

PACEMAKER MODEL
DUPLICATE WORK AT A FRACTION OF FORMER COST

"AMERICAN"

MULTI-PRODUCTION LATHE

- The Machine That Changes Minutes Into Profit

Sizes: 14-inch, 16-inch, 20-inch.



THE AMERICAN TOOL WORKS CO.

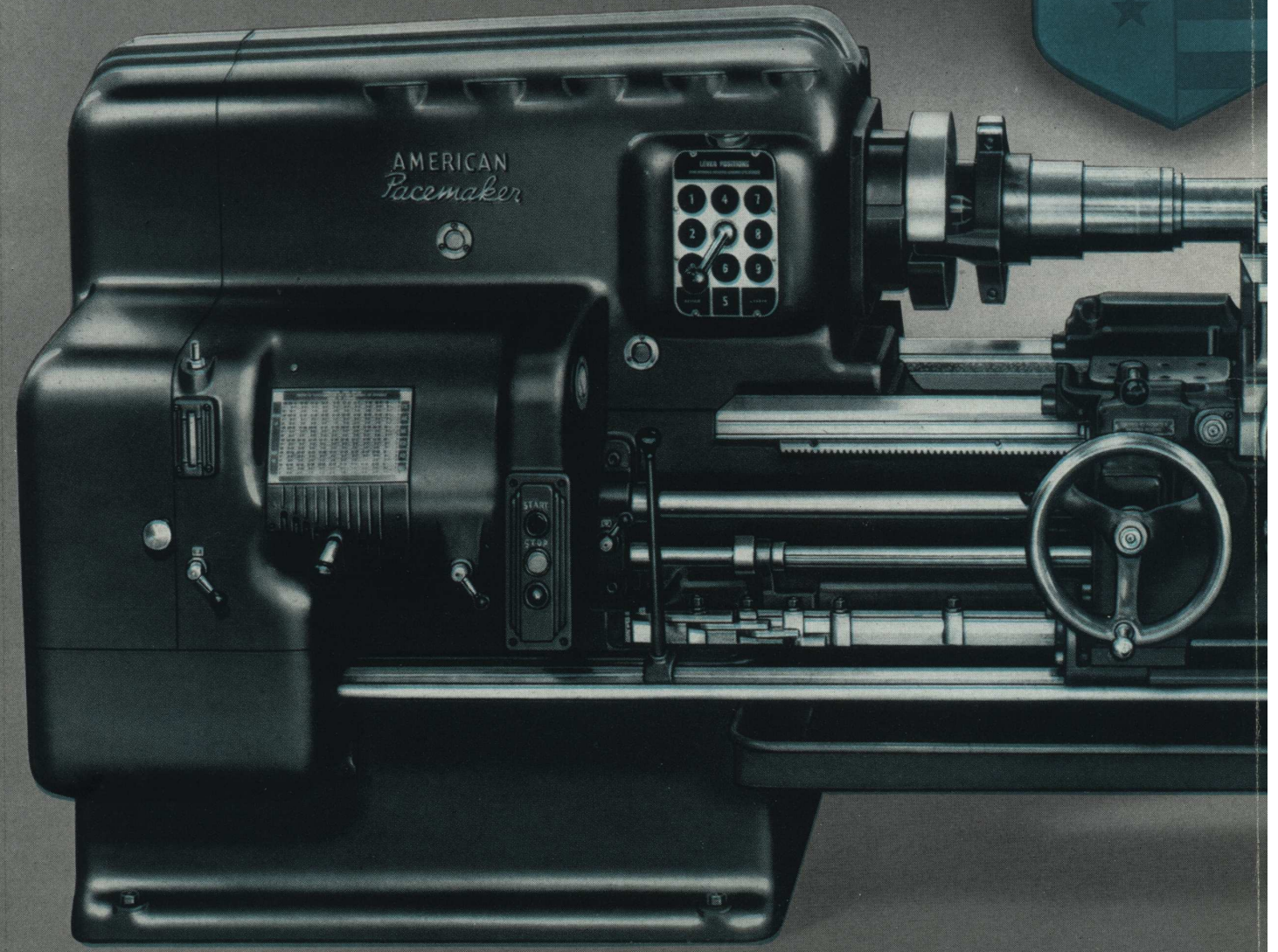
Cincinnati, Ohio, U. S. A.

Lathes and Radial Drills

"AMERICAN"

MULTI-PRODUCTION LATHES





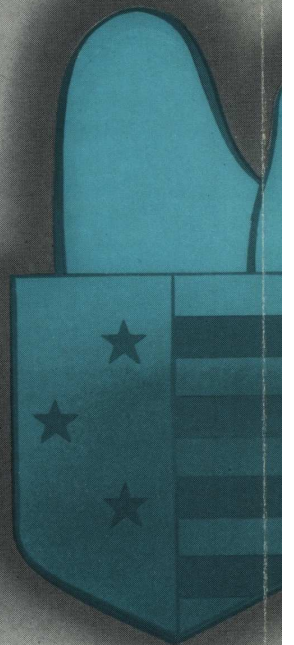
AMERICAN
Racemaker

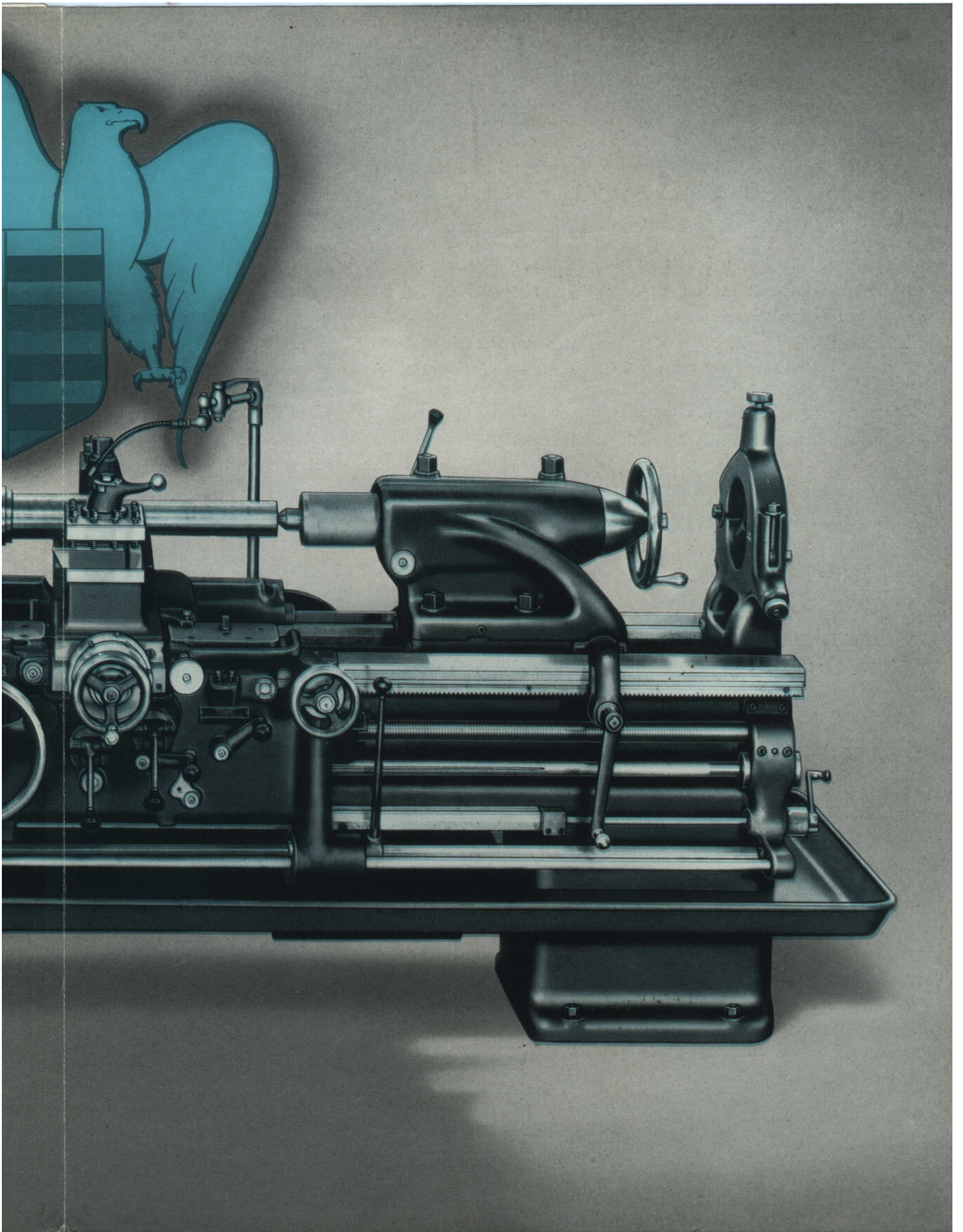
LEVER POSITIONS

1	4	7
2	5	8
3	6	9
0		

START
STOP

READ THESE INSTRUCTIONS
FIRST
1. Turn the machine on the treadle.
2. Turn the treadle wheel to the left
till the needle is in its rest position.
3. Turn the treadle wheel to the right
till the needle is in its rest position.
4. Turn the treadle wheel to the left
till the needle is in its rest position.
5. Turn the treadle wheel to the right
till the needle is in its rest position.
6. Turn the treadle wheel to the left
till the needle is in its rest position.
7. Turn the treadle wheel to the right
till the needle is in its rest position.
8. Turn the treadle wheel to the left
till the needle is in its rest position.
9. Turn the treadle wheel to the right
till the needle is in its rest position.
10. Turn the treadle wheel to the left
till the needle is in its rest position.





