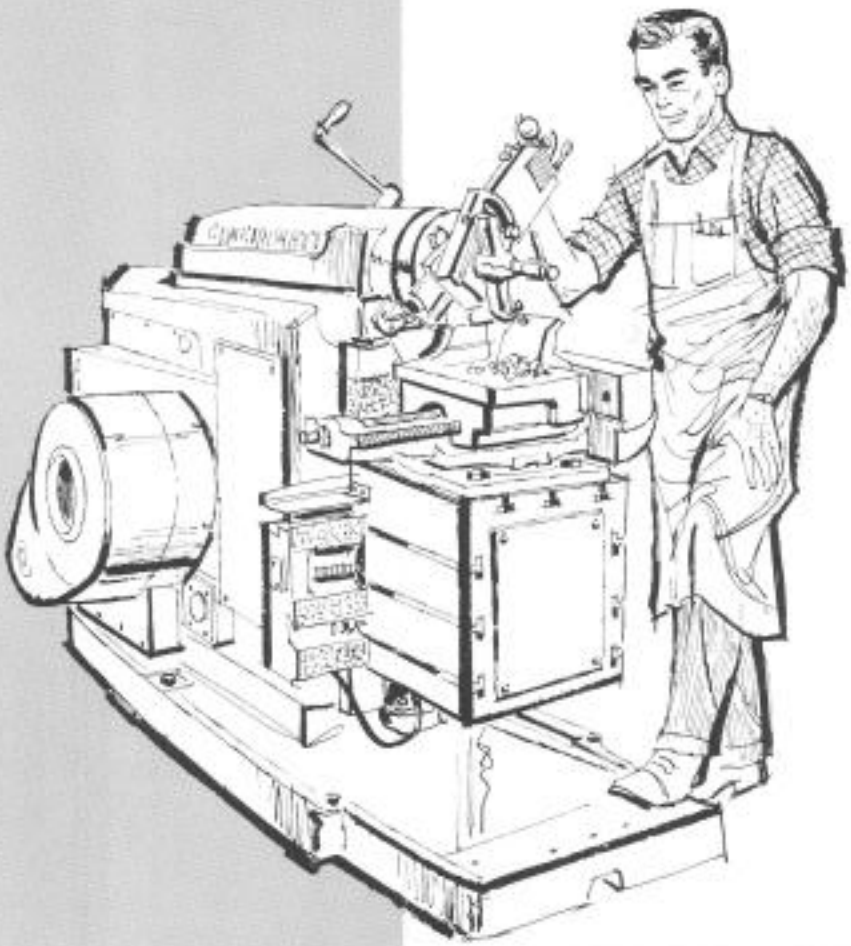
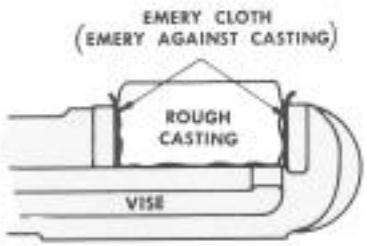
SETUPS ON CINCINNATI® RIGID SHAPERS



CINCINNATI

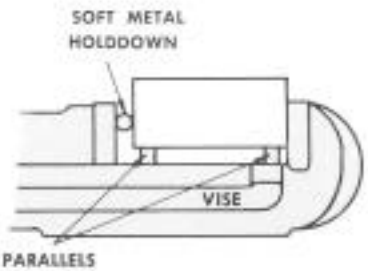
THE CINCINNATI SHAPER COMPANY
CINCINNATI, OHIO 45211, U. S. A.
IN THE UNITED KINGDOM: THE CINCINNATI SHAPER CO., LTD.
PEEL PARK PLACE, EAST KILBRIDE, GLASGOW, SCOTLAND

