

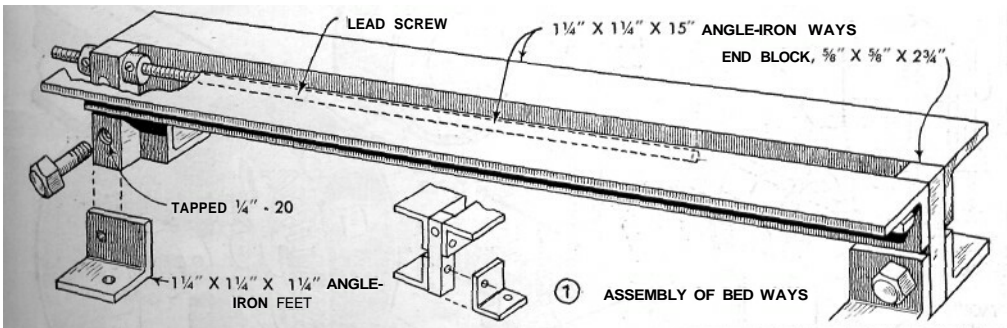
MIDGET *Metal-* *Turning* LATHE

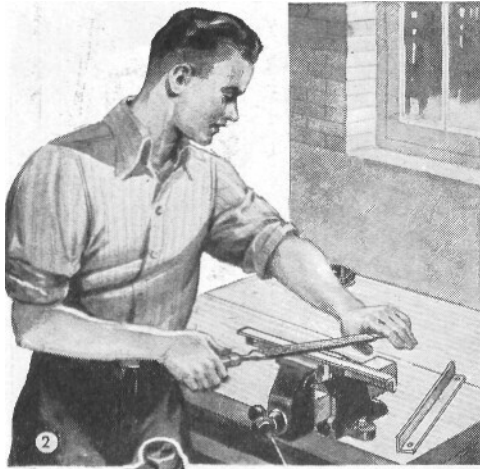
by A. D. Mayo

CRAFTSMEN, modelmakers and others who need a small metal-turning lathe can make one almost entirely from scrap material available in junk or auto-wrecking yards. A chuck may have to be purchased, but many turning jobs can be done between centers or on an improvised faceplate. The lathe shown here has a swing of 4 1/2 in. A larger one, of course, can be made by changing the proportions.

In making the ways, Fig. 1, select straight

lengths of angle iron. These can be filed on the inner surfaces so that the slide block, Fig. 7, will travel true to within about .001 in. For finishing them smooth, a piece of fine emery cloth wrapped around a file or block is rubbed over the ways as in Fig. 2. One of the end blocks is drilled for a lead screw as shown in Figs. 6 and 7. This should not be done, however, until the carriage and slide block are positioned on the lathe, to assure locating the lead screw at the

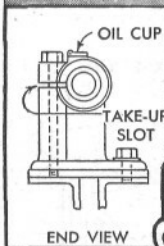
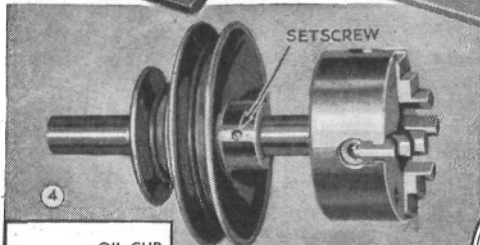
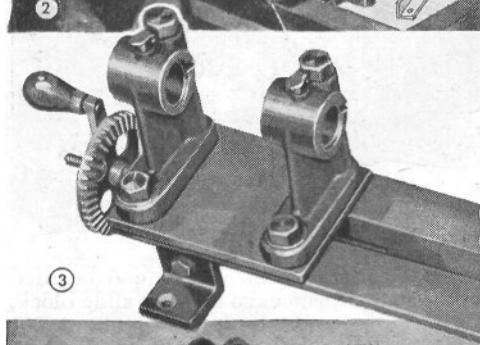




proper height. The screw is secured by collars and rotated by a gear wheel taken from a discarded hand drill. Or, almost any small crank or a wheel fitted with a knob will do. To allow maximum travel of the carriage, the screw should not be cut to length until all other working parts are in place and ready for use.

