

How to Use the Hand-Mitering Machine

Hand mitering machines are manufactured by several different concerns. Basically most of the machines are similar and consist of three main parts — the *bed*, the *work holder*, and the *knife holder*. Figure 46-A shows the Rouse hand miterer, a model popular with many printers.

USE THE HAND MITERING MACHINE

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The numbers marked along the outer edge of the bed (Figure 46-A) show the position for the work holder when cutting designs of that number of sides. When cutting triangles or pentagons, the 3 or 5 setting will give the correct angle only if each of the designs has sides all of which are equal in length.

Notches in the outer edge of the bed of the machine are engaged by a spring projection on the work holder, thus keeping the holder at the exact angle desired.

Note in Figure 46-B the work holder is held against the bed by means of a bolt (see the nut just above "&" in the name) and a spring. One loop of the spring and the knurled nut holding it are visible under the bed — near the end of the left forefinger. Some mitering machines have a thumb screw, instead of the spring, for securing the holder to the bed. Examine the mitering machine in your shop to find out which device is used on it.

To change position of the work holder on a spring-equipped machine, disengage the projection from the notch in the bed by pulling out on the little rod, using the left forefinger, as shown in Figure 46-B. Hold the rod out and move the holder with the right hand until the position wanted is reached. Release the rod and test — by trying to move the holder with the right hand — to see that the projection has engaged the notch.

Before trying to move the holder on a machine equipped with a thumb screw, loosen the screw one full turn — but do not loosen it more than one turn or the holder may jump its track. After the holder is positioned, the thumb screw must be tightened with thumb and finger pressure. Never use a wrench on a thumb screw.

A great many of the rule designs we see have perfectly joined corners, but most of them have been printed from electrotypes. The electrotypist, while making his wax mold, has joined the corners for the printer.

A trick used by some compositors to get better rule joints is to insert a narrow strip of cardboard under the work holder near the knife. (Figure 46-C.) On spring-equipped miterers, the work holder can be lifted enough to insert the cardboard by pushing down on the parts extending past the curved edge of the bed. When the rule is placed face up on the

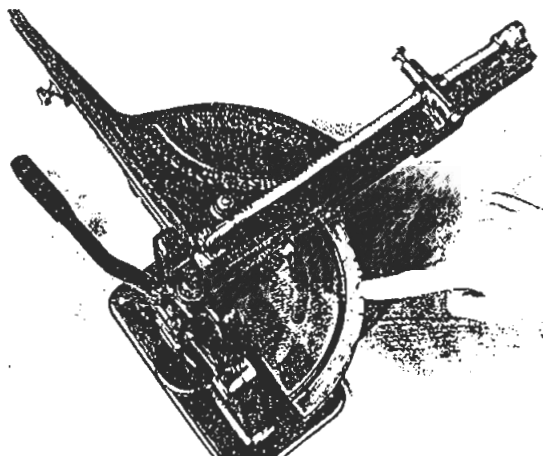


Fig. 46-A. Rouse Hand Miterer; Numbers Indicate Work Holder Position

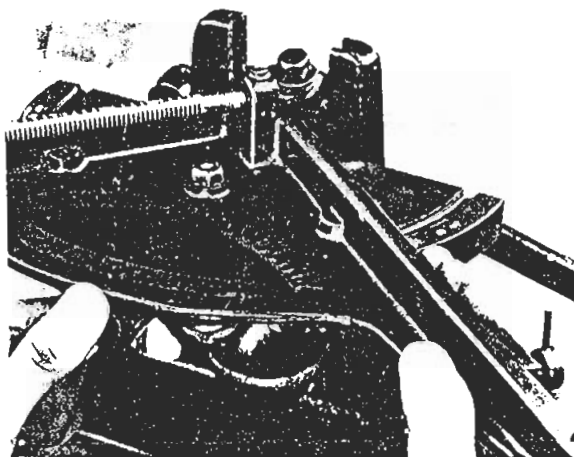


Fig. 46-B. Changing Work Holder Position on a Spring Equipped Machine

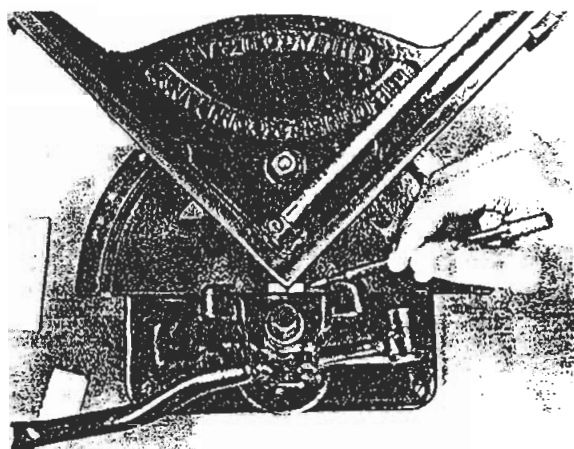


Fig. 46-C. Cardboard Strip Causes Rule Face to Be Cut Slightly Longer — Gives Better Joints

