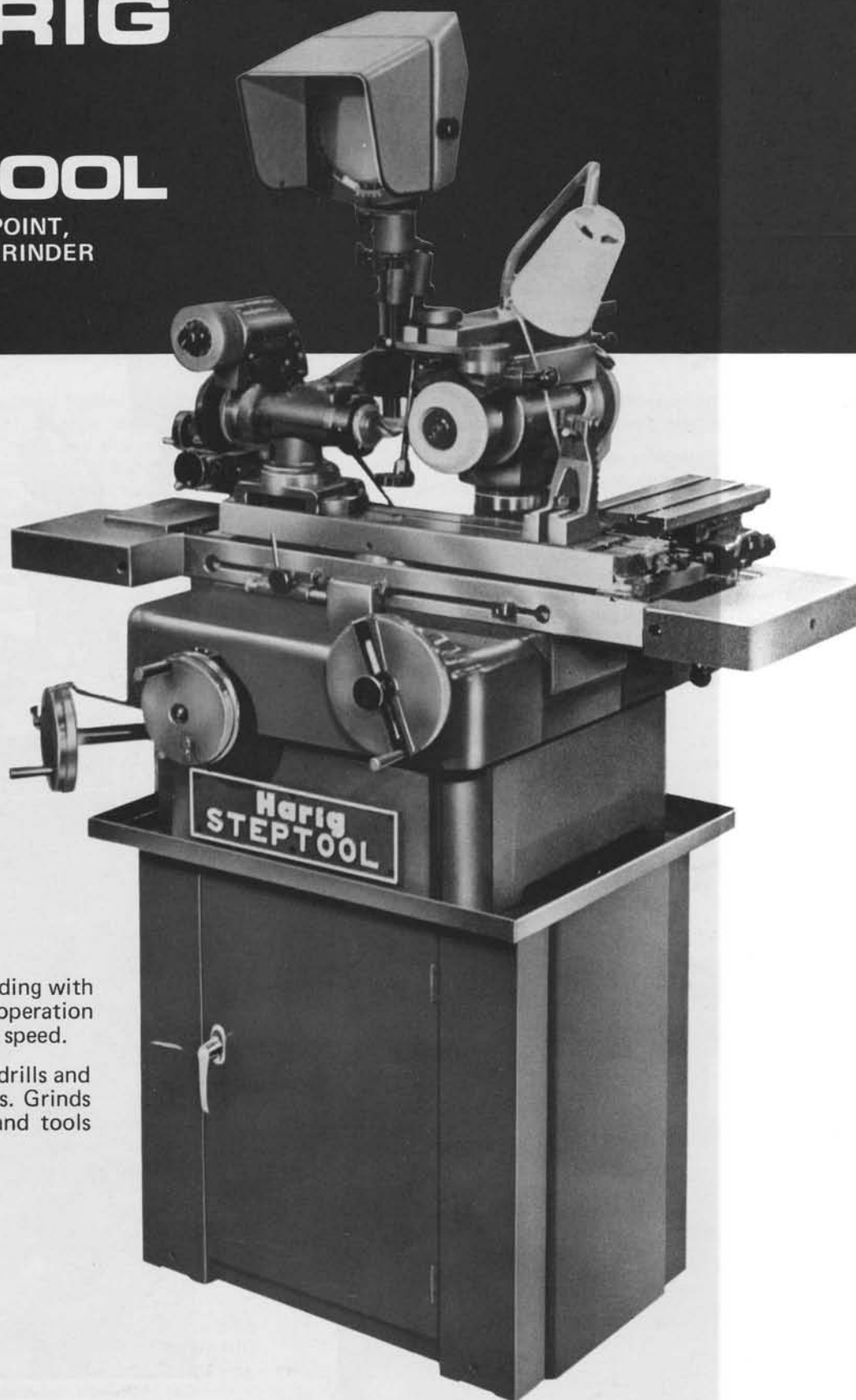




STEPTOOL

RELIEF, DRILL POINT,
TOOL & CUTTER GRINDER



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

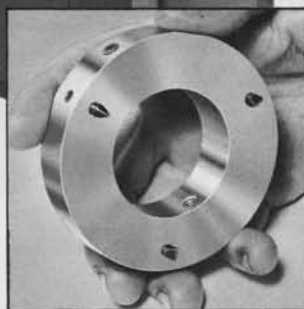
