

*Catalog No. 12*



*The* HJORTH LATHE

*Manufactured by*

HJORTH LATHE & TOOL COMPANY

Office

BOSTON, MASS., U. S. A.

Works

WOBURN, MASS., U. S. A.

## FOREWORD

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WE present in the following pages illustrations of the Hjorth Bench Lathe and some of its attachments. MR. HENRICK J. HJORTH, the designer, has a wide reputation both here and abroad as the inventor of our important mechanical devices.

Aided by his practical experience of more than thirty years, he has devoted his inventive genius to designing, building and perfecting a precision Lathe which embodies improvements possessed by no other Lathe on the market.

His purpose was to construct a Lathe that could meet the exacting requirements of the modern machine shop where accuracy and speed, with its consequent low cost per unit out-put, is essential. His success in this respect may be said to mark a great advance in the evolution of Lathe construction.

We submit this catalog for the serious consideration of those who wish to adopt a Lathe which possesses the latest and best improvements in machine tool construction.

### HJORTH LATHE & TOOL COMPANY

#### OFFICE

27 School St., Boston, Mass., U. S. A.

#### WORKS

Woburn, Mass., U. S. A.

## SPECIFICATIONS OF THE HJORTH LATHE

No. 4 and No. 5

(For detailed construction see pages 56 to 60 inclusive)

The Bed is very heavy and rigid of construction, having large internal ribs which effectually prevent springing of bed under heavy duty. Its bearings and attachments are scraped to a master standard guage, so that all attachments made by us will always fit our lathe. Head and Tail Stock Spindles are hardened, tempered and ground.

The Hjorth Lathe has many patented features and attachments, making it a machine of great variety and scope in capacity and performance.

Length of bed, 36 inches  
Swings over ways, 8 $\frac{1}{2}$  inches  
Distance between centers, 18 inches  
Hole through spindle,  $\frac{3}{4}$  inches  
Diameter of aluminum pulley, for grinding attachment, 14 inches  
Diameter of counter pulleys, 5 inches  
Face of counter pulleys, 1 $\frac{1}{2}$  inches  
Diameter of tail stock spindle, 1 $\frac{1}{8}$  inches  
Capacity of chucks up to  $\frac{3}{4}$  inch

Angle of chuck head, 15°  
Diameter of lathe cone pulleys, 3 $\frac{1}{2}$ , 4 $\frac{1}{2}$  and 5 inches  
Face of cone pulley, 1 $\frac{1}{2}$  inches wide  
Speed of counter shaft, 1000 revolutions fast, 500 revolutions, slow and reverse.  
Weight of lathe, 143 pounds, countershaft and treadles, 63 pounds.  
Brown and Sharpe No. 6 Taper 2 $\frac{1}{2}$  inches long is used for head and tail stock.

All the above specifications apply to both No. 4 and No. 5 lathes, except capacity of chucks for No. 5 lathe is up to  $\frac{7}{8}$  inch, face of cone pully is 1 $\frac{3}{8}$  inches wide, hole through live spindle 1 inch.

COMBINATION SCREW AND LEVER TAIL STOCK  
INDEPENDENT END-THRUST ADJUSTMENT  
AUTOMATIC CHUCK CLOSER  
(All Patented)



Above illustration shows the Automatic Chuck Closer, Head with the independent end thrust adjustment, (shown on next page) and the combination screw and lever tail stock. Also T rest and shoes constructed to move lathe to permit belt adjustment. (The latter enables gineing of belt to head stock cone). Note center removing rod in tail stock spindle.

Stroke of Combination Tail Stock is  $4\frac{1}{2}$  inches and its screw movement is  $2\frac{3}{4}$  inches, while the screw movement of plain tail stock is 3 inches.

### THE HJORTH PATENTED HEAD STOCK SPINDLE



1—Points to Independent End-Thrust Flange  
2—Points to Locking Device

3—Points to Independent Strain Relieving Collar  
4—Points to Automatic Chuck Closer

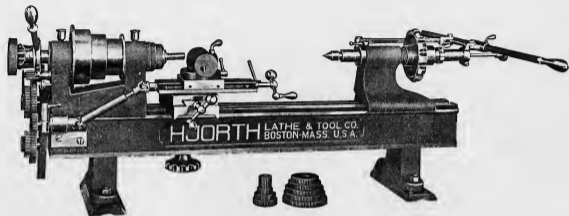
Each bearing is supplied with four felt oiling grooves.

Spindles and bearings are of best tool steel hardened, ground and lapped. Hole through the live spindle  $\frac{3}{8}$  inch. Drawn-in spindle engages self-centering collet chucks and permits round stock up to  $\frac{3}{8}$  inch to pass through. The nose of spindle is threaded and threads after being hardened are accurately ground, allowing face plates, jaw chuck, etc., to be affixed. The spindle front bearing is of the two-angle type, namely  $30^\circ$  and  $45^\circ$ . The spring collets have a  $15^\circ$  angle for compression. This degree of angle has been adopted, as experience has shown that such angle furnishes the maximum grip on the stock being held, with the minimum pull on the threads of the spindle and chucks.

The end-thrust adjustment of front bearing is accomplished in rear of cone pulley by an adjusting nut which can be locked when properly set and the rear bearing is adjusted by screw.

Special attention is called to the above described patented end-thrust strain relieving device, which goes with every Hjorth head stock, and the merit of which is self-evident.

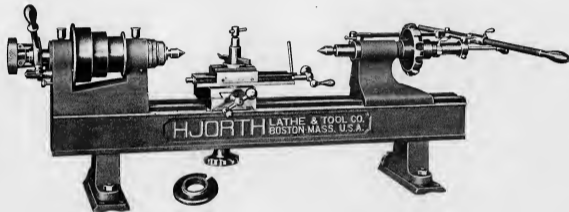
*SCREW CUTTING ATTACHMENT AND COMBINATION SLIDE REST*



Above illustration shows Screw Cutting attachment for cutting threads from 10 to 80. (See table in back of catalog pages 46 and 47.)

