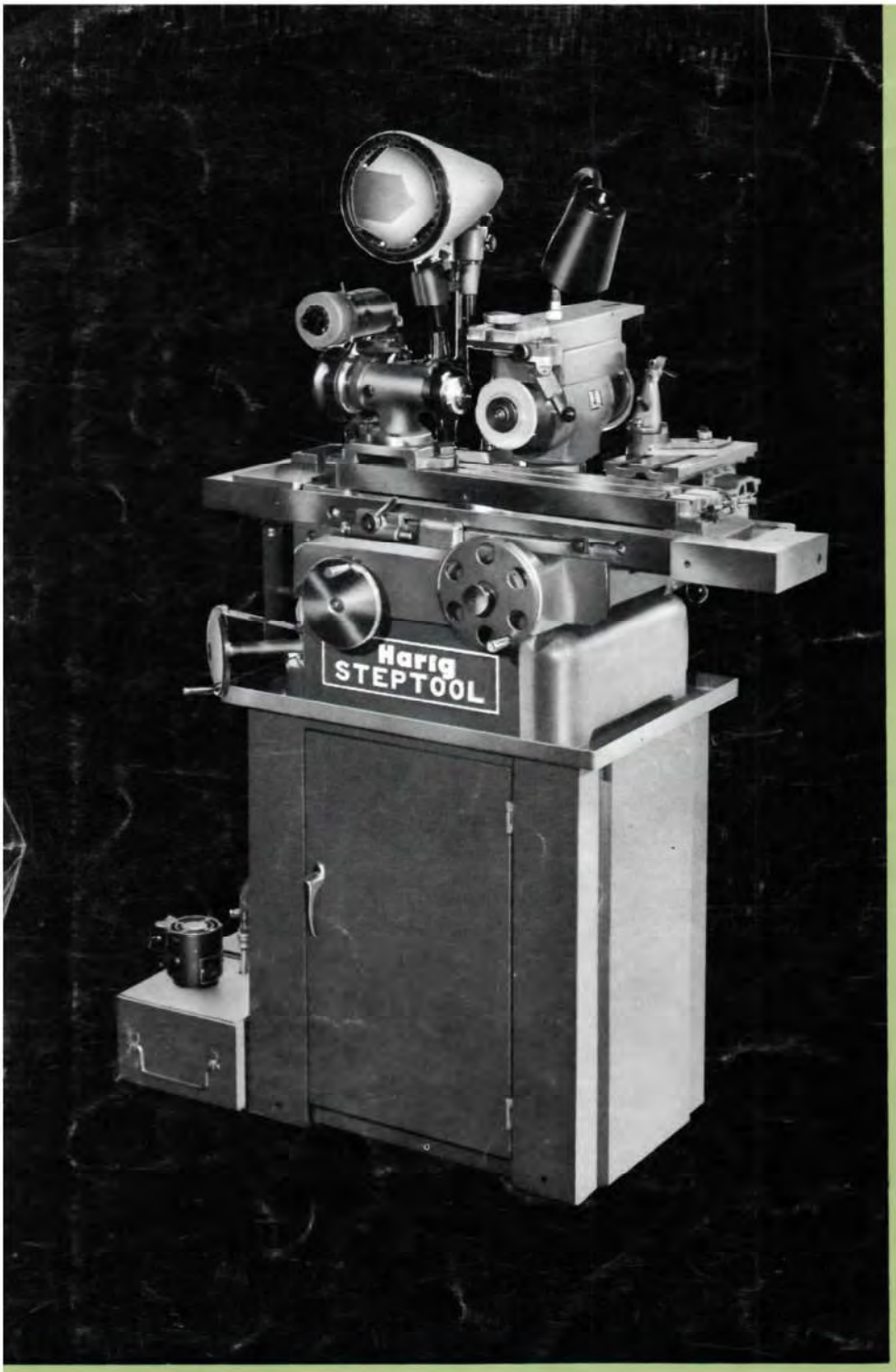



Cam-relief and drillpoint grinding with quick changeover . . . simple operation . . . exceptional accuracy and speed.

Capacity to 2⅛" for helixpoints, stepdrills and other cam-relief ground tools. Grinds more types of drill points and tools than any other machine.

