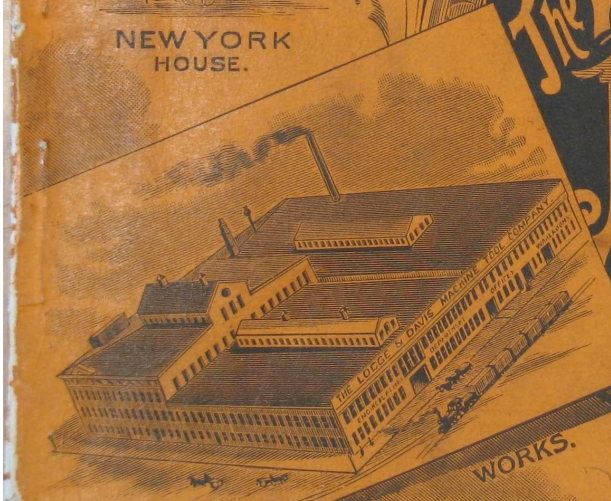
NEW YORK
HOUSE.

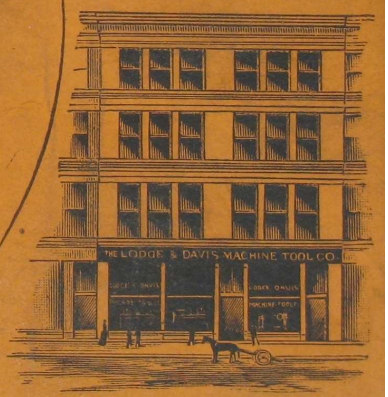
The Lodge & Davis Machine Tool Co.

Cincinnati.

Machine Tools.



WORKS.



CHICAGO HOUSE

pre-1892

THE LODGE & DAVIS MACHINE TOOL CO.

CHAS. DAVIS, President. WM. LODGE, V. Pres. & Gen'l Mgr.
WM. H. BURTNER, Treasurer. A. MULLER, Secretary.

WORKS: CINCINNATI, OHIO.

BUILDERS OF

Iron, Brass and Steel Working Machinery

NEW YORK HOUSE, No. 64 Cortlandt Street.
CHICAGO HOUSE, 68 & 70 South Canal St.
PITTSBURGH HOUSE, S. E. Cor. Market and Water Sts.

BOSTON OFFICE, 23 & 25 Purchase St.
PHILADELPHIA OFFICE, 19 N. Seventh St.
ST. LOUIS OFFICE, 823 N. Second St.
SAN FRANCISCO OFFICE, 21 & 23 Fremont St.

INTRODUCTION.

IT is impossible, in the space allotted, to give as full a description of our make of Machine Tools as could be done in a regular catalogue. This book is merely intended as a pocket memorandum for the use of our Stores, Agents and Customers, and to indicate in a general way the line of machines we are placing on the market.

Large cuts and photographs, with full descriptions, will be furnished when desired. In purchasing Machine Tools a personal inspection is always desirable, and we cordially invite prospective buyers to visit our works at Cincinnati, or our stores at New York, Chicago and Pittsburgh, where we endeavor to carry in stock a full line.

Respectfully,

THE LODGE & DAVIS MACHINE TOOL CO.

WORKS: CINCINNATI, O.

NEW YORK, 64 Cortlandt Street.
CHICAGO, 68 & 70 S. Canal Street.
PITTSBURGH, S. E. Cor. Water and Market Streets.

CHARACTER OF WORK.

All sliding surfaces are scraped to a fit. All spindles, collars, bushings, etc., are ground upon Universal Grinding Machines of the highest standard. All sizes made to standard gauges. All gearing cut from the solid. All machines thoroughly tested before leaving the works. Blue prints and foundation plans furnished upon application.

STANDARD ENGINE LATHES—16 to 38-inch Swing.

The leading features of our Standard Engine Lathes are as follows:

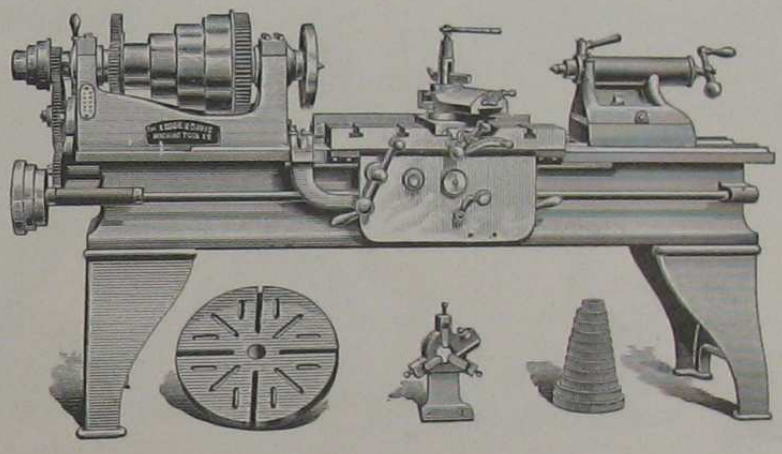
First—We furnish with each Lathe our Improved Taper Attachment.

Second—An Automatic Stop is provided for the length feed, by which the carriage can be stopped automatically at any point on the shears. This is particularly desirable where large amounts of duplicate work are to be turned out.

Third—The lead screw is placed inside the bed directly under the front **V.** It is thoroughly protected by an improved guard from dirt and chips, and the half nuts, operated by a lever on the apron, take hold of the screw directly under the line of strain.

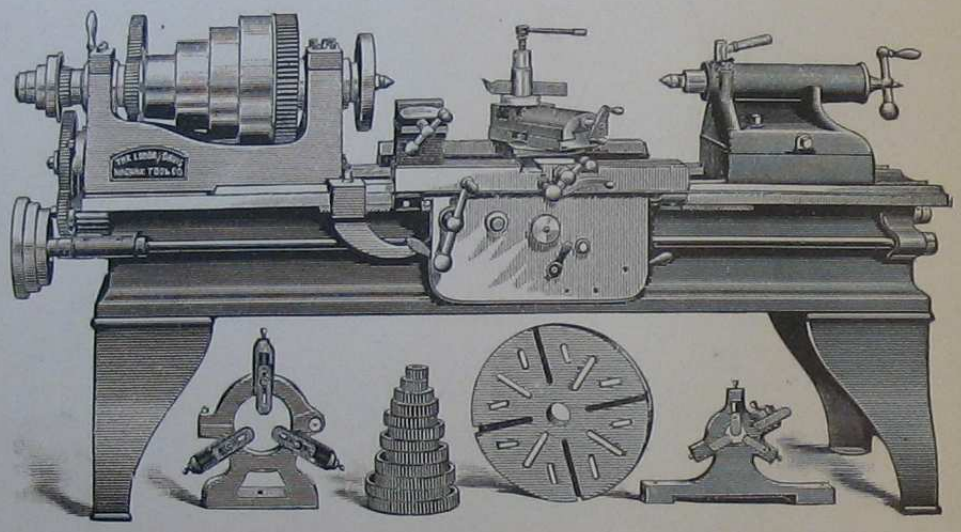
Fourth—All feeds are reversed in the apron.

Having ample metal, these lathes are adapted to turning out rapidly and continuously large amounts of work. The carriages have long bearings and the spindles are large, running in extra long phosphor bronze boxes.



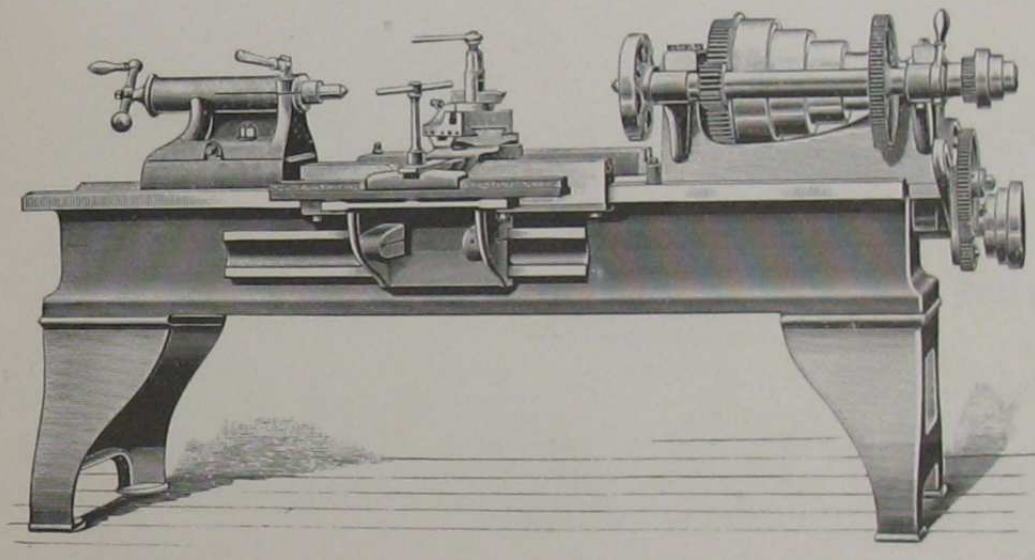
General Design of 16 and 18-inch Standard Engine Lathes.

Write for large cuts with full descriptions.



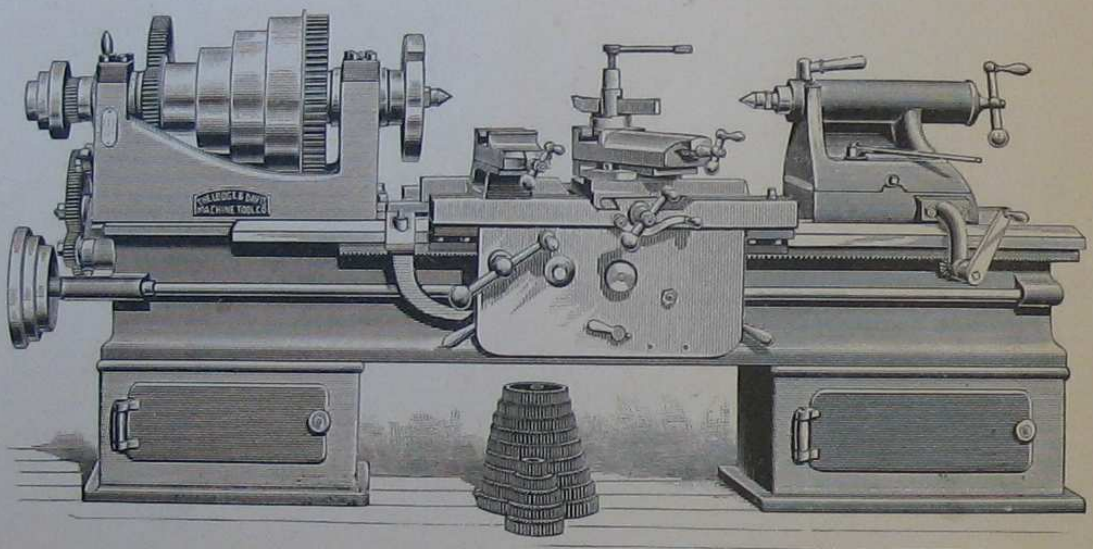
General Design of 19 and 21-inch Standard Engine Lathes.

Write for large cuts with full descriptions.



