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All prices are net F. O. B. factory

PRICE SHEET No. 179

No. 1H and No. 2HL Plain and Universal High Speed Milwaukee Knee Type Milling Machines

Kearney & Trecker Corporation, Milwaukee, Wisconsin

Nos. 1H and 2HL PLAIN

MACHINE	POWER FEED RANGE			WORKING SURFACE OF TABLE	NET WEIGHT Lbs. Approx.	MOTOR DATA		WIRING MOTOR AND STARTER	CODE WORD		PRICE Including Power Rapid Traverse and Coolant System. Without Motor or Starter
	Long	Cross	Vert.			Max. Horse-Power	Speed		U. S. Std. Lead Screws	Metric Lead Screws	
1H Plain	22"	8"	16"	40" x 9"	2350	3	1800	\$15.00	LARCH	LARDI	\$2790.00
2HL Plain	28"	10"	16"	46" x 9"	2450	3	1800	15.00	LARIN	LARJO	2945.00

STANDARD SPECIFICATIONS

POWER FEED RANGE {1H Plain—longitudinal 22", cross 8", vertical 16".
2HL Plain—longitudinal 28", cross 10", vertical 16".

WORKING SURFACE of table—{1H Plain—40" x 9".
2HL Plain—46" x 9".

SPEED RANGE—35 to 1400 r.p.m.

FEED RANGE—1/2" to 20" per minute.

SPINDLE REVERSE—built-in mechanical type.

CUTTER-COOLANT SYSTEM.

RAPID TRAVERSE—Two-way "Live" Type—Longitudinal only—rate 150" per minute.

SPINDLE—No. 40 National Standard taper. (Note: No. 50 taper not available on these machines.)

ARBOR SUPPORTS—Two—self-oiling with adjustable bushings (one style "A" 23/32" hole; one style "B" 1 7/8" hole with studs for arm brace).

(If specified when ordering machine, an Intermediate Arbor Support with 1 7/8" hole can be substituted in place of the Style "A" Arbor Support, without charge.)

ADJUSTABLE ARM BRACE.

BUILT-IN PUSH BUTTON, multiple V-belts, sheaves, adjustable motor bracket and mounting of motor at factory, when desired.

ARBOR DRAW-IN-ROD.

NECESSARY WRENCHES.

EXTRAS

	Code Word	Price
SPEED RANGES: Extra for substituting at factory only:		
20 to 800 r.p.m.....	LASAG	\$18.00
60 to 2400 r.p.m.....	LASCI	60.00
FEED RANGES: Extra for substituting at factory only:		
1/4" to 10".....	LASEK	18.00
3/4" to 30".....	LASIO	18.00
1" to 40".....	LASNU	18.00
1 1/2" to 60".....	LASOV	18.00
For substituting Belt drive arrangement (without countershaft) at factory only.....	LASSY	175.00
5" Plain Vise with hardened jaws.....	ATTDO	50.00
Wiring motor and starter.....	STADE	15.00

ALLOWANCES FOR PARTS OMITTED FROM STANDARD EQUIPMENT

Outer Arm Brace.....	LATAH	\$24.00
Style "A" Arbor Support.....	LATBI	38.00
Style "B" Arbor Support with studs for arm brace.....	LATEL	42.00
Coolant System.....	LATHO	42.00
Power Rapid Traverse.....	LATIP	55.00

Nos. 1H and 2HL UNIVERSAL

MACHINE	POWER FEED RANGE			WORKING SURFACE OF TABLE	NET WEIGHT Lbs. Approx.	MOTOR DATA		WIRING MOTOR AND STARTER	CODE WORD		PRICE Including Power Rapid Traverse and Coolant System. Without Motor or Starter
	Long.	Cross	Vert.			Max. Horse-Power	Speed		U. S. Std. Lead Screws	Metric Lead Screws	
1H Universal	22"	8"	16"	40" x 9"	2650	3	1800	\$15.00	LAROU	LARTY	\$3305.00
2HL Universal	28"	10"	16"	46" x 9"	2750	3	1800	15.00	LARUZ	LARVA	3460.00

STANDARD SPECIFICATIONS

POWER FEED RANGE {1H Universal—longitudinal 22", cross 8", vertical 16".
 {2HL Universal—longitudinal 28", cross 10", vertical 16".

WORKING SURFACE of table—{1H Universal—40" x 9".
 {2HL Universal—46" x 9".

SPEED RANGE—35 to 1400 r.p.m.
 FEED RANGE— $\frac{1}{2}$ " to 20" per minute.
 DIVIDING HEAD—8" swing Model H Spiral Universal Wormwheel type, pre-loaded, ball bearing 40 to 1 ratio, with 3 single index plates, adjustable tailstock, center rest, dividing center and work driver, index and lead chart, arranged with drive connection for spiral milling, including Conventional Lead Attachment—lead change gear box, segment, and change gears for obtaining leads by power from $2\frac{1}{2}$ " to 149".
 SPINDLE REVERSE—built-in mechanical type.
 CUTTER COOLANT SYSTEM.
 RAPID TRAVERSE—Two-way "Live" Type—Longitudinal only—rate 100" per minute.
 SPINDLE—No. 40 National Standard taper. (Note: No. 50 taper not available on these machines.)
 ARBOR SUPPORTS—Two—self-oiling with adjustable bushings (one style "A" 23/32" hole; one style "B" $1\frac{7}{8}$ " hole with studs for arm brace).
 (If specified when ordering machine, an Intermediate Arbor Support with $1\frac{7}{8}$ " hole can be substituted in place of the Style "A" Arbor Support, without charge.)
 ADJUSTABLE ARM BRACE.
 BUILT-IN PUSH BUTTON, multiple V-belts, sheaves, adjustable motor bracket and mounting of motor at factory, when desired.
 ARBOR DRAW-IN-ROD.
 NECESSARY WRENCHES.

EXTRAS

	Code Word	Price
SPEED RANGES: Extra for substituting at factory only:		
20 to 800 r.p.m.	LASAG	\$ 18.00
60 to 2400 r.p.m.	LASCI	60.00
FEED RANGES: Extra for substituting at factory only:		
$\frac{1}{4}$ " to 10"	LASEK	18.00
$\frac{3}{4}$ " to 30"	LASIO	18.00
1" to 40"	LASNU	18.00
$1\frac{1}{2}$ " to 60"	LASOV	18.00
For substituting 10" MODEL H SPIRAL UNIVERSAL DIVIDING HEAD in place of 8" H head regularly furnished.	LATMU	40.00
(Note: Conventional lead, low lead, chucks, etc., are interchangeable between 8" and 10" Model H Dividing Heads.)		
For substituting LOW LEAD ATTACHMENT (in place of conventional lead on Universal machines) to obtain 40,000 different leads by power from .022" to 2918".	LATOW	180.00
For substituting Belt drive arrangement (without countershaft) at factory only.	LASSY	175.00
5", 3-jaw Universal Chuck with special adapter for 8" or 10" swing Model H Dividing Head	ATMOU	75.00
6", 3-jaw Universal Chuck with special adapter for 8" or 10" swing Model H Dividing Head	ATNUA	90.00
5" Swivel Vise with hardened jaws	ATUBU	65.00
Wiring motor and starter	STADE	15.00

ALLOWANCES FOR PARTS OMITTED FROM STANDARD EQUIPMENT

Outer Arm Brace	LATAH	\$ 24.00
Style "A" Arbor Support	LATBI	38.00
Style "B" Arbor Support with Studs for Arm Brace	LATEL	42.00
DIVIDING HEAD—8" Model H Worm wheel type, tailstock, center rest, etc., but WITHOUT lead change gear box and change gears	LATRY	340.00
Conventional Lead Attachment	LATTA	50.00
Coolant System	LATHO	42.00
Power Rapid Traverse	LATIP	55.00

STANDARD ATTACHMENTS FOR MODELS 1H AND 2HL PLAIN AND UNIVERSAL MACHINES

(See reverse side for balance of attachments)

When ordering, be sure to mention serial number of machine stamped on BOTH sides of column

DESCRIPTION	No. 1H and 2HL MACHINES		
	Size	Code Word	Price
WIRING for motor and starter (Built-in push button is included with machine)		STADE	\$ 15.00
PLAIN VISE with hardened steel jaws.....	5"	ATTDO	50.00
SWIVEL VISE with hardened steel jaws.....	5"	ATUBU	65.00
CHUCK, Universal, 3-jaw, with special adapter for 8" or 10" swing Model H Dividing Head	5"	ATMOU	75° 65.00
	6"	ATNUA	90.00
ROTARY TABLE—HANDWHEEL and GRADUATED DIAL type, HAND FEED only	12"	HISFY	390.00
(All power drive mechanism is omitted)			
ROTARY TABLE—INDEX type, with 3 INDEX PLATES and CRANK, HAND FEED only	12"	HUTCH	420.00
(All power drive mechanism is omitted)			
POWER DRIVE MECHANISM—for either style ROTARY TABLES, providing both POWER FEED and POWER RAPID TRAVERSE.....		LATUB	95.00
EXCEPTION:—Drive mechanism is not required for Rotary Tables when machine is already equipped with Low Lead Attachment as Low Lead Attachment provides the drive for both Power Feed and Power Rapid Traverse. When table is ordered separately and Power Drive is desired specify when Low Lead Attachment is available.			
NOTE:—HANDWHEEL and GRADUATED DIAL units and 3 INDEX PLATES and CRANK units are interchangeable on same Rotary Table.			
—If 3 INDEX Plates and CRANK unit are wanted with Rotary Table already equipped with HANDWHEEL GRADUATED DIAL unit—ADD...	12"	HUTOU	60.00
—If HANDWHEEL and GRADUATED DIAL unit is wanted with Rotary Table already equipped with 3 INDEX PLATES and CRANK unit—ADD	12"	HUREH	40.00
Additional trip dogs for Rotary Tables—each.....	12"	HURBE	6.00
VERTICAL SPINDLE ATTACHMENT, swivel base, Timken bearing spindle, No. 40 National Standard End only, speed ratio 1 to 1—speeds same as milling machine spindle.....		SPOCO	465.00
UNIVERSAL MILLING ATTACHMENT, Timken Bearing, No. 40 National Standard End only, speed ratio 1 to 1—speeds same as milling machine spindle		SPOHU	540.00
LIGHT HI-SPEED UNIVERSAL MILLING ATTACHMENT, anti-friction bearings, No. 7 B&S taper only, speed range geared to 50 to 2000 r.p.m. except for machine with 60 to 2400 r.p.m. range when attachment has same speed as machine spindle.			
—with non-adjustment to spindle.....		SPOLY	380.00
—with 1½" adjustment to spindle.....		SPOWI	455.00
STANDARD HI-SPEED ADJUSTABLE UNIVERSAL MILLING ATTACHMENT, anti-friction bearings, No. 40 National Standard End only, speed ratio 1 to 1—speeds same as milling machine spindle.....		LATYE	650.00
NOTE:—This attachment should only be applied to machine having speed range of 60 to 2400 r.p.m. Machine should also be equipped with an attachment crane.			

STANDARD ATTACHMENTS FOR MODELS 1H AND 2HL PLAIN AND UNIVERSAL MACHINES

(See reverse side for balance of attachments)

When ordering, be sure to mention serial number of machine stamped on BOTH sides of column

DESCRIPTION	No. 1H and 2HL MACHINES		
	Size	Code Word	Price
THREAD MILLING ATTACHMENT—for screws, worms, and short leads greater than 45° angle to axis. Spindle takes standard cutters and hobs having 1" hole—Shoulder to nut is 1" maximum.....		LAMAB	\$460.00
FOLLOWER REST for Thread Milling Attachment—to support long slender screws		LAMDE	50.00
CAM MILLING SLIDE for reproducing cams from a master. Can be used only on UNIVERSAL machines equipped with Spiral Universal Dividing Head and Low Lead Attachment.....		LAMEF	235.00
RACK MILLING ATTACHMENT—spindle takes cutters having 1" hole.....		LAMHI	435.00
RACK INDEXING ATTACHMENT with gears and chart.....		LAMNO	145.00
RACK VISE, with steel jaws, opens 3 3/4"x29 3/4" (opens 6" with steel jaws removed)		LAMOP	70.00
SLOTING ATTACHMENT, swivel base, 0 to 2 1/2" stroke, 1 to 1 spindle ratio, 2 to 1 return.....		LAMST	335.00
DIVIDING HEAD (furnished as standard equipment on UNIVERSAL machines) Model H, Spiral Universal Wormwheel type, pre-loaded ball bearing dividing head, 40 to 1 ratio, with 3 single index plates, adjustable tailstock, center rest, dividing center and work driver, index chart—arranged with drive connection for spiral milling, but price does NOT include lead change gear box and change gears.....	8"	LAMTU	485.00
	10"	LAMZO	525.00
NOTE:—Conventional lead, low lead, chucks, etc., are interchangeable between 8" and 10" Model H Dividing Heads.			
CONVENTIONAL LEAD ATTACHMENT (furnished as standard equipment on UNIVERSAL machines) driving mechanism for cutting spirals—includes lead change gear box, segment, and change gears for obtaining conventional leads by power from 2 1/2" to 149".....		LANYA	90.00
LOW LEAD ATTACHMENT driving mechanism for cutting spirals—includes lead change gear box, change gears, worm sets, and built-in lead reverse for obtaining 40,000 different leads by power from .022" to 2918" for Plain or Universal machines.		LANAE	270.00
NOTE:—Any combination of dividing head, Conventional Lead Attachment or Low Lead Attachment can be furnished with PLAIN machines as well as UNIVERSAL machines.			
Set of 4 HIGH NUMBER INDEX PLATES (in addition to 3 standard plates regularly furnished) for dividing by simple indexing all numbers in sequence from 2 to 100, and many beyond.....		LANCE	60.00
RIGHT ANGLE POWER DRIVE BRACKET, 1 to 1 ratio—used with Low Lead Attachment when setting 8" or 10" Model H Dividing Head cross-wise of table for milling scrolls, cams, etc.....		LANEG	105.00
ATTACHMENT CRANE		LANGI	55.00
STYLE "A" ARBOR SUPPORT, adjustable bushing, 23/32" hole for pilot end arbors		LANIK	55.00
INTERMEDIATE ARBOR SUPPORT, adjustable bushing, 1 7/8" hole, WITHOUT studs		LANSU	55.00
STYLE "B" ARBOR SUPPORT, adjustable bushing, 1 7/8" hole, WITH studs for arm brace		LANOR	65.00
ADJUSTABLE ARM BRACE.....		LANMO	35.00
PRECISION MEASURING RODS and DIAL INDICATORS—for Longitudinal, Cross or Vertical adjustments (many combinations are available; consult factory for prices).....			

MILWAUKEE MILLING MACHINES

Bulletin
No. 720A

Models

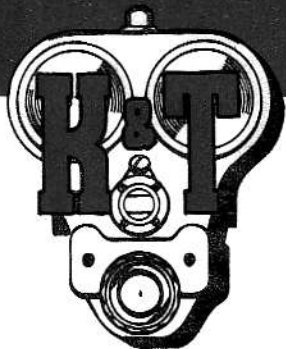
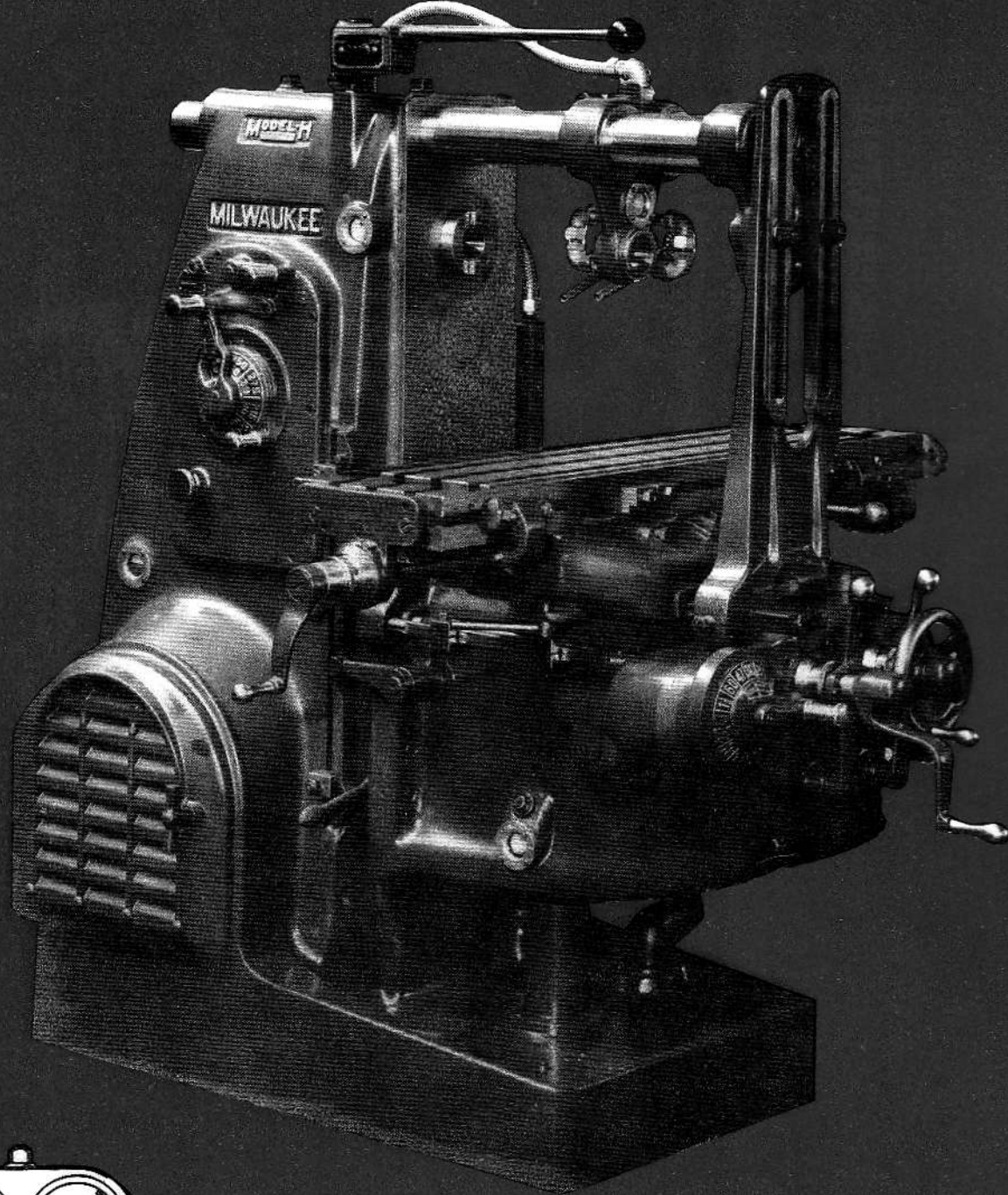
1H and 2HL

COMPACT
Fast
COMPLETE



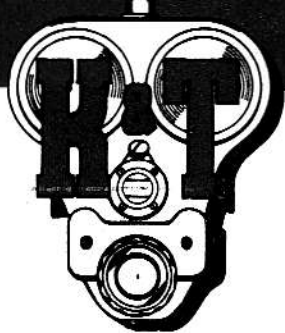
KEARNEY & TRECKER CORPORATION

MILWAUKEE, WISCONSIN



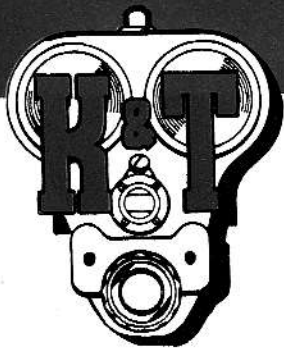
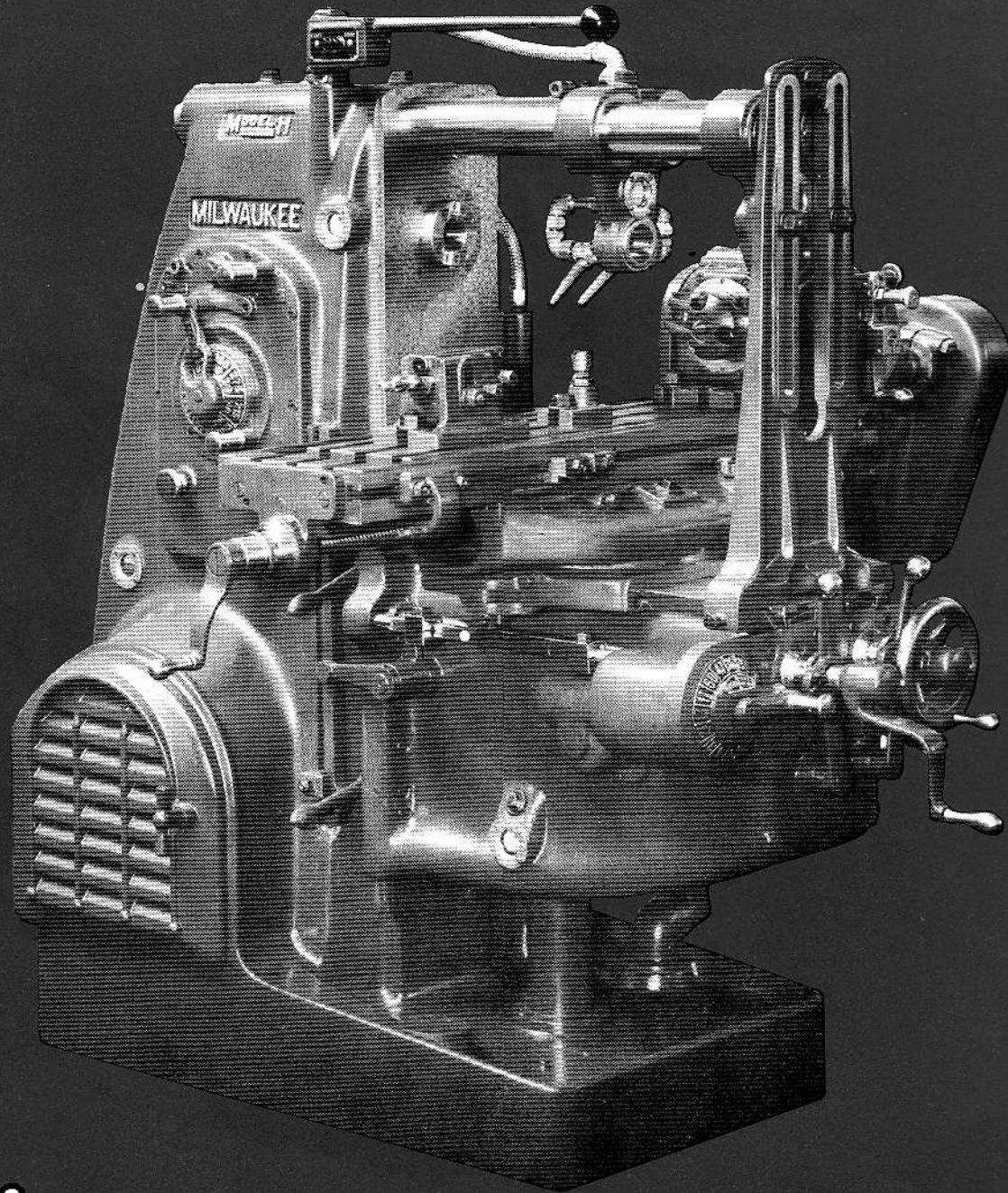
THE experience of doing one thing well . . . building and concentrating on milling machines . . . since 1898 . . . has been incorporated in these 1H and 2HL companion machines. Their many features are new to Plain and Universal machines of this size and fill a definite need in tool-rooms, laboratories, schools and the production line . . . where smaller parts come through in small quantities not requiring automatic machines.

COMPACT, fast, complete . . . exactly describes these new machines. They include the basic features of sound design found heretofore only in the larger Milwaukee Models H and K . . . Low in height . . . minimum floor space . . . all controls finger-touch and within easy reach . . . built-in safety for both operator and machine . . . built-in wiring eliminating unsightly conduits . . . are but a few of the many features found in the new models 1H and 2HL machines.



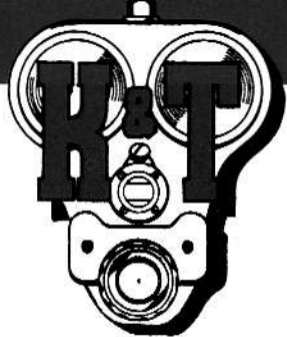
MILWAUKEE MILLING MACHINES

UNIVERSAL TYPE Model 1-H



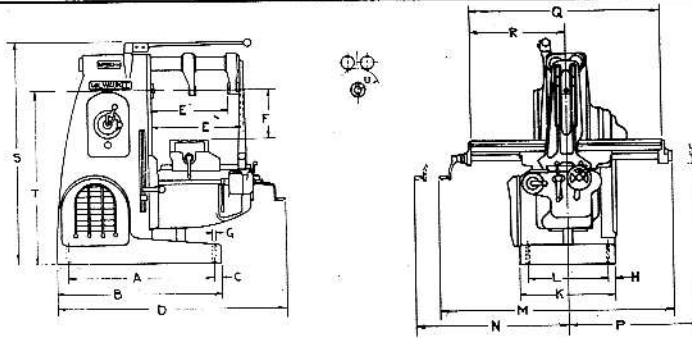
THE performance-accuracy of these machines is the result of design as well as the quality of materials and workmanship employed. Alloy steel, heat-treated gears are mounted on short, stubby multiple splined shafts . . . high-speed gears have ground tooth form . . . full automatic lubrication in column and knee . . . enclosed cross-mounted motor assures our exclusive and strongest column feature, a solid and unbroken back column wall which doubles the strength of the front wall for supporting the knee, saddle, table, work as well as cutters and arbors.

SPINDLE SPEEDS up to 1400 r.p.m. . . . "live" type longitudinal rapid traverse . . . friction clutch drive . . . directional feed levers . . . all speed and feed reverses independent of each other . . . Dividing Head with spindle mounted on anti-friction bearings, same as machine spindle . . . and the famous K&T Double Overarms. See pages 6 and 7 for specifications, page 8 for other features of the finest of small, high-speed and economical milling machines.



SPECIFICATIONS

Models 1-H and 2-HL Plain



Plan Dimensions and General Specifications for Plain Machines

MACHINE	A	B	C	D	E	E'	Min. F	Max. F	G	H	K	Front L	Rear L	M	N	P	Q	Max. R	S	T	U
No. 1H Plain (Inches)	32 3/4 L 33 1/2 R	37	13 1/4	56 1/4	21 1/4	19 1/8	0	16 1/4	1 1/8	1 3/4	22	18 1/2	19 1/2	53 1/8	38 1/4	37 3/8	40	30	55 3/8	44	4 3/8
No. 1H Plain (M/M)	818 L 851 R	940	44	1429	551	486	0	413	21	44	559	470	495	1354	972	950	1016	762	1413	1118	116
No. 2HL Plain (Inches)	32 3/4 L 33 1/2 R	37	13 1/4	56 1/4	21 1/4	19 1/8	0	16 1/4	1 1/8	1 3/4	22	18 1/2	19 1/2	59 1/8	44 1/4	43 3/8	46	36	55 3/8	44	4 3/8
No. 2HL Plain (M/M)	818 L 851 R	940	44	1429	551	486	0	413	21	44	559	470	495	1507	1124	1102	1168	914	1413	1118	116

	DESCRIPTION	No. 1H PLAIN		No. 2HL PLAIN	
		INCHES	MILLIMETERS	INCHES	MILLIMETERS
TABLE	Working Surface	40" x 9"	1016 x 229	46" x 9"	1168 x 229
	Size Overall	40" x 9"	1016 x 229	46" x 9"	1168 x 229
	T-Slots—Number and Width	Three—1 1/8"	Three—17.5	Three—1 1/8"	Three—17.5
	Back Edge of Table to Center of First T-Slot	2 1/4"	57	2 1/4"	57
FEED RANGE	Longitudinal Power Feed	22"	559	28"	711
	Cross Power Feed	8"	203	10"	254
	Vertical Power Feed	16"	406	16"	406
HEIGHT	Center-line of Spindle to Floor (Dimension T)	44"	1118	44"	1118
	Center-line of Spindle to Top of Table (Minimum 0")	16 1/4"	413	16 1/4"	413
WIDTH	Column to Adjustable Overarm Brace—Maximum (Dimension E)	21 1/4"	551	21 1/4"	551
	Column to Inside of Arbor Support—With Brace in Place (Maximum)	19 1/8"	486	19 1/8"	486
	Column to Inside of Arbor Support—Without Brace (Maximum)	19 1/8"	486	19 1/8"	486
DOUBLE OVERARMS	Two Round Solid Steel Bars—Diameter and Width Across Both Overarms	2 7/8" — 6 7/8"	73—175	2 7/8" — 6 7/8"	73—175
	Center-line of Spindle to Underside of Overarms (Radial)	4 3/8"	116	4 3/8"	116
ARBOR SUPPORTS	Self-Oiling with Adjustable Bronze Bushing—Style A with 3/8" Hole, for Pilot End Arbors	1	1	1	1
	Style B with 1 1/8" Hole, with Studs for Arm Brace. NOTE: If specified when ordering machine, an Intermediate Arbor Support with 1 7/8" Hole can be substituted in place of Style A Support, without charge.	1	1	1	1
SPINDLE	Chrome Nickel Steel, Heat Treated, Hardened and Ground—No. 40 National Standard, Taper Hole 3/2" per Foot	Yes	Yes	Yes	Yes
	Diameter of Nose Size of Hole Through (for 5/8" Draw-In Rod)	3 1/2" 1 1/8"	89 17.5	3 1/2" 1 1/8"	89 17.5
SPEEDS	Number—in One Continuous Series, 40 to 1 Ratio	16	16	16	16
	Standard Range, in Geometrical Progression Spindle Reverse (Built-in Mechanical Type, independent of Feeds)	35 to 1400 r.p.m. Yes	35 to 1400 r.p.m. Yes	35 to 1400 r.p.m. Yes	35 to 1400 r.p.m. Yes
FEEDS	Number—in One Continuous Series, 40 to 1 Ratio	16	16	16	16
	Range—Longitudinal and Cross rates per minute are the same Vertical rate per minute is one-half of Longitudinal	1/2" to 20" 1/4" to 10"	12.7 to 508 6.3 to 254	1/2" to 20" 1/4" to 10"	12.7 to 508 6.3 to 254
RAPID TRAVERSE	With Spindle Stopped or Running	150"	3800	150"	3800
	Longitudinal Only—Rate per Minute	150"	3800	150"	3800
DRIVE	Silent Multiple V-Belt from Motor—★	750 r.p.m.	750 r.p.m.	750 r.p.m.	750 r.p.m.
	Pulley Speed Motor Speed Horsepower (Maximum)	1800 r.p.m. 3	1800 r.p.m. 3	1800 r.p.m. 3	1800 r.p.m. 3
CODE WORD	For machine with U. S. STANDARD Lead Screws and Dials	LARCH	LARDI	LARIN	LARIO
	For machine with METRIC Lead Screws and Dials (For belt drive machines—furnished at extra cost—add the word "Belt" to code word.)	LARCH	LARDI	LARIN	LARIO
SHIPPING DATA	Net Weight (Approximate)	2350 Lbs.	1065 Kgs.	2450 Lbs.	1110 Kgs.
	Shipping Weight (Approximate)—Domestic	2850 Lbs.	1495 Kgs.	2950 Lbs.	1540 Kgs.
	Shipping Weight (Approximate)—Export	3300 Lbs.	1495 Kgs.	3400 Lbs.	1540 Kgs.
	Size of Case—Export Cubic Measurements—Export	35" x 61" x 62" 76.6 cu. ft.	989 x 1550 x 1576 2.17 cu. meters	35" x 61" x 62" 76.6 cu. ft.	989 x 1550 x 1576 2.17 cu. meters

STANDARD EQUIPMENT INCLUDES: Spindle reverse, cutter coolant system, 2-way Longitudinal Power Rapid Traverse, arbor draw-in rod, adjustable arm brace, necessary wrenches and arbor supports listed above. Intermediate arbor support can be substituted in place of style A arbor support, without extra charge, when specified on order.

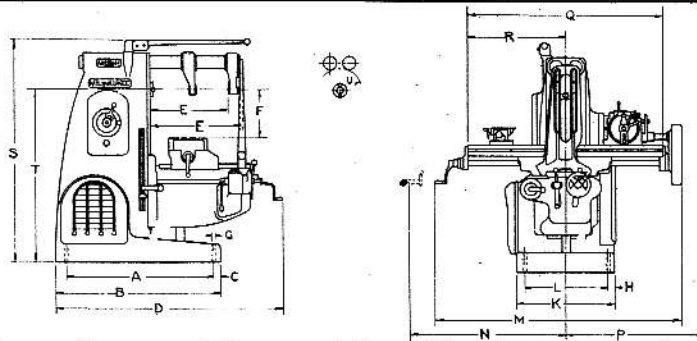
EXTRA EQUIPMENT (available at additional cost): Plain or swivel vise, universal and vertical milling attachments, light hi-speed milling attachment, slotting attachment, attachment crane, rotary tables, arbors, etc. Plain machines can be equipped for driving spiral dividing head with conventional lead attachment and change gears.

(★) All Model H machines are equipped for motor-in-base drive. Price of machine includes push button, multiple V-belts, sheaves, adjustable motor bracket, and mounting of motor at factory, when desired. Price does NOT include motor, starter, or wiring. Any Model H machine can be furnished on special order arranged for belt drive at additional cost.

The manufacturer reserves the right to improve, change or modify the construction of these milling machines or attachments or any part thereof as he may see fit, without incurring any, obligation to make like changes on K&T MILWAUKEE Milling Machines or attachments previously sold.

SPECIFICATIONS

Models 1-H and 2-HL Universal



Plan Dimensions and General Specifications for Universal Machines

MACHINE	A	B	C	D	E	E'	Min. F	Max. F	G	H	K	Front L	Rear L	M	N	P	Q	Max. R	S	T	U
No. 1H Universal (Inches)	32 3/4 L 33 1/2 R	37	1 3/4	56 1/4	21 1/2	19 1/2	0	15 1/4	1 1/2	1 3/4	22	18 1/2	19 1/2	53 1/4	38 1/4	37 1/4	40	30	55 5/8	44	4 3/4
No. 1H Universal (M/M)	818 L 851 R	940	44	1429	551	486	0	387	21	44	559	470	495	1354	972	947	1016	762	1413	1118	116
No. 2HL Universal (Inches)	32 3/4 L 33 1/2 R	37	1 3/4	56 1/4	21 1/2	19 1/2	0	15 1/4	1 1/2	1 3/4	22	18 1/2	19 1/2	59 1/4	44 1/4	43 1/4	46	36	55 5/8	44	4 3/4
No. 2HL Universal (M/M)	818 L 851 R	940	44	1429	551	486	0	387	21	44	559	470	495	1505	1124	1099	1168	914	1413	1118	116

	DESCRIPTION	No. 1H UNIVERSAL		No. 2HL UNIVERSAL	
		INCHES	MILLIMETERS	INCHES	MILLIMETERS
TABLE	Working Surface	40" x 9"	1016 x 229	46" x 9"	1168 x 229
	Size Overall	40" x 9"	1016 x 229	46" x 9"	1168 x 229
	T-Slots—Number and Width	Three—1 1/2"	Three—17.5	Three—1 1/2"	Three—17.5
	—Center Distance	2 1/4"	57	2 1/4"	57
	Back Edge of Table to Center of First T-Slot	2 1/2"	64	2 1/2"	64
FEED RANGE	Longitudinal Power Feed	22"	559	28"	711
	Cross Power Feed	8"	203	10"	254
HEIGHT	Center-line of Spindle to Floor (Dimension T)	44"	1118	44"	1118
	Center-line of Spindle to Top of Table, Maximum (Minimum 0")	15 1/4"	387	15 1/4"	387
WIDTH	Column to Adjustable Overarm Brace—Maximum (Dimension E)	21 1/2"	551	21 1/2"	551
	Column to Inside of Arbor Support—With Brace in Place (Maximum)	19 1/2"	486	19 1/2"	486
	Column to Inside of Arbor Support—Without Brace (Maximum)	19 1/2"	486	19 1/2"	486
DOUBLE OVERARMS	Two Round Solid Steel Bars—Diameter and Width Across Both Overarms	2 7/8" — 6 7/8"	73 — 175	2 7/8" — 6 7/8"	73 — 175
ARBOR SUPPORTS	Center-line of Spindle to Underside of Overarms (Radial)	4 7/8"	116	4 7/8"	116
	Self-Oiling with Adjustable Bronze Bushing—Style A with 3/8" Hole, for Pilot End Arbors. Style B with 1/2" Hole, with Studs for Arm Brace. NOTE: If specified when ordering machine, an Intermediate Arbor Support with 1/2" Hole can be substituted in place of Style A Support, without charge.	1	1	1	1
DIVIDING HEAD	Preloaded Ball Bearings, Model H Wormwheel Type—40 to 1 Ratio—Spindle Nose No. 40 National Standard, same as Machine Spindle	Yes	Yes	Yes	Yes
	Swings Takes in Length, Between Centers	8" 22"	203 559	8" 28"	203 711
SPINDLE	Chrome Nickel Steel, Heat Treated, Hardened and Ground—No. 40 National Standard, Taper Hole 3/32" per Foot	Yes	Yes	Yes	Yes
	Diameter of Nose	3 1/2" 1 1/2"	89 17.5	3 1/2" 1 1/2"	89 17.5
SPEEDS	Number—in One Continuous Series, 40 to 1 Ratio	16	16	16	16
	Standard Range, in Geometrical Progression	35 to 1400 r.p.m.	35 to 1400 r.p.m.	35 to 1400 r.p.m.	35 to 1400 r.p.m.
FEEDS	Spindle Reverse (Built-in Mechanical Type, Independent of Feeds)	Yes	Yes	Yes	Yes
	Number—in One Continuous Series, 40 to 1 Ratio	16	16	16	16
RAPID TRAVERSE	Range—Longitudinal and Cross rates per minute are the same	1/2" to 20"	12.7 to 508	1/2" to 20"	12.7 to 508
	—Vertical rate per minute is one-half of Longitudinal	1/4" to 10"	6.3 to 254	1/4" to 10"	6.3 to 254
DRIVE	With Spindle Stopped or Running	150"	3800	150"	3800
	Longitudinal Only—Rate per Minute				
CODE WORD	Silent Multiple V-Belt from Motor—★	750 r.p.m.	750 r.p.m.	750 r.p.m.	750 r.p.m.
	Pulley Speed	1800 r.p.m.	1800 r.p.m.	1800 r.p.m.	1800 r.p.m.
SHIPPING DATA	Motor Speed	3	3	3	3
	Horsepower (Maximum)				
SHIPPING DATA	For machine with U. S. STANDARD Lead Screws and Dials	LAROU	LARTY	LARUZ	LARVA
	For machine with METRIC Lead Screws and Dials (For belt drive machines—furnished at extra cost—add the word "Belt" to code word.)				
SHIPPING DATA	Net Weight (Approximate)	2650 Lbs.	1202 Kgs.	2750 Lbs.	1247 Kgs.
	Shipping Weight (Approximate)—Domestic	3150 Lbs.	1430 Kgs.	3250 Lbs.	1475 Kgs.
	Shipping Weight (Approximate)—Export	3600 Lbs.	1633 Kgs.	3700 Lbs.	1678 Kgs.
	Size of Case—Export	35" x 61" x 62"	893 x 1550 x 1576	35" x 61" x 62"	893 x 1550 x 1576
SHIPPING DATA	Cubic Measurements—Export	76.6 cu. ft.	2.17 cu. meters	76.6 cu. ft.	2.17 cu. meters

STANDARD EQUIPMENT INCLUDES: Conventional Lead Attachment, 8" Swing Model H Spiral Universal WORMWHEEL type, preloaded ball bearing dividing head, 40 to 1 ratio, with 3 single index plates, adjustable tailstock, center rest, dividing center and work driver, lead change gears, and book of index and lead charts. Spindle reverse, cutter coolant system, 2-way Longitudinal Power Rapid Traverser, arbor draw-in rod, adjustable arm brace, necessary wrenches, and arbor supports listed above. Intermediate arbor support can be substituted in place of style A arbor support, without extra charge, when specified on order.

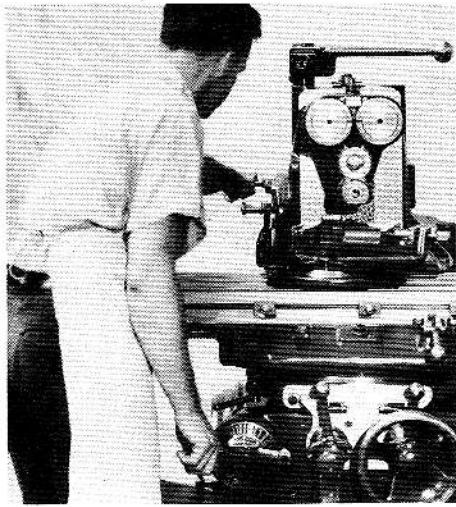
EXTRA EQUIPMENT (available at additional cost): Swivel vise, three-jaw universal chuck, thread milling attachment, right angle drive for dividing head, cam milling slide, universal and vertical milling attachments, light hi-speed attachment, slotting attachment, attachment crane, rotary table, arbors, etc.

(★) All Model H machines are equipped for motor-in-base drive. Price of machine includes push button, multiple V-belts, sheaves, adjustable motor bracket, and mounting of motor at factory, when desired. Price does NOT include motor, starter, or wiring. Any Model H machine can be furnished on special order arranged for belt drive at additional cost.

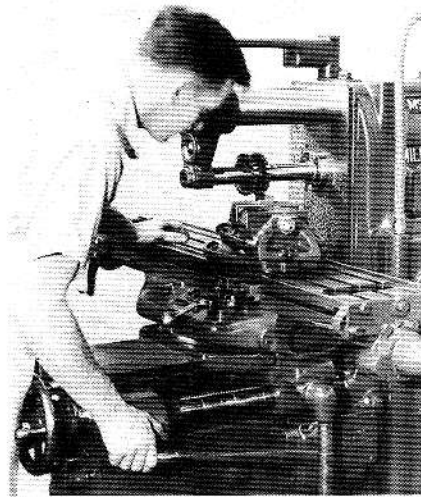
The manufacturer reserves the right to improve, change or modify the construction of these milling machines or attachments or any part thereof as he may see fit, without incurring any obligation to make like changes on K&I MILWAUKEE Milling Machines or attachments previously sold.

MILWAUKEE MILLING MACHINES

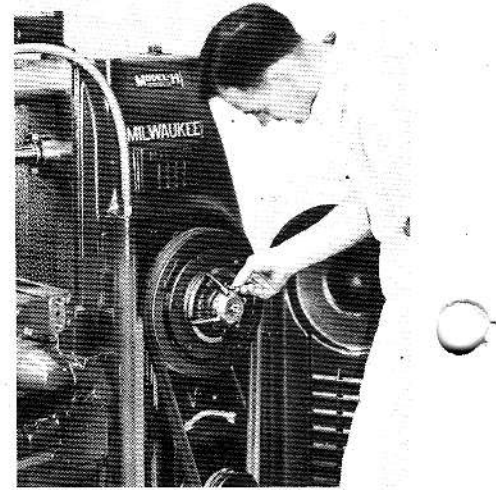
HERE ARE A FEW MILWAUKEE FEATURES



Speed changes are easily accessible from front of machine when desired.



Longitudinal rapid traverse is "live" type and finger-touch controlled.



Drive clutch—with integral brake—is hand adjusted for frail saws and rugged cutters.

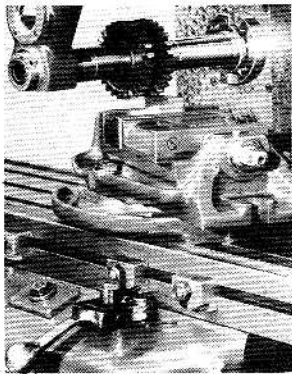
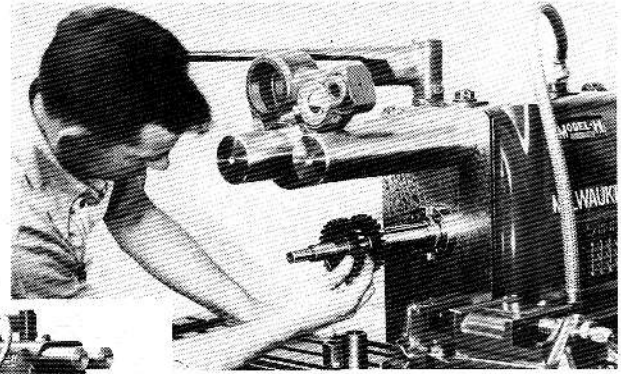
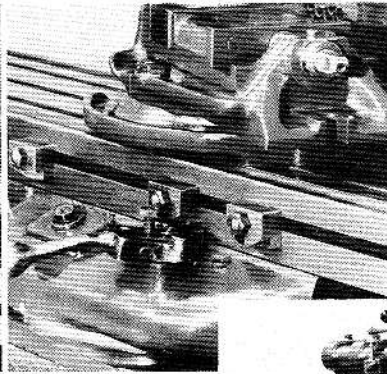
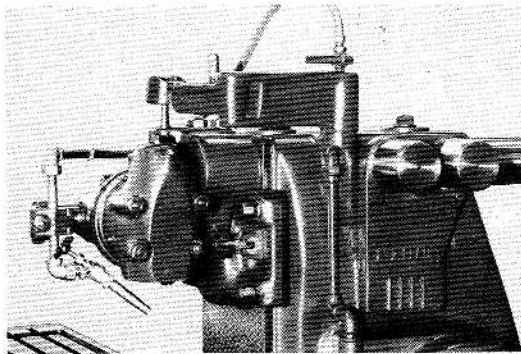


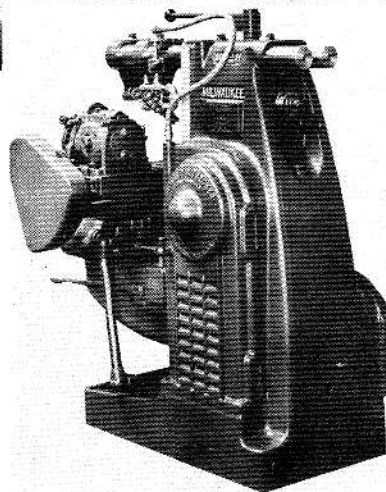
Table feed lever is re-engaging type — tilts up to clear first trip — returns to normal for next stop.



