

SOUTH BEND VERTICAL SPINDLE

Precision

MILLING MACHINE

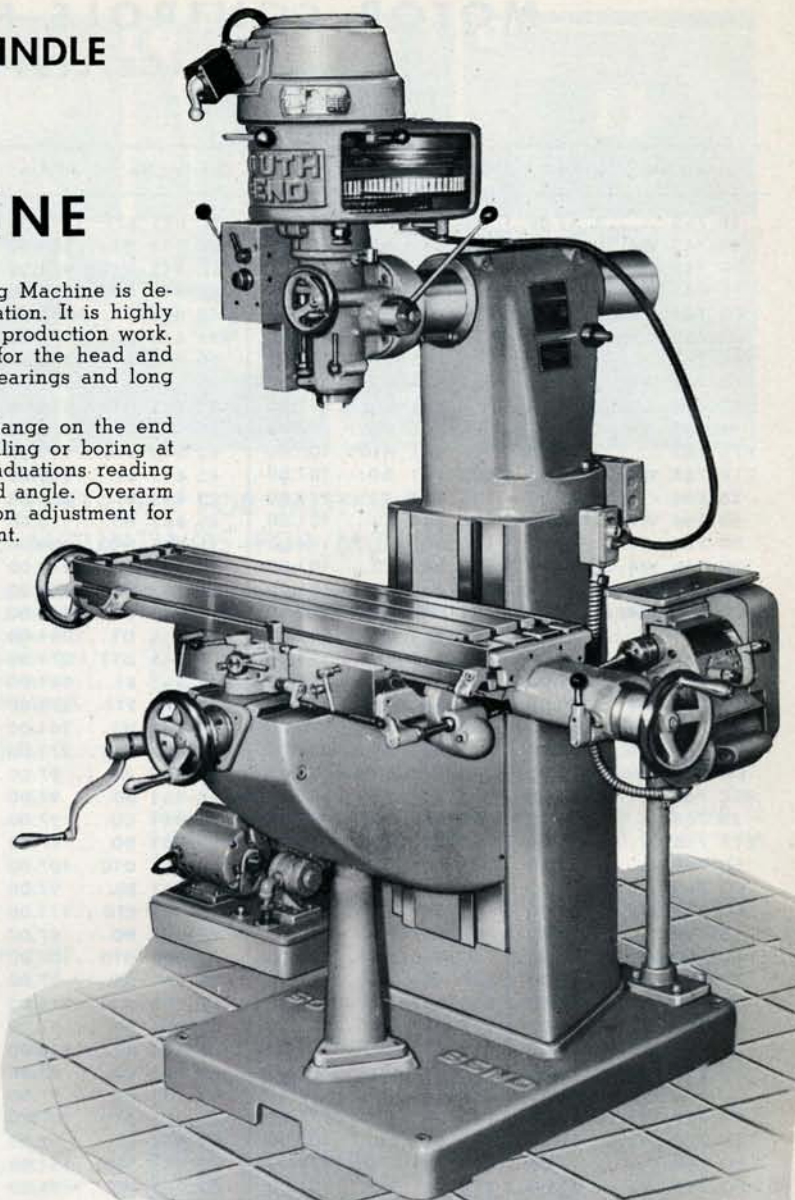
The South Bend Vertical Spindle Precision Milling Machine is designed for maximum convenience and ease of operation. It is highly efficient for a wide variety of exacting toolroom and production work. Heavily constructed column provides rigid support for the head and table assemblies. Massive knee has wide dovetail bearings and long tapered gibs for both column and table.

The universal type head is mounted on a large flange on the end of the overarm and swivels full 360° for milling, drilling or boring at any angle. Worm gearing and precision vernier graduations reading in minutes permit quick and easy adjustment for head angle. Overarm has large key with tapered gib and rack and pinion adjustment for positioning head without disturbing angular adjustment.

