

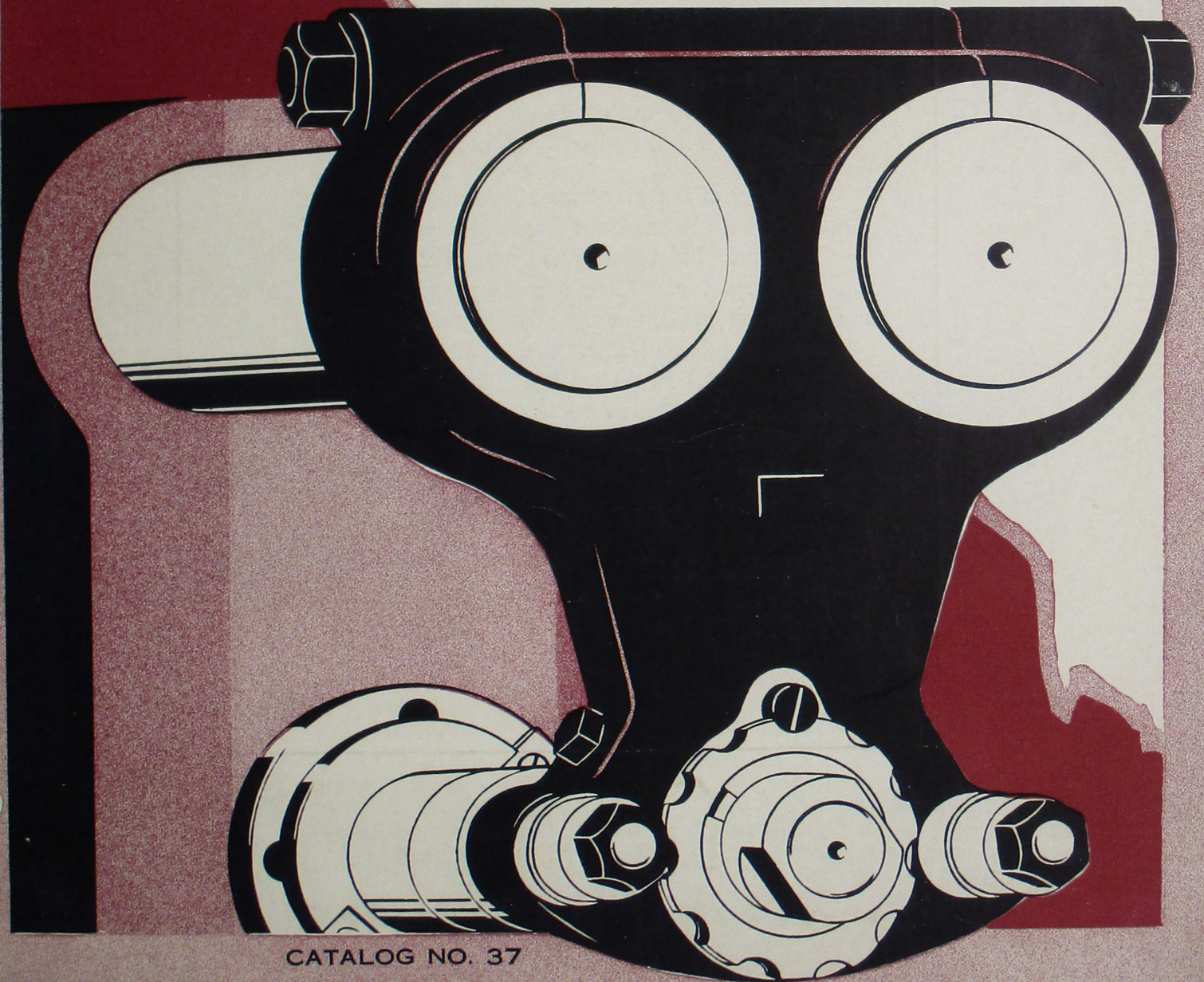
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KEARNEY & TRECKER

Nos. 2, 3, 4

STANDARD & HEAVY MILLING MACHINES



CATALOG NO. 37

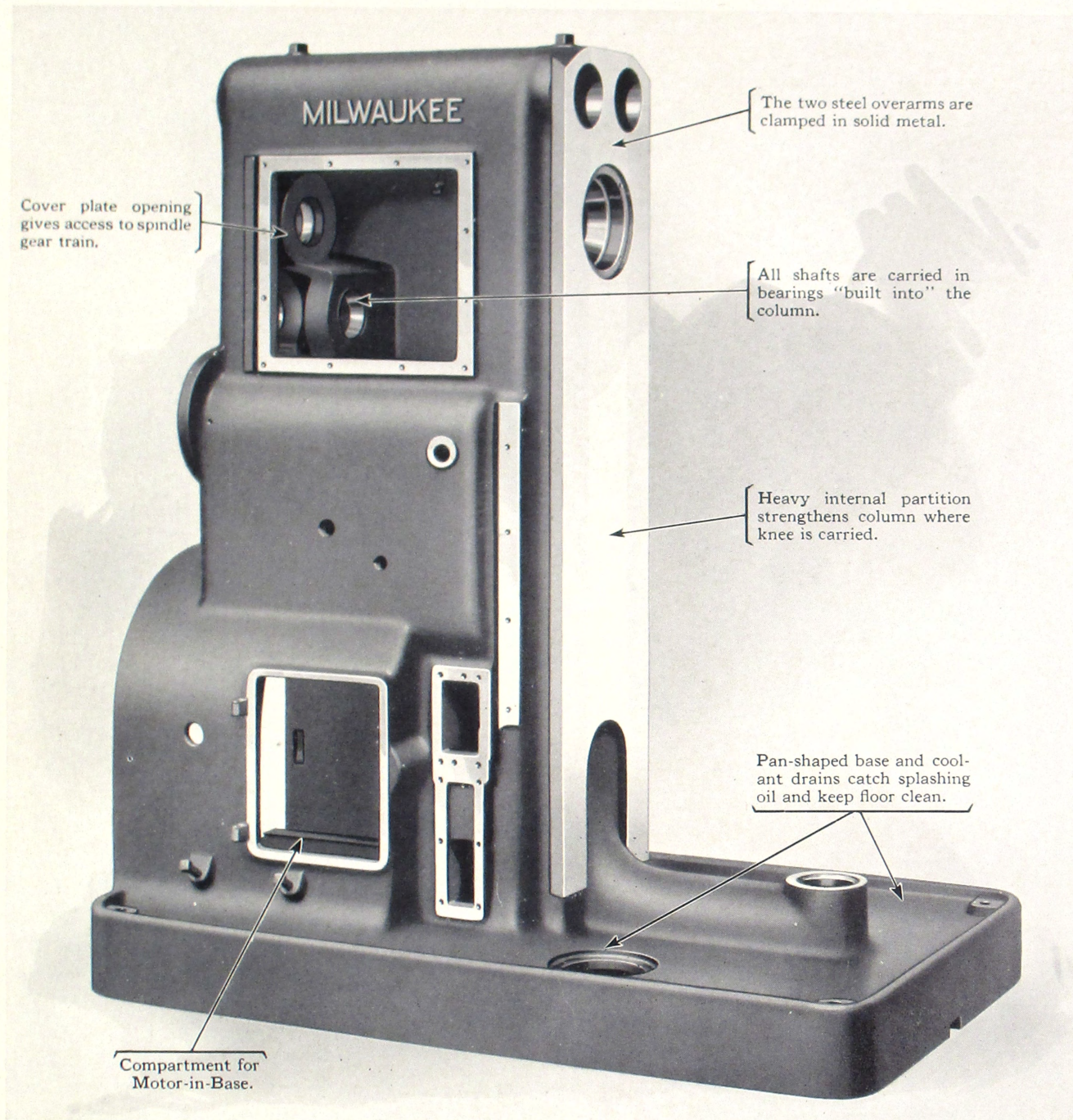
A Worthy Background

OVER a span of years that measures nearly the lifetime of modern-day production machine tools, there has developed a deep-rooted respect for Kearney & Trecker Milling Machines.

From the beginning, Kearney & Trecker have definitely sought this respect. They believed thirty years ago, as they do now, that a milling machine of the finest quality — designed and built to endure — is bound to win preference. And they knew then, as now, that the price of this prestige would be ceaseless care in manufacture and a constant striving toward still higher attainment.

Many of the great improvements in Milling Machines have been made by Kearney & Trecker. First came the powerful all-g geared spindle drive. Then a more powerful cutter drive through the flanged spindle end and hardened drive collar. Next, automatic flooded lubrication. And then the Kearney & Trecker Double Overarms and the solid-head vertical machine, followed by the motor-in-base, and — after many years of research — Timken Bearings on the spindle and gear train.

KEARNEY & TRECKER
CORPORATION
MILWAUKEE, WISCONSIN



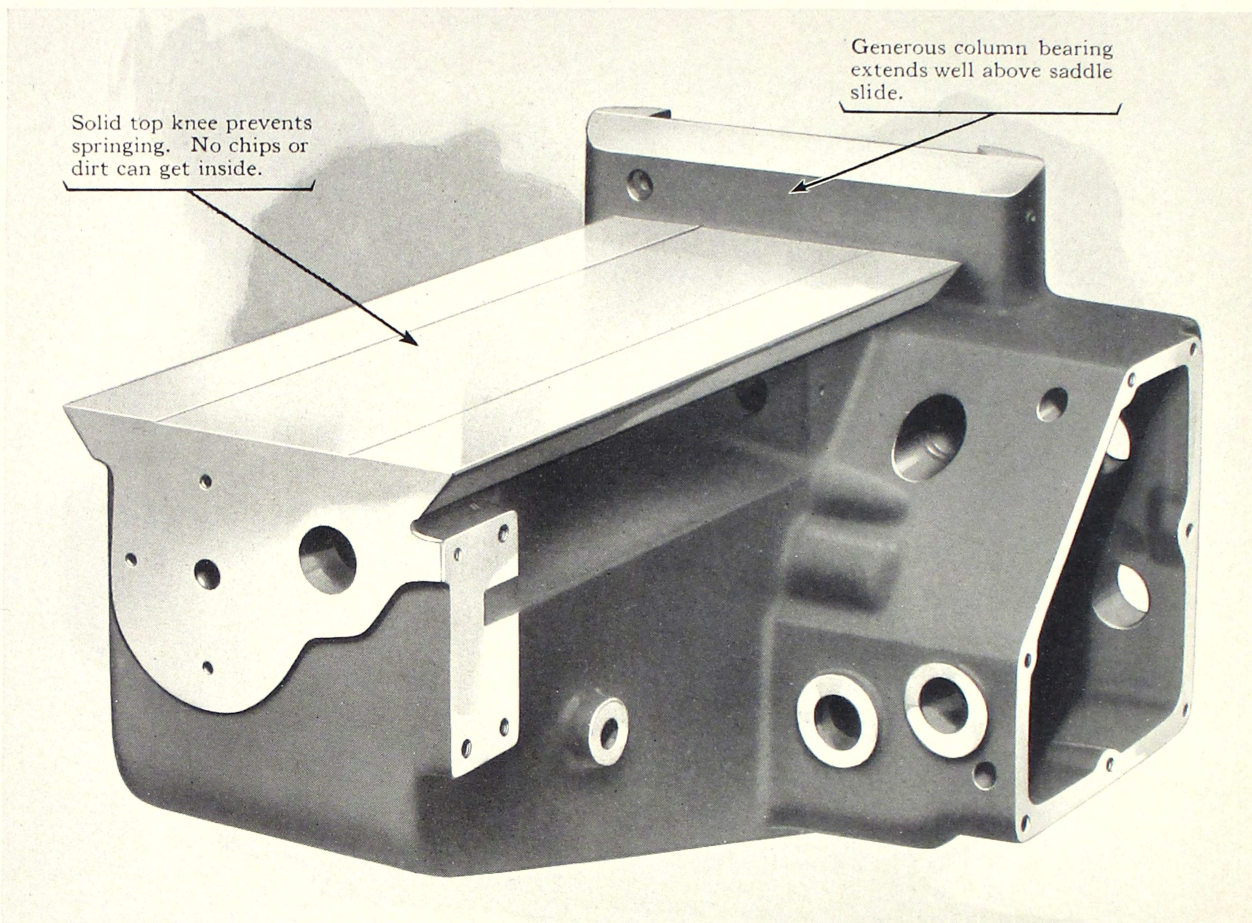
The Column

The column is the backbone of a milling machine. It must have sufficient mass to give it rigidity under severe service — that is why Kearney & Trecker use a heavy box-section, semi-steel casting.

Everything possible is done to give strength and rigidity to this important member. It is cast in one piece and tied together with heavy internal walls.

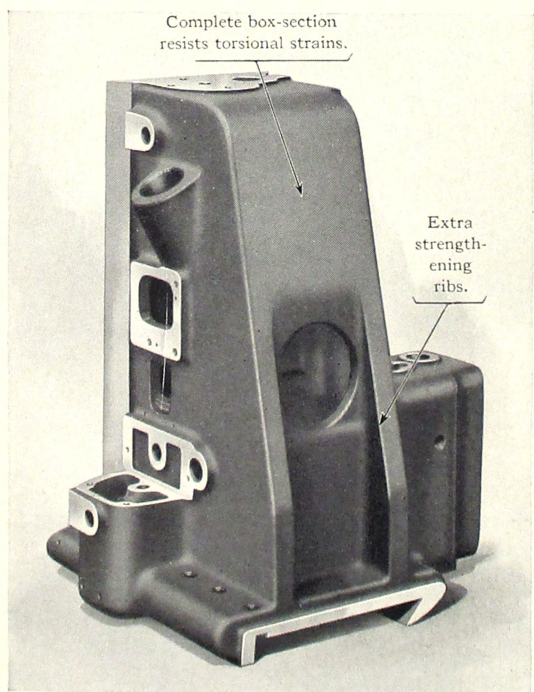
One of these walls is directly below the double overarms — another strengthens the portion which carries the knee, midway down the column.

The holes for the spindle, overarms, and shaft bearings are bored in accurate relation to the knee slide and carefully tested to insure accurate alignment. Every effort is made to build the very finest.



Solid top knee prevents springing. No chips or dirt can get inside.

Generous column bearing extends well above saddle slide.



Complete box-section resists torsional strains.

Extra strengthening ribs.

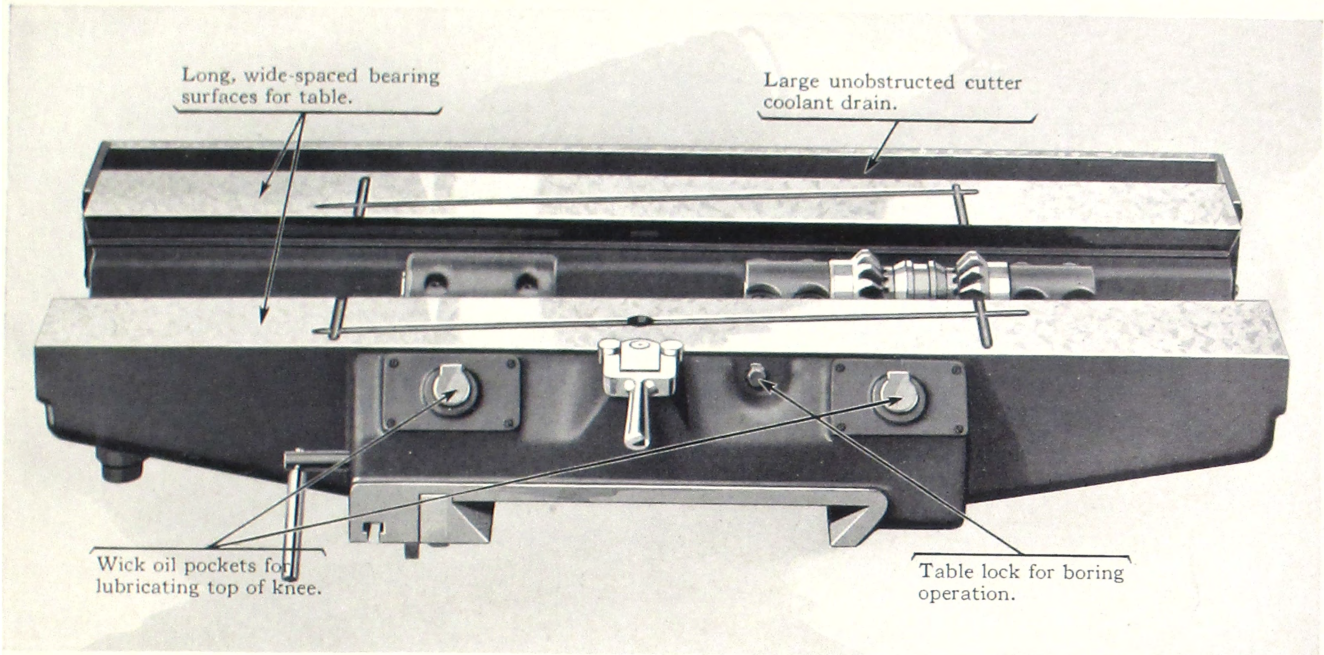
The Knee

The careful thought given to the design and construction of the column would be of little benefit unless the same care were exercised in proportioning the knee, for it must rigidly support the table in the same way that the column and double overarms support the cutter arbor.