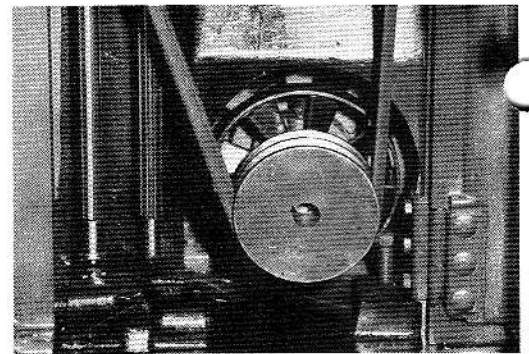
Double Overarms are still best for rigidity and convenience.



A double knuckle attachment crane with parking arms will save handling attachments.



Real backbone construction — a solid rear column wall. Motor reached from sides.



Coolant pump quickly disengaged. Has selective drive — runs constantly or stops with spindle.

KEARNEY & TRECKER CORPORATION

MILWAUKEE, WISCONSIN

TO OBTAIN THE R.P.M. OF A CUTTER AT A DESIRED SPEED (Feet per Minute)

RULE: Divide the feet per minute (F.P.M.) by the circumference of the cutter.

For a 5" cutter, 10 H.S. blades, to run at 80 F.P.M.
the formula would be:

$$\text{F.P.M.} \div \frac{\text{Dia. of Cutter} \times \pi}{12} = \text{R.P.M.}$$

$$\text{or } 80 \div \frac{5 \times 3.1416}{12} = 61.1 \text{ R.P.M.}$$

EXAMPLE: 3.1416 <u> 5</u> In.Dia. 15.7080 Inches	1.31 Feet 12) <u>15.71</u>	61 R.P.M. 1.31) <u>80.00</u> F.P.M. 786 <u>140</u> <u>131</u>
---	-------------------------------	---

TO OBTAIN SPEED OF CUTTER IN FEET PER MINUTE (F.P.M.)

RULE: Diameter of cutter (inches) multiplied by π , multiplied by revolutions per minute, divided by 12.

$$\frac{D \times \pi \times \text{R.P.M.}}{12} = \text{F.P.M.}$$

EXAMPLE: 3.1416
<u> 5</u> In. Dia.
15.7080 In. Circumference
<u> 61</u> R.P.M.
157080
<u>942480</u>
12) 958.188(80 F.P.M.)

TO OBTAIN FEED PER TOOTH PER REVOLUTION (F.T.R.)

RULE: The feed per tooth per revolution equals the feed per minute, in inches, divided by the number of teeth in the cutter, multiplied by the number of revolutions per minute.

$$F \div (T \times \text{R.P.M.}) = \text{F.T.R.}$$

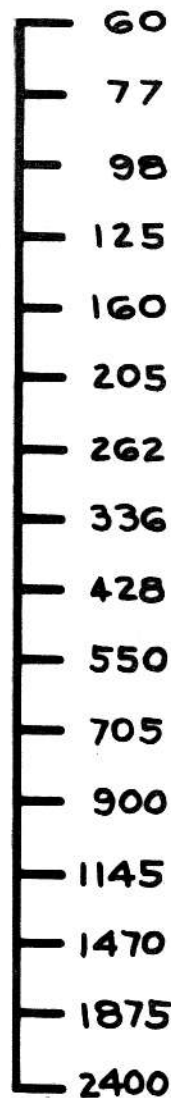
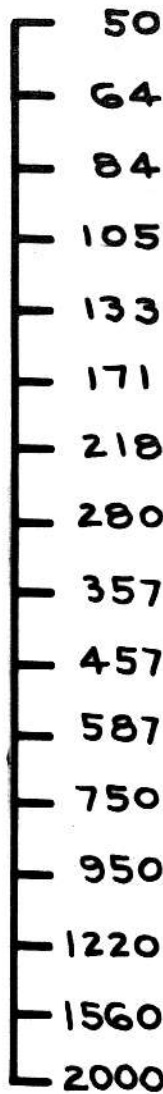
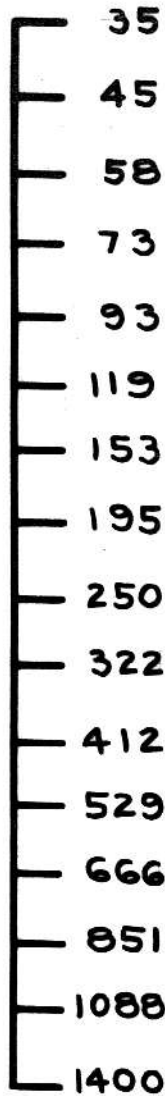
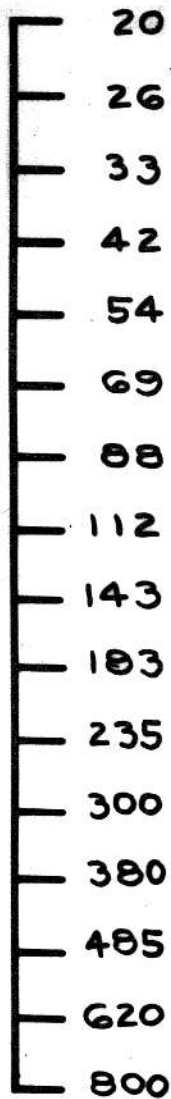
EXAMPLE: 61 R.P.M. <u> 10</u> Teeth 610 T.P.M.	.009 F.T.R. 610) <u>5.500</u> In. Feed 5490 <u>10</u>
---	--

TO OBTAIN FEED PER MINUTE (F.)

RULE: The feed per minute equals the feed per tooth per revolution multiplied by the number of teeth in cutter, multiplied by the number of revolutions per minute.

$$\text{F.T.R.} \times T \times \text{R.P.M.} = \text{Feed}$$

EXAMPLE: .009 F.T.R.
<u> 10</u> T. in Cutter
.09
<u> 61</u> R.P.M.
5.49 Feed



20 TO 800
* 1H-2HL
PLAIN UNIV.
* 1H-2H MFG.
* 2H-PLAIN UNIV.
VERT.

35 TO 1400
STANDARD
1H-2H MFG.
1H-2HL
PLAIN-UNIV.
2H-PLAIN
UNIV. VERT.

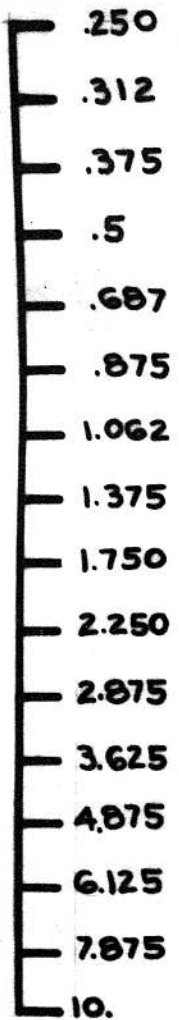
50 TO 2000
* 2 H MFG.
PLAIN-UNIV.
VERT.

60 TO 2400
* 1H MFG.
* 1H-2HL
PLAIN-UNIV.

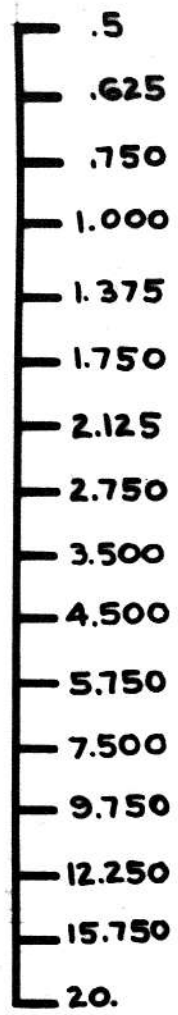
* OPTIONAL
BUILT IN AT FACTORY
AT SLIGHT ADDITIONAL COST

MODEL SPEEDS

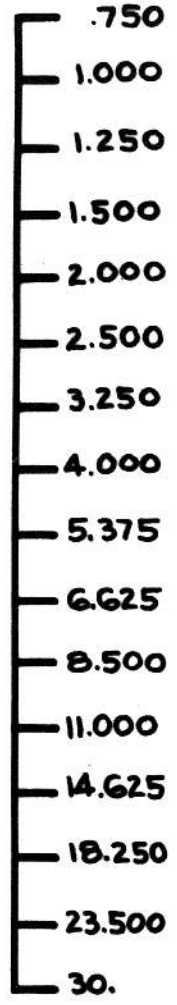
K&T



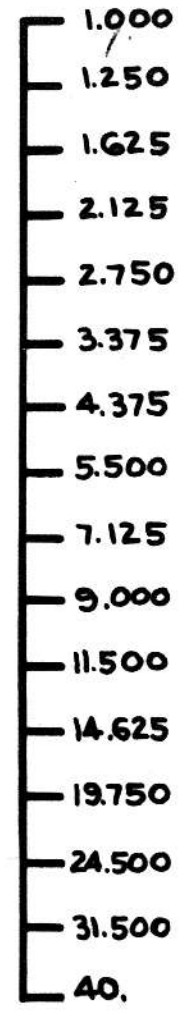
$\frac{1}{4}$ TO 10
 * 1H-2HL
 PLAIN UNIV.
 * 1H-2H MFG.
 * 2H PLAIN
 UNIV. VERT.



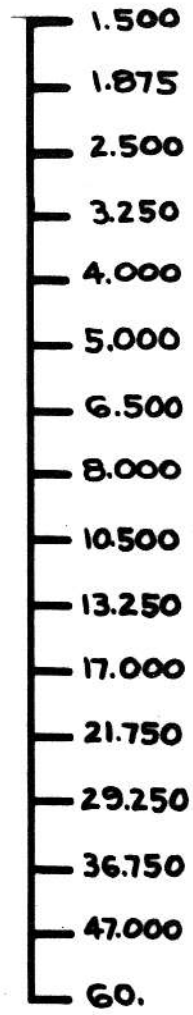
$\frac{1}{2}$ TO 20
 STANDARD
 1H 2HL
 PLAIN UNIV.
 2H PLAIN
 UNIV. VERT.
 * 1H 2H MFG.



$\frac{3}{4}$ TO 30
 * 1H 2HL
 PLAIN UNIV.
 * 1H-2H MFG.
 * 2H PLAIN
 UNIV. VERT.



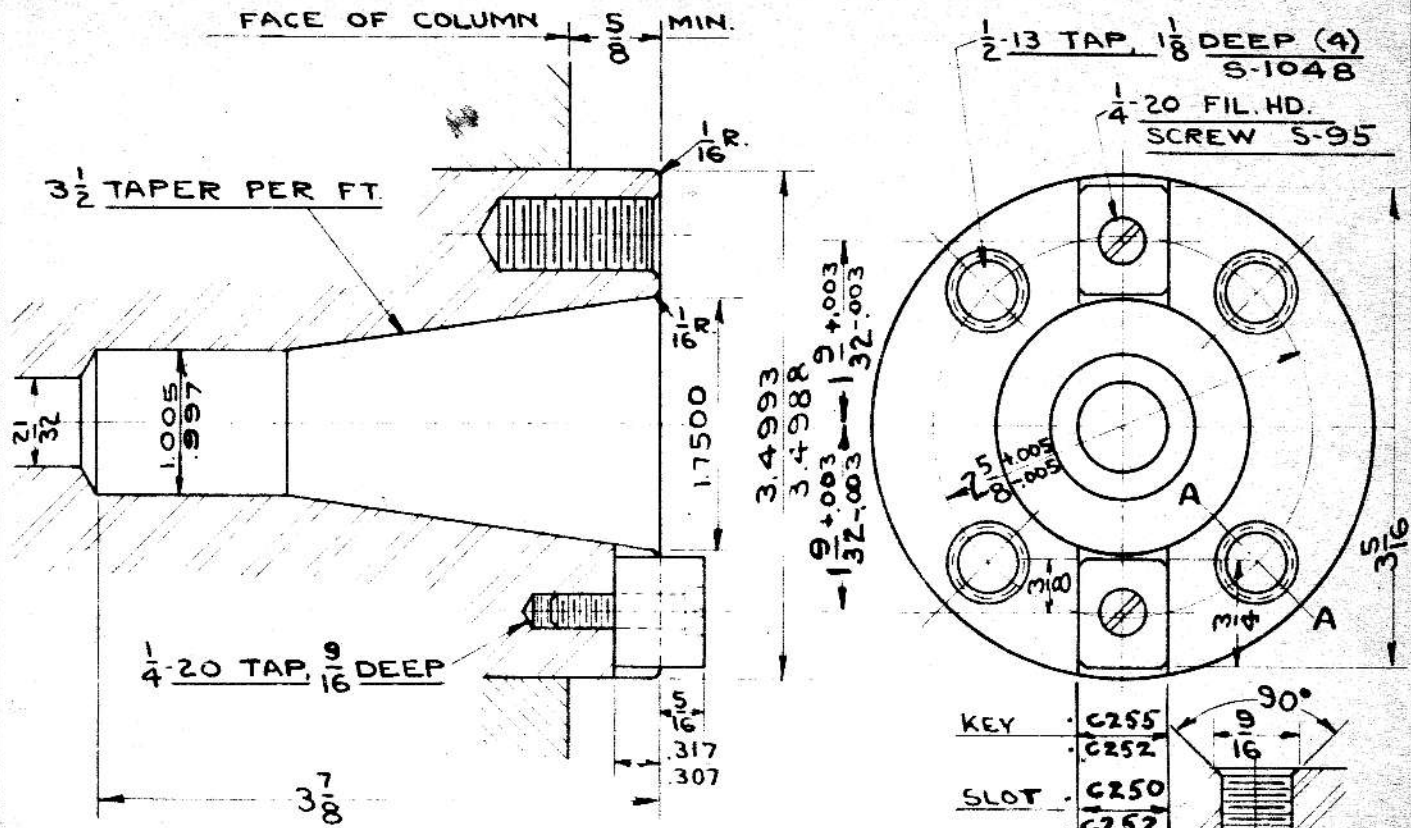
1 TO 40
 STANDARD
 1H-2H MFG.
 * 1H-2HL
 PLAIN UNIV.
 2H PLAIN
 * UNIV. VERT.



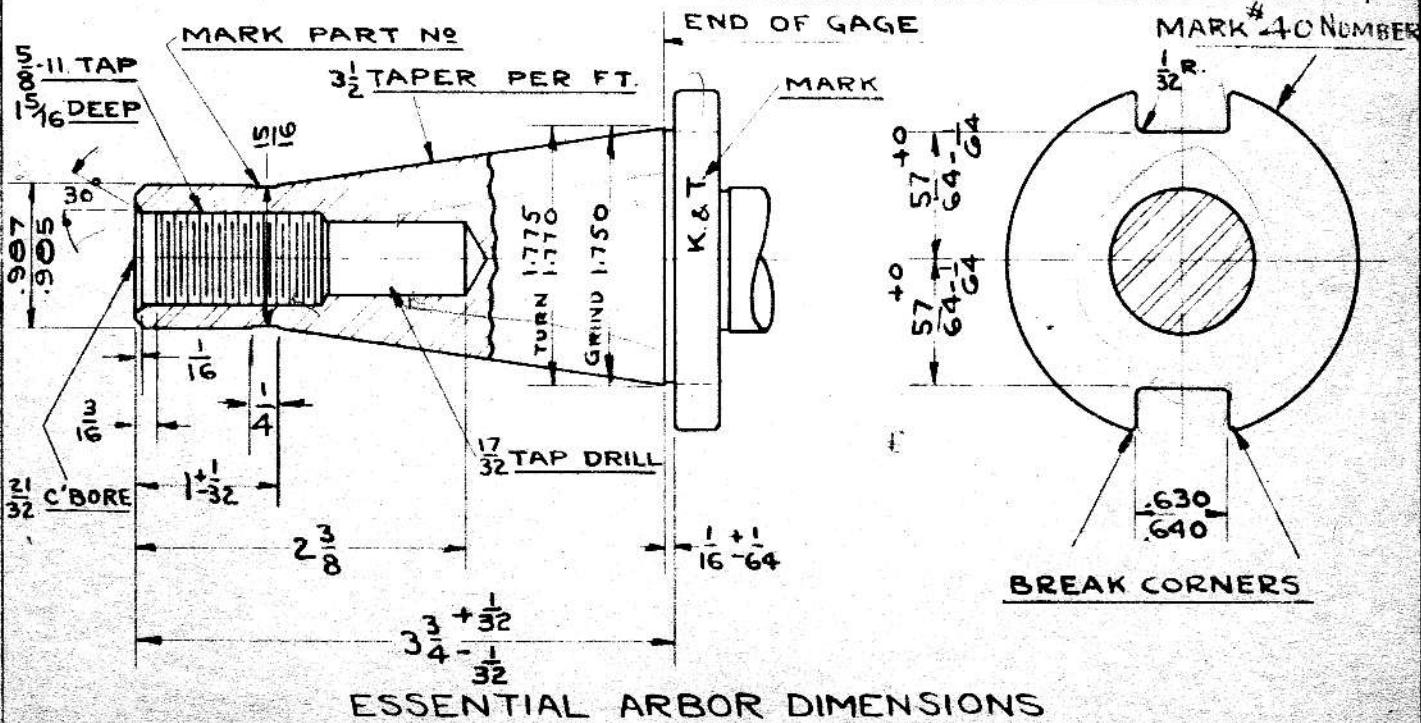
$1\frac{1}{2}$ TO 60
 * 1H-2H MFG.
 * 1H-2HL
 PLAIN UNIV.
 * 2H PLAIN
 UNIV. VERT.

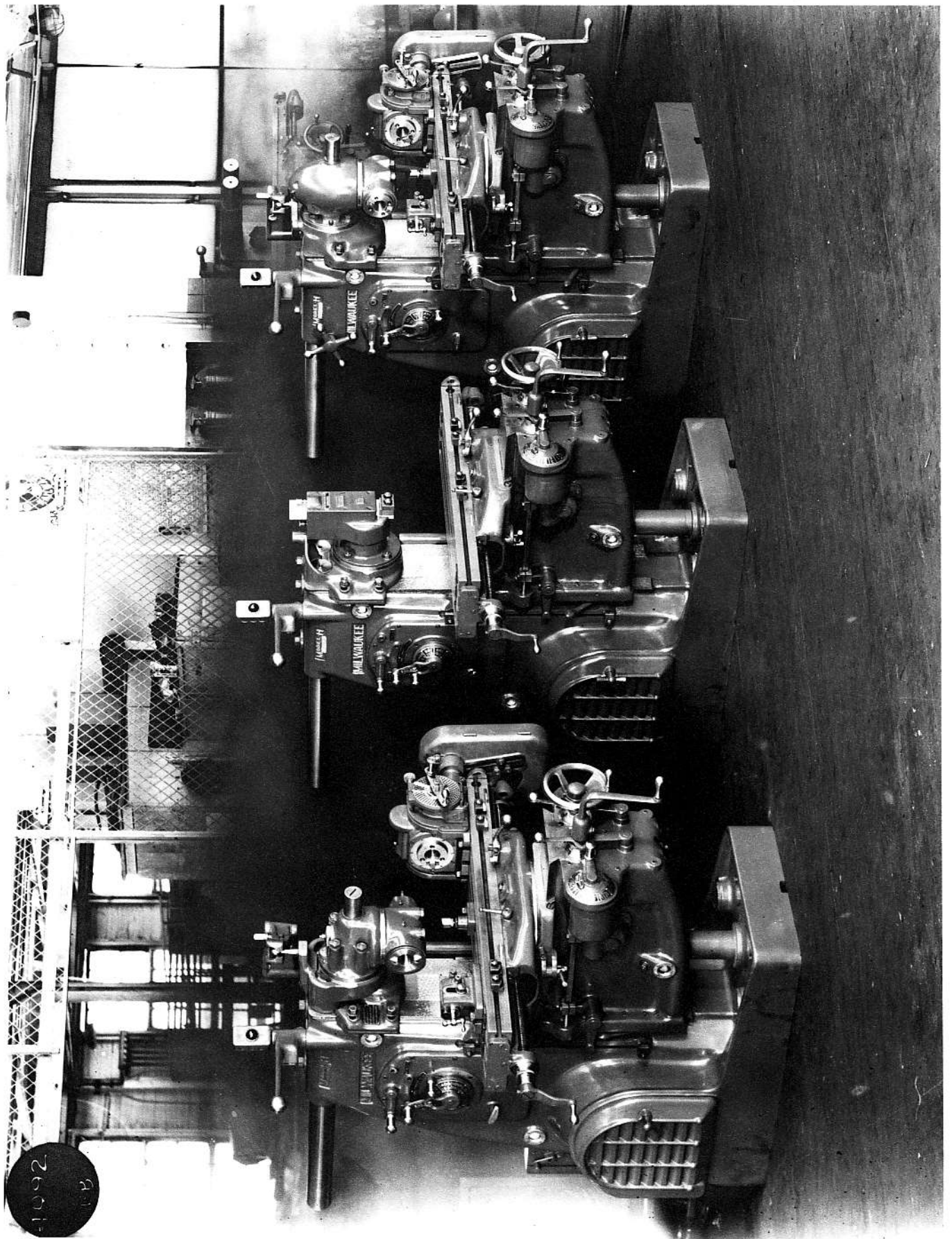
* OPTIONAL
 BUILT IN AT FACTORY
 AT SLIGHT ADDITIONAL COST

MODEL H FEEDS



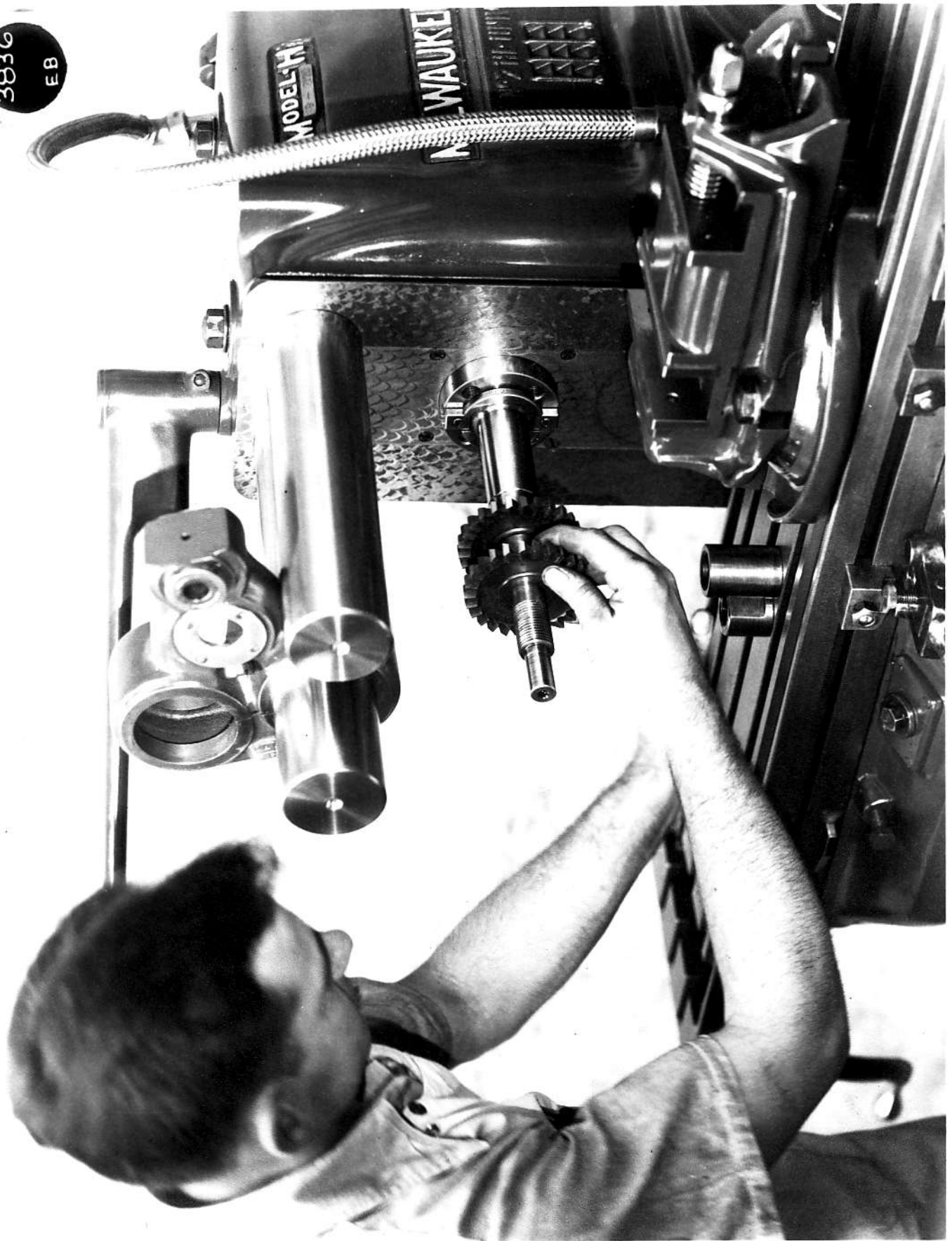
ESSENTIAL SPINDLE NOSE DIMENSIONS
STANDARD ADOPTED BY THE MILLING MACHINE MANUFACTURERS
OF THE NATIONAL TOOL BUILDERS ASSOCIATION, FOR MACHINES
FROM _____ TO _____ HORSEPOWER





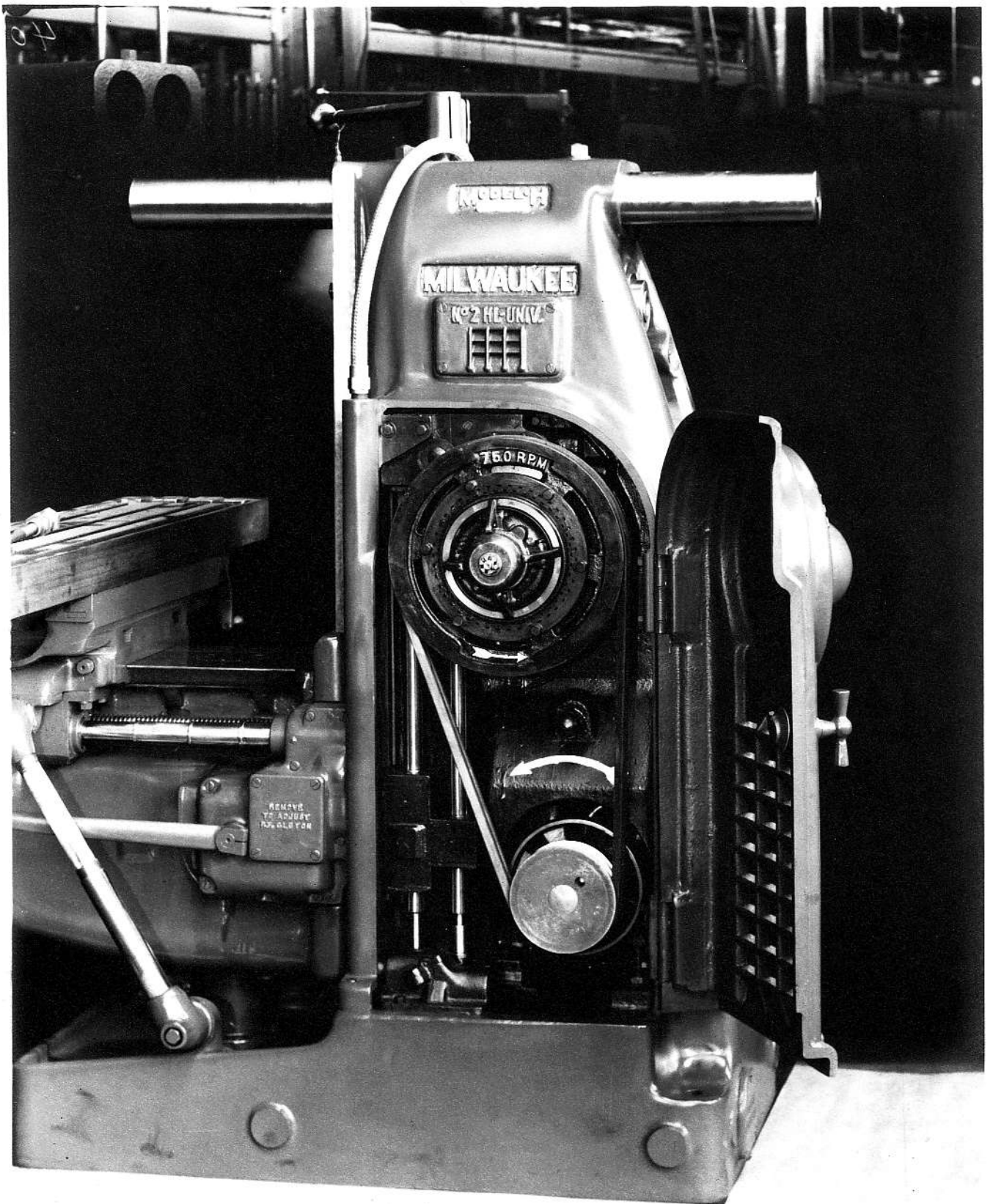
1092
1092

3836
EB







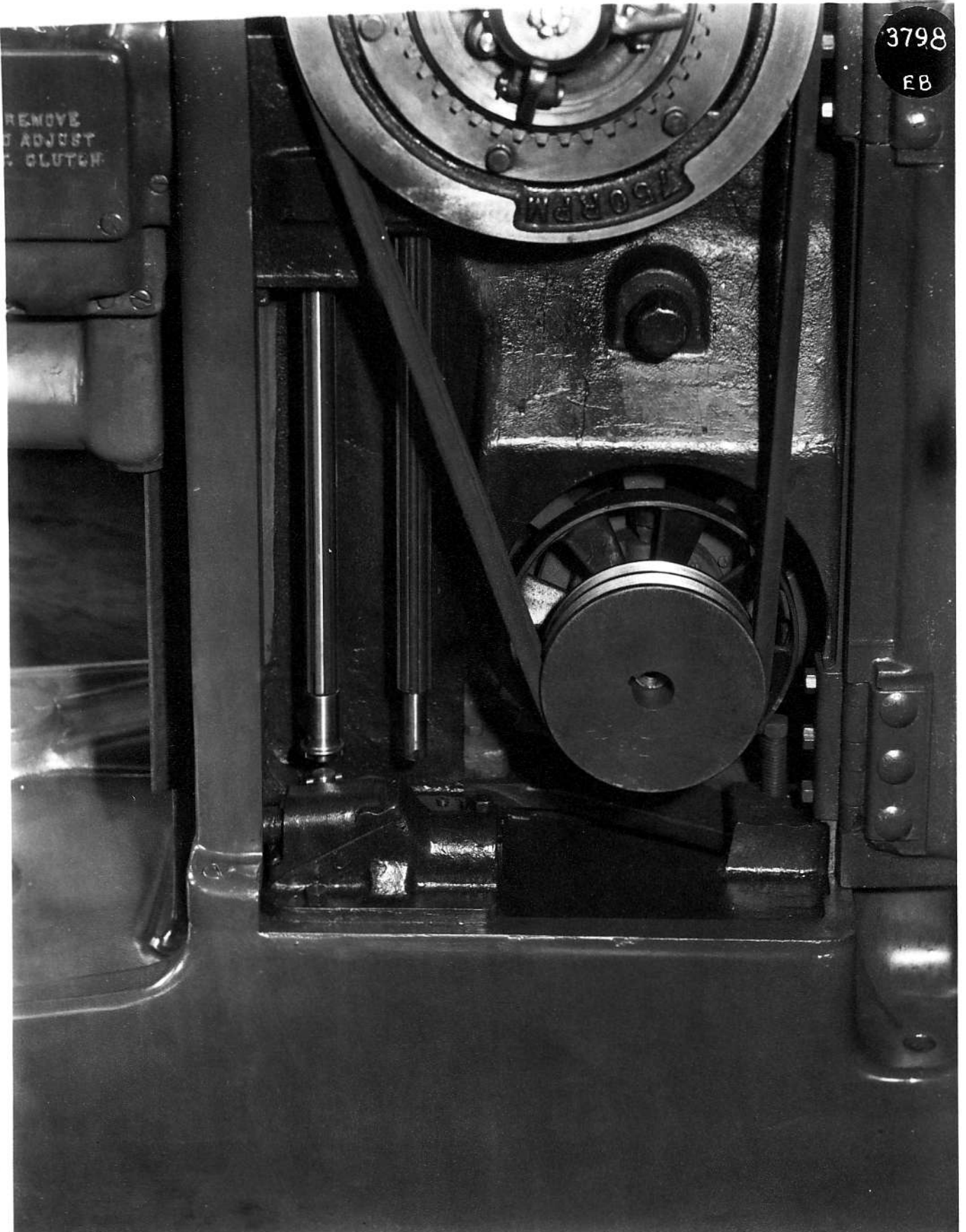


REMOVE
ADJUST
CLUTCH

3798

EB

1500RPM



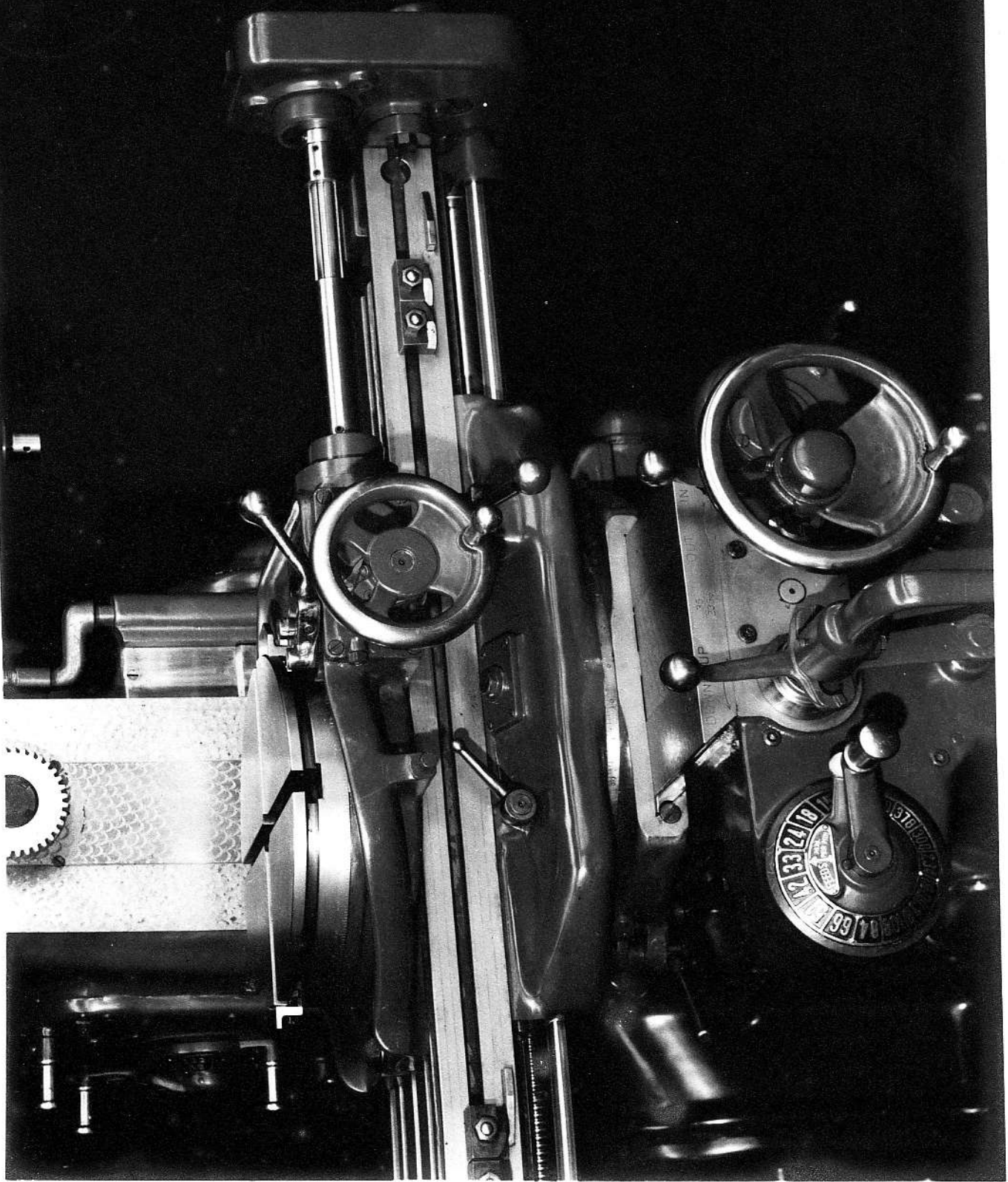
3865

EB



4122

EB



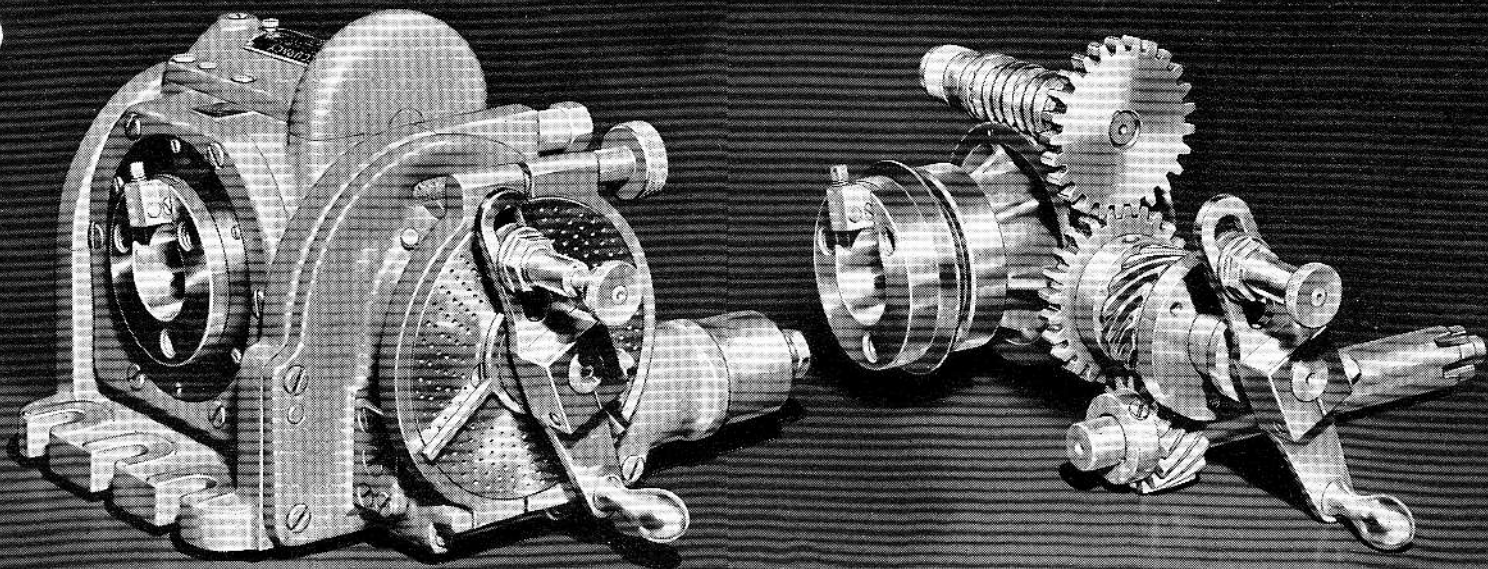
BUI

IN

44

THE NEW
Model
DIVIDING H

SPIRAL UNIVERSAL • WORM WHEEL TYPE • 40 TO 1 RATIO



Another "K & T" achievement!

When purchasing a machine tool or its attachments, one of the most vital factors to be considered is obsolescence. Will the equipment be a profitable producer five, ten, or more years after date of purchase . . . or will it have to be tagged "obsolete" and replaced? • The New Model H Dividing Head, like the New Model H Milwaukee, is definitely guaranteed against early obsolescence. It is not merely an "improved" dividing head but is entirely new and modern in every detail. Yet it is simple and sound in design, and enduring in construction. With ordinary care it will give a lifetime of highly satisfactory and profitable service. And it will remain modern in performance because: First, its accuracy will remain unchanged after years of daily service . . . secondly, it is designed to meet not only today's production requirements but tomorrow's as well. • Here at last is the Dividing Head you have always needed but couldn't buy . . . the Head that makes those fussy jobs easier, and steps up production and profits in the toolroom . . . the Head designed to last, and built to stay on the job . . . your best assurance against early obsolescence and costly replacements.

UNIFORM ACCURACY . . .

under all loads!

The operation of every plain bearing dividing head spindle is dependent entirely on a film of oil. This film, thin as it is, has proved one of the greatest destroyers of dividing accuracy. Without any load the plain bearing spindle will show satisfactory "apparent" accuracy. But when that same spindle is subjected to even average cutting pressures, the oil film is squeezed to one side with the result that the accuracy under load does not measure up to the "apparent" accuracy of the head when idle.

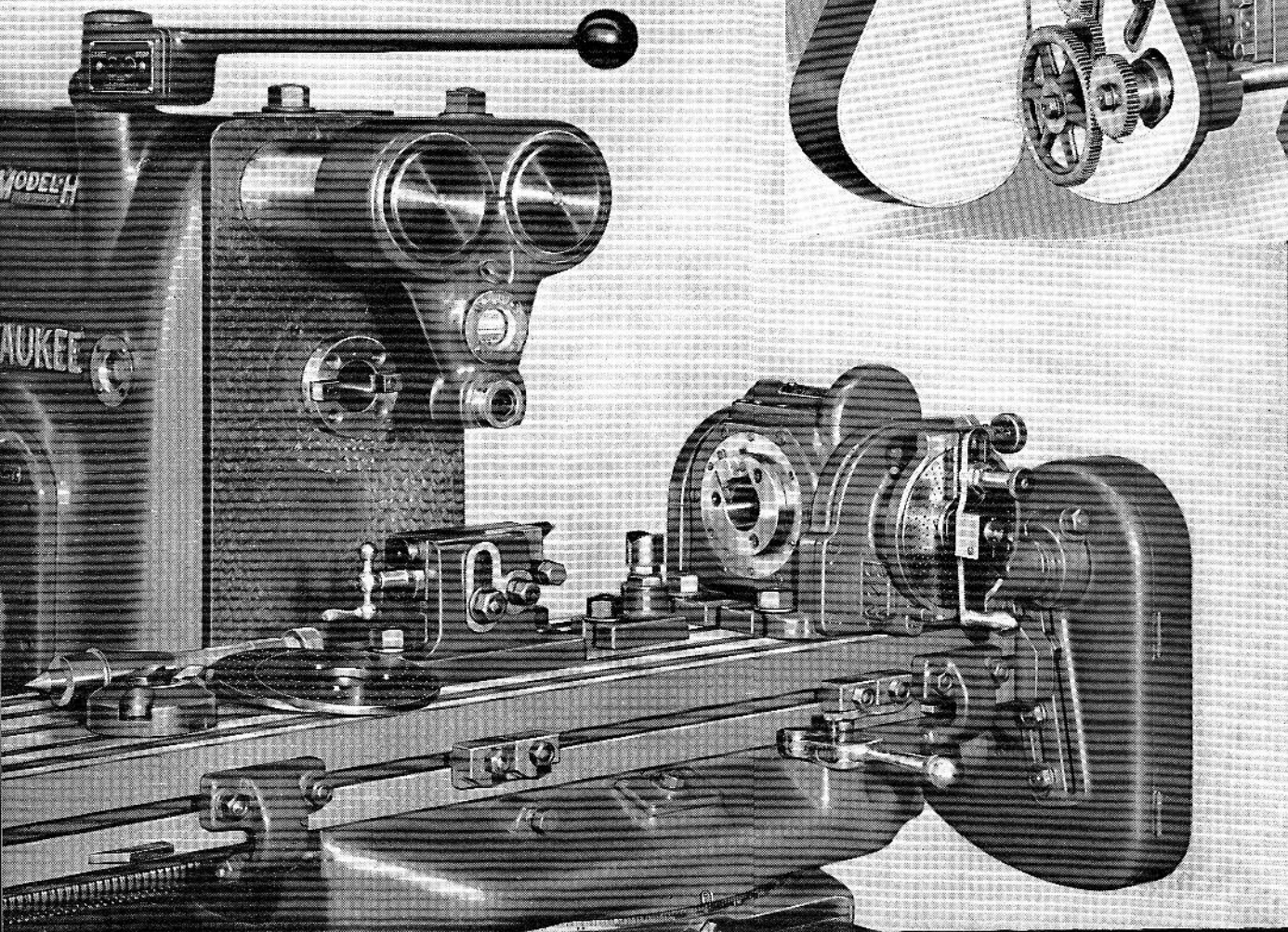
In the New Model H Dividing Head there is no oil film to cause variations in accuracy, spoiled

work and lost time. Instead of the ordinary plain bearings, the rugged spindle is mounted on over-size and matched precision *anti-friction bearings* which are *preloaded* at the factory under several hundred pounds pressure. This gives a metal-to-metal bearing contact which eliminates any chance of accuracy variation regardless of spindle load. For the first time, heavy-load accuracy *equals* no-load accuracy.

CONVENTIONAL LEAD ATTACHMENT

Shown below is a Model H Universal Milwaukee Milling Machine equipped with the New Model H Dividing Head and Conventional Lead Attachment. This attachment is standard equipment on Model H Universal Milling Machines and is supplied with change gears for cutting leads from .670 inch to 149 inches. Leads above 2½ inches can be cut by power. No auxiliary drive shaft is used here as power is taken directly from the table screw.

At the right is shown a rear view of the conventional lead change gear box with safety door opened to show lead change gears.



New two-piece worm

Pre-loaded anti-friction bearings

MODERN, SOUND DESIGN

Some appreciation of the accuracy and rigidity built into this New Model H Head can be obtained by a brief study of the cover illustration. In the right hand view is shown one of the oversize precision spindle bearings located between the spindle face and the large wormwheel. Compare its size with the spindle nose which is $3\frac{1}{2}$ inches in diameter. Note the general ruggedness and excellent workmanship throughout the entire mechanism. Here is modern, sound design . . . here is generous reserve strength in every part to insure accuracy under all loads . . . here again is your guarantee against costly spoiled work, lost time and lost profits.

