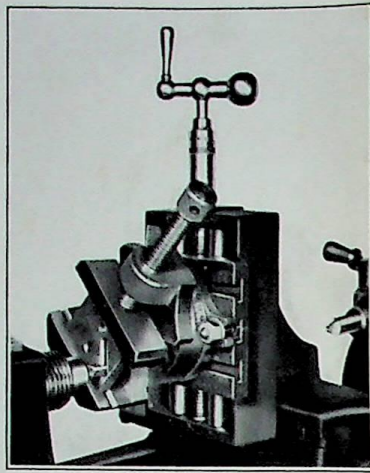


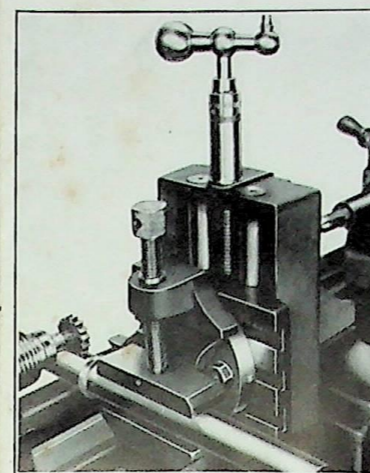
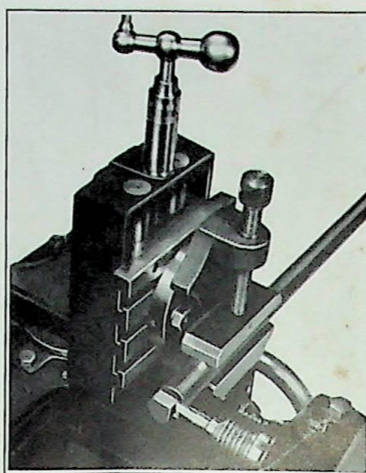


# SHOWING SOME TYPICAL SET-UPS

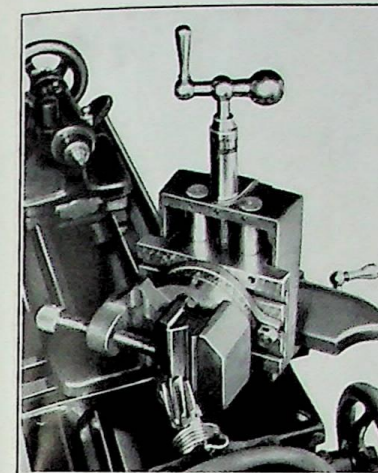
**ANGLE MILLING.** Note that the vise is provided with a sub-base, which permits it to be swung in a complete circle for milling at any desired angle. We have developed a simple method, whereby you can easily graduate the sub-base on your lathe. The collar on the vertical feed screw is graduated by the same method. The Vee slot in the lower vise jaw is readily cut with the same end mill used in facing off the table. The small end mill shown here is of the "fish tail" type. The regular machining instructions include directions for making this type of cutter. "Fish tail" end mills are conveniently used in cutting slots and while only light cuts are taken they are used at relatively high speeds.



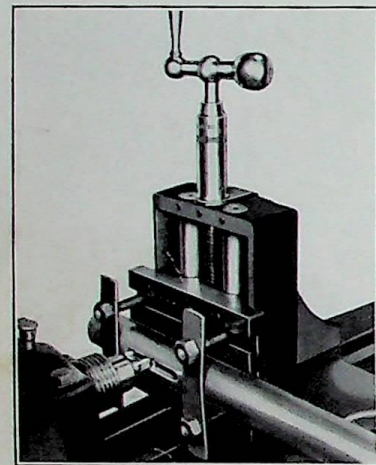
**SQUARING THE END OF A SHAFT.** The sub-base has been removed and the vise bolted directly to the table in this set-up. When the vise is to be used in this position, this is the proper way to mount it. The Vee slot in the lower jaw quickly centers the work. The swivel jaw holds tapered, as well as straight shafts. Note the double-webbed angle bracket which is an integral part of the milling attachment body, where it bolts to the compound rest. It gives additional strength and rigidity. The milling cutter, shown here, is two-fluted and was hand ground from a broken taper-shanked drill. The machining instructions include directions for making this type of tool.



