Instructions for Use of No. 955 9-inch Four Speed Lathe

THE cleats holding the lathe in its box should be carefully removed so as to avoid damaging the machine, and the lathe mounted on a bench or stand. The bench on which it is mounted should have a top of regular 2 inch stock, in order to support the machine properly, or our lathe stand No. 1463 should be used.

Before screwing the machine down to the bench or stand, mark the position of the bed on the bench, then bore a series of holes through the bench top, down the center line of the bed. The holes should be bored in the center of each section of the welded bed, and should be at least 1½ inches in diameter. These holes permit the chips to fall through to the underside of the bench, and prevent them from accumulating under the lathe bed. If desired, a long box or trough can be placed under these holes to collect the chips.

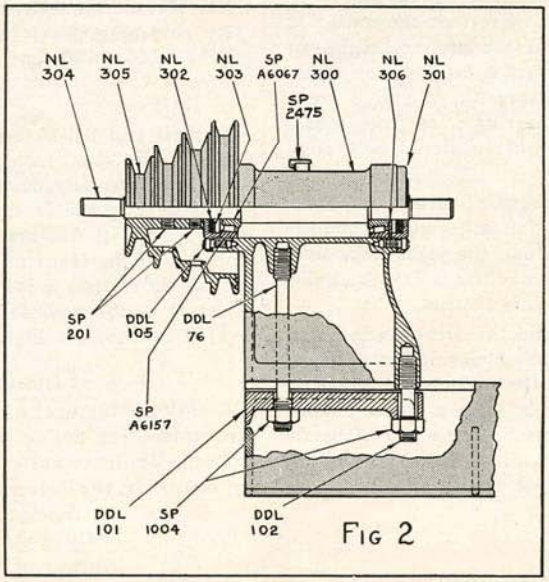


FIG 2

A better way to permit easy disposal of chips is to install your lathe on our set of four lathe feet No. 961. These elevate the lathe off the bench permitting the chips to be easily brushed out, also making it convenient to lay lathe tools, etc., on the bench under the lathe bed. The feet raise the lathe ½ inch off the bench and make necessary an increase of 3 inches in the inside circumference of V belt used. In our regular lathe units V belt No. 595 is used in place of No. 568.

Installing Tool Support

The tool-support base, together with its clamp, are not shipped in place, for convenience in packing. Slide the tailstock off the end of the lathe bed by loosening the clamp nut at the rear, then slide the tool-support base clamp into place under the top of the lathe bed. Note that the spring and the two washers

