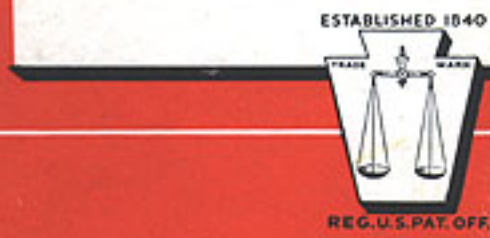
DISSTON

SAW, TOOL AND FILE

MANUAL



HOW TO CHOOSE AND USE TOOLS

"Every youth, from the king's son downwards, should learn to do something finely and thoroughly with his hands."

—RUSKIN

Among the many thousands of persons who have received copies of this DISSTON Manual are men and boys—yes, women too—of all ages, nationalities and races. They represent all walks in life from the boy with a few tools and a packing-case workbench in the shed to the highly skilled craftsworker with kits and cabinets containing scores of fine tools.

All are brothers under the skin, people who have learned that there is no greater joy than working with the hands, fashioning things of beauty and usefulness from wood, metal and other materials.

Many of those who send for this manual are entering the fascinating craft for the first time. Perhaps you are one of them. Then as one craftsworker to another, let me pass along to you a few words of advice gleaned from many years of close association with tools and men who know tools.

The first is this: Buy only good tools. They will repay you a hundredfold in the pleasure you get from your work. They will help you to develop skill. And the work you do will be greatly improved. Yes, good tools cost more than ordinary tools. But you will find that they often pay for themselves by saving what would otherwise be lost in spoiled materials.

And remember this too: Take it easy. Learn to relax while working. An experienced carpenter can saw all day long with less fatigue than a tense worker will feel after only one hour. Try to work with rhythm, particularly when sawing. You'll cut straighter lines, smoother edges, and enjoy the ease of doing it. It's the formula followed by those whose skill you have so often admired.

And now, good luck to you! You may often feel the need of advice, particularly when selecting a new tool. You will find no one more capable of guiding you, or more eager to see you succeed, than your local hardware retailer. You will find he can help you in many ways.

Jacob S. Disston Jr.

PRESIDENT

DISSTON

SAW, TOOL AND FILE

MANUAL

This manual makes no pretense of being an exhaustive treatise on tools and their many uses. To cover the subject completely would require volumes. In fact, volumes already have been written, enough to comprise quite an extensive library.

The purpose, in these few pages, is to describe briefly some of the more important tools used by the craftsworker, to tell how to use these tools to best advantage, and how to care for them and keep them in good serviceable condition.

The Disston Saws, Files and other tools illustrated and described on the following pages, are but a few of the many that Disston makes. The selection has been carefully made with the needs of the average worker in mind. They are the same high grade tools that have been used for years by thousands of experienced carpenters and mechanics. You will find that by using them you will be able to do better work, with greater ease and satisfaction.

HENRY DISSTON & SONS, INC.

TACONY, PHILADELPHIA 35, PA., U. S. A.

THE SAW IN HISTORY

Long before the dawn of history, the saw was being used in every part of the inhabited world. It is one of man's most ancient tools, and antedates civilization by many thousands of years. Remains have been traced back to the days of the hairy mammoth, wooly rhinoceros and saber-toothed tiger, all of which have long been extinct.

Fig. 1. Flint Saw of the Stone Age

It seems reasonable to believe that the first saws were discovered rather than invented. When ancient man wished to cut a bone or stick of wood, he probably reached for the nearest sharp-edged stone. By drawing it back and forth across the object to be severed he discovered that its cutting action was due to this roughness. Eventually, he looked for more suitable stones, chipped the edges, made the teeth more uniform, and the first fabricated saw was born.

Fig. 2. Ancient Australian Saw

Many of these crude saws, roughly shaped from flint, have been found in England and on the European continent. They have also been found in Asia, Australia and the Americas. Regardless of their origin, all bear a close resemblance to each other, differing only in minor details from those illustrated on this page.

Flint saws have been found among the remains of Neanderthal man, who roamed through central Europe about 130,000 years ago. They have been found in caves in France. Many have been dug out of ancient stone heaps in Denmark and Sweden and in the vicinity of the lake dwellings of Switzerland and northern Italy.

Fig. 3. Egyptian Saws

America's earliest records of ancient man were found in Folsom, New Mexico. These consist of tools or weapons of flint with ragged edges made by flaking, and closely resemble the ancient saws of Europe. Before Columbus reached America, the Caribs used saws made of notched shells.

The oldest saw of the historical era was found at Ur of the Chaldees in Mesopotamia. See illustration (Fig. 4). These blades were made from obsidian, a volcanic glass, and are two inches in length. They were made by the Sumerians, a race of ancient Babylon, and the age of the saws has been established at 6,000 to 7,000 years, antedating Abraham by 20 centuries.

Fig. 4. Oldest Saws in the World

Saws in the Bronze Age

The invention of the metal saw was claimed by the early Greeks, who told how the mythological Perdix got the idea from the jawbone of a fish. More authentic evidence is supplied by pictures of saws shown on Egyptian monuments.

Fig. 5. Saw Found at Nimroud near Nineveh

Most saws of the Bronze Age were found in Germany and Denmark. But these were only slightly better than those made of stone. Perhaps it is due to the inefficiency of bronze as saw material that so few specimens have been found—not more than thirty in all Europe.

An almost perfect bronze saw blade was taken from near the remains of an ancient lake dwelling in Switzerland Others have been found in France, Spain, Hungary, Italy and Sweden. In Sweden was also found a stone mould for casting bronze saws. See Figure 7.

The saw is mentioned several times in the Bible. Cicero, in his oration to Cluenthius, mentions an ingenious saw with which a thief cut out the bottom of a chest. Pliny states that saws were used by the ancient Belgae for cutting building stone.

But among the most interesting of the older saws are those shown in Egyptian drawings. These show the teeth pointed backward, so the cutting action was in pulling instead of pushing—a method that still prevails in many parts of the Orient.

The Egyptian saw consisted of a bronze blade attached to a handle with what appears to have been leather thongs. However, some specimens in the British Museum have tangs for inserting into handles.

Double saws, strained with a cord, were used by both the Romans and Egyptians. These might well be called the ancestor of the frame saw and the farmer's wood saw or buck saw.

Inserted tooth saws, which are generally looked upon as strictly modern, can be traced back thousands of years. Evidence that bronze saws with jeweled teeth were used by the ancient Egyptians for cutting stone, was discovered by the Egyptologist, Professor W. M. Flinders Petrie. In Tahiti, the islanders made saws in which shark's teeth were mounted. The Incas of Peru sawed granite and other stone with copper wire in which were embedded diamonds and emeralds.

Saws in the Age of Steel

Not until the advent of the Iron Age were really efficient saws made. One of the oldest examples of iron saws (see Fig. 5) was discovered by Sir Austen Henry Layard, the Assyriologist, at Nimroud near Nineveh. This was a rare find for, because of the rapidity with which iron oxidizes, only a few of these earlier iron saws have ever been found.

A powerful stimulus to the development of the saw was the invention, or discovery, of steel, the date of which is lost in the past. In 850 B.C. Hesiod refers to "bright iron" and "black iron." Ezekiel, in 600 B.C. also refers

Fig. 6. Primitive Types of Stone Saws

Fig. 7. Mould Used for Casting Early Saws

to "bright iron," which undoubtedly was a low grade steel.

Japanese Saw cuts on the pull stroke.

Translations from the Scriptures mention both iron and steel. The Egyptians were familiar with it as far back as the construction of the pyramids, for in 1874 an iron plate was discovered embedded in the masonry of the Great Pyramid of Cheops, which was erected 5400 years ago.

Development of Saw Varieties

In their modern adaptations, saws may be divided into two classes: reciprocating (handsaws) and continuous action (circular and bandsaws).

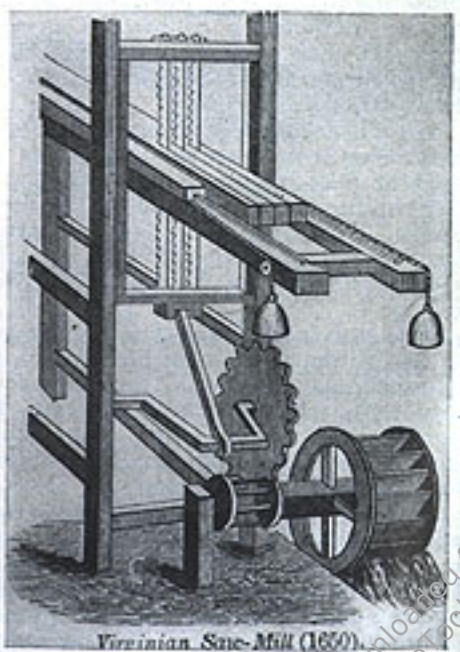
Hippocrates (B.C. 460) is said to have invented the first cylinder or drum saw for use in the operation of trepanning the skull. However, the circular wood saw, as we know it today, was invented in England in 1777 by Samuel Miller, although it has been claimed that circular saws were used in Holland nearly a century before. The first 18-inch circular metal cutting saw was produced in America by Disston in 1889.

William Newberry of London, England, patented the first endless bandsaw in 1808, but his machine and saw were not developed. The difficulty of making a smooth, strong joint was the stumbling block. How much credit should be given to Newberry's ingenuity is debatable. Archeologists state that there are instances to show that the bandsaw had been brought very near to its present form by ancient peoples.

About 1846, Mlle. Crepin, a French woman of great mechanical genius, secured in France a patent on a machine and bandsaw similar to Newberry's. Another patent was later obtained by M. Perin who greatly improved the saw by perfecting the joint. To him has been given the credit for making the general use of the bandsaw possible.

Thus down through the centuries the evolution of the saw moved slowly forward. People of many nations contributed to its development. But during the past hundred years, as metallurgical knowledge increased, the saw advanced rapidly to the high stage of perfection we have today.

During those hundred years Disston has been credited with many important developments in metallurgy, saw design and saw manufacturing. Every type of saw, for the cutting of every kind of material, is manufactured in the Disston plant, the foremost of its kind in the world.



Virginian Saw-Mill (1650).

Steps in Making
A DISSTON HAND SAW

Below are shown a few of the major operations necessary in making, "The Saw Most Carpenters Use."

Sheet Disston steel, which makes two blades.

Cut to shape.

Hardwood block.

Toothed.

Pattern stamped.

Hardened and tempered.

Band sawn to shape.

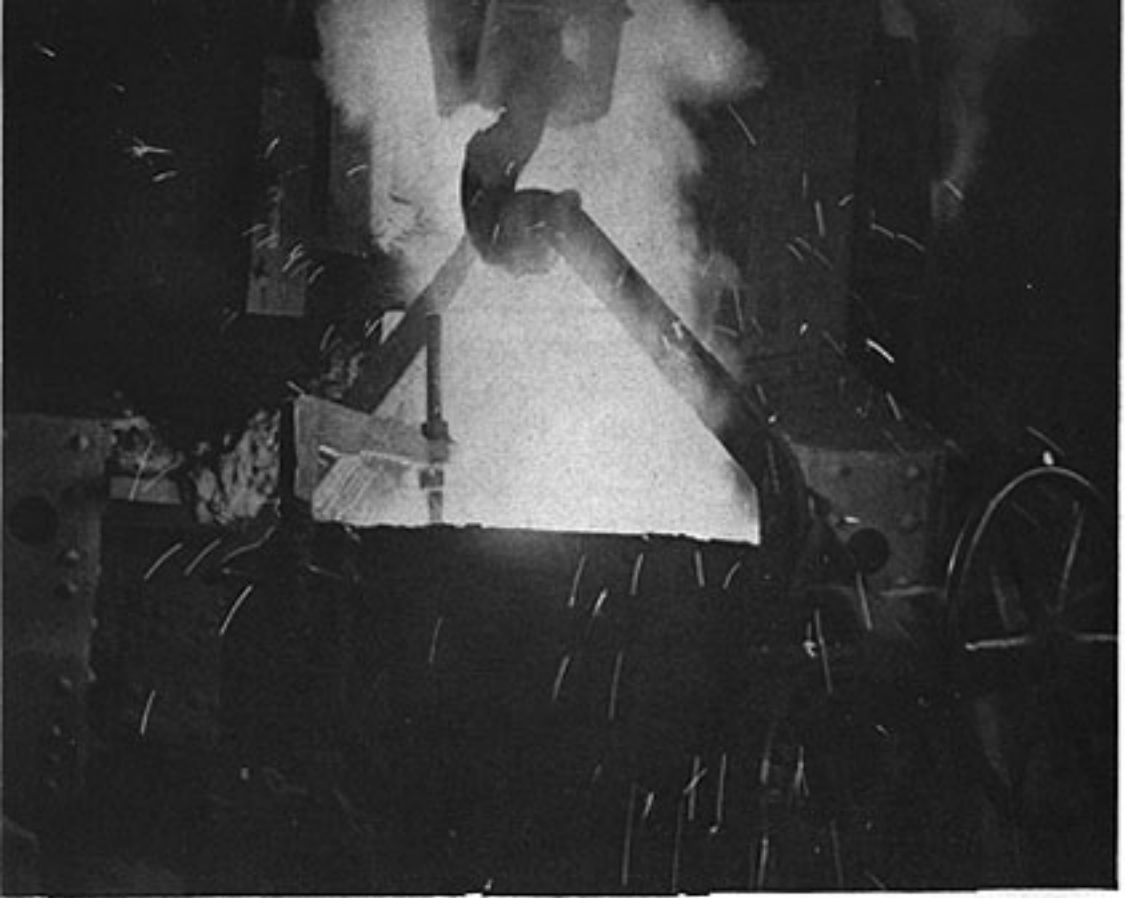
Taperground.

Routed, sanded and belted.

Polished and shaped for handle.

Slit and bored, weather-proofed and finished.

Etched, finished, ready for handle.



Pouring Steel at Disston Tacony Plant

The first requirements

the STEEL from which it is made

When Henry Disston first began the manufacture of saws in 1840 all steels had to be imported. But as these steels failed to meet the high standards which he had set, he decided to make his own steel. After years of study, research and experimentation he finally succeeded in developing the quality of steel he wanted.

In 1855 Henry Disston built his own furnaces and melted the first Crucible Saw Steel made in America. In 1906, the Disston firm took another long forward step; and the first commercial heat of electric saw steel of crucible quality ever made in America was cast in the Disston plant. Since then, Disston has continued to keep pace with the advancing needs for better and better saw and tool steels.

Today the Disston Tacony Plant is equipped with Electric Furnaces, steam hammers, bar and sheet rolling mills, annealing furnaces, and all other modern devices for making high grade saw and tool steels. Heat in the furnaces is regulated and controlled to the closest degree. And exacting tests and laboratory checks, under the supervision of nationally known Disston metallurgists, control every process.

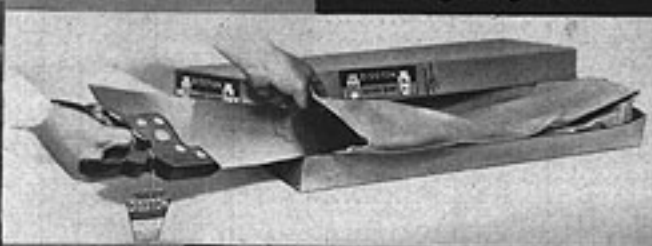
Disston Steel is known the world over. It is famous for toughness, stamina and long cutting life. Its high quality and uniformity are such that many manufacturers come to Disston for the fine steels required in the manufacture of their products.

Making micro-photograph of steel.

Hand saw smithing.

Placing handles on blades and tightening screws.

Testing temper after removing saw blade from furnace.



Packing saws for safe handling in shipping.

# of an efficient tool . . . .

the SKILL with which it is made

Though the use of high quality steel is essential in the making of a fine saw or other tool—skill, careful workmanship and finish also are of vast importance. In the making of a Disston saw, for instance, dozens of operations are necessary before the saw is ready for use.

These operations include; Shaping to produce a perfect balance; Tempering which insures cutting points that stay sharp and teeth that retain their set; True taper grinding by a special Disston process, which provides a blade with the proper thickness, or gauge, along tooth edge and on back; Tensioning to insure that the saw stands up in the cut; Setting with an accuracy that assures clean, straight cutting and smooth edges; Sharpening to a degree so exact that the points of the teeth are uniform and sharp; and fine Finishing for both the blade and handle, because the true craftsworker takes pride in the appearance of his tools.

Following the many operations necessary to produce a Disston saw, are a series of inspections made at different stages of manufacture. Thus when you buy a Disston saw or other tool, you can be sure that you are getting the finest that modern skill and equipment can provide.

Disston saws and other tools are designed and fashioned for definite purposes. Some types will suit your needs better than others. The descriptions on the pages which follow will help you in selecting the type of saw or tool best suited to your needs.

The Well Equipped Workshop

With hundreds of tools from which to choose, the man who is planning to equip a home workshop may be puzzled. Unless he knows definitely what tools he will require, he should start with only those actually necessary. Then he can add to them as his needs increase. Remember, it is better to have but a few good tools than many cheap ones. To help you make a proper selection, we suggest the following lists: for professional worker; home craftsworker; the handy-man; and for the farm workshop.

For the Professional Worker	Home Crafts-worker	Handy-man	Farm Work-shop
*HAND SAWS			
Cross-cut Hand Saw (26" 8 pt.)	x	x	x
Rip Hand Saw (26" 5½ pt.)	x		x
Back Saw	x		
Mitre Saw			
Dovetail Saw			
Compass Saw	x	x	x
Keyhole Saw			x
Pattern Maker's Saw			
Tool Box Saw	x		
Coping Saw	x	x	x
Refitting Tools (Saw Set, Jointer, Clamp)	x		x
*CIRCULAR SAWS	x		
*Refitting Tools	x		
*BAND SAWS	x		
*HACK SAWS	x	x	x
HAMMERS			
Claw Hammer	x	x	x
Ball Pein Hammer	x		x
Cross Pein Hammer			x
Wood Mallet	x		x
HATCHET	x	x	x
CHISELS			
Wood Chisels (set)	x	x	x
Cold Chisels (set)	x	x	x
*Wood Turning Chisels (set)			
*FILES			
Saw Files (Taper, Slim Taper, etc.)	x	x	x
Mill File	x	x	x
Round File			x
Half Round File (10" Bastard)	x		x
Flat File (8" or 10" Bastard)			x
Auger Bit File			x
Square File			
*File Card and Brush	x		x
*File Handles (Interchangeable Type)	x		x
PLANES			
Block Plane	x	x	x
Jack Plane	x		x
Jointer Plane			
Smoothing Plane	x		x
Router Plane			
Rabbet Plane			
PLIERS			
Round Nose Pliers	x		
Slip Joint Pliers	x		x
Vise Grip Pliers	x		x
Wire Cutting Pliers	x	x	
SCREW DRIVERS	x	x	x
BRACE AND BITS	x	x	x
HAND DRILL With Set Drills	x		x

For the Professional Worker	Home Crafts-worker	Handy-man	Farm Work-shop
SQUARES			
Mitre Square	x		x
*Try Square	x		x
Steel Square			x
GAUGES			
*Bevel	x		x
*Cutting or Marking	x		x
*PLUMB AND LEVEL	x		x
*SCRAPERS	x		x
*BURNISHER	x		x
WRENCHES			
Monkey Wrench			x
Pipe Wrench	x	x	x
Alligator Wrench			
TINNER'S SNIPS	x	x	x
WIRE NIPPERS (End Cutting)			x
*WOOD RASP	x		x
DRAWING KNIFE			x
SPOKE SHAVE	x		x
VISE, IRON	x	x	x
INSTRUMENTS			
Compass			
Dividers			x
Triangles			
Calipers			
Folding Rule	x	x	x
Steel Tape (6 ft.)	x		x
MISCELLANY			
Oil Stone	x	x	x
*Wrecking Bar	x	x	x
Jack Knife	x	x	x
Putty Knife	x	x	x
Glass Cutter	x	x	x
Oil Can and Oil	x	x	x
Awl	x		x
Carving Tools			
Mitre Box	x		
C Clamps (Set)	x	x	x
Soldering Iron	x	x	x
Automatic Drill			x
Nail Sets	x	x	x
Countersink	x	x	x
Center Punch	x	x	x
ADDITIONAL TOOLS FOR FARM SHOP			
Straight Lipped Tongs (Blacksmith)			x
Curved Lipped Tongs (Blacksmith)			x
Chain Drill (with Set Twist Drills)			x
Pipe Stock and Dies			x
Rivet Set			x
Blowtorch			x
Pipe Cutter			x
Turning Saw, Web 14"			x

* Indicates Saws and Tools made by Disston.