The carriage is shown in Figs. 8 and 10. For the small work done on a lathe of this size, the feed-screw thread should be fine. The tool post can be raised, lowered or turned in any direction. Even the tool itself can be rotated because it is round, being formed from an old drill bit.

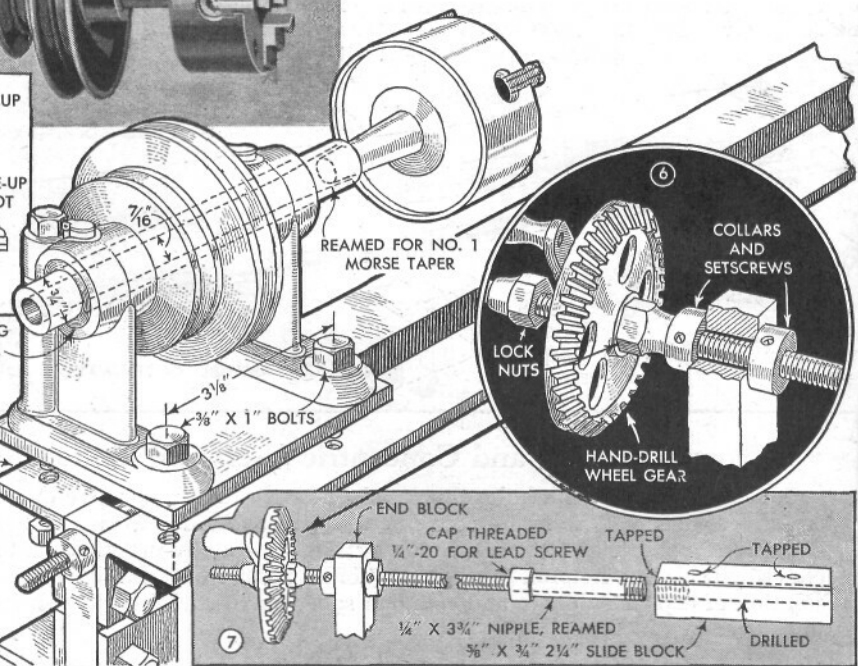
For the head and tailstock, shown in Figs. 3, 9, 12 and 13, overhead-valve tappet assemblies from an auto motor are used. One of the two tailstock bearings, Figs. 8 and 13, has a stud which fits a groove in the tailstock spindle and locks it. Both headstock bearings should have oil cups as shown in the detail of Fig. 5. The two sets of bearing supports are mounted on two plates as shown, after being aligned. This is done by passing the original rocker-arm spindle through all four bearings, then locating the holes to be drilled in the mounting plates. Now, with both sets of supports in correct position on the ways, the plate on which the headstock bearings are mounted is bolted to the ways. The tailstock plate, however, is movable. It is fastened to a spacing bar as in Fig. 12; the bolts through the plate do not pass through the



END VIEW
BRONZE BUSHING
7/8" O. D. 3/4" I. D.