Also Combination Slide Rest. The eccentric tool holder allows for necessary clearance of round turning tools. Our binding system has been tested with the best of results. Both swivels are graduated in degrees allowing any angle to be set at any point. Upper slide movement  $5\frac{1}{2}$  inches, lower  $4\frac{1}{2}$  inches. Diameter of lead screw  $\frac{3}{8}$  inch, lead 10 per inch, acme threads.

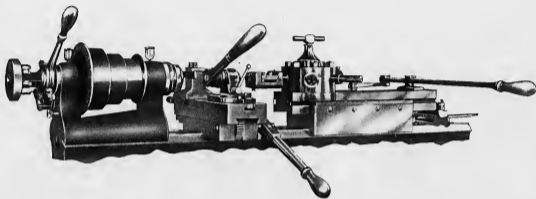
*SLIDE REST WITH ROCKER TOOL POST*



Above illustration shows Slide Rest with Rocker Tool Posts for flat forged tools or a common tool holder for 3-16 inch self hardening tools. This Slide Rest can also be used in connection with screw cutting attachment and all other purposes except with milling attachments.

Tool post accomodates holders up to  $\frac{3}{8}$  inch by  $\frac{7}{16}$  inch. (See page 26).

### TURRET ATTACHMENT

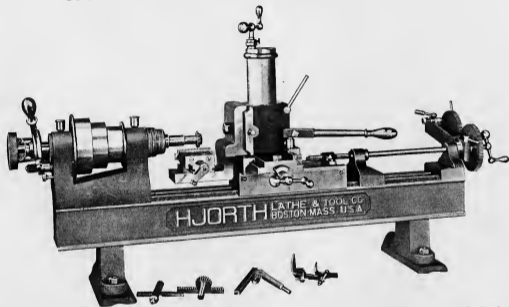


Used in connection with the Forming and Cutting Off Attachment (see page 23), and Automatic Chuck Closer (Patented).

NOTE:—Knurling Attachment operated with Forming Slide. Liberal sliding surfaces, ensuring the maximum of rigidity. Adjustable back and side stops for forming slide. Graduated Swivel Forming-post on cross slide by which any degree of angle may be secured with straight cutters. Independent stops on Turret which are numbered to correspond with each one of the six  $\frac{3}{8}$  inch diameter tool-holes in Turret head. Space between tools of forming attachment allows perfect freedom in the operating of Turret tools.

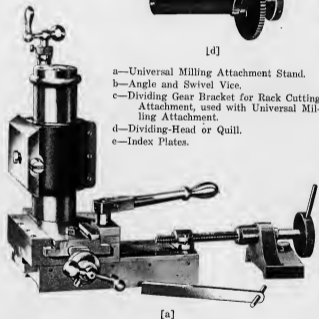


UNIVERSAL MILLING ATTACHMENT (Patented)



Above illustration shows Universal Milling Attachment, Stand and Base mounted for rack cutting with Angle Device, for holding work, on left and Rack, or Dividing Head Cutting Device on right, with Combination Lever and Screw feed. Universal Milling Attachment includes Index Quill and eight Index Plates. This attachment is used in conjunction with the Combination Slide Rest, but not with the Rocker Tool Post Slide Rest. With use of angle and swivel vice on same, various kinds of milling, sawing and slotting can be done. (See table in back.) Longitudinal movement 4 inches.

See Pages 46 and 47 for Gear Tables for Rack-Cutting Attachment.

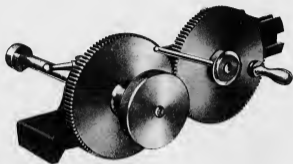


[a]

- a—Universal Milling Attachment Stand.
- b—Angle and Swivel Vice.
- c—Dividing Gear Bracket for Rack Cutting Attachment, used with Universal Milling Attachment.
- d—Dividing-Head or Quill.
- e—Index Plates.



[d]



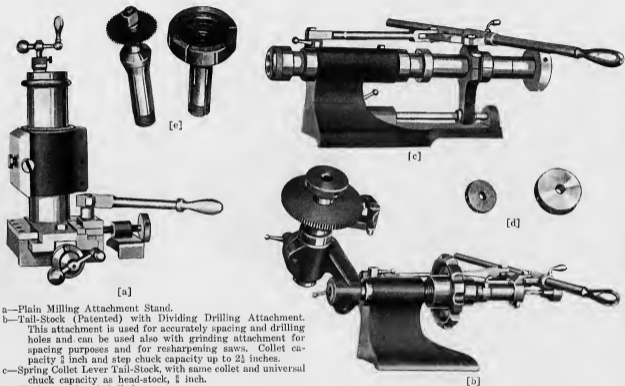
[e]



[b]



[e]

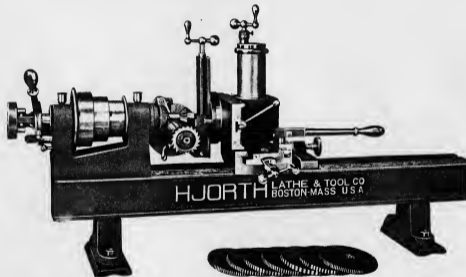


- a—Plain Milling Attachment Stand.  
 b—Tail-Stock (Patented) with Dividing Drilling Attachment.  
 This attachment is used for accurately spacing and drilling holes and can be used also with grinding attachment for spacing purposes and for resharpening saws. Collet capacity  $\frac{1}{2}$  inch and step chuck capacity up to  $2\frac{1}{2}$  inches.  
 c—Spring Collet Lever Tail-Stock, with same collet and universal chuck capacity as head-stock,  $\frac{1}{2}$  inch.  
 d—Work spaced and drilled.  
 e—Collets used in attachment b.