SETUPS ON CINCINNATI



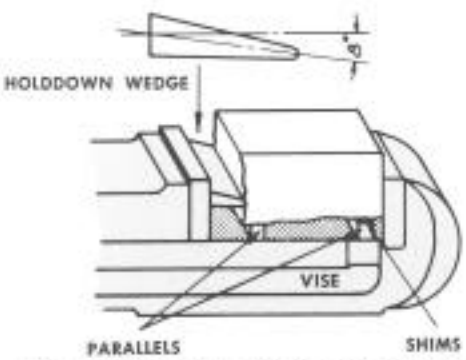
SHAPING ROUGH CASTINGS

Fig. 1



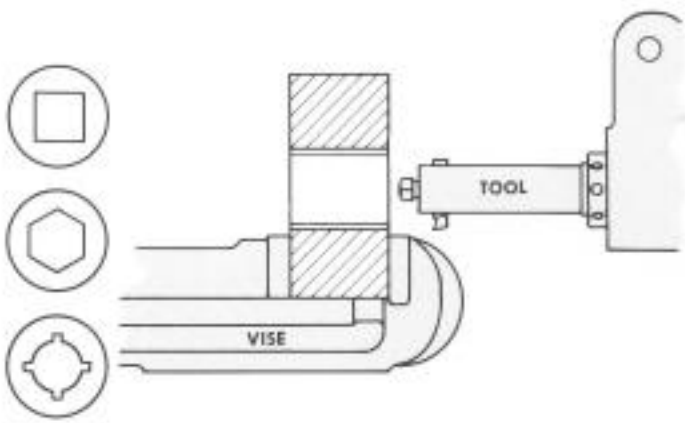
SHAPING PARALLEL TO A FINISHED SURFACE

Fig. 3



SHAPING AT RIGHT ANGLE TO THE FINISHED SURFACE

Fig. 2



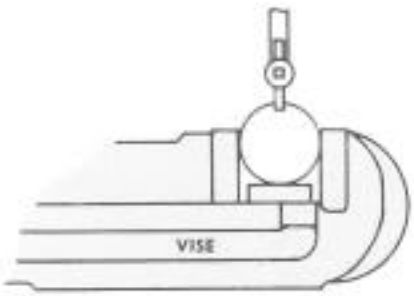
SLOTTING

Fig. 4

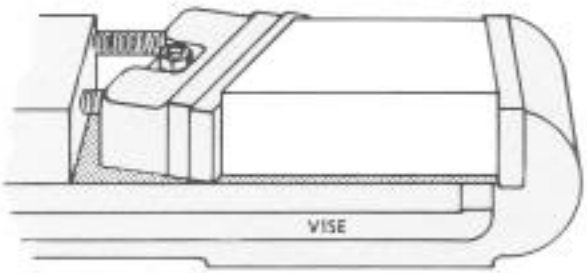
The work must be held securely and solidly while it is being machined, in order to obtain accurate results. It is equally important that the work does not spring out of shape or "give" during the cut. All efforts to grind tools properly, to set tools accurately and operate the Shaper carefully are a total loss if the work is not correctly supported and secured.

The majority of Shaper work is held in the vise furnished with the machine. Figures #1 thru #8 show some typical arrangements. When using the vise, be sure clamping surfaces are clean and free from nicks and burrs. Tap the work with a soft hammer or "babbitt" to seat it solidly. Shim rough castings to get ample support. Locate the vise as near to the column of the Shaper as possible.

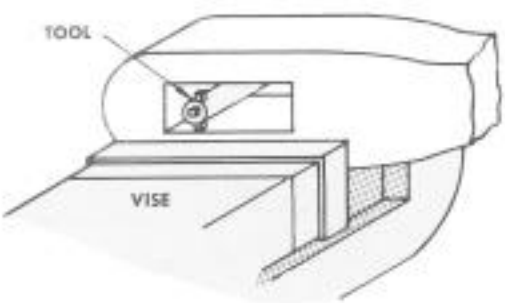
RIGID SHAPERS



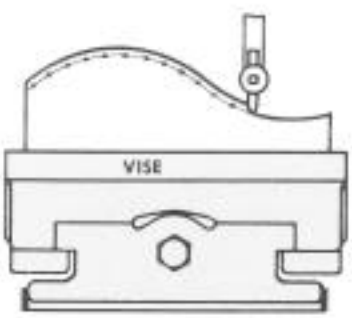
KEYWAYING
Fig. 5



HOLDING TAPERED WORK
WITH DOUBLE SCREW VISE
Fig. 7



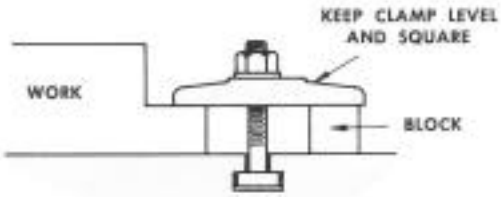
INTERNAL SHAPING
Fig. 6



SHAPING CONTOURS
Fig. 8

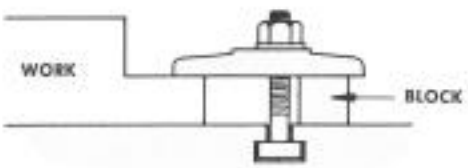
Vise jaws are commonly set in alignment with the stroke of the ram or with the cross feed of the table. In either case, the work should be clamped with its true side against the solid jaw of the vise. Use a holddown on the other side of the work against the movable jaw. The holddown can be a round bar of soft steel, as shown in Figure #3. A taper wedge with a small angle on the face of its thicker end is another type of holddown that is frequently used. This is shown in Figure #2. Holddowns should be located so that the work seats properly.

Tapered work pieces must be properly located relative to the stroke of the ram, in order to prevent slippage. A common setup is shown in Figure #7.