**MILLING A WOODRUFF KEY SLOT.** The cutter is best held in a tapered arbor, as shown. This is easily made and one arbor serves to hold a wide range since the shanks in this class of cutter are uniform in size. A Woodruff cutter is used in making the undercut when Tee slotting the milling attachment table. Cutters of this kind are often conveniently used in other milling operations. As do regular milling machines, the Huron attachment makes use of a flat table for holding all work and fixtures. The Tee slots in the table increase greatly the adaptability of the vise and gear cutting fixture to different sizes of work, since they may be mounted in any one of the three.



**MILLING A VEE BLOCK.** By swinging the vise to ninety degrees from vertical and rotating the compound rest forty-five degrees to the right, a Vee block like this can easily be machined with an end mill. You'll be surprised at the number of milling operations which can be performed with a single end mill, because of the flexibility of the HURON MILLING ATTACHMENT. Note, also, that mounting the attachment on top of the compound rest makes possible an angular feed in a horizontal plane, an oftentimes desirable procedure, not possible with attachments mounted otherwise. A lug on the bottom of the attachment base fits in the compound rest Tee slot to hold it in position.



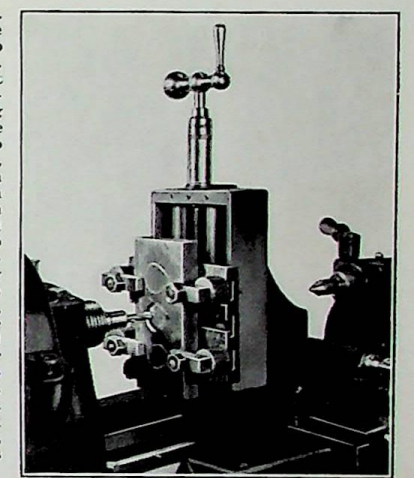
**MILLING A STRAIGHT KEYWAY.** This set-up illustrates another advantage possessed by the attachment, because of its Tee slotted table. A shaft, too large to be conveniently held in the vise is quickly strapped to the table, where the Tee slot holds it in position. Again we make use of a hand made cutter to demonstrate what excellent work these tools will do, if constructed with reasonable care. Their advantage lies not only in the savings in initial cost, but in the fact that they may be sharpened by hand without special equipment. The regular machining instructions accompanying the castings show you how to make this type of end mill.

## THE MOST VERSATILE OF ALL MILLING ATTACHMENTS

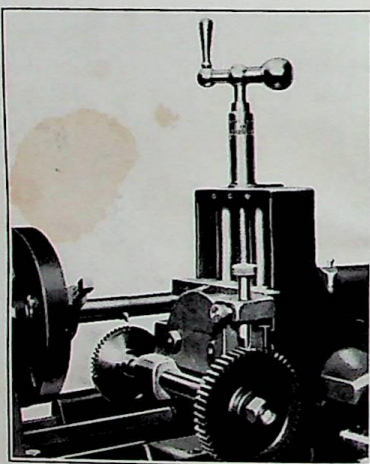
MILLS FLUTES in straight or tapered REAMERS, in TAPS, HOBS and SPECIAL CUTTERS. CUTS SLOTS, SPLINES, KEYWAYS, TEE SLOTS, DOVETAILS, VEE GROOVES, RECESSES . . . PRODUCES SPUR, BEVEL, MITRE and WORM GEARS, RACHETS, RACKS and CAMS. SURFACES, SQUARES SHAFTS, MILLS HEXES. Permits the drilling of accurately SPACED HOLES, the sinking of DIE CAVITIES and BORING. SPOT FACES, INDEXES, PRODUCES CONTOURS . . . SWIVEL VISE JAW HOLDS round, square, rectangular, irregular and tapered work with ease. SCORES OF OTHER USES. . . . .

We believe the NEW HURON MILLING ATTACHMENT will handle a greater variety of work than any attachment on the market, today. Equip your lathe with a 'HURON' and you will have a UNIVERSAL MILLING MACHINE with the SENSITIVITY and ACCURACY necessary in machining the delicate parts of a model engine, plus the CAPACITY and STRENGTH required in cutting a keyway in a large diameter shaft. If you own a lathe, YOU NEED A 'HURON' MILLING ATTACHMENT. You'll be surprised at the RANGE of work it will handle and at the SPEED with which it can be set up and done.

