



*You can learn some new tricks by*

# Machining Your Own Milling Attachment

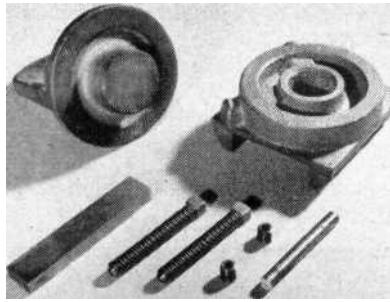
**By Harry Walton**

**Y**OU do not begin to get full use from a lathe until you have a milling attachment. With it you can do slotting, keyway cutting, gear shaping, slitting and grooving. You can saw stock square or at angles, and spot holes in work with pinpoint accuracy. A milling attachment costs a handful of

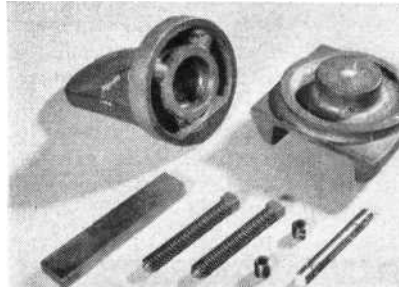
folding money. But here is one you can make from two castings. They cost about a fourth what a finished attachment would. Machining them is fun, and may even teach you a few handy dodges. For instance, you mill parts of the castings to make the attachment you're going to mill with!

When finished you have a husky, well-designed lathe accessory that will not let

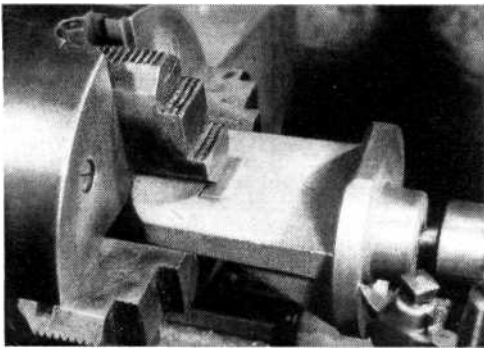
*Two kinds of castings fit different compound mountings*



HERE ARE CASTINGS for a popular 9" lathe having the dovetail post on the underside of its compound rest and a recess in the top of the cross slide. The base casting (at left above) therefore has metal for a similar post, while the vise casting to right of it has a cored hole to be bored out for a recess.

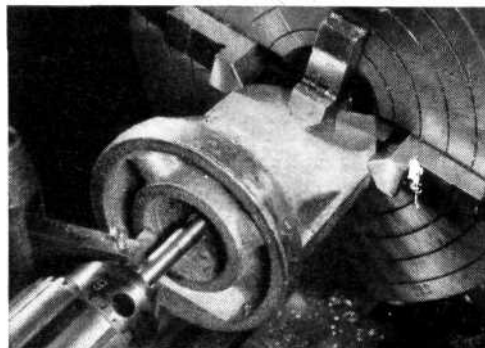
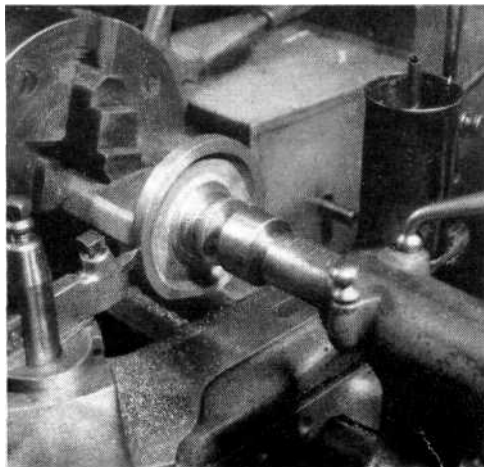


OPPOSITE TYPE of castings will fit a popular 10" lathe, which has the dovetail post on top of the cross slide and a recess to fit it in the compound rest. The base casting (at left above) therefore has a cored recess. Vise casting has metal for a post. Kits include screws and stock for vise jaw and locking pins.



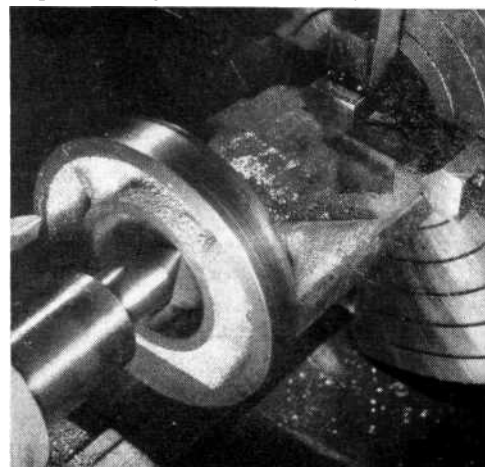
GRIP THE BASE in a four-jaw chuck if available, centering it to make round end run fairly true. A universal chuck can be used by laying a bar of suitable thickness across two jaws. Centerdrill the outer end deeply and engage the tailstock center to support it.