MULTI-PRODUCTION EQUIPMENT

The selection of this equipment is to be determined by the character of customer's work.

"Easy Access" Chip and Coolant Pan.
(Special Pan for easy chip removal.)

Coolant Pump and fittings.

Automatic Longitudinal Stops with stop dogs and center hole compensator.

Positive Diameter Stops.

Direct-Reading Cross Feed Dials with adjustable indicating clips.

Quick-set Scale in Bed Wall.

Built-in Anti-friction Tailstock Center.

Connected front and rear tool rests of various types with tool holders to suit.

Power Rapid Traverse for carriage.

Ammeter for indicating horse power consumption.

Steady Rests with roller jaws.

THE AMERICAN MULTI-PRODUCTION LATHE

The "American" Multi-Production Lathe is a semi-automatic lathe designed and equipped to machine duplicate shafts on the most economical basis. It fills the gap between the standard engine lathe and the highly specialized, single purpose automatic lathe.

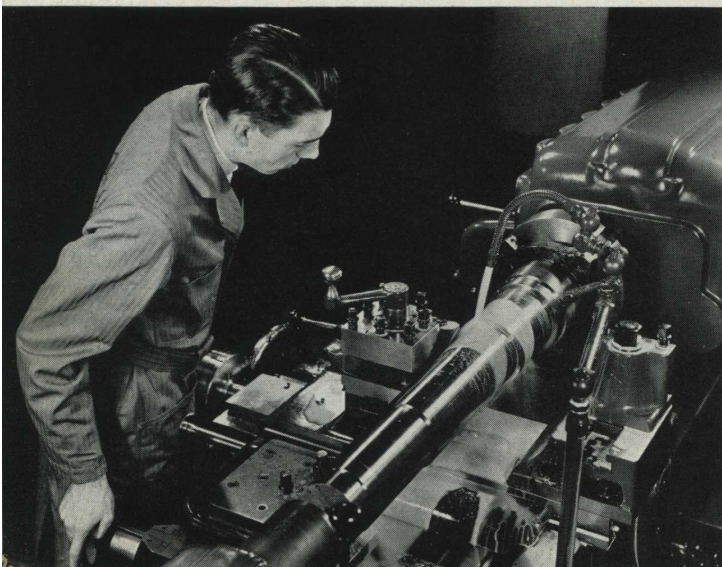
In many plants shafts are not produced in sufficient quantities to justify the set-up time required by the automatic lathe but are produced in large enough quantities to make the production afforded by the standard engine lathe too costly. Users of our Multi-Production Lathes tell us that it pays them to set up their Multi-Production Lathes for lots containing as few as 4 pieces.

Multi-Production Lathes are equipped to use cemented carbide cutting tools to the limit of their efficiency. They have the power, the stamina, the range and the duplicating equipment to insure the effective use of these high-speed cutting tools. In fact, to use cemented carbide tools safely and effectively automatic equipment is a virtual necessity as the operator can hardly be expected to manually manipulate his machine at such high cutting speeds. This duplicating equipment provides the further advantages of eliminating time loss due to measuring and calipering and of reducing spoiled work to a minimum.

A decided advantage in versatility over the automatic lathe is offered by this Multi-Production Lathe. By retaining all of the standard engine lathe features it provides the same adaptability and range as the standard engine lathe, while in addition through its combination of automatic length stops, positive diameter stops, direct measuring cross feed dials with indicating clips and special multiple tooling it offers, in a very high degree, the productive advantages of the Automatic Lathe.

When considering a Multi-Production Lathe care should be exercised to avoid selecting too small a size. We have reason to believe that the present cutting alloys, in spite

of their amazing efficiency, have not reached their peak and that the future will witness further improvement that may greatly increase the cutting ability of these or other alloys over those available at present. In selecting a new machine, anticipate future developments in cutting tools as far as possible and select a machine with sufficient capacity to use an improved cutting tool satisfactorily.

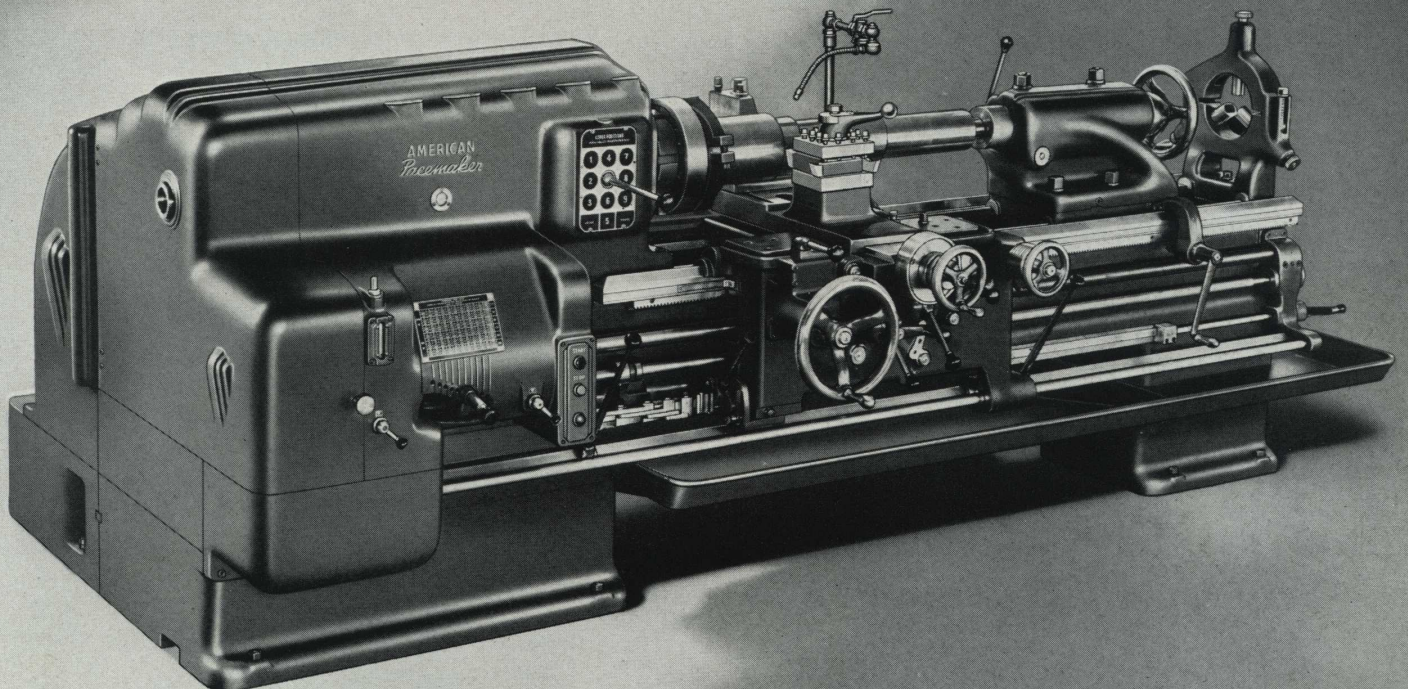


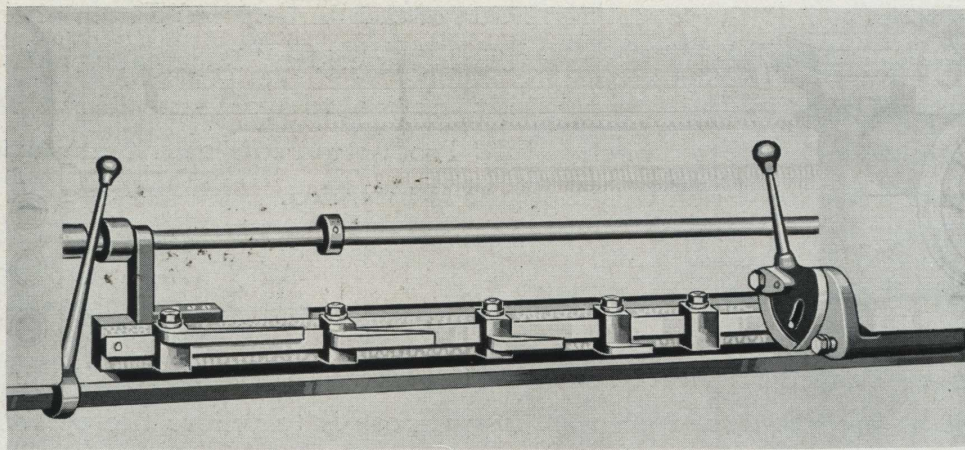
The Multi-Production Lathe is an adaptation of the "American" Pacemaker Lathe to the rapid production of duplicate work. The "American" Pacemaker Lathe is comprehensively portrayed by Bulletin No. 16, therefore, to avoid repetition this bulletin will be devoted to a description of the Multi-Production equipment employed to produce duplicate work for which this machine is intended.