RIGHT

CLAMPING EFFECT IS ON WORK

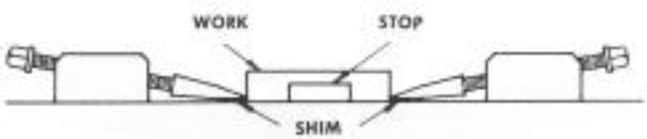


WRONG

CLAMPING EFFECT IS ON BLOCK

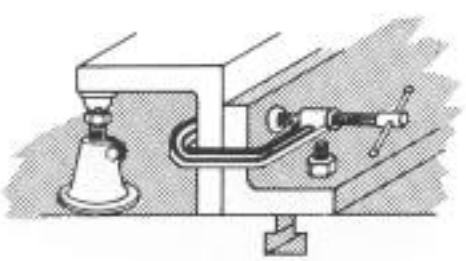
CLAMPING WORK TO TABLE

Fig. 9



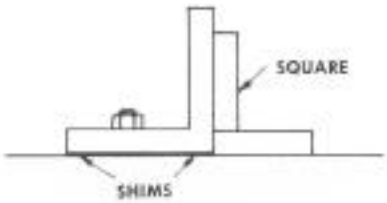
HOLDING THIN WORK WITH TOE DOGS

Fig. 10



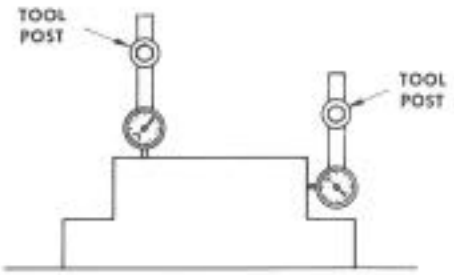
SHAPING ANGLES

Fig. 11



SQUARING UP ANGLE FOR SHAPING

Fig. 12



USING DIAL INDICATOR FOR SETTING WORK LEVEL AND PARALLEL

Fig. 13

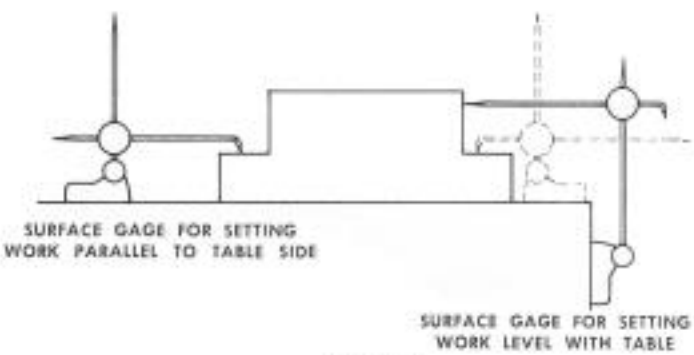


Fig. 14

Work may also be clamped directly against the table of the Shaper, as shown in Figures #9 and #10. Tap the work with a soft hammer or "babbitt" to be sure it rests solidly against the table. Shim rough castings to get ample support. Locate the work as near to the column of the Shaper as possible.

A few of the many types of special fixtures used for holding work are shown in Figure #11, and in some of the photographs in back of this booklet.

When setting up work on the Shaper table, a precision square, as shown in Figure #12, is helpful. The work may be set parallel and level with great accuracy by mounting a dial indicator in the tool post. See Figure #13. This method should also be used for aligning a vise very accurately. Figure #14 illustrates the use of surface gages in accurately setting up the work.