How to Choose and Use Hand Saws

There are many different kinds and patterns of hand saws, and each is designed for a special purpose. They vary in weight, length, and tooth points to the inch, character of steel, finish and construction.

In the Disston line there are hand saws for every kind of work—for ripping or cross-cutting. Cross-cut Saws are made in different lengths and in various points for fine, medium or coarse cutting. Rip Saws are made 26 inches long, 5½ points.

Disston Hand Saws are improved in every feature: Lighter, narrower blades for easier sawing and to save the user's strength; true taper ground from tooth edge to back, and from butt to point at the back, with even gauge along the entire tooth edge. Disston saws always run true. They will run with less set, and stay sharp longer than ordinary saws.

TO MAKE a perfectly square end cut is easy, when the face of the board is marked square and a try square used, as illustrated, to keep the saw in a perfectly vertical position.

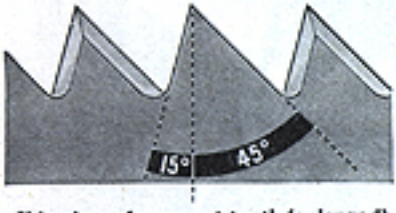
The CROSS-CUT Saw

The cross-cut saw is used for cutting across the grain, and has a different cutting action from that of the rip saw. The teeth cut like sharp-pointed knives. They are also made with more points to the inch than the rip saw. The front face of a cross-cut tooth has an angle of 15°; the back of the tooth has an angle of 45°.

Unless the blade of a cross-cut saw is made of high grade steel, the teeth quickly lose their keen-cutting quality. When selecting a hand saw, cross-cut or rip "it is best to get one with a name on it which has a reputation"—quoted from the founder, Henry Disston.

THE CROSS-CUT SAW TOOTH

The angle of a cross-cut saw tooth is 60°, the same as that of a rip saw. The angle on front of the tooth is 15° from the perpendicular, while the angle on the back is 45°.



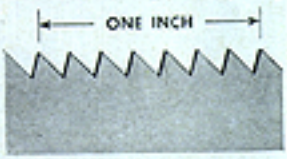
Side view of cross-cut teeth (enlarged)

The teeth are usually filed with a bevel of about 24°. The upper half of each tooth is set, alternately, one to the right, the next to the left, to assure clearance. The true taper grind of Disston Hand Saws gives them additional clearance, and makes them run more easily and more accurately with less set than saws ground in the ordinary manner. Also, it helps to keep saws sharp for a longer time.

Tooth edge of cross-cut saw

POINTS TO THE INCH

Points to the inch is a term used to designate the size of teeth in a saw. The saw with a small number of tooth points to the inch, 7 points for example, will make a rough cut, yet cut fast. Saws with more points, say 10 or more, will make smooth, even cuts, but not cut as fast as the coarse tooth saw.



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

AMOUNT OF SET

The amount of set given a saw is highly important because it determines the ease with which the saw runs; it insures accuracy of cutting; and it helps keep the saw sharp for a longer time.

The nature and character of the wood to be cut also must be considered. Green or wet wood requires a saw with coarse teeth and wide set, 7 points to the inch, while a 10 or 11 point saw with light set will work better in dry, well seasoned lumber. For ordinary cross-cutting, the user will find the 7 or 8 point most in demand.

LENGTH OF BLADES

The length of either rip or cross-cut hand saws is measured from point to butt on the cutting edge. Cross-cut saws are made in different lengths.

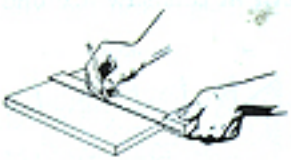
Some patterns of Disston cross-cut saws are made with blades 20, 22, 24 and 26 inches long; and rip saws with blades 26 inches. Saws 24 inches and shorter are known as panel saws. The 20 inch, 10 point cross-cut saw is most popular among the shorter saws.

How to Use a Cross-Cut Saw

Using a cross-cut saw differs in some ways from the manner in which a rip saw is used. While practically all rip cutting is on the forward stroke, the cross-cut saw cuts on both forward and back strokes.

Place board across two sawhorses and cut outside the area they occupy

Use two sawhorses of equal height, and cut from outside the area, as shown in illustration above. When cutting within the area, you risk pinching saw and splitting the work.



Carefully measure and mark cutting line

Be sure measurements are exact, and that your mark for straight cutting is at right angle to length of board. The best tool to use for this marking is a try square.

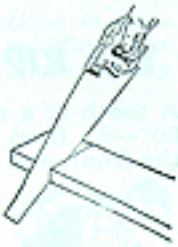
When starting the cut, place saw at side of line to assure proper length. Start cut near butt of saw, using a short draw stroke. Repeat slowly a few times until a slight groove is started, then cut straight with full a stroke.

Start cut near butt of saw

The correct position for cross-cutting is shown in the illustration at right. 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 of cut and action of saw at each stroke.

Proper position for cross-cutting

Sawing progresses easier, truer and faster when full-length strokes are made. Muscles do not tire so quickly; and the saw stays sharp longer.



Use full length strokes

When the cut is nearly completed, support the waste end of the work with the free hand, and cut slowly with light, short strokes to avoid splintering. Do not twist off waste with saw blade

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

Proper angle for cross-cutting

Look carefully at repair work to see that there are no nails in the path of saw. Don't throw your saw around; keep blade covered with a thin coat of light oil and hang it up when not in use.

D-95 Lightweight Pattern Straight-back

	Lengths	Points
Cross-cut	26"	7, 8, 9, 10, 11, 12
Rip	26"	5½

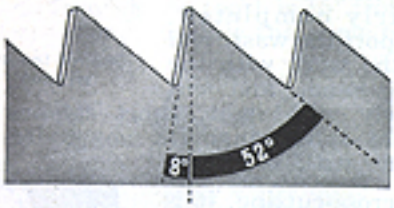
The Disston D-95 Masterpiece Hand Saw is streamlined for beauty, action, service. Blade of the finest Disston Steel, perfectly ground, striped back, set and filed; polished to a brilliant lustre. Molded plastic handle, patented, 4 chromium-plated screws, lock washers and nuts. Cannot work loose.

What is a RIP Saw?

The Rip Saw is used for cutting with the grain. Teeth differ from those of a cross-cut saw in size and shape. The Rip Saw has fewer teeth, or points, to the inch hence they are larger. The forward slant of the angle of a rip tooth is 8° from the perpendicular. The cutting edges are square instead of pointed. Although both types of saws are interchangeable to some extent, each should be used specifically for the kind of work for which it is designed.

THE RIP SAW TOOTH

A tooth of a rip saw has an angle of 60°—8° from the perpendicular on the front, and 52° on the back.



Side view of rip teeth (enlarged)

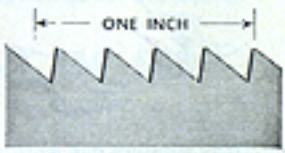
The tooth resembles a small chisel, and its cutting action is much the same, each tooth chipping out a small portion of the wood from the kerf. Cutting is done by the forward stroke. The upper half of each tooth is set alternately, one to the left and one to the right, to give clearance. This set, on each side, is equal to one-third or less the thickness of the blade.

Tooth edge of rip saw

POINTS TO THE INCH

The size of the teeth in a saw is determined by points to the inch, as shown in the illustration below.

Disston Rip Saws are made 5½ points to the inch in the 26-inch length. The teeth in this saw are one point finer at the point than at the butt. This permits easier starting in the cut.



5½-point rip teeth.

LENGTH OF BLADES

Blade lengths of both rip and cross-cut hand saws are measured from point to butt on the cutting edge. Rip saws are made 26 inches in length. Cross-cut saws are made in different lengths. Saws 24 inches and shorter are known as panel saws.

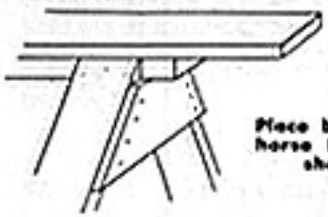
D-15 Lightweight Pattern Straight-back

	Lengths	Points
Cross-cut	26"	7, 8, 9, 10, 11, 12
Cross-cut	24"	8, 10,
Rip	26"	5½

A fine Disston Saw—highest quality material, best workmanship. Disston steel blade, striped back, true taper ground. Beautiful finish. Cover-top, laminated wood, carved handle, weatherproof finish.

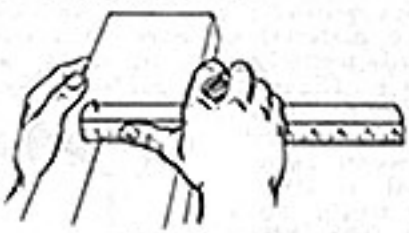
How to Use a Rip Saw

Place the board, which you are to saw, at about knee height. This enables you to get well above your work, and saw with comfort, and cut a straight kerf.



Place board on sawhorse lengthwise for short rip cuts

Your first operation is to mark the cutting line. Be sure your measurements are exact before starting. The best instrument to use is a marking gauge (see page 50). After your line has been marked, do not cut straight through the center of the line, but along the side of it into the waste material (see page 14).



Mark width carefully

If you are right-handed put right knee (left knee when cross-cutting) on board, and your left hand a few inches to the left of the cutting line so that the weight of the body is comfortably balanced.

Start cut with a draw stroke, and use thumb to steady blade

Start the cut with the finer teeth at the end of the blade, and with a draw stroke. Put very little pressure on the saw until the kerf is well started. Then take long, easy strokes. Do not force the blade at any time. This is not only tiring, but it also makes following the line more difficult.

End of downward stroke should be 6" to 8" from butt of blade

When most of the cutting is done with a few inches in the middle of the blade, the saw is dulled more rapidly and wears unevenly.

Get well above your work so that the eye is on the same line with the saw blade and marking. The proper angle for ripping is 60° between tooth edge and board. If board is thin, lessen this angle to about 45°.

Proper position for ripping

Finally: Keep your saw sharp. Disston Rip Saws cut fast, smooth and easily when kept properly sharpened. Users say that Disston saws retain their keen cutting points longer than other saws.

Proper angle for ripping

D-12 Lightweight Pattern Straight-back

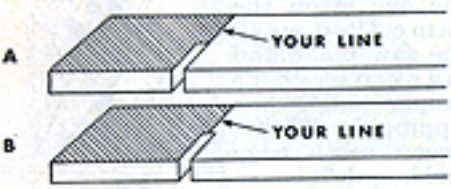
	Lengths	Points
Cross-cut	26"	7, 8, 9, 10, 11, 12
Rip	26"	5½

Used by mechanics everywhere for fine finishing work. A fast, smooth, easy-cutting saw. Disston steel blade —high polish, striped back, true taper ground. Cover top, carved handle, weatherproof finish.

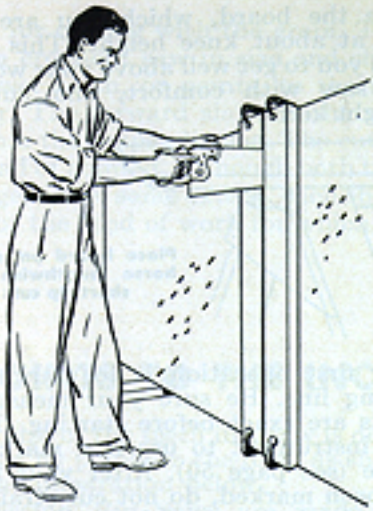
Hints Regarding Use of Hand Saws

When sawing across the grain, if nature of work permits, place board as shown at (B) below. This avoids splintering at the last resin ring, as sometimes happens when the board is placed as shown in illustration (A).

When ripping or cross-cutting keep on waste side of line—do not try to saw on the line or "saw out the line." This assures that board will be of right width or length, see illustration (A) below. When cutting on the line you cut into the board as well as the waste as shown in (B).

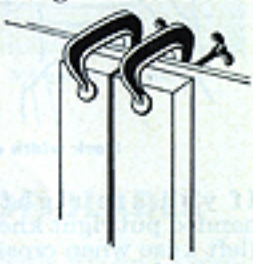


The same principle applies when cutting a mortise. Remember that accuracy is essential in good carpentry. Measure carefully, saw straight, keep into the waste material, and your pieces will fit together smoothly.



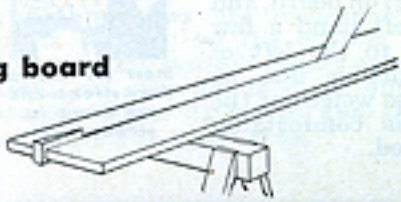
When cutting plywood or wallboard

When cutting plywood or wallboard place material on edge with guide boards securely clamped at top and bottom. Clamp these guides to board that is to be cut, making distance between guides equal to width of saw teeth. Then saw with blade between clamped boards and your cut will be straight and true.



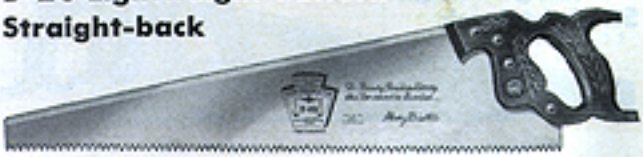
When rip-sawing a long board

After a rip cut has extended a few feet, the kerf may close sufficiently to cause the saw to bind. To avoid this, insert a small wedge at start of cut.



	Lengths	Points
Cross-cut	26"	7, 8, 9, 10, 11, 12
Cross-cut	24"	8, 9, 10, 11
Cross-cut	20"	10
Rip	26"	5½

D-23 Lightweight Pattern Straight-back

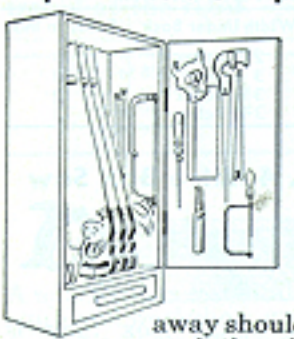


Always popular with saw users demanding quality and workmanship. Disston Steel blade, high polish, striped back, true taper ground. Cover-top, carved handle, weatherproof finish.

When saw leaves line

If you watch your work carefully and saw with full length strokes this should not happen. But when it does, a slight twist upon the handle of the saw will draw blade back to the line.

When not in use saws should be kept in moisture-proof cabinet.



In making the cabinet, use well-seasoned lumber of a kind that resists warping. Make door tight-fitting. All tools should be safeguarded against rust, and when put away should be wiped with a cloth which has been dipped in a light oil.

No. 28 Tool Box Saw

A handy tool for small work.

Blade of Disston Steel, skew-back; hardened and tempered; polished; striped back; 12-inch length, 10 points to the inch. Hardwood handle, weatherproof finish.

No. 10 Plumber's Saw

Specially tempered to cut joists, rafters, flooring, etc., in which nails are embedded; will also cut soil pipe, gas pipe, etc. Blade of Disston Steel. Reversible and adjustable handle, weatherproof finish; carved, cluster bolt and wing nut. Length of blade 18 inches.

No. D-19 Flooring Saw

For general repair work. Blade of Disston Steel; 18-inch length; 9 points to the inch; 4 1/16 inches at butt. Beginning at about center of back, blade is toothed and curved to the point. Teeth on curved edge are shaped to enter a flat surface. Weatherproof finish handle; carved, reversible and adjustable to various positions; cluster bolt and wing nut.

No. 1 Patternmaker's Saw

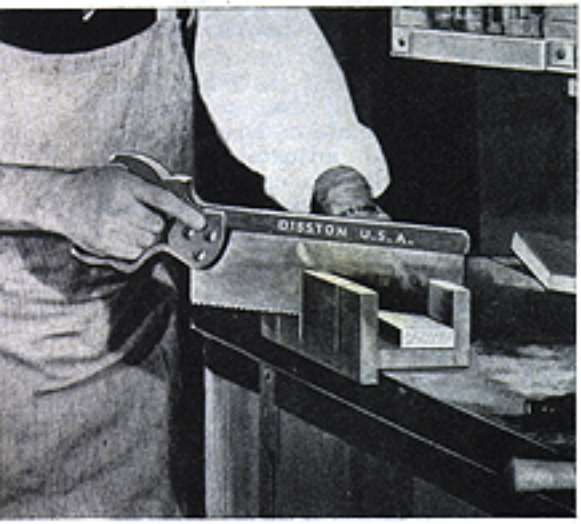
Designed for small, accurate work in pattern and cabinet-making. Blade is thin (.028) and is made of Disston Steel with Disston temper; 7 1/2 inches long and 1 1/2 inches wide. Teeth (15-point) are shaped to make a fine, exact cut. Open handle, weatherproof finish.

D-8 Medium Pattern Skew-back

	Lengths	Points
Cross-cut	26"	7, 8, 9, 10, 11
Cross-cut	24"	8, 9, 10, 11
Cross-cut	22"	8, 10, 11
Cross-cut	20"	10, 11
Rip	26"	5 1/2

"The Saw Most Carpenters Use." Disston Steel blade, polished, striped back, true taper ground. Cover-top handle, weatherproof finish.

How to Choose and Use Back Saws



Disston Back Saws are made of the same fine steel as Disston hand saws. They have the famous Disston temper and edge-holding qualities so vital to the craftsworker who wants high quality tools.

In using a back saw in a mitre box be sure the cut 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.

If a mitre box is not used, it is advisable to support the work with a bench hook. In making mortises, keep saw level after starting cut, and watch depth at both ends of cut.

To sharpen a back saw use a 4- or 5-inch Disston Extra Slim Taper File.

Disston No. 4 Back Saw

The blade is of Disston Steel, hard and tough, with teeth shaped for fast, accurate cutting. Back is extra heavy. Handle of hardwood, with Disston weatherproof finish.

No. 4 Back Saw Dimensions

Length of Blade	Width Under Back	Points to Inch
10 inches	2 ½ inches	13
12 inches	3 inches	13
14 inches	3 ½ inches	13
16 inches	3 ¾ inches	13

Disston No. 4 Mitre Box Saw

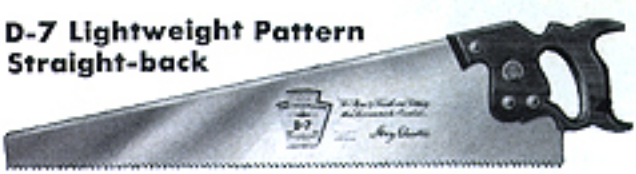
Every Disston Mitre Box Saw is tested for accuracy. It will run true, and cut a smooth, accurate joint. All blades are made 11 points to the inch. Blade of Disston Steel, with hard, tough Disston temper. Back of bright, polished steel. Hardwood handle, Disston weatherproof finish.

Disston Mitre Box Saws are made in all required sizes; those 4 inches under back in 22, 24 and 26-inch lengths, 5 inches under back, 28 inches in length; 6 inches under back, 30 inches in length.

The following sizes are most popular:

Length of Blade	Width Under Back
26 inches	4 inches
28 inches	5 inches

D-7 Lightweight Pattern Straight-back



	Lengths	Points
Cross-cut	26"	7, 8, 9, 10, 11
Rip	26"	5½

Universally popular, moderate priced Disston Hand Saw. Disston steel blade, striped back, true taper ground. Cover-top handle, weatherproof finish.

Disston No. 68 Dovetail Saw

Wherever the finest possible joint is wanted, and for dovetailing, tenoning, model building, pattern making, etc., a Disston Dovetail Saw is needed.

The Disston No. 68 Dovetail Saw has a straight handle. This saw is extremely thin (.020), with fine teeth (15 points). Sturdy steel back supports the Disston Steel Blade. This saw is excellent for fine work in grooving operations shown in the hint illustrated at the right.

Length of Blade	Width Under Back
8 inches	1 ½ inches
10 inches	1 ⅝ inches

For accurate cutting of grooves: FIRST, mark deeply three or four times with knife.