MOUNTING PLATE
3/4" X 3" X 4 1/8"
1 1/4" X 1 1/4"
ANGLE

HEADSTOCK



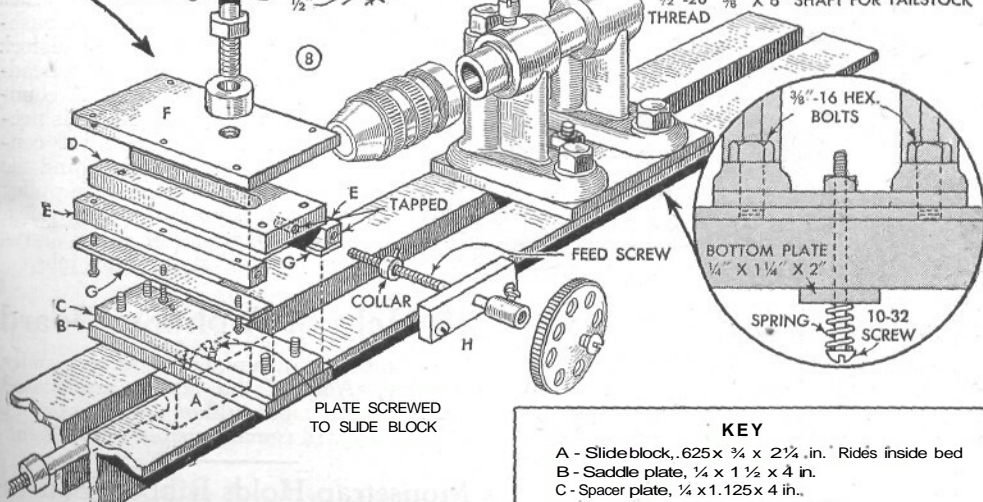
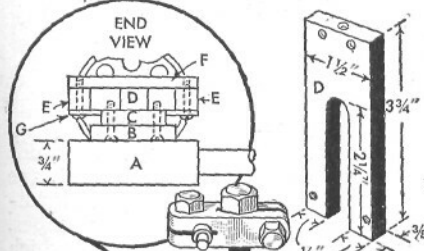
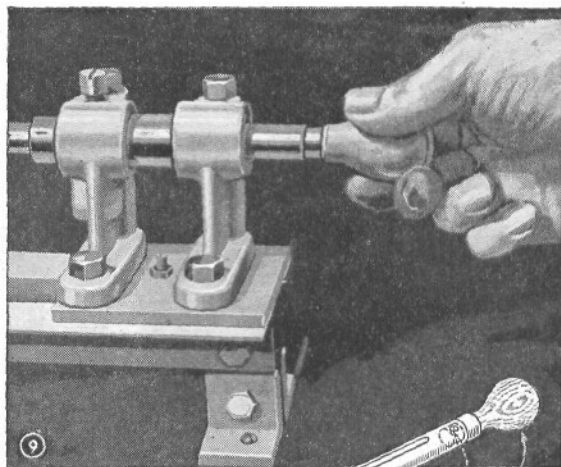
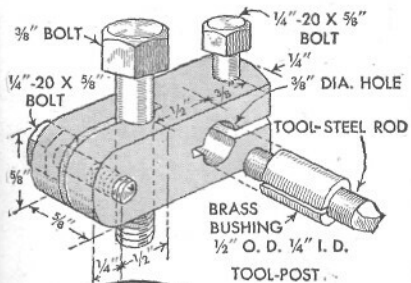
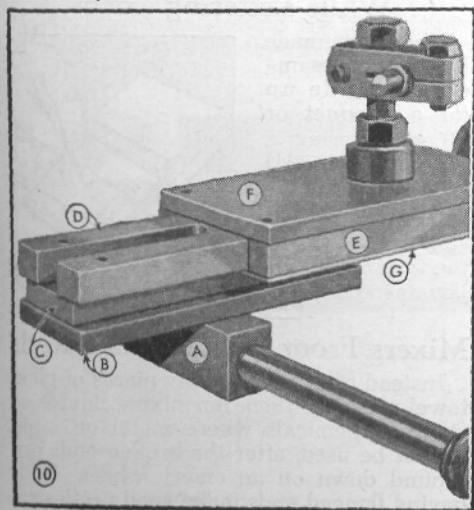


