

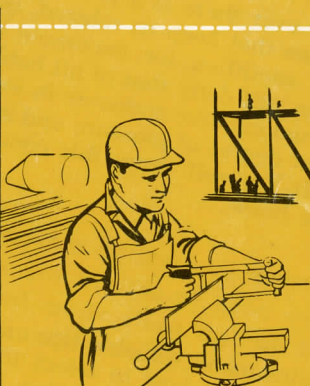
DISSTON

SAW, TOOL AND FILE

MANUAL



IN SCHOOL



AT WORK



AT HOME

**HOW TO
CHOOSE, USE, AND CARE
FOR TOOLS**

PORTER

DISSTON DIVISION

H. K. PORTER COMPANY, INC.
PITTSBURGH 19, PA.

To Our Hobbyist and Professional Friends:

TODAY more than ever there is a need for engaging in activities and hobbies that keep us relaxed, fresh, and in the proper mental condition for maximum effort. And we're certain no one will deny that of all hobbies, that of craftsworking—actual creative endeavor in wood or metal—gives the greatest degree of pleasure and satisfaction—and in these Do-It-Yourself times this comes in mighty handy around the home.

Regardless whether you are an amateur or professional it always pays to choose the right tool for each job—and to use tools right for longer life:

This book contains many valuable tips and guides on the uses of tools—tells you how to select the right tool for each use. Use the book; and for further information consult your hardware and building supply dealer.

Use quality tools—enjoy the long term economy of quality: Good tools not only last longer and work better, they will also repay you a hundredfold in the pleasure you get from your work. They help you develop greater skill; the work you do will be greatly improved. Of course, good tools do cost more than ordinary tools. But you'll find that they pay for themselves many times over by saving what would otherwise be lost in spoiled materials.

In pursuing your hobby, 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 dealer. Go to him for advice—he'll be glad to help you.

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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, Power Tools, Garden Tools 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.

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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, woolly rhinoceros and saber-toothed tiger, all of which have long been extinct.

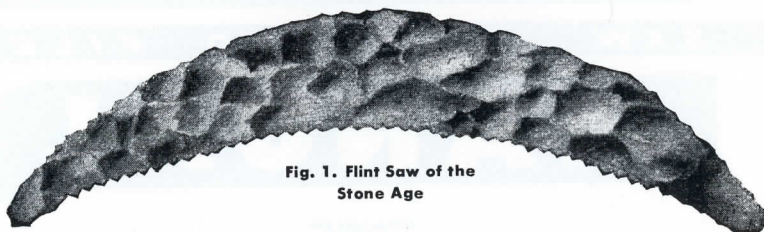


Fig. 1. Flint Saw of the Stone Age

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.

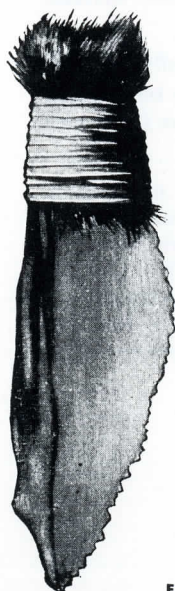


Fig. 2. Ancient Australian Saw

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.

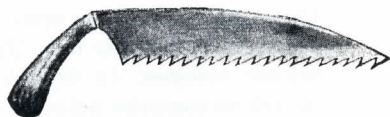
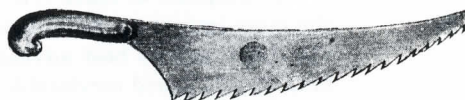


Fig. 3. Egyptian Saws



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.

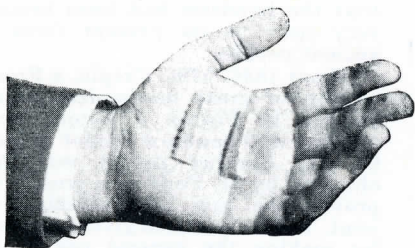


Fig. 4. Oldest Saws in the World

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—no 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 Cluentius, 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 pre-

vails 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

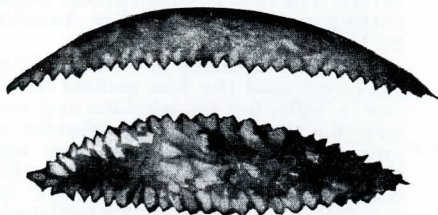


Fig. 6. Primitive Types of Stone Saws

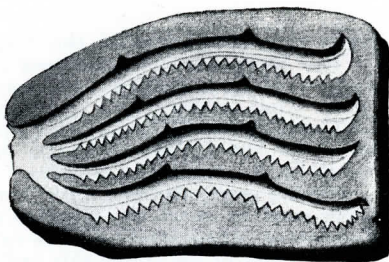
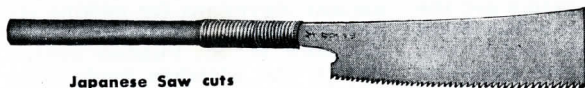


Fig. 7. Mould Used for Casting Early Saws

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.

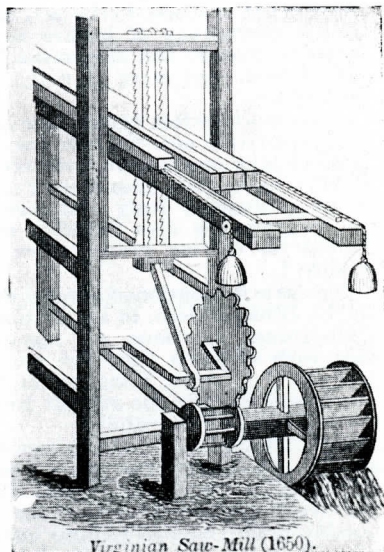
William Newberry of London, England, patented the first endless bandsaw in 1808, but his machine and saw were not developed. The difficulty of making a smooth, strong joint was the stumbling block. How much credit should be given to Newberry's ingenuity is debatable. Archeologists

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).

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 Workshop
*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.....	x	x	
Dovetail Saw.....	x		
Compass Saw.....	x	x	x
Keyhole Saw.....	x	x	x
Coping Saw.....	x	x	x
Refitting Tools (Saw Set, Jointer, Clamp).....	x		x
*CIRCULAR SAWS.....			
*Refitting Tools.....	x	x	x
*BAND SAWS.....			
*HACK SAWS.....			
HAMMERS			
Claw Hammer.....	x	x	x
Ball Pein Hammer.....	x		x
Cross Pein Hammer.....	x		x
Wood Mallet.....	x		x
HATCHET.....			
CHISELS			
Wood Chisels (set)....	x	x	x
Cold Chisels (set)....	x	x	x
*Wood Turning Chisels (set).....	x	x	
*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.....			x
File Card and Brush....	x		x
*File Handles (Inter-changeable Type)....	x		x
PLANES			
Block Plane.....	x	x	x
Jack Plane.....	x		x
Jointer Plane.....			x
Smoothing Plane.....	x		x
Router Plane.....			
Rabbet Plane.....			
POWER TOOLS			
*6½" Electric Circular Saw....	x	x	x
*Saber Saw.....	x	x	x
¼" Drill.....	x	x	x
Sander.....	x	x	x
SCREW DRIVERS			
BRACE AND BITS			
HAND DRILL			
With Set Drills....	x		x

For the Professional Worker	Home Crafts-worker	Handy-man	Farm Workshop
SQUARES			
Mitre Square.....	x		x
Try Square.....	x		x
Steel Square.....			x
GAUGES			
Bevel.....	x		x
Cutting or Marking.....	x		x
PLUMB AND LEVEL.....			
*SCRAPERS.....	x	x	x
BURNISHER.....	x		x
WRENCHES			
Monkey Wrench.....			x
Pipe Wrench.....	x	x	x
Alligator Wrench.....			
TINNER'S SNIPS.....			
WIRE NIPPERS (End Cutting).....			
*WOOD RASP.....			
DRAWING KNIFE.....			
SPOKE SHAVE.....			
WISE, IRON.....			
INSTRUMENTS			
Compass.....		x	
Dividers.....			x
Triangles.....		x	
Calipers.....	x	x	x
*Steel Tape (12 ft.) .	x	x	x
*Long Tape (50 ft.) .	x	x	x
MISCELLANY			
Oil Stone.....	x	x	x
Jack Knife.....	x	x	x
Putty Knife.....	x	x	x
Glass Cutter.....	x	x	x
Oil Can and Oil.....		x	x
Awl.....	x		x
Carving Tools.....	x		
Mitre Box.....	x		
C Clamps (Set).....		x	x
Soldering Iron.....	x	x	x
Automatic Drill.....			x
Nail Sets.....	x	x	x
Countersink.....	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.

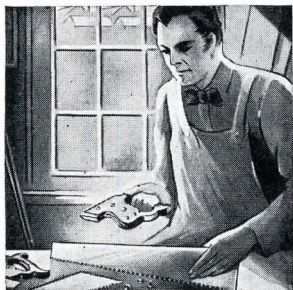
More than a Century of DISSTON LEADERSHIP

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.

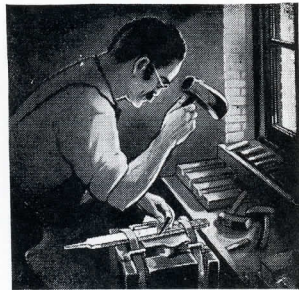
A few of the many Disston developments are shown on these two pages. They indicate some of the reasons why the name Disston is so highly regarded by those who appreciate fine quality in the tools they use.



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.



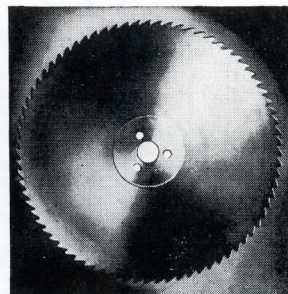
1855 Disston built his own furnace and cast the first crucible saw steel ever made in America. Disston Steel always has been famous for the service it renders to users.



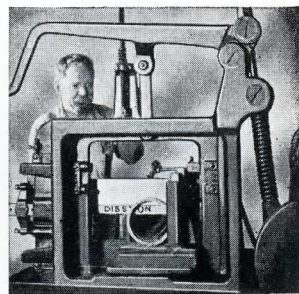
1865 Because he needed better files, Henry Disston began the manufacture of files in 1865. Today, Disston makes 250 kinds—more than 1,000 different cuts and sizes.



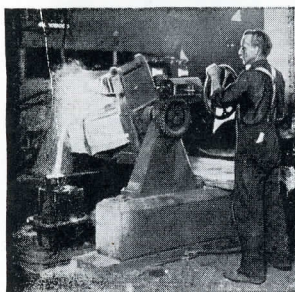
1874 Henry Disston designed the skew-back saw. Until then all handsaws had straight backs. He called in his engineer and with a piece of crayon drew the design on the office floor.



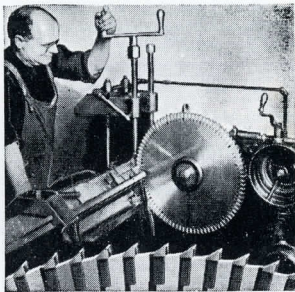
1889 Disston produced the first 18-inch circular metal cutting saw, which revolutionized metal cutting in America. This first milling saw was used in Midvale Steel Works.



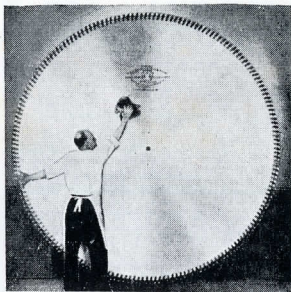
1894 Disston made America's first power machine hack saw blades. Millions of Disston Power Machine and Hand Hack Saw Blades are now in use throughout the world.



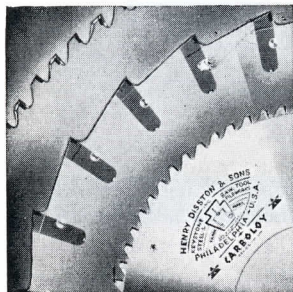
1906 Disston cast first heat of electric saw steel of crucible quality in America.



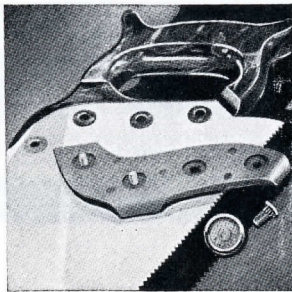
1918 Disston introduced the Sectional Interlock Inserted Tooth Milling Saw. In 1922, Disston was awarded the Franklin Institute Medal for this improvement.



