

SUGGESTIONS ON The Care of Saws

By
C. C. TAINTOR

INVENTOR OF THE TAINTOR SAW SET



Taintor Mfg. Company

113 Chambers Street

NEW YORK

Hints on the Care of Saws

There is no tool so much in the hands of the mechanic as the saw, and no tool that can be more depended upon when in perfect order. The saw, however, is seldom in perfect order. The filing of it is put off as long as possible, resulting in a great loss both of time and good workmanship. Many good workmen dread filing their own saws, yet the saw is as simple in construction as any tool he has to use. It is but a strip of tempered steel with triangular notches cut in its edge.

Uniformity in the teeth, sharp points and sharp cutting edges are the great essentials of a perfect saw.

No Hard and Fast Rules

It is not intended here to give hard and fast rules for the care of saws as a great deal must be left to the judgment of the mechanic under the conditions in which he is placed. These conditions will vary greatly in different localities. For instance, a saw to work in a piece of lumber in a moist climate will require different treatment than one to work in the same piece in a dry atmosphere. The intelligent mechanic therefore should learn the requirements of the saw under the different conditions in which he is placed and act accordingly. The intention at this time is rather to show how the saw will be affected by the various modes of treatment herein described.

A System Recommended

It is recommended, however, that the workman should adopt a system,—the one best for his needs,—and adhere closely to

It, for in this way only can he train his eye and hand to produce the most perfect results.

It is also recommended that the novice who desires to become an expert in saw filing take strips of soft metal, such as soft steel or brass, about the thickness of a saw blade and practice on these in bringing the teeth to the state he wants them. In this way he will save his saws, files and time while training his eye and hand.

Shape of Teeth

Saw teeth, whether of cut-off or of rip saws, are triangular in shape, consequently what is known as a three cornered file will touch one edge of two teeth in filing. This is the way a saw should be filed for it gives the correct form to the teeth and steadies the file.

A saw should never be allowed to get dull, therefore frequent filing is recommended.

Hand, Panel and Back Saws

The teeth of all saws designed to cut across the grain are a series of sharp-pointed knives which cut the grain of the wood first at one side of the kerf and then at the other and carry the chip off in what is commonly known as saw-dust.

All the teeth in a saw should be uniform in length, size, pitch, bevel and set.

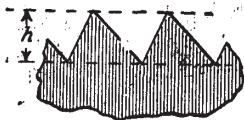
The more bevel a tooth has the smoother it will cut in soft woods.

Saws for hard wood should have less bevel than for soft. Butchers' saws also should have but little bevel.

The more pitch a tooth has the faster it will cut, but if too much pitch is given, the saw will neither run nor cut so smoothly as with less pitch.

Some Definitions

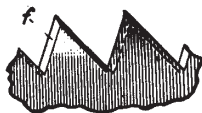
The **LENGTH** of a tooth is its height from base to point, and is determined by the number of points to the inch.



The **PITCH**, sometimes called the rake or the hook, is the angle of the cutting edge of the tooth to the line of the points.

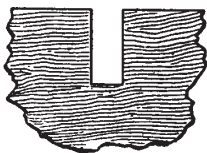


The **BEVEL**, also called the fleam, is the amount taken off the thickness of the tooth back from the cutting edge.



The **SIZE** of a tooth is its width at its base.

The **SET** of a saw is the distance the teeth stand out beyond the surface of the saw blade.

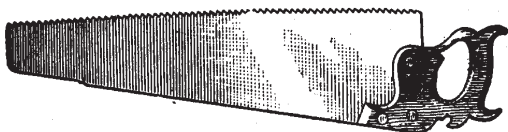


The **KERF** is the channel cut by the saw.

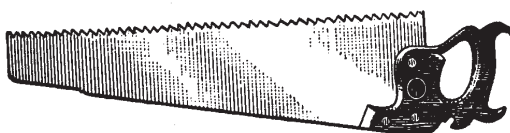
The **HEEL** or **BUTT** of the saw is the end that has the handle; the **TOE** or **POINT** is the other end.

