The DISSTON SAW, TOOL & FILE BOOK

The

DISSTON

SAW, TOOL, AND FILE BOOK

An Illustrated book of information concerning the selection, care, and use of saws, tools, and files.

HENRY DISSTON & SONS, INC.
PHILADELPHIA, U. S. A.

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INTRODUCTION

THE growth and success of any industry depend largely upon the policies of its founders. In proportion as the breadth of opportunities for the future is recognized so does an enterprise develop on broad lines or narrow. No product can make a reputation and build up any sizable sale for itself unless it be of really high quality. And conversely, very seldom does a good article fail to create a demand for itself.

Henry Disston knew all that, over eighty years ago, when he founded the Disston Saw Works. Although there was a strong prejudice against American made tools, he knew that his product would be good enough to overcome that feeling. His first demand was for flawless steel. In order to be positive of that, to be sure that it always ran true to specifications, he built his own steel mill. Then he sought better treatment, especially in regard to temper. Finally he must have the most expert workmanship and finish.

Bringing all operations from the making of the steel to the finished article under his personal supervision gave Henry Disston his quality product. He never allowed the standard to fall. The Disston brand has continually been the guarantee of a good tool.

And as he believed and practiced, so have his sons and grandsons. The House of Disston will always support a statement of Henry Disston's: "If you want a saw, it is best to get one with a name on it that has a reputation. A man who has made a reputation for his goods knows its value as well as its cost, and will maintain it."

In the following pages we have attempted to explain the uses of different types of saws. Too often an amateur saw-user expects a rip saw to cut across the grain successfully, or makes some other natural mistake. It is not lack of intelligence that causes these errors, but lack of information. Many men do not even know that there is a difference between cross-cut and rip saws.

However, it is human nature for a man, who has bought a saw he didn't want, to feel a little disgruntled; for him to feel that he has been badly treated, or that the saw is not a good one.

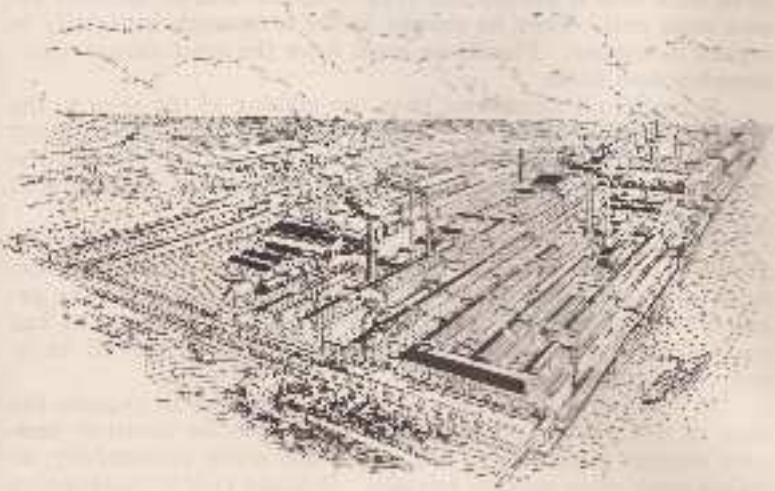
The aim of this book is to offset that possibility.

We have given a brief description of what the different types of saws are for—whether for cabinet making or building a coal bin.

Furthermore, the demand for an article of instruction on saw filing has been demonstrated to us not only by personal inquiry and letter, but also by the return of fine quality saws from users who pronounced them defective and rendered them useless, through lack of knowledge of how to keep them in order. These conditions have led us to include instructions for the setting, filing, and general care of saws.

This information if carefully followed, should assist in keeping a saw in proper working condition. It is based on long, practical experience in manufacturing, on a study of actual conditions, and on working tests of saws in the hands of users.

There is also a brief story, "How a Saw Cuts," which is included because it has proved to be of great interest to those who have seen it.



THE DISSTON FACTORY

68 BUILDINGS 48 ACRES 5000 EMPLOYEES

How to Choose and Use Hand Saws

ON the blades of Disston Hand Saws you will find etched these words: *"For Beauty, Finish, and Utility, this Saw cannot be Excelled."* They appear over the signature of Henry Disston, who founded the Disston Saw Works in 1840.

Today the Disston Hand Saw is known the world around as "The Saw Most Carpenters Use," and thousands of skilled craftsmen in Disston plants in Philadelphia, and Canada, are loyally supplying the world's demands.

Among these saw makers are a score who have been with Disston more than half a century, and nearly three hundred who have been making Disston Saws for thirty to forty years. The history of Disston is the history of saw making in America, for most of the notable improvements in the industry were originated here.

Hundreds of mechanics have written of Disston Saws in constant daily use twenty, thirty, even fifty years.

The new Disston Hand Saws are finer now than ever before—improved in every feature. Lighter blades, for easier cutting; narrower blades, saving strength; true-tapes ground, faster cutting; thin, yet stiff, true running; new weatherproof finish handles; better balance. They will run with less set, cut easier, and stay sharp

Mechanics are using more Disston Saws than all other makes of saws combined. Disston Saws are in use in any large building operation.

"THE SAW MOST CARPENTERS USE"

longer, than any other hand saws ever made. They are modern saws for modern sawing, to meet users' needs today.

The following features, obtainable only in Disston Hand Saws, are found in all Disston Hand Saws:

Disston Steel

Disston Steel is the world's great cutting steel, made only in the Disston Steel Works, where the first crucible saw steel ever made in America was produced in 1855, and where the first commercial heat of crucible electric tool steel was cast in 1906. The quality of Disston Steel is so generally acknowledged that manufacturers of other products, who must have steel to meet the most exacting requirements, come to Disston for this finer steel.

Disston Steel puts stamina, toughness, and long cutting life into every Disston Saw, Tool, and File.

Disston Temper

This better steel takes and holds a better temper; a *saw* temper which, while hard, is tough, yet readily filed and set. With this temper, a Disston Hand Saw takes and holds a keener cutting edge. The special Disston processes of hardening and tempering are based on long, practical experience and modern metallurgical practice.

Every saw bearing the Disston name must meet exacting tests of steel and temper, of hardness and stiffness, of "spring," and tension.

True-Taper Grind

Every Disston Hand Saw is true-taper ground. This taper is a *double* taper, graduating uniformly from the cutting edge to the back of the blade and from the handle to the point. The tooth edge is of even thickness from end to end.

This method of grinding gives better clearance in the cut, gives better balance to the saw, and insures easier cutting.

Note the thin back of a Disston Hand Saw, and observe the uniformity of the tooth edge, and the rich, lustrous, beautiful finish, which reflects the quality of the workmanship throughout.

Thin, yet Stiff

The thinner a blade is, if it is stiff, the better it cuts and the easier it is to use. All Disston Hand Saws are thin, yet stiff, as Disston true-taper grinding removes all unnecessary weight without making the saw limber.

Those thinner, narrower blades save the users' strength at every stroke. There is no strain on the wrist, no drag on the arm. Every blade "follows through" as never a hand saw could before.

The teeth are shaped to take hold better, bite deeper, and retain their keen edges longer.

New Handles, Weatherproof Finish

Handles have larger hand holes, for a more comfortable grip, and covered tips, which add beauty and strength to the handle, in which the blade has triple anchorage. Each blade is let into the handle the proper distance to give perfect balance.

All Disston Hand Saw handles have the new Disston weatherproof finish, more beautiful and far more durable than the finest hand polish. This finish seals the pores of the wood and prevents warping. Two years' test exposure outdoors did not affect it.

Cross-cut Saws

A hand saw for cross-cutting is made for cutting across the grain of the wood; it cannot be used to advantage for ripping or cutting with the grain. The teeth of a cross-cut saw are shaped differently from the teeth of a rip saw, and work differently.

Tooth edge of cross-cut saw

Teeth for cross-cutting are filed at an angle of 45° and the cutting edges of the teeth are filed with a bevel of 15° as shown in the diagram below. The upper half of each tooth is set, alternately, one to the right, the other to the left, for clearance. See illustration above. The true-taper grind of Disston Hand Saws gives them added clearance in the cut.

Side view of cross-cut teeth (enlarged)

Saws are made either skew-back, (as in D-8 Saw on page 11), or straight-back, (as in D-15 Saw on page 10). The skew-back blade is slightly lighter in weight; a straight back gives the blade more stiffness.

Points to the Inch

"Points to the inch" designates the size of teeth. A saw always has one more point to the inch than completes teeth in that inch. Disston Lightweight Hand Saws for cross-cutting are made 7 to 11 points to the inch. For most work the 8-point teeth, which are medium, are preferred. Saws with finer teeth make smoother cuts. Green, wet wood requires wider set.

8-point cross-cut teeth, showing how points are counted

7-point 8-point 10-point 11-point

Rip Saws

A rip saw is made for cutting with the grain of the wood. The front faces of the teeth are vertical and the backs of the teeth run at an angle of 60° as shown in the diagram below. The upper half of each tooth is set, alternately, one to the right and one to the left, to give clearance. This set amounts to about half the thickness of the blade, as illustrated. Disston Rip Saws have teeth at the point of the blade finer than those at the butt, to enable user to start saw in cut more easily. The teeth of a rip saw cut like vertical chisels, each tooth chipping out a small portion of the wood.

Tooth edge of rip saw

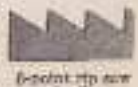
Side view of rip teeth (enlarged)

Disston Rip Saws are made 4½, 5, 5½, 6 and 7 points to the inch. The 5½ point rip saw is most widely used and will prove most satisfactory for general work. Some mechanics, however, prefer blades toothed 6 points to the inch.

Lengths of Saw Blades

The length of a rip or cross-cut hand saw is measured from point to butt of the cutting edge of the blade. The most popular length in either rip or cross-cut hand saws is 26 inches. Disston Lightweight Saws, for cross-cutting, are made with blades 20, 22, 24 and 26 inches long, and, for ripping, with blades 24 and 26 inches long. Saws 24 inches, and shorter, are termed panel saws. Of the shorter saws, the 22-inch 10-point cross-cut is most popular.

5½-point rip teeth, the popular size for rip saws



6-point rip saw teeth

How to Use a Cross-cut Saw

Keep your saw *sharp* and set properly. Instructions for setting and filing are given on page 32.

The proper position for cross-cutting is shown below. An imaginary line through the saw, arm, and shoulder would be slightly to the left of the saw blade, permitting a clear view of the line where the work is to be cut. Raise the work high enough to prevent point of blade from striking floor or ground.

Proper position for cross-cutting

To start the cut, rest the blade on the waste side of the cut, support the side of the blade with the left thumb, and draw the saw toward you a few times until a slight groove is formed; then cut straight with a full stroke.

Cross-cutting a vertical work

In cross-cutting, it is best to maintain an angle of 45° between the tooth edge of the saw and the face of the work. Extending the forefinger alongside the handle aids in guiding the blade. Take long, easy strokes and make each stroke do its work.