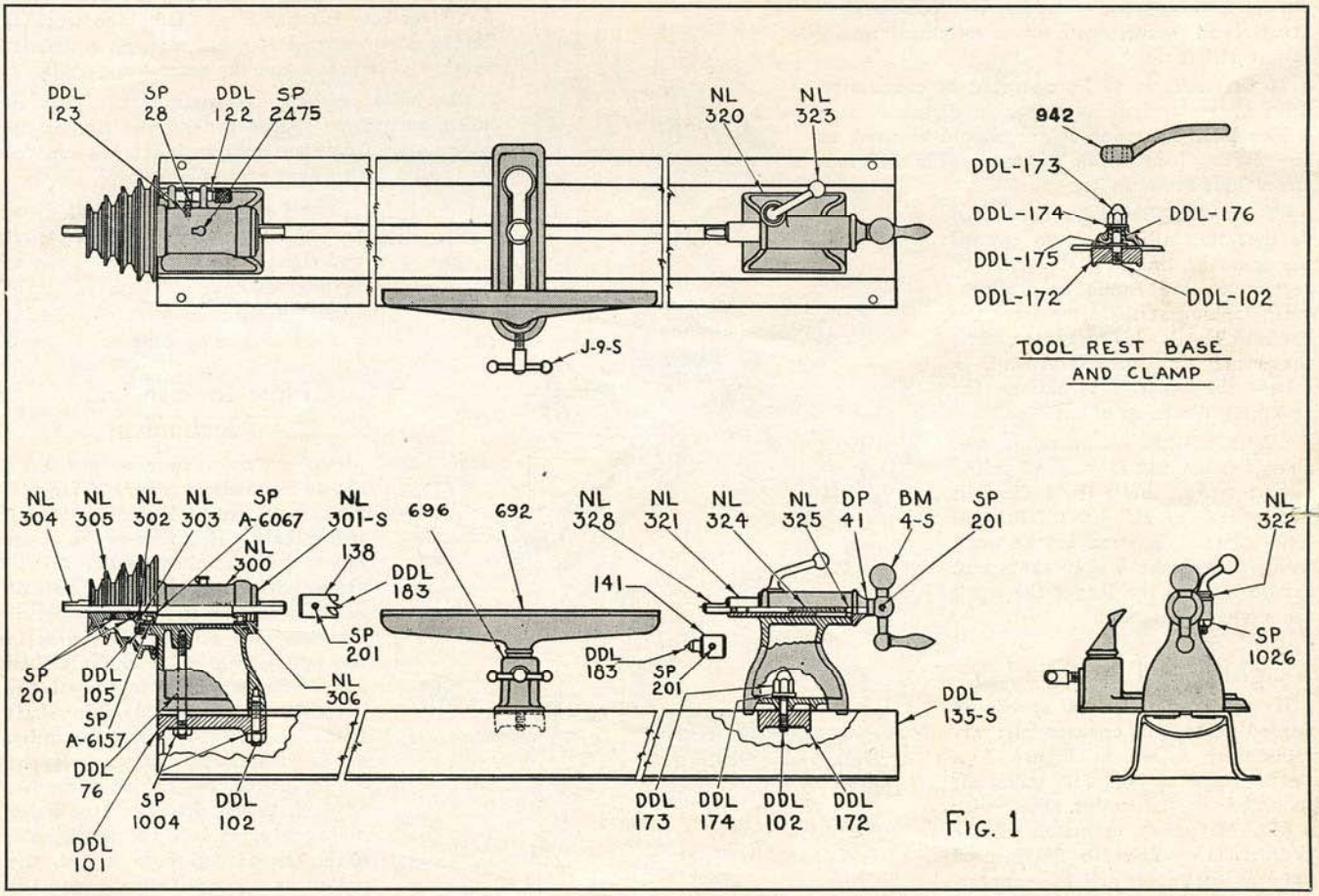


FIG. 1

should be *above* the lathe bed. The spring prevents the clamp from dropping down whenever the tool-support base is removed. Now replace the tailstock and slip the tool-support base over the clamp bolt.

Screw the bed of the lathe firmly to the bench, about one to two inches back from the front edge. Install the motor so that the No. 932 four-speed drive pulley lines up perfectly with the cone pulley on the lathe headstock. This can be done by passing a length of string around both pulleys, to check the alignment. See that the motor is mounted at the proper height, so as not to make the belt too tight, which will result in undue wear on the bearings, or too loose, which would result in belt slippage.

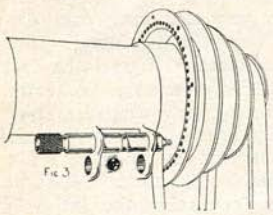


Fig 3

The headstock is securely fastened to the lathe when shipped To move the tailstock to any point along the lathe bed, simply loosen the clamp nut at the rear, move the tailstock to the position desired, then clamp by tightening the nut.

The center points of both the cup and the drive centers are replaceable if they should become bent or worn. To replace, grip the center, upside down between two blocks of wood in the vise, then drive out the center pin with a small punch. Insert the new point and drive it home with a piece of hardwood, being careful not to bend it while doing so. Center points No. DDL-183 are sold for 15c per half dozen.

Power and Speed

If the lathe is to be operated directly from a motor one-third H. P. will be found ample, except for very heavy work. Use only a constant-speed motor, however; a universal motor is not satisfactory.

If the lathe is to be operated in connection with a countershaft as shown in Figure 7, then a Repulsion-Induction motor should be used, as the starting load of this arrangement is too great for a Split-Phase motor.

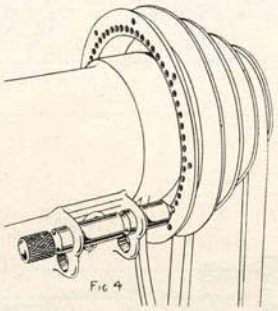


Fig 4

The motor should be connected so that the lathe revolves toward the operator, that is in the same direction as the hands of a clock, when looking at the lathe from the headstock end. If the motor turns the wrong way, turn it around, or follow the maker's directions for reversing direction of rotation.

With a 1,725 r.p.m. motor, and using the No. 932 four-speed pulley on the motor shaft, the lathe will have speeds of 900, 1,400, 2,200 and 3,400 r.p.m. The smaller the work being turned the higher the speed should be, and the larger the work the slower the speed.

Eight-Speed Installation

If a larger range of speeds is needed, then the countershaft arrangement shown in Figure 7 is used. Here a No. 718 pulley is mounted on the motor shaft, with a No. 720 pulley to match on the countershaft. Belt No. 284 is used between the motor and the countershaft. The No. 932 pulley is used at the opposite end of the countershaft.

