SAW EFFICIENCY

.... How

To Select the Right Wood

•

Make 50 Objects

•

Choose Your Saws

•

File, Set, & Refit All Saws

OHLEN-BISHOP SAWS

Columbus, Ohio

Printed in U. S. A. 12-36

KEEP THIS BOOK HANDY

Valuable Additions To It Will Be Mailed To You From Time To Time

You will notice that the binding side of "Saw Efficiency" is punched with three holes. This feature will make the manual more and more valuable to you as the months go by. For we will send you, from time to time, additional and extremely useful information on saws and sawing problems, as well as working plans and drawings, as they are compiled and released by us.

This material will be printed in the regular "Saw Efficiency" page form and punched exactly as this book is punched. It will also be paged to indicate specifically in what section it is to be inserted. With the first insert that is mailed to you will be included three fasteners for clipping-in all following inserts.

If you requested "Saw Efficiency" by letter or by coupon, we have your name and address on file. **If you obtained your copy from some other source, be sure to send us your name and address so you will be on our standing "Saw Efficiency" mailing list.**

WOOD is universal. Its uses are infinite. In buildings, furnishings, and an innumerable variety of objects it represents the use of many tools. But, of all these, there is none more significant than the saw.

It is the most useful tool for quickly, accurately, and easily reducing wood to size and shaping it to desired dimensions.

We, as saw makers, are interested in wood-working of all kinds. We consider the tremendous army of woodworkers, both amateur and professional, our natural allies and friends.

We have prepared this book especially for them. Although it has taken a great deal of time, it has been a most enjoyable task to make this little manual on wood-working both as comprehensive and as authoritative as possible. We have done this in order that it may be of the greatest possible assistance to those who refer to it.

Less complete manuals of this type have heretofore been sold for prices ranging from 10c to 50c. To insure the widest possible distribution, however, we are offering the present edition absolutely free of all charge or obligation. By so doing, if we succeed in being definitely helpful to those who work in wood, we shall feel repaid.

THE OHLEN-BISHOP COMPANY

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For Quick Reference

An Appreciation

In order to make sure that the contents of this book would be both as complete and authoritative as possible, it has been necessary to consult many sources of information and many individuals whose aid is hereby gratefully acknowledged.

* * *

We wish, in particular, to acknowledge the valuable assistance given by Dr. William E. Warner, Associate Professor of Education in Industrial Arts, Ohio State University, in preparing the material presented.

* * *

Special credit is also hereby extended to the publishers of Popular Mechanics Magazine for their kind permission to adapt and include herein a very considerable amount of copyrighted material which originally appeared in their informative columns. This material covers several highly specialized subjects, and we are confident that it is the synthesis of scores of years of experience.

* * *

We wish to credit, too, the U. S. Department of Agriculture for brief excerpts from official bulletins on lumber and building.

THE RIGHT WOOD TO USE

How to Recognize Different Kinds of Wood. Their Qualities and Uses. Where to Get the Wood You Want. Simple Care of Wood

Selecting the right wood to start with is of first importance (on nearly every job of repair or construction). Especially so when you are making something that will be exposed to weather or something that requires fine, intricate fitting.

At the place where you buy the wood you are going to use, be sure to ask for **kiln dried** lumber. Or at least try not to accept any other than thoroughly seasoned material. Otherwise you will have to allow time for the wood to dry thoroughly. And even when you do that, the discouraging result may be warping, curling edges, checking or splitting in your finished piece of work.

Where to Get Woods

The most satisfactory and dependable place to get your wood materials is your local lumber dealer. You can look over his stock and select exactly the size, color, quality, and grain you desire. Furthermore, you will find the lumber dealer's advice and hints on how to work various woods to be very helpful.

When you desire more specialized woods, good places to go are planing mills, hardwood companies, flooring specialists, or a good woodworker or furniture maker.

For some work, such as model making, pattern making, and unique finishing effects, the rarer woods may be desired. These hard-to-find materials are furnished by several specialized companies for just such special projects as you may be considering. These companies also furnish made-up kits of common and rare woods cut to convenient sizes for small work. To obtain the address of one of these suppliers located nearest you, write to the Popular Mechanics Magazine, The Home Craftsman, or any other of the home craft publications.

Good values in odd pieces of lumber for general use may be found at used lumber or house-wrecking companies.

The Commonly Used Woods—Their Advantages, Weaknesses and Uses

SOFT WOODS

Basswood. Wood light, soft, stiff but not strong, of fine texture, and white to light brown in color. The wood shrinks considerably in drying, and stands well. Suitable to both turning and carving. Used in the manufacture of furniture and woodenware, for toys, also for paneling of car and carriage bodies. Very workable.

Cedar. Light, soft, stiff, not strong, of fine texture. Sap and heartwood distinct—sapwood lighter; heartwood a dull, grayish brown, or red. The wood seasons rapidly, shrinks and checks but little, and is very durable. Used largely in moth-proof chests and closets, also for shingles, toys, patterns, furniture and many woodworking purposes. Easily worked, easily finished.

Cypress. An attractive wood of rich, reddish brown color. Soft, easy to work with, resists warping well, but tends towards fine checking. Its beauty is adaptable for many pieces of furniture. Also used for posts, ties and many timbers exposed to weather.

Fir. A specific wood whose name is often confused to imply the entire list of coniferous woods. It is easily distinguished from spruce, pine, larch, etc., by its absence of resin ducts. Similar to spruce in appearance. Wood is stiff, strong, of even texture. Color, orange brown. Seasons rapidly without injury. Used for much general heavy construction as well as toys and the like, also resonance wood and paper pulpwood.

Gum. Wood is heavy, medium hard, strong, tough, of fine texture, frequently cross-grained, of yellowish or grayish color, troublesome in seasoning, warps and checks considerably, is not durable if exposed. Quite easily worked and useful for many small articles. Much interior finish is of gum wood.

Hemlock. Light to medium weight, soft, stiff but brittle, commonly crossgrained, rough and splintery. Color a light, reddish gray, free from resin ducts. Moderately durable, shrinks and warps considerably, wears rough, saws and nails well. Used principally for members and timbers in construction.

White Pine. Very variable, very light and soft. Usually it is stiff, quite strong, of even texture, and more or less resinous. Sapwood is yellowish white; heartwood, orange brown. Pine shrinks moderately, seasons rapidly. Mostly quite durable, and if well seasoned, resists the attacks of boring insects. It is easily worked in any way whatsoever. White pine is used more extensively than any other kind of wood. You can make anything out of it (though it is too costly for many uses).

Poplar. Wood is light, very soft, not strong, of fine texture and whitish, grayish to yellowish color, usually with a satiny luster. The wood shrinks moderately but checks little, is extremely easy to work, but is not durable. Used some in building and furniture, much in barrels, crates and boxes, considerably for woodenware and paper pulp.

Redwood. Wood is light, soft, stiff, fairly strong, of fine texture. The narrow sapwood is whitish; the heartwood light red, soon turning to brownish red when exposed. Seasons rapidly, checks but little, and is very durable. Used much for large construction and heavy lumber.

Spruce. Light, very soft, stiff, moderately strong, less resinous than pine; has no distinct heartwood, and is of whitish color. Quite easy to work and splits well. Used in many ways the same as white pine but is preferred for paper pulp and musical instrument sounding boards.

HARD WOODS

Applewood. Wood is somewhat heavy and quite hard but usually resilient. Heartwood is reddish, sapwood yellowish to reddish. Applewood is used almost entirely for saw handles because it takes a fine finish and an excellent high polish. One of the most beautiful of all woods when worked and finished by experienced craftsmen.

Ash. Wood is heavy, hard, strong, stiff, quite tough, not durable in contact with soil, straight grained, rough on the split surface and coarse in texture. The wood shrinks moderately, seasons with little injury, stands well and takes a good polish. Gets brittle with age. Is easier to work than oak. Use especially for furniture, also much for finishing lumber, stairways, panels, shipbuilding, and in the manufacture of cars, wagons, machinery.