Proper starting of saw for cross-cutting

Supporting the waste side of the work will prevent the wood from breaking when the cut is nearly completed. Do not twist off strips of waste with the saw blade.

Look carefully at repair or alteration work to see that no nails are in the path of the saw.

Don't throw your saw around; keep it oiled and hang up when it is not in use.

How to Use a Rip Saw

The position for ripping should be such as to permit long, easy strokes. The user who does most of the cutting with a few inches of blade, in the middle of the saw, not only has difficulty in keeping the line of the cut straight, but he also dulls the saw more rapidly, because a few teeth are called upon to do all the cutting. Full strokes are desirable in both ripping and cross-cutting.

Starting the cut with a draw stroke

In ripping, the cut should be started with the finer teeth, at the point of the blade. Ripping usually is done with the work supported on saw horses, but if the board must be held in a vise, place it to give approximately the cutting angle shown to the right.

Ripping with the work in vise

An angle of 60 between the cutting edge of the saw and the face of the work makes the saw cut with the greatest ease.

Disston Rip Saws, with their Disston steel and temper and Disston true taper grinding, cut with extreme ease when kept properly sharpened, and it is not necessary or desirable to force them in the cut.

Proper angle of saw for ripping

No saw can continue to do good work indefinitely without resharpening, although all Disston saws require less sharpening than others and, when sharpened, retain their keen cutting edges longer. Keep your saw sharp.

In ripping and cross-cutting, it is good practice to cut on the waste side of the line instead of holding the line.

A Selection of Saws and Tools for the Home Shop

THE amateur mechanic who takes pride in his work and who enjoys the ownership of fine tools will see that all his saws bear the name Disston. There is no substitute for Disston quality. The following Disston Saws, Tools, and Files are needed in the home tool kit:

Disston Hand Saw for cross-cutting. The 26-inch length, 8 points to the inch, is most desirable for general work. Disston D-15 is the finest saw in the Disston line, while the Disston D-8 is the most popular Disston Hand Saw.

Disston Rip Saw is also most convenient in the 26-inch length, 5½ points to the inch. The D-15 or D-8 will please you.

Disston Back Saw. The handiest of all small saws. Its fine teeth and stiff back enable you to do smooth, accurate cutting of mitres, grooves, etc., for making furniture, picture frames, mortises and tenons, and doing all fine cabinet work. The Disston No. 4, with 12-inch blade, 3 inches under back, is most popular.

Disston No. 115 Compass Saw, with the new square top plunger type handle, for cutting circles, curves, ovals, etc., 12 or 14-inch blades, can be used in regular or reverse positions. Or you may want a Disston No. 2 Nest of Saws, consisting of a plumber's 14-inch compass saw, tempered to cut wood in which nails are embedded, lead pipe, etc.; a 16-inch regular compass saw blade, and a 10-inch keyhole saw blade.

Disston No. 68 Dovetail Saw, 8-inch, for use wherever the finest possible joint is needed, and for dovetailing, pattern making, etc.

Disston No. 5½ Try Square, 6-inch blade.

Disston No. 3 Bevel, 8-inch blade.

Disston Featherweight Plumb and Level, weight less than two ounces, 9 inches long, with three proved glasses; or the Disston No. 16 Plumb and Level (adjustable), 26-inch length.

Disston No. 36½ Hack Saw Frame, adjustable to take all blades from 8 to 12 inches long, and **Disston Duraflex Hack Saw Blades**, made of Disston Steel.

Disston Cabinet Scrapers, for giving a fine finish to cabinet work, floors, etc.

Disston Files, to keep Disston saws in perfect condition; also Disston Files for general metal working, and Disston Cabinet Files (fine teeth) and wood rasps (coarse teeth) for woodworking. Disston makes files for every purpose—all made from Disston Steel.

Described in the following pages are other Disston Tools which will interest you.

Disston Lightweight Saws

(Skip Pattern)

The modern saws for modern sawing, all made from the famous Disston Steel

D-15 Lightweight Pattern, Straight-back

The finest Lightweight saw that Disston makes. Improved pattern of rosewood handle, with new grip, roomy and comfortable. New carving, new weatherproof finish, nickel-plated screws. Disston true-taper ground.

Cross-cut

24 inches ..... 7, 8, 9, 10 and 11 points
26 inches ..... 7, 8, 9, 10 and 11 points

Rip

26 inches ..... 5½ and 6 points

Price, 26-inch length, $5.85 each

D-12 Lightweight Pattern, Straight-back

Improved pattern of applewood handle, carved; new weatherproof finish. Nickel-plated screws. Disston true-taper grind.

Cross-cut

24 and 26 inches ..... 7, 8, 9, 10 and 11 points

Rip

24 inches ..... 7 points
26 inches ..... 5½ and 6 points

Price, 26-inch length, $4.50 each

D-23 Lightweight Pattern, Straight-back

Improved pattern of applewood handle, carved; new grip, roomy and comfortable; new weatherproof finish. Brass screws. Disston true-taper grind.

Cross-cut

20 inches ..... 10 and 11 points
22 inches ..... 9, 10 and 11 points
24 and 26 inches ..... 7, 8, 9, 10 and 11 points

Rip

24 inches ..... 7 points
26 inches ..... 5, 5½, 6 and 7 points

Price, 26-inch length, $3.35 each

D-16 Lightweight Pattern, Straight-back

Improved pattern of applewood handle; new weatherproof finish. Brass screws. Disston true-taper grind.

Cross-cut

26 inches ..... 7, 8, 9, 10 and 11 points

Rip

26 inches ..... 7½ points

Price, 26-inch length, $3.45 each

Disston Lightweight Saws

(Continued)

D-8 Lightweight Pattern, Skew-back

This is one of the most popular saws in the entire Disston line. This improved pattern of applewood handle, the new weatherproof finish, with brass screws. Disston true-taper grind.

Cross-cut

26 inches ..... 7, 8, 9, 10 and 11 points

Rip

26 inches ..... 5½ points

Price, 26-inch length, $3.45 each

D-7 Lightweight Pattern, Straight-back

Improved pattern of beechwood handle, with new weatherproof finish; brass screws. Disston true-taper grind.

Cross-cut

24 and 26 inches ..... 7, 8, 9 and 10 points

Rip

24 inches ..... 7 points

26 inches ..... 5½ points

Price, 26-inch length, $3.10 each

D-17 Regular Pattern, Skew-back

Known as the Disston Double Duty saw. The most efficient saw ever made for both crosscutting and ripping with the same tool. Widely used for fast, rough sawing in general construction work. The arrangement of the teeth, five regular cross-cutting teeth alternating with two ripping teeth, separated by deep gullets for clearance, insures easy and fast cutting. Disston true-taper grind. Beechwood handle; new weatherproof finish, brass screws.

Made in 26-inch length only

Price, $3.70 each

Disston Regular Pattern Saws

(Standard Width)

All made of the famous Disston Steel

To those who prefer Regular Pattern (Standard width) saws, we can supply all the old-time favorites, improved in every feature, including Disston true-taper grinding, thinner blades, weatherproof-finish handles with covered tops, larger hand holes, etc. Disston Regular Pattern Saws are made in all required lengths and points. The numbers of these old-time favorites are D-115, D-8, D-120 and D-17, in skew-back patterns, and D-12, D-16 and D-7 in straight-back,

How to Choose and Use Back Saws

YOU will find your Disston Back Saw the handiest of small saws. It is indispensable for fine joinery or cabinet work. Its fine teeth and stiff back enable you to do smooth, accurate cutting in making miters (corner angles), dadoes (grooves), tenons (in mortise-and-tenon joints), etc. It is useful for cutting moldings, picture framing and other light stock.

Cabinet makers prefer the Disston Back Saw because it has a heavier back, which stiffens the blade and keeps it down in the cut; because the teeth are shaped and set to cut smoother and easier; because the blade and handle are balanced to insure better work; and because Disston Back Saws also are made of Disston Steel, with the Disston temper and edge-holding qualities.

Disston Back Saws are made in lengths of 8, 10, 12, 14 and 16 inches, with from 12 to 16 points to the inch. The 12-inch length, 14 points, is most popular.

A bench hook is good to have for use with a back saw.

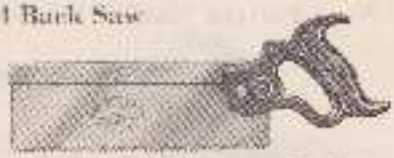
In using a back saw in a miter box be sure that the cut to be made lines up with the slots in the box. Hold work against back of box and start cut carefully with a back stroke, holding handle of saw slightly upward. Gradually level the saw and continue cutting with blade horizontal. Hold saw firmly for clean, straight and accurate cutting.

You should also have a bench hook (at left) to support the work when not using a miter box. Have bench hook at left of cut to be made. Use two bench hooks to support long material. In making mortises, tenons, etc., keep saw level after starting cut, and watch depth at both ends of cut. Use a light, even, level stroke.

Sharpen a back saw with a 8-inch Disston Special Extra Slim Blunt Saw File or a Disston Slim Taper Saw File.

Disston No. 4 Buck Saw

Length of Blade	Width Under Back	Points to Inch
8"	2 1/16"	10
10"	2 1/16"	10
12"	4"	10
14"	4 1/16"	10
16"	4 1/16"	10



Handiest of all small saws. Necessary for all fine joinery and cabinet work. The finest buck saw made. Blade is of Disston Steel, with the Disston temper—hard and tough. Teeth are shaped for fast, accurate cutting. Backs are extra heavy, of bright, polished steel. Handles are of beechwood, with the Disston weatherproofed finish; brass screws.

Disston No. 4 Mitre Box Saw

The leading manufacturers of mitre boxes supply Disston Saws as standard equipment for them. Every Disston Mitre Box Saw is tested for accuracy. Every one will run true and cut a smooth, accurate joint. The blade is placed deep into the handle, and the back is extra heavy, preventing any twisting in the cut. All blades are made 11 points to the inch. Blades made of Disston Steel, with hard, tough Disston temper. Back of bright, polished steel. Beechwood handle, Disston weather-proof finish; brass screws. The following sizes are most popular:

Length of Blade	Width Under Back
20"	4"
26"	4"
28"	4"

Disston Mitre Box Saws are made in all required sizes: those 4 inches under back in 18 to 28-inch lengths; 5 inches under back, 26 to 32-inch lengths, 6 inches under back, 28, 30 and 32-inch lengths.

Disston No. 68, 70 and 71 Dovetail Saws

Wherever the finest possible joint is desired, and for dovetailing, inserting, model building, pattern making, etc., a Disston Dovetail Saw is needed. No. 68 has straight handle; No. 70, open grip handle. No. 71 is same as No. 68, with handle offset to permit cutting with blade flush to the board in a face or wall. All are extremely thin (.018"), with fine teeth (17 points). Sturdy brass plated steel back supports the Disston Steel blade.

