

# Disston 1919 Handbook On Saws

## INSTRUCTIONS

for SETTING *and* SHARPENING or FITTING

## CIRCULAR SAWS

The best saw that could be made would not manufacture lumber in a satisfactory manner, nor be safe from possible vital injury unless kept properly set and sharpened. It is therefore very necessary that all saws should be kept in best possible condition, though the contrary is too often the case for the most general cause of trouble is a dull or improperly fitted saw.

**SPRING  
SET  
BRIAR  
DRESS.**



There are two styles of "fitting" Rip saws; the "swage-set and square dress," and the "spring-set and briar or slightly beveled dress."

The swage-set is best adapted to and recommended for mills of moderately large feed and capacity, while the spring-set and briar dress is best adapted to mills of light power and capacity, the reason for which is found in the fact that one tooth of the swage-set and square dress style practically equals in capacity two teeth of the spring-set and briar dress pattern. It thus follows that up to its limit of capacity a saw with the spring-set and briar dress fitting will run easier than a saw containing the same number of teeth that are swage-set and square-dressed.

**SWAGED  
TEETH.**

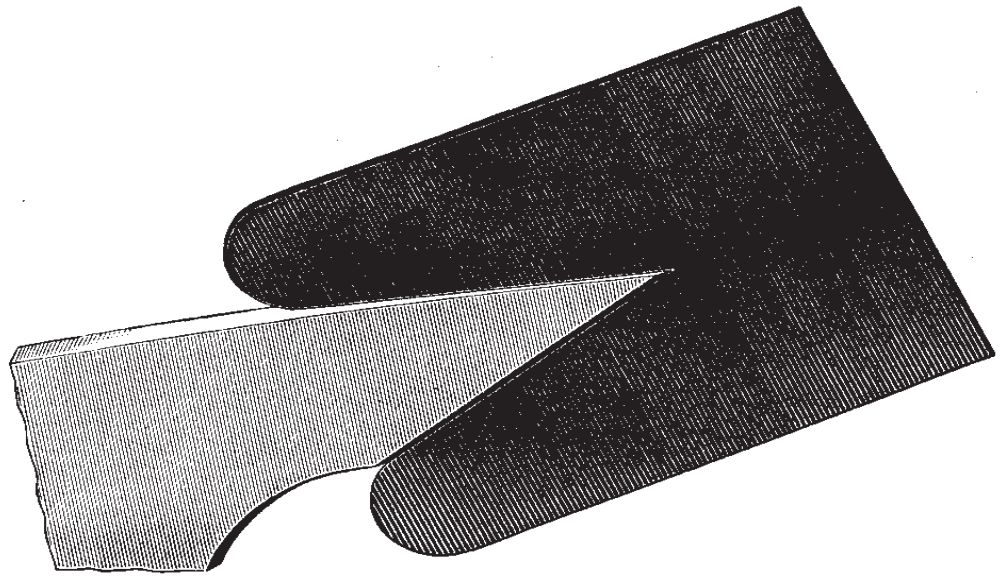


**TO PROPERLY FIT UP A RIP SAW WITH SWAGE-SET:** first see that the saw is perfectly round. No saw will give good results if it is "out of round." Each tooth in the saw should do the same amount of cutting and if the saw has long and short teeth, the long tooth will be subjected to a strain that should be equally divided between two, three or four teeth, which renders the saw liable to accident, and at best largely reduces the capacity of mill and turns out poorly manufactured lumber.

If the saw is not round it should be made so by "jointing" it until all the teeth are of the same length. In the absence of a saw-sharpening machine, the jointing can be accomplished best by holding a piece of grindstone against the teeth whilst the saw revolves at a medium or moderate speed. If a piece of grindstone is not available, take a piece of soft emery wheel or any other kind of stone that will grind the long teeth down to a common length.

After jointing, file all the teeth to a keen point, taking care to just file out the marks of the stone, thus leaving all the teeth of the

same length, and as near as possible the same shape, for the teeth cannot be swaged or upset to advantage unless filed sharp and to the proper shape. To do this without a gauge requires considerable practice and experience. A gauge as per illustration is furnished gratuitously upon application and one is included with every swage.



