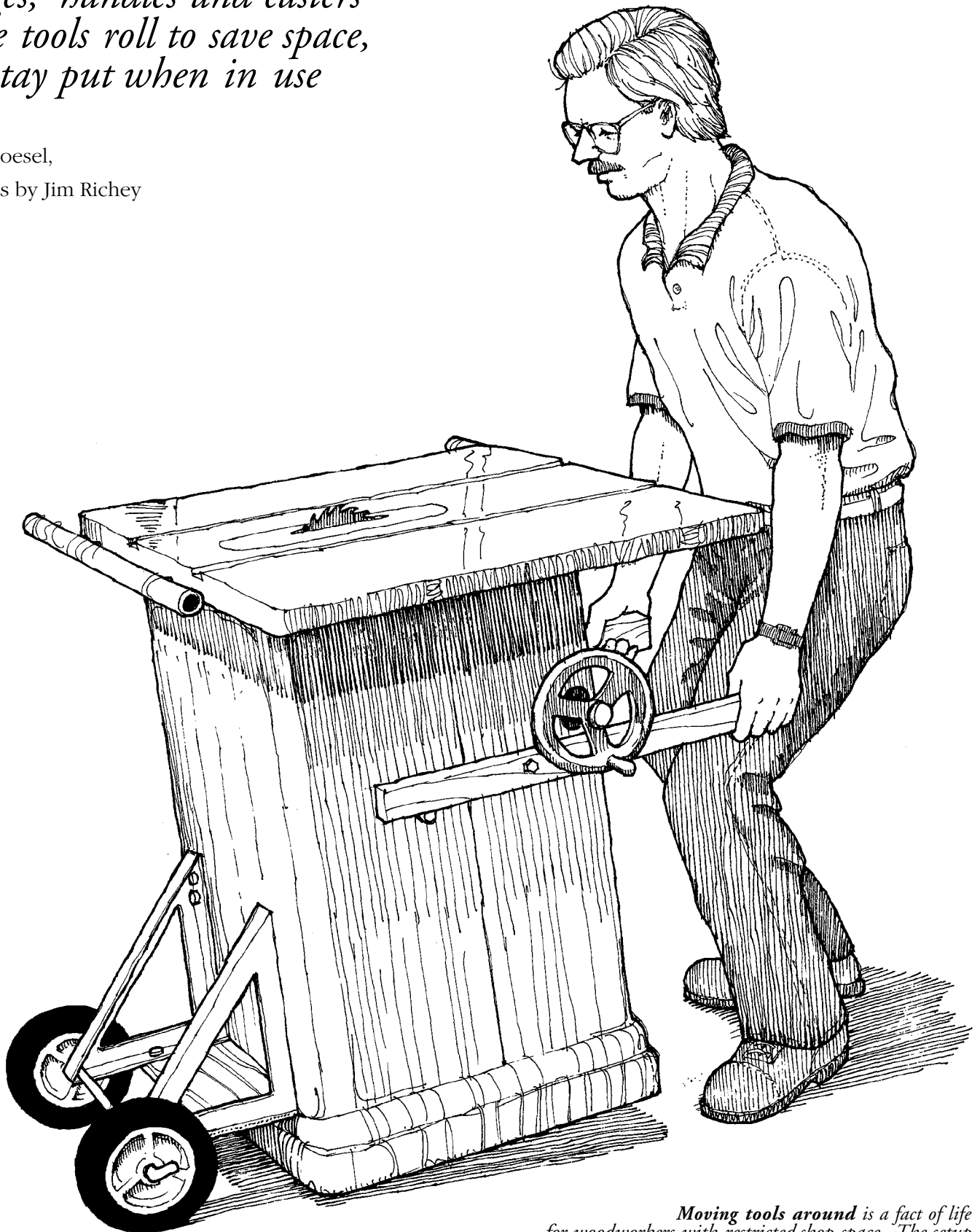


Machines on Wheels

Hinges, handles and casters make tools roll to save space, but stay put when in use

by Jim Boesel,

Drawings by Jim Richey



Moving tools around is a fact of life for woodworkers with restricted shop space. The setup shown here, two lawn mower wheels mounted on the back of the tool's base, works great for moving tablesaws. The handles are placed at a good height for lifting and pivot out of the way when not in use.