The knee of a milling machine is subjected to tremendous torsional twist, as well as vertical thrust. It is well known among engineers that a box-section resists torsion better than any other construction. That is the reason the Kearney & Trecker knee is box-shaped — and to make it even stronger the top is solid and there are two heavy strengthening ribs underneath.

Furthermore, the bearing of the knee on the column is carried generously above the top of the saddle slide. This gives the knee a more tenacious grip on the column and much greater resistance to strain from any direction.

Look at these photographs and judge for yourself whether or not the knee is built for maximum rigidity.



The Saddle

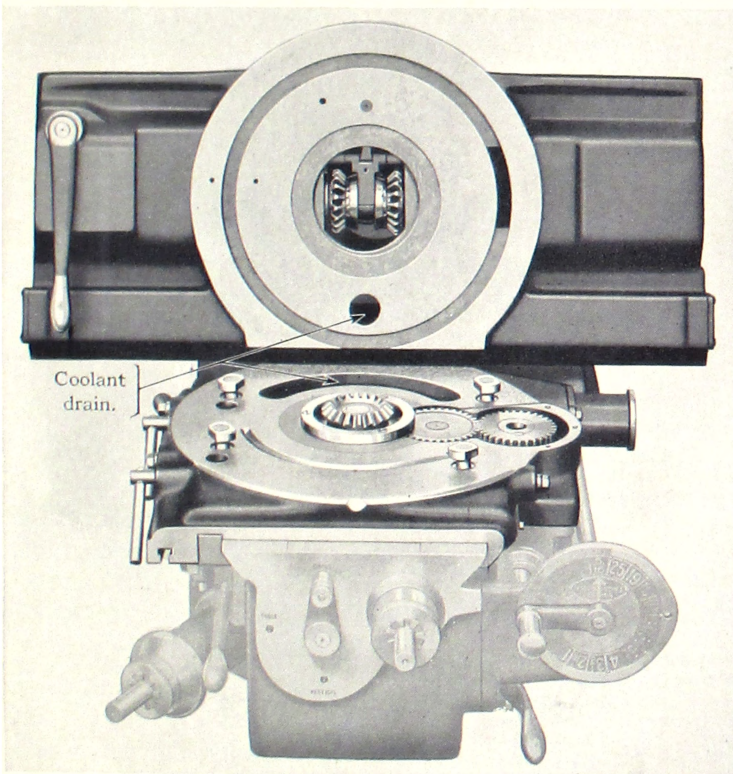
The construction of the saddle, which supports the table on the knee, has been given the attention it deserves. The K & T saddle, is a deep, heavy, semi-steel casting — widened,

and extended in length to provide maximum support for the table.

The table bearings are at the top of the saddle, rather than at the bottom of the dovetail. Thus, larger bearing surfaces are secured, and they are located far enough apart to give ample resistance to twisting strains.

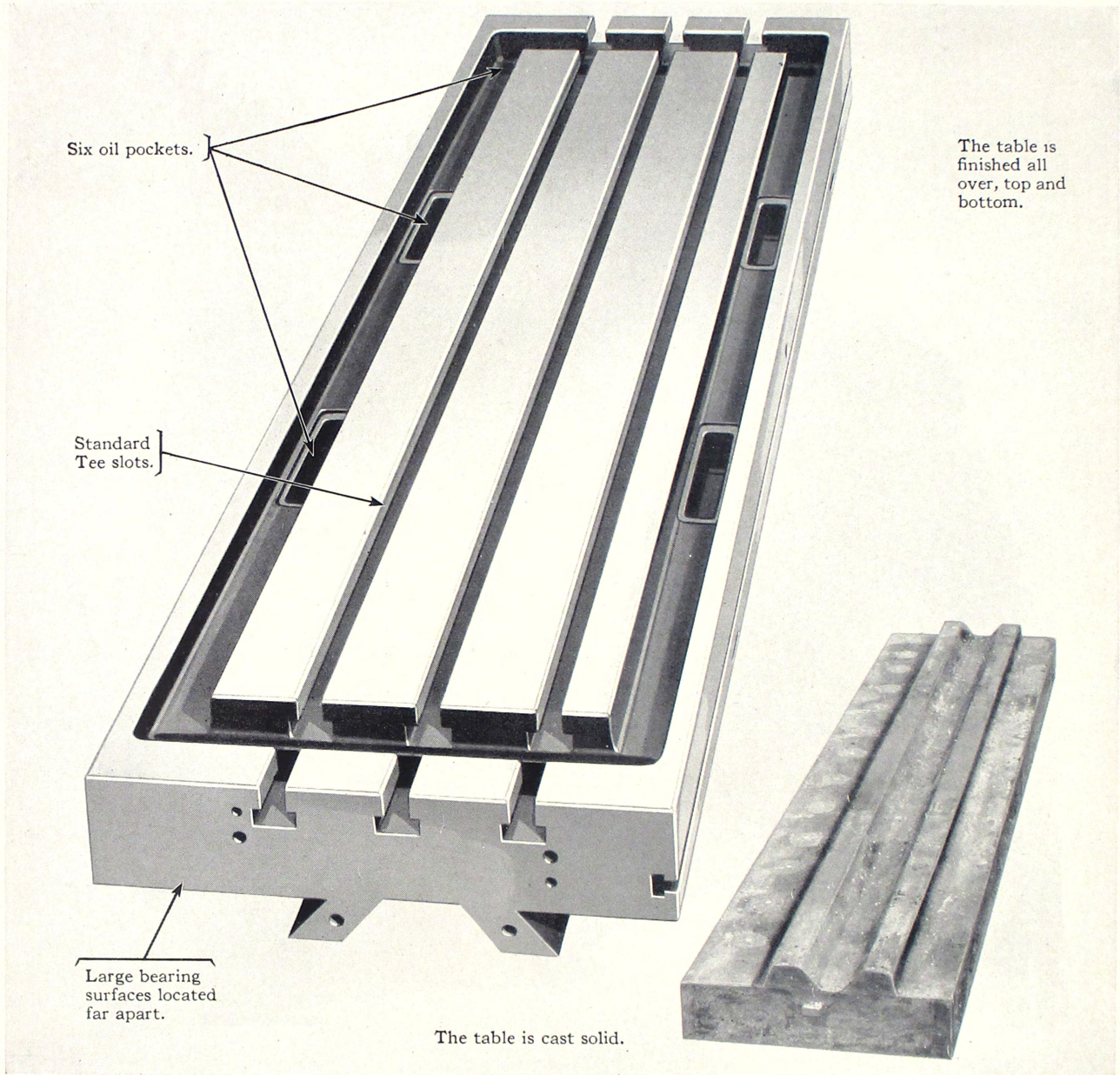
A tapered gib holds the table securely on the saddle. This gib is provided with an adjustable screw at each end which forms a means of adjusting the gib in either direction, as well as locking it solidly in position.

At the back of the saddle is a large unobstructed passage through which the flood of cutter coolant — eight gallons per minute — is quickly carried away.



The Swivel Block

Illustrated at the left is the swivel block for a Universal Milling Machine with the saddle removed. Of special interest is the large diameter clamping circle, with the four Tee bolts located as far as possible from the center of rotation. The knee and saddle locks are positive and non-slipping.



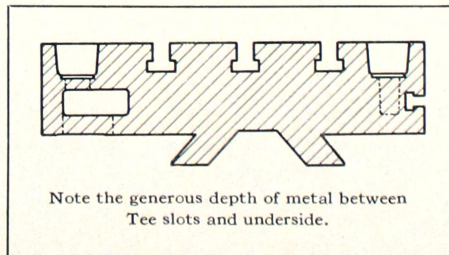
The table is finished all over, top and bottom.

The table is cast solid.

The Table

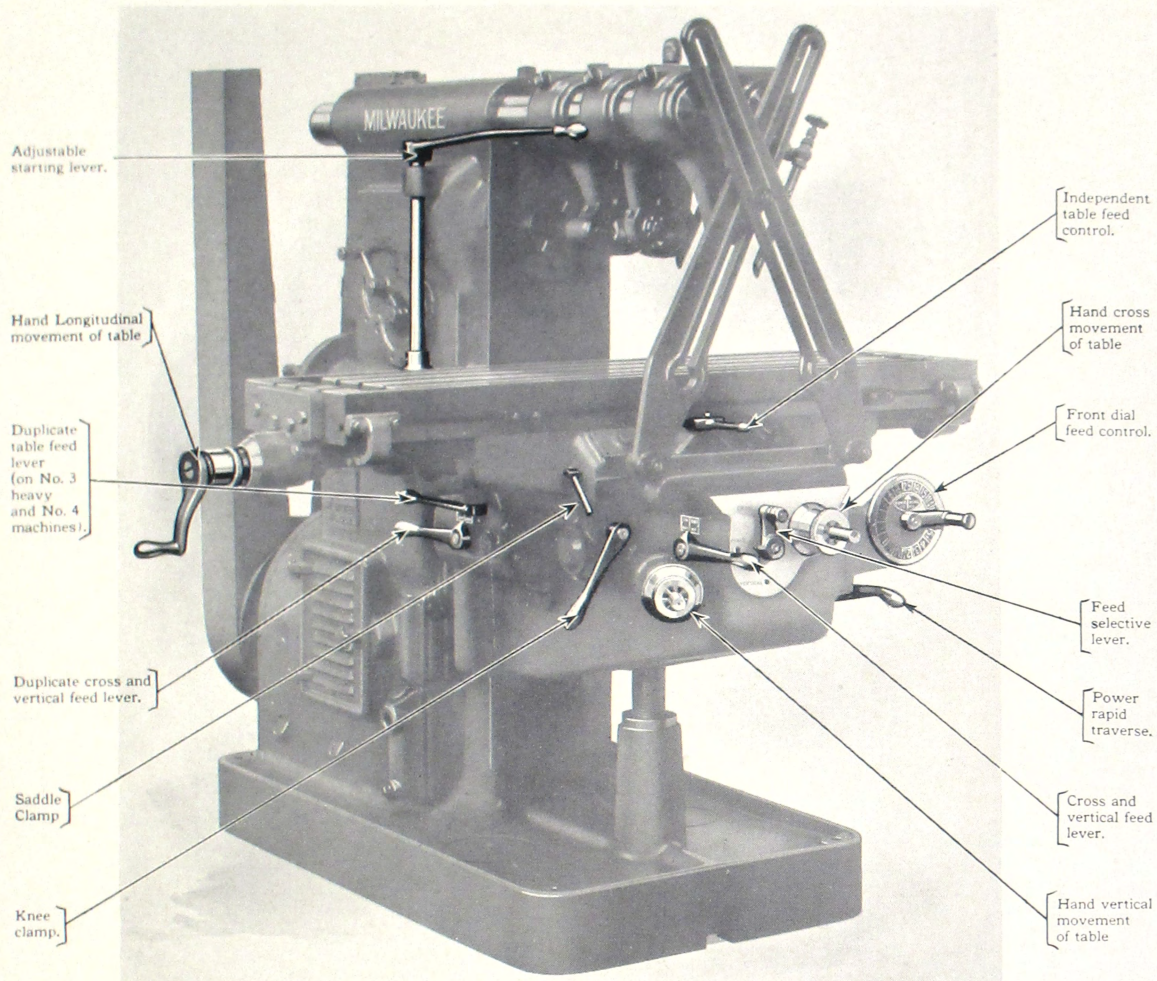
The table of a Milwaukee Milling Machine is a massive block of semi-steel — cast solid and machined all over.

It is a proven fact that when scale is left on the under side of a milling machine table there is a tendency toward warpage. Finishing the table all over, both on the top and on the bottom, is worth while because it totally eliminates this chance of distortion.



Another common cause of "springing" in a milling machine table is the lack of metal between the Tee slots and the under side. It will be noted from the sketch that a generous depth of metal is allowed around each Tee slot.

All Kearney & Trecker Milling Machine tables have six coolant drain pockets — each provided with a screen to prevent chips from clogging the return line to reservoir.



Centralized Control

With Centralized Control a Milwaukee Miller is easy to operate. All control levers are conveniently grouped at the front of the machine, just where the operator wants them.

At the right of the knee is the Front Dial Feed Control and just below it the Power Rapid Traverse Lever.

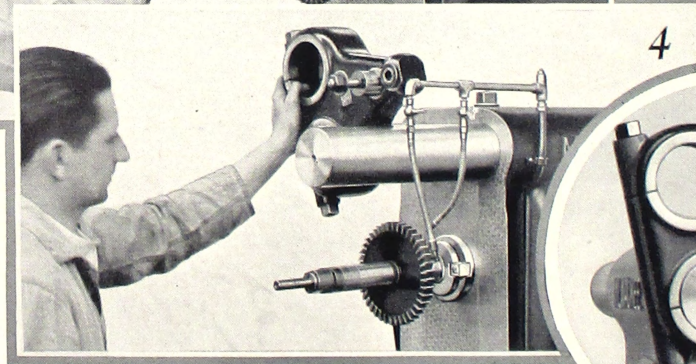
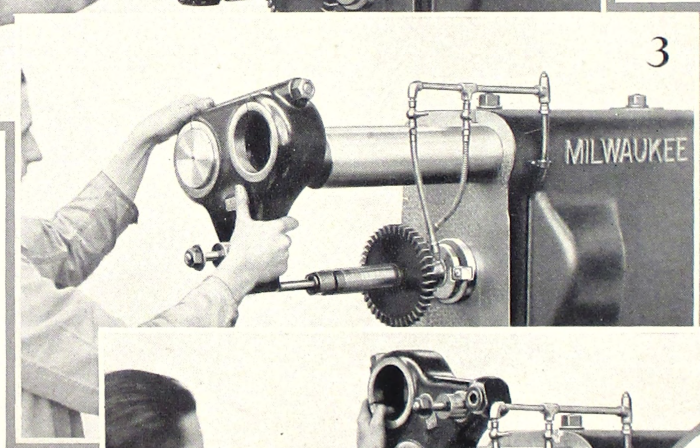
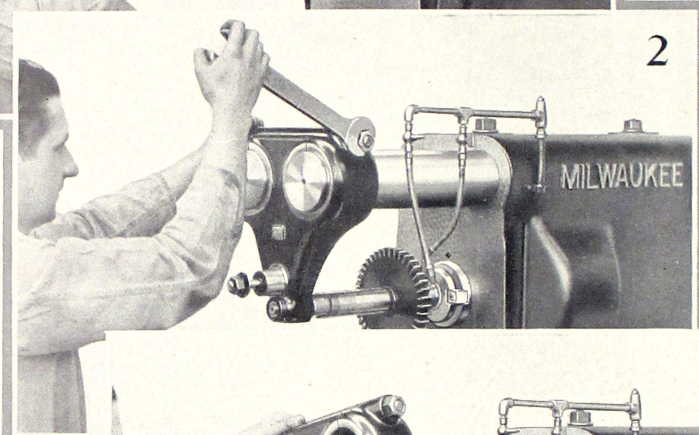
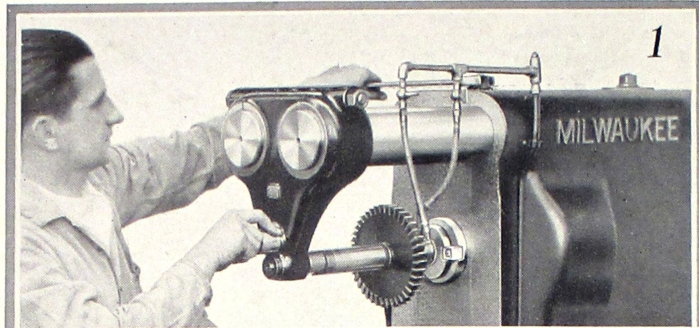
At the front of the knee is a three-position plunger for determining either Table, Cross, or Vertical feed.

