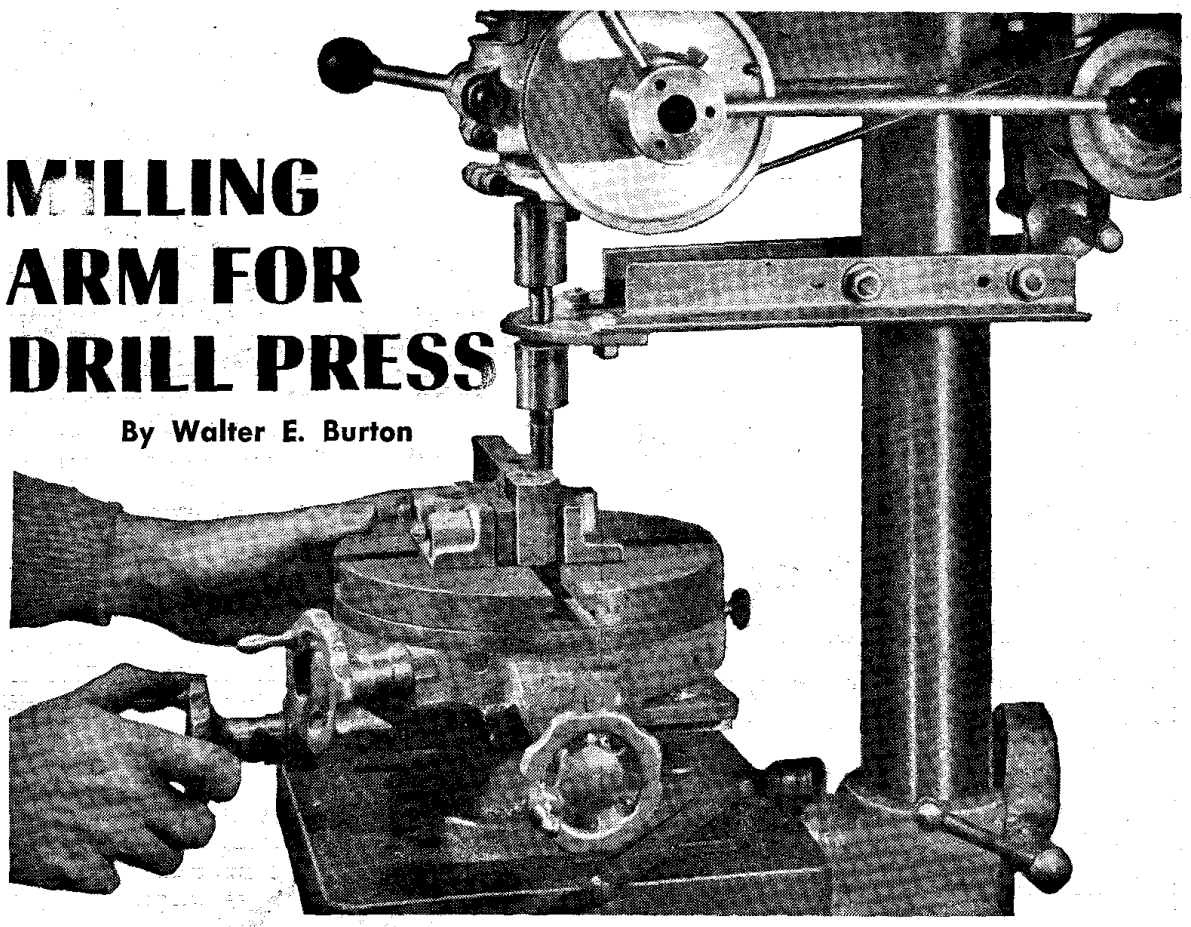
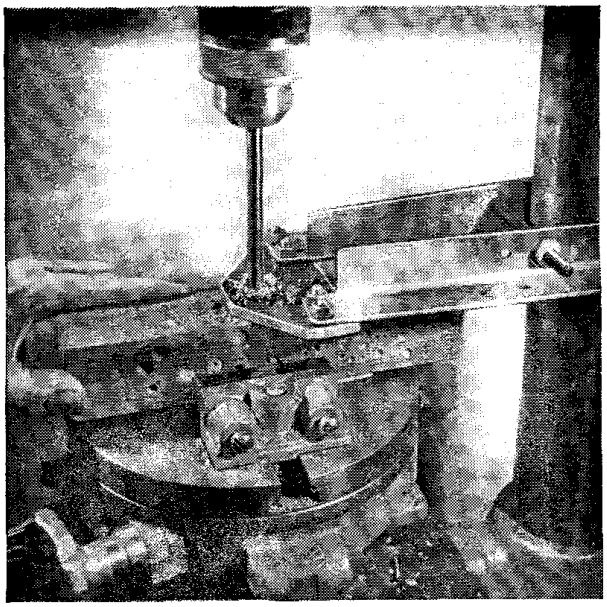
MILLING ARM FOR DRILL PRESS