No. 70

No. 68

Length of Blade	Width Under Back
6" (Nos. 68 and 70)	1 3/4"
8" (Nos. 68 and 70)	1 3/4"
10" (Nos. 68, 70, 71)	1 3/4"
12" (Nos. 68, 70, 71)	1 3/4"

No. 1 Pattern Makers' Saw

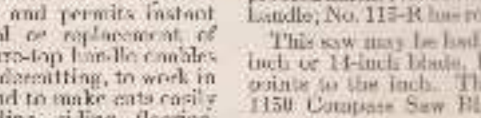
The blade of the No. 1 Disston Pattern Makers' Saw is extremely thin 21 gauge (.032). This saw is designed for small, accurate work in pattern and cabinet making. The teeth are specially shaped to make a fine, exact cut. They are made 15 points to the inch. Blade, of Disston Steel with Disston Temper, is 7½ inches long and 1⅛ inches wide. Open handle, applewood, with the Disston weatherproofed finish; brass screws.

No. 6 Stair Builders' Saw

Used for trenching out stringers, making slots in stair treads or risers, cutting accurate dadoes, etc. Removable blade may be raised or lowered in back to cut any depth up to ⅝ inch. Blade made of Disston Steel, with Disston temper, is 6 inches long and 1⅝ inch wide, 20 gauge (.035), toothed eight points to inch. Handle, of hardwood, extends entire length of blade; has concave curve to receive hand when extra pressure is desired.

The New Disston No. 115 Compass Saw

with Reversible Handle



Developed by Disston, and the finest and handiest Compass Saw ever made. A plunger adjustment does away with screws or levers and permits instant removal, reversal or replacement of blade. The square-top handle enables the user to do undercutting, to work in close quarters, and to make cuts easily in corners, molding, siding, flooring, etc., with the blade in reverse position.

Blades are Disston true-taper ground, like a Disston Hand Saw—a feature not found in any other compass saw. True-taper grinding, with Disston steel and temper, insures easier cutting, faster and better work.

The highly polished blade is toothed to ⅛ inch of end and specially shaped to enter the work. Handles are shaped to give the correct hang. They have rounded edges for a comfortable grip. They are given the Disston weatherproofed finish. No. 115-A has applewood handle; No. 115-R has rosewood handle.

Nail Cutting Blade [illegible]

This saw may be had with either 12-inch or 14-inch blade, both toothed 8 points to the inch. The Disston No. 1150 Compass Saw Blade, 14 inches, 12 points, tempered to cut nails embedded in wood, may be bought separately. It fits only the No. 115 handle.

Plunger Adjustment [illegible] Patent Applied For

NO. 2 COMPASS SAW

The narrow tapering blade in this saw permits its use in cutting circles, ovals, curves, etc., in panels after the part has been made by the use of an auger or brace and bit. It is also used for starting the cut in laid flooring, siding, and similar work for the insertion of a hand saw.

The blade is of Disston-made Steel, and of a special temper to allow for the twisting and turning necessitated by the nature of the work. The handle is of hardwood, fitted with brass screws. The saw is made in 10 to 18 inch lengths.

NO. 4 COMPASS SAW—INTERCHANGEABLE

This saw is the same as the No. 2 compass saw except that the handle is of beech and the blade is slotted so that it may be removed and changed easily. When in place the blade is securely locked by a lever action on the handle. This gives in one tool, a compass saw with a large or small, wide or narrow blade—whichever is best suited for a particular piece of work. The No. 4 compass saw is made in 10 to 20 inch lengths.

NO. 5 KEYHOLE SAW

In making a keyhole, first bore a hole. Then use one of these small tapered saws and cut to the shape desired. The No. 5 is made for this work and for light, irregular sawing of a similar nature.

The handle is of iron with a white-metal finish. The blade may be adjusted to any length by sliding it back into the handle, or it may be pushed through the handle, and the butt of the blade used as a screw-driver.

The blade, 7 inches long, is of Disston made Steel, especially tempered for the work. It is held firmly in the handle by a knurled headed screw.

NO. 95 KEYHOLE SAW

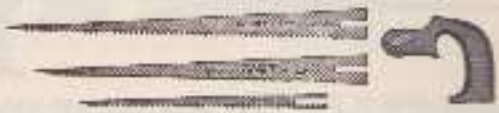
This keyhole saw is preferred by some on account of the style of the handle, which is round, made of hardwood, polished, with nickel-plated ferrules. The handle is slotted clear through, permitting the adjustment of the blade for the length of cutting edge desired. This feature also allows for the blade to slide into the handle, which permits of carrying the saw in the pocket conveniently. Moreover, this means protection for the blade. The blade, of Disston-made Steel, specially tempered, is 10 inches long, ground to a thin back, and is held in place firmly by means of a steel grip inside the handle. This grip is tightened by a set screw on the handle.

NO. 3 NEST OF SAWS

This is a nest or combination of saws for general use. The handle is of beech, with varnished edges, and is equipped with a special adjustable lever tightener. There are three Disston-made Steel Blades of special temper—a 10 inch keyhole saw blade, a 14 inch compass saw blade, and a 16 inch pruning saw blade.

The lever tightener is adjustable to take in different thicknesses of blades. The convenience of this set of saws will readily be appreciated.

NO. 7 NEST OF SAWS



This nest of saws is most commonly used by plumbers. It consists of a beech handle and three blades—a 14 inch plumbers' compass saw blade tempered to cut wood in which nails are embedded, lead pipe, and that class of work encountered in the ordinary course of plumbing; a 16 inch regular compass saw blade, and a 10 inch keyhole saw blade. This nest, like the No. 3, is a combination to permit the user to do the kinds of work mentioned, with only one tool.

NO. 10 COPING SAW

A coping saw is used for cutting on curved lines in such work as shaping the ends of mouldings for joints, for narrow scroll work, making shelf brackets, wood toys, etc.

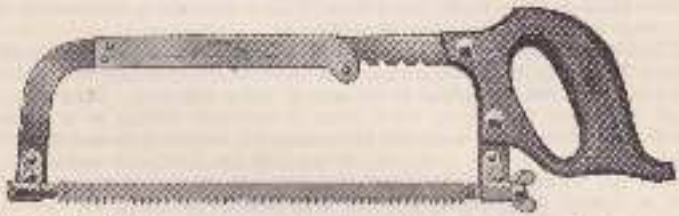
The No. 10 is a well-made coping saw and is much stronger and more efficient than the ordinary wire-back style. The blade is controlled or adjusted for sawing sharp corners or angles by two knurled screwheads, and is readily inserted or removed.

The hardwood handle is polished and fitted with a heavy nickel-plated steel ferrule. The frame is of Disston-made Steel, nickel-plated, ⅜ of an inch wide by 3/16 of an inch thick and is 4½ inches deep from the teeth-

edge of the blade to the inside of the back. The length of the blade is 6½ inches from pin to pin.

Extra blades, fitted with pins for the No. 30 coping saw may be purchased separately.

NO. 36½ HACK SAW EXTENSION FRAME

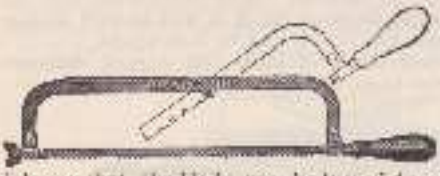


The No. 36½ is an extraordinarily well built hack saw frame, widely used because of its strength, ease of adjustment, and efficient service.

The handle on the No. 36½ is very popular. It is of the bandsaw type and gives the user exceptionally good control of the saw. The grip is large and comfortable and does not slip from or cramp the hand. It is made of nicely finished hardwood.

The nickel plated steel frame is adjustable by half inches for blades 8 to 12 inches long. The sockets are secured by rivets. The stretchers, which hold the blade rigidly in place, are reversible for sawing straight or sideways and will not fall out while readjusting blade. The frames are sold without blades.

NO. 110 HACK SAW ADJUSTABLE FRAME



This is an excellent adjustable hack saw frame for general all-around use in cutting metal, and can be adjusted for blades from 8 to 12 inches long.

The frame is of nickeled steel. The hardwood handle is black. The pivoted sockets are reversible so that the blade can be turned to cut sideways. The stretchers will not fall out while readjusting.

NO. 10 PLUMBERS' SAW

This saw is made particularly for use in making repairs where it is necessary to cut through joists, rafters, flooring, and the like in which nails may be embedded—also for cutting soil pipe, gas pipe, etc. The blade is of Disston-made Steel, specially tempered and toothed for this work.

The hardwood handle is nicely carved and polished. It may be adjusted to various positions most convenient for each piece of work. The lengths vary from 16 to 24 inches.

CHROMOL HACK SAW BLADES FOR HAND USE

The Disston "Chromol" Hack Saw Blades are widely known for their exceptional cutting quality and durability.

The blades are of special Disston Alloy Steel peculiarly suited for metal-cutting. The teeth, to insure the greatest possible strength and to make them sharp and clean cut, are milled in instead of being punched. They are "set" in such a manner that every third tooth is straight cutting as a cleaner while the two intervening teeth are set alternately to the right and left. This arrangement allows each tooth to do its full share of the work and the action of the "cleaner" tooth relieves the set teeth of part of the wear. This makes a faster, easier cutting blade and greatly prolongs its usefulness.

Disston Chromol Blades are hardened throughout by a Disston process which renders them hard and tough without being brittle.

The lengths, measured from the center of one hole to the center of the other hole range from 8 to 18 inches.

For cutting the various classes of material we recommend blades, for hand frame use, of the following number of "points to the inch."

Soft steel, cast iron, etc., and all general work—16 points or 15 teeth to the inch.

Steel, light angle iron, and hard metals 18 points or 17 teeth to the inch.

Brass, copper, drill rods, iron pipe, and sheet metal—24 points or 23 teeth to the inch.

Tubing and metal thinner than 22 gauge—32 points or 31 teeth to the inch.

The stock sizes are ⅝ inch wide, 22 gauge for 8, 9, and 10 inch blades, and 9/16 of an inch wide, 23 gauge for 12, 14, and 16 inch blades.

We manufacture various other styles of blades for cutting different metals by hand or machine. Write to us for further information.

HAND HACK SAWS
NO. 340

The hand hack saw is made especially for the use of structural iron workers and others in places, and on work, where the frame hack saw cannot be used because of the limitation of the depth of the cut that can be made with the hack saw frame.

The hand hack saw, being longer on the cutting edge, allows for a much longer cutting stroke and is therefore preferred when much cutting is to be done.

The blade, of Disston made Steel, is given a special high temper; it is hollow ground for clearance, and **requires no set.** It is made 12 points to inch and in lengths from 10 to 30 inches. **Do not set the teeth; an attempt to do so may break them.**

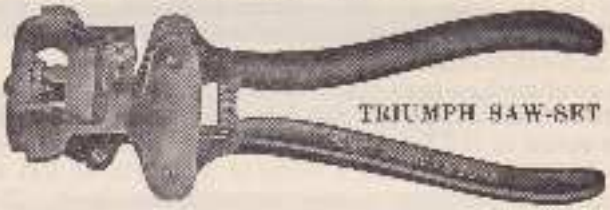
This same style of saw is specially made for cutting various metals, as follows:

The No. 341 is for cutting copper and brass. This saw is made 10 points to the inch, in lengths from 10 to 30 inches. The teeth should not be set as the blade is ground for clearance.