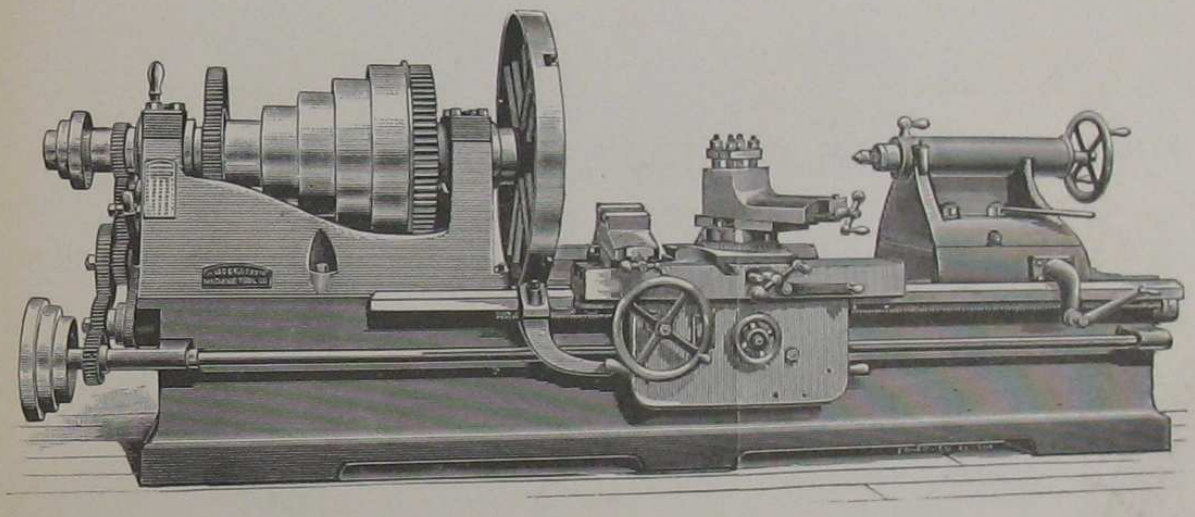
Rear View—showing General Design of Taper Attachment as furnished with all Standard Lathes.

Write for large cuts with full descriptions.



General Design of 24, 27 and 30-inch Standard Engine Lathes.

Write for large cuts with full descriptions.

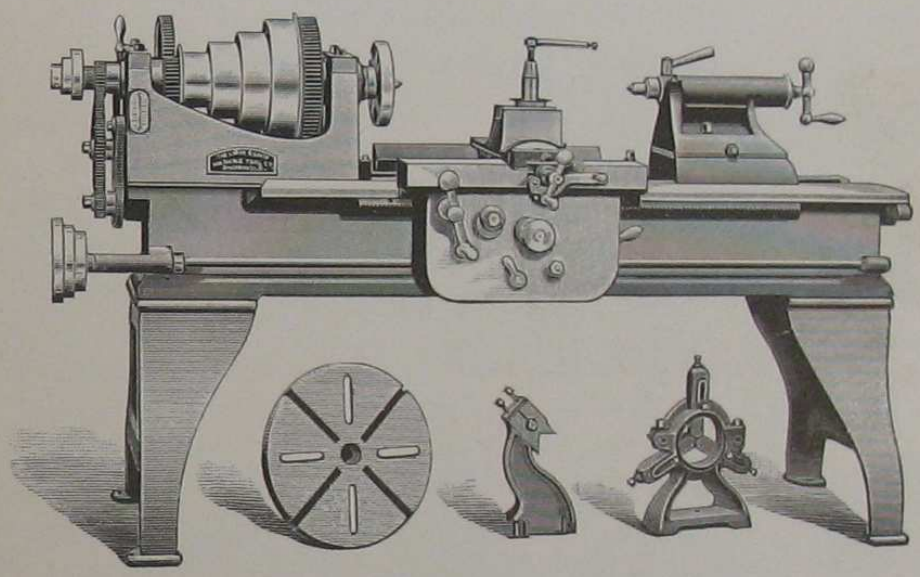


38-inch Standard Engine Lathe. Extra Power Feed in Compound Rest in place of Taper Attachment.

Write for large cuts with full descriptions.

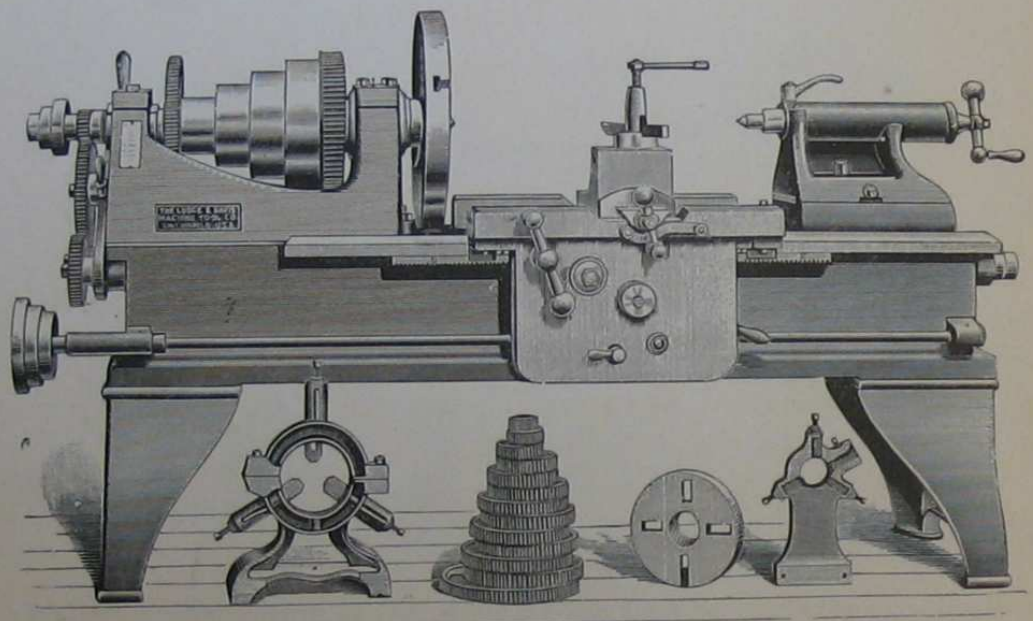
ENGINE LATHES WITHOUT EXTRA ATTACHMENTS.

To meet the demand for a first-class Lathe without extra attachments, we manufacture a line of Lathes with power length and cross feeds and all features furnished on regular Engine Lathes. We thoroughly guarantee the quality and workmanship of these tools.



General Design of Engine Lathes, 14, 16 and 18-inch Swing.

Write for large cuts with full descriptions.



General Design of Engine Lathes, 21 and 24-inch Swing.

N. B.—24-inch Lathe furnished with Compound Rest. Write for large cuts with full descriptions.

DIMENSIONS.

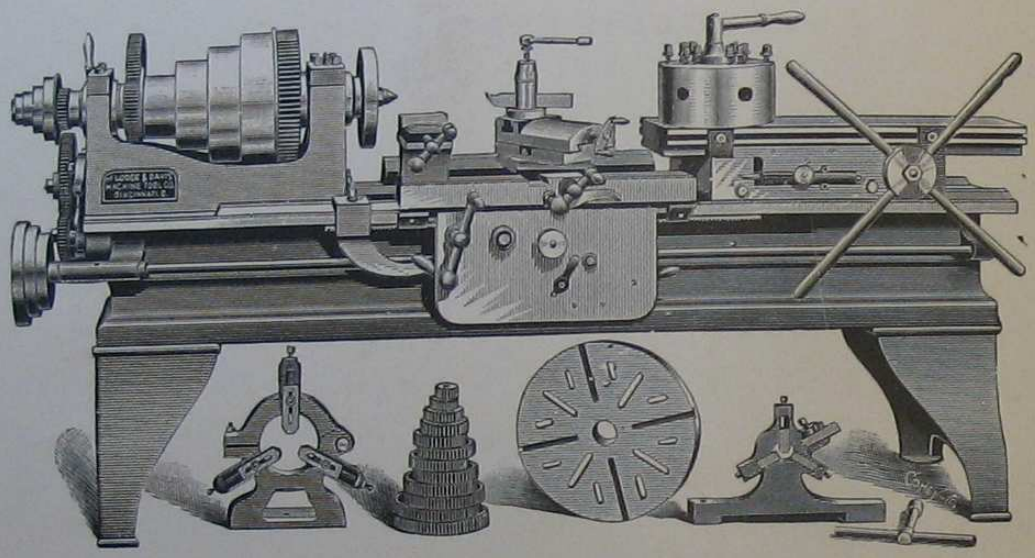
STANDARD ENGINE LATHES.

	SWING.	SWING OVER CARRIAGE.	SHORTEST BED.	BETWEEN CENTERS.
16-inch	16½ in.	9¼ in.	6 ft. 4 in.	3 ft. 1 in.
18-inch	18½ "	10¾ "	6 " 3 "	3 " 1 "
19-inch	19½ "	12½ "	9 "	5 " 3 "
21-inch	21½ "	13½ "	9 " 2 "	5 " 3 "
24-inch	24½ "	17 "	10 " 5 "	6 " 1 "
27-inch	27½ "	19½ "	10 " 8 "	6 " 1 "
30-inch	30½ "	21¼ "	10 " 7 "	5 " 2 "
38-inch	38½ "	26¾ "	12 "	5 " 3 "

ENGINE LATHES, WITHOUT EXTRA ATTACHMENTS.

	SWING.	SWING OVER CARRIAGE.	SHORTEST BED.	BETWEEN CENTERS.
14-inch	14½ in.	9⅛ in.	6 ft. 1 in.	3 ft. 1 in.
16-inch	16½ "	9¼ "	6 " 4 "	3 " 1 "
18-inch	18½ "	12⅜ "	6 " 7 "	3 " 1 "
21-inch	21½ "	13⅜ "	6 " 7 "	3 " 1 "
24-inch	24½ "	17 "	10 " 3 "	6 " 1 "

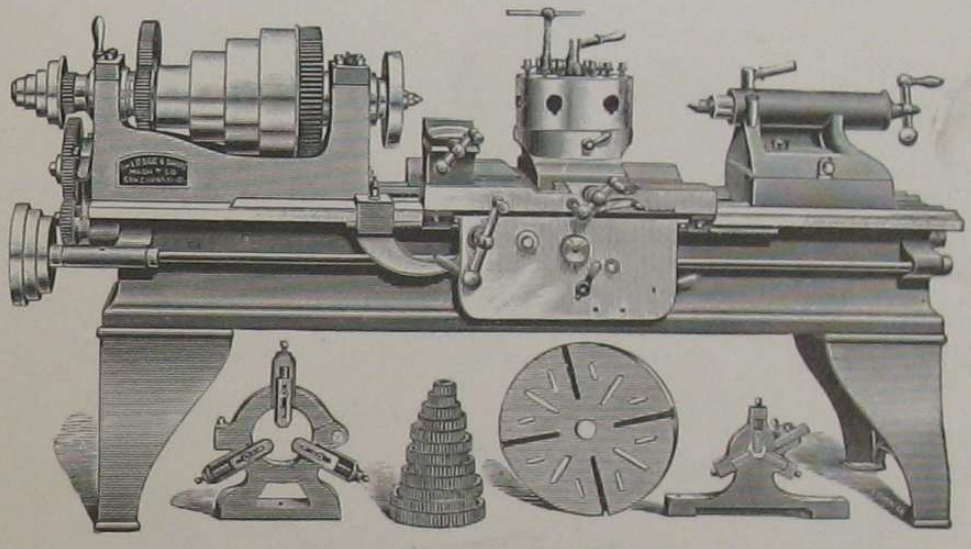
EXTRA LENGTHS OF BEDS FURNISHED IN TWO-FOOT LENGTHS.



Standard Engine Lathe, with Turret on Shears.

Turret interchangeable with Tail Stock.

Write for large cuts with full descriptions.



Standard Engine Lathe, with Turret on Carriage.

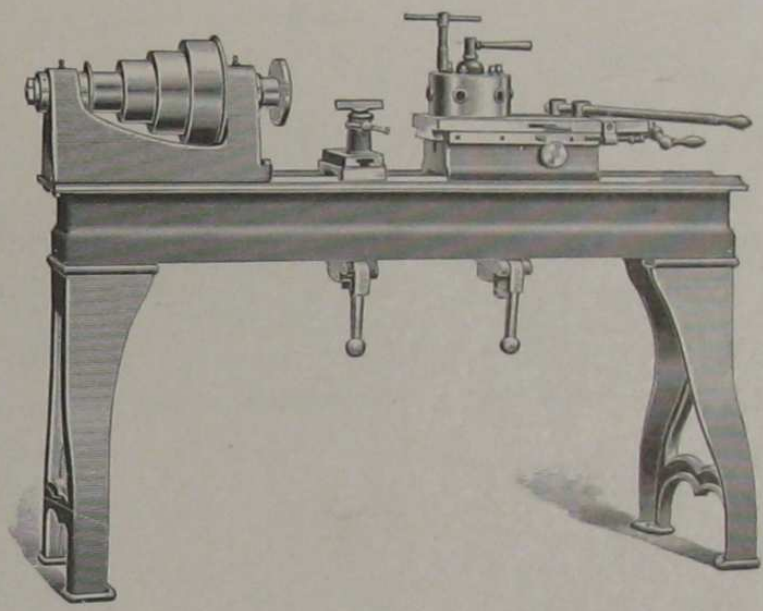
Turret interchangeable with Compound Rest.

