

Published by

**CHAS. MORRILL**

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New York City



**HOW TO** JOINT SET AND SHARPEN  
**SAWS**

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ARE STAMPED**

**CHAS.  
MORRILL  
NEW YORK**



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**OUR WARRANT**

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We will replace any part (not the entire tool) that breaks during legitimate use within a year after purchase. Mail the part to us for our inspection together with a statement of the claim.

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## Introduction

"Saw Points" exemplifies the best saw practice of the day, having been compiled from the leading authorities, and by following its instructions anyone can properly fit a saw.

Fitting consists of jointing, setting and filing the saw teeth so that the saw will run easy and cut fast, clean and smooth.

Jointing is the process by which the points of the saw teeth are made to lie in the same line.

Setting is the process of bending with a sawset (spring set) or of upsetting with a swage (swaging or spread set), saw teeth so that they project beyond the saw blade, giving it clearance.

Filing is the process of putting the proper shape, rake and fleam on the tooth.

## GENERAL INFORMATION

The elements of a saw tooth are its face or front, point, back and gullet or throat. The channel cut by the saw is called the kerf. The side inclination of alternate teeth is called set. The heel or butt of the saw blade is the end nearest the handle, the other end being the toe or point. Saws are listed by the number of saw points to the inch at the heel, and this number is generally stamped on the saw blade. There is always one more point than teeth. Rip saws usually have one less point at the heel than at the toe.

## MORRILL'S "SAW POINTS"

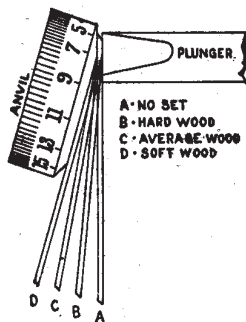
The length of a tooth is its height from base to point. The pitch, rake or hook is the angle of the cutting edge of the tooth to the line of points.

The bevel or fleam is the angle of the front or back of the tooth to the side. To crown a saw is to have the line of the points in a slight outward curve.

### TO FIT HAND SAWS

The saw should first be secured in a saw clamp or held between two strips of board in a vise.

Joint the saw by lightly running a jointer or file lengthwise over the points of the teeth until they are all in a line slightly crowned.



*Second*—Set the saw. (Use a "Special" Saw-set). The depth of set should not be greater than half the length of the tooth; if it is greater, the body of the saw will be sprung or the tooth so

## MORRILL'S "SAW POINTS"

weakened as to cause it to be easily broken out. The width of set is regulated by the work. For average work, about  $\frac{1}{16}$  inch on each side is sufficient; for hard or dry wood, a little less, and for green, wet or soft woods, a little more. In any case, the saw should be given just set enough to clear. Go down one side of the saw and set the alternate teeth to one side, then reverse the saw and set the remaining teeth to the other side. Care should be taken that the teeth are set over to the same side as when new.

The set should be uniform, as the proper working of a saw depends on the setting. A sharp saw improperly set will not cut, but a dull saw properly set will. A hand saw should be set several times between filings.

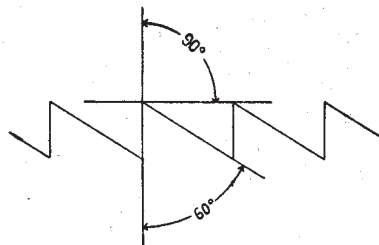
*Third*—File the saw. The saw should be filed from the heel to the toe, with a three-cornered file. No one saw will do all kinds of work, and a saw should be carefully selected for each class of work. The manner in which the teeth are filed should be noted when the saw is bought, and followed whenever the saw is re-sharpened. Descriptions and illustrations follow, showing the correct shapes to be given saws used for various purposes.

### RIP SAWS

A slitting or ripping saw has its cutting edge at right angles to the fibre of the wood, severing it in one place, the throat wedging out the piece.

