No. 1 UNIVERSAL GRINDING MACHINE MOTOR DRIVEN



CAPACITY:

CENTERS SWING 10" DIAMETER CENTERS SWING $8\frac{1}{2}$ " OVER WATER GUARDS CENTERS TAKE 20" IN LENGTH

BROWN & SHARPE MFG. CO. Providence, R. I., U. S. A.

SPECIFICATIONS No. 1 Universal Grinding Machine Motor Driven

CAPACITY Centers swing 10" diameter, $8\frac{1}{2}$ " over water guards; take 20" length.

- WHEEL SPINDLE Of tool steel. Bearings hardened, ground, and lapped. Self-aligning phosphor bronze boxes provided with means of compensation for wear. Driven by constant speed motor, 1 H.P.; 1½" belt. Guarded. Spindle and wheel quickly removed. Hinged caps for boxes. Takes wheels to 10" diameter, 3%" to ½" thick.
- WHEEL STAND SLIDE Solidly supported on bed and base which form rear column of machine. Counterweighted to take up backlash. Swivels. Base graduated in degrees to 90° either side of zero. Wheel can be used in any position without inter-ference. Transverse movement controlled by handwheel. Graduations read to thousandths of an inch on diameter of work. Metal cover protects ways from dust and water. Wheel spindle driving motor mounted on adjustable motor plate. Plate fastened to a raised platform cast integral with wheel stand. Motor may be reversed for internal grinding.
- AUTOMATIC CROSS FEED Accurate. Cross feed mechanism runs on anti-friction bearings with adjustment for wear. Range .00025" to .004" on diameter of work at each reversal of the table. Integral part of the machine. Easily and quickly set. Automatically thrown out when work is to size. Can be set to feed full amount at both ends of table travel or any part of full amount at either end.
- SWIVEL TABLE Turns on a large central stud, hardened and ground; bronze bushing provides means of compensation for WIVEL TABLE Trans on a large central stud, hardened and ground, bronze busing provides means of compensation for wear. Clamped at both ends. Can be set at an angle to table ways. Scale graduated to 7° reads half the included angle. Scales reading to 3" taper per foot and 25% indicate the included angle. 1 T-slot ⁹/₁₆" wide.
 TABLE Driven by a ¹/₂ H. P. constant speed motor. Travel automatic. Controlled by adjustable dogs; dog brackets slide on
- rack. Ways proportioned to give large wearing surfaces. Oil distributed evenly by rolls. Ways protected by metal covers.
- SPEEDS Speeds of wheel, work, and table entirely independent of each other. Changes obtained by use of change and cone pulleys. There are 3 changes of wheel spindle speed: 2444, 2850 and 3560 R. P. M.; 4 changes of work speed: 122, 210, 351 and 633 R. P. M.; 8 changes of table speed: 3", 5", 7.5", 10.5", 15", 25", 37" and 51" per minute.

REVERSING MECHANISM Accurate. Allows work to be ground close to shoulder.

- **HEADSTOCK** A complete unit, driven by a 1/4 H.P. constant speed motor. Turns on stud. Can be clamped at any desired angle. Graduated scale on base indicates setting in degrees to 100° either side of zero. Spindle hardened, ground and lapped. Phosphor bronze boxes provided with means of compensation for wear. Front end threaded, 11/2" diameter, 6 R. H., U.S. S.; has No. 6 Taper Hole. Drives on either live or dead centers. Quick acting clutch starts and stops rotation of work without stopping motor. Operated by convenient lever.
- FOOTSTOCK Clamped to swivel table by a lever. Metal cover protects spindle. Holder for diamond tool attached. Wheel can be trued without removing work.
- UNIVERSAL BACK RESTS For supporting slender work or splined shafts. Universal in all movements. Capable of most delicate adjustments. Automatically compensate for difference in diameter as the work approaches size. Pressure on shoe automatically released when work is to size. Equipped with adjustable bronze shoes easily and quickly adjusted to different diameters.
- WET GRINDING Provision for abundant supply of water. Tank and centrifugal pump attached to rear of machine. Pump simple in construction; needs no priming or packing. Driven from table driving motor.

BASE Hollow. Rigidly braced internally. Fitted as a closet. Supported at three points, preserving alignments.

FLOOR SPACE At right angles to spindle, 48". Parallel to spindle, 107".

EQUIPMENT No. 03M Internal Grinding Fixture; 6" 4-jawed independent chuck; face plate; face chuck; wheel truing stand; 2 universal back rests; 2 adjustable bronze shoes; center rest. 2 grinding wheels: 1, 10" diameter, 1/2" thick, 3" hole; 1, 6" diameter, 1/2" thick, 2" hole. Set of dogs; set of telescopic water guards; wrenches and everything else shown in cut on cover and in panel below, including three constant speed motors, controlling equipment, and wiring complete.



WEIGHTS AND SHIPPING DATA*	Net Weight, Lbs. (Approx.)	Domestic Shipping Weight, Lbs. (Approx.)	Foreign Shipping Weight, Lbs. (Approx.)	Dim. For Shipment, Inches	Space Occupied, Cu. Ft.
Machine, complete, with Motor Drive	2650	3000	3100	79x36x48	79

*Because of the fineness of motor balance required for both direct and alternating current installations the machine is only furnished fitted with motors

The Universal Head is available for use on the Motor Driven No. 1 Universal Grinding Machine as an extra. Separate specifications are issued on the Belt Driven No. 1 Universal Grinding Machine.

