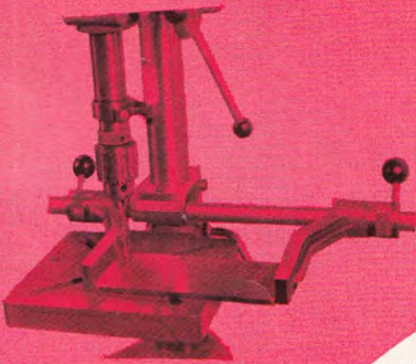


UNIVERSAL  
3-WAY VISES  
PAGE 1



UNIVERSAL MILL VISE  
PAGE 5



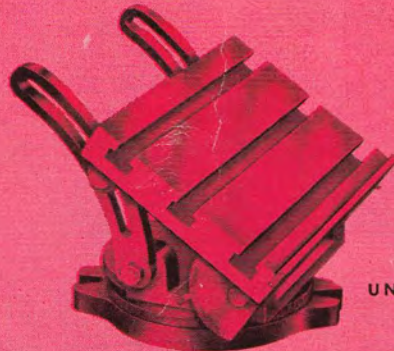
UNIVERSAL SAFETY  
WORK-HOLDERS FOR  
DRILL PRESSES  
PAGE 7

**You can  
make any set-up  
*EASIER  
QUICKER***

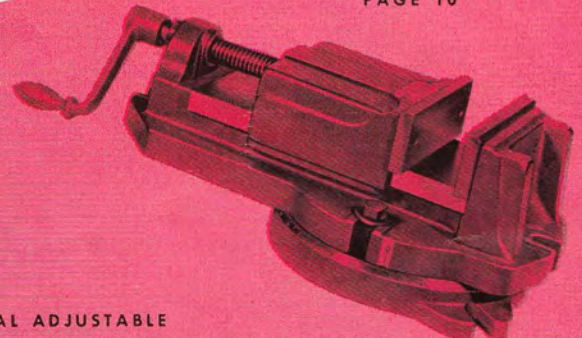
**WITH  
UNIVERSAL  
VISES AND WORK  
HOLDING FIXTURES**



UNIVERSAL PRECISION  
ADJUSTABLE LATHE FIXTURE  
PAGE 3



UNIVERSAL ADJUSTABLE  
ANGLE PLATE  
PAGE 9



UNIVERSAL LOW-BOY  
MACHINE VISE  
PAGE 10

**UNIVERSAL VISE & TOOL COMPANY • PARMA, MICH.**

CATALOGUE 9155

# With a "UNIVERSAL" You Can Machine Any Angle

**101 USES . . .** The "Universal" 3-Way Vise holds work rigidly for milling, drilling, boring, reaming, grinding, shaping, die sinking, checking — in fact for any operation involving either single or compound angles.

**COMPOUND ADJUSTMENTS QUICK, EASY . . .** The most complicated compound angles can be set quickly and easily. Double swivel cradles (each allowing 90-deg. adjustment), over a full swiveling base (allowing 360-deg. rotation), provide three separate motions, individually adjustable and lockable.

**MACHINE SHOP HEADACHES CURED . . .** The "Universal" is a specific remedy for many a headache in your machine shop. For instance, drilling a "cackeyed" hole, or . . . making two different cuts when milling a slot at a tricky angle.

**CAN REPLACE A DOZEN SPECIAL FIXTURES . . .** Ease of setting any complex angle, and interchangeability of jaw plates with your own special plates, make "Universal" an ever-ready fixture for temporary set-ups in short or pre-production runs. Saves time, trouble and expense.

**ROUND OR ODD-SHAPED WORK . . .** Unusually large jaw opening lets you readily insert your own specially shaped jaw plates for round or odd-shaped work, making the vise in reality an economical, quickly prepared universal fixture.

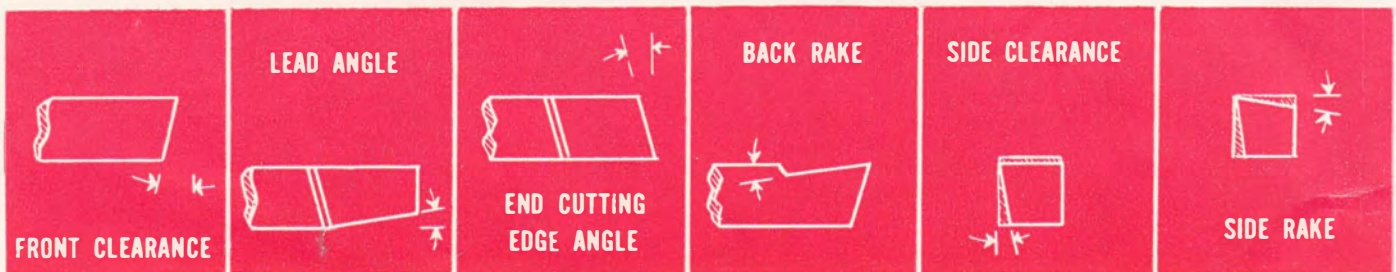
**ADAPTS SINGLE-PURPOSE MACHINES TO SPECIAL JOBS . . .** If you cannot get delivery on some special machines needed for rush jobs — then use your "Universal" Vise and adapt many of your standard machines to special jobs — in a hurry!

**FULLY PORTABLE — WITHOUT RESETTING WORKPIECE . . .** Movable from machine to machine without removing the work or disturbing the work angle. Two large base lugs provide for easy but rigid bolting or clamping.

**WEDGE-LOCKS — 2000-LB. TORQUE TESTED . . .** The cradles and the base are held securely in set position by long arc-shaped locking wedges. The locking is so positive that jaw position is not shifted even by a 2000-lb. torque load.

**EXTRA RIGIDITY — ELIMINATES VISE "CHATTER" . . .** The "Universal" holds work absolutely rigid and chatterproof. Any reasonable workpiece weight or production-cut load can be handled with toolroom accuracy at production speeds and without danger of changing set angle.

**GREATER WORK CAPACITY — BUT COMPACT . . .** The "Universal" is a heavy-duty vise, weighing as much as a third more than comparable units, and providing greater jaw capacity and more adjustments. All without sacrificing compactness. For instance: jaw opening and width are both extremely large (over 5 in.) yet closed height is only 7¾ in.



## LOWER COST TOOLING—HIGHER PRODUCTION by Accurate Angle-Grinding of Cutter Rakes and Clearances

ACCURATE ANGLE-GRINDING OF CUTTER RAKES AND CLEARANCES LETS YOU CUT AT HIGHER SPEEDS, GIVES YOU COARSER FEEDS, HOLDS YOUR TOOL EDGES LONGER, WITH LONGER RUNS BETWEEN GRINDS, HOLDS TOLERANCES FOR LONGER PERIODS—YIELDS PRODUCTION ECONOMIES.