Flange mounted motor designed for operating in any position is mounted on milling machine head. Motor housing swivels around spindle for maximum flexibility in setting up work. A compound V-belt and timing belt "Lo-Loss" drive transmits power to the spindle with extreme smoothness. Aluminum pulleys are accurately machined and balanced. Convenient belt tension release permits changing speeds quickly and easily. Reversing switch controls direction of spindle rotation, permitting right- or left-hand milling. Convenient mechanical brake permits stopping spindle quickly. Spindle lock is provided for easy changing of cutting tools.

Spindle is made of hardened and ground alloy steel and runs in Timken tapered precision roller bearings. The ten-spline spindle has lever for rapid movement and handwheel for slow feed. A dependable micrometer depth stop is graduated in thousandths and positive quill lock is provided.

Table has dual controls for operating from either end. Movement of table is controlled by two Acme thread feed screws, each equipped with large easy-reading satin finish chrome plated micrometer collars with black graduations. Adjustable stops are provided for regulating the length of table feed. Three T-slots for clamping work or fixtures extend full length of table.



PRICES OF SOUTH BEND MILLING MACHINES

Equipment included in prices of milling machines listed below consists of three phase, 60 cycle, 220/440 v. A.C. motor; reversing switch; master collet holder; wrenches; and four collets having 3/8", 1/2", 5/8" and 3/4" capacities respectively. See pages 76 and 77 for cutter arbors, vises and other accessories.

Catalog Number	Table Length	Motor		Price
		R.P.M.	H.P.	
MIL3212	32"	1200	3/4	\$1829.00
MIL3218	32"	1800	1	1829.00
MIL4212	42"	1200	3/4	1911.00
MIL4218	42"	1800	1	1911.00

ALTERNATE MOTORS AND CONTROL

Prices below show the additional cost for single phase and special three phase motors and controls in lieu of regular three phase motors and controls of corresponding horsepower and speed, when specified at time milling machine is ordered.

Cat. No.	H.P.	Ph.	Cycles	Volts	R.P.M.	Price
MIL2804	3/4	1	60	115	1200	\$52.00
MIL2805	3/4	1	60	230	1200	52.00
MIL2628B	1	1	60	115	1800	45.00
MIL2628D	1	1	60	230	1800	45.00
MIL2712D	1	3	60	220	1200	41.00
MIL2712F	1	3	60	440	1200	41.00

MECHANICAL POWER TABLE FEED

The South Bend Vertical Spindle Milling Machine can be supplied with power longitudinal feed at extra cost, provided this feature is specified at time machine is ordered. The power feed mechanism has independent motor drive and lever operated quick change mechanism which provide a range of 30 longitudinal feeds 1/4" to 15" per minute. Table feeds in either direction and directional control lever has quick release and neutral position. Automatic feed stops are adjustable for any desired length of cut within the normal feed range. Mechanical overload clutch is provided. When ordering, specify phase, cycle and voltage of motor required.

MIL3262. 32" Power Feed Table in lieu of regular..... \$350
 MIL4262. 42" Power Feed Table in lieu of regular..... \$350

HYDRAULIC POWER QUILL FEED

Hydraulic power quill feed attachment can be supplied at extra cost when specified at time Milling Machine is ordered. A single control lever permits feeding the spindle in either direction, up or down, and also has neutral or off position. Rate of feed is infinitely variable 0 to 25" per minute. Rapid traverse lever permits positioning quill quickly. Maximum length of feed is 4" and length of travel can be accurately controlled by positive depth stop. The hydraulic feed quill also has the regular manual feed lever and manual fine feed handwheel. When ordering, specify phase, cycle and voltage of motor required.