## MORRILL'S "SAW POINTS"

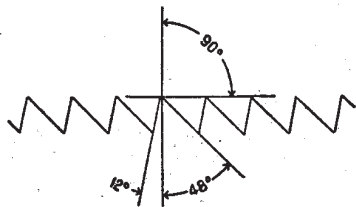
### RIP SAWS—Continued



A 4-point rip saw for soft wood or a 5-point for medium hard wood should have rake in front and be filed straight across, filing one-half the teeth from each side after setting, while for ripping hard and cross-grain woods a finer tooth rip saw, with the teeth filed slightly beveled, is needed.

### CROSS-CUT SAWS

In a cross-cut saw the cutting edge strikes the fibre at right angles to its length, but severs it on each side before dislodging it.



## MORRILL'S "SAW POINTS"

### BUCK SAWS

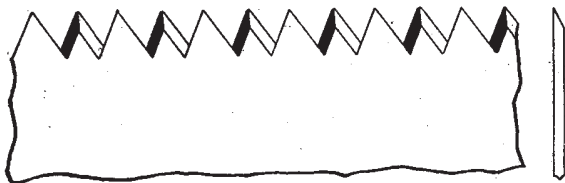


The 5-point peg tooth used in buck saws for cutting soft and wet woods has the rake on the side, has no pitch, and the angle of the fleam is about 45 degrees.



The 6-point used in buck saws for hard wood is generally filed with a medium amount of fleam on the front of the tooth and none on the back.

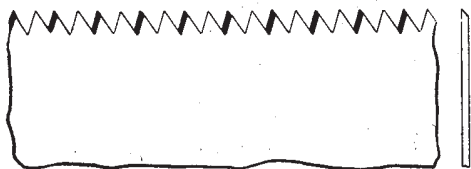
## MORRILL'S "SAW POINTS"



The 5½-point is used for soft wood where speed, rather than fine work, is required. It is filed with the same amount of fleam back and front.



The 7-point saw used for medium hard wood has less fleam on the back.



The 10-point saw used for hard woods has no fleam on the back.

## MORRILL'S "SAW POINTS"

The 11-point saw, if used for cutting soft wood mitres, dovetails and other fine work, is filed with fleam back and front, while, if used for hard woods, is filed with fleam only on the front.

A pruning saw is thicker than a regular cross-cut saw, has more pitch, is fleamed on both sides of the tooth, and has a large set.

Compass, scroll and web saws are crosses between a rip and cross-cut saw, and have very little fleam. They are set the same as a cross-cut saw.

Butcher and hack saws have their teeth filed straight through without any fleam, and are very lightly set.

After the saw is set and filed, it should be laid on a flat surface and the sides of the teeth lightly rubbed over with an old file or oil-stone to remove any feather edges.

To sum up: The same principles apply throughout, whether the saw is coarse or fine toothed. The teeth on saws used for soft wood should have little or no pitch, should have a fleam back and front and have a large set; those for medium hard woods should have more pitch, less fleam on the back and medium set; for hard woods, still more pitch, no fleam on the back and a small set. Too much pitch and too heavy a set are bad, for they will cause a saw to take hold so keenly that frequently it hangs up suddenly in the thrust and kinks or breaks the blade. The usual angle of pitch is 60 degrees. When a cross-cut hand saw is properly fitted a needle can be slid along the groove formed by the teeth.

## MORRILL'S "SAW POINTS"

### TO FIT TWO-MAN CROSS-CUT SAWS

It is necessary to have a jointer, a templet, a raker gauge and a sawset in order to vary the bevel, shape, length and angle of the teeth to suit the work.

The cutting teeth act as a series of knives, cutting across the fibres of the wood and collecting the dust and chips in their gullets; whence they are carried out of the kerf.

The rakers are a series of clearing teeth which carry out of the kerf the dust and shavings made by the cutting teeth.