The handle above at the front of the saddle engages the power table feed in either direction. The horizontal lever at the left of the knee engages the Cross or Vertical power feed. Both of these levers

are duplicated at the rear of the Table — handy to the operator when he is standing in back of the table for boring operations.

The lever, extending downward at the left side of the knee, clamps the knee to the column and saves walking around the table. And last, but not least, is the convenient Adjustable Starting Lever, well up out of the way, freeing the operator from the danger of getting his arm near the cutters.

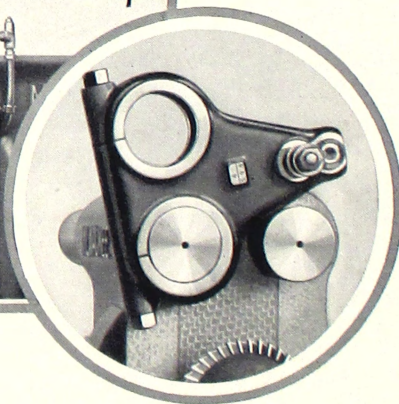
A Kearney & Trecker Milling Machine justly deserves the title "Controlled from the Front". The safe and convenient location of its control levers makes it a pleasure to operate and a real producer.



Double Overarms

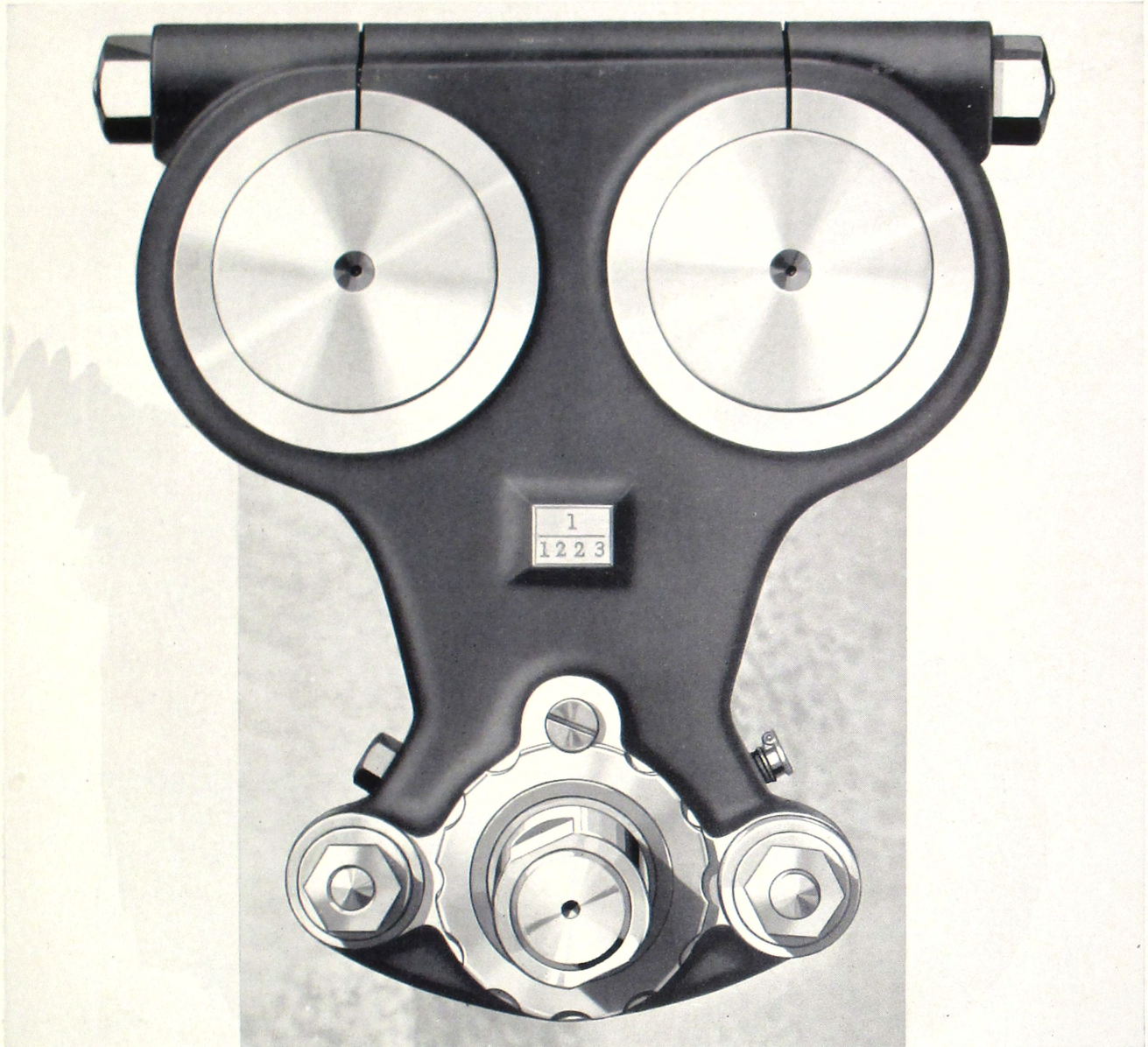
The convenience of the double overarm construction makes it possible for the operator to quickly get at the cutter without lifting off the arbor support. Watch how he does it!

1. He first loosens the arbor nut and then the column clamp nuts.
2. Loosens binder nut on right side of arbor support.
3. Slides left bar out of column until arbor support clears right bar.
4. Swings arbor support upward and pushes left bar toward column, resting arbor support against right bar.



The cutter and arbor are now accessible. The arbor support is up out of the way, and, without any tugging or lifting, all the weight has been born by the overarms.

The basic Double Overarm Patent, and a number of Patents Pending, are the property of Kearney & Trecker Corporation, and are used on other machine tools only by license agreement. All Patent Rights are Fully Reserved.

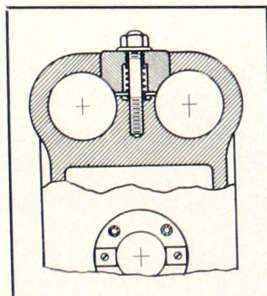


The most highly respected feature of a milling machine is the Kearney & Trecker Double Overarms. These two steel bars, laced together by a broad triangular arbor support, insure positive align-

ment of the arbor. The strength and stiffness of this method of construction insures greater accuracy, permits heavier cuts at a greater distance from the column and increases cutter life.

Consider the Following Important Facts:

1. The two bars are of solid steel.
2. They are clamped in solid metal, extending clear through the column.
3. The clamping in the column is equalized. No matter which clamping block is tightened first, the position of the overarms is unchanged.



4. The heavy arbor supports which lace the two bars together form triangles with the arbor. Their broad bases will resist tremendous side thrust.
5. The arbor supports have maximum bearing surfaces on the overarms, and grip each bar all the way around.



Pick-Off Feed Gears

For Manufacturing Type Machines

Pick-Off Feed Gears are now standard equipment on all Manufacturing Knee Type Milwaukee Milling Machines of the No. 2 Standard, No. 2 Heavy and the No. 3 Standard sizes.

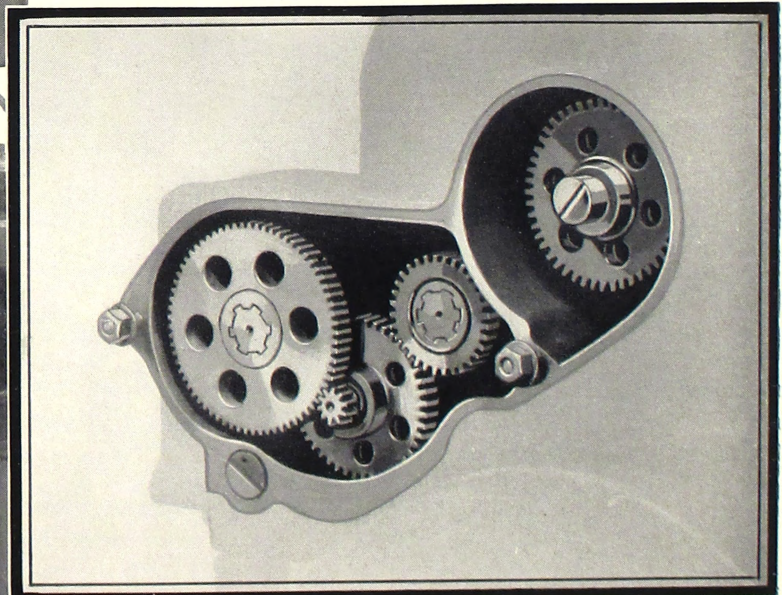
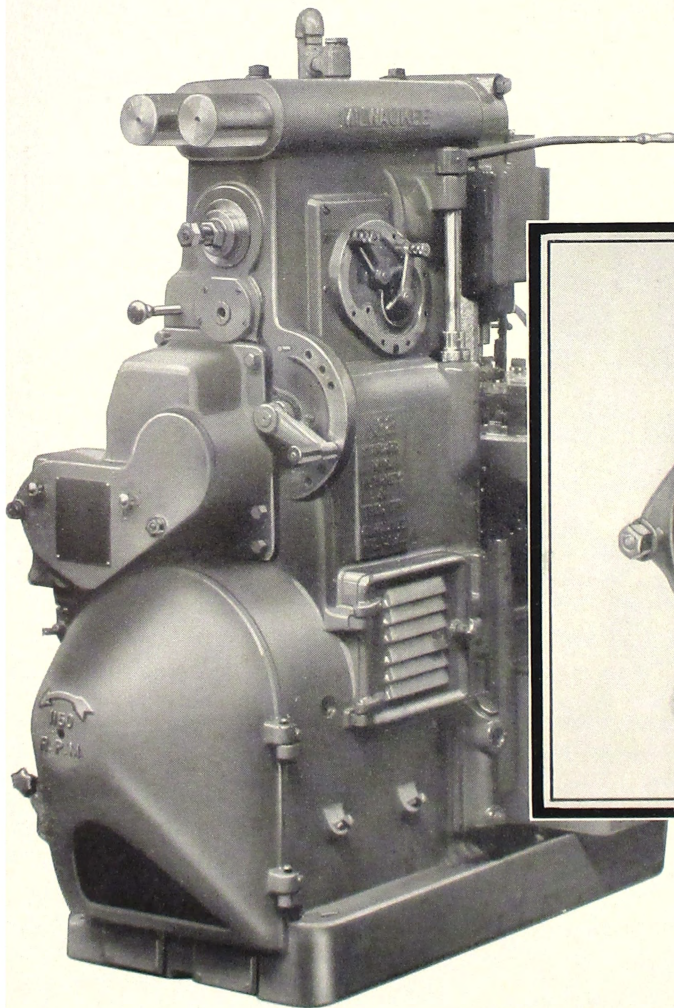
While it is true that the knee type milling machine has given way to the Lincoln or Automatic type of miller for many straight run jobs, still it always has, and always will be an important factor in many production lineups. There are many, many operations that demand the flexibility, ease of adjustment, and general all around usefulness of this basic machine.

Realizing this fact, and because of the demand for simplification on large lot operations, Kearney & Trecker now furnish Pick-Off Feed Gears as standard equipment on all Manufacturing type milling machines of the No. 2 Standard, No. 2 Heavy and No. 3 Standard series — both horizontal and vertical models.

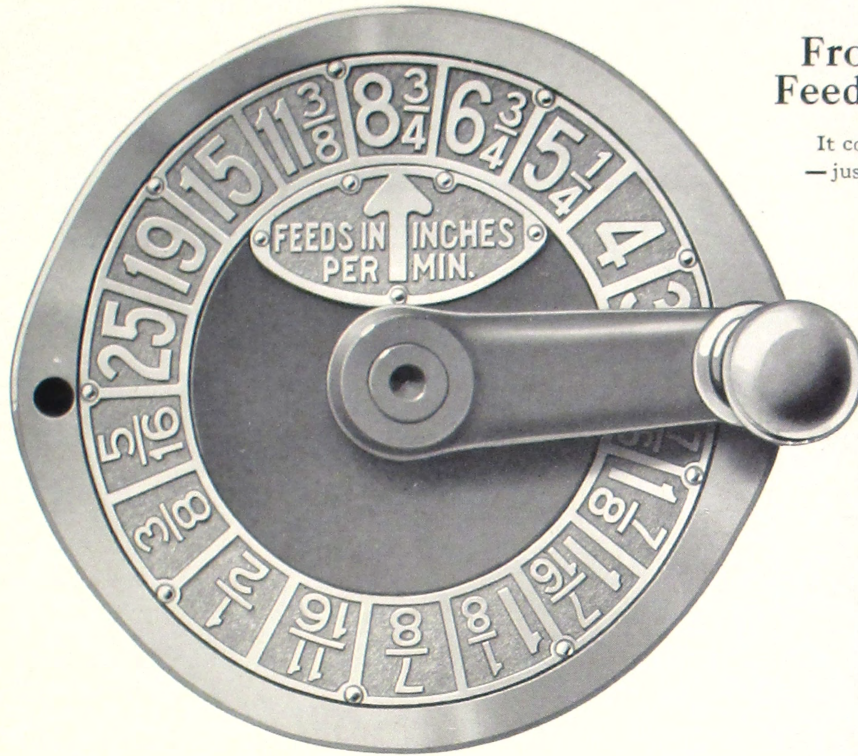
There is quite a substantial saving in the cost of the machine when arranged with Pick-Off Feed Gears, and we are giving this advantage to the user whose work requires a minimum of feed change.

With nine standard Pick-Off Gears, 18 combinations of feed are available.

The decision to supply Pick-Off Feed Gears as standard equipment again demonstrates the desire of Kearney & Trecker Corporation to provide the type of equipment best suited to your needs.



Showing position of Pick-Off Gear Feed Box at the back of the column and arrangement of gears within the box.



Front Dial Feed Control

It couldn't be simpler
— just turn the crank!

Quick Change Feed Box For Plain and Universal Type Machines

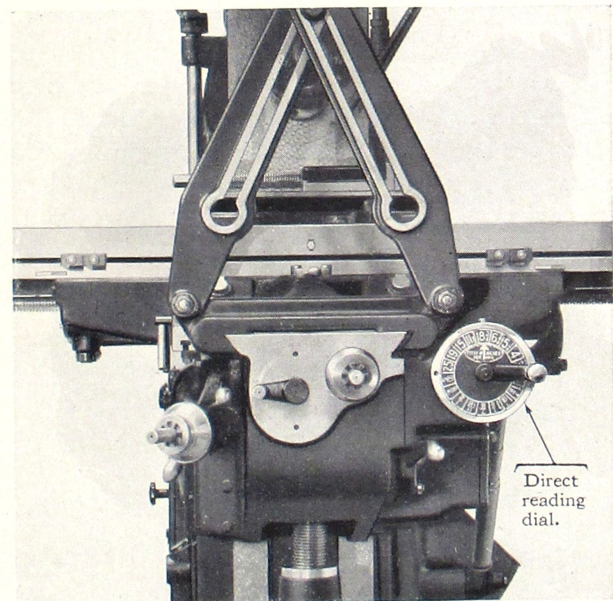
Quick Change Feed Boxes with Front Dial Control on Kearney & Trecker Plain and Universal Type Milling Machines enable the operator to instantly secure 18 changes of feed, whether the machine is in operation or standing idle.

It is all done from the front of the knee — just turn the crank with one hand until the arrow points to the desired feed.

The dial is direct reading — there is no chart or table to study — and when the man responsible for production passes the machine he can tell at a glance what feed is being used.

Although the control is at the front of the knee, the feed box is at the rear of the column. This permits building a more rugged feed mechanism, with the gears and shafts automatically lubricated, the same as those of the spindle drive inside the column.

All of the gears in this sturdy, selective type feed box are made of alloy steel — heat-treated and hardened. All control parts are mounted on New Departure Ball Bearings which assure a free running and highly efficient mechanism.

