

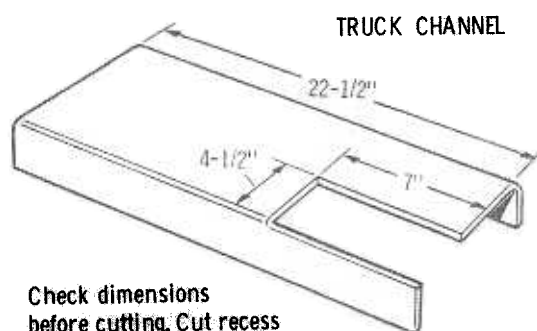
## Build a power hacksaw from washing-machine parts

By BRADFORD DITTMER

In this ingenious adaptation, the back-and-forth mechanism of a discarded impeller-type washing machine pushes a saw instead of an agitator

### SEE ALSO

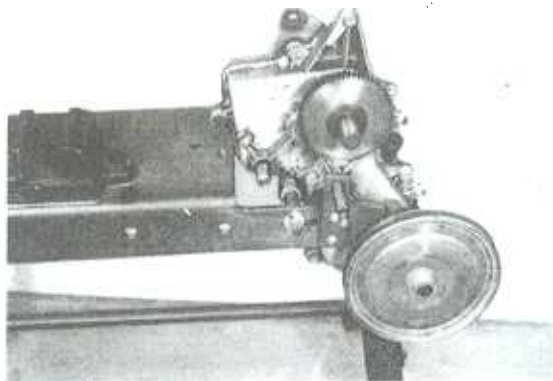
Arbor presses . . . Cutoff machines . . .  
 Hydraulic presses . . . Lead ladles . . . Machining . . .  
 Metal casting . . . Motors, shop . . .  
 Power-tool stands . . . Sheet metal . . . Torches

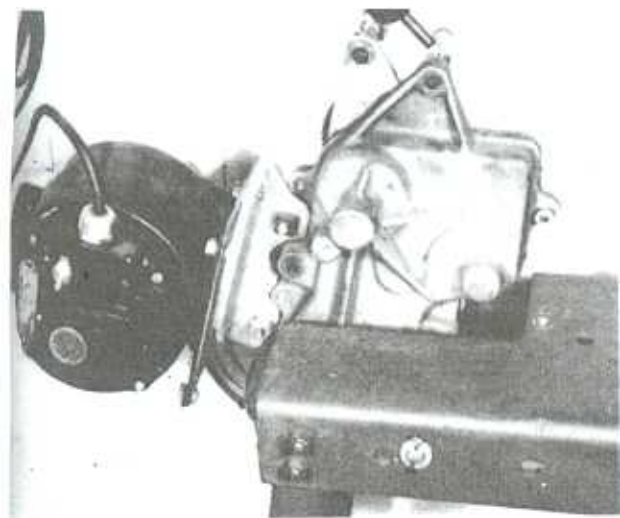


Check dimensions before cutting. Cut recess to suit gearbox used.

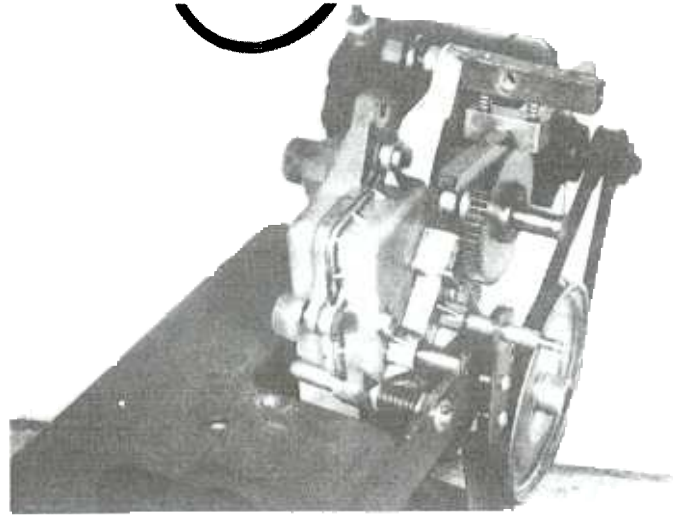
**FOR ACCURACY**, make a test stand using wood before cutting recess in the truck channel.