SECOND, cut away material at side on an angle with point of knife.

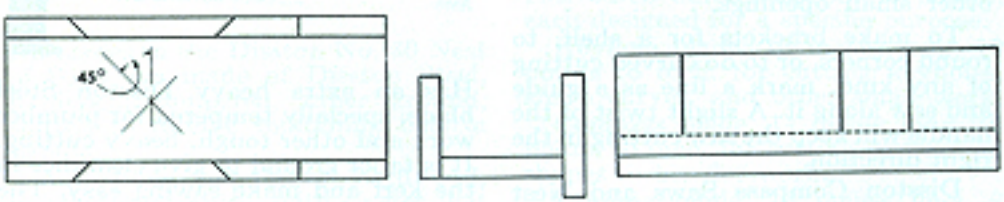
THIRD, place saw flush against edge of groove for further cutting.

How to make a Mitre Box

A mitre box is essential to the properly equipped workshop, and it is very easy to make. The length should be about 24 to 36 inches, and its width determined by the kind of work you do.

Use only well-seasoned wood about 1 or 1½ inches thick for the bottom. Measure the width desired; and square ends accurately. For the sides, use ¾ inch or 1-inch boards. One side board should be an inch wider in order to extend at bottom and serve as a stop. The side pieces should not be higher above bottom than the width under back of your back saw. Saw and plane them together to assure equal size. Attach both sides firmly to bottom board, using a butt joint, lightly glued and screwed.

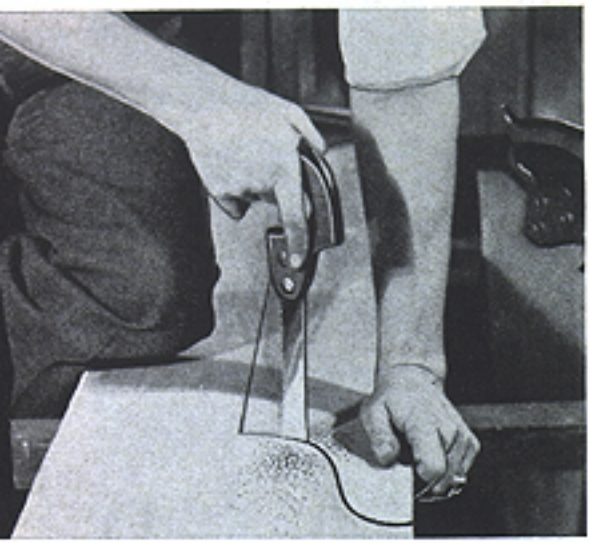
Mark the two 45° lines as shown in illustration at left, using a mitre square; extend lines down sides, inside and out, to guide when sawing slots. Mark the square saw-cut using mitre or try square. This cut may be at center of mitre box, between the 45° cuts, or at the end, as preferred. Saw both sides at one time.



Using a Mitre Box

When using a mitre box, place box at front of work bench with the wide side of box extending below front edge of work bench. If there is considerable sawing to do, it is helpful to use a clamp to hold box firmly to bench. Hold work at the back of box. Line up mark on work perfectly with slots in box; start cut with saw raised slightly from horizontal till cut is started, then saw horizontally until cut is finished. Best results will be secured if a back saw is used.

How to Choose and Use Small Saws



There are many uses for compass saws in the shop, in the home, on the farm, and in vocational training schools. Since it is used largely for cutting curves, a lateral pressure is exerted. Unless the blade is made of exceptionally good steel it may soon bend out of shape, and inaccurate work will result.

However, its use is not confined to cutting curves and circles, it is useful when starting a cut from a hole bored in the wood. It is also handy for cutting holes in board and plaster to receive gas or water pipes, electrical outlets, floor boards, keyholes, and other small openings.

To make brackets for a shelf, to round corners, or to do curved cutting of any kind, mark a line as a guide and saw along it. A slight twist of the handle will keep the saw cutting in the right direction.

Disston Compass Saws and Nest Saws are made tough and strong, yet flexible enough to stand the strain of cutting a curve. All are made of Disston Steel, and are tempered to assure a long cutting life. They are taper ground from tooth edge to a thin back which allows for clearance. They also taper to a sharp point, and are toothed to the point for easy access to holes and for cutting sharp curves.

Disston No. 2 Compass Saw

Open grip handle is shaped for easy control when sawing; has Disston Steel blade toothed to point; taper ground for clearance; tempered to withstand strain of curve cutting; tapered to sharp point; 10 points to inch. Hardwood handle has Disston weatherproof finish. Sizes, 12 and 14 inches.

The Disston No. 4 Interchangeable Blade Compass Saw

A convenient and practical tool for any kit. Has a flat top handle, comfortable grip, and weatherproof finish. Blades are supplied in 12 and 14 inch lengths, each 10 points to the inch. Cluster bolt and wing nut adjustment in handle holds blade firmly, and permits easy removal for use in reverse position. All blades are made of Disston Steel, taper ground, and tempered to stand strain of curve cutting.

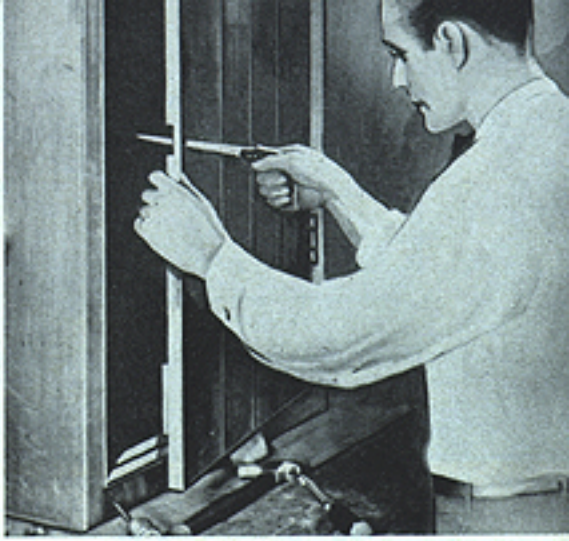
No. 8 Plumber's Compass Saw

Has an extra heavy Disston Steel blade, specially tempered for plumber work and other tough, heavy cutting. It is taper ground to give clearance in the kerf and make sawing easy. The butt of the blade is slotted; hole directly in front of slot receives bolt; cluster bolt and wing nut clamps blade securely in handle—no moving back or front, up or down. Can be used in regular or reverse position.

Square top, hardwood handle with comfortable, open grip. Disston weatherproof finish. Made in 12- and 14-inch lengths, each 8 points to inch.

DISSTON
Keyhole Saws

To cut a keyhole it is good practice to mark with pencil or scriber, shape and size of hole desired, then bore a hole through the door, chest, drawer or whatever you are working on. Then with this handy little saw cut along the marked line.



No. 7 Nest of Saws

Widely used by plumbers, electricians, and others. Three blades and one handle—the 14-inch, 11-point blade has special temper for cutting lead pipe, thin metals and wood in which nails are embedded. The 10-point, 14-inch blade is for regular compass saw work. The keyhole blade is 10 inches long, 10 points to the inch, tempered, tapered to a sharp point for keyhole and other sharp-curve cutting. All blades tempered to withstand strain of curve cutting.

All blades are of Disston Steel, taper ground. Square top handle has weatherproof finish, cluster bolt and wing nut adjustment.

No. 60 Nest of Saws

All blades in the Disston No. 60 Nest of Saws are made of Disston Steel, hardened, tempered, taper ground, slotted to receive tightening bolt in handle.

Adjustable handle of hardwood, weatherproof finish, with cluster bolt and wing nut, permitting quick adjustment and replacement of blades.

Square top permits reversing blade for work in close quarters.

Plumber's blade is 18 inches long, 15 points to the inch, tempered to cut nails. Compass blade is 14 inches long, 10 points to the inch. Keyhole blade is 10 inches long, 10 points to the inch.

No. 15 Keyhole Saw

Designed for cutting frets and other fine work. Blade is made of Disston Steel, with thin back, and tapered to a sharp point. Teeth are 10 points to inch. Open grip, hardwood handle, weatherproof finish. Blade is made in two lengths—10 inch and 12 inch.

No. 3 Nest of Saws

Suitable for a wide range of work. Has three different types of blades, each designed for a specific purpose.

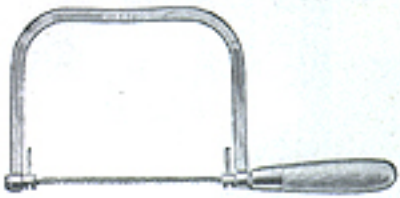
Keyhole blade, 10 inches long, 10 points to inch, for cutting keyholes, sharp curves, and other small work.

Compass blade, 14 inches long, 10 points to inch, for cutting curves and shapes in heavier work.

Pruning blade, 16 inches long, 8 points to inch, for pruning fruit and ornamental trees, shrubbery, etc. Can also be used as a general purpose saw.

All blades are made of Disston Steel; all fit the same flat top handle and are securely held by cluster bolt and wing nut adjustment, which permits use in regular or reverse position. Handle has weatherproof finish.

Disston No. 10 Coping Saw



Designed for cutting curves, shaping the ends of molding for joints, for scroll work, making shelf brackets, wooden toys, etc. It takes narrow blades, only 1/8 inch wide, fitted at each end with a pin which is inserted in stretcher at each end of frame. Blades are 6 7/16 inches long between pins.

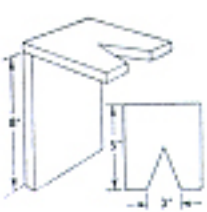
A square nut, forced into the handle, engages threaded end of stretcher. By turning handle, blade is strained and can be turned as desired for cutting sharp angles. When placing blades in frame have teeth pointing toward handle.

Using coping saw with saddle

Frame is made of Disston Steel. It is 3/8 inch wide, 5/16 inch thick, and 4 3/4 inches deep from tooth edge to inside of back. Hardwood handle.

A coping saw is generally used with a saddle, as illustrated, to support the work. It consists of a board with a V-notch attached to a support.

In cutting scroll work, furniture overlays, etc., the piece marked with the design is held on the saddle and shifted so that the saw can accommodate the curves as they are encountered. Change angle of blade in the frame when making sharp turns, to avoid breakage.



HOW TO MAKE A COPING SADDLE

Cut board 8 to 12 inches long by 5 inches wide. In a second piece, 5 inches square, cut a V-notch 3 inches wide by 3 1/2 inches deep Attach as shown, using butt joint, screwed or nailed (see page 61), and reinforce with a glued block or metal brackets.

Disston No. 10 Coping Saw Blades

For wood. Made of spring saw steel. Bright blade, filed and set. Blade fits Disston No. 10 frame. Overall length 6 5/8 inches; 6 1/16 inches pin to pin; 1/8 inch wide; 15 points to inch.

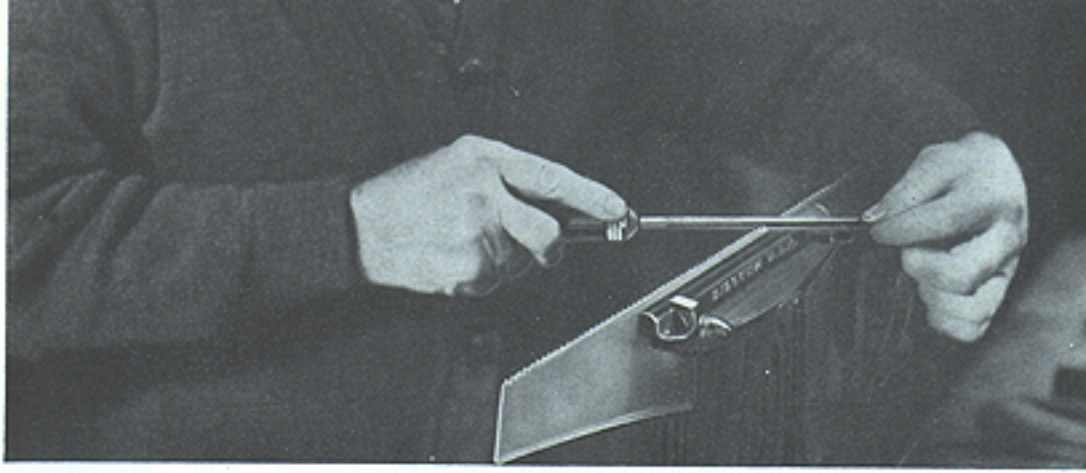
No. 2 Coping Saw Blades
(Loop end)

An all purpose blade for cutting wood, fibre materials, brass, celluloid, bone, composition board, copper and other materials. These blades cannot be used in No. 10 coping saw frame, but are made for use in the Disston No. 2 coping saw.

Blades are oil hardened and tempered; teeth set and filed; black finish. Ends of blade are looped and tempered to stand strain of tension. Length 6 inches overall; 1/16" inch wide; 17 points to inch.

When you have finished using your coping saw, release tension on blade, or remove before hanging up frame.

TO CUT circular discs on jig saw: clamp plywood board to table; use sharpened brad placed at one side of saw as center of disc. Pivot work on brad and revolve against saw.



How to Sharpen a Hand Saw

A Disston Saw is a fine tool, accurately made by skilled mechanics, 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 instructions carefully.

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

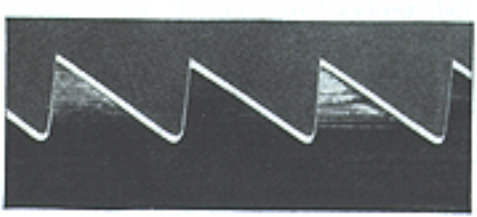
First examine the tooth-edge of your saw to see if teeth are uniform in size and shape, and that they are properly set.

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 cut longer and better, and sufficient set will remain to enable the saw to clear itself.

Second, study the shape of the teeth. Teeth of saws for cross-cutting should be shaped as shown in upper illustration below, left. Teeth of saws for ripping should be shaped like those shown in lower illustration below, left.

A saw cannot give good service unless the teeth are of even, uniform size and properly shaped. If the teeth are uneven, it will be necessary to joint the saw and shape the teeth in accordance with the following instructions:

Shape of cross-cut saw teeth



Shape of rip saw teeth

JOINTING

Jointing means bringing all the teeth to the same height. This need be done only when the teeth are uneven and incorrectly shaped, or when the tooth edge is not straight or is excessively breasted. Unless the teeth are regular in size and shape, it is useless to attempt to set and file a saw.

THE ABOVE illustration is a photographic reproduction showing actual conditions of a saw returned to us. It is typical of the manner in which many saws are abused. It is best to have saws, such as this, retoothed at the factory.

Looking from back of saw, this shows how the teeth, when set, extend beyond the sides of the blade.

HOW TO JOINT A SAW

The Disston Hand Saw Jointer, described on page 26, is made to help you do this work accurately. This tool holds the file squarely on the tooth edge and eliminates any chance of tipping the file to one side or the other and rounding the points of the teeth. In case you do not have a jointer, proceed as follows:

Place the saw in a clamp, handle to the right. Lay a Mill file lengthwise flat upon 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 the teeth that have been jointed and joint the teeth a second time. The teeth then will be of equal height. Do not allow the file to tip to one side or the other. Hold it flat.

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 and angle. The teeth must be uniform in size. (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.

SETTING THE TEETH

Edge view of cross-cut teeth

As mentioned before, one need not reset the teeth of a well-tempered hand saw every time the teeth need a light sharpening. If it is not necessary to joint and shape the teeth, examine the saw to see if the teeth have the proper amount of set indicated in illustration at right and opposite on next page. If they have proper set the saw is ready for filing. If they do not, set them in accordance with the following instructions:

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 push hard in the cut.

DEPTH OF SET

Whether the saw is fine or coarse, the depth of the set should not go lower than half the tooth. This is important. If deeper than this it is likely to spring, crimp or crack the blade, if it does not break out a tooth.

A taper 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 along the back which provides the measure of clearance necessary for easy running.

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

Edge view rip teeth

USING A SAW SET

The general practice, outside a saw factory, is to set the teeth by bending over the point of tooth by pressure with a special tool known as a saw set. Many so called saw sets are impractical; they give too deep a set, or the pressure is improperly applied. Recognizing this difficulty years ago, Diston invented and produced the Triumph Saw Set. We fully recommend it as a tool that will do this work properly. The Triumph Saw Set is illustrated and described on page 26.

In setting teeth, particular care must be taken to see that the set is regular. It must be the same width from end to end of the blade, and the same width on both sides of the blade, otherwise the saw will not cut true, it will run out of line and the cut will be "snaky." Frequently complaints have been made that the saw is soft and will not hold an edge, when the main trouble is the irregularity of the width of the set.

FILING THE TEETH

There are a variety of shapes in teeth, variation in angles, bevel, etc., each adapted for a special work, such as cutting dry, seasoned lumber; wet or green lumber; hardwood; soft wood; etc. The saw user should follow these instructions for saws in ordinary use, for the teeth, whether large or small, are alike. All but the most experienced should follow these recommendations for the 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 a line with the operator's elbows for best working position.

The following table indicates the file to be used:

4½, 5½, 6 points—7 inch Slim Taper
7, 8 points—6 inch Slim Taper
9, 10 points—5 or 6 inch Slim Taper
11, 12, 13, 14, 15 points—4½ inch Slim Taper
Over 16 points—5 inch Superfine Metal Saw, No. 2 Cut
Jointing teeth—8 or 10 inch Mill Bastard

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 in rip saws, 5½ points, the teeth at the point of the blade are finer than the balance of the blade; therefore in measuring rip saw teeth, take the regular teeth at butt of blade.

Place the saw in filing clamp WITH HANDLE AT RIGHT. The bottom of the gullets of teeth should be ⅛ inch 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 "How to Joint a Saw" on opposite page) to form a VERY SMALL flat top on each tooth. The purpose of this is to provide a guide for filing. It does, however, again even up the teeth—which is the main purpose of jointing. Now, file the teeth as instructed in the following paragraphs:

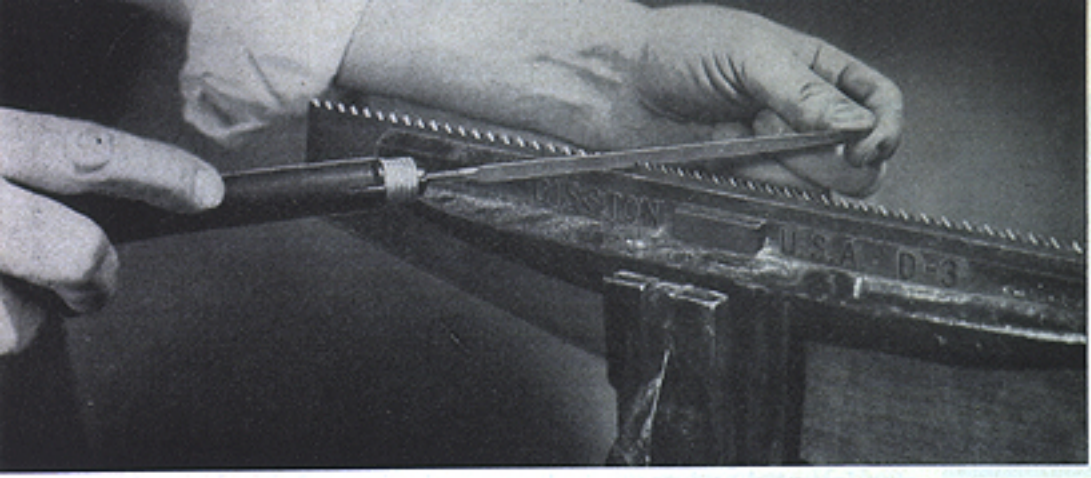
FILING HAND SAWS FOR CROSS-CUTTING

Stand at first position, illustration shown below. 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

First position for filing hand saws for cross-cutting

handle toward the LEFT to the desired angle. Illustration above shows the correct angle.

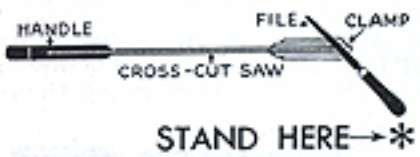
Hold the file level and at this angle. Do not allow file to tip upward or downward. Be sure the file sets down well into the gullet. Let it find its own bearing against the teeth it touches. It will help the beginner if he will first observe the shape and bevel of some of the unused teeth that can most always be found near the



Position of file for beveling teeth

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 back of the tooth to the left and the front of 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.



