

them. Whatever method of setting a saw may be employed, bear in mind just one thing and the desired result will be obtained—and that one point is this: The only way to set a saw is to bend the teeth outward the distance necessary to cut a kerf of the required width. That is the cause and the effect, and it matters nothing how the teeth are bent.

One man may do a fine job at saw setting with no tools but a hammer and a punch, the saw being laid flat on the smooth end of a block and the teeth bent outward by hitting them with the hammer through the medium of the punch. Another man bends the teeth by means of a monkey wrench, or a special tool, consisting of a notch the thickness of the saw blade, cut in the side of a bit of steel. Each tooth is bent over with this tool, and a gauge is used to make sure that each tooth projects just far enough, but not too far.

The familiar hammer saw-set is in evidence in every mill and in the woodworker's tool chest. This is a refine-

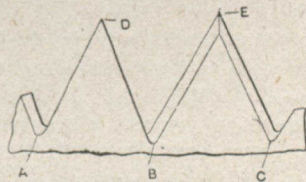


Fig. 5.

ment of the crude punch and hammer method, but the result is the same. Then there is the elaborate spring set of various kinds, improvements on the monkey wrench business, but bending the tooth in exactly the same way. It matters not which way the saws are set, but it does matter a good deal how they are set, for if the set is not exact in every tooth, then that saw can never cut smooth, no matter how much time is spent on it.

#### Balance, Lost Motion and Filing.

Sometimes it is impossible to round a saw perfectly for the reason that either the saw, or the mandrel, or the pulley, is out of balance. There may be a little lost motion in the bearings, and then, if there is the least lack of balance in the running gear, the saw will shake and flutter so badly that it is impossible to either round the saw, or do good, smooth work after it has been set and filed. Therefore, see that the saw is in perfect running balance, taking saw and arbor, all together, ready to run, before attempting to round the saw. Of course, if there is no tendency to wobble or run untrue, the balance business is probably all

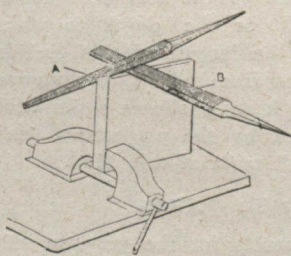


Fig. 6.

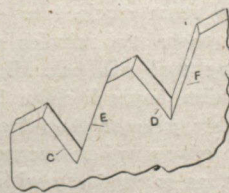


Fig. 7.

right, and may be neglected until it is found necessary to look for some unknown cause of trouble. When that time comes, it is well to look to the balance and the fit of the boxes.

While filing is one of the most important factors in doing smooth work with saws, it is not the only thing which causes good or bad work, for, no matter how well a saw is filed, it will not do the best work unless it is well rounded, evenly set, and well balanced in close-fitting bearings. Thus, while filing is not all, no good work can be done without it,

and, everything else being well done, good filing will insure smoothness of cut. Therefore, learn to file correctly, then take the necessary time and patience to do a perfect job.

To file a saw to the best advantage for smooth cutting, it must be known exactly what service is required of the saw. If it is to cut pine or some other soft wood, then the teeth must be made slim and filed with a flatter bevel—more “fleaming”—than if the saw is to cut mahogany, oak, or any other hard wood. If a saw is to cut brown ash, the teeth must be given much less “rake” than if other woods are to be sawn, for there is so much grit in that kind of wood it is almost impossible to keep the saw sharp unless it is filed like a hack-saw for cutting metal.

If a saw is to do rough work and lots of it, then the teeth may be filed more nearly square across than is proper for comparatively slow, smooth cutting. Fig. 5 shows a tooth in three positions, front, edgewise, and looking straight at the point of the tooth. This tooth is designed for very smooth cutting of medium soft wood, and, if properly used and kept sharp, it will cut as smooth as if the surface had been filed.

The tooth shown by Fig. 5 is several times as large as the actual tooth, and is made to a large scale in order to more fully show the method of filing. A large three-cornered file was used, about eight inches long, and the cuts A and C were made from the front side of the saw, while cut B was made from the back side. Two sides of a tooth are filed at the same time. For instance, the sides B, D and B, E are cut at the same time by the strokes of the file, as may be judged by an inspection of the corners A and C, which show that the file was dropped, handle low, in front of the saw while making the cuts A and C, and that the file was held handle low on the back side of the saw while making cut B.

In any case, the point of the file should be pointed ahead in the direction in which the saw is to revolve. In no case should the file be pointed backward when filing. If a file is pushed over a piece of metal as shown by A, Fig. 6, the file will squeal and squeak so loud that it can be heard all over the shop, and good filing is impossible, no matter whether on a saw or a cutter. The reason for this noise and bad filing is that the file is working against the spring of the thin metal which is being worked. Were the saw so thick that it did not spring under the pressure of the file, then the squealing and chattering would cease at once. To prove this, hold the file as at B, Fig. 6, and the tool at once begins to cut in a noiseless and most satisfactory manner.

Referring again to Fig. 5, it will be noted that in filing the cut A, the file is pushed against the edge of thin metal, just as it is at A, Fig. 6, where the squeaking is so fierce. Still, there is no squeaking when filing tooth A, Fig. 5, even when pushing the file against the metal from A to D. To find the reason for this seeming contradiction, look at Fig. 7 and try the experiments there shown. Run the file into the thin metal as at C, and as long as the file is pushed square across, there is no squeaking. But try to turn the shank of the file either to the right or to the left, so as to cut fleaming as in filing a saw, and the concert commences at once.

How, then, is the filing to be done “against the metal” and a good job done? No file will cut well or fast while it is “screeching”; therefore, hold the file in some manner to render it noiseless, save for the regular cut of the teeth. Never file when the tool squeals, for you are doing little except spoiling the file—and one's ears. The solution of