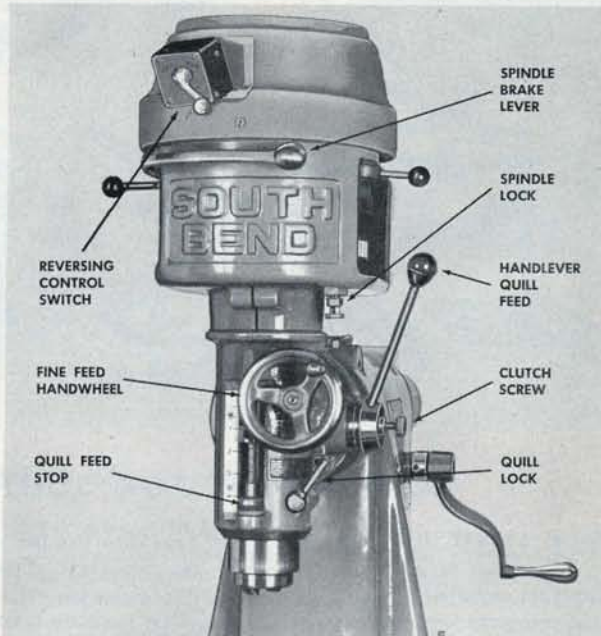
MIL7049. Power feed spindle in lieu of regular..... \$250

COMPARE THESE FEATURES

- Overarm has large key with tapered gib and rack and pinion adjustment for positioning head in or out without disturbing angular alignment of head.
- "Lo-Loss" combination timing belt and V-belt drive to spindle transmits full h.p. efficiently at all speeds. Convenient belt tension release is provided for quick and easy speed changes.
- Quill is ground and accurately fitted to semi-steel head casting. Quill bearing in head is bored and honed to a perfect precision fit with quill. Quill has lever operated fast feed and hand-wheel operated slow feed as standard equipment. (Hydraulic power feed is available at extra cost.) Turnstile lever for rapid hand feed disengages when worm and worm gear fine feed is used.
- Spindle has dependable micrometer depth stop graduated in thousandths, and positive quill lock. Independent spindle lock is also provided.
- Spindle is made of hardened and ground alloy steel, has 1 1/4" ten-spline drive, takes No. 30 MM taper quick change individual holders.
- Spindle face has four 3/8"-16 bolt holes for mounting face milling cutters, etc.
- Large diameter easy reading micrometer collars for positioning table have nonglare satin finish surface with black graduations.
- Lever locks for table, knee and saddle are conveniently located on front of machine. Chip guard between dovetails protects cross-feed screw from damage.
- Adjustable stops in T-slot are provided for regulating length of table travel.
- Manual longitudinal and cross-feeds to table are standard equipment. Power longitudinal feeds available at extra cost.

SPECIFICATIONS

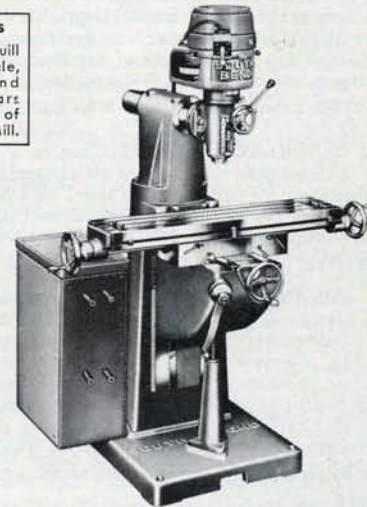
Table width.....	9"	Spindle speeds.....	8
Table lengths.....	32"-42"	r.p.m. with 1 h.p., 1800 r.p.m. motor	135, 220, 350, 560, 900, 1450, 2330, 3750
Table travel, longitudinal.....	20"-30"	r.p.m. with 3/4 h.p., 1200 r.p.m. motor	90, 150, 230, 375, 600, 965, 1550, 2500
Table travel, cross.....	9 1/2"	Net weight, Approx.	
Table travel, vertical.....	18"	With 32" Table.....	1635 lbs.
Table feed screws, Acme thread.....	1 1/4"-5	With 42" Table.....	1700 lbs.
Table to spindle, maximum.....	20"	Shipping weight crated, approx.	
Spindle to column, maximum.....	20"	With 32" Table.....	1950 lbs.
Ram travel by rack and pinion.....	15"	With 42" Table.....	2000 lbs.
Ram diameter.....	4 1/2"	Shipping weight boxed, approx.	
Head rotates.....	360°	With 32" Table.....	2430 lbs.
Quill diameter.....	3 1/4"	With 42" Table.....	2625 lbs.
Quill travel.....	4"	Cubic feet boxed, 32" Table.....	100
Collet capacity, maximum.....	3/4"	Cubic feet boxed, 42" Table.....	118
Spindle taper.....	#30 MM		



The principal controls for the Milling Machine head are illustrated above. The controls are conveniently located and so easy to operate that you will become familiar with them in just a few minutes.