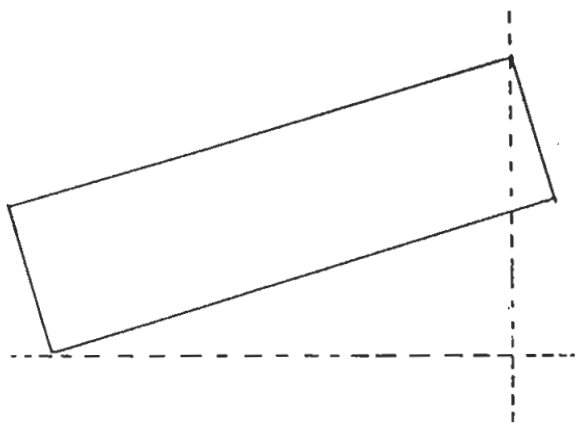


Fig. 46-D. Miterer Takes More From Bottom When Rule Is Raised with Cardboard

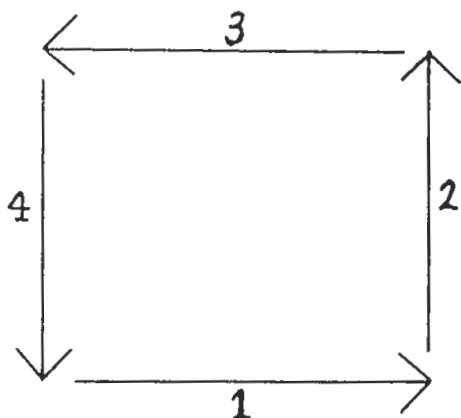


Fig. 47-A. The Four Motions Used in Mitering

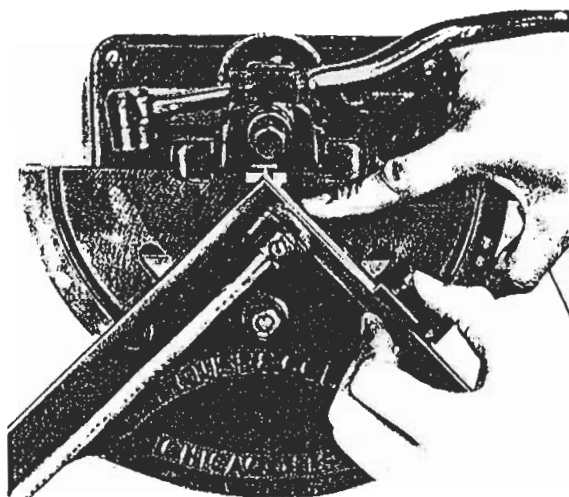


Fig. 47-B. Set Sliding Gauge so that About Three Points Will Be Mitered Off Rule

mitering machine, the cardboard will cause the bottom of the rule to be cut slightly shorter than the top. This is illustrated by the diagram in Figure 46-D. The slightly extra length on the face edge should give a better joint.

Present day printers try to avoid designs which make use of rule borders with joining corners. Even when the utmost care is used in mitering, lock-up, and make-ready, it is still very difficult to get perfect joints at the corners of the rule. Poorly joined corners detract from the appearance of any printing job, and if rules are used, the corners should be made to join.

Unit 47

How to Miter a Rectangle

To miter a rectangular contrast rule panel with an outside measure of 17 x 10 picas (the ticket shown under Unit 49 has such a border), proceed as follows:

1. Cut, on the lead and rule cutter, two pieces of strip rule, 17½ picas, and two pieces, 10½ picas, in length.

2. Loosen the thumb screw which fastens the work holder to the bed. Move the work holder, as shown in Figure 46-B, until each of its sides is in line with the figure 4 on the bed. Figure 47-B shows the work holder in the new position.

3. Insert a narrow cardboard under the end of the work holder, as shown in Figure 46-C. Tighten the thumb screw.

4. Place one of the 17½ pica pieces of rule against the side of the rule holder nearest you. The face of the rule should be up, with the hair-line side nearest the knife. Set the gauge (Figure 47-B) so that about three points can be mitered off the end of the rule.