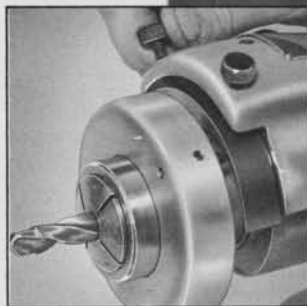
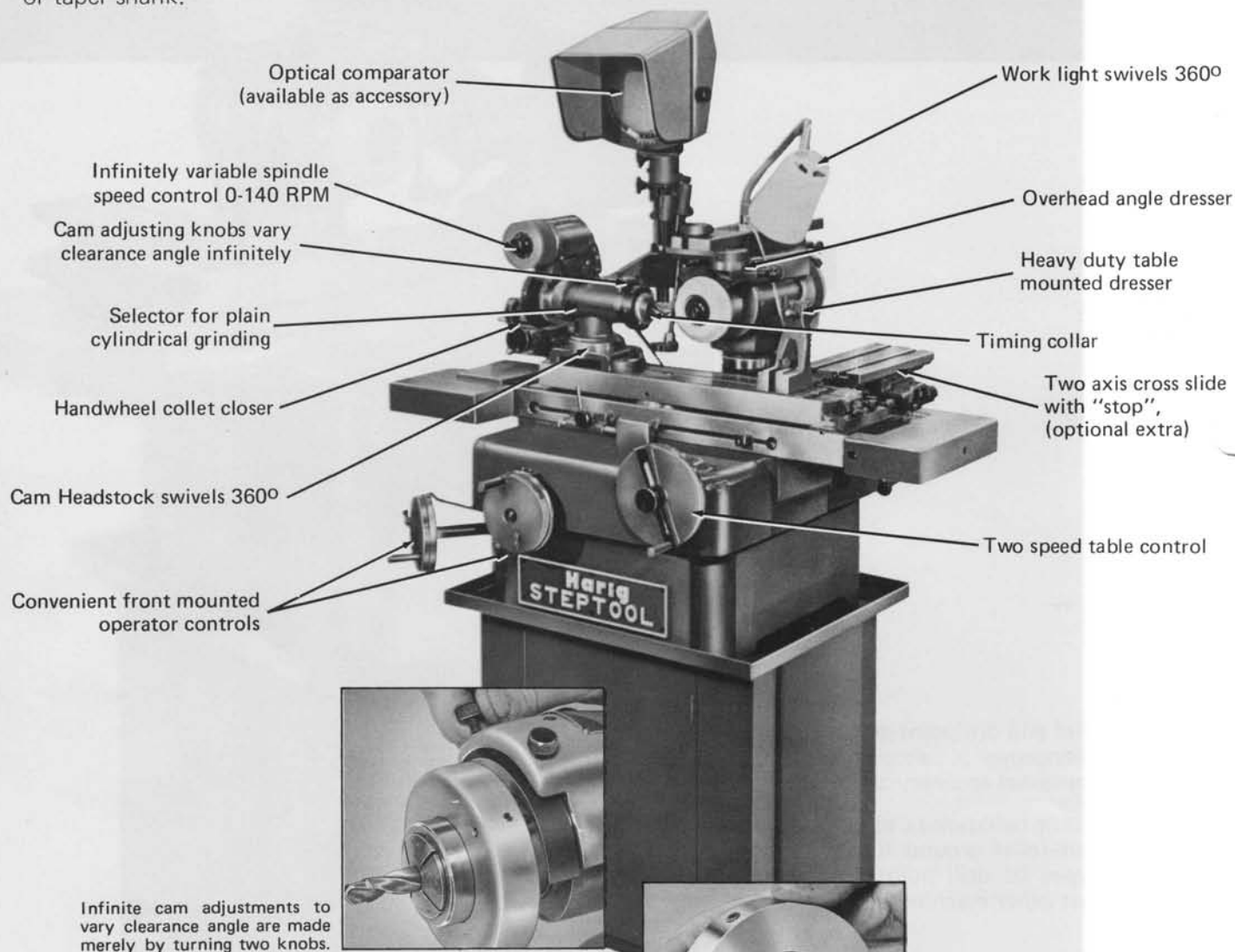
For grinding helixpoints, stepdrills and
other cam-relief ground tools. Grinds
more types of drill points and tools
than most other machines.