Metric Graduations

at no extra cost, metric quill stop screw and depth scale, metric feed screws and metric graduated collars can be supplied in lieu of English if ordered with Mill.



CABINET FOR MILLING MACHINE

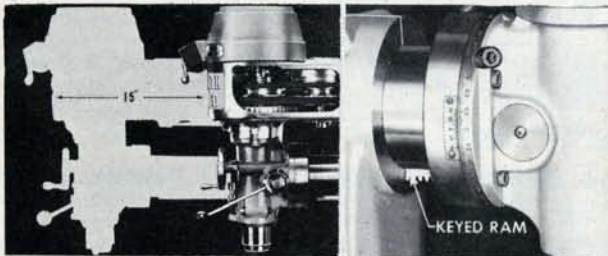
This steel cabinet has two compartments, one for holding the hydraulic pump and reservoir for operating power spindle feed and the other for coolant pump and reservoir.

MIL7052. Cabinet for Milling Machine Price.....\$41.50

COOLANT EQUIPMENT FOR MILL WITH MOTOR LISTINGS

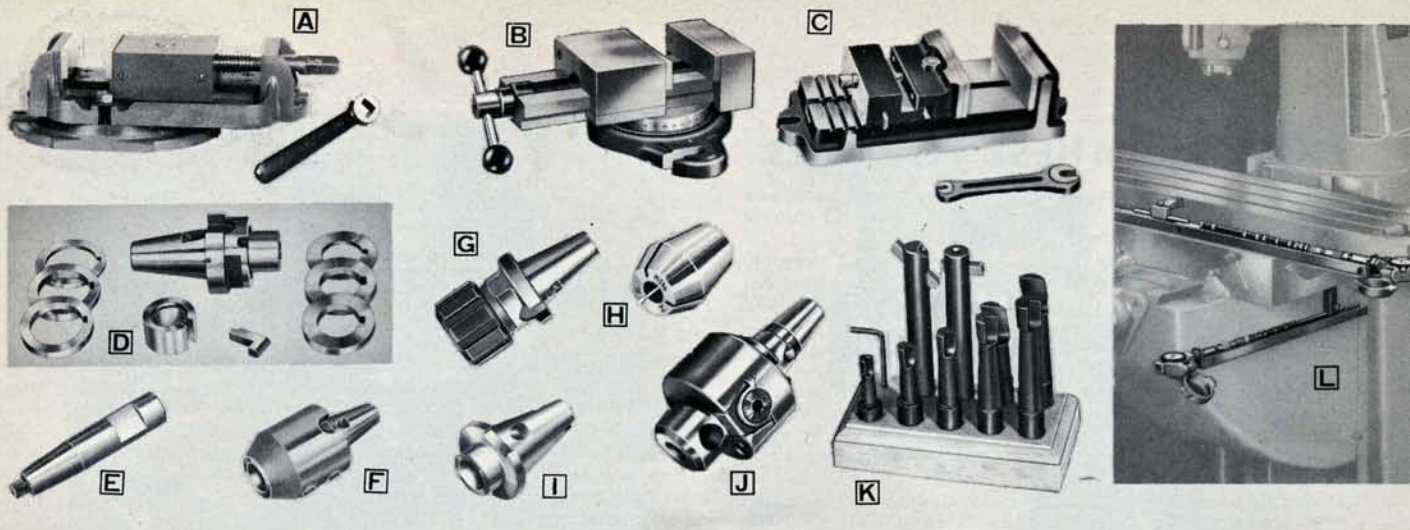
Coolant Pump Equipment for Milling Machine includes coolant pump, tubing, reservoir, 1/4 h.p. motor, and switch. If coolant pump equipment is purchased with the milling machine, piping will be assembled in place and necessary electrical connections made.