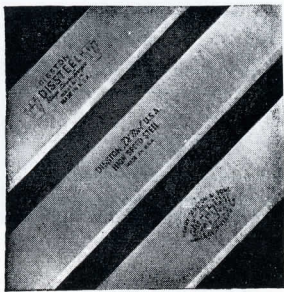
1924 Disston made 110-inch Spiral Inserted Tooth Cut-off Saws for cutting shingle bolts from the large logs on the Pacific Coast. Each saw weighed 1595 pounds; each had 190 teeth.



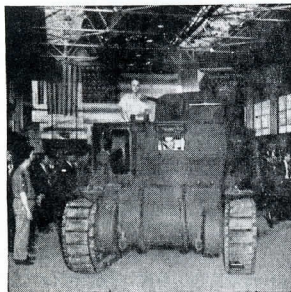
1929 Disston perfected and introduced Disston Carboly-fitted Saws and Knives with cutting edges tipped with Carboly, the hardest alloy ever used for saws and knives.



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.



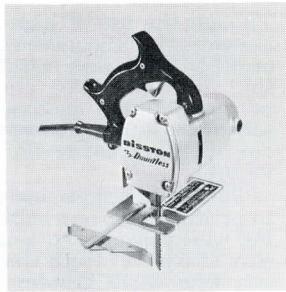
1939 Disston announced the first complete line of thin planer knives ever offered to the millman—Dissteel, Di-mol and Disston High Speed Steel.



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.



1955 Disston purchased by H. K. Porter Company, Inc., large industrial corporation. Carlson-Sullivan rule company purchased and added rule line to many Disston products.



1957 Disston Division enters power tool field with D-23 sabre saw. Electric circular saw, hedge trimmer added following year.



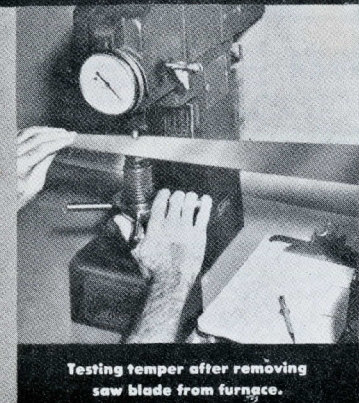
Making micro-photograph of steel.



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.

The first requirement

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

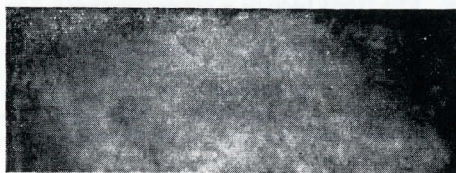
accuracy that assures clean, straight cutting and smooth edges; Sharpening to a degree so exact that the points of the teeth are uniform and sharp; and fine Finishing for both the blade and handle, because the true craftsworker takes pride in the appearance of his tools.

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.

Steps in Making A DISSTON HAND SAW

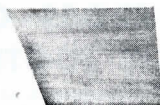
Below are shown a few of the major operations necessary in making the world's highest quality handsaw.



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
belled.



Polished and
shaped for
handle.



Etched,
finished,
ready for
handle.



Slit and
bored,
weather-
proofed and
finished.

HOW TO CHOOSE

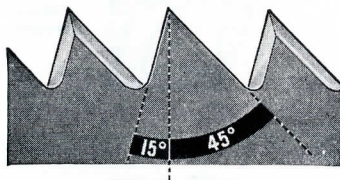
THE CROSS-CUT SAW

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.

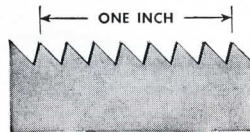


Tooth edge of cross-cut saw

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

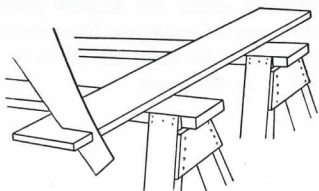
The length of either rip or cross-cut hand saws is measured from point to butt on the cutting edge. Cross-cut saws are made in different lengths.

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.

AND USE HAND SAWS

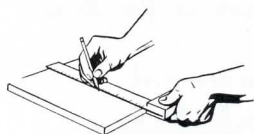
HOW TO USE A CROSS-CUT SAW

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

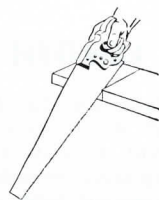
Use two sawhorses of equal height, and cut from outside the area, as shown in illustration above. When cutting within the area, you risk pinching saw and splitting the work.



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 a full stroke.



Start cut near butt of saw

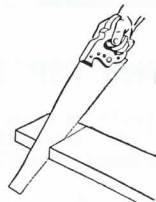
The correct position for cross-cutting is shown in the illustration at right. An imaginary line through the saw, arm and shoulder would be slightly to the left of the saw blade, permitting a clear view of the line of cut and action of saw at each stroke.



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.

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



Use full length strokes

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.

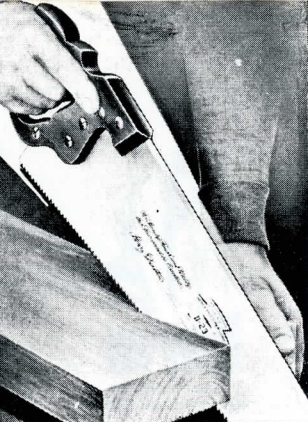
D-95 Lightweight Pattern Straight-back



The Masterpiece of hand saws. Full carved walnut piece handle, secured with five chromium-plated screws, one a

medallion. Blade of finest alloy steel, full taper ground, accurately set and full bevel filed.

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

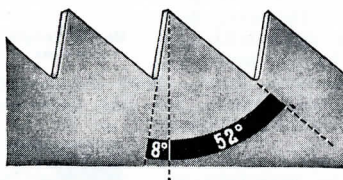


WHAT IS A RIP SAW?

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 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.

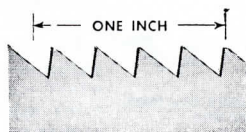


Tooth edge of rip saw

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 $5\frac{1}{2}$ points to the inch in the 26-inch length.



$5\frac{1}{2}$ -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.

	Lengths	Points
Cross-cut	26"	7, 8, 9, 10, 11, 12
Cross-cut	24"	8, 10
Cross-cut	20"	10
Cross-cut	16"	11
Rip	26"	$5\frac{1}{2}$

D-23 Lightweight Pattern Straight-back

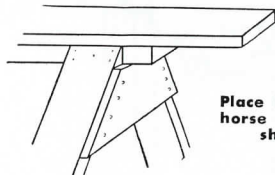


Always popular with saw users demanding quality and workmanship. Finest Alloy Steel blade, polished,

striped back, true taper ground. Cover-top, carved handle, weatherproof finish.

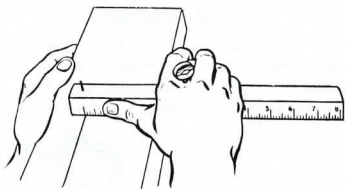
HOW TO USE A RIP SAW

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. 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 16).



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 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°.



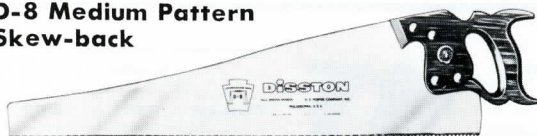
Proper position for ripping

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-8 Medium Pattern Skew-back



Designed for users who prefer a medium weight, skew-back pattern saw. Finest Alloy Steel blade, polished,

striped back, true taper ground. Cover-top handle, weatherproof finish.

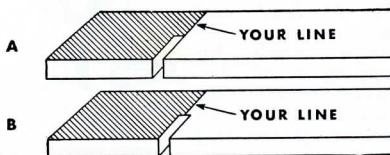
	Lengths	Points
Cross-cut	26"	8, 10
Cross-cut	22"	10
Cross-cut	20"	10
Rip	26"	5½

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).



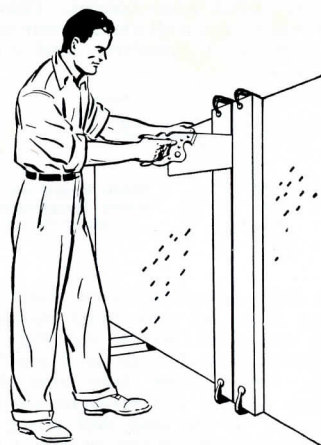
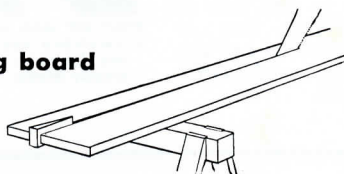
When ripping or cross-cutting keep on waste side of line—do not try to saw on the line or “saw out the line.” This assures that board will be of right width or length, see illustration (A) below. When cutting on the line you cut into the board as well as the waste as shown in (B).



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.

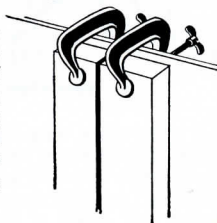
When rip-sawing a long board

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.



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.



D-7 Lightweight Pattern Straight-back

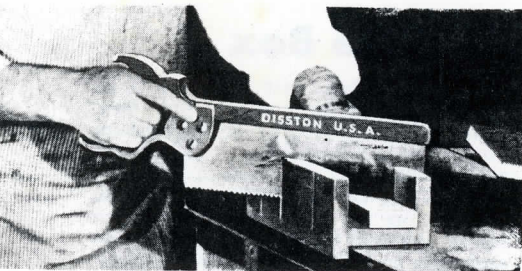


	Lengths	Points
Cross-cut	26"	8, 10
Rip	26"	5½

Universally popular, moderate priced Disston Hand Saw. Special steel blade,

true taper ground. Cover-top handle, laminated wood 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 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 Alloy 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—26 inches, 28 inches
Width Under Back—4 inches, 5 inches

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.

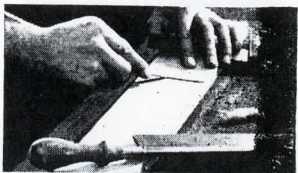
The Disston No. 68 Dovetail Saw has a straight handle. This saw is extremely thin (.020), with fine teeth (15 points). Sturdy steel back supports the Disston Steel Blade. This saw is excellent for fine work in grooving operations shown in the hint illustrated below.

Length of Blade	Width Under Back
10 inches	1 3/4 inches

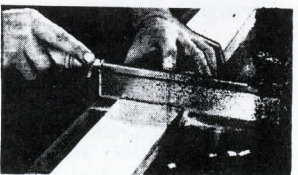
For accurate cutting of grooves: **FIRST**, mark deeply three or four times with knife.



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



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



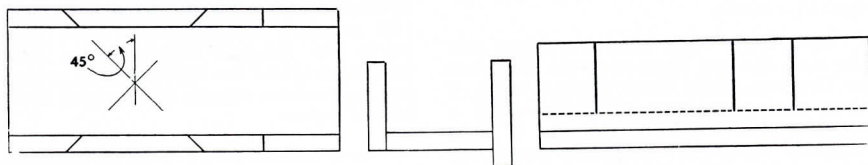
How to make a Mitre Box

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.

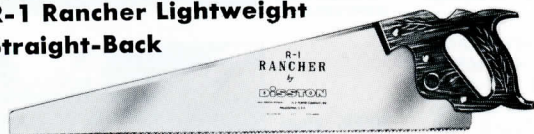


Using a Mitre Box

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.

R-1 Rancher Lightweight Straight-Back

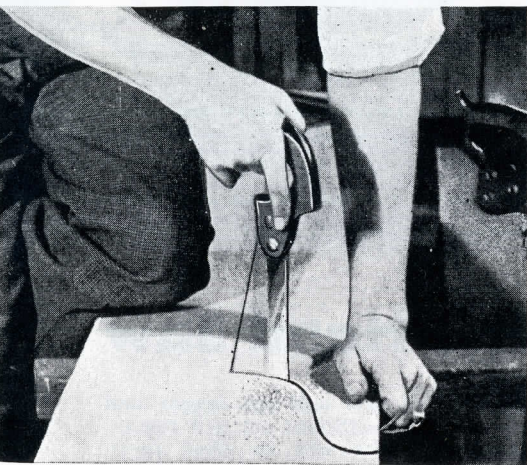


	Lengths	Points
Cross-cut	26"	8, 10
	20"	10
Rip	26"	5½

A good high quality serviceable saw for householders and do-it-yourselfers. Ground, polished and bevel filed.

Natural hardwood handle, carved hand grip and boss; four nickel-plated screws, one a medallion.

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.