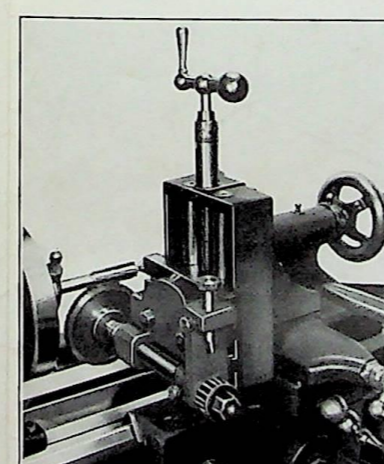
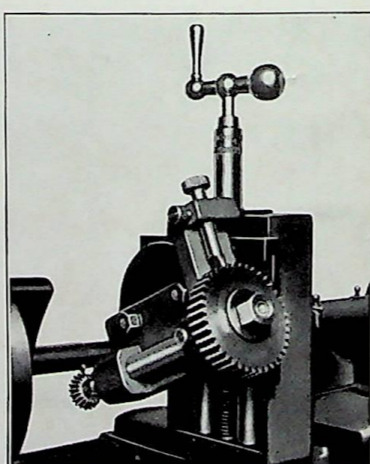
**SINKING A DIE CAVITY.** Notice how a plain table surface permits work to be held in this position. In fact this is the most accurate method of holding work for milling where the nature of the piece permits it to be so mounted. Furthermore, there is a reduction in overhang when work can be mounted directly on the table. Small jigs and fixtures can be bolted to the table and used conveniently for the milling of small duplicate pieces in quantities. Note, here, the use of a different type of clamp. Hardwood blocks support the outer ends. Under some circumstances large washers will work well as clamps. Again where the work covers the entire table, machinists' or C-clamps can be used.



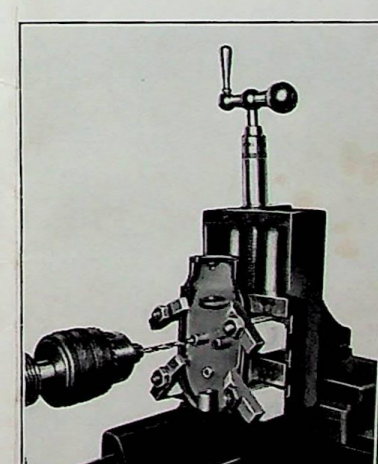
**CUTTING A SPUR GEAR.** The steel blank is held on a mandrel which screws into the end of the gear cutting fixture spindle. The fixture bolts to the table being properly positioned by lugs on its base which drop into the table slot. THE GEAR TEETH ARE CUT ON THE TOP of the blank making it easy to watch the cutting operation. A lathe gear is used for indexing the blank. The variety and excellence of the gears on your lathe make them ideal for this job and they permit a wide range of divisions. Where lathe gears are not available, we can supply others suited to the purpose. The gear teeth are being cut with a fly tool held in an arbor.



**CUTTING BEVEL GEAR.** The gear cutting fixture is designed so that it may be mounted on the vise sub-base, as here shown, making it possible to swing the blank to the correct cutting angle. A fly tool is also used for this job and cuts the full depth of the tooth in its trip across. The feed is horizontal and accomplished by moving the lathe cross slide. Three cuts are of course necessary to finish the teeth, the blank being rotated and the milling attachment turned through the angle necessary to produce the correct tooth form at the back of the gear. You'll be surprised at the ease with which you can cut gears using fly tools. You can make them and save \$ and \$. We tell you how.

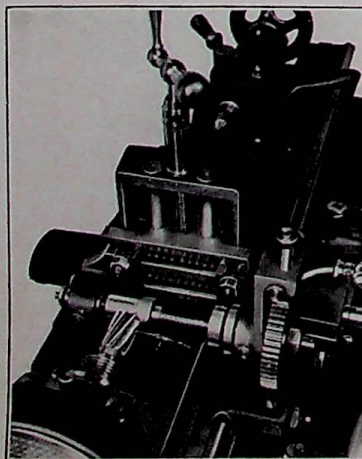


**HOBBING OUT TEETH IN A WORM GEAR.** This is an interesting operation and is semi-automatic since the hob carries the blank around as it cuts the teeth, the spindle being left free to turn. The only hand feed necessary is on the vertical screw, a half dozen adjustments producing the required depth of tooth. A standard 1/2 inch, thirteen thread tap was here used for the hob. The 115 teeth in the three inch diameter cast iron blank were produced in fifteen minutes. The worm to go with this gear is easily made on the lathe by cutting a 1/2 inch, thirteen thread screw. A few taps and a HURON MILLING ATTACHMENT will make a wide range of worm gears.

