MAKING THE SLIDE REST

I **SAID** earlier in this article that I would describe the slide-rest in some detail. I have heard it said that this is a difficult piece of work to execute, but what is really meant, I think, is that it is difficult to make on the equipment usually installed in a private workshop.

The problem really centres around the production of accurate dovetail slideways, and it is true that this type of construction is not often met with in building models. But this, in itself, does not mean that the work is inherently difficult. On the contrary, I suggested that, given the right equipment, it is quite straightforward.

So far as I know, there are three ways of making this type of slideway. One is to build up by screwing together separate pieces of metal. It can also be milled from the solid and it can be made on a shaping machine. I will describe

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the last method because I used it myself and because I think you can obtain the use of a shaper more readily than a milling machine. In fact, many amateurs own a small shaping machine and evening institutes and technical colleges all over the country have them.

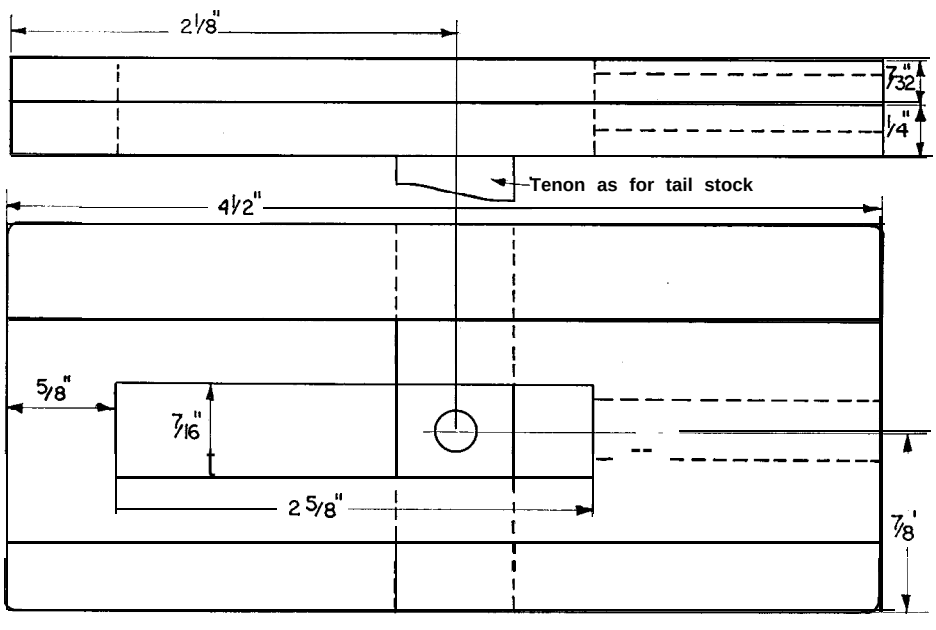
The cross-slide consists of the saddle **(14)** and the slide (IS), together with the feedscrew and its bearing and other small items, none of which need much explanation. The main components are in cast iron and the material was gradually accumulated by setting aside anything which appeared useful. The metal was then cut up and shaped in a small shaping machine to produce rectangular blocks of solid material.

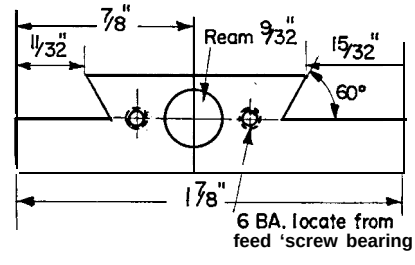
The saddle, for example, starts as a cast-iron slab measuring 4-1/2 in. X **1-7/8** in. X 1/2 in. and is marked out as shown in Fig. 4a. Fig. 4b shows the next stage where much of the waste material has been shaped away. The method of holding the work on the machine table will depend on various factors, but I like to clamp the work directly to the table, positioning the clamping dogs as shown. If a suitable shaper tool is not to hand it will have to be ground so that it provides clearance 01 and 02 as shown in Fig. 4c.

The line ***AB*** represents the path of the tool as it is fed down the incline on the finishing cut, and this is obtained by setting the head of the machine 30 deg. (not 60 deg. as might be supposed) to the vertical. Note this point carefully, for it is a natural mistake to make. Fig. 4d explains this.

With the cutter correctly ground, start by roughing out the metal, keeping away from the lines you have marked on the material. After a while the work should look like ***E*** in Fig. 4. Before taking the finishing cut it may be advisable to sharpen and hone the cutter so that, if you take care, the final surface will need little or no attention from the scraper. Fig. 4f shows how the final cut has been obtained by feeding with the tool from ***L*** to ***M*** and ***MN*** is being machined with the table moving from right to left. The tool slide is of course locked for this operation.