**Gauge by which to File and Regulate the Shape of Saw-Teeth of Large Saws.**

The next operation is "swaging" the teeth for clearance, which under ordinary conditions, should be one-sixteenth inch on each side of the teeth. Taking for granted the back of the tooth is in good shape, the swaging must

## DISSTON CONQUEROR SWAGE, JUMPER OR UPSET.



be done from the front or under side; this gives the proper "rake" and saves unnecessary

reduction in diameter of saw.

Swaging consists, first, of holding the convex side of the Conqueror Swage or Up-set on the tooth, striking it half a dozen or more firm hammer-blows until the tooth is spread to the desired width; after which the straight or flat side of swage is used on the teeth; one or two blows being sufficient to flatten or square up the tooth.

In Swaging, care must be taken to hold the swage at such an angle that the lines or contour of backs of teeth are not changed as the swaging marks should show principally on the fronts of teeth where practically all the filing will be done. The operator must also be careful not to hold the swage at materially different angles as this would have a tendency to fracture the teeth as well as making the saw badly out of round by driving some teeth down and others up.

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## DISSTON HANDBOOK

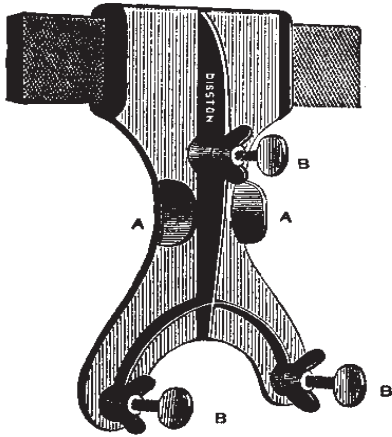
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Following swaging, the saw must again be jointed and each tooth then filed or ground until brought to a keen point. If filed by hand, due care must be taken to file square across the teeth so that all cutting-edges will be at right angles to the side of saw, for if the saw is not filed square it will "lead" in or out of the log according to the side of the saw bearing the high corners; high corners on the log side of a saw will cause it to run into the log and vice versa. It is also important that the same "hook" or pitch line and general shape of teeth be maintained.

The next operation consists of "side-filing" which simply means bringing all the points to one uniform width. It is very difficult to swage or set a saw so accurately that all the teeth are *exactly* the same

width, and as a slight variation in the widths of cutting points of a saw will not only cause it to work badly but will make rough lumber, it is therefore desirable that all the points of teeth be made exactly the same width, which is readily accomplished by the use of our Side File.

**DISSTON  
IMPROVED SIDE FILE.**  
MADE IN THREE SIZES.



This file must be so adjusted by means of the set screws as to conform to the width of set desired. The jam-nuts are for the purpose of securing the set screws in the desired position. When the Side File has been properly adjusted it must be held in position by means of the clips "A," against the saw-blade, the points of the set-screws "B" only touching the blade. Each tooth in succession must be filed until the set of tooth conforms to the gauge of the set-screws. Thus all uneven or overhanging corners will be removed.

This completes the operations of Setting and Sharpening, or fitting the saw, and if the work is done according to these directions and the saw is properly operated on a correctly adjusted mill, it will saw easy and true until dull again, but it should be re-sharpened before it is allowed to get so dull as to show a tendency to pull extra hard, leave its true line, or heat up. There is no economy in attempting to run a saw too long without sharpening. Many hours time have been wasted and many saws ruined through the false economy of not sharpening them often enough. We have never seen a saw mill where it was not true economy to sharpen saws from two to four times in a full day's sawing. A saw, properly swaged or set, will stand from two to

five filings before it needs re-swaging or re-setting.