Write for large cuts with full descriptions.

Turret Boring and Chucking Lathes.

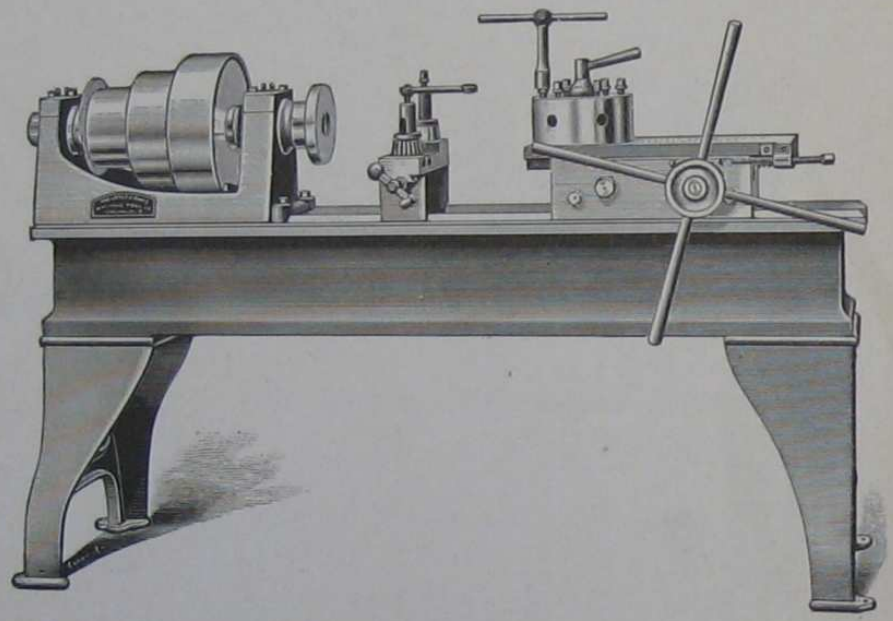
Very large amounts of duplicate work can be bored and tapped rapidly and successfully upon these tools. The smaller sizes are particularly adapted to the manufacture of specialties in iron and brass—the larger sizes to boring pulleys, gear wheels, etc. On several sizes the movements are all automatic. Boring on Engine Lathes is a relic of the past. No first-class manufacturing machine shop can afford to be without a Chucking Lathe.

See cuts pages 18, 19, 20 and 21.



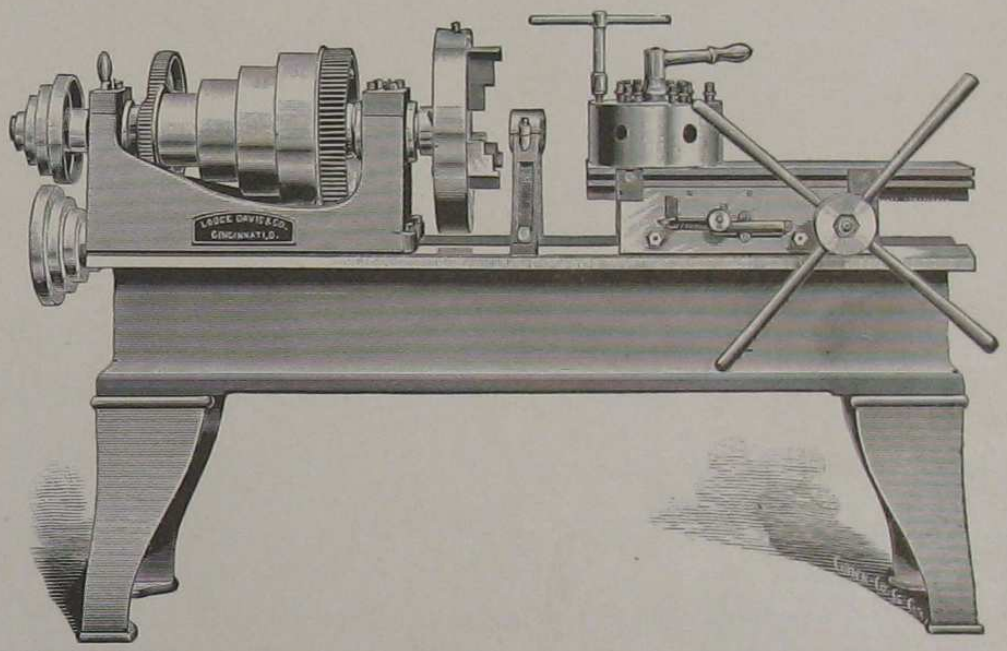
12 and 15-inch Turret Boring Lathes.

Write for large cuts with full descriptions.



18-inch Turret Boring Lathe, with Automatic Turret.

Write for large cuts with full descriptions.



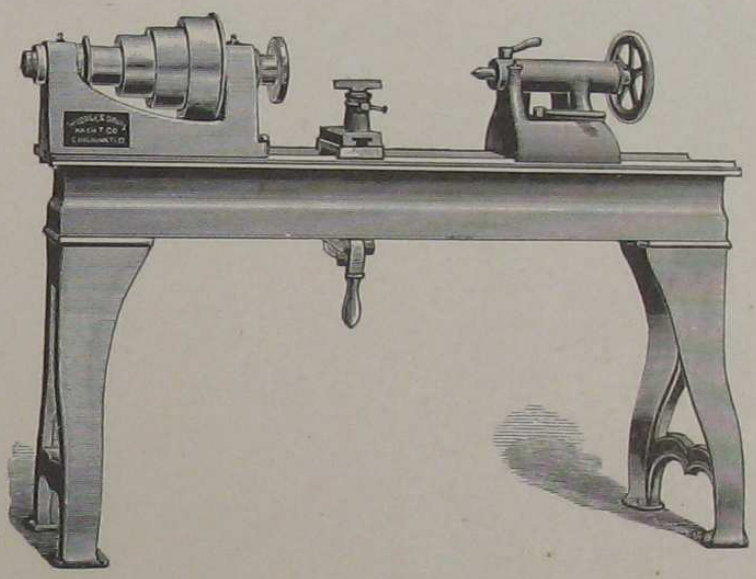
21-inch Turret Chucking Lathe, with Automatic Turret and Power Feed.

Made also in 36-inch swing.

Write for large cuts with full descriptions.

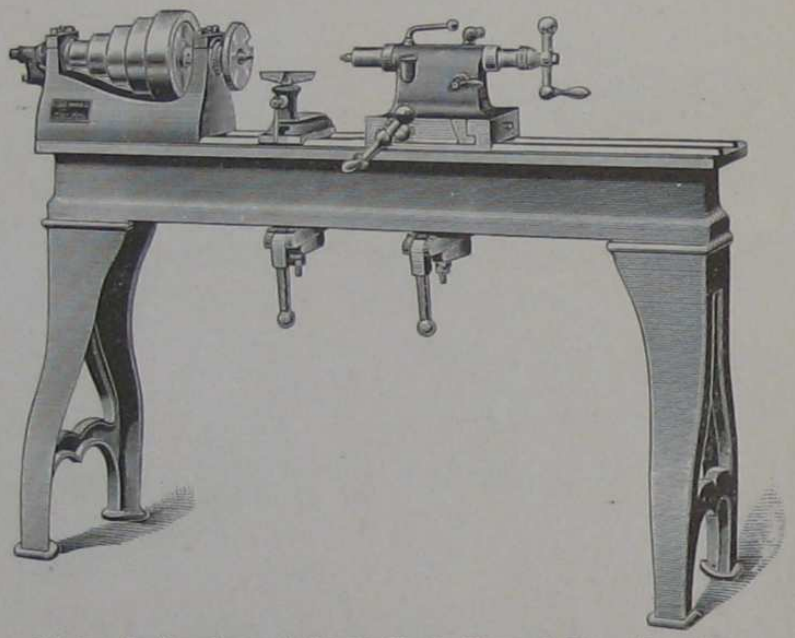
BRASS WORKERS' TOOLS.

The varied operations required in the manufacture of brass articles call for an extended line of Machine Tools. We present in the following pages a complete line of these machines as demanded by the latest and best shop practice. We have them now running in the largest and most advanced works in the country.



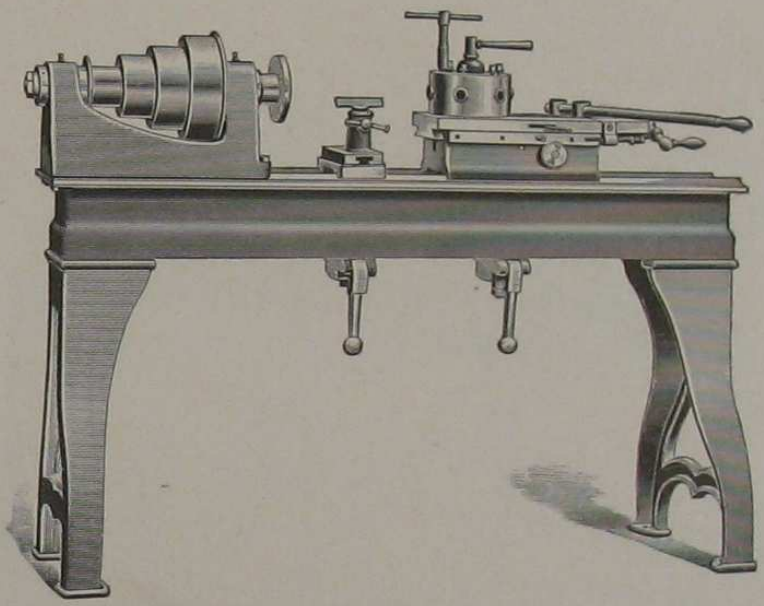
12 and 15-inch Hand Lathes.

Write for large cuts with full descriptions.



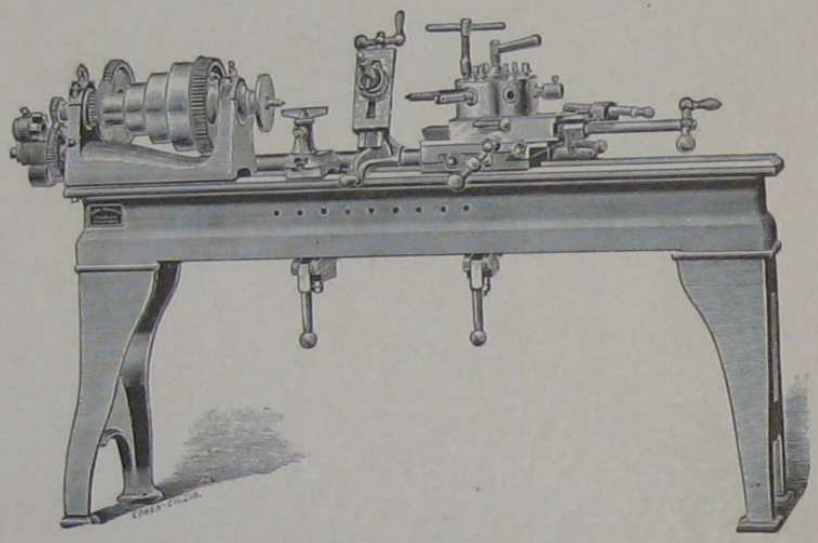
14-inch Swing, 5-foot Bed, Hand Fox Lathe.

With dove-tail set over and quick return to spindle. Write for large cuts with full descriptions.



12 and 15-inch Plain Turret Lathes.