#### DIRECTIONS FOR FITTING

*First*—Pass a jointer (using a mill file) over the teeth until it touches the shortest cutting tooth, taking care to hold the file squarely, for if held at an angle the teeth on one side of the saw will be longer than those on the other and will make the saw run to that side.

*Second*—Using a raker gauge, file down the raker teeth until they are the proper length. For very hard and dry wood the rakers should be  $\frac{1}{10}$  inch shorter than the cutting teeth; for hard, green wood,  $\frac{1}{8}$  inch, and for soft, green wood,  $\frac{1}{2}$  inch.

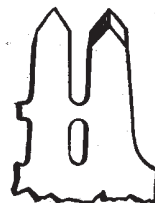
If the rakers are to be swaged, make them the same length as the cutting teeth, as the swaging will shorten them sufficiently.

*Third*—File up the rakers to a sharp edge, making the top square with the blade.

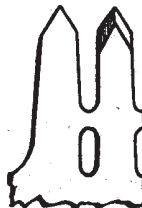
## MORRILL'S "SAW POINTS"



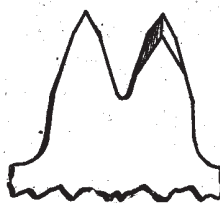
Bevel for common tooth without rakers



Bevel for knots and frozen timber, not a fast sawer.



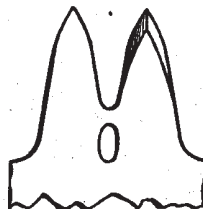
Bevel for ordinary work.



Diamond point bevel, easy to maintain and holds its point best.



Flat, thin bevel, for soft wood, a fast sawer but points are weak.



Round point bevel, a fast sawer with strong points.





## MORRILL'S "SAW POINTS"

*Fourth*—Shape up the teeth, preferably to their original shape and size, at right angles to the blade and from their beveled side. In shaping up the teeth it is advisable to use a templet, so as to have them uniform. Then bevel the edges according to the work in hand, bringing the cutting teeth to a keen point. (The cuts show the shapes and bevels best adapted for different conditions.)

As much bevel as possible should be given the tooth, leaving enough backing so that the point will not break or bend if it strikes a knot. If the points break or bend, either the angle of the cutting point should be increased or the bevel reduced. Frozen, knotty or very hard timber requires a tooth in which the bevel is not too flat.

The principal difference between the rounded and flat bevels is that the rounded bevel gives more backing to the point of the tooth and still leaves a fast cutting saw. The flat bevel is largely used because it is much easier to file.

*Fifth*—If the rakers are to be swaged, spread their points by blows from a light hammer to a thickness not exceeding that of the saw blade. If the rakers are not to be swaged, proceed to set the saw.

*Sixth*—Set the teeth over about  $\frac{1}{4}$  inch from their points (use a Morrill No. 3 or 4 Sawset). The amount of set will depend on the class of work and the manner in which the saw is ground. For average work, thin back saws require about  $\frac{1}{16}$  inch set on each side, and for straight-back

## MORRILL'S "SAW POINTS"

saws about  $\frac{1}{16}$  inch. Set the saw just wide enough to clear and run freely, but not so much that it chatters.

Saws used on frozen, hard and dry woods require little set; on average woods, as noted above; on soft, green or wet woods, the most.

### TO FIT CIRCULAR SAWS

In the usual gauges (7, 8, 9) of large circular saws used in the ordinary manner on the average feed and timber,  $\frac{3}{8}$  inch on each side of the saw is about the least set that should be used. Saws used on hard, dry and frozen timber require less set; on very soft, wet or green timber more. Thin saws require as much set as thick ones.

### TO FIT A CIRCULAR RIP SAW WITH SPRING SET

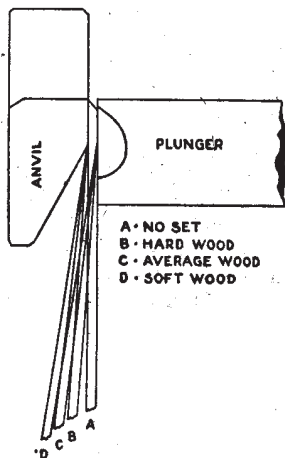
See that the saw is round, and if not round, joint and file the teeth until they are all of the same length, shape and size.

