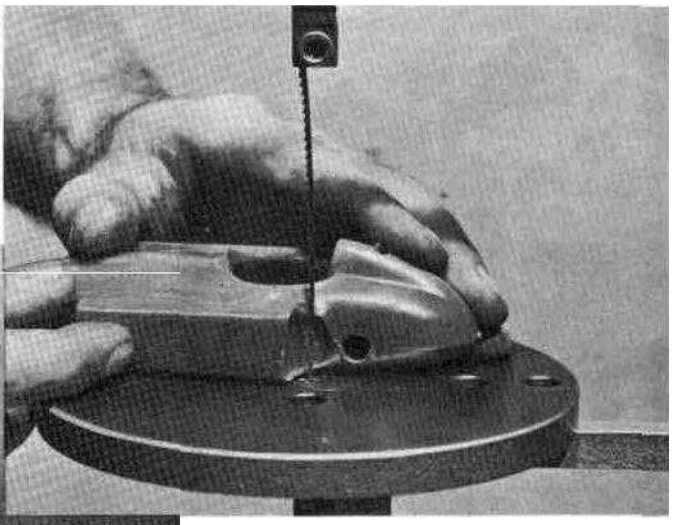
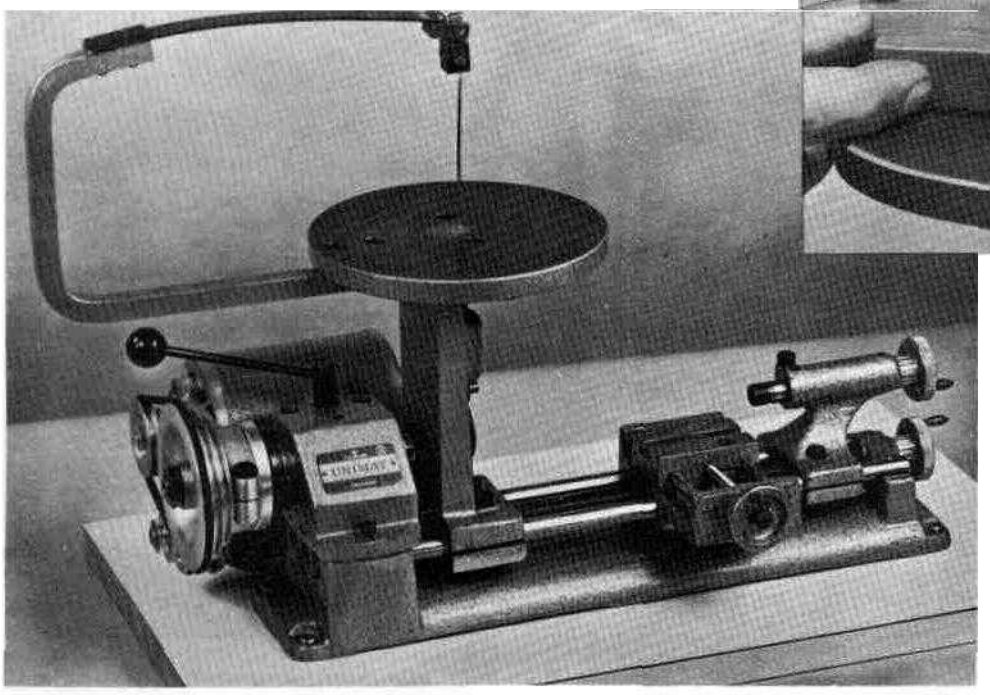
DB 1070

JIG SAW

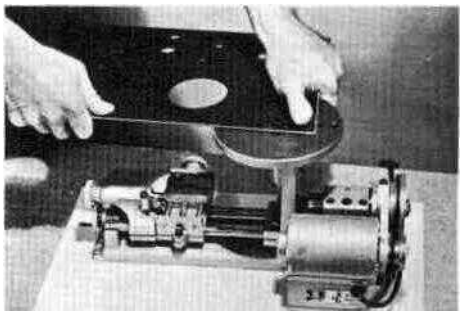
cuts intricate shapes in metal wood and plastics...