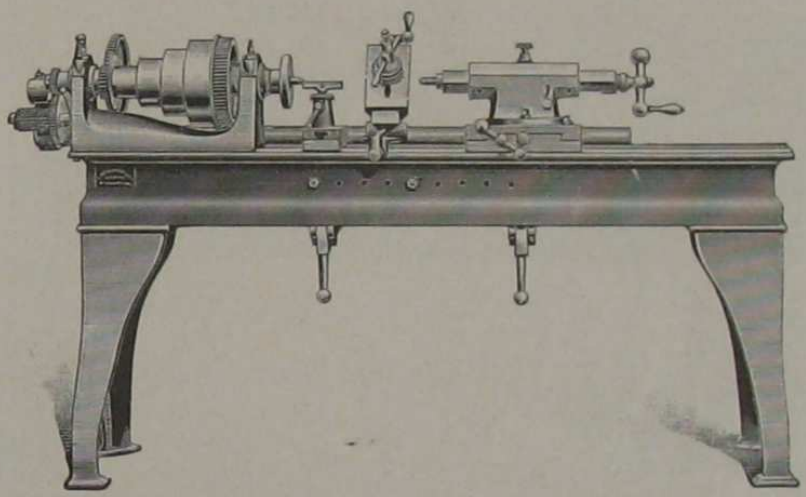
Write for large cuts with full descriptions.



15-inch Swing, 6-foot Bed, Fox Monitor Lathe.

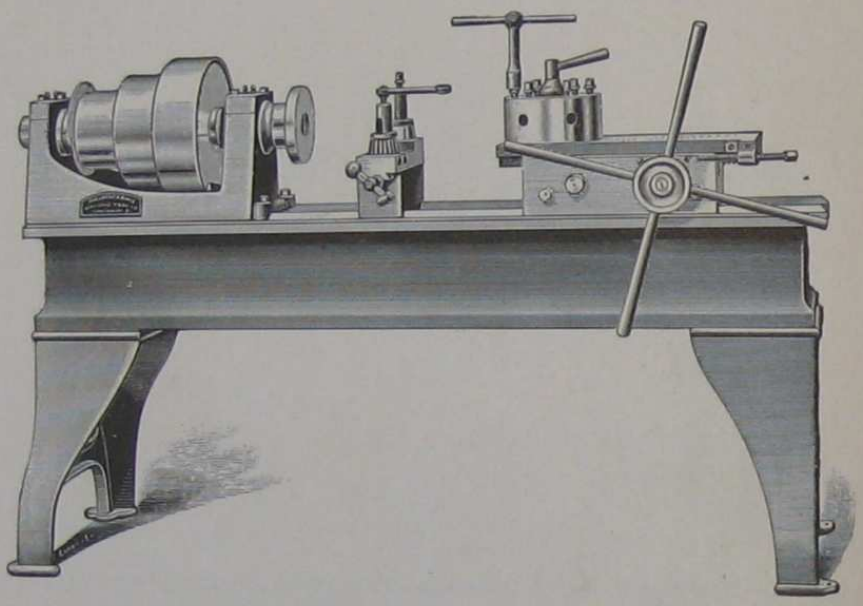
Made also 14-inch Swing, 5-foot Bed.

Write for large cuts with full descriptions.



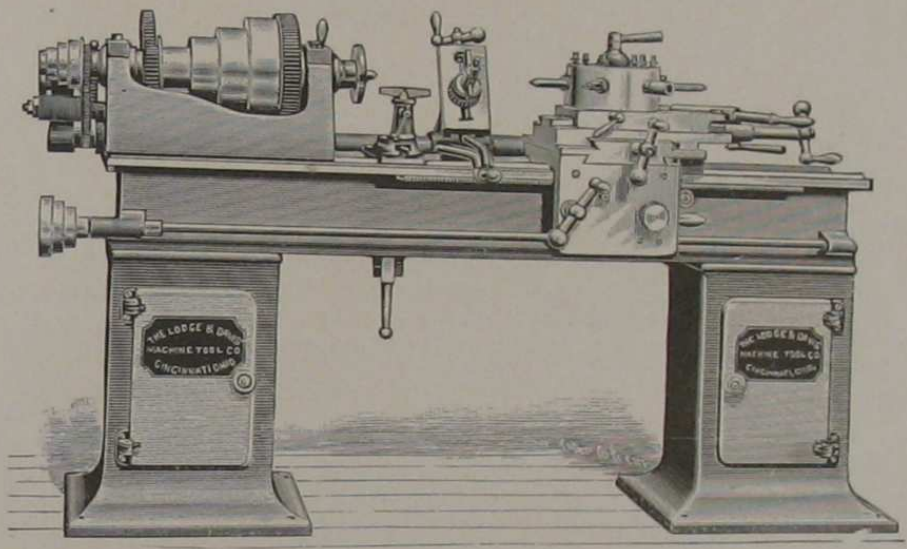
15-inch Swing, 6-foot Bed, Square Arbor Lathe.

Write for large cuts with full descriptions.



18-in. Swing, 6-ft. Bed and 21-in. Swing, 7-ft. Bed Automatic Turret Lathes.

Furnished, when desired, with Geared Friction Head and Chasing Bar. Write for large cuts with full descriptions.

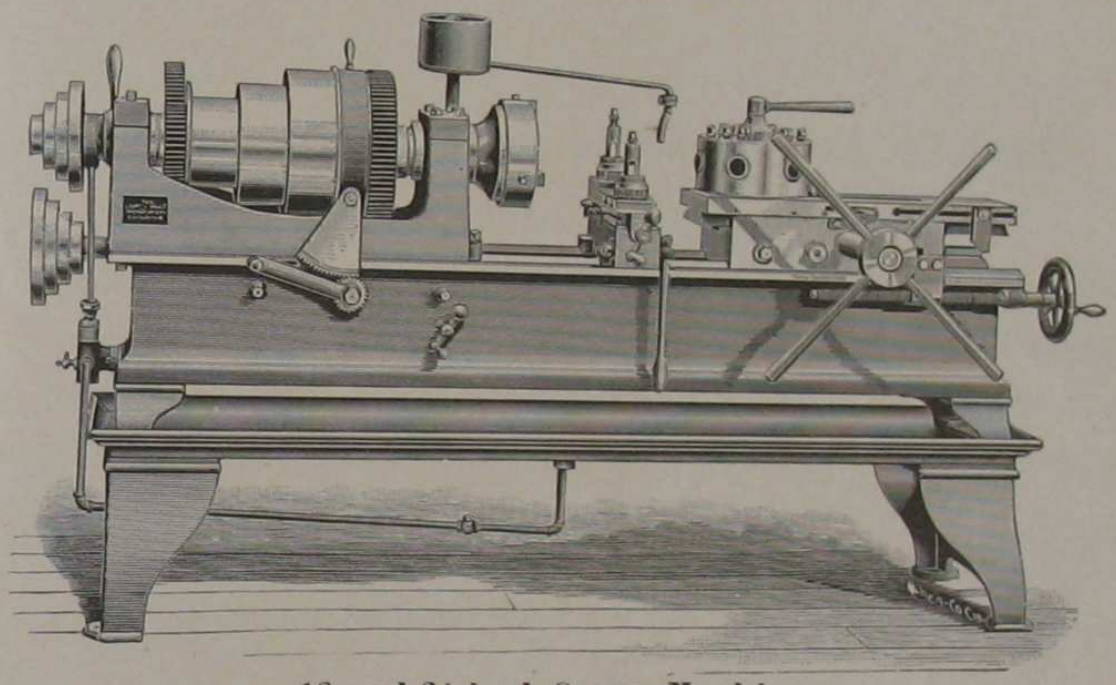


18-inch Swing, 6-foot Bed, Improved Cabinet Turret Lathe.

Complete with Taper Attachment. Write for large cuts with full descriptions.

SCREW MACHINES.

These machines are from entirely new patterns and designed with reference to turning out rapidly large amounts of duplicate work. We furnish with these tools our improved Geared Friction Heads, Automatic Turrets with power feed, Automatic Pump, our improved Double Cut-off Rest with longitudinal movement, Automatic Stop to feed, Universal Chuck, Double Friction Countershafts, etc.



18 and 21-inch Screw Machine.
Write for large cuts with full descriptions.

GEARED FRICTION HEAD MONITOR LATHES.

18-INCH AND 21-INCH SWING.

We apply to the 18-inch and 21-inch Monitor Lathes our improved Geared Friction Head, which is indispensable where two speeds are required to complete the work. *By this device it is unnecessary to stop the machine to throw in the back gears.* The speed can be varied in the ratio of 4½ to 1. All changes can thus be made for reducing different diameters, and after boring the speed can likewise be reduced for tapping.

Chasing Bar, Power Feed, etc., can be supplied when necessary.

PULLEY LATHES.

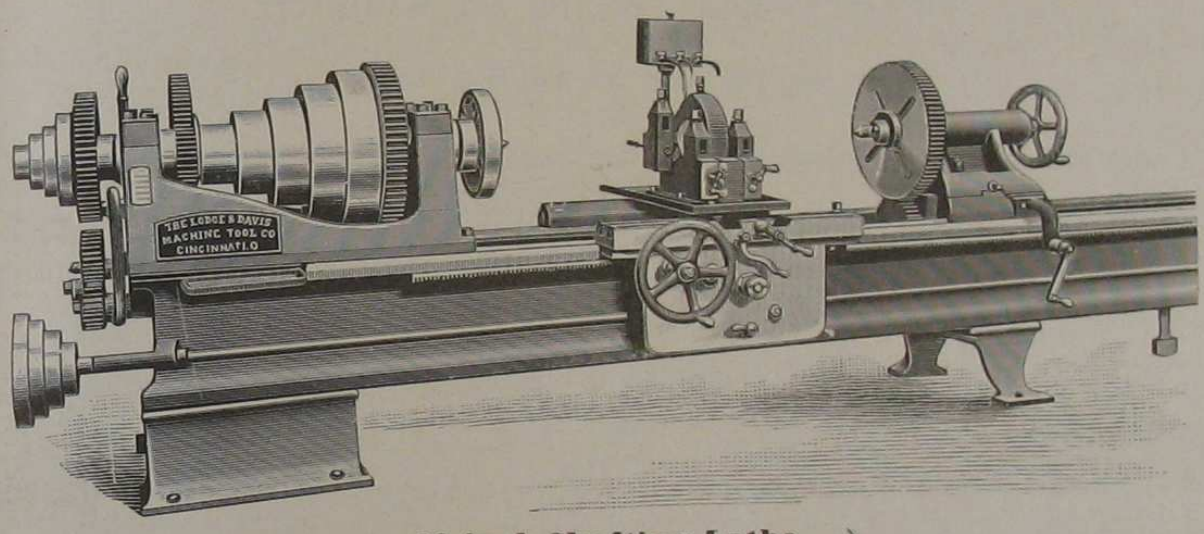
We have now in work improved designs of Pulley Lathes that will bore and turn pulleys simultaneously. This has heretofore been but indifferently accomplished, owing to faulty design and construction. We propose to eliminate these difficulties.

We shall manufacture three sizes, viz: 30-inch, 42-inch and 60-inch.

SHAFTING LATHES.

For turning shafting, to obtain the quickest and best results, we have applied to our Standard Engine Lathes a Geared Tail Stock, which enables the extra cut to be taken successfully without reversing the shaft in the lathe. In addition to this feature we supply a Three-tool Shafting Rest, with Automatic Pump, etc.

With these features applied to our Standard 27-inch, 30-inch and 38-inch Lathes, we guarantee to turn out as many feet of shafting per day as any lathe in the country.



30-inch Shafting Lathe.

Write for large cuts with full descriptions.

IMPROVED IRON PLANERS.

24, 26, 32 and 36 Inches Wide.

These tools have been designed for extra heavy duty. The beds are of great depth and width, and the metal is distributed to the best advantage for resisting the strain. The tables are deep and scraped to a bearing, giving a smooth, steady motion, and producing the most accurate work.

The cross rails are wide, having an extra large bearing on the housings. By our improved "lock-shifting device," one belt is moved off the driving pulleys before the other is moved on, thus avoiding a shrieking of the belts. Improved oiling devices are furnished for lubricating the ways.

32-INCH AND 36-INCH IRON PLANERS.

Holes for bolts are drilled outside of pockets, enabling work of extra length to be planed on the table. The tables are reversed from either side of planer.

By our "original" duplex shifting device the operator may adjust the cut from either side of the planer.

The back dog is so arranged that it can be lifted to let the table run from under the tool to examine the work, and is provided with steel rollers to avoid the wearing caused by constant rubbing or friction, which usually takes place at this point.