LOW LEAD ATTACHMENT—40,362 LEADS *By Power*

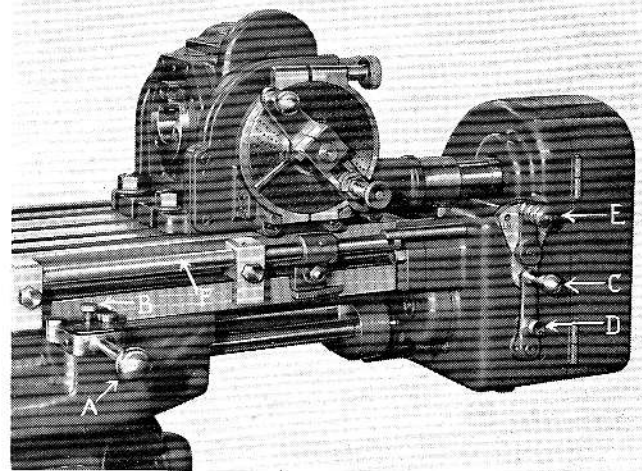
When equipped with the Low Lead Attachment shown at right, the Model H Dividing Head will actually cut by power 40,362 different leads, ranging from 38 threads to the inch to a maximum lead of over 2,000 inches. Most short leads can be stepped up or down by as small an amount as $1/10,000$ th of an inch. This wide range of leads is of real value to the tool maker when confronted with that "fussy" job. Furthermore, the cutting of short leads by power completely eliminates tedious, unsteady hand feeds and "hard" drives. The power rapid traverse regularly furnished on Model H Machines is available for all leads when using this attachment.

Leads below 8 inches are driven by an auxiliary shaft under the machine table. Feed lever (A) is locked in neutral with knurled screw (B) and all feeds and power are engaged by table feed lever (C). Lever (C) is directional and moved to left or right for left or right hand feeds. Lever (E) is also directional and is used for chang-

NEW 2-PIECE WORM

. . . Increases Accuracy

Another modern and exclusive development included in the New Model H Head is a two-piece worm, clutched together but separated $1/16$ inch in assembly. Instead of the usual cams or eccentrics for taking up wear between worm and wormwheel, adjustment for wear is now made by merely bringing the two worm sections closer together without disturbing their fixed axis of rotation. In this manner the accuracy of the worm is never destroyed. The tooth contact relation remains unchanged and actually improves with service.



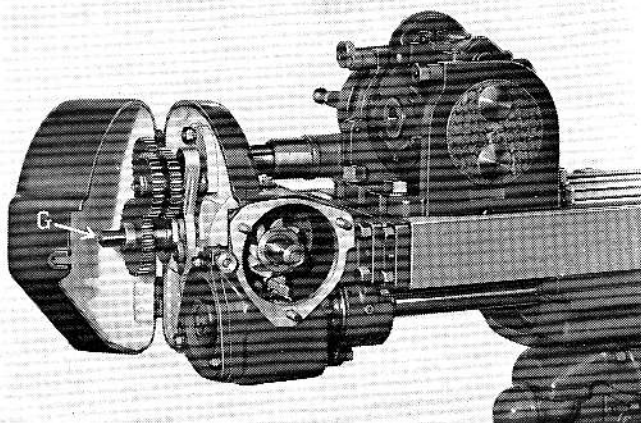
ing the "hand" of the spiral. Feed trip shaft (F) is used only on leads below 8 inches and can be removed on leads above 8 inches.

Leads above 8 inches are driven directly from the table screw. Table direction lever (C) is locked in neutral using the knurled screw (D) and all feeds and power are engaged by table feed lever (A).

At left is shown a rear view of the Low Lead Gear Box with safety door open and cover plate removed to show large size of worm and wormwheel. Hand crank square (G) on end of lower gear shaft permits checking lead set-up as well as hand feeding the lead when desired.

STANDARDIZED SPINDLE END

The hardened and ground spindle end is the No. 40 National Standard with $3\frac{1}{2}$ inches per foot, non-sticking taper, so that arbors are interchangeable with the mill-



. . . PERMANENT ACCURACY ASSURED

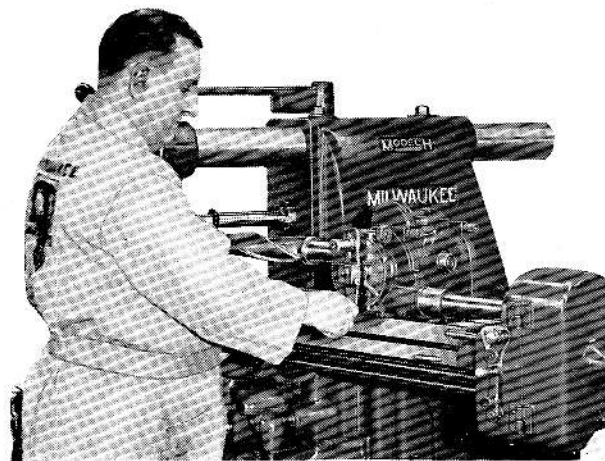
ing machine spindle. An expanding key takes up all play between the driving key and the collar of the arbor, and gives a metal-to-metal positive drive.

POSITIVE ALIGNMENT CLAMPING

Large self-equalizing clamps that grip all-the-way-around are used to clamp the spindle, the spindle block, and even the index plates. This equalized clamping pressure prevents springing and distortion — another factor contributing to permanent accuracy. Incidentally this system of clamping is the same superior construction that is used on the more expensive Model K Hypoid Head.

ACCURACY

The indexing accuracy of a Model H Dividing Head is within the accepted standard of one minute of arc — the equivalent of 1/21,600th part of a circle.

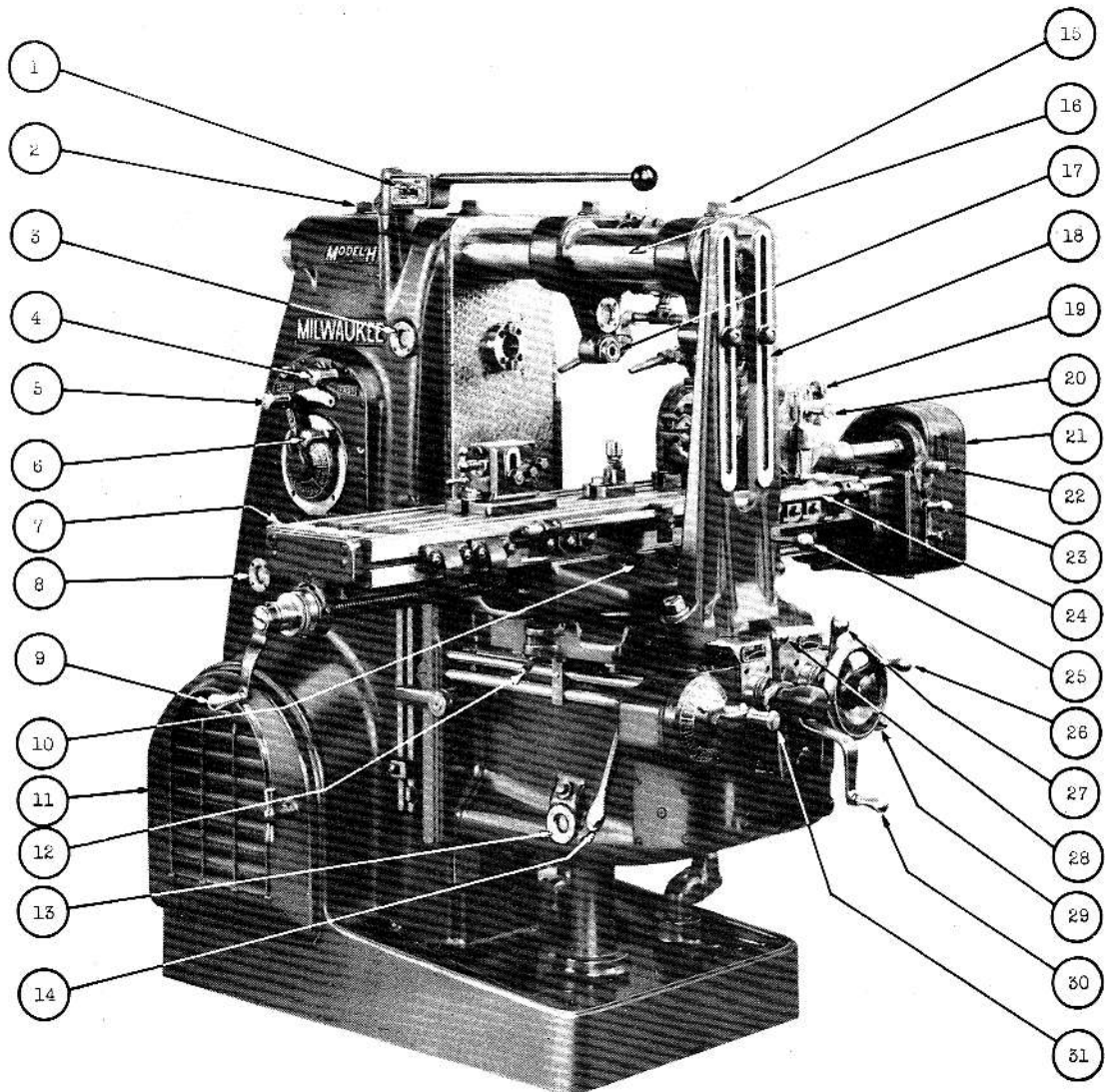


The Majority of Operators are Rightbanded—That is why K&T have placed their dividing head at the right hand end of the table, to enable the operator to stand at his normal position ahead of the index crank, to index easily and naturally with his right hand — and more accurately, too.

SPECIFICATIONS — MODEL H WORMWHEEL HEAD

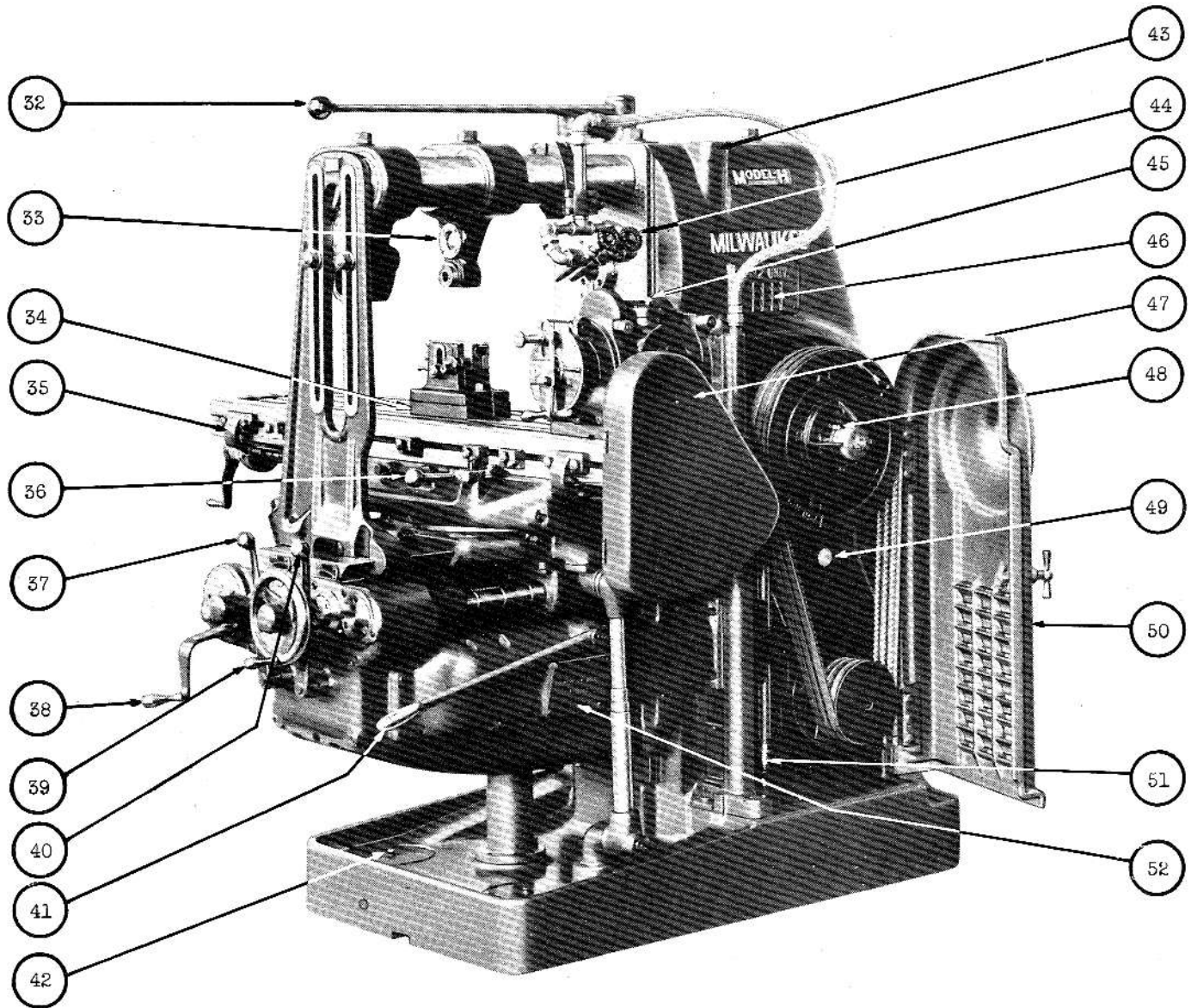
DESCRIPTION	8" Head		10" Head	
	Inches	Millimeters	Inches	Millimeters
Swing.....	8"	203	10"	254
Ratio of index crank to spindle.....	40 to 1	40 to 1	40 to 1	40 to 1
Spindle swivels below horizontal and beyond perpendicular.....	5°	5°	5°	5°
Height in vertical position, face of spindle to top of table.....	7 3/8"	183	9"	229
Taper hole in spindle—same as milling machine spindle so that arbors are interchangeable.....	3/2" per foot No. 40 National Standard			
Diameter No. 40 National Standard Spindle Nose.....	3/2"	89	3/2"	89
Hole through spindle—diameter.....	1"	25.4	1"	25.4
Number of single index plates regularly furnished as standard equipment.....	3	3	3	3
HIGH NUMBER single index plates available at extra cost.....	4	4	4	4
Divisions obtainable by simple indexing using the three single plates regularly furnished.....	All numbers in sequence from 2 to 100 except 51, 53, 57, 59, 61, 63, 67, 69, 71, 73, 77, 79, 81, 83, 87, 89, 91, 93, 96, 97, and 99, and many above.			
Divisions obtainable by simple indexing with the addition of four HIGH NUMBER index plates.....	All numbers in sequence from 2 to 100, all even numbers up to 200, and all numbers divisible by 5 up to 520 except 125, 175, 225, 250, 275, 325, 350, 375, 425, 450, 475, 500, and 515.			
Standard Equipment—when furnished with Model H MILWAUKEE MILLING MACHINES	Equipment consists of Model H Wormwheel type, 40:1 ratio Spiral Universal Dividing Head with three single index plates, adjustable tailstock, center rest, dividing center and work driver, index and lead charts—together with conventional lead change gear box and change gears. When desired, low lead gear box can be substituted, at additional cost.			
Standard Equipment—when Model H Dividing Head is ordered separately.....	When desired for indexing purposes only, Model H Worm and Wormwheel type dividing head can be purchased separately. When so furnished, the price includes the dividing head with three single index plates, adjustable tailstock, center rest, dividing center with work driver, index chart, and arranged with drive connection for spiral milling—but price DOES NOT include lead change gear box or change gears.			
CODE WORD—when Model H Dividing Head is ordered separately.....	8"		10"	
Net weight—dividing head only.....	HUPEG 90 lbs.		LAMZO 95 lbs.	
Net weight—dividing head, including tailstock, center rest, etc.....	130 lbs.		135 lbs.	
Shipping weight—dividing head, including tailstock, center rest, etc.....	160 lbs.		165 lbs.	
Size of case.....	18" x 30" x 16"		18" x 30" x 16"	
CODE WORDS—Attachments used with Model H Dividing Head				
3-Jaw Universal Chuck (5").....	ATMOU			
Four Single type HIGH NUMBER index plates.....	HUPOR			
Right Angle Power Drive Bracket.....	HUPSU			
Cam Slide for reproducing cams from master.....	HURSO			
Thread Milling Attachment.....	HURLO			
Thread Milling Attachment Follower Rest.....	HIXIG			

MODEL 2H UNIVERSAL MILWAUKEE MILLING MACHINES



1. Adjustable starting lever with built-in push button
2. Equalized clamps firmly grip both overarms without springing column
3. Sight oil gauge tells instantly all gears and bearings are getting oil
4. Speed change lever
5. Speed change lever
6. Speed change lever
7. Built-in mechanical spindle reverse - does not reverse feeds
8. Column reservoir oil level gauge
9. Table crank - disengages when hand pressure is released
10. Table lock for boring operations
11. Cross mounted motor - easy to get at
12. Saddle clamp
13. Knee combination oil level and flow gauge
14. Knee to column clamp lever
15. Arbor supports grip overarms all the way around
16. Famous K&T overarms have never been equalled
17. Arbor supports have adjustable bronze bushings with sight feed lubricators
18. Adjustable arm brace - close coupled set-ups
19. Knurled nut for index plate
20. Index plunger
21. Low Lead Box - is not standard equipment - 40,362 leads from .021" to 2918"
22. Lead reverse clutch reverses hand of spiral
23. Table direction lever for leads below 8"
24. Feed trip rod for leads below 8"
25. Directional table feed lever
26. Cross handwheel
27. Directional cross feed lever
28. Directional vertical feed lever
29. Power Rapid Traverse lever
30. Vertical handcrank
31. Feed change lever

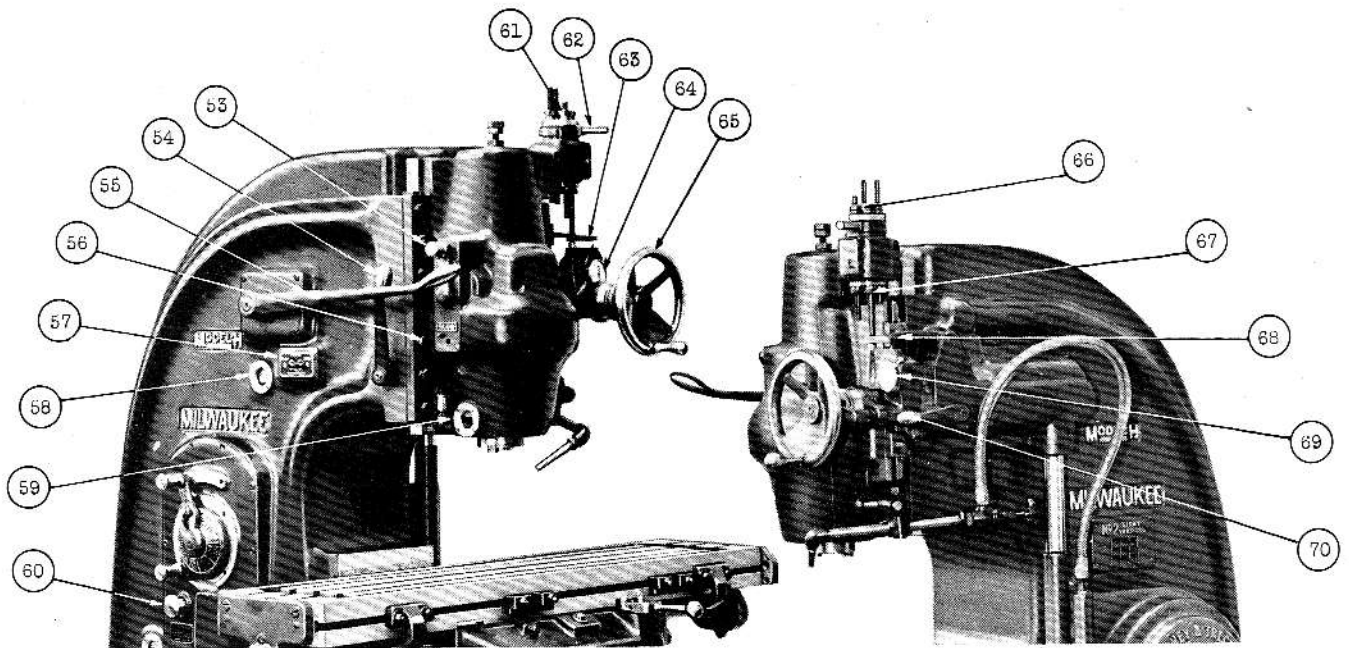
MODEL 2H UNIVERSAL MILWAUKEE MILLING MACHINES



- 32. Adjustable start and stop lever
- 33. Arbor support oil level gauge
- 34. 1" raising blocks to swing 10"
- 35. Accurate table stop
- 36. Table feed directional lever
- 37. Vertical feed lever
- 38. Vertical hand crank
- 39. Cross handwheel
- 40. Cross feed lever
- 41. Power Rapid Traverse lever
- 42. Plates protect screened pockets
- 43. Horizontal columns machined to receive attachment crane
- 44. Two coolant nozzles each with two swivel joints

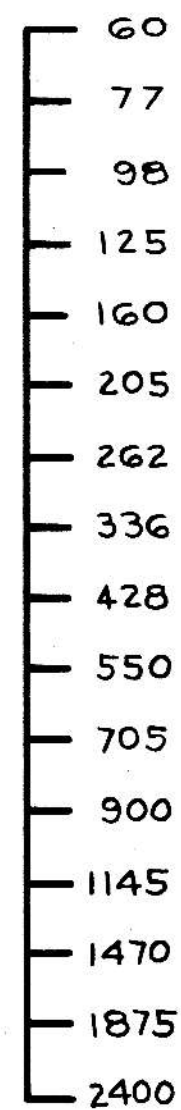
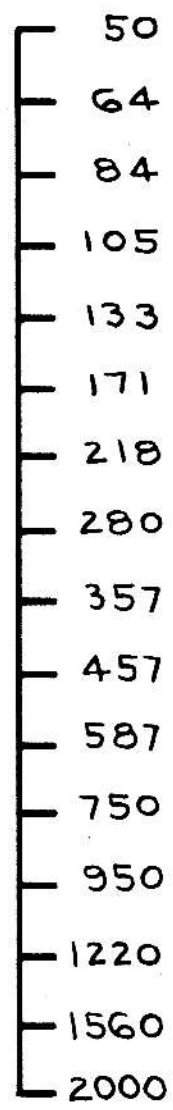
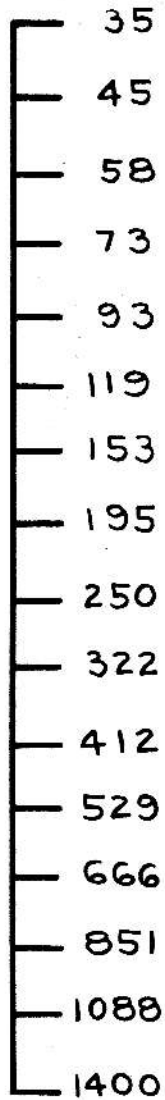
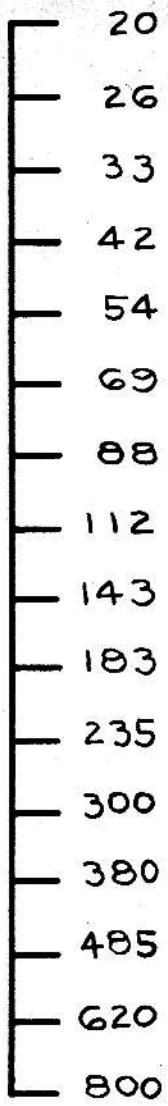
- 45. Dividing head spindle clamping screw
- 46. Column air breather prevents condensation
- 47. Conventional lead box - not standard equipment
- 48. Drive clutch adjustment and lock pin
- 49. Pipe cap for draining column oil reservoir
- 50. Door covers drive sheaves and belts
- 51. Coolant pump drive clutch -- snaps on
- 52. Cover plate for power rapid traverse clutch

MODEL 2H VERTICAL MILWAUKEE MILLING MACHINES



- 53. Speed change lever
- 54. Sliding Head hand clamp
- 55. Start and stop clutch lever
- 56. Sliding head clamp nuts - used when head remains at fixed height
- 57. Built-in push button - avoids unsightly conduits
- 58. Sight oil gauge for gears and bearings in column
- 59. Oil gauge for oil level and pump in sliding head unit
- 60. Built-in mechanical spindle reverse - does not reverse feeds

- 61. Lock nuts for dial screws
- 62. Ratchet handle indexes four position stop
- 63. Feed trip arm also operates indicator
- 64. Dial indicator
- 65. Sliding Head Handwheel - automatically disengages when feed is engaged.
- 66. Locking nuts for dial screws
- 67. Graduated dials for dial screws
- 68. Feed trip arm also operates indicator
- 69. Dial indicator
- 70. Directional feed lever for sliding head



20 TO 800
* 1H-2HL
PLAIN UNIV.
* 1H-2H MFG.
* 2H-PLAIN UNIV.
VERT.

35 TO 1400
STANDARD
1H-2H MFG.
1H-2HL
PLAIN-UNIV.
2H-PLAIN
UNIV. VERT.

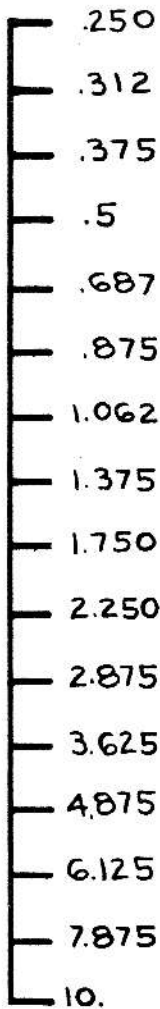
50 TO 2000
* 2H MFG.
PLAIN-UNIV.
VERT.

60 TO 2400
* 1H MFG.
* 1H-2HL
PLAIN-UNIV.

* OPTIONAL
BUILT IN AT FACTORY
AT SLIGHT ADDITIONAL COST

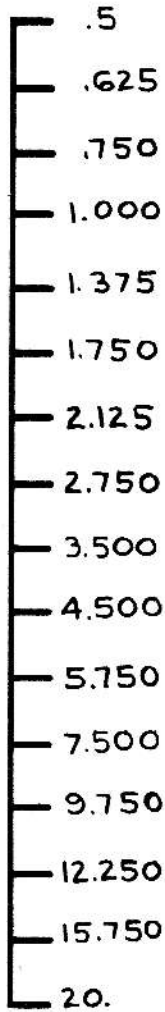
MODEL SPEEDS

K&T

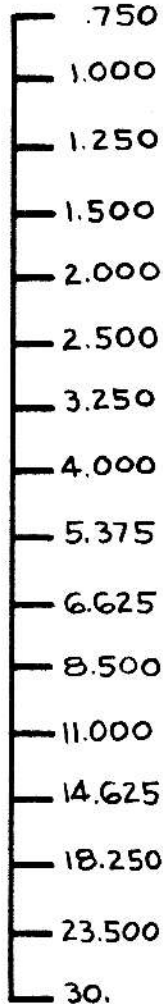


$\frac{1}{4}$ TO 10
 * 1H-2HL
 PLAIN UNIV.
 * 1H-2H MFG.
 * 2H PLAIN
 UNIV. VERT.

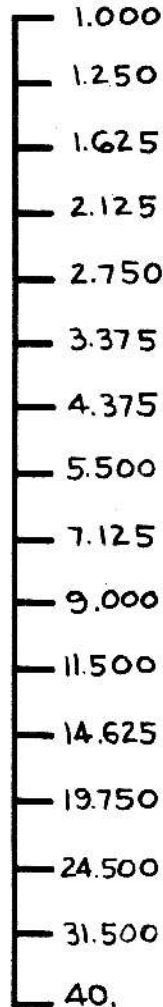
* OPTIONAL
 BUILT IN AT FACTORY
 AT SLIGHT ADDITIONAL COST



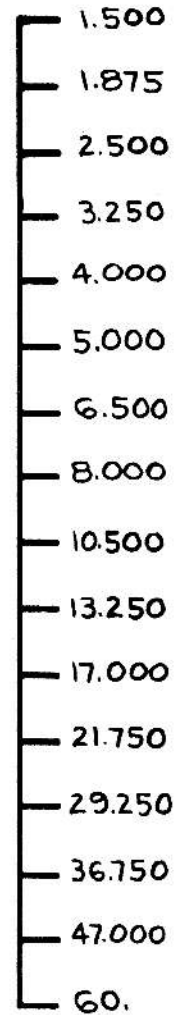
$\frac{1}{2}$ TO 20
 STANDARD
 1H 2HL
 PLAIN UNIV.
 2H PLAIN
 UNIV. VERT.
 * 1H 2H MFG.



$\frac{3}{4}$ TO 30
 * 1H 2HL
 PLAIN UNIV.
 * 1H-2H MFG.
 * 2H PLAIN
 UNIV. VERT.



1 TO 40
 STANDARD
 1H-2H MFG.
 * 1H-2HL
 PLAIN UNIV.
 2H PLAIN
 * UNIV. VERT.

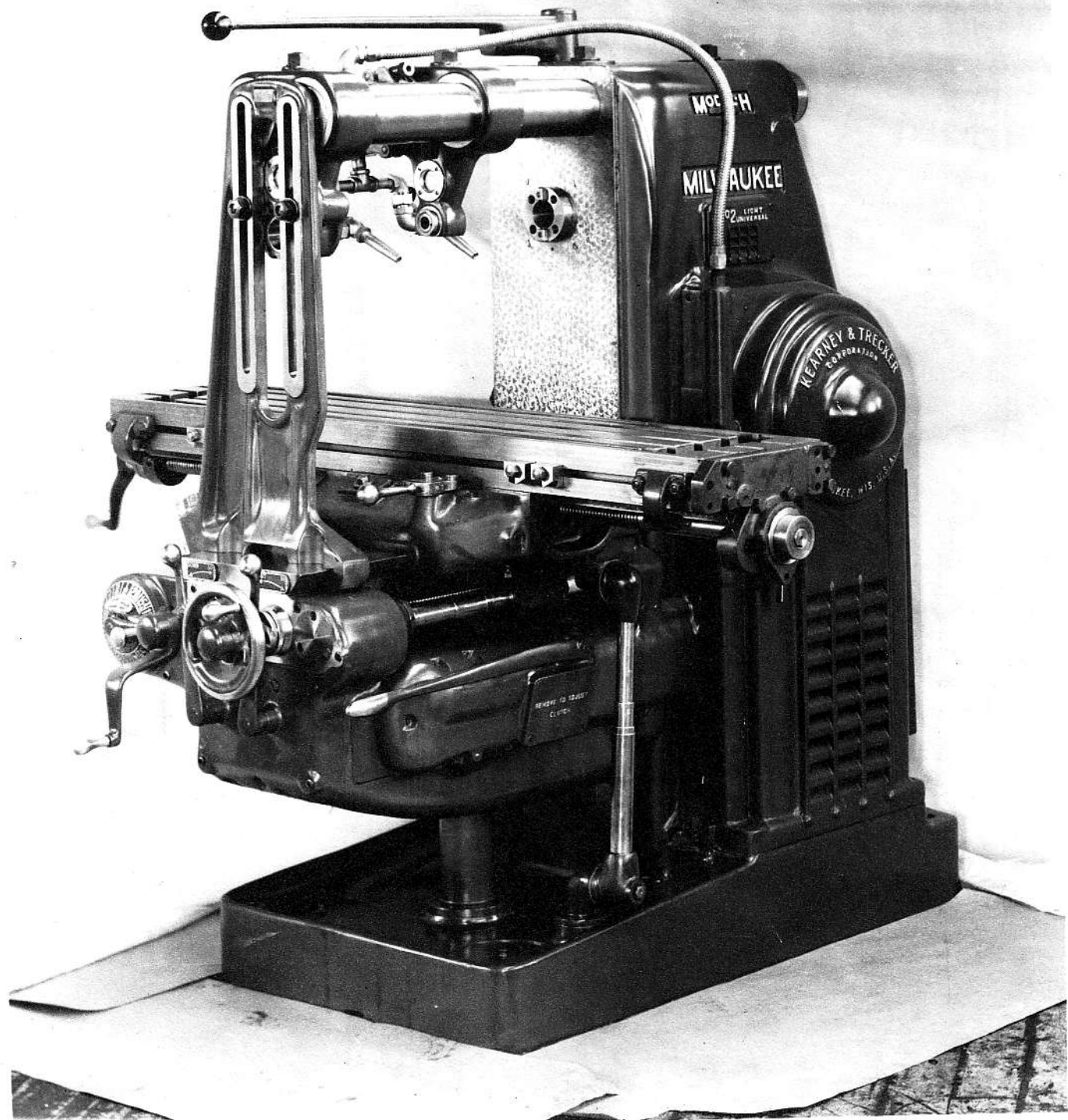


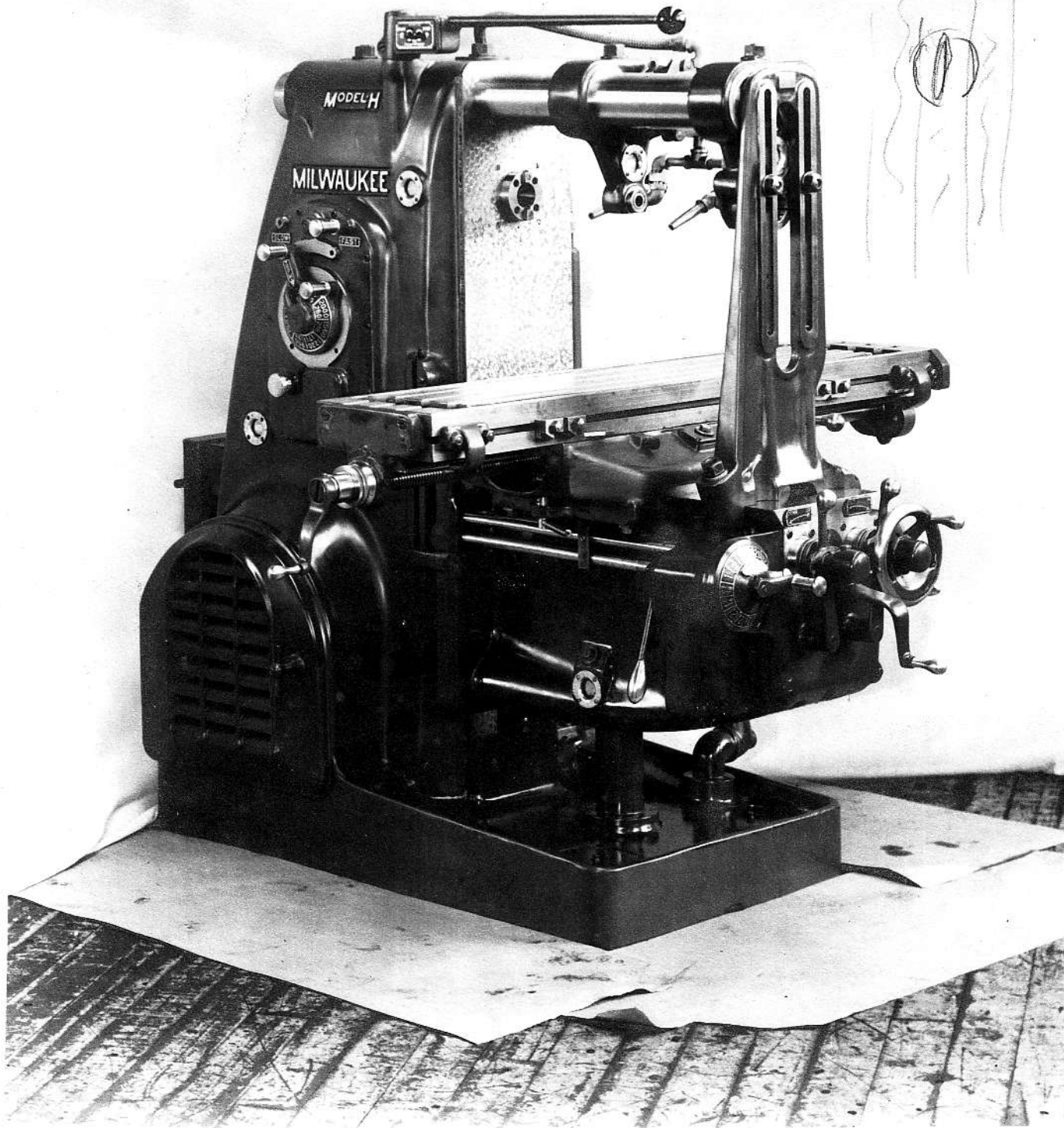
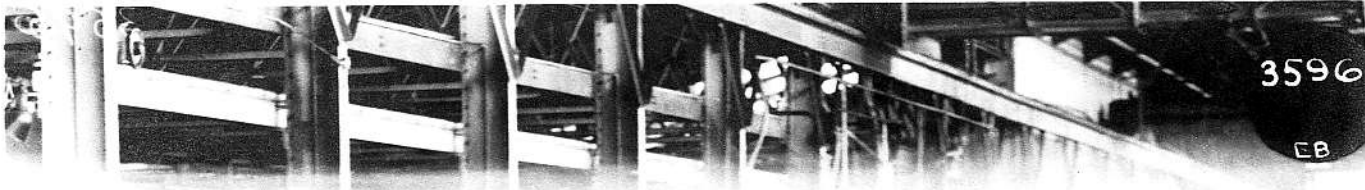
$1\frac{1}{2}$ TO 60
 * 1H-2H MFG.
 * 1H-2HL
 PLAIN UNIV.
 * 2H PLAIN
 UNIV. VERT.

