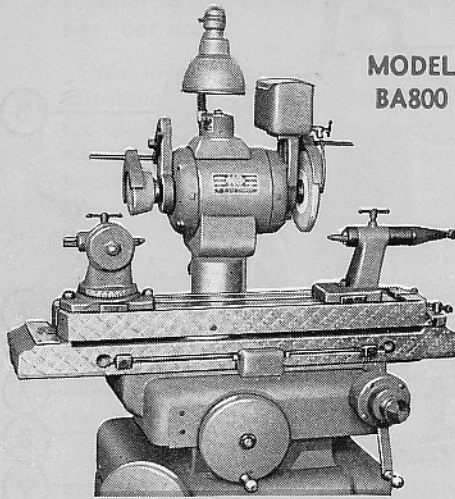
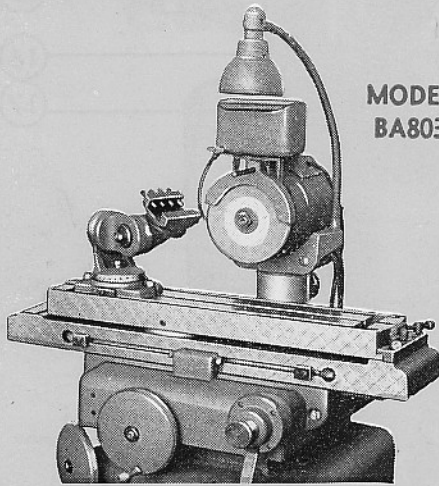


K. O. Lee GRINDERS



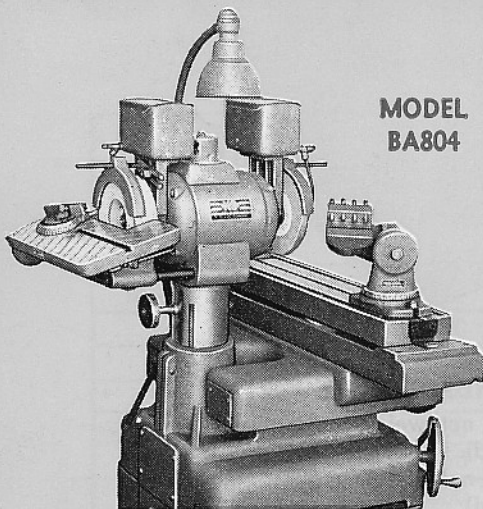
MODEL
BA800

TOOL AND CUTTER GRINDER



MODEL
BA803

CHIP BREAKER GRINDER



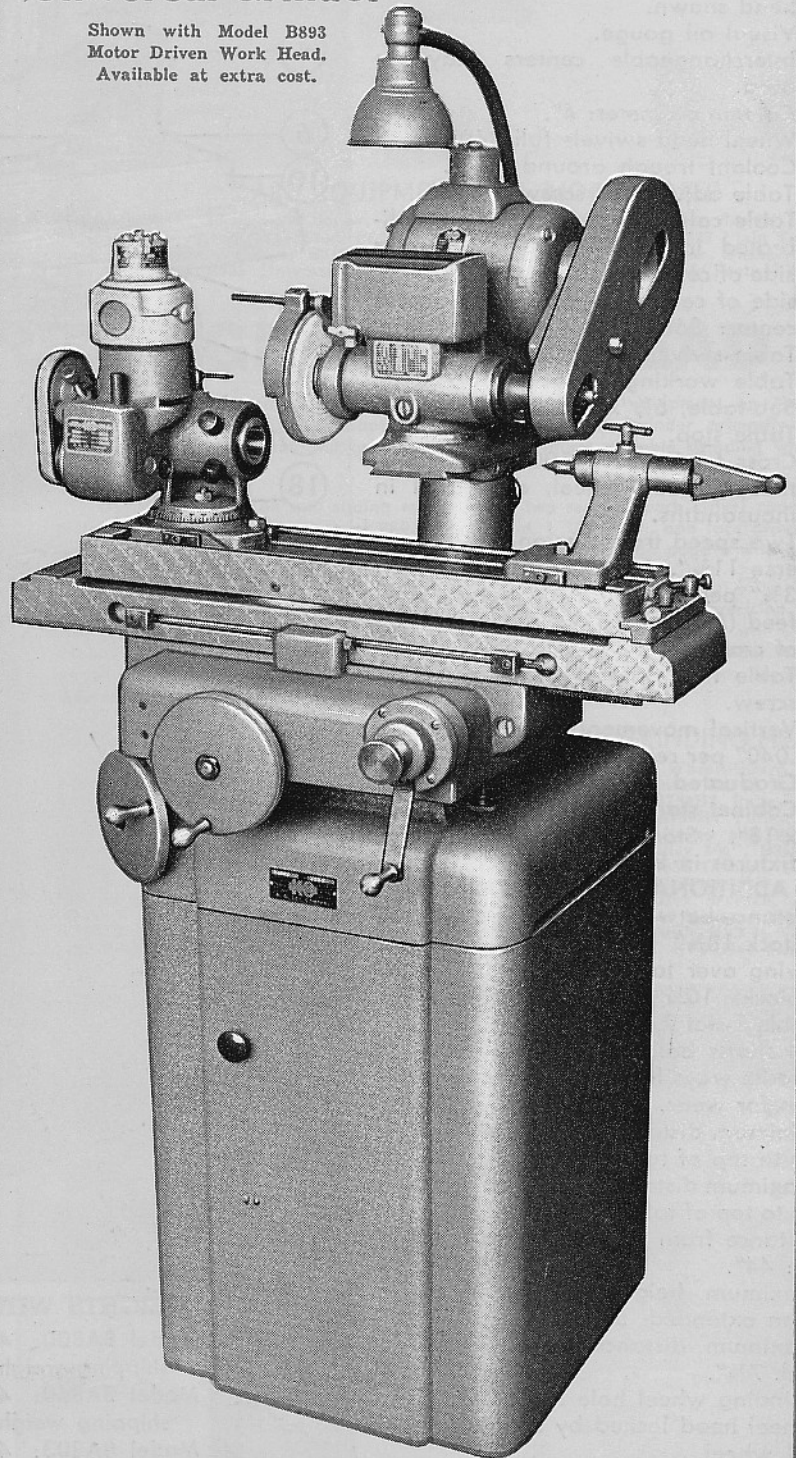
MODEL
BA804

CARBIDE TOOL GRINDER



Model BA860 Universal Grinder

Shown with Model B893
Motor Driven Work Head.
Available at extra cost.



K. O. LEE COMPANY, ABERDEEN, SO. DAKOTA

SPECIFICATION FEATURE PARADE

**Model
BA860**

SPECIFICATIONS APPLY TO ALL MODELS

1. Flexible light to spot-light the operator's work.
2. Reversing switch conveniently located.
3. Several types of motor assemblies available. B855 universal grinding head shown.
4. Visual oil gauge.
5. Interchangeable centers may be used.
6. Column diameter: 4".
7. Wheel head swivels full 360°
8. Coolant trough around table.
9. Table adjustment screw.
10. Table calibrations on left end: calibrated in taper-per-foot 3" either side of center; in degrees, 15° either side of center. Table calibrations at center: 360°.
11. Table swivels 225°.
12. Table working surface, 5¼"x25¼".
13. Sub-table, 6½"x30¼".
14. Table stop.
15. Cross feed: 6¾"—.100" per revolution of hand wheel, calibrated in thousandths.
16. Two speed transmission, table traverse 11¾". Fast feed (direct drive): 3¾" per revolution of crank. Slow feed (5 - 1 ratio): ¾" per revolution of crank.
17. Table hold-down tension adjusting screw.
18. Vertical movement of column: 6¾"—.040" per revolution of hand wheel. Graduated in thousandths.
19. **Cabinet stand base dimensions:** 18" x 18". Storage compartment for fixtures in base.

ADDITIONAL SPECIFICATIONS

Distance between centers of head and tail stock 18¾"

Swing over table: 8¼" (with 1" raising blocks, 10¼").

Table T-slot 7/16".

All shafts ball-bearing mounted.

Saddle ways have automatic compensation for wear.

Minimum distance centerline of wheel shaft to top of table: 3¾".

Maximum distance centerline of wheel shaft to top of table: 10½".

Distance from floor to center of head stock: 44".

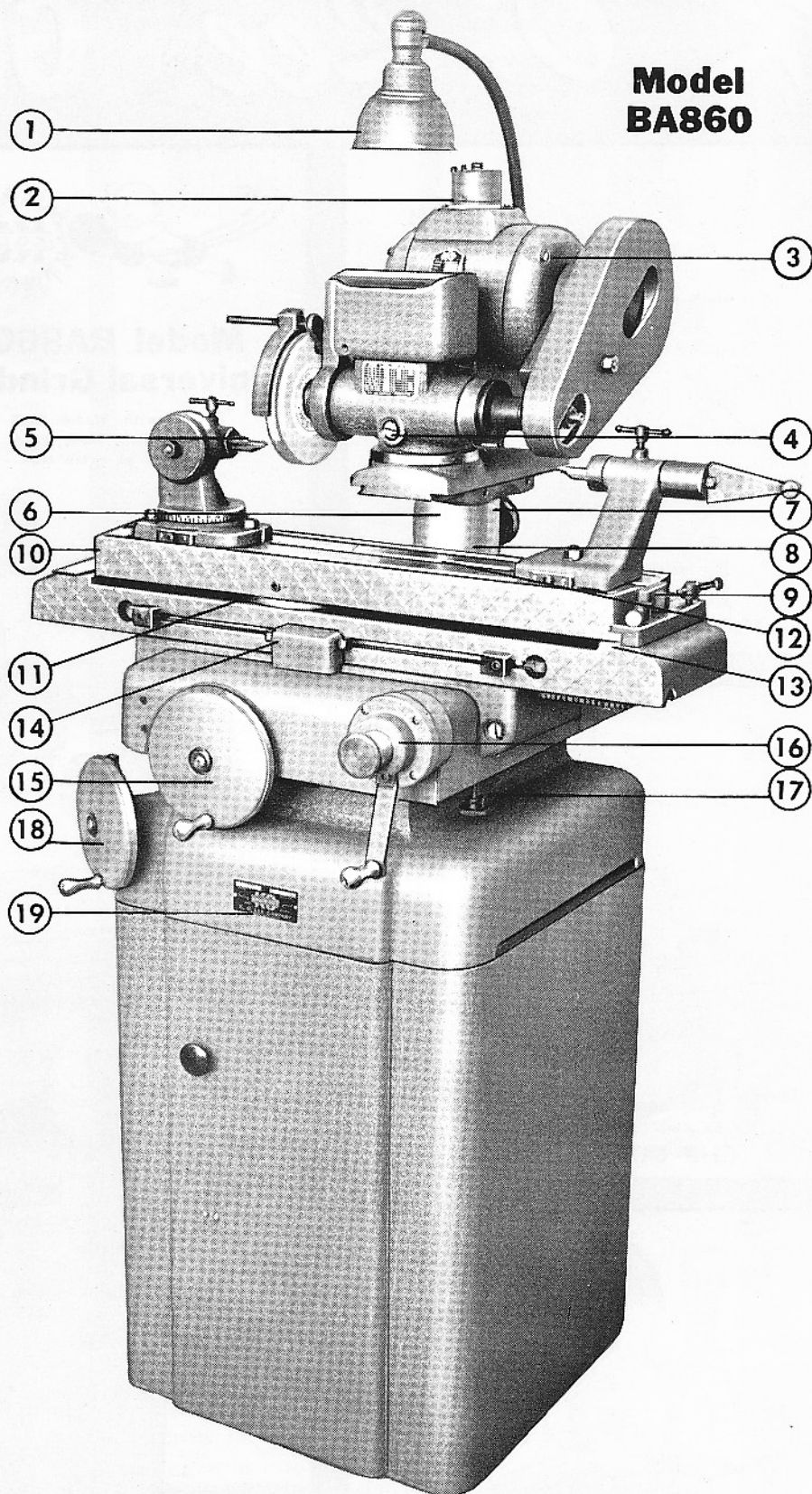
Maximum height of machine with column extended: 56¼".

