HOW TO MAKE A 6" SCREW-CUTTING LATHE.

Some weeks ago an appeal appeared in the columns of the *English Mechanic*, and as no one seems willing to come forward, I beg to offer my little quota, trusting that my readers will correct me in any mistakes I may make. The lathe, though a thread-worn topic, about which so much has been written, still presents itself, as must be the case, as a simple machine, and the basis of our tools—a machine used in nearly every trade from the potter's wheel to the watchmaker's lathe, and it was with some reluctance I encroached on the editor's good nature to write on this subject. After some consideration I have thought the description throughout of a 6" screw-cutting lathe would be acceptable to most. I will presume at the outset that some knowledge of the use of the hammer and chisel, the file and carpentering tools has been acquired, and that my reader has sufficient time, money, and perseverance to carry out the work *in toto*. It has been my experience to have been for some time engineering tutor in the best and perhaps only establishment of its kind in England, and it was my pleasure to watch several 6" screw-cutting lathes being turned out in a really creditable style; they were supplied with castings, and worked according to the standard working drawings, and it was my duty to tide the makers over their difficulties. Suppose, then, that we are supplied with a full set of working drawings fully dimensioned, and that we have the use of a good lathe, a grindstone, a smith's fire, some carpenters' tools, a drilling machine, and a good firm vise. First of all, after a good look at the general drawing, we must decide if we can make the patterns; if so, the bed and legs should be done first and the two headstocks. Now get some of the best white timber, free of knots and free of any smell of turpentine at the ends, or at all damp, and jack all the dirt off so that you will have your timber handy. Next decide how you will make your pattern, duly considering the thickness and dimensions of your timber, and leave plenty to come off afterwards, not forgetting besides the fact that all patterns should be made an ⅛in. in the foot larger for iron, and 1-16 in. in the foot larger for brass, as the metal contracts in the sand. The next thing is to plane up the timber, for the purpose of glueing and screwing the pieces together. Should the reader not have been shown how to use the plane, he ought to practise a little first on some odd pieces. First of all, how to grind the plane iron; this must be held square to the grindstone for some time; if you are continually taking it off, either from a little water going down your sleeve or because your arm is tired, you will find your iron all sorts of

FIG. 1

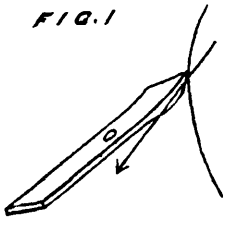
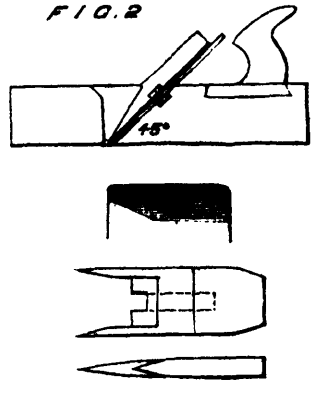


FIG. 2



angles. Beginners generally try to get an edge on quickly, by grinding thus (see Fig. 1), more especially if there is a nick in the edge from having planed over a nail. The edge of the iron should be straight in the middle and the corners just worked off (see Fsg. 2.) I am alluding now to the smoothing or finishing plane. Look now at the edge and set it out as far as you want by alternately tapping the wedge to tighten, and the tail end of the plane to loosen the iron. The doubled iron should be screwed home 1-16in. off the edge of the cutting-iron; it turns the shavings up and causes them to break off and not choke the plane. A little wooden pot of tallow should be kept handy, to grease the underneath of the plane, as also to grease saws and wood-screws before they are put in. Now get a couple of bay wood or deal straight edges, and place them thus (see Fig. 3). If they do not look parallel, the surface is twisted, and the first thing to do is to make the two ends parallel; now chalk the straight edge,

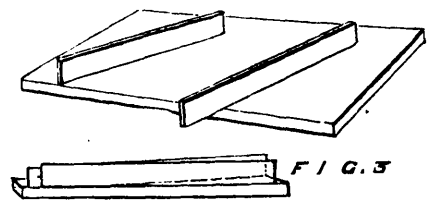


FIG. 3

which will show the lumps which the plane will take off in much the same way as a scraper is used to make a good surface, by spreading the hollows and lumps evenly over the surface. A little extra trouble in making good joints for glueing will be amply repaid by an appearance of solidity in the work so very essential in patterns which have to be carved about so much afterwards. Fig. 4 shows a bench and stop, which can be raised

FIG. 4

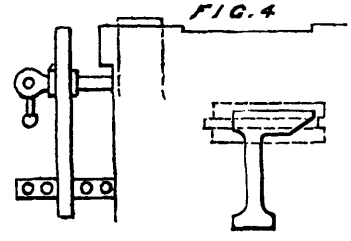
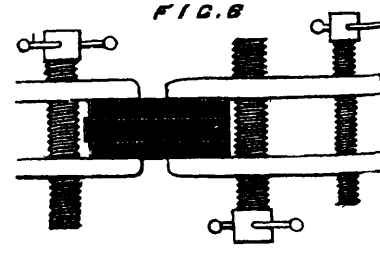


FIG. 5

for any thickness of timber; the vise screws may be iron or wood, and the jaw is kept parallel to the side of the bench by altering the pegs at the bottom. Eig. 4 shows how to build the top part of the lathe-bed with as many layers of wood as the thickness of the timber permits. No wood should be, as a rule, used in patterns that has any black marks of rot in it. When the joints have been planed, they should lie all over quite close, showing no crack, the main object being to exclude atmospheric pressure. Sometimes a rough plane is used (see Fig. 5), but, except in building segments, we do not approve its use, as it sometimes burrs the wood up. The next thing before glueing is to screw them together, looking carefully at the drawing to see that they are put where they can remain, after all the cutting away is done. Now take out the screws and nail one board on the bench, wipe the two surfaces and see that there is no dirt, and put some thin glue on evenly, and get some one to help you work the top piece once or twice over the under piece till they are fast, and wipe off any glue that has oozed out away with a wet rag, in fact, dip the rag in the hot water of the glue-pot. Next bind the two boards

FIG. 6



together with two or three wood clamps (see Fig. 6,) or tack them together till dry. When three layers are glued together the screws may be put in with some grease, the heads being countersunk at least ¼in. under the top. We have so far only done what is called joinering; while these pieces are drying get out, for the gap, front end of the lathe, webs, and ends of the lathe-bed, as much timber as will be wanted. The lathe-bed should be cast upside down, as all impurities and blows in cast-iron float on the top of the casting, and the surface for the slide-rest should be as hard as possible. It will then be necessary to see what pieces require to be loose for moulding, and what snugs, &c., ribs, or nameplate require to be put on, care being taken to leave ¼in. or 3-16in. for any future machine work.—*English Mechanic.*