Before and After

When the saw comes from the factory its teeth are all uniform in size, length, bevel, pitch and set and looks like this:

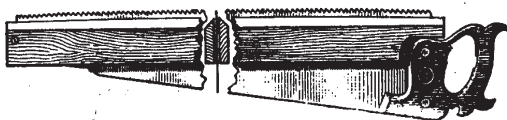


After it has been filed a few times by the unskilled filer it may look like this:



Clamping the Saw

The first thing to do in filing a saw is to place it in a suitable clamp. Good clamps are to be found in the market, but in the absence of such, a very satisfactory one can be made by dressing up two strips of board, three inches or so wide, having the faces that come together slightly rounded from end to end (convex), so that they will hold the saw firmly in the center. The upper outside edges should be beveled at about 45 degrees so that the file can approach the saw. A

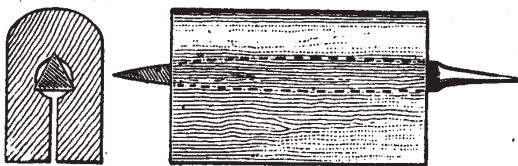


screw will hold the strips together at one end while the other end.—which should be cut away for the handle so that all the teeth will be clamped,—may be held in a vise. In this clamp the saw should be held so tight that there shall be no vibration.

Jointing

The saw is then ready to be jointed. Sufficient care is not usually taken in this operation, for a little rolling of the jointing file will make the teeth irregular in length. The file should be held at right angles to the sides of the saw squarely on the top of the teeth. This is difficult to do if the file is held in the hand.

A very good device is made by taking a block of wood, say 4 in. or so long and $1\frac{1}{2}$ in. thick by $2\frac{1}{4}$ in. wide, and boring a hole lengthwise through it, the hole to be a little smaller than the face of a three cornered file (a wornout one is as good as any). Drive the file into the hole, then from the bottom of the



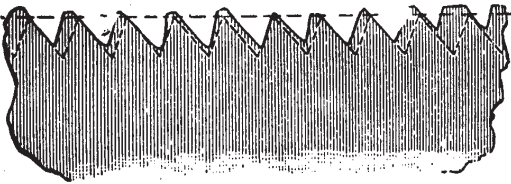
block cut a saw kerf square with the face of the file at its center. This makes a good gauge for jointing. A flat file can of course be used in the block instead of the three cornered one. A round piece, as for instance a large chisel handle or a doorstop, could be used instead of the block and treated in the same manner as described. Special devices for this purpose are found in the market.

In jointing take off the smallest amount possible, making all teeth the same length as the shortest one.

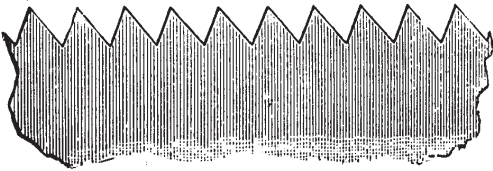
The line of the points of the teeth should be left in a slight curve from the heel to the toe, or be "crowned" as it is sometime called.

Regulating

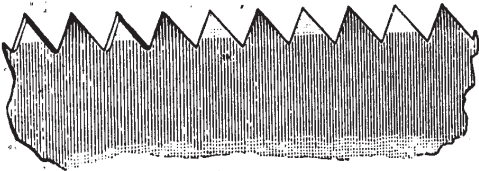
If the teeth have become irregular and it is necessary to joint considerable from the points, first regulate them by filing square across every tooth, filing back on the large ones, bringing them nearly to a point, making all points of the same size. If now the teeth



are all of a size, the grooves at their bases will be in a line parallel with that at their points the whole length of the saw. In regulating it is well to look at their bases as well as at their points. The pitch of the tooth also should be looked to while regulating.



Setting



After jointing and regulating, if regulating has been necessary, the setting should be done.

The Setting of a Saw is more important than is generally believed. A saw properly set will run more smoothly through the wood, thus saving the strength of the user and will permit him to work closer. The teeth should be bent with perfect uniformity and in a manner to squeeze the metal so that the teeth will be "set," i. e., fixed in their new position. Teeth that are only bent and not "set" will spring back unevenly. The first so-called saw sets only bent the teeth, but a blow from a hammer displaced the metal; therefore some of the older men still insist that a hammer-set is best. Saws set by the **Taintor Positive Saw Set** hold their set longer than when set by a hammer or hammer-set.

A saw should be set as little as may be and still have it "clear." It is a common fault of workmen to set their saws too much, and it is often the case that they are set so wide that the chip or saw dust gets between the end of the tooth and the wood, which is being cut, thus causing binding. Medium size teeth should be set about one-half way down from the points to their roots and coarse ones about one-third of the way, but never as low as the roots.