Maximum distance from column to wheel: 7¾".

Grinding wheel hole size 5/8".

Wheel head locked by simple turn of hand wheel.

Flexibility of machine enables most jobs to be performed with single chucking.



WEIGHTS WITH STANDARD EQUIPMENT

- | | | |
|--------------|----------------------|------------------------------------|
| Model BA800: | 445 lbs. net weight. | 510 lbs. shipping weight (crated). |
| Model BA860: | 480 lbs. net weight. | 545 lbs. shipping weight (crated). |
| Model BA803: | 430 lbs. net weight. | 500 lbs. shipping weight (crated). |
| Model BA804: | 445 lbs. net weight. | 510 lbs. shipping weight (crated). |

MODEL BA860 UNIVERSAL GRINDER

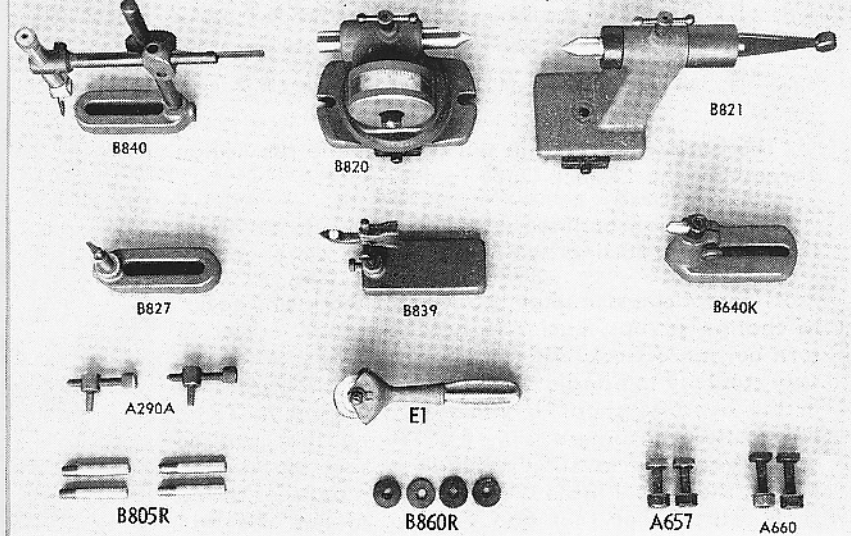
The K. O. Lee Company with over twenty-five years of experience in the manufacture of fine machine tools has developed a universal grinder that is superior to any on the market of similar size, bar none.

We invite you to visit our franchise distributors and compare this machine for quality material, engineering, workmanship, sturdy construction, modern appearance and above all the low price. We believe you will be pleasantly surprised.

The biggest value in grinders today. It will do anything grinders costing several times more will do. This fine machine is truly universal, being able to handle all the various grinding jobs in the average shop.

Model BA860 Universal Grinder is equipped with the new B855 Universal Grinding Head described in detail below.

PHOTOGRAPH OF STANDARD EQUIPMENT



STANDARD EQUIPMENT FOR MODEL BA860

A290A Table Adjustment Screw, A657 T-Slot Bolt, A660 T-Slot Bolt, B640K Diamond Dresser, B805R Base Stud, B820 Head Stock, B821 Tail Stock, B827 Plain Tooth Rest, B839 Center Gauge, B840 Universal Tooth Rest, B860R Rubber Washer, E1 Wheel Dresser, B855 Universal Grinding Head. Breakdown of B855 Parts Listed Below.

B855 UNIVERSAL GRINDING HEAD

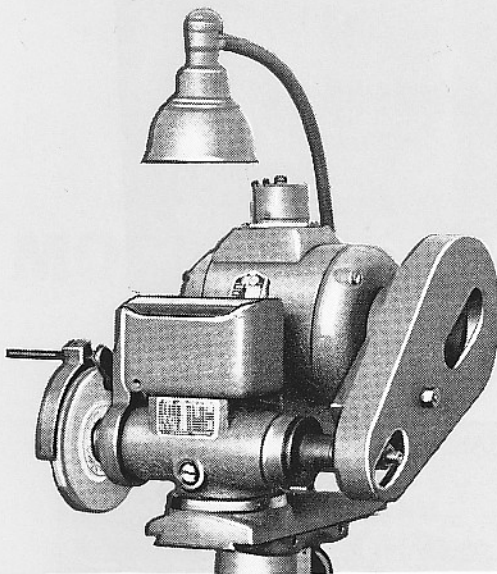
The B855 Universal Grinding Head which is standard equipment on Model BA860 grinder only, can be adapted to any BA800 series grinder primarily for cylindrical, internal or external grinding operations where variable grinding wheel speeds are required.

Quill is mounted on one sliding member and two swivels, each swivel capable of full 360° turn. With addition of B893 Work Head, I. D., O. D., and face grinding can be accomplished with a single chucking. Setups are shown on page 6 with B893 Motor Driven Work Head.

The spindle of this head is mounted with the finest type of super precision ball bearings. Spindle has taper socket to accommodate removable arbors which are seated by integral thread at inner end. Spindle is belt driven from either side. Wheel head can be positioned from column over table or in other positions to serve operational requirements.

STANDARD EQUIPMENT FOR B855 UNIVERSAL GRINDING HEAD

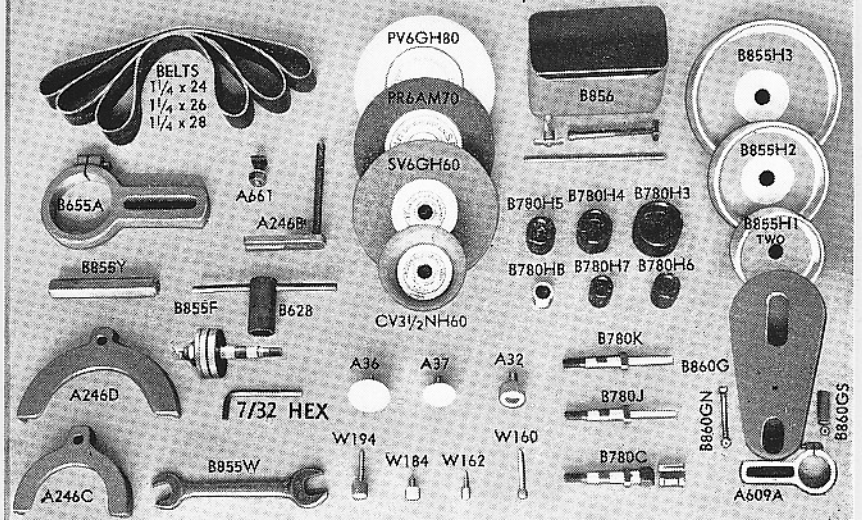
A246B Wheel Guard Bracket, A246C Wheel Guard 4", A246D Wheel Guard 6", A609A T-Slot Arm, A663 T-Slot Bolt, A661 T-Slot Bolt, B628 Wrench, B655A T-Slot Arm, B780C Collet Chuck Assembly, B780HB Spacer Bushing, B780H3 Pulley 2", B780H4 Pulley 1½", B780H5 Pulley 1¼", B780H6 Pulley 1¼", B780H7 Pulley 1", B780J Wheel Arbor (3-40), B780K Wheel Arbor (¼-28), B855F Pulley and Wheel Arbor Assembly, B855GE Motor and Saddle Assembly, B855H1 Pulley 3¾", B855H2 Pulley 4½", B855H3 Pulley 6", B855W Wrench (11/16 x ¾), B856 Coolant Tank Assembly, B860G Belt Guard, B860GS Spacer Short, B860GN Special Nut, 1¼" x 24" Flat Belt, 1¼" x 26" Flat Belt, 1¼" x 28" Flat Belt, 7/32" Hex Wrench, A32 Mounted Cup Wheel, A36 Mounted Wheel, A37 Mounted Wheel, W160 Mounted Wheel, W162 Mounted Wheel, W184 Mounted Wheel, W194 Mounted Wheel, CV3 ½ NH60 Cup Wheel, PR6AM70 Cut Off Wheel, PV6GH80 Straight Wheel, SV6GH60 Saucer Wheel.



AVAILABLE SPEEDS WITH B855 UNIVERSAL GRINDING HEAD

Motor Pulley Diameter	Quill Pulley Diameter	Spindle Speed R.P.M.
3¾	3¾	3450
4½	3¾	4600
3¾	2	5820
4½	2	7760
6	2	10350
6	1½	13800
6	1¼	16560
6	1⅛	18400
6	1	20700

PHOTOGRAPH OF STANDARD EQUIPMENT



MODEL BA800 TOOL GRINDER

MODEL
BA800

"The busiest machine in the shop" is the reputation earned by the "Knock-Out" Tool grinder.