5. Figure 47-A diagrams the four motions used in mitering. The position at the finish of Motion No. 1 is shown in Figure 47-C. The knife holder is at the bottom and is being held against the right hand side of the slide by the pressure on the handle.

6. Figure 47-D shows the position at the finish of Motion No. 2. The knife holder has reached the top of its stroke. The holder is kept against the right hand side of the slide during the second motion so that the knife will clear the rule on the up stroke of the holder.

7. At the end of Motion No. 3, as shown in

Figure 47-E, the work holder is still at the top, but the face of the holder is now against the end of the rule. The knife is above the rule ready to start its cut.

8. Figure 47-F shows the knife making a shave during Motion No. 4. This motion should be made with a slow, steady stroke, all the while keeping the holder firmly against the end of the rule. The knife should shave about a half point at each stroke when correctly adjusted.

9. Continue mitering, using the 1, 2, 3, 4 motions until the knife no longer shaves because of contact of the knife holder against the left side of the slide.

10. Miter the second piece of $17\frac{1}{2}$ pica rule, using the same gauge setting.

11. Figure 47-G shows the gauge on the other side of the rule holder being set to miter the other end of the two rules. The thumb screw has been loosened, the plunger depressed with the first finger, and the gauge moved to the 17-pica position. The micrometer gauge at the end of the graduated rod must be be set at "0." (Figure 46-A.)

12. Lock the gauge with the thumb screw. Place one of the rules against the work holder with its mitered end against the gauge. Hold it in position, as shown in Figure 47-H, and miter the other end, using the 1, 2, 3, 4 motions. Miter the other rule.

13. Reset the gauge and miter the two shorter rules to 10 picas.

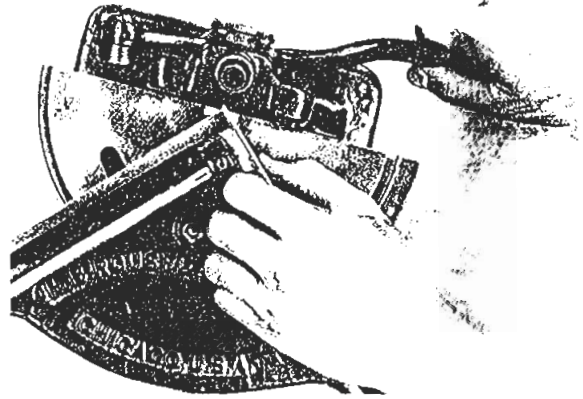


Fig. 47-C. Position at End of Motion 1 — Handle Down and to the Right

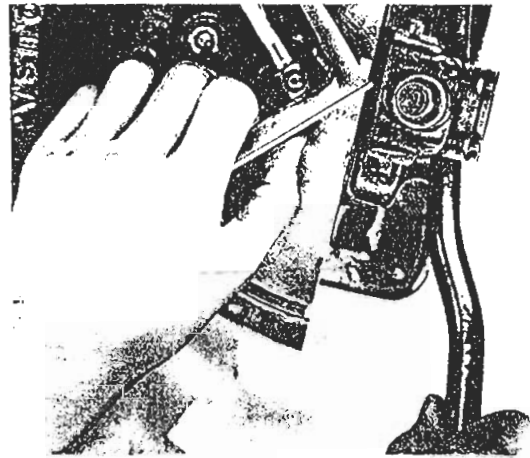
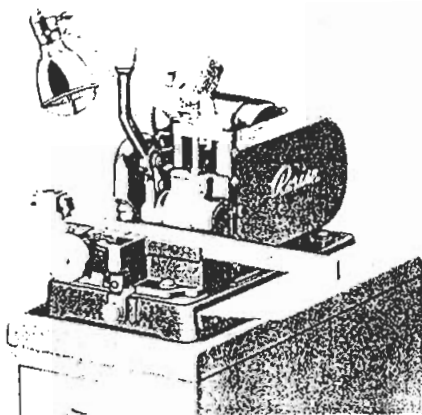