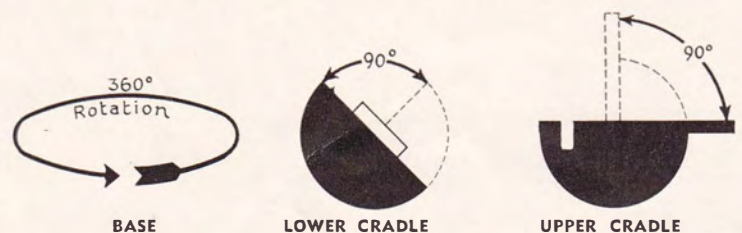
A "Universal" Vise now provides the simplest, most dependable and economical way to accurately machine and grind cutting tool angles!

For example — the average high-speed steel lathe turning tool requires six angles ground — front clearance, lead angle, end cutting edge angle, back rake, side rake and side clearance. All six can be ground quickly and accurately in a Universal Vise mounted on a magnetic chuck, **without removing the tool-bit from the vise jaws!** And the back and side rake, two most important angles, can be ground at the same time, **on one set-**

**ting of "Universal"!**

And for carbide-tipped tools, where usually three or four sides of the steel shank are angle-milled in addition to the recess, "Universal" is made to order!

### A TRULY UNIVERSAL MACHINE VISE WITH 3 SEPARATE ANGULAR ADJUSTMENTS.



# On Any Machine Tool—At Any Simple or Compound Angle

SETTING RIGIDITY ASSURED  
ALL MOVEMENT  
LOCK TESTED  
WITH 2000-LB.  
TORQUE  
LOADING

REMOVABLE HANDLE for safety and convenience.

STURDY (80 LB.) CONSTRUCTION reduces vibration and deflection under heavy loads.

BRONZE BUSHING, heavy screw for added holding power.

RIGIDITY, compactness and 3-Way adjustment make the "Universal" suitable for both tool room and production use.

REMOVABLE hardened steel jaw plates—instantly replaced with your own special jaw plates.

LOWER CRADLE has 90° range (45° each side of horizontal).

EXTRA HEAVY bosses to insure against breakage at maximum strain point under heavy loads.

JAW OPENING is full 5 inches, accommodating a wide range of work.

UPPER CRADLE has 90° range from horizontal to vertical.

UPPER AND LOWER CRADLES and swiveling base all are securely locked by four deep-seated, oversized, hardened steel bolts and flange rings acting on arc-shaped wedges. These wedge locks are all tested to withstand 2000 lbs. torque load.

HEAVY LUGS and underface base slots for bolting to machine tools.

TURNTABLE BASE rotates full 360°.

NOTE: All graduations are chrome plated, with large, clear-cut markings and are accessibly located for quick, easy reading.

BASE accurately machined—true flat, parallel and squared to the vertical axis.

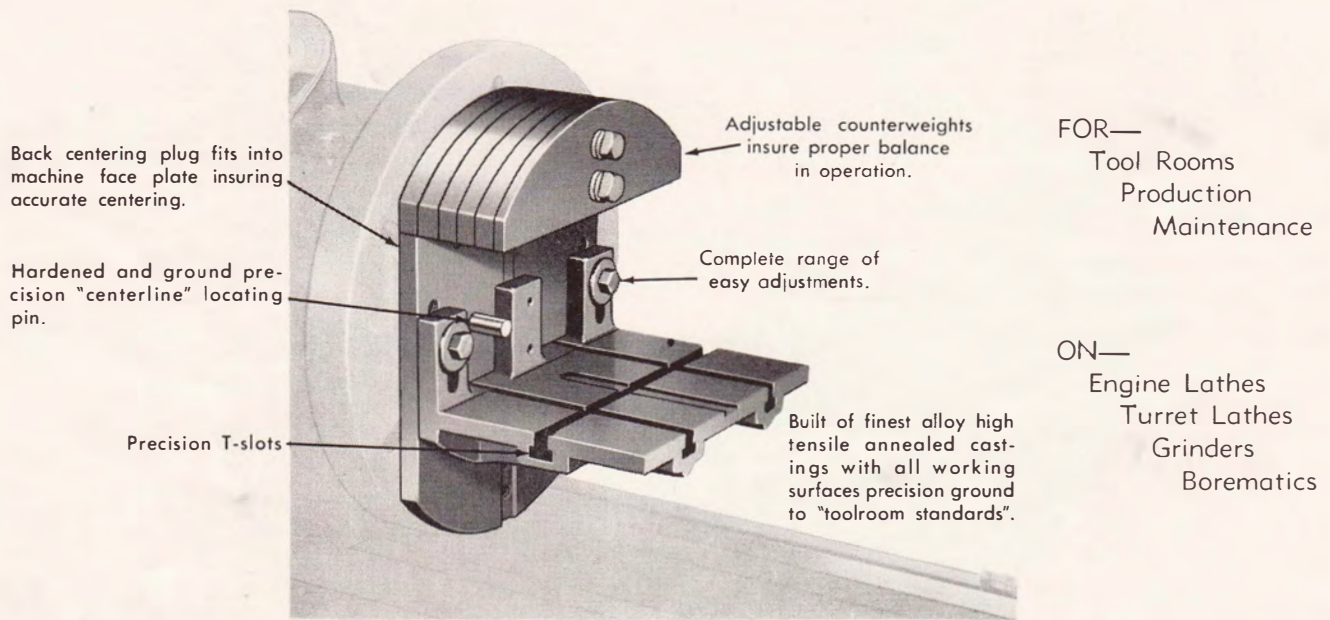
## "UNIVERSAL" 3-WAY VISE SPECIFICATIONS AND PRICES (3 SIZES)

	MODEL 1	MODEL 2	MODEL 3 (grinders model)		MODEL 1	MODEL 2	MODEL 3 (grinders model)
HEIGHT (closed) inches.....	7¾	6¼	4¼	JAW HEIGHT, inches.....	1⅞	1¾	1
HEIGHT (highest position) inches.....	18¼	14	9¾	DIAMETER OF BASE, inches.....	10¾	9	5¼ sq.
JAW WIDTH, inches.....	5½	3½	2¾	WEIGHT, pounds.....	80	42	20
JAW OPENING, steel jaws in place.....	5	3½	3¼	PRICES, F.O.B., Parma, Mich.....	195.00	175.00	160.00
Steel jaws removed.....	6	4½	4				

THE TOOL YOU CAN'T AFFORD TO BE WITHOUT! COMPACT-STURDY-ACCURATE-QUICKLY ADJUSTED

# INCREASE LATHE PRODUCTION—SAVE TIME—SAVE MONEY

## FIVE MODELS TO FIT ALL LATHES



(Model 13 Pictured)

## MOUNTING AND SETTING UP THE "UNIVERSAL" PRECISION LATHE FIXTURE

A shallow counterbore is machined in the lathe face plate to receive the fixture back plug and to accurately locate the "Universal" Precision Lathe Fixture on the lathe spindle centerline. (On models 9, 11 and 13 a back plug is made to fit the lathe spindle bore.) The "Universal" Precision Lathe Fixture is held securely to the face plate by capscrews inserted through the face plate slots into tapped holes provided. The bottom of the hardened and ground "centerline" locating pin is on the exact centerline of the lathe spindle. By means of this pin and scale readings, calipers or inside micrometers the "Universal" Precision Lathe Fixture can be accurately set vertically. The center keyway in the plate is also on exact lathe centerline and work is located horizontally by readings from this point or from the plate edge. The work or sub-fixture is easily held by the precision T-slots provided. Proper balance in operation is insured by adjusting the counterweights provided. The maximum distance that the fixture

plate can be set from the lathe centerline is shown as dimension "C" below. The fixture plates are fully adjustable through this range. Plate dimensions and "centerline" locating pin dimensions are of extreme accuracy insuring precision set-ups.