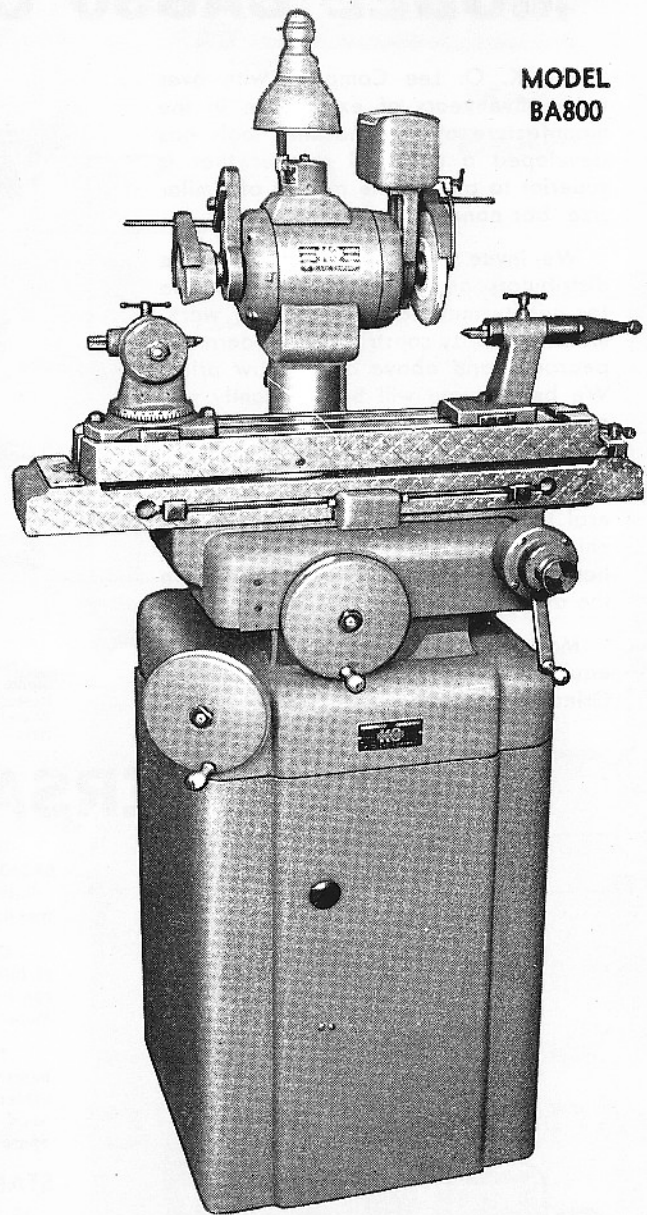
This precision engineered grinder will do anything that machines costing two or three times more will do.

Its compactness makes it easier to work on, easier to change set-ups, easier to hold accuracy, easier to turn out more work. This fine machine has the necessary capacity to handle all the tool and cutter grinding in the average shop. It will take work up to 18 3/4" long between centers with 8 1/4" swing that can be easily increased to 10 1/4" with 1" raising blocks, No. B818. The swivel table is graduated in degrees at the center, taper per foot and degrees at the end and has a coolant trough for wet grinding. The motor head swivels through 360° and the rotation of the double shaft extension being reversible makes it easy to keep two different wheels mounted.

The "K-O" fixtures available for external and internal grinding, tap grinding, radius grinding, make the "Knock-Out" Tool Grinders so versatile it's no wonder users call them "the busiest machines in the shop."

STANDARD EQUIPMENT FOR MODEL BA800

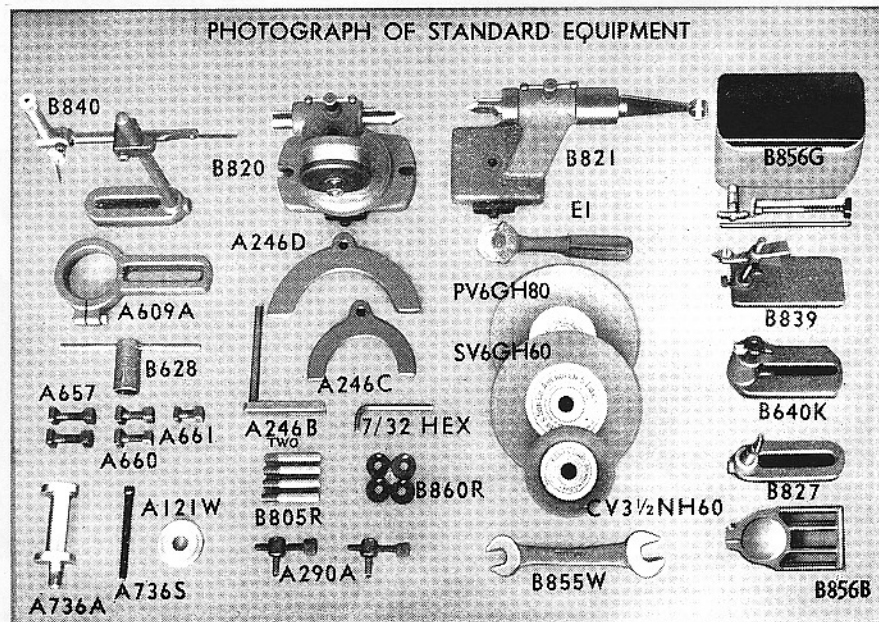
A246B Wheel Guard Bracket, A246C 4" Wheel Guard, A246D 6" Wheel Guard, A290A Table Adjustment Screw, A609A T-Slot Arm, A657 T-Slot Bolt, A660 T-Slot Bolt, A661 T-Slot Bolt, A736A Arbor, A736S Draw Bolt, B628 Wrench, B640K Diamond Dresser with A173 Diamond Nib, B805R Base Stud, B820 Head Stock, B821 Tail Stock, B827 Plain Tooth Rest, B832() Motor Saddle Assembly, B839 Center Gauge, B840 Universal Tooth Rest, B855W Open End Wrench, B856 Bracket, B856C Cover, B856G Tank, B860R Rubber Washer, B865 Cabinet Base, E1 Wheel Dresser, 7/32" Hex Wrench, CV3 1/2 NH60 Cup Wheel, PV6GH80 Straight Wheel, SV6GH60 Saucer Wheel.



AVAILABLE MOTORS

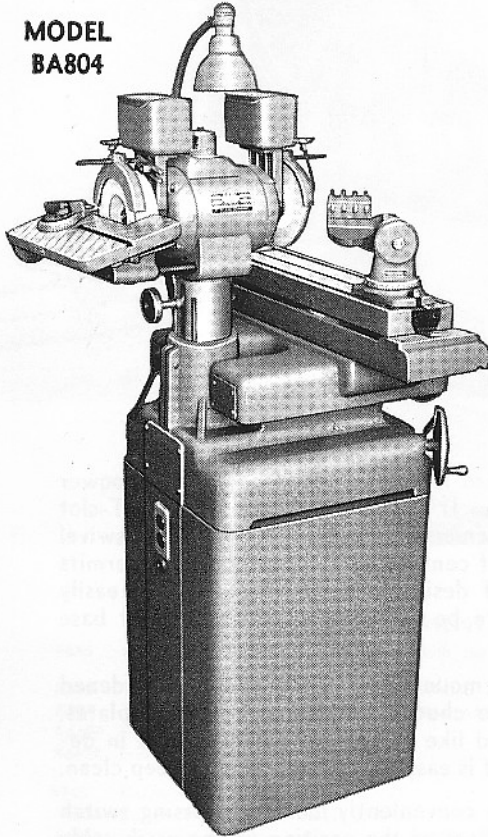
B832 1/4 HP, 110 volt, single phase, 50/60 cycle Motor Assembly (Recommended for use on B803 Chip Breaker Grinder only), B832AA 1/2 HP, 115-230 volt, single phase, 60 cycle Motor Assembly, B832B 1/4 HP, 220 volt, single phase, 60/50 cycle Motor Assembly, B832E 1/2 HP, 220 volt, three phase, 60/50 cycle Motor Assembly, B832F 1/4 HP, 220/440 volt, three phase, 60/50 cycle Motor Assembly, B832FA 1/4 HP, 440 volt three phase 50/60 cycle Motor Assembly, B832G 1/2 HP, 220/440 volt, three phase, 60/50 cycles Motor Assembly, B832FA 1/2 HP, 440 volt, three phase, 60/50 cycle Motor Assembly, B832F 1/4 HP, 110 volt, single phase, 25 cycle Motor Assembly, B832L 1/2 HP, 220 volt, three phase, 25 cycle Motor Assembly, B832P 1/2 HP, 115 volt, direct current Motor, B832R 1/4 HP, 230 volt, direct current Motor Assembly, B832S 1/2 HP, 115 volt, direct current Motor Assembly, B832U 1/4 HP, 550 volt, three phase, 25 cycle Motor Assembly, B832W 1/2 HP, 550 volt, three phase, 60 cycle Motor Assembly, B832Y 1/2 HP, 550 volt, three phase, 25 cycle Motor Assembly.

PHOTOGRAPH OF STANDARD EQUIPMENT



MODEL BA804 CARBIDE TOOL GRINDER

MODEL
BA804



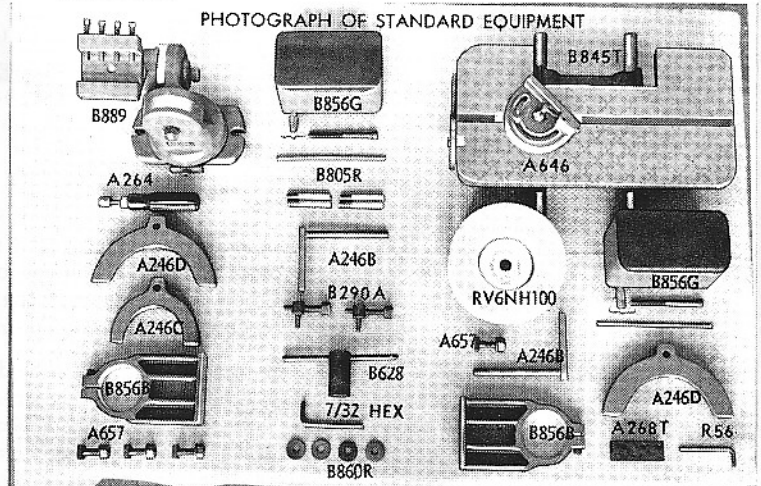
The new Model BA804 Universal Carbide Tool Grinder is built for fast and accurate grinding of single point conventional tools. This machine is precision built for a specific purpose, not an adaption to an operation. It holds appeal to the intelligent purchaser who demands high quality machinery and of reasonable price.

The picture at the left shows the machine as a complete universal Carbide Tool Grinder. On the right of the machine is mounted a six inch silicon carbide recessed grinding wheel along with the graduated tilting table and indexed protractor, making it ideal for rough grinding operations. It is equipped with the Universal work holding fixture which can be readily re-set for repeat grinding of chip breakers.