Catalog Number	Motor				Price
	Current	Phase	Cycle	Voltage	
MIL7061A	A.C.	1	50	115	\$182.00
MIL7061B	A.C.	1	60	115	180.00
MIL7061C	A.C.	1	50	230	184.00
MIL7061D	A.C.	1	60	230	182.00
MIL7063C	A.C.	3	50	208/220	201.00
MIL7063D	A.C.	3	60	208/220	201.00
MIL7063E	A.C.	3	50	440	201.00
MIL7063F	A.C.	3	60	440	201.00
MIL7063G	A.C.	3	50	550	201.00
MIL7063H	A.C.	3	60	550	201.00
MIL7063S	A.C.	3	50	380	201.00



KEYED RAM SAVES TIME

This feature saves you the time and annoyance of resetting the head angle every time the ram is moved transversely. A large key fitted with adjustable tapered gib holds the ram and head assembly in angular alignment, even when ram lock is released for transverse movement of head. The head swivels on a large flange on the end of the ram. Vernier graduations and worm adjustment make angular settings precise and easy.



ACCESSORIES FOR SOUTH BEND MILLING MACHINES

A 4" SWIVEL VISE, with 360° swivel base, has flanges for clamping to machine table. Base has two 11/16" T-slot bolts for swivel and two 11/16" keys to fit machine table slots. Ground steel jaw plates are removable. Vice jaws are 4-1/2" wide, 1-13/16" deep and open 4". Wrench for vise is included in price. Shipping weight 61 lbs.

MIL7450. 4" Swivel Milling Machine Vise. Price f.o.b. factory . . . \$84.60

B 4" SWIVEL VISE has base with slotted flanges for bolting to machine table. Swivel is graduated 180° to permit setting vise at any angle with slots in machine table. Jaws are replaceable and are made made of hardened steel. Jaws are 4" wide, 1" deep and maximum jaw opening is 4". Shipping wt. 18 lbs.

CE9100. Swivel Machine Vise. Price f.o.b. factory . . . \$29.75

C QUICK-ACTING VISE. This is a sturdy accurately machined vise for general all around work. Has quick-acting adjustment for self-aligning jaw. Vise screw is wrench operated. Vise jaws are replaceable hardened steel and are 5 1/2" wide, 2 1/8" deep and open 6 1/2". Shipping weight 40 pounds.

MIL7013. 5 1/2" Quick-acting Milling Machine Vise. Price . . . \$80.00

D MILLING CUTTER ARBOR. This arbor is designed to hold standard side milling cutters and dovetail cutters from 3" to 6" diameter with 1/8" to 3/4" face and having either a 1" or 1 1/4" diameter arbor hole. (See page 51 for milling cutters.) Cutter is securely held by a split expansion taper bushing and flush tightening screw. Cutters are driven by a key which fits standard size key slots. Spacing collars are provided to accommodate various face widths. Shipping weight 3 pounds.

MIL7035. Side Milling Cutter Arbor. Price f.o.b. factory . . . \$39.50

NOTE: We are in position to supply 30 MM Shell End Mill Arbors to fit South Bend Mills. We must know shank diameter to fit cutter hole. Arbors on special order only. Not subject to return. Price on request.

E THREADED ARBORS FOR ANGULAR CUTTERS. These arbors have 3/4" diameter straight shank to fit into 3/4" quick change tool holder or 3/4" collet held in master collet holder. (See page 51 for milling cutters.) Shipping weight 1 pound.