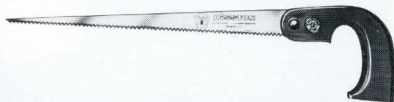
To make brackets for a shelf, to round corners, or to do curved cutting of any kind, mark a line as a guide and saw along it. A slight twist of the handle will keep the saw cutting in the right direction.

Nest & Keyhole Saws



To cut a keyhole it is good practice to mark with pencil or scribe, 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.

Disston No. 2 Compass Saw



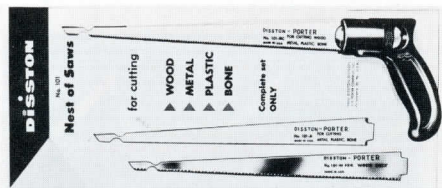
Open grip handle is shaped for easy control when sawing; has special Steel blade toothed to point; tempered to withstand strain of curve cutting; tapered to sharp point; 10 points to inch. Hardwood handle has Disston weatherproof finish. Size: 12 inches.

The Disston No. 4 Interchangeable Blade Compass Saw

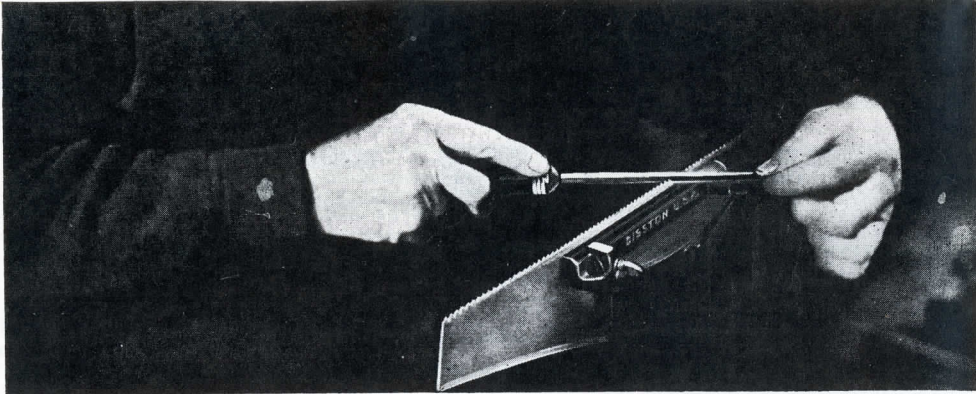


A convenient and practical tool for any kit. Has a flat top handle, comfortable grip, and weatherproof finish. Blades are supplied in 12 and 14 inch lengths, each 10 points to the inch. Cluster bolt and wing nut adjustment in handle holds blade firmly, and permits easy removal for use in reverse position.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

Disston No. 101 Nest of Saws



Three blades for practically every cutting job are easily interchangeable, and can be locked securely in any of 8 positions. There's a wood cutting blade, a fine tooth metal cutting blade, and a coarser tooth metal or wood cutting blade. The strong plastic handle has a comfortable grip and gives the saw lightness, strength and balance. Ideal for cutting curves and circles as well as starting a cut from a bored hole.



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

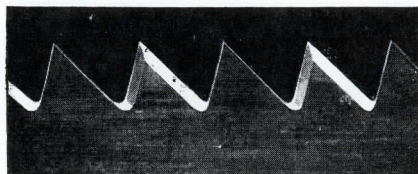
razor) the saw will cut longer and better, and sufficient set will remain to enable the saw to clear itself.

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.

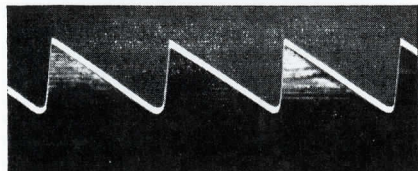
A saw cannot give good service unless the teeth are of even, uniform size and properly shaped. If the teeth are uneven, it will be necessary to joint the saw and shape the teeth in accordance with the following instructions:

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.



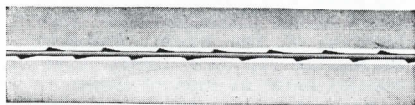
Shape of cross-cut saw teeth



Shape of rip saw teeth



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, retooled 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

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

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:



Edge view of cross-cut teeth

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.

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:

4 1/2, 5 1/2, 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—4 1/2 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, 5 1/2 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 1/8 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

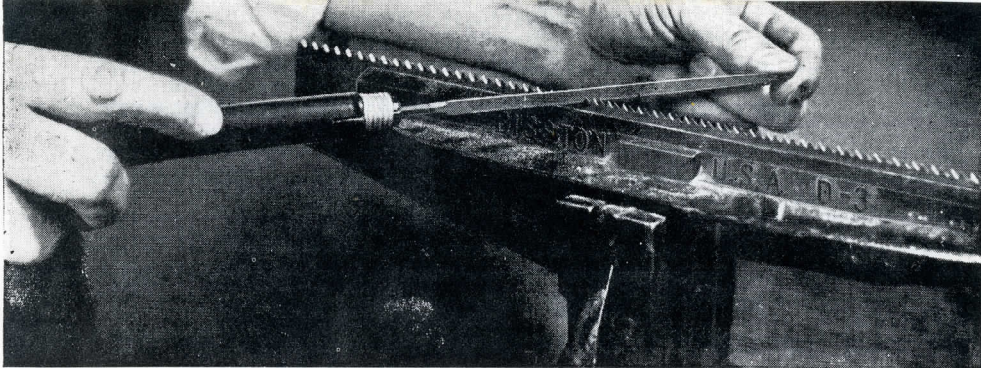


*** <—STAND HERE**

First position for filing hand saws for cross-cutting

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

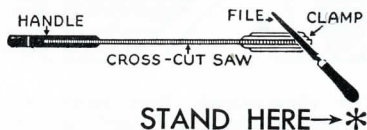
Hold the file level and at this angle. Do not allow file to tip upward or downward. Be sure the file sets down well into the gullet. Let it find its own bearing against the teeth it touches. It will help the beginner if he will first observe the shape and bevel of some of the unused teeth that can most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

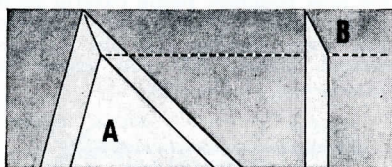
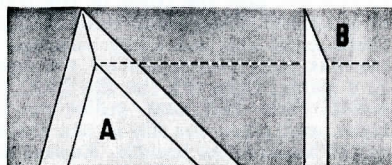
The angles 15° front and 45° back are for cross cut saws; and 8° front and 52° back for rip saws as the saws are made at factory will prove most satisfactory for general use. When a saw has less angle at the front of the teeth than these recommendations, it is said to have more hook or pitch. If too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

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

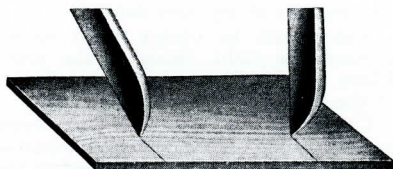
The proper amount of bevel to give the teeth is very important, for if there is too much bevel the point will score so deeply that the fibres severed from the main body will not crumble out as cut, but must be removed by continued rasping.



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.



A

B

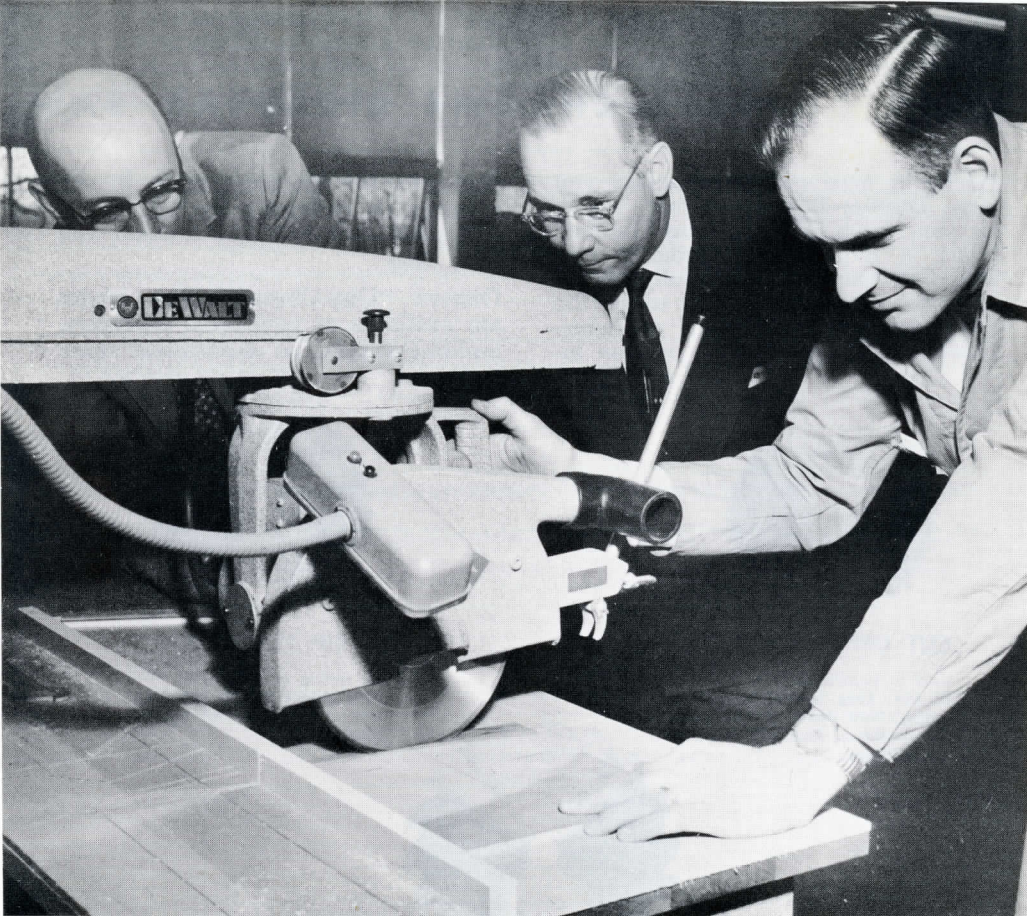


C



D

the saw often takes hold too keenly causing it to "hang up" suddenly in the cut—resulting sometimes in a



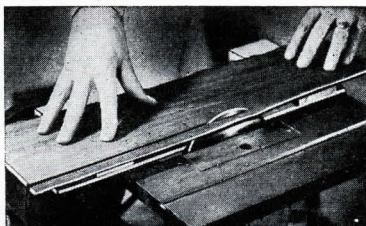
How to Choose and Use Circular Saws

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 highest quality steel, hardened and tempered to give long and exacting service.

A well-equipped shop should have a plywood, 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 circular saws, especially for workshop use. The Disston Diss-Chrome 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 DISS-CHROME CIRCULAR SAW

Whatever type cutting situation you face, Disston has the correct blade, for *you*. Each Disston "Diss-Chrome" blade is individually hardened and tempered, each tooth carefully sharpened by expert craftsmen using the most modern equipment available. Disston's chrome plating process in-

ures long life for each blade by increasing its resistance to rust, grime and pitch and reducing friction and heat wear.

Disston "Diss-Chrome" saw blades are available at your local hardware, building supply, or department store.



CUT OFF (Style "L")

Used in squaring and trimming to size. Long lasting, smooth cutting. Hard chrome plated for rust resistance. Available in all popular sizes.



RIP (Style "A")

For cutting with the grain only. Hard chrome plated, rust resistant. Available in all popular sizes.



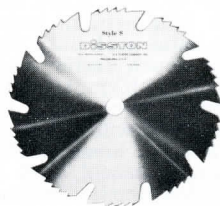
STYLE "W" (Combination)

Popular with building contractors. Coarse tooth spacing for easy feeding. Ideal for trimming roofers and all-purpose construction work. Cross cuts, rips, mitres. Hard chrome plated, rust resistant. Available in all popular sizes.



STYLE "U" (Combination)

Cuts across, with and diagonal to grain. Excellent for radial arm type machines. Hard chrome plated, rust resistant. Available in all popular sizes.



STYLE "S" (Combination)

Ideal home workshop saw for all-purpose combination jobs on bench and portable machines. Gives smooth, fine finish for rip, diagonal or cross grain cutting work. Hard chrome plated, rust resistant. Available in all popular sizes, flat and hollow ground.

BLADES (Portable or Bench Machines)



STYLE "V" (Combination)

Similar to Style "W." Finer tooth spacing for smoother cuts. Available in all popular sizes.