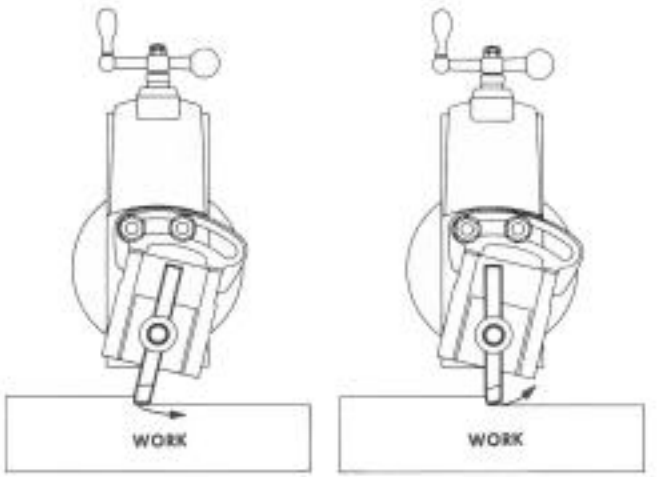


Fig. 15

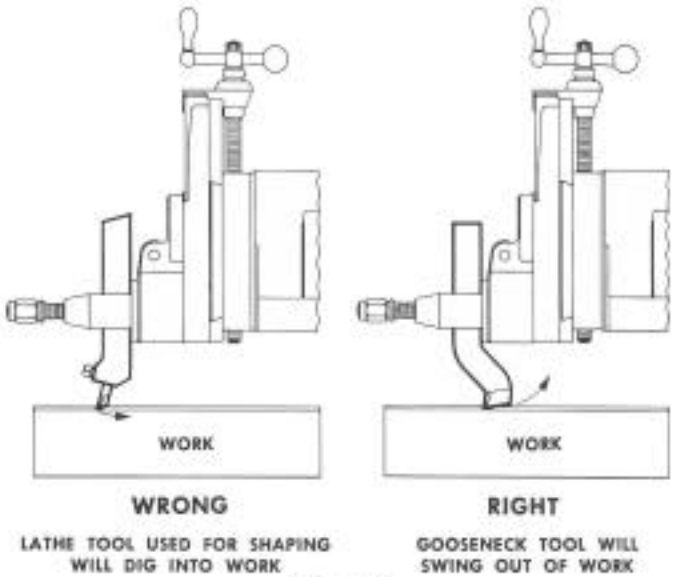


Fig. 16

For jobs requiring excessive overhang of work or tool, a sharp pointed tool should be used on both steel and cast iron to eliminate chatter.

Fig. 18

Set the tool vertically, as shown in Figure #15, so that it will swing out of the work if it slips. For maximum rigidity, tools should be clamped securely with the smallest possible overhang. This is demonstrated in Figure #17. Also, the clapper box should be set so that its top slants slightly away from the cutting edge of the tool. This permits the tool to swing away from the work on the back stroke of the ram, and protects the cutting edge from unnecessary wear. Figures #15, #19 and #20 show correct setting of a clapper box.