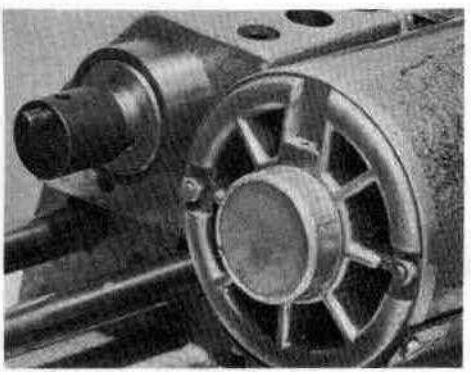


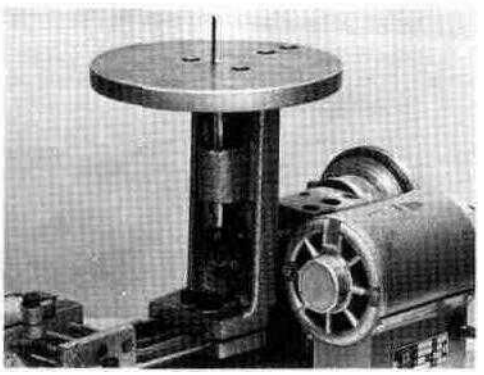


26A (Above) For delicate jobs use minimum spindle speed. A foot switch provides a convenient control factor.

26B (left) Jig saw will cut to center of 16-inch circle. Ball bearing mechanism gives smooth reciprocating action.







26C Eccentrlc drive threads on headstock spindle (left).

26D With frame removed, saber saw handles large workpieces such as electronic meter panel, above.

Perhaps the modeler's most useful attachment is the Unimat Jig Saw. It follows any line you can draw on metal, wood, plastic, and hardboard. The eleven speed headstock drive gives you a means of using just the right speed for the job, prolonging blade life and getting a smooth controlled cut. every time.

Your first step in installing the attachment is to feed the headstock spindle full right and lock it in place. Then put the jig saw eccentric drive on the spindle (Photo 26C). Next slip the base assembly over the bed and add the clamping plate as in Photo 26D. Before locking the Allen head screws, gently slide the assembly toward the headstock so that the eccentric drive pin engages the mechanism. Check the action by revolving the headstock pulley by hand.

The table fastens to the base with two Allen head screws. Install a saber blade and you are ready for saber cutting. Two more screws mount the jig saw arm, as in Photo 26B.

Before turning the power on. arrange your belt drive for lowest speed. It is always a good idea to make a trial cut at minimum R.P.M. to get the "feel" of the machine and the material. Then, you can increase speed for faster cutting. The blade must be centered in the slot, Jigsaw blades will break if they are clamped out of line.

A coarse-toothed blade cuts faster, but also tends to break or tear thin material. Fine-toothed blades tend to choke up on thick material. Usually the coarse blade is intended for fast wood cutting, the medium-toothed blade for plastics, and the fine-toothed blade for metals. Spiral-toothed blades have the advantage of cutting in any direction.

Unimat saber saw blades are color coded: blue for metal cutting, red for plastics, and yellow for wood.

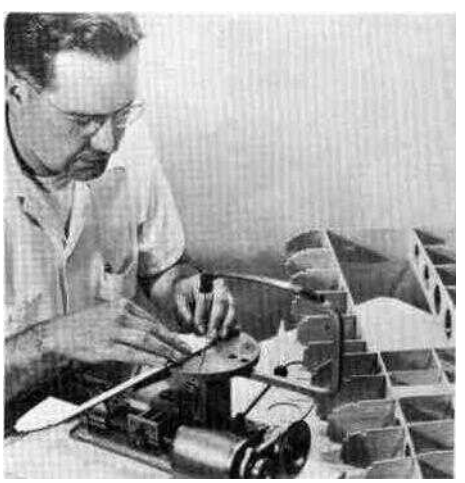
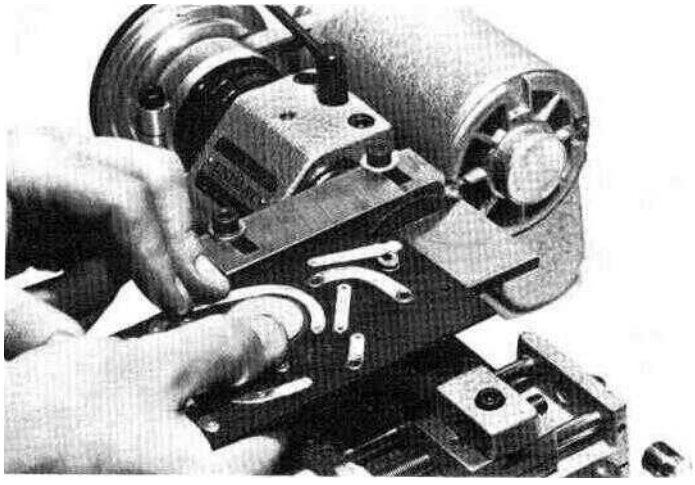