A few typical applications of the "Universal" Precision Lathe Fixture are shown on the next page. These are only a few of the hundreds of jobs where this versatile tool is proving itself. You will find that it makes lathes much more useful than ever before and lets you do jobs on lathes that used to require expensive special machinery. Your toolroom, production and maintenance costs will be cut.

The "Universal" Precision Lathe Fixture is so simple in design and operation that the "greenest hand" can use it and your experienced machinists will find it a ready answer to hundreds of machining problems.

## SPECIFICATIONS AND PRICES

MODEL NUMBER	FITS	DIMENSION "A" WIDTH OF PLATE	DIMENSION "B" LENGTH OF PLATE	DIMENSION "C" Min. and Max. Distance— Fixture Plate Top To Lathe Centerline	APPROXIMATE WEIGHT	PRICE—FOB
						Parma, Mich.
9	9" LATHES AND LARGER	7.250"	6"	0"—2"	27 LBS.	90.00
11	11" LATHES AND LARGER	7.250"	6"	0"—3"	29 LBS.	95.00
13	13" LATHES AND LARGER	7.250"	6"	0"—4"	31 LBS.	105.00
16 HEAVY DUTY	16" LATHES AND LARGER	12.000"	8"	0"—5½"	115 LBS.	195.00
24 HEAVY DUTY	24" LATHES AND LARGER	18.000"	12"	0"—8½"	255 LBS.	465.00

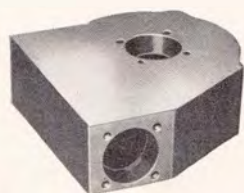
All models shipped equipped with one set of T-slot nuts, set of counterweights and wrench. Models 16 and 24 shipped with back centering plug. On models 9, 11 and 13 back centering plug is quickly turned on your own lathe

PRODUCT OF

**UNIVERSAL VISE & TOOL COMPANY • PARMA, MICHIGAN**

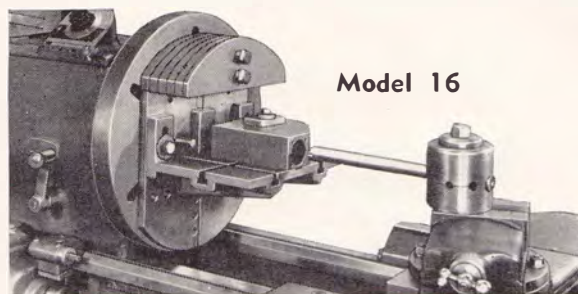
# WITH THE NEW "UNIVERSAL" PRECISION LATHE FIXTURE

## Production Boring



## TYPICAL APPLICATIONS

Casting Bored on a "Universal" Precision Lathe Fixture — A perfect substitute for an expensive boring mill.



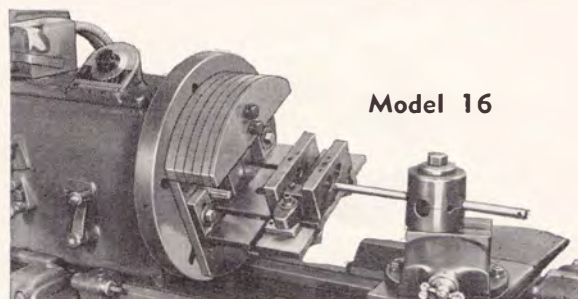
Model 16

To accurately position and bore a gear case casting.

## Tool Room



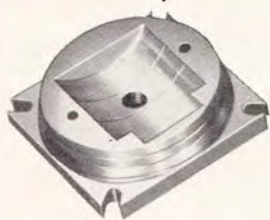
Both holes accurately located and precision bored on a "Universal" Precision Lathe Fixture.



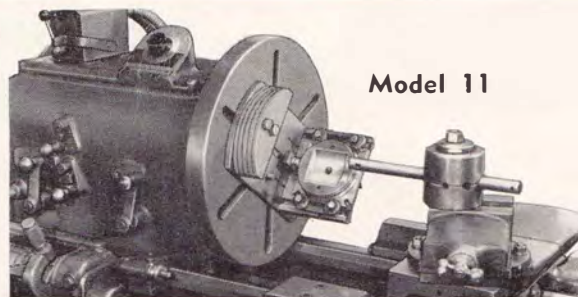
Model 16

To accurately bore two holes in a drilling fixture.

## Maintenance Dept.



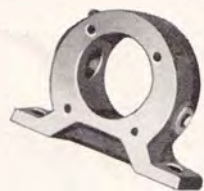
Located, held and precision machined on a "Universal" Precision Lathe Fixture — no special cutters required.



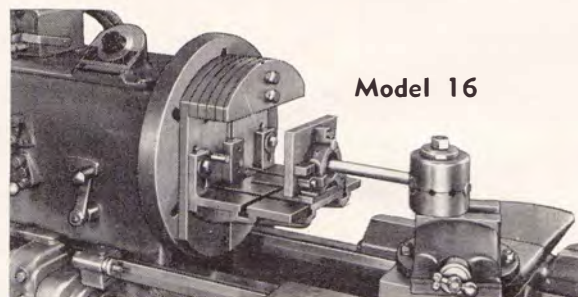
Model 11

To accurately machine a radiused recess in a machine part.

## Production



Simple sub-fixture on "Universal" Precision Lathe Fixture cuts tooling costs and increases accurate production.



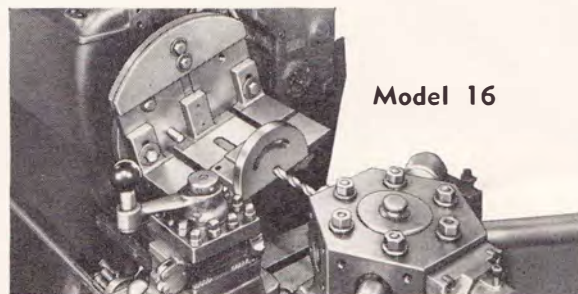
Model 16

To accurately position and bore a bearing housing.

## Turret Lathe Production



Casting mounted in a simple sub-fixture on "Universal" Precision Lathe Fixture. Production up and tool design and building costs way down.



Model 16

To locate, turn, face, center drill, drill and tap a machine casting.