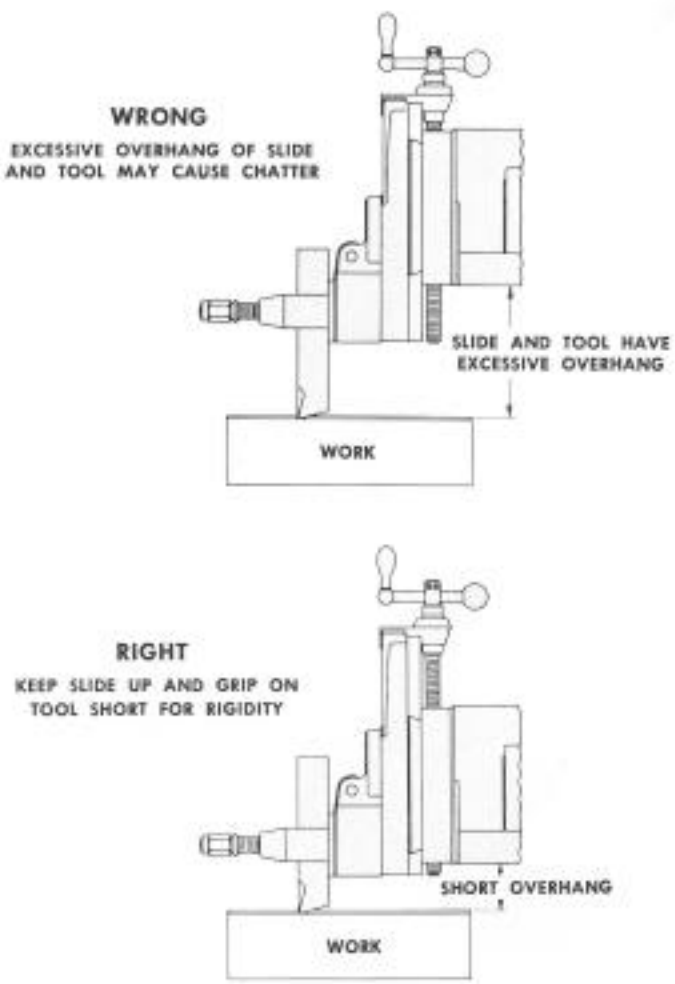


Fig. 17

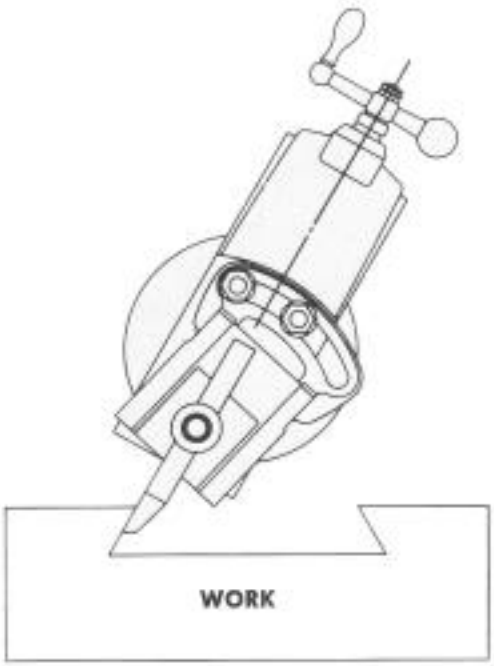


Fig. 19

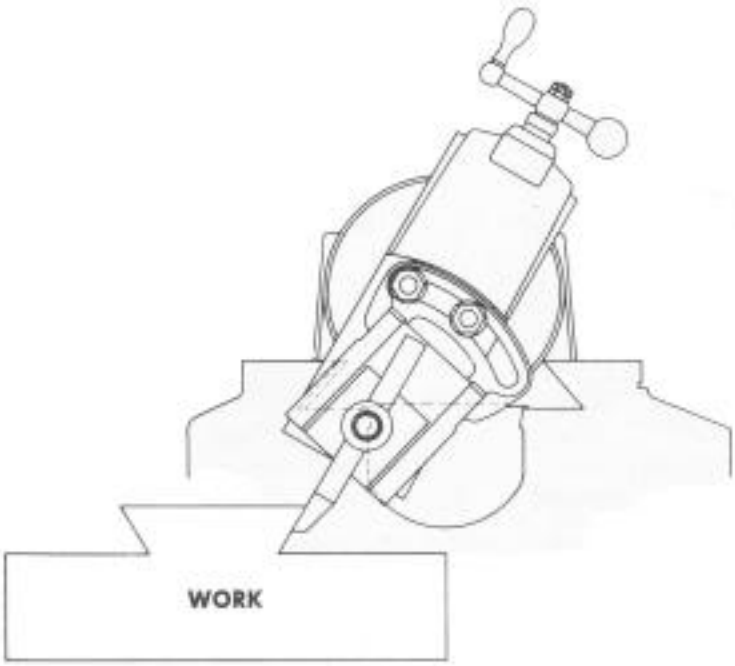


Fig. 20

SHAPING DOVETAIL WITH SLIDE AND CLAPPER BOX SET AT THE CORRECT ANGLE

NOTE: SLIDE MUST BE SET AT SAME ANGLE AS DOVETAIL

Figures #19 and #20 illustrate shaping an inclined surface. When doing this type of work, DO NOT RUN THE RAM BACK INTO THE COLUMN WITH THE SLIDE SET AT AN ANGLE. SLIDE WILL STRIKE COLUMN.

Cutting oils are helpful in finishing work. The photo shows a brush being used in applying the oil. The kind and grade of oil or lubricant depends on the nature of the work. Lard oil, kerosene, ordinary machine oil and compounded oils are each best suited for certain applications.

Sharp tools should be used at all times, with proper clearances ground on their sides as well as at their end. Stone the cutting edges of tools after grinding to obtain longer life. Standard cutting tool forms recommended for steel and cast iron are shown in Figures #21 thru #23. These may vary, depending on the material and the particular type of job being done.

The initial cut is usually a roughing cut, used to bring the work within a few thousandths of the finished dimension. On steel, .010" to .015" should be left for finishing. On cast iron, leave .005" to .010". When doing very accurate work, some operators take more than one finishing cut.

Use a brush, not your fingers, to keep chips from collecting on the work. The Shaper should be kept well lubricated and clean. Keep all gibs properly adjusted. The ram and sliding block gibs, the tapered clapper pin, and ram and stroke adjusting screws are especially important. These adjustments are illustrated in your Shaper Operator's Manual.

If the tool chatters, look for:

(1) Improper clamping and setting of the tool.

(2) Improperly ground tool.

(3) Improper clamping of the work.

(4) Improper adjustment of the machine.

(5) Improper cutting speed.