The Vs have extra large bearing surfaces, with special provision for holding and distributing oil for lubricating same.

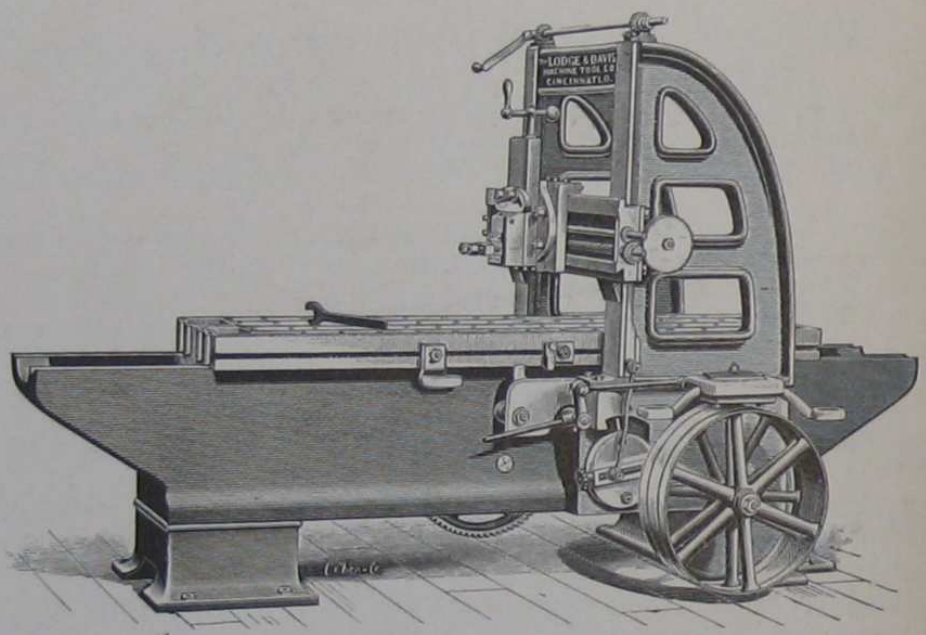
The bearings for all shafts are fitted solidly into the bed their entire length, giving greater solidity than where simply bolted to outside of frame.

Each shaft, with all its appurtenances, may be taken out intact, when for any reason it is necessary to take the planer apart. This is a feature that will be appreciated by all users

The ratio of the belt travel is 60 to 1, and the return of table is about 4 to 1.

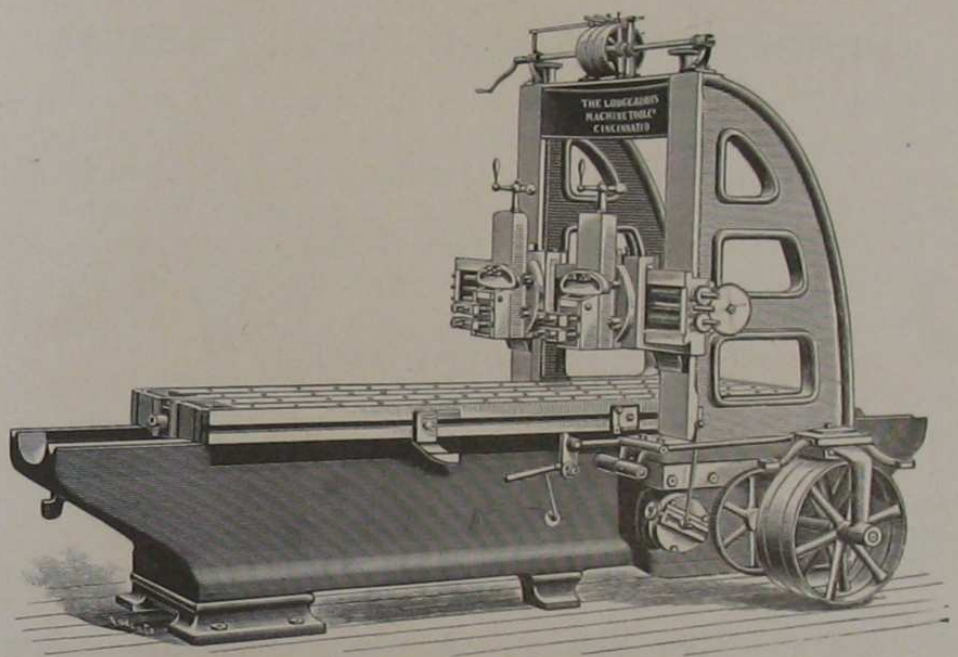
The entire cross rails in 32 and 36-inch planers are raised and lowered by power, and are made of extra length, enabling the purchaser to add an additional head at any time.

☞Extra deep beds, to resist cutting strain.
☞Shifting device insures noiseless belts.
☞All planers operated from both sides.
☞Table reverses without jar.
☞Feed operated from both ends of cross rail.
☞Improved device for holding planer bolts.
☞Improved oiling devices.
☞Write for special prices.



24 and 26-inch Iron Planers.

Write for large cuts with full descriptions.



32 and 36-inch Iron Planers.

Write for large cuts with full descriptions.

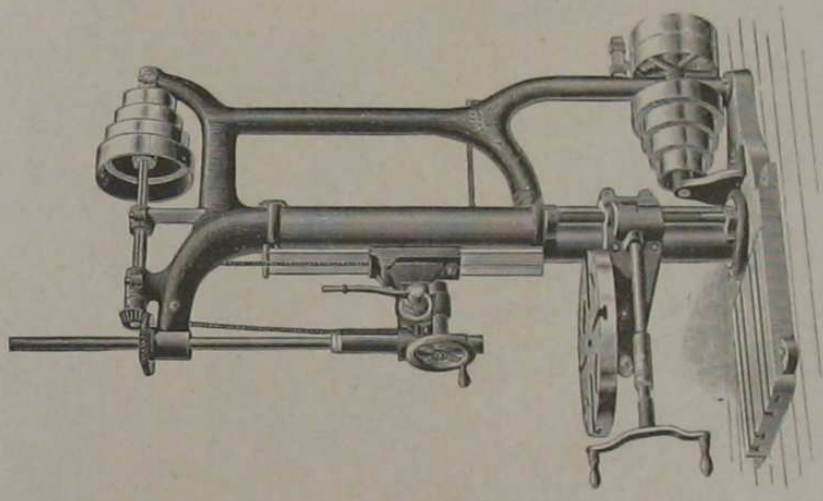
IMPROVED STANDARD DRILL PRESSES.

In offering these newly-designed tools to the trade, we are confident that they embrace more labor-saving devices than any similar line of tools now on the market.

On sizes above 28-inch swing we furnish our improved patented **Automatic Stop** to the down feed, an indispensable feature where a large number of holes are to be drilled to a depth. We furnish on all sizes our patented quick return, which is operated by the right hand alone, leaving the left hand of the operator free to retain its hold upon the work.

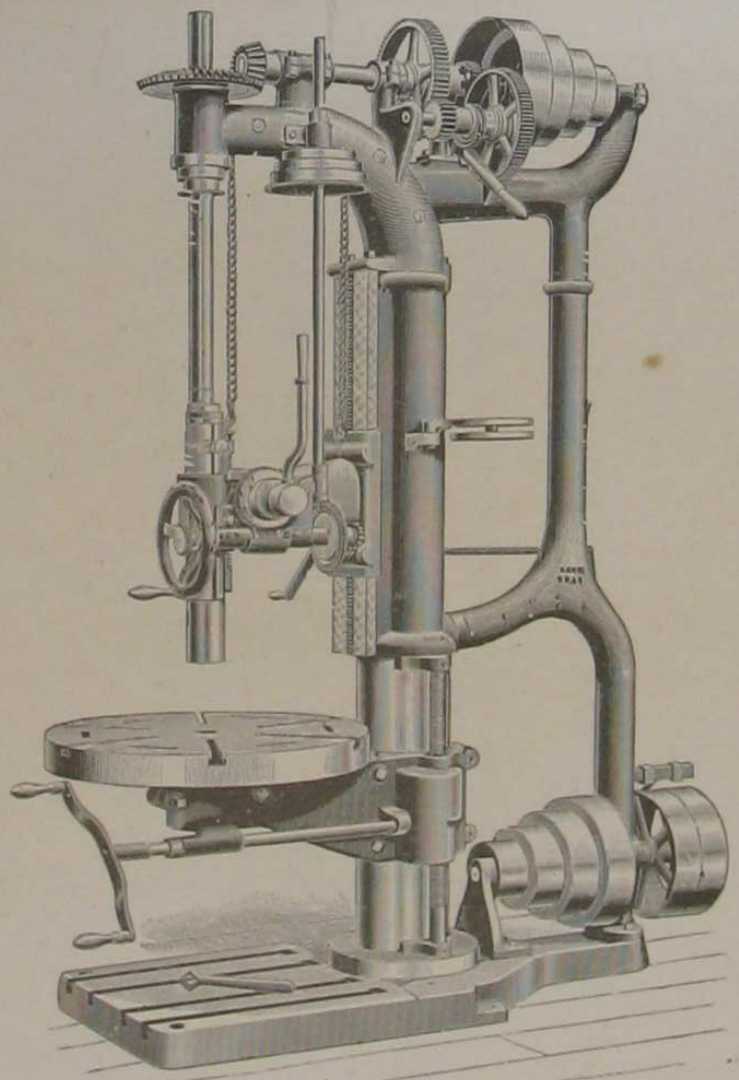
☞ Table raised and lowered from the front.
☞ Heavy back brace to column.
☞ Long belts.
☞ Gibbed heads, operated by rack and pinion.
☞ Improved device for throwing in back gears.
☞ **T** slots in table.
☞ We furnish with the 40-inch Standard Drill our improved square table, designed for heavy bridge work, of which we have sold a large number.

The 40-in. Drill is also fitted, when desired, with revolving table, operated by power. This feature is particularly adapted to boring cored holes in pulleys, gear wheels, etc.



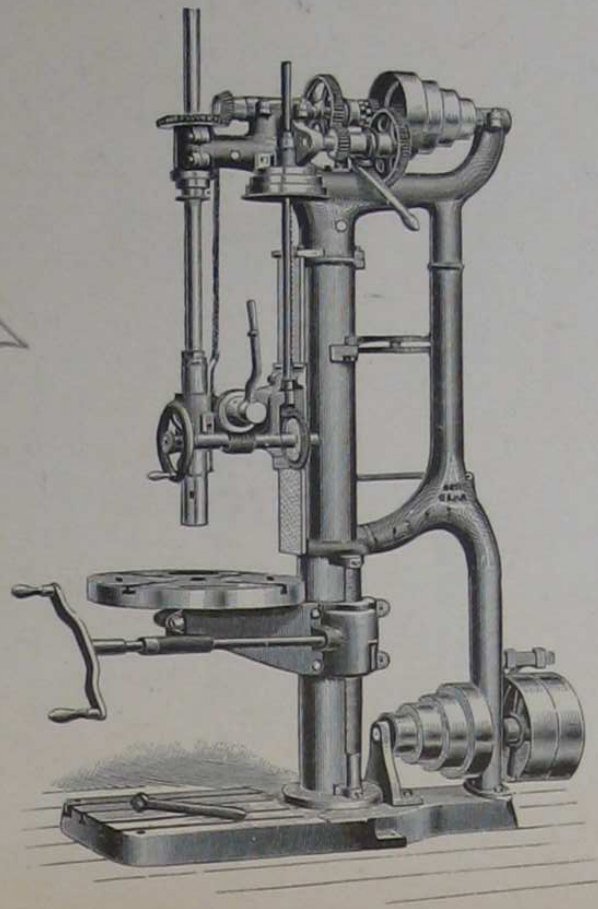
20 and 24-inch Sliding Head Standard Drill Press.

Write for large cuts with full descriptions.