Defects in Tools for Setting

A great many tools are on the market for setting saws, some of them only bend the teeth and do not "Set" them, that is, **force the metal to the support of the tooth** in its new position.

Others are liable to slip on the tooth after the pressure is applied, so there is no certainty in the distance from the point that the tooth will be bent, and consequently the teeth will not stand in line.

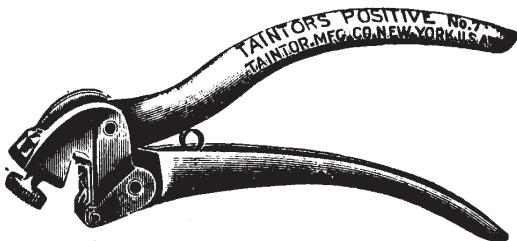
Others have gauges that are liable to slip; still others set the thick end of the saw (where there is a difference in thickness) more than the thin end, thus increasing the amount of set by double the difference of thickness.

Probably the greatest fault of most of these tools is that they injure the side of the tooth by cutting a fine groove or crease, where it is bent. As a result the tooth is weakened and may break at the next setting or, what is more likely to occur, when the tooth is filed, the point comes off and many a workman blames his saw manufacturer for what is really due to the fault of a saw set which is improperly constructed.

Another fault of saw sets is that the blow or pressure, as the case may be, is applied first at the point of the tooth. This being the weakest part, it first curls it, then straightens it, and sometimes breaks it. A tool producing any of these results should not be used.

The Taintor Positive Saw Set

The Taintor Positive Saw Set was especially designed to obviate all of these defects, and the manner in which it has been received by the best mechanics and the efforts at imitation by other manufacturers is the very best evidence that these points have been successfully covered. This tool should be in the hands of every mechanic who wishes to do perfect work.

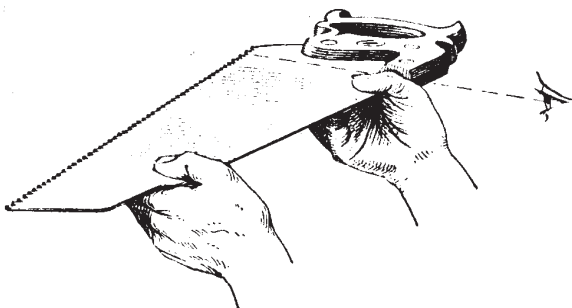


Full description and directions for use will be found on pages 19, 20 and 21 of this book.

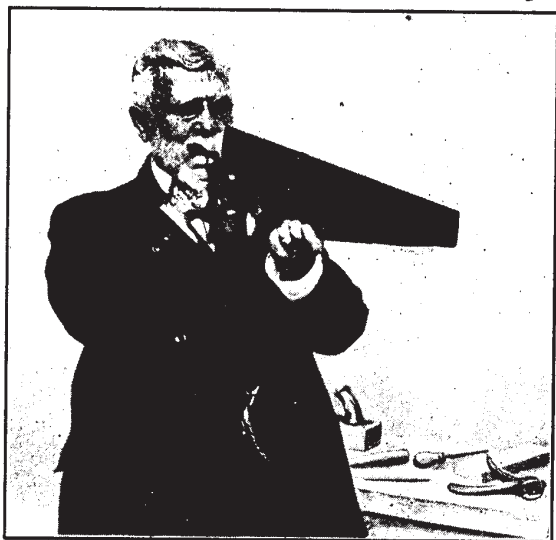
The teeth when set by this tool conform to the side and face of the anvil on which the setting has been done. The faces of the anvil are numbered so that any setting may be returned to, but these numbers have no reference to the number of the saw or number of teeth to the inch.

A saw should be set according to the work to be done and not according to the number of points to the inch; in fact, the same saw might need to be set differently for different purposes.

Face No. 4 of the Taintor Positive Saw Set may be used as a trial face for a saw for ordinary work in dry wood. Set a few teeth, then look across the face of the saw



to see if the teeth have been moved the right amount. If they have not find the anvil face



that will give the desired amount of set then complete the setting.

After filing, the teeth should be in line on both sides of the saw and the groove should be perfectly straight when looking down the length of the saw from heel to point. These two ways of examining the setting are better than either way alone.



The Taintor Positive Saw Set

may be used with the saw held in the hand or in the hand with one end resting on the bench, or in the clamp. In either case the tool will easily adjust itself to the work to be done as all parts work in unison. If the setting is done in the clamp the teeth of the saw should be placed high enough above the edge of the clamp so that the saw set will not touch.