Every woodworker would love to have enough space so that every machine could be set up and ready to go at all times. In reality, most shops don't provide that luxury. As often as not, woodworking machines have to share a garage with, of all things, a car. And even if the shop space is sacred unto itself, tool collections have a way of outgrowing space the way kids outgrow clothes. For many woodworkers, the only solution is to move a machine into whatever open space is available when they need to use it and then stow it away again to make room for the next machine to be used. Unfortunately, most floor-model machines are designed to be heavy and stable; ease of movement is a minus not a plus, so woodworkers have had to figure out how to make machines mobile when necessary while keeping them stable when they're in use.

In a letter to the editor in *Fine Woodworking* #93 (March/April 1992), Charles Klavness of Hempstead, N.Y., asked other readers for ideas about how to stabilize tools on wheels. In response, we received more than 20 letters with suggestions ranging from sources for commercial locking casters (see the sources of supply box on p. 63) to tried-and-true methods used in the theater to move scenery and props quickly and efficiently. Here is a distillation of the best of these ideas.

Tip onto two wheels

One of the most direct approaches was sent in by Dean Stevick of Herndon, Va. (see the drawing at left). Stevick attached two lawn mower wheels to the back of his tablesaw, so the tool still sits solidly on the floor but can be moved by lifting its front end. The wheels were mounted on an axle made from a ½-in.-dia concrete anchor bolt with a 90° bend in one end. The metal brackets that hold the axle were bolted to the saw's base. Stevick recommends the wheels be mounted no more than ⅛ in. above the floor when the machine is standing upright. And he advises against using this method on top-heavy machines like a drill press or bandsaw.