If a saw-sharpening machine is not available the jointing can be done by holding a stone against the saw teeth while the saw is revolving at a moderate speed, taking care not to grind beyond the length of the shortest tooth.

After jointing, file the teeth to a sharp point,

## MORRILL'S "SAW POINTS"

using a gauge or templet, or, if none is handy, file to as near the original shape and size of the tooth as can be remembered.



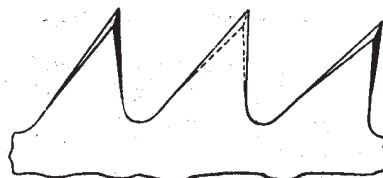
Next, set the teeth over about  $\frac{3}{8}$  inch from their points about  $\frac{1}{16}$  inch alternately to each side of the saw. (Use a No. 5 Sawset.) Then file the teeth straight through, or square to side of the saw, on the fronts, and bevel each alternate tooth slightly on the back.

### TO FIT CIRCULAR CUT-OFF SAWS

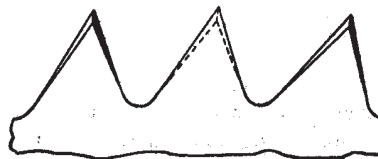
These are fitted the same as rip saws, except the teeth are given more bevel both front and back.

## MORRILL'S "SAW POINTS"

Bevel only a small portion of the tooth from the point and dress the remainder of the tooth and the gullet straight across, rounding out the gullet with either a gummer or a file.



SOFT WOOD



HARD WOOD

If fit properly, a circular saw will saw easy and true until dull. It should be re-sharpened before it pulls hard, runs askew or heats up. A saw should be sharpened from two to four times in a full day's run. A saw properly set will stand from two to five filings before it requires re-setting.



## MORRILL'S "SAW POINTS"

### BAND SAWS



TYPICAL SHAPE BAND-SAW TOOTH

After a band saw has been tensioned it should be fitted. The setting and filing of the teeth is practically the same as in a circular saw. The amount of set for a 14-gauge saw should not exceed  $\frac{1}{8}$  inch on each side. The less set the better. Band saws should be frequently re-sharpened, a two and a half hours' run being about the limit.

### A BRIEF HISTORY OF SAWSETS

Saws were first set by a hammer and anvil or by a hammer and punch, but these methods left no two teeth at the same angle, or depth of set. Also, the frequent hammerings injured the teeth, and, if the steel was soft, strung it so that the teeth dulled quickly; if hard, crystallized it so that they broke out easily.

The notched plate sawset sprang the saw blade and set the teeth in a curve, and the chief fault of the lever sawsets was a lack of strength.

The modern type of sawsets dates from 1878, when CHAS. MORRILL invented the No. 1 old style sawset, in which the power applied to the handles is multiplied and transmitted without loss to the plunger by a cam. This sawset was an in-

## MORRILL'S SAWSETS

stant success, displacing all of the other types of sawsets. In the MORRILL sawsets the principle of compression is employed, making the steel stronger and more homogeneous. Along the same principles followed the Nos. 1, 3, 4, 5, 10 and 11 sawsets.

Observing that many persons either set their saws too far down or too far over, thereby making the saw run hard and the teeth break easily, the No. 95 Sawset, provided with a rotatable, indexed anvil, to give the proper set to any hand saw, was placed on the market.

In 1912 the "Special," an improved No. 95, was brought out and met with immediate favor, being to-day the leading sawset for hand saws. In 1913 an improved indexed anvil giving absolutely correct depth and angle of saw was adopted, so that the "Special" can now be used with as perfect results by the most inexperienced person as by the most expert mechanic.