STEPTOOL

Capacity from #78 thru 1-1/16" with Model S head. L or R hand, straight or taper shank.

- Wheel head swivels 360°
- 5 1/4" x 27" table swivels 225°
- Longitudinal travel, 14"
- Fast feed — 3 3/4" per revolution
- Slow feed — 3/4" per revolution
- Vertical movement of column — 7" x .050 per revolution
- Maximum distance to center of wheel from table — 10 1/2"
- Minimum distance to center of wheel from table — 3 3/4"
- Grinding wheel spindle, 1/2 HP, 208-230/460 V. 3 Phase, 60 Hz
- Model S headstock fixture, 115 V.
- Crossfeed travel 7 1/2" x .100 per revolution
- Space requirement: 40" wide x 62" long x 61" high. Weight: 950 lbs.



Cam followers adjustable for wear. Easily changed index hubs for 2, 3 or 4 flutes are standard. Other index hubs available to 12 flutes at extra cost. Quarter arc cam recommended for use with index hubs 4 flutes and above.

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



can pay for itself in months



HELIXPOINTS

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



SIMPLIFIES MANY OPERATIONS

Center drilling and bushings can often be eliminated. One station can be saved on turret drilling.



SHEET METAL AND SPUR POINT

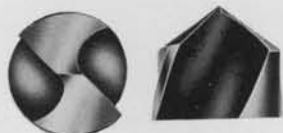
Helps eliminate egg shaped holes and burrs. One of an endless variety of special points.



TAPS

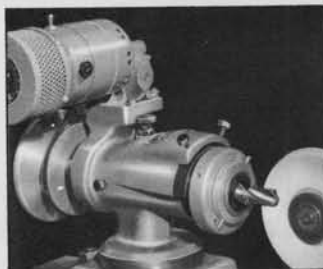


Accurate sharpening loads teeth equally for longer life, reduced tap breakage and more accurate size control. For taps with more than 4 flutes, or 4 flute taps over $\frac{1}{2}$ " diameter, a quarter arc cam is recommended.



MODIFIED SPLITPOINT

This point can be produced in a single set-up and can often eliminate the need for web thinning. Sine motion of the cam gives a lower lip relief angle at center of drill for longer drill life on tough materials.



STEPDRILLS & COUNTERSINKS

Drilling and reaming operations can be combined using a single drill. Multiple hole diameters can be produced with a single drill. When sharpening countersinks, cam is adjusted to accurate lift to help produce chatterless cutting.

SHARPENS AN ENDLESS VARIETY OF IMPORTANT TOOLS

NOTE: Some require extra cost attachments.



Reamers



Gun
Reamers



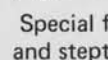
Single flute (uniflute)
countersinks



Core drill points



Multiple stepdrills

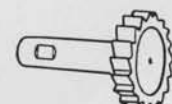
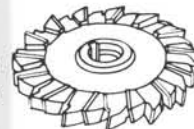


Special form
and steptools

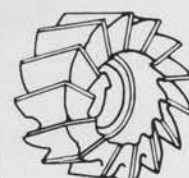


Combined drill
and countersink

Staggered tooth
side milling cutters



Key seat
cutters



End mills

Shell mills



options and accessories

OPTICAL COMPARATOR

Large, easy-to-read, eye-level comparator gives operator magnified view of his work. No need to remove tool for checking. Includes hood with 6" diameter screen protractor ring assembly, contour illuminator, compound slide and choice of 10 or 20 power lens system. (10 is standard.)



ONE HORSEPOWER GRINDING WHEEL SPINDLE

Extra power for grinding larger drills.

MATCHED CENTERS

For cutter grinding. One solid and one spring center.

A male center for the Model S relief grinding fixture can be purchased for use with the spring center.

SOLID FINGER SUPPORT

For sharpening tapered spiral cutters and endmills.