**"UNIVERSAL" TOOLS ARE IN USE IN MORE THAN 10,000 PLANTS**

See Back Page for a Partial List of Users of "UNIVERSAL" Precision Tools

# NO OTHER MILL VISE OF

## NO SLIPPING

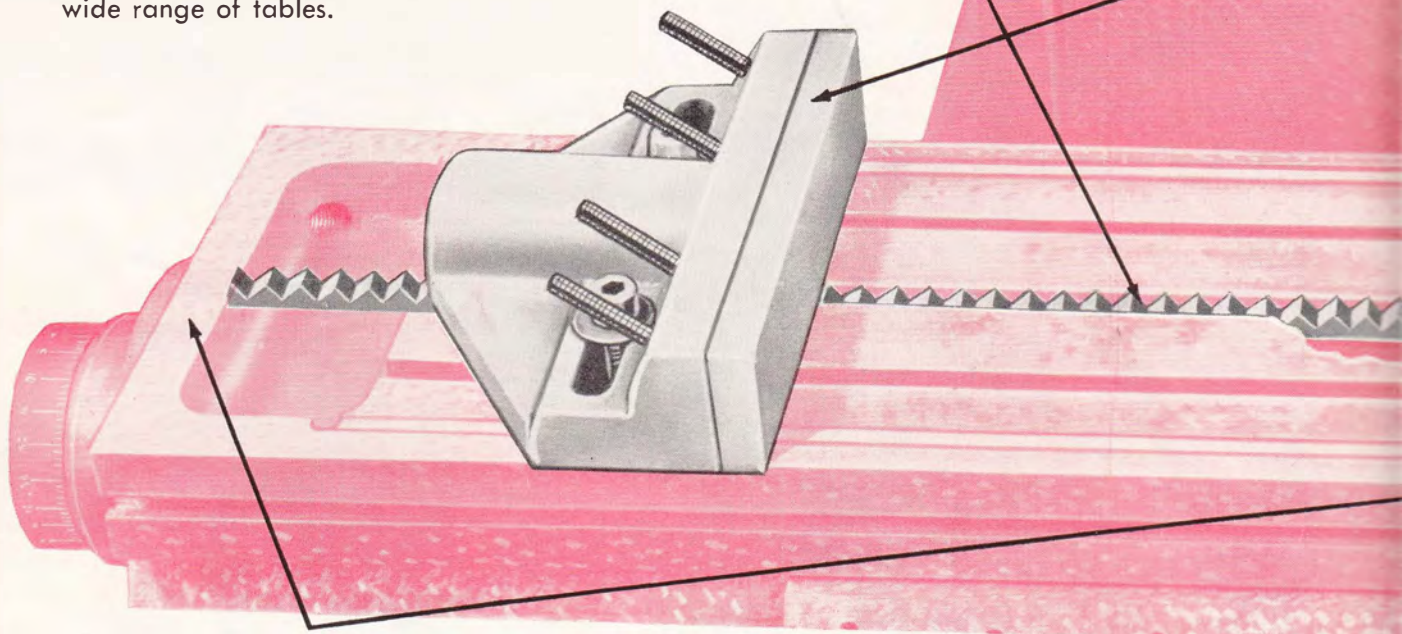
Teeth in the key in the bottom of each jaw fit into the teeth on the Tie-Bar locking the jaw in place.

## SQUARE SET

Key in the bottom of each jaw assures square setting of vise with the T-slot table.

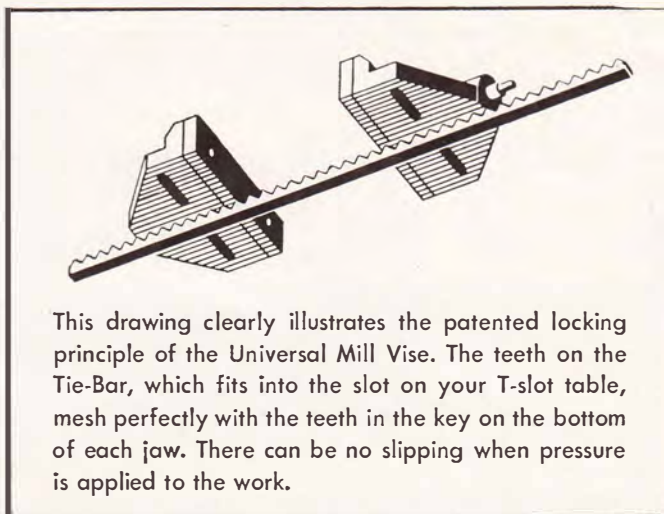
## VERSATILITY

Elongated holes for T-slot bolts enable the Universal to fit a wide range of tables.



## FULL TABLE LENGTH OPENING

There is no limit to the opening other than the length of the table.



This drawing clearly illustrates the patented locking principle of the Universal Mill Vise. The teeth on the Tie-Bar, which fits into the slot on your T-slot table, mesh perfectly with the teeth in the key on the bottom of each jaw. There can be no slipping when pressure is applied to the work.

## You can machine any on a T-Slot Table with UNIVERSAL MILL VISE

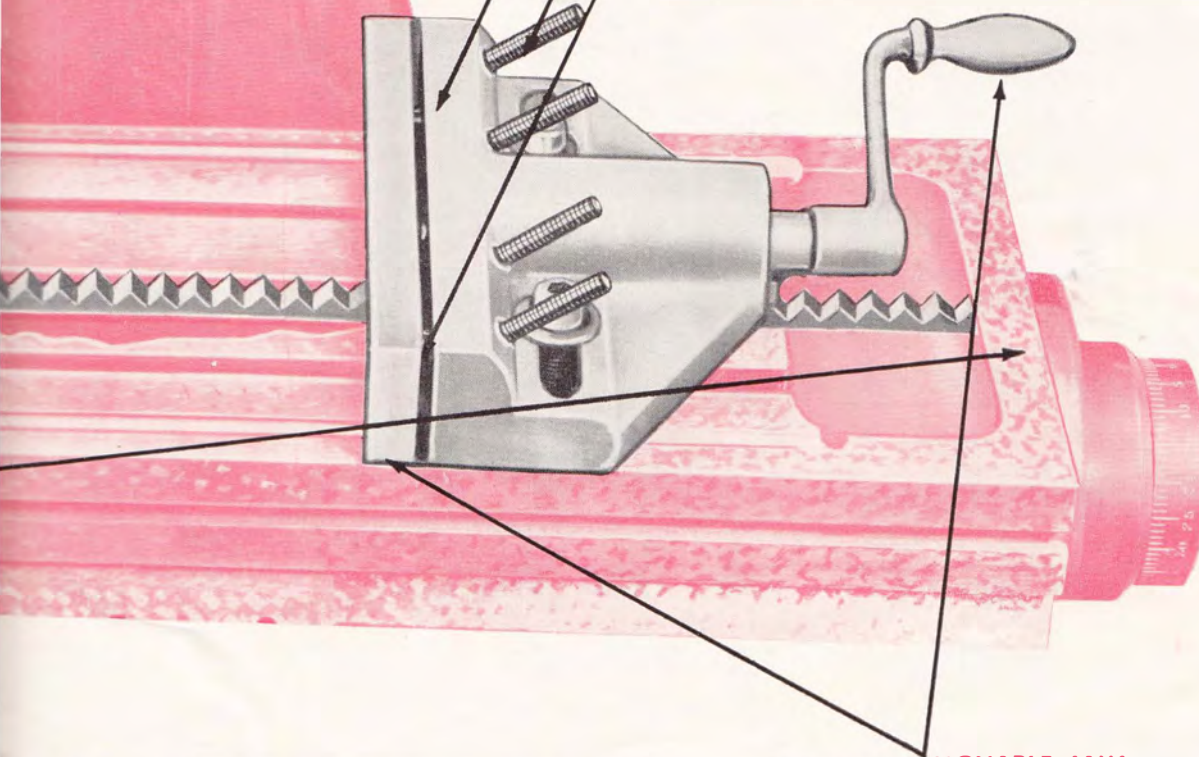
- In tool shops and mold shops where large blocks are held rigidly for milling, shaping, grinding, die-sinking, or any machining operation that can be set up on a table.
- In pattern shops for holding large patterns for machining.
- For production machining on large pieces.
- Standard 36" Tie Bar can be cut to any shorter length. Extra length tie bars can be furnished at slight additional cost.