Second position for filing cross-cut saws

Study the second position illustration shown above before you go further. Turn the saw around in the clamp, HANDLE TO THE LEFT. Take second position. 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 to the desired angle toward the RIGHT. 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, until you reach the handle of the saw.

In filing teeth use care to see that in the final sharpening all the teeth are of the same size and height, otherwise the saw will not cut satisfactorily, as the teeth being of uneven sizes will place the strain only on the larger or higher teeth, and will cause the saw to jump or bind in the kerf; this will in many cases kink the blade, throwing it out of true.

FILING HAND SAWS FOR RIPPING

With one exception, this operation 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. The file should be placed in gullet so as to keep the angle on the front of each tooth 8° at front, 52° at back, as explained on Page 12 in description of rip saw teeth.

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 to file in every second gullet until handle-end of saw is reached.

In reading this part of the saw filing instructions, the inexperienced user may be tempted to save the trouble

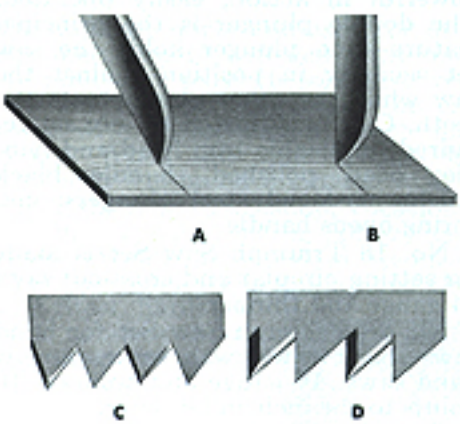
of turning the saw around in clamp and try to file all teeth from the same side of the blade. Don't do it—this practice is one of the things that makes saws run to one side. This should never be done either with the rip saw or with a cross-cut saw.

PROPER SHAPE AND ANGLE OF SAW TEETH

On pages 10 and 12 the angles of cross-cut and rip teeth were described. However, some additional information 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.

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

The angles 15° front and 45° back are for cross-cut saws; and 8° front and 52° back for rip saws as the saws are made at factory will prove most satisfactory for general use. When a saw has less angle at the front of the teeth than these recommendations, it is said to have more hook or pitch. If too much hook is given to the teeth

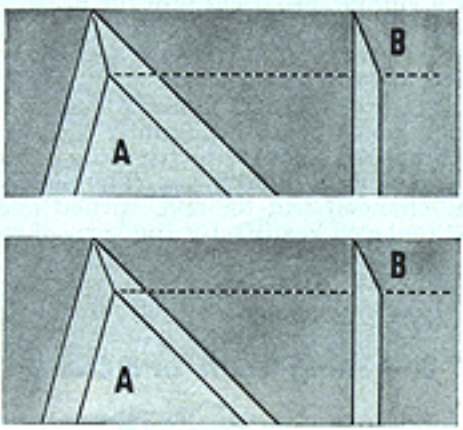


the saw often takes hold too keenly causing it to "hang up" suddenly in the cut—resulting sometimes in a kinked blade. When there is too much set, the teeth may be broken, because the strain caused by the unnecessary amount of set is out of proportion to the strength of the blade.

In filing saws for cross-cutting, the file is held at an angle, therefore, the teeth are given an angle on the front and back of the teeth which is called bevel.

Bevel of the Teeth

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.



The illustration, first figure above, shows—a tooth (enlarged) of a cross-cut saw with the same amount of bevel front and back. This saw with long front B is best suited for work in soft woods where rapid, rather than fine, work, is required.

The second illustration 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 B.

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 carefully.

TOOLS FOR REFITTING HAND SAWS

Anyone can sharpen a saw with the following Disston tools. They are the best and most practical tools made for the purpose.

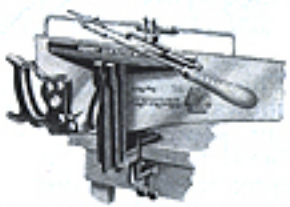
No. 10 Hand Saw Jointer

The Disston No. 10 Hand Saw Jointer is a simple, practical tool for dressing uneven saw teeth to uniform height before shaping the teeth and resetting a saw.

Made of malleable iron, formed to fit the hand. It opens and closes like a hinge, and is fitted with a file of the proper cut to joint a saw. The file can be changed end for end, turned over or replaced readily by the turn of set screws. Size over all 2¼ inches by 5 inches.

File furnished with each jointer.

D-3 Filing Guide and Clamp



Saw and guide in position for filing

The D-3 Filing Guide and Clamp is especially designed for those not experienced in filing hand saws. It enables the user to file each tooth at the same angle. It is made to file both cross-cut or rip saws. The length of the jaw is 12½ inches.

Clamp is japanned; strong and durable; readily adjusted; eccentric lever opens and closes jaws; thumb screw attaches clamp to bench.

Any taper or slim taper file can be used in filing guide.

Guide frame is made of heavy steel wire; japanned iron swivel attachment; hardwood file handle turned for a comfortable grip.

Six-inch Disston Slim Taper File supplied with the D-3 Filing Guide and Clamp.

No. 1 Saw Filing Clamp

The Disston No. 1 Saw Clamp is one of the most convenient and easily operated hand saw filing clamps made. It has a Ball and Socket adjustment which permits the clamp to be placed at any angle, backward, forward or to either side. A turn of the lever holds the clamp rigidly in place. A thumb screw device attaches clamp to bench.

A malleable iron lever, pressed downward, causes the jaws to grip the saw blade and hold it firmly in position until filing job is completed. The reverse movement of lever opens the jaws. The entire clamp is japanned.

No. 28 Triumph Saw Set

The Disston Triumph Saw Set makes saw setting easy. It is a strong tool, powerful in action, easily operated. The double plunger is the principal feature—one plunger holds the saw set securely in position against the saw while the other plunger sets the teeth. Can be adjusted to any set required; malleable iron head and handle; head polished, handle black finish; hardened steel plungers; coil spring opens handle.

No. 18 Triumph Saw Set is made for setting circular and cross-cut saws 14 gauge and thinner.

No. 28 Triumph Saw Set for hand saws, back saws, web saws, narrow band saws, 16 gauge and thinner, 10 points to the inch and coarser.

The No. 280 Triumph Saw Set is made for setting hand saws, back saws, butcher saws and other saws with 10 to 16 points to inch.

ABOVE—Trimming inlay picture with "square board" made of plywood with a strip to fit table slot tacked to bottom.

How to Choose and Use Circular Saws

The modern home craftsworker does not long remain satisfied with tools for hand work only. He soon discovers how much faster and easier he can work with motor-driven bench machines. When this time arrives, his first need will be for a circular saw.

For the home workshop, vocational training school, and for factory use, Disston Small Circular Saws are ideal. They are made from the famous Disston Steel, hardened and tempered to give long and exacting service.

A well-equipped shop should have a rip, a cross-cut, a combination flat ground, and a combination hollow ground circular saw. For many types of work you will find a Dado Head very desirable.

Disston makes a full line of these small circular saws, especially for workshop use. The Disston De Luxe Homework shop line is described on the following page.

Using same "square board" to cut straight edge on piece of thin stock having no straight side.

DISSTON DE LUXE CIRCULAR SAWS

In these De Luxe Saws you get Disston Steel and Disston workmanship of the same high standards, same guarantee, as the famous Disston Circular Saws used by the world's leading lumber mills.

They have a high, smooth finish, keen teeth, accurate fitting. These fine blades make cutting easier and more accurate.

De Luxe Cut-off—D-40

De Luxe Rip—D-110

D-850 De Luxe Combination Flat Ground

De Luxe Combination Flat Ground—D-320

De Luxe Combination Hollow Ground—D-3200

Diameter	Number and Type	Gauge	Center Hole Inches
6 inches	D-40 Cut-off, D-110 Rip, D-850 Combination, D-320 Combination.	18	½
	D-3200 Hollow Ground	19/16	½
7 inches	D-40 Cut-off, D-110 Rip, D-850 Combination, D-320 Combination.	18	½
	D-3200 Hollow Ground	19/16	½

Diameter	Number and Type	Gauge	Center Hole Inches
8 inches	D-40 Cut-off, D-110 Rip, D-850 Combination, D-320 Combination.	18	½, 5/8, ¾
	D-3200 Hollow Ground	17/14	½, 5/8, ¾
10 inches	D-40 Cut-off, D-110 Rip, D-850 Combination, D-320 Combination.	16	5/8, ¾
	D-3200 Hollow Ground	17/14	5/8, ¾

DISSTON DE LUXE CIRCULAR SAWS

(for metal)

The Disston D-4-M and D-6-M Circular Saws are made of Disston steel in 4 and 6-inch diameters. They are used for sawing brass, bronze, copper and soft metal alloys.

Number	Diameter	Center Hole Inches	Thickness Inches
D-4-M	4 inches.....	½	1/32
D-6-M	6 inches.....	½, ⅝	1/24

DISSTON DE LUXE DADO HEADS

D-16 DADO

The Disston D-16 Dado is of entirely new design for home workshop and small industrial machines. The D-16 produces smooth, square-bottom grooves; cuts with, across or diagonally to the grain. Outside cutters hollow ground for added clearance. Cuts grooves varying in width from ⅛-inch to 13/16-inch. Made of Disston Steel, carefully finished and accurately fitted.

Outside cutters have 8 sections of cutting teeth and 4 raker teeth. The 8 sections of cutting teeth are ground alternately to left and to right to divide the cut.

Inside cutters ⅛-inch and ¼-inch are swage set for clearance.

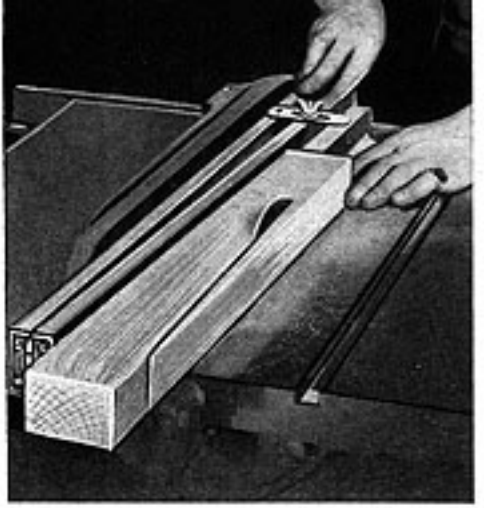
Set consists of 2 outside cutters, ⅛-inch thick and 4 inside cutters, one 1/16-inch, two ⅛-inch and one ¼-inch.

D-16 Dado Set

Diameter	Kerf Inches	Center Hole Inches
6 inches	11	½, ⅝, ¾

Single Cutters

	Diameter	Kerf Inches	Center Hole Inches
Outside	6 inches	⅛	½, ⅝, ¾
Inside	6 inches	1/16	½, ⅝, ¾
Inside	6 inches	⅛	½, ⅝, ¾
Inside	6 inches	¼	½, ⅝, ¾



CUTTING TAPERS—A hinged jig with thumb-screw attachment for holding one end of the work the desired distance away from fence makes the cutting of tapers accurate and easy.

REFITTING SMALL CIRCULAR SAWS

Jointing the Saw

The first step in refitting circular saws is jointing; getting all the teeth the same height. Joint the teeth by running the saw slowly backward by hand on the mandrel, while holding a piece of emery stone or a mill file, lightly against the tops of teeth. Continue until the tops of all the teeth show that they have been touched by the emery stone or file.

Shaping the Teeth

After jointing, put the saw in filing clamp and shape the teeth as near to the original shape as possible. Have all the teeth of the same shape with gullets of even depth and width. Use a Disston 6 inch or 7 inch Taper file for fine tooth saws and combination saws. Use a Disston 6 inch or 8 inch Mill file with round edges for rounding the gullets of rip saws.

A 30" ROD of steel or brass, substituted for short mitre gauge slot piece, will enable owner of small table saw to handle wide boards.

Setting the Teeth

After the teeth have been shaped, they should be set with a Disston No. 18 Triumph Saw Set. (See page 26.) The saw should project fairly well above the clamp jaws. Place the die and anvil of the saw set on the tooth to be set, taking care not to carry the set down too far on the tooth. If this is done the body of blade (below the gullets) will be distorted. Be sure every other tooth is set in the same direction it was when the saw was new. After setting, any teeth which are not in alignment with the others, should be corrected.

The raker teeth of flat ground combination saws should not be set. The teeth and rakers of hollow ground combination saws should not be set.

Saws for electric hand saws should have more set than bench saws—about .018 to .025 on each side.

Posed by the late Chas. M. Hoover who had worked for Disston more than 60 years when photograph was made.

Filing Small Circular Saws

After setting, file the teeth as nearly as possible the same shape as they were when the saw was new. You probably noticed, when your cut-off or combination saw was new, that the teeth were beveled alternately; one tooth was filed or sharpened with the bevel on the right hand side and the next tooth had the bevel on the left hand side. They are filed in this manner to sever the fibres of the wood more easily. In resharpening, bevel the teeth as they originally were beveled.

REFITTING CIRCULAR SAWS

Saws usually are sharpened for all around cutting. If your work is mostly in soft wood, you may carry a wider bevel on the teeth. In filing, do not reduce the length of the teeth; simply bring them up to a sharp point. If the teeth are uneven, the saw cannot cut properly. Have all teeth of the same shape, with gullets of even depth.

Do not file sharp corners or nicks in the bottom of the gullets. This usually results in cracks in the gullets.

Bevel the teeth in cut-off saws on both the face and back edges. More bevel, however, is filed on the face than on the back of the teeth

File rip saw teeth straight across to a chisel-like edge. Then give the teeth a very slight bevel on the back of the teeth. In filing any saws, take care that the bevel does not run down into the gullets. The bevel on both the face and back should be about one-third the length of the teeth. In filing a flat ground combination saw, which cross-cuts, rips and mitres, use the same method for beveling the scoring teeth as is used in sharpening a cut-off saw. Some combination saws have rakers, or cleaner teeth, to remove the material left in the cut by the beveled cutting teeth, hence the points of these rakers or cleaner teeth should be filed 1/64-inch shorter for hardwood, 1/32-inch for soft wood, than the points of the beveled cutting teeth. After filing these teeth shorter, square the face of each raker tooth and bring it to a chisel-like edge by filing on the back of the tooth only.

In sharpening a hollow ground combination saw, follow the method used with a flat ground combination saw, but do not set the teeth, as the hollow grinding provides ample clearance.

WHEN RIPPING or beveling narrow pieces, hold-downs like these insure accurate work without endangering the fingers.

Making cuts for feather-edge joint at corner of small box.

TOOLS FOR REFITTING SMALL CIRCULAR SAWS

Disston Taper File

Best adapted for filing teeth of small cut-off and combination saws. Use 6, 7 or 8 inch size.

6 or 8 inch Cant Saw file is recommended for filing combination saws and outside dado cutters.

Disston Mill Bastard File
Two Round Edges

Will give best service for filing rip saws. Use 6 or 8 inch size.

Disston Triumph Saw Set

The No. 18 Triumph Saw Set gives a perfect set on small circular saws. The best tool for the purpose.

Circular Saw Filing Clamp No. 7

Saw in clamp

Disston Circular Saw Filing Clamp No. 7

Handy, well-built, tool for filing circular saws, 5 to 18 inches in diameter. Fastens to bench with thumb screw; elbow joint tilts clamp to any angle. Place saw on movable bracket. Thumb screw permits raising or lowering of saw to correct position for filing. Cut-ved jaws grip rim of saw.

More than a Century of DISSTON LEADERSHIP

In 1840, Henry Disston, a young man of vision, was certain that he could make a better saw than those then in use. So he set up a shop in a cellar in Philadelphia, and began the manufacture of Disston saws.

From the very start his business was a success. Within a few years, the demand switched from foreign saws to those made by Henry Disston. The Disston saw works was firmly established, eventually to become famous throughout the world.

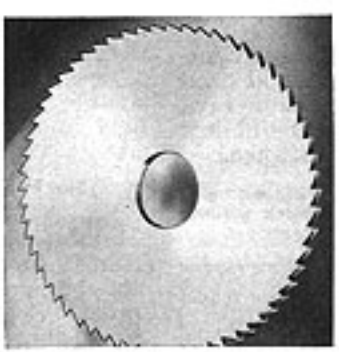
For more than a century the enterprise started by Henry Disston has progressed steadily through the years making one advancement after another. A few of the many Disston developments are shown on these two pages. They indicate some of the reasons why the name Disston is so highly regarded by those who appreciate fine quality in the tools they use—why the Disston Saw is "The Saw Most Carpenters Use."

1840 Henry Disston began the manufacture of saws in Philadelphia, and trained saw makers in his methods. Disston Saws rapidly displaced imported saws throughout America.

1855 Disston built his own furnace and cast the first crucible saw steel ever made in America. Disston Steel always has been famous for the service it renders to users.

1865 Because he needed better files, Henry Disston began the manufacture of files in 1865. Today, Disston makes 250 kinds—more than 1,000 different cuts and sizes.

1874 Henry Disston designed the skew-back saw. Until then all hand saws had straight backs. He called in his engineer and with a piece of crayon drew the design on the office floor.



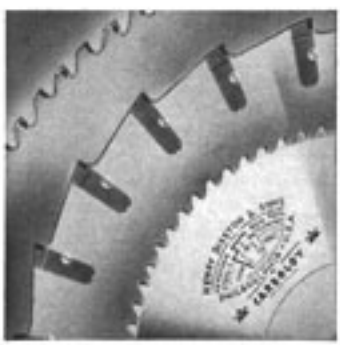
1889 Disston produced the first 18-inch circular metal cutting saw, which revolutionized metal cutting in America. This first milling saw was used in Midvale Steel Works.

1894 Disston made America's first power machine hack saw blades. Millions of Disston Power Machine and Hand Hack Saw Blades are now in use throughout the world.

1906 Disston cast first heat of electric saw steel of crucible quality in America. Today, giant furnaces in Disston Steel Works make tool steel of this quality every day.

1918 Disston introduced the the Sectional Interlock Inserted Tooth Milling Saw. In 1922, Disston was awarded the Franklin Institute Medal for this improvement.

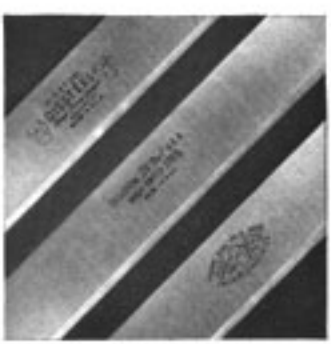
1924 Disston made 110-inch Spiral Inserted Tooth Cut-off Saws for cutting shingle bolts from the large logs on the Pacific Coast. Each saw weighed 1595 pounds; each had 190 teeth.



1929 Disston perfected and introduced Disston Carboloy-fitted Saws and Knives with cutting edges tipped with Carboloy, the hardest alloy ever used for saws and knives.

1935 Disston developed the D-95 MASTERPIECE, a hand saw with new type handle, made of toughest, strongest molded material ever developed. Will not chip, shrink or swell.

1936 Disston began production of the Disston Chain Saw, which has so greatly increased production and cut costs in the forests, shipyards, on railroads, and wherever else large timbers are cut.



1939 Disston announced the first complete line of thin planer knives ever offered to the millman — Dissteel, Di-mol and Disston High Speed Steel.

1940's Disston supplied vast quantities of armor plate, Steel, Saws, Tools, Files and other products and material for our armed forces and war industries.

1947 Disston developed this fine set of wood turning chisels for the professional and home craftsworker. Blades of extra high carbon tool steel. Each chisel is perfectly balanced.

How to Choose and Use Band Saws

Band saws are designed specially for high speed work. They are used chiefly in shops where there is considerable sawing to be done. However many home workshops are equipped with small band saw machines for which Disston DeLuxe Wood and Metal Band Saws are made.

These are used for cutting wood, metal, fibre, plastics, etc. They are made of the famous Disston Steel, which is recognized by thousands of users for its toughness and temper. And they have the resiliency necessary to stand the constant strain and bends to which such saws are subjected.