ROUGH OUT with a fairly deep cut at low speed to get under casting scale. Swing the compound rest to 30° and turn post to same shape as that on the compound. Face off the bottom to leave post the same height also. Finally, turn outer rim of the base true.



TURN A 60° POINT on a 3/8" rod. Chuck the base casting, centerdrill deeply, and support it with the pointed rod in the tailstock. Bore recess a close fit on the cross-slide post. For the offset tool shown, clamp a bit with a setscrew in a hole drilled across a 3/8" bar.

FACE OFF with a cut straight across from recess to rim. Be careful not to remove much metal after first deep cut to get under scale, or recess may become too shallow for the post. Recess is cored deeply enough not to require facing inside if carefully machined.

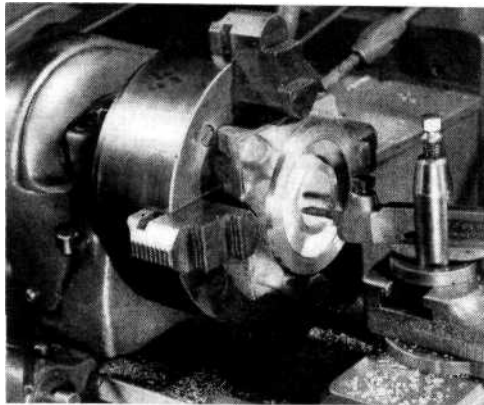


you down. The castings are plenty rugged, and there is only 1" overhang between the outside of the vise and the base. This remarkably small offset reduces the tendency to chatter, which otherwise means milling at a snail's pace with light cuts, or getting a rough finish.

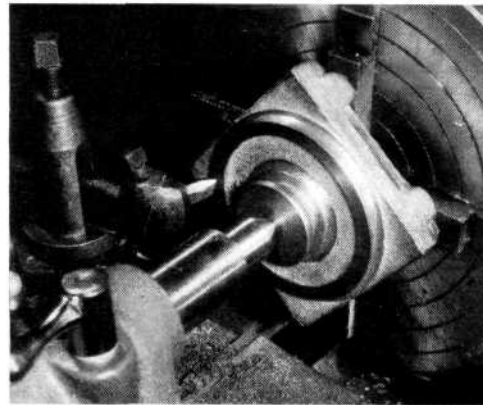
The jaws are 3 1/2" wide and they open to 2". Both the vise and the base can be swiveled for angular milling, as shown in the large photo on page 214.

What makes construction easy is the neat trick of using the compound rest for the vertical milling feed. The base casting fits on the cross slide, the compound is clamped on it in an upright position and the vise is mounted on the compound. Castings are available\* for 9" and 10" lathes, and for both the common compound mountings. To check yours, just take off the compound-

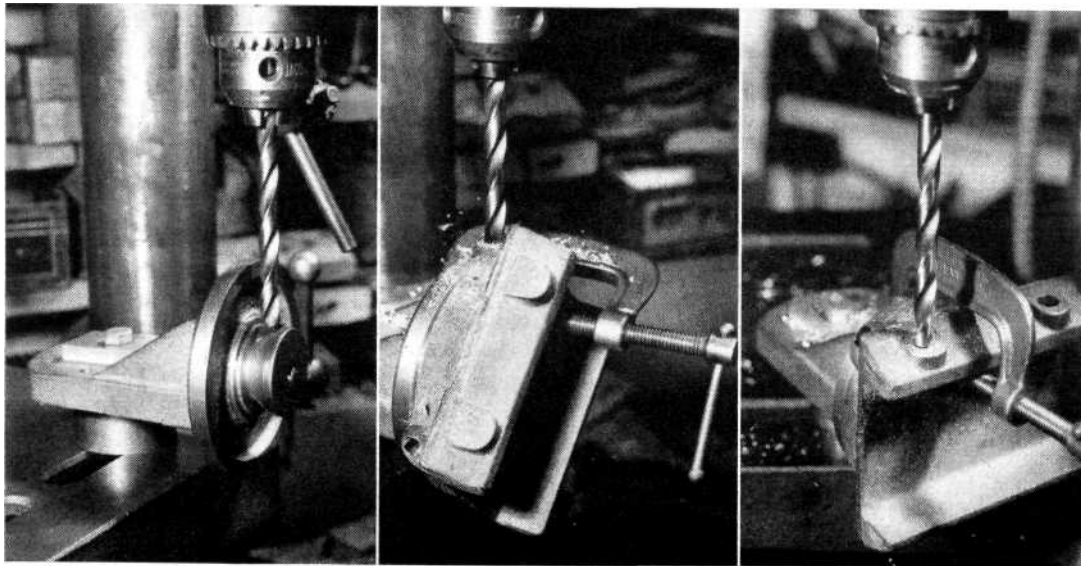
*\*Sold by Fiord McGu \*kin, 314 N. Monroe Ave., Ridgeiaoml, N.J.; 57.50 postpaid.*