*PLAIN MILLING ATTACHMENT*

*With Base and Stand, Screw and Lever Feed, Quill and 8 Dividing Index Plates*

Numbered 45-54-60-64-72-80-84-100) (Patented)



The Combination Slide Rest is used with this Attachment. This illustration shows also a milling slide designed for milling only. (See next page).

## UNIVERSAL AND PLAIN MILLING ATTACHMENT

Illustrations on pages 10 and 11 show Universal Milling Attachment with combination lever and screw feed for gear cutting, milling of cutters, reamers, taps, etc. Accommodates spring chucks up to  $\frac{5}{8}$  inch.

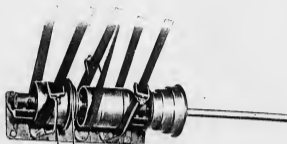
The cylindrical post on this milling attachment is much more rigid and practical than the old style of block or upright slide. The vertical screw provides for setting the shoeblock at a height most suitable for the kind of work to be milled above as well as below the lathe center.

The shoeblock is graduated in degrees so as to be set to any angle for cross or angular

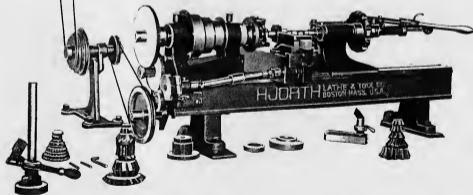
milling, this makes the shoeblock independent from lower slide, so that any angle set can be properly milled. A key, inserted through shoeblock, is held on the cylindrical post by means of two taper headed screws so that shoeblock can be raised or lowered without changing its square position to lathe bed. When angle milling is to be done, loosen key by removing taper screws.

Cylindrical post and cross-slide each have a movement of  $3\frac{1}{2}$  inches.

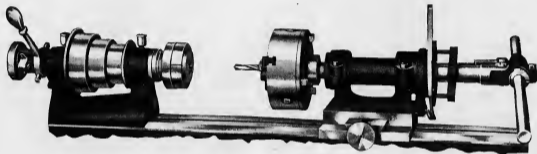
The milling slide is held on shoeblock by means of an eccentric binder and has a movement of  $5\frac{1}{2}$  inches.



This illustration shows  
the Hjorth Releiving or  
Backing-off Attachment.  
See table on page 46.

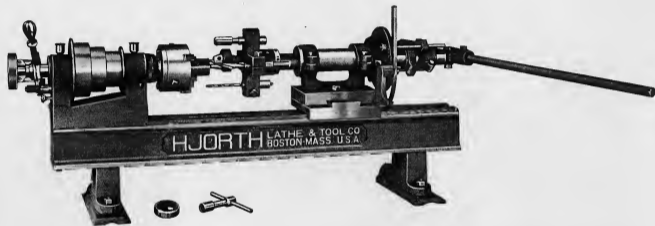


*DRILLING ATTACHMENT*



Drilling Attachment with interchangeable index plate, designed for Center and Off Center Work for drilling, milling, tapping and indexing. Off center work is done accurately by removing drill to headstock chuck and work to universal chuck, which by means of cross slide can be placed by operator in desired position.

*TURRET DRILLING AND TAPPING ATTACHMENT*



Above illustration shows the Turret Drilling and Tapping attachment for **Drilling, Reaming and Tapping**. Construction of patented lathe headstock enables turret to drill up to  $\frac{3}{4}$  inch. Lever handle 36 inches. Stroke of spindle 4 inches.



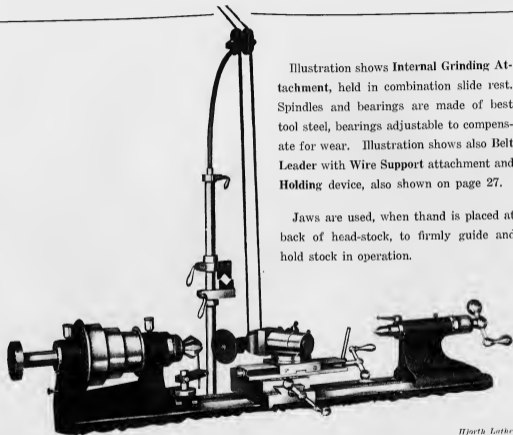
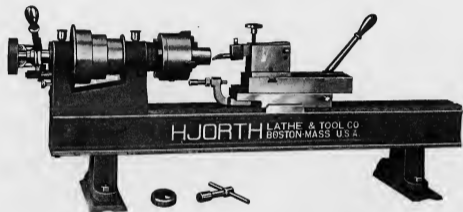


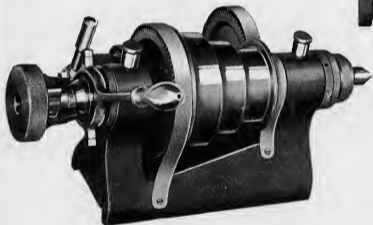
Illustration shows **Internal Grinding Attachment**, held in combination slide rest. Spindles and bearings are made of best tool steel, bearings adjustable to compensate for wear. Illustration shows also **Belt Leader with Wire Support attachment and Holding device**, also shown on page 27.

Jaws are used, when thand is placed at back of head-stock, to firmly guide and hold stock in operation.