Blades are straight and true. Teeth are properly set, have the correct pitch, size, space and depth for fast cutting and smoothness of operation.

Disston DeLuxe Band Saw for Wood or Metal

These fine saws are a special development by Disston. They are capable of standing the severe bending strain on small machines, having been made specially for use on wheels of small diameters—10, 12, 14 and 16 inches. On wheels of these sizes Disston De Luxe Band Saws will give longer and better service.

How to use a Band Saw for Best Results

See that band saw is not too wide for the cut to be made. Use narrow saws for sharp curves and angles. Be sure your saw is sharp and has sufficient set to prevent binding.

Wheels should be clean and run true. Strain blade over wheels to give correct tension, so saw will not slip. Guide wheel must turn freely; it should not press against blade when saw is not cutting.

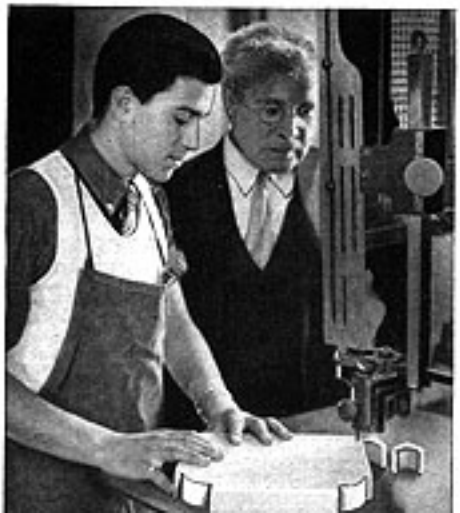
Close both guard doors. *Set upper guide just high enough to clear work to be cut.* Get full speed before starting to cut. Follow outside of line marked on work; leave line on the finished piece.

In cutting curves, use one hand as pivot and turn work with other hand. Never try to pick pieces of wood out of the table slot while saw is running. In backing out of cut, do not twist saw.

Refitting Narrow Band Saws by hand

Those who do not have an automatic filing machine may sharpen narrow band saws by hand. Disston's Adjustable Band Saw Clamp, No. 4 is used for hand sharpening.

Place the saw to be sharpened on a long bench so that it is supported throughout its length on the same level during filing. Make sure teeth point to the left. The clamp will hold a section of approximately 50 teeth at one setting. The saw is then moved so that one section after another is worked on until the entire length of the saw has been sharpened.



It is usual to joint the section slightly before beginning to file the teeth. This is done with a Disston Hand Saw Jointer or by lightly running a mill file over the tops of the teeth to make them all of a uniform height. Jointing will also assist as a guide in filing as explained later.

Keep the teeth on your saw the same as when new. Use a Disston Band Saw Taper file for sharpening Narrow Band Saws as follows:

3 and 3½ pt.—6″ No. 35 Band file.
4 and 5 pt.—6″ No. 45 Band file.
5 and 6 pt.—6″ No. 56 Band file.
7, 8, 9 and 10 pt.—7″ Ex. Slim Taper file.

Hold the file in a horizontal position. File each tooth straight across the saw at right angles to the blade, raising your file on the back stroke.

If the point of any tooth is not brought up sharp after the stroke of the file, do not do extra filing to sharpen this particular tooth. Instead, continue until you have filed the section you are working on. By this method, each section may require two or three goings-over.

Outline of properly shaped band saw tooth showing position of set.

Set too low and not parallel to length of saw.

Teeth may be set with a Disston Triumph No. 28 Saw Set, (see page 26) in the same manner as hand saw teeth are set. When setting is necessary, it should be done before the teeth are filed. It should be remembered that if the saw is to do only straight line cutting, best results are obtained by the least set possible. In this connection, remember that sufficient set is necessary to clear the blade in the cut, particularly when cutting on curved lines. Study the illustration above.

The illustration at left shows standard narrow band saw machine in use in Vocational Training Shop. Disston Narrow Band Saws for such machines are supplied in widths from 1/16 inch to 1¾ inches in 20, 21, 22 and 25 gauge in 3, 4, 5, 6 and 7 points.

For use on machines having wheels 10 inches to 16 inches in diameter, band saws 25 gauges in thickness are recommended.

How to Choose and Use Hack Saws

Hack Saws are designed for cutting metals of all kinds and materials other than wood. Even though most of your work may be with wood, you will find many occasions for using this handy and indispensable tool.

There are four main parts to a hack saw—frame, stretcher, handle, and blade—and the design and quality of all are important.

When choosing a hack saw (1) be sure the frame is strongly built and suitable for the job, (2) that stretchers are simply made, yet efficient, and that they allow for easy removal, replacement and straining of blades, (3) that handle has a comfortable grip located on frame so as to bring pressure on the blade with least effort, and (4) that blades have the correct number of teeth for the material to be cut.

On the following pages are instructions on how to use a hack saw, what blade to use for different metals, together with suggestions on holding work in vise.

BEFORE CUTTING off bolts, turn nut all the way up on the threads first. Then when bolt is cut, unscrewing nut will straighten any battered threads.

DISSTON
Hack Saw Frames

No. 110

The Disston No. 110 Hack Saw Frame is adjustable by half inches for blades 8 to 12 inches. Fitted with hand stretchers which are reversible to four positions.

Frame of Disston Steel, 5/8 x 3/4 inch; rounded edges; depth 3 3/8 inches from tooth edge of blade to inside of back. Eyes are riveted to frame; square stretchers, cannot pull out; pin in each to engage hole in blade.

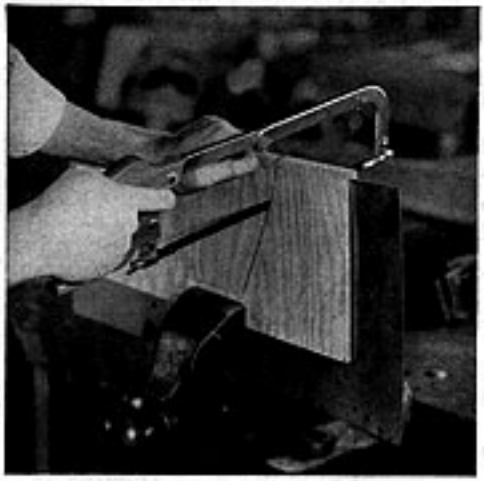
Hardwood handle, turned for comfortable grip; black finish; wing nut adjustment at front of frame makes removal, replacing and straining of blade easy.

No. 36½

This is an ideal frame for all around use. Extension frame adjustable by half inches for 8 to 12 inch blades. Made of Disston Steel, 3/4 x 5/16 inch; rounded edges. Depth, 3 5/16 inches from tooth edge to inside of back; eyes are riveted to frame; stretcher on front end, round; on handle end, square. Pin in each stretcher holds blade in position.

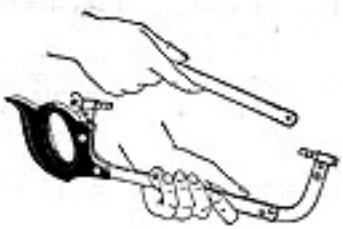
Hardwood handle, weatherproof finish; large, comfortable, closed grip, fastened to frame with two saw screws.

Wing nut adjustment makes removal, replacing and straining of blade easy.

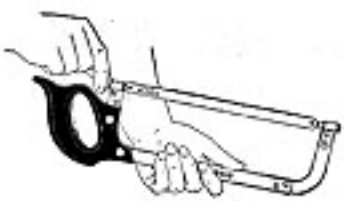


Thin metal can be hack sawed with a coarse-tooth blade when a piece of scrap wood is placed on both sides of work.

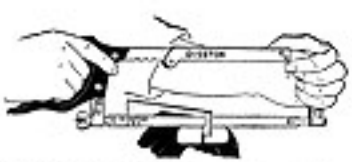
Putting Blade in Hack Saw Frame



First make certain teeth are pointing away from handle and place holes in blade over both pins.



Then tension blade.



Hold hack saw this way when sawing.

USE THE RIGHT HACK SAW BLADE

Hack Saw blades are designed for the cutting of a wide variety of materials, particularly metals, which vary in size, shape, hardness and structure. Thus, in order to obtain the most satisfactory results it is important to use the blade best suited for the purpose.

Disston makes four kinds of hand blades, and two kinds of machine blades. Each is a highly efficient and accurate cutting tool, and will produce excellent results when properly used. The blades, illustrated below, are for hand use only.

Steel Quality is Important

The cutting which a hack saw will do depends upon the quality of steel of which it is made. The steel must be good to begin with, and it must be heat treated to proper hardness and uniform structure. Disston Hand Hack Saw Blades are made of three kinds of steel:

1. High Speed Steel.
2. Molybdenum High speed Steel.
3. Tungsten Alloy Steel.

. . . the finest steels for the purpose. They are properly heat-treated in automatically controlled furnaces. They are uniform and of proper hardness.

The hardness of Disston blades is let down at the holes in order to prevent their snapping when the blades are strained in the frame or a machine. Teeth are left unset at each end to assure rigidity and proper alignment in frame or machine.

Teeth and Set

For straight, accurate and fast cutting, the teeth must be correctly and accurately shaped and set. This means that each tooth is exactly the same in shape and size as every other tooth. The setting is done in a machine which does this work automatically.

The shape of the teeth in Disston Blades and the amount of set are correct. They have proved to be the best through years of research and test.

Disston High Speed Hand Blades are made 10 inches; 18, 24, 32 teeth to the inch. 12 inches; 14, 18, 24, 32 teeth to the inch.

Disston Di-Mol Molybdenum High Speed Steel Hand Blades are made 10 inches; 18, 24, 32 teeth to the inch. 12 inches; 14, 18, 24, 32 teeth to the inch.

Disston Chromol Hand Blades (hardened throughout) are made 10 inches; 18, 24, 32 teeth to the inch. 12 inches; 14, 18, 24, 32 teeth to the inch.

Disston Duraflex Hand Blades (hardened on tooth edge) are made 10 inches; 18, 24, 32 teeth to the inch. 12 inches; 14, 18, 24, 32 teeth to the inch.

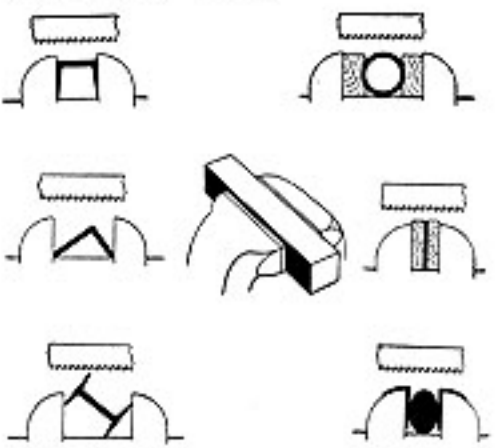
HOW TO USE YOUR HACK SAW CORRECTLY

To use a hack saw correctly, a few points are important. Be sure to strain the blade sufficiently in the frame and when cutting do not twist or bend the blade. Make slow strokes with even pressure, putting the greatest amount of pressure on the forward stroke and lifting slightly on the back stroke. Make each stroke do its full amount of work.

If the blade is not strained properly in the frame, breakage will result, as may also occur when undue strain is placed on the blade by twisting the frame sideways while cutting. It is also important that the correct number of teeth per inch be used on the specific metal for which it is intended. Using the wrong blade will only shorten the life of the blade and cause undue breakage.

It should be borne in mind that in general the coarser tooth blades cut faster and the finer tooth blades cut slower with less risk of tooth breakage.

How to Hold Work in Vise

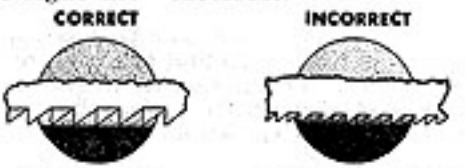


Above illustrations show ways of clamping irregular shapes. To hold oval or circular work in square jaw vise, use wood, leather or copper filler pieces to grip work and to prevent marring.

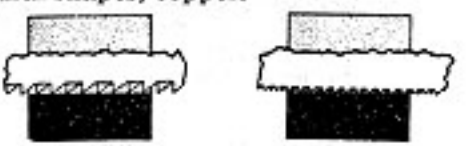
Importance of selecting hand hack saw blades with proper number of teeth for cutting various kinds of work of different metals is shown in the following:

Proper Number of Teeth

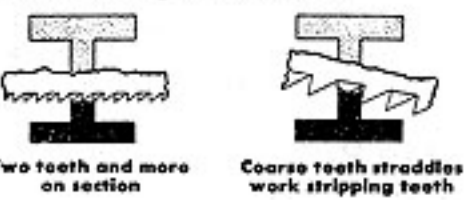
Use 14 teeth for cutting material 1-inch or thicker in sections of cast iron, machine steel, brass, copper, aluminum, bronze, slate. All illustrations on left are "correct"—those at right are "incorrect."



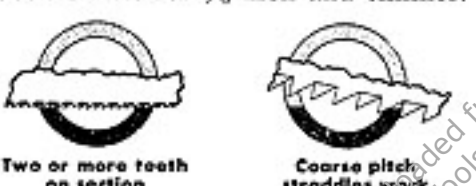
Use 18 teeth for cutting materials ¼-inch to 1-inch in sections of annealed tool steel, high speed steel, rail, bronze, aluminum, light structural shapes, copper.



Use 24 teeth for cutting material ⅛-inch to ¼-inch in sections of iron, steel, brass and copper tubing, wrought iron pipe, drill rod, conduit, light structural shapes, metal trim.



Use 32 teeth for cutting material similar to recommendations for 24 tooth blades for ⅛-inch and thinner.



THE FILE IN HISTORY

The origin of the file, like that of the saw, is lost in the distant past. Homer mentions files in his Odyssey. Solomon must have been speaking of files when he said, "Iron sharpeneth iron; so a man sharpeneth the countenance of his friend." And, in I Samuel: XIII; 21, we read, "They had a file for the mattocks, and for the colters, and for the forks, and for the axes, and to sharpen the goads."

But we must go back far beyond recorded history to find the beginning of the story of the file. As in the case of nearly all tools, the ancestor of the file existed in the stone age.

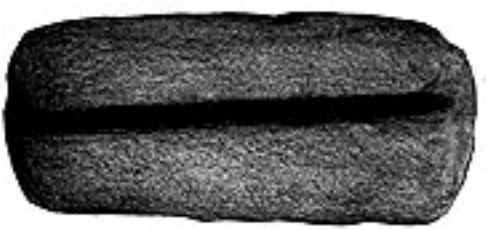


Fig. 1. Stone Used by Ancient Pueblo Indians for Polishing Arrow Shafts.

Although the abrasive stones then used for grinding, cutting and smoothing cannot properly be called files, they represent the first evolutionary step in the file's development. Their use was universal, for remains of these early abrasive stones have been uncovered in all parts of the world.

Fig. 2. Ancient Bronze File from Crete.

First Metal Files were Bronze

When we enter into the Bronze Age, about B.C. 2500, we begin to find samples of the true file. It could not have been a very effective tool for the cutting of stone and metal. Although bronze is capable of a certain amount of hardening, it is far from being a serviceable file-making material.

Enough of these early bronze files, however, have been found to indicate that they were in general use. Bronze files have been found in Hallstatt, in Upper Austria. The Egyptians of the Lisht Dynasty, about B.C. 1200 to 1000 made small rasps of bronze (see Fig. 3). The ancient Romans, Greeks and other European peoples made both files and rasps.

An interesting bronze file was discovered in Crete by an expedition from the University of Pennsylvania. It is now in the Museum of Candia. A likeness to the half-round file of today will be noticed at once (see Fig. 2).

Then Came the Age of Iron

After the discovery of iron, considerable advancement was made in the quality of all tools including files. The earliest steel tools were made by the Assyrians about B.C. 670. Files, in various forms, were among them.

One type showed a remarkable similarity to the mill files we use today, having well shaped tangs and a slight taper at the point. The main difference is in the pattern. The rows of teeth, instead of being diagonal, were cut at right angles to the length of the file.

In writing about the Assyrian files and rasps, W. M. Flinders Petrie says: "An elementary file is formed like a very thick knife, hacked by chisel cuts on both sides and back. The long rasp is exactly of the modern pattern, with points raised by punching."

Fig. 3. Bronze Rasps used by Egyptians.

Cutting Files by Machine

Leonardo da Vinci, a noted scientist as well as artist, is supposed to be the first one to invent a machine for cutting files. This was about 500 years ago. Other inventions that followed employed much the same principle.

Mathurin Jousse, in a work published in 1627, illustrates and describes a file cutting machine. This was later produced by another Frenchman, named Duverger. In 1725, a second machine was invented, also in France, by Ferdonet Thiout. Then came the cutting machines of Brachal and Gamain in 1756 and 1778.

During the early years of the 19th century a number of machines were developed in England and in the United States. But, the first really practicable machine was invented by E. Bornot of Paris, and patented in the United States in 1860. It was brought to this country two years later. Other machines, by other inventors, quickly followed.

The First Disston Files

In the 1860's, when so much attention was being given to the development of file-cutting machines, Henry Disston & Son (the Company's name at that time) were manufacturing saws and thus used large numbers of files. Since they were unable to obtain satisfactory files from outside sources, they found it necessary to make their own.

The Disston files proved to be of such fine quality that customers asked to be supplied. The demand grew fast, and it was decided to enter the field of file-making. In 1865 a plant was equipped and additional skilled workmen employed. At first, files were made by hand, but Henry Disston, realizing that machines were necessary to produce perfect files, made a study of the machines then coming into use.

The Disston engineers began extensive experiments of their own, and eventually succeeded in developing a file-cutting machine that met every requirement. One improvement followed another from year to year. Today, Disston file makers produce files of correct pattern—files with clean, strong, sharp teeth cut at correct angles and of uniform width and depth.

Improved heat treatment gives unusual life to Disston Files. Rigid inspection assures uniform quality. But there is much more to file-making than simply cutting the file teeth. Several processes and operations are employed, requiring a wide variety of equipment and many diversified skills. There are a number of important steps from the making of the steel to the finishing of the completed file. How these are followed in the making of Disston files is illustrated on Page 43.

Fig. 4. Examples of Primitive Files.

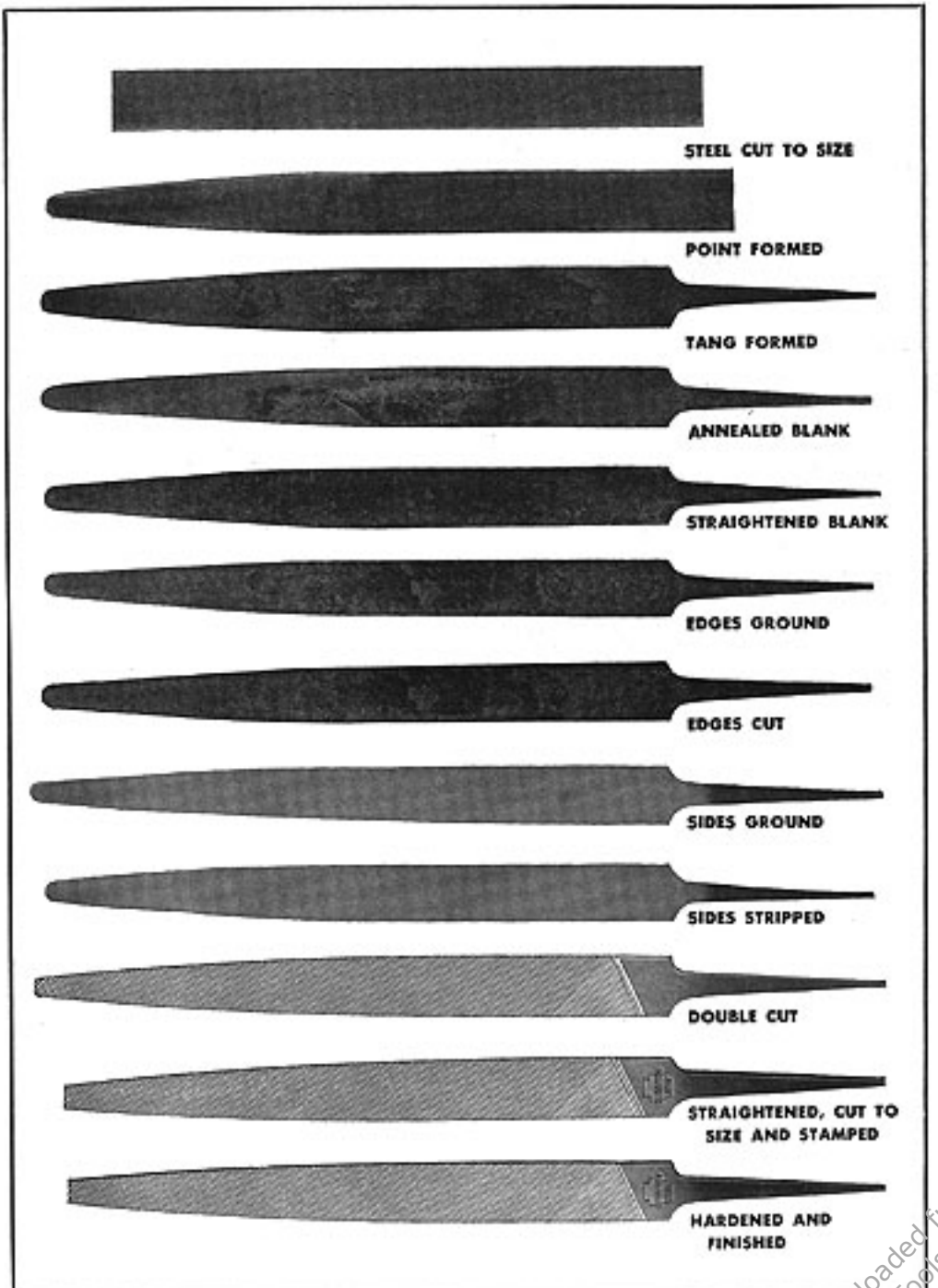
Other Examples of Primitive Files

Compare number under each illustration with number in caption below for character of file or rasp and origin of example.