**WISE CASTING** can be gripped with chuck jaws either outside as above, or inside its own jaws as at right. Bore the recessed type a close fit for the compound post. Then face off, taking care to leave recess deep enough.

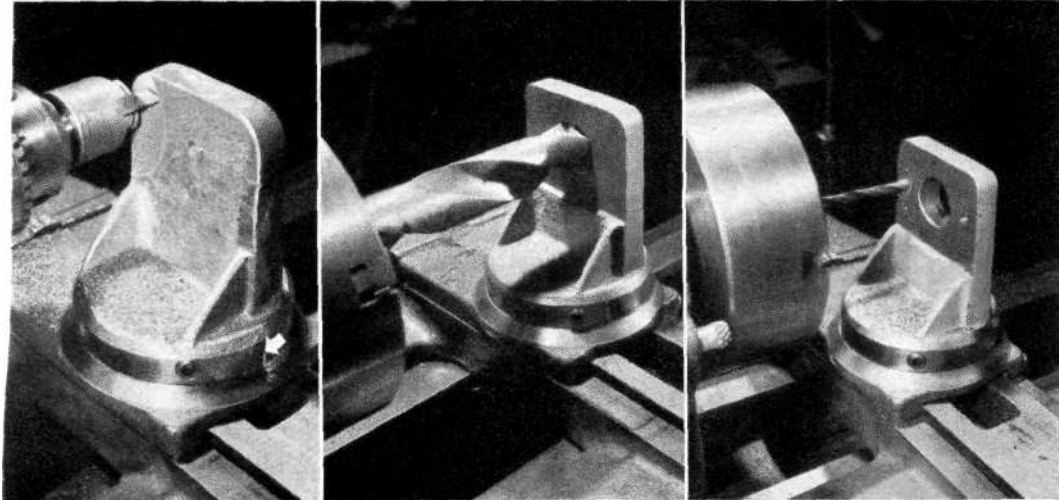


**OTHER TYPE** of vise casting is first center-drilled for tailstock support. Then the compound is swung to 30° for turning the post to a duplicate of the one on the cross slide. Facing (above) completes work on this side.



**MOUNT POST-TYPE BASE** on the drill press as above, align drill on the slope and set the depth stop short of it. Clamp the vise on as in the center photo. Drill 5/16", remove vise to drill into recess, and tap 3/8"-16. Then re-

clamp the vise on the base to drill screw holes through the bosses provided (right above). The recess type of base is itself tapped for screws. Cut and shape locking pins, chamfering 60° corners to prevent burring.



MOUNT THE BASE on the cross slide with locking pins and screws, web side toward the spindle and square to the ways. Chisel a mark at zero and any other graduations wanted. Set a fly cutter to swing just above the webs. Face

by advancing the cross feed (left above). With a big drill or a fly cutter, make a hole to fit the lathe tool post in the center of the faced side. Then drill a No. 7 hole  $\frac{3}{8}$ " from each edge as at right above and tap  $\frac{1}{4}$ "-20.

TURN TWO BUTTONS from steel rod to just enter the narrow part of the compound slot. Drill them  $\frac{1}{4}$ " and recess for the screws that hold them on the faced upright, as below. Slip the tool post through the large center hole from the headstock side. Then slide the compound slot over the buttons and the foot of the post as in the bottom photo. Tighten the tool post against a tool holder slipped into its slot on the right-hand side.

MOUNT THE VISE on the compound rest, its jaw horizontal. With a milling or a fly cutter, face the inside as shown below, using slow speed and feed. A straight milling cutter is good for machining the lower jaw. To attach a movable jaw to the vise screws (handier than a loose piece) grind the screw ends flat to get under casehardening. Then drill and tap them 8-32. Drill, counterbore and countersink the jaw piece as shown. END