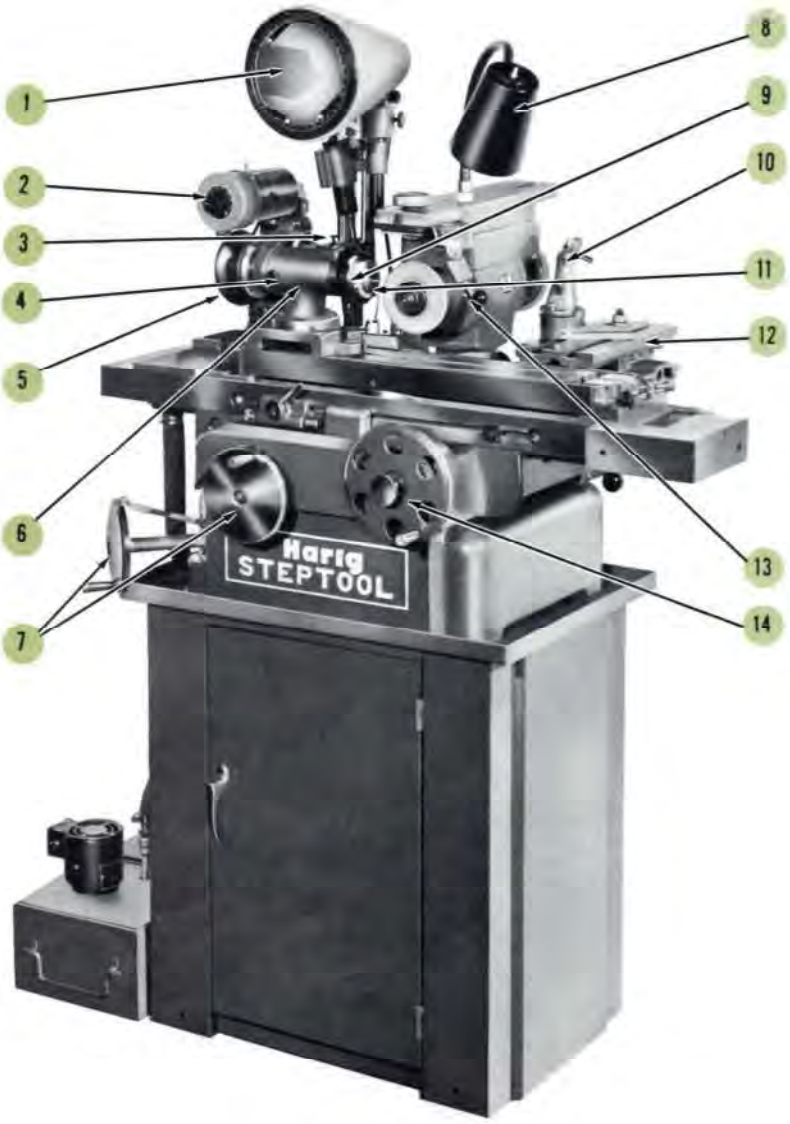
# HARIG

## STEPTOOL

RELIEF & DRILL POINT GRINDER

HARIG PRODUCTS, INC.

# CONSTRUCTION AND DESIGN




Capacity from #60 thru 1 1/32" with Model S head or from 1/2" thru 2 1/8" with Model L head. With reducing collet sleeve, range extended to include from 1/8" to 2 1/8". L or R hand, straight or taper shank.

- **Wheel head swivels 360°**
- **Table swivels 225°**
- **Operates wet or dry**
- **Longitudinal travel, 14". Fast feed — 3¾" per revolution**
- **Slow feed—¾" per revolution**
- **Vertical movement of column—7" x .040 per revolution**
- **Maximum distance to center of wheel from table—10½"**
- **Minimum distance to center of wheel from table—3¾"**
- **ELECTRIC: Grinding wheel spindle, ½ H.P. One H.P. optional. Headstock 110 volt**
- **Crossfeed travel 7½" x .100 per revolution**
- **Space occupied: 40" wide x 62" long x 61" high. Weight: 950 lbs.**

1 Optical comparator available as optional accessory
2 Infinitely variable spindle speed control
3 Cam adjusting knobs vary clearance angle infinitely
4 Selector for plain cylindrical grinding
5 Handwheel collet closer
6 Cam Headstock swivels 360°
7 Convenient front controls for all movements
8 "Cool" light swivels 360°
9 Infinitely adjustable cam
10 Web-thinning and split-point fixture. Also grinds margins on stepdrills.
11 Timing collar
12 Double crosslide with "stop"
13 Built-in angular dresser
14 Two speed table control for custom or production

# NOVEL FEATURES SIMPLIFY OPERATION

Collets are specially designed for gripping flutes . . . hold tools with minimum overhang. Concentricity in "tenths". Rapidly changed.