STANDARD EQUIPMENT FOR MODEL BA804

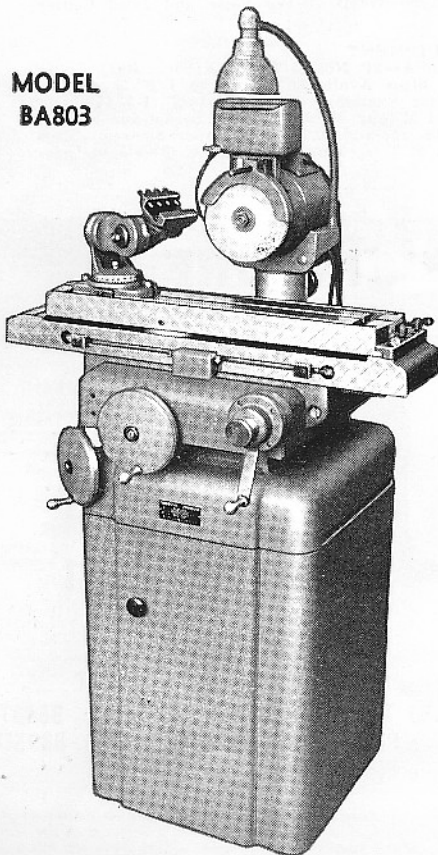
A246B Bracket, A246C 4" Wheel Guard, A246D 6" Wheel Guard, A267 LT Tube, A657 T-Slot Bolt, B628 Wrench, B805R Base Stud, B832E Motor and Saddle Assembly, B855W Open End Wrench, B856B Bracket, B856C Cover, B856G Tank, B860R Rubber Washer, B865 Cabinet Base, B839 Universal Work Holding Fixture, 7/32" Hex Wrench, B845 Carbide Tool Grinding Attachment—BREAK-DOWN OF B845 PARTS—A246B Bracket, A246D 6" Wheel Guard, A267LT Tube, A268T Tool Holder, A646 Protractor, A657 T-Slot Bolt, B845T Table Assembly, B856B Bracket, B856C Cover, B856G Tank, RV6NH100 Grinding Wheel, R56 Bristo Wrench.

PHOTOGRAPH OF STANDARD EQUIPMENT



MODEL BA803 CHIP BREAKER GRINDER

MODEL
BA803



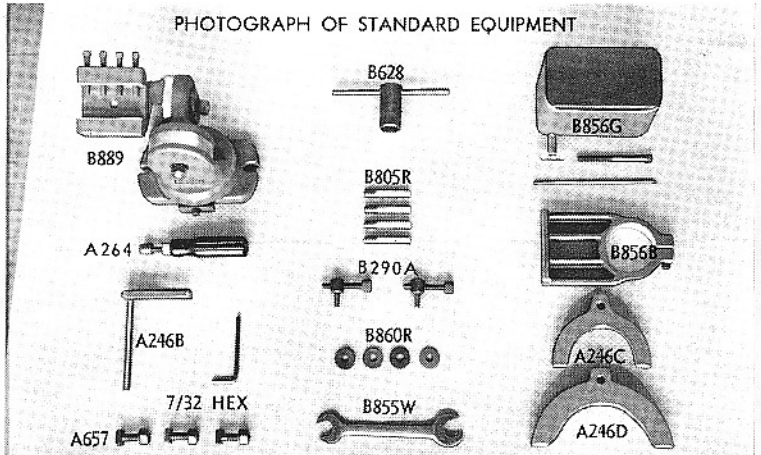
The Model BA803 Chip Breaker Grinder is manufactured with the same high quality basic features offered on our other models. This machine is designed for the grinding of small boring bits and flat form tools. 1 1/4" or 2" vise can be supplied for holding tools while being ground. Note: Diamond Wheel is not included with grinder. Grinding wheel hole size 5/8".

Models BA803 and BA804 can easily be converted to BA800 Machine by addition of BA800 Standard Equipment.

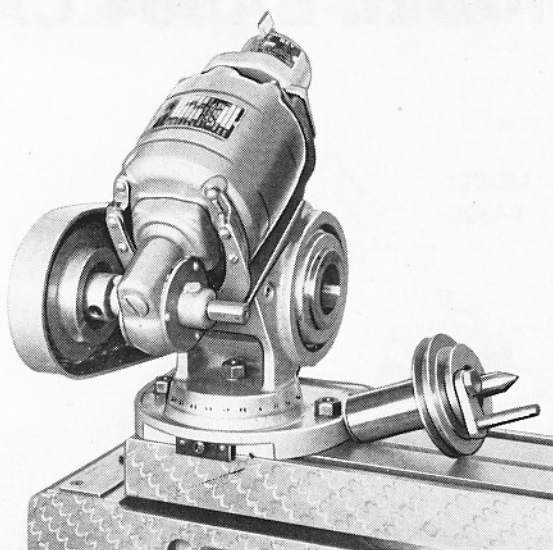
STANDARD EQUIPMENT FOR MODEL BA803

A246B Bracket, A246C 4" Wheel Guard, A246D 6" Wheel Guard, A267 LT Tube, A647 T-Slot Bolt, B628 Wrench, B805R Base Stud, B832 Motor and Saddle Assembly, B855W Open End Wrench, B856B Bracket, B856C Cover, B856G Tank, B860R Rubber Washer, B865 Cabinet Base, B889 Universal Work Holding Fixture, 7/32" Hex Wrench.

PHOTOGRAPH OF STANDARD EQUIPMENT



B943 MOTOR DRIVEN WORK HEAD



AVAILABLE MOTORS

115V - 1 Phase, 60 Cycle
230V - 3 Phase, 60 Cycle
440V - 3 Phase, 60 Cycle

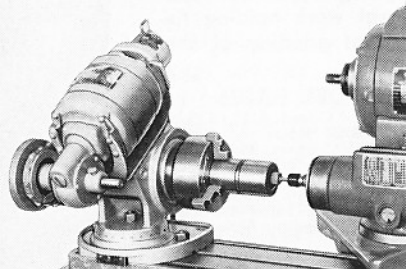
Please specify voltage

SPINDLE SPEEDS

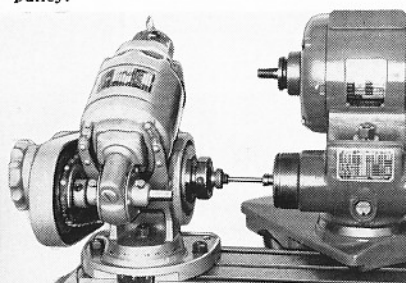
150 and 250 RPM

Other pulley combinations available - 60 RPM to 450 RPM - Additional cost of \$20.00.

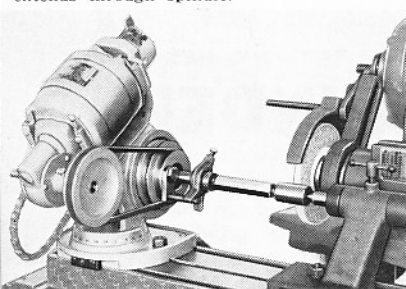
Grinding center point using B642T taper sleeve.



Internal grinding of special sleeve using A401E three-jaw universal chuck. Belt guard has been removed to show drive pulley.



Internal grinding of bushing being held in B641 collet fixture. Collet draw sleeve extends through spindle.



Cylindrical grinding plug gauge using B943D dead center. Pulley is transferred to other side of motor shaft. Work spindle is locked solid. Belt guard removed for photo.

The B943 Motor Driven Work Head is a compact self-contained power unit for internal and external grinding. It is held in position by two T-slot bolts and can be mounted at any convenient spot on the table. The swivel base, which is graduated 90° one side of center and 45° on the other, permits the Work Head to swivel full 360° if desired. Swivel base can be easily removed from head permitting units to be mounted on table without base if desired.

The No. 11 B & S tapered spindle, mounted on ball bearings, is hardened and ground, and is designed to receive chucks, collet fixtures, face plates, straight or tapered sleeves, centers, and like equipment. Streamlined in design, this fixture is quickly mounted and is easy for the operator to keep clean.

The special motor is provided with conveniently located reversing switch which is handy for the operator regardless of the position of the work table or rotation of the work. Motor is fully protected from dust and from any oil entering from working parts. This power unit is easily and quickly mounted on other makes of grinders. The motor is an independent unit and may be changed in the field by loosening two hold down screws.

STANDARD EQUIPMENT

B943 Motor Driven Work Head with Swivel Base. B943D Driver Plate and Dead Center Assembly.

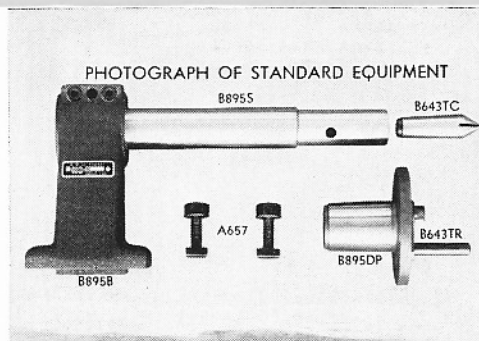
AVAILABLE EQUIPMENT

A401E 4" Three-Jaw Universal Chuck mounted on A643P No. 11 B & S Arbor. B641 Collet Fixture. B641C Collets for B641 Collet Fixture. Sizes Available: 3/16" to 1/2" by 64ths, 17/32" to 1" by 32nds. B641K Straight Sleeves. Sizes Available: 1-1/16", 1-1/8", 1-3/16", and 1-1/4". B642K No. 11 B & S Adapter with standard Milling Machine Taper Socket for holding B & S Cam Lock Tapers. Available in taper Nos. 10, 20, and 30. B642T Taper Sleeves. Sizes Available: Morse 1, 2, 3, and 4; Brown and Sharp 5, 7, 8, 9 and 10. B844E 6" 4-Jaw Independent Chuck mounted on No. 11 B & S Arbor.

MODEL B895 DEAD CENTER FIXTURE

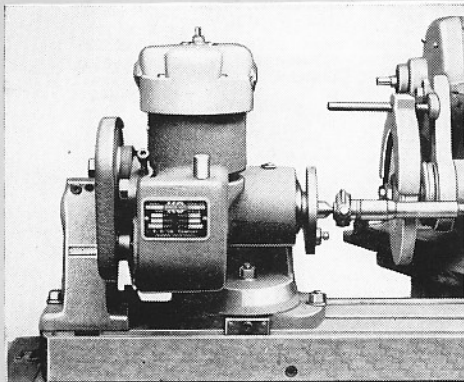
Extremely accurate grinding "on centers" can best be performed with the dead center attachment. This attachment can be used with any "B" Series Motor Driven Work Head, either right or left hand. No modification of work head is necessary—center extends through spindle and is supported on back side by a very rigid bracket. Drive plate fits in nose of spindle.

B643TC Center is removable and can be easily replaced. It is possible to regrind the center with B642T - No. 5 B & S Taper Sleeve. This sleeve fits any work head with No. 11 B & S Taper Spindle.