AUTOMATIC LONGITUDINAL STOPS

The Automatic Length Stop Mechanism automatically trips the longitudinal feed of the carriage at predetermined points. Its purpose is to relieve the operator of the responsibility of disengaging the carriage feed at the proper moment and to eliminate delays occasioned to work measurements. The advantage thus gained permits the lathe to actually cut metal more minutes per hour, resulting in more finished pieces of work per day.

This mechanism consists of a steel bar adjustably mounted on the lower front side of the bed on which the adjustable stop or trip dogs are mounted. A swinging lever with dog contactor is provided at the lower left side of the apron for contacting the stop dogs.

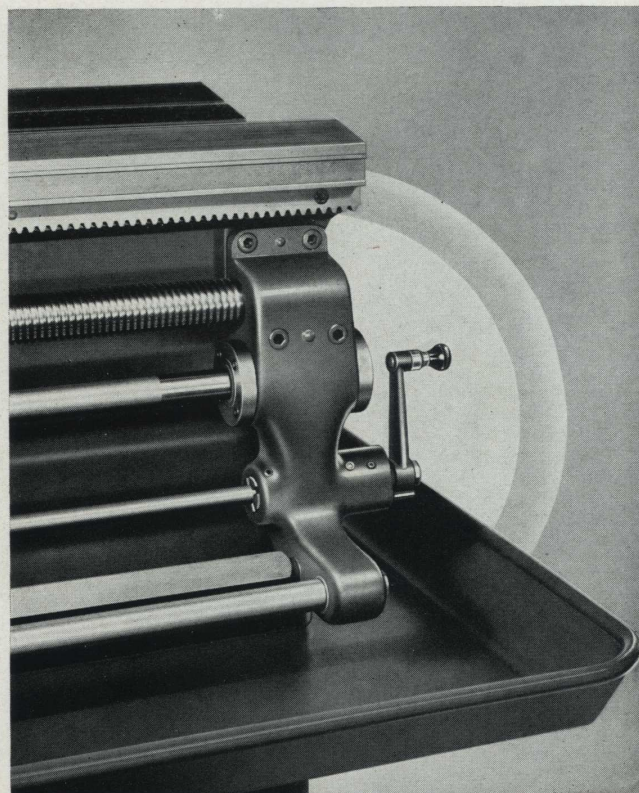




Details of Automatic Length Stop Mechanism (Fig. No. 1)

ACCURATE SETTING OF STOP DOGS

A novel arrangement is provided for convenient and accurate setting of the stop dogs along the bar, which is decidedly in advance of anything yet supplied for this purpose. By throwing the bar control lever at the tailstock end of bed 180 degrees, the stop bar is moved endwise against a positive stop and the feed clutch automatically held in its disengaged position, while the stop dogs are being located. The bar control lever is then returned to its original operative position and the automatic stop mechanism is ready to function. With this arrangement the stop dogs can be conveniently set by means of gauge or scale measurements with the absolute assurance that the feed will trip automatically at exactly the right point for every shoulder. This dog setting arrangement entirely eliminates guesswork in locating the stop dogs and thus inspires confidence in the results. It can be depended upon to produce any quantity of duplicate work to very close limits of accuracy. This construction provides the combined advantage of an automatic trip for the feed at predetermined points and positive locating points for squaring shoulders, grooving and necking for grinding.

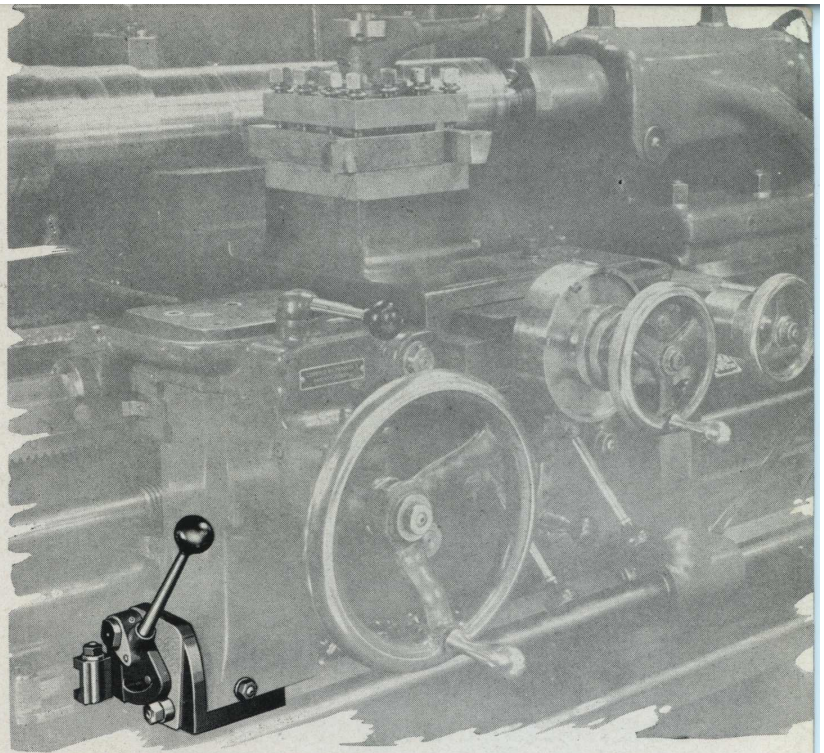


Control Lever for Accurate Setting of Stop Dogs (Fig. No. 2)

CENTER HOLE COMPENSATOR

Occasionally variation in center hole depths prevents the accuracy required, consequently a center hole depth compensating mechanism is provided to compensate for the varying center depths and thus maintain a constant accuracy of shoulder lengths and positions without changing the setting of the stop dogs.

This mechanism is located at the lower left-hand side of the apron and consists of an adjustable stop contactor actuated by a fine pitch screw. The adjustment of this contactor forward or backward will compensate for any changes in relation between the dogs and the work caused by variations in the depths of the center holes in the work.



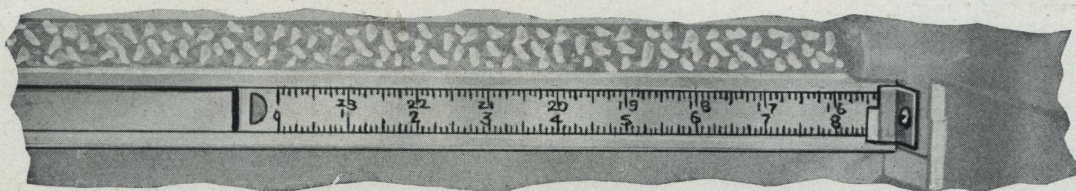
Center Hole Compensator (Fig. No. 1)

QUICK-SET SCALES

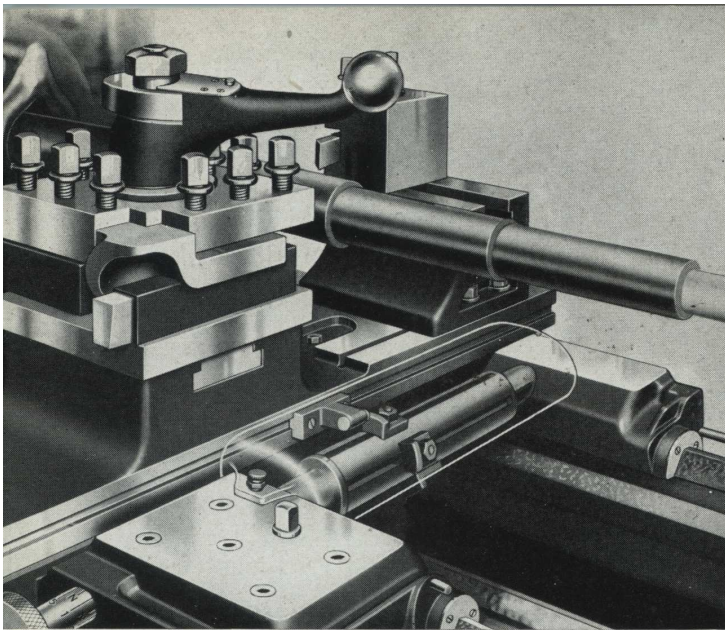
This entirely new and decidedly valuable feature is now available for accelerating the setting of the longitudinal stop dogs. The new "American" Quick-Set Scale is a recent development for which there has been a crying need ever since longitudinal stops came into use. It consists of a long stainless steel scale, graduated from both ends in 64ths, adjustably fitted to the front wall of the bed vee. Two knife-edge pointers fixed to the carriage are provided for indicating the scale reading.

The right-hand pointer is used for locating shoulder lengths from the tailstock end of the work, and the other pointer for locating the remaining shoulders on the opposite end, after the work is reversed between centers.

The Quick-Set Scale, in our opinion, is the most important improvement ever made in a multiple longitudinal stop mechanism, for it not only minimizes errors of measurement but its use cuts stop-setting time to a fraction of what it was formerly.