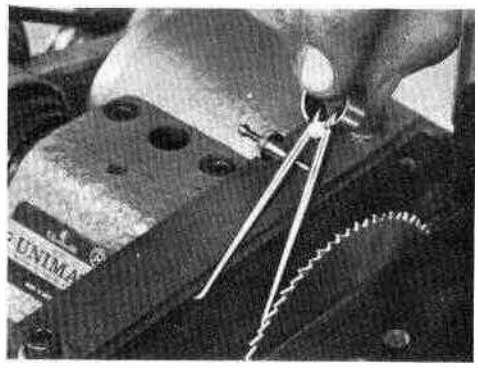
Photo shows boat bulkheads sawed from hardwood. To cut sharp inside corner, use spiral blade. With plain blade, make first cut slightly short of comer, then come in at right angle for finish cut.

DB 1230 21/2-INCH CIRCULAR SAW

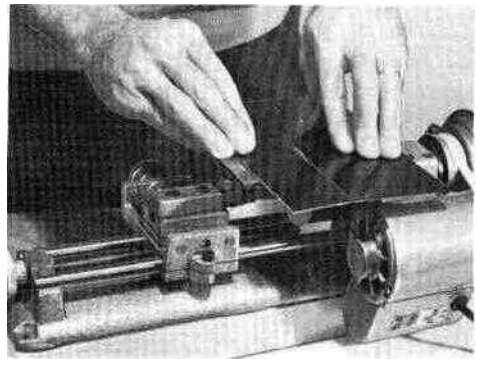


27A Electronic designers find small table saw ideal for cutting phenolics, printed circuit boards and insulating material.

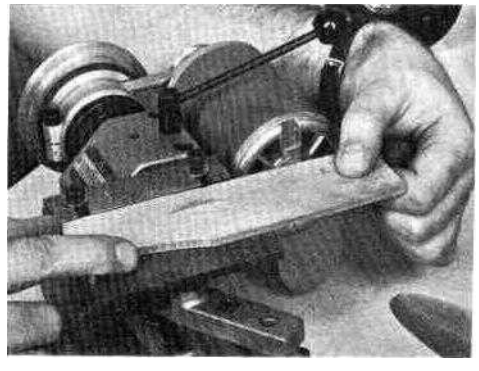
27B Fit blade properly and you've got the most accurate inexpensive table saw in the world!



27C Using XR 41 inside spring caliper to set fence for desired cut.



27D When cutting thin sheet metal, feed slowly. Lift and twist thin slices away from the rearmost saw edge to avoid jamming. Use kerosene on soft aluminum.



27E When wood grain converges near your saw line, the wood may compress back of the cut and jam the saw. Stop the saw and put a small wedge in the cut.

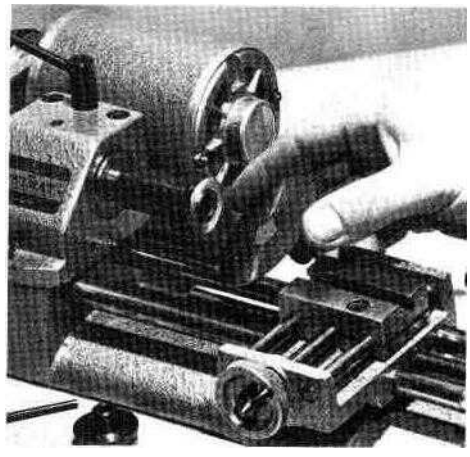
Unimat Circular Saw Attachments are designed to give you a tool at very low cost that will do extremely fine, straight accurate cutting of metals, wood and plastics.

Installing the attachment takes only a few seconds. If your Unimat is set up as a lathe, you can change over to the circular saw and back to the lathe in less time than it takes to change blades on some table saws! Be sure your headstock spindle threads are clean, and that the surface of the cross feed is free of chips. The attachment fastens to the cross slide with two Allen screws and T-slot nuts.

You will find that the saw blade will not fit the arbor until you take a fine truing cut with a lathe tool (see instruction, page 18). Proceed *very* cautiously. It takes a very small cut, less than 1/32-inch to fit the saw to the arbor. Unimat saw blades will then all fit the arbor, however the meticulous machinist; will want to permanently equip each special saw blade he acquires with its own arbor, because saws will wear into a more perfect circle with use. Also, you can devise saw sharpening fixtures which will dress the saw teeth while the saw is mounted on the headstock spindle. By such means, you can develop perfectly balanced saws for ultra-thin high speed cutting.