1. Heavy rasp, blade 13 inches long, 1 inch wide. China. 2. Square file, 11 inches long, $\frac{1}{4}$" square, cross-cut on all four sides. China. 3. Pointed rasp with a curved face; blade 14 inches long. China. 4. Smaller rasp, blade 7 inches long, cross section elliptical but cut only on one side. China. 5. Heavy wood rasp; made of wood with 42 steel blades set into it. China. 6. Smaller wood rasp; same character but with only 15 blades set in a straight surface. China. 7. Knife-shaped file; the wide end is finely cross-cut on both sides; the narrow end is flat on one side and curved on the other, cross-cut on both surfaces. China. 8. Small file; blade only two inches long, one side flat, the other curved, cross-cut on both surfaces. China. 9. Crude hand-cut file from Indo-China. 10. Thin flat file, $8\frac{1}{4}$ inches long, $1\frac{1}{2}$ inches wide; cut only on the edges on both sides. China. 11. File with a thin diamond shape cross section, finely cut on all four sides. Indo-China. 12. Small file, cross-cut on the two flat surfaces, but not on the edges. Japan. 13. Dried tail of a fish, probably a Skate or a Ray, used as a wood rasp. Yucatan. 14. Knife-shaped file, cross-cut on both sides and single cut on the back. China. 15. Small file, blade thickest in the middle, finely cut on all four faces. Japan. 16. Rasp, single cut only about half length of the blade. Indo-China.

THE MAKING OF A DISSTON FILE

We illustrate below twelve important steps of making an ordinary Flat file. Along the line of manufacture there are numerous inspections to insure the quality and uniformity of Disston Files.



How to Choose and Use Files

There are many different kinds of files, and each is designed for a specific use. However, it is not necessary that the homecrafter have more than several patterns, for certain types can be used for many purposes.

File differences consist chiefly of shape, size, coarseness or fineness of cut.

Shape is determined chiefly by the cross-section of the file—flat, round, triangular, etc. A tapered file is one that tapers from heel to point. A blunt file is of same thickness throughout. The more commonly used sizes range from 4 to 10 inches in length, with cross-sections in proportion.

The cut of a file is determined by the spacing, or number of teeth per inch, and their arrangement into Single, Double or Rasp cuts.

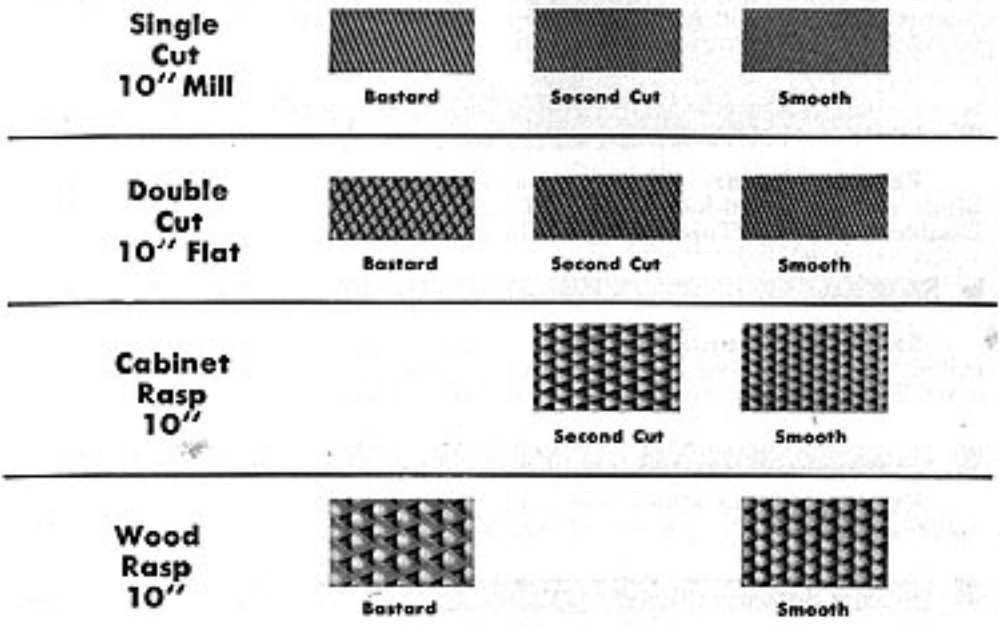
The quality of a file is determined by the cleanness, sharpness, and uniformity of the cut, and by the steel from which it is made.

Disston files are made of tough, high grade steel to enable them to cut faster and last longer than ordinary files. They are correct in pattern, have clean, sharp teeth cut uniformly in width and depth. Improved heat treatment gives them unusually long life.

When ordering files, give definite information as to length, kind, cut and brand.

STANDARD CUTS OF FILE TEETH

All American Pattern files have a standard character of tooth; for instance, all regular Flat, Half Round, Round, Square and other machine shop files are double cut. Mill files, Tapers and other saw files are single cut. The following illustrations show the comparative coarseness of teeth in 10-inch files and rasps.



SHAPES OF FILES AND THEIR USES

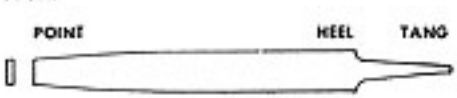
MILL—A single-cut, tapered or blunt file. For compositions of brass and bronze, and smooth finishing in general.

PILLAR—A double-cut, sides parallel file used chiefly for filing slots and keyways.

SQUARE—A double-cut, tapered file for slots, keyways and general surface filing.

TAPER—Triangular in section, single cut, tapered or blunt. Chief use is for sharpening saws with 60° angle teeth.

CANTSAW—Single cut. Blunt. For sharpening circular and cross-cut saws with "M" teeth, and other saws with less than 60° angle teeth.



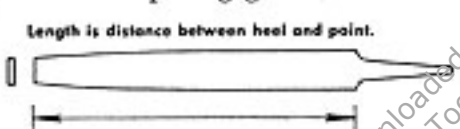
ROUND—Double cut, tapered. For filing circular openings and curved surfaces.

HALF ROUND—Double cut. Tapered For both metal and wood filing. Used for both flat and curved surfaces.

PIT—A true "half-round" file with thickness equal to one-half width. Single cut. Used chiefly for circular openings.

KNIFE—Double cut and tapered. For use on work having sharp angles.

CROSS-CUT—Single cut. Blunt. For some types of cross-cut saws—sides for filing teeth, rounded back for deepening gullets.



Disston Files and Rasps

Eighty-three years of file manufacturing backed by control of raw materials have resulted in producing files of superior quality.

All Disston files are hard, tough, and of uniform quality, which causes them to cut fast and last long. They are correct in pattern, have clean, strong, sharp teeth—cut to proper angle, uniform in width and depth. Rigid inspection assures the uniform quality of Disston Files.

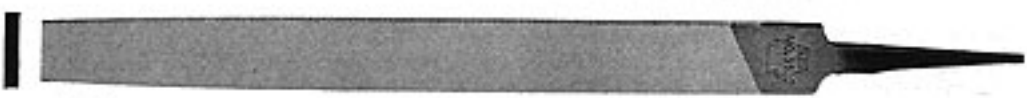
Following are illustrated several of the many patterns of Disston Files. All made in standard cuts and lengths.

Regular Taper—The principal use for Taper Files is for filing saws. Made in 6, 7, 8, 10-inch lengths. Disston also makes Slim, Extra Slim and Double Extra Slim Taper Files for the same purpose.

Extra Slim Hand Saw Blunt—This file is made blunt to assist the unskilled filer in making a level, uniform stroke. Designed especially for filing saws. Has unusually long sweep for its length; made in 5½, 6, 7-inch lengths.

Round—Round Files taper to blunt point. Made in Bastard, Second Cut and Smooth, in 4, 6, 7, 8, 10, 12, 14, 16-inch lengths.

Square—Square Files taper to blunt point. Made in Bastard, Second Cut and Smooth, in 4, 6, 8, 10, 12, 14, 16, 18-inch lengths.



Mill—The Mill File is tapered in both width and thickness. Used for lathe work and draw filing and for sharpening many kinds of edged tools. Made with square edges or two round edges. Also made in Blunt. The Mill, Bastard cut, is made in 4, 6, 7, 8, 10, 12, 14 and 16-inch lengths.

Flat—Flat Files are tapered both in width and thickness. Generally used by machinists for many kinds of flat work. Made Bastard, Second Cut and Smooth, in 4, 6, 8, 10, 12, 14, 16 and 18-inch lengths.

Half Round—Half Round Files are made for fast filing of metal either on flat or curved work. They are made in 4, 6, 8, 10, 12, 14 and 16-inch lengths in Bastard, Second Cut and Smooth.

HOW TO USE A FILE

1—Be sure work to be filed is held securely. Loose work permits the file to chatter, which dulls the teeth.

2—In placing the handle on the tang of the file, do not hit the end of the file to drive it into the handle. Push the handle on, and holding the point of the file up, tap the butt end of the handle on the bench to drive the tang into place

3—Do not exert too much pressure but keep the file cutting—do not allow it to slip over work, as this dulls the teeth.

4—Be sure to raise the file slightly during the return stroke in order to clear the work and prevent dulling by wearing away the backs of the teeth, thus destroying the cutting edges. This does not hold true in the filing of soft metals, such as lead, aluminum, etc. The correct procedure in this case is to draw the file back along the metal on the return stroke as an aid in cleaning the teeth.

5—If the file is not cutting and you find that the spaces between the teeth are choked, you should use a Disston File Card and Brush. Never tap the file to clear its gullets of clogged material. This may break the teeth.

6—On completing your work, do not throw the file on the bench. Lay it down with all the respect due a quality tool. Remember that to do their work effectively, files must be made as hard as fire and oil can make them. Consequently, the teeth are easily chipped and dulled by rough handling.

Disston No. 2 File Card and Brush

Lengthens life of file; assures faster, better work. When a file is clogged a few strokes across its surface with a Disston File Card and Brush will clean out the gullets and allow the file to cut into the metal. The card wire is fine enough to enter a fine-tooth file and loosen clogged chips; brush cleans them out. Strongly built, light in weight; comfortable handle—face of card and brush, 5¼ x 2 inches, overall 9⅜ inches.

Disston Stronghold File Handles

Made from selected wood, in four sizes. Shaped for comfortable grip; smooth, sanded surface. Ferrule end is slit to allow for expansion and contraction when tang is inserted or removed.

The outstanding feature of the Stronghold Handle is the coiled spring-steel ferrule. It expands to allow the tang of file to enter the handle, and then holds it rigidly. No more loose file handles.

The coiled spring-steel ferrule and slit-end handle permit the use of several sizes of files with one handle. Tap lightly with hammer at ferrule end to remove handle from file.

Number of Handle	Length of Handle	Length of Files Used in Handle
No. 1.....	4½ inches	3 to 6 inches
No. 2.....	4⅞ inches	6 to 10 inches
No. 3.....	4⅞ inches	10 to 12 inches
No. 4.....	5⅝ inches	14 and 16 inches

How to Choose and Use Hand Tools

Although Disston is noted chiefly for its fine saws, experienced craftsworkers know that they can expect the same high quality in the other tools that bear this famous name.

The Disston tools described on the following pages are the very finest you can buy. They are unexcelled in quality of materials, workmanship and accuracy. Many of them are essential to a well-equipped workshop.

Disston Squares, Bevels, Gauges and Levels, like other Disston products, are designed for professional use, and can be depended upon for their accuracy and fine construction. With proper care they should last a lifetime.

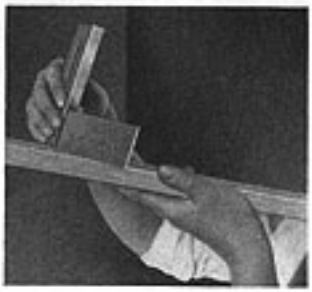
The blades of Disston Try Squares are graduated to eighths of an inch. The stocks are firmly and squarely attached to blades, and can be used with confidence on the most exacting work. Disston Bevels, Gauges and Levels are equally trustworthy.

Since this Manual cannot show all saws and tools made by Disston, only those Disston tools which are most likely to be needed by Home Shop and Farm Shop owner are discribed.

For other tools of Disston make, consult your local hardware retailer.

For accurate marking, use a knife instead of pencil. Place point of knife on exact spot and move try square up to knife, then mark.

HOW TO USE THE TRY SQUARE

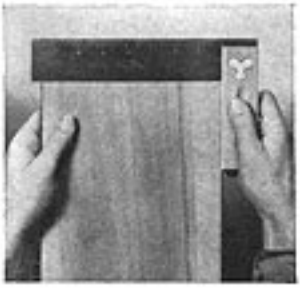


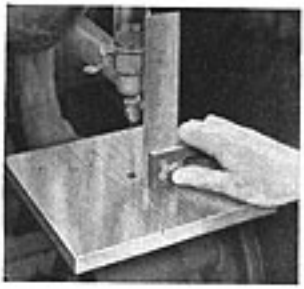
TESTING LEVELNESS OF SURFACE

Try square ground true on edge, may be used for testing surface of a board. Hold board and try square as shown and turn so light can shine under blade.

SQUARING END FROM EDGE

The material to be tested should be held in one hand, and the stock of square held against the edge to be tested so the blade will show squareness.

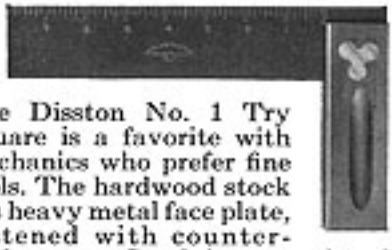




TESTING SCROLL SAW BLADE

Fine scroll saw blades may be tested for squareness to saw table as shown. Lines scribed with sharp awl on table surface also are handy.

Disston No. 1 Try Square



The Disston No. 1 Try Square is a favorite with mechanics who prefer fine tools. The hardwood stock has heavy metal face plate, fastened with countersunk screws. Stock is grooved to form comfortable grip.

Disston Steel blade, blued; machined parallel, is graduated eighths of an inch on both sides from stock to end of blade.

Lengths of blade, 4½, 6, 7½, 8, 9, 10 and 12 inches.

BEVELS

Bevels are closely related to squares. They are also known as T-bevels and bevel squares.

In laying out work, the Disston No. 2 Bevel provides a reliable means of duplicating any angle, by locking the blade in stock at angle desired.

Blades on Disston Bevels are made of Disston Steel. They are perfectly true on both edges, and slotted to move to and fro on bolt of locking device which holds blade at any desired angle. Blade is half round shape at one end; 45° mitre at other end.

Disston wood stock bevels are held in locked position with bolt and nut through top end of stock which locks blade in position.

Disston No. 2 Bevel

The Disston No. 2 Bevel has hardwood handle, grooved to form comfortable grip; fitted with heavy metal face plates, tapered on lever side, bringing the lever in line with handle, permitting bevel to lay flat on either of its sides.

Disston Steel blade, blued finish. Half of blade has slot to move on tightener bolt; is adjustable to any desired angle; one end of blade rounded; other end has a 45° angle.

Lengths of blade, 6, 8, 10 and 12 inches.

SETTING ANGLES WITH BEVEL

After the angle is determined, hold the stock of bevel against the edge of work and adjust it so the bevel edge of the blade meets the line, then tighten the nut and the bevel is set.

GAUGES

For men who work regularly in wood, a gauge is a necessary tool for his kit. For marking lines parallel to straight working surfaces and to provide a straight line to guide planing or sawing, or to lay out mortises, tenons, etc., a marking gauge is the tool to use.

Disston Marking Gauges are made from hardwoods, beautifully finished, and built for wear and accuracy in marking. The heads are curved on two sides, flat on two other sides. The beams have graduated inches. The heads are locked on beams with wing nut screws.

Scribing with a marking gauge

No. 76 Marking Gauge

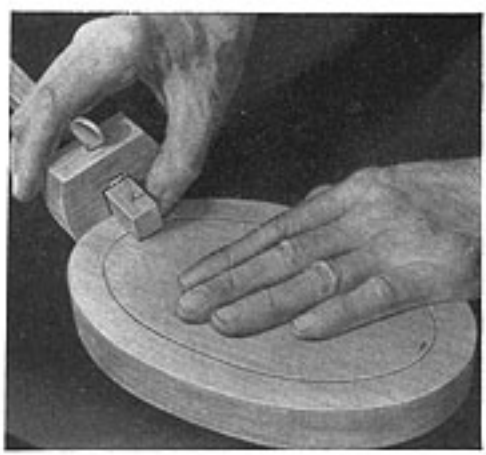
The Disston No. 76 Marking Gauge is made of hardwood, smoothly finished. Stem is graduated by 16ths. The adjusting screw bears against a brass plate in head to prevent wear on the stem.

Size of stem is 8½ x 11/16 x 11/16 inches. Head is 2⅛ x 2½ x 1 inches.

No. 77 Marking Gauge

The Disston No. 77 Marking Gauge is made of hardwood. Stem is graduated by 16ths. Two brass plates on oval head prevent wear on face. The adjusting screw bears against brass plate to prevent wear on stem.

Size of stem is 8½ x 11/16 x 11/16 inches. Head is 2⅛ x 2½ x 1 inches.



Irregular shaped objects can be accurately and easily marked with the marking gauge. Use light pressure, holding the gauge as shown.

No. 90 Goose Neck Wrecking Bar

The Disston No. 90 Goose Neck Wrecking Bar is a handy tool for mechanics and around the home for pulling spikes, prying off box lids, removing boards, etc.

Made from Disston Octagon Tool Steel. Drop forged. Supplied in the following sizes:

½" x 12" with 1" claw
¾" x 24" with 1½" claw
¾" x 30" with 1½" claw
¾" x 36" with 1½" claw

LEVELS

Carpenters, masons, farmers, mechanics and the handy man around the home will find many uses for a good plumb and level.

Disston makes just the style of plumb and level suited to your particular job—all styles and sizes, and they are accurate and dependable in every respect.

The wooden levels are made from straight-grained hardwoods, carefully selected, air and kiln dried. Some of them have the fixed type level and plumb glasses, others have the adjustable type, which may be adjusted should usage or climatic conditions alter their accuracy. All glasses are proved—have two lines scored on the glass. When the bubble in the glass is in center of these lines the work is perfectly level or plumb. All Disston levels made from wood have both sides grooved to afford sure grip.

The Disston aluminum Featherweight Level is the lightest weight level on the market, yet exceptionally strong.