STANDARD EQUIPMENT

A657 T-Slot Bolt, B643TC Center, B643TR Drive Pin Assembly, B895B Bracket, B895DP Drive Plate, B895S Shaft.



Grinding the O.D. of Straight Arbor being held between B895 Dead Center Fixture and B821 Tail Stock. B895 Dead Center is mounted on left of B893 Work Head with center extending through work head. Work is driven by B895DP Drive Plate.

B942 SENSITIVE WORK HEAD

No. 11 B & S TAPER
IN SPINDLE

Here is a Sensitive Ball Bearing Work Head that is highly accurate and versatile. It is fully universal and may be used on any make of tool grinder. The head can be swiveled in both horizontal and vertical planes and is graduated in degrees. Indexing of the work is done at the back of the spindle. Index discs with any number of divisions are available for use with this unit.

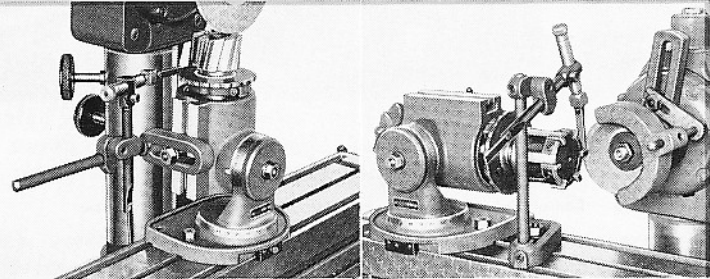
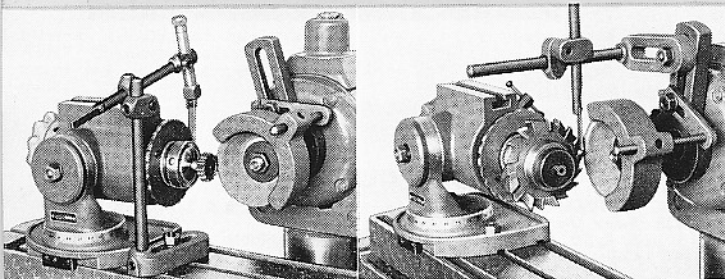
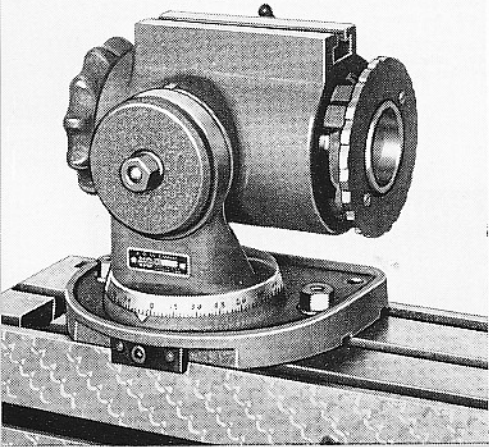
The spindle is mounted in ball bearings, and is hardened and ground for accuracy and long life. It may be mounted on either side of the angle bracket for convenience in setting up work. At the top, a spindle lock is provided which securely holds the spindle in any desired position. The spindle has a No. 11 B & S taper.

STANDARD EQUIPMENT

One B942C Collar. One B792D24 Index Disc with 24 divisions unless otherwise specified.

AVAILABLE EQUIPMENT

A401E 4" 3-Jaw Universal Chuck mounted on No. 11 B & S Arbor. B642R Index Discs for A642P Collar. 6, 8, 20, 24, 28, 32, and 36 divisions available. B641C Collet Fixture. B641C Collets for B641 Fixture. Available sizes: 3/16" to 1/2" by 64ths, 17/32" to 1" by 32nds. B641K Straight Sleeves. Available sizes: 1-1/16, 1/8, 1-3/16, and 1/4 inch. B642K No. 11 B & S Adapter with Standard Milling Machine Taper Socket for holding B & S Cam Lock Tapers. Available in taper Nos. 10, 20, and 30. B642T Adapter Sleeves. Available sizes: Morse 1, 2, 3, and 4; B & S 5, 7, 8, 9, and 10. B844E 6" 4-Jaw Independent Chuck mounted on No. 11 B & S Arbor.



Sharpening a key seat cutter being held in the B942 Work Head with a B941 Collet Fixture. Cutter is indexed with B840 Univ. Tooth Rest.

A stagger tooth cutter is shown being sharpened. It is held with a B852 arbor and B840 Univ. Tooth Rest mounted on motor bracket.

Gumming out shell end mill being held in a vertical position using B840 Universal Tooth Rest on index disc and B876 column extension.

Sharpening a carbide face mill using No. 10 B & S Adapter. The cutter is indexed on the tooth by the B840 Universal Tooth Rest.

B992 SENSITIVE WORK HEAD

No. 50 Milling Machine
Taper in Spindle

This is a rugged, but sensitive, ball bearing workhead with a No. 50 milling machine taper in the spindle to accommodate mounted and solid milling cutters of all kinds. The head can be swiveled in both horizontal and vertical planes and is graduated in degrees. Indexing may be done either directly on the cutter tooth or on an index plate mounted on the back of the spindle. Index discs with various divisions are available.

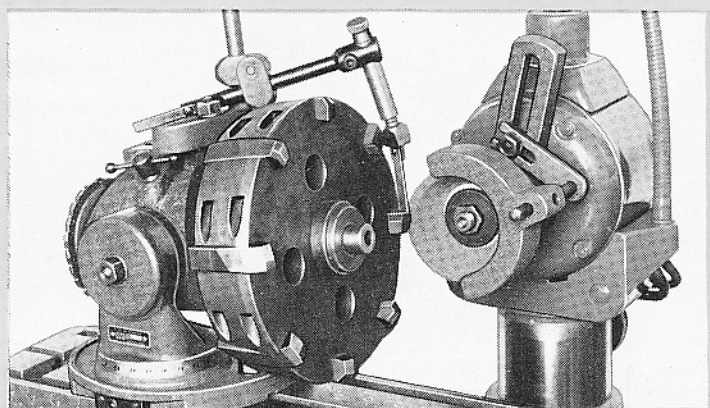
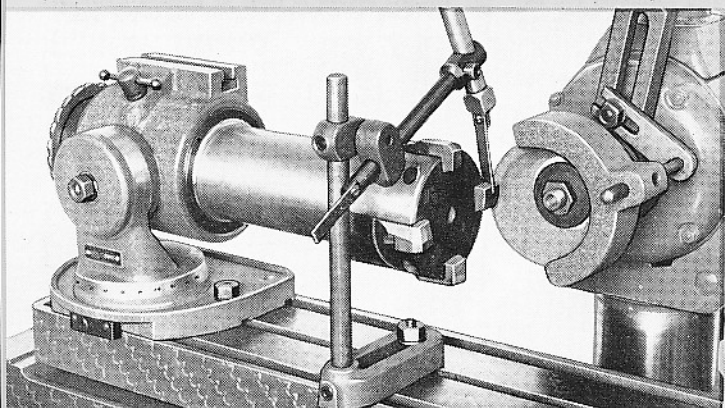
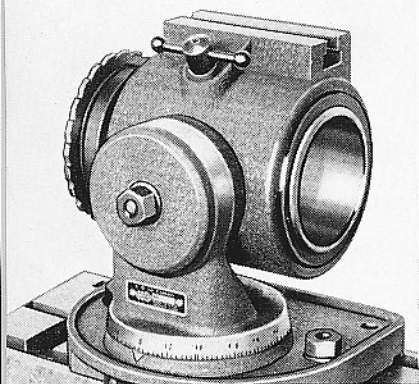
Adaptor sleeves for No. 40 milling machine taper and No. 11 B & S Taper are available. This makes possible the use of all "Knock-Out" fixtures such as collet fixture (B641), B & S and Morse taper sleeves, straight sleeves, etc., for grinding all types of tools from small end mills, keyway cutters, etc., to inserted blade cutters up to 8" diameter. A 1" raising block (B818) increases the capacity to 10-inch swing.

STANDARD EQUIPMENT

B992 Sensitive Workhead including: B792B Draw Bolt Assbly. B792C Collar with B792D24 index disc.

AVAILABLE ACCESSORIES

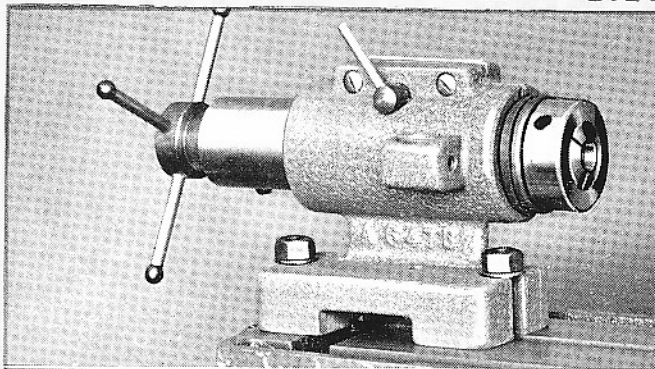
B792D Index discs, 6, 8, 20, 24, 28, 32, and 36 divisions available, B792F 50 to 40 milling machines taper sleeves, B792G 50 M.M. to 11 B & S taper sleeve, B792T Draw Sleeve for use with B792G Taper Sleeve.



Grinding a 4" diameter inserted blade cutter 14" long overall. Cutter head and shank are one piece and the long overhang necessitates a rigid fixture such as the B992 work head. Index finger may be mounted on the table.

An 8" inserted blade milling cutter with cemented carbide blades being ground using B992 work head. Greater accuracy and longer tool life are obtained by grinding cemented carbide cutters on the machine arbor.

B647 TAP GRINDING FIXTURE

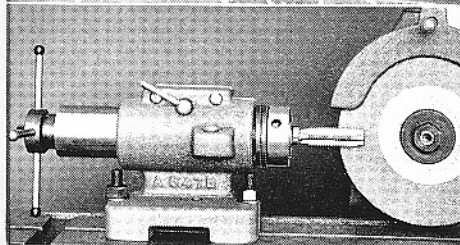


STANDARD EQUIPMENT

- B647 Tap Grinding Fixture complete with the following equipment:
 B647A 9/16" collet.
 B647B Bushings to fit Nos. 7 & 8, 9 & 10, 12, and sizes 1/4", 5/16", 3/8", 7/16", 1/2", and 5/8" taps.
 B647CA Cam for taps up to 3/4".
 B647CB Cam for taps from 3/8" to 3/4".
 B647CC Cam for taps over 3/4".
 B647D2 Two flute index disc.
 B647D3 Three flute index disc.
 B647D4 Four flute index disc.