Beech. Wood heavy, hard, stiff, strong, of rather coarse texture, white to light brown, not durable in the ground, and subject to the inroads of boring insects. Shrinks and checks considerably in drying, works and stands well, and takes a good polish. Used much for furniture, in turnery, for handles and lasts.

Birch. A heavy, tough wood, light in color. Hard and close grained. Very durable, will stand much wear and tear. Excellent for lathe turning. It is frequently applied with various stains to imitate mahogany or black walnut to very good effect. Excellently adaptable to furniture.

Cherry. Wood is heavy, hard, strong, of fine texture. Sapwood yellowish white, heartwood reddish to brown. Shrinks considerable in drying, stands well, takes a fine polish, and is much esteemed for its beauty. Takes all kinds of working well but must be worked carefully. Used chiefly for decorative finishing lumber, furniture, boats, and in turnery. Cherry is rapidly becoming one of the most costly woods.

Chestnut. Wood is light, moderately soft, stiff, not strong, of coarse texture. The sapwood is light, the heartwood darker brown. It shrinks and checks considerably in drying, works quite easily, and is very durable. Used in cabinet work, cooperage, for railway ties, telegraph poles, and locally in heavy construction.

Hickory. Wood is very heavy, hard, and strong. Proverbially tough, of rather coarse texture, smooth, and of straight grain. The broad sapwood is white, the heart reddish nut brown. It dries slowly, shrinks and checks considerably; is not durable in the ground or if exposed, and is always subject to the inroads of boring insects. Hickory excels as carriage and wagon stock, but is also used extensively in implements, machinery, and tool handles.

Locust. Wood very heavy, hard, strong, and tough. Of coarse texture, very durable in contact with the soil, shrinks considerably and suffers in seasoning. Very narrow sapwood is yellowish, the heartwood brown, with shades of red and green. Used especially for ties, posts, etc.

Mahogany Wood light to dark reddish brown. Fine grained and with many cross grains, and, usually, small figures. The best varieties come from Mexico, Central America, and Africa. Wood tends to hardness, and in some cases is difficult to work. Can be worked into many beautiful surface effects. Mahogany has innumerable commercial imitations.

Maple. Wood is heavy, hard, strong, stiff, and tough. Of fine texture, frequently wavy grained, this giving use to "curly" and "blister" figures. Not durable in the ground or otherwise exposed. Maple is creamy white with shades of light brown in the heart. Shrinks moderately, seasons and works very well, wears smoothly and takes a fine polish. Especially used in furniture, ceiling, flooring, and paneling. Excellent for wood carving, turnery, and scroll work.

Oak. Very variable, but usually very heavy and hard, strong, rather tough, of coarse texture, very durable. Sapwood whitish, heart yellow to orange brown. Shrinks and checks badly, gives trouble in seasoning, but stands well, is durable, and little subject to attacks of insects. Used for innumerable purposes. Especially adapted to common carpentry, cooperage, turnery, and wood carving.

Osage Orange. Wood very heavy, exceedingly hard, strong, not tough, of moderately coarse texture, and very durable. Sapwood is yellow, heart brown, soon turning grayish brown if exposed. It shrinks considerably in drying, but once dry it stands unusually well. Employed at present for posts, railway ties, etc. A splendid wood, far too little appreciated. Is excellent for turned ware and wood carving.

Yellow Pine. Very variable, quite light, and soft. Grain smooth but strongly marked. Usually stiff, of even texture, and quite strong. Definitely yellowish to tan color, and quite resinous. Shrinks moderately, seasons rapidly and well. Works easily and is mostly quite durable. Used largely in the average house and practically every woodworking industry.

Walnut. Wood heavy, hard, strong, of coarse texture. The narrow sapwood whitish, the heartwood chocolate brown. The wood shrinks moderately in drying, works and stands well, takes a good polish, is quite handsome, and has been for a long time the favorite cabinet wood in this country. Has become very costly. Employed largely as a veneer, for inside finish, cabinet work, and turnery. Also used in high quality saw handles.

How Woods Compare In Weight, Shrinkage, and Strengths

From U. S. Dept. of Agriculture Technical Bulletin No. 158

Common Name	Specific gravity, oven-dry based on volume when green	Weight per cubic foot		Shrinkage from green to oven-dry conditions based on dimensions when green			Composite Strength Values				
		Green	At 12 percent moisture content	Radial	Tangential	Volumetric (composite value)	Bending strength	Compressive strength (endwise)	Stiffness	Hardness	Shock resistance
		Pounds	Pounds	Percent	Percent	Comparative fig.	Comparative fig.	Comparative fig.	Comparative fig.	Comparative fig.	Comparative fig.
Hardwoods:											
Apple	.61	55	47	5.6	10.1	170	85	75	139	119	146
Ash, blue	.53	46	40	3.9	6.5	113	109	107	139	119	147
Ash, green	.53	49	40	4.6	7.1	122	107	106	157	107	116
Ash, white	.54	48	41	4.6	7.5	126	110	106	161	108	139
Basswood	.32	41	26	6.6	9.3	158	61	62	126	31	54
Beech	.56	54	45	5.1	11.0	162	102	94	169	96	135
Birch, yellow	.55	57	43	7.2	9.2	166	106	98	174	86	171
Elm, American	.46	54	36	4.2	9.5	145	85	74	130	66	123
Gum, red	.44	50	34	5.2	9.9	150	86	77	134	60	99
Hickory	.65	63	51	7.3	11.4	182	138	123	188	.....	292
Locust, honey	.60	61	44	4.2	6.6	107	112	111	153	155	144
Maple	.57	56	44	4.9	9.5	147	114	106	178	115	138
Oak, red	.56	64	44	4.2	9.0	143	101	92	168	103	139
Oak, white	.59	63	47	5.3	9.3	155	99	93	149	109	125
Poplar, yellow	.38	38	28	4.0	7.1	119	71	68	135	40	58
Walnut	.51	58	39	5.2	7.1	116	111	113	167	88	124
Willow	.34	50	25	2.5	7.8	126	45	41	70	35	91
Softwoods:											
Cedar, red	.44	37	33	3.1	4.7	78	67	887	80	81	114
Cedar, white	.29	28	22	2.1	4.7	69	50	52	78	30	47
Cypress, Southern	.42	50	32	3.8	6.2	104	79	92	136	52	76
Douglas fir	.41	37	31	4.1	7.6	112	80	90	159	58	72
Fir, white	.35	41	26	3.8	7.9	110	72	76	141	41	66
Hemlock	.38	50	28	3.0	6.8	98	72	79	121	51	67
Pine, white	.36	35	27	4.1	7.4	118	69	75	137	35	65
Pine, yellow	.38	45	28	3.9	6.3	97	65	69	112	41	58
Redwood	.41	55	30	2.7	4.2	65	90	104	134	59	70
Spruce	.37	34	28	4.3	7.7	121	71	74	135	42	71
Tamarack	.49	47	37	3.7	7.4	128	84	96	147	53	85

Interesting Points On Sawing Lumber

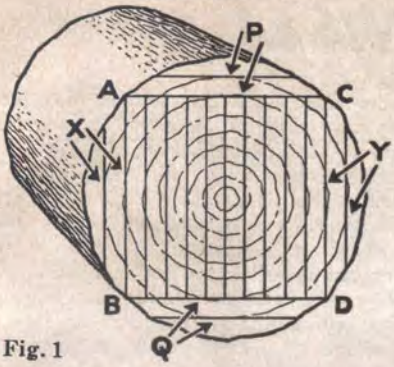


Fig. 1

This is called plain or bastard sawing. In some cases called **flat** or **sash.** First the log is squared by sawing off sides PQ and XY, leaving the square or rectangular section ABCD. This is to get flat resting surfaces for sawing. The edging saw, commonly used to true the edges, need not be used with this bedding. The boards or slabs PQ and XY, since they are nearly all sapwood, are of inferior quality. They are worth saving, however, in the case of larger logs.