MODEL H FEEDS

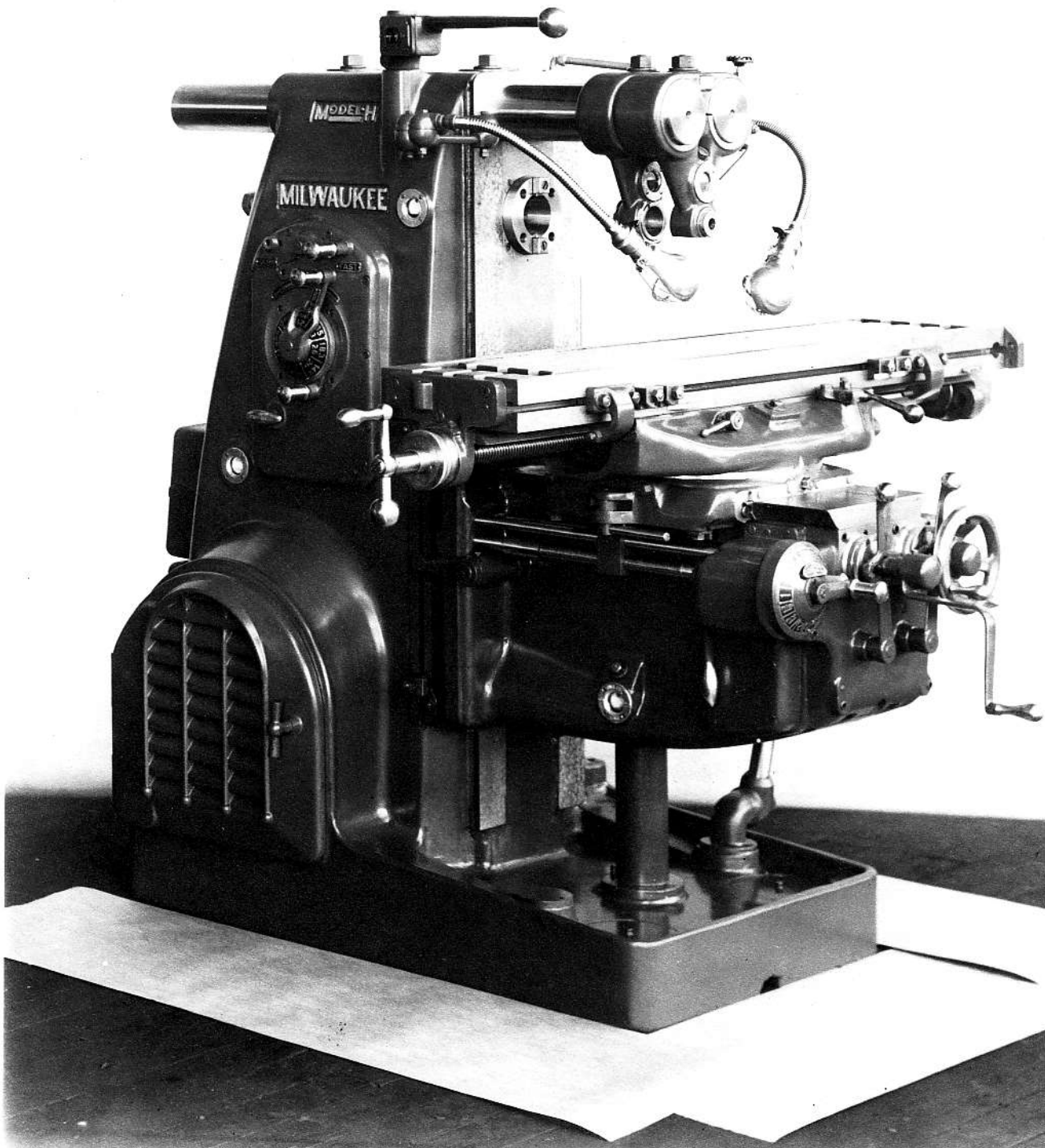
3597

EB

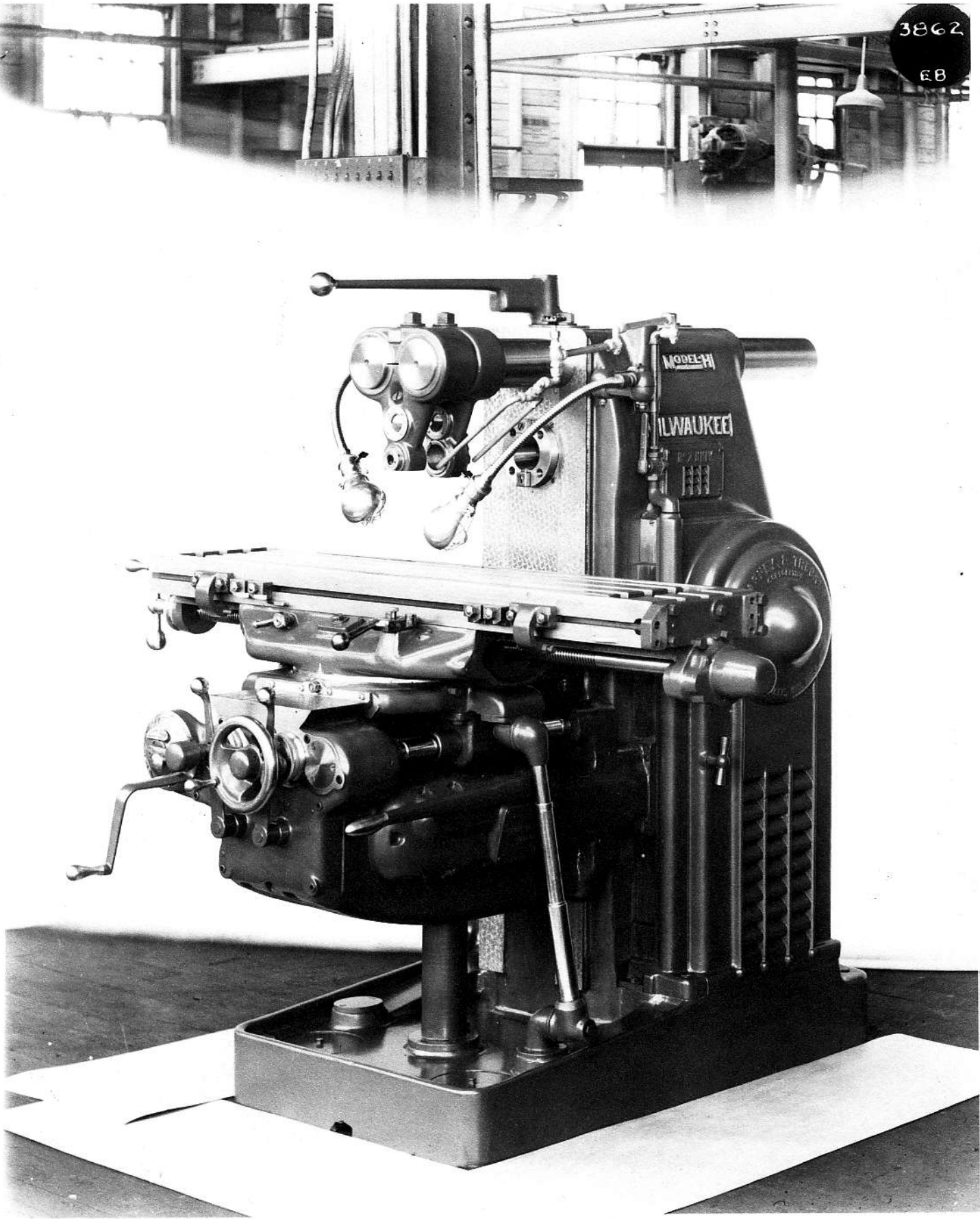




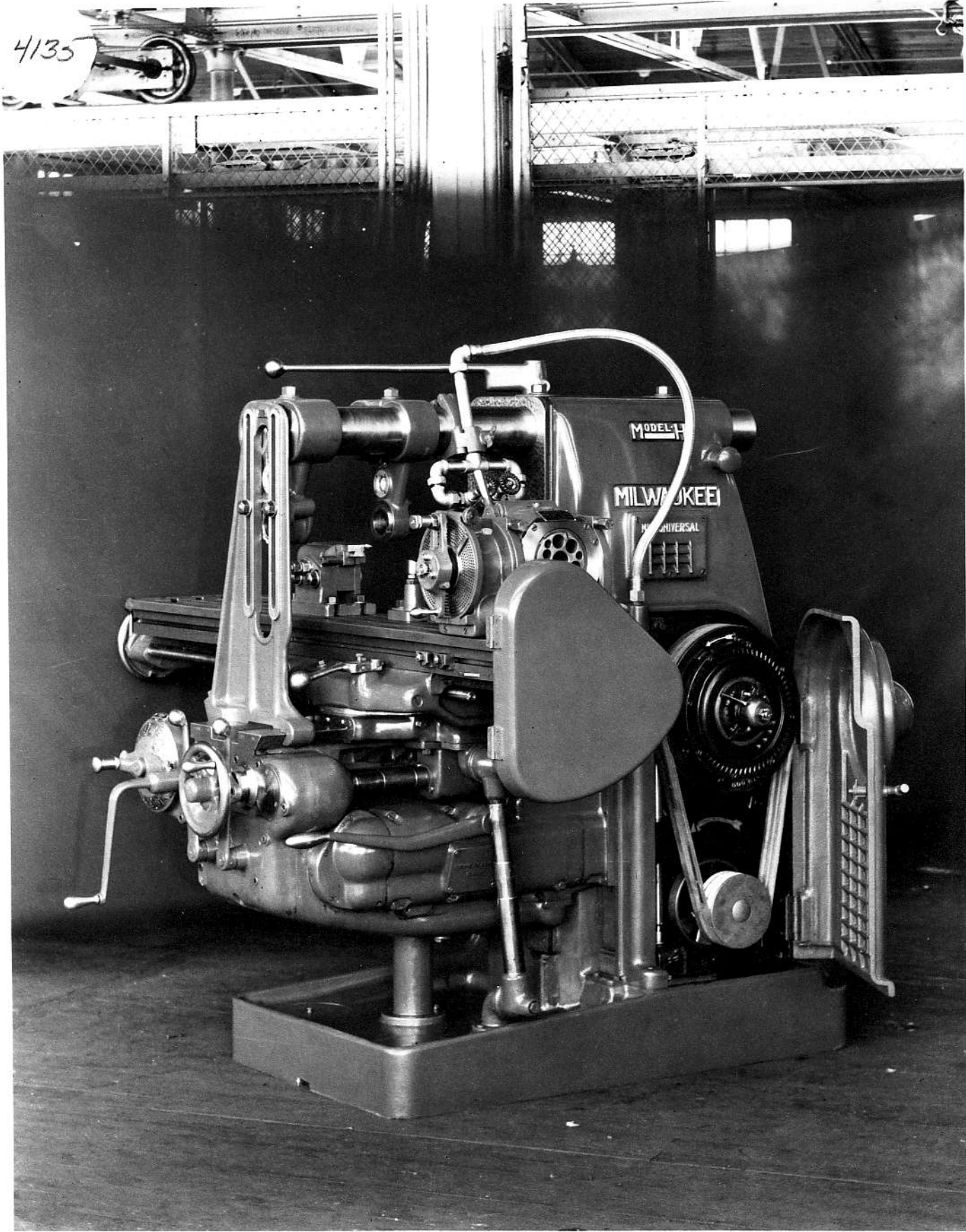
3863
EB

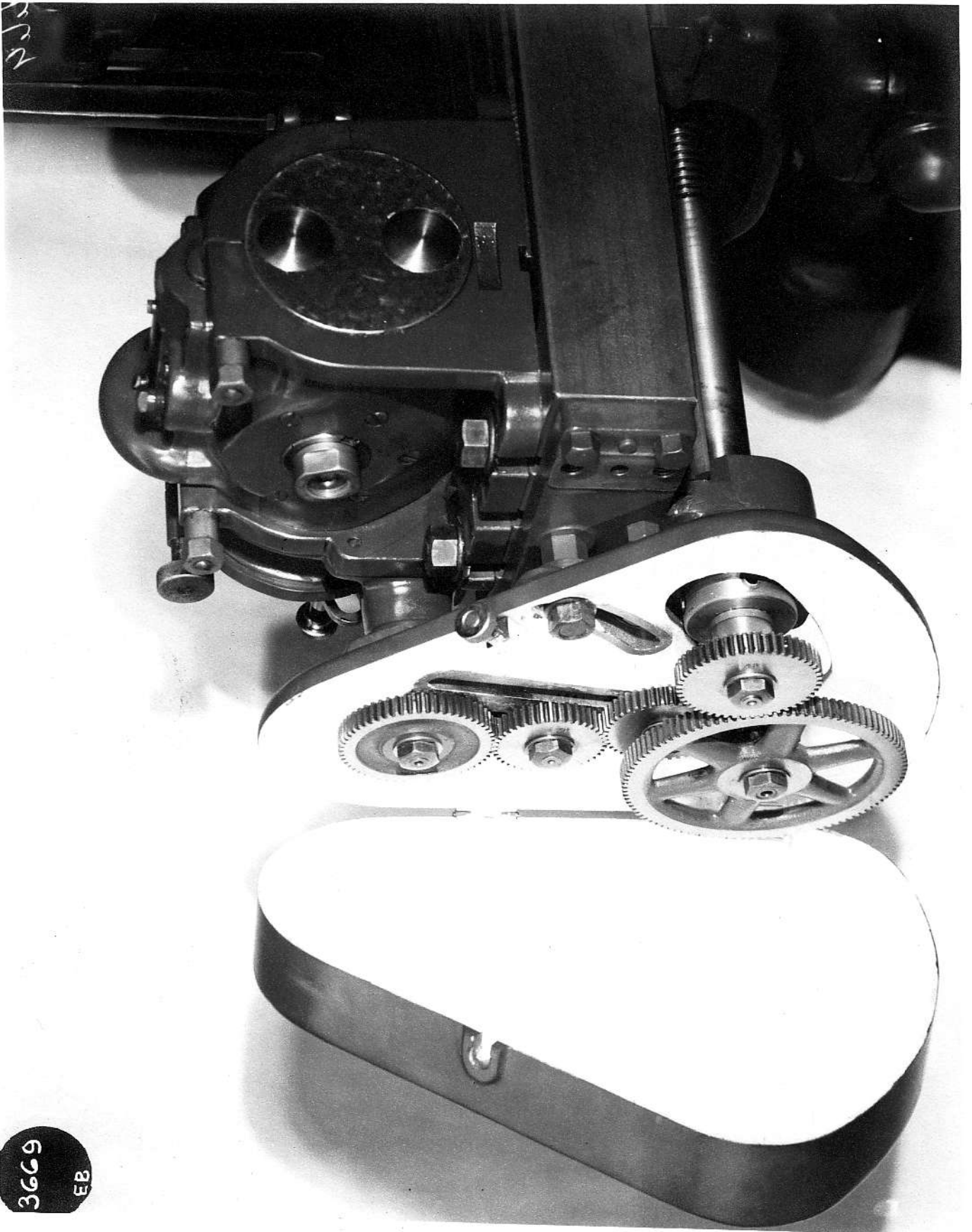


3862
E8

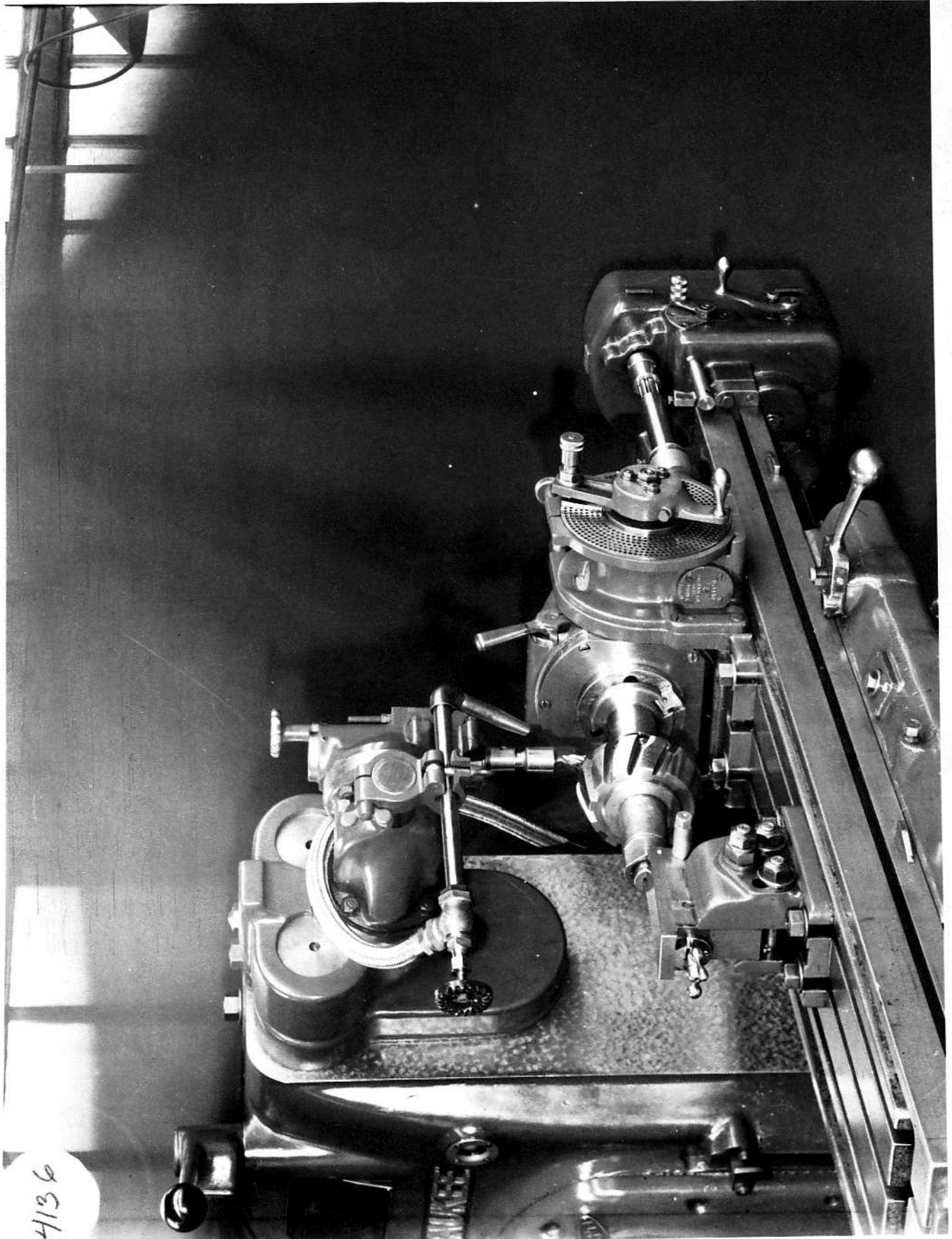


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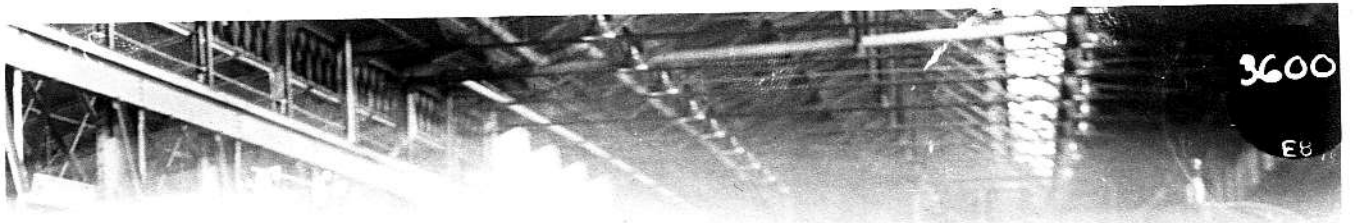




3669
EB

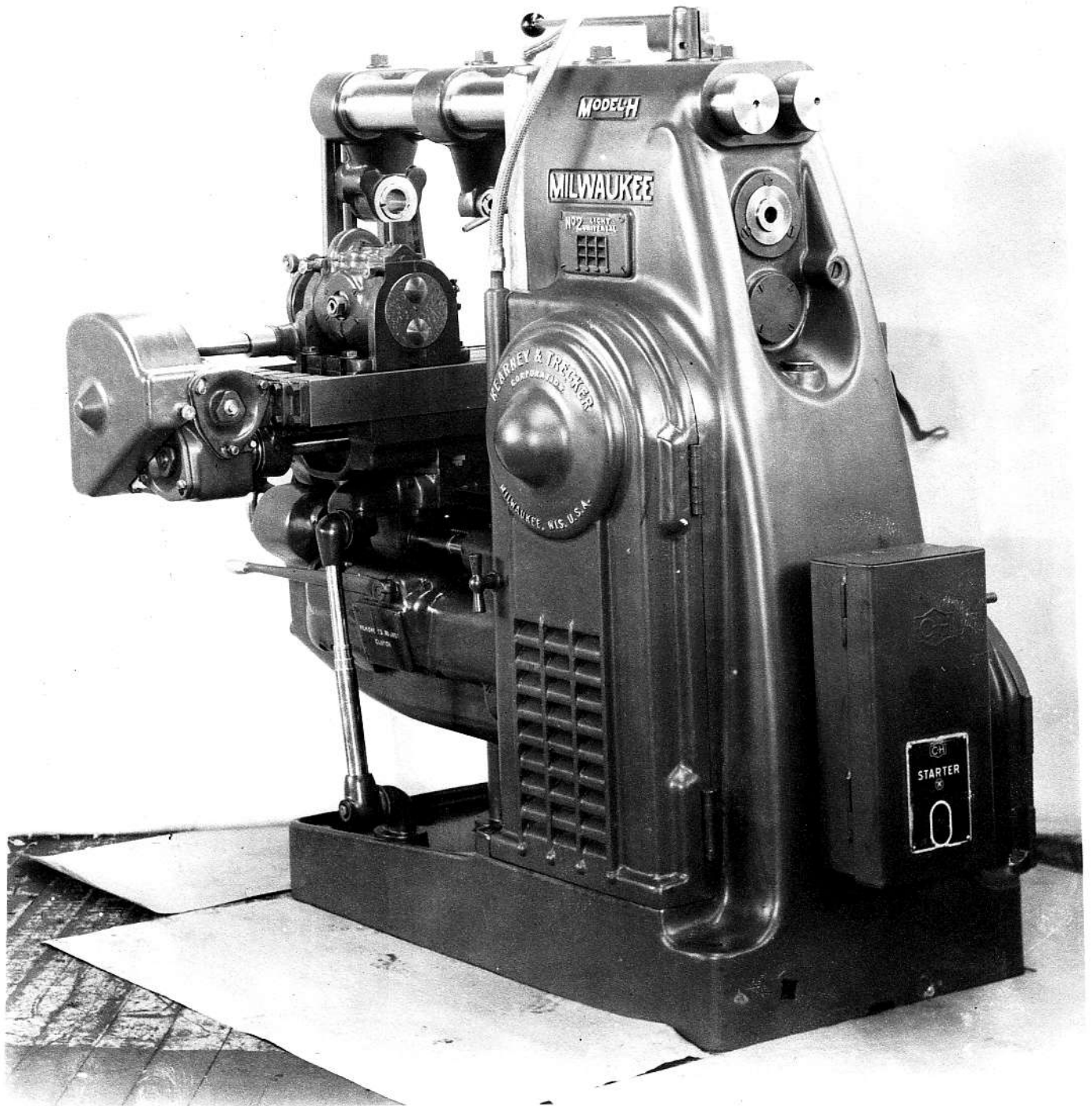


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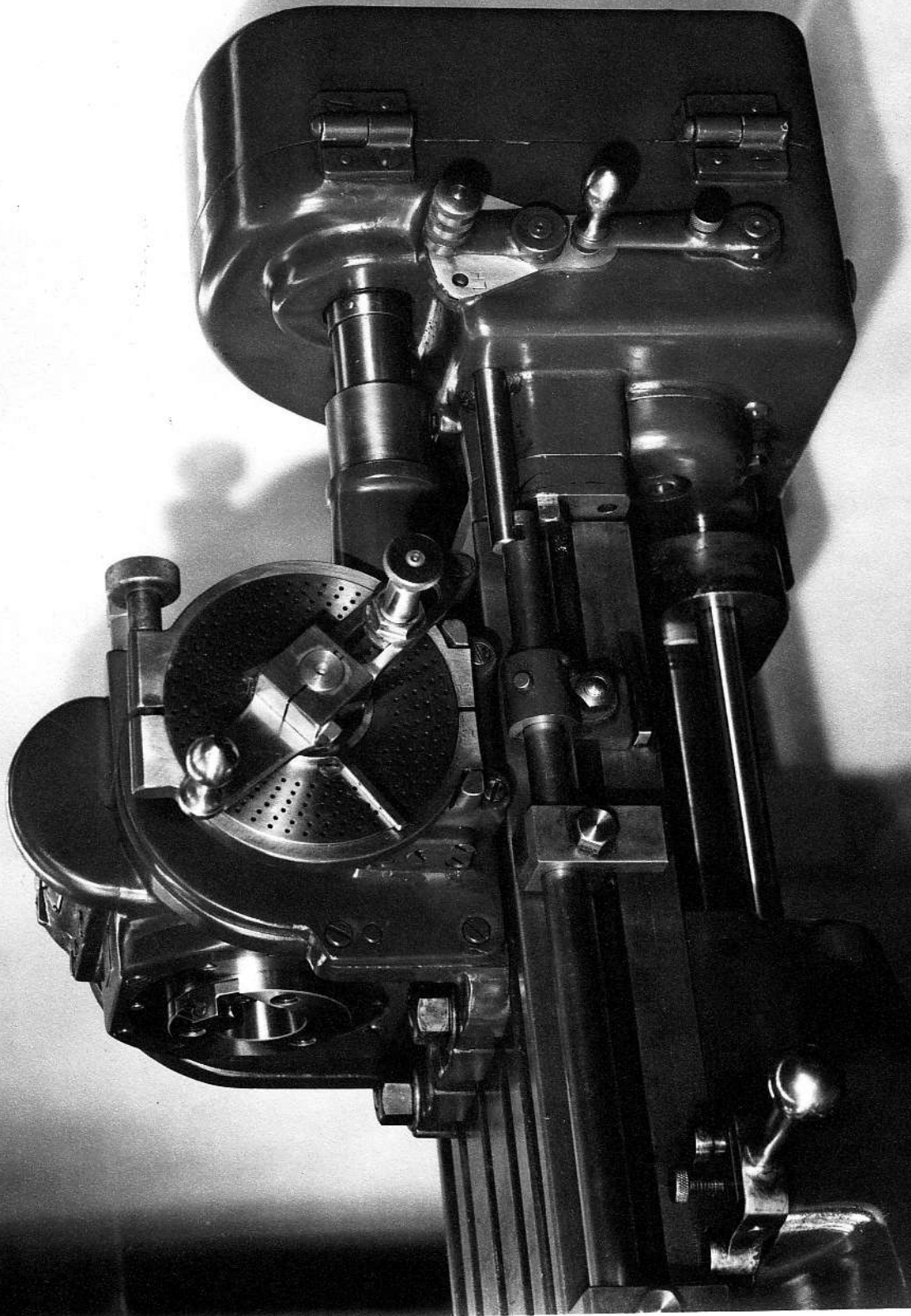


3600

E8

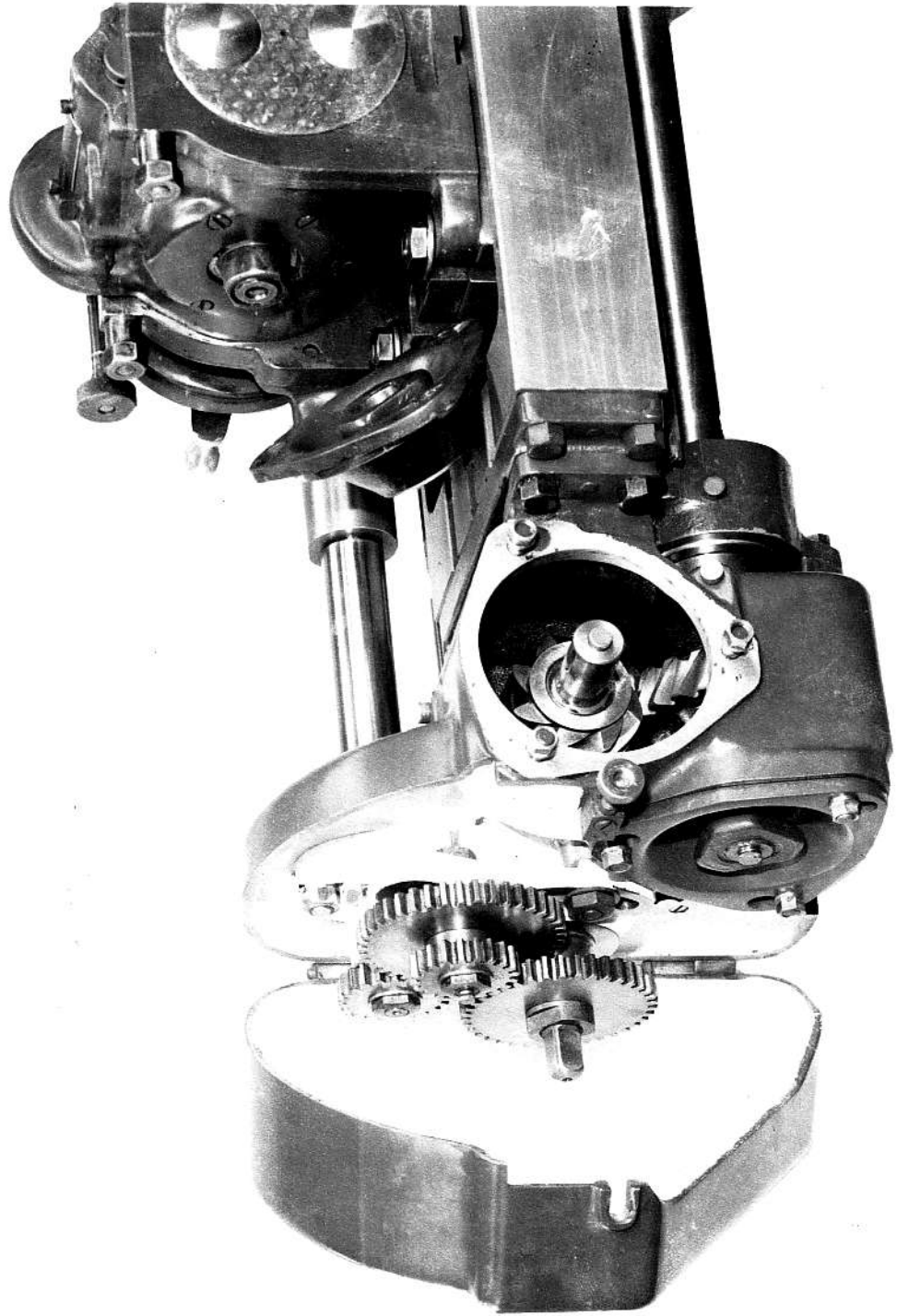


3672
EB



3672

3603
E8





MODEL H
SERIAL 10000

MILWAUKEE

START STOP
CUTLER-HAMMER

SLOW

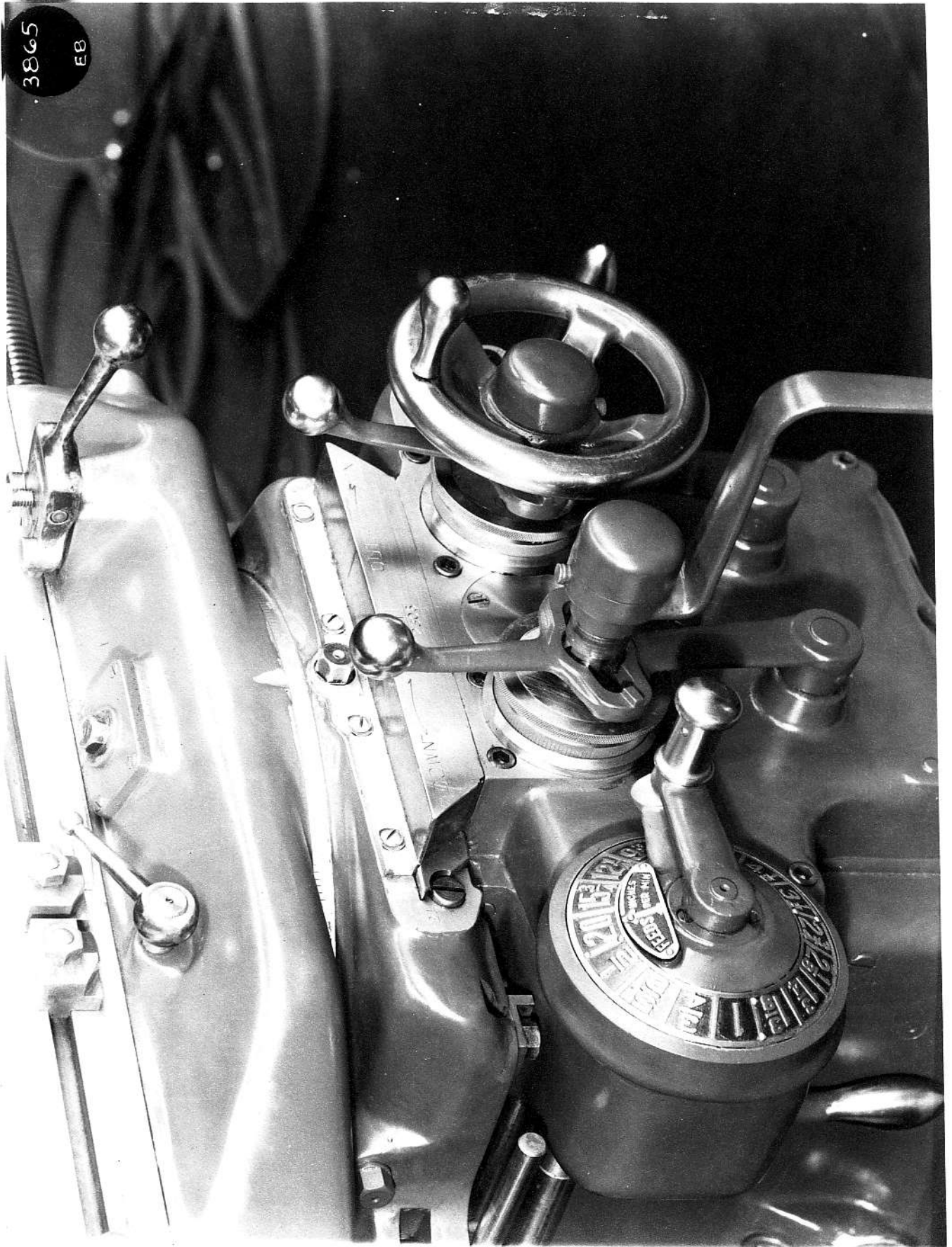
FAST

57 64 95 80
130 140 150 160 170 180 190 200
210 220 230 240 250 260 270 280
290 300 310 320 330 340 350 360
370 380 390 400 410 420 430 440
450 460 470 480 490 500 510 520
530 540 550 560 570 580 590 600
610 620 630 640 650 660 670 680
690 700 710 720 730 740 750 760
770 780 790 800 810 820 830 840
850 860 870 880 890 900 910 920
930 940 950 960 970 980 990 1000



3865

EB



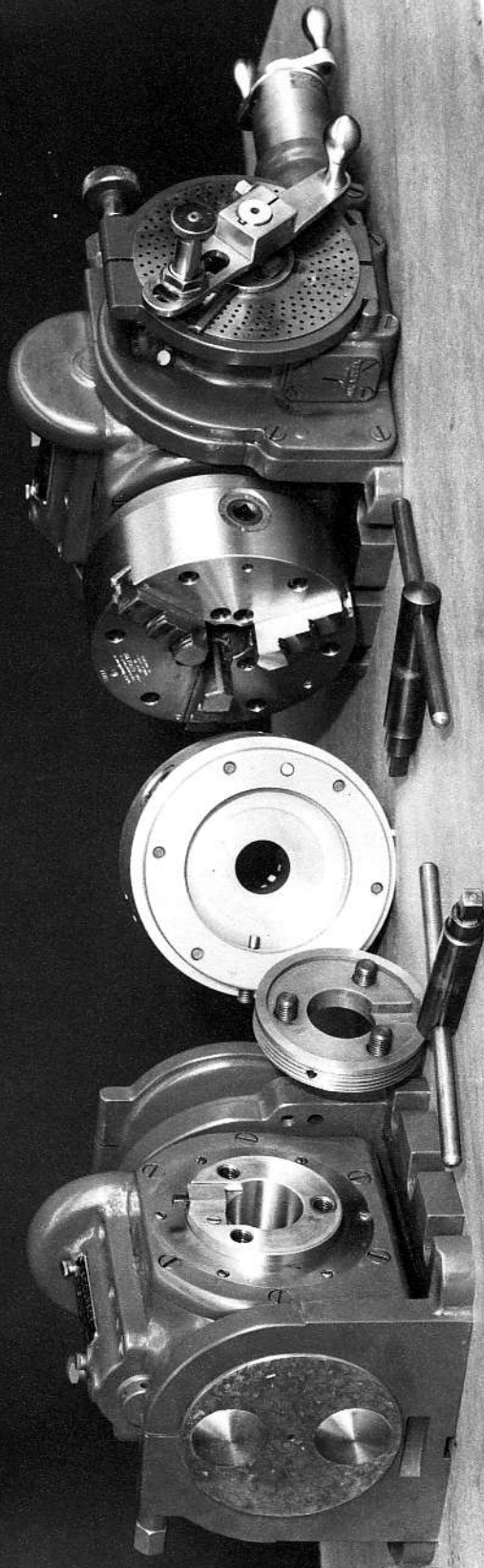
3675

EB



4004

EB



3670
EB

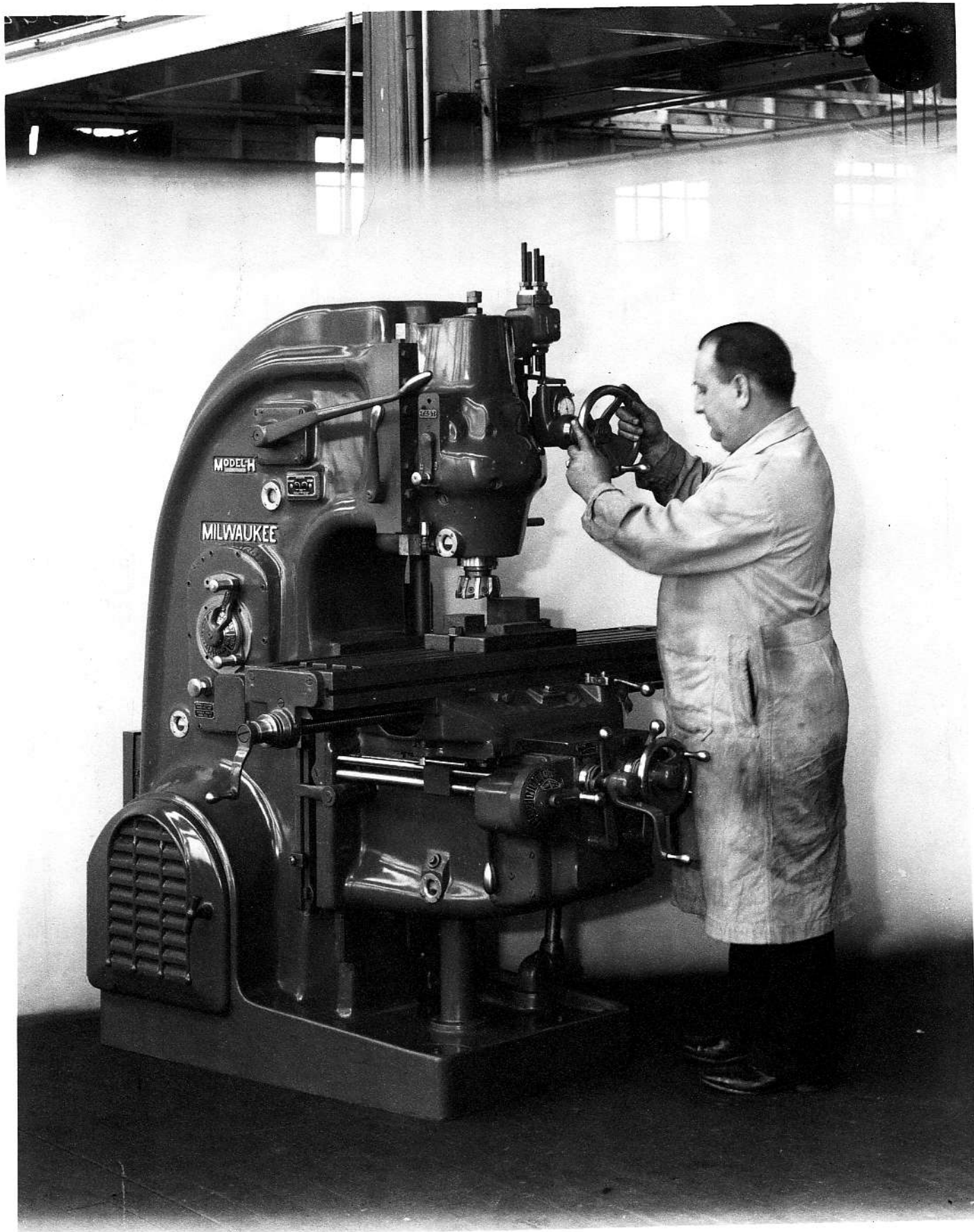


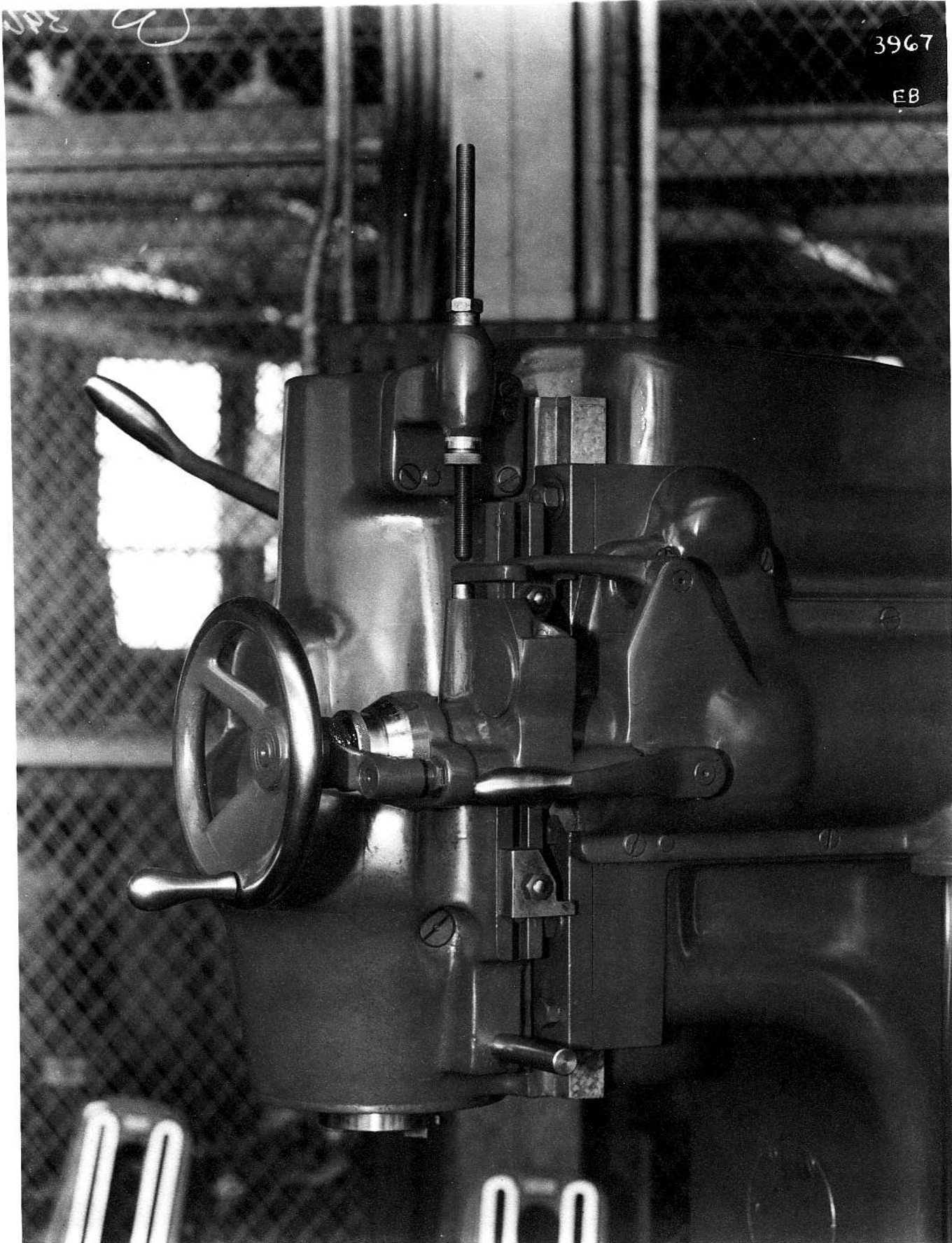
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3671
EB



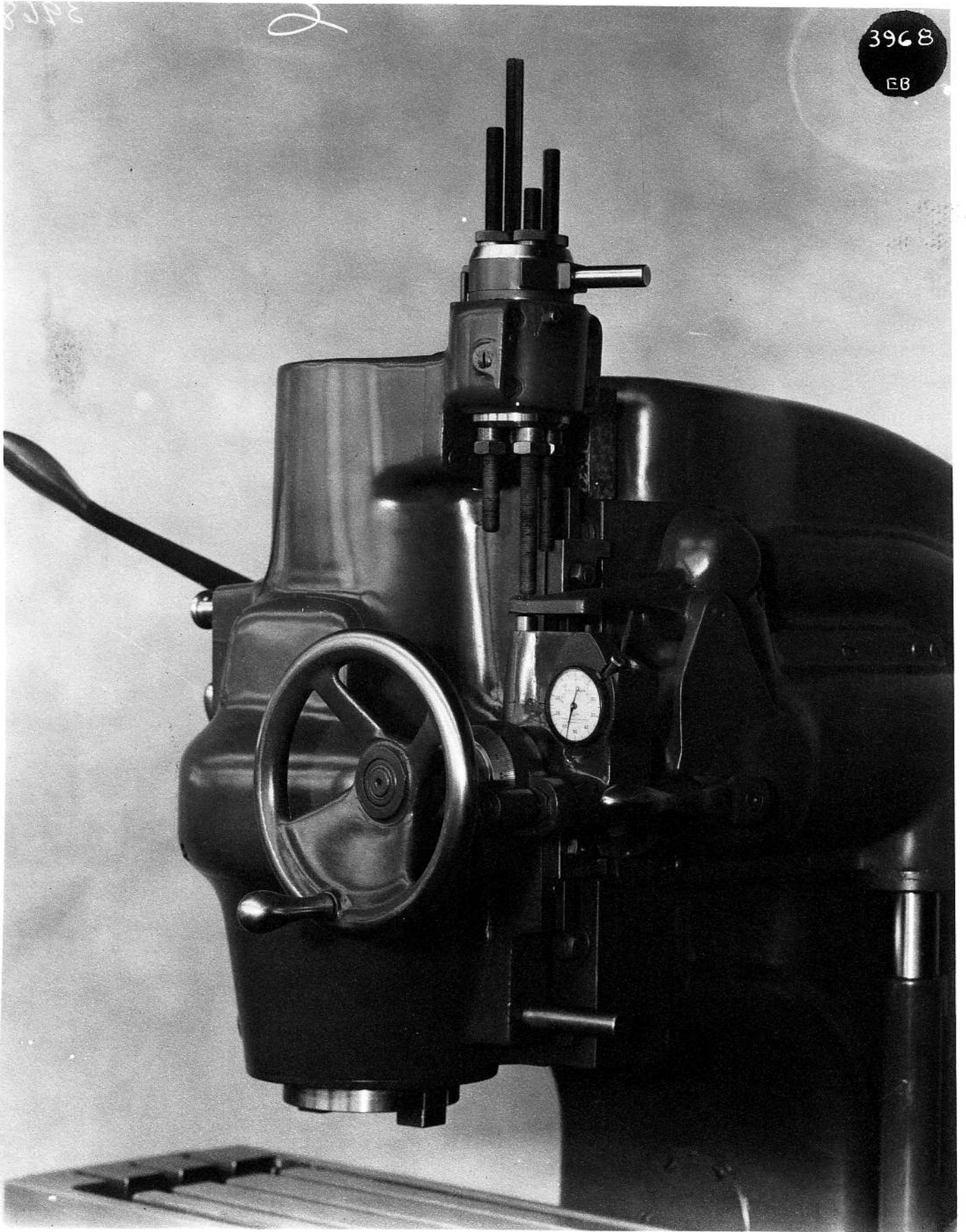
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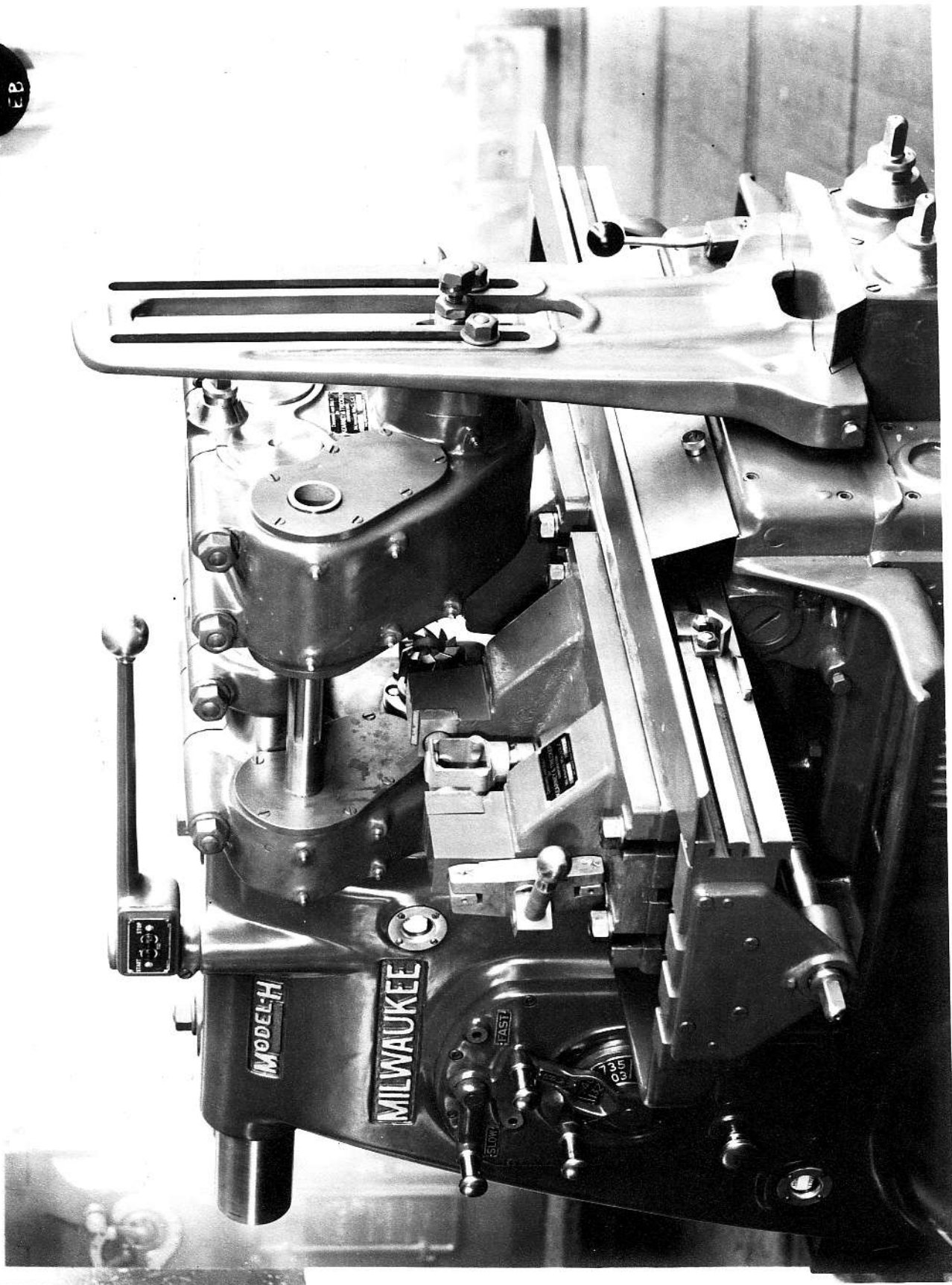
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EB