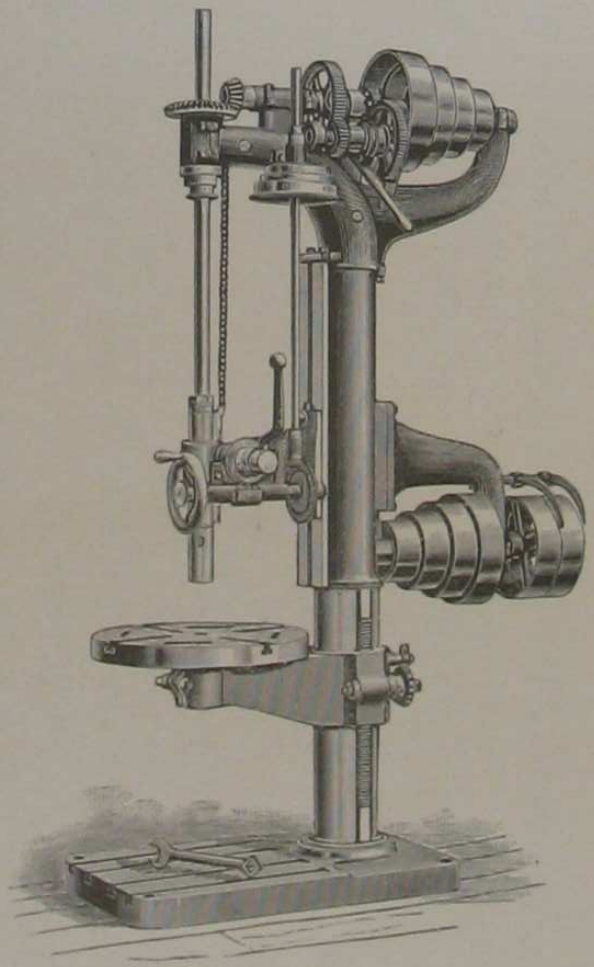
28, 32 and 40-inch Back Geared and Power Feed Standard Drill Press, with Automatic Stop.

Write for large cuts with full descriptions.



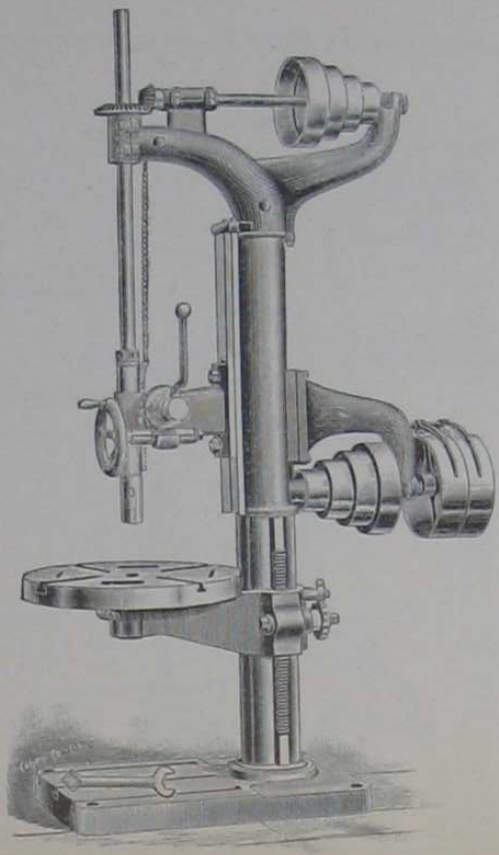
25-inch Standard Drill Press, with Back Gear and Power Feed.

Write for large cuts with full descriptions.



24, 28 and 32-inch Back Gear and Power Feed National Drill Press.

Write for large cuts with full descriptions.



24-inch Sliding Head National Drill Press.

Write for large cuts with full descriptions.

IMPROVED RADIAL DRILLS.

We have in process of construction a new and improved Radial Drill with five-foot arm. The distinctive features of this tool are:

Extra stiffness under pressure.
Less number of parts.
Less complications.
Reverse motion for tapping.
Extra long belts.
Internal back gears.
No bevel gears in countershaft.
Extra large base and box table.
Extra heavy.

Write for large cuts with full descriptions.

IMPROVED BOILER MAKERS' DRILL.

We are now placing on the market an extra heavy Boiler Makers' Drill that will drill to the center of 73 inches. By building out back of the frame a larger radius may be covered.

Steel spindle is $2\frac{7}{16}$ in. in diameter and has a vertical movement of 12 in.
Cone pulley has four steps for $3\frac{1}{4}$-inch belt.
Largest step on cone is 14 inches in diameter.
Is back geared.
Spindle is bored to fit No. 5 Morse taper.

Write for large cuts with full descriptions.

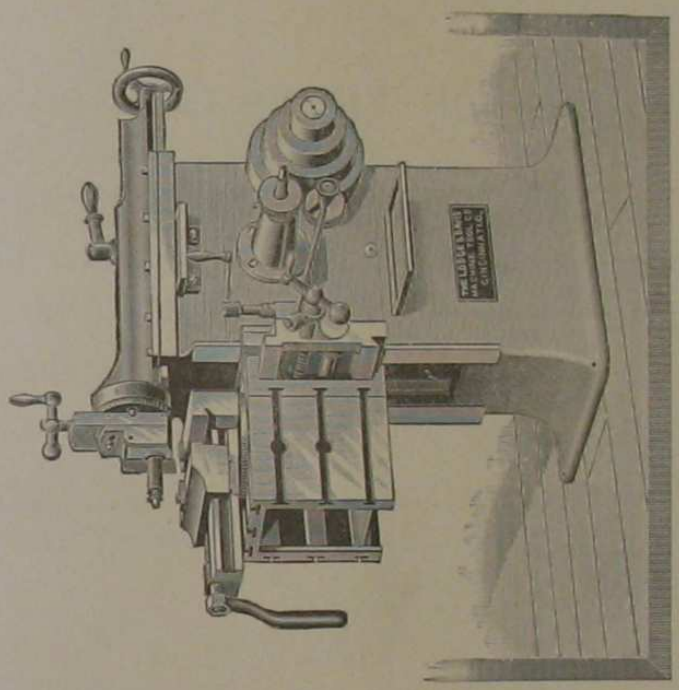
Improved 15 and 20-Inch Crank Shapers.

The stroke of these Shapers can be changed and adjusted while the machine is running. The stroke is at all times positive and they will invariably plane to a line.

The vise is made to swivel and may be transferred from the top of the table to the side, adapting the machine to a large range of work. Centers are furnished suitable for planing taps, reamers, etc.

Work can be bolted to the top and side of our improved box table.

The table may be removed and work bolted to the slotted apron to which box table is attached. All bearings are accurately scraped to a fit.



15 and 20-inch Crank Shapers.

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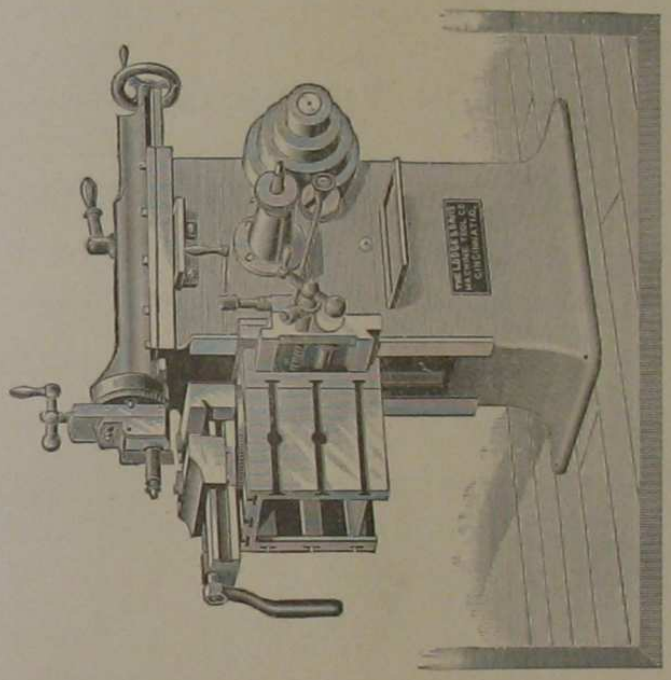
Work can be bolted to the top and side of our improved box table.

The table may be removed and work bolted to the slotted apron to which box table is attached. All bearings are accurately scraped to a fit.



15 and 20-inch Crank Shapers.

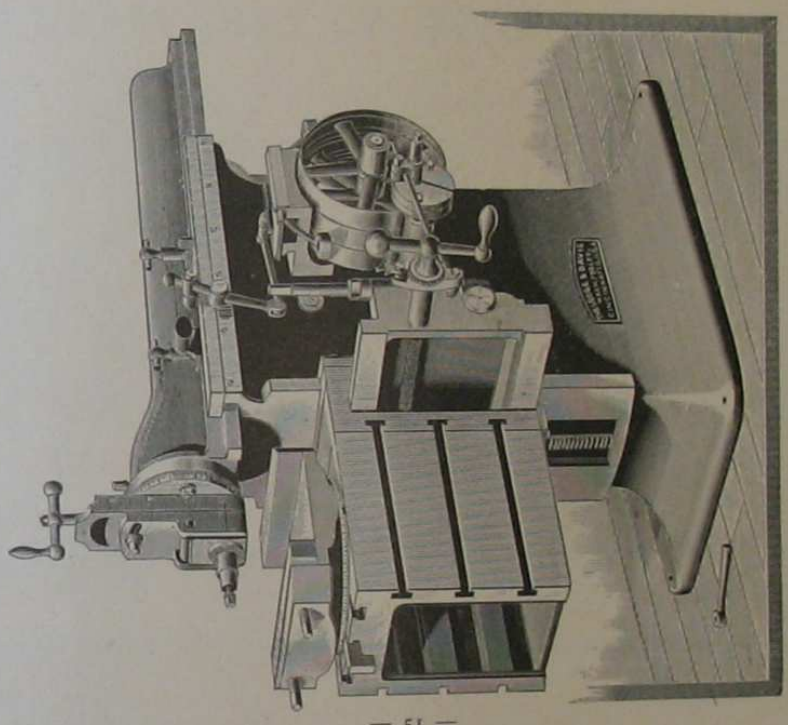
Write for large cuts with full descriptions.

20, 26 and 32-Inch Triple Geared Shapers.

The stroke of these Shapers can be changed while the machine is running. By our improved lock-shifting device one belt is moved off the driving pulley before the other is moved on, thus avoiding a shrieking of the belts.

An open space is provided under the ram, admitting long lengths of shafting clear through. This feature admits of a key seat being cut on a shaft of any length.

The box table can be removed and work bolted to the slotted apron to which table is attached.



20, 26 and 32-inch Triple Geared Shapers.

Write for large cuts with full descriptions.

New and Improved Milling Machines.

New and improved features are incorporated in these tools. The table is operated by a bronze screw four inches in diameter, running in oil. The screw engages in a thread cut in the under side of the table itself. This brings the push closer to the work than is possible by any other kind of feed.

☞ Table has automatic feed its entire length.

☞ Feed tripped automatically in either direction.

☞ Separate train of gears for hand feed and quick return.

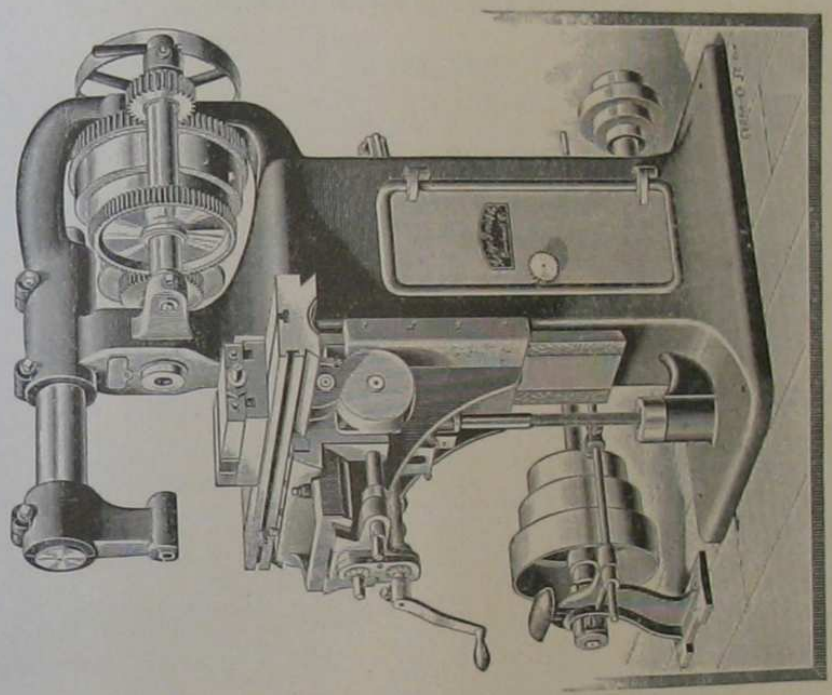
☞ One crank used for all hand movements.