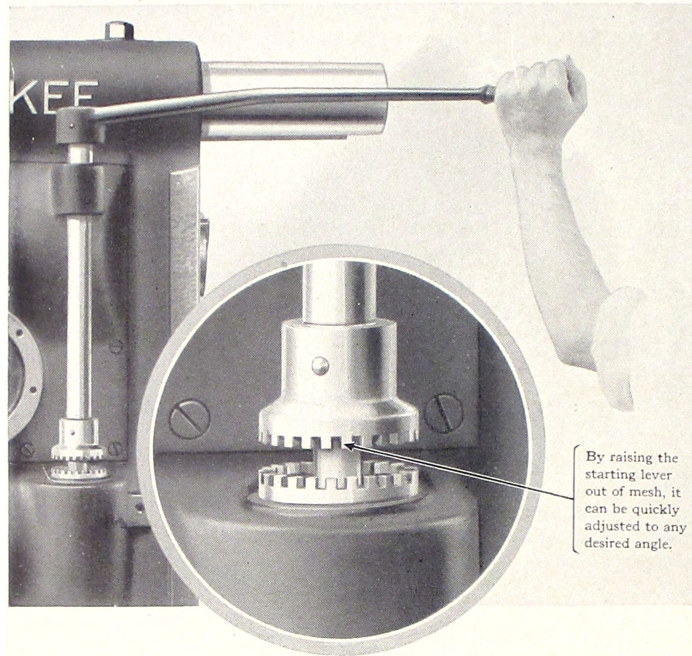


The Feed Control Dial is located conveniently at the front of the machine.



Starting Lever

Adjustable — Convenient



By raising the starting lever out of mesh, it can be quickly adjusted to any desired angle.

The safety and convenience of the new adjustable starting lever on all "Milwaukee" Milling Machines, except the No. 4 Heavy Models, are apparent from the illustration. It is always handy for the operator without his having to reach across the table. No. 4 Heavy Plain, Universal and Vertical machines have duplicate starting levers — one in a vertical position, on the side of the column just back of the table, and another on the side of the knee convenient to the right hand of the operator.

You will note the square-toothed clutch at the base of the vertical shaft. By raising the lever out of mesh it may be quickly adjusted to any angle to suit the operator's convenience, or it may be moved completely out of the way to accommodate large work.

The Friction Clutch

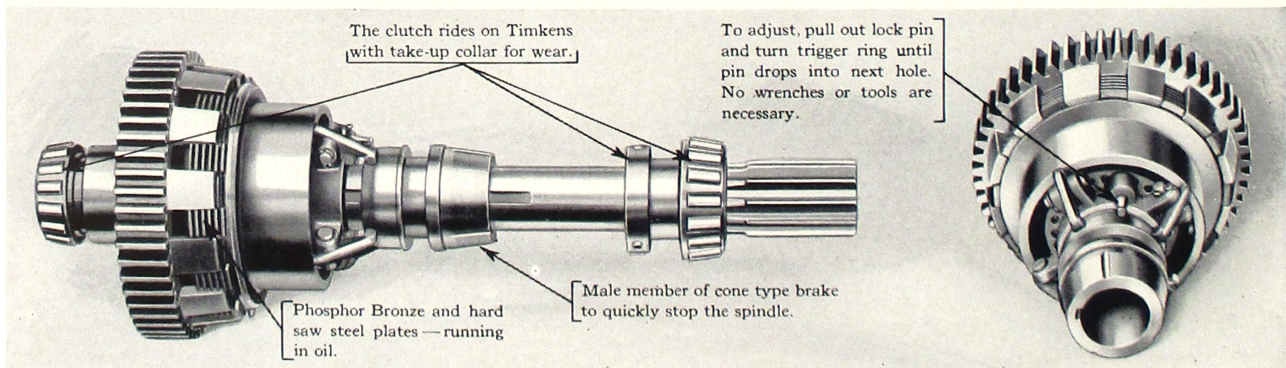
The main drive clutch for starting and stopping the machine is of the multiple disc type. The contact is metal to metal between phosphor bronze and hardened saw steel plates — running in oil. The plates are amply separated when disengaged, eliminating all possibility of drift. Opposite the clutch is a cone type brake for quickly stopping the spindle.

Observe how easily adjustments can be made. It is perfectly simple — no tools or wrenches are

required — and it can be done in a minute. The adjustment when made is uniform over the entire frictional area.

This new clutch is designed to work continuously under full load, and operates smoothly and positively at all times.

A smaller friction clutch of similar type is used for engaging the built-in power rapid traverse.

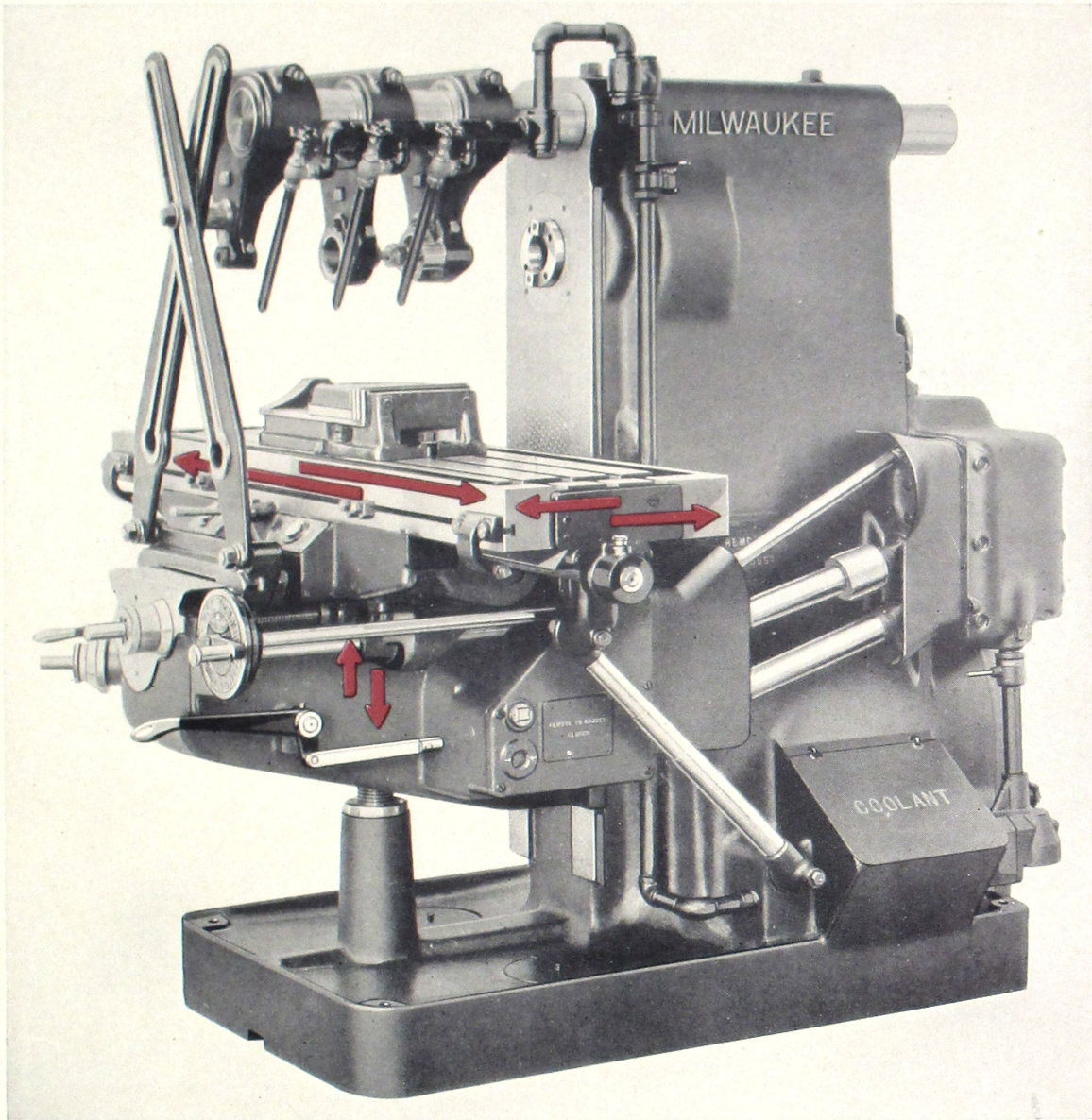


The clutch rides on Timkens with take-up collar for wear.

To adjust, pull out lock pin and turn trigger ring until pin drops into next hole. No wrenches or tools are necessary.

Phosphor Bronze and hard saw steel plates — running in oil.

Male member of cone type brake to quickly stop the spindle.



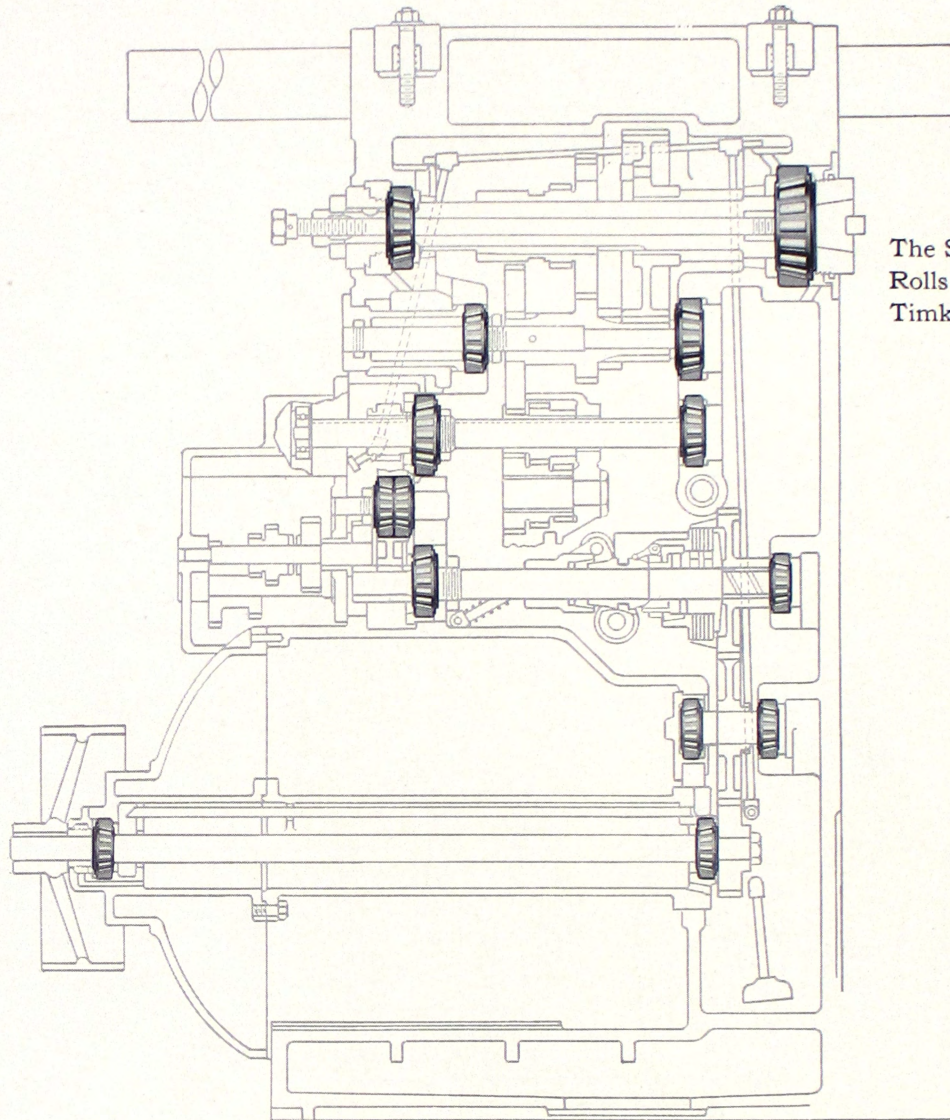
Power Rapid Traverse in Six Directions

Power rapid traverse in all directions is a big factor in the ease with which a milling machine may be "set up" and operated. This is especially true when raising the table carrying a heavy workpiece.

The rates of travel are very fast. The table can be quick traversed, left or right, at two rates of travel — 70" and 150" per minute — in or out at 70" per minute — and up or down at the rate of 50" per

minute. All movements are conveniently controlled by a single lever at the front of the machine.

Power Rapid Traverse in six directions means that the operator will get more work out of a Kearney & Trecker Milling Machine — and with less physical effort on his part. By conserving the operators energy you increase his efficiency, which enables him to produce more and better work.



The Spindle
Rolls on
Timkens!

Timken Bearings Throughout

Timken Roller Bearings offer the following advantages in No. 2, No. 3, and No. 4 "Milwaukee" Milling Machines —

Greater Rigidity — A thinner oil film is required between the rolls and races.

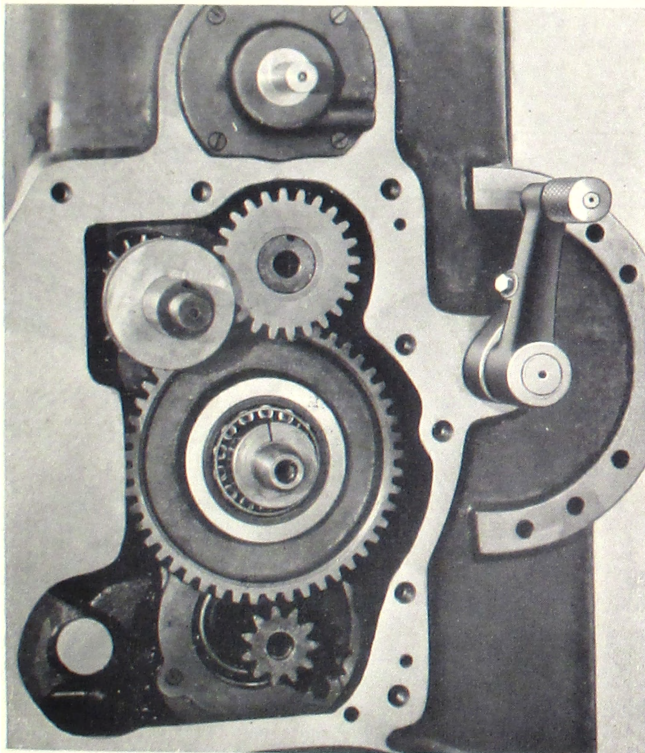
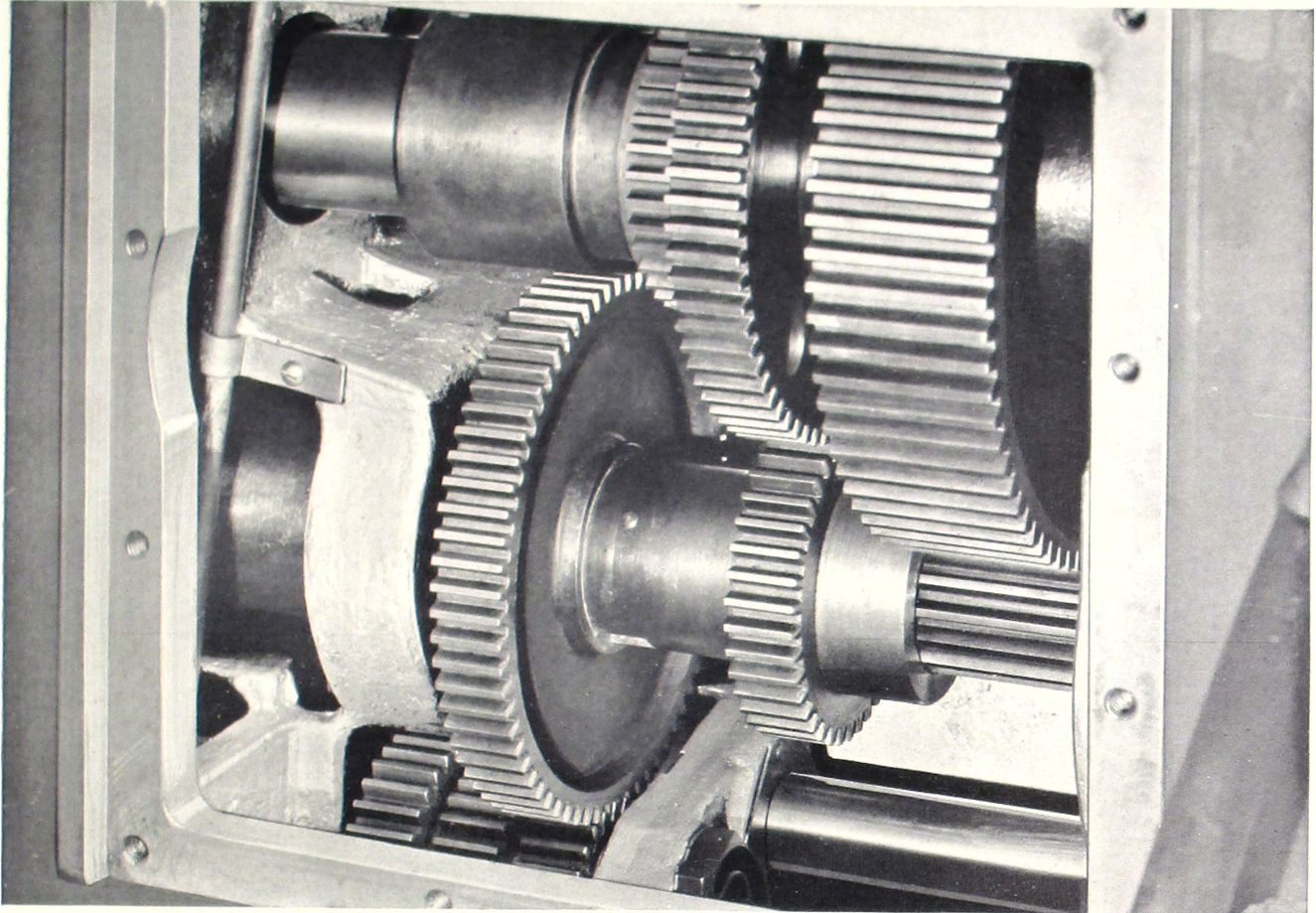
Greater Precision — Metal to metal contact, eliminating all bearing float.