AIRFLO®

Practically frictionless air film bearing gives operator the ultimate in touch sensitivity necessary for accurate sharpening of all types of end mills and milling cutters. Range 1/64" thru 1-1/4" diameter with proper collet or bushing. Can be used for split points, margin grinding and web thinning.

MODEL S

Power driven spindle with 115 volt variable speed reversible motor. Sharpens most types of drill points (#78 thru 1-1/16") including helix points for accurate hole locations without costly center drilling. (Includes 2, 3 and 4 flute index hubs, center gage, helix-point radius gage and lip positioner.)

COLLETS

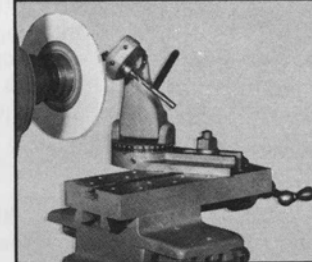
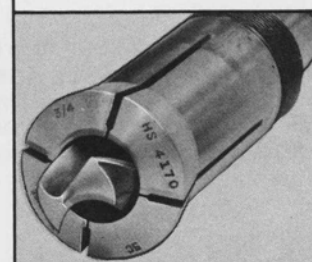
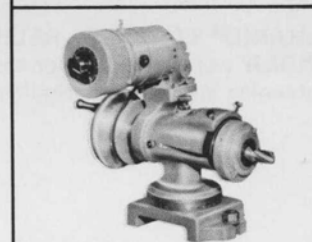
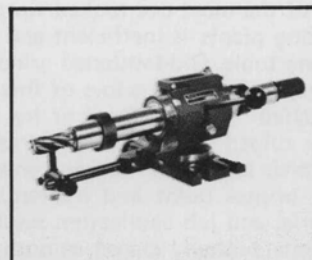
Specially designed 5-ST collets grip drill lands more accurately because of longer gripping length and symmetrical two or four split design.

SPIRA-MARGIN

For crankshaft, splitpoint and margin grinding. Can also be used for web thinning within its size range of 3/16" to 3/8". Includes 7 notched finger guide bushings. Additional bushings available for smaller size drills.

WEB THINNING HEAD

Used for web thinning, crankshaft and splitpoint grinding; uses interchangeable 5-ST collets; range 1/64" thru 1-1/16".



STEPTOOL

relief, drill point, tool & cutter grinder

One of the most overlooked wasteful hidden costs in metal working plants is inefficient and improper maintenance of cutting tools. Old-fashioned grinding and sharpening methods result in needless loss of thousands of dollars a year. A "Botched" grind-by-hand or by inefficient equipment can cause ruined parts and exasperation to machine operators and their lead-men. Precision sharpened taps or twist drills with proper point and clearance angle for each specific material and job application result in great savings through accurate, properly spaced, smooth, relatively burr-free holes.

The HARIG® STEPTOOL RELIEF AND DRILL POINT GRINDER was developed for easy, efficient and precision resharpener and original grinding of twist drill points, taps,

stepdrills, countersinks, deburring cutters, endmills, reamers, and a myriad of other special and basic production cutting tools.

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

The HARIG STEPTOOL RELIEF AND DRILL POINT GRINDER is extremely versatile. It confines to one machine the many operations that heretofore had to be done on more expensive grinders or specialized machines. Fingertip adjustment of clearance angle and the sine motion of the cam of the patented Model "S" Head makes the Steptool the ideal drill sharpening machine.

MODEL 101

Our basic relief grinding machine capable of cam relief grinding a wide variety of drill points, stepdrills, taps, countersinks and other applicable tools. Includes ½ HP double-ended spindle, Model S fixture, overhead angle dresser, heavy-duty table mounted wheel dresser, work light and 3 grinding wheels.