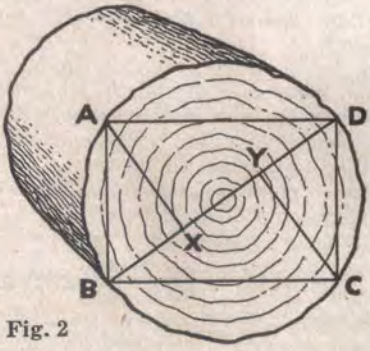


Fig. 2

Showing the way a log is squared when only one heavy beam is wanted. Method is to divide the longest diameter DB into three parts by the points X and Y. Then perdiculars are erected on DB at X and Y. The points A and C, thus obtained, are joined, giving the rectangle ABCD.

Characteristic distortion of flats, squares and rounds as affected by the direction of the annual rings. Tangential shrinkage is about twice as much as radial.

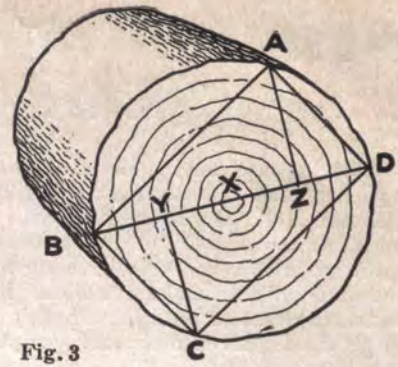
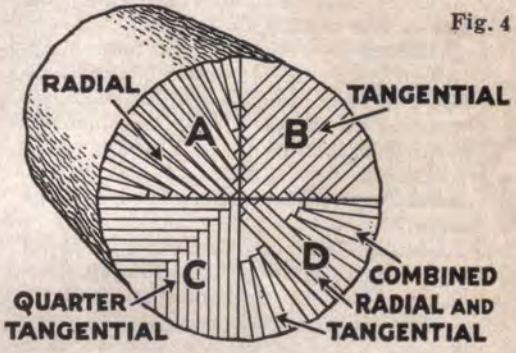


Fig. 3

Showing how a particularly stiff timber is obtained. Method is to divide the longest diameter DB into four parts by the points XYZ. Then perpendiculars are erected on DB at Y and Z. The points A and C, thus obtained, are joined, giving the rectangle ABCD.

Fig. 4



These are the various common methods of quarter sawing. Quarter, or sometimes called rift sawing, and flat sawing (described in Figure 1) account for the terms **edge grain** and **flat grain** respectively (terms frequently used by lumbermen and carpenters).

Suggestions on the Selection and Care of Wood

When you are buying wood, always keep in mind the strength, location, prominence, and character that will be needed. In some cases you can do just as good a job with a very cheap, low grade of wood as with an expensive wood. But it is usually best in all craftsmanship to keep to the higher grades wherever possible. For, considering the many hours usually invested in a fine piece of woodwork, it is foolish to gamble with the curling, warping, marring, or poor workability that may come in inferior material.

Grades of Lumber

In the case of standard lumber, the grades are usually as follows:

Number 1—Practically perfect in appearance. Small blemishes may be allowed in large dimensions. Restricted to one inch of sapwood, a small sound, or a small discoloration per board.

Number 2—Restricted to one or two sound knots, an inch of sapwood, and one other blemish.

Common Boards—May have three or four sound knots per board, but two-thirds of one side must be clear stock.

Culls—The lowest grade of salable lumber. One-half of one side of each board must be usable.

Woods Recommended For Various Uses

In many cases where light stiff wood is wanted, the soft woods excel, for instance, in framing. Also where heavy, steady stress is to be supported, yellow pine, spruce, and the like will do the work as well as hardwoods, which are more expensive for the same amount of stiffness.

Wood that is to bear moving loads or shocks, especially small pieces, should always be hardwood. The heavier woods are always stronger than light woods of the same class.

Explanatory examples: For inside finish and trim, white pine, white wood, fir, cypress, chestnut, North Carolina pine and long leaf yellow pine are good. For outside work that will have to stand weather, cypress, cedar, fir, spruce, as well as the harder white pine, and long leaf yellow pine are used. The two, spruce and long leaf yellow pine, have disadvantages. Spruce will check badly after short exposure, and yellow pine does not take a good paint finish.

Cypress is a good standard wood for trim, siding and similar construction. It is ahead of many woods in durability, and, in comparable grades, it costs much less than other wood adaptable to outside finish.

Lesser Grades Satisfactory

Knots, coarse grain, and other defects may or may not reduce the strength of the lumber. If they are not located at important places in the piece, their effect is unnoticeable. For instance: a grade of lumber with sound, standard knots is not objectionable in work where strain or pressure is negligible, such as siding, trim, casing, cabinets, closets, shelves, etc.

A good, lesser grade of lumber with sound knots can be made to look as well, last as long, and will cost considerably less than if clear lumber is used. A good method is to coat all knots with shellac and then paint the whole piece with three or four coats of good paint.

When You Order Lumber

Always ask for random widths. The lumber dealer stacks his stock that way. If you specify certain widths and lengths, he may have to do much sorting or even special sawing to give you what you ask for, and naturally he has to charge you for this trouble.

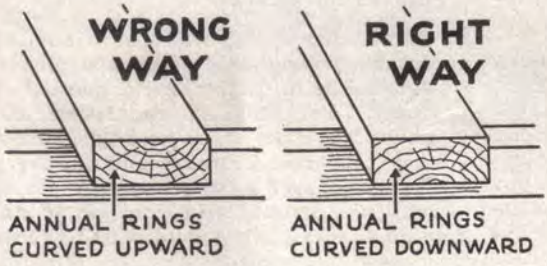
Wide boards cost more than narrow boards. One board 1″ x 10″ x 10′ will cost more than two boards 1″ x 5″ x 10′.

Standard lumber always comes in length multiples of 2 ft. They run from 10 ft. long to 24 ft. long. Longer or shorter lengths are special and cost extra. Widths are always multiples of 1 in. All boards 1 in. or less in thickness cost the same as a 1 in. board.

A Few Things That Will Help Keep Wood in Good Condition

1. Damage from handling, assembling and weathering are the enemies that cut down the permanency of outside wood construction. In the parts of a construction job that are to be exposed to weather and, of course, eventually painted, it is well to give all pieces that have been cut to length a coat of paint even before they are nailed together. This is excellent to seal even tightly facing surfaces. Of course, it is done only rarely because of excessive handling cost. But on small jobs you can well afford to do it yourself.

2. Lumber that is to be stacked outdoors can be protected against the ever-present end checking by painting the ends with a good sealer.



3. Exposed planks and boards should be nailed down with a view to their best weather-resisting surfaces. Note illustration.

This is important in giving a much smaller opportunity for water to creep in along the annual rings and start decay.

4. Of course, all lumber that is to be stored anywhere should be stacked evenly and carefully. Spacers to allow drying should be placed close enough together to prevent any possible sagging and consequent warping. See illustrations below.

5. All the finer and more costly woods, as used in most craftsmanship, are deserving of storage in a closed cabinet or closet located away from heat or possible moisture. With this protection your materials can be stored for a long time without deterioration.

Fig. 4A. Showing a "kink" in the lower boards caused by careless placing of spacers. This happens all too frequently.

Fig. 4B. Showing spacers placed too far apart with consequent sagging and eventual bad warping if the boards stand for any length of time.

HOW YOU CAN SAVE TIME, SAVE LABOR, SAVE MONEY FOR YOURSELF BY OWNING A GOOD SAW

The More Work You Do, the More It Will Pay You to Have Several Saws — Each Designed For the Particular Job

If you want to cut something or fix something in the basement or around the house only occasionally—

In cutting firewood to length, making a crate, cutting a shelf, making a rack, fixing broken furniture, or any one of 1001 little "odd jobs" around the house, everyone needs a good all-around saw. If you have one hanging up handy, you can do these jobs easily, quickly and independently (of your neighbors). The cost is little. See page 17. (Section on minor repair).