Greater Production — A closely fitted bearing makes possible heavier and smoother cuts.

Greater Thrust Capacity — Tapered roller surfaces resist tremendous end thrust.

Greater Service — At high or low speeds, Timkens will last the life of the machine.

Greater Economy — More power delivered to the cutters. Timkens operate efficiently with minimum lubrication or maintenance cost.



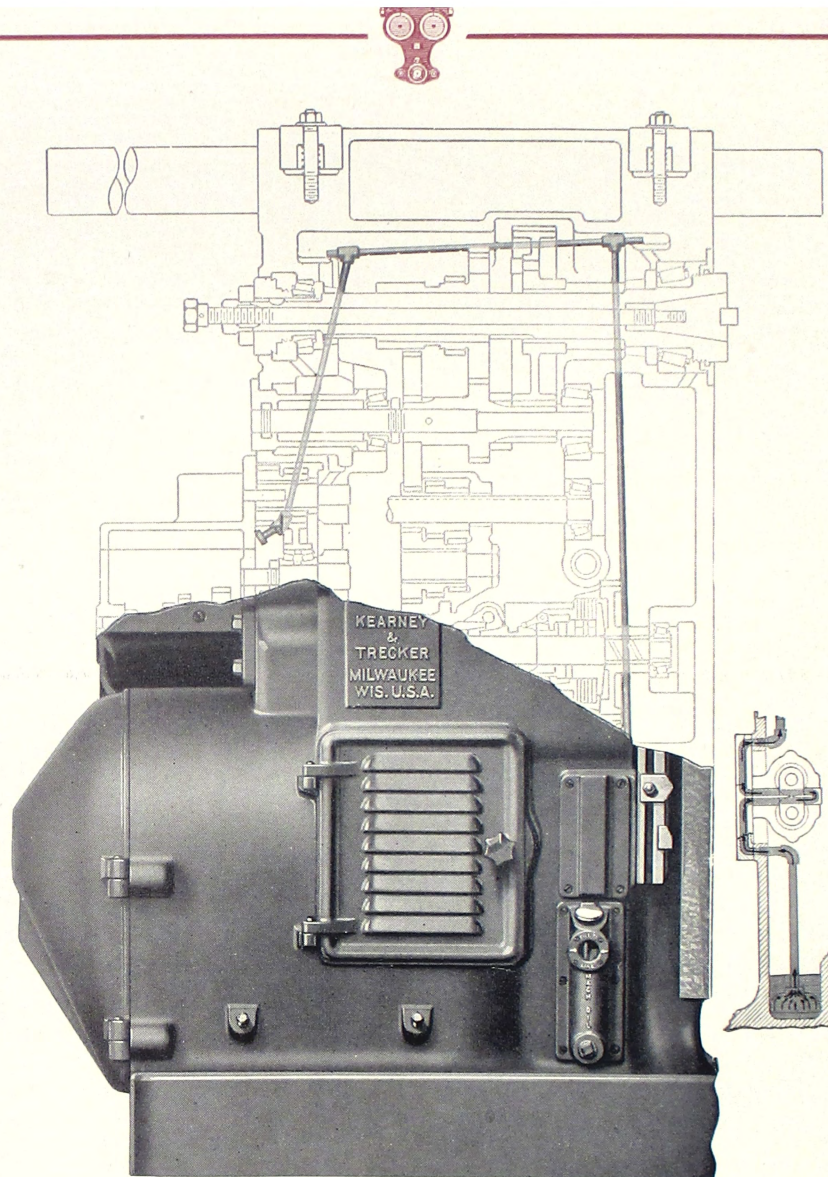
Powerful Gear Train

Solid Mountings

All shafts in the spindle gear train are "built into" the column. Only the shifter forks for changing speeds are carried on the cover plate.

The Kearney & Trecker method of solid bearing mounting adds years of life to the milling machine, and insures a rigid drive to the spindle. This construction eliminates all gear chatter due to springing of the mechanism when under load.

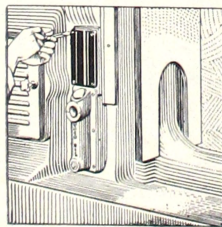
Large diameter shafts — short distances between bearings — hardened alloy steel gears — and Timken Bearings throughout — plus the Kearney & Trecker Solid Bearing Mountings — give a powerful and smooth running gear train.



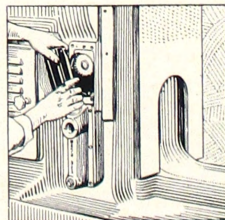
Automatic Flooded Lubrication

All moving parts back of the face of the column on a "Milwaukee" Milling Machine are automatically lubricated. A fresh supply of clean oil is constantly pumped to the top of the column, distributed from perforated pipes, and flooded down over all gears, shafts, and bearings throughout the entire column and feed box.

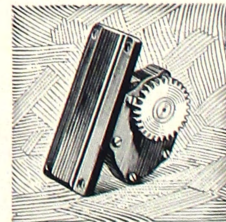
The pump, the filling station with its spring cap, the sight level gauge and drain plug — are all located together on the left side of the column. To remove the pump is but a matter of seconds. Only a screw driver is needed and no pipe joints have to be broken. The entire system is simple and reliable — out of the way and yet readily accessible.



Remove cover plate screws



Lift out the pump.



Pump and cover plate are one unit — no pipe joints to be broken.



KEARNEY & TRECKER pioneered the first automatic flooded lubrication for a milling machine, and have developed this to the point where very little of this important matter is dependent upon the watchfulness of the operator. Not only is the

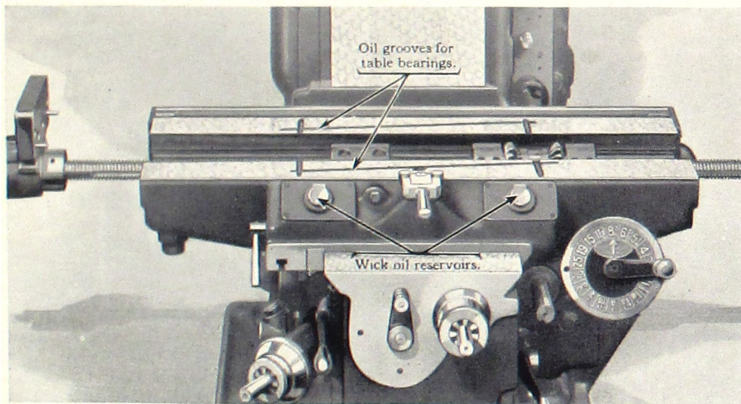
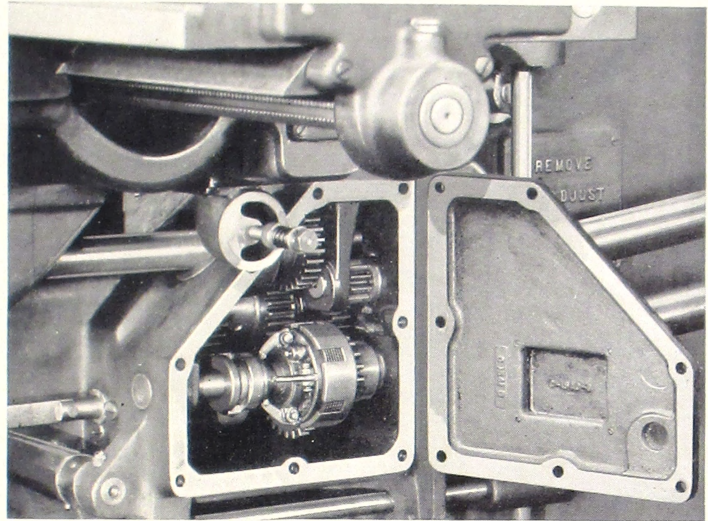
gear train inside of the column continually flooded with oil, but the moving parts inside the knee, the bearing surfaces between the knee, saddle and table, and the universal joints are properly lubricated with a minimum of attention.

Splash Lubrication

Kearney & Trecker milling machines are provided with splash lubrication for all moving parts inside of the knee including the elevating screw. An oil filler plug and a sight level gauge are conveniently located at the right rear side of the knee. There is another plug underneath for draining.

The only attention required is to add additional oil — three or four times a year.

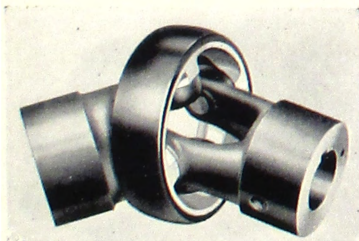
A small friction clutch for operating the power rapid traverse is located in this splash oil compartment.



Centralized Oiling

Table bearings on Kearney & Trecker Milling Machines are lubricated from a single oil hole at the front of the table. In a similar manner, two large reservoirs at the front of the saddle, which are filled with wicking, carry the oil to the table screw mechanism and also to the top of the knee. By this means lubricant is applied internally at the points of greatest bearing pressure.

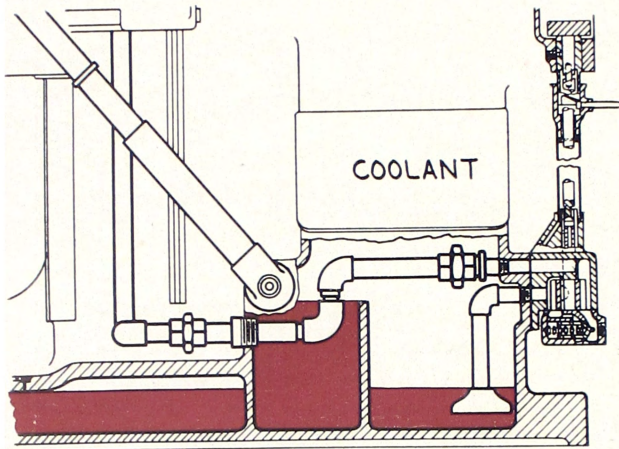
Self-Oiling Universal Joints



Automatic oiling in Kearney & Trecker Millers is carried even to the universal joints. There are oil pockets inside of the feed box and the splash lubrication chamber in the knee, which provide a "head" of oil above each end of the universal joint shafts. The oil flows down inside a joint fork and is carried by centrifugal force into the ring, thus keeping the connecting pins automatically lubricated at all times.



Low Pressure, Flood Volume Cutter Coolant System



Eight Gallons of coolant per minute floods over the cutters, quickly carrying away the heat generated in the cut. The automatic pump — which operates only when the machine is running — is standard equipment on all machines — at no extra cost.

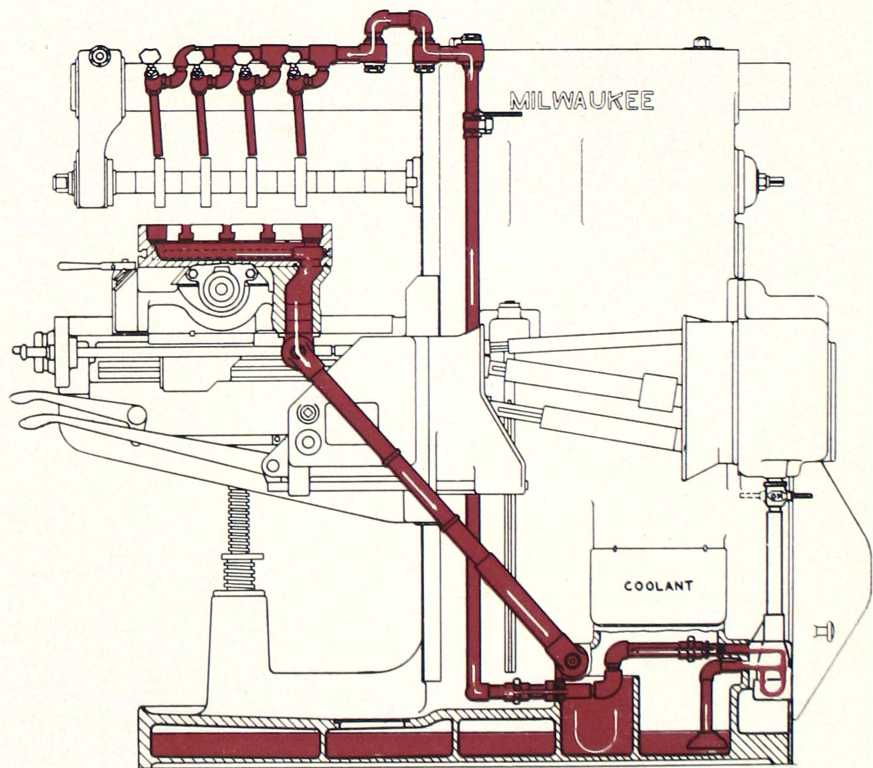
The system is complete, both as to delivery and return of the coolant. The pump is located externally at the right rear of the column. It may be quickly taken off by removing four screws and without breaking any pipe joints. Just above the pump is a two-tooth clutch in a vertical drive shaft from the feed box. When milling cast iron, or other materials not requiring coolant, the pump may be shut off completely.

Pressure is low and uniform at all times, regardless of whether the volume is reduced to a thin stream of coolant as would be

delivered to a slitting saw, or all four valves are wide open pouring coolant over broad slab milling cutters.

The coolant distribution pipes may be quickly adjusted by hand to any desired position. Each pipe has its individual regulating valve, handy to the operator, and another valve near the top of the main line is for shutting off the whole system.

The return of the coolant is through screened pockets in the table, into a greatly enlarged passage at the rear of the saddle, and then through a large telescopic return tube down to the reservoir in the base of the column. Two large screened drains located in the base, return to the reservoir all coolant that splashes over the table.



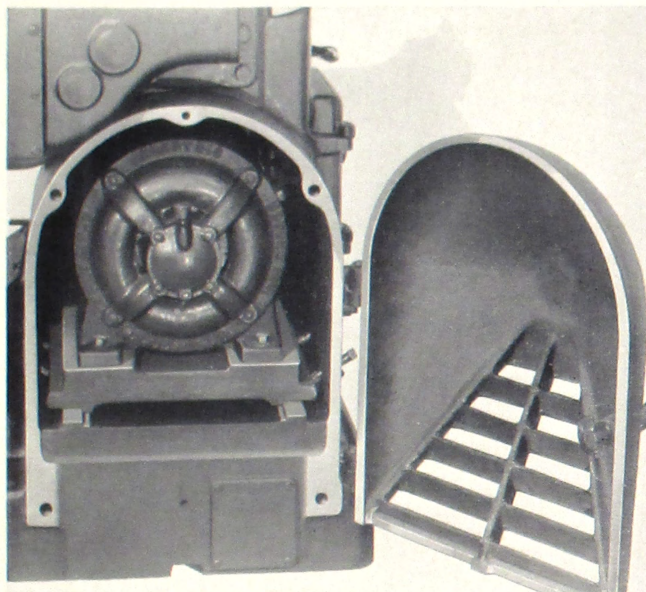


Optional Drive

The modern tendency for machine tools is toward individual motor drive. The majority of Milwaukee Milling Machines are furnished that way, but the

drive is optional, and you may have either Belt or Motor-in-Base, depending on the method which best suits your shop requirements.