# FERS THESE FEATURES

**GROUND STEEL JAWS**

**HOLD DOWN BOLTS**

**MOVABLE JAWS—MINUTE ADJUSTMENTS EASY**

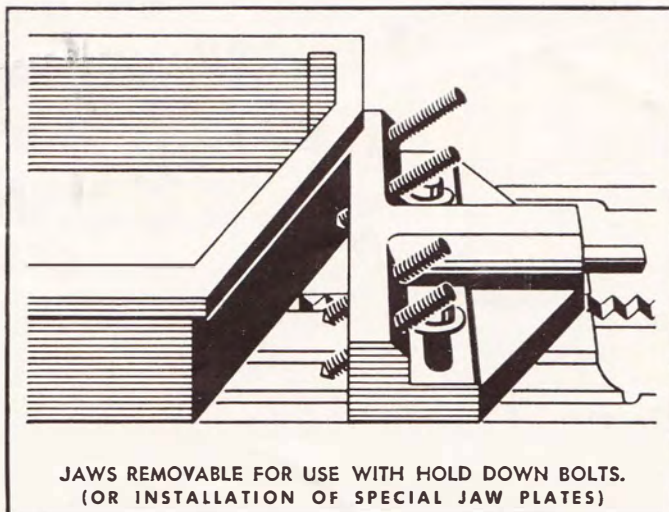


**MOVABLE JAW**

The movable jaw permits minute adjustments, by giving the handle a one half turn after the approximate set up has been made.

## **SPECIFICATIONS AND PRICES**

WIDTH OF JAW— $8\frac{7}{8}$ "  
DEPTH OF JAW— $2\frac{1}{2}$ "  
Range of distances between holding T-slots— $3\frac{1}{2}$ " to 8". Standard tie bar fits all T-slots  $\frac{1}{2}$ " or wider.  
Price (Standard Model) with  $\frac{1}{2}$ " T-slot keys and 36" Tie-Bar.  
F.O.B., Parma, Michigan. \$90.  
Extra "T-Slot" keys, any size—\$3.00 per set of 4.



**JAWS REMOVABLE FOR USE WITH HOLD DOWN BOLTS.  
(OR INSTALLATION OF SPECIAL JAW PLATES)**

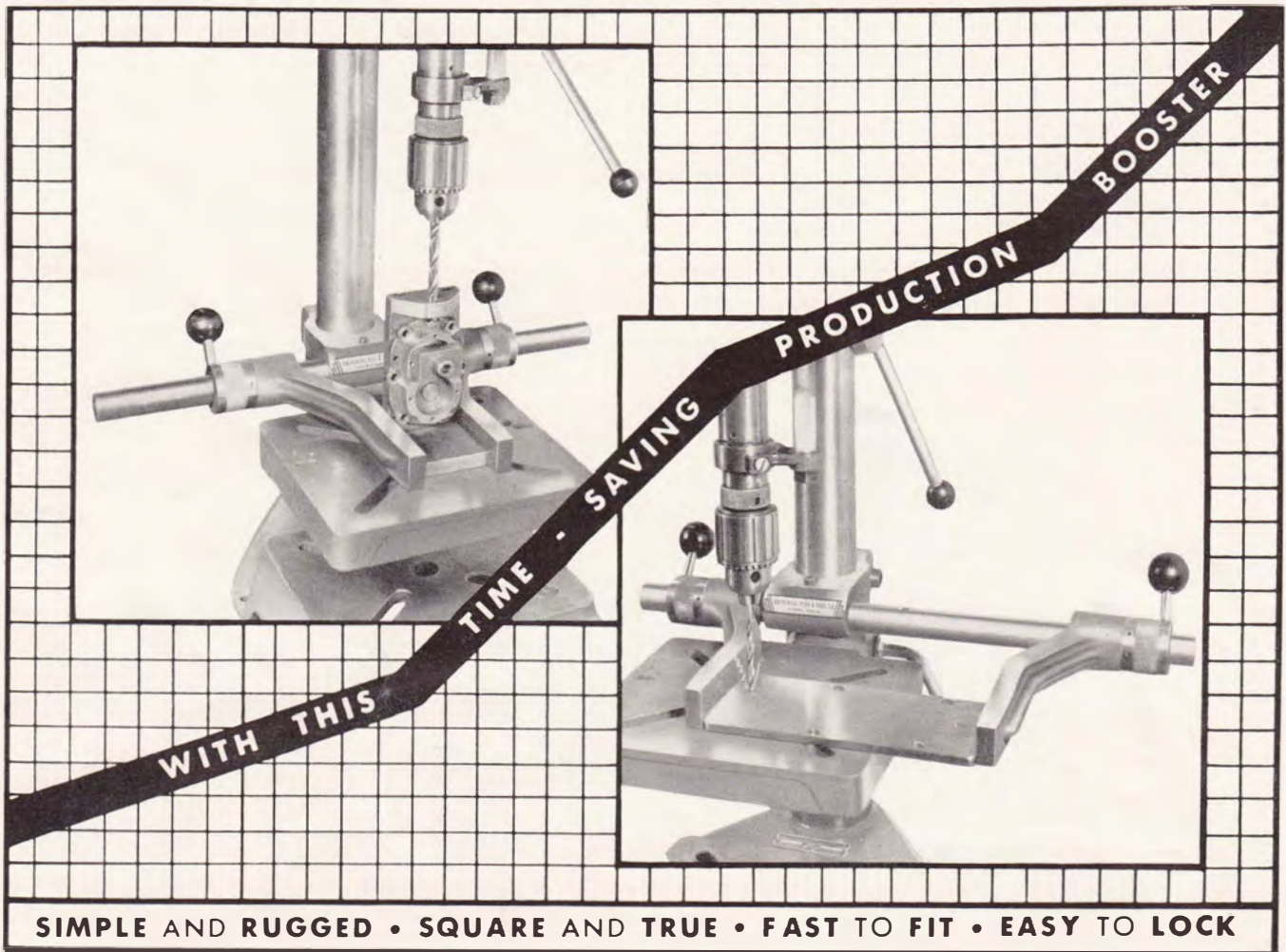
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# STOP DRILL PRESS ACCIDENTS



## REMOVES TEMPTATION TO HOLD BY HAND!

**IT'S ACTUALLY USED**—Welcomed!—by drill press operators. That's because the Universal Safety Work Holder makes attachment swift, simple, solid.

**INSTANTLY ADJUSTABLE** arms give firm true grip on odd shapes . . . on tumble jigs and others. Often saves cost of making one-time jigs, or trying makeshifts.