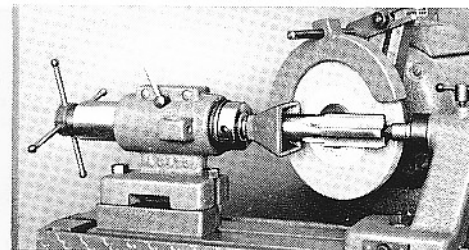
AVAILABLE ACCESSORIES

- B647B Bushing Taps No. 1 to 6 inclusive.
 B647C5 Cam, Special for 2 Flute Taps.
 B647C5L Cam, Special for 2 Flute Taps, L.H.
 B647CL Three sizes left hand cams.
 B647D Five and six flute index discs.
 B647E .800" collet to fit 1" tap.
 B647F Bushings for B647E Collet to fit 1 1/16", 3/4", and 7/8" taps.
 B647P Driver for use in grinding taps over 1".
 Note: Either A261G Spring Center (see price list) or B821 "Quick-Release" Tail Stock must be used with B647P Driver when grinding taps over 1" diameter.

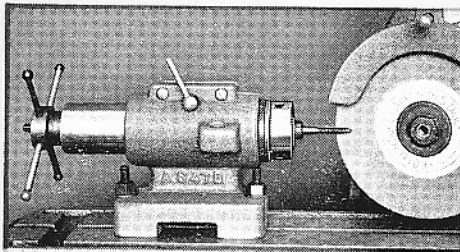


Sharpening a standard tap.

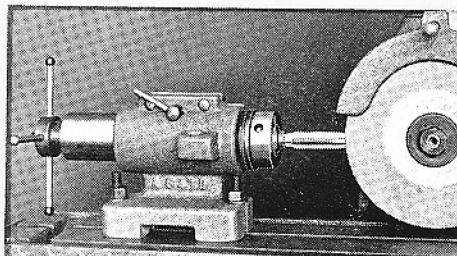
The B647 Tap Grinding Fixture is a sturdy, compact unit built to accommodate taps from a No. 8 size to 2 1/2" in diameter. It is easily mounted and set up for taps having two to six flutes, and is adaptable to any make of tool grinder.



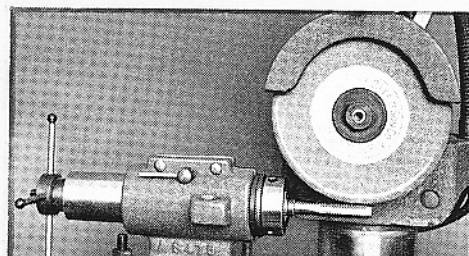
Sharpening a 2 1/2" tap.



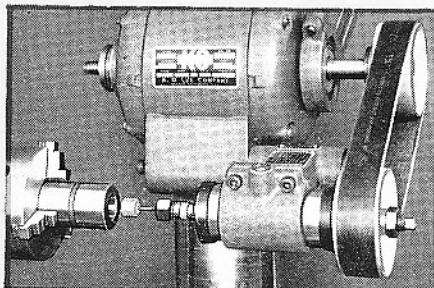
Grinding the relief on a No. 10 tap.



Salvaging broken tap.



Grinding the flute of a standard tap.



Internal grinding checking sleeve held in A401E Three-jaw Universal Chuck.

B880 HIGH SPEED GRINDING ATTACHMENT

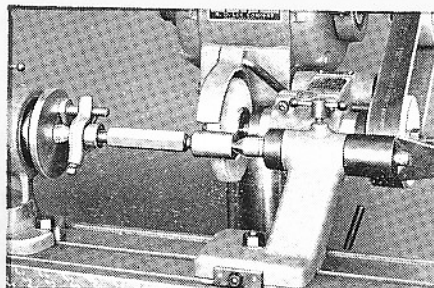
The B880 High-Speed Grinding Attachment can do all types of cylindrical and internal grinding; tapered or straight.

The attachment is quickly and easily installed or removed from the machine. Rigidity and alignment being assured by matching of machined surfaces.

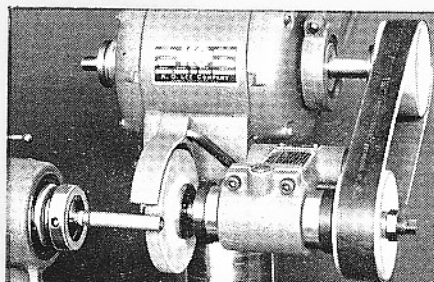
Eight pulleys are supplied with the attachment, thus giving the operator speeds from which to select for the job at hand. Also supplied as standard equipment are thirteen assorted grinding wheels. This supply permits the operator a wide selection from which to choose.

When used with the Motor Driven Work Head, your K-O Grinder becomes a fine, dependable universal grinding machine, permitting a wide scope of operations.

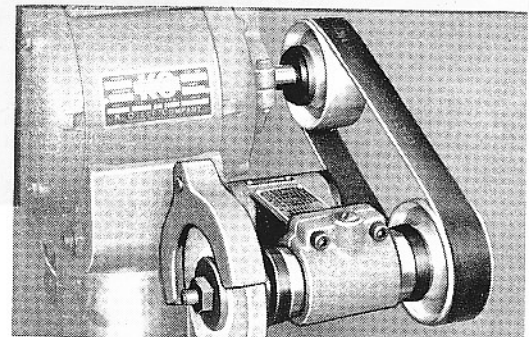
This attachment is designed for Models BA800, BA803 and BA804.



Cylindrical grinding plug gauge held between B643T Drive Plate and B821 Tail Stock.



Cylindrical grinding of arbor using B641 Collet Fixture.

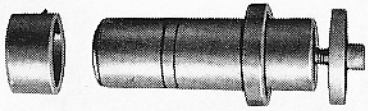


STANDARD EQUIPMENT

- A246C 4 Wheel Guard. B740A Bracket. B740GA Arm for Wheel Guard. B740S Stud. B780A Quill Assembly. B780C Collet Chuck Assembly. B780F Ext. Grinding Arbor Assembly. B780HB Spacer Bushing. B780H3 Pulley 2". B780H4 Pulley 1 1/2". B780H5 Pulley 1 1/4". B780H6 Pulley 1 1/8". B780H7 Pulley 1". B780J Wheel Arbor (5-40). B780K Wheel Arbor (1/4-28). B855H1 Pulley 3 3/8". B855H2 Pulley 4 1/2". B855H3 Pulley 6". B880N Name Plate. KO-16 Speed Chart. P4605 Plug. 1 1/4x22 Belt (Gates Speed Flex). 1 1/4x26 Belt (Gates Speed Flex). 2x1/8 S. T. Round Head Screw. 7/16x3/4 U.S.S. Hex Socket Set Screw. 7/32 Hex Wrench. 5/16x1 S.A.E. Hex Socket Cap Screw. 9/16 S.A.E. Hex Jam Nut (H). 9/16 S.A.E. Washer (H). 7/16x3/8 U.S.S. Hex Socket Set Screw (Flat Point). A32 Mounted Cup Wheel. A36 Mounted Wheel. A37 Mounted Wheel. W160 Mounted Wheel. W162 Mounted Wheel. W163 Mounted Wheel. W175 Mounted Wheel. W184 Mounted Wheel. W185 Mounted Wheel. W194 Mounted Wheel. CR2 1/2MH60 Cup Wheel. PV2FF60 Straight Wheel. P54BH60 Straight Wheel. P54FH60 Straight Wheel.

DIAMETER OF WHEEL	WHEEL SPEED RPM	PULLEY ON MOTOR 3450	PULLEY ON SPIND.
6 TO 5	3,450	3 3/8	3 3/8
5 TO 4	4,600	4 1/2	3 3/8
4 TO 3	5,820	3 3/8	2
3 TO 2	7,760	4 1/2	2
2 TO 1 1/2	10,350	6	2
1 1/2 TO 1	13,800	6	1 1/2
1 TO 3/4	16,560	6	1 1/4
3/4 TO 1/2	18,400	6	1 1/8
1/2 TO 1/4	20,700	6	1

AVAILABLE ARBORS AND ADAPTERS



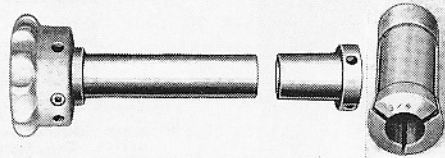
SHELL END MILL AND CUTTER ARBOR

No. 11 B & S Taper O.D.

Specially Designed to Sharpen OD and Face of Shell Type Milling Cutters

B848	1/2"	Arbor
B849	3/4"	Arbor
B851	1"	Arbor
B852	1 1/4"	Arbor
B853	1 1/2"	Arbor

SPECIAL SIZES AVAILABLE ON REQUEST



B641 & B941 COLLET FIXTURES AND B641C COLLETS

B641 Collet Fixture for B843, B893 and B943 Motor Driven Work Head, B842 and B942 Sensitive Work Head and B885 Radial Grinding Fixture.

B941 Collet fixture for B942 head.

B641C Collets for B641 and B941 Collet Fixtures. Available sizes: 3/16" to 1/2" by 64ths, 1/32" to 1" by 32nds. Special sizes 3/16" to 1/4" by 64ths.



CUTTER GRINDING ARBOR

These Arbors can be used with Various Type Cutters using B820 Head Stock

A280 Friction Collar for A282, A283 and A284 Arbors, and A301 Chucks

A281 Friction Collar for A285 Arbor

A282 3/4" Cutter Grinding Arbor

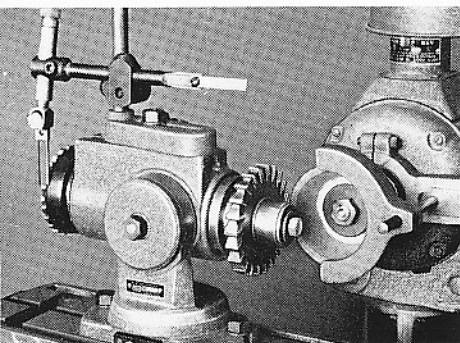
A283 5/8" Cutter Grinding Arbor

A284 1" Cutter Grinding Arbor

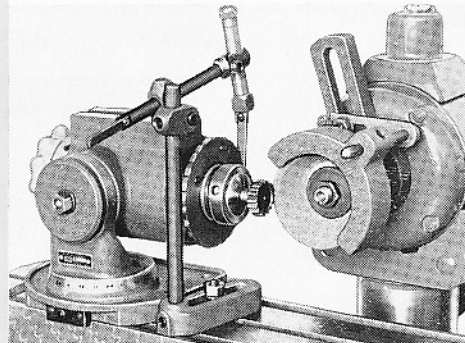
A285 1 1/4" Cutter Grinding Arbor

A286 Friction Collar for A286L Arbor

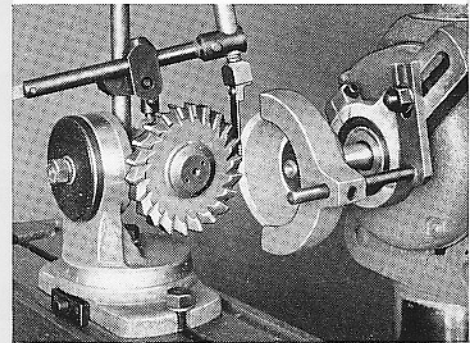
A286L 1 1/2" Cutter Grinding Arbor



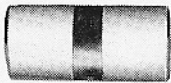
A side milling cutter is shown being sharpened. It is held with a special arbor and B840 Universal Tooth Rest is used on index plate.