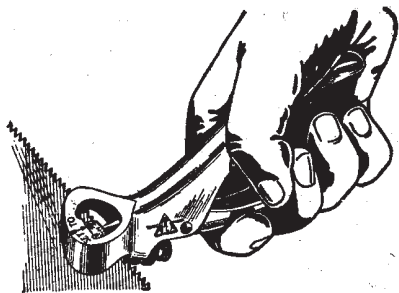
### MORRILL'S "SPECIAL" SAWSET

The "Special" Sawset will set any 4 to 15 point saw not over 16 gauge, is made of polished semi and tool steel, is 6 inches long, 10 oz. in weight, and is packed in a paper carton having printed thereon full uses, directions and warrant.

*To Use*—The anvil number corresponding to the number of saw points to the inch of the saw is turned to the arrow. The sawset is then placed on the saw and the gauge screw turned up and locked, after which the saw is set in the usual way.

## MORRILL'S SAWSETS

The indexed anvil enables any inexperienced person to set a saw as well as the most expert mechanic. The saw is set just right, not too much or too little, and if the wrong set is present it is taken out and the correct set put in at the same operation. Also no teeth can be broken out. Other advantages are an inclined anvil, allowing the operator to see the set he is giving his saw;



The "Special." Price, \$1.00

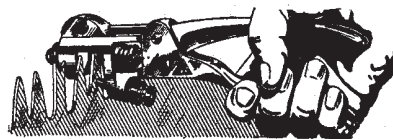
the lever handle on the bottom, keeping the saw from wobbling; a dust and dirt proof body, and a lock nut on the gauge screw.

### MORRILL'S NOS. 3 AND 4 SAWSETS

The No. 3 is for single-toothed and the No. 4 for double-toothed cross-cut and circular saws 14 to 16 gauge. Made of cast finished semi and tool steel, are 9 inches in length and 17 oz. in weight, and are packed one each in a paper carton having imprinted thereon full uses, directions and warrant.

## MORRILL'S SAWSETS

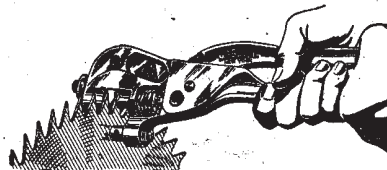
*To Use*—Set the anvil so that its edge will strike the tooth about  $\frac{1}{4}$  inch down from the point.



Nos. 3 and 4. Price, \$1.50 Each

Then run up the gauge screw until the desired angle of set is obtained.

### MORRILL'S NO. 5 SAWSET



No. 5. Price, \$2.00

For timber and board saws 6 to 14 gauge. Made of cast finished semi and tool steel; 15 inches long, 3 pounds in weight; packed in a paper carton having imprinted thereon full uses, directions and warrant.

*To Use*—Set the anvil so that its edge will strike the tooth about  $\frac{1}{4}$  inch down from the point. Then run up the gauge screw until the desired angle of set is obtained.

## MORRILL'S BENCH STOPS

**No. 1 Old Style Sawset.....Price, \$0.75**

For hand, band and jig saws, any width

**No. 1 Sawset.....Price, \$1.00**

For all hand saws down to  $\frac{1}{2}$  inch wide

**No. 10 Sawset.....Price, \$1.00**

For hand, band, jig, butcher and fret saws,  
any width

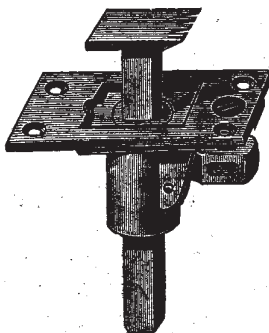
**No. 11 Sawset.....Price, \$1.00**

For hand, band and jig saws, any width

The above sawsets are each  $6\frac{1}{2}$  inches long, 10 oz. in weight, and are for hand saws not over 16 gauge. Made of polished semi and tool steel.