If you want to keep your trees in good condition and save a nice sum every season—

Practically every home has a number of fruit trees, shade trees and shrubs surrounding it. Many have orchards and groves. For the best appearance and production these trees need good care. They should be pruned regularly, every season. If you have many trees or if you grow considerable fruit, it is advisable to call in an experienced pruner or tree surgeon for this job. But the minor pruning you can do yourself at a worthwhile saving every season. All you need is a good, general pruning saw which costs very little.

THIS IS THE SAW YOU NEED

The Ohlen-Bishop No. B-23
26 inch, 8 point, crosscut tooth.
(See page 23 for details).

THIS IS THE SAW YOU NEED

Ohlen-Bishop No. 99-N Pruning Saw

If you want to do regular and more extensive repairing and make small articles at home—

Of course, any repair job that affects an important part of the construction of your home, or that requires intricate fitting, deserves to be done by an experienced carpenter. But such work as building new back steps, a partition in the cellar, or a lattice in the back yard may cost more than the job is worth to you. These and many other building jobs you can easily do yourself.

Also, you can make a great many articles such as shelves, cupboards, and cabinets that add greatly to the convenience of the home. (See page 17, "Small objects for the home").

If you live in the country, there will be many times when you want to cut up cordwood, fell trees, and cut logs for splitting.

When doing all these jobs, you can save time, material, and a lot of trouble by owning a few saws that are made for specific operations.

You need saws that cut from the hardest to the softest wood, in any direction of the grain. Among your tools should be—a saw that cuts circles and curves; a saw that cuts at accurate angles and depths; a saw that cuts small holes and

perforations; a set of saws for many small, close cuts; a saw that cuts green cordwood; and a saw that cuts timber and logs. Such saws will pay for themselves many times over by saving your time and the material you are working with.

THESE ARE THE SAWS YOU NEED

Ohlen-Bishop
Nest of Saws No. 16-6

Ohlen-Bishop No. B-23
26 inch, 8 pt., Crosscut

Ohlen-Bishop
Keyhole Saw No. 16

Ohlen-Bishop No. B-8-S
24 inch, 10 pt.

Ohlen-Bishop
Champion Wood Saw No. 642

Ohlen-Bishop
Back Saw No. 8, 14 inch

Ohlen-Bishop
Compass Saw No. 2, 12 inch

Ohlen-Bishop
Crosscut Saw No. 225-B (wide)

(See pages 23, 24, 50, 51, 52 for details)

If you want to enjoy the pleasure and recreation of a good Home Workshop—

Usually the purpose of a home workshop is to make articles of furniture for the home. This can be a constant delight. In making any other than the most simple pieces, specially designed saws are indispensable.

To make fine long cuts with the grain, to cut scroll work and grills, to cut grooves of all widths and depths, to cut off innumerable pieces, to cut in hard-to-get-at places—you need highly specialized saws.

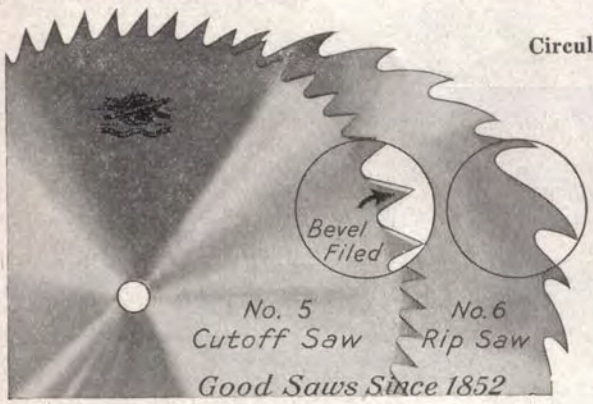
When you have this equipment, you can buy all your material in bulk, and in almost any odd widths or lengths your supplier happens to have in stock. This alone makes possible an appreciable saving every time you buy wood. And, added to this, is the great saving in time and trouble by being able to do, easily, every operation to complete the job.

Ohlen-Bishop
Band Saw

Ohlen-Bishop
Pattern-Maker's Saw No. 2
8 inch

Ohlen-Bishop
Circular Combination Saw No. 9
8 inch

THESE ARE THE SAWS YOU NEED



Ohlen-Bishop
No. 5 Cutoff and No. 6 Rip Saws

Ohlen-Bishop
Dado, 8 inch

Ohlen-Bishop
No. B-501-S, 6 pt. Rip

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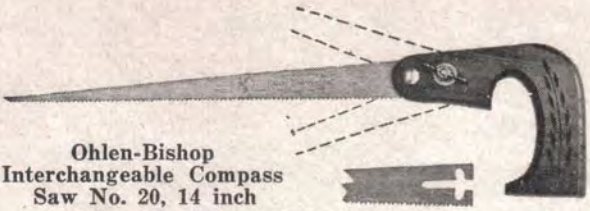
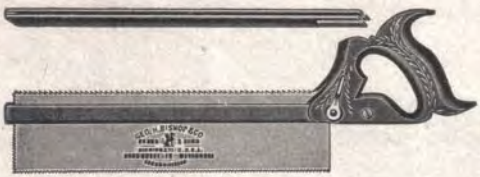


Ohlen-Bishop
Interchangeable Compass
Saw No. 20, 14 inch

Ohlen-Bishop
Scraper No. 8



Ohlen-Bishop
Back Saw No. 10
14 inch

Ohlen-Bishop
Scraper No. 13

Ohlen-Bishop
Mitre Box Saw No. 88
28 inch

Ohlen-Bishop
Scraper, No. 14

(See pages 23, 36, 50, 51, 52, 53 for details)

If you are a carpenter and want to do the best work possible—

If you are a carpenter, you know exactly the saw to use for each particular job. The correct steel, the exact handle, the precise toothing, the fine quality that stands up under long, hard service—all these you can judge accurately.

For your convenience we ask you to please turn to pages 23, 36 and 50. In these sections are presented saws whose superior quality and service have given carpenters and mill men complete satisfaction for 85 years.

When you are ordering a hand saw be sure to specify length, style (straight-back or skewback; narrow, lightweight pattern or regular wide pattern), whether rip or crosscut, and points per inch.

Average Number of Nails Per Pound

Size Penny	Length Inches	Common Wire	Finishing Wire
3	1¼	567	805
4	1½	318	583
5	1¾	270	500
6	2	181	308
7	2¼	162	236
8	2½	104	187
9	2¾	97	171
10	3	68	120
12	3¼	63	112
16	3½	48	
20	4	31	62
30	4½	24	
40	5	17	
50	5½	14	
60	6	10	

It is a Pleasure to Work with Good Saws

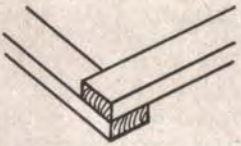
On the following pages are presented the plans and descriptions of a number of things to build. These are only a few to give **examples** of the many and varied articles you can make in a good home workshop. There is no intention of presenting even a cross section of the thousands of items for which there are existing plans, blue prints, etc. But, **by studying the plans presented on the following pages you can learn a great deal about methods, materials, and tools required.** However, **you can obtain plans** for practically any item you might like to make. **Simply write to one, or several, of the Craft Magazines listed on page 48.**

What Joint For This Job?

These are the common wood joints that are used every day by the finest wood craftsmen. They are presented in groups according to their customary adaptability. Of course, the uses of many of these joints overlap or are interchangeable. Usually you will want to employ the joint that is the most suitable to your material and which gives adequate strength.

Basic Joints—for Boxes and Simple Construction

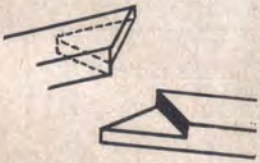
Butt Joint. Simply nailed together or reinforced with other pieces.



Plain Lap Joint. Commonly used for splicing, angling, or corner lapping.

Half Lap Splice. For joining the ends of two straight or curved pieces to lengthen a member.

End Half Lap. For window, door screen and many other frames and light panel construction.