For ordinary work you'll find that the perfectly trued Unimat saw blade offers an advantage. Unlike the usual home workshop saw, you will be able to follow a marked line on wood very easily though guiding freehand. There is no tendency with a truly smooth running machine for the blade to pull away from the line.

A rip fence is included for repeat cutting. You can set it by rough trial and re-setting, or you can use an Inside Caliper (XR-41) to measure from the blade to the fence. A faster way requires that you have a sample piece of material of exactly the desired width. Layers of thin metal can be used to make up the thickness. Place the sample between the saw blade and the fence along with a layer of thin paper for clearance spacing. Gently press the fence toward the saw blade.



With the paper layer against the saw, the blade should just barely turn with a little resistance. Then lock the fence in place. On some materials you will need a very slight extra clearance at the rear end of the fence.

Every time you set up for precise slitting, cut an extra piece of stock about 4 inches long, mark it and save for future use as a width setting gauge. Sets of such "thickness blocks" will not only enable you to quickly run duplicate work in the future, but will have many other uses in your shop.

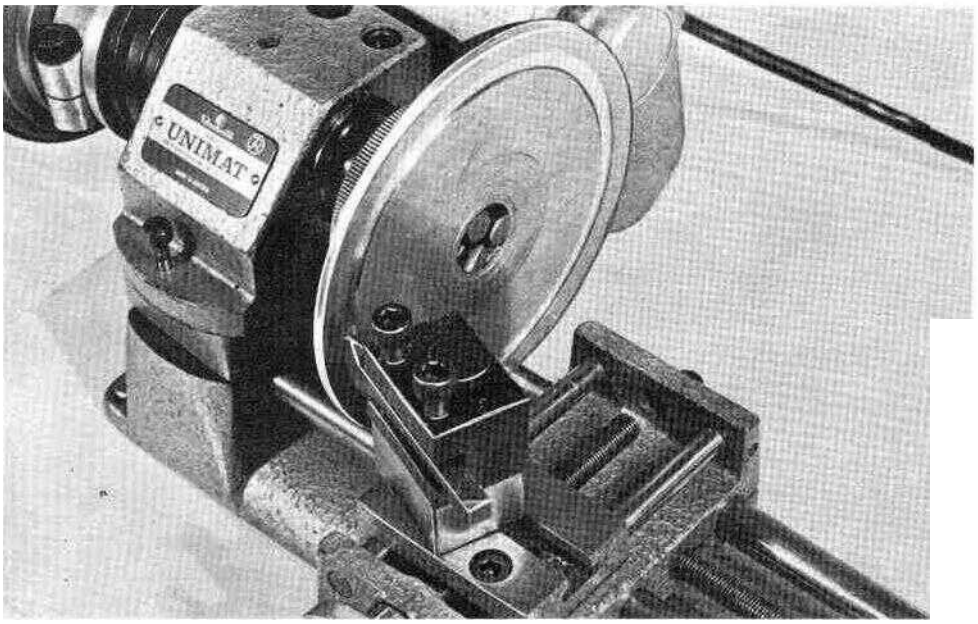
For a start, try ripping scrap material first. With a little practice you'll soon find that you can hold wood thicknesses to micrometer tolerances. The right speed for sawing in any material is the speed that gives you the fastest, smoothest cut without overheating the blade. Always feed gently. Feeding hard will overload the teeth—chips will backup, and overheating that can draw the saw blade temper, is the result. Excessive speeds can also burn the work.

Two standard blades, 2 3/8-inch diameter are stock for the small DB 1230 saw table. The coarse-toothed blade is intended for wood (DB 1231); the fine toothed blade for aluminum, light metals and plastics (DB 1232). Any fine-toothed blade can also be used on thin pieces of wood and will produce very accurate smooth cuts. But such use can overheat and ruin the blade. With care, cutting slowly, keeping the blade cool, it can be done in an emergency.