Before removing the cutter it is most important to determine the height ***H with*** some accuracy, for this has to be reproduced when you machine the other side. There are various ways of doing this, but I filed a little gauge block so that the tool just made contact as shown in Fig. 4g. The other side is machined in exactly the same way (using a tool of opposite hand) the tool-head being swung over to the other side. This time, however, the gauge block is brought into use.





14 **SADDLE** **CAST IRON**

Before taking the finishing cut, feed the cutter down until it just contacts the block. Set the tool-slide index ring to zero and lock it. This is the limiting position of the downward feed of the tool and ensures that both horizontal surfaces of the dovetail lie in the same plane. In other words, the height Zf will be the same on both sides.

This completes the machining of the dovetail on this component, but consideration of the drawing will show that there are other operations to perform. There is a slot to cut out to give clearance for the feed nut and a long hole has to be drilled and reamed to locate the feedscrew bearing. The tenon to locate the saddle on the bed is exactly the same as that fitted to the tailstock and so this will need no description.

Now consider the cross-slide, item 15. Fig. 5a shows the shape of the slab ready for shaping the dovetail. Proceed exactly as before, using the same cutting tools and general procedure. The use of the gauge block however is unnecessary this time, but when the dovetail is complete, change the clamps to the position shown in Fig. 5 and take a light finishing cut across the surfaces YY.

Before mating the two components it is well to do as much drilling as possible. Drill the holes for the gibscrews first, but tap the central one only and resist the temptation to tap the others while you have the tackle to hand. Remember the words of a song : " It's not what you do do. It's more what you don't do ! "

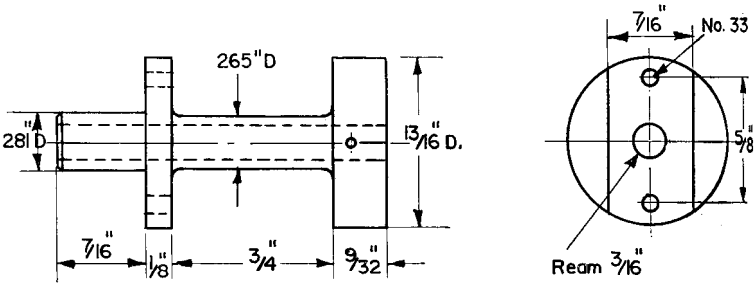
The 2 BA holes are for the attachment of the topslide and the 1/4 in. reamed hole is for the feed nut. All these can be attended to and the two parts mated together. First file away all sharp corners. I have drawn Fig. 5b exaggerated to explain why. Failure to do this is not likely if you are experienced in this kind of thing, but if you are a beginner it is a natural fault to overlook it.

Now take the cross-slide and scrape it flat, top and bottom. With a triangular scraper, scrape the surfaces of the dovetail to the best of your ability. They are difficult to get at. The aim is to break the surface up with the scraper and to do it as evenly as possible. The cross-slide is now used as a reference surface (or miniature surface plate) and so smear it with engineer's blue and slide it about on the saddle. Ignore the short 60 deg. faces at this stage.

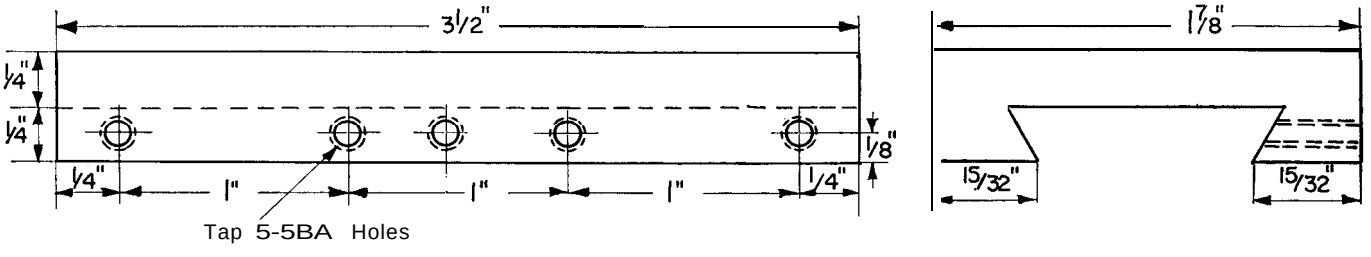
Scrape the saddle where necessary and in a short time tbe slides will fit. If the work on the shaper has been done properly there will, in fact, be very little scraping to do. Break up the sloping 60 deg. surfaces on the saddle as before and check for any obvious discrepancy.