Work from heel to point on both sides of the saw and raise the saw set as it passes from tooth to tooth. By setting from heel to point the tool is not so likely to catch on the teeth.

Care

In filing great care is necessary. In case one's eyes are not strong enough to see the points of the teeth clearly, glasses should be used while filing.



Carefully choose your files. They should be straight and evenly cut and straight in the handle. If too large they obstruct the view of the points of the teeth.

When filing keep the teeth of the saw regular in size. The tendency is to make the ones on the farther side on the first filing too large, the bevel misleading the eye.

Filing

After the saw has been jointed and set, adjust it in the clamp for filing. Place it as low in the clamp as the position chosen for the file will permit. The point of the saw should be to the left. This position gives to most persons the best view of the teeth while finishing after the saw has been turned. If, however, experience teaches that the teeth to be finished can be seen better from the other side, file to the right of the clamp first.

The clamp should then be placed in the best light obtainable and at the height that will give the operator the best view of the teeth. This will vary with different persons. A little below the armpits is found to be right by a good many filers.

Hold the file firmly with the point somewhat elevated at the pitch and bevel decided on.

The filing should be done with the point of the file traveling in the direction of the point of the saw cutting the edges of both teeth. This gives the correct form to the teeth and steadies the file, which should be lifted slightly on the return stroke.

The reason for filing towards the point of the saw is that the file moves in the direction of the setting and of the cutting edge of the teeth, and there will thus be less vibration. If on the contrary the filing is done toward the heel of the saw the file is cutting against the setting and against the cutting edge of the tool, and the vibration will be sufficient to take the points off the teeth and the cutting edge will be rounded as well as full of fine notches made by the teeth of the file.

If those who advocate filing in the opposite direction (that is toward the heel of the saw) will use a magnifying glass in comparing teeth so filed with those filed

toward the point, the reason for filing as above recommended will be obvious.

In filing toward the point of the saw there will be a slight feather edge on the tooth which may be taken off by running a straight oilstone lightly over the sides of the saw. If this is not done, however, the feather edge will soon disappear. The feather edge, by the way, is the only argument for filing toward the heel.



File every other tooth. File back on the widest teeth as shown by the size of their points. Make the points on each side of the file the same size, taking care to leave enough of the flat produced by the jointer to be seen. See that the cutting edge of each tooth is sharp before leaving it.

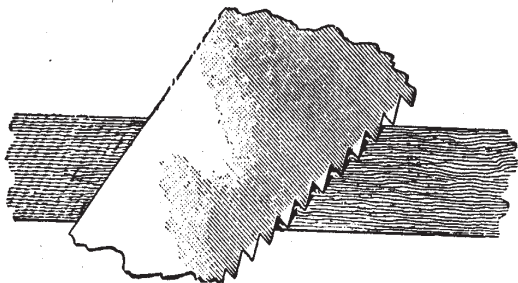
It is well during the progress of the work to occasionally put the file back to the first tooth filed to make sure that the pitch and bevel originally assumed have been maintained. This certainly should be done when it has been necessary to shift the saw in the clamp or after laying the file down for any cause.

After filing one side of the saw in the way described turn the saw "end for end" and file the other side in the same manner, but the point of the teeth must be watched very carefully, for even a small fraction of a stroke of the file, after the tooth has been brought to a point, will reduce its length.

The glint on the point of the tooth, *i. e.*, the reflection on the flattened end produced by the jointing, is the only guide for its length, and after that has been lost further filing will be simply guesswork. If after taking the saw from the clamp the work is not satisfactory run the jointer very lightly over the ends of the teeth and after returning the saw to the clamp touch them up with the file.

Rip or Slitting Saws

The teeth of rip saws are a series of chisels following one after the other as they cut their way through the material.

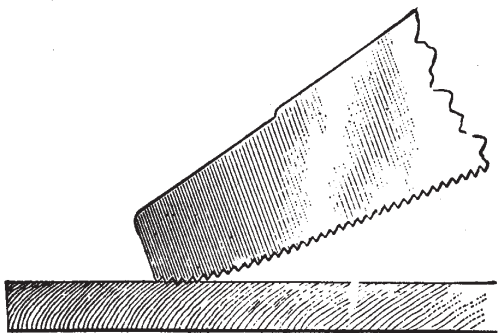


The teeth should be filed square across and kept uniform in length, pitch and set. Filing every other tooth enables one to file with the setting, the tooth set toward the workman being touched only slightly.