**10 SECONDS**

Infinite cam adjustments to vary clearance angle are made merely by shifting two buttons.

**3 SECONDS**

Tools located by grasping with lip-positioner and inserting into fixture against positive stop.

**4 SECONDS**

Web thinning and splitting fixture permits thinning the web, or splitting the point. Will also grind step drill margins rapidly.

**90 SECONDS**

No limit to flute numbers including odd numbers. Cam followers adjustable for wear.

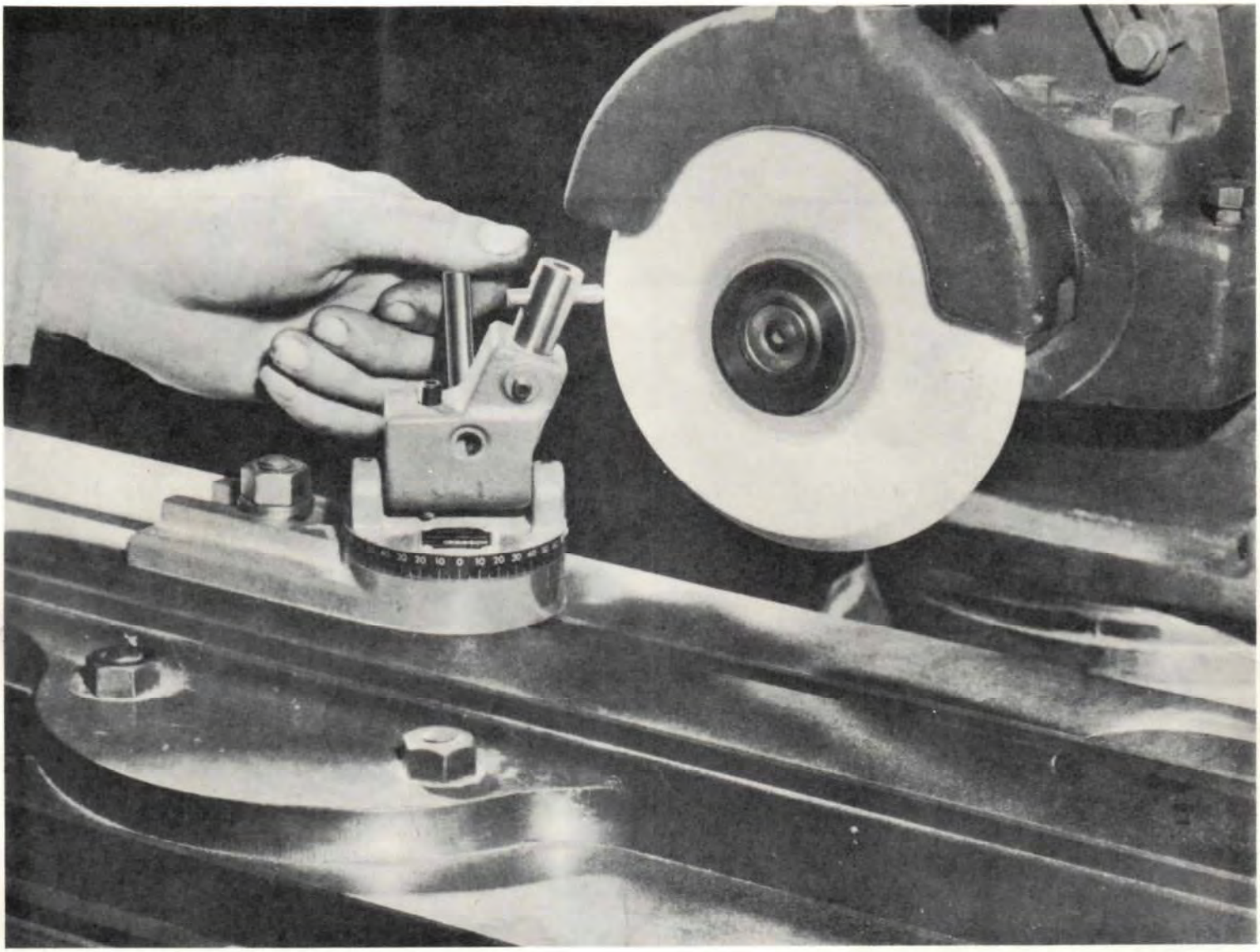
Change to different number of flutes.