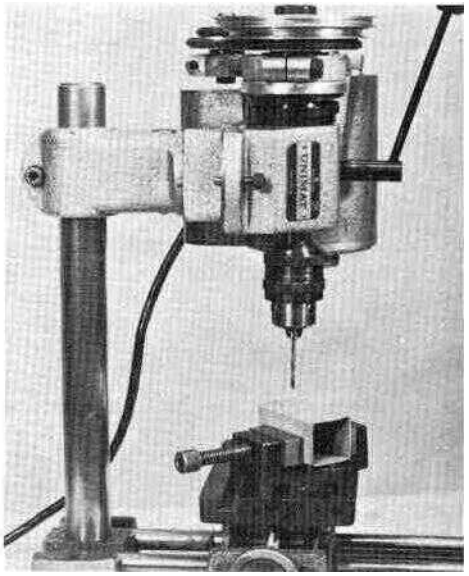
To cut very long thin pieces. or to cut large unwieldly sheets of material, you will find you'll need to improvise outboard sawing guides. Turn some 2-step rollers on your lathe. These can be mounted on heavy wood blocks nailed or clamped to the rear or sides of your work bench to guide the saw cut in an absolutely straight line.

DB 1310

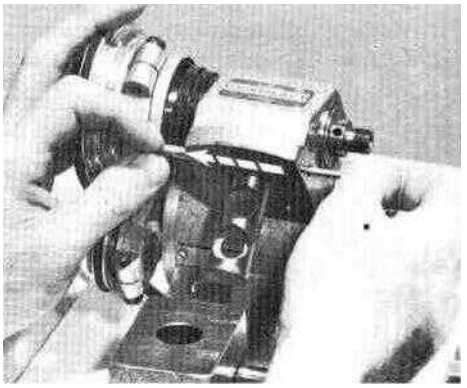
HEADSTOCK RAISING BLOCK & CLAMPING BOLT



Unimat lathe equipped with headstock and tool holder raising blocks machines aluminum disc of 43/16-inchdiameter.



Headstock raising block used on drill press set-up increases reach. Drill press will now drill lo center of 7 5/8 -inch0 circle.



Clamping pin should pull out easily.

Fitting between the headstock casting and the lathe bed casting, this newly introduced accessory increases your lathe toafull 4 7/16-inch swing.

The block is steel, machined on both sides 3/4-inch thick and is supplied with a longer clamping bolt. Because the new bolt has two holes, you can use it on the lathe set-up, either with or without the raising block.

To install the bolt, remove the locking pin as the photo shows. After a long period of use. this pin may freeze in place. Do not force by punching or hammering. Use a drop of "Liquid Wrench" or penetrating oil to free the pin. Install the new bolt and replace pin.

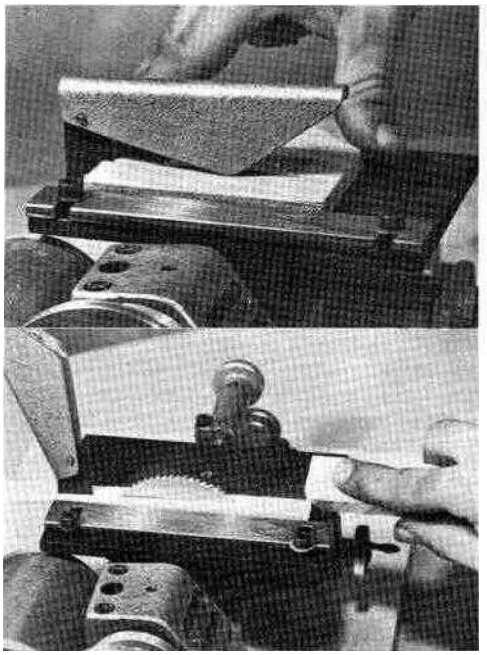
The quickest way to align the lathe headstock is to mount the face plate on the tailstock, and the 3-jaw chuck (with jaws removed) on the headstock. Partially tighten the tapered headstock clamping screw and butt the face of the 3-jaw chuck against the face plate, allowing the headstock to swivel into line. Tighten clamping screw solidly.

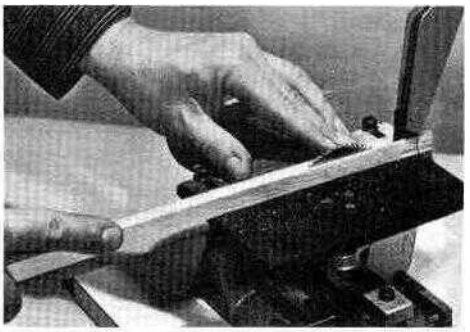
With raising block in place, light lathe cuts can be taken with the tool holder in normal position. However this upsets the geometry of the tool, and is not recommended for extensive work. Make a toolholder raising block of a piece of 3/4-inch thick scrap aluminum, steel or.hard wood. One of the long bolts from the Milling or Indexing Table will hold the improvised tool post block in place.