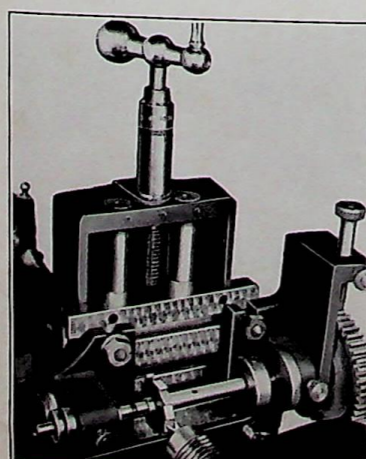


**DRILLING SPACED HOLES.** Often-times the nature of the work makes the accurate positioning of holes a difficult matter. The Tee slotted table makes it easy to hold work as irregular as that shown here, after which the locating of the holes within reasonably accurate limits is accomplished with the graduated cross slide feed on the lathe and the graduated vertical feed on the milling attachment. Two parallel pieces of flat stock underneath hold the work in correct position with respect to the table surface. One of the holes, or some other predetermined point is used as a reference. The depth of the holes is easily controlled with a carriage stop.

## SEMI-MACHINED . . . . CAN BE FINISHED ENTIRELY ON YOUR LATHE

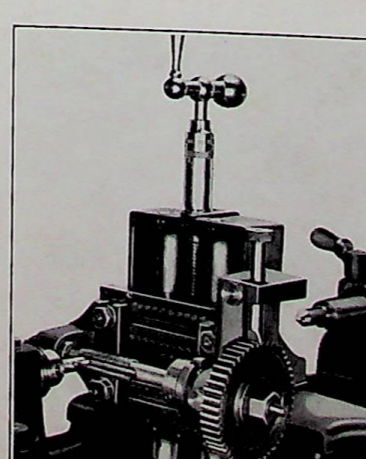


**USING THE DIVIDING CENTERS.** A special bolt, calling for a hexagonal section as shown was machined from round stock and the six flat surfaces are here being milled. The dividing centers employ a gear for the division of the work. A job like this is quickly set up and the end mill produces each flat in a single cut. The centers bolt to the table, accurately lined up by the lugs on their bases which drop into the center slot in the table. The construction of the dividing centers gives a maximum center distance of almost the length of the table. Where shorter center distances are required either or both centers may be moved inward.



**MILLING THE TEETH IN A RACHET.** The work is held on a mandrel between centers. Note the holding dog on the mandrel and the holding plate on the head spindle. A small tapered pin in the holding dog engages in a slot in the holding plate, fixing the work firmly in place. Note, also, the "feed in" provisions on the tail spindle. The center points are made from standard taper pins and are removable. Notice the two holes for the socket head, table-locking screws. They are easily adjusted with a regular L-shaped hex wrench. The decorative effect on the milling attachment table can be produced with the attachment in place on the tool post rest of the lathe.

**MILLING THE FLUTES IN A TAP.** The material used in making this tap was unannealed carbon steel drill rod; tap size 5/8 inch. The threads were cut first and the flutes milled with an end mill made from a twist drill. Four cuts to the flute were sufficient to produce the necessary depth. Here was a tough assignment, but it was easily handled by the attachment. Your attention is here called to the slide rod extensions which screw into the lower end of the slide rods. They are used when unusual rigidity is called for. Horizontal screws pass through these extensions and take a bearing on the cross slide, giving great rigidity to the set-up.



**BORING WITH THE ATTACHMENT.** The Tee slotted table makes it possible to hold work in position for accurate boring jobs. In this illustration the holes in the dividing center castings are being bored in true alignment. After one casting is bored, the bar is turned end for end, its direction of travel reversed and using the same fly tool the other casting bored. The gear bearing holes are bored in the same way, with the same bar and tool, placing them precisely in line. Also, this boring bar and fly tool are used in boring the slide rod holes in the milling attachment body and table castings. See the illustration on the back of this sheet.