*To Use*—Set the anvil so that its edge will strike about half way down the saw tooth, then run up the gauge screw until the desired amount of set is obtained, and proceed to set the saw in the usual way.

### BENCH STOPS



**No. 1. Price, \$0.75**

## MORRILL'S HAND PUNCHES

These Bench Stops have been the standard for over thirty years. The working plate and spindle are made of wrought steel and are held in any position by a cam lever operated by a screw and nut. The end that the screw is in should always be placed on the bench towards the operator. The body is made of semi-steel.

The No. 2 is an improvement on the No. 1, being larger and having two sets of teeth, one coarse, the other fine. For very fine work the smooth sides of either the No. 1 or No. 2 can be used, as the working plate can be placed in any quarter. **Price, \$1.00.**

### NO. 1 PUNCH



**Price, \$1.00**

Length, 7 inches. Weight, 11 ounces.

Sizes: AA, or  $\frac{1}{16}$  inch; A, or  $\frac{5}{32}$  inch; B, or  $\frac{1}{8}$  inch; C, or  $\frac{3}{16}$  inch; D, or  $\frac{1}{4}$  inch.

These punches utilize the principle of the combination of cam and lever, and will perforate any thickness from tissue to one-quarter of an inch of leather, rubber, pasteboard, paper, cloth, celluloid or other pliable substances. We do not recommend or warrant this punch for metal, although it will punch very thin metal.

## MORRILL'S SOAPURN

### "HERCULES" PUNCH

Price, \$3.00

Length, 11½ inches. Weight, 2½ pounds.

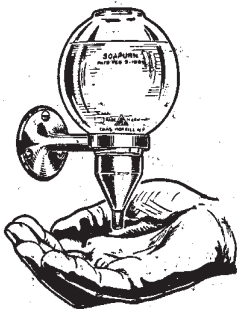
Sizes:  $\frac{1}{8}$  inch,  $\frac{3}{8}$  inch,  $\frac{1}{2}$  inch,  $\frac{5}{8}$  inch,  $1\frac{1}{8}$  inch,  $\frac{7}{8}$  inch,  $\frac{1}{4}$  inch,  $\frac{3}{4}$  inch,  $1\frac{5}{8}$  inch,  $1\frac{1}{2}$  inch,  $\frac{3}{8}$  inch.

Will punch a ¼-inch hole through No. 18-gauge sheet iron or its equivalent.

All punches and dies are interchangeable. The depth of throat is 1 inch. The punch is made of steel and cannot be broken by hand pressure.

### LIQUID SOAP DISPENSER

The bracket, cover and valve are made of non-corrodible metal. The glass jar has a valve with



only one moving part, made so that only a few drops of soap are forced out at each time. The Soapurn eliminates the danger of infection from

## MORRILL'S NAIL PULLER

dirty soap, is sanitary, economical and particularly valuable for use in wash-rooms of hotels, clubs, factories, railroad stations, offices, etc.

5 different styles, from \$1.00 up

Send for "Soapurn Catalog"

### MAKE YOUR WORK EASY WHEN OPENING BOXES BY USING A MORRILL NAIL PULLER

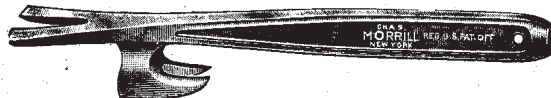


Price, \$1.50

Length, 18 inches. Weight, 4 pounds.

Pulls a nail twice as easy as any other puller and lasts many times longer. Jaws cannot spread. Cannot bruise your hand or roll off inclined places. Drop-forged from high-grade steel; no springs to break; rust-proof finish.

### MORRILL'S BOX OPENER



Price, \$1.25

Length, 14 inches; weight, 1½ pounds; drop-forged from high-grade steel. Is a most useful tool around a shop or home and can also be used as a claw bar, box chisel, strap cutter, a nail puller and a hammer