Mounting wheels on the back side of a machine works well as

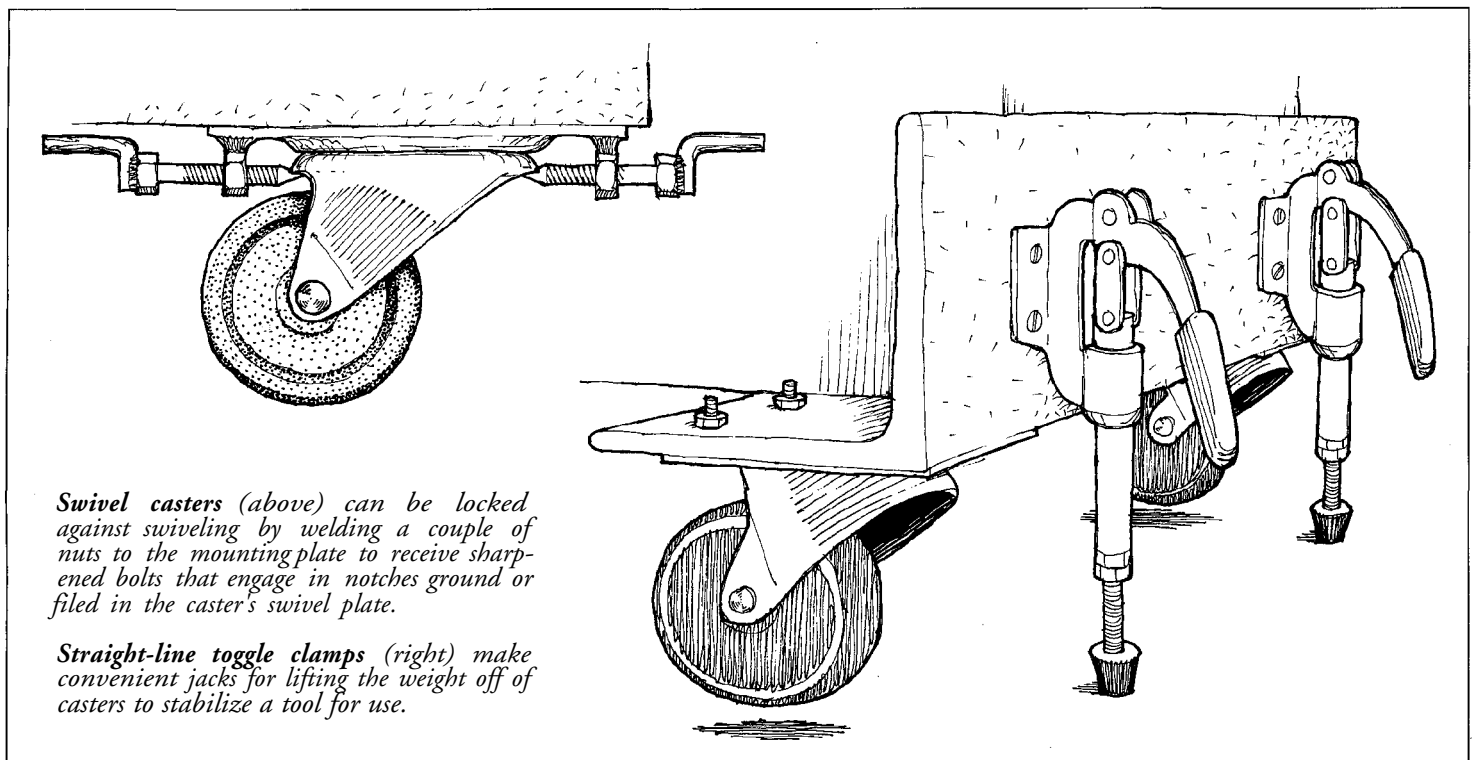
long as you can lift one end without too much difficulty. J. Rufford Harrison offered a similar method but added two oak handles that make lifting a heavy machine much easier on the back (see the drawing at left). The handles are bolted to the machine's base or stand so that they normally hang vertically alongside the machine and out of the way. When the handles are pivoted up to the horizontal position, they bump into another bolt that prevents further rotation and provides the leverage to lift the machine. The handles can be placed at a height that gives the most leverage and that makes it easy to roll the tool around like a wheel barrow.

Stabilizing swivel casters

The above method is fine if you have the room to maneuver the machine forward and back on two wheels when making sharp turns, but what if you, like T.L. Manley Jr. of Coraopolis, Pa., have to turn your bandsaw on a dime to move it around a cramped shop? Manley mounted his bandsaw on four swivel casters for optimal maneuverability and then bolted two straight-line toggle clamps to the angle iron used to mount the casters, as shown in the drawing at right below. The toggle clamps, or "thrust jacks" as Manley calls them, lift the weight of the tool slightly and act as brakes. Instead of using four jacks, one for each wheel, Manley used only two, but he has devised a way to lock the swivel mechanism on the other two casters to prevent any wobble at that end of the saw. He welded nuts on opposite sides of the caster base to receive small "crank" bolts that are sharpened to a point, so they will jam in notches ground in the caster's turntable (see the drawing at left below).

To align the wheels, he rolls the machine forward just before throwing the jacks down. This situates the wheels at a right angle to the force of the thrust when the saw is in use. Then he screws the crank bolts into the notches to eliminate any chance of the wheels changing position.