MODEL 101E

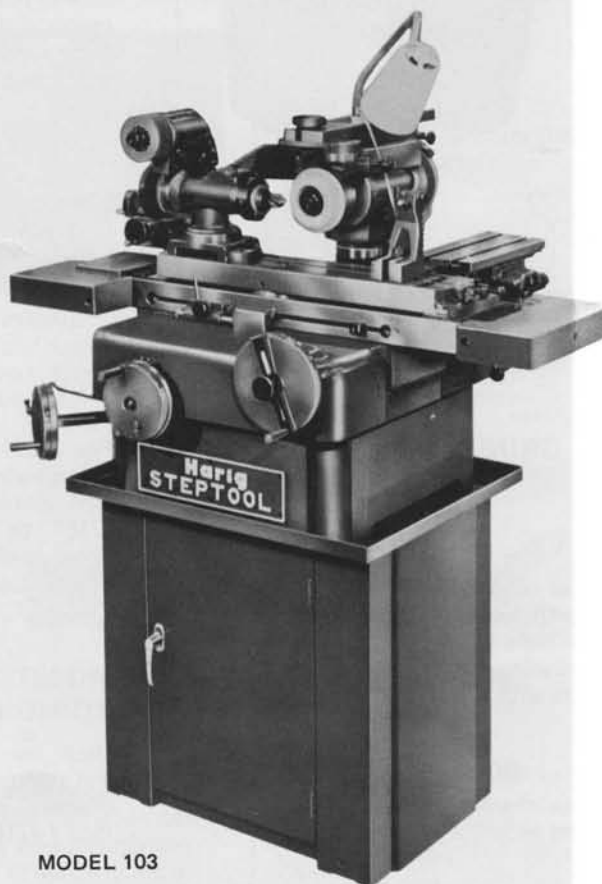
Basic cutter grinder with sensitive ball bearing table and AIR-FLO® fixture for sharpening end mills. (Does not include Model S fixture.) With optional extra centers and other attachments, the 101E is a machine capable of sharpening a wide range of milling cutters.

MODEL 102

Same as basic Model 101, with added auxiliary slide table and Spira-Margin fixture with 7 notched finger guide bushings.

MODEL 103

The ultimate for modern tool grinding. Includes all standard features of the 101 plus auxiliary slide table and the HARIG AIR-FLO® fixture (not shown) for end mill sharpening, web thinning and split pointing.



MODEL 103

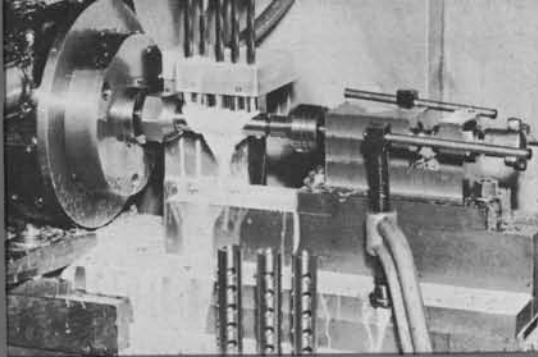
case histories

OFFER

Any three identical 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.

partial list of users

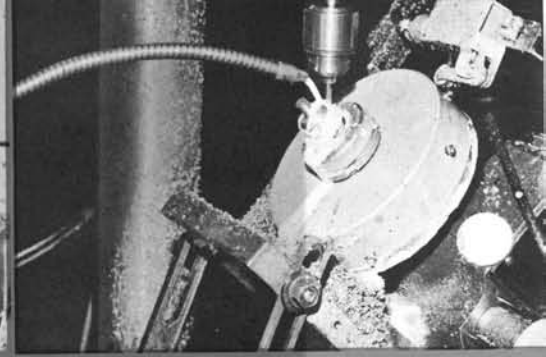
DISTRIBUTED BY:



Helixpoint Drill Life

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

| | Former | Present |
|------------------------|--|---------------------|
| Tools: | HSS $\frac{3}{8}$ " 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 |

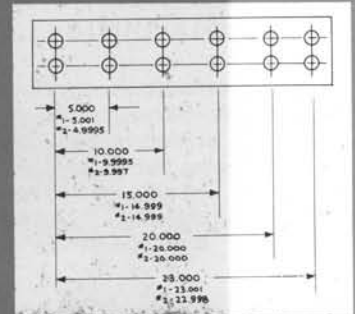
Note: Helixpoints drill faster—speeds production—one man runs two machines.

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.

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.

Scratchy finishes, scrapped pieces, incorrect tolerances, all commonly associated with hand grinding or incorrect fixtures are eliminated with STEPTOOL cam-relief grinding.



HARIG PRODUCTS, INC.

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(312) 695-1000 TWX 910-251-3363

ST-7-76