Motor-in-Base Drive



Both the motor and the drive are *on the inside*.

The motor is permanently bolted to a base plate which fits into accurately machined ways and is held down by four external wedge bolts. To remove the motor it is only necessary to loosen two of the bolts and slide out the entire unit.

The drive is direct through gears, the same as all the rest of the spindle drive train. The motor is set with its pinion facing the front of the machine, where it receives automatic flooded lubrication the same as all other gears and bearings inside the column.

The motor pinion has an outboard bearing on Timkens — and to go a step further, the three initial fast running gears have ground teeth. Thus the drive is not only safe, powerful, and well lubricated, but also — quiet.

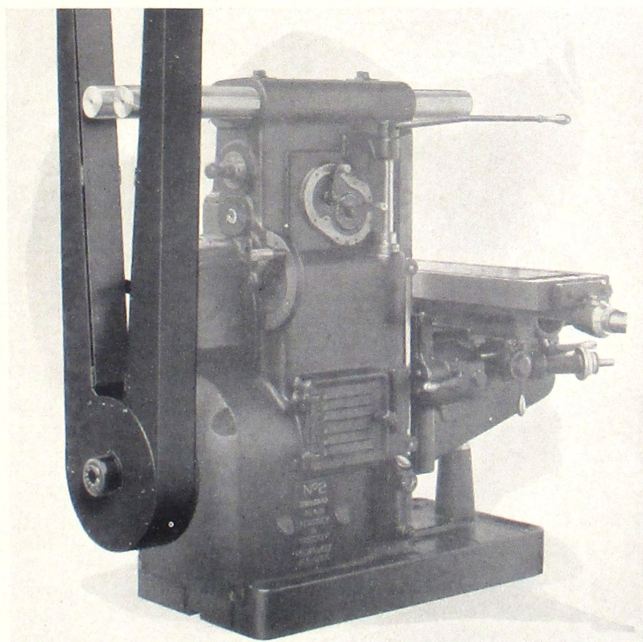
Belt Drive

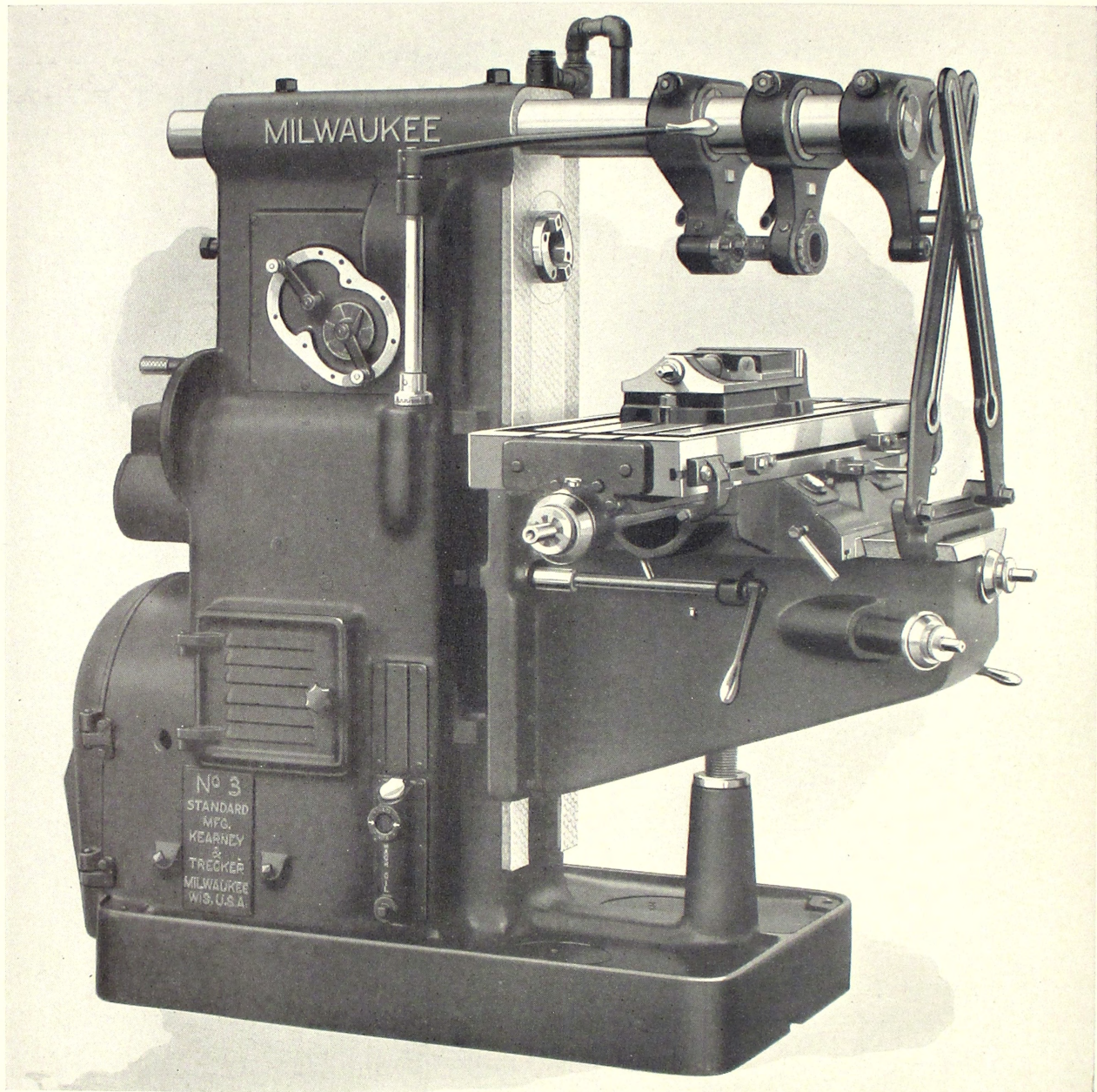
The same column may be converted into either Belt or Motor-in-Base drive.

When the machine is ordered with belt drive, the door at the back of the motor compartment is replaced by a bracket which bolts to the rear of the column and carries the belt pulley and Timken-mounted drive shaft. This is clearly shown by illustration on Page 14.

The belt is guarded up to the full legal height of six feet above the floor. The guards, which are hinged at the bottom, may be revolved to clear the overarms on either side or opened wider to straddle them as shown in the illustration.

Also, when using a crossed belt, the two inner panels of the guards may be swung out on their hinges and connected together to provide one large passageway.



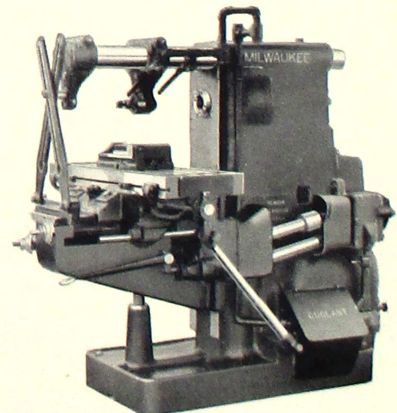


Manufacturing Type Milling Machines

In order to supply the need for a milling machine especially suited for straight run production work, Kearney & Trecker have included in their line what is known as a Manufacturing Type, knee and column machine. This model has Power Feed to the table only. Cross and vertical movements of the table are made by hand.

Always a popular model we have now gone a step further by supplying Pick-off Gear Feed Boxes as standard equipment on all Manufacturing Type Machines listed on the opposite page.

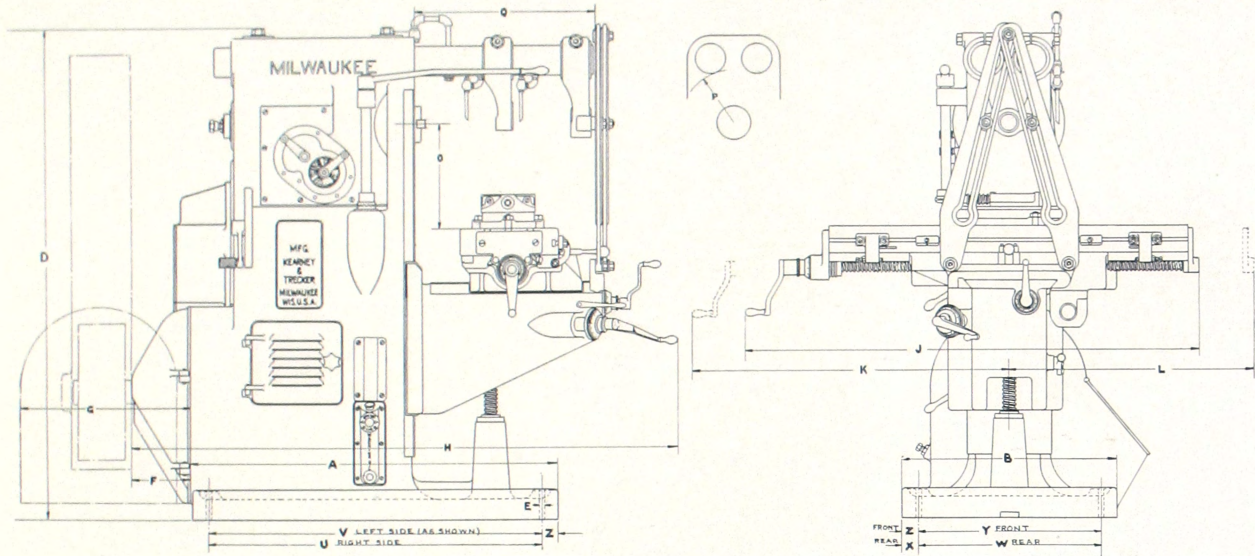
There is quite a substantial saving in the cost of the machine when arranged with Pick-off Feed Gears, and we are giving this advantage to the user whose work requires a knee type milling machine with a minimum of feed change.





MANUFACTURING

Milwaukee Milling Machines



Plan Dimensions

Machine	A	B	D	E	F	G	H	J	K	L	O	P	Q	U	V	W	X	Y	Z
No. 2 STANDARD Manufacturing	45 1/4"	24"	63"	1 1/4"	11"	20 3/8"	74"	65 1/4"	50 3/8"	43 1/4"	18 1/2"	6 3/8"	26"	41 3/4"	40 3/8"	21 1/2"	1 1/4"	20"	2"
No. 2 HEAVY Manufacturing	48 1/4"	28"	66"	1 3/8"	11"	22 3/8"	75"	65 3/4"	50 1/2"	43 3/8"	18 1/2"	6 7/8"	29 7/8"	44 1/4"	43 3/4"	24 1/4"	2 1/8"	23 3/4"	2 1/8"
No. 3 STANDARD Manufacturing	48 1/4"	28"	66"	1 3/8"	11"	22 3/8"	75"	75"	59 1/4"	50 1/8"	18 1/2"	6 7/8"	29 7/8"	44 1/4"	43 3/4"	24 1/4"	2 1/8"	23 3/4"	2 1/8"

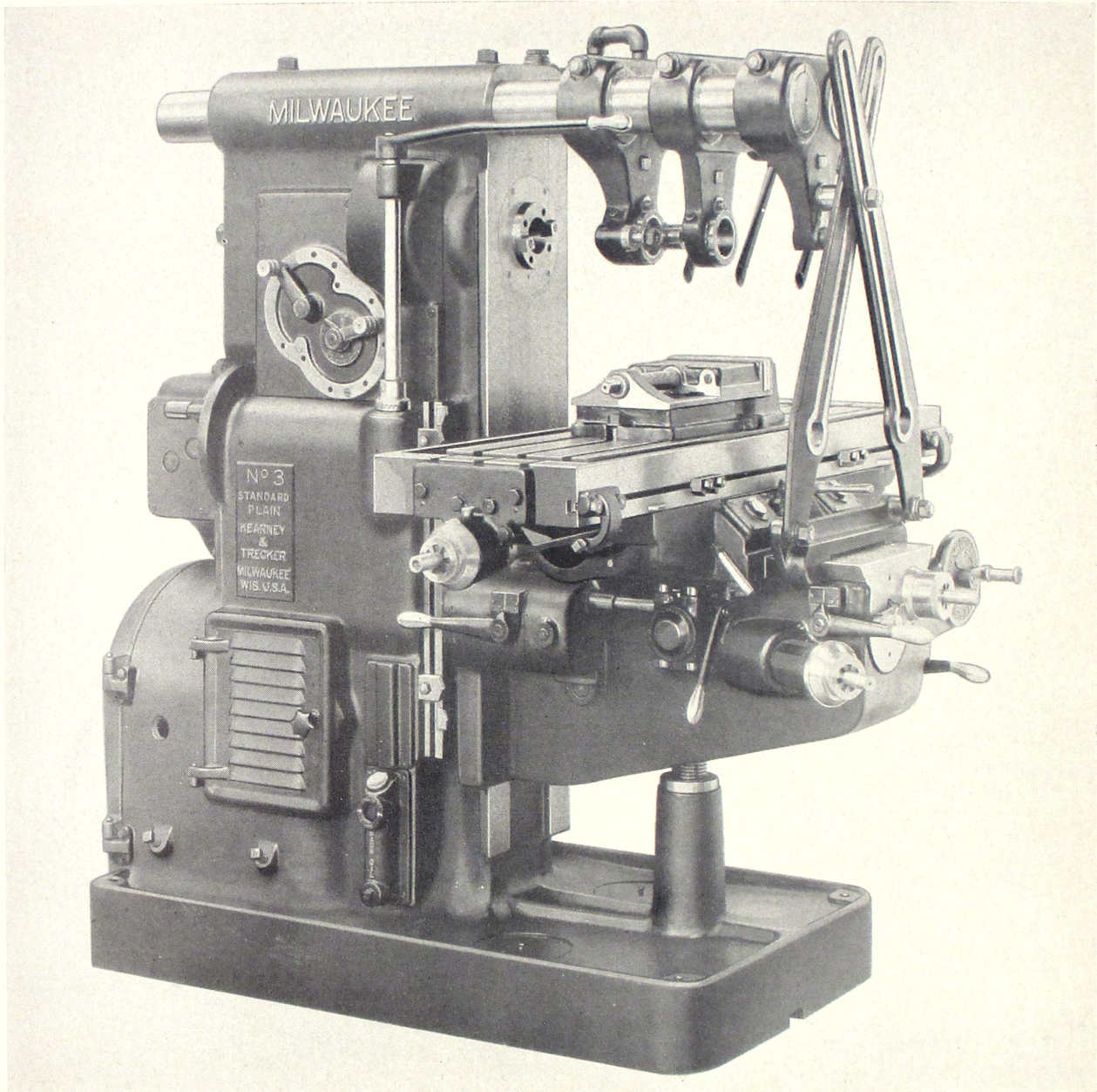
Manufacturing Type Machines regularly furnished with Pick-Off Gear Feed Boxes.

Specifications

	No. 2 STANDARD		No. 2 HEAVY		No. 3 STANDARD	
Table feed — automatic	28"		28"		34"	
Cross feed — hand	10"		10"		12"	
Vertical feed — hand	18"		18"		18"	
Power Rapid Traverse — Longitudinal	150" per min.		150" per min.		150" per min.	
Working surface of table	50" x 12 1/2"		50" x 14"		60" x 15"	
Overarm diameters	3 5/8"		3 7/8"		3 7/8"	
Number of arbor supports	2		2		3	
Number of speed changes	18		18		18	
Speed Range (R. P. M.)	17 to 420		15 to 360		15 to 360	
Number of feed changes (Pick-off gears)	18		18		18	
Feed Range (inches per min.)	1" to 40"		1" to 40"		1" to 40"	
Number of standard pick-off gears in set	9		9		9	
Diameter of driving pulley	14"		14"		14"	
Width of driving belt	2"		3"		3"	
Speed of driving pulley (R. P. M.)	600		600		600	
* H. P. of motor for electric drive	5		7 1/2		7 1/2	
Speed of motor (R. P. M.)	1200		1200		1200	
Approx. Weights — Belt or Motor Drive (without motor)	Belt	Motor	Belt	Motor	Belt	Motor
Net weight (in pounds)	4550	4200	5600	5250	5950	5600
Shipping weight (domestic)	4850	4500	5900	5550	6275	5925
Shipping weight (foreign)	5250	4900	6400	6050	6750	6400
Cubic feet (1 box) about	85	85	104	104	105	105
Code Word	MABIX	MAMAB	MABJY	MAMDE	MABLA	MAMEF

* Motor should be sent to Milwaukee to insure satisfactory mounting.