Quick-Set Scale (Fig. No. 2)



Positive
Diameter Stops
(Fig. No. 1)

POSITIVE DIAMETER STOPS

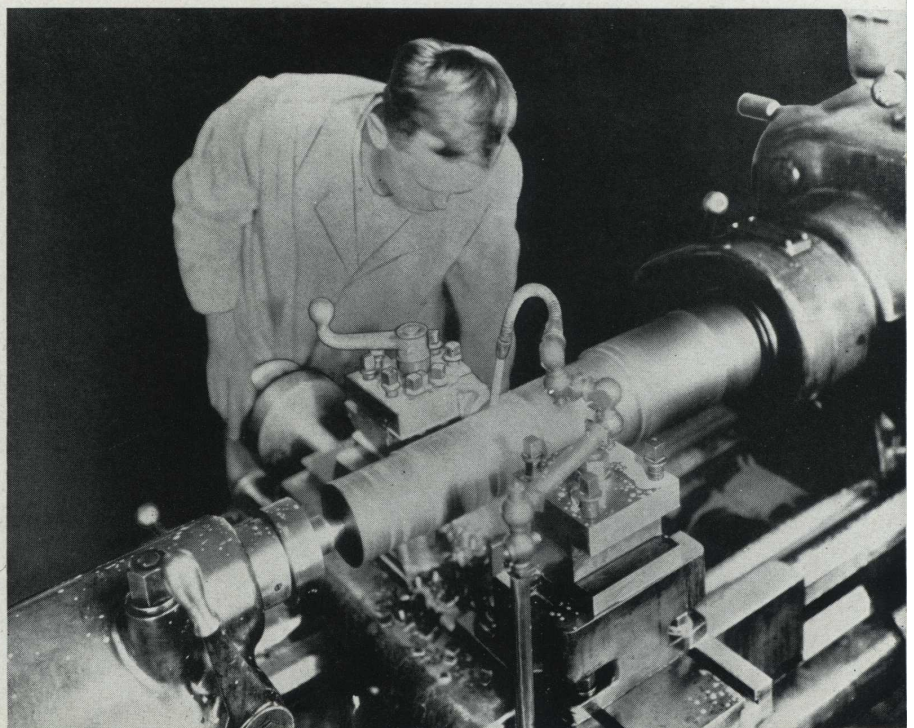
The Multiple Positive Diameter Stop Mechanism is manually operated. It consists of a cylinder having five slots, in each of which a stop dog is adjustably mounted. These dogs contact a stop bracket positioned as desired along the slot provided in the right-hand side of the tool rest.

Control of this mechanism is thru a knurled knob at the front of the carriage. This control knob carries a collar numbered from 1 to 5 for indicating the correct stop set-up for each diameter. Additional stop dogs may be furnished when dealing with more than five diameters.

Between each stop position is a neutral point shown on the control knob collar by the letter N, which indicates a point at which the tool rests will pass over the stop dogs without interference. When both front and rear rests are used, stop dogs may be supplied for each.

Although this mechanism provides a positive stop for the tool slide, where close limits must be held it is difficult to secure the high degree of accuracy required. In such cases we recommend the Dual Direct-Reading Cross Feed Dials with indicating clips instead.

Turning Shafts at Speeds
that Convert Minutes into
Profits. (Fig. No. 2)



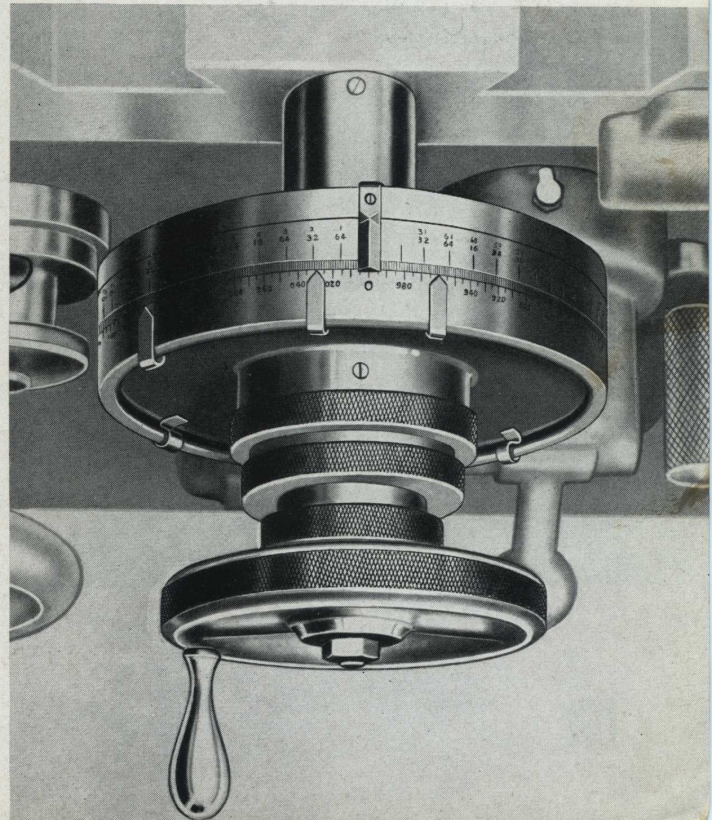
DUAL DIRECT-READING CROSS FEED DIALS

The greatest advance ever made in cross feed measuring means is represented by the newly developed "American" Dual Direct-Reading Cross Feed Dials. These dual or twin dials are of large diameter, providing plenty of space for legible graduations, are geared to the cross feed screw and graduated so as to provide direct reading for diameter reductions. Adjustable indicating clips are regularly provided for quick and easy reading of work diameters. The dials operate either independently or in unison. One dial is graduated in $\frac{1}{64}$ inches to read from 0 to 1", the other from 0 to 1" in thousandths. A fixed knife-edge pointer facilitates the reading of the dial graduations. One complete revolution of the dials indicates a one inch reduction of the work, while a fractional setting, for example, $\frac{1}{4}$ " or a decimal setting, for example .015" will produce a reduction of those exact amounts. This direct and positive reading feature which completely eliminates mental gymnastics on the part of the operator, is a great improvement in that it reads in any part of an inch without presenting a problem in arithmetic.

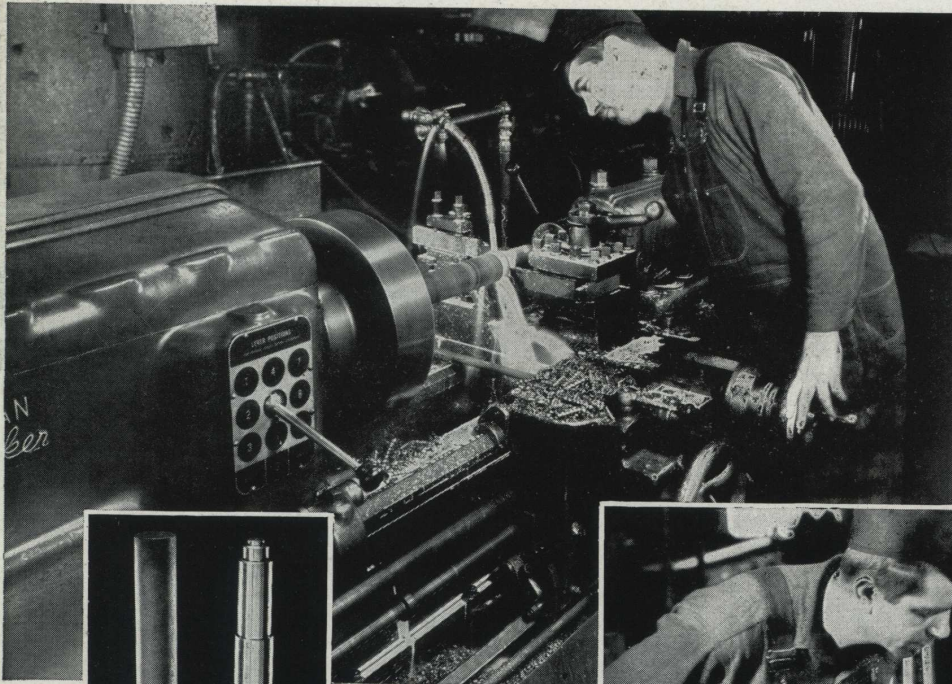
To operate the Dual Dials properly, first take a cut at the end of the work, measure the turned diameter and set No. 1 indicating clip from this reading. Next in successive order set indicating clips for each diameter to be turned. With indicating clips now set the operator simply turns from one diameter to the next using the indicating clips as a guide. When a final finishing cut or a finishing cut for grinding is taken, the dial, which is graduated in thousandths, is used to accurately secure the desired diameters.

When multiple diameter stops are furnished, the setting of the stop dogs is greatly facilitated by the use of the dual dials. Dual Direct-Reading Cross Feed Dials can be furnished for any size "AMERICAN" Lathe.