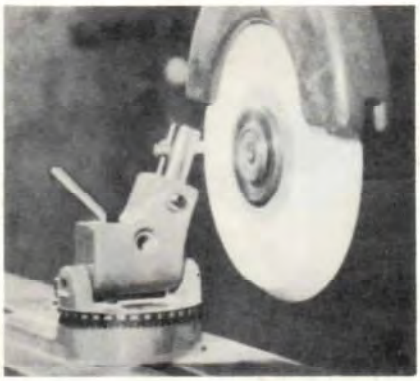
**40 SECONDS**

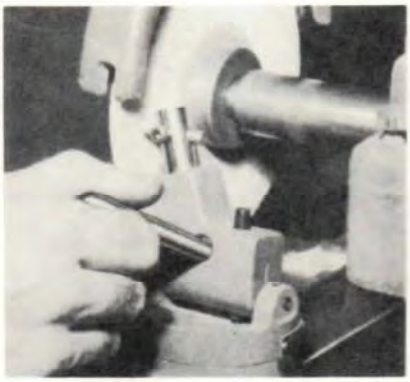
# ANGLE DRESSER

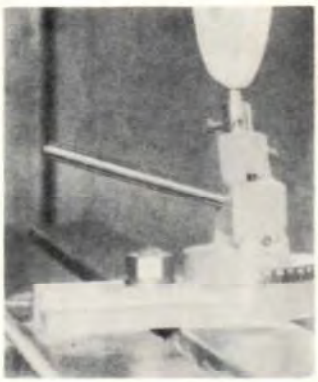
$95.00

INCLUDES DIAMOND









**HARIG STEPTOOL** 5765 HOWARD STREET • CHICAGO 48, ILLINOIS

# — FOR EVERY GRINDING DEPARTMENT

LOW COST VERSATILE ANGLE DRESSER

The Steptool Angle Dresser is the safest and fastest angle dresser for use in tool and cutter grinding, form tools, cylindrical and surface grinding. The dressing action is obtained by rocking between centers. Abrasive dust is no detriment to the dressing motion since the centers do not admit dust, and have a take-up, to acquire a snug 'feel'. Sticking, jerky or loose, chattering motion is eliminated, resulting in fine micro-finishes. Small and handy, it can hinge down out of way to prevent collision with the grinding wheel. Safe, because operators' hands never get near the grinding wheel. The Steptool Dresser with graduated base also locks in fixed position for dressing horizontally or under the wheel with the slide movements of the machine itself. A sturdy post carrying the diamond nib swivels the point in any direction and raises up and down to match the center-heighths of any make of grinder, and permits grinding or sharpening above center while the diamond actually dresses at center. The dresser also lends itself to cam-relief grinding techniques, and it can dress an arc in the wheel for radial relief sharpening. THIS DRESSER WILL SAVE OPERATOR FATIGUE AND EXASPERATION WITH SWINGING THE WHEEL-HEAD BACK AND FORTH TO DRESS ANGLES.

**HARIG STEPTOOL**
5765 HOWARD STREET
CHICAGO 48, ILLINOIS
~~NEwcastle 1-5050~~



H PRINTED IN U.S.A.

# Harig STEPTOOL WHEEL OF APPLICATIONS

*Big Savings through Modern Tool Pointing*

**Helixpoints**

Today tape controlled drilling is steadily increasing. Needless loss of dollars can be saved by self centering, better hole size, reduced bell mouth, better finish and increased drill life.

**Stepdrills**

Single or multiple step drills further supersede old fashioned pointing. Multiple hole diameters are produced with a single drill.

WHAT THE MACHINE CAN DO FOR YOU!

**Simplifies difficult jobs**

Twist drills become so efficient that center drilling and bushings can be eliminated. Two stations can be saved on turret drilling. Improves hole and spacing tolerances.