Manufacturing type machines are equipped with spindle reverse, automatic pump cutter coolant system, plain vise, and necessary wrenches.

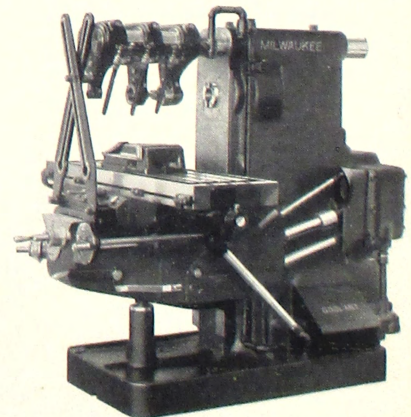


Plain Type Milling Machines

In the Kearney & Trecker Plain type milling machine you have a general purpose miller with the range and flexibility for a multitude of milling operations.

Just as suitable as the Manufacturing type for straight run production jobs, the Plain milling machine gives you the added advantage of Power Cross and Vertical Feed to the table. This is a big factor in the ease with which the machine may be set up and operated when a variety of milling jobs are going through, or when raising the table carrying a heavy workpiece.

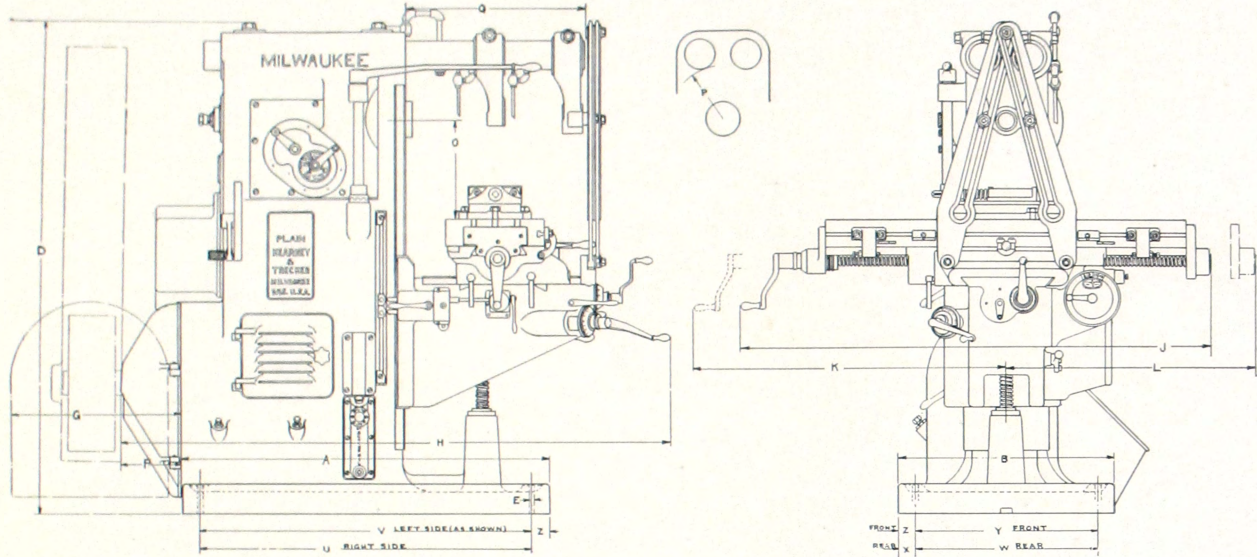
For convenience of operation the larger size Plain Milling Machines, No. 3 Heavy, No. 4 Standard, and No. 4 Heavy, are equipped with duplicate front and rear control levers.



Kearney & Trecker **MILWAUKEE** Milling Machines



PLAIN Milwaukee Milling Machines



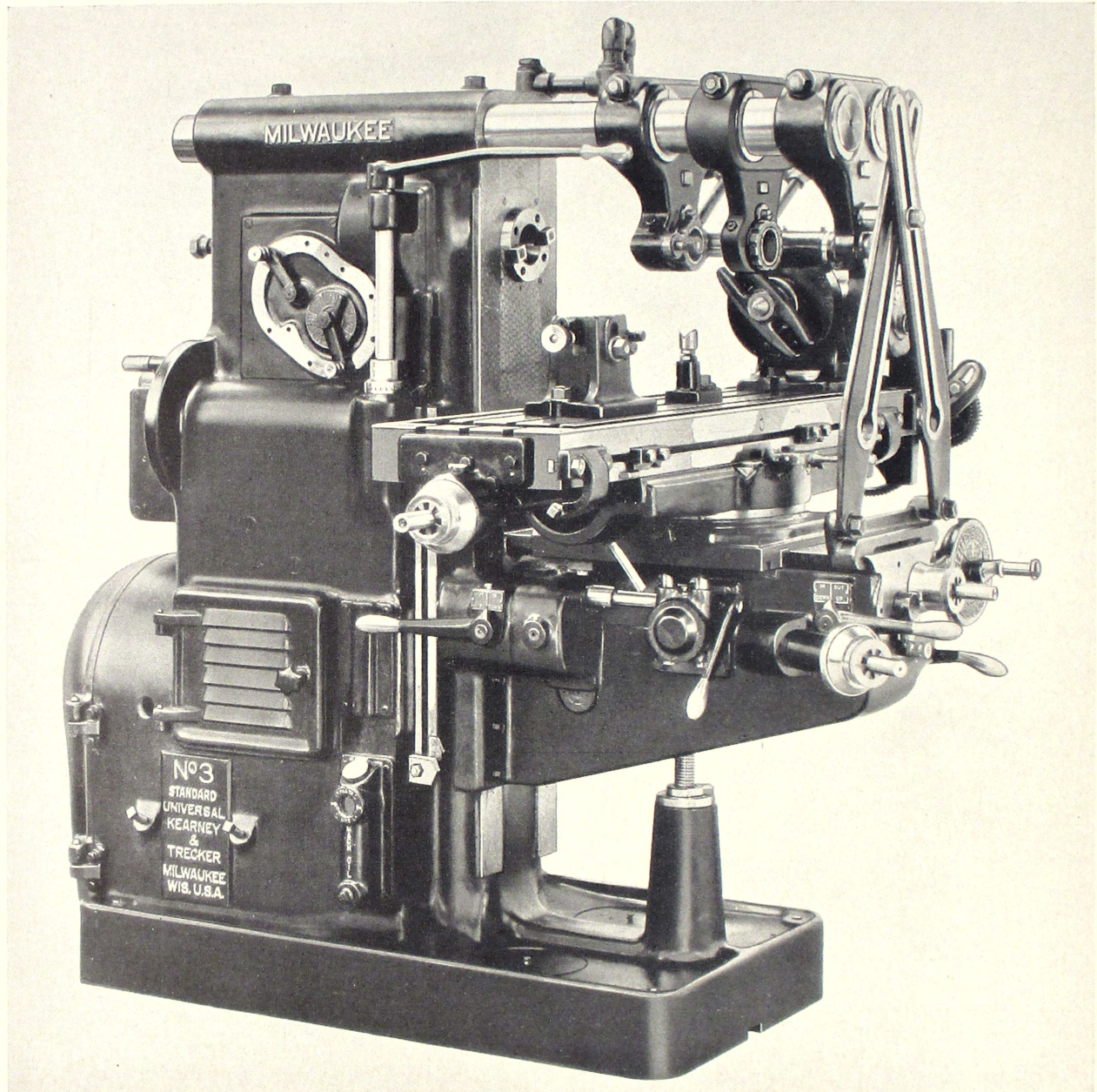
Plan Dimensions

Machine	A	B	D	E	F	G	H	J	K	L	O	P	Q	U	V	W	X	Y	Z
No. 2 STANDARD Plain.....	45 1/4"	24"	63"	11 1/8"	11"	20 5/8"	74"	65 3/4"	50 3/8"	43 7/8"	18 1/2"	6 1/16"	26"	41 3/4"	40 3/8"	21 1/2"	1 1/4"	20"	2"
No. 2 HEAVY Plain.....	48 1/4"	28"	66"	13 1/8"	11"	22 3/8"	75"	65 3/4"	50 1/2"	43 5/8"	18 1/2"	6 1/16"	29 7/8"	44 1/4"	43 3/4"	24 1/4"	2 1/8"	23 3/4"	2 1/8"
No. 3 STANDARD Plain.....	48 1/4"	28"	66"	13 1/8"	11"	22 3/8"	75"	65 3/4"	50 1/2"	43 5/8"	18 1/2"	6 1/16"	29 7/8"	44 1/4"	43 3/4"	24 1/4"	2 1/8"	23 3/4"	2 1/8"
No. 3 HEAVY Plain.....	55 3/8"	32"	70"	13 1/8"	12 1/4"	23 1/4"	82"	76"	59 3/4"	50 7/8"	19 1/2"	7 7/8"	31 3/4"	51 1/8"	51 1/8"	28 3/4"	1 5/8"	27 1/2"	2 1/4"
No. 4 STANDARD Plain.....	55 3/8"	32"	70"	13 1/8"	12 1/4"	23 1/4"	82"	86"	64 5/8"	55 7/8"	19 1/2"	7 7/8"	31 3/4"	51 1/8"	51 1/8"	28 3/4"	1 5/8"	27 1/2"	2 1/4"
No. 4 HEAVY Plain.....	64 3/8"	38"	74"	13 1/8"	10 1/4"	27 1/2"	91"	92 1/8"	70 5/8"	63 7/8"	19 1/2"	7 7/8"	35"	58 1/4"	58 1/4"	32 1/4"	2 7/8"	32 1/4"	2 7/8"

Specifications

	No. 2 STANDARD		No. 2 HEAVY		No. 3 STANDARD		No. 3 HEAVY		No. 4 STANDARD		No. 4 HEAVY	
Table feed — automatic.....	28"		28"		34"		34"		42"		42"	
Cross feed — automatic.....	10"		10"		12"		12"		14"		14"	
Vertical feed — automatic.....	18"		18"		18"		19"		19"		19"	
Power Rapid Traverse — Long.....	150"/min.		150"/min.		150"/min.		150"/min.		150"/min.		150"/min.	
Power Rapid Traverse — Cross.....	70"/min.		70"/min.		70"/min.		70"/min.		70"/min.		70"/min.	
Power Rapid Traverse — Vert.....	50"/min.		50"/min.		50"/min.		50"/min.		50"/min.		50"/min.	
Working Surface of Table.....	50" x 12 1/2"		50" x 14"		60" x 15"		60" x 16"		70" x 16"		76" x 19"	
Overarm diameters.....	3 5/8"		3 7/8"		3 7/8"		4 1/4"		4 1/4"		4 3/4"	
Number of arbor supports.....	2		2		3		3		3		3	
Number of speed changes.....	18		18		18		18		18		18	
Speed Range (R. P. M.).....	17 to 420		15 to 360		15 to 360		13 to 320		13 to 320		13 to 320	
Number of feed changes.....	18		18		18		18		18		18	
Feed Range (inches per min.).....	1/16" to 25"		1/16" to 25"		1/16" to 25"		1/16" to 25"		1/16" to 25"		1/16" to 25"	
Diameter of driving pulley.....	14"		14"		14"		16"		16"		16"	
Width of driving belt.....	2"		3"		3"		4"		4"		5"	
Speed of pulley (R. P. M.).....	600		600		600		600		600		600	
*H. P. of motor (1200 R. P. M.).....	5		7 1/2		7 1/2		10		10		15	
Approx. weight — Belt or Motor Drive (without motor)	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor
Net weight (in pounds).....	4800	4450	6050	5700	6350	6000	7800	7450	8450	8150	11150	10800
Shipping weight (domestic).....	5100	4750	6350	6000	6675	6325	8300	7950	8950	8650	11750	11400
Shipping weight (foreign).....	5500	5150	6850	6500	7150	6800	8800	8450	9450	9150	12750	12400
Cubic feet (1 box) about.....	85	85	104	104	105	105	147	147	155	155	227	227
Code Word.....	MOBEH	MOMET	MOBFI	MOMFU	MOBIL	MOMIX	MOBLO	MOMJY	MOBOS	MOMLA	MOBRU	MOMOD

*Motor should be sent to Milwaukee to insure satisfactory mounting.
Plain type machines are furnished complete with spindle reverse, automatic pump cutter coolant system, plain vise, and necessary wrenches.

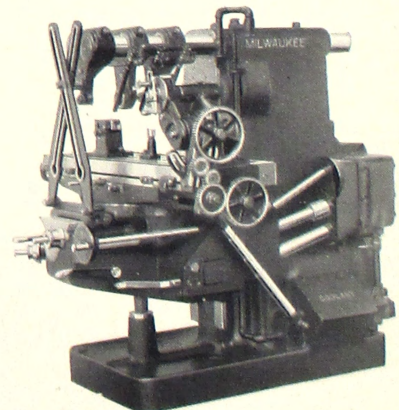


Universal Type Milling Machines

In the Universal Type Milling Machine, Kearney & Trecker give to you all that the name implies — a precision tool of the highest quality, capable of handling every kind of milling work, whether it be a production job demanding the utmost in machine flexibility, or the finest precision job in your tool room.

The "Milwaukee" Universal has all of the qualities of other Kearney & Trecker Milling Machines which affect accuracy and long life — flexibility and ease of operation, with added features which give it unlimited range of application.

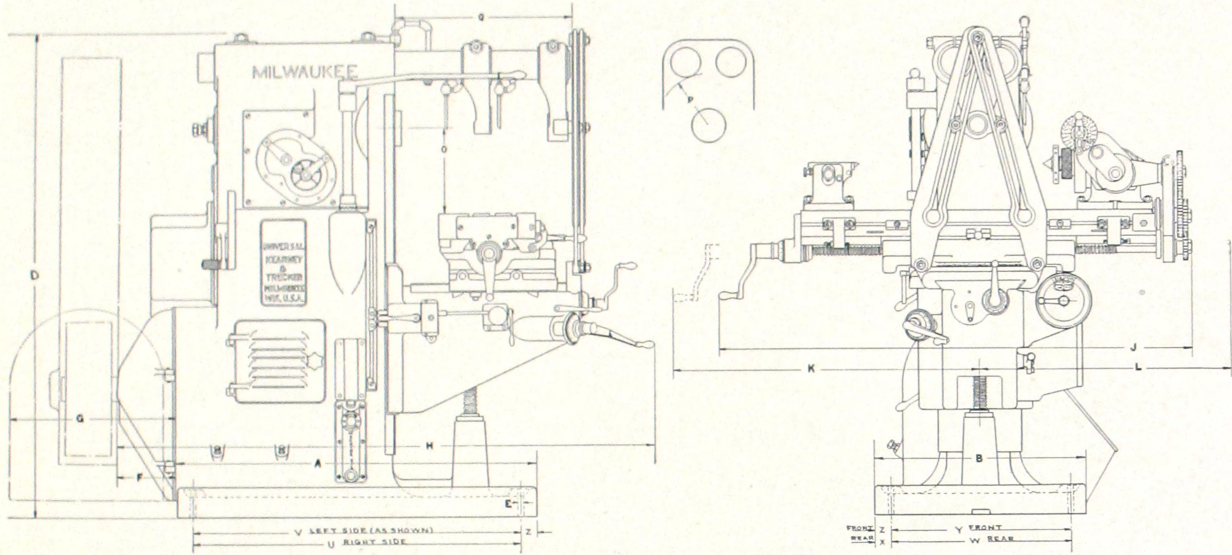
All "Milwaukee" Universal Milling Machines are equipped with spindle reverse, automatic pump cutter coolant system, swivel vise, spiral universal dividing head and tailstock, center rest, index plates and change gears for all divisions 2 to 100 and many above, index chart and necessary wrenches. The three larger sizes listed on opposite page also have duplicate front and rear control levers.