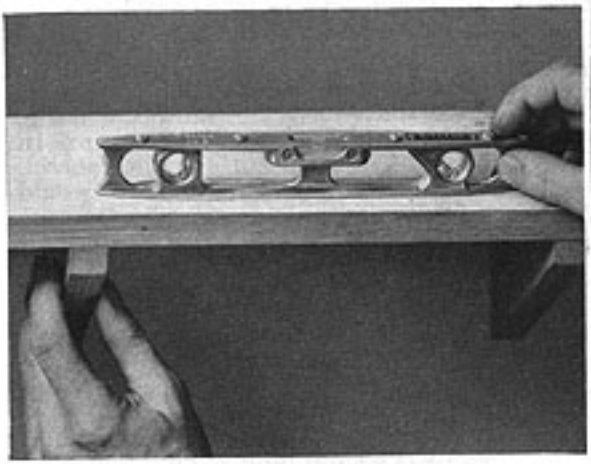
A-11 Featherweight Pocket Level

The Disston A-11 Featherweight Pocket Level is a die cast aluminum alloy . . . a material similar to that used in airplane construction—light in weight, but strong. Will not rust or corrode.

Sides of level parallel for 2¼ inches from center, then taper to point at each end—ends slightly rounded. The level glass view on top side at center; 90° plumb glass at one end; 45° angle glass at other end.

Top plate aluminum mirror finish and stamped "Disston U.S.A." Orange and black decalcomania reading "Disston U.S.A." at opposite end.

Length	Width at Center	Height	Weight Each
9 inches	½ inch	1 ¾ inches	2 ounces



Leveling shelf with Disston A-11 level

Disston No. 255 Plumb and Level

The Disston No. 255 Plumb and Level will be a credit to any mechanic's kit. Walnut stock, nicely finished, showing the beautiful grain of the wood. Sides are grooved for sure grip. The top plate is nickel-plated. Both plumb and level glasses are proved.

Length, 10 inches; depth, 1¾ inches; width, ⅞ inch.

Disston No. 16 Plumb and Level

The Disston No. 16 Plumb and Level is very popular. It has given complete satisfaction to carpenters and mechanics for years. Both plumb and level glasses are proved, and adjustable. The stock is thoroughly seasoned cherry-wood, filled and lacquered; arch top plate; side views. Metal ends protect it against rough usage; grooved sides to afford sure grip.

Made in the following dimensions:

Lengths	Depths	Widths
24 inches	3 inches	1 ⅞ inches
26 inches	3 inches	1 ⅞ inches
28 inches	3 ¼ inches	1 ⅞ inches
30 inches	3 ¼ inches	1 ⅞ inches

SCRAPERS

Cabinet scrapers play a much more important part in cabinet-making, hardwood floor finishing and in smoothing wood surfaces in general, than their plain appearance would indicate.

Scrapers are used, principally, for smoothing a surface after it has been planed; or smoothing a surface that cannot be planed readily. In refinishing furniture, scrapers are about the only tool that will give satisfactory results. Veneers, generally, are not planed, but are scraped.

A mistaken idea prevails that scrapers should remove only fine dust. If properly sharpened and skilfully operated they will actually plane—remove a fine shaving.

In use, the scraper may be either pushed or pulled. When pushed, the scraper is held firmly in both hands, the fingers on one side and the thumbs on the other side. It is tilted forward, away from the operator, far enough to prevent chattering. When pulled, the operation of blade is reversed.

The Disston Line of Cabinet Scrapers comprises various styles and sizes, all made from Disston Saw Steel, and ground to a perfectly smooth surface. They can be used by hand, in holders, and in scraper planes. The blades are edge holding, made with either straight cut edges, or with edges dressed and ground, ready to be burnished.

Disston No. 120 Acme Cabinet Scraper

The Disston No. 120 Acme Cabinet Scraper is made of extra high-tempered hand saw steel with dressed edges and true flat surface. It is the finest and best scraper made. Used by hand, in holders and in scraper planes. Made 20 gauge for regular work; for floor layers, cabinet-makers, golf professionals, etc.

Sizes, 2½ x 5 inches; 2½ x 6 inches; 3 x 5 inches; 3 x 6 inches.

Disston No. 20 Cabinet Scraper

The Disston No. 20 Cabinet Scraper is similar in shape to the No. 120. It is made of hardened and tempered Disston Steel; plain edges; easy to burnish; 20 gauge; for use by hand or in scraper planes.

Sizes, 2 x 4 inches; 2 x 6 inches; 2½ x 5 inches; 2½ x 6 inches; 3 x 4 inches; 3 x 5 inches; 3 x 6 inches; 4 x 6 inches.

Disston Nos. 1 & 6 Wall Scrapers

The Disston Nos. 1 and 6 Wall Scrapers are favorites with paperhangers and painters.

Made of Disston Steel, the blades are hardened and tempered. The scraping edge of No. 1 blade is double beveled. No. 6 blade is not beveled.

Number of Scraper	Scraping Edge	Length of Blade
No. 1	3½ inches	5 inches
No. 1	4 inches	5 inches
No. 6	3½ inches	5 inches
No. 6	4 inches	5 inches

Disston No. 4 Wall Scraper

The Disston No. 4 Wall Scraper has a malleable iron socket colored orange and black, 1-inch inside diameter. A screw hole is drilled in one side of socket to permit fastening scraper to pole.

The Disston Steel blade is hardened and tempered, polished, and beveled to a knife edge. 4 inches in length, with a scraping edge of 3⅞ inches, the blade is securely riveted to socket.

SHARPENING SCRAPERS

For Square Edge Scraping

Some cabinet scrapers are supplied with dressed edges, ready for use; others with plain edges which must be dressed before using. In dressing an edge:

1—Place scraper in vise and draw-file on edges at right angles to face of scraper. Or file lengthwise on scraper edge with file held perfectly flat. The Disston No. 10 Hand Saw Jointer is fine for the latter method of filing as its use insures a perfectly square edge.

2—Next check edge by holding it against a flat surface to see if it is hollow at the center. A scraper edge hollow at center will leave scratches on work.

3—Now lay scraper flat on oil stone and hone until corner of the edge is sharp; then hone other corner.

NOTE: In refitting dressed edged scrapers, follow these instructions also.

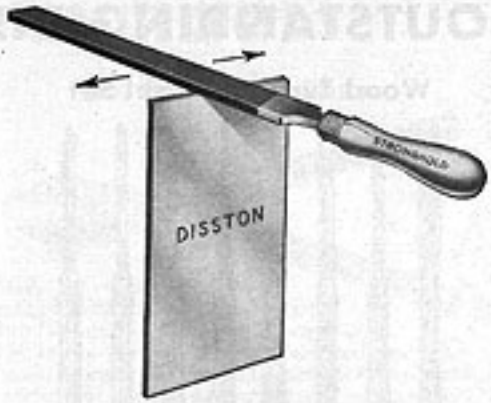
For Fast Cutting

To put a fast-cutting edge on a cabinet scraper:

First, file it with a bevel of about 30°, similar to a bevel on a chisel.

Then, place scraper in a vise and run a burnisher over the keen edge, first at an angle of about 15° and finally at about an 8° angle.

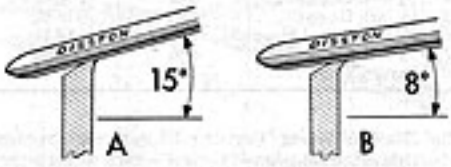
Proper way to hold cabinet scraper



Draw-filing edge of cabinet scraper

This puts a hook on the edge which cuts, or shears off the fiber ends and gives a very smooth surface.

The following illustration and accompanying legend will make clear how to put a faster cutting edge on a scraper.



Turning the edge of a cabinet scraper, using a 4½-inch No. 1 Oval Burnisher.

In this operation the steel is first pressed out from the edge, then tipped over slightly, and finally bent down to give a "hook" to the edge.

Disston Cabinet Burnishers

Disston Cabinet Burnishers are made in one pattern. Blades are of highly polished Disston Steel—steel sufficiently hard to turn the edge of cabinet scrapers and other edged tools without damaging the burnisher.

Round hardwood handle, shaped for comfortable grip, varnished.

	Blade length
No. 1 Oval—light.....	4½ inches

OUTSTANDING DISSTON SPECIALTIES

Wood Turning Chisel Set

No.	Pattern	Length Blades Inches	Overall Length Inches
1	1 inch Skew . . .	6¾	16¾
2	½ inch Skew . . .	6¾	16¾
3	¾ inch Gouge . .	6¾	16¾
4	½ inch Gouge . .	6¾	16¾
5	¼ inch Gouge . .	6¾	16¾
6	½ inch Round Nose	6¾	16¾
7	½ inch Spear Point	6¾	16¾
8	Parting Tool . . .	6¾	16¾

The Disston Wood Turning Chisels which comprise this set are designed for use with a wood lathe.

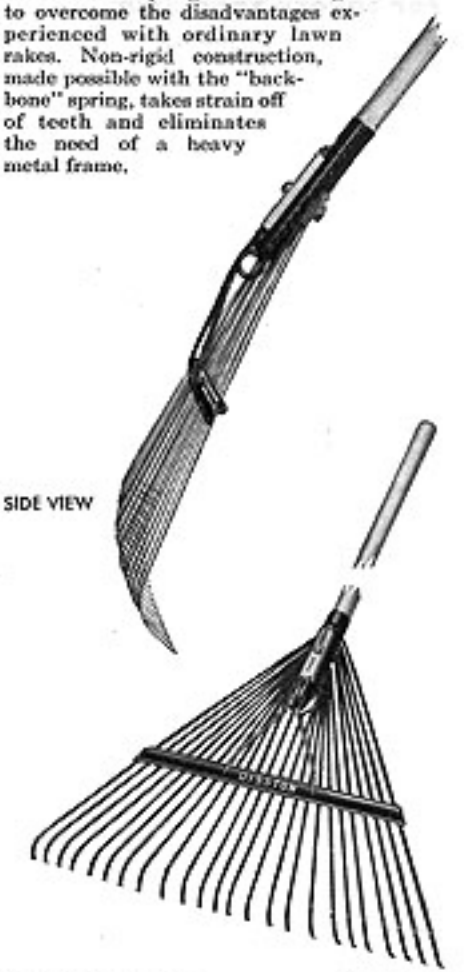
Each of the eight chisels is made of Disston special Steel, hardened to file hardness, ground with proper bevels and polished.

Forged tangs are carefully fitted into hardwood handles so blades are held securely. Each blade stamped with the name DISSTON, a Keystone and U.S.A.

Handles, 10 inches long, are made of hardwood and have a clear, lacquer finish. Each handle carries a small orange and black decalcomania reading DISSTON—U.S.A. Strong, rounded top, nickel-plated, steel ferrules.

DISSTON SPRING RAKE

The Disston Spring Rake is designed to overcome the disadvantages experienced with ordinary lawn rakes. Non-rigid construction, made possible with the "backbone" spring, takes strain off of teeth and eliminates the need of a heavy metal frame.



Made in two sizes—
D-18—18 Teeth . . .
D-24—24 Teeth

Teeth are held in place by patented slot and key construction in both ferrule and spacer. Flange on spacer provides four point suspension of teeth and reduces tooth breakage. Rake should be kept oiled in tube.

Teeth extremely flexible in all directions. Teeth pass around obstructions such as embedded stones, surface roots, etc.

Hardened and oil tempered, the special flat spring steel teeth of this rake will not become sharp, teeth will not cut grass; teeth will not catch on roots. Bent teeth easily restored to original shape with fingers. The Disston Spring Rake has proved itself a favorite with gardeners on estates; with cemetery superintendents; with park attendants; with golf course greens keepers; etc.

OTHER DISSTON TOOLS

No. 166 Pruning Saw

Most popular saw of its type made. Cuts fast. Blade tapers to point for use in close quarters; made of Disston Steel; reverse teeth, 7 points to inch; 1⅝ inches wide at handle. Hardwood handle; two brass screws fasten blade. 14 inch length.

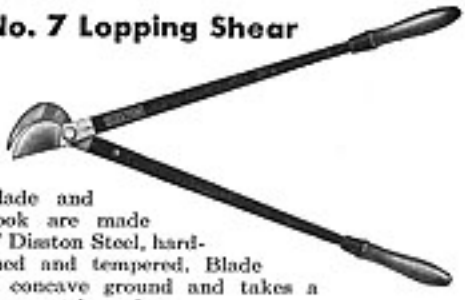
No. 38 Pruning Saw

Can be folded and carried in pocket. Blade of Disston Steel, taper ground; long, slender, needle teeth. Beechwood handle, wing nut and bolt adjustment. Butt end of blade rests firmly against rivet when pruning. 12 inch length.

No. 4 Pruning Saw

Has tapering blade with teeth on both edges. Made for general pruning. Blade of Disston Steel; one edge has plain cross-cut teeth, 8 points to the inch; other edge has teeth, known as Lumberman or Lightning pattern, for heavier work. Beechwood handle, weatherproof finish, large handhold for gloved hand. Three brass screws fasten blade in handle. 18 inch length.

No. 7 Lopping Shear



Blade and hook are made of Disston Steel, hardened and tempered. Blade is concave ground and takes a keen cutting edge.

Designed to make a shearing cut. Has long, strong arms. Blade and hook are held in place by a fine threaded bolt and fastened with a nut. This permits fine tension adjustment. A stop lug, forged on the hook arm, prevents arms from closing on fingers. The tang on arms passes through handle and washer, and riveted on ends. Handles 8 inches, reinforced by ferrule. Hook 2¼ inches; arms 26 inches; length overall, 28½ inches.

No. 30 Hedge Shear

Made of best material, finely finished. Properly balanced; easy leverage. Blades of Disston Steel, 1¾ inches wide, half oval, hardened and tempered, concave ground, highly polished; one blade notched for heavier cutting. Black lacquered ferrule with pin through ferrule, handle and tang. A bolt screwed into threaded hole in blade gives proper tension. Bolt is locked in place by nut.

Hardwood handles, natural clear lacquer finish, black diagonal band at ferrule end. DISSTON, U.S.A. and Keystone stamped on handle in gold. Made in 8 and 10 inch length of blades.

No. 40 Hedge Shear

The most durable, lightweight hedge shear made; easy action, cuts clean. Blades made flat, 1⅛ inches wide. Disston Steel, hardened and tempered; full polished, concave ground. Blade, shank and tang are of one piece forged steel. Tang extends half way through handle and is secured by two brass rivets.

Handles are hardwood, natural finish, 9 inches long, fastened to the tangs with two solid brass rivets. 1⅝ inches wide at grip end; taper gradually toward the blades. A bolt screwed into threaded hole in blade is tightened until proper tension is secured, then locked in place by a lock nut. Made in 8-inch length.

No. 156 Hand Pruner

One of the finest pruners made. The hook and cutter levers are drop forged from high carbon tool steel. Hook specially heat treated, ground and polished. Blade is of special alloy steel, hardened, tempered, finely ground and highly polished; securely attached to cutter handle with double blind rivets.

Equipped with the Disston patented tension adjustment. Professional type tan leather sheath and catch. Handles highly polished and knurled. Blued volute spring. 8¾ inches overall.

DISSTON CROSS-CUT SAWS

The highest quality cross-cut saws of Disston manufacture are known as "Precision-Ground". Other Disston cross-cut saws are known as "Taper-Ground".

We illustrate and describe below a few of the numbers of each type which have proved most popular.

No. 494 Beaver

The Disston No. 494 Beaver Precision-ground Cross-Cut Saw is a four-cutter-one-raker type, designed for felling and bucking small timber. Ground perfectly true, 3 gauges thinner on back than on tooth edge.

Made of Disston Alloy Steel—strong, tough and of proper resiliency. High temper—cutting points stay sharper and teeth retain set longer.

Made in 4, 4½, 5, 5½, 6 foot lengths.

No. 152 Champion

The Disston No. 152 Champion Cross-cut Saw is taper ground 2 gauges thinner on the back than on the tooth edge. Blade of Disston Steel, ground by Disston process on lines to conform to the tooth edge of the saw.

Made in 5, 5½, 6 foot lengths.

No. 214 Triumph Lance Perforated

The Disston No. 214 Triumph Lance Perforated Cross-cut Saw is a narrow blade, hollow-back, four-cutter-to-one-raker type. Blade of Disston Steel, ground by Disston process; 2 gauges thinner on the back than on the tooth edge.

3¾ inches wide. Made in 5, 5½, 6 foot lengths.

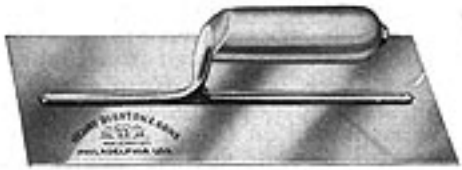
No. 554 Champion One-Man

The Disston No. 554 Champion is a good medium-priced, all-round saw. Full-width blade; two-cutter-one-raker type; finer teeth at point for starting cut. Blade of Disston Steel; curved breast. Hardwood handle, weatherproof finish, 3 brass screws.

Made in 3, 3½, 4, 4½ foot lengths.

TROWELS

No. 28 Finishing Trowel



Has improved mounting of specially treated metal that gives perfect balance. Disston Steel blade hardened and tempered; specially ground, 24 gauges thick, polished and lacquered. Long mounting securely fastened to blade with ten countersunk rivets; flat thumb rest. Basswood handle, smooth finish. Tang through handle, threaded to receive brass hexagon nut.

Lengths, inches.....	10½	11	11½
Widths, inches.....	4½	4¾	4¾
Mounting, inches.....	9	9½	10

No. 338 Flexolite Finishing Trowel

A modern trowel designed to meet the needs of modern plastering. It has the "California Pattern" handle. Disston Steel blade, hardened and tempered; specialy ground, 24 gauges thick. Polished and lacquered. Long, aluminum alloy mounting, with flat thumb rest, is fastened to the blade with ten rivets. Basswood handle, smooth finish. Tang extends through handle—end threaded to receive brass hexagon nut.

Lengths, inches.....	10½	11	11½
Widths, inches.....	4½	4¾	4¾
Mounting, inches.....	9	9½	10

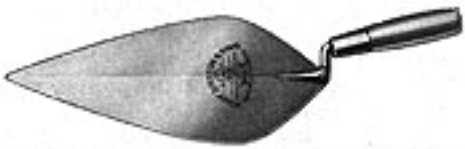
No. 15 Pointing Trowel

The only pointing trowel made with a spiral tang for locking the hickory handle to the trowel. Blade, post and tang are forged from one piece of Disston Steel; hardened and tempered.

Lengths, inches.....	4	5	6
Widths, inches.....	2½	2½	2¾

Disston Steel insures the flexibility and durability of Disston Trowels

No. 5 Brick Trowel



True taper ground from heel to point and from center to edges for flexibility; post at right angles to the blade; handle set for proper life and balance; edges shaped for striking brick. A favorite for brick laying when small mortar joints are required. Blade, post and tang are forged from one piece of Disston Steel; hardened and tempered; lacquered. Hickory handle, lacquered, shaped to hand; strong steel ferrule, 1¾ inches long. Spiral tang locks handle securely.

Lengths, inches.....	9	10	11	12
Widths, inches.....	4⅛	4¼	4⅜	5

No. 10 Brick Trowel

"Philadelphia Pattern." True taper ground from heel to point and from center to edges. Post at right angles to the blade; handle set for proper lift and balance; edges shaped for striking brick. This pattern trowel is more universally used than any other pattern. Blade, post and tang are forged from one piece of Disston Steel; hardened and tempered; polished and lacquered. Hickory handle, lacquered, shaped to hand; spiral tang locks handle on trowel; heavy steel ferrule 1¾ inches long.

Lengths, inches.....	9	10	11	12
Widths, inches.....	4⅝	4¾	5⅛	5½

PROPER CARE OF SAWS, TOOLS and FILES

When given proper care, a Disston Saw, File or other tool will last almost indefinitely. Thousands of Disston Saws in use today have been giving good service for a quarter-century or more. Occasional reports are received telling of Disston Hand Saws that have been in use more than 50 years, having been handed down from father to son—even to grandson.

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 care.