The operation of fitting a "Spring-set," or briar-dress Rip saw is the same as the foregoing in all respects except

the swaging is omitted and the points of the teeth are bent alternately right and left with a "Samson" or similar setting tool to give the

**DISSTON  
SAMSON SAW-SET**

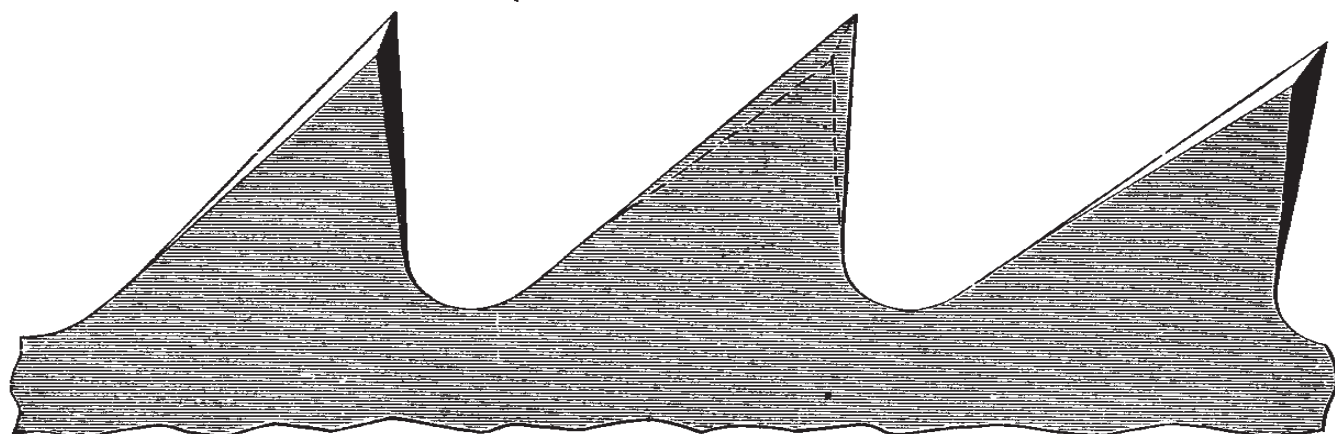
THE MOST USEFUL, POWERFUL AND DESIRABLE MADE.



necessary clearance to each side of the saw ; then all teeth are filed straight through or square to side of saw on the fronts, but each alternate tooth is slightly beveled on the backs similar to sketch—



## CUT-OFF SAWS.

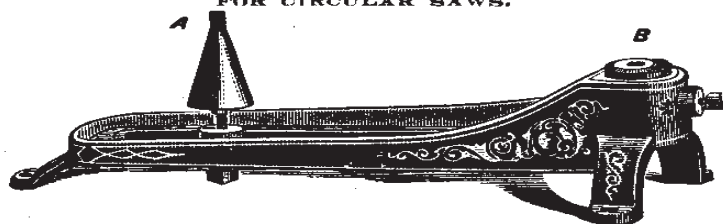


A.

Circular Cut-off saws are fitted the same as briar-dress rip saws, except the teeth are given more bevel both front and back as shown in illustration "A."

There are several different kinds of tools on the market for setting small circular saws, but the most efficient one we know of is our circular saw Setting-Stake, with which tool each tooth is given practically the same amount of set.

### DISSTON IMPROVED ADJUSTABLE SETTING-STAKE FOR CIRCULAR SAWS.



This valuable tool can be adjusted to set any saw from six to thirty inches in diameter. The cone "A" is moved in or out to suit the diameter of the saw, and raised or lowered, as may be required. The movable anvil "B" is made of hardened steel, and some portions of the face being beveled more than others, the operator can regulate the amount of set as desired.