Kearney & Trecker **MILWAUKEE** Milling Machines



UNIVERSAL Milwaukee Milling Machines



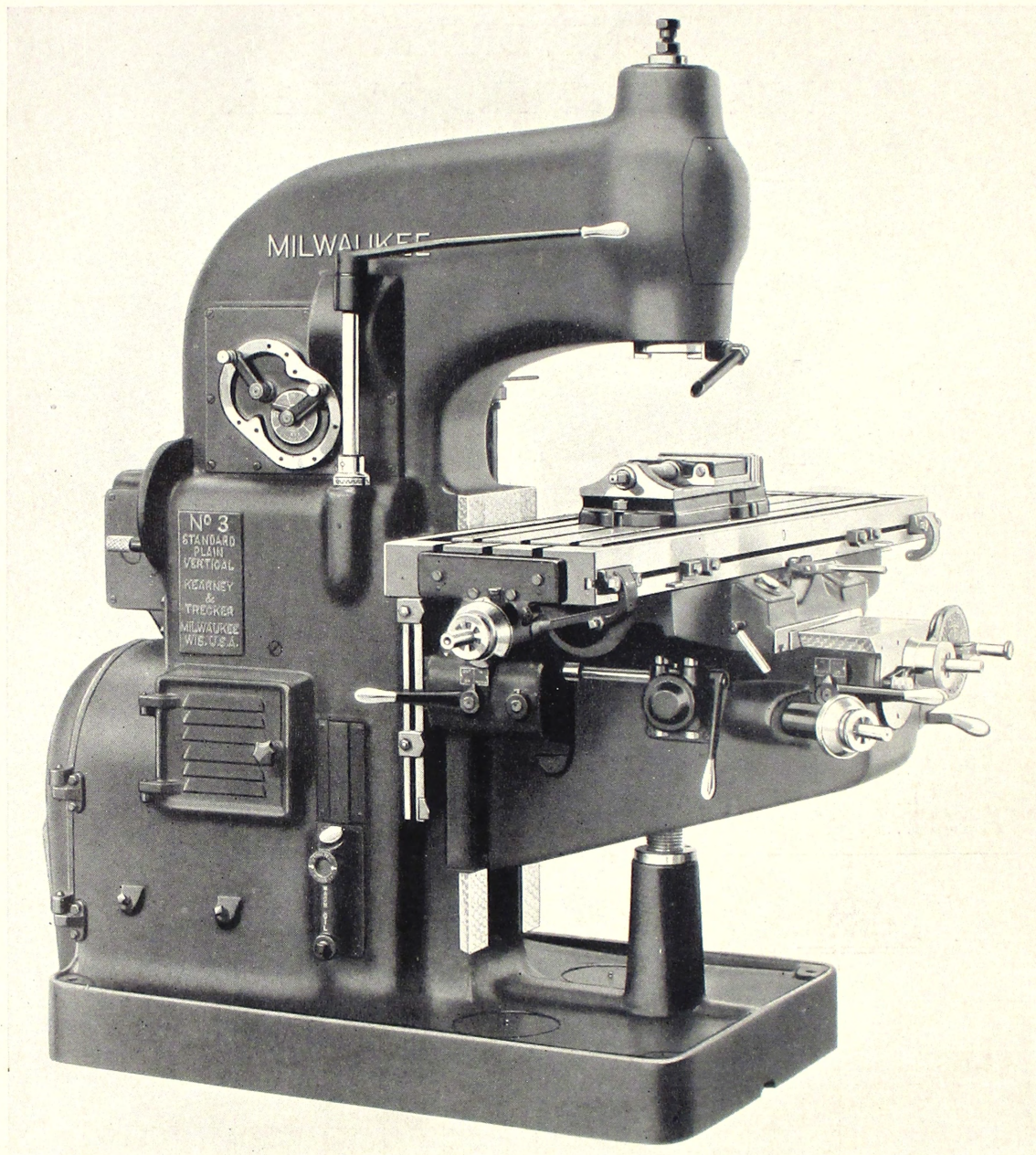
Plan Dimensions

Machine	A	B	D	E	F	G	H	J	K	L	O	P	Q	U	V	W	X	Y	Z
No. 2 STANDARD Universal	45 1/4"	24"	63"	11 1/8"	11"	20 5/8"	74"	66 7/8"	50 3/8"	45"	17 1/2"	6 7/16"	26"	41 3/4"	40 3/8"	21 1/2"	11 1/4"	20"	2"
No. 2 HEAVY Universal	48 1/4"	28"	66"	11 1/8"	11"	22 3/8"	75"	67 7/8"	50 1/2"	45 3/4"	17"	6 1/16"	29 7/8"	44 1/4"	43 3/4"	24 1/4"	2 1/8"	23 3/4"	2 1/8"
No. 3 STANDARD Universal	48 1/4"	28"	66"	11 1/8"	11"	22 3/8"	75"	67 7/8"	59 1/4"	52 1/4"	17"	6 1/16"	29 7/8"	44 1/4"	43 3/4"	24 1/4"	2 1/8"	23 3/4"	2 1/8"
No. 3 HEAVY Universal	55 3/8"	32"	70"	12 1/4"	12 1/4"	23 1/4"	82"	78 1/2"	59 5/8"	53 3/8"	19 1/2"	7 7/8"	31 3/4"	51 1/8"	51 1/8"	28 3/4"	1 5/8"	27 1/2"	2 1/4"
No. 4 STANDARD Universal	55 3/8"	32"	70"	12 1/4"	12 1/4"	23 1/4"	82"	78 1/2"	64 5/8"	58 3/8"	19 1/2"	7 7/8"	31 3/4"	51 1/8"	51 1/8"	28 3/4"	1 5/8"	27 1/2"	2 1/4"
No. 4 HEAVY Universal	64 3/8"	38"	74"	12 1/4"	10 1/4"	27 1/2"	91"	94 3/8"	70 5/8"	66 1/4"	17 1/2"	7 7/8"	35"	58 1/4"	58 1/4"	32 1/4"	2 7/8"	32 1/4"	2 7/8"

Specifications

	No. 2 STANDARD		No. 2 HEAVY		No. 3 STANDARD		No. 3 HEAVY		No. 4 STANDARD		No. 4 HEAVY	
Table feed — automatic	28"		28"		34"		34"		42"		42"	
Cross feed — automatic	10"		10"		12"		12"		14"		14"	
Vertical feed — automatic	17"		16 1/2"		16 1/2"		19"		19"		17"	
Power Rapid Traverse — Long	150"/min.		150"/min.		150"/min.		150"/min.		150"/min.		150"/min.	
Power Rapid Traverse — Cross	70"/min.		70"/min.		70"/min.		70"/min.		70"/min.		70"/min.	
Power Rapid Traverse — Vert.	50"/min.		50"/min.		50"/min.		50"/min.		50"/min.		50"/min.	
Working surface of table	50" x 12 1/2"		50" x 14"		60" x 15"		60" x 16"		70" x 16"		76" x 19"	
Overarm diameters	3 5/8"		3 7/8"		3 7/8"		4 1/4"		4 1/4"		4 3/4"	
Number of arbor supports	2		2		3		3		3		3	
Index centers swing	10"		12"		12"		14"		14"		14"	
Centers take in length	31"		28 1/2"		38 1/2"		39"		49"		55"	
Three jaw universal chuck	6"		8"		8"		9"		9"		9"	
Number of speed changes	18		18		18		18		18		18	
Speed Range (R. P. M.)	17 to 420		15 to 360		15 to 360		13 to 320		13 to 320		13 to 320	
Number of feed changes	18		18		18		18		18		18	
Feed Range (inches per min.)	1/16" to 25"		1/16" to 25"		1/16" to 25"		1/16" to 25"		1/16" to 25"		1/16" to 25"	
Diameter of driving pulley	14"		14"		14"		16"		16"		16"	
Width of driving belt	2"		3"		3"		4"		4"		5"	
Speed of pulley (R. P. M.)	600		600		600		600		600		600	
*H. P. of motor (1200 R. P. M.)	5		7 1/2		7 1/2		10		10		15	
Approx. Weights—Belt or Motor Drive (without motor)	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor
Net weight (in pounds)	5200	4850	6550	6200	6900	6550	8200	7850	8850	8500	11750	11400
Shipping weight (domestic)	5500	5150	6800	6450	7225	6875	8500	8150	9350	9000	12050	11700
Shipping weight (foreign)	6000	5450	7350	7000	7800	7450	8950	8600	9850	9500	13700	13100
Cubic feet (1 box) about	85	85	104	104	105	105	147	147	155	155	230	230
Code Word	MUBGO	MUMEY	MUBIR	MUMGA	MUBOX	MUMIC	MUBSA	MUMKE	MUBUC	MUMOI	MUBWE	MUMVO

*Motor should be sent to Milwaukee to insure satisfactory mounting.
See opposite page for standard equipment.



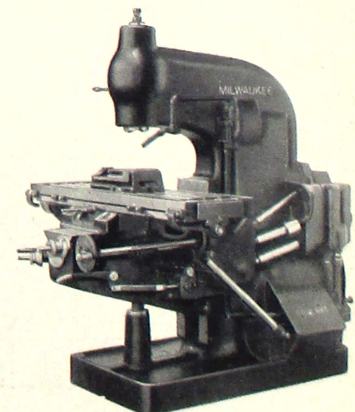
Rigid Head Vertical Milling Machines

In designing the Rigid Head Vertical Milling Machine, Kearney & Trecker departed from the usual practice of having both the knee and the spindle adjustable. Duplication of adjustments can be had only at the expense of rigidity and the vertical miller of today is called upon to do its share of heavy duty work.

In the "Milwaukee" Vertical the knee alone can be moved vertically — the spindle has adjustment only to compensate for wear. This construction is extremely rigid and assures correct alignment through years of service.

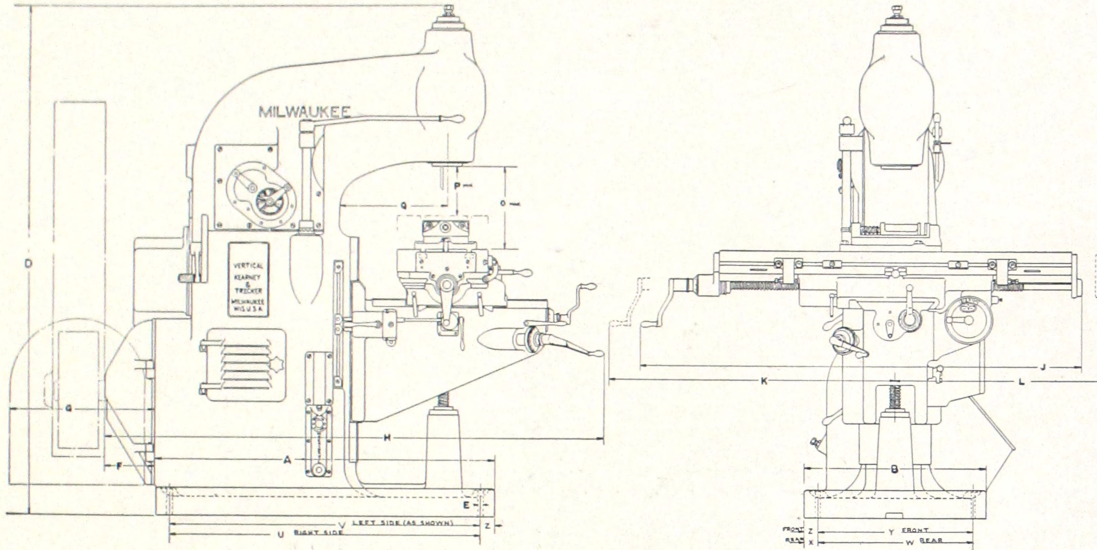
"Milwaukee" Vertical Millers embody the same features as the horizontal machines which promote years of satisfactory service — heavy box section column, solid top knee, Timken bearings throughout, centralized controls, automatic flooded lubrication and low pressure coolant system.

Pick-off gears are standard equipment on Manufacturing Type Verticals listed on opposite page.





VERTICAL Milwaukee Milling Machines



Plan Dimensions

Machine	A	B	D	E	F	G	H	J	K	L	O	P	Q	U	V	W	X	Y	Z
No. 2 STANDARD Mfg. Vertical . . .	45 1/4"	24"	73"	11 1/8"	11"	20 5/8"	74"	65 1/4"	50 3/8"	43 1/4"	17 7/8"	1"	12 1/8"	41 3/4"	40 3/8"	21 1/2"	1 1/4"	20"	2"
No. 2 STANDARD Plain Vertical . . .	45 1/4"	24"	73"	11 1/8"	11"	20 5/8"	74"	65 1/4"	50 3/8"	43 1/4"	17 7/8"	1 3/8"	12 1/8"	41 3/4"	40 3/8"	21 1/2"	1 1/4"	20"	2"
No. 3 STANDARD Mfg. Vertical . . .	52 1/4"	32"	80"	13 1/8"	9"	22 3/8"	77"	75"	59 1/4"	50 1/8"	20"	2 3/8"	16 1/2"	47 3/4"	47 3/4"	27 3/4"	2 1/8"	27 3/4"	2 1/8"
No. 3 STANDARD Plain Vertical . . .	52 1/4"	32"	80"	13 1/8"	9"	22 3/8"	77"	75"	59 1/4"	50 1/8"	20"	2 3/8"	16 1/2"	47 3/4"	47 3/4"	27 3/4"	2 1/8"	27 3/4"	2 1/8"
No. 4 HEAVY Plain Vertical	64 3/8"	38"	90"	13 1/8"	10 1/4"	27 1/2"	91"	92 1/8"	70 5/8"	63 7/8"	20"	2 1/16"	21"	58 1/4"	58 1/4"	32 1/4"	2 7/8"	32 1/4"	2 7/8"

Manufacturing Type Vertical Machines regularly furnished with Pick-Off Gear Feed Boxes.

Specifications

	No. 2 STANDARD Mfg. Vert.		No. 2 STANDARD Plain Vert.		No. 3 STANDARD Mfg. Vert.		No. 3 STANDARD Plain Vert.		No. 4 HEAVY Plain Vert.	
Table feed — automatic	28"		28"		34"		34"		42"	
Cross feed — automatic	12"		12"		14"		14"		14"	
Cross feed — hand	12"		12"		14"		14"		14"	
Vertical feed — automatic	16 1/2"		16 1/2"		17"		17"		17"	
Vertical feed — hand	16 1/2"		16 1/2"		17"		17"		17"	
Power Rapid Traverse — Long	150"/min.		150"/min.		150"/min.		150"/min.		150"/min.	
Power Rapid Traverse — Cross	70"/min.		70"/min.		70"/min.		70"/min.		70"/min.	
Power Rapid Traverse — Vert.	50"/min.		50"/min.		50"/min.		50"/min.		50"/min.	
Working surface of table	50" x 12 1/2"		50" x 12 1/2"		60" x 15"		60" x 15"		76" x 19"	
Throat to center of spindle	12"		12"		16 1/2"		16 1/2"		21"	
Number of speed changes	18		18		18		18		18	
Speed Range (R. P. M.)	17 to 420		17 to 420		15 to 360		15 to 360		13 to 320	
Type of Feed Box	Pick-Off Gears		Quick Change		Pick-Off Gears		Quick Change		Quick Change	
Number of feed changes	18		18		18		18		18	
Feed Range (inches per min.)	1" to 40"		1/8" to 25"		1" to 40"		1/8" to 25"		1/8" to 25"	
No. of standard pick-off gears in set	9		9		9		9		9	
Diameter of driving pulley	14"		14"		14"		14"		16"	
Width of driving belt	2"		2"		3"		3"		5"	
Speed of pulley (R. P. M.)	600		600		600		600		600	
*H. P. of motor (1200 R. P. M.)	5		5		7 1/2		7 1/2		15	
Approx. Weights — Belt or Motor Drive (without motor)	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor	Belt	Motor
Net weight (in pounds)	4350	4000	4600	4250	5750	5400	6150	5800	10850	10500
Shipping weight (domestic)	4650	4300	4900	4550	6075	5725	6475	6125	11350	11000
Shipping weight (foreign)	5150	4800	5400	5050	6650	6300	7050	6700	12750	12400
Cubic feet (1 box) about	95	95	95	95	165	165	165	165	250	250
Code Word	VABEK	VAMAS	VOBEX	VOMAG	VABNU	VAMGY	VOBFA	VOMCI	VOBJE	VOMIO

*Motor should be sent to Milwaukee to insure satisfactory mounting.
Vertical Milling Machines are furnished complete with spindle reverse, plain vise, automatic pump cutter coolant system, and necessary wrenches.

*If it can be milled—
mill it faster!*