With this arrangement speeds ranging from 340 to 3400 r.p.m. can be obtained. The chart, Fig. 7, shows the various speeds obtained through the use of different pulley arrangements. The slower speeds are especially useful for large faceplate work to be done on the outer end of the spindle in connection with the floor stand for the tool supports (No. 697, see Fig. 10).

Do not attempt to drive this arrangement with a No. 6300 motor, as the result will not prove satisfactory. A No. 6400 or a No. 6600 motor must be used.

By reversing the 5″ and 6″ pulleys the four higher speeds will be 1,160, 1,700, 2,500 and 3,780 r.p.m.

Lubrication

The oil cup SP-2475 in the lathe headstock is provided so that the Timken bearings of your lathe may receive proper lubrication. A few drops of a good quality light machine oil should be injected from time to time, enough to keep the oil level up to but not above the oil level plug SP-514 which is tapped into the front of the main body of the headstock. Do not use more than a few drops every 10 to 15 working hours. When in doubt, remove the oil level plug to see that the oil level is neither too high nor too low.

The Index Mechanism

A unique feature of your 9-inch lathe is the indexing mechanism, for fluting, reeding or dividing work in the lathe.

Reeds or flutes are cut in turned work, such as table legs, by mounting the turning between a pair of "index centers," enabling the work to be turned a definite amount between each cut. The flute is usually cut by means of a routing tool held in a flexible shaft or in a portable shaper, which is run against a template in the manner shown in Figures 5 and 6. After one cut has been made, the work is "indexed" or turned forward through a definite number of degrees, and the second cut made.

The indexing device consists of two rows of holes, accurately spaced around the rim of the cone pulley, together with an index pin adapted to engage with either row of holes.

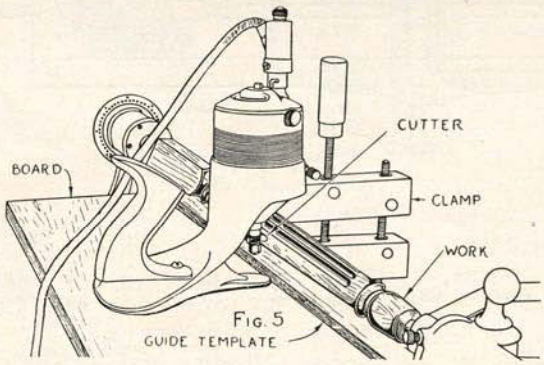


Fig. 5

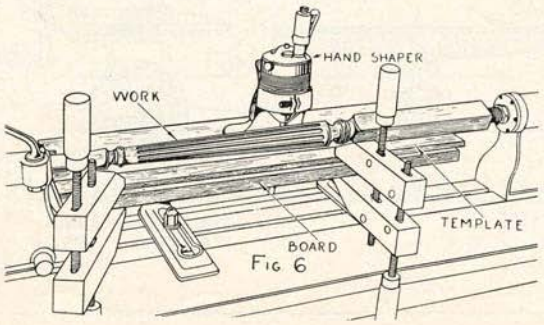


Fig 6

There are 60 holes in the inside row of holes, spaced 6 degrees apart, and eight holes in outer row, spaced 45 degrees apart. These two rows enable a great amount of indexing and dividing to be done.

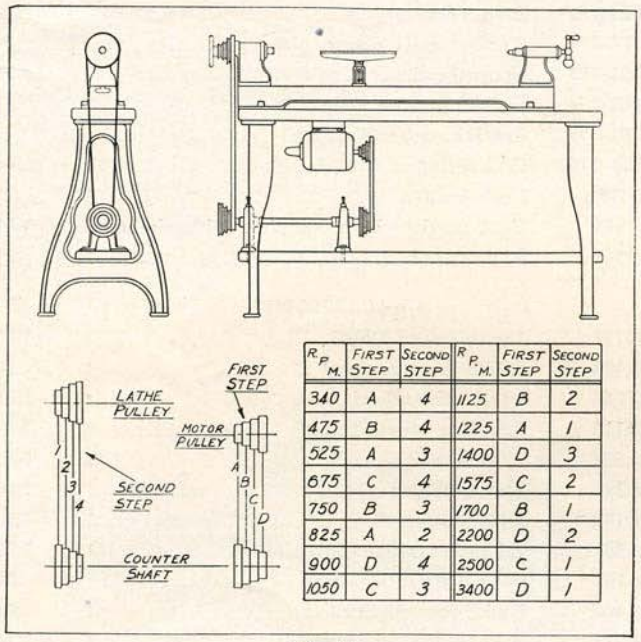
How to Use Index Mechanism

For example, suppose six flutes are to be made in a turned leg, the turning is placed between centers, the index pin is placed in the upper holes in its bracket, so that it will align with the inner row of 60 holes, and the end of the pin is inserted into one of the holes in the pulley rim. The flute is then cut in the work by means of the portable router or flexible shaft (Figures 5 and 6), then the index pin is withdrawn from the hole, the pulley turned forward, counting the holes as this is done, and the index pin re-inserted into the tenth hole. After the second flute is cut, the pulley is turned forward another