**Split-Crankshaft point**

Split pointing and web thinning speeds penetration and reduces pressure of drill. For deep holes and exotic metals.

**Sheet Metal and Spur Point**

Eliminates burrs and egg shaped holes. One of an endless variety of special points.

**Taps**

Sharpen on flutes and chamfer. Longer life and faster cutting. Taps normally used once and thrown away can be resharpened at great savings.

**Other styles of drill points**

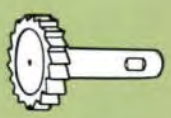
Cast iron helixpoint
Modified split point (missile point)
Core drill points
Plastic points
Semi-conventional points
Tough steel point
Non-ferrous point

## ...PLUS SHARPENING AN ENDLESS VARIETY OF IMPORTANT TOOLS

Single flute (uniflute) countersinks

Special form and steptools

Key seat cutters



Core drill points

Combined drill and countersink

End mills

Multiple stepdrills

Staggered tooth side milling cutters

Shell mills

## CASE HISTORIES

**Helixpoint Drill Life**

Case History 1.
Part: Hydraulic Sleeve Valve
Material: 52100 Stainless Steel
Machine: 5 Spindle Natco

| | Former | Present |
|---|---|---|
| Tools: | HSS ⅜" dia. chisel points | Helixpoints |
| Feeds: | 1" per Min. | 2" per Min. |
| Speeds: | 400 RPM | 400 RPM |
| Production: | 13 per hr. | 35 per hr. |
| Pieces per Sharpening: | 26 | 308 and still sharp |

**Helixpoint Drill Life**

Case History 2.
Part: Check Valve Cone
Material: 302 Stainless Steel
Machine: Dumore Drill Head, Auto Air-indexing Fixture

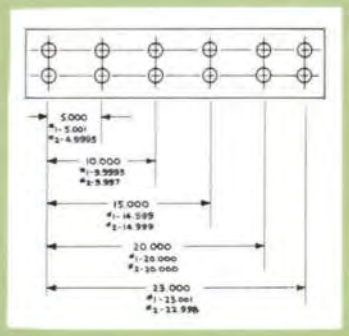
| | Former | Present |
|---|---|---|
| Tools: | 7/32" dia. HSS Chisel Points | Helixpoints |
| Feeds: | Approx. 8" per Min. | 60# Air Pressure |
| Speeds: | 565 RPM | 565 RPM |
| Production: | 23 | 40 |
| Pieces per Sharpening: | 64 | 864 |

Note: Helixpoints drill faster—speeds production—one man runs two machines.

## CASE HISTORY NO. 3

Fred Chelcun, manufacturing engineer at DITTO Inc. observing a helixpoint drill entering a rough casting without prior center drilling.

N/C drilling was vastly improved in hole spacing accuracy with the use of helixpoints. Perpendicularity resulted in perfect print size top and bottom.




Test drilling in N/C drilling machine shows accuracy of drilling with helixpoint sharpened drill. #1 set of dimensions was achieved by simply drilling and reaming. #2 set was done by centerdrilling, drilling and reaming.
CONCLUSION: FOR BEST RESULTS IN N/C DRILLING USE HELIXPOINTS.

## PARTIAL LIST OF USERS

**Chicago Pump Company Div. FMC**
**Heat-X Corporation**
**Hagen Chemical Company**
**New Hampshire Ball Bearing Co.**
**Ditto, Inc.**
**Millersburg Reamer Co.**
**Minneapolis Honeywell Co.**
**Gould Pumps, Inc.**
**Illinois Tool Works**
**Bendix Corp.**
**General Electric Company**
**Collins Radio Company**
**Remmele Engineering Co.**
**Rocketdyne Div., North American Aviation**
**Stromberg Carlson Co.**
**Stanley Tools, Inc.**
**Western Electric Co.**
**Waukesha Motors Company**
**Ronson, Inc.**
**Consolidated Electro Dynamics**
**Westinghouse Electric Co.**
**Cupples Products Corp.**
**Line-O-Matic, Inc.**
**Bristol Company**
**Anderson Electronics**
**Appleton Electric Co.**
**Auto-Ponents, Inc.**
**A. B. Dick Co.**
**Marsh Instrument Co.**
**Turner Corp.**
**Wagner Castings Co.**
**LaBour Co., Inc.**
**South Bend Tool & Die Co., Inc.**
**Dubuque Stamping & Mfg.**
**Iowa Ordnance Div.**
**Wee Mite Model Shop**
**Maryland Mold Co.**
**A. J. Mitchell Co.**
**Gage Tool Co., Inc.**
**Queen Products Div.**
**Tool Specialties Co.**