☞ Column cast in one piece.

☞ Overhanging arm has extra long bearing in the sleeve.

Universal Machines in process of construction, with swivel tables, universal heads, rotary vises, centers, chucks, etc.

We have also under way a small size of Milling Machine, adapted to the rapid handling of light work.



Back Geared Milling Machine.

Write for large cuts with full descriptions.

LATHE CHUCKS.

When Lathes and Chucks are purchased of us at the same time, we fit all chucks to nose of spindle without extra charge.

—— PRICE LIST ——

Universal and Combination Lathe Chucks,

With Reversible Jaws.

Diameter.	Three-Jaw.	Four-Jaw.
6-inch Chuck.....	$26 00	$32 00
9 " "	34 00	42 00
12 " "	44 00	56 00
15 " "	52 00	64 00
18 " "	62 00	75 00
21 " "	80 00	95 00
24 " "	100 00	120 00
30 " "	170 00	200 00
36 " "	230 00	285 00
42 " "	270 00	325 00

Independent Chucks

With Reversible Jaws.

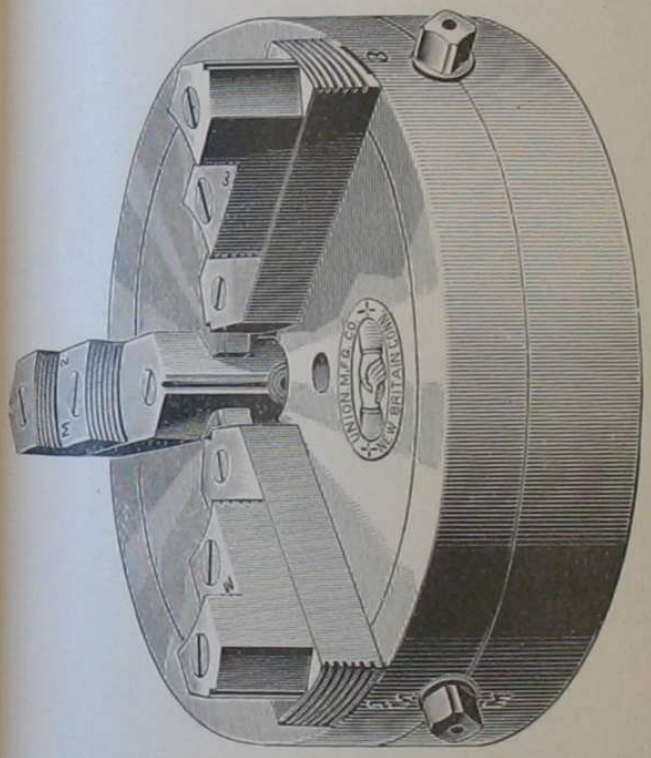
Diameter.	Price.
4 inches,	$14 00
6 "	18 00
8 "	22 00
10 "	26 00
12 "	30 00
14 "	34 00
15 "	35 00
16 "	38 00
18 "	44 00
20 "	50 00
22 "	57 00
24 "	65 00
30 "	120 00

Improved Two-Jaw Chucks

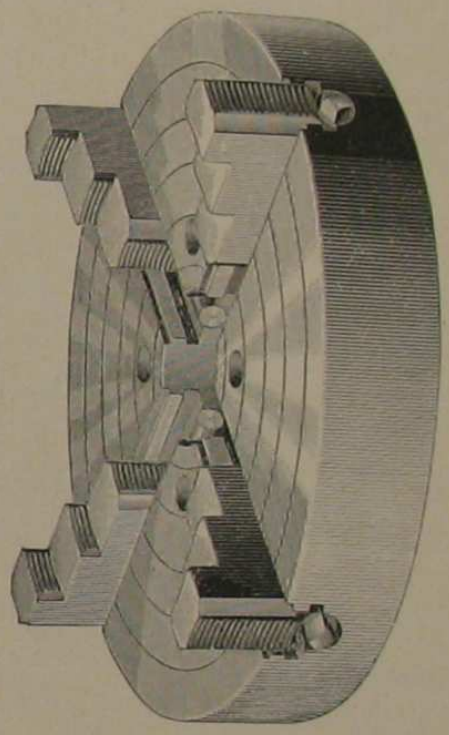
With Slip Jaws.

Size.	Price Round Body.	Price Box Body.
4½ in.,	$16 00	$.....
6 "	20 00	.....
7 "	24 00	24 00
9 "	30 00	30 00
12 "	.....	36 00
15 "	.....	42 00

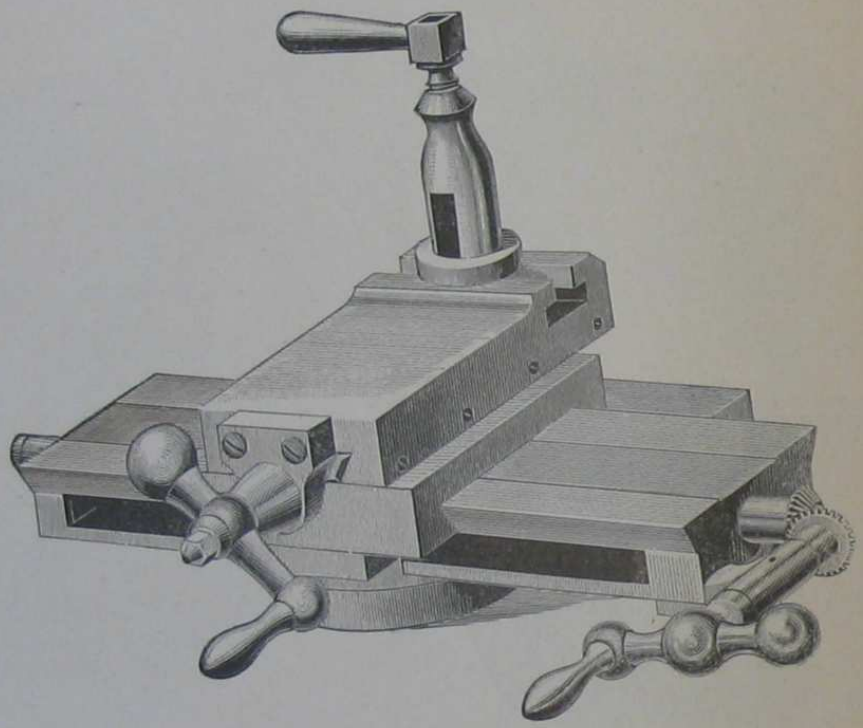
Discounts on Chucks on Application.



Improved Combination Chuck.

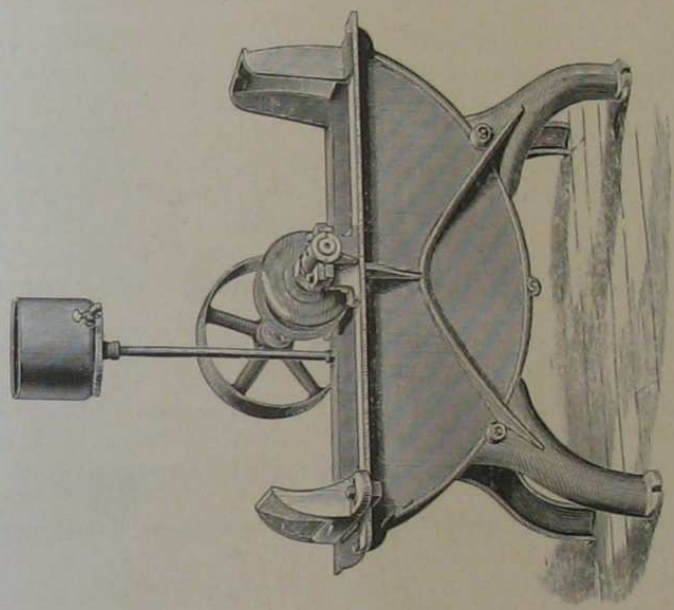


Improved Independent Chuck.



15-inch Slide Rest.

Slide Rests, Cut-off Rests, Hobbs, Leaders, Followers, Box Chucks, Wire Feed Chucks, etc., furnished on application.



Grindstone Frame.

Holds a stone 34 in. diameter, 4 in. face.

Write for large cuts with full descriptions.

HOW TO ERECT MACHINE TOOLS.

When machine tools are first received from the works, if they have been shipped any distance, either in an open or box car, there are more or less grit and dirt accumulated in transit. In order to thoroughly eliminate these the tools should be taken carefully apart and thoroughly cleaned.

The next thing would be to locate the position of the tool, also the countershaft, care being taken to set it level and thoroughly in line with the main driving shaft. The first and most important thing is a stone foundation, if on the ground floor. If not, a very careful leveling is imperative.

Ordinary levels are not sufficiently accurate to level machine tools. A first-class one may be bought, for six dollars ($6), from Queen & Co., of Philadelphia, Pa., so sensitive that one thickness of paper will show a decided variation.

If the tool being erected is a lathe, the level should then be placed across the ways at one end, in connection with a true straight edge, and then be transferred to the other end, when likely quite a perceptible difference will be found. This can be eliminated by carefully packing with paper until both ends are absolutely alike. The middle may then be tried, and, unless it is a very heavy machine, would, no doubt, be found all right; but, if not, the same process of packing with paper will be necessary.

After the machine is belted up especial care should be taken, for three or four weeks, to keep all the running parts and sliding surfaces well oiled.

If these directions are carefully followed there will be little trouble about the machine running properly.

CALCULATING SPEED OF PULLEYS.

TO FIND SIZE OF PULLEY ON LINE SHAFT.

Multiply diameter of pulley on countershaft by its number of revolutions, and divide the product by number of revolutions of line shaft. The quotient will be the diameter of pulley on line shaft

EXAMPLE.—Countershaft runs 120 revolutions; diameter of pulley, 10 inches; line shaft runs 120. $120 \times 10 = 1200$. $\frac{1200}{120} = 10$ inches diameter.

TO FIND SIZE OF PULLEY ON COUNTERSHAFT.

Multiply diameter of pulley on line shaft by its number of revolutions, and divide the product by number of revolutions of countershaft.

EXAMPLE.—Diameter of pulley on line shaft, 18 inches; line shaft runs 160 revolutions; countershaft runs 120 revolutions. $\frac{18 \times 160}{120} = 24$ inches diameter.

TO FIND NUMBER OF REVOLUTIONS OF COUNTERSHAFT.

Multiply diameter of pulley on line shaft by its number of revolutions, and divide product by diameter of pulley on countershaft.

EXAMPLE.—Diameter of pulley on line shaft, 30 inches; line shaft runs 140 revolutions; diameter of pulley on countershaft, 12. $\frac{30 \times 140}{12} = 350$ revolutions.

Rule for Gearing Engine Lathes for Screw Cutting.

Take from the index the number of threads cut by equal gears and multiply it by a number that will give for a product a gear on the index. Place this gear on the spindle or stud. Then multiply the number of threads per inch to be cut by the same number, and put the resulting gear on the screw.

EXAMPLE. – Lathe cuts four threads by equal gears, and thirteen threads per inch are wanted.

$$\frac{\text{Spindle or stud}}{\text{Threads to be cut}} = \frac{4}{13}.$$

The constant five will give for a product a gear on the index $\frac{4 \times 5}{13 \times 5} = \frac{20.}{65.}$ Therefore, to cut thirteen threads per inch, would require a gear of twenty teeth on the spindle or stud, and a gear of sixty-five teeth on the lead screw.

Rule for Finding Number of Revolutions for Different Cutting Speeds.

Assuming 36 feet as the proper cutting speed for cast iron, which equals about 140 revolutions per minute for one inch in diameter to be turned, divide the number 140 by the diameter of the work, which gives the proper number of revolutions.