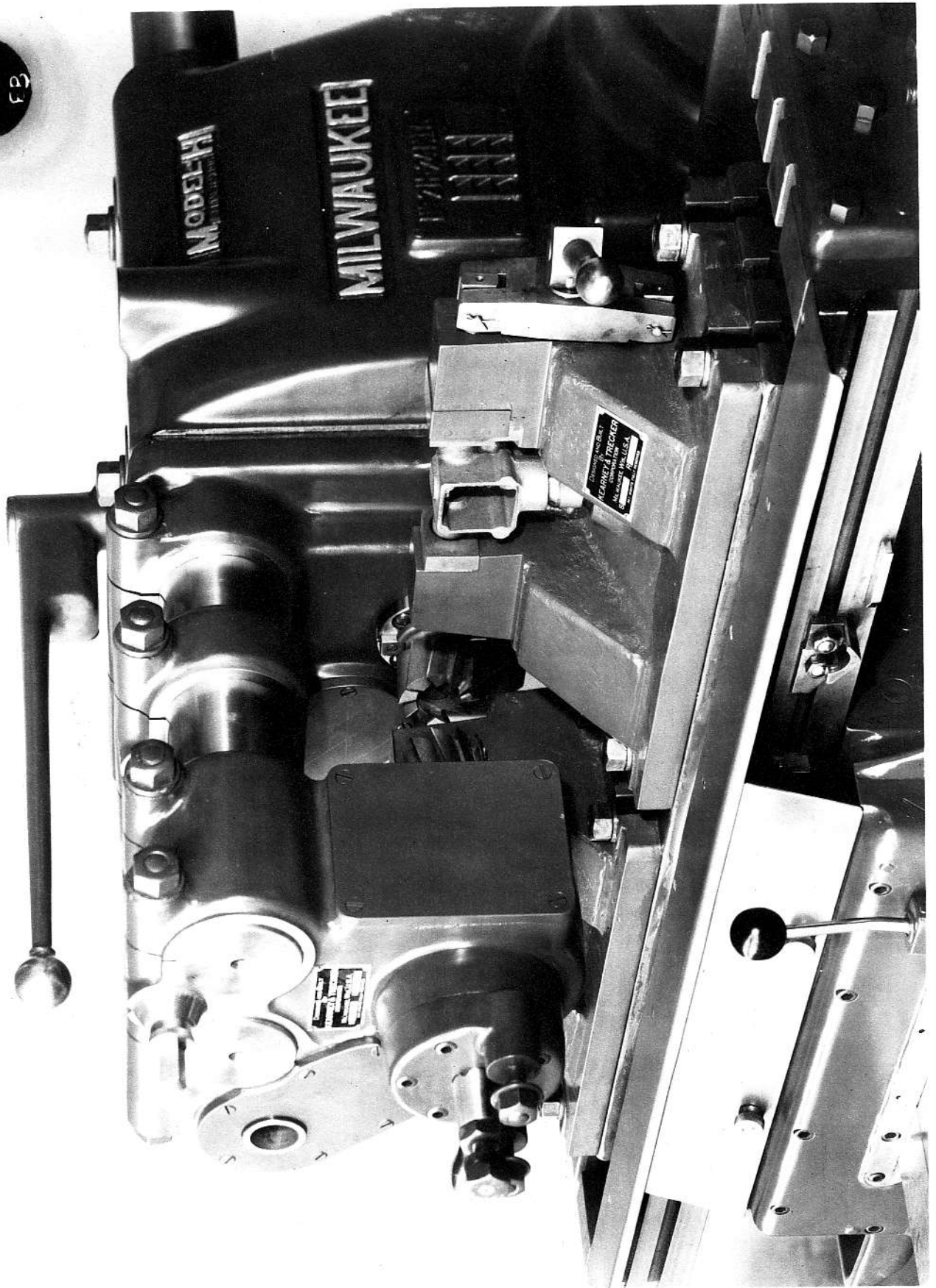


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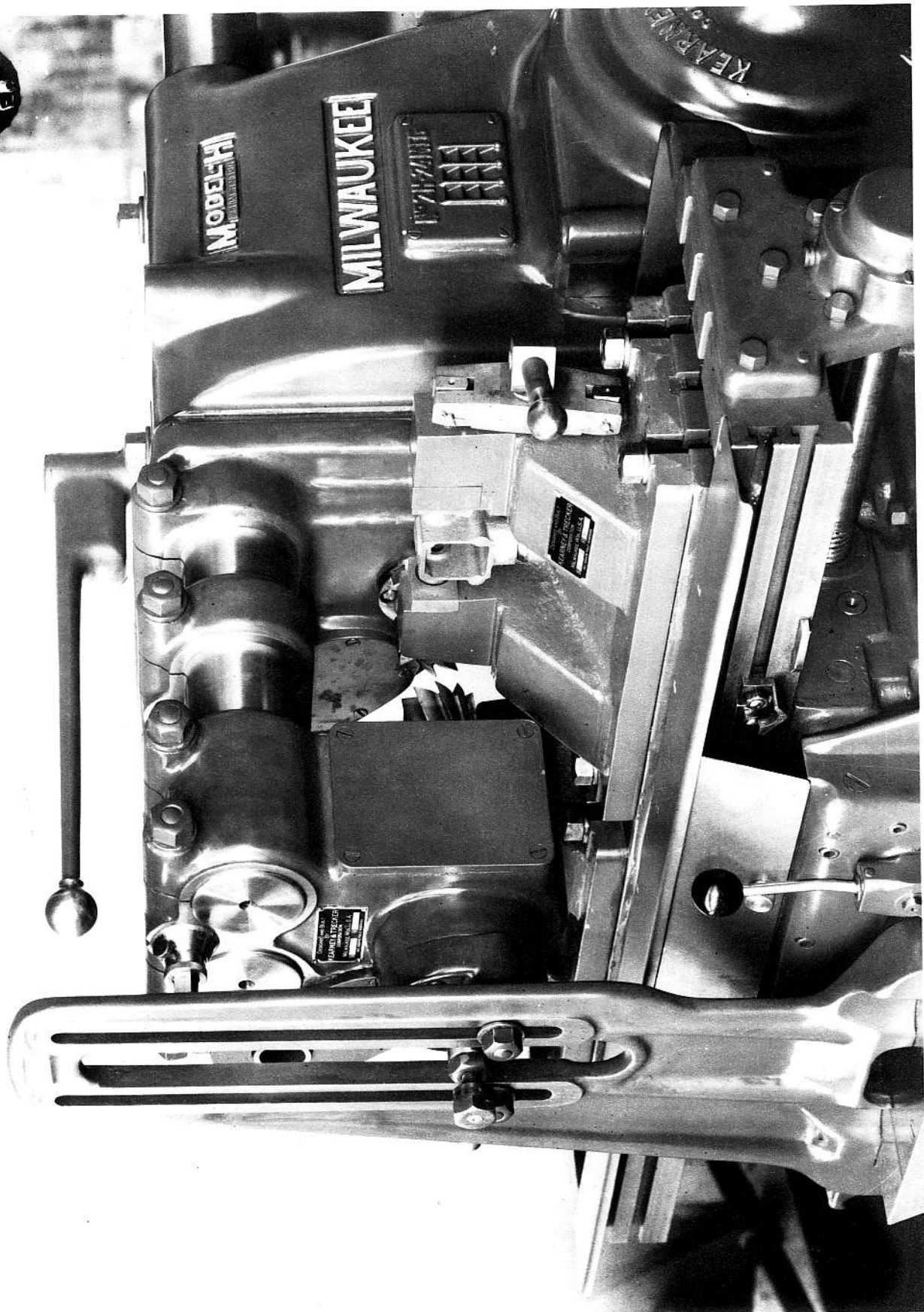
EB



3730
FB



3729
EP



MODEL H1
PORTABLE ENGINE

MILWAUKEE



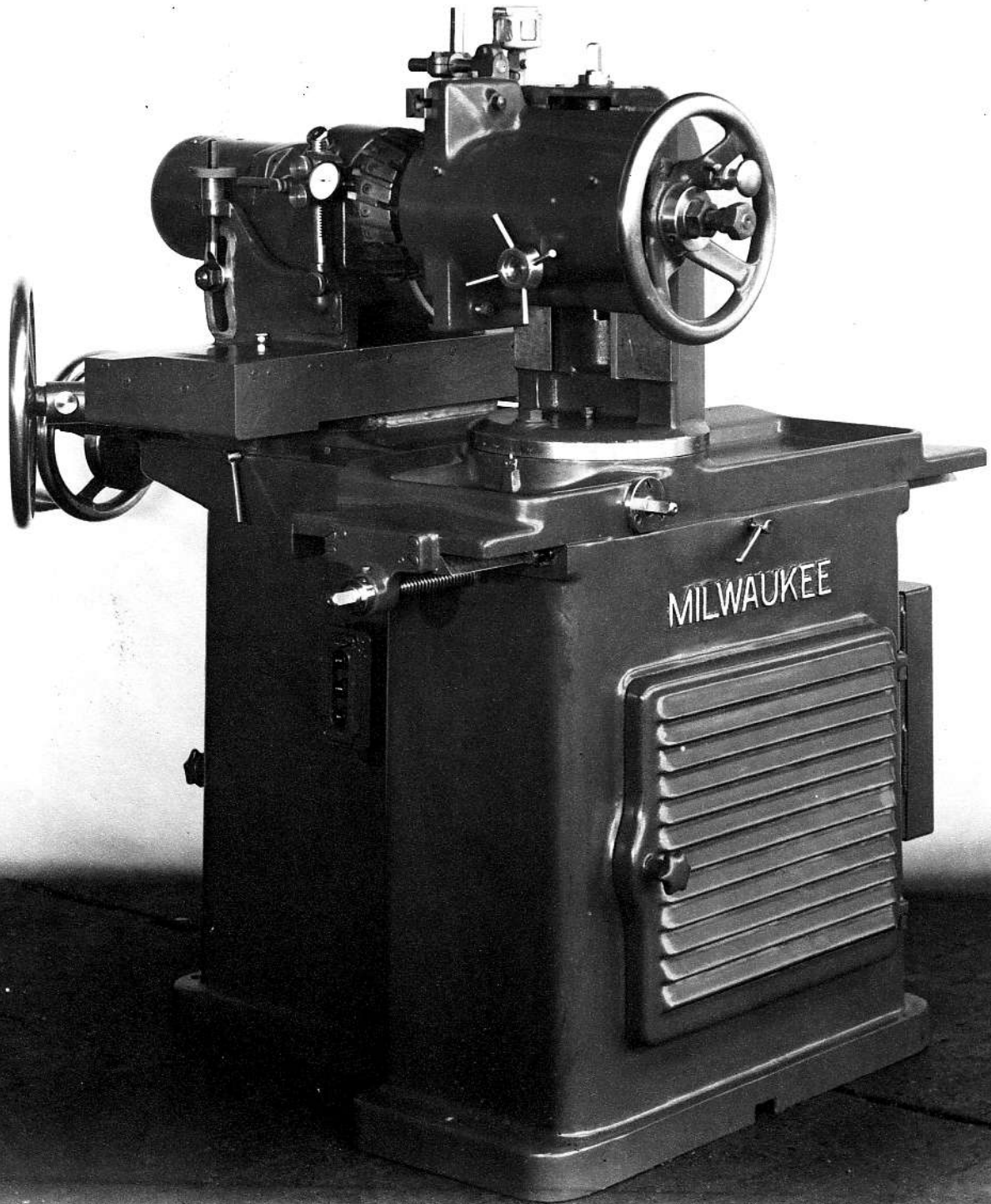
KEARNEY

MILWAUKEE
PORTABLE ENGINE

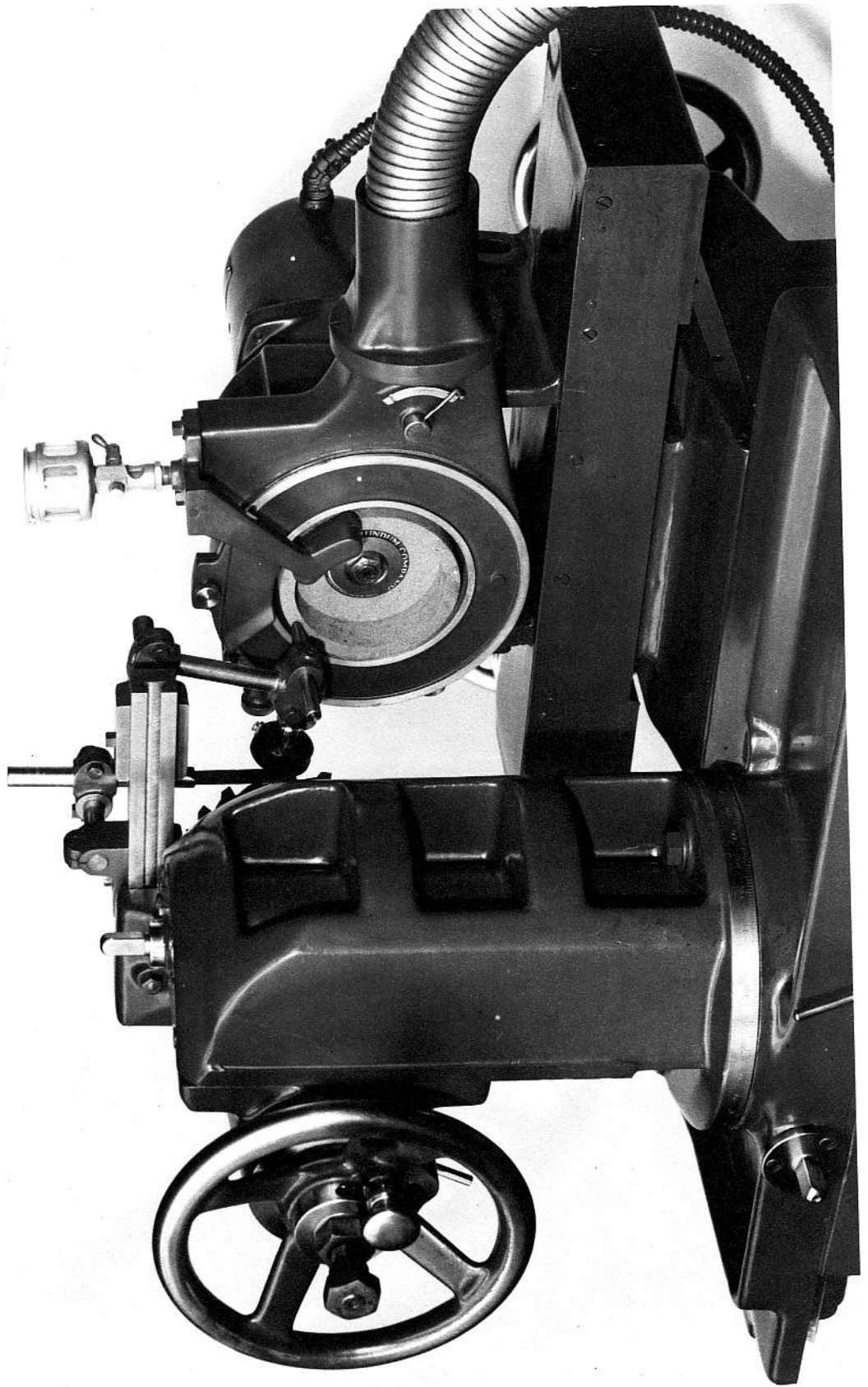
MILWAUKEE
PORTABLE ENGINE

3879

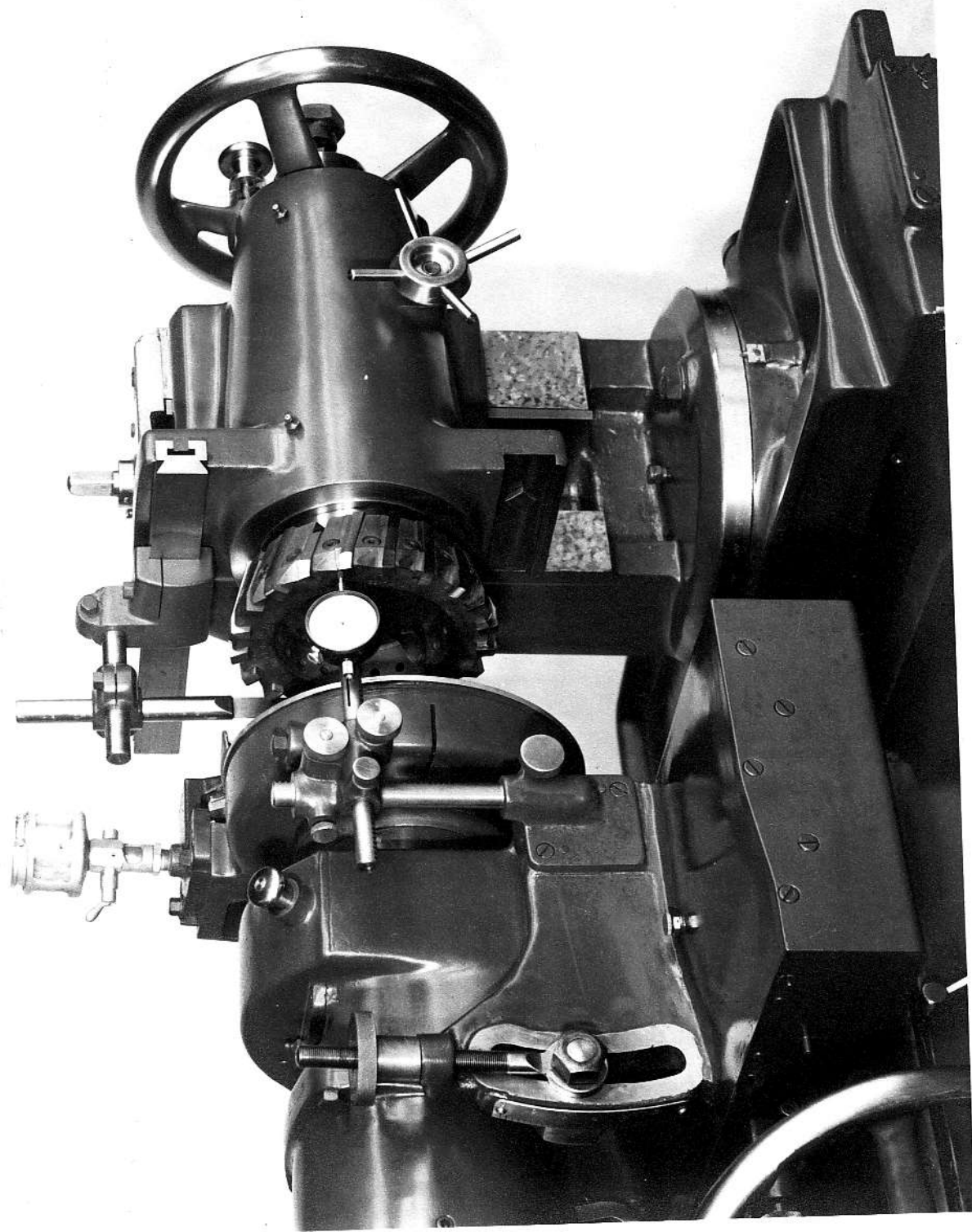
EB

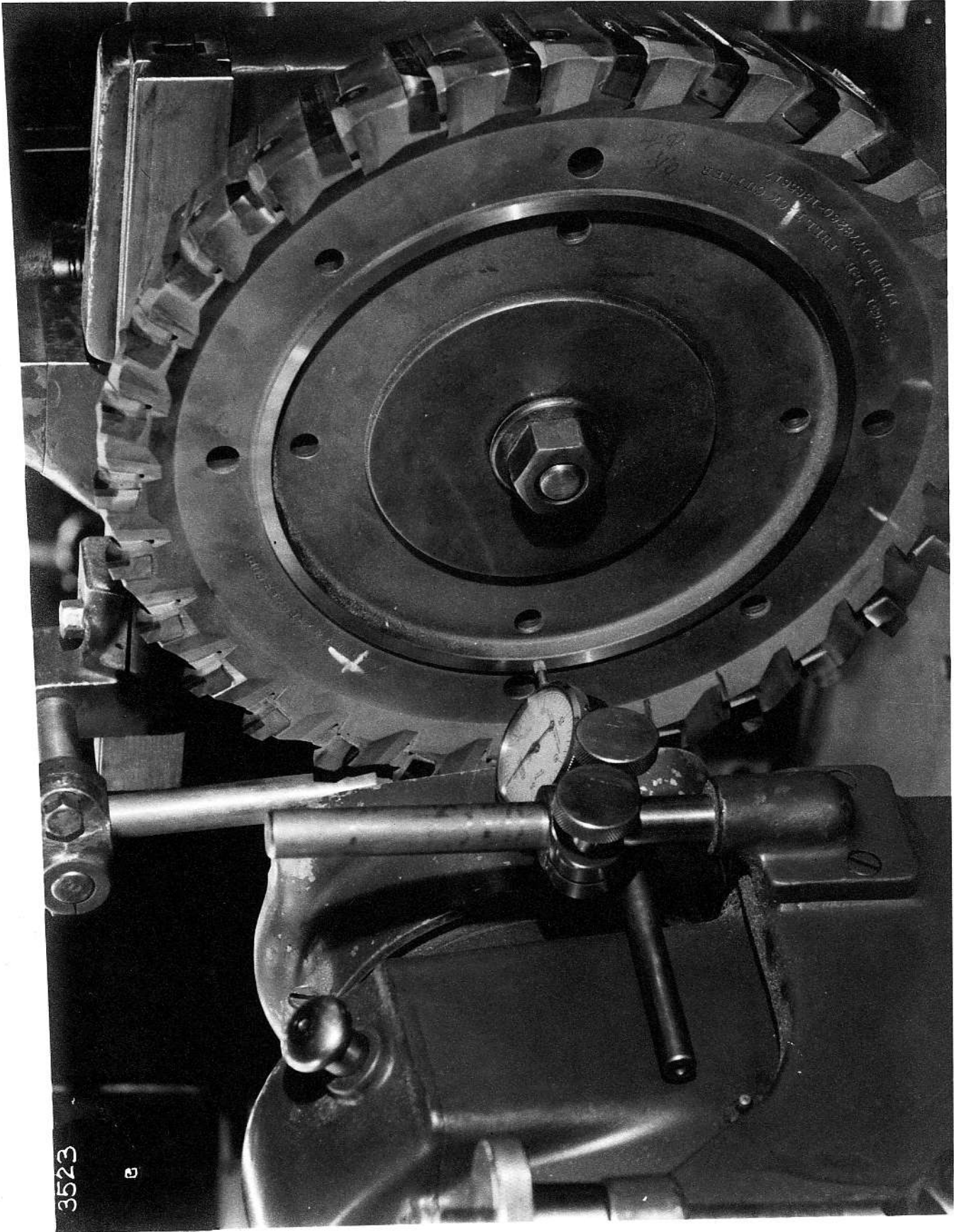


3880
EB



1881
EB

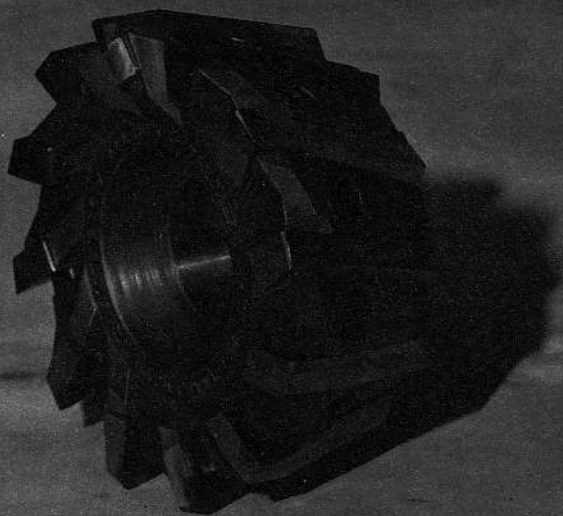




3523

2

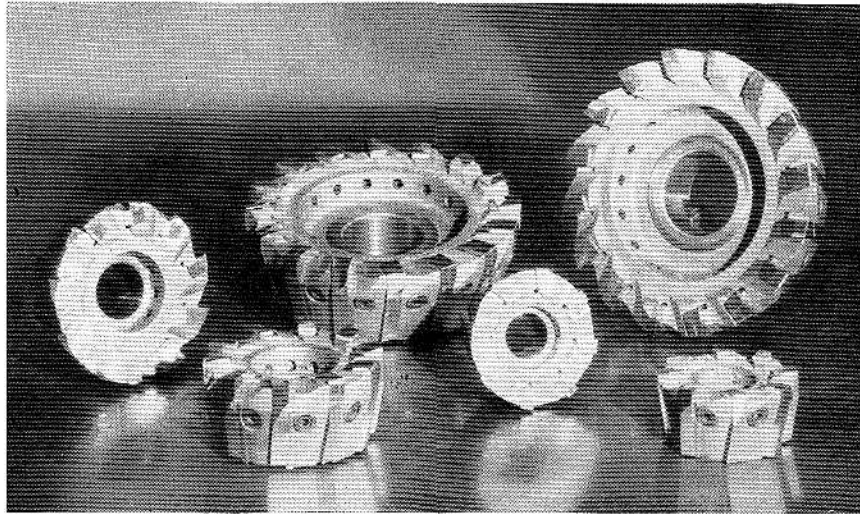
3389



2326

T-C MILLING

With... K&T FULL-BACK Cutters



WHEN first attempts were made to use Tungsten and Tantalum Carbides for milling, most machine shops got off on the wrong foot. They thought T-C blades would work in any old type of cutter body. Results proved they were mistaken.

Traditional cutter body design was wrong . . . too much overhang of blades caused destructive vibration; lack of a positive lock permitted dangerous end-slippage and loosening of blades; inadequate strength and rigidity of the body prevented satisfactory T-C results.

Kearney & Trecker engineers recognized this cutter body problem and tackled it in a practical manner. More than 100 experimental T-C Cutters were built and tested on actual milling jobs at the higher speeds and faster feeds which are expected in T-C milling. That's how the K & T FULL-BACK cutter design was developed . . . and that's why these cutters get proper results in T-C milling.

T-C research, carried on by Kearney & Trecker ever since the introduction of these sensational cutting metals, has determined three basic re-

quirements for the fullest measure of success in T-C milling:

1. *The milling machine must be rigid.*
2. *The fixture must provide solid support.*
3. *The cutter body must be properly designed.*

FULL-BACK . . . that explains it! Each T-C blade is fully and *solidly* backed up for practically its entire length by the heavy cutter body . . . blade overhang is thus reduced to a minimum of 1/16-in. as compared with the traditional 1/8-in. to 1/4-in. projection. Chip clearance is provided by cutting out the body in front of each blade.

Existing milling machines, if in good condition, can be made to produce satisfactory results in T-C Milling with K & T FULL-BACK Cutters. Rigidity is important. Power to the spindle should be smooth. Jerky, unsteady table feeds are not good. Run-down, obsolete machines won't give T-C milling a fair chance. (An entirely new line of K & T Milling Machines, basically designed for T-C milling, is now available.)

If you give Tungsten and Tantalum Carbide a fair chance by having the basic conditions right, you can perform miracles in slashing production costs with modern T-C milling.

KEARNEY & TRECKER CORPORATION « » MILWAUKEE, WIS.
PIONEERS OF FASTER MILLING METHODS

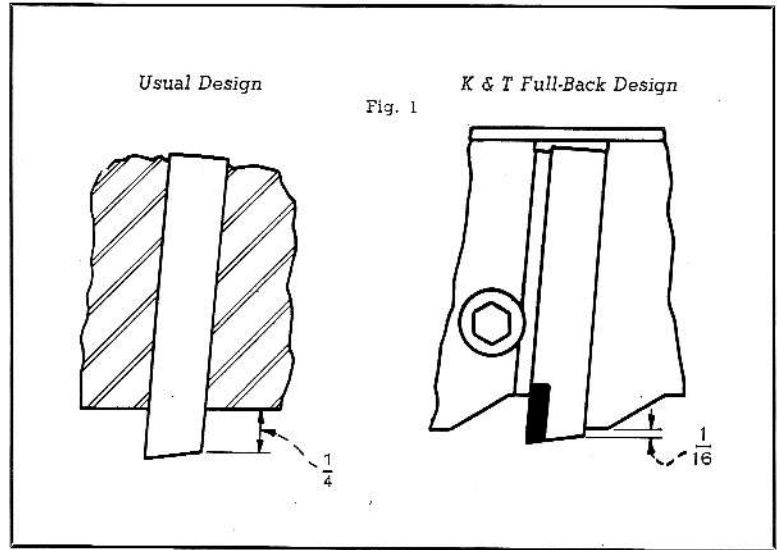
FULL-BACK SUPPORT . . AVOIDS VIBRATION

BLADE overhang induces blade vibration . . . and vibration is the worst evil T-C knows! K & T FULL-BACK design reduces overhang to 1/16-in. . . . instead of 1/4-in. to 3/4-in. overhang as on other cutters. The body is cut out in front of blade to provide proper chip clearance. (Patents pending.)

Every engineer knows that amplitude of vibration increases as the CUBE of the free length. For example a cutter blade which projects beyond the body 1/4-in. has 8 times the vibration of a blade with only 1/16-in. of overhang. If the blade projects 3/4-in. beyond the body . . . as is often the case with ordinary bodies . . . the vibration is 64 times that of a blade projecting 1/16-in.

Think what this means to Tungsten Carbide, whose very essence of success depends on the elimination of vibration.

Figure 1 shows how K & T Full-Back Cutters reduce vibration to the absolute minimum.

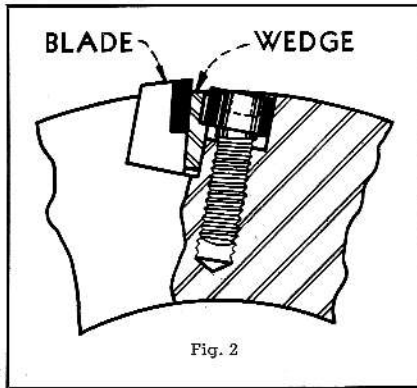


POSITIVE LOCK NO END-SLIPPAGE

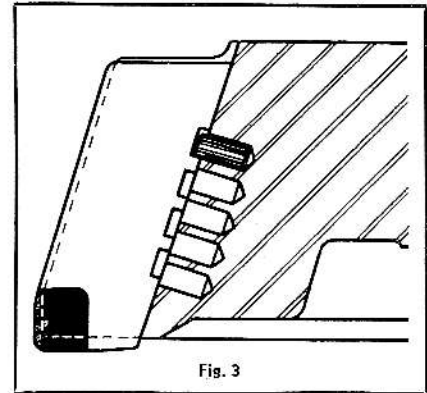
A positive blade lock is secured through a hardened-and-ground wedge, tapered reverse to oppose the front tapered surface of each blade. Each wedge, as shown in Figure 2, is firmly anchored in position by a

screw. This positive lock of tapered blade and tapered wedge is unfailing insurance against danger of blades working loose and damaging either the T-C cutter or the machine.

pin and slot construction are both patented K & T features, designed exclusively for K & T FULL-BACK Cutters, and have been an important contribution to the success of T-C milling.



No end-slippage, either! The pin and slot construction, shown in Figure 3, prevents blades from pushing away from the cut. Spaced 1/4-in. apart are five holes in cutter-body slots under each blade. In the bottom of each blade are four slots, 5/16-in. apart. A removable pin, placed in the desired hole, is then made to engage the proper slot in the blade to obtain the uniform adjustment wanted. Thus the pin and slot construction not only eliminates end-slippage, but provides the added advantage of easy adjustability . . . when a set of blades requires outward setting, the increment of adjustment is 1/16-in. This avoids excessive overhang of blades. The adjustment is easy, speedy, accurate and uniform.

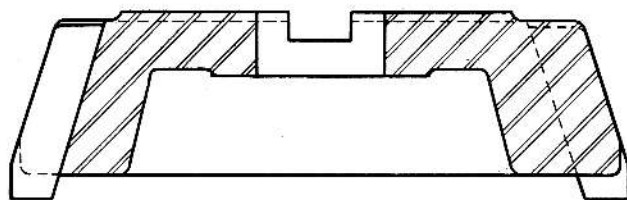


The tapered wedge and blade, and the

GREATER STRENGTH, RIGIDITY, ACCURACY!

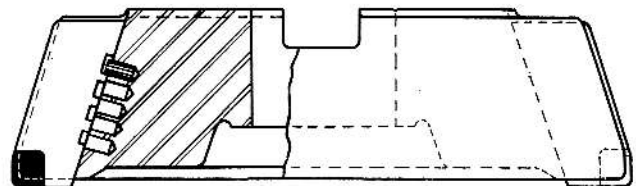
Compare the cross section views in Figure 4, showing an old-style cutter and a K & T FULL-BACK. The demands of T-C milling make the old-style cutter obsolete. The massive FULL-BACK body has the strength and rigidity vital to successful T-C results.

The rugged, heavy, forged steel body is accurately machined, hardened and ground. The FULL-BACK design is basically correct. That's why it does the job better and delivers maximum results in T-C milling.



Old Style Cutter

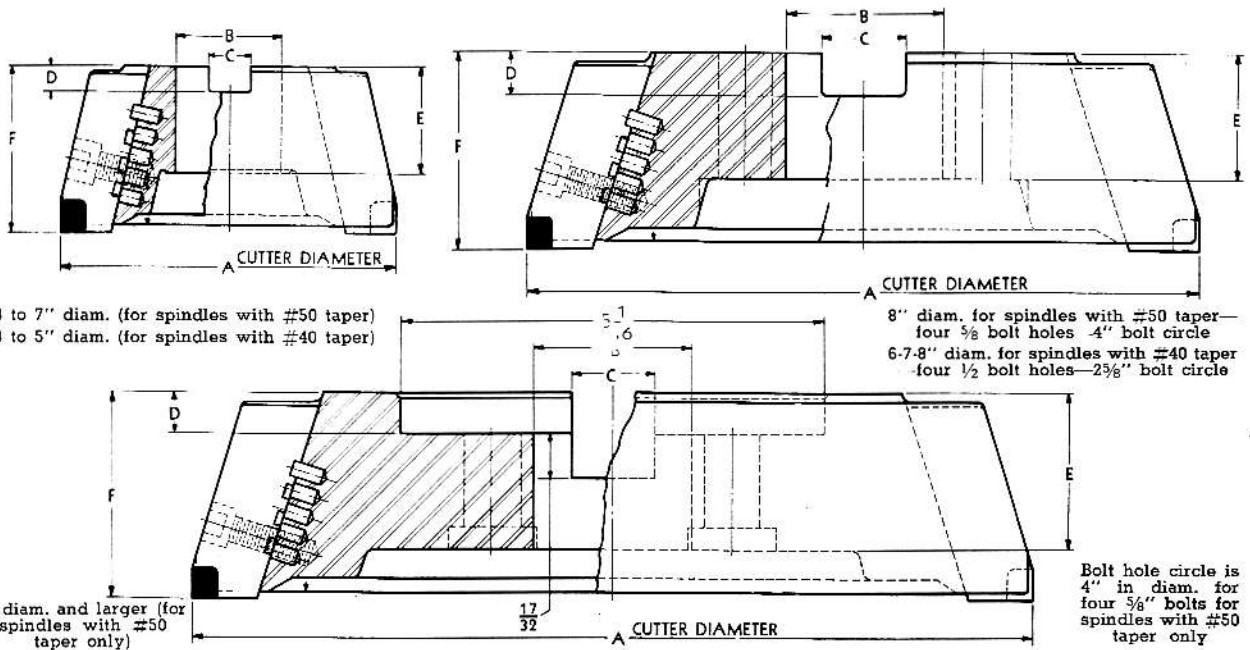
Fig. 4



K & T Full-Back Cutter

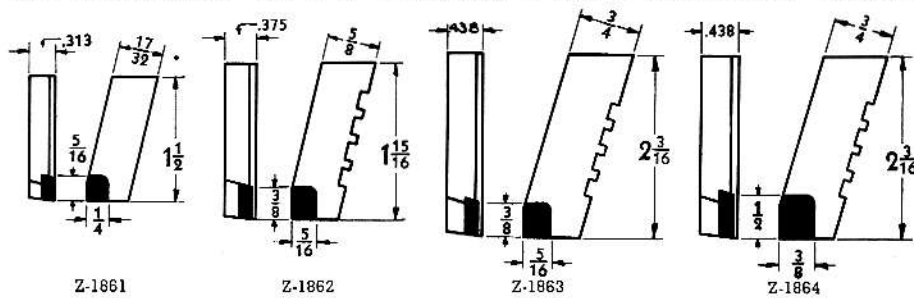
ONLY IN K & T FULL-BACK CUTTERS ARE

SPECIFICATIONS OF STANDARD SIZES OF K&T FULL-BACK CUTTERS

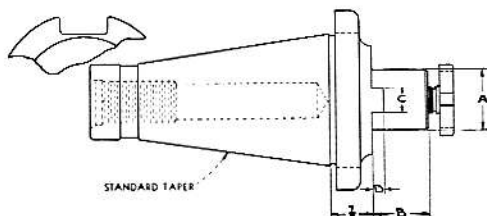


Cutter Body Number	A	B	C	D	E	F	No. of Blades	Blade No.	Style C Arbor No.		Centering Plug	
									#40 Taper	#50 Tap.	#40 Tap.	#50 Tap.
Z-1803R or L	3	1	3/8	1 1/2	1	1 1/4	8	Z1861 R or L	10522	4666		
Z-1804R or L	4	1 1/4	3/2	1 1/2	1 1/4	1 1/2	10	Z1862 R or L	10523	4585		
Z-1805R or L	5	1 1/2	3/4	1 1/2	1 1/2	2 1/4	10	Z1863 R or L or Z1864 R or L	10524	4667		
Z-1806R or L	6	2	3/4	1 1/2	1 1/2	2 1/4	12		11635	4650		
Z-1807R or L	7	2	3/4	1 1/2	1 1/2	2 1/4	16		11635	4650		
Z-1808R or L	8	1 3/4	1	1 1/2	1 1/2	2 1/4	18					4640
Z-1809R or L	9	1 3/4	1	1 1/2	1 1/2	2 1/4	20					
Z-1810R or L	10	1 3/4	1	1 1/2	1 3/4	2 1/4	22					
Z-1811R or L	11	1 3/4	1	1 1/2	1 3/4	2 1/4	24					
Z-1812R or L	12	1 3/4	1	1 1/2	1 3/4	2 1/4	26					
Z-1814R or L	14	1 3/4	1	1 1/2	1 3/4	2 1/4	30					
Z-1816R or L	16	1 3/4	1	1 1/2	1 3/4	2 1/4	34					
Z-1818R or L	18	1 3/4	1	1 1/2	1 3/4	2 1/4	38					
Z-2106R or L	6	1 1/2	3/8	3/8	1 1/2	2 1/4	12				10525	
Z-2107R or L	7	1 1/2	3/8	3/8	1 1/2	2 1/4	16				10525	
Z-2108R or L	8	1 1/2	3/8	3/8	1 1/2	2 1/4	18				10525	

SPECIFICATIONS OF T-C BLADES FOR FULL-BACK CUTTERS



SPECIFICATIONS FOR K&T STYLE C ARBORS FOR T-C FULL-BACK CUTTERS



#40 Taper Arbor	Arbor Number	#50 Taper Arbor	Arbor No.	A	B	C	D
41 C-7/8 T. C.	10522	51 C-7/8 T. C.	4666	1	1 3/16	3/8	3/16
41 1/2 C-7/8 T. C.	10523	51 1/2 C-7/8 T. C.	4585	1 1/4	1 3/16	1/2	3/4
41 1/2 C-7/8 T. C.	10524	51 1/2 C-7/8 T. C.	4667	1 1/2	1 7/16	5/8	5/16
42 C-7/8 T. C.	11635	52 C-7/8 T. C.	4650	2	1 7/16	3/4	3/8

ALL OF THESE FEATURES OBTAINABLE!

NOTE: THIS DATA WILL PROVE VALUABLE FOR SHOP REFERENCE

Additional copies of this page, for shop use, furnished on request

RECOMMENDED SPEEDS and FEEDS for K&T FULL-BACK CUTTERS

SPEEDS...

Based on our broad experience with Tungsten and Tantalum Carbide milling, we recommend the following cutter speeds which are listed in FEET PER MINUTE. These speeds are based on the cutting characteristics of various metals. These speeds are safe speeds, but it may be necessary to alter them, one way or another, to suit particular cases.

With all conditions favorable . . . for instance:
a rigid set-up . . .
free-cutting material . . .

and a machine in good operating condition . . . these speeds may be increased slightly.

Under conditions not so favorable . . . for instance:
with hard material . . .
lack of rigidity in the set up . . .

and a milling machine not in the best of condition . . . a suitable reduction will have to be made.

To determine how much speed the cutters will stand, start slowly and increase the speed gradually.

TABLE OF CUTTING SPEEDS FOR TC MILLING
IN FEET PER MINUTE

Material to be milled	ROUGHING		FINISHING
	Over 1/8 in. depth of cut	Under 1/8 in. depth of cut	Under 1/16 in. depth of cut
Cast iron, soft.....	200- 250	250- 325	300- 400
Cast iron, medium.....	150- 200	200- 250	250 300
Cast iron, hard.....	100- 125	125- 175	150- 250
†Malleable iron.....	225- 300	250- 350	350- 450
†*Cast Steel.....	100- 200	150- 250	200- 300
†*Low Carb. Steel, soft.....	150- 200	175- 250	200- 350
†*Low Carb. Steel, med.....	100- 150	150- 225	175- 250
†*Low Carb. Steel, hard.....	75- 100	100- 150	150- 200
Yellow Brass.....	300- 400	350- 500	400- 600
Ordinary Bronze.....	200- 300	250- 350	350- 500
†Aluminum.....	800-1200	1000-1500	1500-2000

†Use Coolant

*Tantalum Carbide

FEEDS...

The only efficient way to determine the Feed per Minute of a milling cutter is from the Feed per Tooth per Revolution. No other method is quite as effective. From our long experience with milling operations of all kind, we have found that the Feed per Tooth per Revolution of a milling cutter has a direct relation to cutter life.

Too much feed overloads the teeth of the cutter, and very often causes breakage. With too fine a feed, excessive wear takes place because the teeth have to pass in contact with the work more often for a given length of cut than is necessary.

Be very careful not to overload the machine. Sometimes a heavy set-up may be handled in a machine somewhat light for the cut, in which case the cutter should not be run at maximum feed, because an overload will result. When the cut being taken is exceptionally wide, it is often necessary to reduce the Feed per Tooth per Revolution to avoid an overload.

A practical method of arriving at the proper feed for a given cut is to . . . OPERATE THE CUTTER AT THE CORRECT SPEED AND APPLY AS MUCH FEED AS A COMBINATION OF THE CUTTER, THE MACHINE, AND THE WORKPIECE WILL STAND WITHOUT INJURY TO ANY ONE OF THESE FACTORS.

Here are two examples which explain the use of the Speed and Feed Tables.

TABLE OF FEEDS (Per Tooth per Revolution)
FOR TC MILLING

Material to be Milled	Roughing Depth 1/8-1/4 in.	Semi-Finishing Depth 1/16-1/8 in.	Finishing Depth 1/64 or under
Cast Iron.....	0.008-0.010	0.009-0.014	0.006-0.008
Malleable Iron..	0.008-0.010	0.009-0.014	0.006-0.008
Brass.....	0.010-0.012	0.012-0.016	0.008-0.010
Bronze.....	0.010-0.012	0.012-0.016	0.008-0.010
Aluminum.....	0.004-0.007	0.005-0.007	0.003-0.006
Steel.....	0.004-0.008	0.005-0.009	0.003-0.006

Increase finishing feeds according to smoothness of surface desired.

EXAMPLES:...

Here are two examples which explain the use of these Speed and Feed Tables.

EXAMPLE No. 1: What should be the Table Feed per Minute and the proper Speed for a 5-in. cutter having 10 teeth, to be used for milling soft cast iron on which the depth of cut is 1/8-inch. By referring to the Table of Cutting Speeds, we find that 250 to 325 ft. per minute is recommended for a cut of this kind. Therefore, assuming that 300 ft. per minute would be most practical, the first factor to determine would be the r.p.m. of the cutter. Referring to Formula No. 1, shown below, we find that the r.p.m. is determined by dividing the Feed per Minute by the circumference of the cutter. The circumference of a 5-in. cutter is equal to 5x3.1416, or 1.31 ft. Then, dividing the desired speed of 300 ft. per minute by 1.31 ft., the result would be 229 r.p.m.

Now, referring to the Table of Feeds, we find that the recommended Feed per Tooth per Revolution for a cut of this kind would be from 0.008 to 0.010 in. Assuming that the smallest feed would be best, we then multiply the teeth per minute by 0.008 in. The

teeth per minute would be obtained by multiplying the number of teeth in the cutter by the r.p.m., which would be 10x229, or 2290, see Formula No. 4. So for our answer we would have 2290x0.008 in. per tooth, which would indicate a Table Feed of 18.3 in. per minute.

EXAMPLE No. 2: Suppose an 8-in. cutter having 18 teeth, was intended to finish aluminum at 1500 ft. per minute, and that a Feed per Tooth per Revolution of 0.004 in. was found to be best for the nature of the cut. This problem would be worked out in a very similar manner. First, we would determine the circumference of the cutter in feet, which would be equivalent to 8 multiplied by 3.1416, divided by 12, which would equal 2.1 ft. The recommended Feet per Minute, divided by the circumference, would be equal to the r.p.m., which in this case would be 1500 divided by 2.1, which would equal 715 r.p.m. Now then, taking our Feed per Tooth per Revolution, and using Formula No. 4, shown below, we would have: 0.004x18x715 equals 51.5 in. Table Feed per Minute.

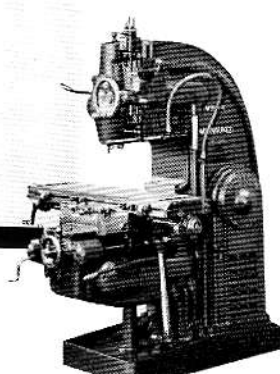
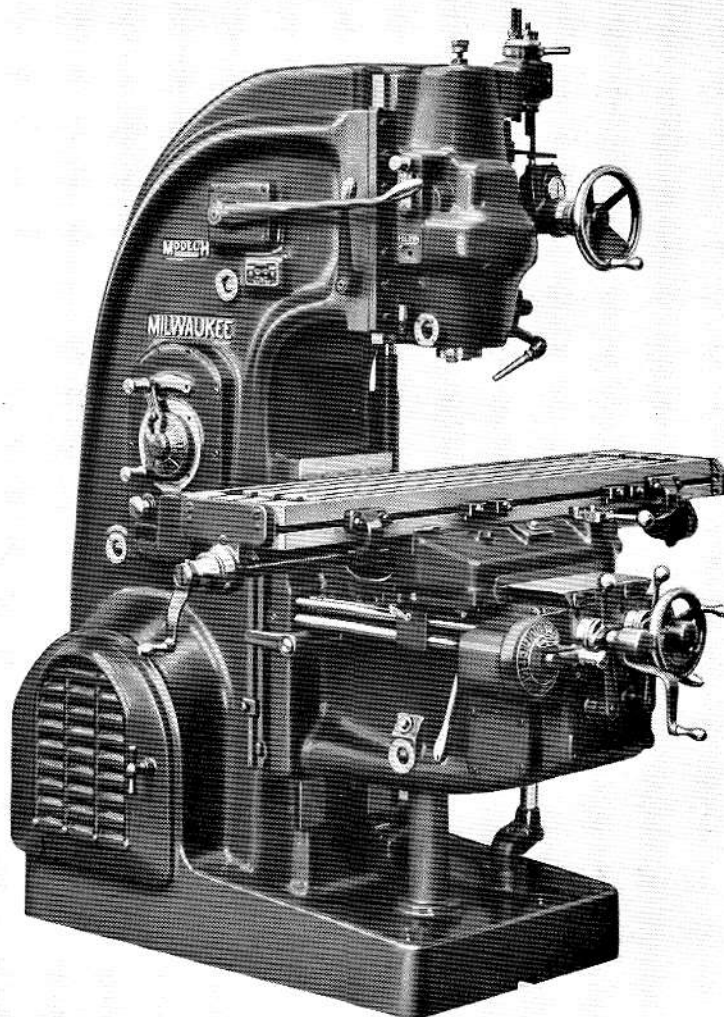
The following formulae will be of assistance in calculating speeds and feeds of milling cutters in which certain factors are known and others are to be determined.

	To Find	Having	Rule	Formula
Formula No. 1	Revolutions Per Minute	Feed per Minute and Diam. of Cutter	Feed per Minute, divided by circumference of cutter	$\text{FPM} \div \frac{\text{Diam.} \times \pi}{12} = \text{RPM}$
Formula No. 2	Speed of Cutter in feet per Minute	Diameter of cutter and R.P.M.	Diameter of cutter, multiplied by 3.1416, multiplied by RPM, divided by 12	$\frac{\text{Diam.} \times \pi \times \text{RPM}}{12} = \text{FPM}$
Formula No. 3	Feed per tooth per revolution	Feed per Minute and No. of teeth per minute	Feed per Min. (in.) divided by No. of teeth per Min. (No. of teeth in cutter x RPM)	$F : (T \times \text{RPM}) = \text{FTR}$
Formula No. 4	Feed per Minute	Feed per tooth per rev., No. of teeth in cutter and R.P.M.	Feed per tooth per Rev., multiplied by No. of teeth in cutter multiplied by RPM	$\text{FTR} \times T \times \text{RPM} = F$

FPM = Feet per minute
RPM = Revolutions per minute

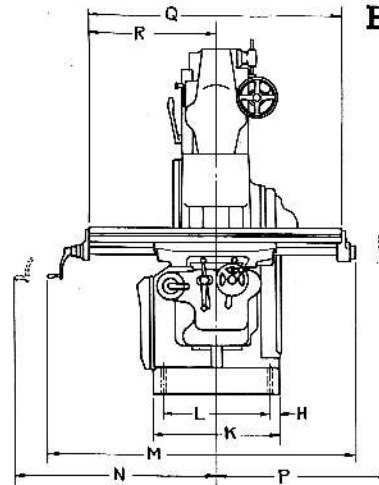
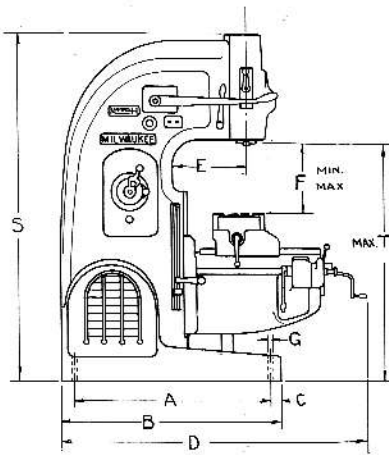
FTR = Feed per tooth per revolution
T = Number of teeth in cutter.