The No. 342 is for cutting metal trim. This saw is for cutting light pressed steel shapes, steel mouldings, and metal trim of all kinds. It is made 16 points to the inch. The teeth should not be set as the blade is ground for clearance.

The No. 343 is for cutting babbetin. This saw is made 11 points to the inch. **The teeth in this blade can be set.**

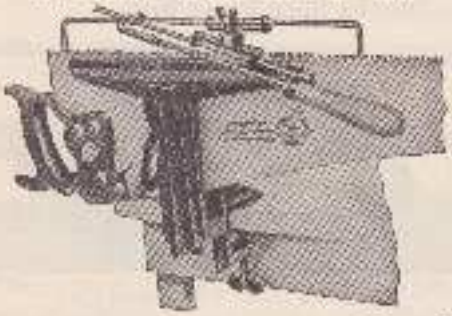
SAW SHARPENING TOOLS



TRIUMPH SAW-SET

This tool operates by the use of two plungers. Pressure on the lower lever forces one plunger against the body of the saw to hold it rigidly in position and prevent slipping. Pressure on the upper lever at the same time operates the second plunger to press against and set the teeth.

D-3 FILING GUIDE AND CLAMP



There is no reason why any person, with a little practice, should not be able to resharpen a saw, if he has proper instructions and exercises ordinary care in following them.

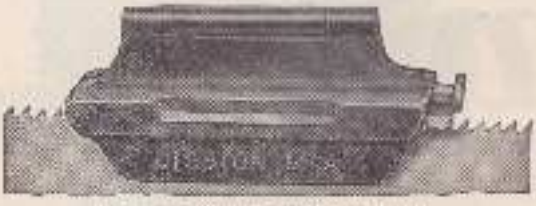
The Disston Jet Filing Guide and Clamp is specially designed to assist those not skilled to file a saw correctly. By means of the file holder and sliding arrangement the file can be adjusted to any position required and so held during the entire operation of filing. Thus every tooth will be filed at the same angle without that variation so difficult to overcome in filing by hand alone. It is made to file both cross-cut or rip saws. The length of the jaw is 12½ inches.

This illustration shows a saw and the guide in the proper position for filing. There are three marks on the lower hub of the swivel attachment, and one mark on the upper. One of the three marks shows when the file is in position for filing one side of the teeth of a cross-cut saw, and another when it is in position for filing the other side. The third, or center mark, shows when the file is in position for filing rip saws. To obtain the correct position, loosen the wing-nut and move the guide around to the point desired. After tightening the wing-nut, loosen the screw in the file holder and adjust the file for the shape of tooth wanted.

A good method is to place the saw in the clamp, then select a tooth of correct shape and let the file down into it; tighten the set screw in the handle, then file a tooth to see if the shape suits. If not, turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth. When one side is filed, reverse saw and attachment and file the other teeth.

For rip saws, place the file at right angles with the saw, noting the center mark as mentioned above, and file every tooth. Always keep the file as nearly horizontal as possible. Use a 5½ in Disston Slim Taper File.

HANDSAW JOINTER



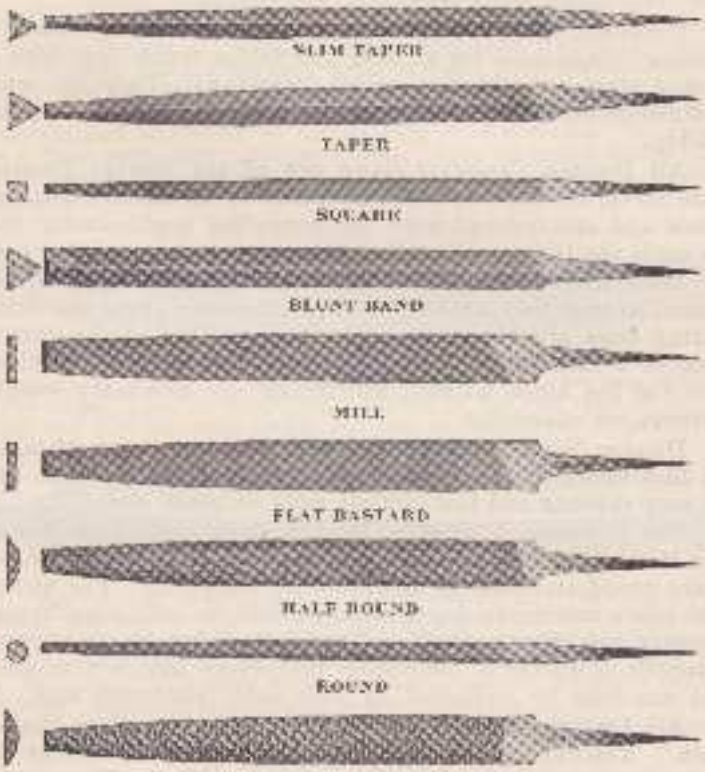
How saw holder in position on a saw

As noted in the section "How to Sharpen a Saw" beginning on page 32, when the teeth of a saw become irregular in size, it is absolutely necessary to dress them down until all are of an equal height. This should be done before attempting to re-set or sharpen.

To facilitate this work and insure accuracy we fully recommend the Disston Hand Saw Jointer.

It is made of iron, japanned. It is hinged to open for positioning on the saw and adjusting the file, which is securely locked in place by a screw.

FILES



Files. For accurately sharpening well-tempered saws, carefully made files of good cutting quality are prime essentials.

Disston Files are of Disston-made Steel, with well-formed teeth. They are hardened by a Disston special process.

We use over 35,000 dozen files annually in our own handle department, saw works, and machine shops. This enables us to watch and maintain a high standard of quality and efficiency

Information regarding files suitable for sharpening hand saws will be found on page 36 under the heading "Necessary Equipment."

CROSS-CUT SAWS

Cross-cut saws are made primarily for cutting down, or "felling" trees, and for cutting the fallen trunk into logs of desired size—an operation called "bucking." They are made in different styles to cut the various kinds of timber easily and quickly.

All Disston Cross-cut Saws are of the famous Disston-made Steel; are hardened and tempered by special Disston processes and are finished with the same fine workmanship that has made the Disston Hand Saw "the saw most carpenters use."

Disston Cross-cut Saws are taper ground—that is, are ground so that they are of the same thickness along the entire cutting edge and then taper, on lines parallel to the cutting edge, to a thin back. This gives maximum amount of clearance for the blade without sacrificing any necessary weight, stiffness, or elasticity.

Disston High-Grade Cross-cut Saws, some styles of which are illustrated, are becoming increasingly popular because they are easy running and fast cutting saws of great durability.

The Suwanee, Virginian, Beaver, Buzz, and Cedar Savage One-Man are all high-grade saws. They are made for use where speed and ease in operation are essential. For anyone with much sawing to do, these saws will be very satisfactory. Whether the "four-cutter" or "two-cutter" type is to be used, is largely a matter of individual preference and is a question that can best be answered by your local hardware man.

All high-grade cross-cut saws are made with a "raker-tooth." The raker tooth is set between each group (either two or four) of scoring teeth and looks like a chisel. The scoring teeth cut a groove at the sides of the cut and this raker tooth planes out the material from the center. That is why "sawdust" made with Disston High-Grade Cross-cut Saws looks like shavings.

The regular cross-cut saws, of which No. 1 Tenon Tooth is an example, are the old type of saw and are used for ordinary sawing where speed and exceptional durability are not such important factors.

NO. 495 SUWANEE CROSS-CUT SAW

The Disston Suwanee Cross-cut Saw is of the highest grade of the cross-cut saws made by Disston. In material, workmanship, and design it represents the best. It is largely used by experienced lumbermen because of its record and speed in operation, and durability. The Suwanee is most commonly used for "bucking" or cutting fallen timber to lengths, a wide type blade being preferred by many for this work, although it is and can be successfully used for "felling" or cutting down standing timber. The Suwanee is a "four cutter with raker tooth" type. It is six gauges thinner on the back than on the tooth edge. It is made in lengths from 5 to 8 feet and longer if required.

NO. 289 VIRGINIA CROSS-CUT SAW

This saw is exactly like the Suwanee in design and is made for the same purpose. It is made to meet the demand from those users who prefer the "two cutter" type. It is six gauges thinner on the back than on the tooth edge and is of the same quality and cost as the Suwanee. It is made in lengths from 6 to 8 feet and longer if required.

NO. 484 BEAVER (HOLLOW BACK) CROSS-CUT SAW

For "felling" or cutting down trees a narrow type blade is most commonly used, because it is easier to operate in this work than a wider blade.

The Beaver of the same good quality as the Suwanee and Virginian, is made primarily for "felling" although it can be used for other work. It is a "four cutter" with raker teeth; the blade is narrow, cut with a curved or "hollow" back, and ground three gauges thinner on the back than on the cutting edge. This saw is made in lengths from 4 to 8 feet and longer if required.

NO. 470 BUZZ CROSS-CUT SAW

The Buzz, of the same quality of material and workmanship as the saws described above, is a blade intermediate between the wide (as Suwanee and Virginian) and the narrow (beaver) types and is used for both "bucking" and "felling" where the trees to be cut are small. The Buzz is similar in quality and price to the Beaver. It is made in lengths 4 to 8 feet and longer if required.

NO. 410 CEDAR SAVAGE ONE-MAN CROSS-CUT SAW

The Disston Cedar Savage One-man Cross-cut Saw is especially adapted for cutting cedar. It is designed to be used by one man, although it can be fitted with an auxiliary handle for two men's use. It is made of the same quality Disston made Steel as Disston Hand Saws. The blade is narrower than the regular one-man cross-cut saw (of which Disston makes a complete line) and, being ground to a taper, affords the necessary clearance with the least amount of set.

This is a "four-cutter" saw. The teeth are deep with special shaped undercut and ample gullet room. It is fitted with a large handle with two horns, made of selected, thoroughly seasoned hardwood. The grip is extra large, suitable for a gloved hand. This saw is made in lengths 3 to 6 feet.

NO. 1 TENON TOOTH CROSS-CUT SAW

This style of cross-cut saw is perhaps the oldest form in use. It is still used by a great many for bridge work, framing, and ordinary two-man sawing where one tool must do many kinds of work.

HANDLES FOR CROSS-CUT SAWS

NO. 119 HANDLE

This pattern of handle is made to be fastened on the edge of the saw and is preferred by some users. The handle, 13½ inches long and 1⅝ inches in diameter, is made of carefully selected, thoroughly seasoned hardwood, shaped for an easy, comfortable grip, and fitted with heavy malleable iron castings and a strong threaded bolt with a wing nut.

NO. 122 HANDLE

This is the best and strongest loop handle made. It is easily and quickly adjusted to, or removed from, the saw. This handle has a very easy and comfortable grip. It is made of carefully selected, thoroughly seasoned hardwood, well-fitted with malleable iron castings.