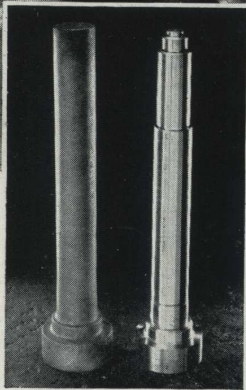
Direct-Reading Cross Feed
Dials with Adjustable Clips
for Indicating Diameters



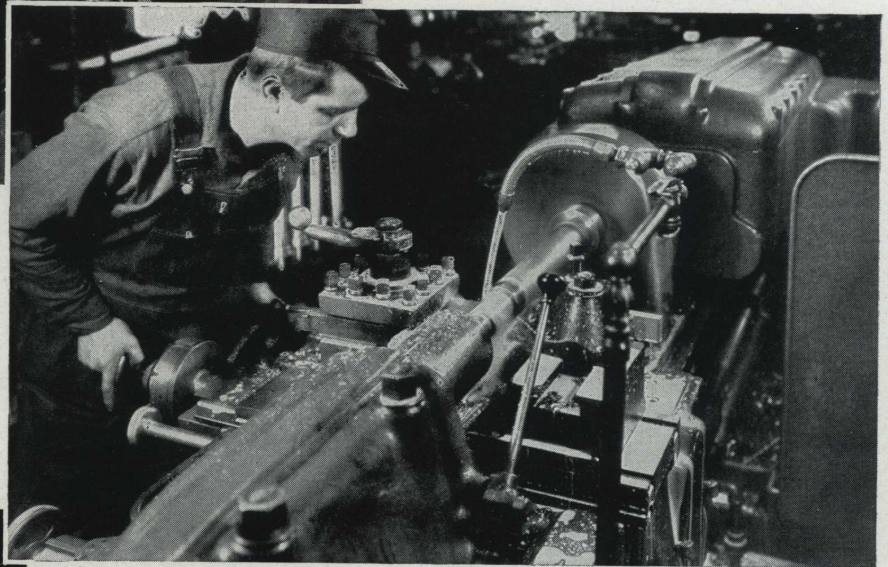
MINUTES INTO PROFITS



20-inch "American" Multi-Production Lathe, turning elevating pinion shafts from rough forgings.



THIS to THIS
in 18 minutes



This is no stunt! It's a steady production job day in and day out. Total floor to floor time, 18 minutes. Cutting speed, 175'. Feed, .015". Maximum depth of cut, $\frac{3}{8}$ ". Material, S.A.E. 4640 steel—heat-treated.

PRODUCTION EQUIPMENT

Front and rear tool holders. Automatic length stops. Direct reading cross feed dials with indicating clips. Built-in roller bearing tailstock center. This is the kind of performance that transforms minutes into profits.



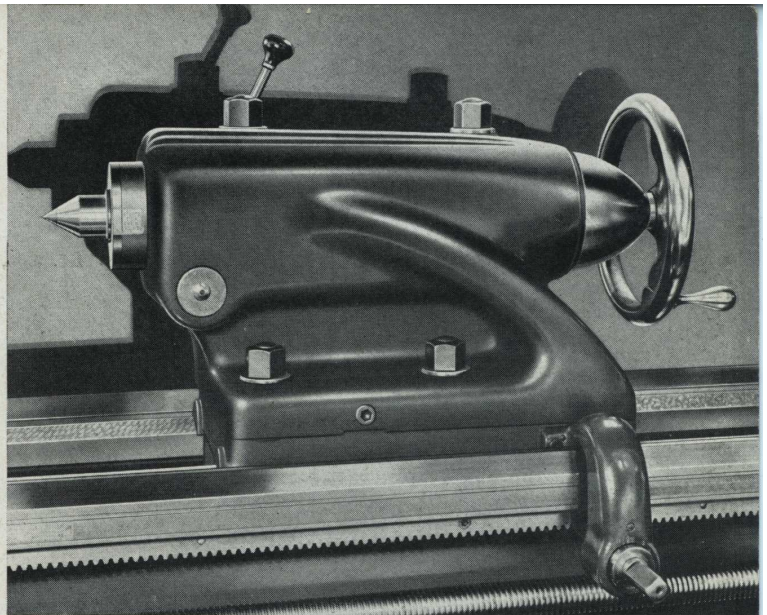
BUILT-IN ANTI-FRICTION TAILSTOCK CENTER

When turning work at the high speeds made possible by cemented carbide cutting tools, the work must be mounted on a live or revolving tailstock center. If mounted on a dead center frictional heat will develop, resulting in elongation of the work, burning of the center and distortion of the center hole in the work.

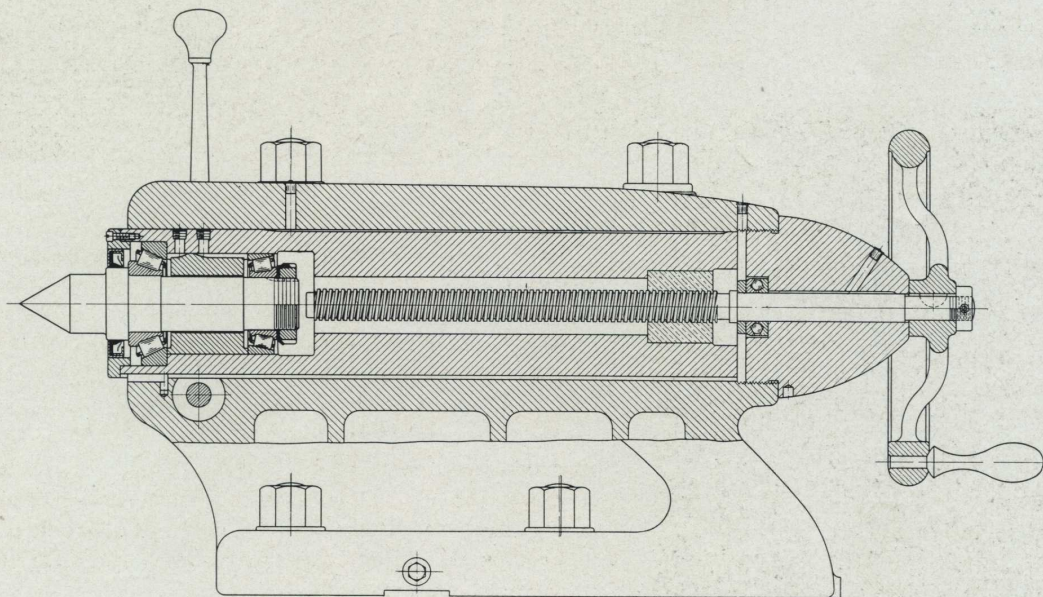
For turning work of this nature we have developed a Built-In Anti-Friction Tailstock Center. This unit consists of a massive tailstock with enlarged barrel, ball bearing thrust and oversize spindle.

On 20-inch and larger sizes the revolving center is mounted on Timken Roller Bearings as shown by the accompanying illustration. The center itself is not removable but the entire spindle unit may be quickly replaced with a "dead center" unit to accommodate drills, reamers and taps.

On 14-inch and 16-inch lathes the Built-In Anti-Friction Center is mounted on ball bearings instead of roller bearings. When machining small diameter shafts which will stand only light center pressures without deflection, we prefer the ball bearing mounting.



Heavy Duty Tailstock with Built-in Anti-friction Center
(Fig. No. 1)



Sectional View of Built-in Roller-Bearing Center
(Fig. No. 2)



16" "AMERICAN" PACEMAKER CAM TURNING LATHE

AMERICAN
Pacemaker

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AMERICAN
MACHINE CO.

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RIGID TOOL MOUNTINGS

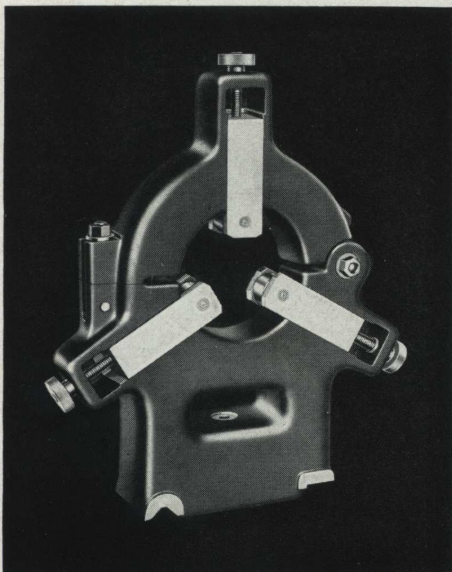
If cemented carbide tools are to be used successfully for cutting steel the complete elimination of vibration is essential, for it has been found that vibration is a most destructive agent in the use of this type of tool; consequently the greatest care must be exercised in order to prevent it. In the elimination of vibration the mounting of the tool is of great importance. If cutting tool is insecurely mounted or if supporting rest is weak, vibration will result. The importance of this subject has demanded a great deal of study and experimentation in order to secure just the right combination to provide the greatest rigidity.