Sharpening a key seat cutter being held in the B942 Work Head with a B941 Collet Fixture. Cutter is indexed with B840 Univ. Tooth Rest.



Plain milling cutter being sharpened, mounted on a A284 Arbor and held by A280 Friction Collar. The tooth rest is indexed against the tooth being ground.

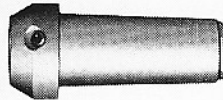


B642T TAPER SLEEVES

NO. 11B & S TAPER O.D.

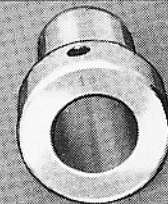
These Sleeves can be used on all Type Cutters with Taper Shanks.

B642T Taper Sleeves for B842, B942 Sensitive Work Head, B843, B893, B943 Motor Driven Work Head, and B885 Radial Grinding Fixture. Available sizes: MORSE 1, 2, 3, and 4; B & S 5, 7, 8, 9, and 10.



B642K ADAPTER No. 11 B & S O.D.

This Adapter has a Standard Milling Machine Taper Socket for holding B & S Cam Lock Tapers. Available in Taper Nos. 10-20-30. For use in B842, B942 Sensitive Head, B843, B893, B943 Motor Driven Work Head and B885 Radial Grinding Fixture.

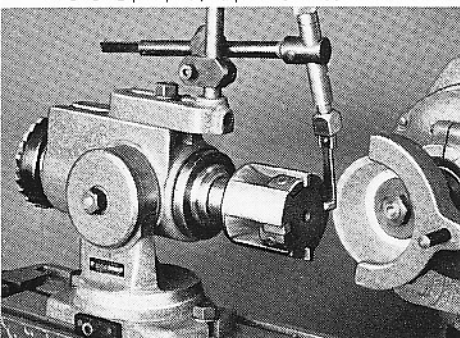


B641K STRAIGHT SLEEVES

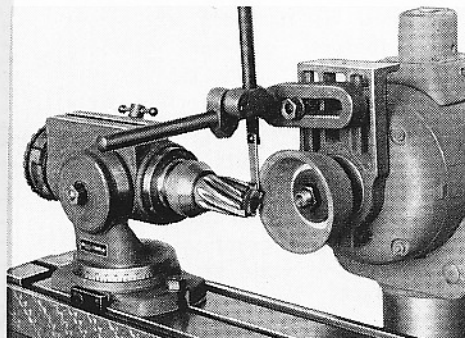
No. 11 B & S Taper O.D.

These Sleeves can be used to sharpen straight shank cutters of sizes given.

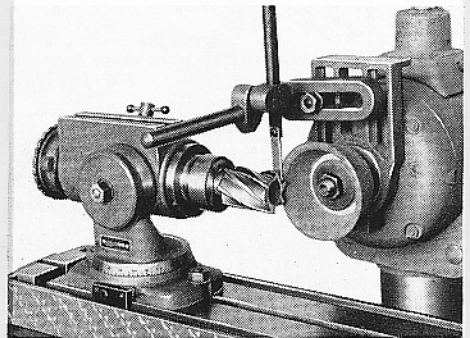
B641K Straight Sleeves to be used in B842, B942 Sensitive Head, B843, B893, B943 Motor Driven Work Head and B885 Radial Grinding Fixture. Available sizes: 1 1/8", 1 1/4", 1 3/8", 1 1/2".



Sharpening a carbide face mill using No. 10 B & S Adapter. The cutter is indexed on the tooth by the B840 Universal Tooth Rest.



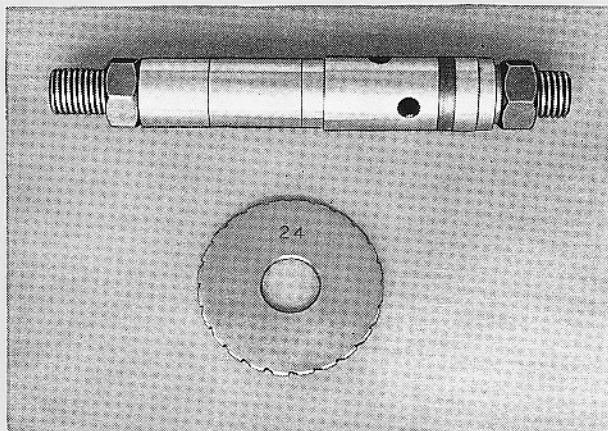
A Milling Machine Taper Lock End Mill is Shown Being Sharpened using B642K No. 30.



A Straight Shank End Mill Being Sharpened, Held with 1-1/16" Straight Sleeve.

CUTTER AND HOB GRINDING ARBORS

For Straight, Spiral and Helical Cutters and Hobs



ARBOR SETS

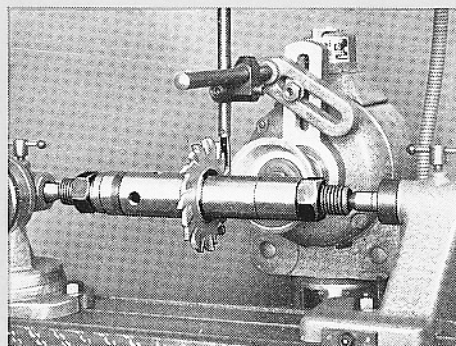
- B648A** Set of three Cutter and Hob Grinding Arbors including:
 B650 $\frac{7}{8}$ " arbor with spacer sleeves and collar for index discs.
 B651 1" arbor with spacer sleeves and collar.
 B652 $1\frac{1}{4}$ " arbor with spacer sleeves.
B648B Set of five Cutter and Hob Grinding Arbors including:
 B649 $\frac{3}{4}$ " arbor with spacer sleeves and collar.
 B650 $\frac{7}{8}$ " arbor with spacer sleeves and collar.
 B651 1" arbor with spacer sleeves and collar.
 B652 $1\frac{1}{4}$ " arbor with spacer sleeves.
 B653 $1\frac{1}{2}$ " arbor with spacer sleeves.

SINGLE ARBORS

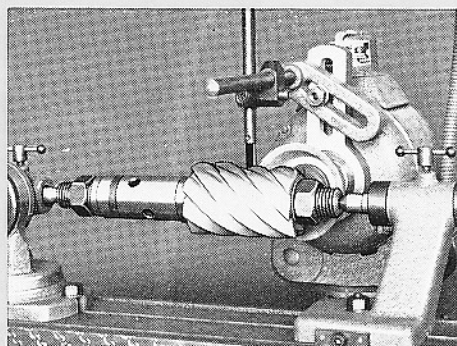
Any arbor may be purchased singly without penalty to the customer. Index Discs must be purchased separately. All index discs fit any arbor.

INDEX DISCS

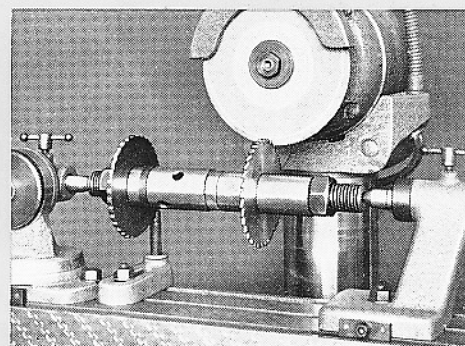
B648D Index Discs to fit all arbors. Available in 24, 30, 32, 34, 36, 38, 40, 42, 44, 48, 52, 54, and 56 divisions.



Sharpening alternate tooth cutter held on B652 $1\frac{1}{4}$ " straight arbor. B840 Universal Tooth Rest is indexed on cutter tooth.

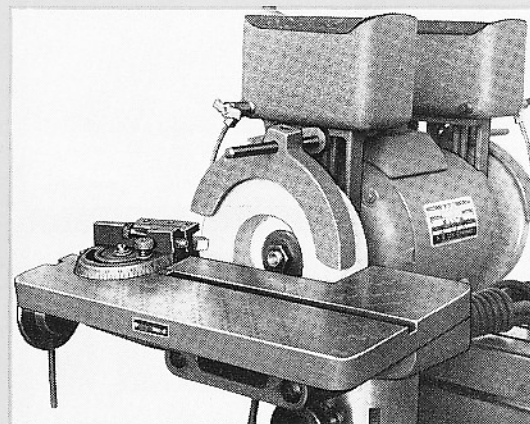


Sharpening a spiral slot cutter held on B651 1" straight arbor. B840 Universal Tooth Rest is indexed on cutter tooth.



Gumming out $\frac{1}{8}$ " slitting saw held on B651 1" straight arbor. B827 plain tooth rest is indexed against index disc.

B845 TILTING TABLE ATTACHMENT



The B845 Tilting Table Attachment, complete with large 10" x 14" Tool Rest Table, Protractor, Tool Holder, Coolant Tank, and Silicon Carbide Wheel, is built to fit all K-O grinders except Models BA860. Accurate settings to any angle from horizontal to 20° below can be made with the eccentric wheel at the side. Rough and finish grinding on conventional single point, carbide tipped tools and high speed steel cutting tools is done with this attachment. Provision is made in the protractor to accommodate diamond screw for dressing wheel. After rapidly hogging off metal by an alternate grinding procedure, accurate grinding of double angles is essential for obtaining fine finishes. All of these operations and many more can be accomplished with this attachment.

STANDARD EQUIPMENT

A246B Bracket, A246D 6" Wheel Guard, A267LT Tube, A268T Tool Bit Holder for Tools from $\frac{3}{16}$ " to $\frac{5}{16}$ " square. B845T Tilting Table Assembly. A646 Protractor. B856B Bracket, B856C Cover, B856G Tank, A657 T-Slot Bolt. RV6NH100 6" x $1\frac{1}{2}$ " x $\frac{5}{8}$ " Silicon Carbide Recessed Grinding Wheel.

AVAILABLE EQUIPMENT

A268TL Tool Bit Holder for Tools from $\frac{5}{16}$ " to $\frac{1}{2}$ " square.