Fig. 47-D. Keep Knife Holder Against Right-hand Side of Slide During Motion 2



Rouse Vertical Miterer



Fig. 47-E. Motion 3 Brings Knife Holder Against Rule End with Knife Above Rule

Unit 48

How to Miter Other Designs

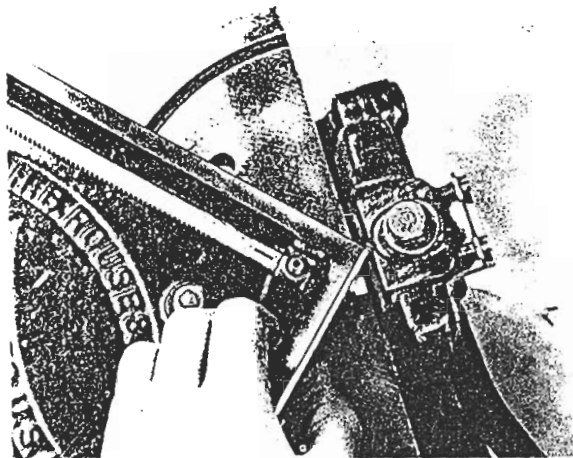


Fig. 47-F Knife Makes its Shave During Motion 4

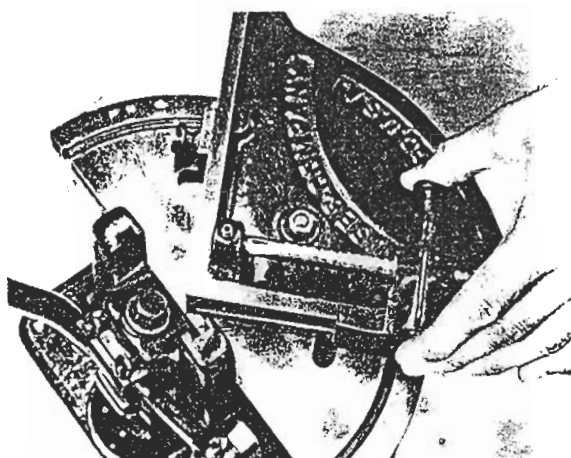


Fig. 47-G Setting the Gauge to 17 Picas Preparatory to Mitering Second End of Rule

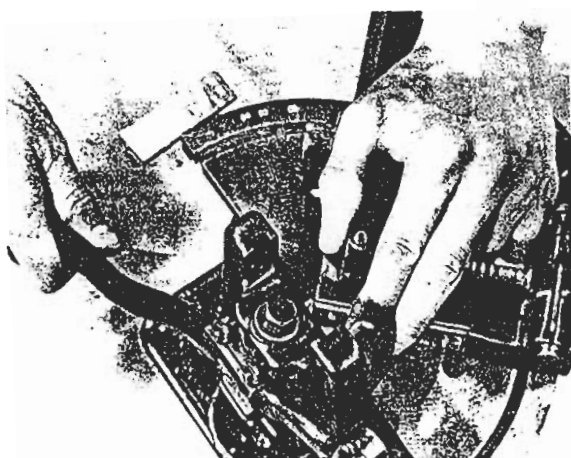


Fig. 47-H Mitering the Second End of Rule

To miter regular polygons of 5, 6, 8, 10 or 12 equal sides, set the near side of the rule holder at the number which corresponds to the number of sides in the figure to be mitered. Cut the rules on the slug cutter, making them one-half pica longer than the side. Place the strip of cardboard in position; set the gauge so that about three points will be mitered off the end of the rule and miter one end of each of the rules, making sure that the face is up and the shoulder of the rule is turned the proper way. Move the rule holder over to the far edge so that the number showing is the same as the one used in mitering the first end of the rule. Set the gauge at the exact measure wanted. See that the cardboard is in position; and, then, miter the remaining end of each of the rules. For example:

To miter a regular pentagon (five-sided figure with all sides equal), place the rule holder so that the near edge leaves the figure 5 in view. This will give a 54° angle. Miter one end of each of the five rules, then move the holder into position so that the figure 5 on the far side of the bed is left showing. Miter the other ends of the five rules. This angle will also be 54° . When the rules are placed into position, the two 54° angles will give the 108° angle of the pentagon.

The following table shows the rule holder setting for the most common designs:

Type of Polygon	Work Holder Setting	Resulting Angle
	0 (unmarked)	15°
	1	18°
	2	$22\frac{1}{2}^\circ$
Triangle (equilateral)	3	30°
	$3\frac{1}{2}$	36°
Square or rectangle	4	45°
Pentagon	5	54°
Hexagon	6	60°
Octagon	8	$67\frac{1}{2}^\circ$
Decagon	10	72°
Duodecagon	12	75°

The positions 0, 1, 2, and $3\frac{1}{2}$ are useful in cutting such figures as five-pointed stars, diamonds, and triangles of unequal sides.