PLATE SCREWED TO SLIDE BLOCK

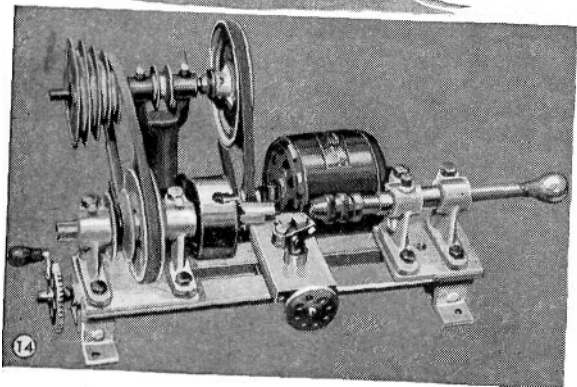
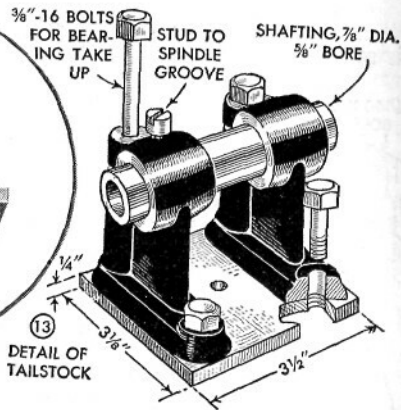
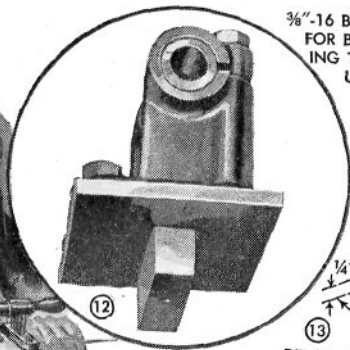
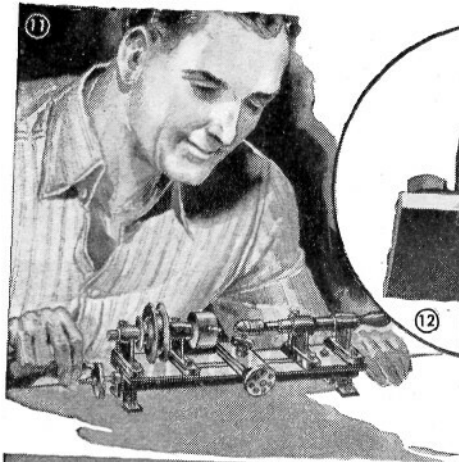
KEY

- A - Slide block, .625 x 3/4 x 2 1/2 in. Rides inside bed
- B - Saddle plate, 1/4 x 1 1/2 x 4 in.
- C - Spacer plate, 1/4 x 1.125 x 4 in.
- D - Cross-slide way, .375 x 1 1/2 x 3 3/4 in.
- E - " gb, .375" x 4 in. key stock; 2 req'd
- F - " top plate, 1/4 x 2 1/4 x 4 in.
- G - " retainer, .062 x 1/2 x 4 in.
- H - Front panel for cross slide, 1/4 x .687 x 2 1/4 in.



ways. The assembly can be locked by a screw through a bottom plate as shown in the circular detail of Fig. 8. To check the alignment, the carriage can be used as illustrated in Fig. 11: with the tool touching the spindle near the headstock, the carriage is moved toward the tailstock. If the bearing supports are in alignment, the tool will touch the spindle uniformly throughout its travel from end to end.

After using the rocker-arm spindle to align the bearings, suitable lengths are cut off, one for a sliding fit of the tailstock spindle, Fig. 9, and the other, for the headstock, reamed at one end to take an adapter on which the chuck is screwed. The tailstock



spindle is fitted with a small chuck and a wood handle. In order to use a tailstock center and other attachments having a No. 1 Morse taper you can make an adapter which screws on the spindle. Bronze bushings are inserted in the headstock and pulleys are fitted on the headstock spindle as in Fig. 4. A countershaft as shown in Fig. 14 is necessary and may be mounted conveniently on the bench behind the lathe. With a four-step cone pulley as shown, it is possible to provide a considerable range of speed as required for various turning jobs.