ten holes, the third flute cut, and so on until all the flutes have been cut. Simply dividing the number of holes in the row by the number of flutes to be cut will give the number of holes that must be taken each time, and it will be noted that 8 and 60 provide a very large number of possible divisions.

The arrangement shown in Figures 5 and 6 for supporting the shaper while cutting the flutes consists of a 1 inch board, fastened by two bolts through the regular tool-support bases. To the rear of this board is clamped a strip of wood to serve as a guide template. This strip is set to the taper of the leg, and the "toe" of the shaper holder bears against the strip and regulates the depth of the cut. Where the contour of the leg is curved, the template, of course, is curved also to correspond to the leg.

While a common type of hand shaper is shown in use in these illustrations, a flexible shaft, carrying either a shaper cutter or a round-nose router bit, can be used in the same way, by making a wooden holder or clamp for the chuck of the flexible shaft, the clamp being adapted to bear against the guide template in the same manner.



R.P.M.	First Step	Second Step	R.P.M.	First Step	Second Step
340	A	4	1125	B	2
475	B	4	1225	A	1
525	A	3	1400	D	3
675	C	4	1575	C	2
750	B	3	1700	B	1
825	A	2	2200	D	2
900	D	4	2500	C	1
1050	C	3	3400	D	1

Fig. 7

Dividing Faceplate Work

Another valuable use of the indexing mechanism is the division of faceplate work. Suppose we have a disk on the faceplate which is to be accurately divided into eight segments. The index pin is set in the lower hole in its bracket so that it lines up with the outer row of eight holes, and inserted into one of the holes. Now a surface gauge is used to draw a horizontal line exactly across the center of the work. When this line has been drawn, the work is indexed one hole and another line drawn, and similarly until all the segments have been accurately marked.

A little study will soon disclose many other uses of the index mechanism.

Warning. Do not, under any circumstances, use the index pin as a lock to hold the pulley stationary while unscrewing faceplates or other attachments. If this is done it will ruin the usefulness of the index.

When the lathe is used for turning, see that the pin is pulled back until the ball catch snaps in place, thus holding the pin and preventing it from sliding forward to catch in the pulley while the latter is moving.

Operating the Lathe

Never drive the piece to be turned into the drive center while the center is in place in the lathe. If you do this you will eventually disturb the fit of the bearings in the headstock or break the take-up spring.

Always be sure to remove the drive center from the lathe and drive it into the end of the work by tapping the end of the center shank with a mallet to sink the spurs into the wood. If the wood to be turned is very hard, it is well to saw diagonals about ⅛ inch deep into the end of the wood so that the spurs will drive it easily. After the spur center has made its impression in the wood, replace it in the lathe, then place the work between the centers. Set and tighten the tailstock to the bed so that when the piece to be turned is held against the drive center there will be about ½ inch between the end of the turning and the point of the cup center. Still holding the wood between the centers, turn the ballcrank handle on the tailstock spindle so that the point of the cup center enters the wood. Turn the lathe by hand, and see that the wood turns easily, but without shake, then tighten the tailstock sleeve clamp to hold the spindle in this position.

Adjusting Tool Rest

Always adjust the tool rest so that it is from ⅛ inch to ¼ inch away from the piece to be turned, and about ⅛ inch above the center. Never make tool-rest adjustments while the machine is running. Before starting the lathe see that all adjustments have been properly made and that all adjusting screws and clamps are tight.

Use a slow speed when roughing off the corners of the work. If a band saw is available, always rough large faceplate work to shape before mounting it on the faceplate.

Do not wear a loose necktie, loose shirt sleeves or any other loose clothing while working on the lathe, as there is great danger that such loose clothing will be caught in the revolving work.

(NOTE: The illustration shown in Fig. 7 shows the No. 930 11-inch lathe, but the instructions referring to this figure applies equally to the 9-inch lathe. The various installations shown in Fig. 7 are identical for both lathes, except that belt No. 568 is used for the 9-inch lathe.)