### OFFER

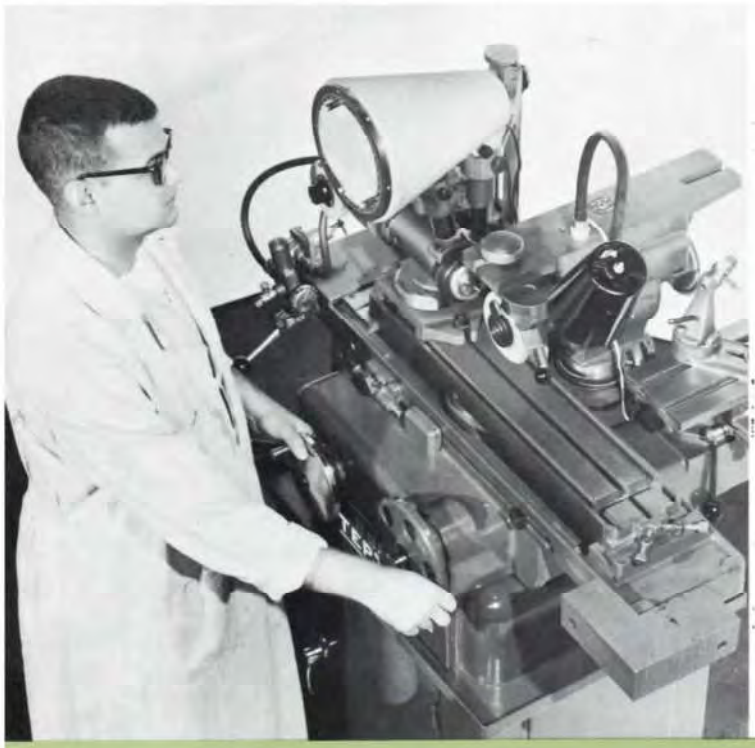
Any three drills may be sent to Harig for pointing to your specifications. There will be no charge for this work. Time schedule will be at Harig's discretion. Nominal charge for larger quantities and tests for gang drilling.

Scratchy finishes, scrapped pieces, incorrect tolerances, all commonly associated with hand grinding or incorrect fixtures are eliminated with STEPTOOL cam-relief grinding. The Steptool grinder is the latest addition to Harig's family of precision machines.

# HARIG PRODUCTS, INC.

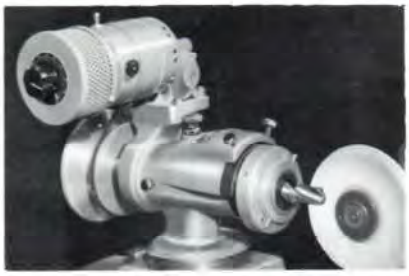
**1875 Big Timber Road • Elgin, Illinois 60120 Phone (312) 695-1000**

# HARIG STEPTOOL *in action*



Operator clearly views image of stepdrill on optical comparator. No need to remove tool for inspection.


The same simple technique is employed on a 2" drill which is pointed with exceptional accuracy on the large capacity headstock.



Grinding a ¼" stepdrill to print. Savings can pay for machine in months. Grinding time—

**4 MINUTES**

Sharpening a 5/16" tap. Seconds of rotation and the tap is sharp and ready to cut. Grinding time—

**15 SECONDS**

Sharpening a piloted countersink. Cam is adjusted to delicate lift to produce chatterless cutting. Grinding time—

**15 SECONDS**

## ACCESSORIES

**Hand Operated Model.** For small plants and screw machine shops with a limited number of tools. Economically priced, it can provide substantial savings.

**Speed-grip Air Operated Collet Closer.** For production sharpening, substantial time can be saved over standard handwheel unit.

**Air-Flo Fixture.** For sharpening end mills and milling cutters. Floating on a cushion of air it provides "finger sensitive" control with no sticking or jerking while grinding.