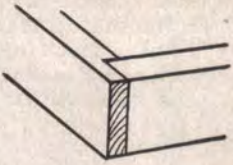


Mitred Half Lap. For same uses as end half lap but gives greater bracing.

Cross Half Lap. A good strengthener where two square pieces cross each other.

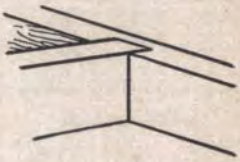
Middle Half Lap. The ideal T-joint as for dividing cross members to a main frame.

Joints for Cabinets, Drawers and Fine Assembly



Rabbet Joint. A grooved joint cut with the grain. End grain is concealed from the front.

Dado Joint. A grooved joint cut across the grain.

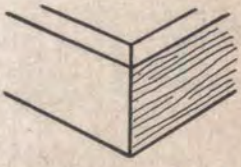


Stopped Dado Joint. Used to conceal the groove from the front.

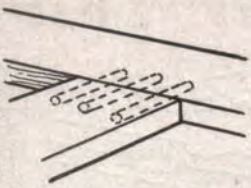
Dovetailed Dado Joint—Gives much greater strength than simple dado. Requires very careful cutting.

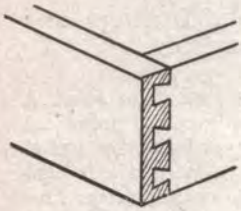
End Dado Joint. Combines the dado and rabbet joint. Can be varied by making a tongue-and-rabbet dado.

Mitre Joint. Usually cut at 45° but may be varied to any angle.



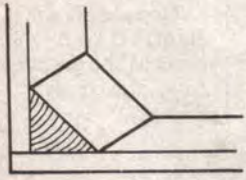
Dowel Joint. Used in all fine cabinet work. Serves as a butt edge or mitre joint anchored by two or more dowel pins. Entire joint is glued.





Half Blind Dovetail. The usual method for drawer fronts. More difficult to make. Dovetails show only at side.

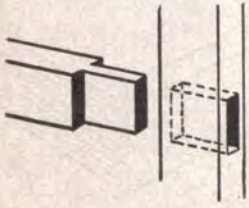
Blind Dovetail. Used only in the finest drawer construction. Requires very careful laying out and cutting. Only the mitre cut shows.



Glued Joint. For joining panels, table tops, etc., this joint occurs frequently in cabinet work. Glued blocks or dowels are often added.

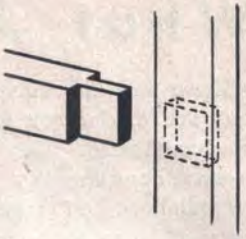
Multiple End Dovetail. Ideal in drawer construction where two or more dovetails are desired.

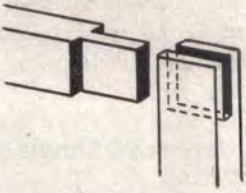
Joints for Framing, Flooring, Doors, Etc.



Plain Mortise and Tenon. Tenon extends completely through the mortised piece.

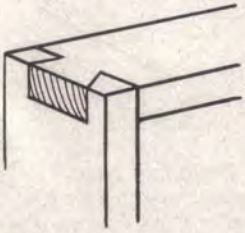
Blind Mortise and Tenon. Same as the plain except that the tenon is concealed.

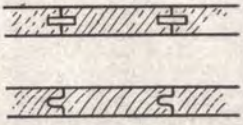




Open Mortise and Tenon. Sometimes called a slip joint. A very good simple type.

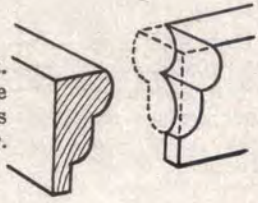
Single Through Dovetail. For narrow pieces. More secure than mitre or rabbet.





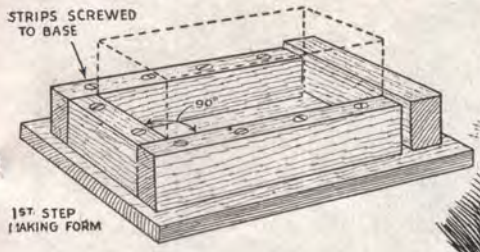
Matched Joints. Sometimes called tongue-and-groove or splined. Excellent to get smoothness over big, flat surfaces.

Coped Joint. For joining the corners of various types of moulding.



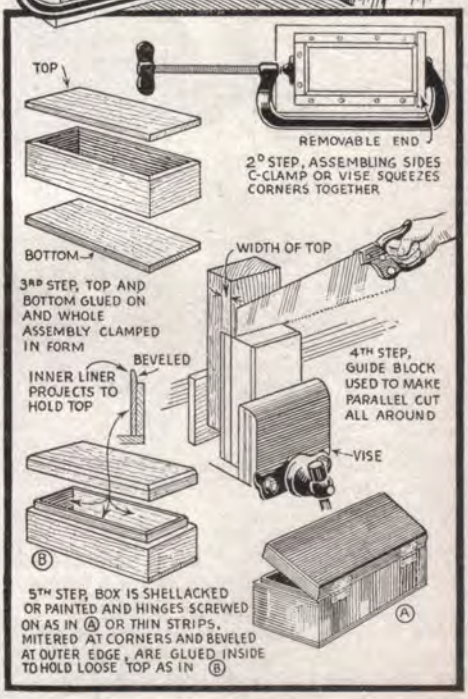
Study these joints carefully and refer to them when you are studying the "How to Make" descriptions on the following pages. Also refer to pages 11, 12, and 13 for the saws to use in making them.

Repairs and Small Objects You Can Make for the Home



Form Simplifies Making Small Glued Boxes

Small wood boxes with glued mitred corners can be made quickly and accurately by using a form in which the assembly is clamped. The form consists of three wood strips screwed to a base, the inside dimensions of the form being the same as the outside size of the box. The sides of the box are cut to correct length, casein glue is applied to the mitred ends, and the pieces are then set up in the form. A separate block is placed against the end of the box and the pressure of a C-clamp or vise will then keep the glued edges firmly together. If the form has been impregnated previously with melted paraffin, glue will not adhere to it and the assembly of sides can be removed without trouble. Next, the top and bottom of the box are laid on the glue-coated edges of the sides, and the box is again placed in the form, this time with a block on the top, the C-clamp straddling top and bottom to squeeze these pieces against the sides. After the glue has dried, make a guide block for sawing the box in two, both block and box being held in a vise. The guide block enables you to make a neat cut which will be parallel to the top. Then wood liners, also mitred at the corners, are placed inside the box to hold the cover, or the cover may be hinged.

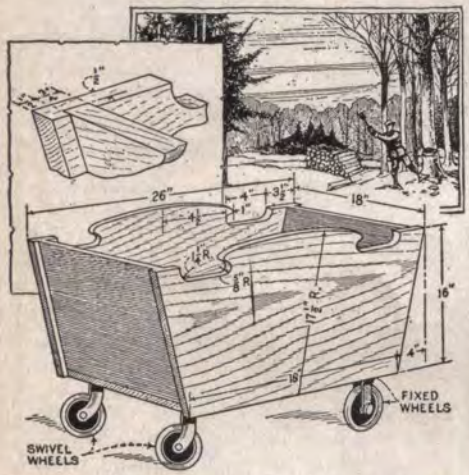


Thin Block Tacked to Edge of Door Will Prevent Rattling

Before hanging the doors in a building at the Century of Progress, the rear edge of each one was planed down to leave a small shoulder at the top as indicated.

The shoulders bind against the door casings and prevent rattling. Similar results can be had in the home. If you do not wish to plane the doors, nail a thin wedge of wood to the hinged edge of the door.