TOOL RESTS

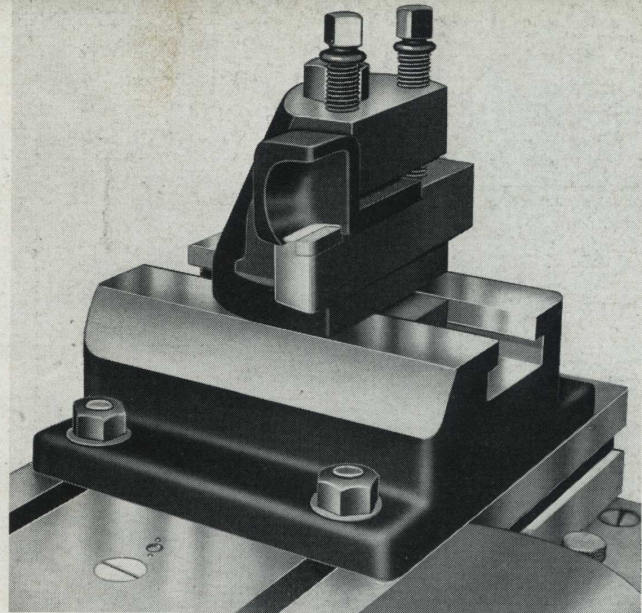
A great variety of tool rest combinations is available to select from, facilitating the selection of just the proper tooling arrangement for the work. This is a great asset to any production lathe inasmuch as the actual amount of work produced is often largely dependent upon the correct tooling for it.

ROLLER JAW STEADY RESTS

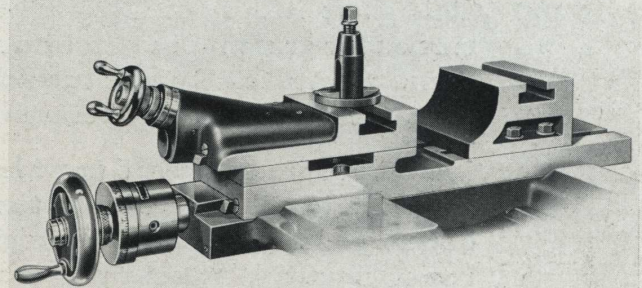
When machining work at the high surface speeds permitted by cemented carbide cutting tools, plain jaw steady rests are inadequate owing to the rapid wear of the plain jaws. We have, therefore, developed and are prepared to furnish anti-friction mounted roller jaw steady rests with approximately the same capacities as the plain jaw rests.



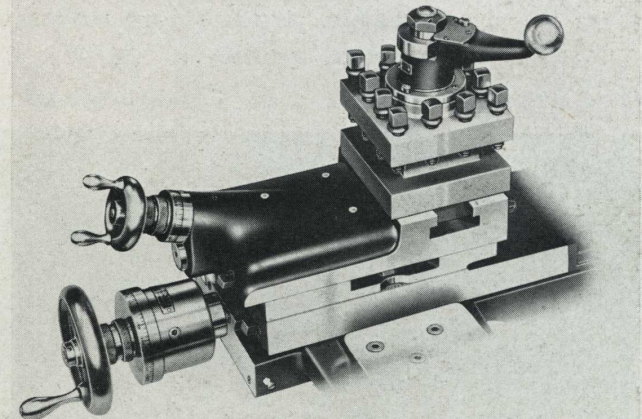
Roller Jaw Steady Rest (Fig. No. 2)



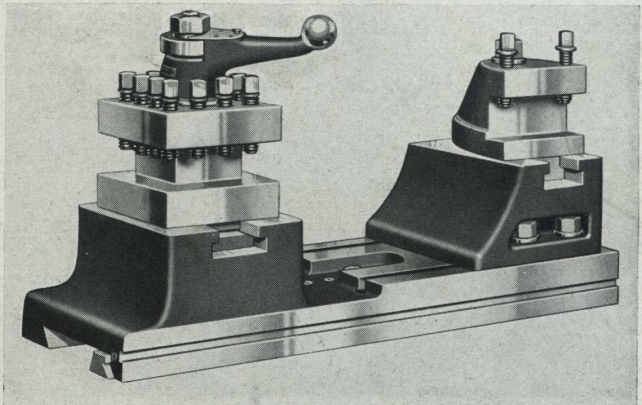
High Duty Tool Holder and Patented Chip-Breaker (Fig. No.1)



Combined Compound and Plain Block Rests (Fig. No. 511)

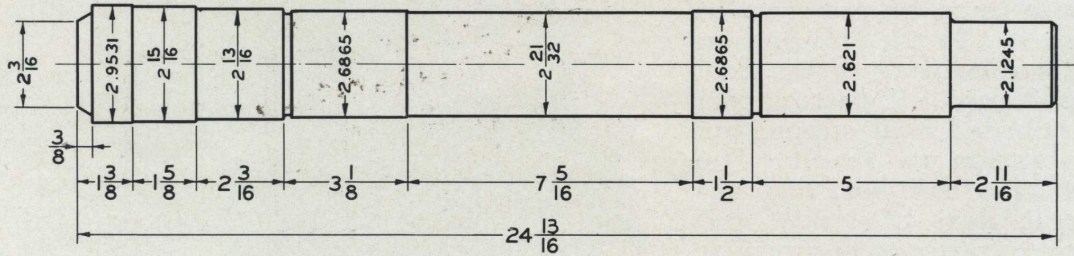


Compound Rest with 4-Way Tool Block mounted in Top Slide (Fig. No. 503)



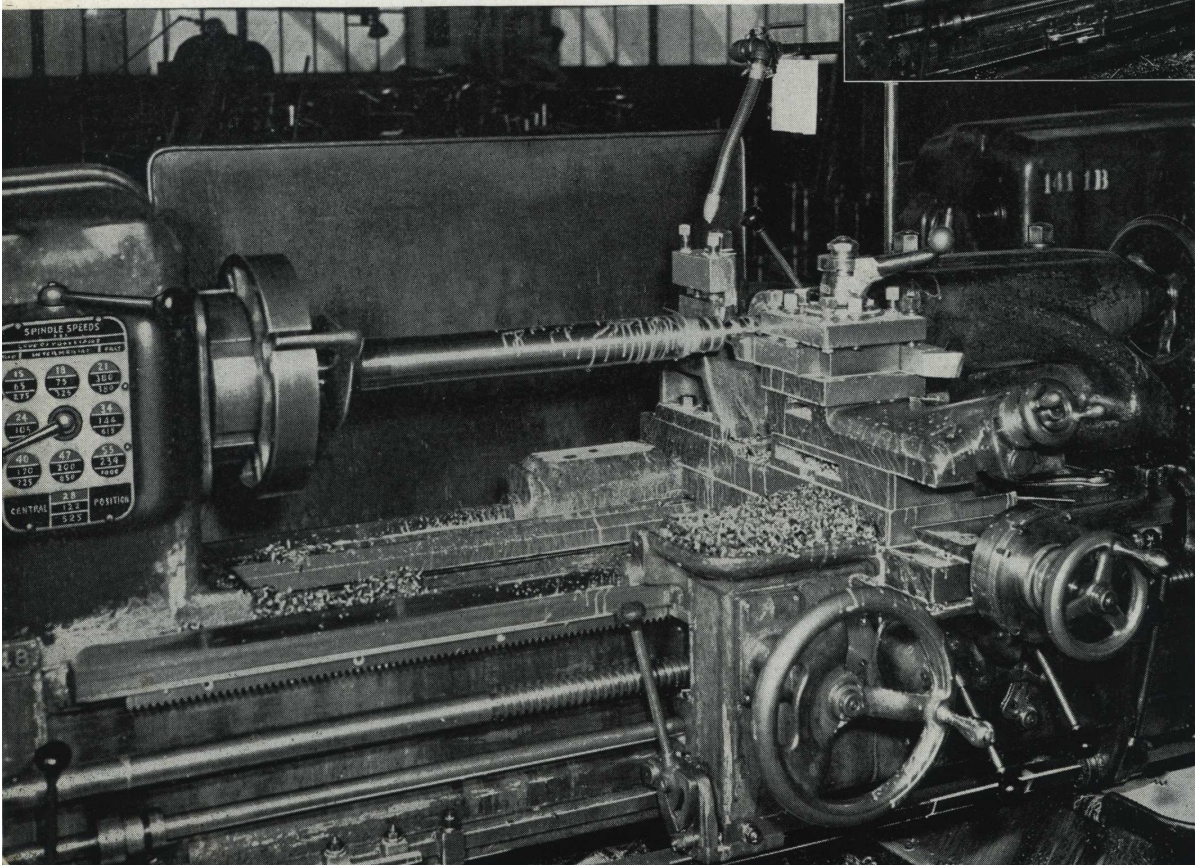
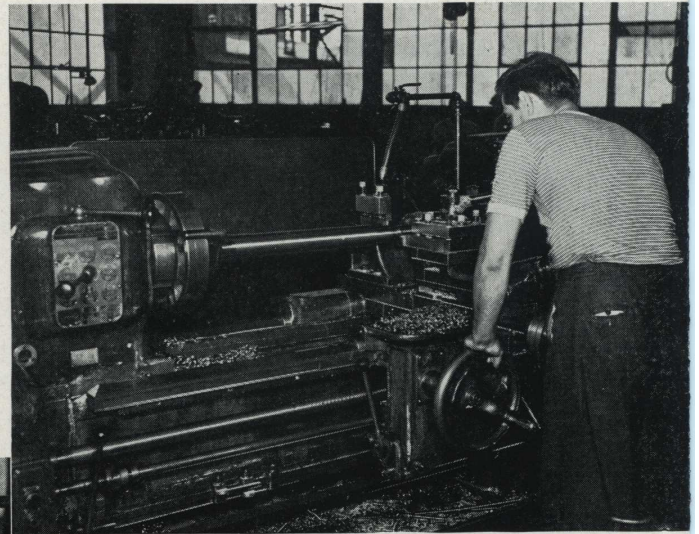
Combined Plain Block Rest with 4-Way Tool Block at front and Adjustable Block Rest with High Duty Tool Holder at rear. (Fig. No. 514)

A PROMINENT NEW ENGLAND MACHINE TOOL BUILDER IS USING "AMERICAN" MULTI-PRODUCTION LATHES TO SPEED UP PRODUCTION.