$\pi = 3.1416$
F = Table feed per minute



No. 2H Vertical Milwaukee

The new Model H VERTICAL has been designed for fast and convenient operation. It is not a light machine, and neither is it a heavy duty machine. It is a compact, modern tool that is well proportioned and has unusual power for its size. It is handy to operate and gives excellent account of itself when put to heavy cuts.



Plan Dimensions and General Specifications

MACHINE	A	B	C	D	E	F Min.	F Max.	G	H	K	L Front	L Rear	M	N	P	Q	R	S	T
No. 2H Vertical (Inches)	37 $\frac{3}{8}$ L 39 $\frac{3}{4}$ R	43	1 $\frac{3}{8}$	60 $\frac{3}{4}$	14	0	17 $\frac{3}{4}$	1 $\frac{1}{8}$	1 $\frac{3}{8}$	25	21 $\frac{1}{4}$	22 $\frac{3}{4}$	62 $\frac{3}{4}$	47	42 $\frac{3}{4}$	50	25	70	46
No. 2H Vertical (M/M)	955L 997R	1091	48	1530	356	0	438	21	48	635	539	564	1594	1194	1073	1270	635	1778	1168

	DESCRIPTION	NO. 2H VERTICAL	
		Inches	Millimeters
TABLE	Working Surface	50"x10"	1270x254
	Size Overall	50"x10"	1270x254
	T-Slots—Number and Width	Three— $\frac{1}{4}$ "	Three—17.5
	—Center Distance	2 $\frac{1}{4}$ "	57
	Back Edge of Table to Center of First T-Slot	2 $\frac{3}{4}$ "	70
RANGE	Longitudinal Power Feed	28"	711
	Cross Power Feed	12"	305
	Vertical Power Feed (Knee)	15"	381
	Sliding Head Travel	4"	102
	Distance Spindle Nose to Top of Table—Maximum	17 $\frac{3}{4}$ "	438
	Throat Distance—Center-line of Spindle to Column (Dimension E)	14"	356
SPINDLE	Chrome Nickel Steel, Heat Treated, Hardened and Ground—		
	Center Bearing (increases stiffness 8 times)	Yes	Yes
	No. 40 National Standard, Taper Hole 3 $\frac{1}{2}$ " per Foot (See Below)	Yes	Yes
	Diameter of Nose	3 $\frac{1}{2}$ "	89
	Size of Hole Through (for $\frac{3}{8}$ " Draw-In Rod)	$\frac{1}{4}$ "	17.5
SPEEDS	Number—in One Continuous Series, 40 to 1 Ratio	16	16
	Standard Range in Geometrical Progression	35 to 1400 r.p.m.	35 to 1400 r.p.m.
	Optional Ranges Substituted at Additional Cost	20 to 800 r.p.m. or 50 to 2000 r.p.m.	20 to 800 r.p.m. or 50 to 2000 r.p.m.
	Spindle Reverse (Built-in Mechanical Type, independent of Feeds)	Yes	Yes
FEEDS	Number—in One Continuous Series, 40 to 1 Ratio	16	16
	Range—Longitudinal and Cross rates per minute are the same } —Vertical rate per minute is one-half of Longitudinal	See Note	See Note
POWER FEED TO HEAD	Furnished to Order and Built-In at Factory—		
	Number of Feeds	16	16
	Range in Geometrical Progression (one-half of Longitudinal)	See Note	See Note
RAPID TRAVERSE	With Spindle Stopped or Running—		
	Longitudinal—Rate per Minute	150"	3600
	Cross—Rate per Minute	150"	3600
	Vertical (Knee)—Rate per Minute	75"	1800
	Vertical Head (when Power Feed is ordered)	75"	1800
DRIVE	Silent Multiple V-Belt from Motor—★		
	Pulley Speed	750 r.p.m.	750 r.p.m.
	Motor Speed	1800 r.p.m.	1800 r.p.m.
	Horsepower (Maximum)	5	5
CODE WORD	For machine with U. S. STANDARD Lead Screws and Dials	HAYJA	
	For machine with METRIC Lead Screws and Dials (For belt drive machines—furnished at extra cost—add the word "Belt" to code word.)		HAKOS
SHIPPING DATA	Net Weight (Approximate)	3800 lbs.	1725 kgs.
	Shipping Weight (Approximate)—Domestic	4100 "	"
	Shipping Weight (Approximate)—Export	4550 "	2066 kgs.
	Size of Case—Export	41"x68"x76"	1041x1727x1930
	Cubic Measurements—Export	122 cu. ft.	3.45 cu. meters

SPEED RANGE is optional—either 20 to 800 r.p.m., 35 to 1400 r.p.m., or 50 to 2000 r.p.m. NOTE: The range of 35 to 1400 r.p.m. is standard and will be furnished unless otherwise specified. If desired, the range of 20 to 800 r.p.m. or 50 to 2000 r.p.m. can be substituted at slight additional cost.

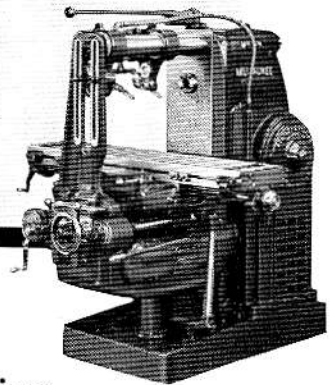
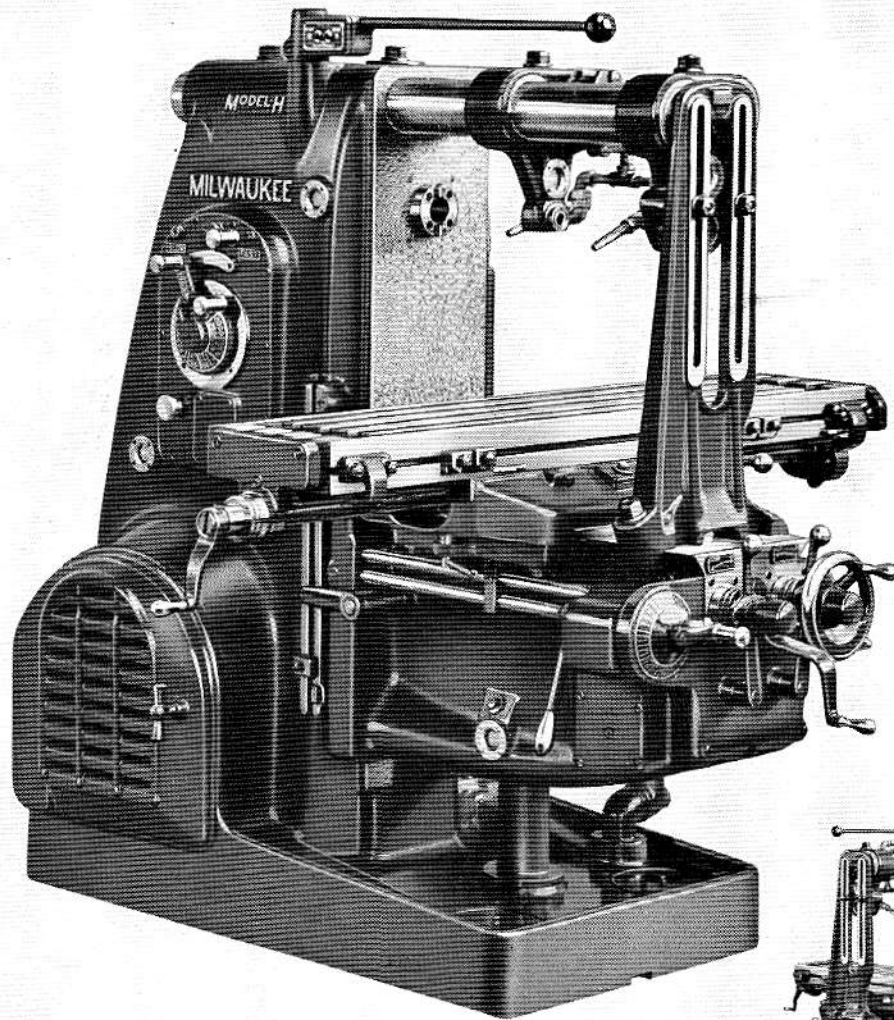
FEED RANGE is optional—either $\frac{1}{4}$ " to 10" (6 to 240 M/M), $\frac{1}{2}$ " to 20" (12 to 480 M/M), $\frac{3}{4}$ " to 30" (18 to 720 M/M), 1" to 40" (24 to 960 M/M), or 1 $\frac{1}{2}$ " to 60" (36 to 1440 M/M) per minute can be furnished. NOTE: The range of $\frac{1}{4}$ " to 20" per minute is standard and will be furnished unless one of the other ranges is specified, at additional cost.

MACHINE SPINDLE: When desired, machines can be furnished at extra charge with No. 50 National Standard Spindle end, taper of hole 3 $\frac{1}{2}$ " per foot, diameter of nose 5 $\frac{1}{8}$ ", hole through 1 $\frac{1}{8}$ " for 1" diameter draw-in rod.

STANDARD EQUIPMENT INCLUDES: Spindle reverse, cutter coolant system, 6-way Power Rapid Traverse to table, hand feed to head, single rod graduated positive stop for sliding head, arbor draw-in rod and necessary wrenches.

EXTRA EQUIPMENT (available at additional cost): Plain or swivel vise, rotary tables, arbors, power feed to head, etc. Vertical machines can be equipped for driving spiral dividing head with either conventional change gears, or low lead attachment.

(★) All Model H machines are equipped for motor-in-base drive. Price of machine includes push button, multiple V-belts, sheaves, adjustable motor bracket, and mounting of motor at factory, when desired. Price does NOT include motor, starter, or wiring. Any Model H machine can be furnished on special order arranged for belt drive at additional cost.



No. 2H Plain Milwaukee

A Modern, High Speed, Milling Machine
that is "just the right size!"

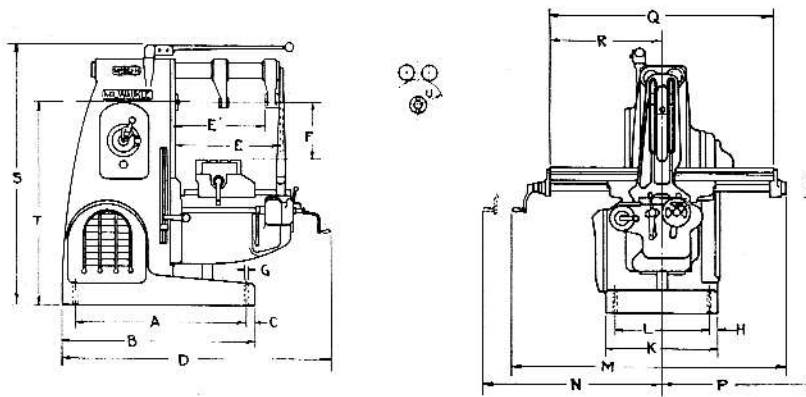
The new No. 2H MILWAUKEE has the rigidity and range of a standard No. 2 miller, yet it is smaller, faster, more flexible. K&T engineers have accomplished in a milling machine what the automotive engineers have accomplished in their faster, more efficient small cars.

Model H machines have been designed to mill those thousands of parts for which a heavier machine would be slow, cumbersome, and unprofitable. These new machines occupy less floor space . . . they are lower in height . . . more convenient for the operator . . . quicker to set up . . . easier to handle . . . yet it is amazing to see the cuts

they will pull. This is because Model H machines are strictly modern and their design is based upon sound engineering principles.

The column is stronger because of its unbroken, solid rear wall . . . the center bearing makes the spindle 8 times stiffer . . . there are anti-friction bearings throughout . . . alloy steel gears slide on multiple splined shafts . . . high speed gears with ground tooth form . . . enclosed cross-mounted motor . . . multiple V-belt drive . . . speeds up to 2000 r.p.m. . . . feeds up to 60" per minute, and a live rapid traverse. Without question, here is a modern, high speed milling machine — "just the right size."

KEARNEY & TRECKER CORPORATION
MILWAUKEE, WISCONSIN



Plan Dimensions and General Specifications

MACHINE	A	B	C	D	E	E'	F Min.	F Max.	G	H	K	L Front	L' Rear	M	N	P	Q	R	S	T	U
No. 2H Plain (Inches)	37 $\frac{3}{4}$ L 39 $\frac{3}{4}$ R	43	1 $\frac{7}{8}$	60 $\frac{3}{4}$	24 $\frac{3}{8}$	21 $\frac{1}{4}$	0	17 $\frac{1}{4}$	1 $\frac{1}{8}$	1 $\frac{7}{8}$	25	21 $\frac{1}{4}$	22 $\frac{1}{4}$	62 $\frac{1}{4}$	46 $\frac{3}{4}$	42	49 $\frac{1}{2}$	24 $\frac{3}{4}$	58 $\frac{3}{8}$	46	5 $\frac{1}{8}$
No. 2H Plain (M/M)	955L 997R	1091	48	1530	617	540	0	438	21	48	635	539	564	1580	1187	1067	1245	629	1495	1168	135

	DESCRIPTION	NO. 2H PLAIN	
		Inches	Millimeters
TABLE	Working Surface	50"x10"	1270x254
	Size Overall	50"x10"	1270x254
	T-Slots—Number and Width	Three—1 $\frac{1}{8}$ "	Three—17.5
	—Center Distance	2 $\frac{1}{2}$ "	57
	Back Edge of Table to Center of First T-Slot	2 $\frac{3}{4}$ "	70
FEED RANGE	Longitudinal Power Feed	28"	711
	Cross Power Feed	10"	254
	Vertical Power Feed	17"	432
HEIGHT	Center-line of Spindle to Floor (Dimension T)	46"	1168
	Center-line of Spindle to Top of Table, Maximum (Minimum 0") (Dimension F)	17 $\frac{1}{4}$ "	438
WIDTH	Column to Adjustable Overarm Brace—Maximum (Dimension E)	24 $\frac{3}{8}$ "	617
	Column to Inside of Arbor Support—With Brace in Place (Maximum) (Dimension E')	21 $\frac{1}{2}$ "	540
	Column to Inside of Arbor Support—Without Brace (Maximum)	21 $\frac{3}{4}$ "	552
DOUBLE OVERARMS	Two Round Solid Steel Bars—Diameter and Width Across Both Overarms	3 $\frac{3}{8}$ "—8 $\frac{3}{8}$ "	92—213
	Center-line of Spindle to Underside of Overarms (Radial) (Dimension U)	5 $\frac{7}{8}$ "	135
ARBOR SUPPORTS	Self-Oiling with Adjustable Bronze Bushing—Style A with $\frac{3}{8}$ " Hole, for Pilot End Arbors	1	1
	Style B with 1 $\frac{1}{4}$ " Hole, with Studs for Arm Brace NOTE: Intermediate Arbor Support with 1 $\frac{1}{4}$ " Hole can be substituted in place of Style A Support, without charge.	1	1
SPINDLE	Chrome Nickel Steel, Heat Treated, Hardened and Ground—Center Bearing (increases stiffness 8 times)	Yes	Yes
	No. 40 National Standard, Taper Hole 3 $\frac{1}{2}$ " per Foot (See Below)	Yes	Yes
	Diameter of Nose	3 $\frac{1}{2}$ "	89
	Size of Hole Through (for $\frac{5}{8}$ " Draw-In Rod)	1 $\frac{1}{8}$ "	17.5
SPEEDS	Number—in One Continuous Series, 40 to 1 Ratio	16	16
	Standard Range in Geometrical Progression	35 to 1400 r.p.m. 20 to 800 r.p.m.	35 to 1400 r.p.m. 20 to 800 r.p.m.
	Optional Ranges Substituted at Extra Cost	or 50 to 2000 r.p.m.	or 50 to 2000 r.p.m.
	Spindle Reverse (Built-in Mechanical Type, independent of Feeds)	Yes	Yes
FEEDS	Number—in One Continuous Series, 40 to 1 Ratio	16	16
	Range—Longitudinal and Cross rates per minute are the same —Vertical rate per minute is one-half of Longitudinal	See Note	See Note
RAPID TRAVERSE	With Spindle Stopped or Running—Longitudinal—Rate per Minute	150"	3600
	Cross—Rate per Minute	150"	3600
	Vertical—Rate per Minute	75"	1800
DRIVE	Silent Multiple V-Belt from Motor—★		
	Pulley Speed	750 r.p.m.	750 r.p.m.
	Motor Speed	1800 r.p.m.	1800 r.p.m.
	Horsepower (Maximum)	5	5
CODE WORD	For machine with U. S. STANDARD Lead Screws and Dials	HAJOR	
	For machine with METRIC Lead Screws and Dials (For belt drive machines—urnished at extra cost—add the word "Belt" to code word.)		HAKIL
SHIPPING DATA	Net Weight (Approximate)	3450 lbs.	1566 kgs.
	Shipping Weight (Approximate)—Domestic	3750 "	
	Shipping Weight (Approximate)—Export	4200 "	1907 kgs.
	Size of Case—Export	41"x68"x65"	1041x1727x1651
	Cubic Measurements—Export	105 cu. ft.	2.97 cu. meters

SPEED RANGE is optional—either 20 to 800 r.p.m., 35 to 1400 r.p.m., or 50 to 2000 r.p.m. NOTE: The range of 35 to 1400 r.p.m. is standard and will be furnished unless otherwise specified. If desired, the range of 20 to 800 r.p.m. or 50 to 2000 r.p.m. can be substituted at additional cost.

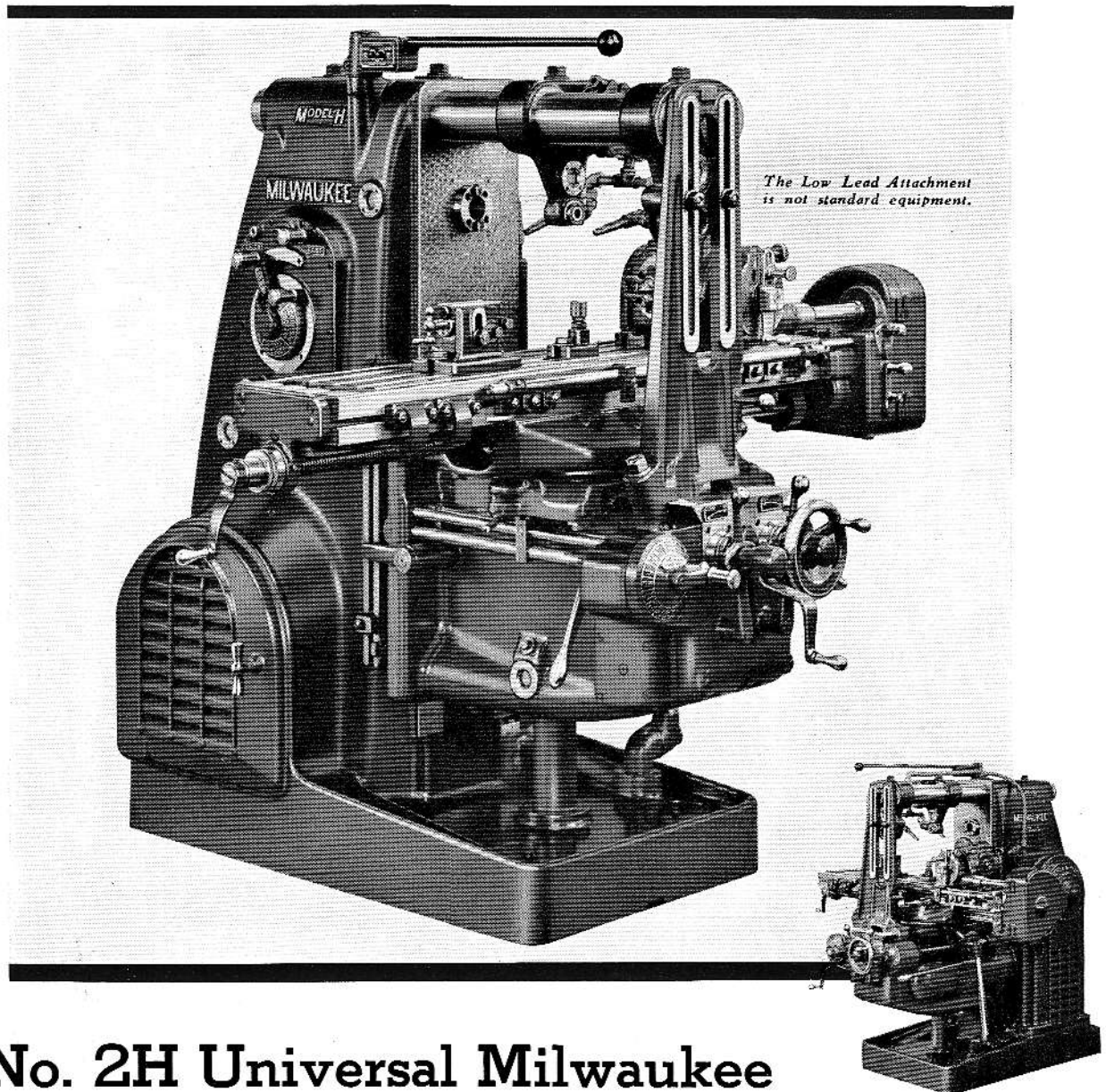
FEED RANGE is optional—either $\frac{3}{4}$ " to 10" (6 to 240 mm); $\frac{1}{2}$ " to 20" (12 to 480 mm); $\frac{3}{4}$ " to 30" (18 to 720 mm); 1" to 40" (24 to 960 mm); or 1 $\frac{1}{2}$ " to 60" (36 to 1440 mm) per minute can be furnished. NOTE: The range of $\frac{1}{2}$ " to 20" per minute is standard and will be furnished unless one of the other ranges is specified, at additional cost.

MACHINE SPINDLE: When desired, machines can be furnished at extra charge with No. 50 National Standard Spindle end, taper of hole 3 $\frac{1}{2}$ " per foot, diameter of nose 5 $\frac{7}{8}$ ", hole through 1 $\frac{1}{8}$ " for 1" diameter draw-in rod.

STANDARD EQUIPMENT INCLUDES: Spindle reverse, cutter coolant system, 6-way Power Rapid Traverse, arbor draw-in rod, adjustable arm brace, necessary wrenches and arbor supports listed above. Intermediate arbor support can be substituted in place of style A arbor support, without extra charge, when specified on order.

EXTRA EQUIPMENT (available at additional cost): Plain or swivel vise, universal and vertical milling attachments, light hi-speed milling attachment, slotting attachment, rotary tables, arbors, etc. Plain machines can be equipped for driving spiral dividing head with either conventional change gears or low lead attachment.

(★) All Model H machines are equipped for motor-in-base drive. Price of machine includes push button, multiple V-belts, sheaves, adjustable motor bracket, and mounting of motor at factory, when desired. Price does NOT include motor, starter, or wiring. Any Model H machine can be furnished on special order arranged for belt drive at additional cost.



No. 2H Universal Milwaukee

A New High Speed Milling Machine of Modern Design and Proportions

For countless operations in the toolroom and shop where accuracy must be accompanied by speed and flexibility, here is a machine that is "just the right size!" It is rigid and compact . . . light enough to be convenient . . . heavy enough to have plenty of power and capacity. It is a high speed Universal machine of modern design and proper proportions — the kind of a machine that operators have wanted for convenience, and management has wanted for profits.

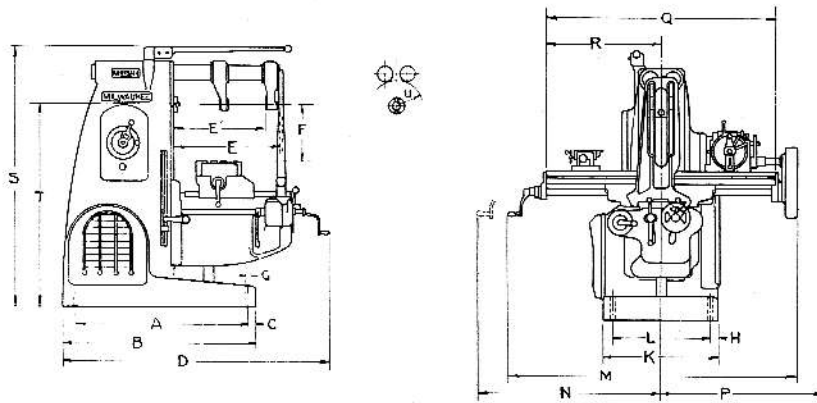
The 2H UNIVERSAL comes equipped with a new 8" dividing head. The swing was purposely made 8", for this size amply covers the majority of requirements, and it keeps the head small and

compact. The spindle of this new head is mounted on precision ball bearings, and the spindle end is the No. 40 National Standard, the same as on the milling machine, so that arbors are interchangeable.

A 10" swing dividing head can also be supplied at a slight additional cost.

There is also available, at slight extra cost, a new Low Lead attachment with which it is possible to obtain over 40,000 different leads ranging from 38 turns to the inch up to 1 turn in 2900 inches . . . and every one of these leads is obtainable by power!

KEARNEY & TRECKER CORPORATION
MILWAUKEE, WISCONSIN



Plan Dimensions and General Specifications

MACHINE	A	B	C	D	E	E'	F Min.	F Max.	G	H	K	L Front	L Rear	M	N	P	Q	R	S	T	U
No. 2H Universal (Inches)	37 $\frac{5}{8}$ L 39 $\frac{1}{4}$ R	43	17 $\frac{1}{2}$	60 $\frac{3}{4}$	24 $\frac{1}{8}$	21 $\frac{1}{4}$	0	16	1 $\frac{1}{8}$	1 $\frac{1}{8}$	25	21 $\frac{1}{4}$	22 $\frac{1}{4}$	62 $\frac{3}{4}$	46 $\frac{3}{4}$	42 $\frac{3}{4}$	49 $\frac{1}{2}$	24 $\frac{3}{4}$	58 $\frac{7}{8}$	46	5 $\frac{1}{8}$
No. 2H Universal (M/M)	955L 997R	1091	48	1530	617	540	0	406	21	48	635	539	564	1584	1187	1078	1245	629	1495	1168	135

	DESCRIPTION	NO. 2H UNIVERSAL	
		Inches	Millimeters
TABLE	Working Surface	50"x10"	1270x254
	Size Overall	50"x10"	1270x254
	T-Slots—Number and Width	Three— $\frac{11}{8}$ "	Three—17.5
	—Center Distance	2 $\frac{1}{4}$ "	57
	Back Edge of Table to Center of First T-Slot	2 $\frac{3}{4}$ "	70
FEED RANGE	Swivels—Right or Left	47°	47°
	Longitudinal Power Feed	28"	711
	Cross Power Feed	10"	254
HEIGHT	Vertical Power Feed	17"	432
	Center-line of Spindle to Floor (Dimension T)	46"	1168
WIDTH	Center-line of Spindle to Top of Table (Dimension F)	16"	406
	Column to Adjustable Overarm Brace—Maximum (Dimension E)	24 $\frac{1}{8}$ "	617
DOUBLE OVERARMS	Column to Inside of Arbor Support—With Brace in Place (Maximum) (Dimension E')	21 $\frac{1}{2}$ "	540
	Column to Inside of Arbor Support—Without Brace (Maximum)	21 $\frac{3}{4}$ "	552
ARBOR SUPPORTS	Two Round Solid Steel Bars—Diameter and Width Across Both Overarms	3 $\frac{5}{8}$ "—8 $\frac{3}{8}$ "	92—213
	Center-line of Spindle to Underside of Overarms (Radial) (Dimension U)	5 $\frac{1}{8}$ "	135
DIVIDING HEAD	Self-Oiling with Adjustable Bronze Bushing—Style A with $\frac{3}{16}$ " Hole, for Pilot End Arbors	1	1
	Style B with $\frac{1}{8}$ " Hole, with Studs for Arm Brace	1	1
SPEEDS	NOTE: Intermediate Arbor Support with $\frac{1}{8}$ " Hole can be substituted in place of Style A support, without charge.		
	Preloaded Ball Bearings, Model H Wormwheel Type—40 to 1 Ratio—Spindle Nose No. 40 National Standard, same as Machine Spindle	Yes	Yes
	Swings	8"	203
SPINDLE	Takes in Length	32 $\frac{1}{2}$ "	825
	Chrome Nickel Steel, Heat Treated, Hardened and Ground—Center Bearing (increases stiffness 8 times)	Yes	Yes
	No. 40 National Standard, Taper Hole $\frac{3}{4}$ " per Foot (See Below)	Yes	Yes
FEEDS	Diameter of Nose	3 $\frac{1}{2}$ "	89
	Size of Hole Through (for $\frac{3}{4}$ " Draw-in Rod)	1 $\frac{1}{8}$ "	17.5
	Number—in One Continuous Series, 40 to 1 Ratio	16	16
	Standard Range, in Geometrical Progression	35 to 1400 r.p.m.	35 to 1400 r.p.m.
RAPID TRAVERSE	Optional Ranges, Substituted at Extra Cost	20 to 800 r.p.m. or 50 to 2000 r.p.m.	20 to 800 r.p.m. or 50 to 2000 r.p.m.
	Spindle Reverse (Built-in Mechanical Type, independent of Feeds)	Yes	Yes
DRIVE	Number—in One Continuous Series, 40 to 1 Ratio	16	16
	Range—Longitudinal and Cross rates per minute are the same } —Vertical rate per minute is one-half of Longitudinal	See Note	See Note
SHIPPING DATA	With Spindle Stopped or Running—Longitudinal—Rate per Minute	100"	2400
	Cross—Rate per Minute	100"	2400
	Vertical—Rate per Minute	50"	1200
CODE WORD	Silent Multiple V-Belt from Motor—★		
	Pulley Speed	750 r.p.m.	750 r.p.m.
SHIPPING DATA	Motor Speed	1800 r.p.m.	1800 r.p.m.
	Horsepower (Maximum)	5	5
SHIPPING DATA	For machine with U. S. STANDARD Lead Screws and Dials	HAJSU	HAKLO
	For machine with METRIC Lead Screws and Dials		
	(For belt drive machines—furnished at extra cost—add the word "Belt" to code word.)		
	Net Weight (Approximate)	3750 lbs.	1703 kgs.
	Shipping Weight (Approximate)—Domestic	4050 "	1838 kgs.
SHIPPING DATA	Shipping Weight (Approximate)—Export	4500 "	2043 kgs.
	Size of Case—Export	41"x68"x65"	1041x1727x1651
	Cubic Measurements—Export	105 cu. ft.	2.97 cu. meters

SPEED RANGE is optional—either 20 to 800 r.p.m., 35 to 1400 r.p.m., or 50 to 2000 r.p.m. NOTE: The range of 35 to 1400 r.p.m. is standard and will be furnished unless otherwise specified. If desired, the range of 20 to 800 r.p.m. or 50 to 2000 r.p.m. can be substituted at slight additional cost.

FEED RANGE is optional—either $\frac{3}{4}$ " to 10" (6 to 240 mm); $\frac{5}{8}$ " to 20" (12 to 480 mm); $\frac{3}{4}$ " to 30" (18 to 720 mm); 1" to 40" (24 to 960 mm); or 1 $\frac{1}{2}$ " to 60" (36 to 1440 mm) per minute can be furnished. NOTE: The range of $\frac{1}{2}$ " to 20" per minute is standard and will be furnished unless one of the other ranges is specified, at additional cost.

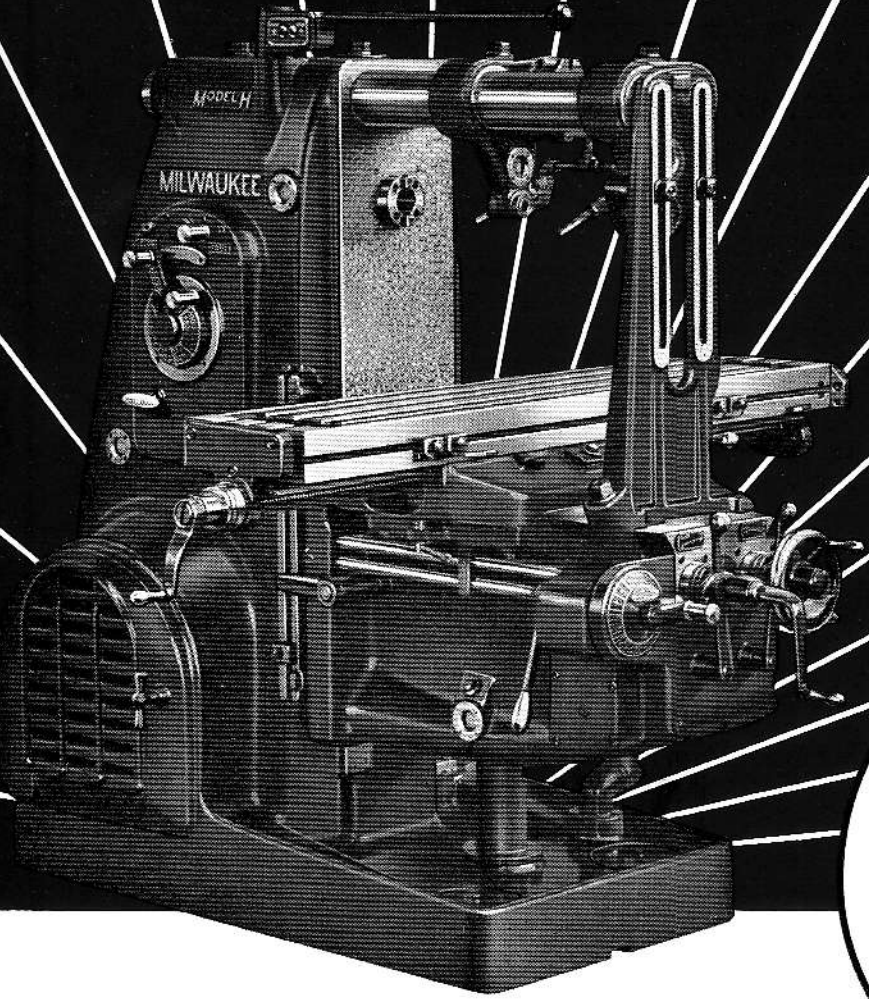
MACHINE SPINDLE: When desired, machines can be furnished at extra charge with No. 50 National Standard Spindle end, taper of hole $\frac{3}{4}$ " per foot, diameter of nose 5 $\frac{1}{8}$ ", hole through 1 $\frac{1}{8}$ " for 1" diameter draw-in rod.

STANDARD EQUIPMENT INCLUDES: 8" Swing Model H Spiral Universal WORMWHEEL type, preloaded ball bearing dividing head, 40 to 1 ratio, with 3 single index plates, adjustable tailstock, center rest, dividing center and work driver, lead change gears, and book of index and lead charts. Spindle reverse, cutter coolant system, 6-way Power Rapid Traverse, arbor draw-in rod, adjustable arm brace, necessary wrenches, and arbor supports listed above. Intermediate arbor support can be substituted in place of style A arbor support, without extra charge, when specified on order.

EXTRA EQUIPMENT (available at additional cost): Plain or swivel vise, 3-jaw universal chuck, thread milling attachment, right angle drive for dividing head, cam milling slide, universal and vertical milling attachments, light hi-speed attachment, slotting attachment, rotary table, short lead attachment with 17 change gears and three interchangeable worm sets, arbors, etc.

(★) All Model H machines are equipped for motor-in-base drive. Price of machine includes push button, multiple V-belts, sheaves, adjustable motor bracket, and mounting of motor at factory, when desired. Price does NOT include motor, starter, or wiring. Any Model H machine can be furnished on special order arranged for belt drive at additional cost.

BULLETIN No. 7147



A
Profitable
Investment

No. 2 MODEL H
MILWAUKEE MILLING MACHINE

The No. 2 Model H MILWAUKEE is a *new size* of milling machine. It is stronger and sturdier than the so-called "light type" miller, and yet it is not a heavy duty machine. It has been designed to handle more profitably those hundreds of milling operations for which a larger machine would be too slow and cumbersome.

A description which properly summarizes this new machine was given by a customer when he said, "You have accomplished in a milling machine what the automotive engineers have accomplished in their more economical and more efficient small cars."

THAT PRODUCE PROFITS!

If you will compare the construction of any ten year old milling machine in your plant with the modern time-saving and cost-reducing features of the new No. 2 Model H MILWAUKEE, you will appreciate why the replacement of your old millers with new MILWAUKEES will produce profits for you.

The new No. 2 Model H MILWAUKEE has been designed to turn out work faster, with less fatigue, and lower costs on the general run of milling operations. Its construction has been based on the same sound engineering principles that have proved so successful in the larger and higher powered Model K machines.



Consider these features: The column is stronger because of its unbroken solid rear wall . . . the center bearing for the spindle makes it 8 times stiffer . . . there are anti-friction bearings throughout . . . alloy steel gears sliding on multiple spline shafts . . . high speed gears with ground tooth form . . . enclosed cross-mounted motor . . . multiple V-belt drive . . . speeds up to 2000 r.p.m. . . feeds up to 60 inches per minute, and a live rapid traverse. Without question, the Model H is a productive, high speed milling machine . . . a profitable investment for any plant.

OPTIONAL SPEED RANGE

In order to provide the proper speed range for all sizes of cutters and types of material, the No. 2 Model H MILWAUKEE can be furnished with any one of three optional speed ranges: 20 to 800 r. p. m., 35 to 1400

r. p. m., or 50 to 2000 r. p. m. In each range there are 16 changes of speeds available in one continuous series, 40 to 1 ratio. These changes are accomplished with sliding gears and the speed in use is shown on a large direct reading dial.

CENTER BEARING MAKES SPINDLE 8 TIMES STIFFER

It is a well known engineering fact that deflection varies as the *cube* of the unsupported length. Placing a center bearing on the spindle reduces its unsupported length by one-half and deflection is, therefore, reduced by the cube of one-half, or one-eighth. In other words, the introduction of a center bearing makes the spindle eight times stiffer! When your milling work requires the hogging off of a lot of metal, an eight-times-stiffer spindle means something. Surely, this is a feature that produces profits.

The spindle is the No. 40* National Standard. Its front and center bearings have precision tapered rollers for taking radial and thrust loads. The rear bearing has precision straight rolls for radial load only. The bearings are spaced far enough apart to avoid destructive pinch-bar effect, thus providing a more rigid spindle without adding any undue load on the bearings. Two spur gears, each transmitting 8 different speeds, are solidly mounted on the spindle. These gears are of wide face, coarse pitch, and are keyed on the spindle with six integral splines.

(**When desired, a No. 50 National Standard spindle can be furnished at small additional cost.*)

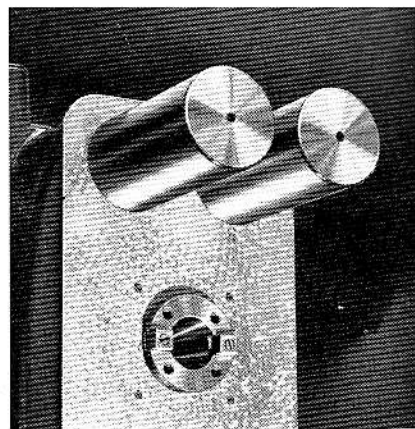
OPTIONAL FEED RANGE

To match the optional selection of speeds, the Model H MILWAUKEE can be furnished with any one of five different feed ranges: $\frac{1}{4}$ to 10", $\frac{1}{2}$ to 20", $\frac{3}{4}$ to 30", 1 to 40", or $1\frac{1}{2}$ to 60" per minute. Each range is provided with 16 changes of feed in one continuous series, 40 to 1 ratio. Feed selection is made at the front of the knee by a single crank lever and large direct reading dial. The crank can be rotated in either direction to obtain the feed desired without "running through" the entire range. This method of changing feeds is so simple and handy that the operator can either boost his feed

up or down a notch while in the cut, and without looking away from his work. The speeds and feeds of this modern milling machine are designed to cover not only the complete range of today's cutters, but tomorrow's as well. This assurance against obsolescence should merit your serious consideration.

CROSS FEED RATE SAME AS LONGITUDINAL

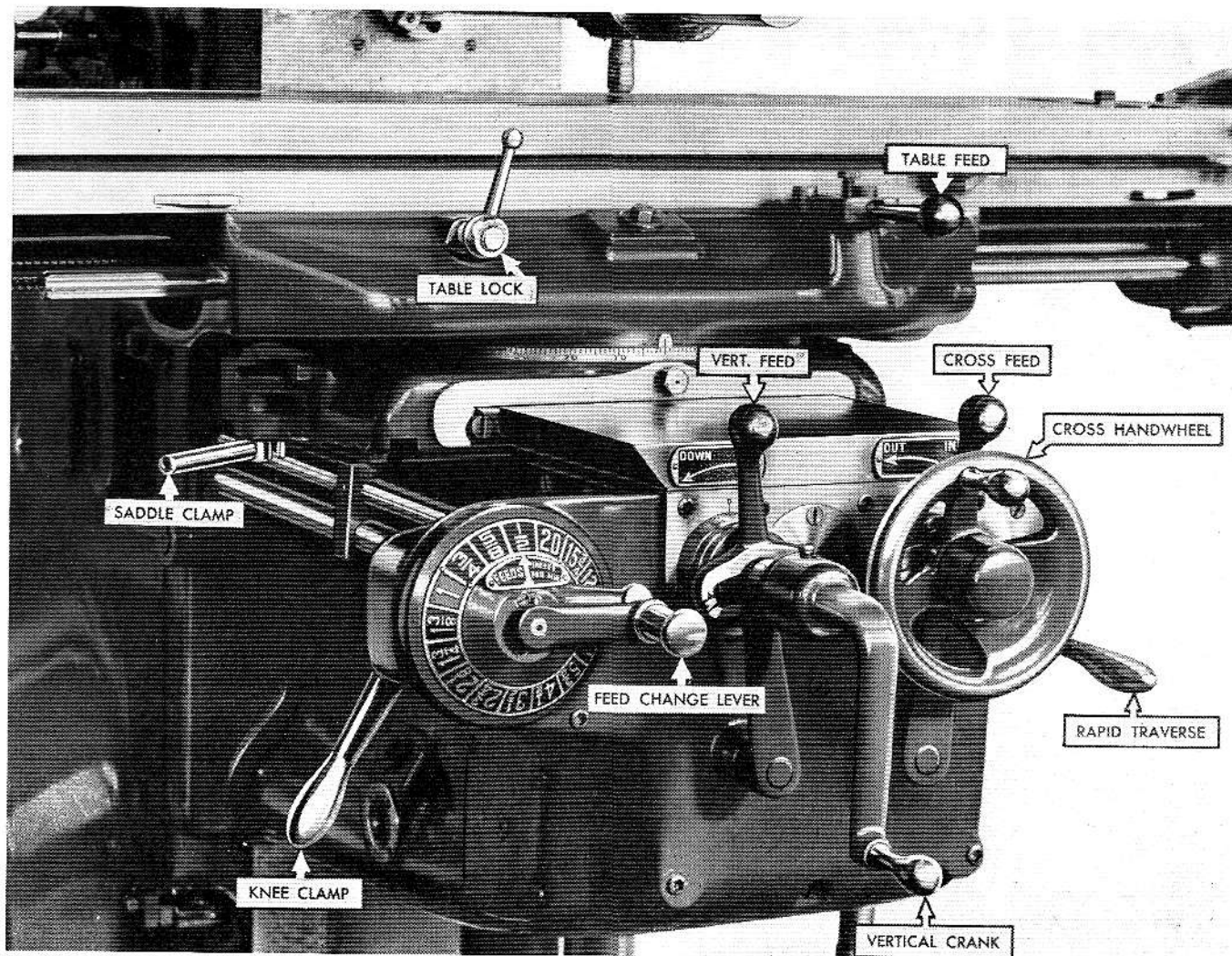
For years, on most milling machines, the feed rate shown on the dial has applied only to the longitudinal table feed. The cross feed was some fraction of this, and the vertical feed still another fraction. On the No. 2 Model H MILWAUKEE, both the longitudinal and cross feed rates are as shown on the dial, and only the vertical feed is reduced $\frac{1}{2}$. Having the same feed rates for the longitudinal and cross movements is a splendid feature, especially for Vertical machines or Horizontal machines fitted with Vertical Attachments. When milling around a flange, it is very desirable to use the same rate of feed in both the longitudinal and cross directions, thereby maintaining a uniform finish.



DOUBLE OVERARMS

Since first invented by Kearney & Trecker in 1912, the famous double overarms have stood the test of time and they will continue to be an outstanding structural achievement. Think of the *resistance* these two solid steel bars offer against deflection. No wonder you can do rapid, accurate work . . . and produce profits . . . on a MILWAUKEE MILLING MACHINE.

The CONTROLS are SIMPLE and SAFE!



CONTROL LEVERS HAVE SAFETY INTERLOCKS WHICH PREVENT SPINNING HANDWHEELS AND HANDCRANKS

Such features as single lever speed control, pilot wheel for the over-arms, and duplicate rear feed controls, have been purposely omitted on the No. 2 Model H MILWAUKEE in order to lower the cost and keep this machine simple. In all other respects, however, the *essential* controls are as modern and refined as will be found on the most expensive millers.

Standing at the front of the table, the operator can conveniently control any movement of the table to the right or left, the saddle in or out, and the knee up or down. He can make hand adjustments which are indicated in thousandths on large micrometer dials, he can engage power feed in any direction, and he can overtake any feed in any direction with power rapid traverse. All of the controls are directional and their functions always remain the

same, regardless of the direction in which the spindle is rotating.

The handle which controls the table feed is directional. Move it to the right, and the table feeds right; move it to the left and the table feeds left. This handle is of the tilting and re-engaging type—an exclusive K&T feature. The workpiece can be rapid traversed up close to the cutter—the table feed tripped out by a pre-set dog—and the operator can then raise the handle and re-engage the feed into the cut. This feature facilitates the more frequent and efficient use of power rapid traverse with absolute safety to the machine, the cutter, and the workpiece.