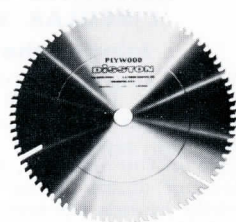
STYLE "S" (Planer)

Designed for finishing work. Hollow ground blade, allows cutting in any direction and produces extremely smooth cuts requiring no sanding. Ideal for butt joints for furniture. Hard chrome plated, rust resistant. Available in all popular sizes.



FLOORING

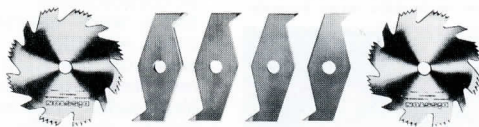
Extra durable, special steel and temper for rough work. Ideal for old, used lumber where nails may be encountered. Cuts in any direction. Hard-chrome plated, rust resistant. Available in all popular sizes.

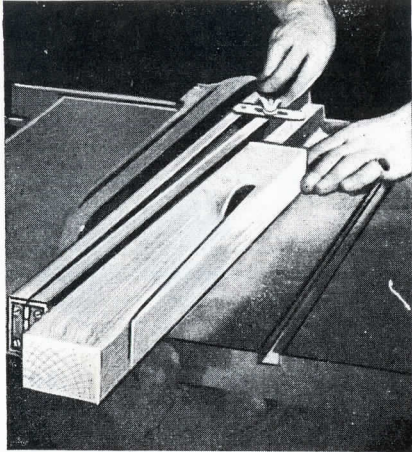


PLYWOOD

New special design for smooth, splinter-free plywood cuts. Hollow-ground, extra sharp. Hard-chrome plated, rust-resistant. Available in all popular sizes. Standard 8".

DISSTON DELUXE DADO HEADS





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

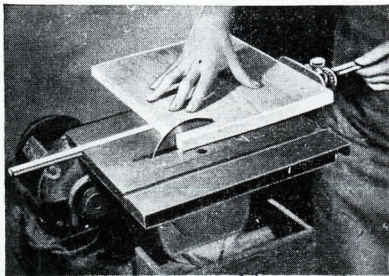
Jointing the Saw

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.

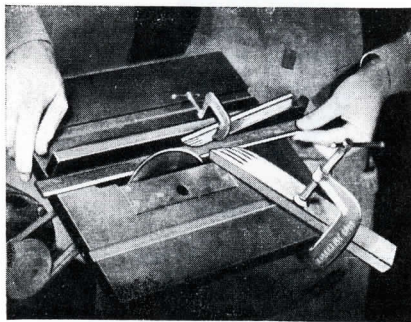


Setting the Teeth

After the teeth have been shaped, they should be set with a Disston No. 18 Triumph Saw Set, or the No. 24 or 34 Pistol Grip 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 .015 to .020 on each side.



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

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 $\frac{1}{64}$ -inch shorter for hardwood, $\frac{1}{32}$ -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.

TOOLS FOR REFITTING SMALL CIRCULAR SAWS

Disston Mill Bastard File

Two round edges



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

Disston Taper File



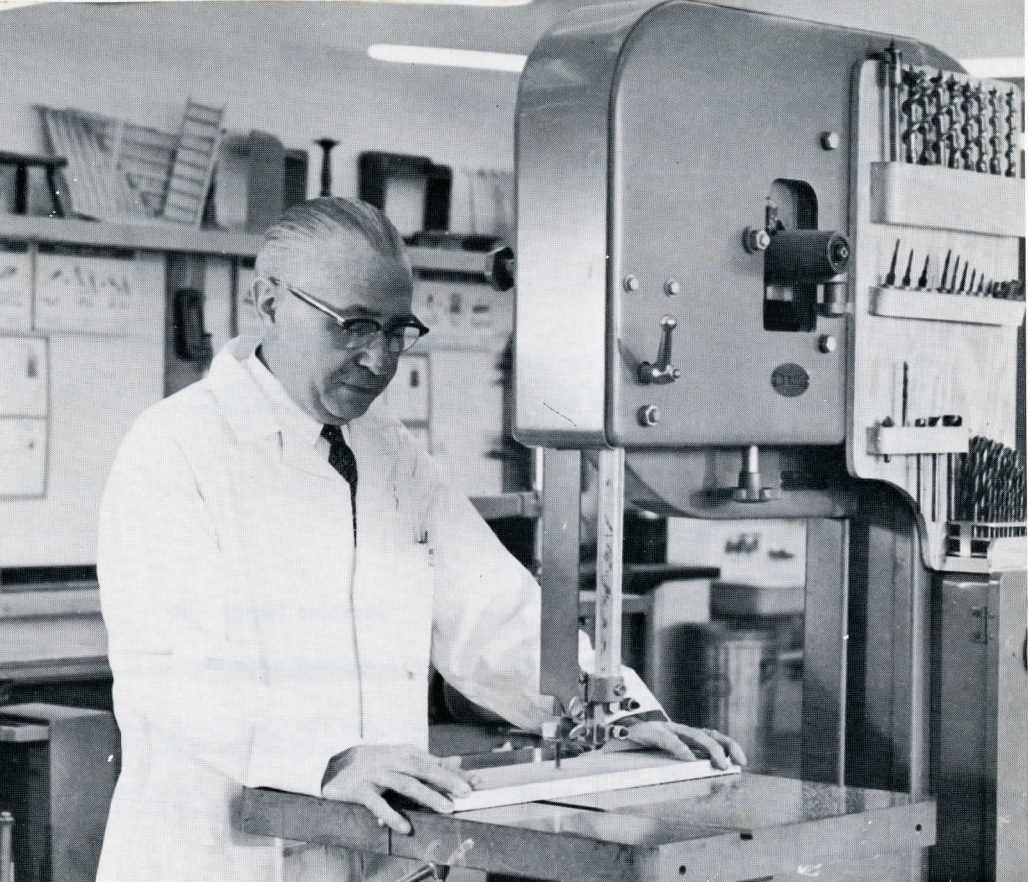
Best adapted for filing teeth of small cut-off and combination saws. Use 6, 7 or 8 inch size.

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

Disston No. 34 Pistol Grip Saw Set



The Disston No. 34 Saw Set gives a perfect set on small circular saws 11 gauge and thinner.



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 Band Saws are made.

These are used for cutting wood, metal, fibre, plastics, etc. They are made of the highest quality steel, 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.

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.

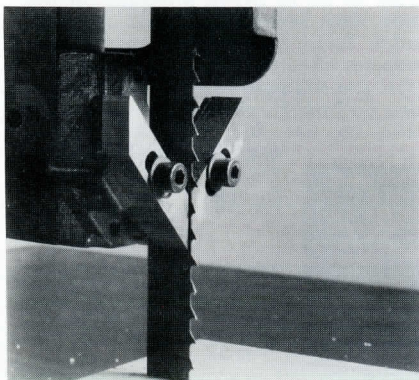


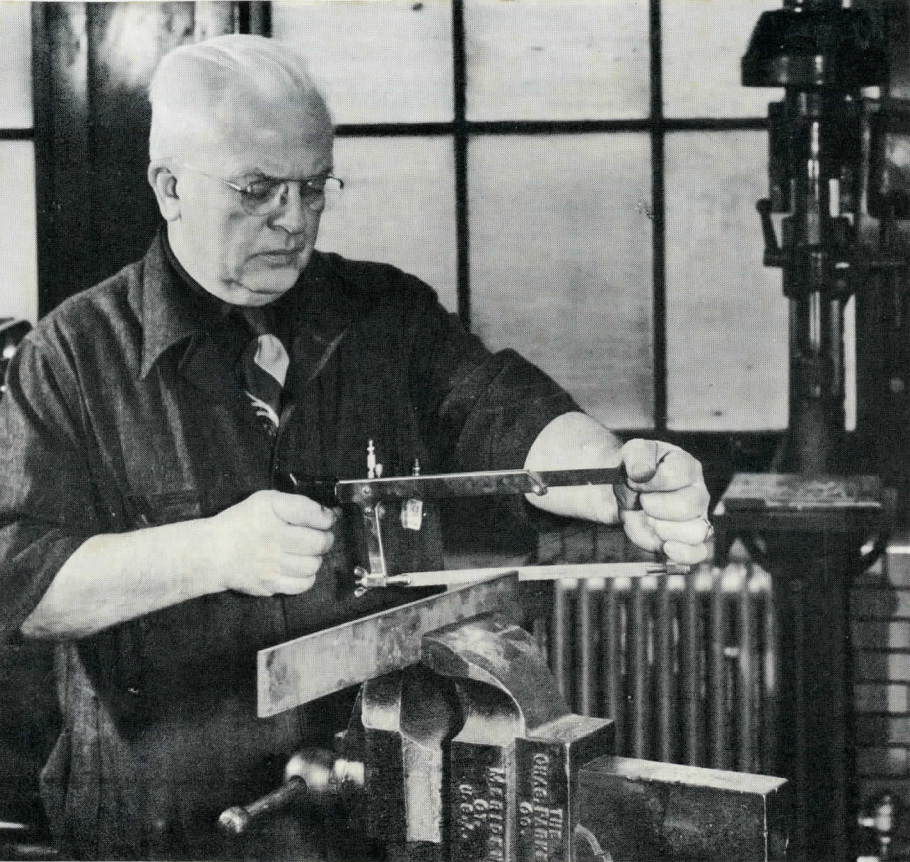
Set too low and not parallel to length of saw.

Teeth may be set with a Disston No. 24 Pistol Grip 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 ⅜ 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

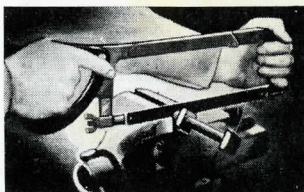
Hack Saws are designed for cutting metals of all kinds and materials other than wood. Even though most of your work may be with wood, you will find many occasions for using this handy and indispensable tool.

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.

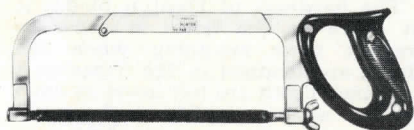


BEFORE CUTTING off bolts, turn nut all the way up on the threads first. Then when bolt is cut, unscrewing nut will straighten any battered threads.

DISSTON

Hack Saw Frames

No. 368

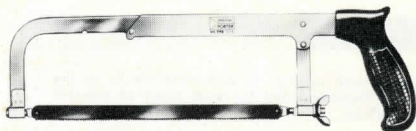


A sturdy, well made frame adjustable to 8, 10, or 12 inch blades and four cutting positions. Blade locks securely in desired position. Depth, $3\frac{5}{8}$ inches from tooth edge to inside of back. Pin in each stretcher holds blade in position.

Streamlined steel handle with black plastic facing; large, comfortable, closed grip; and fastened to frame with three screws.

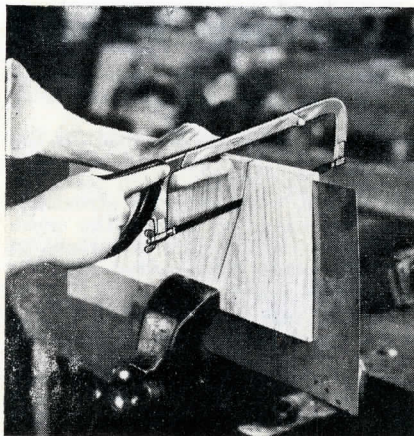
Wing nut adjustment makes removal, replacing and straining of blade easy.

No. 348 Hack Saw Frame



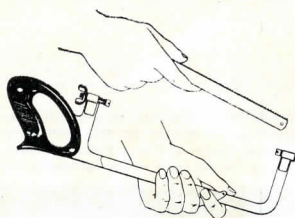
The Disston No. 348 Hack Saw Frame is a good moderate priced frame. Bright nickel-plated steel frame adjustable to 8, 10, or 12-inch blades in four cutting positions. Wing nut adjustment.

Black plastic pistol grip handle. Depth from tooth edge to inside of back, $3\frac{1}{8}$ inches.

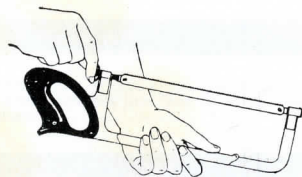


Thin metal can be hack sawed with a coarse-tooth blade when a piece of scrap wood is placed on both sides of work.

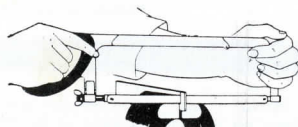
Putting Blade in Hack Saw Frame



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 five kinds of hand blades, and three 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.