**Web Thinning Index Head.** Uses interchangeable 5-ST collets. Capacity 3/16" thru 1 - 1/32".

**2⅛" Capacity Headstock.** Grind points with unusual accuracy not normally found on large drills.

# WHY A FLOOR MODEL DRILL AND RELIEF GRINDER?

**HARIG STEPTOOL RELIEF AND DRILL POINT GRINDER, RANGE: #60 THROUGH 2-1/8"**

Most plants today purchase machine tools for savings and efficiency in production, but one of the most overlooked wasteful hidden costs in metalworking plants is the inefficient and improper maintenance of cutting tools.

Old-Fashioned methods of grinding and sharpening cutting tools result in the needless loss of thousands of dollars a year. A "Botched" grind by hand or by inefficient equipment can cause ruined parts and exasperation to the machine operators and their lead-men. Conversely, a precision sharpened tap or twist drill with the proper point and clearance angle for the specific material and job application will result in great savings through accurate, properly spaced, smooth and burr-free holes.

The HARIG STEPTOOL RELIEF AND DRILL POINT GRINDER exists and was developed for the efficient and precision resharpening and original grinding of twist drill points, taps, stepdrills, countersinks, deburring cutters, endmills, reamers, and a myriad of other special and basic tools ordinarily used in production. Years of experience and understanding of the operator's needs have led to the design features which make it possible for an unskilled operator to grind the tools with ease and simplicity.

This machine, placed near the tool crib or tool grinding department and available for immediate tool sharpening or alteration, account for tremendous savings in trouble and money and wasted down-time.

The HARIG STEPTOOL RELIEF AND DRILL POINT GRINDER is extremely low priced for its enormous versatility, and it confines to one machine the many operations that heretofore had to be done on expensive tool and cutter grinders or specialized machines.

**TYPES OF TOOLS QUICKLY GROUND AND RESHARPENED**

**Twist Drills**—*Spiral Point (Helixpoint) • Conventional Point • *Split Point • Modified Split Point • *Web Thinning • Sheet Metal Point • Missile Point • Printed Circuit Point • Core Drills—3 or 4 flute • *Stepdrills, Original step and resharpening • Double-Margin Drills • Taps • Countersinks and Deburring Cutters • Uniflute Countersinks • Combination Drill and Countersinks • Piloted Tools • *Reamers and Stepreamers • Valve Seating Tools • Boring Tools • *Multiple Step Tools • *Endmills • Mill Cutters, Stagger, Plain and Shell.

*Machines performing only this operation exist which are more costly than the Harig Steptool Machine!

**CONCERNING DRILL-POINTING, ETC.**

**Range:** Range of diameters of drills, etc., that can be ground is #60 through 1-1/32" inclusive. Up to 2⅛" with large headstock.

**Colleting:** 5-ST Collets, 1/64" collapsibility, 4 split, extra deep, designed for gripping directly on flutes. Set of 5-ST Collets optional with any Model consists of 66 Collets, sizes 1/64" through 1-1/16" inclusive by 64th increments. Air action collet-closer and pull piece for rapid colleting. 8-ST Collets for large headstock.

**Variety of Twist Drils which may be Sharpened:** Straight or tapered shank, right or left, 3 or 4 flute core drill, fast, normal or slow spiral.

**Flexibility of Point Configuration: Infinite variety without limit** of point angles, cutting relief angles, styles of point: Helixpoint (Spiral Point) • to ½" Conventional Point (Chisel Point, Flat) • Semi-Conventional Point (Slight Crown) • Split Point (Crankshaft Point) • General Purpose Point • Non-Ferrous Point • Sheet Metal Point • Trepan Point (Spur Point).


**Model 102C.**

The ultimate for modern tool grinding. Equipped with optical comparator, built-in wheel dressing, integral slides and fixture for web-thinning and split pointing. Capable of sharpening virtually every known cutting tool.


**Model 102.**

Same as 102C, but without comparator.


**Model 101.**

Same as model 102, but less features pertaining to web-thinning and splitting.


**Model 101E.**

Standard machine with sensitive ball bearing table and air-flo fixture for straight or tapered end mills and milling cutters. Ball nosed end mill sharpening arrangement available.


**Model 101L.**

Same as 101, but with capacity from ½" thru 2⅛", with reducing collet sleeve, range extended to include from ⅛" to 2⅛", L or R hand, straight or taper shank.