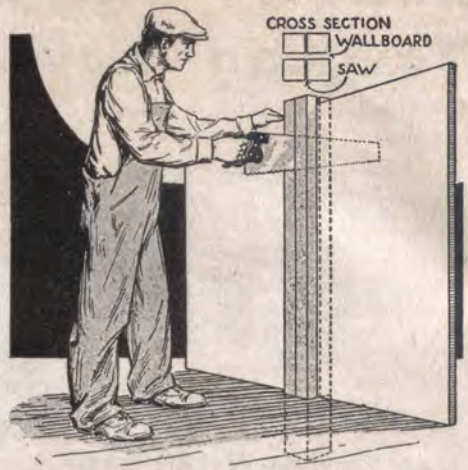
A Neat Rubber-Tired Woodbox For the Fireplace



Fitted with Wheels and Finished to Suit, This Woodbox Looks Well Near Any Fireplace

The woodbox shown here eliminates much of the labor of tending to a wood fire in the grate. Rubber-tired wheels enable it to be moved with little effort, and its good lines render it rather attractive. To make it, use 1-in. stock, preferably surfaced pine or fir, sanded on one side. After the top of the sides have been laid out with the use of a paper pattern, they can be cut with a fretsaw. Nail together with six-penny finishing nails, spaced 3 in. apart, and mount the box on two fixed rubber tired wheels and two swiveled ones.

A Saw Guide for Cutting Wallboard



A Convenient Saw Guide That Will Save You Time in Cutting Through Wallboard

For cutting wallboard quickly, the illustrated guide will be found helpful. It consists of two 5-ft. lengths of 2 by 6-in. stock, nailed together at one end with a 10-in. piece of ½-in. stock between to serve as a spacer so that the wallboard can be slipped between. A saw slit is made through the center, and the guide is erected as indicated.

Grooves Cut In Outside Stair Treads Prevent Warping

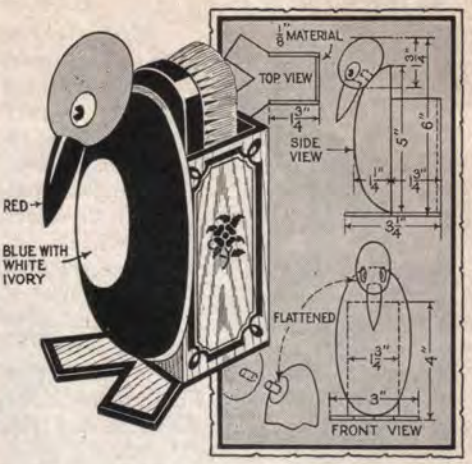
Stair treads exposed to the weather usually warp lengthwise and the ends cup upward. This loosens the nails and causes the tread to be more or less unstable, if not actually unsafe. To avoid this trouble, cut two or three narrow grooves lengthwise on the underside of each tread, the depth of the grooves being about one-third the thickness of the stock. This is best done on a circular saw, but may be done with a backsaw, using a guide strip clamped to the tread. The sides and edges of the treads should be painted before nailing in place.

Kitchen Woodbox Filled Outdoors

This Built-In Woodbox for the Farm Kitchen Can Be Filled from the Outside.

It will be found convenient to build a wood box for the farm kitchen that can be filled from the outside, as shown in the drawing. An opening through the wall allows access to the box from the inside, and it will be found best to provide a hinged door for the opening to keep out the cold.

Penguin Brush Holder



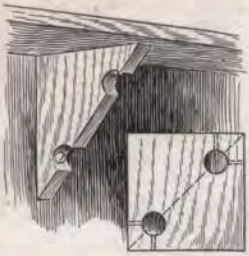
This downcast penguin with his sad eyes earns dresser space by holding a small clothes brush in the case of his back. Painted in a bright blue, shaded to an ivory, he is an amusing little fellow. Both the beak and feet are bright red. For the base and box, use ⅛-in. material. The head and body can be turned on a lathe, the latter sawed in half, or whittled out. Paint as suggested and shellac the holder.

A Cabinet for Your Neckties

Replacing the familiar rack, this cabinet for your neckties will protect them from dust and also provide a place for cuff and collar buttons, tie pins, etc. A mirror, set at the right height, will also be found useful and the door may be inlaid to make it more attractive. One rack is fastened to the back of the door while the other rack is pivoted to a bracket screwed to the side near the top, so that it can be swung outward. All necessary dimensions are given in the drawing. The sides can be made of ¾-in. poplar, the back from a piece of composition board, and the door is cut from three-ply veneer. The cabinet is mounted on the wall on wood screws at a suitable height.

Swinging Rack, Button Drawer and Mirror Make This Cabinet Handy.

Easily Made Shelf Brackets



Where beauty is not a factor, shelf brackets can be quickly made from a square piece of wood, the size and thickness of which, of course, depend on the size of brackets desired. First, two 1-in. holes are drilled through the stock near the corners on a diagonal. Then screw holes are bored as shown. Finally, the block is sawed through the diagonal and the brackets are ready to mount.

Shelves on Cabinet Door Provide More Space for Glassware

If you need a little extra room in the kitchen cabinet, shelves that are fitted onto the doors will hold many glass tumblers. As the shelf sizes will vary with each job, a little ingenuity on the part of the craftsman will be required to work out something suitable. In some cases it is advisable to use metal brackets to support the shelves, while in others the method indicated will be satisfactory.

Step Aids in Reaching Upper Shelves of High Cupboard

Permanently attached between the lower drawers by means of two iron brackets, a step will be useful in reaching the upper shelves of a tall cupboard. A 6-in. step does not project far enough to interfere with passage, nor will it prevent opening of the drawers.

Novel Photo Wall Bracket

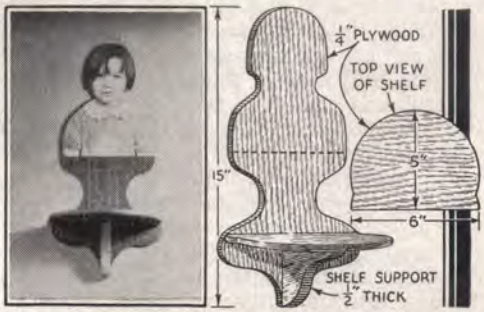


Photo Mounted on a Wall Bracket to Support Ornaments Gives it a Personal Touch

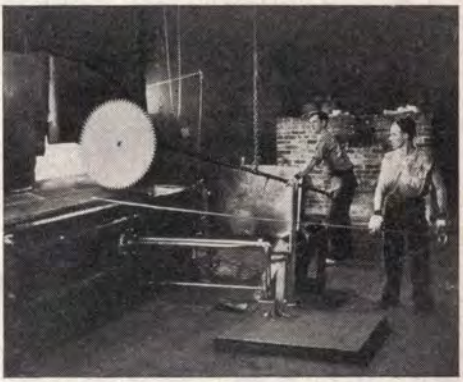
Here is an unusual method of displaying a large photograph on a wall bracket which will serve to support a clock, pot of flowers or some ornament in the home. Dimensions given can be varied to suit the photo, which is glued to the surface of the wood as shown.

To Do Good Work EASILY You Need Really Good Saws

Ohlen-Bishop Saws Have Been Serving Critical Craftsmen for 85 Years

Nothing slows up the job more surely or makes work harder than an inefficient saw. A saw may **look** right — it may be, apparently, the right size, weight, style, design, tooth, and gauge for the job in hand—and still fail to deliver in a satisfactory manner.

Shrewd craftsmen, both professional and amateur, know that Ohlen-Bishop saws look right and **are right!** They have been choosing Ohlen-Bishop Saws for the past 85 years. We list here some of the reasons why they have found their choice so satisfactory.



1. Special Analysis Steels.

The stresses and internal adjustments set up within the steel of which a hand saw is made are quite different from those within a power saw. For these reasons, the choice of the steel used in **any particular saw** becomes a highly technical problem. It is easy to see that the same steel will not do for all types of saws.

Laboratory technicians analyze, by the latest scientific methods, the steel requirements for every Ohlen-Bishop type of saw. They set up the exact specifications for the analysis that will do the job best. They check each batch to make sure of the exact qualities and the perfect uniformity that Ohlen-Bishop standards demand.

There is no such thing as a single super-steel that will serve all saw purposes. In each type of saw Ohlen-Bishop uses steel of the special analysis that will fit the particular job that saw is intended to do.