SUPER-SAFE blades are scientifically designed to meet rigid safety requirements. Made of high speed steel, hardened on the tooth edge only, the tough body of each blade is flexible enough to absorb severe cutting strains without shattering. Resists wear and cuts easily through a wide variety of metal and metal products such as stainless steel, copper tubing, aluminum conduit.



HIGH SPEED STEEL blades are extremely hard and tough and easily cut metals which cannot be sawed with ordinary steels. Due to their hardness, they are valuable for mass production cutting of stainless steel, chromium-nickel steels and other alloys, even under shock and conditions of stress.



DI-MOL blades are made of molybdenum steel, made tough enough to withstand abuse in the hand sawing of tool and machine steels, and cast iron. Recommended for most types of general machine shop production.



DURAFLEX blades are fashioned of high quality steel, hardened on the tooth edge only, giving extra flexibility to each blade. Recommended for the roughest type of work—such as cutting flexible conduits and for cutting in awkward positions.



CHROMOL blades are an all-hard type of blade manufactured from a special alloy steel. These blades are designed to stand up in cutting even the hardest metals. Excellent for non-production work.

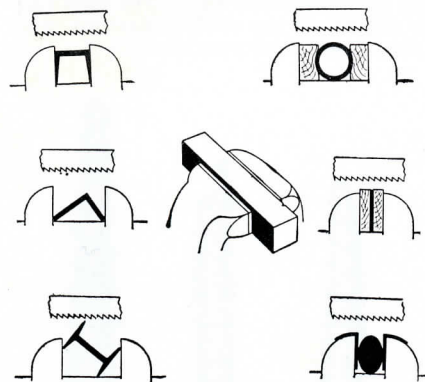
HOW TO USE YOUR HACK SAW CORRECTLY

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



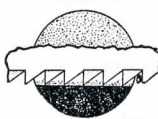
Above illustrations show ways of clamping irregular shapes. To hold oval or circular work in square jaw vise, use wood, leather or copper filler pieces to grip work and to prevent marring.

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."

CORRECT



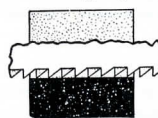
Plenty of chip clearance

INCORRECT

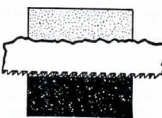


Fine teeth. No chip clearance. Teeth clogged

Use 18 teeth for cutting materials $\frac{1}{4}$ -inch to 1-inch in sections of annealed tool steel, high speed steel, rail, bronze, aluminum, light structural shapes, copper.

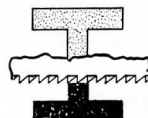


Plenty of chip clearance



Fine teeth. No chip clearance. Teeth clogged

Use 24 teeth for cutting material $\frac{1}{8}$ -inch to $\frac{1}{4}$ -inch in sections of iron, steel, brass and copper tubing, wrought iron pipe, drill rod, conduit, light structural shapes, metal trim.



Two teeth and more on section



Coarse teeth straddles work stripping teeth

Use 32 teeth for cutting material similar to recommendations for 24 tooth blades for $\frac{1}{8}$ -inch and thinner.



Two or more teeth on section



Coarse pitch straddles work

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.

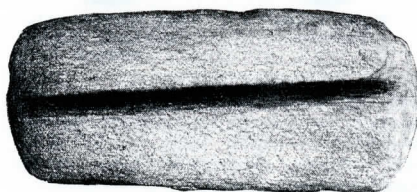


Fig. 1. Stone Used by Ancient Pueblo Indians for Polishing Arrow Shafts.

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."

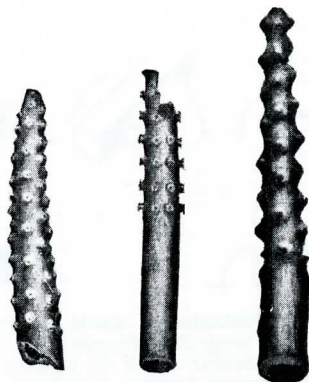


Fig. 3. Bronze Rasps used by Egyptians.

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.

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.

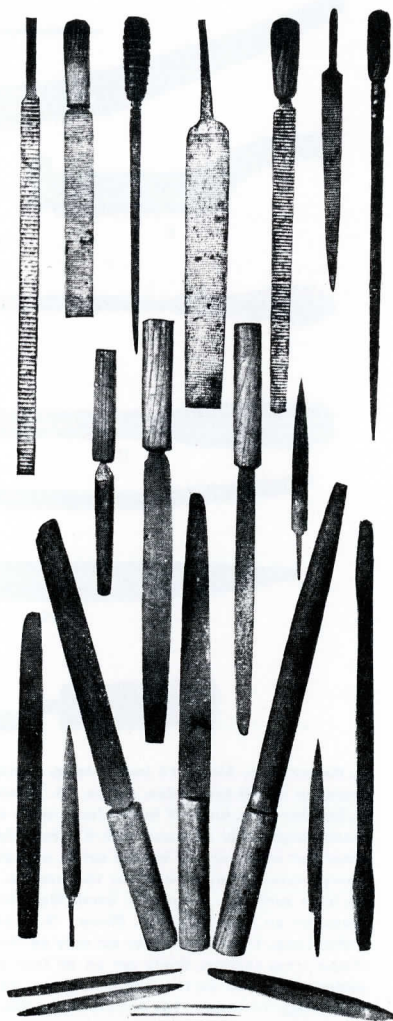
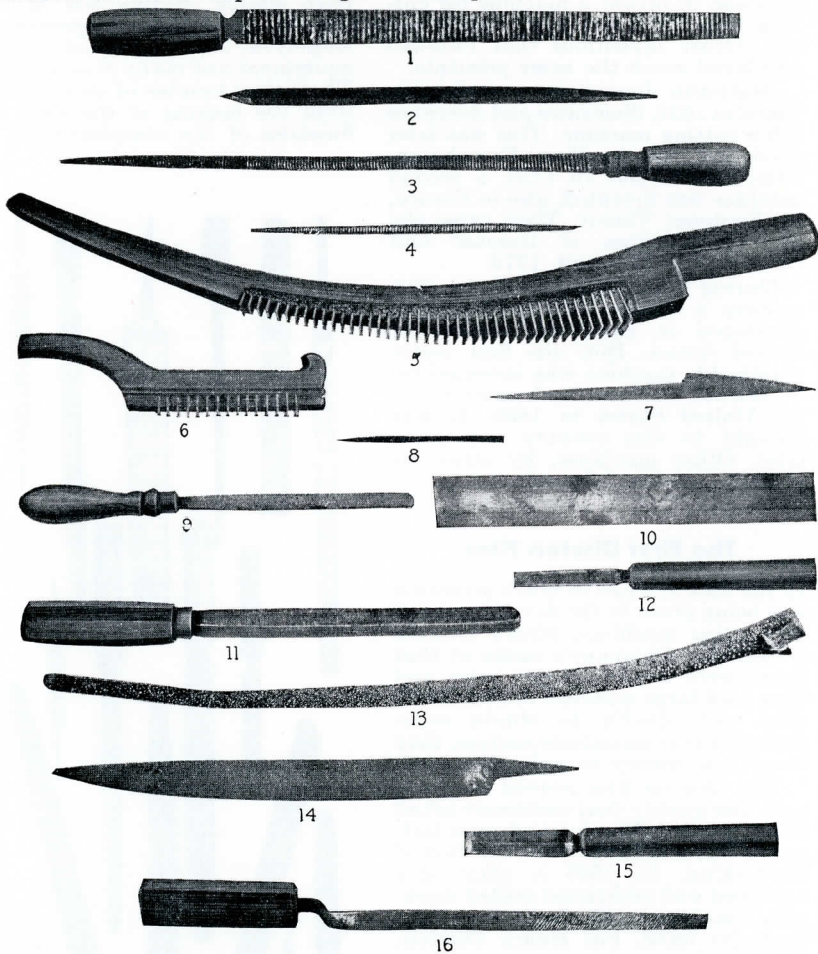


Fig. 4. Examples of Primitive Files.

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, $\frac{5}{16}$ " 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 $\frac{3}{4}$ inches long, 1 $\frac{3}{4}$ 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.

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 homemaker 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, Ta-

pers and other saw files are single cut. The following illustrations show the comparative coarseness of teeth in 10-inch files and rasps.

**Single
Cut
10" Mill**



Bastard



Second Cut



Smooth

**Double
Cut
10" Flat**



Bastard



Second Cut



Smooth

**Cabinet
Rasp
10"**



Second Cut



Smooth

**Wood
Rasp
10"**

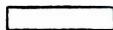



Bastard





Smooth


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

More than eighty-five 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.

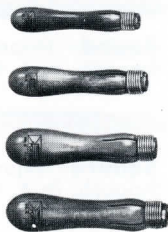
HOW TO USE A FILE

- 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 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.....	4 1/4 inches	3 to 6 inches
No. 2.....	4 3/8 inches	6 to 10 inches
No. 3.....	4 7/8 inches	10 to 12 inches
No. 4.....	5 3/8 inches	14 and 16 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 sizes, all 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 straight cut edges, ready to be burnished.

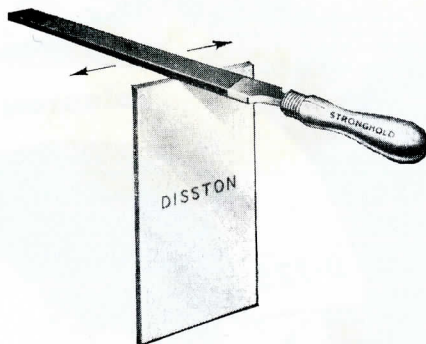
SHARPENING SCRAPERS

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.

Turning the edge of a cabinet scraper, using a 4 1/2-inch No. 1 Oval Burnisher.



Draw-filing edge of cabinet scraper

- 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:

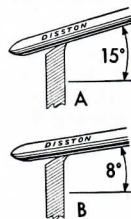
First, file it with a bevel of about 30°, similar to a bevel on a chisel.

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.

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.

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 Portable Electric Circular Saws

The Disston line of circular saws incorporates every quality feature demanded by the professional or do-it-yourself users. The D-650 and the D-725 are specifically designed and engineered for extra power and cutting capacity of everyday professional use. The D-600 is a powerful, fast cutting portable saw with all the features of a much more expensive unit. The D-600 will perform hundreds of household sawing jobs with ease.

The Disston line of circular saws are powered by a 115V, AC-DC motor

with a 6700 RPM rating, cutting speed is approximately 6300 surface feet per minute. The housing is die-cast aluminum with "Diss-Glaze" finish, gear and pinion are of the best quality steel, machined to close tolerance for smooth, quiet operation. The D-650 and D-725 are also equipped with anti-friction bearings throughout, to meet continuous duty demands of professional users. Wide Helical gears transmit full power to blade for smooth operation and highest cutting speed. UL and CSA approved.

WHEN TO USE A PORTABLE ELECTRIC CIRCULAR SAW

A must for every complete carpenter or do-it-yourself shop, the circular saw makes quick work of any straight line cutting job. Trimming floorboards, ripping planks quickly, quantity board

cutting, wall board, plywood sections are all perfect for the electric circular saw. The circular saw will also cut metal sheet and plastic.

**D-650
DEFENDER**

6 1/2"

The DISSTON "DEFENDER" is equipped with a 115 volt, AC-DC motor with 6700 RPM Rating. Precision helical gears provide smooth operation plus maximum tooth strength. Rated at 10 amps.



**D-600
DISCUS**

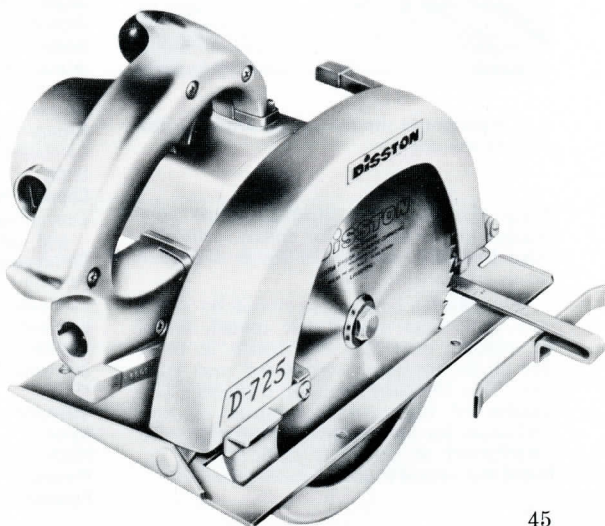
6 1/2"

The "DISCUS" will perform hundreds of household sawing jobs with ease. Plenty of speed and power to cut hardwood or plastic. Rated at 10 amps.