This shaft in lots of 25 is being turned for grinding in 14 minutes each. Cemented Carbide turning tools are used for this operation.

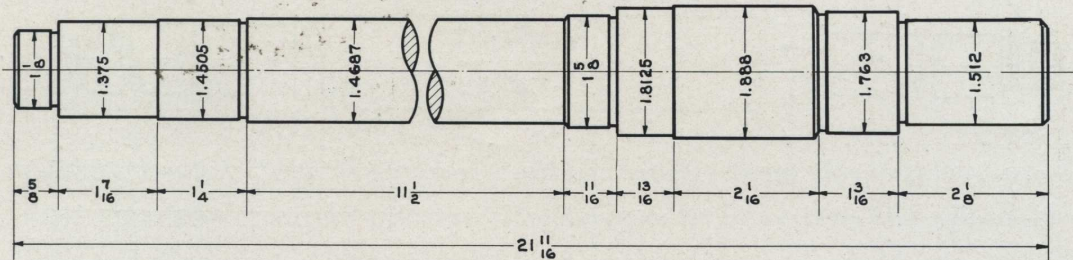
The high spindle speeds provided by "American" Multi-Production Lathes combined with their high power input, "finger-tip" control and general stamina insure profitable production units of unexcelled quality.



This kind of Production Converts Minutes into Profits.

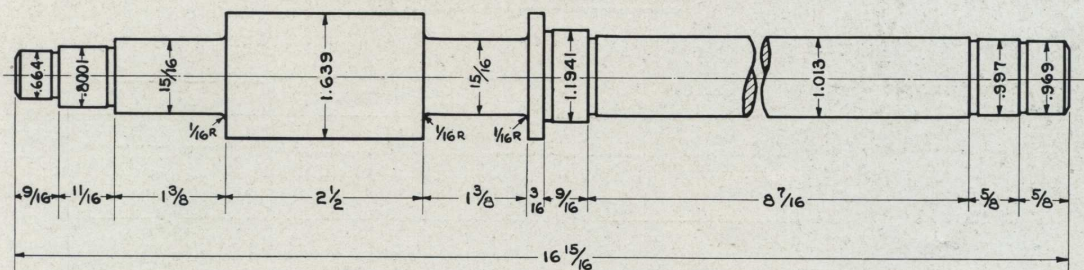
EXAMPLES OF HIGH-SPEED PRODUCTION ON 16" MULTI-PRODUCTION LATHES

DRIVE SHAFT



- Floor to floor time 15.30 minutes
- Material, 2" diameter heat-treated (35-40 Scl.) bar stock SAE 4145
- First setting (long end)
 Rough and finish turn, face, neck and chamfer 11.75 minutes
- Second setting (short end)
 Rough and finish turn, face, neck and chamfer 3.55 minutes
- Roughing speed 200 feet per minute
- Finishing speed 225 feet per minute
- Feed015" per revolution
- Driving motor 10 H.P.

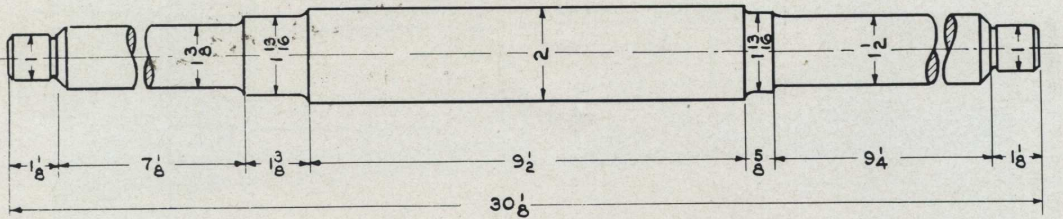
TRAVERSE CLUTCH SHAFT



- Floor to floor time 10.75 minutes
- Material, 1 3/4" diameter heat-treated (35-40 Scl.) bar stock, SAE 4145
- First setting (large end)
 Rough and finish turn, face, neck and break corners 4.00 minutes
- Second setting (small end)
 Rough and finish turn, face, neck, recess and break corners 6.75 minutes
- Roughing speed 150 feet per minute
- Finishing speed 225 feet per minute
- Feed015" per revolution
- Driving motor 10 H.P.

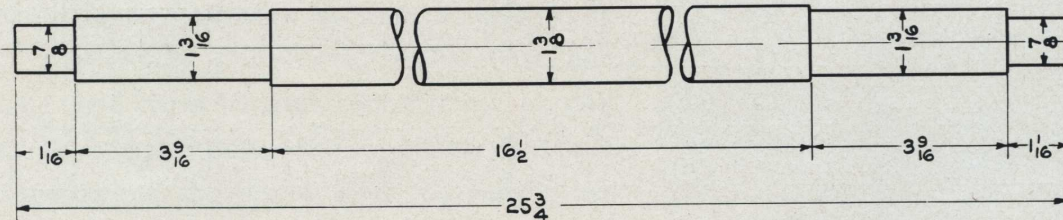
EXAMPLES OF HIGH-SPEED PRODUCTION ON 16" MULTI-PRODUCTION LATHES

SPREADER SHAFT



Floor to floor time	13.65 minutes
Material, 2" diameter bar stock SAE 1045	
First setting (short end)	
Turn for grinding, face, neck and chamfer	6.65 minutes
Second setting (long end)	
Turn for grinding, face, neck and chamfer	7.00 minutes
Cutting speed	225 feet per minute
Feed017" per revolution
Driving motor	10 H.P.

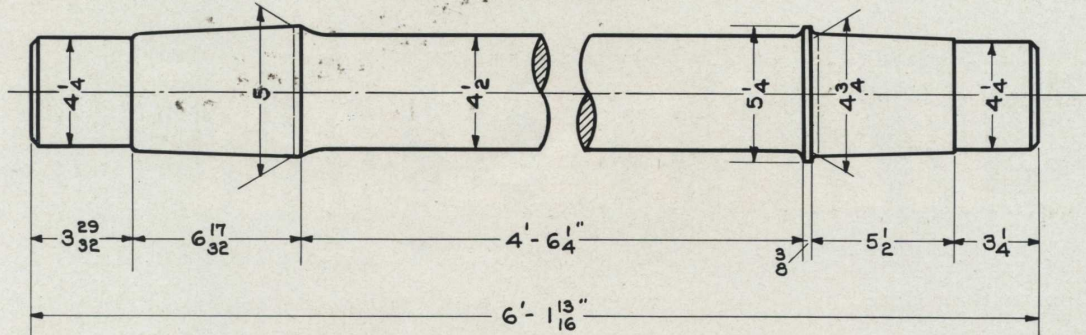
LIFT TRUCK AXLE



Floor to floor time	9.00 minutes
Material, 1 3/8" diameter bar stock SAE 4145	
First setting (1st end)	
Turn for grinding, face, round corners and chamfer	4.50 minutes
Second setting (2nd end)	
Turn for grinding, face, round corners and chamfer	4.50 minutes
Cutting speed	190 feet per minute
Feed0126" per revolution
Driving motor	10 H.P.

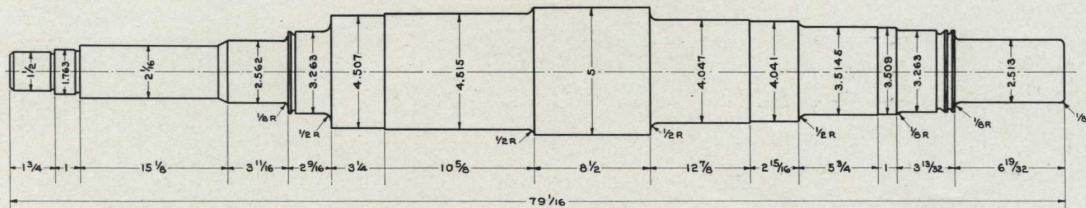
EXAMPLES OF HIGH-SPEED PRODUCTION ON 20" MULTI-PRODUCTION LATHES

PISTON ROD



Floor to floor time	62.00 minutes
Material, rough turned, normalized and tempered forging, C-1050	
First setting	
Finish turn and face long end and center section	29.80 minutes
Second setting	
Finish turn short end, finish face and chamfer both ends	13.15 minutes
Third setting (long end)	
Finish turn taper and round corner	9.35 minutes
Fourth setting (short end)	
Finish turn taper and form radii	9.70 minutes
Roughing speed	275 feet per minute
Finishing speed	350 feet per minute
Feed017" per revolution
Driving motor	20 H.P.