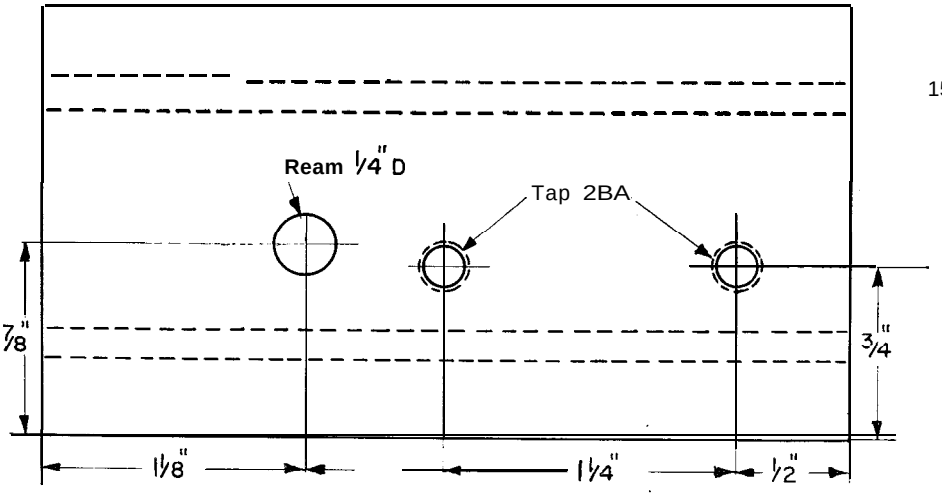
You now prepare a strip of bright mild steel for the gib. Fig. 5c shows its section and this diagram also shows the surfaces which are in contact when the assembly is complete. The gib should fill the space and if the assembly is stiff so much the better. On the other hand, it should not be necessary to use force to get the gib in.

In the single tapped hole in the cross-slide, fit a screw and tighten it up. Normal pressure on the screw-driver