**NO BOLTS OR CLAMPS** to hold vise when needed. And the true alignment—the square-machined faces—automatically provide parallels.

**MADE IN TYPES** to fit round or box columns . . . the Universal Safety Work Holder safeguards men, production schedules and costs with mere nominal investment. (\$27 to \$35.25 each.)

### CAST IRON

Arms and Collars

### STEEL

Cross Rod

### CHROME PLATED

Working Parts

### SQUARE-MACHINED

Arms, Faces,  
Tops, Bottoms

### MAN-SIZE

Lock Knobs  
and Levers

• See opposite page for details of models, specifications and prices.

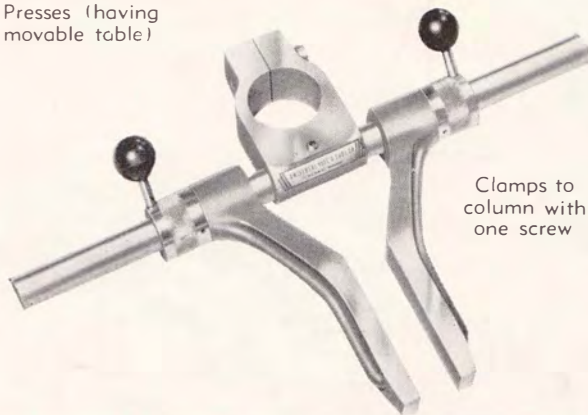
# WITH UNIVERSAL WORK HOLDERS

## NOTE THESE FEATURES!

1. The "Universal" Safety Work Holder clamps to the column of your drill press.
2. A quarter turn of the handles locks the arms.
3. These arms can be opened the full width of the drill press table to accommodate work as wide as the table itself.
4. The rod can be locked in any location, crosswise, or can be left floating for self centering drilling.
5. Split collar allows installation on drill press without disturbing machine in any way.
6. Arms are instantly removable to clear special jigs, extra large work, etc.

### MODELS 1 THRU 7

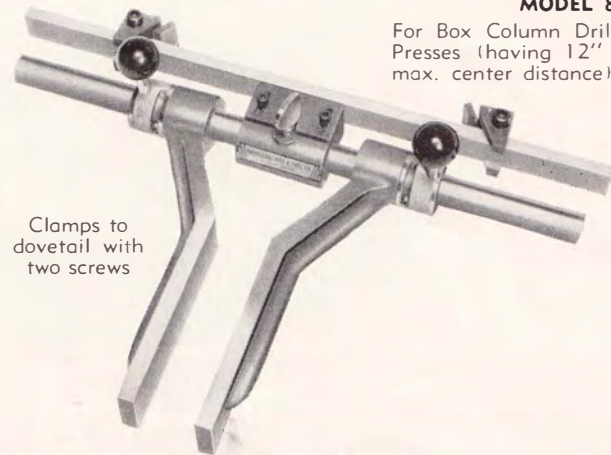
For Round Column Drill Presses (having movable table)



Clamps to column with one screw

### MODEL 8

For Box Column Drill Presses (having 12" max. center distance)



Clamps to dovetail with two screws

## THERE'S A "UNIVERSAL" SAFETY WORK HOLDER FOR EVERY POPULAR SINGLE SPINDLE DRILL PRESS

MODEL	FITS	ARM LENGTH	WORK WIDTH	PRICE F.O.B. Parma, Mich.
<b>No. 1</b> For 1 3/8" Round Col.	Montgomery-Ward Power-King 61	9 1/4"	10 1/2"	\$27.00
<b>No. 2</b> For 2 1/4" Round Col.	Atlas 53 Power-King 620 Craftsman (Sears-Roebuck) 13 1/2" ball bearing type	9 1/4"	10 1/2"	\$28.00
<b>No. 3</b> For 2 3/4" Round Col.	Atlas 63-73-64-74 Boice-Crane 1600 and 2600 Buffalo 15 Delta 14 in. Craftsman (Sears-Roebuck) industrial quality 15" Walker-Turner D-950	10 1/2"	10 1/2"	\$29.50
<b>No. 4</b> For 3" Round Col.	Canedy-Otto (Royal) 16	10 1/2"	10 1/2"	\$30.75
<b>No. 5</b> For 3 1/2" Round Col.	Canedy-Otto (Royal) 18 Delta 17	12 1/2"	10 1/2"	\$31.75
<b>No. 6</b> For 3 3/4" Round Col.	Walker-Turner D-1100	12 1/2"	10 1/2"	\$33.50
<b>No. 7</b> For 4" Round Col.	Buffalo 18 (Column diameter runs from 3-29/32" to 4". Give exact diameter)	12 1/2"	10 1/2"	\$35.00
<b>No. 8</b> For Box Col. Only	All box column drill presses having table held to column by a dovetail. Distance from front of column to center of drill must not exceed 12".	10" to 12 1/2"	10 1/2"	\$35.25

QUOTATIONS WILL BE MADE ON MODELS TO FIT DRILL PRESSES NOT LISTED  
WHEN ORDERING AND ON INQUIRIES, BE SURE TO SPECIFY:

1. Make and Model of drill press.
2. If box column—give distance from front of column dovetail to center of spindle.
3. If round column—give exact column diameter.
4. Whether or not drill press table is movable.
5. Table size.