MIL7037. Arbor with 3/8"—24 right-hand thread for holding angular cutters **CE66753** and **CE66754**. Price f.o.b. factory . . . \$4.95

MIL7038. Arbor with 3/8"—24 left-hand thread for holding angular cutters **CE66751** and **CE66752**. Price f.o.b. factory . . . \$4.95

F QUICK CHANGE TOOL HOLDERS fit into No. 30 MM taper to hold single end straight shank end mills, drills, boring bars or other straight shank tools. No. MIL7016 will also hold double end mills. (See page 51 for milling cutters.) Shipping weight 4 lbs. each.

Cat. No.	Capacity	Price	Cat. No.	Capacity	Price
MIL7016	3/16"	\$14.60	MIL7020	3/4"	\$15.65
MIL7017	3/8"	12.80	MIL7021	7/8"	19.30
MIL7018	1/2"	12.25	MIL7022	1"	19.45
MIL7019	5/8"	11.70			

G MASTER COLLET HOLDER. One master collet holder is supplied as part of the regular equipment with each milling machine. Additional master collet holders are supplied as extras. Shipping weight 3 lbs.

MIL7000. Master Collet Holder and Wrench. Price f.o.b. factory . \$43.00

H EXTRA COLLETS. These collets fit into master collet holder (standard equipment) to take straight shank milling cutters, boring tools, etc. Shipping weight 1 pound each.

Cat. No.	Capacity	Price	Cat. No.	Capacity	Price
MIL7001	1/16"	\$10.80	MIL7007	3/16"	\$3.60
MIL7002	1/8"	10.80	MIL7008	1/2"	3.60
MIL7003	3/16"	3.95	MIL7009	3/16"	3.60
MIL7004	1/4"	3.95	MIL7010	3/8"	3.60
MIL7005	5/16"	3.95	MIL7011	1 1/16"	3.60
MIL7006	3/8"	3.60	MIL7012	3/4"	3.60

I MORSE TAPER SLEEVE. This sleeve has the No. 30 MM taper on the outside to fit into the milling machine spindle and has a No. 2 Morse taper inside to receive taper shank drills, reamers, boring bars, end mills and other taper shank tools. Shipping weight 1 pound.

MIL7039. No. 2 Morse Taper Sleeve for Milling Machine. Price . \$7.50

J OFFSET BORING HEAD. This boring head has No. 30 MM taper shank to fit directly into taper of milling machine spindle. Body is 2 3/4" diameter and maximum bar offset is 5/8". Offsetting screw has dial with graduations reading in thousandths and each complete revolution of screw moves tool .050". Bar or tool capacity is 5/8". Price includes T wrench. Shipping weight approx. 4 1/4 lbs.

MIL7043. Offset Boring Head. Price f.o.b. factory . . . \$85.00

K BORING TOOL SET for use with Offset Boring Head described above. Consists of nine boring bars and boring tools for 3/8" and larger holes. Made of hardened high speed steel with 5/8" diameter shanks. Price includes wrench and wood base. Shipping weight 3 1/2 lbs.