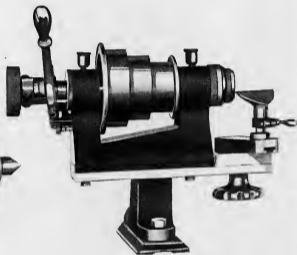
*SLOTING ATTACHMENT*



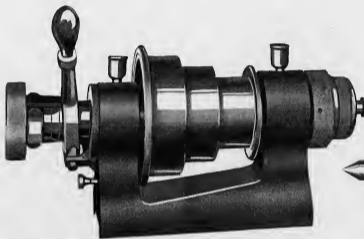
Above illustration shows Slotting Attachment on base of forming slide for key-seating.



BACK GEARED HEADSTOCK  
with  $\frac{1}{2}$  inch collet capacity.



INDEPENDENT LATHE HEADSTOCK  
on stand with Automatic Chuck Closer  
Attachment for filing, polishing and  
hand-tooling. Either slide rest can also  
be attached and used.



[a]

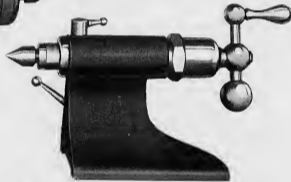


[b]

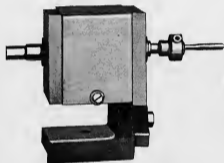
a—Lathe No. 5 Head-Stock, collet capacity  $\frac{7}{8}$  inch;  
Live Spindle capacity 1 inch.

b—Special Head-Stock Lever, index for use on  
indexed cone rim.

c—Regular Screw Tail-Stock.

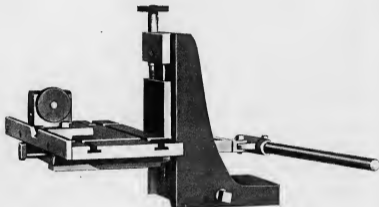


[c]

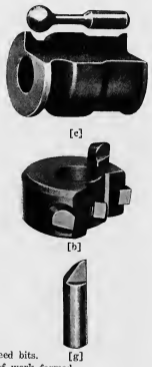
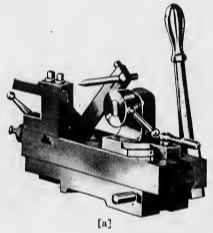
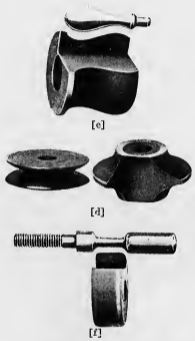


REVERSIBLE TAPPING ATTACHMENT

Tapping spindle may at any time, during operation, be reversed by means of clutch and reverse-gear.



ADJUSTABLE TABLE FOR SAME



a—Forming and Cutting-Off Slide, with graduated swivel tool post and two adjustable stops. (See page 9).

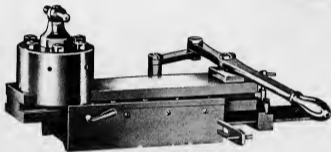
b—Holder, with high speed bits.  
c, d, e and f—Samples of work formed.  
g—Bit for holder b.



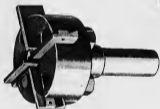
[c]



[d]



[a]

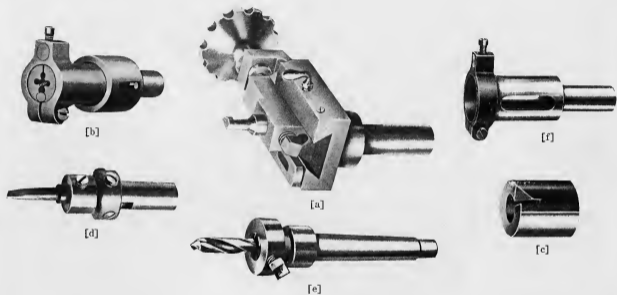


[b]



[e]

- a—Lathe Bed Turret Attachment, with  $\frac{3}{8}$  inch tool holes.  
b—Box Milling Tool.  
c—Box Mill  $\frac{1}{2}$  Inch Shank, made for turret, and Taper Shank for tail-stock.  
d—Knurling Tool for turret or tail-stock.  
e—Hollow Mill.



a—Turret Recessing Tool.

b—Elastic Die Holder, for turret and tail-stock.

c—Centering Tool, for turret.

d—Adjustable Boring Tool, for turret and tail-stock.

e—Drill Holder.

f—Elastic Die Holder.

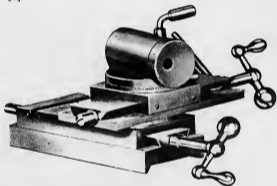




[c]



[b]



[a]



[e]



[d]

- a—Combination Slide Rest, used for all attachments including milling, (see page 7).  
b—Adjustable Cutting-Off Tool Holder, for either slide rest.  
c—Lever Attachment, for quick moving of upper slide head in turning and grinding.  
d—External Grinding Attachment.  
e—Grinder Support, for sharpening cutters held on T rest.



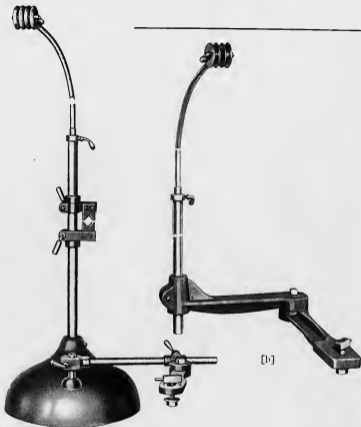
[c]



[d]

- a—Combination Belt Leader and Wire Support.  
b—Grinder Belt Leader, fastened from inside of lathe bed.  
c—Holder, for grinders when used with racker tool posts slide rest.  
d—Internal Grinding Attachment.