**GEARBOX IS MOUNTED** using 1/2-in. stock, washers and pins. First, test dimensions on wood base.

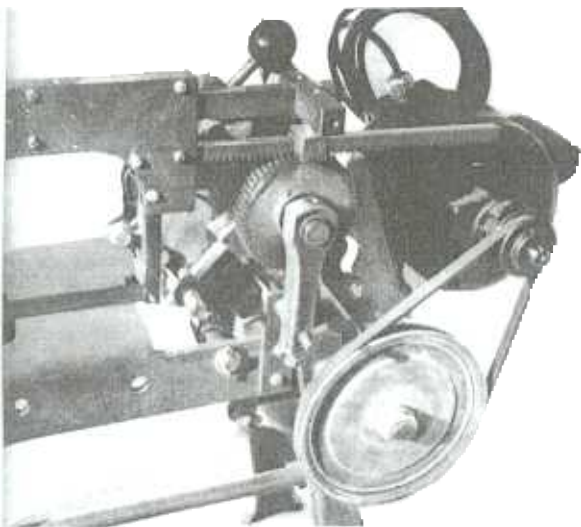




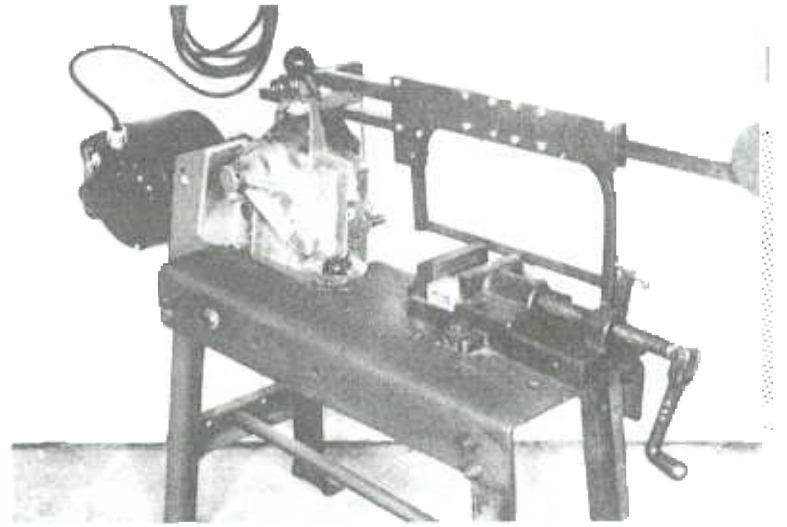
**MOTOR IS MOUNTED** on existing bolts on gearbox. Plate fastens to an angle to receive motor.



**60-TOOTH GEAR** is mounted on driveshaft against collar. Key parts line up on this gear's center line.



**BRASS PLATE** extended down one leg provides way to attach rack, takes springiness out of leg.



**READY TO GO**, saw includes counterweight added to outboard end of saw guide.

☛ A WELCOME ADDITION to any metal-worker's shop would be a power hacksaw, but few home shops boast of one because of the cost. Happily, you can treat yourself to this luxury by using the gearbox from a discarded washing machine (obtainable at a very modest price from your local appliance dealer; it's one less "trade-in" he has to haul to the junkyard).