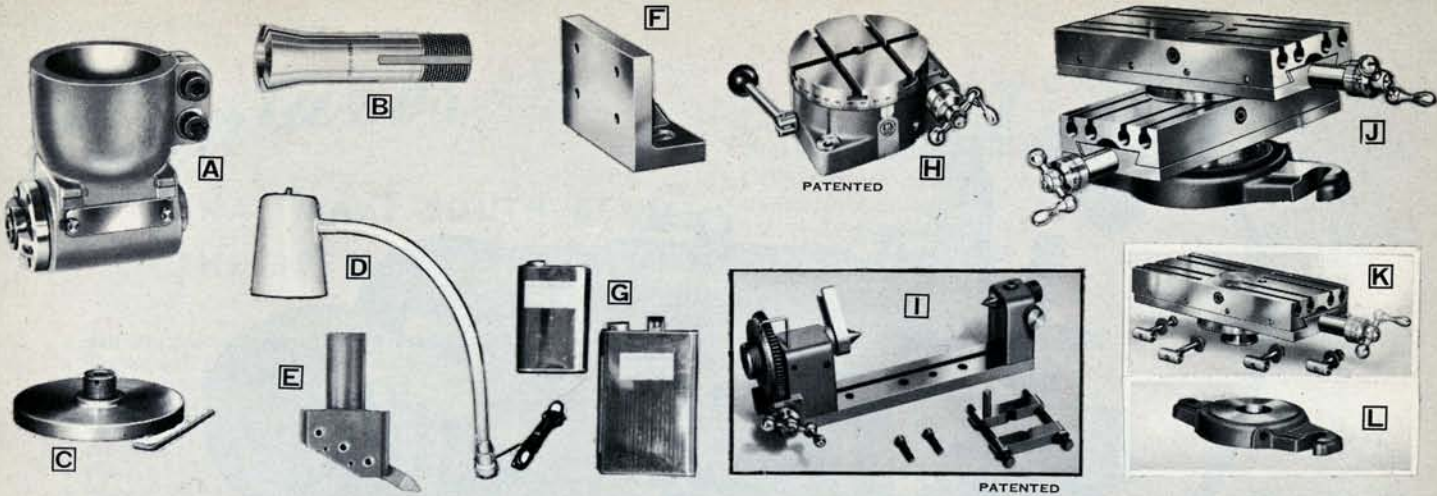
MIL7044. Boring Tool Set. Price f.o.b. factory . . . \$29.00

L MEASURING TRAYS AND RODS. Measuring trays are attached to table and knee of milling machine and used with 5/8" diameter end measuring rods and micrometers (listed below) for positioning table with extreme precision. Especially useful for jig boring operations. Dial indicators supplied with measuring trays have 100 graduations reading in thousandths of an inch. Indicator housing is so constructed that indicator is protected against accidental damage. Shipping weight approximately 35 pounds.

MIL7040. Measuring Trays and Indicators for 32" Table . . . \$129.50

MIL7041. Measuring Trays and Indicators for 42" Table . . . \$136.50

MIL7042. Set of Precision End Measuring Rods consisting of two 4" to 5" inside micrometers, one 10" solid rod, and two each solid rods 1", 2", 3", and 6" long. Packed in wooden case. Shipping wt. 5 lbs. Price . . . \$217.50



ACCESSORIES FOR SOUTH BEND MILLING MACHINES

A 90° MILLING HEAD. This attachment greatly increases the versatility of the milling machine. It clamps onto quill of milling machine and may be set at any angle. The 90° spindle has #30 MM taper and takes same holders, arbors, sleeves or other tools that are normally used in regular spindle. Also supplied are draw-in collet attachment for the spindle and one 1/2" capacity No. 3 collet. Spindle is driven from the milling machine spindle through bevel gears and operates at same speed as milling machine spindle. Shipping weight 20 lbs.

MIL7050. 90° Milling Head. Price f.o.b. factory..... **\$81.50**

B EXTRA COLLETS FOR 90° MILLING HEAD. Regular South Bend No 3 **←R-S-B←** steel collets. Any capacity 1/16" to 1/2" round in increments of 1/16". (See page 40 for square and hexagon collets.) Shipping weight each 6 ozs.

CE3050. Steel Collet. Price each f.o.b. factory..... **\$5.05**

C CHUCK ADAPTER STUD for mounting chuck on table of milling machine, drill press, shaper or other machine for holding work. Consists of accurately machined base plate with threaded stud on which lathe chuck may be screwed. When ordering be sure thread on stud conforms with thread in back of chuck to be used. Price includes bar for screwing stud into base plate but does not include clamps or bolts.

Catalog Number	Diameter of Plate	Thread Diameter	Threads per Inch	Shipping Weight	Price
CE3445	6 1/4"	1 1/2"	8	7 lbs.	\$7.75
CE3446	6 1/4"	1 3/8"	8	10 lbs.	9.05
CE3447	7 1/2"	2 1/4"	8	13 lbs.	10.65
CE3448	11 3/4"	2 3/8"	6	14 lbs.	19.30

D WORK LIGHT. For clear vision without eyestrain, equip your milling machines (and other machine tools) with this South Bend Work Light. May be permanently installed by drilling and tapping one hole in the milling machine column. When ordered with milling machine, the column will be drilled and tapped for the work light at no extra charge. Shipping weight 5 pounds. Bulb is not included.