*Horth Lathe & Tool Company*



[a]

[b]

*Page Twenty-Seven*



[b]



[c]

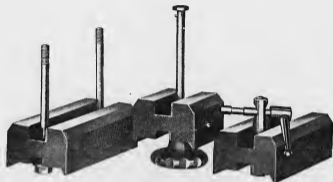


[e]



[d]

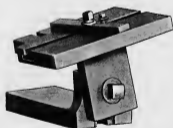
- a—Gear Swivel, with bracket.  
b—Screw Cutting Attachment Ball Joint.  
c—Spindle Gear.  
d—Switch Gear, for screw cutting.  
e—Screw Cutting Gears.



TWO INCH RAISING BLOCKS

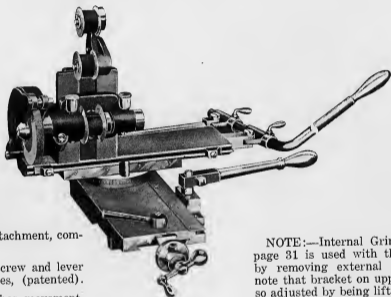


PATTERNMAKER T REST



SAW TABLE

## UNIVERSAL GRINDING ATTACHMENT

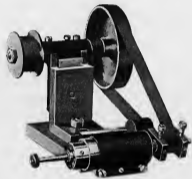


Universal Grinding Attachment, composed of:

- 1—Lower slide with screw and lever feeds, movement 5 inches, (patented).
- 2—Upper slide, 7 inches movement.
- 3—Table bracket, holding external spindle.

Speed of spindle for external grinding 6,000, and for internal grinding 35,000 revolutions per minute.

NOTE:—Internal Grinder shown on page 31 is used with this attachment by removing external bracket. Also note that bracket on upper slide can be so adjusted by being lifted, swivelled or reversed, that grinder spindle can be placed in any desired position for work under operation.



INTERNAL GRINDING ATTACHMENT  
(Patented)



OVERHEAD COUNTERSHAFT DRUM  
For Universal Grinding Attachment  
(See page 60).

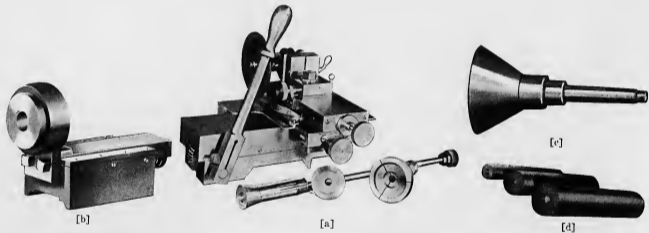


STAND FOR HJORTH LATHE



OIL SUPPLY TANK  
For Lathe

## FORM GRINDING ATTACHMENT



a—Form Grinding Attachment, the circular paper cutter shows where face, curve and cutting edge by this attachment are all ground in one operation. ¶ This attachment is designed to grind stock into various forms and shapes by means of a grinding slide and forming cam.

b—Self-Centering Drilling Attachment, with automatic device returning slide to original position after each operation.

c—Bell Center, used in tail-stock with attachment (b).

d—Samples of work.

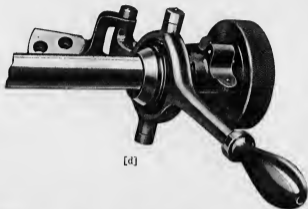




[b]



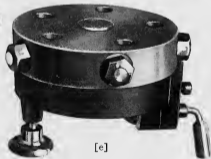
[c]



[d]



[a]

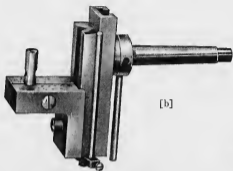


[e]

a—Adjustable Screw Slotting Attachment, with vertical adjustment of base, for variation in size of saws, and adjustable regulation stop.  
b—Tip Over T Rest (Patented), with movable T post and upright locking device.  
c—Back Rest, with combination jaws. d—Automatic Chuck Closer Attachment.  
e—Turret Tail-Stock, with five  $\frac{1}{2}$  inch tool holes.

Page Thirty Four

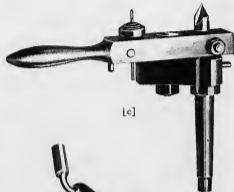
Horth Lathe & Tool Company



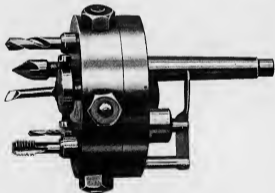
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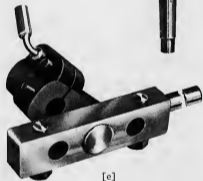
[d]



[c]

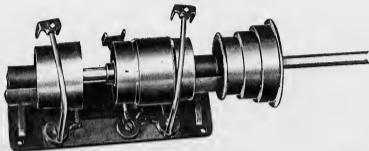


[a]



[e]

- a—Turret Tail-Stock Attachment, with lever locking device and  $\frac{1}{4}$  inch tool holes.  
 b—Adjustable V Block and Angle Table, for drilling and tapping.  
 c—Drilling, Reaming and Centering Attachment.  
 d—Graduating Slide Attachment.  
 e—Turret Lever Tail-Stock, with two  $\frac{3}{8}$  inch tool holes.



THREE SPEED COUNTER-SHAFT

Made to be attached to either wall or ceiling.  
Supplied with Self-Oiling Cups.



THREADLES FOR COUNTER-SHAFT  
With Vertical Screw Adjustment

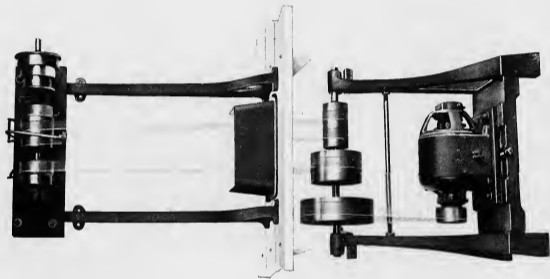
*Part Thirty-Six*



ALUMINUM PULLEY

Used with grinding attachment.  
Diameter 14 inches.