Features of Construction

THE No. 1 Universal Grinding Machine (Motor Driven) is an unusually compact and efficient machine of the modern, self-contained type. It is recommended to those desiring the complete unit-type of machine and also to those whose installation problem prohibits the use of overhead works.

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Headstock control lever operates clutch which affords rapid starting or stopping of the work drive.

Headstock a complete unit. Sturdily constructed. Individual motor drives on both live and dead centers. Base swivels. Scale graduated to read to degrees. Driving motor securely mounted on platform.

Table guards protect ways of bed from injury by grit or coolant.

Adjustable reversing dog slides on rack. Has fine adjustment by thumb screw.

Reversing lever actuated by table dogs. May be operated by hand. Connected with the cross feed mechanism for automatically feeding wheel to work.

Cross feed handwheel.

Base supported on three points to preserve alignments. Large closet affords ample room for storage of accessories. Wheel guard affords ample protection for operator. Complies with safety code standards. Spindle driven by belt from individual motor on wheel stand. Belt guards protect operator. Spindle carried in adjustable phosphor bronze boxes on counterweighted wheel slide.

Footstock slides on table. Clamped in position by convenient lever. Spindle operated by spring lever. Hand clamp locks spindle for heavy work.

Spring latch for engaging fine adjustment of swivel table.

Fine adjustments of swivel table made by knob at front.

Lever for engaging either hand or automatic feed of table.

Conveniently located push button switch simultaneously controls the three motors used for driving headstock, wheel spindle, power feed of table, and coolant pump.

Table handwheel.

Wheel spindle driven by individual motor (reversible for internal grinding) securely mounted on platform cast integral with wheel stand. Correct tension in drive belt maintained by screw adjustment.

Screw arrangement for reversing the direction of pull of counterweight for internal grinding.

Wheel platen swivels on large base. Scale, graduated to 90° either side of zero, indicates adjustment.

Ample supply of coolant provided by pump and tank attached to base at rear of machine.

Power for table movement is supplied by motor mounted on bracket at rear of machine behind headstock motor reversing switch.

Power is transmitted to table by belts through countershaft and set of cone pulleys. Cone pulleys provide changes of table speed. Changes easily and quickly made.



Details of Construction

Wheel Stand Completely Adjustable

THE grinding wheels of the Brown & Sharpe Universal Grinding Machines may be used in practically any horizontal position of the spindle as the wheel stand is completely universal in its construction. The wheel can be mounted either on the left end of the self-aligning spindle or between its bearings.

The spindle is mounted in a wheel stand carried on a swivelled platen in which there are T-slots allowing transverse adjustments of the wheel stand. The wheel platen is carried, in turn, on a counterweighted wheel stand slide which has both transverse and angular adjustments.

The cross feed mechanism, which may be operated automatically or by hand, controls the transverse movements of the wheel stand slide. The automatic cross feed is accomplished by means of a ratchet and pawl which can be made to feed from .00025" to .004" on the diameter of the work at each reversal of the table. The mechanism can be set to feed the full amount at both ends of the table or any part of it at either end. The automatic cross feed is automatically thrown out when the work is to size. Hand operation of the cross feed is by a handwheel which is graduated to read to thousandths of an inch.



WHEEL STAND

Every effort has been made to assure long life and accuracy for these machines. The worm shaft is mounted in self-aligning radial ball bearings and ball thrust bearings, and adjustments for wear are easily made from the front of the machine by turning a notched locking screw. The cross feed worm threads are hardened and ground, and the worm wheel is made of hard bronze. An adjustment is provided to take up wear between the worm and wheel. The cross feed rack pinion shaft is mounted on tapered roller bearings and has means of compensation for wear.

As an aid to the elimination of backlash, the cross slide is counterweighted by suspending a weight on a chain that is fastened to an auxiliary slide which may be adjusted in relation to the cross slide. The chain runs through the center of the rack pinion thereby allowing full angular movement of the cross slides. The position of the auxiliary slide and resultant pull of the counterweight are adjusted by a screw at the rear of the platen. The pull of the counterweight steadies the infeed in both external and internal grinding. The platen need not be reversed for internal grinding as the wheel stand motor is reversible, thus eliminating the need of a special countershaft to replace the spindle.

Angular settings of the wheel stand slide to 90 degrees either side of zero are made by means of the graduated swivel base. The entire assembly is solidly supported on a heavy bed and base which forms the rear column of the machine.

BROWN & SHARPE GRINDING SERVICE

Among the many departments maintained to provide service for our customers is one developed solely to solve grinding problems. Our engineers have at their disposal an abundance of data and a wealth of experience acquired through years of operation on many kinds of grinding work, both in our own shop and in others where our machines are at work. Because of this fund of information and experience we are especially fitted to design correct grinding methods for any particular job to which our machines may be applied.

Layouts and fixtures produced by this Service have helped many manufacturers to faster and better grinding with Brown & Sharpe machines. Do not hesitate to call on this Service in connection with your requirements.

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