MIL7047. Work Light for milling machine. Price f.o.b. factory... **\$14.20**

E FLY CUTTER for use with Vertical Milling Machine. Has 5/8" shank and takes 5/16" cutter bit. (Cutter bit not included.)

MIL7058. Fly Cutter. Price f.o.b. factory..... **\$8.75**

F ANGLE PLATE. This is a heavy cast iron angle plate suitable for clamping work on the milling machine, shaper, drill press, face plate of lathe, etc. Size 4 1/2" x 3" x 2". Has six bolt holes. Shipping weight 4 pounds.

CE9640. Angle Plate. Price f.o.b. factory..... **\$10.00**

G HYDRAULIC OIL For use in Power Feed Quill on Vertical Milling Machine.

CE7053. 1 qt. can Hydraulic Oil..... **\$1.30**

CE7054. 1 gal. can Hydraulic Oil..... **4.10**

H ROTARY INDEXING TABLE. You will find this rotary indexing table a great convenience for mounting small work on the milling machine, drill press, or shaper. Used for accurately spacing holes, indexing clutch teeth, machining squares, hexagonal or octagonal shapes, milling circular grooves or T-slots, etc. Table is 4 1/2" in diameter and has three T-slots for clamping work. Edge of table is graduated 360°. Table is turned by worm gearing having graduated collar and ball crank. Thumb screw on front of ball crank locks graduated collar in any position. Each graduation indicates a table movement of 3 minutes. One complete revolution of the ball crank turns the table 5 degrees. Clamping device is provided for locking table in any position. Top of table is precision ground. Base has two bolt holes for clamping to machine table. Price includes eight clamping bolts with nuts and washers. Shipping weight 14 lbs.

CE9144. Indexing table. Price f.o.b. factory..... **\$61.75**

I INDEXING CENTERS. This is an indispensable device for milling splines or flutes in shafts, laying out work, accurate cross drilling, gear cutting, milling or shaping hexagons, squares, etc. Base has bolt holes for clamping on table of milling machine, drill press or shaper. Takes work between centers up to 5" in diameter, 6" long. Revolving center has large dial graduated 360°. Center is turned by worm gearing having graduated collar and ball crank. Each graduation indicates a center movement of 3 minutes. One complete revolution of the ball crank turns the center 5°. Worm gear can be disengaged for quick positioning of indexing center. Clamping device is provided for locking center in any position. Base has two bolt holes for clamping to machine table. Price includes two clamping bolts. Shipping weight 12 lbs.

CE9635. Indexing Centers. Price f.o.b. factory..... **\$76.90**

J UNIVERSAL TABLE. For angular milling operations. Both upper and lower slides have graduated swivels and may be turned through full 360°. Slides can be used without graduated swivels to reduce height if desired. They can be positioned at any angle with each other and may be turned individually or together. Each slide has feed screw with micrometer collar reading in thousandths of an inch. Dovetails are equipped with full length gibs for take-up. The precision ground work surface is 4" x 8 7/8" and maximum travel is 4" for either slide. Table has four slots for clamping work. Clamp bolts fit snugly into round slots in such a way that there is little danger of breaking out or otherwise damaging the slots. Supplied with base for use on milling machines, drill press, etc.

CE9156. Universal Table complete with base for South Bend milling machine or other machine tools, two slides, two graduated swivels, and eight clamp bolts with nuts. Ship. wt. 43 lbs. Price..... **\$131.00**

CE9157. Single Table with one graduated swivel and four clamp bolts with nuts. Ship. wt. 19 lbs. Factory price..... **\$63.50**

CE9159. Base only for adapting single table to South Bend milling machine or other machine tool. Ship. wt. 8 lbs. Price..... **\$4.85**