The No. 2 Model H millers are also provided with the new safety feature of a complete and positive interlocking system so that handcranks and

handwheels cannot be left attached nor accidentally revolve while power feed or power rapid traverse is engaged. This is accomplished by interference rings which have been cast integral in the cross and vertical control levers at the front of the knee. These interference rings obstruct the engagement of power feed when hand feed is in use, and in like manner they obstruct the engagement of hand feed when power feed is in use. The table handcrank is automatically disengaged when not used for hand movement. The three feeding movements of the table—longitudinal, cross, and vertical—are all independent of each other and with their interlocks the operator is completely protected. This new K&T interlocking system marks one of the greatest advancements for safety of operation that has been accomplished in many years.

CONSIDER THESE PROFI

Start and stop lever, adjustable through 300° with built-in push button control.

Equalized clamps—firmly grip both overarms.

On No. 2-H Model Machines No. 40 or No. 50 National Standard spindle can be had. Center bearing increases stiffness 8 times.

Sight oil gauge—tells instantly that all gears and bearings are getting oil.

16 Speeds in one continuous series—35 to 1400 r. p. m. standard—20 to 800 or 50 to 2000 r. p. m. optional.

Tilting type tailstock.

Column has solid rear wall, not weakened by large openings.

Built-in mechanical spindle reverse— independent of feed or power rapid traverse.

Positive limit stops are provided for table, knee, and saddle.

Column oil level gauge.

Easy-to-read micrometer dials.

Table hand crank, safety type, automatically disengaged when not in use.

Saddle clamp.

Cross mounted motor—easy to get at—well ventilated.

16 Feeds in one continuous series $\frac{1}{2}$ " to 20" per min. standard— $\frac{1}{4}$ " to 10", $\frac{3}{4}$ " to 30", 1" to 40", or $1\frac{1}{2}$ " to 60" optional. Dial revolves in either direction.

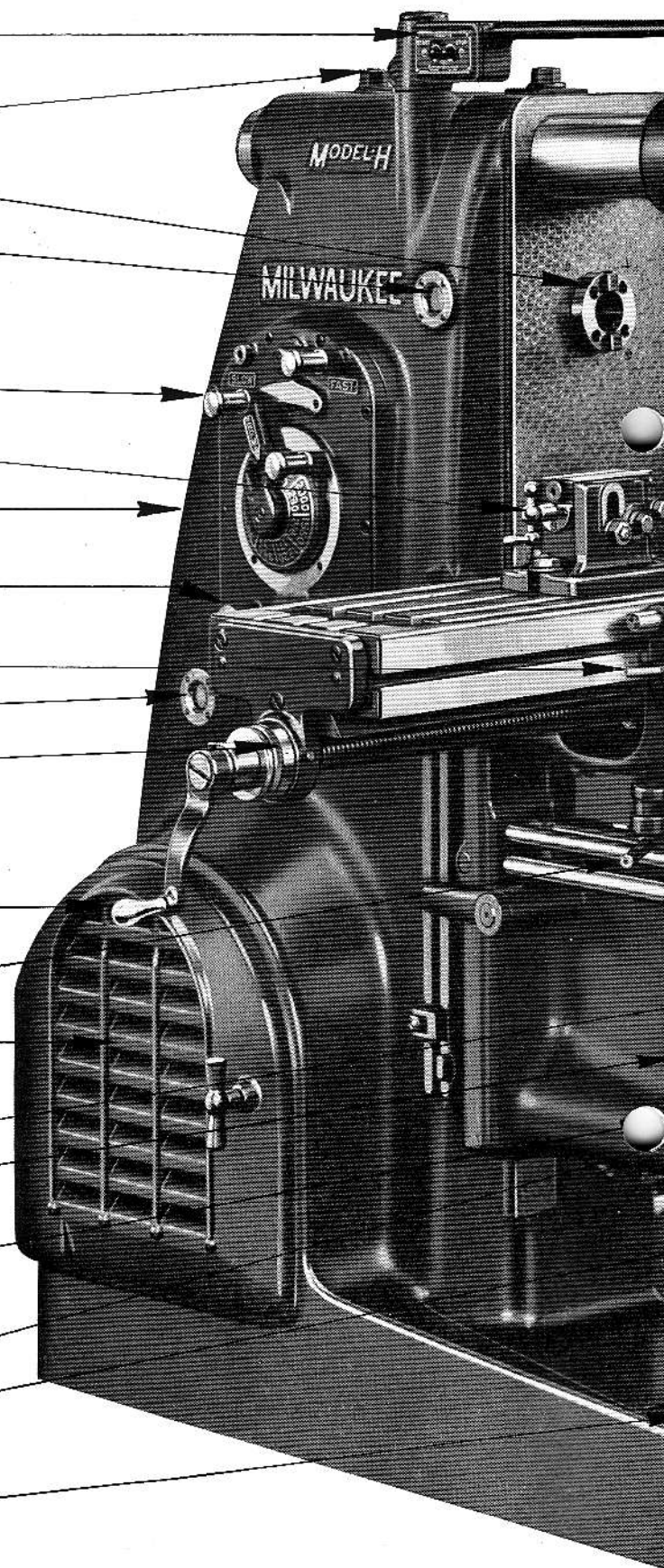
Filler plug for oil reservoir in knee.

Combination oil level and flow gauge. Pump and reservoir for lubricating all gears, shafts, and bearings in knee.

Adjustable knee clamp.

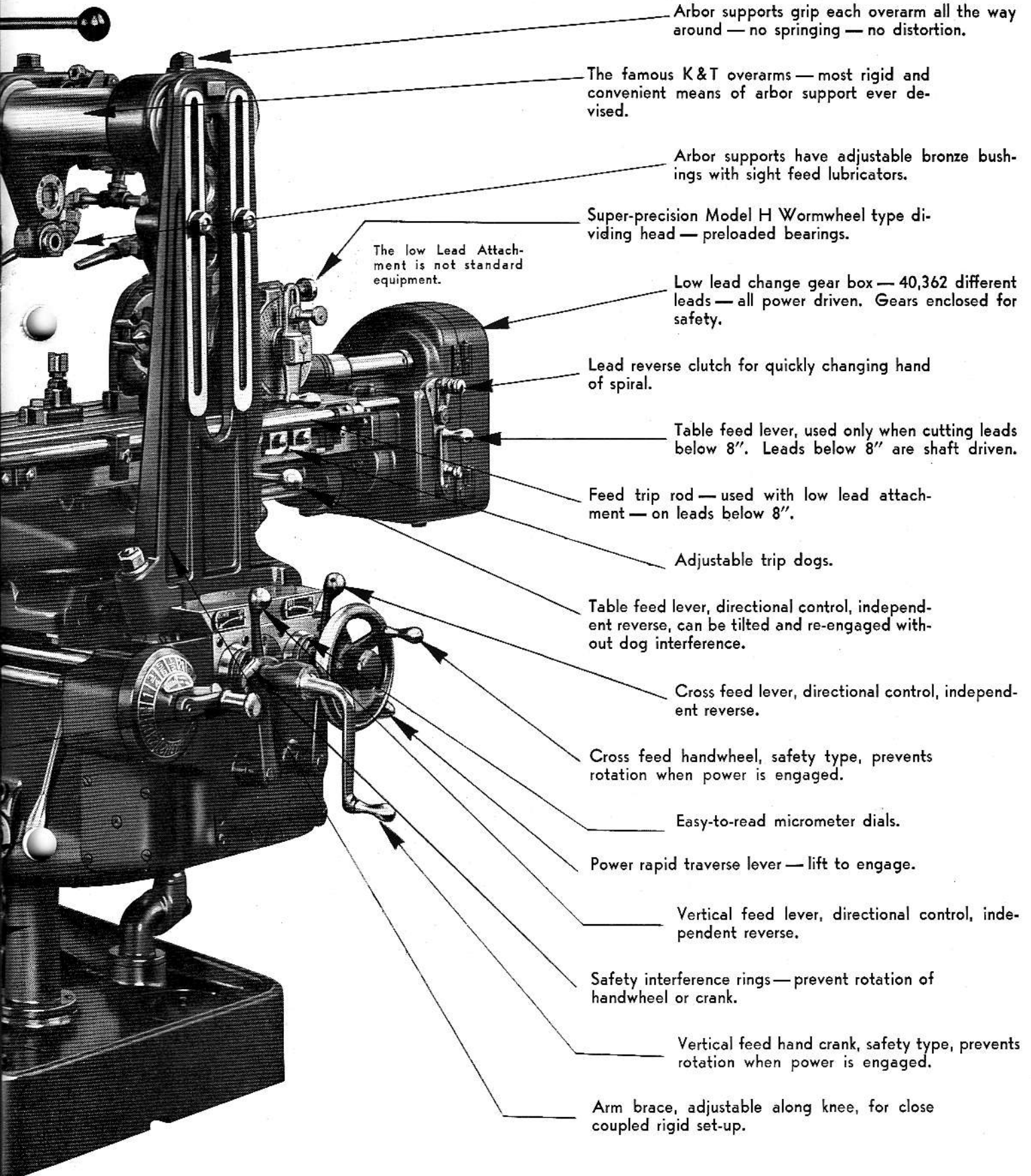
One piece elevating screw, guarded, automatically lubricated.

Cover plates protect screened openings in coolant reservoir.



CAN YOU AFFORD TO

T PRODUCING FEATURES



Arbor supports grip each overarm all the way around — no springing — no distortion.

The famous K&T overarms — most rigid and convenient means of arbor support ever devised.

Arbor supports have adjustable bronze bushings with sight feed lubricators.

Super-precision Model H Wormwheel type dividing head — preloaded bearings.

The low Lead Attachment is not standard equipment.

Low lead change gear box — 40,362 different leads — all power driven. Gears enclosed for safety.

Lead reverse clutch for quickly changing hand of spiral.

Table feed lever, used only when cutting leads below 8". Leads below 8" are shaft driven.

Feed trip rod — used with low lead attachment — on leads below 8".

Adjustable trip dogs.

Table feed lever, directional control, independent reverse, can be tilted and re-engaged without dog interference.

Cross feed lever, directional control, independent reverse.

Cross feed handwheel, safety type, prevents rotation when power is engaged.

Easy-to-read micrometer dials.

Power rapid traverse lever — lift to engage.

Vertical feed lever, directional control, independent reverse.

Safety interference rings — prevent rotation of handwheel or crank.

Vertical feed hand crank, safety type, prevents rotation when power is engaged.

Arm brace, adjustable along knee, for close coupled rigid set-up.

UN YOUR OLD MILLERS?

RIGIDITY DIDN'T JUST "HAPPEN" IT WAS DESIGNED INTO THESE MACHINES

K&T engineers, collaborating with one of the country's foremost scientists on sound and vibration, made exhaustive studies and operating tests with the aid of sensitive recording instruments to determine the amount, location, and causes of vibration in milling machines. We first found out *where* rigidity was necessary, and then *designed* it into the new No. 2 Model H MILWAUKEE.

MOUNTING MOTOR CROSSWISE PERMITS SOLID BACK WALL

Our research proved that the back wall of a milling machine should be like the front column face . . . a thick, *SOLID* wall, without any openings. These two walls are the *backbone* of the milling machine for they must resist the tremendous cutting pressures that are exerted upward on the spindle and downward on the knee. Like the frame of a "C" clamp or a large micrometer, any holes or openings through the web or neutral axis of the structure do not impair its strength. This explains why the motor is mounted crosswise of the column in the new Milwaukee. The large compartment doors are located in the side walls of the column, thus keeping the rear wall *SOLID* and unbroken . . . thereby providing a massive and *outstandingly rigid* structure.

The structure of the Model H is so compact and close coupled, and its internal ribbing, shafts, and gears are of such generous proportions that the cuts which can be taken "without a murmur" are truly amazing.

Openings Lie in Neutral Axis



It is just as logical, and even more necessary, to have a SOLID and unbroken rear column wall on a milling machine as to have a SOLID and unbroken flange around the frame of a micrometer. Large openings in the side walls of the milling machine column . . . like the holes in the web of the micrometer . . . lie in the neutral axis and do not affect the accuracy or rigidity.

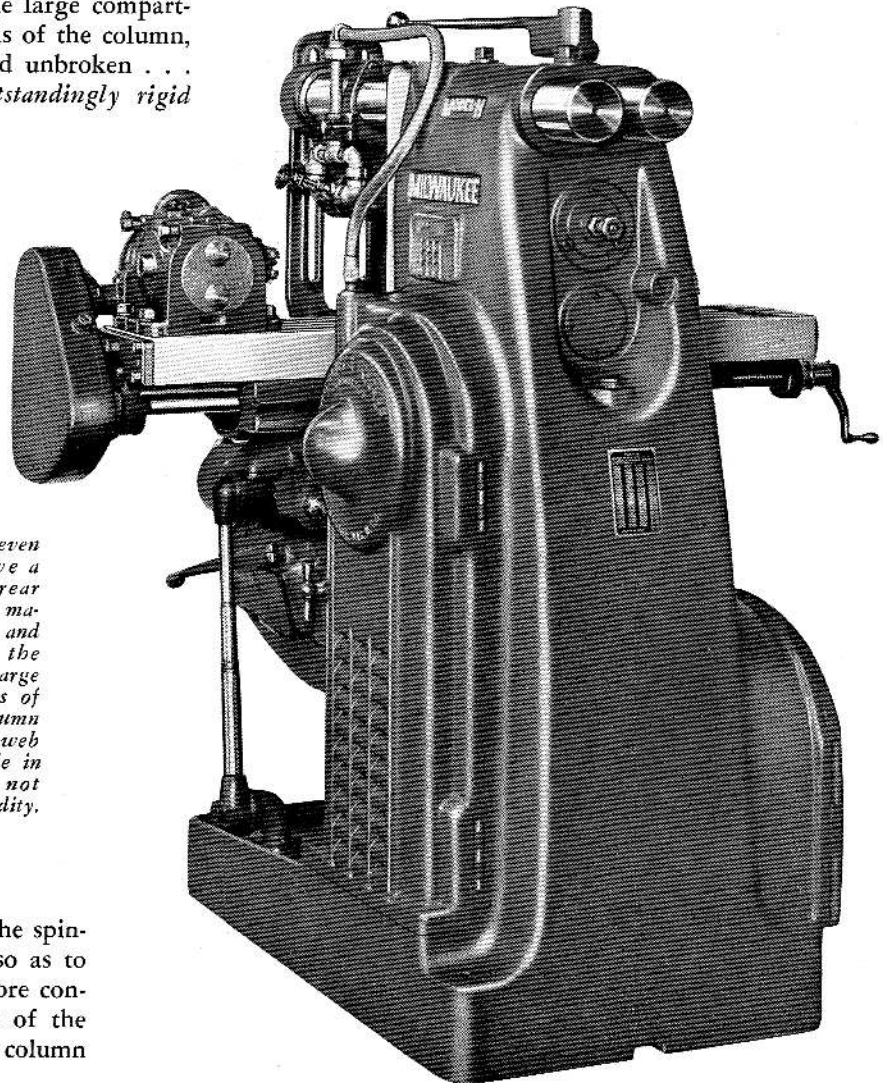
LOWER HEIGHT

The column height from the center of the spindle to the floor has been worked out so as to bring the top of the work table to a more convenient height for ninety-five per cent of the usual milling operations. Lowering the column makes the entire structure more rigid.

RIGID KNEE, SADDLE AND TABLE

Our scientific research did not stop at the column; it was carried also to the knee, the saddle, and in fact to every part of these machines. There are wider and heavier ways at the top of the knee, reinforced with massive, closed box-section walls. The column and knee lock solidly together, the knee bearing is longer and extends well up on the column face.

The saddle is longer, wider, and heavier than would usually be furnished on a machine of this size. The table is thick-sectioned with ample metal between the bottom of the T-Slots and the underside. The knee, saddle, and table are all provided with full length tapered gibs. Each gib is provided with adjusting screws, not just at one end but at both ends. Not a detail has been overlooked which will add to the long life and maintained accuracy of this modern milling machine.



TO PRODUCE PROFITS — A MILLING MACHINE MUST BE EASY-TO-OPERATE

The compactness of the No. 2 Model H MILWAUKEE makes everything handy for the operator. There is no reaching, no tugging, no backbreaking fatigue — every control is within easy reach, and the controls are sensitive and balanced. That is what makes this machine so flexible and fast.

“LIVE” RAPID TRAVERSE

A rapid traverse of 150" per minute for the table and saddle, and 75" per minute for the knee, is always available regardless of whether the spindle is running. A live rapid traverse saves time on set-ups. To engage rapid traverse merely raise the long lever at the right side of the knee. You don't have to pull or yank it; all it requires is a finger-tip movement—and whatever feed is engaged is instantly overtaken by the faster rapid traverse rate. Let go of the lever, and normal feed resumes.

CONVENIENT ADJUSTABLE STARTING LEVER

The main starting lever for the spindle is readily accessible at the top of the column. It is always in the same plane and can be swung around to any position convenient to the front, side, or rear of the machine. This handle is long enough for the operator to reach from any point *safely*, and without having to lean across the table or near the cutters. The start and stop push button control has been removed from the side of the column and placed directly on the adjustable starting lever. This provides a more accessible, safer, and convenient location, and also eliminates unsightly conduits.

Lowering the height of the column several inches has likewise lowered the height of the table. The controls are easier to operate and workpieces can be loaded conveniently without back-straining effort.

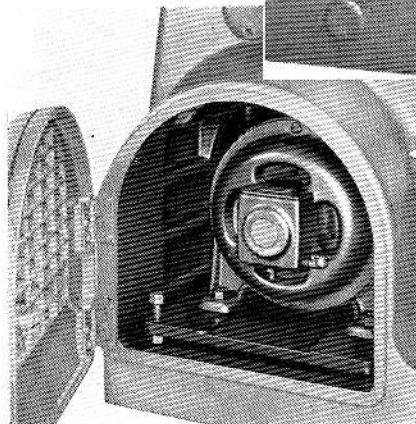
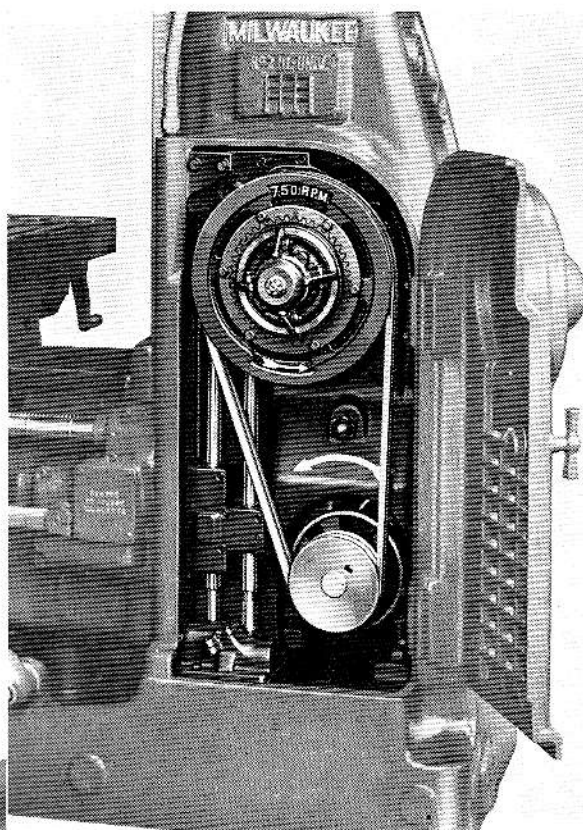
CONVENIENT CLAMPS

The knee is solidly clamped to the column by a single adjustable lever conveniently located at the left side of the knee. Similarly, the saddle lock is also conveniently located at the left side of the knee. A single fixed handle, easily reached from under the table, provides a simple and positive method of instant clamping. Both the knee and saddle clamps are provided with man-sized handles

Cross-mounting of the motor not only permits a solid back wall and stronger column structure, but also makes both ends of the motor accessible and assures perfect ventilation.

The drive is through multiple V-belts . . . positive and silent! The motor is mounted on a hinged plate with adjusting screws for quick and easy adjustment of belt tension.

Opening the large louvered door exposes: 1) the main drive clutch adjustment; 2) the coolant pump and its drive connection; 3) the column oil drain pipe.



with plenty of leverage. They are easy to reach — easy to tighten.

ADDITIONAL FEATURES

The main drive starting clutch is the single plate, dry disc type, which has proven so successful in automobiles. Mounted in the main drive pulley, as shown in the illustration above, this clutch is quickly accessible when the motor compartment door is open. The clutch can be adjusted by hand without the use of any tools.

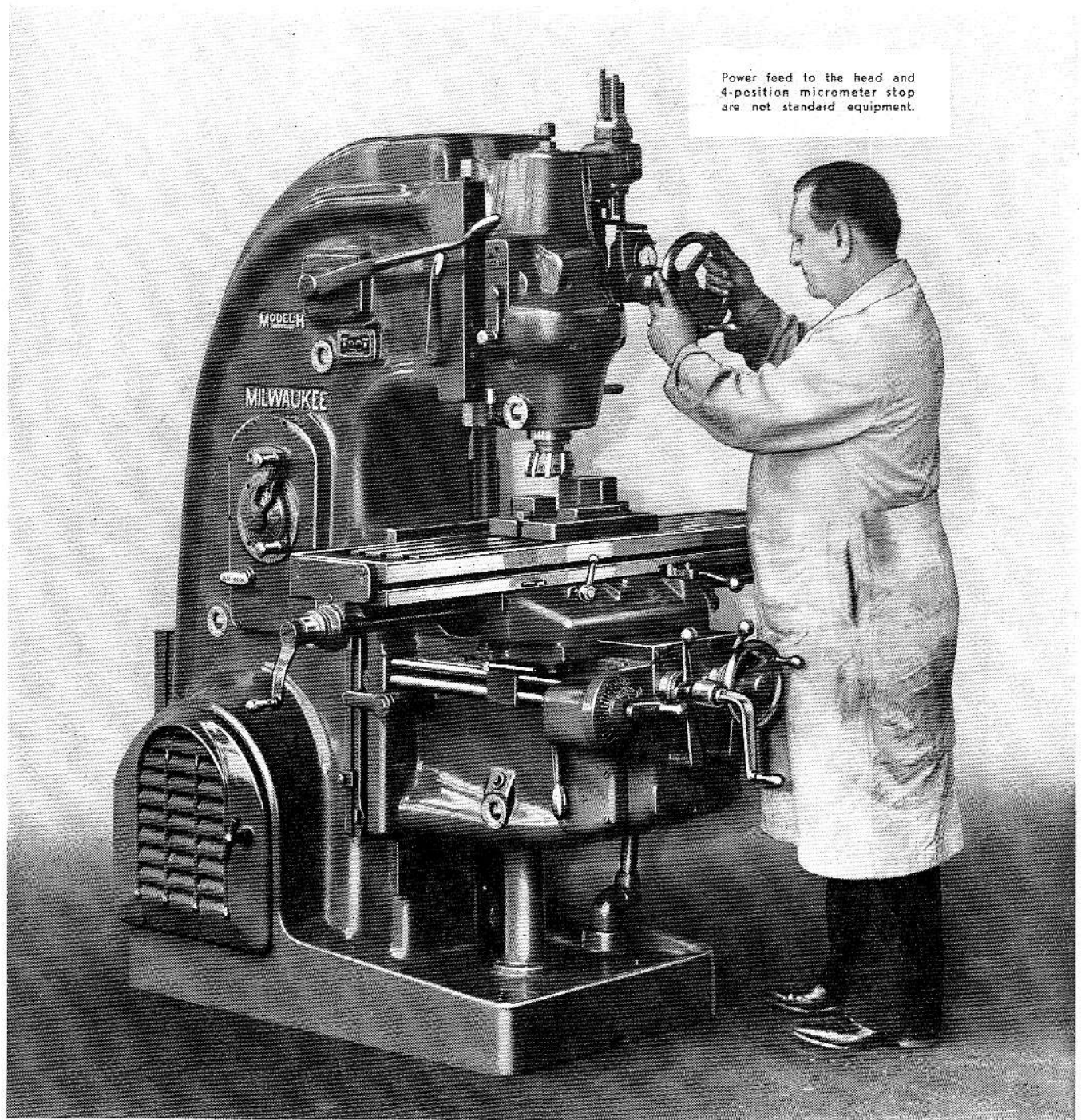
The lubrication system is automatic to the fullest, practical degree, and requires a minimum of attention. There are pressure lubricating pumps located in the column, the knee, and also in the sliding head on the Vertical machines. Clear vision oil sight gauges are conveniently placed and

the column has an air breather to prevent condensation.

The cutter coolant system is of the low pressure, flood volume type. There are adjustable nozzles for regulating the coolant flow at the cutters and the pump automatically stops when the cutter stops. However, the coolant pump can be re-connected so that it will be in continual operation, whether the spindle rotates or is stationary, while the motor rotates. This is advantageous when it is desired to wash chips from vise or fixture. A clutch, readily accessible by opening motor compartment door, is provided for disconnecting the coolant pump, in either case, when coolant is not required.

There are several very practical and useful standard attachments provided for these Model H machines — Rotary Tables, Vertical Spindle Attachments, Universal Milling Attachments, etc. Every one of these attachments is new, modern, and designed to broaden the versatility and increase the profit possibilities of these very efficient Model H Milling Machines. A crane attachment can be furnished for parking any attachment at side of machine when not in use. Crane attachment can not be applied to machines in field.

No. 2 MODEL H SLIDING-HEAD VERTICAL



Except for the spindle being in a vertical plane, the construction of the Model H Vertical is identical with the Horizontal types. The spindle, with its solidly mounted drive gears, slides up and down with the head as one complete unit. The two major range changes in spindle speeds are made directly at the spindle, thus power is delivered through low torque, high speed shafts—the ideal condition for any gear train. This feature, plus the large bull gear solidly mounted on the spindle and serving as a heavy flywheel, gives a smoother and more powerful drive than has been attained with

other types of construction. When judged by modern standards of engineering, the Model H MILWAUKEE is outstanding in its field. It will produce more work, produce it faster, and more accurately—the three all important factors which make this milling machine a sound and profitable investment.

At slight additional cost, Model H Verticals can be furnished with power feed and rapid traverse for the sliding head. This is a feature that will pay for itself many times over. Be sure to specify power feed to the head on YOUR Vertical.

This Price Sheet supersedes and cancels Price Sheet No. 156 dated Dec. 22, 1936.

All prices are net F. O. B. factory

PRICE SHEET No. 168

No. 2 MODEL H High Speed Milwaukee Knee Type Milling Machines

Kearney & Trecker Corporation, Milwaukee, Wisconsin

No. 2H PLAIN

POWER FEED RANGE			WORKING SURFACE OF TABLE	NET WEIGHT Lbs. Approx.	MOTOR DATA		WIRING MOTOR AND STARTER	CODE WORD		PRICE Including Power Rapid Traverse and Coolant System. Without Motor or Starter
Long.	Cross	Vert.			Max. Horse-Power	Speed		U. S. Std. Lead Screws	Metric Lead Screws	
28"	10"	17"	50"x10"	3450	5	1800	\$15.00	HAJOR	HAKIL	\$3590.00

STANDARD SPECIFICATIONS

POWER FEED RANGE—longitudinal 28", cross 10", vertical 17".

WORKING SURFACE of table—50" x 10"

SPEED RANGE—35 to 1400 r.p.m.

FEED RANGE— $\frac{1}{2}$ " to 20" per minute.

SPINDLE REVERSE—built-in mechanical type.

CUTTER COOLANT SYSTEM.

RAPID TRAVERSE—Six-way "Live" Type—longitudinal 150", cross 150", vertical 75".

SPINDLE—No. 40 National Standard taper.

ARBOR SUPPORTS—Two—self-oiling with adjustable bushings (one style "A" $\frac{23}{32}$ " hole; one style "B" $1\frac{1}{8}$ " hole with studs for arm brace).

(If specified when ordering machine, an Intermediate Arbor Support with $1\frac{1}{8}$ " hole can be substituted in place of the Style "A" Arbor Support, without charge).

ADJUSTABLE ARM BRACE.

BUILT-IN PUSH BUTTON, multiple V-belts, sheaves, adjustable motor bracket and mounting of motor at factory, when desired.

ARBOR DRAW-IN-ROD.

NECESSARY WRENCHES.

EXTRAS

	Code Word	Price
SPEED RANGES: Extra for substituting:		
20 to 800 r.p.m.....	HOVUW	\$18.00
50 to 2000 r.p.m.....	HOVAT	60.00
FEED RANGES: Extra for substituting:		
$\frac{1}{4}$ " to 10".....	HUSIM	18.00
$\frac{3}{8}$ " to 30".....	HUSKO	18.00
1" to 40".....	HUSOT	18.00
$1\frac{1}{2}$ " to 60".....	HUSWA	18.00
For substituting No. 50 National Standard Spindle End.....	HUTAF	60.00
(This change must be made at the factory and cannot be done in the field and applies to the milling machine spindle only. The No. 40 spindle ends on attachments and dividing heads cannot be altered).		
For substituting Belt drive arrangement (without countershaft).....	BELT	175.00
6" Plain Vise with hardened jaws.....	ATTAL	60.00
Wiring motor and starter.....	STADE	15.00

ALLOWANCES FOR PARTS OMITTED FROM STANDARD EQUIPMENT

Outer Arm Brace.....	HUVEK	\$24.00
Style "A" Arbor Support.....	HUVIO	38.00
Style "B" Arbor Support with studs for arm brace.....	HUVNU	42.00
Coolant System.....	HUVSY	42.00
Power Rapid Traverse.....	HUVUA	65.00

No. 2H UNIVERSAL

POWER FEED RANGE			WORKING SURFACE OF TABLE	NET WEIGHT Lbs. Approx.	MOTOR DATA		WIRING MOTOR AND STARTER	CODE WORD		PRICE Including Power Rapid Traverse and Coolant System. Without Motor or Starter
					Max. Horse-Power	Speed		U. S. Std. Lead Screws	Metric Lead Screws	
Long. 28"	Cross 10"	Vert. 17"	50" x 10"	3750	5	1800	\$15.00	HAJSU	HAKLO	\$4320.00

STANDARD SPECIFICATIONS

- POWER FEED RANGE**—longitudinal 28", cross 10", vertical 17".
- WORKING SURFACE** of table—50" x 10".
- SPEED RANGE**—35 to 1400 r.p.m.
- FEED RANGE**— $\frac{1}{2}$ " to 20" per minute.
- DIVIDING HEAD**—8" swing Model H Spiral Universal Wormwheel type, pre-loaded, ball bearing 40 to 1 ratio, with 3 single index plates, adjustable tailstock, center rest, dividing center and work driver, index and lead chart, arranged with drive connection for spiral milling, including Conventional Lead Attachment—lead change gear box, segment, and change gears for obtaining leads by power from $2\frac{1}{4}$ " to 149".
- SPINDLE REVERSE**—built-in mechanical type.
- CUTTER COOLANT SYSTEM.**
- RAPID TRAVERSE**—Six-way "Live" Type—longitudinal 100", cross 100", vertical 50".
- SPINDLE**—No. 40 National Standard taper.
- ARBOR SUPPORTS**—Two—self-oiling with adjustable bushings (one style "A" $23/32$ " hole; one style "B" $1\frac{1}{8}$ " hole with studs for arm brace). (If specified when ordering machine, an Intermediate Arbor Support with $1\frac{1}{8}$ " hole can be substituted in place of the Style "A" Arbor Support, without charge.)
- BUILT-IN PUSH BUTTON**, multiple V-belts, sheaves, adjustable motor bracket and mounting of motor at factory, when desired.
- ADJUSTABLE ARM BRACE.**
- ARBOR DRAW-IN-ROD.**
- NECESSARY WRENCHES.**

EXTRAS

	Code Word	Price
SPEED RANGES: Extra for substituting: 20 to 800 r.p.m.	HOVUW	\$18.00
50 to 2000 r.p.m.	HOVAT	60.00
FEED RANGES: Extra for substituting: $\frac{1}{2}$ " to 10"	HUSIM	18.00
$\frac{3}{8}$ " to 30"	HUSKO	18.00
$1\frac{1}{8}$ " to 40"	HUSOT	18.00
$1\frac{1}{2}$ " to 60"	HUSWA	18.00
For substituting No. 50 National Standard Spindle End (This change must be made at the factory and cannot be done in the field and applies to the milling machine spindle only. The No. 40 spindle ends on attachments and dividing heads cannot be altered).	HUTAF	60.00
For substituting LOW LEAD ATTACHMENT to obtain 40,000 different leads by power from .022" to 2918" (Low lead attachment cannot be operated when raising blocks are used with dividing head).	HOBSA	180.00
For substituting Belt drive arrangement (without countershaft)	BELT	175.00
5", 3-jaw Universal Chuck with special adapter for 8" swing Model H Dividing Head	ATMOU	75.00
6", 3-jaw Universal Chuck with special adapter for 8" swing Model H Dividing Head	ATNUA	90.00
One set of 1" Raising Blocks, including extended change gear segment and cover—to increase swing of dividing head and tailstock to 10"	HUTIN	70.00
6" Swivel Vise with hardened jaws	ATUCO	75.00
Wiring motor and starter	STADE	15.00

ALLOWANCES FOR PARTS OMITTED FROM STANDARD EQUIPMENT

Outer Arm Brace	HUVBK	\$24.00
Style "A" Arbor Support	HUVIO	38.00
Style "B" Arbor Support with Studs for Arm Brace	HUVNU	42.00
DIVIDING HEAD —8" Model H Worm wheel type, tailstock, center rest, etc., but WITHOUT lead change gear box and change gears	HUVOV	340.00
Conventional Lead Attachment	HUPMO	50.00
Coolant System	HUVSY	42.00
Power Rapid Traverse	HUVUA	65.00

No. 2H VERTICAL

POWER FEED RANGE			WORKING SURFACE OF TABLE	NET WEIGHT Lbs. Approx.	MOTOR DATA		WIRING MOTOR AND STARTER	CODE WORD		PRICE Including Power Rapid Traverse and Coolant System. Without Motor or Starter
Long.	Cross	Vert.			Max. Horse-Power	Speed		U. S. Std. Lead Screws	Metric Lead Screws	
28" Hand Feed to Head	12" Knee 15" 4"	15"	50"x10"	3800	5	1800	\$15.00	HAJYA	HAKOS	\$4320.00

STANDARD SPECIFICATIONS

POWER FEED RANGE—longitudinal 28", cross 12", vertical (Knee 15"), (Hand Feed to Head 4". Power Feed to Head is extra as listed below.)
WORKING SURFACE of table—50" x 10".
SPEED RANGE—35 to 1400 r.p.m.
FEED RANGE— $\frac{1}{32}$ " to 20" per minute.
SPINDLE REVERSE—built-in mechanical type.
CUTTER COOLANT SYSTEM,
RAPID TRAVERSE—Six-way "Live" Type—longitudinal 150", cross 150", vertical 75".
SPINDLE—No. 40 National Standard taper.
HAND FEED TO SLIDING HEAD.
SINGLE ROD adjustable positive stop for sliding head.
BUILT-IN PUSH BUTTON, multiple V-belts, sheaves, adjustable motor bracket and mounting of motor at factory, when desired.
ARBOR DRAW-IN ROD.
NECESSARY WRENCHES.

EXTRAS

	Code Word	Price
SPEED RANGES: Extra for substituting:		
20 to 800 r.p.m.	HOVUW	\$18.00
50 to 2000 r.p.m.	HOVAT	60.00
FEED RANGES: Extra for substituting:		
$\frac{1}{32}$ " to 10"	HUSIM	18.00
$\frac{1}{16}$ " to 30"	HUSKO	18.00
$\frac{1}{8}$ " to 40"	HUSOT	18.00
$\frac{1}{4}$ " to 60"	HUSWA	18.00
For substituting No. 50 National Standard Spindle End. (This change must be made at the factory and cannot be done in the field and applies to the milling machine spindle only. The No. 40 spindle ends on attachments and dividing heads cannot be altered).	HUTAF	60.00
For substituting Belt drive arrangement (without countershaft)	BELT	175.00
Power Feed ($\frac{1}{2}$ " longitudinal rate) and Power Rapid Traverse (75" per min.) to sliding head	HOBBI	150.00
Four-position Micrometer Stop and Dial Indicator (reading to thousandths) for step milling and boring operations	HOBGO	180.00
6" Plain Vise with hardened jaws	ATTAL	60.00
Wiring motor and starter	STADE	15.00

ALLOWANCES FOR PARTS OMITTED FROM STANDARD EQUIPMENT

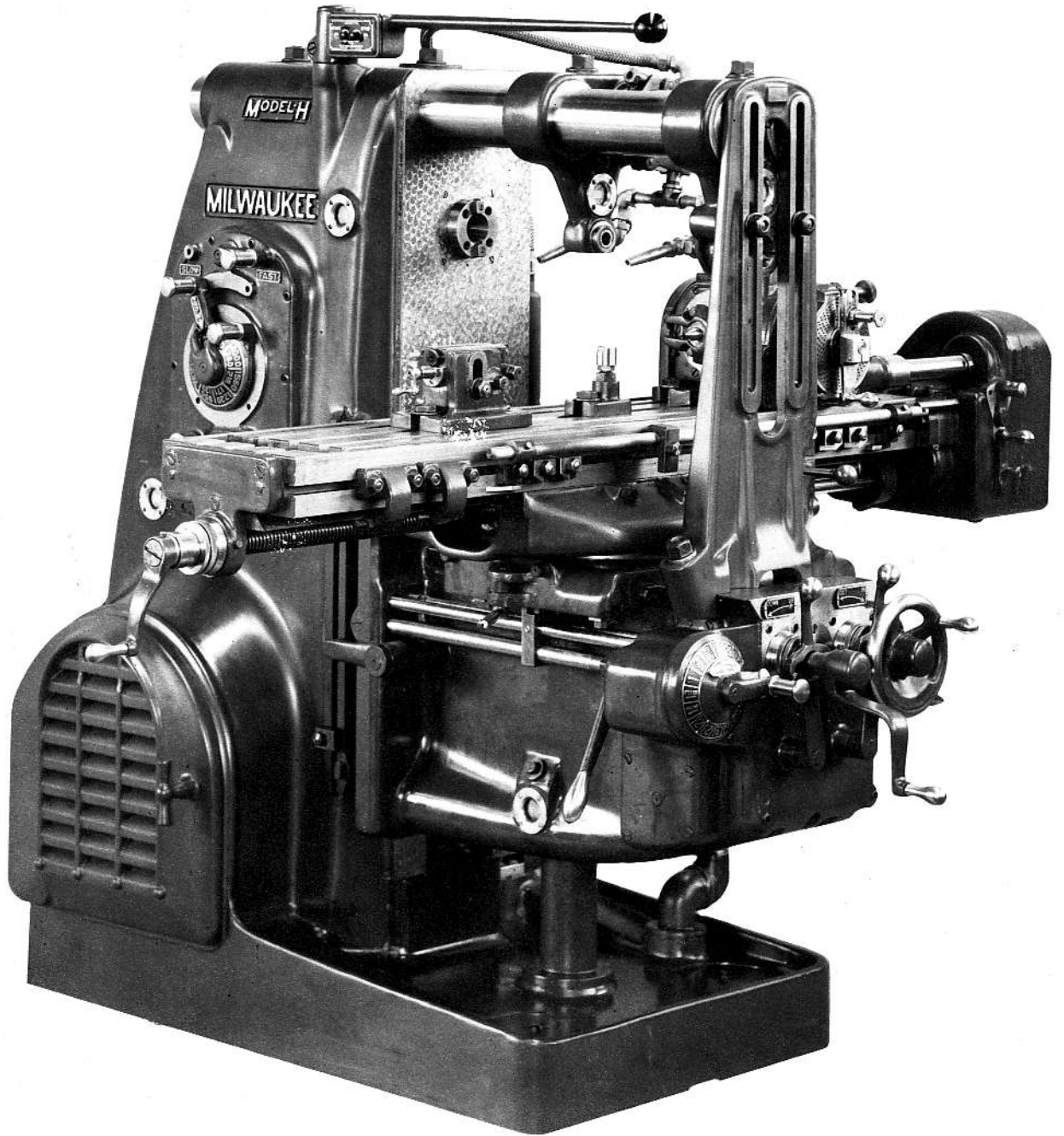
Coolant System	HUVSY	\$42.00
Power Rapid Traverse	HUVUA	65.00

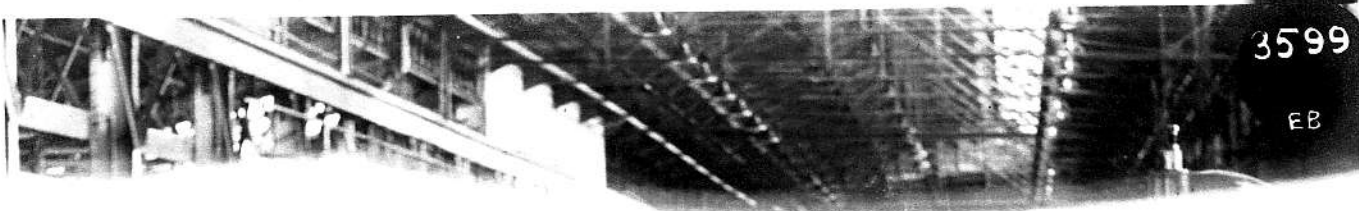
STANDARD ATTACHMENTS FOR MODEL H MACHINES

When ordering, be sure to mention serial number of machine stamped on BOTH sides of column

DESCRIPTION	No. 2 H MACHINES		
	Size	Price	Code Word
WIRING for motor and starter (Built-in push button is included with machine).....		\$15.00	STADE
PLAIN VISE with hardened steel jaws.....	5"	50.00	ATTDO
	6"	60.00	ATTAL
SWIVEL VISE with hardened steel jaws.....	5"	65.00	ATUBU
	6"	75.00	ATUCO
CHUCK, Universal, 3-jaw, with special adapter for 8" swing Model H Dividing Head.....	5"	75.00	ATMOU
	6"	90.00	ATNUA
POWER FEED (1/2 longitudinal rate) and POWER RAPID TRAVERSE (75' per minute) to sliding head, Vertical machines.....		150.00	HOBBI
4-POSITION MICROMETER STOP and DIAL INDICATOR (reading to thousandths) for step milling and blind boring operations.....		180.00	HOBGO
ROTARY TABLE—HANDWHEEL and GRADUATED DIAL type, HAND FEED only..... (All power drive mechanism is omitted).....	12"	390.00	HISFY
	16"	530.00	HUTJO
ROTARY TABLE—INDEX type, with 3 INDEX PLATES and CRANK, HAND FEED only..... (All power drive mechanism is omitted).....	12"	420.00	HUTCH
	16"	565.00	HUTDI
POWER DRIVE MECHANISM—for either style ROTARY TABLES, providing both POWER FEED and POWER RAPID TRAVERSE.....		95.00	HUTTY
EXCEPTION:—Drive mechanism is not required for Rotary Tables when machine is already equipped with Low Lead Attachment as Low Lead Attachment provides the drive for both Power Feed and Power Rapid Traverse. When table is ordered separately and Power Drive is desired specify when Low Lead Attachment is available.			
NOTE:—HANDWHEEL and GRADUATED DIAL units and 3 INDEX PLATES and CRANK units are interchangeable on same Rotary Table but are NOT interchangeable between 12" and 16" sizes.			
—If 3 INDEX Plates and CRANK unit is wanted with Rotary Table already equipped with HANDWHEEL GRADUATED DIAL unit—ADD.....			
	12"	60.00	HUTOU
	16"	60.00	HUTUZ
—If HANDWHEEL and GRADUATED DIAL unit is wanted with Rotary Table already equipped with 3 INDEX PLATES and CRANK unit—ADD.....			
	12"	40.00	HUREH
	16"	45.00	HURST
Additional trip dogs for Rotary Tables—each.....	12"	6.00	HURBE
	16"	6.00	HURFI
VERTICAL SPINDLE ATTACHMENT, swivel base, Timken bearing spindle, No. 40 National Standard End only, speed ratio 1 to 1—speeds same as milling machine spindle.....		465.00	SPINU
UNIVERSAL MILLING ATTACHMENT, Timken Bearing, No. 40 National Standard End only, speed ratio 1 to 1—speeds same as milling machine spindle.....		540.00	HURIL
LIGHT HI-SPEED UNIVERSAL MILLING ATTACHMENT, anti-friction bearings, No. 7 B&S taper only, speed range 50 to 2000 r.p.m. regardless of speed range of milling machine.....			
—with non-adjustment to spindle.....		380.00	LIGBE
—with 1 1/2" adjustment to spindle.....		455.00	LIGAD
THREAD MILLING ATTACHMENT—for screws, worms, and short leads greater than 45° angle to axis. Spindle takes standard cutters and hobs having 1" hole—Shoulder to nut is 1" maximum.....		460.00	HURLO
FOLLOWER REST for Thread Milling Attachment—to support long slender screws.....		50.00	HIXIG
CAM MILLING SLIDE for reproducing cams from a master. Can be used only on UNIVERSAL machines equipped with Spiral Universal Dividing Head and Low Lead Attachment.....		235.00	HUROS
RACK MILLING ATTACHMENT—spindle takes cutters having 1" hole.....		435.00	HURRU
RACK INDEXING ATTACHMENT with gears and chart.....		145.00	HURUX
RACK VISE, with steel jaws, opens 3 3/4" x 29 3/4" (opens 6" with steel jaws removed).....		70.00	HURVY
SLOTTING ATTACHMENT, swivel base, 0 to 2 1/2" stroke, 1 to 1 spindle ratio, 2 to 1 return.....		335.00	HUPAC
PLAIN INDEX TABLE with either 2, 4 or 8 stations. (Stations must be specified when ordering).....	15"	365.00	HUPCE
DIVIDING HEAD (furnished as standard equipment on UNIVERSAL machines) Model H, Spiral Universal Wormwheel type, pre-loaded ball bearing dividing head, 40 to 1 ratio, with 3 single index plates, adjustable tailstock, center rest, dividing center and work driver, index chart—arranged with drive connection for spiral milling but price does NOT include lead change gear box and change gears.....	8"	485.00	HUPEG
CONVENTIONAL LEAD ATTACHMENT (furnished as standard equipment on UNIVERSAL machines) driving mechanism for cutting spirals—includes lead change gear box, segment, and change gears for obtaining conventional leads by power from 2 1/2" to 149".....		90.00	HUPGI
LOW LEAD ATTACHMENT driving mechanism for cutting spirals—includes lead change gear box, change gears, worm sets, and built-in lead reverse for obtaining 40,000 different leads by power from .022" to 2918" for Universal, Plain or Vertical machines.....		270.00	HUPIK
NOTE: Any combination of dividing head, Conventional Lead Drive or Low Lead Drive mechanism can be furnished with PLAIN and VERTICAL machines as well as UNIVERSAL machines.			
Set of 4 HIGH NUMBER INDEX PLATES (in addition to 3 standard plates regularly furnished) for dividing by simple indexing all numbers in sequence from 2 to 100, and many beyond.....		60.00	HUPOR
RIGHT ANGLE POWER DRIVE BRACKET, 1 to 1 ratio—used with either Conventional or Low Lead Attachment when setting 8" Model H dividing head crosswise of table for milling scrolls, cams, etc.....		105.00	HUPSU
SET of 1" RAISING BLOCKS, including extended change gear segment and cover—to increase swing of Dividing Head and tailstock to 10". (Used only with conventional lead for spiral milling.).....		70.00	HUTIN
ATTACHMENT CRANE.....		55.00	HUPUW
STYLE "A" ARBOR SUPPORT, adjustable bushing, 23/32" hole for pilot end arbors.....		55.00	HUPYA
STYLE "B" ARBOR SUPPORT, adjustable bushing, 1 1/8" hole, WITH studs for arm brace.....		65.00	HUVAG
INTERMEDIATE ARBOR SUPPORT, adjustable bushing, 1 1/8" hole, WITHOUT studs.....		55.00	HUVCI
PRECISION MEASURING RODS and DIAL INDICATORS—for Longitudinal, Cross or Vertical adjustments (many combinations are available; consult factory for prices).....			