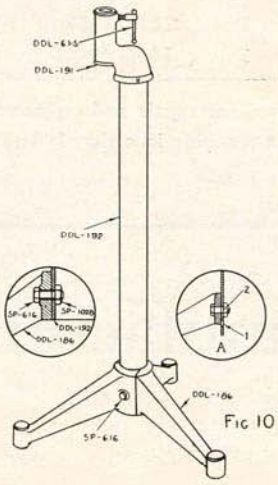


Fig 10

Note:

It is naturally impossible, in the space of an instruction sheet, to give complete instruction in wood-turning. Our handbook

"Getting the Most Out of Your Lathe"

however, contains very complete instructions in the art of wood-turning. The price of this work is $ .25.

Replacement Parts

IMPORTANT: To avoid possible errors be sure to include the serial number of the machine when ordering parts for repair or replacement.

Number	Name of Part	No. Req.	Price Each
	HEADSTOCK PARTS		
NL-300	Headstock body only	1	$1.95
NL-301-S	Bearing cap with felt and retaining washer	2	.25
NL-304	Headstock spindle	1	1.00
NL-305	Headstock pulley, 4-step	1	1.40
NL-306	Crimped take-up spring	1	.10
DDL-76	Stud (7/16x4½)	1	.10
DDL-101	Headstock clamp	1	.35
DDL-102	Stud (7/16x2¼)	1	.10
DDL-105	Spec. fill. head screw	8	.10
DDL-122	Index pin	1	.15
DDL-123	Index-pin spring	2	.10
DSS-79	Fiber washer	1	.10
A-6067-S	Timken bearing complete	2	1.25
SP-28	¼" Steel Ball	2	.10
SP-201	5/16x5/16 Allen Screw	2	.10
SP-502	Oil level plug	1	.10
SP-1002	7/16-14 hex. nut	2	.10
SP-2475	Oiler	1	.10
#956	Complete headstock with clamp	1	9.50
	LATHE BED		
#944	Lathe bed	1	9.20
	TAILSTOCK GROUP		
NL-320	Tailstock body only	1	1.55
NL-320-S	Tailstock complete with clamp	1	3.75
NL-321-S	Tailstock quill	1	.65
NL-322	Quill lock sleeve	1	.10
NL-323	Ball-crank clamp screw	1	.15
NL-324	Quill spindle	1	.10
NL-325	7/16-14 spec. nut, L. H.	1	.10
NL-328	Quill extension for tail stock	1	.15
DDL-102	7/16x2¼ stud	1	.10
DDL-172	Tailstock clamp plate	1	.25
DDL-173	7/16-14 spec. acorn head nut	1	.10
DDL-174	Steel washer	1	.10
BM-4-S	Ball crank handle with pin	1	.70

Number	Name of Part	No. Req.	Price Each
DP-41	Fiber washer	1	$ .10
SP-201	Quill extension for tail stock	1	.10
SP-1026	⅜-16 hex nut	1	.10
	CENTER PARTS		
DDL-183	Replaceable pins for centers	2	.10
SP-201	5/16x5/16 Allen screw	2	.10
#138	Drive center	1	1.00
#141	Cup center	1	1.00
	TOOL SUPPORT PARTS		
DDL-11	Tool support base only (2 5/16 high)	1	.55
DDL-102	Stud (7/16x2¼)	1	.10
DDL-172	Tool-support clamp plate	1	.25
DDL-173	Acorn-head nut	1	.10
DDL-174	Special washer (top)	1	.10
DDL-175	Special washer (bottom)	1	.10
DDL-176	Coil spring	1	.10
J-9-S	Lock bolt	1	.20
#696	Tool support base complete with clamp	1	1.15
#942	Box wrench	1	.25
	ACCESSORIES		
#111	5 inch emery wheel	1	1.25
#113	6 inch buffing wheel	1	.75
#116	6 inch wire wheel	1	1.65
#118	Grinding wheel arbor	1	1.00
#120	½ inch drill chuck	1	1.85
#140	Screw center	1	1.00
#143	3 inch faceplate	1	1.00
#151	8½ inch sanding disk	1	2.10
#192	Special Allen wrench	1	.25
#690	4 inch tool support	1	.75
#692	12 inch tool support	1	1.10
#694	24 inch tool support	1	2.25
#697	Floor stand for tool support	1	8.75
#942	Wrench for acorn nuts	1	.25
#945	Legs for lathe stand (per pair)	2	14.95
#958	Steady Rest	1	4.65
#1463	Stand	1	22.85

NOTE: Prices in this list apply only to parts ordered for repair and replacement. They cannot be used for computing allowance values when a machine is ordered "less" certain parts.

The Delta Manufacturing Company

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