*North Lathe & Tool Company*



Upper picture shows Counter-Shaft Frame.  
Lower picture shows Motor Stand with Jack-Shaft.  
Note, Counter-Shaft, mounted with Bracket, can also  
be used with Lathe with Over-Head Jack-Shaft.



EIGHT INCHES SLOTTED FACE PLATE  
With Angle Adjustable Bevelpointed Screws in jaws,  
for turning of flat work of uniform thickness.



EIGHT INCHES SLOTTED FACE PLATE



COLLET OR CHUCK STAND  
For Wall or Bench.



DRILL STARTING STEADY REST

## Hjorth "B-Ver" Reamers

—Always on the Job—

These reamers have revolutionized the art of finishing many thousands of holes with a single tool, and with an absolutely accurate size and finish.

### POINTS

It is a Solid Expansion Reamer, which represents:—

*Simplicity in design.*

*Maximum life in operation.*

*Extreme accuracy in manufacture.*

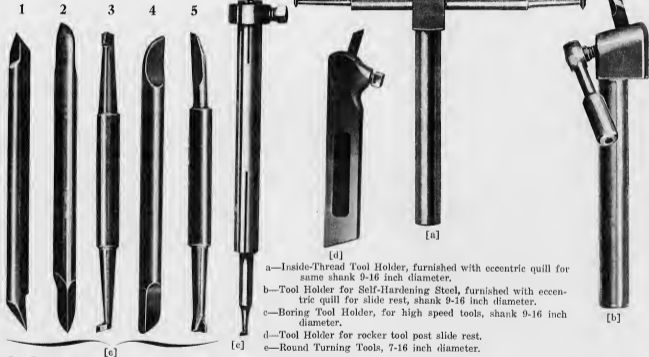
*All the advantages of the loose blade type.*

*Quick and accurate adjustment.*

Requiring no special wrenches, screws or other small parts which are so much in evidence in all other types of adjustable reamers for their proper maintenance and care. (See page 55).



TURNING TOOLS AND  
HOLDERS



a—Inside-Thread Tool Holder, furnished with eccentric quill for same shank 9-16 inch diameter.

b—Tool Holder for Self-Hardening Steel, furnished with eccentric quill for slide rest, shank 9-16 inch diameter.

c—Boring Tool Holder, for high speed tools, shank 9-16 inch diameter.

d—Tool Holder for rocker tool post slide rest.

e—Round Turning Tools, 7-16 inch diameter.



[b]

ool Company



LARGE V CENTER



REVOLVABLE V CENTER



PLAIN V CENTER



LARGE CENTER  
Hardened and  
ground.



HALF CENTER

Horth Lathe & Tool Company

Page Forty-One





SPRING TENSION  
CENTER  
Male or Female



DRILL PLATE



KNURLS



CUTTERS FOR MILLING  
ATTACHMENT



STRAIGHT KNURLING  
TOOL  
For Combination Slide  
Rest, made with Flat  
Shank for Rocker Tool  
Post Slide Rest.



DIAMOND KNURLING  
TOOL  
For Combination  
Slide Rest.

FURLING  
nation  
est.

Company



CLAMP COLLET  
Of over 2 inch capacity.



CLAMP COLLET  
Mounted on Face Plate.



BORING COLLET



STEP COLLET



CENTER CHUCK

*Hjorth Lathe & Tool Company*

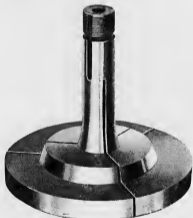
*Page Forty-Three*



ARBOR CHUCK



STEP CHUCK CLOSER



STEP CHUCK



NO. 4 SPRING CHUCK

From 1-64 to 1-8 inch.

For No. 5 Head-Stock, from 1-64 to 7-8 in.



**SLEEVE DIE HOLDER**

For Tail-Stock Spindle, made of steel. By movable Taper Screw Nut Die is adjustable in Holder and accurately centered.



**ELASTIC HAND DIE HOLDER**



**HJORTH PERFECTION SPRING WINDER**  
(Patented)  
(Send for Circular)



*Hjorth Lathe & Tool Company*

*Page Forty-Five*

### Gear table for the Hjorth Lathe

For compound A use gears 60 and 120.

For compound B use gears 30 and 120.

When metric threads are to be cut add gears 100 and 127.

(Lead Screw has 10 Threads per inch)

No. of Threads	Stud	Compound	Screw
10	15		30
11	15		33
12	15		36
13	15		39
14	15		42
15	15		45
16	15		48
17	15		51
18	15		54
19	15		57
20	15		60
22	15	A	33
24	15	A	36
26	15	A	39
28	15	A	42
30	15	A	45
32	15	A	48
34	15	A	51
36	15	A	54
38	15	A	57
40	15	A	60
44	15	B	33
48	15	B	36
52	15	B	39
56	15	B	42
60	15	B	45
64	15	B	48
68	15	B	51
72	15	B	54
76	15	B	57
80	15	B	60

### CHANGE GEAR TABLE

FOR THE

### HJORTH RELEIVING BACKING-OFF ATTACHMENT

No. of Divisions	Spindle Gear	Composite Gear	Intermediate Gear	Chm Gear
4	150	48 x 96	Any	75
6	"	48 x 96	"	50
8	"	24 x 96	"	75
10	"	24 x 96	"	60
12	"	24 x 96	"	50
15	"	24 x 96	"	40

Gears furnished as follows: 24-40-48-50-60-75-96-150

Special Gear Table for the Horth Lathe for cutting threads 3 to 204 per inch.