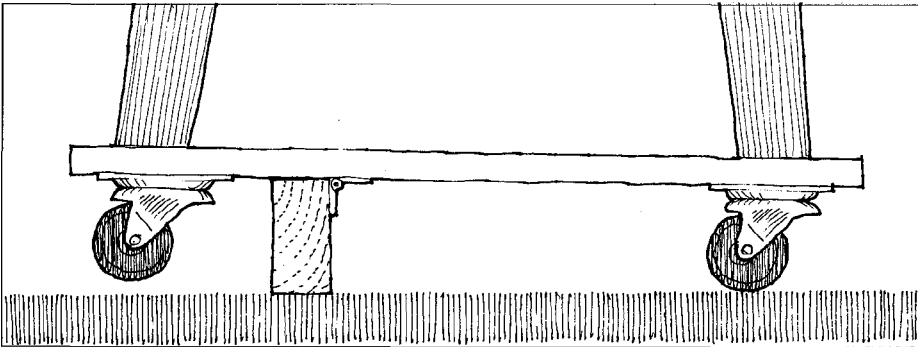
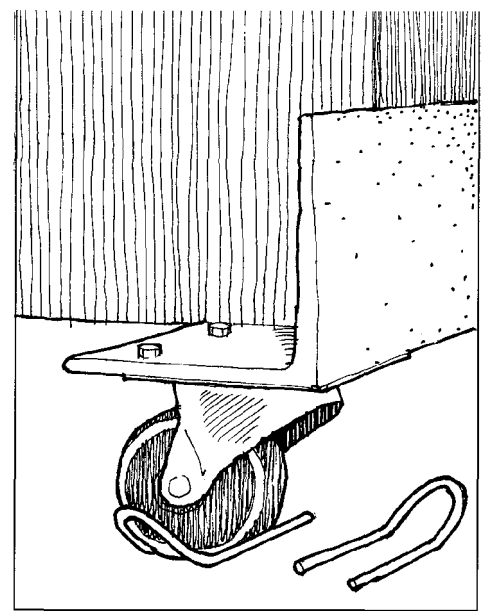
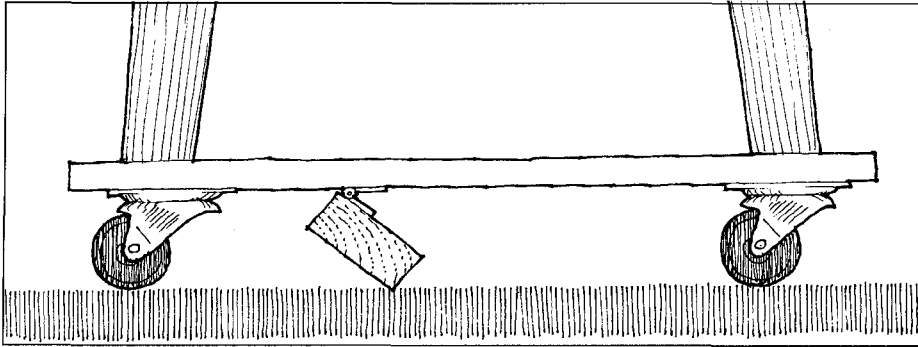
Another type of brake for a tool mounted on four casters was sent in by Pete Russell of Hilton Head Island, S.C. Russell simply



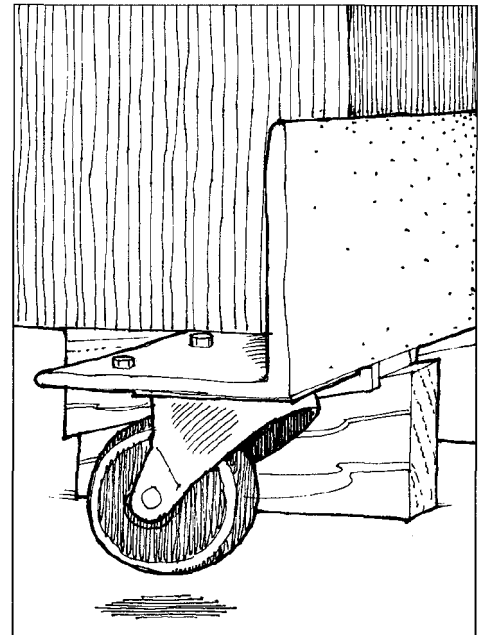
Swivel casters (above) can be locked against swiveling by welding a couple of nuts to the mounting plate to receive sharpened bolts that engage in notches ground or filed in the caster's swivel plate.