B989 UNIVERSAL WORK HOLDING FIXTURE

The B989 Universal Work Holding Fixture has four quadrants permitting the rapid, positive setting of any compound angle. It is easier and faster to set up for such grinding operations as: parallel or angular chip breakers with positive or negative rake, form grinding, inside thread cutters and many other tool room and cutter grinding jobs.

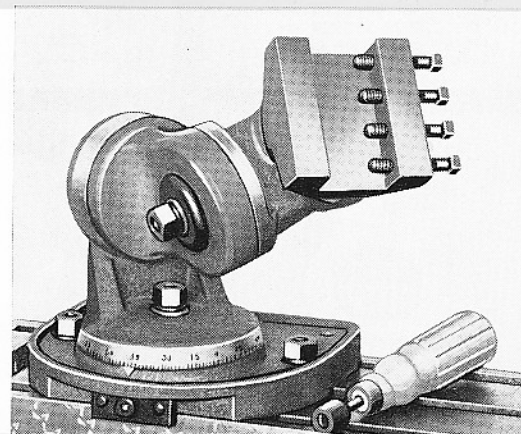
When grinding carbide tools it is advisable to use a Wet Wheel Guard.

STANDARD EQUIPMENT

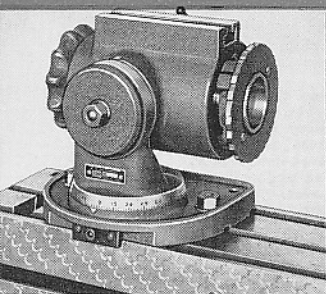
A264 Screw driver type socket wrench, B789X $1\frac{1}{2}$ " vise.

AVAILABLE ACCESSORIES

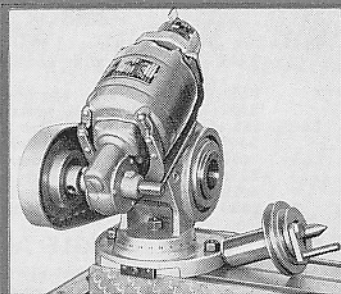
A268T Tool Bit Holder for tools from $\frac{3}{16}$ " to $\frac{5}{16}$ " square, A268TL Tool Bit Holder for tools from $\frac{5}{16}$ " to $\frac{1}{2}$ " square, A767B Wet Wheel Guard with shut off cocks and tubing, B789Z 2" vise. (For descriptions of available grinding wheels see price list).



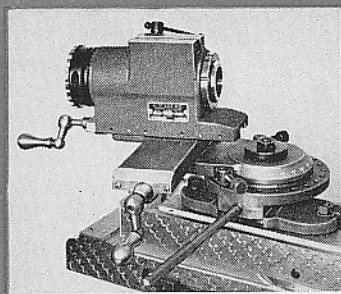
K-O Engineers Make Available More Time-Tested Fixtures Than Any Other Grinder Manufacturer



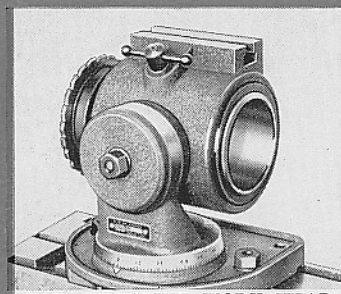
B942 SENSITIVE WORK HEAD
No. 11 B & S Taper in Spindle



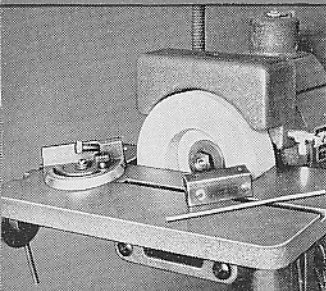
B943 MOTOR DRIVEN WORK HEAD
115V, 230V, 440V Available
No. 11 B & S Taper in Spindle



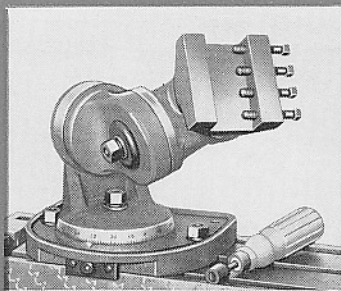
B885 RADIAL GRINDING FIXTURE
No. 11 B & S Taper in Spindle



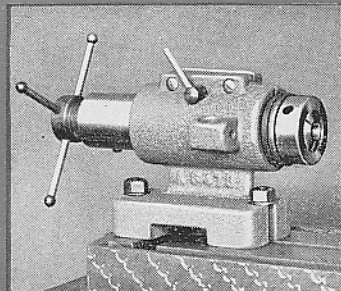
B992 SENSITIVE WORK HEAD
No. 50 Milling Machine Taper In Spindle. Adapter Sleeves for No. 40 M.M. Taper and No. 11 B & S Taper are available



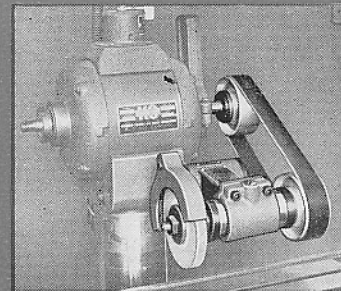
B845 TILTING TABLE ATTACHMENT
Designed for Models BA800, BA803 and BA804



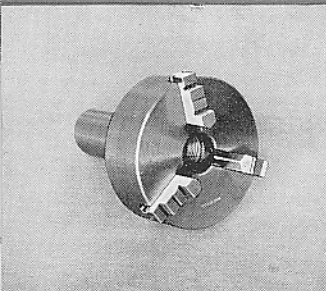
B989 UNIVERSAL WORK HOLDING FIXTURE
With A264 Wrench & B789X Vise



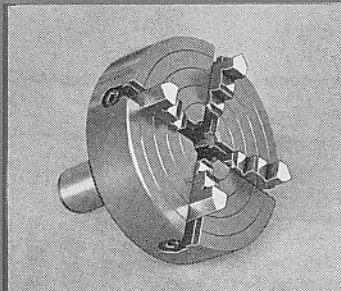
B647 TAP GRINDING FIXTURE



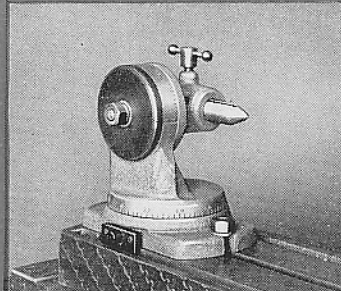
B880 HIGH SPEED GRINDING ATTACHMENT
For B943, B843 and B893 Work Head



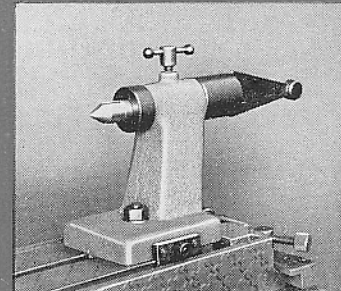
A401E 4" UNIVERSAL 3-JAW CHUCK
Used with all No. 11 B. & S. Taper Spindles



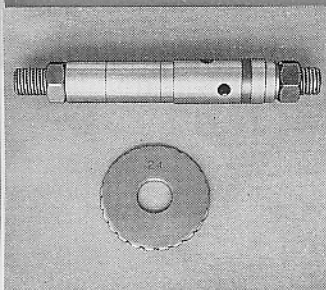
B844E 6" INDEPENDENT 4-JAW CHUCK
Used with all No. 11 B. & S. Taper Spindles



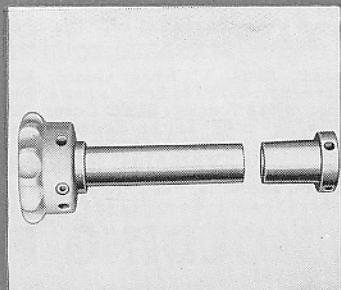
B820 UNIVERSAL HEAD STOCK
With Center



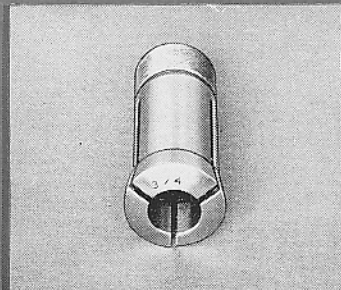
B821 TAIL STOCK
Reversible Spring Center



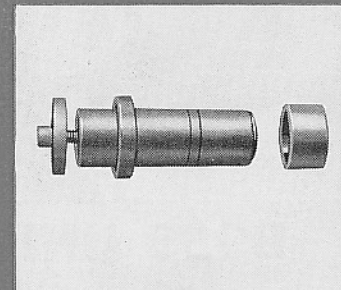
B648 SERIES CUTTER AND HOB GRINDING ARBORS AND INDEX DISCS



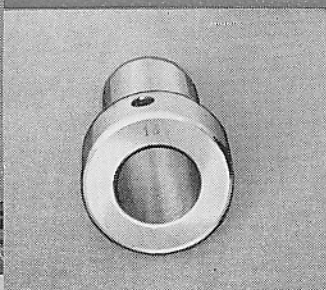
B641 COLLET FIXTURE
Used with all No. 11 B. & S. Taper Spindles



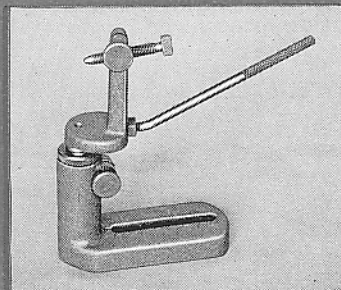
B641C COLLETS FOR B641 FIXTURE
3/16" to 1/2" by 64ths
17/32" to 1" by 32nds



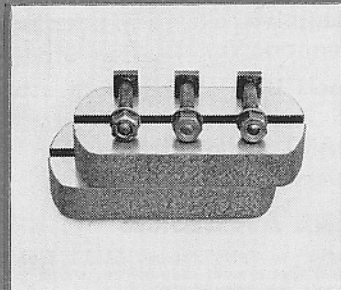
SHELL END MILL AND CUTTER ARBOR
1/2", 3/4", 1", 1 1/4", 1 1/2"
Special Sizes Available



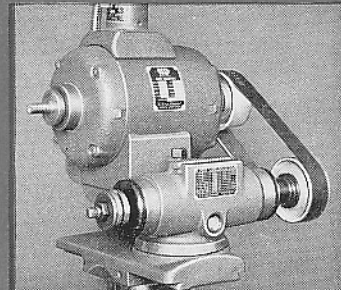
B641K STRAIGHT SLEEVES
Used with all No. 11 B. & S. Taper Spindles



B269 RADIAL DIAMOND DRESSER
With P176D Diamond Screw



B818 TWO 1" RAISING BLOCKS
Increases Swing Over Table from 8 1/4" to 10 1/4"



B855 UNIVERSAL GRINDING HEAD
For Internal and External Grinding