**D-725
7 1/4"**

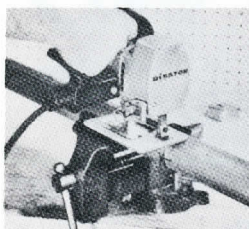
Ideal for carpenters and builders because it is made with greater capacity than any 7 1/4" saw. Knives through the hardest woods up to 2 1/16" on vertical cuts, 2 5/32" for cuts at 45°—deeper cut than any other 7 1/4". Rated at 13 amps.



WHAT IS A SABRE SAW?

The electric sabre saw is the most versatile power saw in the home shop, able to cut wood, tubing, rubber, paper cloth, plywood, metal pipe and plastic by merely changing the blade. This tool can cut straight lines, curves,

scrolls, bevels, circles and mitres. Because of its ability to do so many different type cutting jobs, with practically any kind of material, it is usually recommended as the first power saw to add to your home workshop.



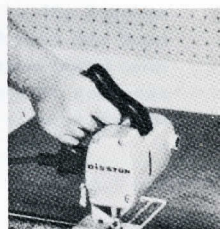
Cuts tubing



Plunge cuts

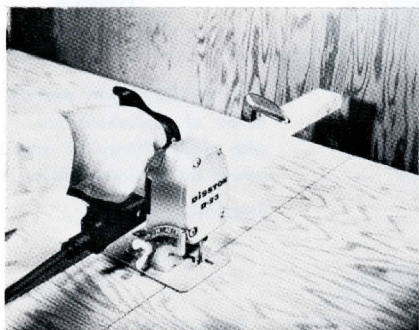


Cuts scrolls



Cuts metal

SELECTING THE BLADE



It is important to use the correct blade for the job you are doing.

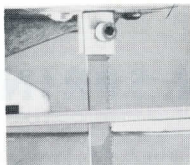
Like circular saw blades, sabre saw blades are designed for many uses. Be sure that the correct blade is used for your particular job.

The blades below are noted by teeth per inch best suited for metal, wood or plastic cutting. The knife is used for cloth, leather, cardboard and rubber. The Disston number indicates the blades of high quality made by the Division for sabre saws. They may be purchased at your local hardware or building supply store.

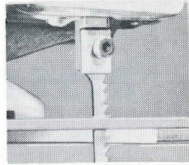
MATERIAL TO BE CUT	Teeth Per Inch	Disston Number
Aluminum Plate, 1/4" — 1/2"	6	BP-6796
Aluminum Sheet, 1/8" — 1/4"	14	BP-6797
Aluminum Sheet, less than 1/8"	18	BP-6798
Aluminum Tubing, Heavy Wall	6	BP-6796
Aluminum Tubing, Medium Wall	14	BP-6797
Aluminum Tubing, Light Wall	18	BP-6798
Angle Iron	14, 18	BP-6797, 98
Asphalt Tile	14, 18	BP-6797, 98
Brass, Heavy	6	BP-6796
Brass, Light and Tubing	14, 18	BP-6797, 98
Bronze	14	BP-6797
Bronze Tubing	14, 18	BP-6797, 98
Cardboard	Knife	BP-6795
Cloth	Knife	BP-6795
Copper, Heavy	6	BP-6796
Copper, Light and Tubing	14, 18	BP-6797, 98
Corrugated Board	Knife	BP-6795
Formica	12	BP-6793
Laminates, Paper	12, 14, 18	BP-6793, 97, 98
Laminates, Cloth	14, 18	BP-6797, 98
Leather	Knife	BP-6795
Linoleum Tile	12, 14	BP-6793, 97
Lucite	12	BP-6793
Masonite	12	
Nylon	12	BP-6793
Plastics	12, 14, 18	BP-6793, 97, 98
Plexiglas	12	BP-6793
Plywood	12	BP-6793

MATERIAL TO BE CUT	Teeth Per Inch	Disston Number
Rubber	Knife	BP-6795
Rubber Tile	12, 14, Knife	BP-6793, 97, 95

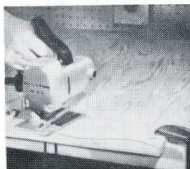
Steel,		
Mild $\frac{1}{8}$ " \rightarrow $\frac{1}{4}$ "	14	BP-6797
Sheet $\frac{1}{16}$ " \rightarrow $\frac{1}{8}$ "	18	BP-6798
Sheet, Thin,		
Under $\frac{1}{16}$ "	32	BP-6799
Tubing	14, 18	BP-6797, 98
Tubing, Thin Wall	32	BP-6799
Wood,		
Heavy Cuts,		
2" x 4" at 45°	6	BP-6794
General Cutting	7, 10	BP-6792, 91
Smooth Cuts	12	BP-6793
Plywood	12	BP-6793



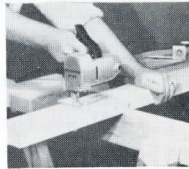
At least two teeth must be on the cutting surface at all times.



When only one tooth is engaged in the work, as shown here, broken blades and "bucking" will result.



Small work should be securely clamped.



Heavy work may be held by hand on saw-horses.

DISSTON SABRE SAWS

DAUNTLESS D-23

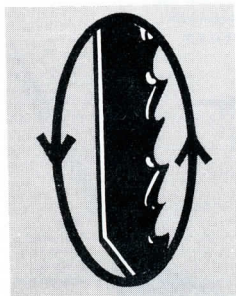


The Disston D-23 Electric Hand Saw is the most versatile saw on the market. Named after its famous predecessor, the D-23 Hand Saw, it is designed for today's mechanic who appreciates quality and long life in his tools.

DAGGER D-20



Similar to the Dauntless, the D-20 or Dagger varies only in that its construction and power requirements are more suitable to the do-it-yourselfer.



EXCLUSIVE
DISSTON
"ORBITE"
ACTION . . .
NO DRAG
OR BACK CUT

The powerful motor operates the saws at 3600 to 3800 strokes per minute delivering maximum blade power for cutting wood up to 2", plastics, rubber tile, linoleum tile, asphalt tile, laminated paper and plexiglas. Also cuts steel plate (up to $\frac{1}{4}$ "), aluminum plate (up to $\frac{1}{2}$ "), angle iron, copper, bronze, brass, pipe, tubing and sheets.

The Dauntless and Dagger both feature "Orbite" blade action, meaning the blade cuts on the up stroke and backs away on the downstroke. This speeds up sawing, reduces fraying and increases blade life. Each Disston saw has a detachable "lock-in" cord which enables simple replacement of the cord when cut or damaged. It is also a safety feature in that it prevents use by unauthorized persons merely by keeping the cord and the saw separate.

DISSTON SPRING ACTION RAKES

Teeth are held in place by patented slot and key construction in both ferule 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 is designed to overcome the disadvantages experienced with ordinary lawn rakes. Non-rigid construction, made possible with the "back-bone" spring, takes strain off of teeth and eliminates the need of a heavy metal frame.

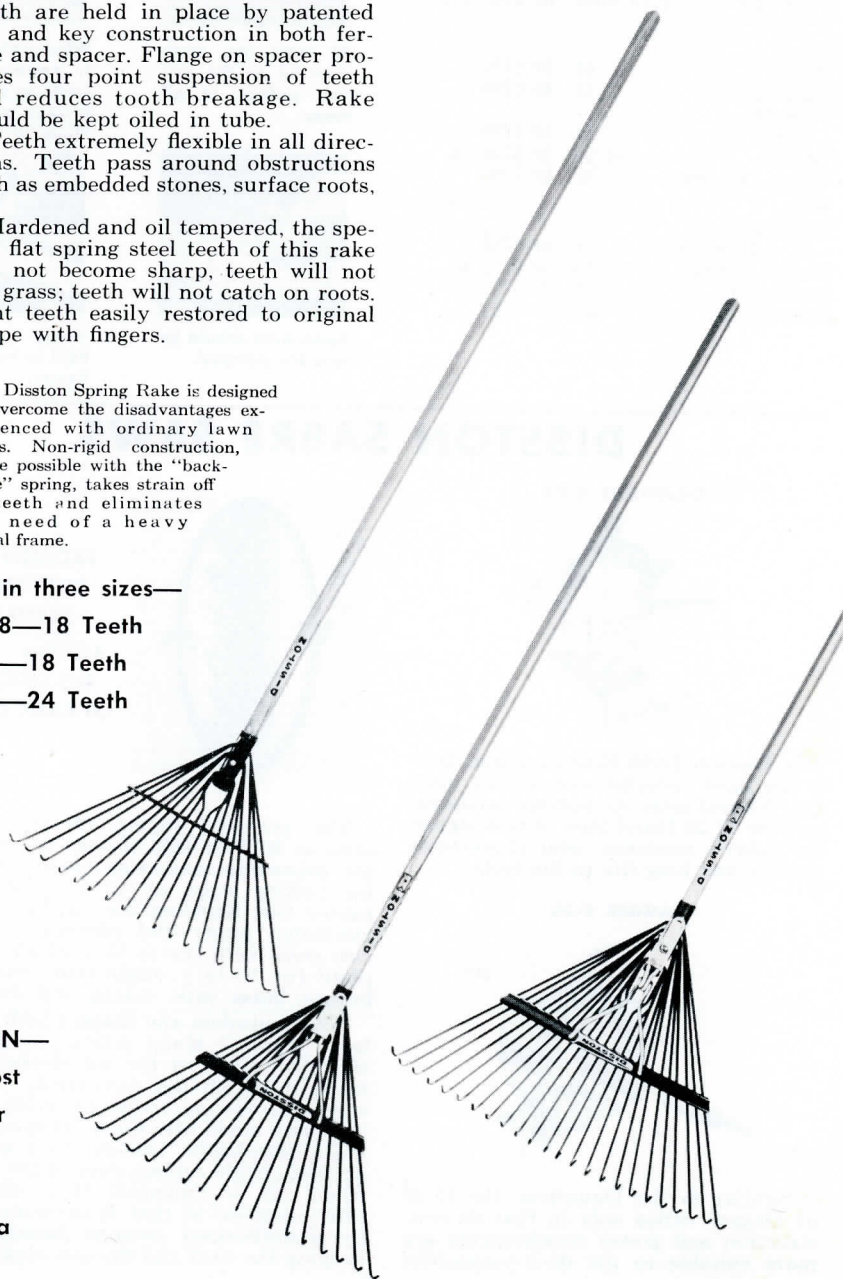
Made in three sizes—

D12-18—18 Teeth

D-18B—18 Teeth

D-24B—24 Teeth

DISSTON—
The Most
Popular
Rake
in
America



DISSTON PRUNING TOOLS

No. 7A LOPPING SHEARS



No. 30A HEDGE SHEARS



Break-proof — extra sharp—extra strong. 7A lopping shear is a professional favorite — cuts thick dry or green wood smoothly and easily. Aluminum orchard lopper (5A) is lightweight—won't break. Strongest lopper made in its price range. Each blade is precision ground, extra sharp—keeps keen edge for years. Each lopper has comfort styled handles—may be gripped comfortably and securely by any size hand.

Lightweight, perfectly balanced, with handles adaptable to any size hand. These features are exclusive with Disston and the result is effortless cutting. Blades are extra sharp. Available with hollow ground blades for precision, razor-sharp cutting edges. Serrated blades hold twigs for cutting—allow more area to be covered with single stroke. Shears available in 8" and 6" blade.



No. 300A GRASS SHEARS

Lightweight, smooth action reduces hand fatigue. Shaped handles provide natural grip wherever grasped. Both vertical and scissor action types are available. Hollow ground blades stay sharp longer . . . last a lifetime. Comfort, styling and action makes Disston grass shears best buys!

No. 10A GRASS HOOK AND SLASHER

Easy grip, sharp edges, durability are features of Disston's grass hooks and slashers. Comfort styled handles may be gripped by any size hand. Comfortable position is automatically the best cutting position. Highest quality steel blades stay sharp longer. Favorites with professionals and do-it-yourselfers. Serrated blade gives greatest possible cutting area.



No. 327A HAND PRUNER



No. 10 HAND PRUNER

Two easy cutting models available. One with anvil type construction—used for accessible stems and one with hook and blade pattern for hard-to-reach twigs and stems. Each hand pruner is gripped easily, fingers automatically position for best cutting grip. High quality steel holds cutting edge—makes pruners tough and durable. Safety catches on every pruner. The pruners the professional uses — because they last longer—do their job better.