NO. 103 CLIMAX HANDLE

This is a reversible handle for holding the cross-cut saw in a horizontal or perpendicular position. It is similar in style to the No. 119. The difference is that the castings are of grey iron and of lighter weight, with malleable iron bolt and nut. This handle is made 13½ inches long and 1¾ inches in diameter.

SCREW-DRIVERS

NO. 88 SCREW DRIVER

Automobilists, mechanics, and all workers who subject their screw-drivers to great strains will find this a very satisfactory tool.

The blade, of Disston-made Steel, is especially hardened and tempered throughout; it is subjected to severe "screw-bar" or pry tests and tests for toughness of the point before leaving our factory.

The handle is of hardwood, black finish, and the shape provides a firm grip. The ferrule is extra long and heavy and nickel plated. The blade is fastened in the handle by a special arrangement of spines which absolutely prevents turning in the handle.

It is made in sizes from 3 to 12 inches.

In all screw-drivers, length is measured by length of blade only.

NO. 31 SCREW-DRIVER

This is a special screw-driver for the use of cabinet makers and others requiring a light tool. It has a round steel blade, 3/16 of an inch in diameter, carefully hardened and tempered, finished bright, sheet hardwood handle.

The tang of this screw-driver is driven into the handle, and a rivet, headed on both ends, extends through ferrule, handle, and tang. This prevents the blade from turning in the socket, making a strong, durable driver.

The sizes range from 2 to 12 inches.

NO. 9 SCREW-DRIVER

In the No. 9 screw driver, the blade extends through the handle and is capped on the end (as shown in the illustration). In addition to this a rivet extends through the handle, ferrule, and blade to prevent the blade from turning in the handle. This construction gives a very strong, durable tool.

The handle has rubberoid finish. The blade, of Disston-made Steel, is carefully hardened and tempered and has a polished finish. This screw-driver is made in sizes from 3 to 12 inches.

NO. 30 SCREW-DRIVER

NO. 15 SCREW-DRIVER

The round blades in the Nos. 30 and 15 screw-drivers are of Disston made Steel, forged to shape, carefully hardened and tempered.

The tang is securely fastened in the handle and a rivet extending through ferrule, handle, and tang is headed on both ends. This prevents the blade from turning in the socket, making a strong, durable screw-driver.

Both of the drivers are made in sizes from 2 to 12 inches.

PLUMB AND LEVELS

Disston Plumb and Levels have achieved an enviable reputation for excellence in workmanship and design. They are all made of carefully aired and kiln dried hardwood stock.

The Disston Plumb and Level Adjustment is the most simple and positive on the market.

The removal of two small screws gives immediate access to the working parts. Loosen the lock screw, true up the bubble by turning the adjusting screw, then tighten the lock screw—the job is done. This is a most simple arrangement to offset possible variations. The adjustment is solid when set and there are no springs to allow annoying inaccuracy. Moreover, this adjustment cannot rust fast, because the screws work directly into the wood.

The Disston line includes levels for all uses. The following are three representative styles.

NO. 16 PLUMB AND LEVEL (ADJUSTABLE)

This is a well-finished and very popular tool at a medium price. The No. 16 is fitted with the Disston Adjustment described above. The stock is of thoroughly seasoned hardwood, stained and polished. This level has the arch top plate over the level glass, two side views, the Disston Corrugated Grip, and is reinforced with solid and very heavy brass ends for protection against breaking or chipping in case of accident. It is made in 28 to 30 inch lengths.

NO. 9 PLUMB AND LEVEL (NON-ADJUSTABLE)

This is a good, practical, non-adjustable level made of plain hardwood stock at a moderate price. The No. 9 has an arch top plate over the level glass. It has two side views and is fitted with the Disston Corrugated Grip —a special grip that gives an unusually comfortable and secure hold on the level. It is made 24 to 30 inch lengths.

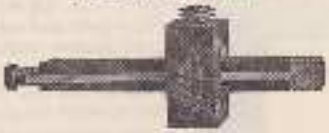
NO. 24 PLUMB AND LEVEL (ADJUSTABLE)

This is a well-made level, of hardwood stock, stained and highly polished. The No. 24 has the Disston Adjustment, Corrugated Grip, Arch Top Plate, Improved Duplex Side Views and solid brass ends. A carefully made and highly finished tool. The No. 24 is higher in finish than the No. 26 and, therefore, slightly higher in cost.

GAUGES

Gauges of this type are used in marking wood for cutting mortises, etc. Two popular gauges are shown from a complete line of over 20 different styles.

NO. 98 GAUGE



This gauge is made for those who desire fine tools. The material, workmanship and finish are of the best quality. The gauge is of genuine rosewood stock, highly polished. The screw slide, head, and stem are protected with brass strips. The No. 98 is fitted with a brass thumb screw for tightening.

NO. 88 MARKING GAUGE

Heavy spur of tempered steel cuts a clean groove. Will not follow grain of wood. Oval head allows close work. Knurled screwhead gives positive lock, but prevents overtightening of screw or splitting of head. Made of cherry wood inlaid with two brass strips. Screw in stem prevents removal of head. Not graduated unless specified. Made specially for school shops.

TRY SQUARES AND BEVELS

The chief requirements of this class of tools, which are used for marking angles for sawing, etc., are accuracy and durability. All Disston Try Squares and Bevels are carefully made of good materials and tested for accuracy.

NO. 1 TRY SQUARE

Try squares are made for measuring and marking right angles. This is the kind of tool used in marking a board for a "square" end. The No. 1 try square has a genuine rosewood stock hollowed for the most comfortable grip, nicely polished, and fitted with a heavy brass face plate. The steel blade is tempered, has a blued finish, is marked with inches for measuring, and is accurately and securely fastened to the stock. Every No. 1 try square is tested at the factory for accuracy. This tool is made in sizes from 3 to 18 inches.

NO. 10 MITRE SQUARE

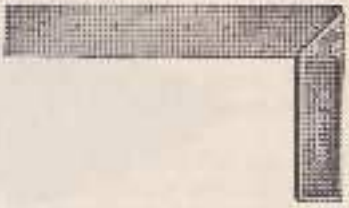
A mitre square can be used in place of a try square and, in addition, the upper end of the stock is cut with a 45 degree angle for marking mitres. The No. 10 is made of the same materials as the No. 1 try square above and the special construction absolutely insures accuracy and strength. The blade is a solid, "L" shaped piece of steel. One arm of the blade extends through a slot in the stock, flush with the back—and is fastened there with heavy brass rivets. This makes the stock and blade practically a one-piece tool.

The sizes vary from 4½ to 12 inches.

NO. 5½ TRY SQUARE

The No. 5½ try square is similar in design and use to the No. 1. However, the No. 5½ is made with a steel blade, tempered and marked in eighth inches for measuring, and has an iron stock, nickel-plated. The iron stock is preferred by some because of the greater strength and durability of the tools than those with wood stocks. The No. 5½ is true for marking on both inside and outside edges. The sizes range from 2 to 12 inches.

NO. 11 MITRE SQUARE



This square is of the same style and construction as the No. 5 ½ except that the upper end of the stock is cut at a 45 degree angle for use in mitering work. This is made in sizes from 2 to 12 inches.

NO. 2 BEVEL

The No. 2 bevel is an adjustable tool that can be set for marking a bevel at any desired angle. It is made with a sensitive rosewood stock, hollowed out to form a comfortable grip. It is filled with a heavy brass face plate. The steel blade is tempered and has a blued finish. The blade is set or released by a brass lever. The most outstanding feature of the No. 2 bevel is that the handle is tapered on the side which takes the tightening lever. This allows the tool to lie flat on either side. This bevel is made in lengths from 6 to 14 inches.

NO. 3 BEVEL

The No. 3 bevel has a nickel plated iron stock; steel blade. The blade is fastened or released by a patented mechanism controlled by a thumb-screw at the butt of the stock. A quarter turn of this screw absolutely locks the blade in place. The No. 3 is made in 6, 8, and 10 inch lengths.

BRICK TROWELS

Each Disston Brick and Pointing Trowel is made of a single piece of Disston-made Steel, of a quality especially adapted for trowel blades. The tang being forged from one end gives a strong solid shank for the handle.

The blades are highly tempered, taper-ground, and possess the requisite springs. The posts are made straight, (at right angle to the blade) which gives a proper balance to the tool. The handles, turned to form, give an easy, comfortable grip. They are reinforced with a strong ferrule and fastened on the tang by a special method to prevent them from coming loose.

While but few trowels are illustrated here the Disston line is complete and meets the requirements of the various users in all sections.

NO. 36 BRICK TROWEL

This is the patented spiral tang which prevents handles on Disston brick trowels from working loose.

The No. 36 Brick Trowel has a wide heel made in the approved shape. Blade of Disston made steel, taper ground from heel to point, to give the desired flexibility.

The steel tang is spiral shaped (see illustration above). The hardwood handle is forced on to this tang with a revolving motion at great pressure. Blade and tang made from one solid piece of Disston steel.

Trowel post at true right angle to blade. Proper left to handle for easy work.

Sizes: 9, 9½, 10, 10½ inches; gauge at post, 75; gauge at point, 25; height of post, 1¾ inch.

NO. 30 BRICK TROWEL
MANHATTAN PATTERN

The No. 30 trowel has a wide heel and one edge more rounding than the other—a style preferred in some sections.

This trowel is made in lengths of half inches from 9½ to 12 inches, measured on the blade from the point to the heel of the post.

POINTING TROWELS

NO. 15 POINTING TROWEL

For the pointing or shaping of the bond or mortar between the bricks or stones of a wall the No. 15 pointing trowel is the shape most generally used.

It is well made in every particular, with a solid forged shank. It is firmly handled and is strong and durable.

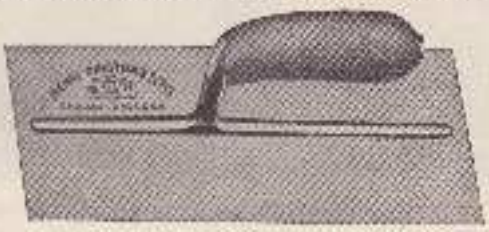
The lengths are in half inches from 4 to 6½ inches, measured on the blade from the point to the heel of the post.

PLASTERING TROWELS

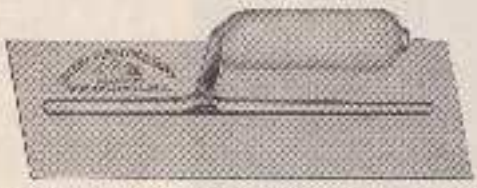
The full Disston line of plastering trowels, covers various patterns, short and long mountings, fastened with three, four, five, or ten rivets to the blade, some of the latter being made extra thin and specially ground as required.

The mountings are made of the best material for the purpose—malleable iron—fitted with handles which are fastened by an improved method and which are not liable to come loose.