Straight-line toggle clamps (right) make convenient jacks for lifting the weight off of casters to stabilize a tool for use.

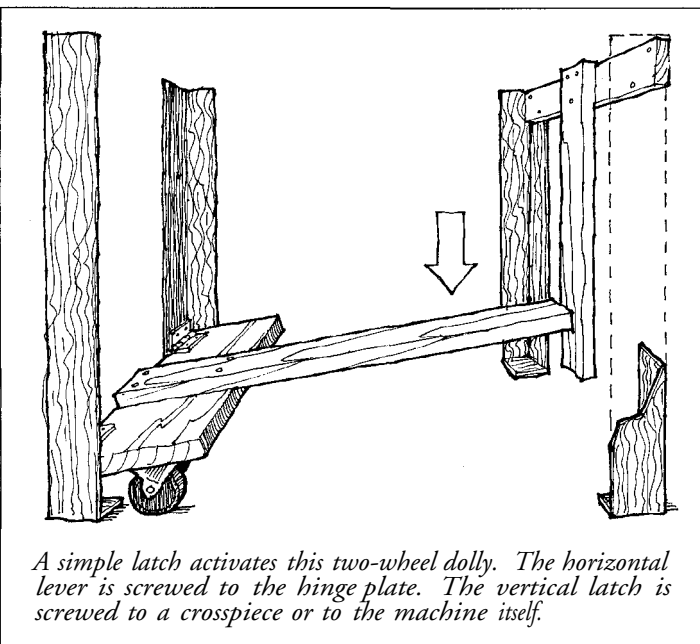
It doesn't take much to stop small diameter casters from rolling. Bent-wire stops slipped around each wheel (right) will do the job. Or raise the load off the wheels by driving opposed wedges against the underside of the machine's base (below).



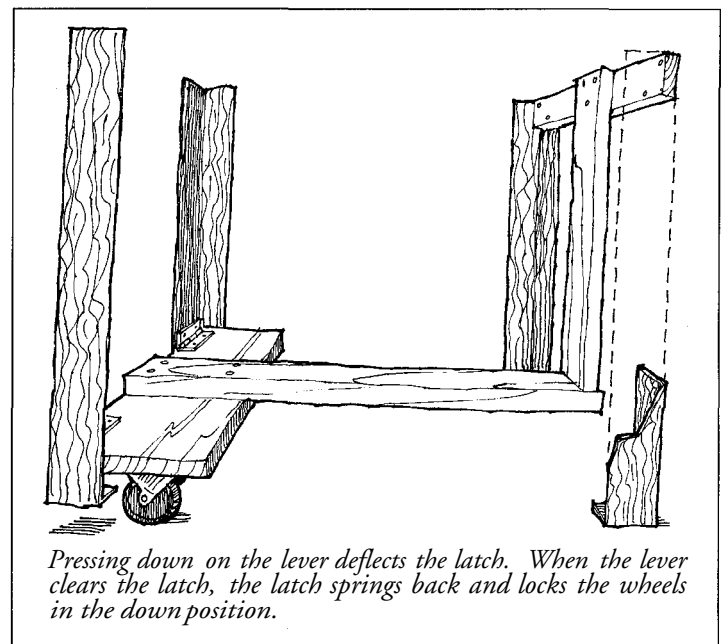
A 2x4 hinged to the bottom of a plywood platform will bounce along the floor when the tool is rolled in one direction. When you want to park the tool, just lift it slightly, and then rock it up onto the 2x4. Hinge the 2x4 so that the hinged joint resists the thrust of feeding material.



Hinged dollies are what stagehands use to move props and scenery. The basic method is to attach the wheels to a plywood plate and then to hinge the plywood to the base or legs of the machine. Two versions are shown below.



A simple latch activates this two-wheel dolly. The horizontal lever is screwed to the hinge plate. The vertical latch is screwed to a crosspiece or to the machine itself.