Cutting Tools Recommended for MILD STEEL

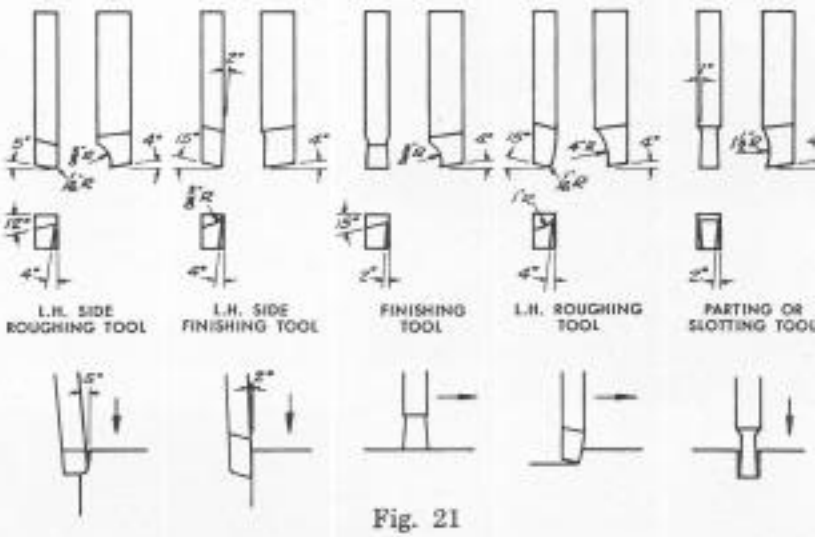


Fig. 21

Cutting Tool Recommended for CAST IRON

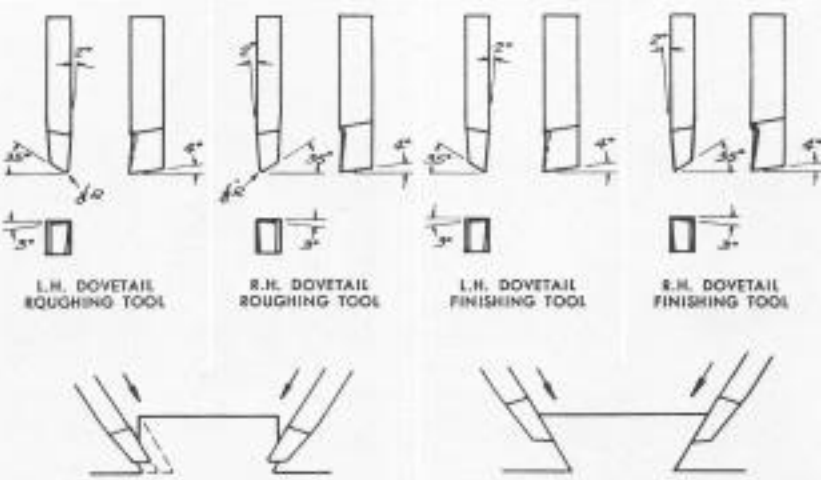


Fig. 22

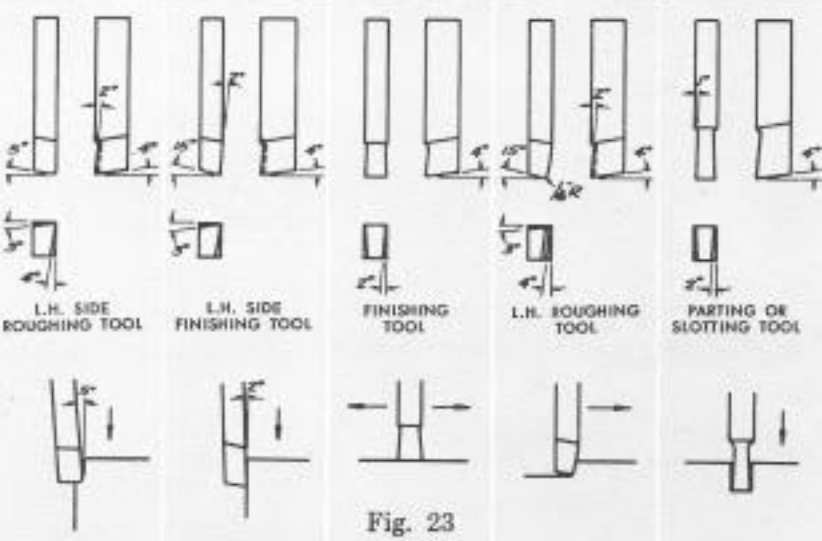
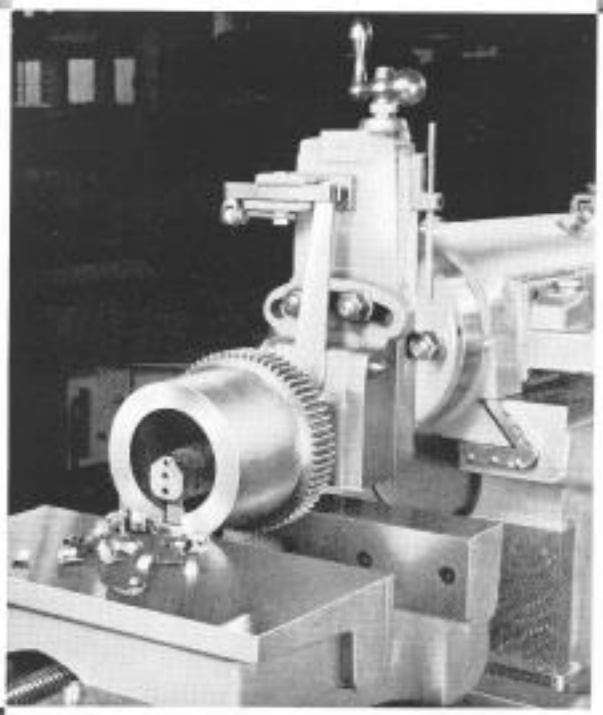


Fig. 23

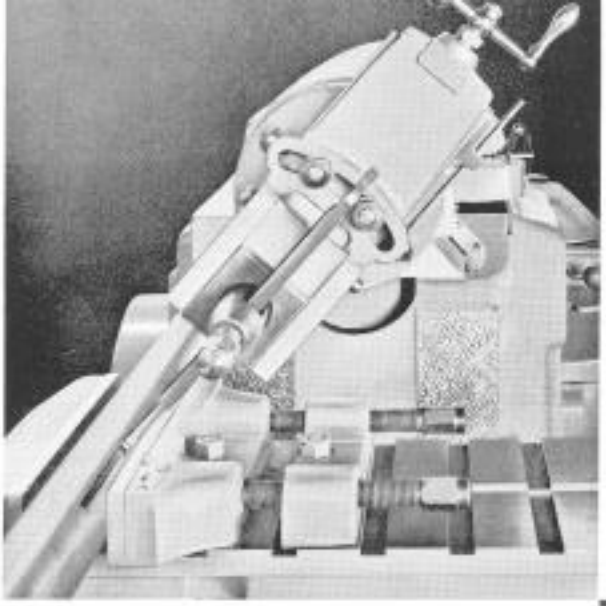
Cutting splines in a shaft, using a Shaper index center. Splined shafts, gears, ratchets and similar parts are made with this device.