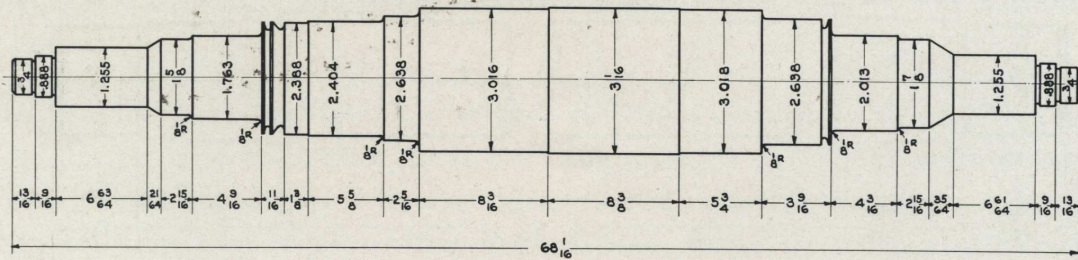
MOTOR GENERATOR SHAFT



Floor to floor time	69.95 minutes
Material, 5 1/4" diameter bar stock (full strain relieved) SAE 1045	
First setting	
Turn spot for steady rest	3.85 minutes
Second setting (large end)	
Rough turn and face	20.80 minutes
Third setting (small end)	
Rough and finish turn, face, neck, form groove, angle and radii	33.75 minutes
Fourth setting (large end)	
Finish turn, face, neck, form grooves and radii	11.55 minutes
Roughing speed	350 feet per minute
Finishing speed	450 feet per minute
Feed020" per revolution
Driving motor	20 H.P.

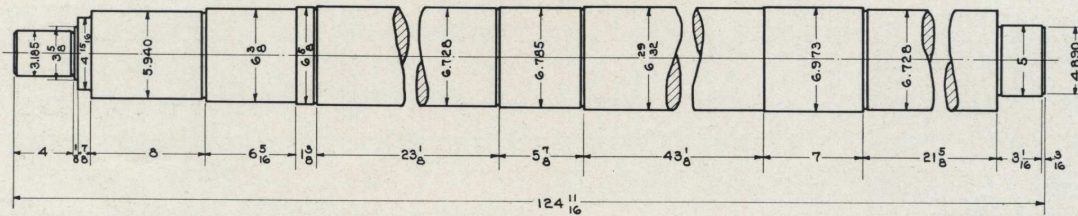
EXAMPLES OF HIGH-SPEED PRODUCTION ON 20" MULTI-PRODUCTION LATHES

MOTOR GENERATOR SHAFT



Floor to floor time	47.75 minutes
Material, 3 1/4" diameter bar stock (full strain relieved) SAE 1045	
First setting (long end)	
Turn spot for steady rest (on 3.003" diameter)	3.75 minutes
Second setting (short end)	
Rough turn and face	11.20 minutes
Third setting (long end)	
Rough and finish turn, face, form groove, angle and radii	20.65 minutes
Fourth setting (short end)	
Finish turn, face, form groove, chamfer and radii	12.15 minutes
Roughing speed	350 feet per minute
Finishing speed	450 feet per minute
Feed020" per revolution
Driving motor	20 H.P.

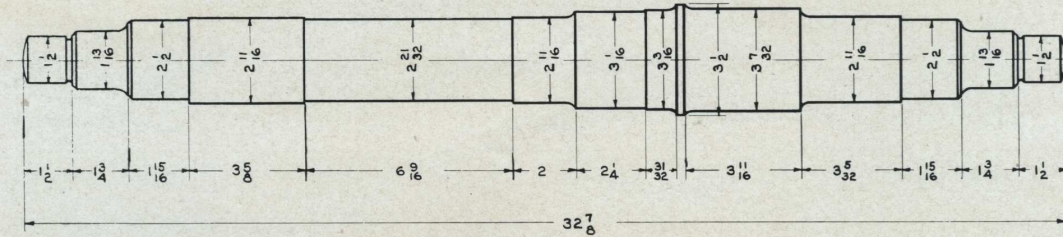
DRUM SHAFT



Floor to floor time	110.75 minutes
Material, 7" diameter chromium nickel alloy bar stock, SAE 3145	
First setting (large end)	
Rough and finish turn, face and chamfer	48.30 minutes
Second setting (small end)	
Rough and finish turn, face and chamfer	62.45 minutes
Roughing speed	225 feet per minute
Finishing speed	275 feet per minute
Feed020" per revolution
Driving motor	20 H.P.

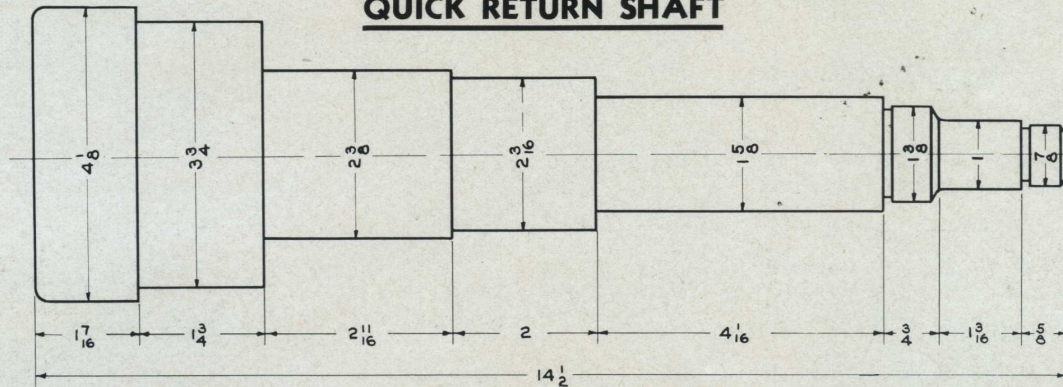
EXAMPLES OF HIGH-SPEED PRODUCTION ON 20" MULTI-PRODUCTION LATHES

REVOLVING SHOVEL SHAFT

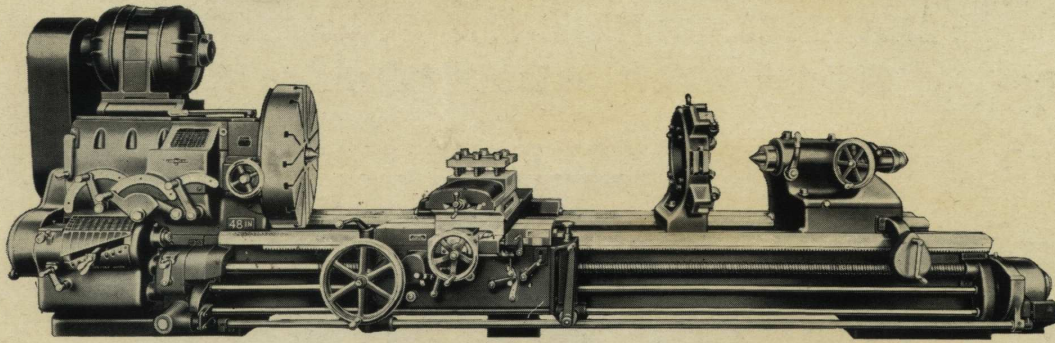


Floor to floor time	37.50 minutes
Material, 3 1/2" diameter bar stock SAE 3135	
First setting (long end)	
Rough turn and face	12.90 minutes
Second setting (short end)	
Rough and finish turn, face, neck and chamfer	13.65 minutes
Third setting (long end)	
Finish turn, face, neck and chamfer	10.95 minutes
Roughing speed	225 feet per minute
Finishing speed	300 feet per minute
Feed017" per minute
Driving motor	20 H.P.

QUICK RETURN SHAFT

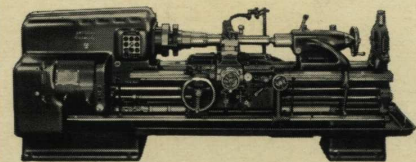
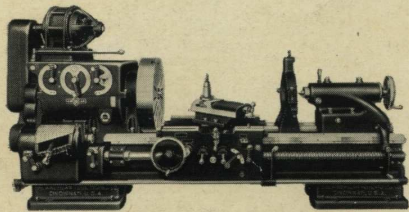
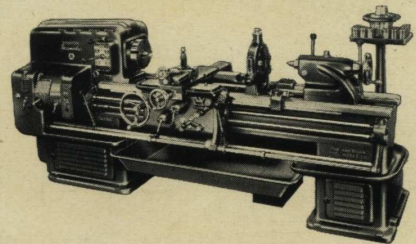
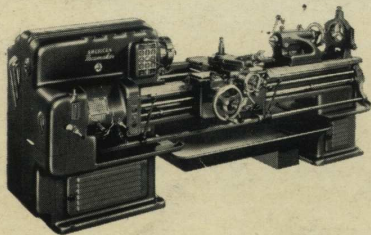


Floor to floor time	45.9 minutes
Material, 4 1/4" diameter bar stock SAE 4145 (annealed)	
First setting	
Rough turn and face head end	3.5 minutes
Second setting	
Rough turn and face long end	21.7 minutes
Third setting	
Finish turn, face, neck and oil groove long end	17.3 minutes
Fourth setting	
Finish turn and face head end	3.4 minutes
Roughing speed	225 feet per minute
Finishing speed	275 feet per minute
Feed017" per revolution
Driving motor	20 H.P.



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