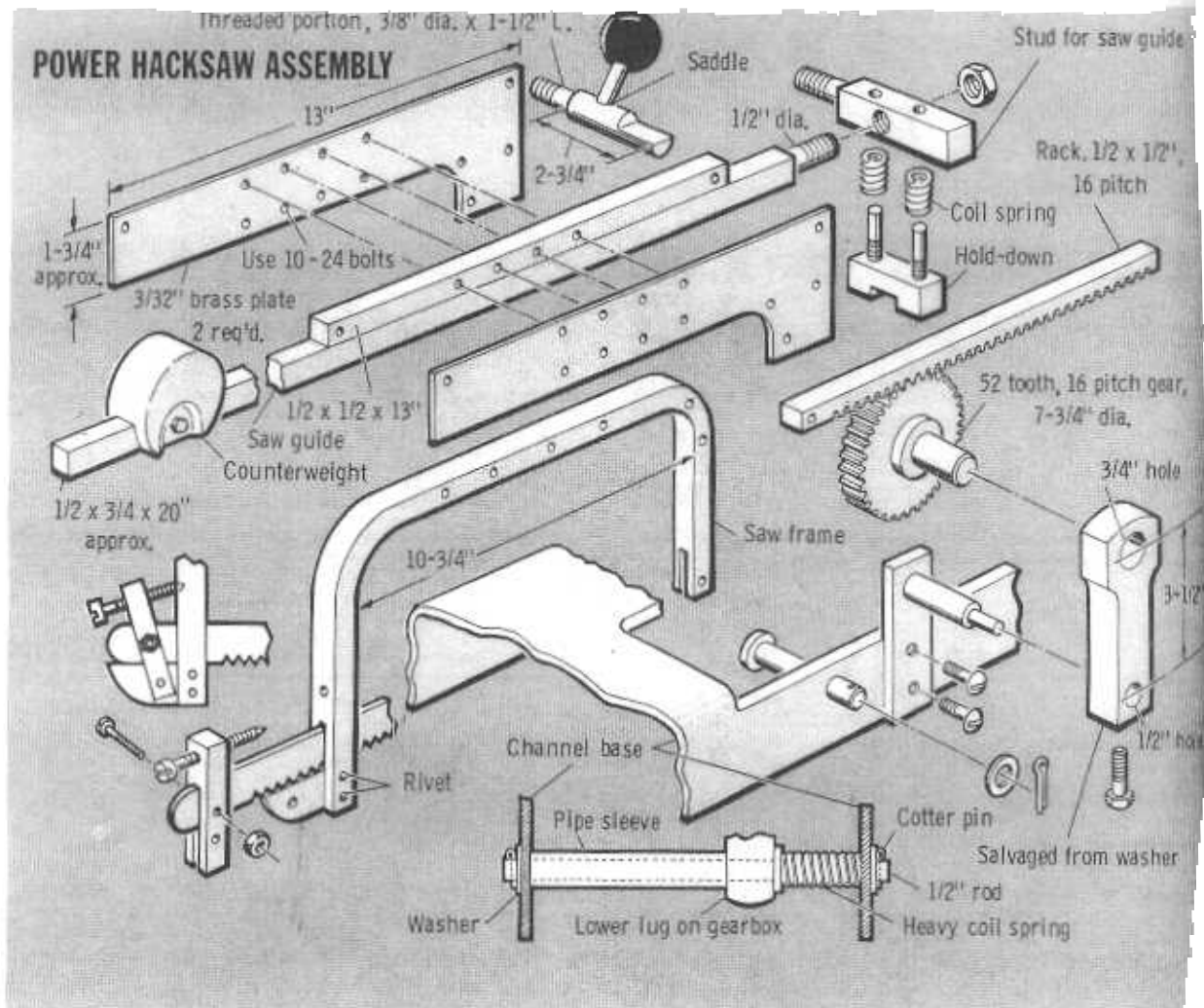
Though any make of washer having a back-and-forth impeller movement can be used with the rack-and-gear method to drive the saw, I used a Sears Kenmore. The gearbox has built-in gear reduction, existing lugs for attaching a motor mount and saw guides, plus a 7-in. driving

pulley. Half of the housing is gray iron casting, the remainder die-cast of a light-weight alloy.

Two changes were necessary: A hole had to be reamed in the large lug on the underside of the iron casting to accommodate the 1/2-in. rod on which the motor rides in the base, and the impeller shaft had to be shortened about 8 in.

#### perfect cutting speed

If you slip a 16-pitch, 60-tooth gear over this 3/4-in. shaft and drive the 7-in. pulley with a 1/4-hp, 1725-rpm motor rigged with a 2-in. pulley, you get just about perfect cutting speed—72 strokes per minute. Stroke length is about 6 1/4 in.



Of cold-rolled stock, the saw frame is made simply by heating and bending it, using a wood template. Slots to cradle the blade are hand-sawed with a hacksaw. They're cut to accommodate the 12-in. power-hacksaw blades that are sold by Sears.

Since the saw operates smoother if the flat surface contacting the saw guides is long, use a straightedge along the top of the frame after bending. Place the blade so it will operate as a drag saw.

#### trial-and-error base

Make a trial-and-error wood base for setting up the machine. Use about 30 in. of 2x8 stock and saw out the recess as shown. About 2 1/2 in. back from the forward end of the recess and 1 in. down from the top surface, drill a 1/2-in. hole across the recess.