EXAMPLE.—Diameter of work 5 inches. $\frac{140}{5} = 28$ revolutions.

The following table gives the constants for different cutting speeds:

CUTTING SPEED.	CONSTANT.	
36 feet.	140 revolutions.	Cast iron.
31 "	120 "	Cast iron.
26 "	100 "	Steel.
21 "	80 "	Steel.
16 "	60 "	Steel.
13 "	50 "	Hardened steel and chilled cast iron.

Approximate Rule for Calculating Horse Power Transmitted by Belting.

A single laced belt of one inch width and 800 feet velocity per minute transmits one horse power.

EXAMPLE.—Diameter of smallest pulley, 30 inches; revolutions, 150 per minute; width of belt, 5 inches.

$$\frac{30 \times 3.1415 \times 150 \times 5}{12 \times 800} = 7.3 \text{ horse power.}$$

TABLE OF DIAMETRAL AND CIRCULAR PITCHES.

TABLE No. 1.

Diametral Pitch.	Circular Pitch.	Diametral Pitch.	Circular Pitch.
2	1.571 inch	12	.262 inch
2¼	1 396 inch	14	.224 inch
2½	1 257 inch	16	.196 inch
¾	1.142 inch	18	.175 inch
3	1.047 inch	20	.157 inch
3½	.898 inch	22	.143 inch
4	785 inch	24	.131 inch
5	628 inch	26	121 inch
6	.524 inch	28	.112 inch
7	.449 inch	30	.105 inch
8	.393 inch	32	.098 inch
9	.349 inch	36	.087 inch
10	.314 inch	40	.079 inch
11	.286 inch	48	065 inch

TABLE No. 2.

Circular Pitch.	Diametral Pitch.	Circular Pitch.	Diametral Pitch.
2	1 571 inch	⅞	3.590 inch
1⅞	1 676 inch	13 16	3 867 inch
1¾	1.795 inch	¾	4 189 inch
1⅝	1.933 inch	11-16	4.570 inch
1½	2.094 inch	⅝	5.027 inch
1 7-16	2.185 inch	9-16	5.585 inch
1⅜	2 285 inch	½	6.283 inch
1 5-16	2.394 inch	7-16	7.181 inch
1¼	2.513 inch	⅜	8.378 inch
1 3-16	2.646 inch	5-16	10.053 inch
1⅛	2 793 inch	¼	12.566 inch
1 1-16	2 957 inch	3-16	16 755 inch
1	3.142 inch	⅛	25.133 inch
15-16	3 351 inch	1-16	50.266 inch

No. 1 table shows the diametral pitches with the corresponding circular pitches.
No. 2 table shows the circular pitches with the corresponding diametral pitches.

TABLE OF DECIMALS EQUALING PARTS OF AN INCH.

1-64 .... .0156	17-64 ..... .2656	33-64..... .5156	49-64..... .7656
1-32..... .0313	9-32 .... .2813	17-32..... .5313	25-32..... .7813
3-64..... .0469	19-64..... .2969	35-64..... .5469	51-64 ..... .7969
1-16..... ..... .0625	**5-16 .... .3125**	**9-16..... .5625**	**13-16..... .8125**
5-64 ..... .0781	21-64..... .3281	37-64..... .5781	53-64 ..... .8281
3-32 ..... .0938	11-32..... .3438	19-32..... .5938	27-32..... .8438
7-64..... .1094	23-64 ..... .3594	39-64..... .6094	55-64..... .8594
1-8..... .1250	**3-8 ..... .3750**	**5-8..... .6250**	**7-8..... .8750**
9-64..... .1406	25 64..... .3906	41-64 ..... .6406	57-64..... .8906
5-32 1563	13-32..... .4063	21-32 ..... .6563	29-32..... .9063
11-64..... .1719	27-64..... .4219	43-64..... .6719	59-64..... .9219
3-16 .... .1875	**7-16..... .4375**	**11-16 ..... .6875**	**15-16..... .9375**
13-64 ..... .2031	29-64 4531	45-64..... .7031	61-64..... .9531
7-32..... .2188	15-32 ..... .4688	23-32..... .7188	31-32..... .9688
15-64..... .2344	31-64..... 4844	47-64 ..... .7344	63-64..... .9844
1-4..... ..... .2500	**1-2.... ..... .5000**	**3-4..... ..... .7500**	**1..... 1.**

WEIGHTS OF METALS.

	Average Weight, Cubic Feet.	Average Weight, Cubic Inches.
Cast Iron	450 pounds	.260 pounds
Wrought Iron	485 pounds	.281 pounds
Gun Metal	528 pounds	.306 pounds
Steel	489 pounds	.283 pounds

Cast Iron is 17½ times heavier than ordinary kiln-dried wood used in common patterns.

WEIGHT OF ROUND STEEL PER LINEAL FOOT.

For Wrought Iron multiply tabular weights by .993.

Diameter in Inches.	Weight Per Foot.	Diameter in Inches.	Weight Per Foot.	Diameter in Inches.	Weight Per Foot.	Diameter in Inches.	Weight Per Foot.
1-16	.0104	13-16	1.761	1 9-16	6.512	2 5-8	18.379
1-8	.042	7-8	2.042	1 5-8	7.043	2 3-4	20.171
3-16	.094	15-16	2.344	1 1-16	7.596	2 7-8	22.047
1-4	.167	1	2.667	1 3-4	8.169	3	24.005
5-16	.261	1 1-16	3.011	1 13-16	8.702	3 1-8	26.048
3-8	.375	1 1-8	3.375	1 7-8	9.377	3 1-4	28.173
7-16	.511	1 3-16	3.761	1 15-16	10.013	3 3-8	30.382
1-2	.667	1 1-4	4.168	2	10.669	3 1-2	32.674
9-16	.844	1 5-16	4.595	2 1-8	12.044	3 5-8	35.05
5 8	1.042	1 3-8	5.043	2 1-4	13.593	3 3-4	37.508
11-16	1.261	1 7-16	5.512	2 3-8	15.045	3 7-8	40.05
3-4	1.5	1 1-2	6.001	2 1-2	16.67	4	42.675

The following was found engraved in hieroglyphics on an ancient Egyptian tomb, but it applies to-day with equal force:

"Look not mournfully into the past: it comes not back again. Wisely improve the present: it is thine. Go forth to meet the shadowy future without fear, and with a manly heart."

The following was found engraved on a barn door in Ohio and it permeates:

If you're looking for a spot
Where trouble cometh not,
  And everything in life is what you crave,
Don't expect it can be found
On the top of any ground;
  You'd better try to find it in the grave.

. . . YOUNG men talk of what they are doing, old men of what they have done, and fools, what they are going to do.—SPANISH PROVERB.

* * *

. . . STAND still when everybody else runs, and run when everybody else stands still.—SPANISH PROVERB.

* * *

. . . MAN advances just in proportion that he mingles thought with his labor.—INGERSOLL.

* * *

. . . FIRST unto thine own self be true, and so sure as the day doth follow night, thou canst not be false to any man.—SHAKESPEARE.

SUGGESTIONS TO WORKINGMEN.

Never consider time wasted that is spent in learning rudiments. In acquiring knowledge of any art or handicraft, the greatest difficulty is experienced at the beginning, because the work then possesses little or nothing of interest. The first lessons with tools are very simple, so much so that we are disposed to undervalue their importance. But such a course is fatal to success. To learn principles thoroughly is to succeed. Be content to learn one thing at a time, and learn that one thing well. This will enable you to advance steadily, step by step, from year to year, and you will some day wonder why you have been able to distance the geniuses who once seemed so far in advance of you. Learn to obey recognized authority. No man ever properly learned to command until he had first learned to obey.

Let your mind, in working hours, be concentrated on your work. Thomas Edison, the inventor, when asked what advice he could give a young workman, said: "Never look at the clock." He meant that a young man whose mind was not on his work, but was watching the clock to reach quitting time, would never succeed. Learn to spell correctly; to write a good, plain hand, and to punctuate your sentences. Do not dress beyond your means, or attempt to make a show or display in the world, because others in your station in life are doing so. Pursue the even tenor of your way without regard to them, and you will have money and position when they will have neither.

SAVE A LITTLE MONEY.

Every man who is obliged to work for a living should make it a point to lay up a little money for that "rainy day" which we are all liable to encounter when least expected. The best way to do this is to open an account with a savings bank or building association. No matter how small your pay, you can save something if you only make up your mind to do so. Having decided what this amount shall be, make your deposit and receive your book No one knows, without trying it, how easy it is to save money when an account has been opened. With such an account a man feels a desire to enlarge his deposit. It gives him lessons in frugality and economy; weans him from habits of extravagance, and is the very best guard in the world against intemperance, dissipation, and vice. We subjoin a table showing the time at which money doubles itself at interest.

TIME AT WHICH MONEY DOUBLES AT INTEREST.

Rate Per Cent.	Simple Interest.	Compound Interest.
Ten.	10 years.	7 years, 100 days.
Nine.	11 years, 40 days.	8 years, 16 days.
Eight.	12½ years.	9 years, 2 days.
Seven.	14 years, 104 days.	10 years, 89 days.
Six.	16 years, 8 months.	11 years, 327 days.
Five.	20 years.	15 years, 75 days.
Four.	25 years.	17 years, 246 days.
Three.	33 years, 4 months.	23 years, 164 days.

SAFE BUSINESS RULES.

Business men, in business hours, attend only to business matters. Social calls are best adapted to the social circle. Make your business known in few words, without loss of time.

A mean action will soon recoil, and a man of honor will be esteemed. Treat all with respect, confide in few, and wrong no man.

Never be afraid to say *No*, and be always prompt to acknowledge and rectify a wrong.

To preserve long friendship keep a short credit. The way to get credit is to be punctual. The way to preserve it is not to use it more than absolutely necessary. Be well satisfied, before you give a credit, that those to whom you give it are safe men to be trusted.

Let your product be first class, and charge a fair living profit. Do not be uneasy if your competitor is apparently doing a big business by making cheap stuff. You do not know but that it may be coming back about as fast as it goes out. Nothing can permanently succeed unless based on merit. Look around and you will find that the prosperous concerns in your line of business make a good article and sell it without regard to what others are doing.

LAW POINTS.

A note dated on Sunday is void. A note obtained by fraud, or from one intoxicated, is void. If a note be lost or stolen, it does not release the maker; he must pay it. An indorser of a note is exempt from liability, if not served with notice of its dishonor within twenty-four hours of its non-payment. A note by a minor is void. Notes bear interest only when so stated. The legal rate of interest varies with different States. Principals are responsible for their agents. Each individual in a partnership is responsible for the whole amount of the debts of the firm. Ignorance of the law excuses no one. It is a fraud to conceal a fraud. It is illegal to compound a felony. The law compels no one to do impossibilities. An agreement without consideration is void. Signatures in lead pencil are good in law. A receipt for money is not legally conclusive. The acts of one partner bind all the others. Contracts made on Sunday can not be enforced. A contract made with a minor is void. Written contracts concerning land must be under seal. "Contract Sales" (or those in which the seller retains the title to the machine until all payments are made), are not good in some States. Chattel mortgages are not good in all States. Full information furnished if desired.

MAN CAN BE COMPARED TO AN ENGINE LATHE.

He has his "fast speeds" and later his "slower speeds;" by that time he has had his "full swing." If his "head stock" is light, he is liable to "chatter," which is an "index" of want of "solidity." His "carriage" and "bearing" depend on his "ways," and he is often tied to an "apron" string. If he comes home late to dinner and finds every thing cold, he is wrathy, and this may be called his "cross feed." If he attends a banquet and eats and drinks for hours, this could be called his "length feed." While going through life he gets many a good "belt," and finds considerable "friction" in trying to "clutch" onto all the money he can. If he fails to pay his rent, his landlord is "bored" and he gets "turned" out. If he steals money he is "chased" to Canada, which is his "finishing cut." If he ever amounts to much, he commences by "roughing" it, then becomes "smoother," and should in time get some "polish." When old, he has some "lost motion," gets on his last "legs," then "dies," and is finally "chucked" in the grave.


L&D

LODGE & DAVIS
MACHINE TOOL