Probably half the saws sent back to the factory for repairs have been injured or ruined just through neglect on the part of the owners or operators, who really know how to properly fit saws, but put off the re-setting and sharpening of their saws just as long as they can force the

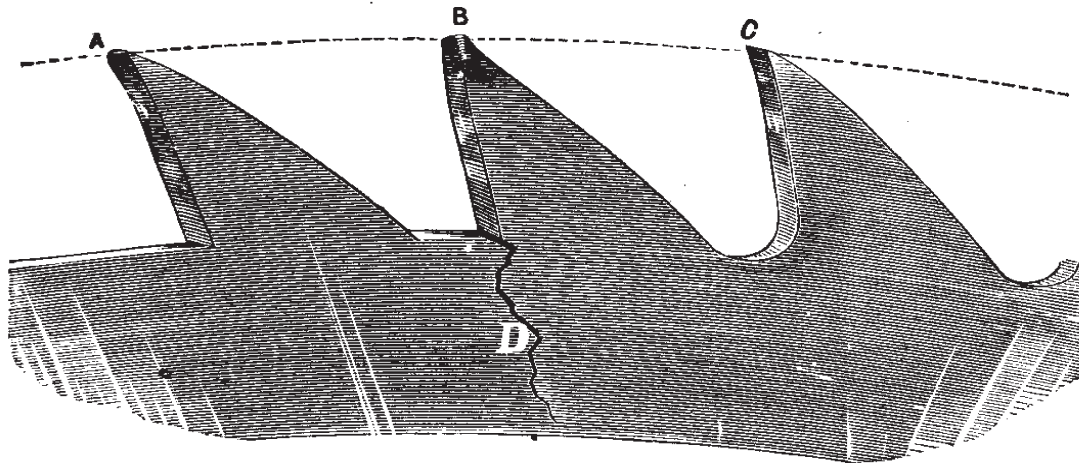
saw through a cut of any kind. Other men, through lack of experience do not know how to "fit" saws. The result is the same in either case, after wasting time and lumber enough to pay a careful and capable fitter or sawyer, who would without injury to the saw or unnecessary wear to appliances turn out the maximum amount of well manufactured lumber for the power available, the careless or inexperienced men have to send the saw to the factory for repairs or purchase a new one, when due regard to a few simple rules would have saved the saw, a quantity of lumber and a great deal of lost time.

The saw is like a razor or any other cutting tool, it will not work



unless it is kept in order and an attempt to *force* it when not in order means a broken saw or a repair bill.

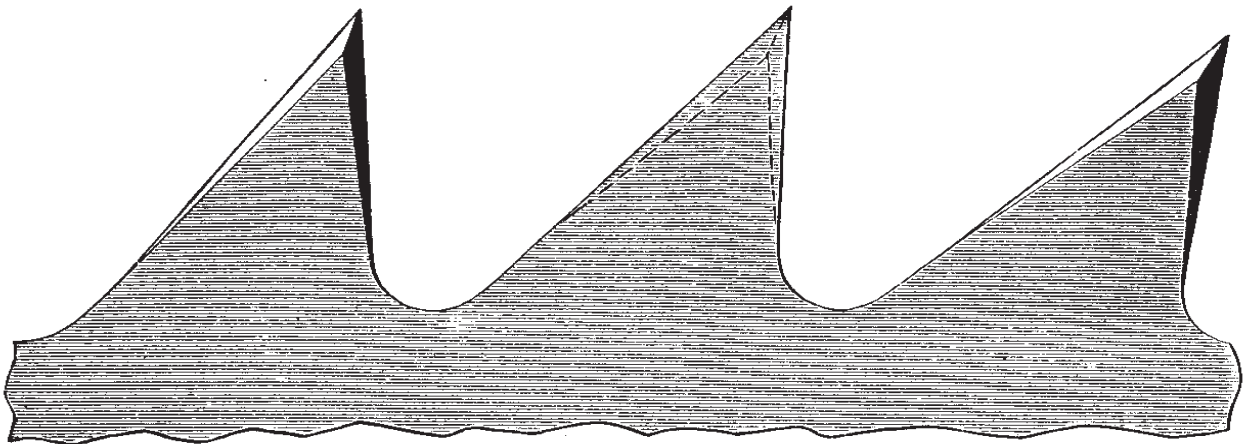
NOTE: Do not file square corners in the gullets of the saw as it prevents proper circulation of saw-dust and is very liable to cause