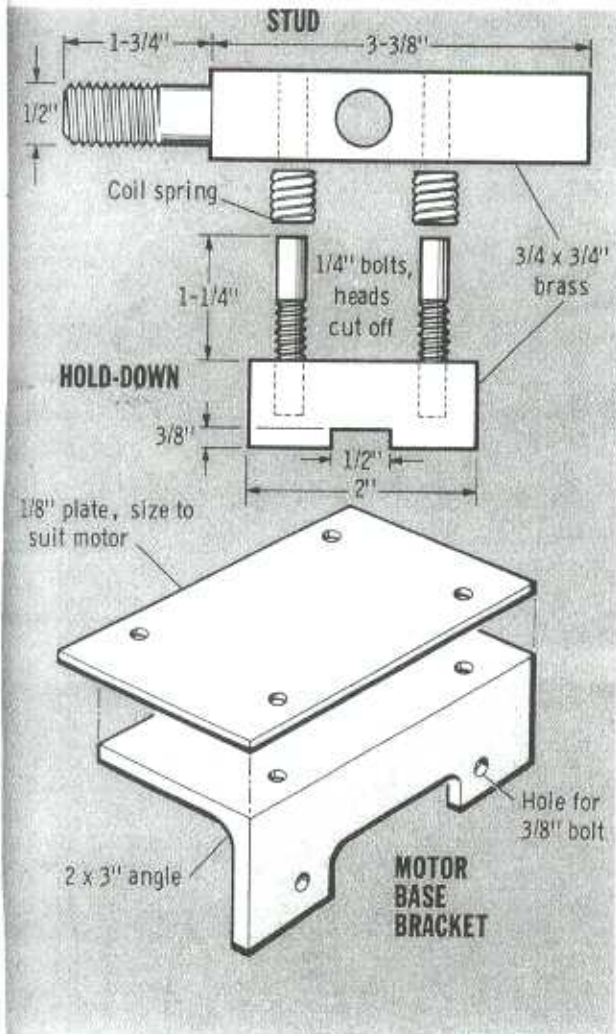
Next, mount the gearbox on a rod inserted across this recess. Block up the back of the box, set it in position, fit and assemble the rest of the fixtures. This done, you can then determine the measurements that you will need to build the permanent stand.

Place the gear on the driveshaft tight against the collar and fasten it with a taper pin. When assembled, all parts on the mechanism are lined up on this gear's center line.

The brass hold-down is notched to fit over the rack. Clamp it in place and drill a hole through both parts on each side of the rack with a No. 7 drill.

#### sliding fit

Next, tap 1/4-20 threads and insert 1/4-in. bolts in the holes and saw off the heads about 1 1/4 in. above the stock. If necessary, enlarge the holes in the stud to assure an easy sliding fit. The



springs slipped over the studs should be of a suitable length to maintain a moderate down pressure on the rack.

To make the saddle, saw out a half-round section under the saw guide. This allows the saw to swing down far enough to finish the cut. Fit this part with a suitable handle for turning to up and down positions. Since the saw operates when the saddle is in any position, there is no need for an extra switch to stop the saw automatically after the cut.

The part salvaged from the washing machine (see drawing) is slipped over the small end over the 1/2-in. stud. The bronze, brushed end goes over the gear shaft to act as an outside bearing. Finally, add a 3/8-in. setscrew to hold it securely on the 1/2-in. stud.

Run the saw out to the end of the forward stroke. The face of the rear vise jaw should be set 1/2 in. ahead of the rear leg of the saw. The saw

guide should be level when the blade is about 3/4 in. above the floor of the vise. And, when the saw guide is level, the rack should be parallel.

When you have the rig checked out, use the measurements from your temporary setup to make the permanent one.

The base shown was made from 8-in. truck channel. (That explains those unused holes.) The legs are of light channel with the lower ends heated and bent to serve as feet.

#### setting the gearbox

To set the gearbox, drill holes for the 1/2-in. rod square with the sides of the channel and parallel to the top surface. Set the gearbox on the rod, block it in its final position and cut a pipe sleeve to fit over the rod between the lug and the far side of the channel. On the near side of the rod, place a stiff spring and use washers if necessary to hold the box in position.

Drill a 1/2-in. hole in a short piece of 1/4 x 1/4-in. stock, and slip the hole over the 1/2-in. stud. Tip the gearbox to its vertical position, clamp the piece to the channel flange and drill for two 1/4-in. bolts. If the spring on the rod is tight, your gearbox is set.

The motor-base bracket is cut from 1 1/2 x 2 1/2-in. angle to fit over two existing lugs on the back of the gearbox. Drill the bracket so it can be bolted onto the lugs with 3/8-in. bolts. Since the 2 1/2-in. face is not wide enough to accommodate the motor base, use a plate—the size of the motor base—between the motor and the bracket. *Caution:* Be sure you set the motor so that the pulley is clear of the rack path on the back stroke.

#### construction tips

It's easier to assemble the saw sliding mechanism if you clamp the saw, saw guide and top slide together. The brass plates can then be clamped in place and holes bored for 10-24 bolts to hold the unit together. After removing the clamps, bore the remaining holes.

When using shims to insure a free-sliding fit, my experience has been that there is too much play when the shims are removed. Thus, I simply tightened the bolts to allow a free slide. It's not a must to use a 60-tooth, 16-pitch gear; a smaller gear—down to 50-tooth—can be used, but it will shorten the saw stroke.

Lengths of cold-rolled stock can be picked up at a local machine shop. If you have difficulty getting the gear and rack, write to Chicago Gear Works, 440 N. Oakley Blvd., Chicago, IL 60612.