# PRECISION Angle Plate...

**HEAVY CONSTRUCTION**

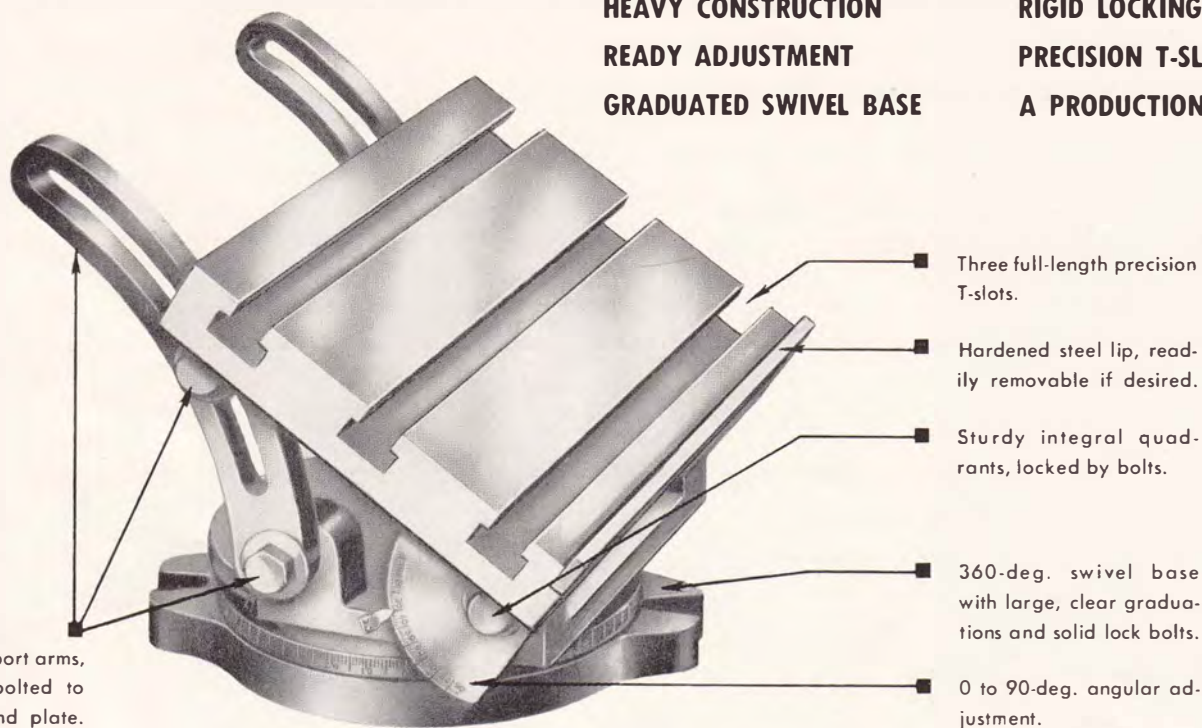
**READY ADJUSTMENT**

**GRADUATED SWIVEL BASE**

**RIGID LOCKING**

**PRECISION T-SLOTS**

**A PRODUCTION TOOL**



Extra-heavy support arms, solidly double-bolted to lugs on base and plate.

Three full-length precision T-slots.

Hardened steel lip, readily removable if desired.

Sturdy integral quadrants, locked by bolts.

360-deg. swivel base with large, clear graduations and solid lock bolts.

0 to 90-deg. angular adjustment.

## SAVE SET-UP TIME...ELIMINATE EXPENSIVE FIXTURES

### SAVE SET-UP TIME

"Universal" Compound Angle Plates are saving precious set-up time in plants all over the country. You can use them on all kinds of shop operations, from jig boring to checking. They can be clamped to a lathe face plate or held on a magnetic chuck.

### ELIMINATE EXPENSIVE FIXTURES

Used with a simple machine vise, they can handle most angular milling, shaping or drilling jobs, eliminating expensive fixtures on short or varied production runs.

### EASILY SET FOR ANY ANGLE

Swivel bases have large, clear graduations from 0-360 degrees, and quadrants are similarly graduated from 0-90 degrees for set-ups accurate to 1/2 of one degree. For closer tolerances—as in jig boring—protractors or sine bars can be applied.

### PORTABLE—WITHOUT DISTURBING SET-UP

"Universal" Compound Angle Plates, with a die, tool or other

part-in process mounted in desired position, can be transferred from machine to machine, as required, without disturbing the set-up.

### RIGID—ACCURATE—RUGGED

Large heavy bases—oversized slotted arms—accurate engineering and solid construction throughout—insure rigid, non-chatter support for heavy pieces or cuts.

### PRECISION T-SLOTS

Three, full-length, T-slots are accurately squared with the base. They provide for both center bolting and edge clamping.

### REMOVABLE LIP

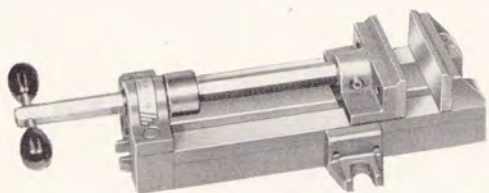
A 1/4 inch steel lip along the lower edge of surface plate, projects 1/4 inch above the surface to carry the downward thrust of work or machine vise, thus reducing clamping load. Three cap-screws quickly remove the lip.

## ANGLE PLATE SPECIFICATIONS

Height, horizontal position, with steel lip .....	5 3/4 in.	Width of surface plate .....	8 in.	Vertical Adjustment .....	90 deg.
without steel lip .....	5 1/2 in.	Number T-Slots .....	3 in.	Diameter of Base .....	7 3/4 in.
Length of surface plate .....	12 in.	Length of T-Slots .....	12 in.	Weight .....	68 lb.
		Horizontal Adjustment .....	360 deg.	Price, F.O.B., Parma, Mich.	\$95.00

# FOUR SPECIALS...Needed in every shop

## UNIVERSAL QUICK-ACTING MACHINE VISES



With "Push-Pull" Lock and release.  
Quick release lock lets you shove jaw against work, then clamp with quick twist. Clamping Knob grips work with only a half turn.

Strong—with steel ways.

Light weight—15 and 17 lbs.—and easily handled on portable jobs. Time saver on Drill Presses, Milling Machines, Planers, Surface Grinders, Shapers.

Made in two sizes:

**Model QA-1 (4-inch opening) .....\$35.00**

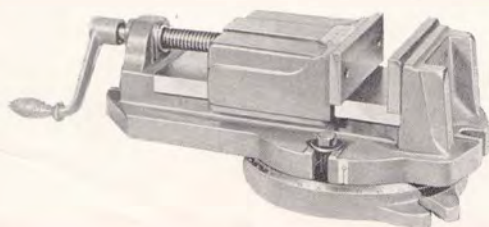
Jaws: 1 1/2" x 4"  
Length 13"  
Width 7"  
Height 3"  
Weight 15 lbs.

**Model QA-2 (6-inch opening) .....\$39.00**

Jaws: 1 1/2" x 4"  
Length 15"  
Width 7"  
Height 3"  
Weight 17 lbs.

Adapters available, for attaching this unit to your drill press column.

## UNIVERSAL LOW-BOY MACHINE VISES



Its low, compact construction allows greater tool clearance and makes it more rigid, stronger, for heavy cuts.

Built with ground working surfaces, with removable hardened and ground steel jaws. Has large Acme screw; drop forged crank handle. "T" bolts have been eliminated for cleaner, smoother swiveling.

Made in two sizes, and available with or without swiveling base:

	P-1	P-2
Height, with base .....	4 3/4"	5 3/4"
Height, without base .....	3 1/2"	4 3/8"
Jaw height .....	1 5/8"	1 5/16"
Jaw width .....	4 1/2"	5 1/2"
Opening with jaws .....	3 5/8"	4 5/8"
Opening without jaws .....	4 3/8"	5 5/8"
Weight .....	38 lbs.	67 lbs.

**Price with swivel base .....\$45.00 \$55.00**

**Price without swivel base..\$37.00 \$47.00**

## UNIVERSAL "MAN-SIZED" PARALLEL CLAMPS EXTRA LARGE SIZE FOR MORE CAPACITY

• CHECK THESE EXCLUSIVE FEATURES . . .

**SIZES START WHERE OTHERS LEAVE OFF — QUICK ACTING — FINEST  
QUALITY HARDENED STEEL.**



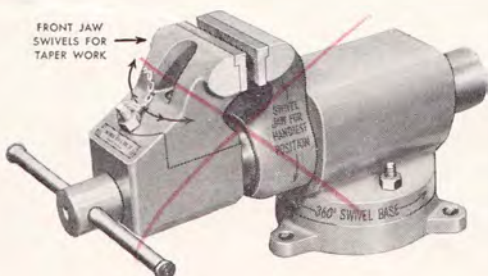
Model	Overall Length	Jaw Length	Jaw Opening	Price	
				Pair	Each
425	9"	4 1/4"	Full 6"	\$10.00	\$5.25
525	11"	5 1/4"	Full 6"	\$11.50	\$5.75
625	13"	6 1/4"	Full 6"	\$12.50	\$6.50

*Discontinued*

## UNIVERSAL ALL-PURPOSE BENCH VISE

For every shop use: tool room, production maintenance, inspection. Jaws swivel to handiest position. Easily holds taper work. Has these exclusive features: swivels in horizontal and vertical planes; front jaw swivels to accommodate taper work; extra large 8-inch opening; rugged construction (weighs 98 lbs.); extra large and flat working surface at back. Available with either serrated or plain hardened, removable steel jaws.