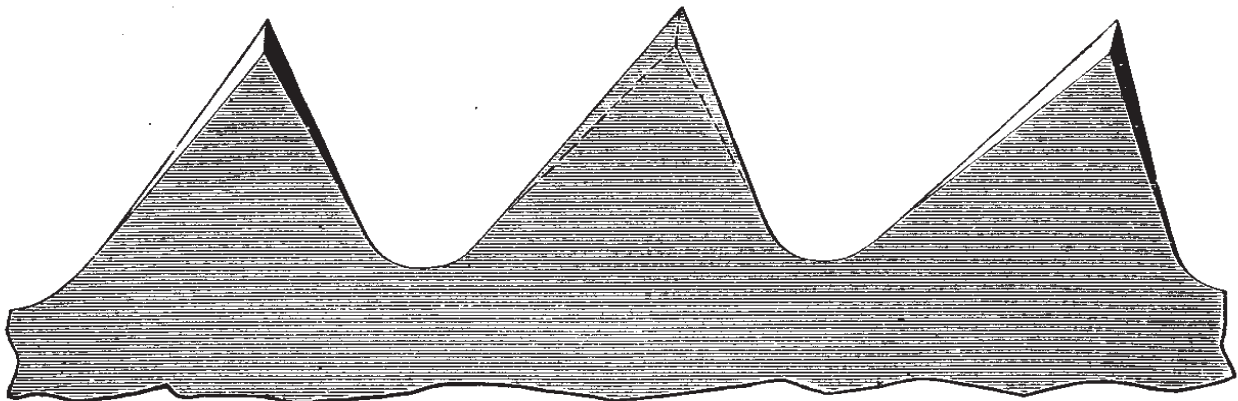
breakage as shown at "D" in cut, particularly when the teeth are dull, or in frosty weather. *Our warranty does not cover saws broken from sharp corners filed in gullets.*

It will be observed in the illustration that in addition to having sharp corners in the gullets, teeth "A" and "B" are very dull; tooth "C" shows how the points and gullets should be dressed. The gullets should be kept rounded out, either with a gummer or a file.

## CUT-OFF SAWS.



A.



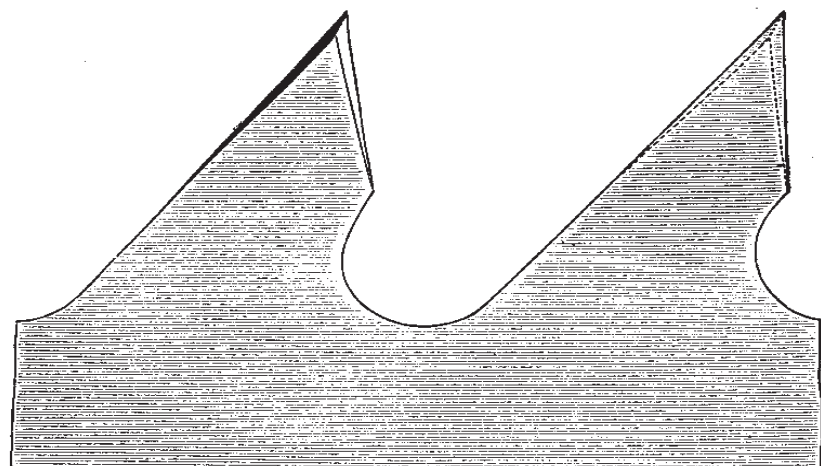
B.

Cut "A" shows proper shape of tooth for cross-cutting soft wood. Cut "B" shows tooth best adapted to cutting hard wood, space of teeth or distance from point to point, being governed by conditions.

Cut-off saws, with the front of the tooth undercut into a round gullet, are the best (see cut "G"). If the teeth are kept in this form, less time will be required in filing, and the bad results from

running a dull saw would be prevented; use as little set as possible; file as soon as saw becomes dull, thus saving time and power, reducing the strain and liability of breakage of the saw.

We can furnish cut-off saws with rounded or undercut gullets as shown above and give any desired amount of rake or space of teeth.