DB 1230a

3 9/16 INCH CIRCULAR SAW

This is a larger version of the table saw shown on page 27. It requires that you use the headstock raising block shown above, and swings a full 3 9/16 -inch saw blade. This larger saw unit comes equipped with one coarse-toothed sawblade £or cutting wood and some plastics,





The 4 3/4 *x* 6 5/16-inch table Include; a pivot guard that protects the fingers and a slitter that helps to open the saw cut (above) and prevent jamming the blade.

When you push wood close to the end of a cut, if the wood suddenly splits, the saw can slice your hand. Make a beveled push-slick, notched to grip various sizes, Paint the stick a bright color—hang it on your tool rack and use it every time you saw small pieces of wood on any power table saw.

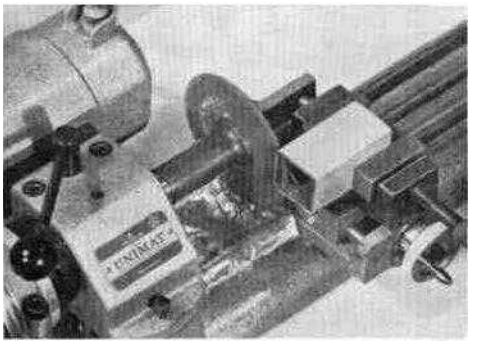
MACHINE SAWING

Dead straight cuts on tubing, round or square stock and odd-shaped sections can be made by clamping the work either in your Machine Vise (DB 1010) or Milling Table (DB 1210) mounted on the cross slide. The work must be lined up dead parallel to the lathe bed, and the headstock perfectly centered in lathe position. As shown in the photo, you slowly feed the work to the cutting blade, with the cross feed screw.

The common fine-toothed saw blades will handle a limited amount of cutting in soft aluminum, but should never be applied to hard aluminum, iron or steel. Special metal slitting blades are available that have hardened teeth, and you can obtain or make thin milling blades that also will cut hard metals. On special order, you can get miniature carbide toothed blades.

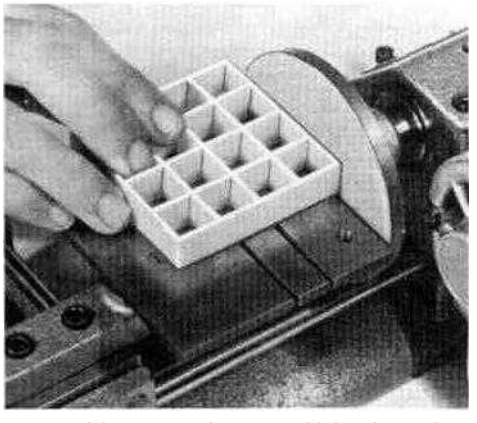
Even hardened tool steel can be cut with this set-up by using the right grade of abrasive cut-off wheel. Modern flexible abrasive wheels should be used at maximum R. P. M. Unlike the rigid wheels, there is little danger of the disc breaking up, but you may need to machine oversized collars to support the wheel properly.

Abrasive cutting can also be done on short lengths of material with the Unimat set up in the drill press position, and the work supported vertically on the cross slide with vise or chuck. With a perfectly clamped set-up, and caution in feeding, you can use larger abrasive wheels, than would fit on the lathe set-up.



Abrasive wheel saws thin stainless tubing. Use damp cloth to keep metal cool.

DB 1330 3 1/2-INCH SANDING DISC



Use minimum speeds to avoid burning soft materials such as the plastic lamp louver.

This cast iron Sanding Disc requires DB 1310 Headstock Raising Block, and has reinforcing ribs on the back side. It is built like a heavy-duty face plate. You can use it as a power sanding disc as shown in the photo, or as a metal-turning face plate. To turn large pieces of metal, you will need to drill radially balanced holes in square or triangular pattern, through which you can bolt your work.

This disc is an ideal companion to cither the large or small circular saw tables. Precision duplicate sanding can be done by clamping a guide to the table parallel to the disc.