Pressing down on the lever deflects the latch. When the lever clears the latch, the latch springs back and locks the wheels in the down position.

hinged a 2x4 to a plywood platform (see the top left drawings on the facing page). When moving the saw, he pushes or pulls it front end first and the 2x4 bounces along the floor. When he wants to use the saw, he simply lifts the front end of the saw slightly and rocks it up onto the 2x4; the hinge joint jams to resist the thrust when feeding material from the front of the saw. If your floor is concrete, the weight of the saw provides enough friction to keep the 2x4 from sliding along the floor when the saw is in use. But Russell suggests that you could increase the friction, if necessary, by adding a rubber strip to the 2x4's bottom edge.

Hinged dollies facilitate a change of scenery

Hinges are also an integral element in the methods shown in the bottom drawings. According to a couple of the readers who sent in variations on this method, hinged dollies have been used for years to move theatrical scenery and props on and off stage in a hurry. Brian Ganter of Foxborough, Mass., mounts two heavy-duty casters on each of two pieces of plywood, which are then hinged to the machine's base or legs. A long arm is securely bolted to one of the plywood dollies so that it extends to the front of the machine and serves as a foot pedal. When you step on the pedal, you cause both sets of wheels to push down and to raise the machine an inch or two off the floor.

David Rogers of Thornhill, Ont., Canada, uses one two-wheel dolly with a simple spring latch to hold the wheels in the down position. The dolly is hinged to two legs as in Ganter's method, but the foot pedal (or lever) doesn't extend quite as far. Instead, the lever is just long enough to deflect the latch mechanism—a 1x2 extending down from a crosspiece attached to the other two legs of the machine's base. When the lever clears the 1x2 latch, the latch springs back and prevents the lever from moving back up. To lower the tool stand back to the floor, Rogers disengages the latch with a "deft little sideways kick, which leaves my foot in position to control the upward motion of the lever and to prevent the tool from dropping heavily."

Bob Thayer of Barnstable, Mass., another reader who credits his theatrical experience for similar methods, points out that leverage is increased by mounting the casters close to the hinge pivot point. He can lift his bandsaw equipped with hinged dollies with "only

finger pressure." Thayer also recommends two books, *Scene Design and Stage Lighting* by Parker and Smith (Holt, Rinehart and Winston, Inc.) and *Scenery for the Theatre* by Burriss-Meyer and Cole (Little, Brown and Company), as good sources for variations on these methods.

A couple of low-tech approaches

Of course you could keep things really simple and just take Don Greenfield's advice. Greenfield, of Crofton, Ky, makes stops by bending a 9-in. length of 1/8-in.-dia. solid wire around a 3/4-in. pipe clamp. He then takes the U-shaped wire and bends the curved end up at about 20°. Sliding one of these stops under each caster locks the wheels when the tool is in use, and the 20° bend makes it easy to pull them out when it's time to roll the tool away. Similarly low-tech is Scandia, Minn., woodworker Keith Hacker's idea for stabilizing mobile tools with wedges, as shown in the top right drawings on the facing page. □

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Sources of supply

The following companies carry casters or mobile bases for heavy machine tools. (The yellow pages for most large cities will also list caster suppliers.)

Delta International Machinery, 246 Alpha Drive, Pittsburgh, PA 15238; (412) 963-2400. (Locking mobile base.)

Garrett Wade Company, Inc., 161 Avenue of the Americas, New York, NY 10013; (212) 807-1155. (Rigid plate casters and locking swivel casters.)

Grizzly Imports, Inc., PO Box 2069, Bellingham, WA 98227; (206) 647-0801. (Locking mobile bases.)

HTC Products, Inc., PO Box 839, Royal Oak, MI 48068-0839; (800) 624-2027. (Locking mobile base.)

Payson Casters, Inc., 2323 Delaney Road, Gurnee, IL 60031-1287; (312) 336-6200. (Wide variety of locking casters.)

Shopsmith Inc., 3931 Image Drive, Dayton, OH 45414-2591; (800) 762-7555. (Retractable casters adaptable to any stand or base.)