17 FEED SCREW BEARING BRASS





15 CROSS SLIDE CI.

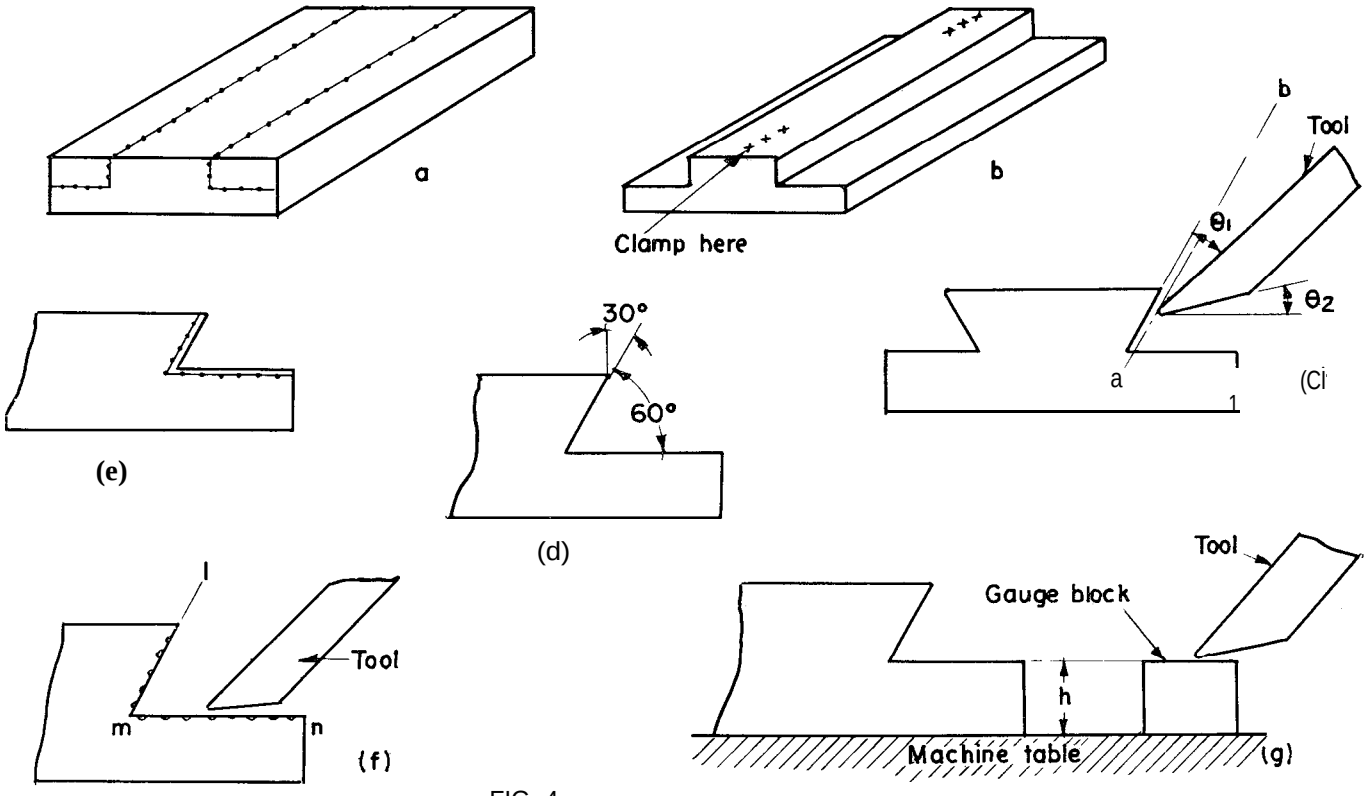
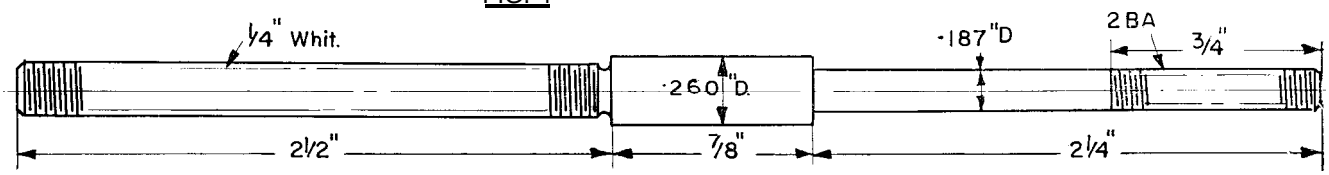
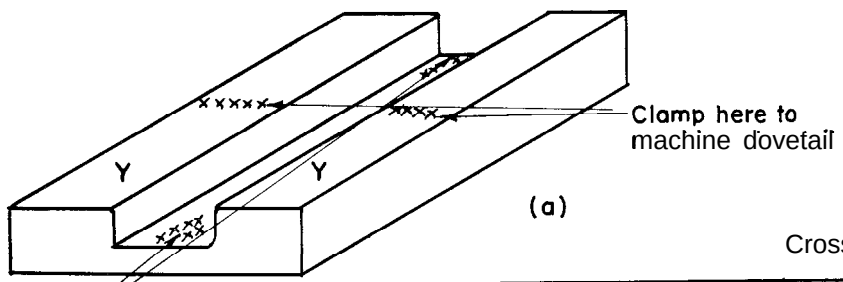


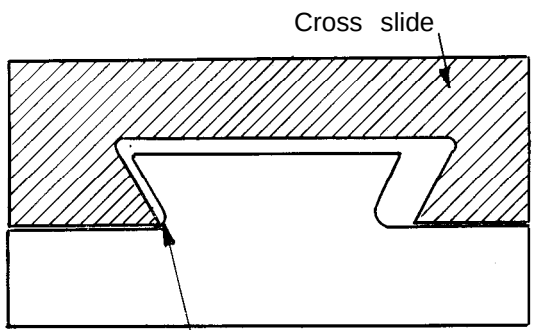
FIG. 4

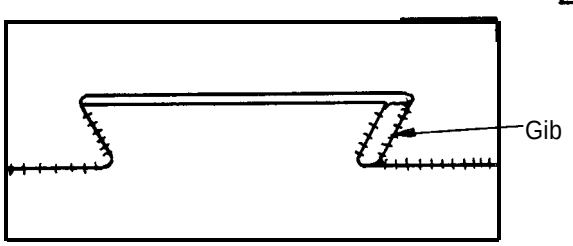


16 FEED SCREW. MS



Clamp here to machine surfaces *Y Y'*





Mating surfaces thus ////// (c)

FIG. 5

should lock both components solid. The untapped holes are now used to guide a drill to make four dimples in the gib. Dismantle the assembly and tap 5 BA for the gibscrews. The ends of the screws must be properly coned to fit neatly into the countersinks in the gib and only four are required. The parts should be thoroughly cleaned and assembled dry.

With all gibscrews slack, see if the parts will slide. If they jam ease the gib a bit by draw-filing with a dead smooth file. Now carefully adjust the gibscrews and slide the parts on one another. You will probably find there are places where there is distinct tightness. If so, dismantle and examine all mating surfaces in a good light. You will find small areas showing evidence of being highly polished. These "high spots" should be lightly removed with a small scraper. Reassemble and try again.

To be continued.