No. of Thread	COMPOUND			No. of Thread	COMPOUND		
	Stud	Inside	Outside		Stud	Inside	Outside
3	30	..	... 18	64	15	30	120 48
4	30	..	... 24	68	15	30	120 51
4½	20	..	... 18	72	15	30	120 54
5	30	..	... 30	76	15	30	120 57
5½	30	..	... 33	80	15	30	120 60
6	30	..	... 36	84	20	30	120 84
7	30	..	... 42	88	20	30	120 88
8	30	..	... 48	92	20	30	120 92
9	30	..	... 54	96	20	30	120 96
10	15	..	... 30	100	20	30	120 100
11	15	..	... 33	104	20	30	120 104
11½	20	..	... 46	108	20	30	120 108
12	15	..	... 36	112	20	30	120 112
12½	15	..	... 39	116	20	30	120 116
14	15	..	... 42	120	20	30	120 120
15	15	..	... 45	124	20	30	120 124
16	15	..	... 48	128	20	20	160 64
17	15	..	... 51	132	20	20	160 66
18	15	..	... 54	136	20	20	160 68
19	15	..	... 57	140	20	20	160 70
20	15	..	... 60	144	20	20	160 72
22	15	60	120 33	148	20	20	160 74
24	15	60	120 36	152	20	20	160 76
26	15	60	120 39	156	20	20	160 78
27	20	60	120 54	160	20	20	160 80
28	15	60	120 42	164	20	20	160 82
30	15	60	120 45	168	20	20	160 84
32	15	60	120 48	172	20	20	160 86
34	15	60	120 51	176	20	20	160 88
36	15	60	120 54	180	20	20	160 90
38	15	60	120 57	184	20	20	160 92
40	15	60	120 60	188	20	20	160 94
44	15	30	120 33	192	20	20	160 96
48	15	30	120 36	196	20	20	160 98
52	15	30	120 39	200	20	20	160 100
56	15	30	120 42	204	20	20	160 102
60	15	30	120 45				

(Lead Screw has 10 Threads per inch)

### Gear Table for Rack-Cutting Attachment

This table gives the index gears to be used for the most common pitches of racks, running from 10 to 48.

(Lead Screw has 10 Threads per inch)

Lead Screw Gear	Pitch of Rack or Diameter Pitch of Flute	Number of Teeth on Index Gear	Number of Turns of Index Gear
100	10	157	12
100	11	143	12
100	12	131	12
100	14	112	12
100	16	98	12
100	18	175	1
100	20	157	1
100	22	143	1
100	24	131	1
100	26	121	1
100	28	112	1
100	30	105	1
100	32	98	1
100	36	87	1
100	40	79	1
100	48	65	1

Extra index gears will be furnished to order.

When ordering extra index gears give pitch of rack to be cut.

Gears furnished as follows: 98-87-79-65.



SURFACE-GAUGE  
(Patented)  
Micrometer Adjustment.



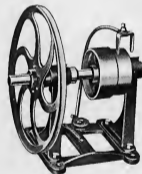
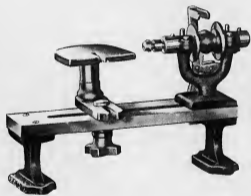
HJORTH DRILL ANGLE  
TESTING-GAUGE  
(Patented)

Made in three sizes:  
 $\frac{1}{2}$  inch, 1 inch and 2 inches.



DEPTH-GAUGE  
Micrometer Adjustment  
(Send for Circulars)





TOOL GRINDER WITH COUNTER-SHAFT



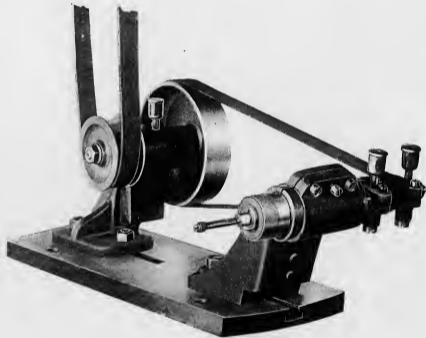
## *HJORTH INTERNAL GRINDER ATTACHMENT*

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The Hjorth Grinding Attachment for Internal Grinding can be used on most all plain or universal grinders now on the market. It has the ceiling countershaft belt adjustment, and a table center adjustment of two and one-half inches for accommodating different center heights, also its own countershaft belt adjustment between quill bracket and countershaft. The quill spindles are of two different types, one for deep and large holes, and one with taper arbors for smaller holes, accommodating smaller emery wheels and diamond grinding plugs.

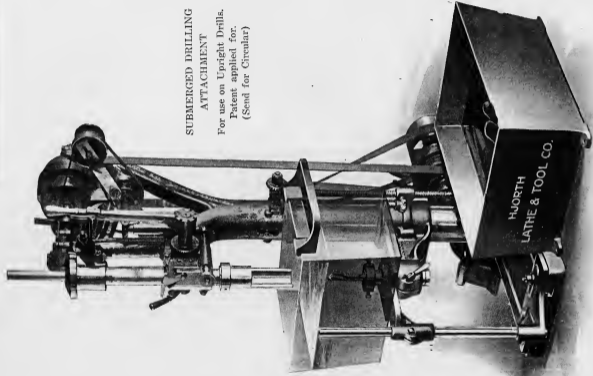
Each quill spindle has two adjustable bearings, lubricated by oil chambers and a separate adjustable end thrust bearing. The countershaft spindle is well supplied with oil chambers and with two bearings of its own and is driven by a clutch to live spindle, thereby relieving all strain from live spindle.

This attachment has one crosswise and two lengthwise open slots in base, thereby facilitating easy adjustment and firm holding, irrespective of position of T slots or grinders of different makes.