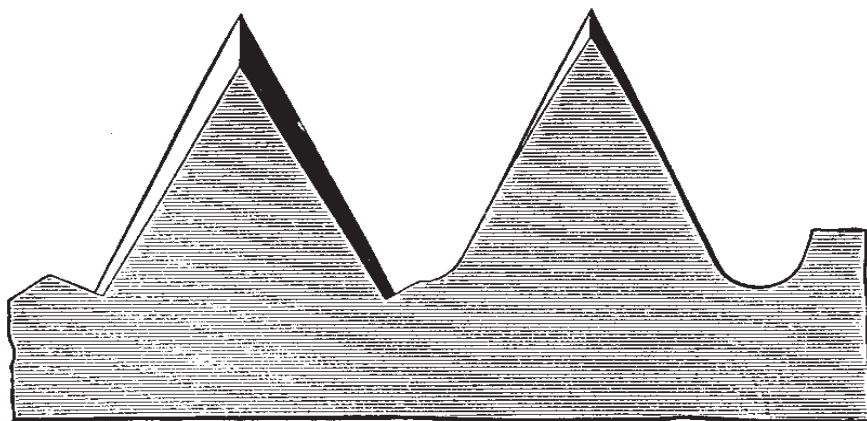


G.

The great loss in the breaking of circular cross-cut or cut-off saws to the mill man and manufacturer of saws induces us to call particular attention to the general neglect in the keeping of these saws in order for the work they have to perform, for there is not the same care given to a cut-off as there is to the larger saws for ripping lumber.

Nearly every case of broken cut-off saws that has come under our notice, has been caused by the careless manner in which they have been filed or gummed. If the time, labor and files consumed in filing the long bevel down the backs and fronts of teeth, were used in filing the gullets down with a round file, or cutting them out carefully with a round face emery wheel, many saws would be saved and much less power consumed, as filing long bevels on the teeth forms square notches in the gullets, which will cause cracks to start, besides preventing free circulation of saw dust. See Cut "C".

The bevel on cross-cut teeth should never extend into the gullets; in fact only a small portion of the tooth from the *point* needs beveling. The remainder of the



C.

D.

tooth and gullets should be dressed straight across, as shown in cut "D". In heavy cutting the front of the tooth should be filed with very little or no bevel. This will prevent much of the lateral strain and chattering caused by the teeth being forced out of line into the sides of the cut. Saws are frequently broken from this cause, particularly if they are dull.

### **HINTS FOR COLD WEATHER.**

As many saws are broken in winter, owing to the great risk in sawing frozen timber, the greatest care should be taken to prevent any undue strain. Keep the points out full, square and sharp, or the saw will dodge out of the cut, particularly in slabbing, as the corners on the log side do the most cutting and soon get dull in sawing knotty frozen timber. Use no more set than is absolutely necessary; have the teeth widest at the extreme points, but do not have them weak; taper the set nicely from point to back. Sharp corners should never be filed in the gullets as cracks are sure to start from such misuse of the saw, particularly in cold weather.

### **SHARPENING AND GUMMING WITH EMERY WHEELS.**

In sharpening or gumming saws with emery wheels always use a good, free-cutting wheel, and never put so much pressure on it or crowd it so fast that the teeth are heated to such an extent they become blue, for when teeth are blued, glazed, or case-hardened by the emery wheel, they are apt to break or crumble when in the cut or the next time they are swaged. Joint the emery wheel occasionally to retain the shape of its face and to remove glaze.

When gumming, it is best to gum around the saw several times instead of finishing each tooth at one operation, for by going over the teeth several times, they are less liable to case-harden or blue, and a more uniform gullet is obtained. After gumming, it is advisable to file all around the saw, taking care to remove the fash or burr left on the edges and all glazed or hard spots. Gumming and sharpening with the emery wheel will cause the saw to "let down" or lose its tension much quicker than by the use of the file or burr-gummer, as it heats and expands the rim of saw, putting it in the shape generally termed by mill-men "buckled," which makes it appear loose and limber and causes it to run "snakey" in the cut. Many saws are condemned just from this cause and thrown aside as worn out, when by proper work and hammering they can be made as good as new saws of the same size.