NO. 28 FINISHING PLASTERING TROWEL



Manufactured from the highest grade Disston-made Steel, tempered by our improved method; accurately ground blades, extra thin, 24 gauge, slightly concaved. Extra long mounting, fastened to the blade with ten rivets. The handle is specially shaped and turned to fit the hand.



NO. 28 PLASTERING TROWEL

This is representative of a group of thin bladed trowels, with special design of rounding, some having a reinforced post, with polished wood handle or leather grip handle, and others with extra thin blades.

No. 28, illustrated, possesses an accurately ground thin blade, fastened to an extra long mounting by ten rivets. The upright forms a shield for the protection of the hand. A long tang extends through the handle which is securely fastened by a hexagon barrel-nut. The end of the polished wood handle is beveled to act as a thumb-rest.

The blades vary in size from 10x4½ inches to 12x5 inches.

This group of plastering trowels represents the most efficient and highest type of trowels ever placed on the market.

In addition to brick, pointing, and plastering trowels the Disston line—a complete line of trowels—includes trowels of special strength and durability for cementers' use, circle or cove trowels, corner trowels for the inside or outside of corners, garden trowels, etc.

HOW TO SHARPEN A SAW

A Disston Saw is a fine tool, accurately made by master-craftsmen and will give a life-time of service if properly handled. Use it as a fine tool should be used. When necessary to set and file it, follow these directions carefully.

Before starting work, read ALL the directions. Then, as you work, read them step by step.

Fig. 1—Side view of crosscut teeth

Examine the tooth-edge of your saw to see if the teeth are uniform in size and shape and to see that they are properly "set."

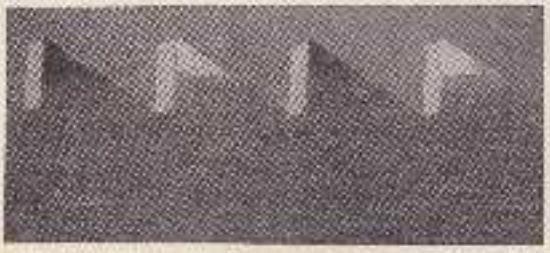


Fig. 2—Side view of rip saw teeth

It is not necessary to reset the teeth of a well-tempered hand saw every time it needs sharpening. If the teeth are touched up with a file from time to time as the saw is used (on the same principle as stropping a razor) the saw will run longer and better, and sufficient set will remain to enable the saw to clear itself. The proper amount of set is shown in Fig. 3.

Fig. 3—Looking from the back of a saw. This shows how the teeth, when set, extend beyond the edge of the blade.

Now study the shape of the teeth. Teeth of saws for crosscutting should be shaped like those in Fig. 1; teeth of saws for ripping like those in Fig. 2, above. A saw cannot give good service unless the teeth are even (of the same size and regular) and properly shaped.

If the teeth are uneven, it is necessary to "joint the saw" and "shape the teeth" in accordance with the instructions below.

JOINTING

(To be done only when the teeth are uneven or incorrectly shaped, as explained above). Unless the teeth are regular in size and shape the set can never be regular and it is useless to attempt to regulate them without "jointing" until all are of equal height.

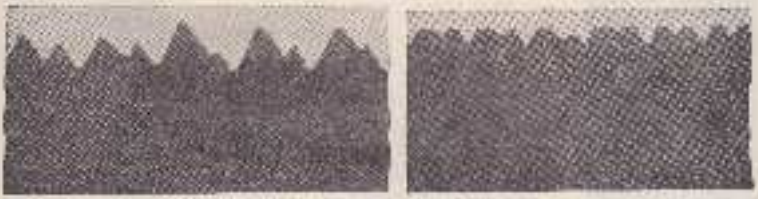


Fig. 1. The above are photographic reproductions of the actual condition of some saws returned to us and are typical of the manner in which many saws are used and abused. It is best to have saws, such as these, retoothed at the factory.

TO JOINT A SAW

Place the saw in a clamp, handle to the right. Lay a mill file lengthwise on the teeth. Pass it lightly back and forth the length of the blade, on the tops of the teeth, until the file touches the top of every tooth. If the teeth of your saw are very uneven, it is best not to make all the teeth the same height the first time they are "Jointed." In this case "Joint" only the highest teeth first, then "Shape" (see "Shaping the Teeth," below) the teeth that have been "Jointed," then "Joint" the teeth a second time, passing the file along the tops of all the teeth until it touches every tooth. The teeth then will be of equal height. Do not allow the file to tip to one side or the other.

The Disston Hand Saw Jointer, described on page 30, is made to help you do this work more accurately. This tool holds the file and is so made that it holds it squarely on the tooth edges. This eliminates any chance of tipping the file to one side or the other and so rounding the points of the teeth.

SHAPING THE TEETH

(To be done only when the saw has been "Jointed.") After jointing, all teeth must be filed to the correct shape. The gullets must be of equal depth. The fronts and backs of the teeth must have the proper shape. The teeth must be uniform in size. (See page 32, Figs. 1 and 2 for shape. Disregard bevel, which will be taken care of later.) To do this, place the file well down in the gullet and file straight across the saw, at right angles to the blade (under no conditions hold the

file at any other angle.) If the teeth you are filing are of unequal size, press the file against the teeth having the largest tops, until you reach the center of the flat top made by "jointing."

Then move the file to the next gullet, and file until the rest of the top disappears and the tooth has been brought up to a point. Make no effort to bevel the teeth at this time.

The teeth, now shaped and of an even height, are ready to be set.

Fig. 5
Rear view showing correct reach

Fig. 6
End view of tip

SETTING THE TEETH

As mentioned before, you need not reset the teeth of a well-tempered hand saw every time the teeth need a light sharpening. If it was not necessary to "Joint" and "Shape the Teeth," examine the saw to see if the teeth have the proper amount of set indicated in Figs. 3 (page 32), 5 and 6 (this page). If they do, the saw is ready for filing.

If they do not, set them in accordance with the following instructions:

Note—It is always necessary to set the teeth when you have "Jointed" and "Shaped the Teeth" of your saw.

The teeth of a hand saw should be set before filing to avoid injury to the cutting edges.

Purpose of Set. The purpose of setting the teeth of saws, that is, springing over the upper part of each tooth (not more than the half of the tooth nearest the point), one to the right, the next to the left, and so on alternately throughout the entire tooth edge, is to make the saw cut a kerf slightly wider than the thickness of the blade. This gives clearance and prevents friction which would cause the saw to bind and pull hard in the cut.

Depth of Set. Whether the saw is fine or coarse, the depth of the set should not go, at the most, lower than half the length of the tooth. This is important. If deeper than this it is sure to spring, crimp, or crack the blade, if it does not break out the teeth.

A properly ground saw requires very little set, for the blade, being of uniform thickness along the entire tooth-edge, tapers thinner to the back and also tapers from butt to point, which provides a measure of the clearance necessary for easy running.

Soft, wet woods require more set and coarser teeth than dry, hard woods. For fine work on dry woods only, either hard or soft, it is best to have a saw with fine teeth and little set.

Setting with Hammer and Anvil. Setting can be done by the use of a special anvil, which has a slightly beveled edge over which the teeth extend. The points of the teeth, extending over this beveled edge, are given the set by striking each a quick blow with a light hammer, the force of which springs the point the depth of the bevel on the face of the anvil. The further over the bevel the point extends, the greater, of course, will be the depth of set. A highly tempered saw may require several blows as it may break if you attempt to set the teeth with too heavy a blow.

Setting by this method requires considerable skill and only by practice can the weight of the blow required be determined. This method is not recommended for the amateur.

Setting with Sawset. The general practice, outside of a saw factory, is to set the teeth with the use of what is termed the spring set—bending over the point of each by pressure with a special tool known as a sawset. Many so called sawsets are impractical; they give too deep a set, or the pressure is improperly applied. Recognizing this difficulty years ago, Disston invented and produced the Triumph Sawset and fully recommend it as a tool that will do this work properly. The Triumph Sawset is illustrated and described on page 19.

FILING THE TEETH

There are quite a number of shapes of teeth, varying in angle, bevel, etc., each adapted for special work such as cutting dry seasoned lumber, wet green lumber, soft woods, hard woods, etc., but the purpose of this article is to treat only on the setting and filing, or sharp-

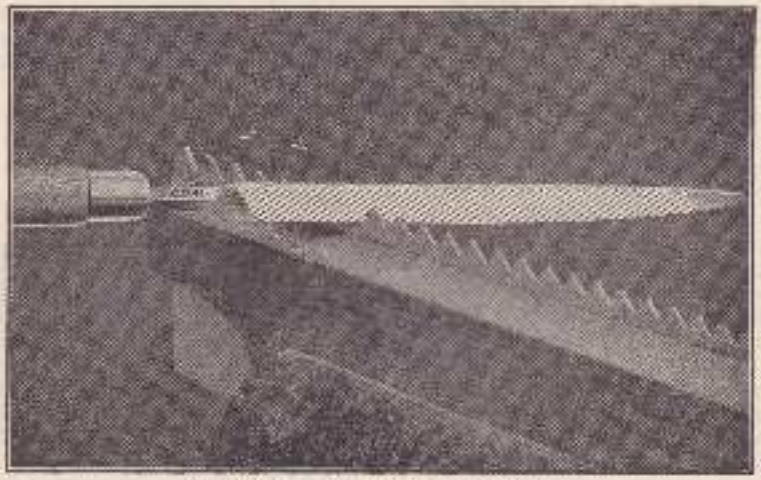


Fig. 1—File in position near point of saw

cning, of those hand saws ordinarily used, the teeth of which are alike, whether large or small. Everyone but the experienced saw user who knows from experience just what angles and bevels he prefers, should follow these rules exactly for best results.

Necessary Equipment. The only equipment necessary consists of a clamp and files. The clamp should be sufficiently strong to hold the blade firm enough to prevent chattering, and one in which the blade can be placed and tightened easily and quickly. The top of the clamp should be on line with the operator's elbows for best working position.

Use the Disston Special Extra Slim Blunt Saw File. It has a special cut, plenty of bite, cuts fast and true. Extra slim, so you can see where and how you are cutting. Parallel sides no taper, for a level, uniform stroke. Following table indicates length of file to be used:

		5 and 5½ point Cross-cut Teeth 7" Spec. Ex. Slim Blunt Saw Files											
6	7	8	"	9	"	"	"	6"	"	"	"	"	"	"
		10	"	11	"	"	"	5"	"	"	"	"	"	"
4½	5	5½	"	6	"	Rip		7"	"	"	"	"	"	"

4 point Rip and coarser, 6" Taper Files.

Fig. 8—First position for filing hand saws for cross-cutting.

To determine the "point" of a saw, count the number of tooth points to the inch, measuring one inch from the point of any tooth. Note that there is always one more point to the inch than there are complete teeth to the inch.

Place the saw in filing clamp with handle at right. The bottom of the gullets should be ⅛ in. above the jaws of the clamp. If more of the blade projects the file will "chatter" or "screech." This dulls the file quickly.