HJORTH INTERNAL GRINDER ATTACHMENT (Patented)

*Hjorth Lathe & Tool Company*



SUBMERGED DRILLING  
ATTACHMENT

For use on Upright Drills.  
Patent applied for.  
(Send for Circular)

HJORTH  
LATHE & TOOL CO.



**DRILL HOLDER**  
With Taper-Socket



**CHUCK**  
For Disk-Work

## Quadruple Production with Hjorth Submerged Drilling Attachment

You can accomplish four times as much chucking work of the kind that is usually done on a lathe with the Hjorth Submerged Drilling Attachment, which introduces a method that is a complete departure from that now in use. Drill during this process remains stationary while the stock revolves. Consider these advantages: No heating of work; no wear on cutting edge of drill; drill constantly lubricated; circulation of compound in tank keeps chips from sticking to drill; revolving of stock keeps it perfectly centered.

This attachment is for use on any make of upright drilling machine. It can be raised up and down to accommodate the size of work.

Write for complete information.

*Hjorth Lathe & Tool Company*



**BUSHINGS**  
With Drills



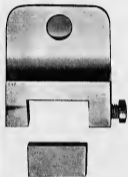
**SIDE OPEN HOLDER**  
For Long Work



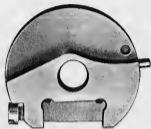
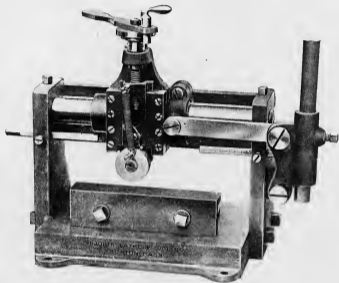
**LIVE SPINDLE  
RECESSED HOLDER**  
With one attached, to take  
other Holders of different  
diameter.

*Page Fifty-Three*

## MARKING MACHINE



HOLDER  
FOR FLAT DIE BLANKS  
Up to 2 inch in length.



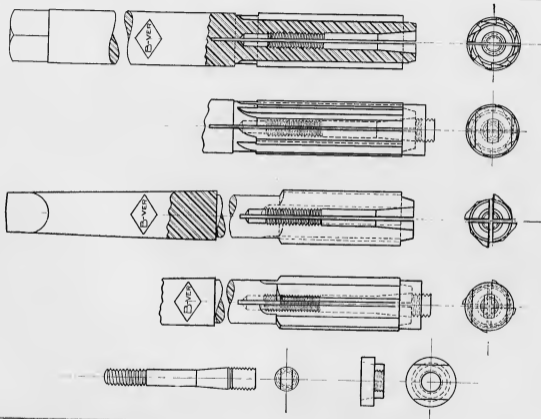
FOR ROUND DIE BLANKS  
Up to 2 inch in length.



FLAT DIE BLANK  
1 1/2 inches in length.

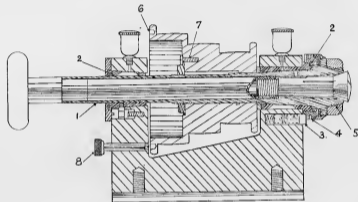
Round dies mark flat work and flat dies mark round work. When round die is used, die is allowed to roll over the work, and when flat die is used work is allowed to roll under the die.

Observe arrow on face of round die blank. Tail of arrow indicates starting point of name to be engraved and point indicates the direction to be followed in engraving.



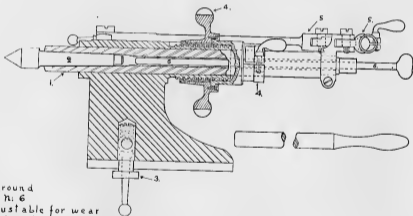
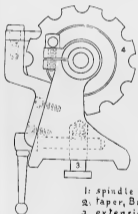
CONSTRUCTION OF THE HJORTH  
B-VER REAMER

Construction and details of the  
Hjorth  
Headstock Pat. Apr. 11, 1911.  
(half size)



1. spindle, made of best tool steel hardened and ground.
2. bearings, also made of best tool steel hardened ground and lapped.
3. compression pin, for engaging adjusting collar.
4. end thrust device to relieve the strain and hugging in heavy drilling and turning between the centres.
5. front thread of the spindle: ground to gauge after hardening.
6. cone pulley: with an index of sixty.
7. locking screw, for adjusting nut.
8. index pin.

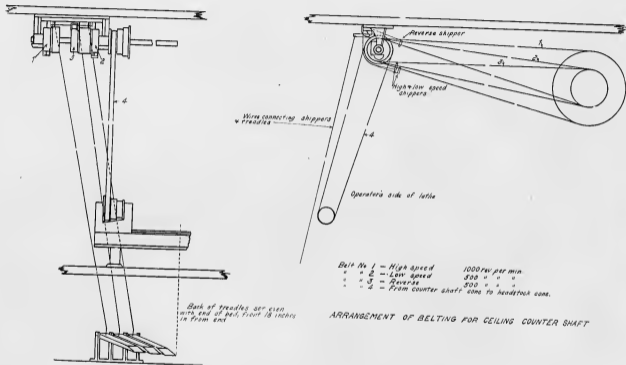
Construction and details of the  
**Hjorth**  
 combination (lever and screw) tail stock  
 Pat. Jan. 10-1911.  
 (half size)



- 1: spindle hardened and ground
- 2: taper, Brown & Sharpe N. 6
- 3: extension binder adjustable for wear
- 4: hand wheel with locking device for centre adjusting.
- 5: adjustable lever handle.
- 6: rod for removing the centre.







- Belt No 1 - High speed 1000 rev per min  
 " 2 - Low speed 500 " " "  
 " 3 - Reverse 500 " " "  
 " 4 - From counter shaft cone to headstock cone.

ARRANGEMENT OF BELTING FOR CEILING COUNTER SHAFT