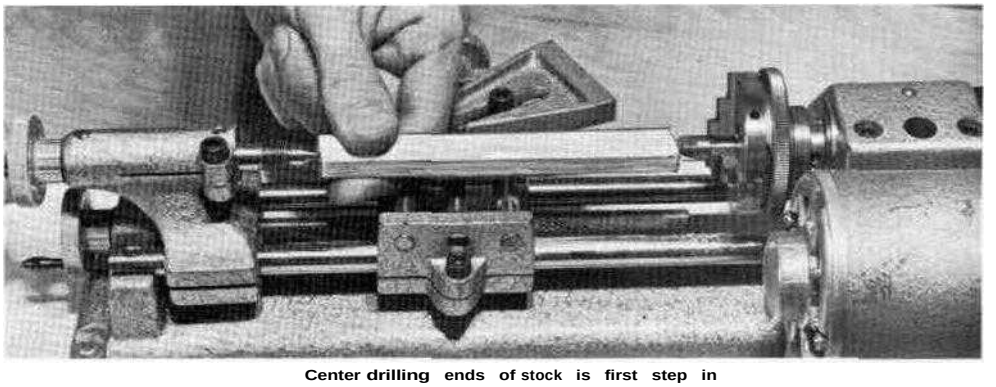
Perfectly round wheels can be produced by installing a pin in the saw table top. Saw a disc shape of any size on the: jig saw. Drill a center hole In the workpiece. then use your sander, and saw table with pin set-up, to sand the edge to a true circle.

If you plan to do considerable work in wood, you will probably want sets of sanding discs (DB 1331, 2, 3) ready to use with fine, medium and coarse paper. To save the cost of buying extra cast-iron discs, turn discs of 1/4-inch hardboard. Mount the disc with three flat-head screws (counter-sunk level with the hardboard surface) to match slot holes in the Unimat face plate. Secure with nuts on the back side of the face plate. Ordinary flat sandpaper can be used in an emergency, to make abrasive discs. But factory made die-cut discs (DB 1131, 2, 3) are preferable, since they have true edges and will lay perfectly flat. Using common rubber cement is hazardous since discs can fly off at high speed. For safety, use Sanding Disc Cement. such as DB 1335 (See Page 32).

WOOD TURNING

Wood turning is a hobby in itself, and in fact is one of the earliest mechanical crafts known to man. You can turn an infinite variety of cylindrical shapes; among them, such practical objects as handles for tools, bases for lamps, trophies, etc. Beautiful models of antique furniture can be seen in many museums and are easily produced on the Unimat. The same is true of architectural models. Many mode! items in metal, for example cannon barrels, start out as wood-turned patterns for foundry castings.

At your local foundry, you can have the shape duplicated in iron, brass or aluminum.



Center drilling ends of stock is first step in wood turning.

As an example in wood turning, let's say we need a dowel of a certain size. Working from a large block or board of wood, the first step is to cut a square section on the table saw. If we want to finish with a 3/4-inch round dowel, 1-inch square would be a good start. Mark the center of each end and set up the lathe as shown above. Put a center drill in the chuck and use the tailstock to push the wood into the rotating drill. Repeat for the other end.

Now mount the wood between the DB 1205 Spur Drive Center (which screws on the lathe spindle) and the tailstock center. The Spur Drive Center has two