2. Only the Most Modern Manufacturing Equipment and Methods Used.

There is no substitute for experience. The 85 years of Ohlen-Bishop satisfactory service to saw users proves that. And, throughout the Ohlen-Bishop manufacturing organization, veteran saw craftsmen perform every operation that controls the long life and efficiency of every saw.

Along with this is the spirit, the machinery, and the men who keep up-to-the-minute pace with modern tools, their increased uses and greater demands of accuracy.

3. Rigid Inspection at Many Stages Throughout Manufacture.

Ohlen-Bishop saws are tested with the utmost precision for temper, grinding, smithing, gauge, taper, tooth accuracy, and finish at the various stages throughout the process of manufacture. No flaw, no inequality, however small, can pass through. No mere approximation is tolerated.

4. Final Inspection and Customer Service.

Every Ohlen-Bishop Saw, before it is finally packed for shipment, is gone over carefully by thoroughly skilled inspectors. They can check at a glance the

minute details, not caught by the average user, which make for efficient saw performance. This is the final guarantee that the Ohlen-Bishop Saw you buy will give you the maximum service for your money.

* * *

If you have some saws which, although not seriously damaged, have gone out of service because they need major repairing and refitting — send them to the Ohlen-Bishop service department. They can be made practically as good as new for a very nominal charge.

* * *

The larger users, many shops, and especially manual training departments can find a real saving in costs and performance results by having all their saws repaired and refitted at least once a year.

OHLEN-BISHOP HAND SAWS POPULAR WITH CRAFTSMEN

No. B-501-S "Greyhound", Straight-back, Lightweight

Length Inches	Points to Inch Cross-Cut	Points to Rip Inch
24	7-8-9-10	
26	7-8-9-10	5½-6

The ideal saw for the most critical craftsmen. Blade of the finest Ohlen-Bishop special analysis steel, taper ground 4 full gauges, thin back, wave polished. Teeth bevel filed. Handle of Genuine Rosewood, artistically carved and polished. Protected with new weatherproof lacquer. Balance is perfect.

Also made in regular pattern, skew back. No. B-500.

No. B-12-S Straight-back, Lightweight

Length Inches	Points to Inch Cross-Cut	Points to Rip Inch
24	7-8-9-10	
26	7-8-9-10	5½-6

Blade is thin back, full taper ground, for fast and easy sawing. Teeth bevel filed. New style selected applewood handle, full carved and polished, comfortable grip, new weatherproof lacquer finish.

Also furnished in regular wide pattern. No. B-12.

No. B-23 Straight-back, Lightweight

Length Inches	Points to Inch Cross-Cut	Points to Rip Inch
24	7-8-9-10	
26	7-8-9-10	5½-6

A beautiful tool to own and use. Handle of selected walnut with perfected center grip, full carved and polished, new weatherproof lacquer. Blade is thin back and full taper ground. Filed to a diamond point. Also furnished in lightweight pattern, skew back. No. B-20.

No. B-8-S "Carpenter Saw", Skew Back, Lightweight

Length Inches	Points to Inch Cross-Cut	Points to Rip Inch
20	8-10-11	
22	8-10-11	7
24	7-8-9-10	6-7
26	6-7-8-9-10	5-5½-6

This is the most popular of all mechanics' saws. Balance is perfect, sawing speed is maximum. Blade is thin back, new narrow lightweight pattern, full taper ground. Teeth are scientifically bevel filed. Handle of selected applewood with new weatherproof lacquer finish and large comfortable grip.

Also furnished in regular wide pattern, skew back. No. B-8.

No. B-7-S Straightback, Lightweight

Length Inches	Points to Inch Cross-Cut	Points to Rip Inch
20	8-10-11	
22	8-10-11	7
24	7-8-9-10	6-7
26	7-8-9-10	5½-6

Handle of selected beechwood with comfortable grip, new weatherproof lacquer finish. Blade is thin back, taper ground 4 full gauges. Teeth are bevel filed. Also furnished in regular wide pattern. No. B-7.

No. C-23-S Straight-Back, Lightweight

Length Inches	Points to Inch Cross-Cut	Points to Rip Inch
20	9-10	
22	9-10	
24	7-8-9	
26	7-8-9-10	5½

Blade is taper ground, 4 full gauges. Thin back, will not buckle or bind. Teeth are bevel filed for fast and easy sawing. Handle is of choice hardwood with highly polished apple finish, full carved and completely weatherproofed. Perfected center grip.

Also furnished in regular width, skew back. No. B-128.

No. 1934-N "American Eagle", Skew Back, Lightweight

Length Inches	Points to Inch Cross-Cut	Points to Rip Inch
16	10	
20	9-10	
24	7-8-9	
26	7-8-9	5½

A very popular model for the home and other average use. Blade is taper ground for easy sawing, highly polished, bevel filed. Handle is of genuine hardwood, lacquer weatherproofed, fine apple finish.

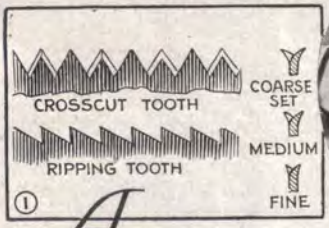
Also furnished with walnut handle. No. 1934-W.

Buy Where You See This Display

Saw Filing, In General

for Hand and Circular Saws

(For Complete and Specific Instructions on Circular Saw Refitting, See Page 39.)

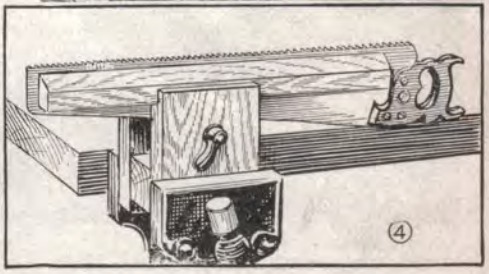


A workshop requisite

Sharp saws, kept in good shape, are as necessary to the workshop owner as a sharp knife is in the kitchen. The work is not difficult and nearly every small shop has the facilities needed for doing it. Hand saws, compass saws, back, mitre box, and other small saws, as well as circular blades and dado heads are easily jointed, set, and filed by hand.

Approach Refitting According to Condition of the Saw

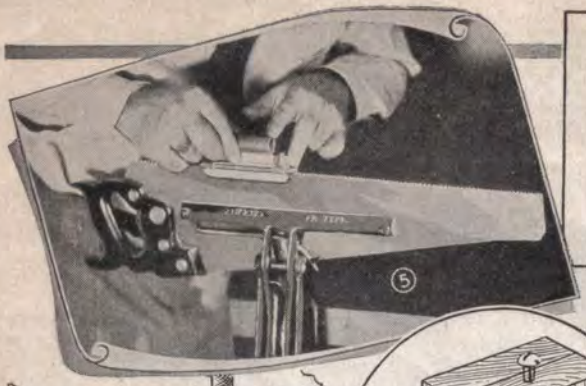
In filing the various types of blades the procedure must be governed to a certain extent by the condition of the tool. If the saw is being filed for the first time, and has not been damaged in any way, it is likely that a mere touching up of the points is sufficient. Setting the teeth should be done only when necessary. In filing a new saw for the first time, every effort should be made to preserve the original shape of the tooth as this is the best guide in filing. The size of the file must suit the teeth, particularly on the crosscut saw, as the number of points to the inch varies with the size of the teeth. A single-cut three-cornered file is most commonly used in filing hand saws and the smaller diameter circular blades.