DISSTON PRUNING SAWS

No. 166 Pruning Saw



Most popular saw of its type made. Cuts fast. Blade tapers to point for use in close quarters; made of Special Steel; reverse teeth, 7 points to inch; 1½ inches wide at handle. Hardwood handle; two nickel plated screws fasten blade. 14 inch length.

No. 38 Pruning Saw



Properly shaped, slotted weather-proofed finish, hardwood handle, blade of Special Steel, 2" wide at handle with long, slender, needle-shaped teeth. Cuts on draw stroke. Butt end of blade rests against rivet when pruning.

No. 4 Pruning Saw



Has tapering blade with teeth on both edges. Made for general pruning. Blade of Special 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 nickel plated screws fasten blade in handle. 18 inch length.

No. K-40 Pruning Saw



Economy version of No. 4. Two edged blade, one for large limbs, one for small limbs. Hardened, tempered, ground and polished special steel blade. Large hole in hardwood handle for gloved hand. Handle weatherproof finished. 18" length.

No. 32 Pruning Saw



Tooth edge directly beneath handle is without teeth and slightly curved, thus preventing saw from catching in clothing when hung on belt hook. Alloy Steel blade, skew-back pattern, cross-cut teeth, 5" wide at butt, 1¼" wide at point. Champion pattern teeth for fast cutting. Length of Blade 24". Shipping Weight per Dozen 21 lbs.





DISSTON DRAGON D-99 B HEDGE TRIMMER

**EASIEST HANDLING,
FASTEST CUTTING**

TECHNICAL FEATURES:

Blade length—13 $\frac{1}{8}$ "

Blade width—2"

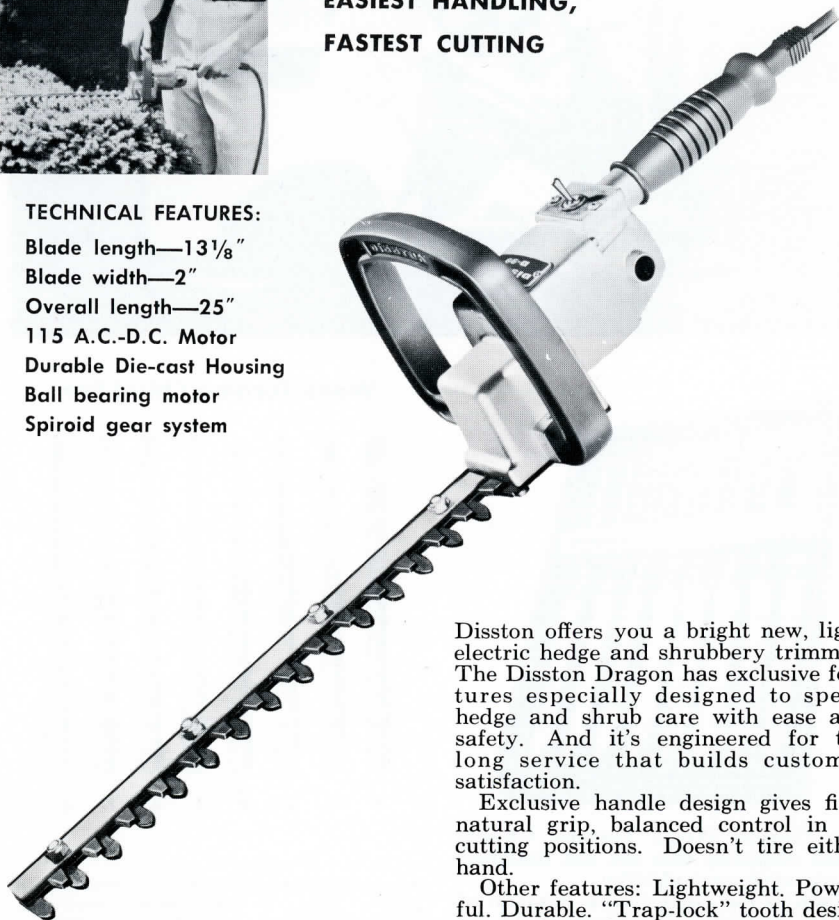
Overall length—25"

115 A.C.-D.C. Motor

Durable Die-cast Housing

Ball bearing motor

Spiroid gear system

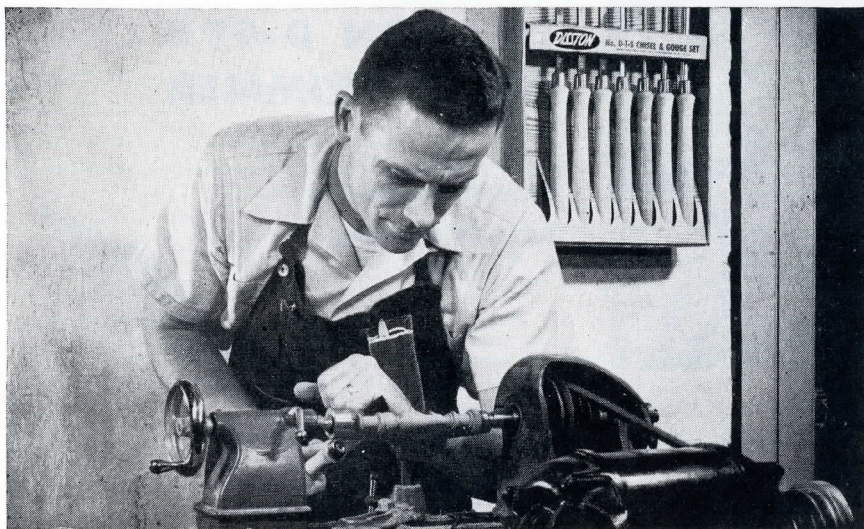


Disston offers you a bright new, light electric hedge and shrubbery trimmer. The Disston Dragon has exclusive features especially designed to speed hedge and shrub care with ease and safety. And it's engineered for the long service that builds customer satisfaction.

Exclusive handle design gives firm natural grip, balanced control in all cutting positions. Doesn't tire either hand.

Other features: Lightweight. Powerful. Durable. "Trap-lock" tooth design for no-skip trimming. Hardened steel blade, bevelled teeth. 1800 cutting strokes per minute.

DISSTON WOOD TURNING CHISELS

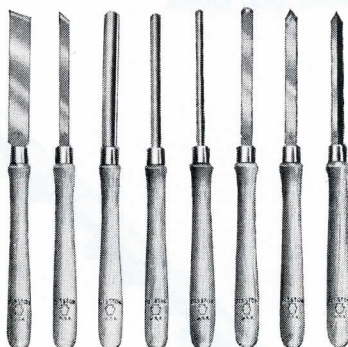


The Disston Wood Turning Chisels which comprise this set are designed for use with a wood lathe.

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.

Wood Turning Chisel Set

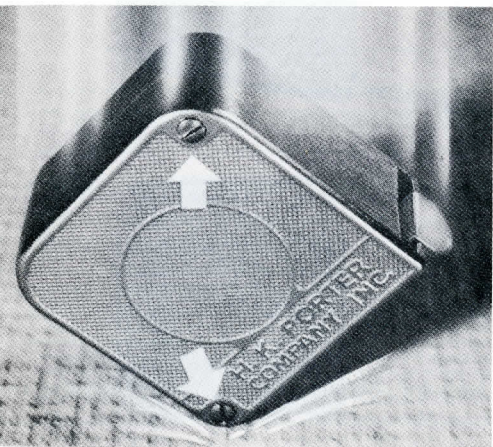


1 2 3 4 5 6 7 8

No.	Pattern	Length Blades Inches	Overall Length Inches
1	1 inch Skew . . .	6 $\frac{3}{4}$	16 $\frac{3}{4}$
2	1/2 inch Skew . . .	6 $\frac{3}{4}$	16 $\frac{3}{4}$
3	3/4 inch Gouge . . .	6 $\frac{3}{4}$	16 $\frac{3}{4}$
4	1/2 inch Gouge . . .	6 $\frac{3}{4}$	16 $\frac{3}{4}$
5	1/4 inch Gouge . . .	6 $\frac{3}{4}$	16 $\frac{3}{4}$
6	1/2 inch Round Nose	6 $\frac{3}{4}$	16 $\frac{3}{4}$
7	1/2 inch Spear Point	6 $\frac{3}{4}$	16 $\frac{3}{4}$
8	Parting Tool . . .	6 $\frac{3}{4}$	16 $\frac{3}{4}$

DISSTON RULES AND TAPES

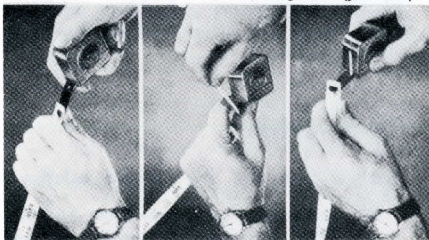
Steel rules are no longer found only in the do-it-yourselfer's tool bench or the carpenter's or mechanic's cabinet; they are used by *every* member of the family for literally thousands of different jobs in the home and out of doors. The busy housewife uses a smaller, more compact rule for sewing and measuring new furniture. The children use them for their models or their own do-it-yourself projects. With this constantly growing usage, many different size and type rules and tapes are available. There is always a problem in selecting a rule because at first appearance all may look similar. Not until a rule has been used for some time can one determine characteristics which separate the quality rule from the ordinary brand.



First, always look for a rule with at least two corner screws. This type rule is desirable because of its durability and strength. When dropped, the halves of the case won't separate and the tape itself is better protected. Note particularly the long tapes (25 to 100 feet) where all four corners should be secured. A long tape with this construction is well protected against many of the rigors of outdoor use. When you *do* purchase a rule with only one center screw, be sure it is

exposed, not inaccessible under the nameplate. At least you can still separate the halves of the case if necessary.

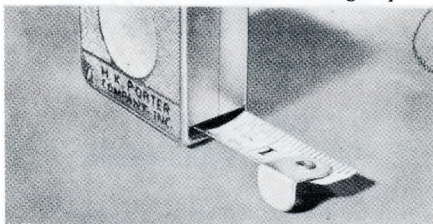
Secondly, be sure you buy a tape with an easily replaceable blade. Pull out the tape the complete length, see if there is a short inner spring connection between the end of the tape and the case. (Note accompanying diagrams)



Obviously, a tape which cannot be replaced if broken, must be thrown completely away—case and all. Replacement blades are available at local hardware and building supply dealers.

Another important feature to check when you are buying a rule is the strength of the tip of the tape. This tip will be put under a great deal of pressure in many situations. Be sure it is strong by hooking over the edge of the counter and pulling back firmly. You may surprise the dealer, but he'll agree that it is best to be sure of the complete quality of *any* tool before you buy.

You may be interested in getting the most accurate tape possible. If so, look for a tape with a "swing tip."



This means the tip may be moved 90° as the above illustration indicates, allowing the most precise inside measurements—when you get the inside dimension of a window or door frame, for instance.

DISSTON RULES AND TAPES

Long "reach" is another desirable feature of a rule, especially to a carpenter or do-it-yourselfer who must take many measurements himself. When you can hold the case and extend the tape out five or six feet without it "breaking" or "collapsing", you have a tape with a good "reach". How handy for measurements at a distance. When you are on a ladder, with no one to hold the other end of the tape, for example!

Disston Steel Tape Rules are manufactured according to the highest standards of quality and accuracy. The line consists of steel tapes from 6' to 100' in length and widths of $\frac{1}{4}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ ". Designed and graduated in all standard sizes for customers ranging from home craftsmen to engineers. Specialty rules include the White Chief Engineers Rule, the Chief Diameter Rule, a Lil Devil Printers Rule and the Big Chief Log Scale.

STAR CHIEF

Extra Length $\frac{3}{8}$ " wide white tape

The heavy-duty steel tape that operates easily, lasts for years. Tempered tool steel end hook has nail hole at zero mark. Crank folds flush into case when not in use. Anti-backlash. Sturdy non-scuff, die cast, chrome finish, "take-apart" case makes blade replacement easy. Available in 25', 50' and 100' lengths.



BIG CHIEF

$\frac{3}{4}$ " wide white tape

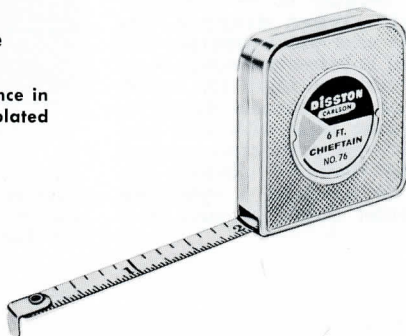
Extra rigid blade designed for long overhead and reach-in measurements. Converts inches to feet at a glance. Swing Tip. Crack-proof, rust-proof blade surface and markings. Sturdy chrome plated case. The lightest $\frac{3}{4}$ " wide rule on the market. Available in 10' and 12' lengths.