A good tool deserves good treatment, and the more care you give it, the better the service it will give you. Always remember, that the quality of the work you do is determined not only by your skill, but also by the condition of the tool which you are using. An ordinary craftsworker, with good, well-cared for tools, can often turn out a better finished job than one who has greater skill but is handicapped by poor tools.

All Disston tools 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.

Moisture, Tool Enemy No. 1

Moisture against a steel face, unless that face is well protected, means almost immediate rust. In order to keep a saw blade in the best working condition, it must be entirely smooth on both sides. Rust means pitting, and, therefore, a rough surface. When you finish using a saw, rub it down with light oil.

One of the best safeguards against moisture is a tightly-fitting tool cabinet (see page 59). Since many home workshops are in basements or sheds, there is usually a certain amount of dampness present. Thus, all tools when not in use should be kept under cover.

Protect Cutting Edges

The way tools are put away is as important as where they are placed. 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 so that no other tools will knock against the teeth and injure them.

Tools should always be placed with the cutting edges away from the person using them. Never hang a saw from a bench where the teeth can scratch a leg or knee.

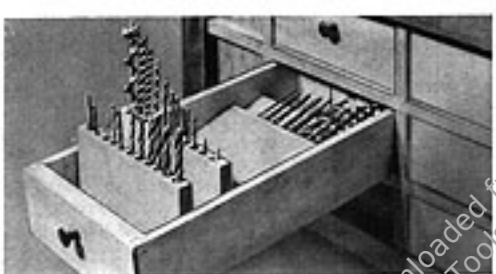
When you are through using a tool, lay it down carefully. Do not drop it. A file, for instance, is an edged tool. Its teeth, to give the greatest efficiency, are very hard. When one carelessly throws a file across a bench he is likely to break off the edges of several teeth.

Frequency of Use a Factor

When tools are put away for a considerable length of time, follow this formula: (1) See that tools are clean and bright; (2) make a linen pad, and heat it until it is completely dry; (3) dip pad in warm linseed oil, and rub over all metal parts of tools, and (4) wrap tools in dry woolen cloth.

How to Remove Rust

Whenever you see signs of rust on your tools get after it at once. Dampen a cloth with sweet oil, and rub the affected part thoroughly. Let the tool stand for a couple of days, then give it a second rubbing with powdered unslaked lime. If some rust still remains, use fine emery cloth, then apply the oil again.

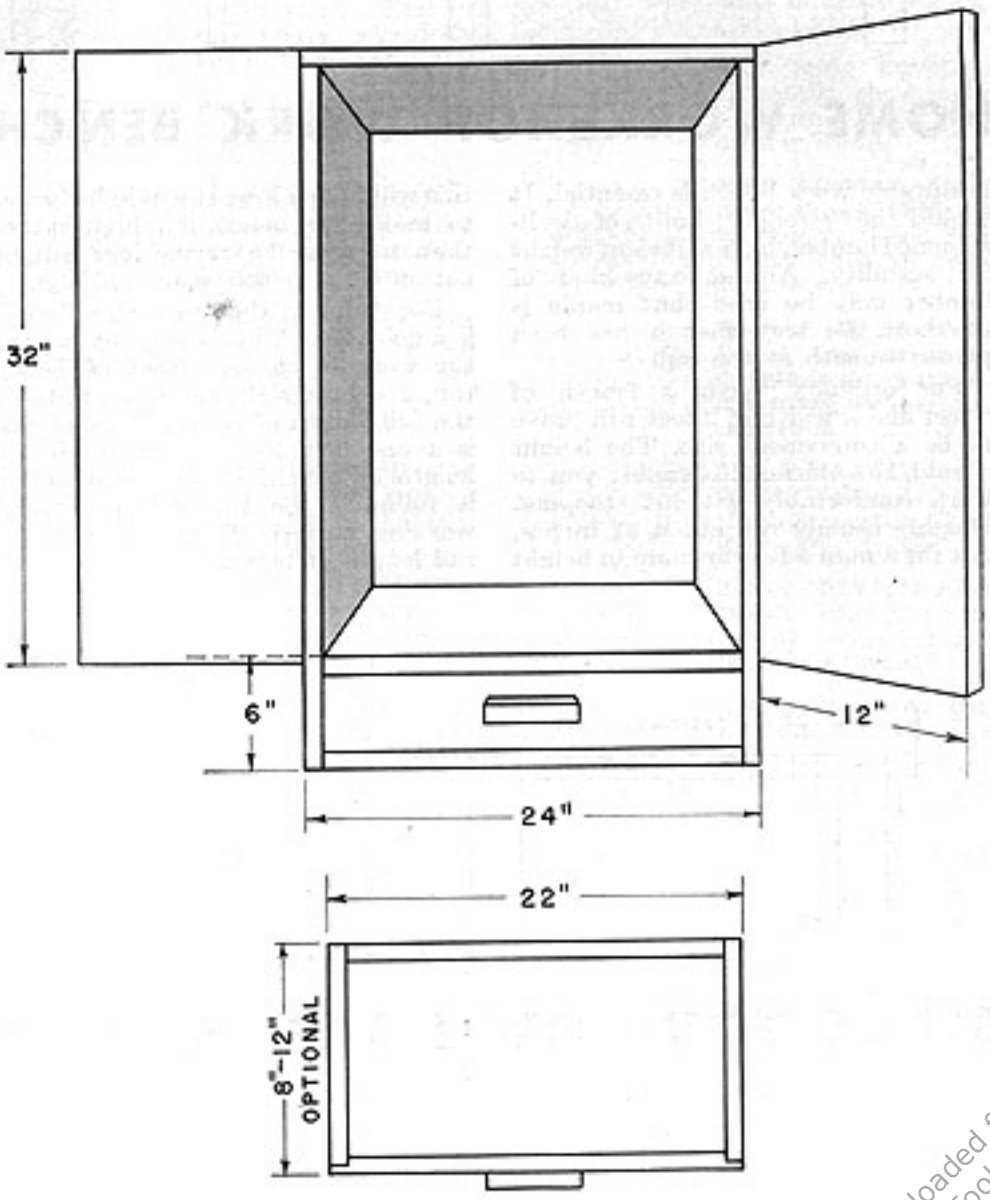


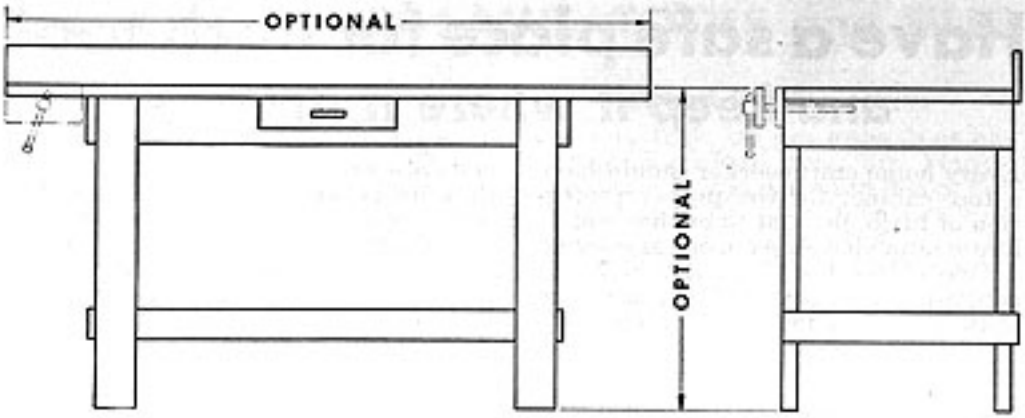
A SIMPLE method of keeping auger bits and drills in order. Wood blocks drilled with holes are hinged to bottom of drawer. They lie flat when drawer is closed.

Have a safe place for each tool
and keep it where it belongs

Every home craftsworker should have a tool cabinet for the proper protection of his tools, and to enable him to locate immediately each one as needed.

One of his first jobs should be to construct a handy wall cabinet, one that is large enough to accomodate not only his present tools, but others that he is likely to purchase as his skill and requirements increase. Below is a drawing of an excellent model, which is not difficult to make, and which should meet his needs for a long time.



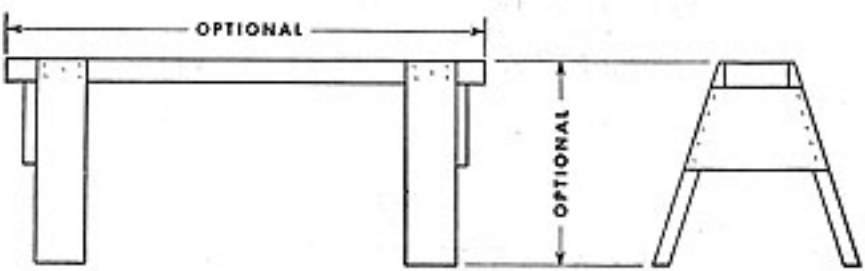


HOME WORKSHOP WORK BENCH

A suitable work bench is essential. It should be strongly built of well-seasoned lumber, have sufficient weight for stability. Almost any kind of lumber may be used, but maple is the best. Be sure that it has been planed smooth at the mill.

For ordinary needs a length of 5 feet and a width of 2 feet will prove to be a convenient size. The height should be sufficient to enable you to work comfortably without stooping. Heights usually run about 32 inches, but for a man 6 feet or more in height this will be too low. It would be better to make the bench too high rather than too low. Later the legs can be cut off if the bench seems too high.

Constructing the top with a "well" is a good idea. This is done by having the working part at front of bench top, a 2 inch slab, 15 inches wide by the full length of bench. Back of this is a one inch by 12 inch board full length of bench. If this construction is followed the top will provide a working surface 27 inches wide by full length of bench.



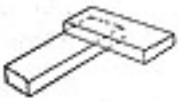
MAKE YOUR OWN SAW HORSES

You will need a pair of saw horses. The type illustrated above is simple to make. Its construction is sturdy. Care should be taken in determining the length of the legs—a six foot man will need a higher saw horse than a shorter man; heights range from 18 to 24 inches.

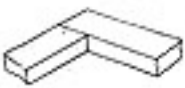
How to make wood joints

One of the first things a craftsworker should learn is how to make all the more common wood joints, and to know which kind is best suited for each type of work. Below are the wood joints generally used.

Most commonly used joints

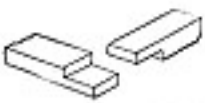


PLAIN LAP JOINT. Used chiefly for splices, angles and corner laps.

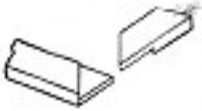


BUTT JOINT. Weakest of all joints. End of one board joined to edge of another.

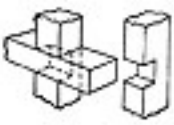
HALF LAP SPLICE. For joining two pieces to add length.



END HALF LAP. Used for window, screen door and other frames. Also for light panels.

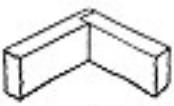


MITRED HALF LAP. For corner joints on frames. Corners are mitred instead of square cut.

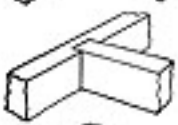


CROSS HALF LAP. For lapping two pieces that cross each other. Adds strength.

MIDDLE HALF LAP. The favorite "T" joint for attaching cross members to frame.

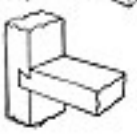


RABBET JOINT. End grain concealed from front. Used for making drawers.



DADO JOINT. A grooved joint cut across grain. For partitions, shelves, etc.

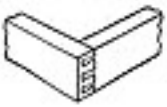
STOPPED DADO JOINT. End of one board notched, groove cut part way through to conceal it from front.



DOVETAILED DADO JOINT. Stronger than simple Dado. Requires careful cutting and fitting.

END DADO JOINT. Combination of Dado and Rabbet joints.

MITRE JOINT. Conceals ends of both boards. Cut at 45°.

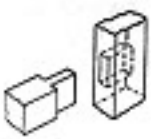


HALF BLIND DOVETAIL. Dovetails show only at side. Used for drawer fronts.

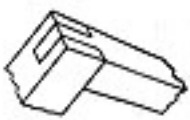
BLIND DOVETAIL. Only mitre shows. Difficult to make. Used for finest drawer construction.

MULTIPLE END DOVETAIL. When two or more dovetails are wanted. For extra strong construction.

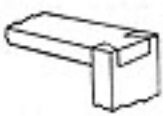
PLAIN MORTISE AND TENON. Tenon extends through mortise. Used in making panels.



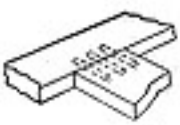
BLIND MORTISE AND TENON. Same as plain, except tenon extends part way through.



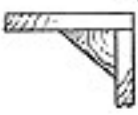
OPEN MORTISE AND TENON. For frames. Can be used instead of half Lap Splice for lengthening boards.



SINGLE THROUGH DOVETAIL. More secure than Mitre or Rabbet when joining narrow pieces.



DOWEL JOINT. Pieces are anchored by dowel pins, and glued. For fine cabinet work.



GLUED JOINT. A Butt joint braced by block. For joining panels, table tops, etc.

How to choose the most suitable wood

with suggestions regarding its storage and care

There are many varieties of wood, each having different qualities. Save time and waste of materials by selecting the wood best suited for the work you have in hand. The following list of the more common woods will serve as a guide.

When buying wood be sure to ask for kiln-dried lumber, and thus avoid future warping, splitting and checking. Your best source is your local lumber dealer, who will be able to advise and help you in many ways.

SOFTWOODS

BASSWOOD. Light, straight-grained and of fine texture. Easy to work. Suitable for both turning and carving. Used for picture frames, moulding, furniture, toys, etc.

CEDAR. Light, fine texture, and beautifully grained. Easily worked and finished. Used for moth-proof chests and closets, toys, furniture, and many other purposes.

CYPRESS. Soft and easy to work. Its rich, reddish brown color makes it particularly well-suited for furniture. Being strongly weather-resistant, it is extensively used for posts, etc.

FIR. Stiff, strong and of even texture. Has an orange-brown color. Suitable for toys and many other articles of heavy construction.

GUM. Heavy, strong, and of fine texture. Is usually cross-grained. Brown to yellow in color. Easily twists and warps when exposed. Used extensively for interior finish and many small articles.

POPLAR. Light, very soft and of fine texture. Gray to yellow in color. Easy to work but not durable. Used for furniture that will not be subjected to rough handling.

REDWOOD. Light, fairly strong, and takes a fine finish. Sapwood is whitish; heartwood is light red, turning to brown upon exposure. Very durable. Used largely for cabinet work.

WHITE PINE. Very light and soft. Differs greatly in quality. Usually quite durable. If well-seasoned, resists boring insects. Exceptionally easy to work. Uses are almost unlimited.

WHITE SPRUCE. Light, stiff and fairly strong. Easy to work, and splits well. Used largely for musical instrument sounding boards, but can often be used for same purposes as white pine.

HARDWOODS

ASH. Heavy, strong and tough. Resembles oak, but is coarser grained and easier to work. Gets brittle with age. Takes a fine finish. Suitable for all kinds of furniture.

BEECH. Heavy, strong and of coarse texture. Works well and takes a good polish, but tends to shrink and check in drying. Used extensively for furniture.

BIRCH. Heavy, tough and close grained. Very durable. Frequently stained to imitate black walnut and mahogany. Excellent for lathe turning and furniture.

CHESTNUT. Light, medium hard, but not very strong. Has a coarse texture. Easy to saw, turn and plane. Inclined to shrink, split and check in drying. Used for cabinet work.

MAHOGANY. Light to dark reddish brown. Fine grained, with many cross grains. Can be worked easily. Takes beautiful finish. Has many imitations. Used largely for furniture.

MAPLE. Heavy, strong and very hard. Fine texture, wavy grained. Excellent for carving, turning and scroll work. Widely used for furniture and paneling.

OAK. Very heavy, hard, strong and durable, but shrinks and checks badly. When quarter sawed produces a smooth, attractive finish. Many uses: furniture, carving, common carpentry, etc.

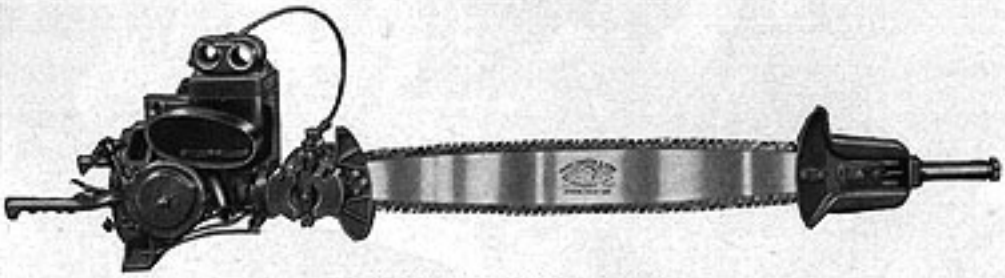
WALNUT. Heavy, hard, and strong Smooth grained, works well, and takes a fine polish. Used largely for cabinet making, furniture, and as a veneer.

YELLOW PINE. Varies considerably. Light, medium hard, and with a smooth but strongly marked grain. Works easily, and is quite durable. Many uses.

DISSTON POWER-DRIVEN CHAIN SAWS

Although Disston Chain Saws are not designed for use in the workshop, they are included in this manual for two reasons: first, to emphasize the completeness of the line of Disston Saws; and second, to bring the saws to the attention of home craftsworkers whose regular occupations may call for high-speed saws of this type.

Disston Chain Saws are made in two types: with Mercury Gasoline Engine, and Pneumatic. The cutting speed of each far exceeds that of a cross-cut saw. Thus, wherever they are used production is greatly increased and cutting costs reduced.



DISSTON CHAIN SAW
with Mercury Gasoline Engine

Designed primarily for use in the forests—felling, bucking and limbing trees—but can be used with equal effectiveness and economy wherever there are heavy timbers to be cut. It is powered by Mercury two-cylinder, two-cycle, alternate firing engine. It operates smoothly, dependably and with minimum vibration.

Equipped with air cleaner, to keep sawdust and dirt from engine and carburetor; fuel filter; die cast cooling fan; reduction gear of 3 to 1 ratio; 13-plate, positive, multiple disc clutch; throttle which may be set in open position; muffler prevents exhaust from annoying operator; plus other distinctive features.

The saw can be taken wherever a man can walk, is easy to operate, and requires no previous experience. It is sturdily built, light in weight, economical to use.

Supplied in 11 h.p. models, with capacities ranging from 24 to 84 inches.

DISSTON CHAIN SAW—Pneumatic

A powerful, air-driven saw that operates effectively in all weathers, and can be used under water and in either horizontal or vertical sawing positions. Powered by a rugged, heavy-duty, vane-type air motor. Supplied in 3½ h.p. which operates on 90 cu. ft. of air per minute at 90 lbs. per sq. in. pressure; and 5 h.p. operating on 150 cu. ft. of air per minute at 90 lbs. pressure.

Extensively used in shipyards, on railroads, in and about coal mines, and for construction work of many kinds. Can be used wherever required compressed air is available.

NOTE: If you or the organization with which you are associated, believe you could use a Disston Chain Saw to advantage, write for full particulars.

Your Hardware Retailer is a Good Man to Know

Don't hesitate to consult your local Hardware Retailer regarding any of your tool problems. His expert knowledge of tools, and his close contacts with carpenters, cabinet makers and other craftsworkers will prove helpful to you.

You will find him interested in you and your work; and, even though he is a busy man, he will be glad to take time out to talk to you and make recommendations.

He carries the Disston line of Saws, Tools and Files, and can supply you with any of the tools and accessories mentioned in this manual. If he should be out of any particular item, he will be glad to order it for you.

Get acquainted with your Hardware Retailer. He is a good man to know —a good friend to have.

ESTABLISHED 1840

REG. U.S. PAT. OFF.

INDEX

MAIN OFFICES AND FACTORY

WEST COAST FACTORY

CANADIAN FACTORY

AUSTRALIAN FACTORY

ESTABLISHED 1840

TRADE MARK

REG. U.S. PAT. OFF.

The large Disston plant in Philadelphia is located on the Delaware River, occupies 84 buildings and covers a ground area of 65 acres. It consists of large steel mills, rolling mills, tool works, laboratories, etc.

Branch Factories are located in Seattle, Wash., Toronto, Canada and Sydney, Australia.

(Printed in U.S.A.)