It will assist you to file a saw properly, if at the start, you pass a file lightly down the tops of the teeth (just as instructed under "Jointing" page 38) to form a very small flat top on each tooth. The purpose of this is to

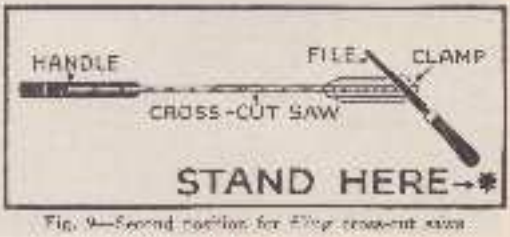


Fig. 9—Second position for filing cross-cut saws.

provide a guide for filing. It does, however, again even up the teeth—which was the main purpose of "Jointing" explained on page 33. Now, file the teeth as instructed in the following paragraphs.

Stand at First Position, Fig. 8. Start at the point. Pick out the first tooth that is set toward you. Place file in the gullet to the left of this tooth. Hold file directly across the blade. Then swing the file handle toward the left for about 45 degrees (half of a right angle). Correct angle is shown in Fig. 8.

Hold the file level and at angle shown in Fig. 9. Do not allow it to tip upward or downward. Be sure the file sets down well into the gullet. Let it find its own bearing against the tooth it touches. It will help the beginner if he will first observe the shape and bevel of some of the unused teeth that can most always be found near the handle-end of a saw. If these teeth are shaped as they left the factory, they will serve as a guide.

The file should cut on the push stroke. It files the tooth to the left and the tooth to the right at the same time. File the teeth until you cut away one-half of the flat tops you made on the teeth as a guide, then lift the file from the gullet. Skip the next gullet to the right, and place the file in the second gullet toward the handle. Repeat the filing operation on the two teeth the file now touches, being careful to file at the same angle as before. Continue this way, placing the file in every second gullet, till you reach the handle-end of the saw.

Study Fig. 9 before you go further. Turn the saw around in the clamp, handle to the left. Take Second Position, Fig. 9. Place the file in the gullet to the right of the first tooth set toward you. (This is the first of the gullets you skipped when filing the other side of the saw.) Turn file handle 45 degrees toward right, this time. Now file until you cut away the other half of the flat top made on the teeth as a guide, and the teeth are sharpened to a point. Continue this, placing file in every second gullet, till you reach the handle of the saw.

FILING HAND SAWS FOR RIPPING

With one exception, this method is exactly the same as that given for Cross-cut Saws.

This exception is that rip saws are filed with the file held straight across the saw, at a right angle to the blade. Some mechanics, however, prefer to file a slight bevel in rip saws.

Place saw in clamp with handle toward the right. Start at the point. Place the file in the gullet to the left of the first tooth set toward you.

Continue placing file in every second gullet and filing straight across. When handle of saw is reached in this way, turn saw around in the clamp. Start at point again, placing file in first gullet skipped when filing from other side. Continue again in every second gullet till handle-end of saw is reached.

THE SHAPE OF SAW TEETH
PROPER ANGLE OF TEETH

Some additional information about the angle of the teeth in saws for cross-cutting may be of use. The angle of the tooth is one of the most important features and too much care cannot be taken to have the correct angle for the duty required.

To illustrate this, the accompanying picture represents a board, across which we wish to make a deep mark with the point of a knife. Suppose we hold the knife nearly perpendicular as at B, Fig. 10. It is evident that it will push harder and will not cut as smoothly as if it were inclined forward as at A, Fig. 10. It follows, then, that the cutting edge of the cross-cut saw should be at an acute angle as at C, Fig. 10, rather than stand perpendicular as at D, Fig. 10.

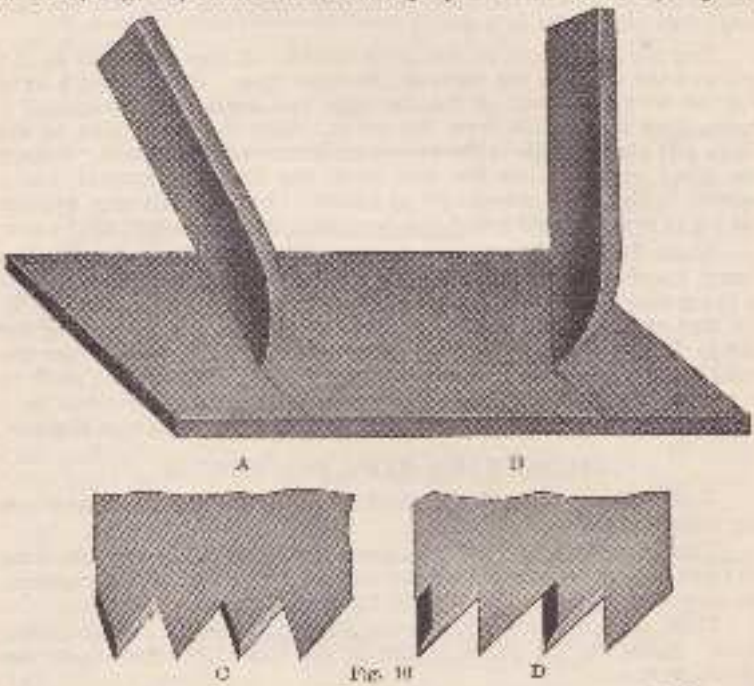


Fig. 10

Too much angle and too heavy a set are very common faults, not only detrimental to good work but ruinous to the saw. When a saw has a large amount of hook or pitch, as at D, Fig. 10, it often takes hold so keenly that frequently it "hangs up" suddenly in the thrust—the result, a kinked or broken blade. When there is too much set,

the strain caused by the additional and unnecessary amount of set is out of proportion to the strength of the blade, and teeth are sometimes broken. The most common angle used is 60 degrees, though this may be varied a little more or less to advantage as the user becomes more expert. In filing saws for cross-cutting, the file is held at an angle, and, therefore the teeth are sharpened on an angle. We speak of this angle on the front and back of the teeth as "bevel."

BEVEL OF THE POINT

The proper amount of bevel to give the teeth is very important, for if there is too much bevel the point will score so deeply that the fibres severed from the main body will not crumble out as cut, but must be removed by continued rasping. In the cut below, B indicates the tooth and C the bevel on the point. The illustration, Fig. 11, shows a tooth (enlarged) of a cross-cut saw with the same amount of bevel front and back. This saw is best suited for work in soft woods where rapid, rather than fine, work is required.

Fig. 11

Fig. 12

Fig. 12 shows a tooth (enlarged) of a saw for medium hardwoods. This tooth has less bevel on the back which gives a shorter bevel to the point as at C.

It will be seen from these illustrations that the bevel on the front of the teeth is about the same, but the bevel of the point looking the length of the saw is quite different, depending upon the difference in the angles of the backs of the teeth. Here again, experience will indicate what is best. For the beginner, we recommend that the instructions given under "Filing the Teeth" be followed exactly.

HOW TO CARE FOR SAWS, TOOLS, AND FILES

Although the preceding pages cover the most important questions in connection with the care of a saw—that is, they tell how to sharpen a saw—there are a few other things that a tool user should know.

Moisture against a steel face, unless that face is well protected, means almost immediate rust. In order to keep a saw blade in the most perfect working condition, it must be entirely smooth on either side. Rust means pitting and, therefore, a rough surface. When you finish using a saw, rub it down with an oiled rag. Sperm oil is the best for this. In case the saw has been slightly rusted it is well to rub the blade down first with fine emery cloth and then apply the oil.

Another important thing is the way edge tools are put away. Whether a saw is placed in a tool box or on a shelf, or hung from a nail or hook, always take care that the tooth edge is placed in such a position that no other tools will knock against the teeth and injure them. Ordinary precaution will protect the teeth so that they will stand up a normal length of time.

The manner in which tools are placed on the bench when not in actual use is extremely important. These tools should always be placed with the cutting edges away from the person using them. An axe or hatchet should never be left standing on the floor where the foot may accidentally strike it. A saw should never be hung from a bench where the teeth can scratch a leg or knee.

When you are thru using a tool lay it down carefully. Do not drop it. A file, for instance, is an edge tool. Its teeth, to give the greatest efficiency, are very hard. When a man carelessly throws a file across his bench he is liable to break off the edges of several teeth. A good tool deserves good treatment and the more care you give it the better service it will give you.

Common sense will lay down for you most of the necessary rules for caring for your tools. Keep them in good working order, in a clean container or neatly arranged on hooks, and keep them in a dry place. If these instructions are followed out there should be no question of the tools losing their efficiency except as they wear out from old age.

All Disston Saws, Tools, and Files are guaranteed to be perfect in workmanship and material. But it is not to be expected that we can make a tool that will do good work when it is not properly used and cared for.

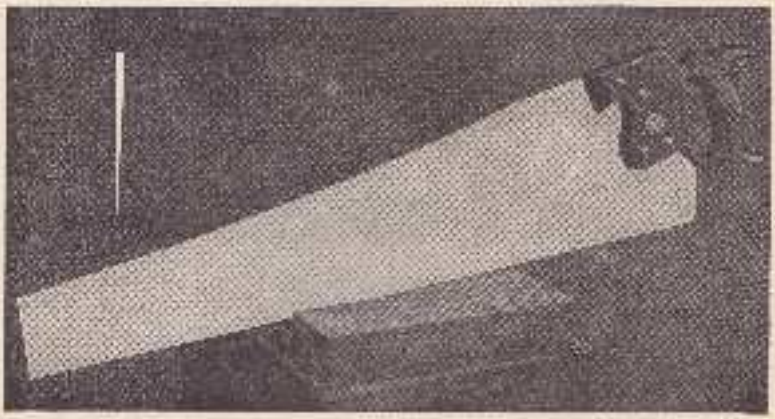
Nearly every day we hear from someone who has used one of our saws 20, 30, and up to 50 and 60 years. On the other hand, some saws, after being used for a few months, are returned to us as defective when they are perfect as far as workmanship and material are concerned, but have been made useless through abuse or lack of ordinary care.

Our main interest, naturally, is to have all our products give the maximum amount of service. Any saw or tool that is not absolutely up to Disston standard, we are only too glad to replace. But we ask the same consideration from the users of our products. Give them ordinary care; use them as they are intended to be used—and we know that the result will more than repay anyone for the little additional effort that is necessary.

HOW A SAW CUTS

An Explanation of the Construction and Operation of Hand Saws. Why cannot a board be cut by a blade with a knife edge when such a blade is used in the same manner as a saw?

Of course we understand that an instrument of this kind will sever exceedingly thin stock. But when it comes to a board of ordinary thickness, the knife edge will merely score to a certain depth. This depth depends upon the length of the bevel. The thicker portion of the beveled edge, coming in contact with the sides of the scoring, prevents the blade from entering further. The blade merely glides back and forth. If additional pressure is applied in an effort to force the cutting edge further into the work, the friction becomes so great that the blade will be jammed or wedged in the board. The reason for this is, that there is no displacement of wood to allow the cutting edge to reach more of the wood continuously, or to allow the back of the blade to slide without binding.