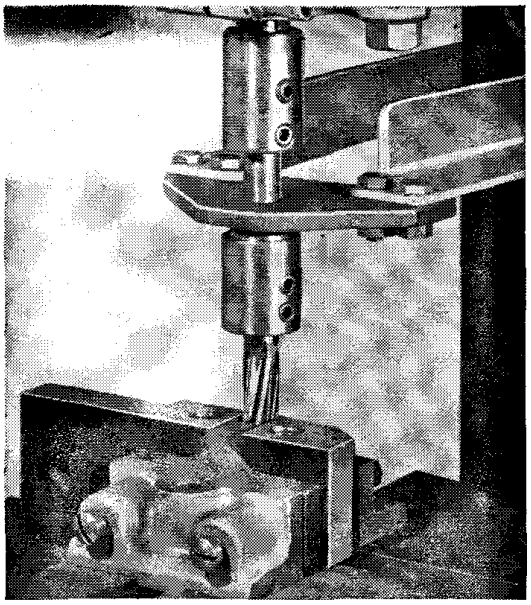
By Walter E. Burton



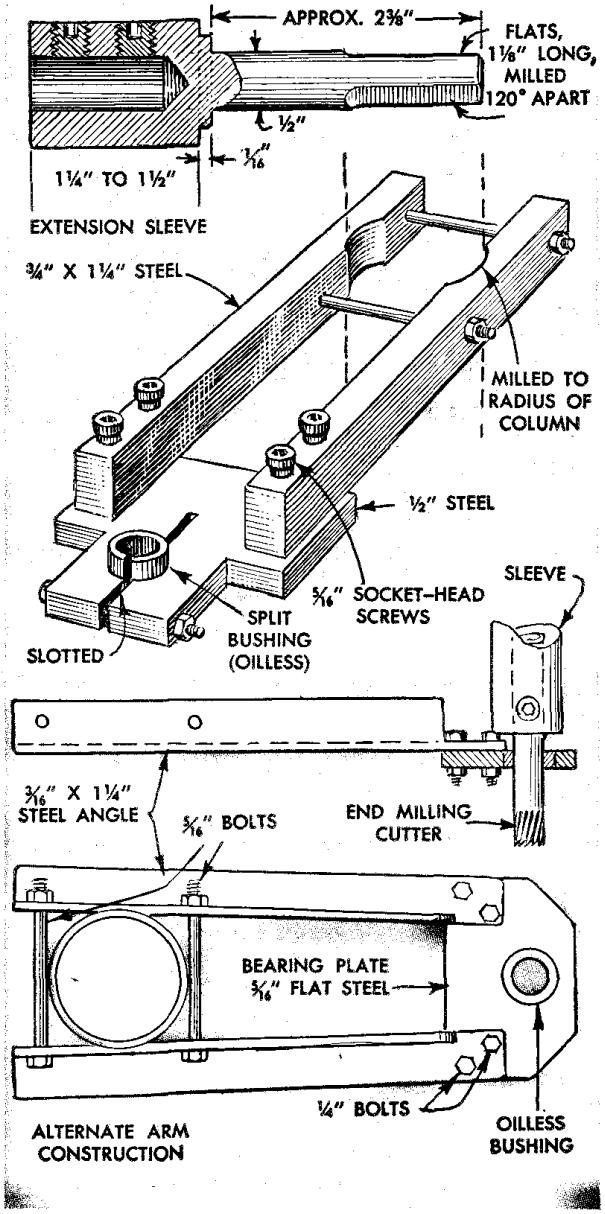
BY ADDING a milling arm which provides a bearing for carrying heavy lateral thrust, your drill press can be made to serve as an accurate vertical milling machine for light work. The arm, pictured in position in the photo above, is clamped to the drill-press column and supports the auxiliary sleeve chuck in the manner shown. The auxiliary chuck can be driven by a conventional drill chuck or by means of the interchangeable spindle furnished as an accessory with some types of drill presses. The accessory spindle is shown in use in the photo above and also in the upper right-hand photo on the following page.

For an occasional job the arm can be made from light steel angle as pictured, but for more accurate repetitive work the supporting arms should be made from ¾ x 1¼-in. steel with the split sleeve bearing held in a ½-in. steel plate as in the center detail on the following page. Slotting both the holder and the bearing provides an adjustment for eliminating any side play in the bearing. Shallow concaves must be milled or filed in both arms so that they can be clamped rigidly to the drill-press column. This operation must be done with care so that when in position the arm is precisely at right angles to the axis of the drill-press spindle. Before the final filing of the concaves, make the extension sleeve as in the upper detail on the following page. Note that the detail shows three flats milled (or filed) on the shank of the sleeve. These are 120 deg. apart so that the chuck jaws will close on a flat surface to give adequate driving power without any slippage. Machine the extension to the dimensions given from one piece of tool steel and drill and tap for set screws as indicated. When used with an accessory drill-press spindle, as pictured, only one flat is necessary and it should be slightly longer than indicated in the detail. Machine the lower end of the shank to a close fit in the bearing, bringing it down to the final





Above, left, drilling the hole in the bearing plate for the bushing. Hole later is reamed to take bushing. Right, unit in operation taking cut across thickness of work. Note spiral cutter



dimension with a fine file if no lathe grinder is available.

Then make a trial assembly of the completed arm with all parts in place, including the extension sleeve. Rotate the spindle by hand to check for runout in the spindle and extension. Slight misalignment in either the vertical or horizontal plane will cause binding. Correct any such tendency by filing the concaves until the rotating parts turn freely. Be sure to tighten the spindle lock each time the parts are tested. If you are building the heavier-type unit, center detail at the left, adjust the split bushing by tightening the clamping bolt to take out any side play that may cause chattering when milling the harder metals.

For average work in both hard and soft metals, the four-lipped end mill with a straight shank generally gives best results. These come with straight and spiral flutes and in certain soft metals the spiral-fluted cutter usually gives the smoothest cut. However, either type can be used with good results. In the right-hand photo, above, a spiral end mill is pictured taking a typical milling cut across the narrow width of the stock. The universal table, pictured in the left-hand photo above and also on the preceding page, feeds in two directions, right and left and in and out, by handwheel feed. The platen also rotates by hand feed. The work is held in a special clamp as shown. Other types of clamping fixtures can be attached to the table when necessary. ★ ★ ★