CHIEFTAIN

$\frac{1}{4}$ " wide white blade

Designed for flat, no-bulge convenience in pocket or handbag. Sturdy chrome plated case. Swing Tip. 6' and 8' sizes.



DISSTON Rules and Tapes

SUPER CHIEF

$\frac{3}{4}$ " wide white blade

Rigid blade permits one-man vertical measurements of 6 feet. Swing Tip. Sturdy die cast case with satiny chrome finish. Two assembly screws strengthen case. Available in 16' length only.



WHITE CHIEF

$\frac{1}{2}$ " wide white blade

Swing Tip blade is rust-proof, crack-proof. Sturdy zinc die cast case with satiny chrome plate. Two assembly screws for shock-proof durability. Available in 6', 8', and 10' lengths.



SPEED CHIEF

Extra Length

$\frac{3}{8}$ " wide white tape

Rewinds 3 times as fast as ordinary tape. Fastest winding long steel tape on the market today. Patented gearing puts speed into re-winding—will reel in 50 feet in 5 seconds. Free wheeling allows tape unwinding as fast as you can pull it out—with stationary handle while unwinding. Tempered tool steel end hook has nail hole at zero mark. Anti-backlash and non-jamming. Sturdy chrome plated "take apart" case permits easy, fast cleaning and tape replacement. Available in 50' and 100' lengths.



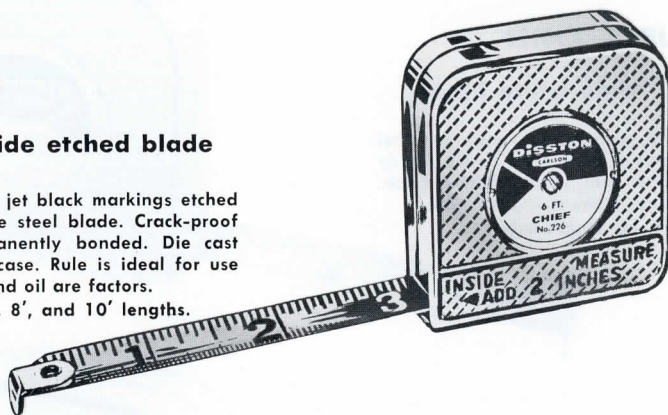
DISSTON Rules and Tapes

CHIEF

$\frac{1}{2}$ " wide etched blade

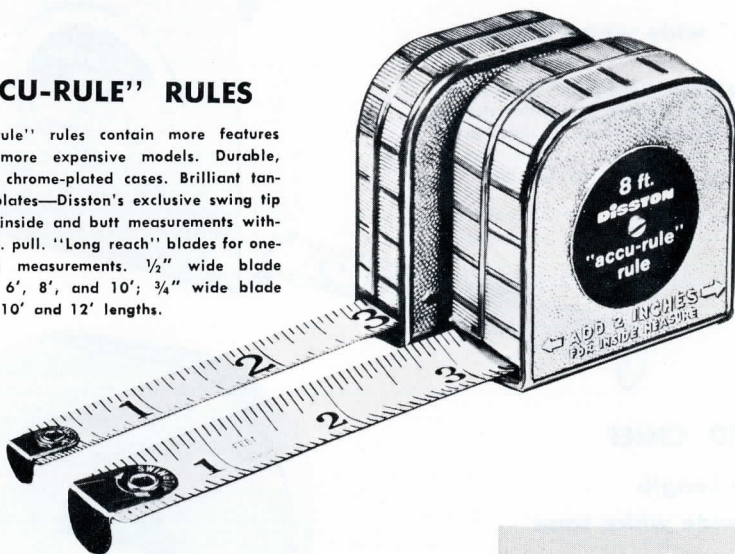
Blade has clear jet black markings etched onto satin lustre steel blade. Crack-proof markings permanently bonded. Die cast chrome plated case. Rule is ideal for use where grease and oil are factors.

Available in 6', 8', and 10' lengths.



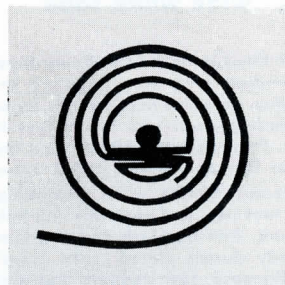
"ACCU-RULE" RULES

New "accu-rule" rules contain more features than many more expensive models. Durable, high-quality, chrome-plated cases. Brilliant tangerine nameplates—Disston's exclusive swing tip for accurate inside and butt measurements withstands 100 lb. pull. "Long reach" blades for one-man vertical measurements. $\frac{1}{2}$ " wide blade available in 6', 8', and 10'; $\frac{3}{4}$ " wide blade available in 10' and 12' lengths.



REPLACEMENT INNERSPRINGS

Steel innersprings for quick, easy replacement in Disston-Carlson rules



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 56). 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.

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.

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.

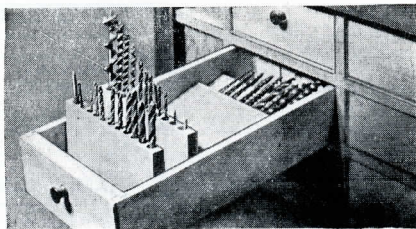
When you are through using a tool, lay it down carefully. Do not drop it. A file, for instance, is an edged tool. Its teeth, to give the greatest efficiency, are very hard. When one carelessly throws a file across a bench he is likely to break off the edges of several teeth.

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 light 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.

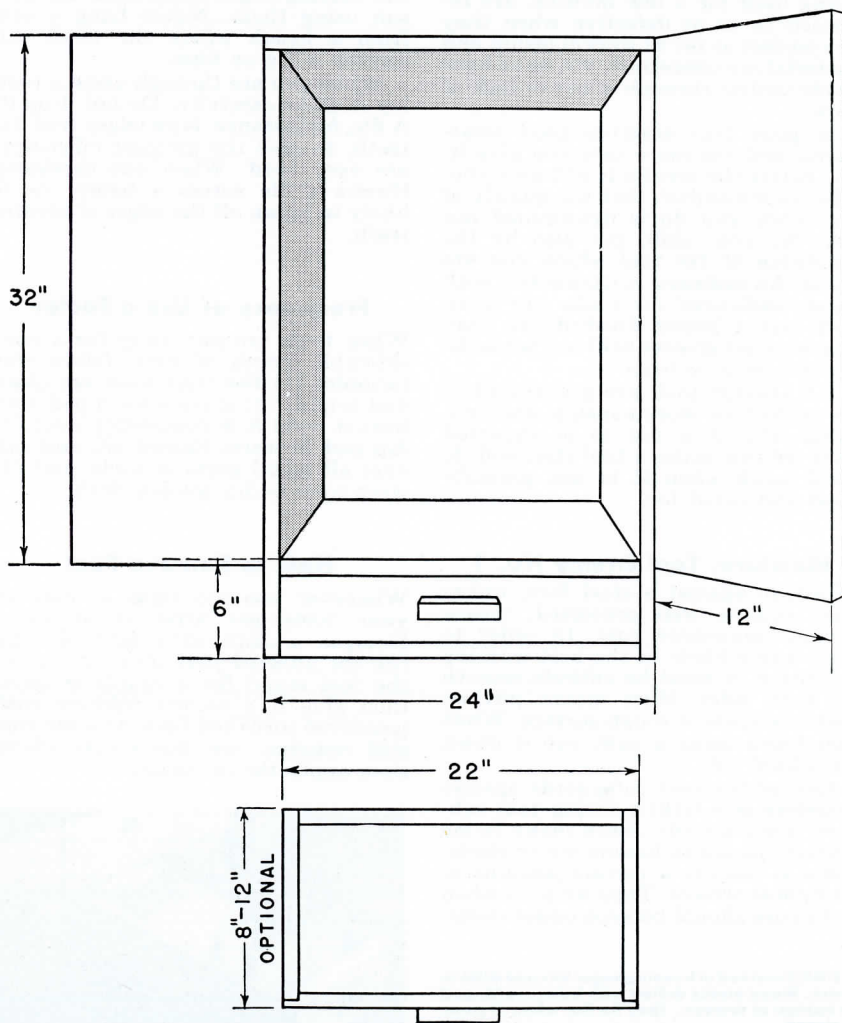


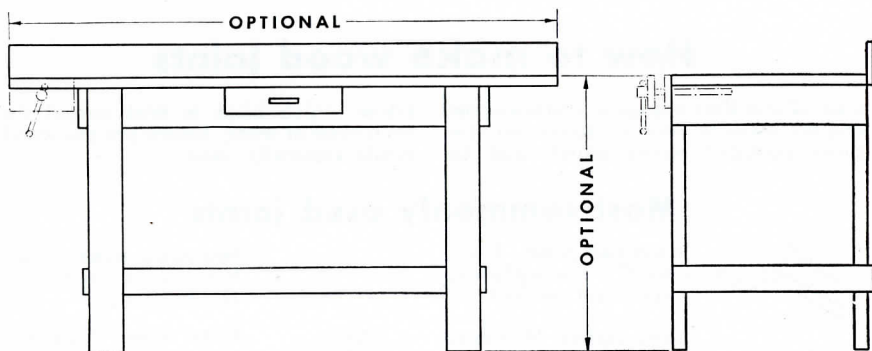
Have a safe place for each tool *and keep it where it belongs*

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 accommodate

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.





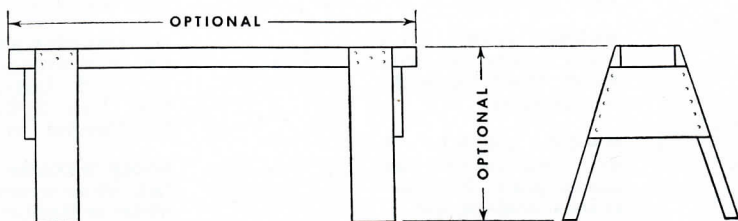
HOME WORKSHOP WORK BENCH

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

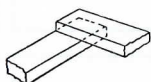
the length of the legs—a six foot man will need a higher saw horse than a shorter man; heights range from 18 to 24 inches.

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.



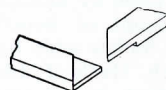
BUTT JOINT. Weakest of all joints. End of one board joined to edge of another.



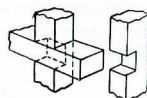
HALF LAP SPLICE. For joining two pieces to add length.



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



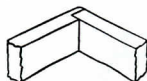
MITRED HALF LAP. For corner joints on frames. Corners are mitred instead of square cut.



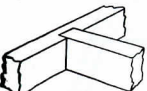
CROSS HALF LAP. For lapping two pieces that cross each other. Adds strength.



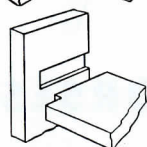
MIDDLE HALF LAP. The favorite "T" joint for attaching cross members to frame.



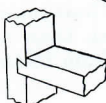
RABBET JOINT. End grain concealed from front. Used for making drawers.



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



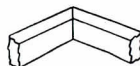
STOPPED DADO JOINT. End of one board notched, groove cut part way through to conceal it from front.



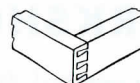
DOVETAILED DADO JOINT. Stronger than simple Dado. Requires careful cutting and fitting.



END DADO JOINT. Combination of Dado and Rabbet joints.



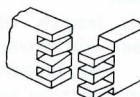
MITRE JOINT. Conceals ends of both boards. Cut at 45°.



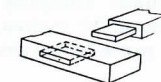
HALF BLIND DOVETAIL. Dovetails show only at side. Used for drawer fronts.



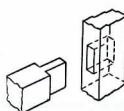
BLIND DOVETAIL. Only mitre shows. Difficult to make. Used for finest drawer construction.



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



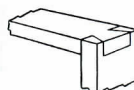
PLAIN MORTISE AND TENON. Tenon extends through mortise. Used in making panels.



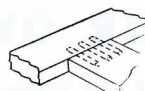
BLIND MORTISE AND TENON. Same as plain, except tenon extends part way through.



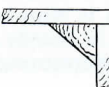
OPEN MORTISE AND TENON. For frames. Can be used instead of half Lap Splice for lengthening boards.



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



DOVEL 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.

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.

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.

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.

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PORTER

DISSTON DIVISION
H. K. PORTER COMPANY, INC.
PITTSBURGH 19, PA.