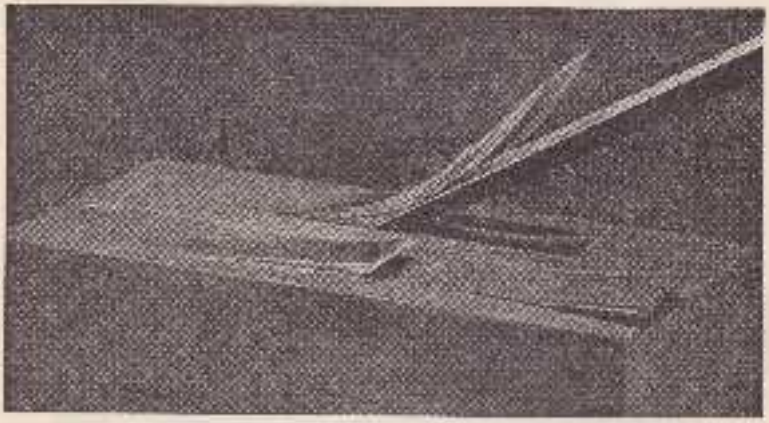


A knife edge with no means for clearance becomes bound or wedged in the wood

Saw Action Similar to that of Chisel. The nearest approach to the cutting action of a saw is the action of a chisel. However, instead of cutting out small pieces of wood like sawdust, the chisel separates and removes a long shaving, by what may be appropriately termed "paring" or "slitting." Its comparatively broad sharp edge separates the fibres of wood

lengthwise with the grain and does not cut on the sides. The wedge-shaped end merely raises the shaving or chip and the chisel, pushed ahead, tears the fibre at the sides. The angle at which the chisel is held, the amount of bevel on the cutting edge, the pressure exerted, and the hardness of the stock are factors which govern the thickness of the shaving.

The actions of both the knife and the chisel are employed in the cutting done by a cross-cut saw. A cross-cut saw moves successive pieces of material, not long shavings but small particles called sawdust, by scoring, cutting, and tearing.



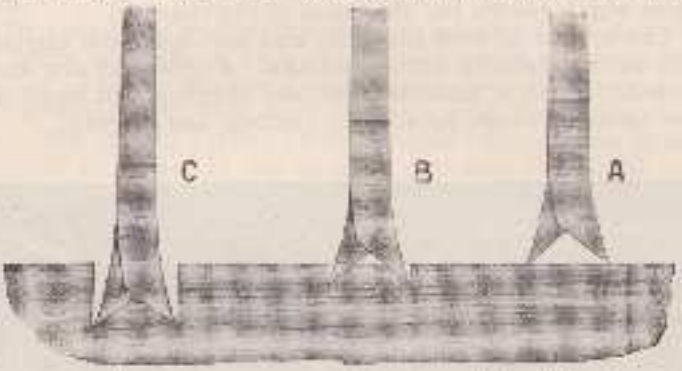
How a chisel cuts

The similarity comes to the rip saw in that its teeth are practically a series of small chisels.

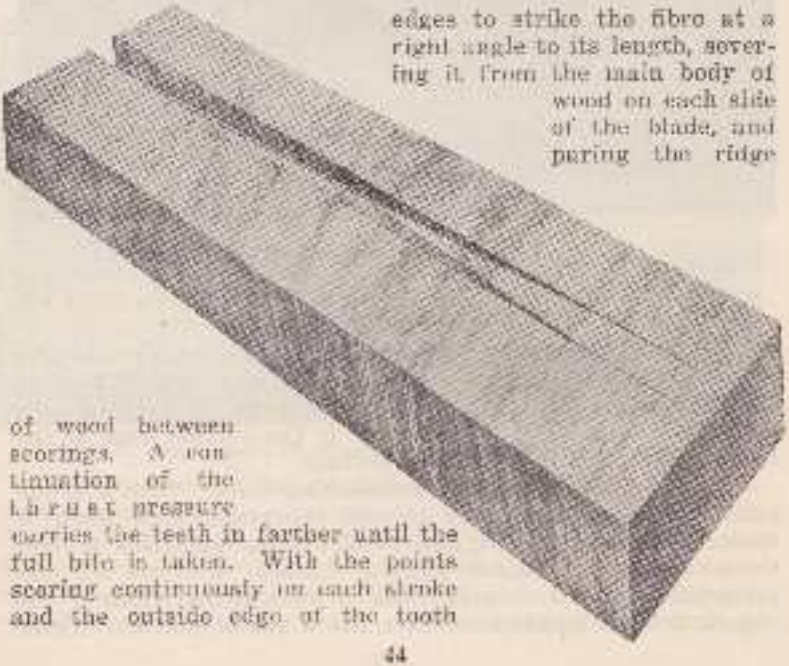
The hand saw for cross-grain cutting possesses practically V-shaped teeth. The teeth are set or bent over slightly to clear the body of the blade in the kerf. Although the back of each tooth is beveled as is the front, it is the outside edge of the front of the point that does the cutting.

How a Hand Saw for Cross-cutting Cuts. Take a cross-cutting hand saw, properly set and sharpened, each tooth of uniform size, shape, set, and bevel. Make with this a light short cut across a smooth piece of lumber. One can see that the extreme points on both sides of the cutting width of the saw first made parallel scorings the width of the set. Those

scorings are similar to the fine cutting of a knife across the face of the wood, thus starting the cut. Then as pressure is applied, the teeth enter deeper and deeper, gradually bringing into action the cutting edge on the outside front of the points. The forward motion of the blade causes the points and cutting



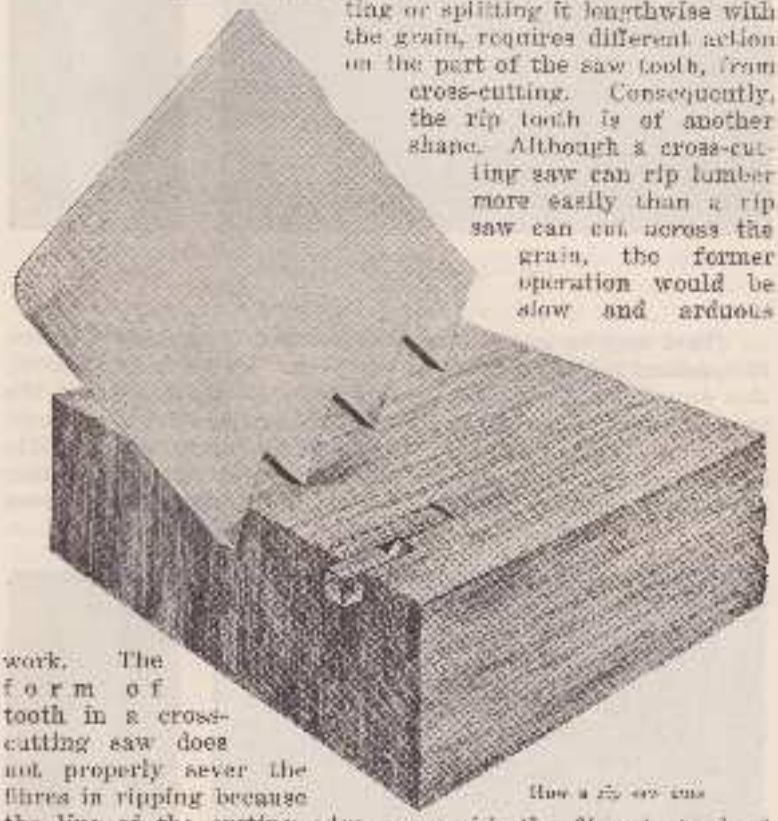
edges to strike the fibre at a right angle to its length, severing it from the main body of wood on each side of the blade, and paring the ridge



of wood between scorings. A continuation of the thrust pressure carries the teeth in farther until the full bite is taken. With the points scoring continuously on each stroke and the outside edge of the tooth

cutting, the beveled front edge of each tooth performs its duty, chisel-like, of crumbling up and dislodging the upper portion of wood left between the cutters. At each thrust of the saw the pieces of wood are carried out of the kerf in the throats or gullets between the teeth, until finally the board is completely divided.

How a Rip Saw Cuts. The ripping of lumber, that is cutting or splitting it lengthwise with the grain, requires different action on the part of the saw tooth, from cross-cutting. Consequently, the rip tooth is of another shape. Although a cross-cutting saw can rip lumber more easily than a rip saw can cut across the grain, the former operation would be slow and arduous work. The form of tooth in a cross-cutting saw does not properly sever the fibres in ripping because the line of the cutting edge runs with the fibre instead of across it. This being the case the saw cannot cut freely nor entirely clear itself in the kerf.



How a rip saw cuts

The rip saw tooth has a straight front. Its cutting edge strikes at practically a right angle to the fibre of the wood, but

severs it only at one place—the front of the tooth wedging out the piece of wood.

Side and end views of cross-cut teeth

This may be more clearly understood by making a direct comparison with the cross-cutting tooth. As previously stated, this scores on the point and cuts with the knife edge on the outside front. The rip tooth, with its straight front and cutting edge on top, strokes down. The comparatively wide cutting edge, cutting across the long fibres of wood, enters deeper and deeper. The wedgelike body of the tooth presses

Side and end views of rip saw teeth

against the partially severed piece of wood until, unable to stand the strain, the fibres on the sides and bottom of the small section tear apart. Piece after piece, each successive tooth cutting its portion of half the width of the kerf, is thus separated from the main body of the board and carried out in the gullets of the teeth at each thrust of the saw. In this manner, the rip saw practically chisels out the kerf in small sections, leading to a complete division of the board.

On a cross-cutting saw the pointed teeth, set alternately to right and left, leave a shallow groove, which runs along the cutting edge from butt to point. This groove is deep enough to allow a needle to slide in it. This is not true with the rip saw. It will be noticed, on glancing down the cutting edge of the rip saw, that the square topped teeth extend entirely across and beyond either side of the blade. The inside of the tooth on the right barely overlaps the inside of the tooth on the left.

Only Small Part of Saw Tooth Actually Cuts. It is a common supposition that the entire tooth of a saw cuts. As a matter of fact, however, the actual cutting is done, with the cross-cut saw, by the points, and front cutting edges which extend only to where the right and left teeth overlay; and, with the rip saw, by the chisel-like edge of the teeth.

Because they are set alternately right and left, each tooth individually severs only half the width of the kerf. This division of duty by the numerous teeth in the hand saw makes possible the performance of quicker work, involving less effort and driving power than if the full width of kerf were cut by each tooth.

So it will seem that, no matter what sort of a saw, the cutting edge of each tooth makes an incision across the long wood fibre. Then the base of the tooth plows out the small pieces thus separated. This is done continuously with each stroke of the saw. The saw enters farther with each thrust, the kerf becomes deeper, until a complete separation of the board is accomplished.

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