WOOD TURNING cont'd

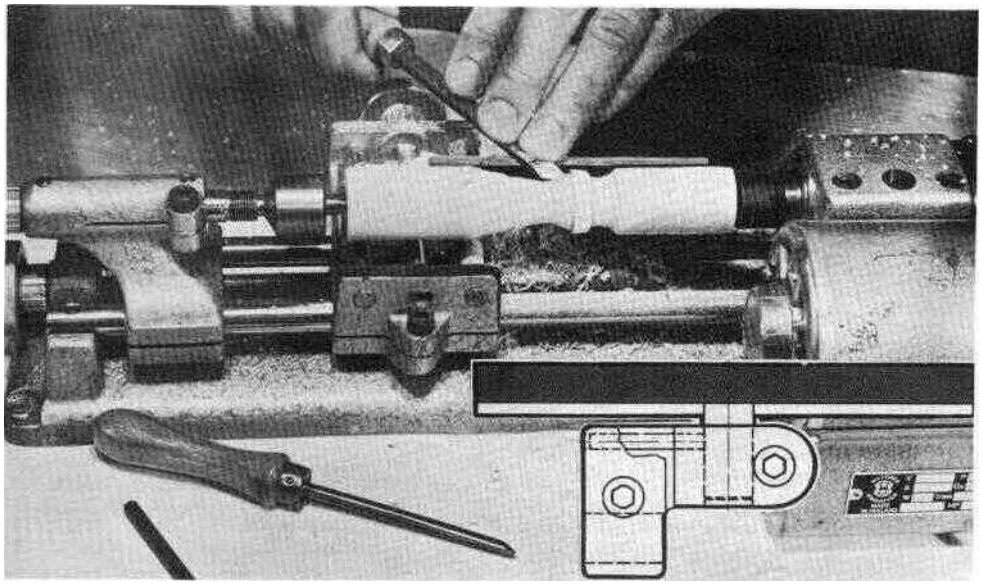
with the

DB 1201 STEADY FOR WOOD TURNING

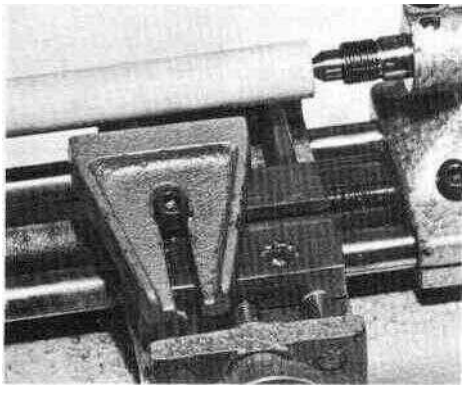
DB 1201a ADJUSTABLE HAND TOOL REST

DB 1205 SPUR DRIVE CENTER

DB 1220 & 1220a BALL BEARING LIVE CENTERS



DB 1201a Adjustable Hand Too! Rest gives you a 4 3/4-inch straight surface for resting your wood turning chisels, in foreground is DB 1136 Round Tipped Gouging Tool. In use is DB 1137 Veining Tool, a straight bladed tip that is useful for cutting in long straight lines, You can grind your own special shape tools from discarded shanks of broken taps, drills, etc. For safety, always use long, well-made handles on wood turning chisels, and always make sure your lathe is solidly locked up before turning power on.



DB1201 Steady Rest is a good support for wood turning in close corners. Also, it makes a useful rest for hand grinding when sharpening chisels, plane blades, etc. Photo shows wood turning job supported in 3-jaw chuck which can be used for very light cutting, or slow sanding work, But set-up is *not sate* at high speed since wood can give, causing 3-jaw chuck jaws to open and possibly cause damage to themselves or bed ways, Also, chuck jaws mar work. On any high speed work, it is always a good Idea to double lock your chucks, lathe dogs, and fixtures, with heavy rubber bands or twine.

prongs which bite into the wood, driving the workpiece. You can use either the regular lathe center, or one of the ball bearing live centers, (DB 1220 or I220a) shown at right. The Live Center is preferred because it will take high speeds without overheating and scorching the wood.

To turn a square into a round, start with a DB 1136 Gouging Wood Chisel. Use a medium speed and with the wood chisel supported on either rest, slowly approach the wood. The handle of the chisel must be firmly gripped in the hands. Avoid digging into the wood too fast. Fingers on the chisel blade will tell you when the tool is overheating.

Make a complete pass to produce a rough cylinder. Then increase the speed and make fine cuts to reduce size until your cylinder is just slightly larger than desired. Finish by taking a final cut with a long strip of sandpaper held in both hands and "stroked" diagonally from one end of the work to the other. Three or four light passes with the paper will give you a perfectly true round piece.

Your Unimat lathe can be used to turn tapered table legs and other long workpieces if you improvise a lathe extension. Make a holder for the tailstock and clamp it to your bench in line with the headstock. Then use a long piece of angle iron or straight bar stock as a steady rest.

With the DB 1310 Raising Block and the DB I201a Adjustable Hand Tool Rest, you can turn small plates and wooden bowls. Secure the workpiece to the face plate with wood screws running from the back.

Live Center DB 1220 (left) with single bail bearing race is suitable for all wood turning jobs. DB 1220a is a heavy duty model. Shown in cutaway view, double ball bearings take more lateral thrust, for tough cuts in metal.

These center bearings are life-time lubricated, and cannot be dismantled. At no time should you oil them since this could break up the grease inside. After long periods of use at high speed, you may notice grease leakage. This will not affect operation, until you see it every time you use the Live Center. Then, it would be wise to force a small amount of new bearing grease through the hole which runs down the stem. Insert the grease with a swab and push inward with a drill blank of diameter to fit.

A wide variety of special tailstock centers can be made to fit the ball bearing centers. For turning pipe, you can make your own cone or cup centers. For machining long shafts, you might want to make a ball bearing chuck center. For very small wood turning jobs, you might need a hollow tube center.

Procedure is easy. First remove the original tailstock center. Use a good quality machinists' punch that just fits the bored hole that runs through the live center. Put the live center face down on a soft wood 2 x 4 that has a half-inch hole drilled through, and gently knock out the live center piece. Copy the shank dimensions and install your own center piece.