Shaping a square end on a tool shank.

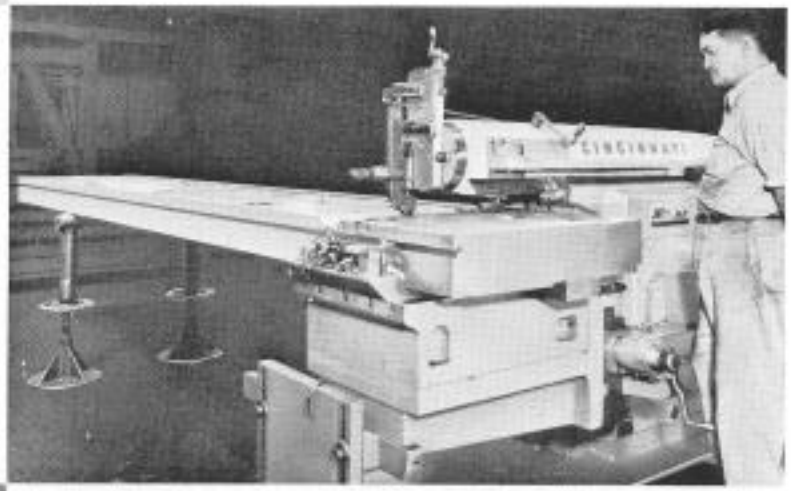


Shapers are frequently used for cutting internal keyways, as shown.

An example of shaping with the work clamped directly to the Shaper table. The machine in the photo is equipped with an auxiliary table top.

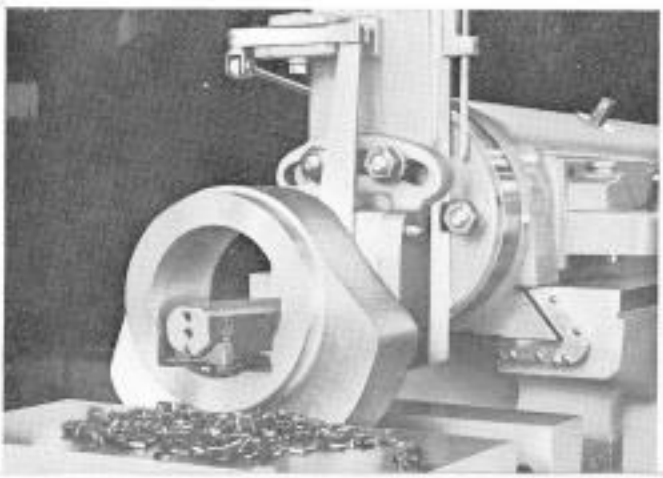


Shaping a keyway in a long shaft.

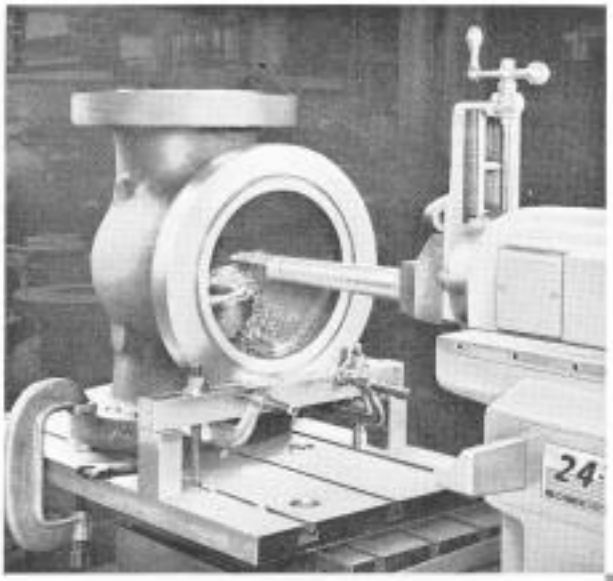


Shaping blind slots in a 10,000 lb. steel plate.

Shaping a short section of a press brake forming die.