Filing half the teeth from one side and then changing end before completing the operation will tend to produce uniformity in the teeth and make it less liable "to run."

Suggestions

A cut-off saw with its point rounding is not so likely to "catch" when starting the kerf, thus preventing the bending of the saw



and splintering the wood. A kerf can also be more easily started in the centre of a plank without boring for it.

Omitting to set one or more teeth opposite to each other at some point along the saw, or bending them a little inward will clear the kerf when the regular teeth or those fully set do not clear it fast enough.

The teeth of a rip saw are usually made finer at its point than further back so that the saw will not be "held up" at its start.

Filing the teeth fleaming at the point and for a short distance back like those of a cut-off saw will reduce the danger of a "hold up" and this part of the saw can be used to cut through knots if encountered on the way.

Saws for coarse work, especially those that may be used to cut diagonally across the grain as for framing rafters, stair carriages, etc., should be filed with considerable fleam with the cutting edge about at right angles to the line of the teeth.

A compass or key hole saw should have less hook and more fleam than a rip or slitting saw, but more set than a cut off saw.

Curls, Bends and Buckles

CURLS.—It is of frequent occurrence that a saw will encounter an obstruction of such a nature that it will be bent and in a manner to stretch the metal on one side. This will give the saw a "curl." This can usually be taken out by finding the center of the curl or curve and curl it in the opposite direction. In this force enough should be used to stretch the metal on the inside of the curve as much as it was stretched on the outside or enough to have the saw remain straight.

BENDS.—A bend is a shorter stretching of the metal and leaves the saw in more of an obtuse angle than a curve. A bend can usually be taken out by hammering, but care must be taken or the last condition of the saw will be worse than the first.

BUCKLES.—A buckle is a bend in which the saw blade is bent or twisted in both directions. A skilful workman can take a buckle out of a saw, but even he is likely to find that getting a new saw is the cheaper thing to do.

Clean and Bright

Saws should be kept clean and bright. If they get rusty they may be cleaned with kerosene oil and very fine emery paper. To keep them bright coat them with a thin film of vaseline, making the vaseline as thin as possible by rubbing it well with a woolen rag. It will not then gum. Any oil having no acid will do. Sapolio will also be found very good for removing the rust and giving a polish to the surface.

Causes of Saws "Running"

A saw is said to "run" when it shows a tendency to "run away" from the mark that should be followed in cutting. There are three causes for this tendency.

One cause is a twist in the saw which will throw it to one side of the mark. This should be treated as mentioned under the heading of Curls, Bends and Buckles.

Another cause is poor filing, which leaves teeth longer on one side of the saw than on the other.

Still another cause is uneven setting—the teeth being set more on one side than on the other.

DESCRIPTION OF THE TAINTOR POSITIVE SAW SETS

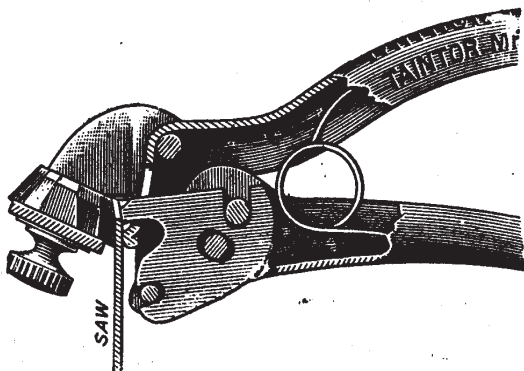
This Saw Set is self-adjusting except the turning of the anvil to change the setting.

It is made entirely of steel.

It is light, strong and durable.

Parts are interchangeable, and it is fully guaranteed.

Defective material or workmanship will be made good, but tools showing wear will not be exchanged.



This tool consists of a frame to which are attached two movable handles, an anvil and a plunger. A spring opens the handles.

In use the upper handle moves first and clamps the saw against the side (lower part) of the anvil, thus preventing its slipping on a saw having even the finest teeth. The lower handle then moves carrying the plunger, first adjusting it to the thickness of the saw.

Additional pressure then tips the plunger and forces the teeth to conform to the face and side of the anvil. In this there is no loss of time and the operator does not realize that both handles have moved.