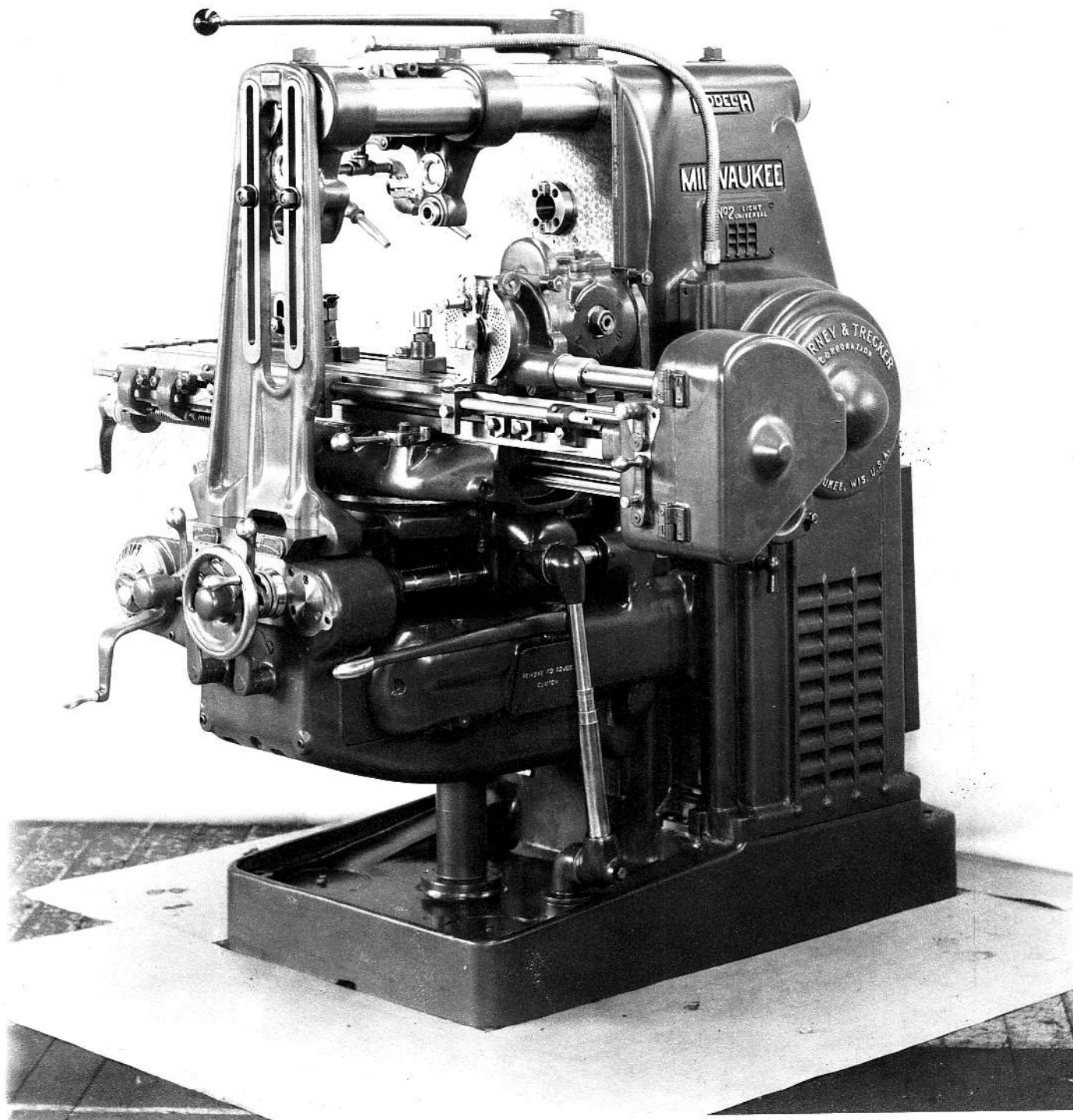
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MILWAUKEE

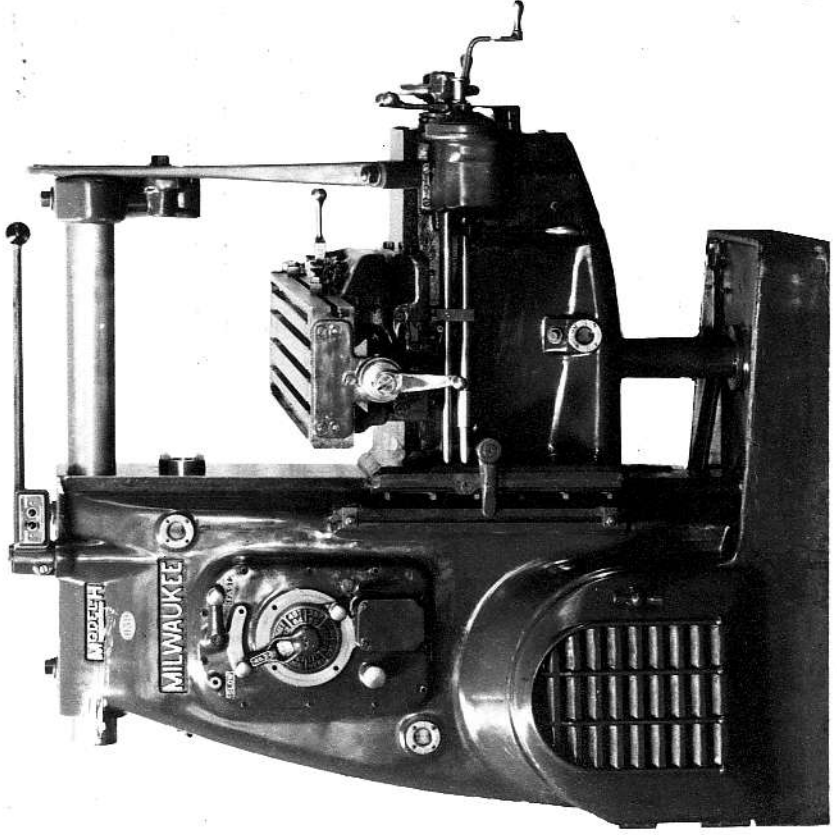
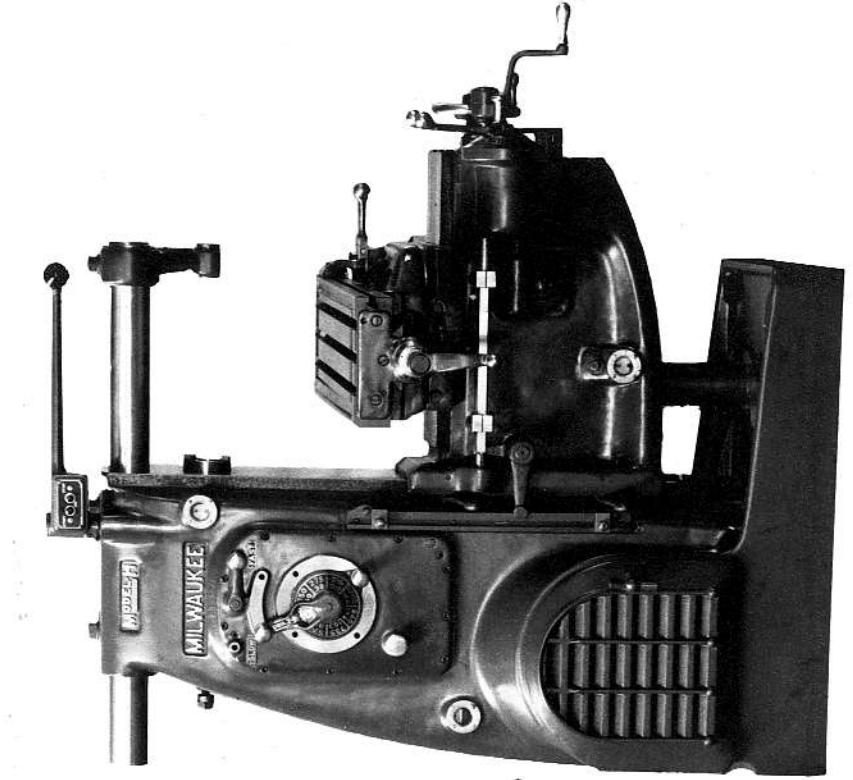
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1/2" LIGHT UNIVERSAL

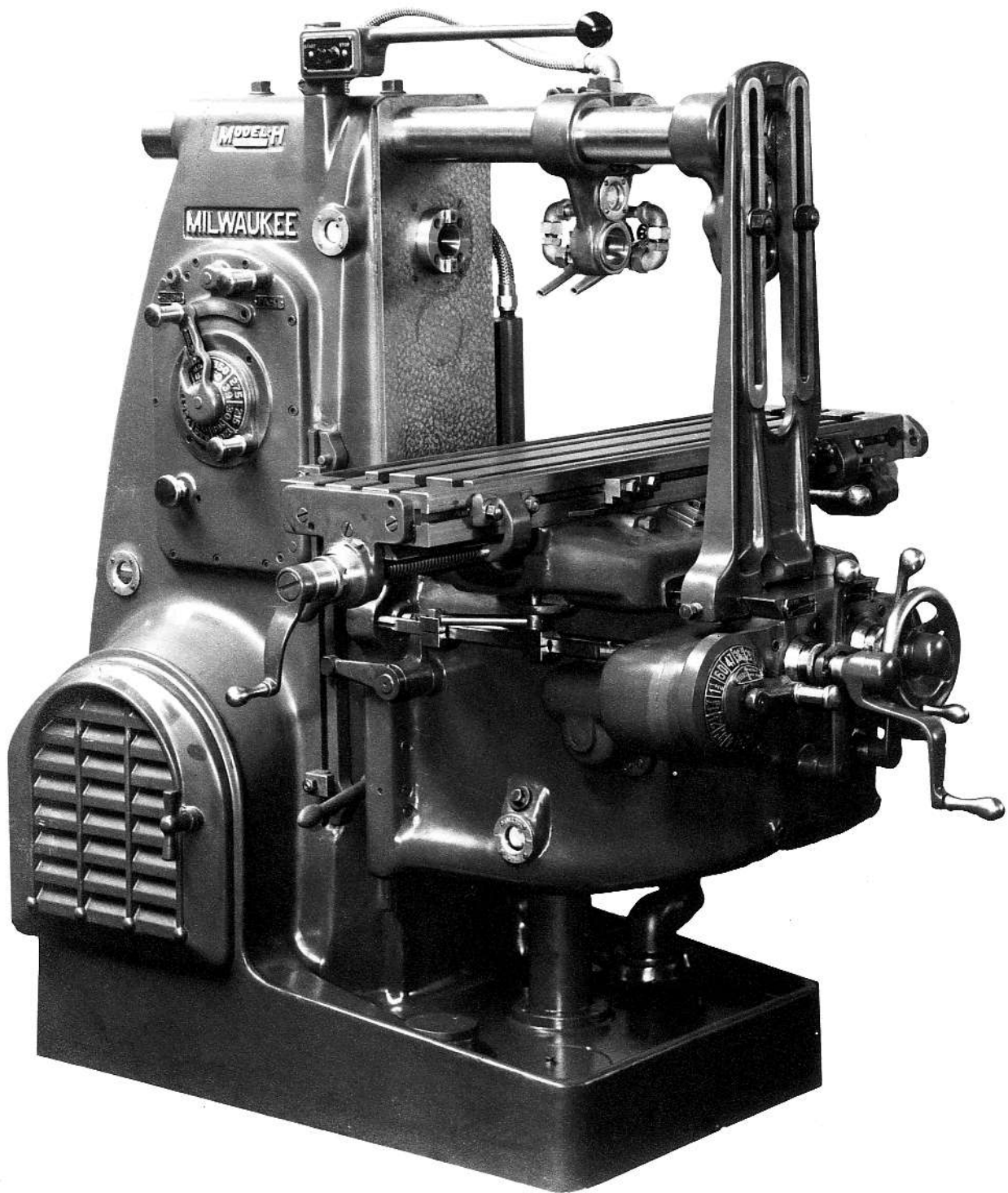
RNEY & TRECKER CORPORATION
MILWAUKEE, WIS. U.S.A.

REVERSE TO 12.405
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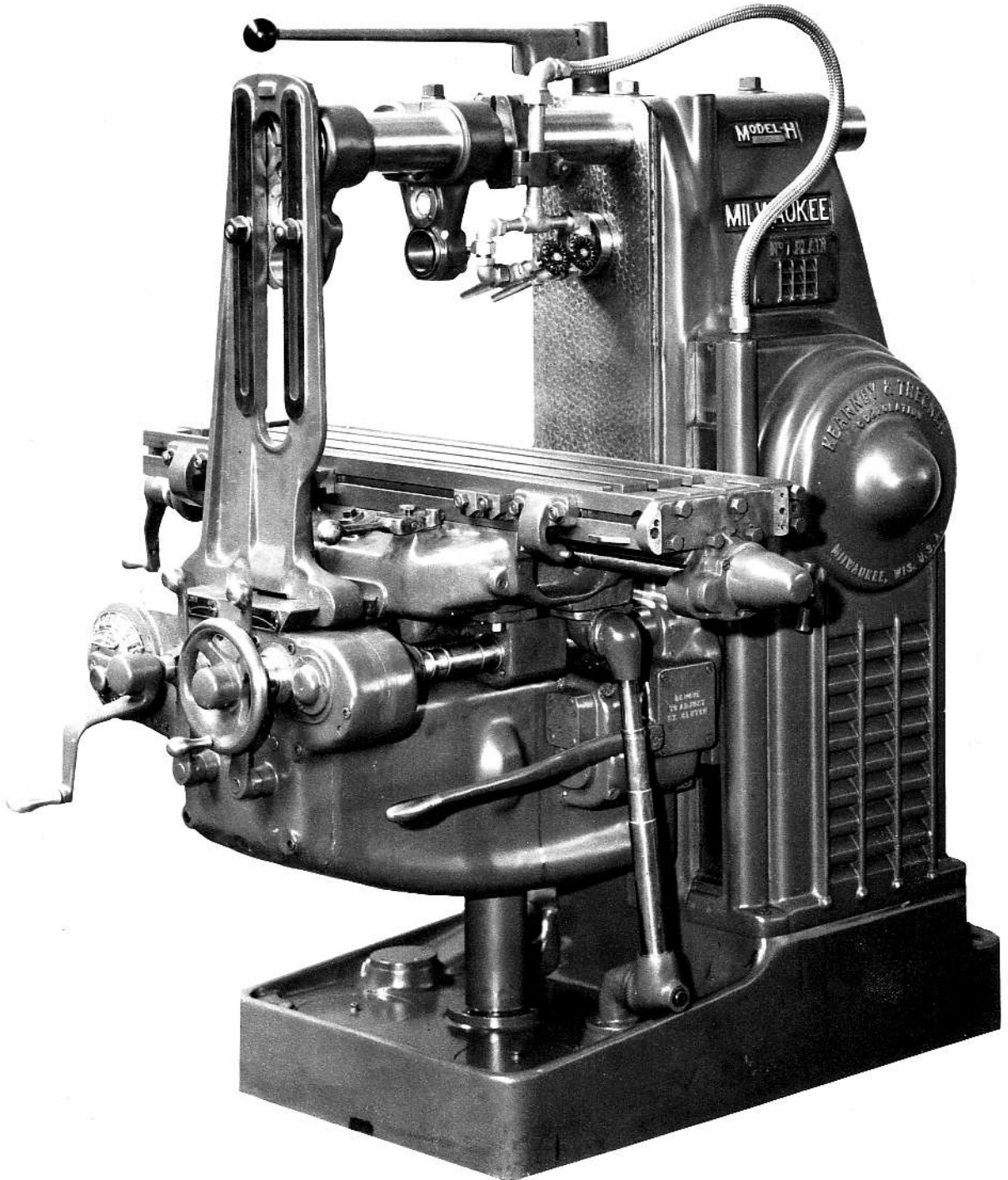


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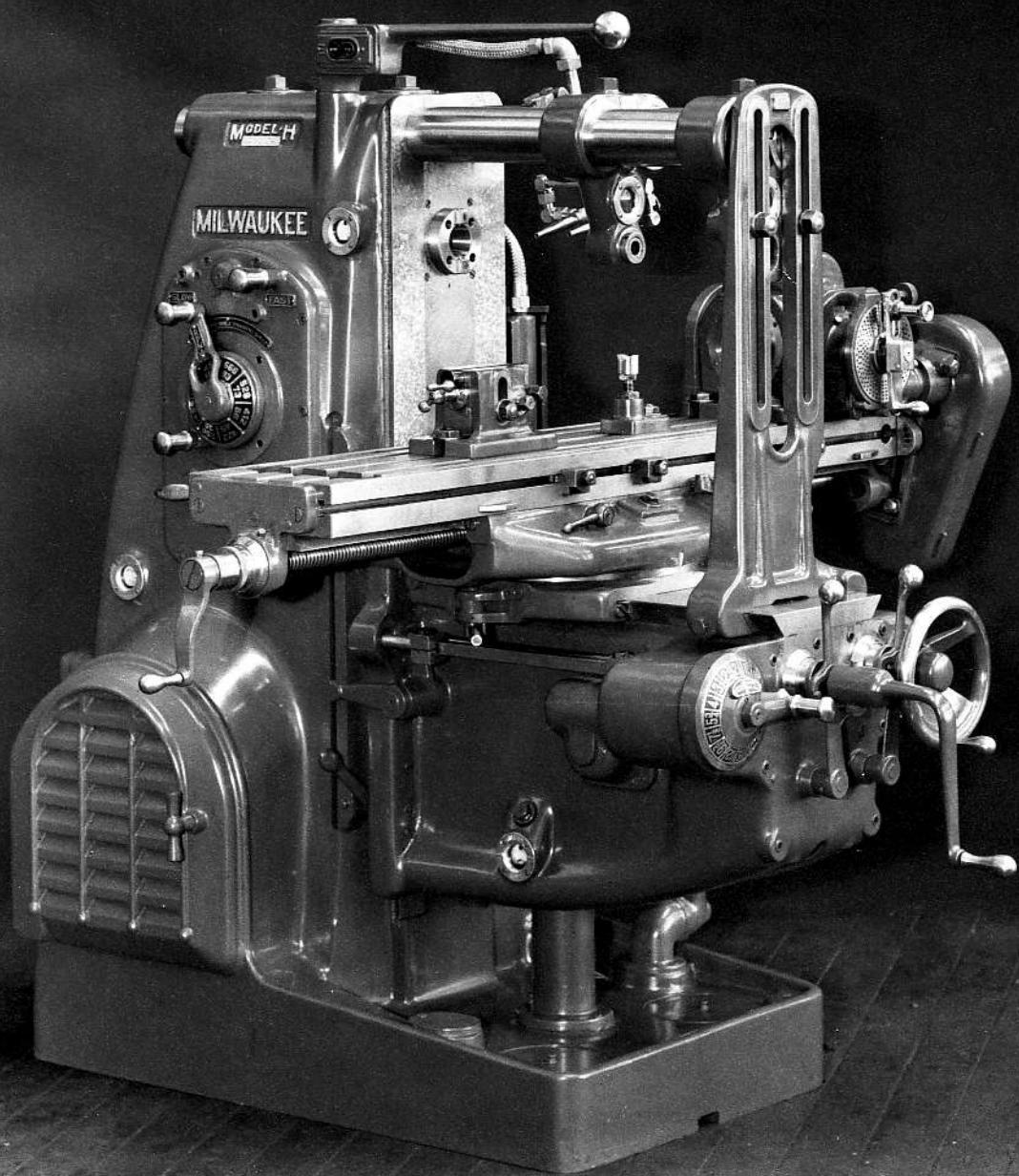
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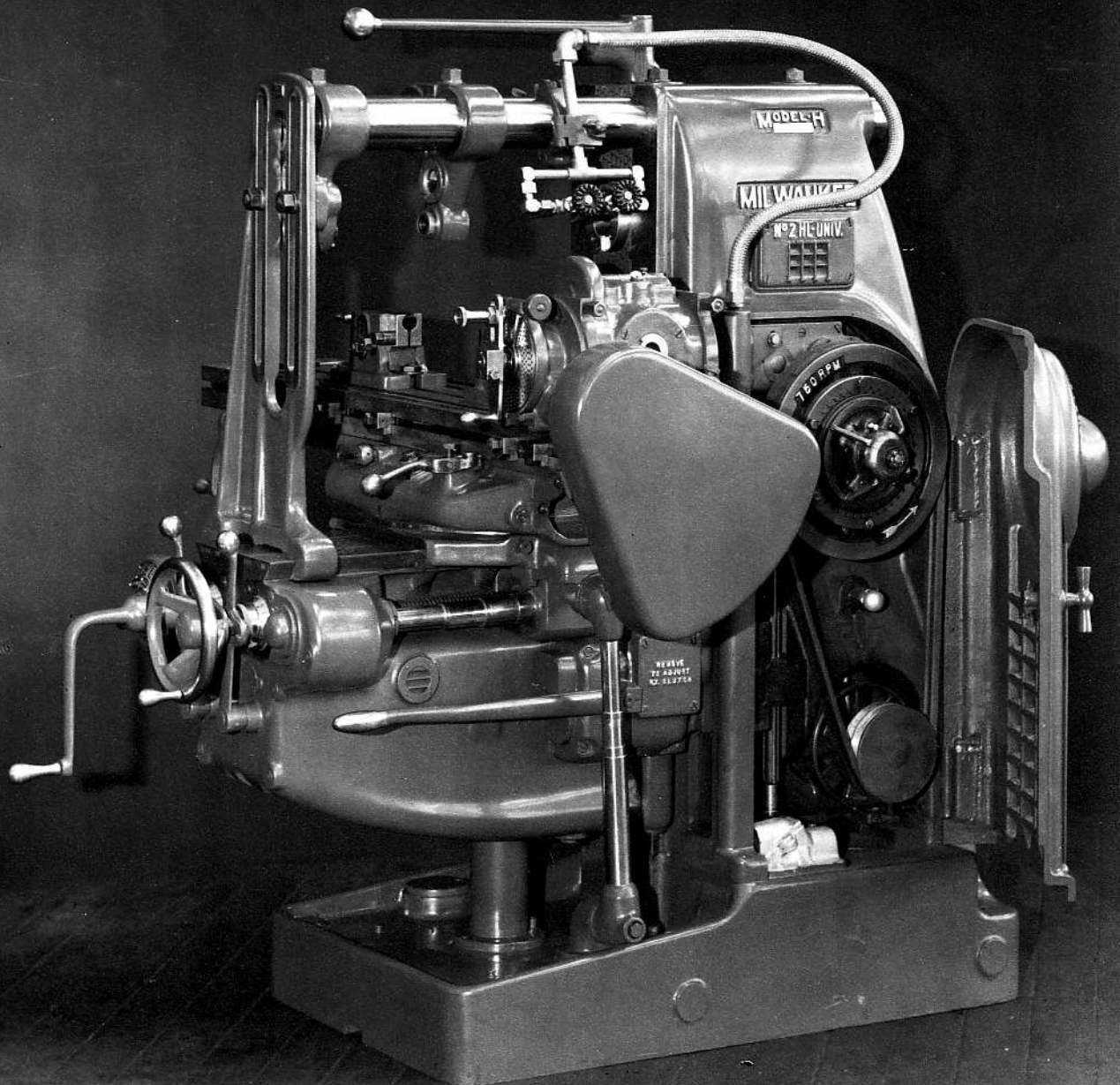
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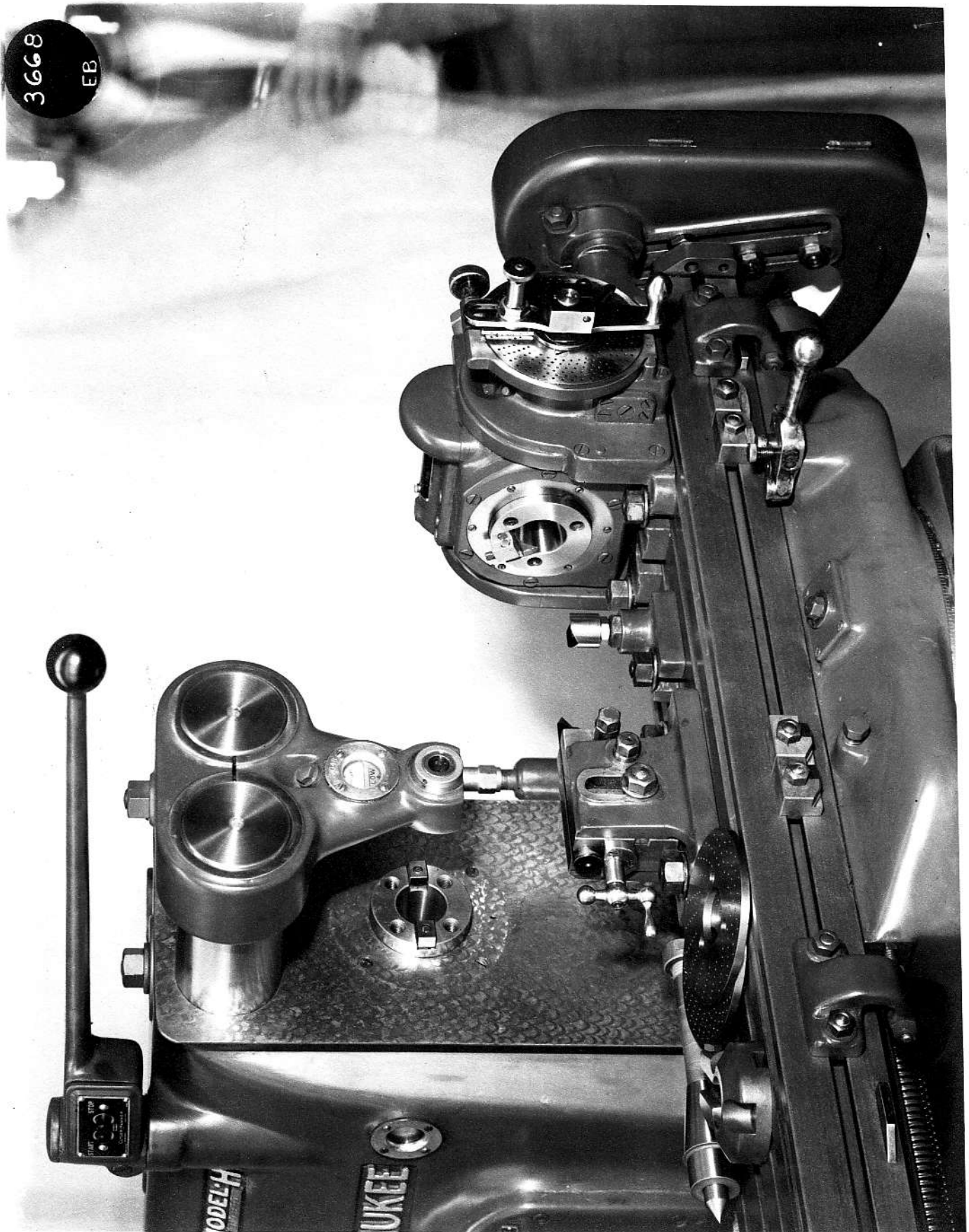


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MODEL H

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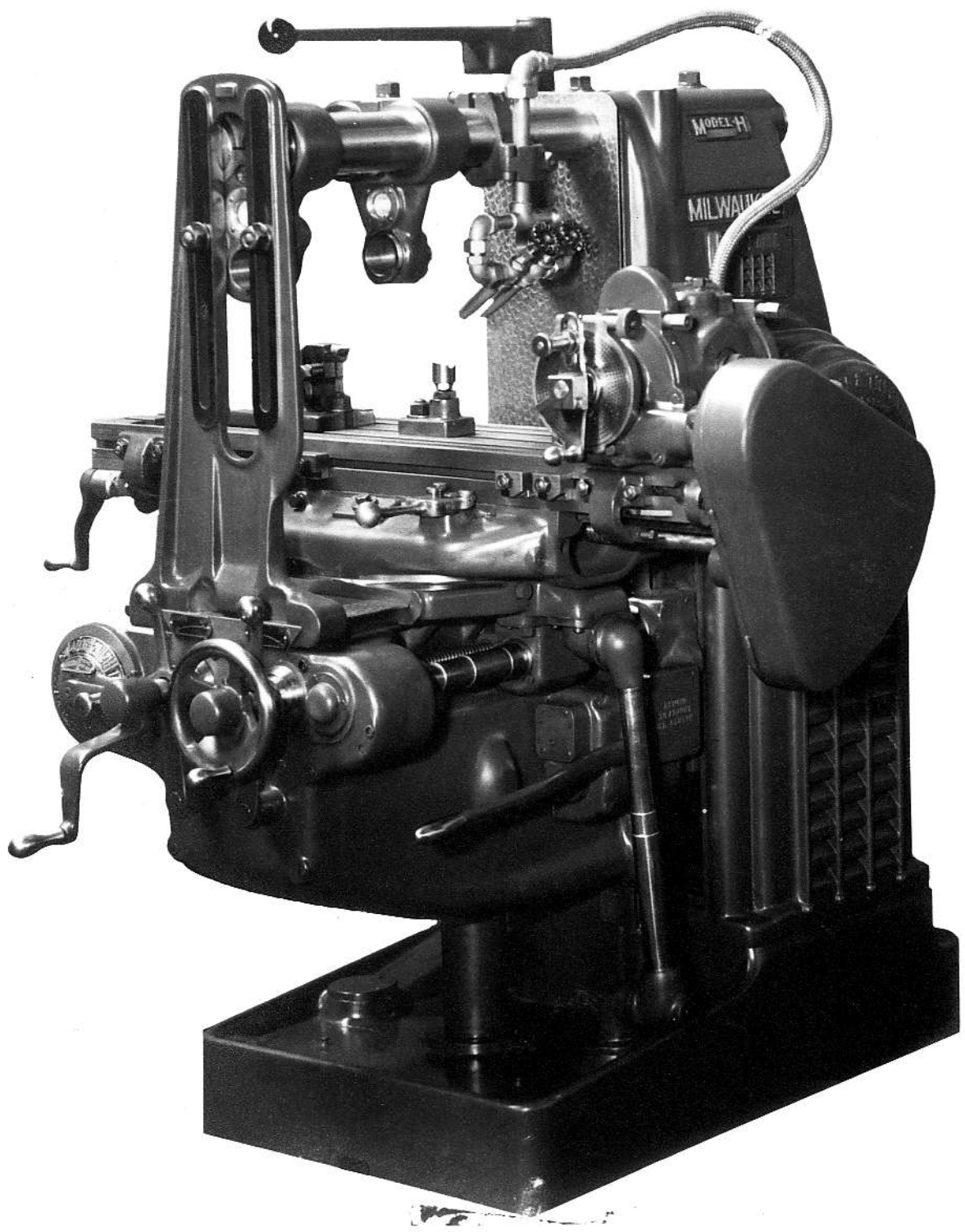


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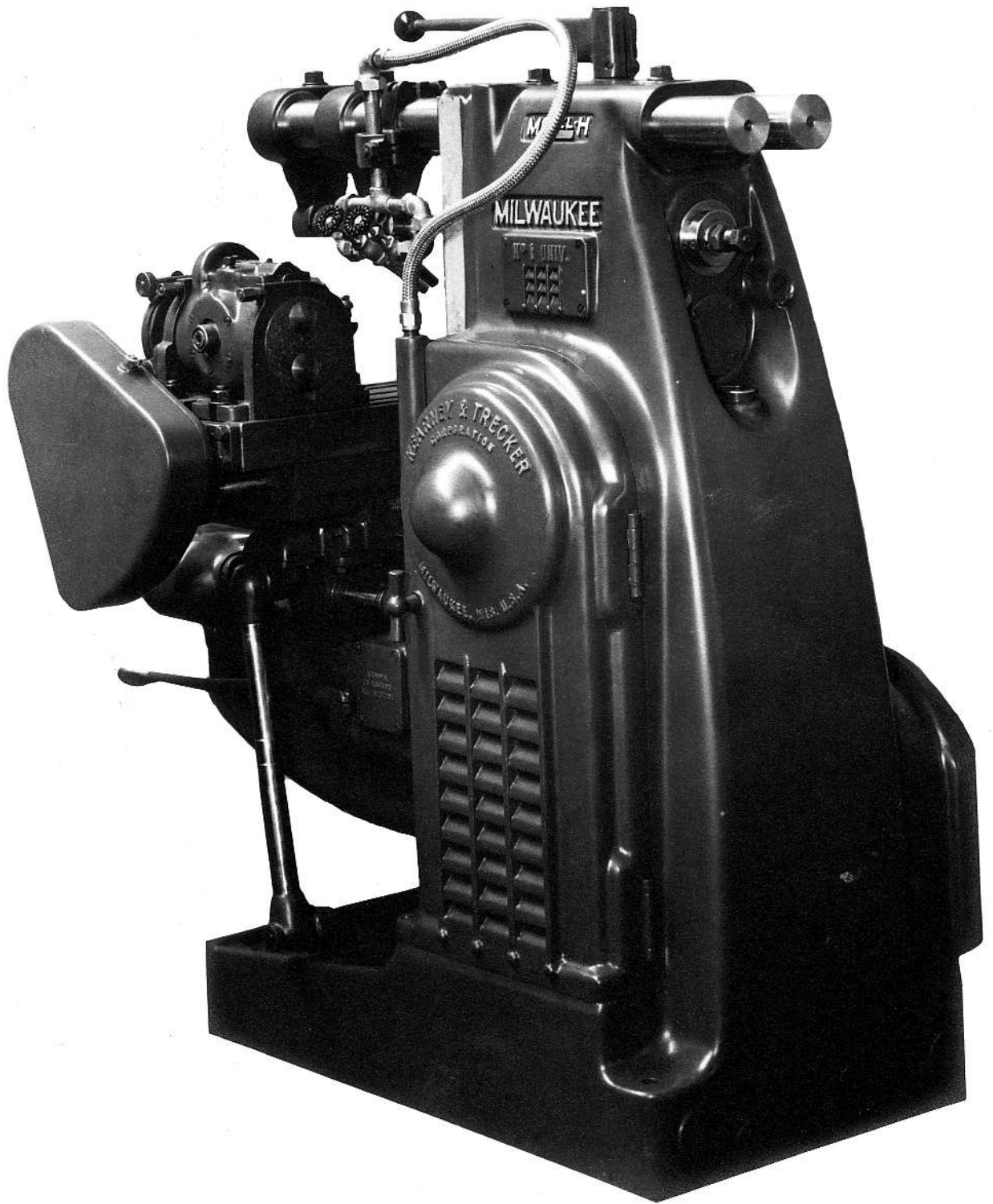
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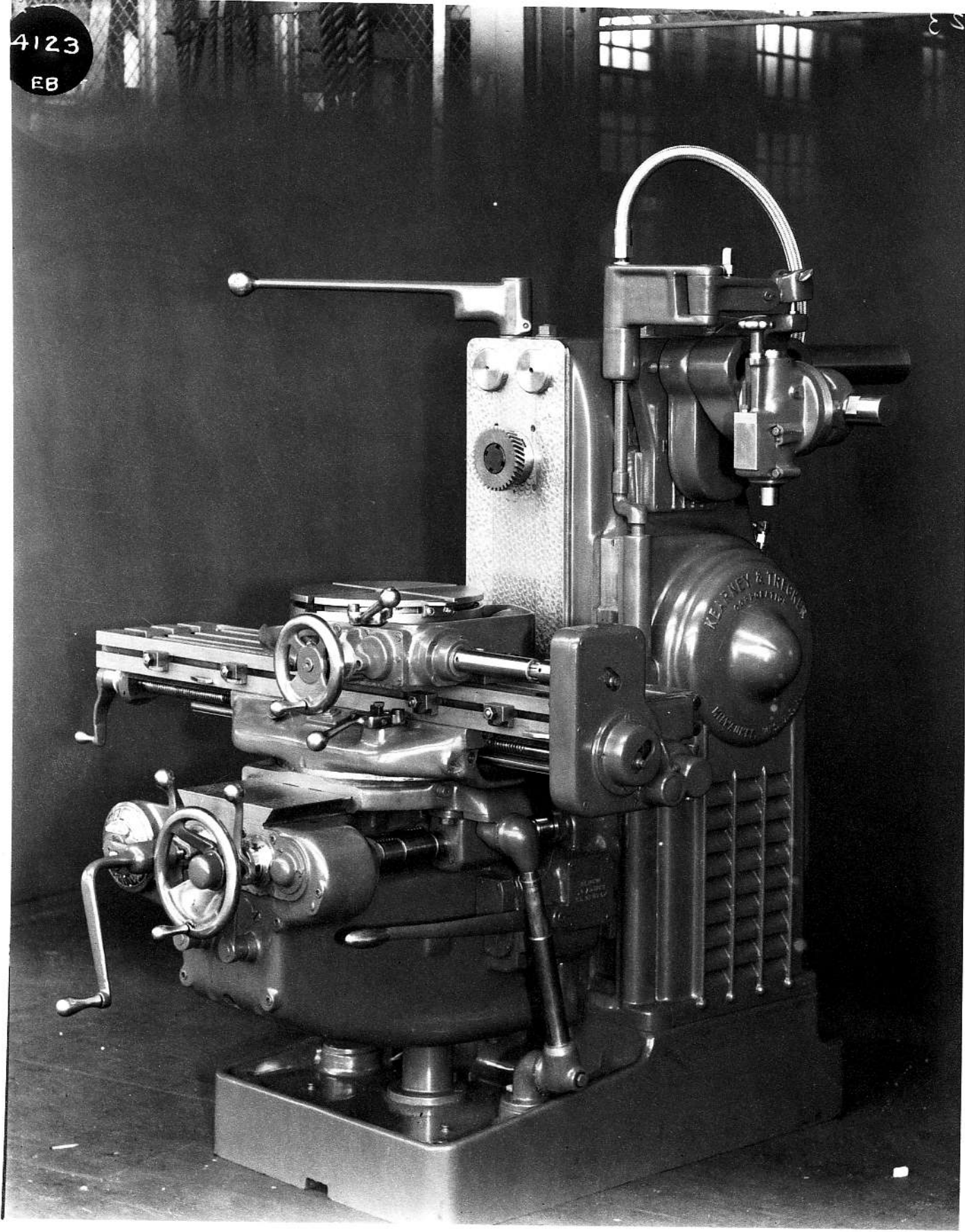


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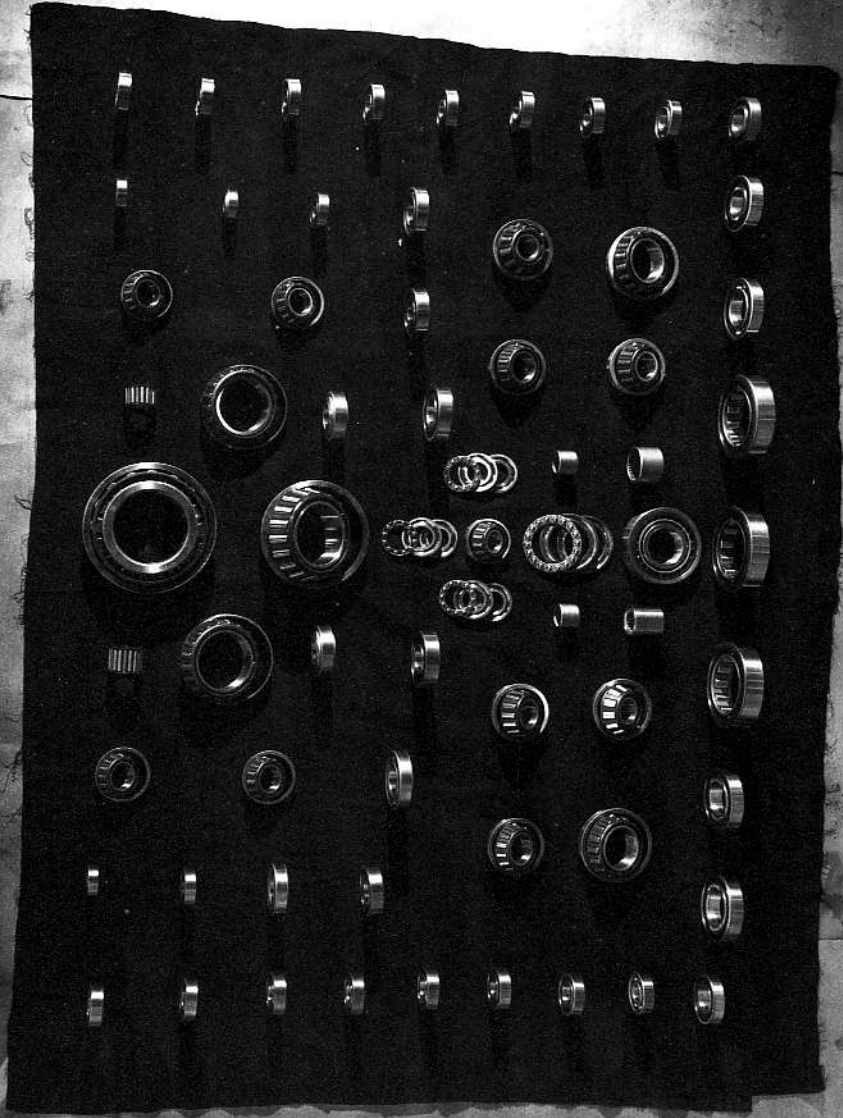


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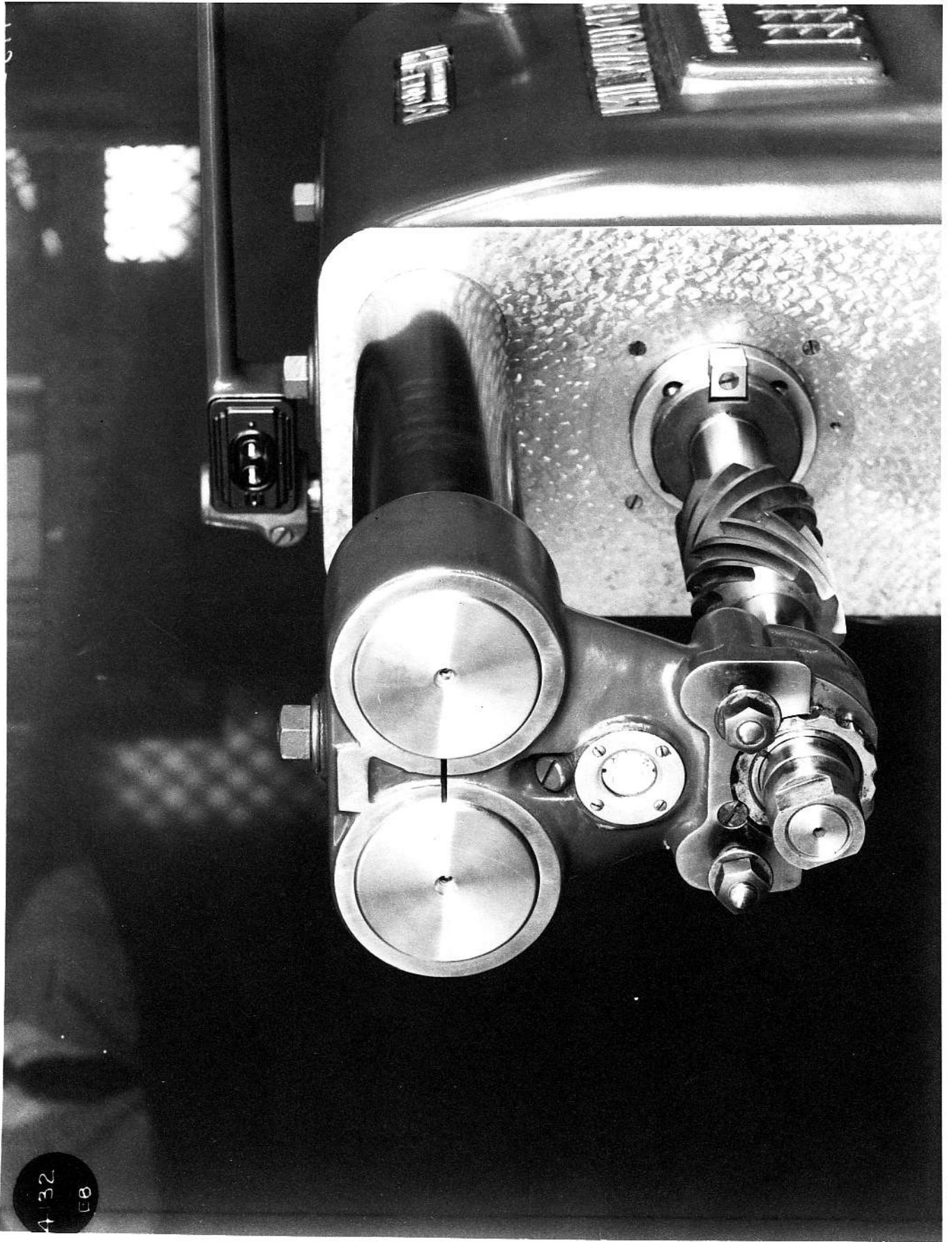
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