Jaw width .....	4 1/2"
Jaws open .....	8"
Height .....	10"
Length .....	21"
Weight .....	98 lbs.
<b>PRICE .....</b>	<b>\$98.00</b>



Swivel Jaws for Handiest Position

**ALL PRICES F.O.B. PARMA, MICHIGAN**

# Partial List of Users of

## "UNIVERSAL" VISES, ANGLE PLATES & FIXTURES

This list represents only a very small percentage of the more than 10,000 leading manufacturers all over the world who use "Universal" products.

### AVIATION

A. G. A. Aviation Corp.  
Bell Aircraft Co.  
Bendix Aviation Corp.  
Cessna Aircraft  
Curtiss-Wright Corp.  
Fairchild Aviation  
Hughes Tool, Aircraft Strut Div.  
Glenn L. Martin Co.  
Mercury Aircraft  
Naval Aircraft Factory, Phila.  
North American Aviation, Inc.  
Pratt & Whitney Aircraft  
Ranger Aircraft Corp.  
Sacramento Air Depot—War Dept., Air Corps  
Taylorcraft Aviation Corp.  
Vultee Aircraft, Inc.  
Warner Aircraft Corp.

### AUTOMOTIVE

American Motors Corp.  
Borg-Warner Corp.  
Cannon Mfg.  
Carter Carburetor Corp.  
Chrysler Corp.  
Eaton Mfg. Div. Wilcox-Rich  
Ford Motor Co.  
Gar Wood Industries  
General Motors Corp. Divisions  
A. C. Spark Plug—Aero Products  
Buick Motor—Cadillac Motor  
Chevrolet—Detroit Diesel  
Fisher Body  
G. M. Truck & Coach  
Harrison Radiator  
New Departure—Oldsmobile  
Libby-Owens-Ford, Aviation Div.  
Motor Wheel Corp.  
Reo Motors Inc.  
Studebaker-Packard Corp.  
White Motor Co.  
Willys-Overland Motors

### RAILROADS

Baldwin Locomotive Works  
Illinois Central R. R.  
New York Central  
Southern Pacific R. R.  
United Traction, Albany

### METAL PRODUCTS

Aluminum Co. of America  
American Brake Shoe & Foundry Co.  
American Brass Co.  
American Can Co.  
American Radiator & Standard Sanitary Corp.  
American Stove Co.  
Babcock & Wilcox Tube Co.  
Bell & Howell Co.  
Bridgeport Brass Co.  
Caterpillar Tractor Co.  
Continental Can Co.

Crane Company  
General Fireproofing Co.  
International Nickel Co.  
Kaiser Metal Products Co.  
McQuay-Norris Co.  
Reed & Barton  
Revere Copper and Brass, Inc.  
Reynolds Metals Co.  
Ruud Manufacturing Co.  
SKF Industries  
Sperry Gyroscope Co.  
Teletype Corp.  
Toledo Scale  
U. S. Aluminum Co.  
Underwood Corp.  
Worthington Pump & Machinery Corp.  
Youngstown Steel Car Corp.

### STEEL

American Steel & Wire Co.  
Atlantic Steel  
Bethlehem Steel Co.  
Inland Steel Co.  
Pittsburgh Steel Co.  
Republic Steel Co.  
Truscon Steel Co.  
U. S. Steel Corp.  
Wheeling Steel Corp.

### ELECTRICAL — ELECTRONICS

Allis Chalmers Co.  
Anaconda Wire & Cable Co.  
Apex Electrical Mfg. Co.  
Crosley Corp.  
Easy Washing Machine Co.  
Electric Auto-Lite Co.  
Electrolux Corp.  
Emerson Electric Co.  
General Cable Corp.  
General Electric Co.  
General Electric X-Ray Corp.  
Howell Electric Motors Co.  
New Haven Clock Co.  
Philco Corp.  
Radio Corp. of America  
Raytheon Mfg. Co.  
Servel Inc.  
Sylvania Corp.  
Western Electric Co.  
Westinghouse Elec. & Mfg. Corp.  
Springfield Baltimore Lima  
Pittsburgh Sharon Sunbury

### MACHINERY—MACHINE TOOLS

American Laundry Machinery Co.  
American Machine & Foundry Co.  
American Machine & Metals, Inc.  
E. W. Bliss Co.  
S. F. Bowser & Co.  
Bullard Co.  
Burroughs Adding Machine Co.  
Chicago Pneumatic Tool Co.  
Cincinnati Bickford Tool Co.

Cincinnati Milling Machine Co.  
Cushman Chuck Co.  
A. B. Dick Co.  
De Laval Separator Co.  
De Laval Steam Turbine Co.  
General Machinery Corp.  
Gisholt Machine Co.  
Ingersoll-Rand Co.  
Jeffrey Manufacturing Co.  
John Deere Co.  
Kearney & Trecker Corp.  
R. K. Le Blond Machine Tool Co.  
Link Belt Co.  
Mesta Machine Co.  
National Acme Co.  
Norton Co.  
Oliver Farm Equipment Co.  
Reed Roller Bit Co.  
Saco-Lowell Shops  
F. J. Stokes Machine Co.  
Textile Machine Works  
Vickers, Inc.  
VGO Press Co.  
Walworth Co.  
Warner & Swasey Co.  
Westinghouse Air Brake Co.

### NAVY YARDS — SHIPYARDS — ARSENALS

Alabama Dry Dock  
Corozal Post, Canal Zone  
General Engineering & Dry Dock Co.  
General Dynamics Corp.  
Hercules Powder Co.  
Key West Naval Station  
Manitowoc Shipbuilding Co.  
Matson Navigation Co.  
New London Submarine Base  
Newport News Shipbuilding & Drydock Co.  
Philadelphia Navy Yard  
Picatinny Arsenal  
Portsmouth Navy Yard  
Puget Sound Navy Yard  
U. S. Ordnance—Fla.  
Washington Navy Yard

### INDUSTRIAL SPECIALTIES

American Optical Co.  
Bausch & Lomb Optical Co.  
Celotex Corp.  
Congoleum-Nairn, Inc.  
Continental Oil Co.  
Dow Chemical Co.  
Firestone Tire & Rubber Co.  
General Mills  
Goodyear Tire & Rubber Co.  
Gulf Oil Co.  
Liquidometer Corp.  
Masonite Corp.  
Minn. & Ontario Paper Co.  
Ohio Oil Co.  
Pacific Mills  
Parke Davis & Co.  
Pepperell Mfg. Co.  
U. S. Rubber Co.