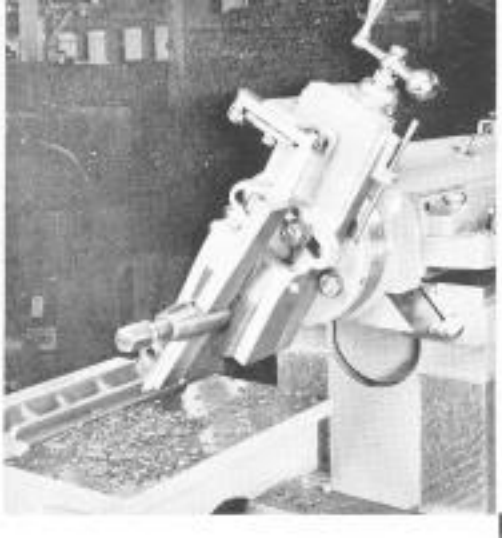
Another example of internal shaping. These Kennedy Keyways must be held to very close tolerances.



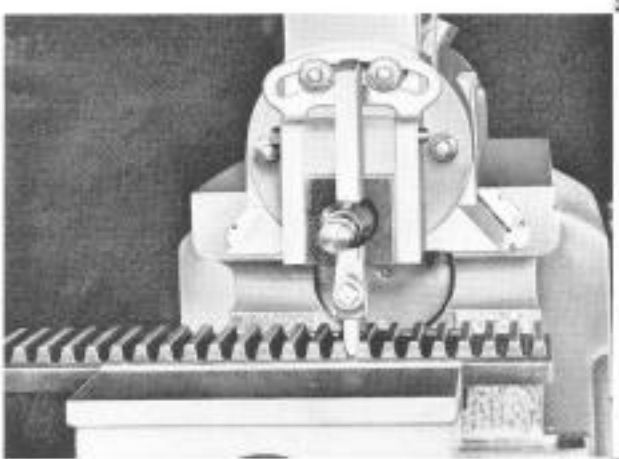
The Shaper is well suited for machining hard-to-get-at areas, such as the internal quides of this gate valve.

The work may be rotated about all 3 axes when the Shaper is equipped with a universal table and swiveling vise. This provides extreme flexibility for shaping compound angles.

A compound angle being shaped on a forming die. The Shaper is equipped with a universal table, auxiliary table top and index center.

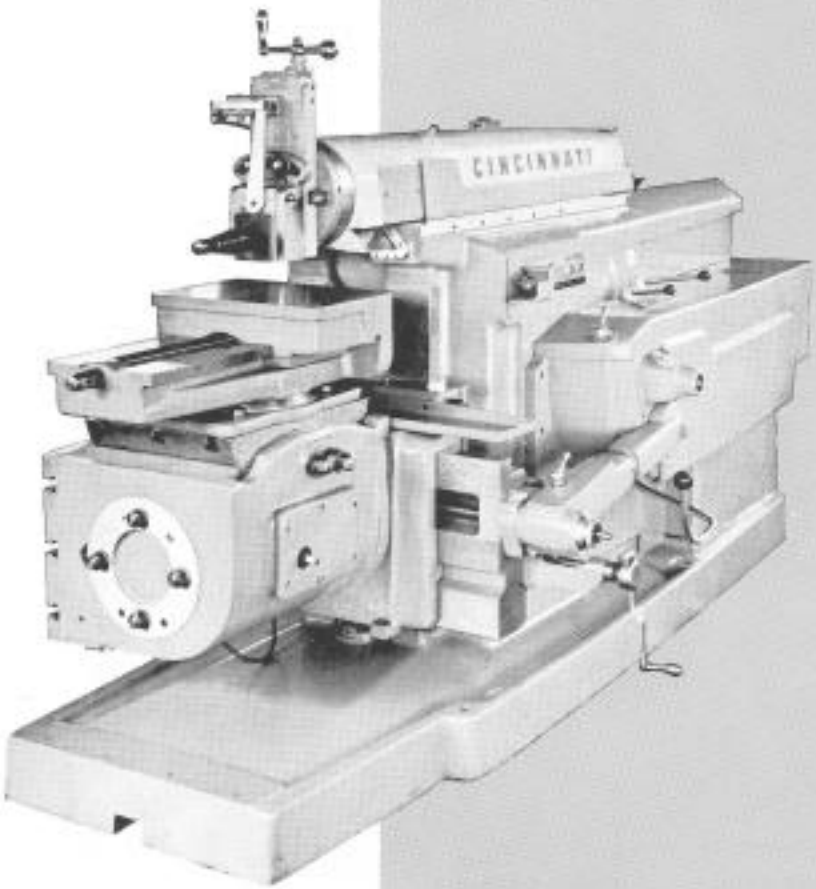


Both male and female dovetails are produced with equal ease. The work and the tool may both be easily swiveled for angular cutting of all kinds.



Cutting a rack is relatively easy with the accurate Cincinnati Shaper cross-feed.

The Shaper is ideal for machining irregular outlines such as this cam contour.



Cincinnati Rigid Shapers are accurate and dependable. The high strength, slot-free ram and wide, heavily ribbed column provide extreme rigidity.

Electro-magnetic brake and clutch insure speedy, dependable operation. Exclusive Cincinnati 50 p.s.i. pressure lubrication is real insurance against wear. Machine sizes available from 20" to 36".

CINCINNATI

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