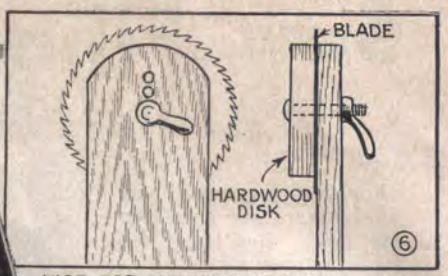


HAND SAWS

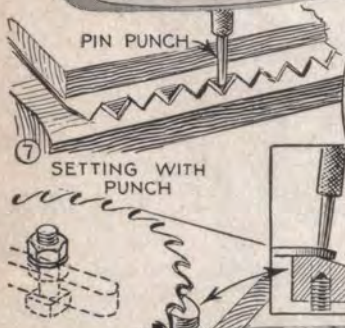
The First Step—Jointing

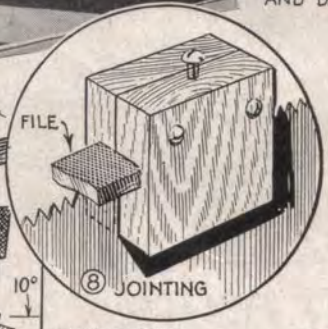
Refitting is practically always started off with a light jointing before setting. Especially so if the teeth of the hand saw have been damaged by running accidentally onto a nail or other metal object, most particularly if the teeth have been damaged only on one side of the blade, as frequently happens. This can be done by making a simple holder from part of an old file as shown in Fig. 8, although a small jointer, as shown in Fig. 5, can be obtained at almost any hardware store. **The object in jointing is to bring all the teeth to**





VISE FOR HOLDING CIRCULAR SAW AND DADO HEAD WHEN FILING





the same length before filing. Damaged teeth should be given only a light jointing; then they should be set and afterward finished to length by a second very light jointing. This avoids taking off too much at first which would necessitate undue filing to shape the teeth properly. **As a rule, a saw in good condition should be only lightly jointed, then set and filed,** but if the set is nearly all out of the teeth it is better to set the teeth first, then lightly joint and file them. In every case the procedure must be determined by the condition of the blade.

Shaping the Teeth an Important Operation

After jointing, it is necessary to properly shape the teeth. To do this, a three-cornered file of the proper size should be held at right angles to the blade and moved straight across in long, smooth, and not too heavy strokes. Bear in mind at all times that the gullets should all be of the same depth.

Degree of Set Depends Largely on the Work to be Done

If the saw is to be used exclusively on softwood the set should be sufficient to form a slight space or valley between the alternate teeth. In hardwood, and for average use, the set should be medium. If the saw is to be used exclusively in hardwood, the set should be very light. Fig. 1 shows the approximate degree of set to meet various conditions. The same is true of both crosscut and ripping blades.

Advisable Equipment to Use in Setting

Hand saw blades may be set by using a pin punch, as in Fig. 7, but a saw setting tool, as shown in Fig. 9, is better as it is possible to adjust the tool so that only about one-fourth the length of the tooth is bent. In setting with a punch, care must be taken that the blade is not cracked at the gullets. The hammer blow must be uniform and it is better to go over each set of teeth twice with the saw clamped between two hardwood strips.

Close-Ups of Hand Crosscut and Hand Rip Saw Teeth That Are Properly Filed

Fig. A—Side view of hand crosscut saw showing correct angle and amount of bevel, appearance of points, also smoothness and evenness of gullets.

Fig. B—Bottom view of hand crosscut saw showing alternate setting of teeth. Note amount of set and evenness on each side. It is the amount of tilt of these alternate points which can be varied to suit the wood that is to be sawed. (More for all softwood, less for all hardwood. The above shows the approximate amount for all average use).

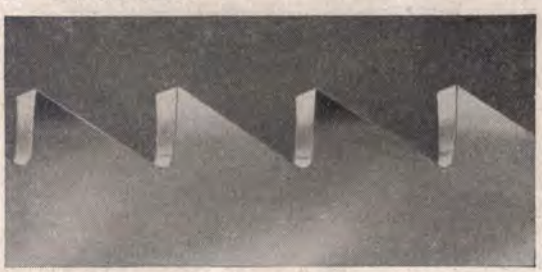


Fig. C—Side view of Rip Saw showing correct smoothness of faces, points, and gullets.

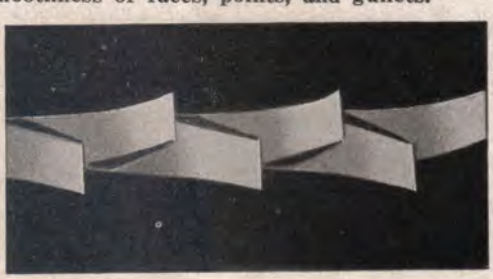


Fig. D.—Bottom view of Rip Saw showing correct amount and evenness of set.

Pointers on Hand Saw Filing

In filing a hand saw it is usually best practice to disregard each individual tooth and adopt a uniform stroke of the file. Though this means that we shall find it necessary to go from one end of the blade to the other several times, the method will produce a job that is nearly perfect, provided, of course, it is done with care and attention to uniformity and number of strokes on each tooth and the angle of the file with the blade. By this method the filing must be continued until the teeth have been brought to a sharp point, removing all traces of the flattened point caused by jointing. If care is used in keeping the file strokes equal, the alternate teeth are reasonably sure to be of the same length. Fig. 12 shows the common angles of the file when sharpening both ripping and crosscut saws. The angle of the bevel on each tooth is determined by the position of the file with relation to the blade, both vertically and horizontally. In this, one should be guided by the original bevel on the tooth, if filing a saw for the first time.

(Note: All the instructions and suggestions described above for hand saws can be applied directly to all small saws such as compass, keyhole, back, mitre box, and the other more specialized saws. Remember, in every case, that the best guide is to follow as nearly as possible the shape and appearance of the teeth as they come from the factory.)

(Note: All crosscutting saws, both hand and circular, are **bevel filed.** All rip saws are filed straight across and **not** beveled.)

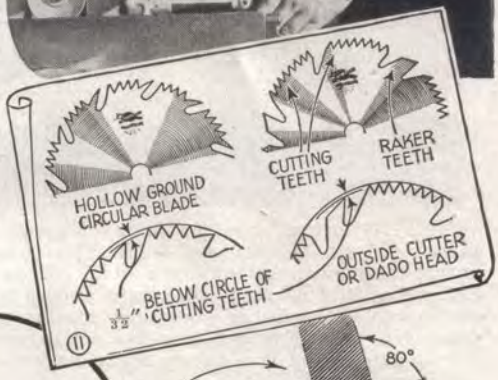
CIRCULAR SAWS

Jointing Circular Saws

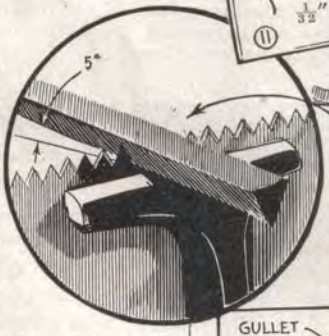
The circular saw blade is best jointed on the arbor as in Fig. 10. The blade is reversed so that it runs backward, the table is raised so that its surface is above the cutting circle, and in this position an oilstone is laid lengthwise on the slot directly over the blade. The machine is started in the regular way and the table is lowered very slowly until the teeth of the saw strike the stone. Care must be taken not to take off more than is necessary. Stop frequently and examine the blade. When every tooth has been touched by the stone, the jointing is complete.

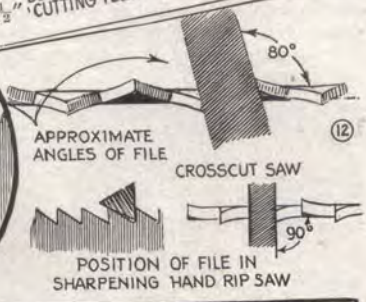
Suggestions on Setting

Circular saw blades, 10 in. or more in diameter, are generally set on a stake made as shown in Fig. 7. Teeth of blades under this size can be set more accurately with the ordinary hand saw set. When starting, see that the tool is properly adjusted by making a trial setting on two or three teeth, then set each alternate tooth, after which the blade is reversed and the rest of the teeth finished.



In filing, follow the same procedure as that described for hand saws.





Special attention to Jointer Blades and Dado Cutters

Fig. 11 shows a hollow-ground, smooth-cutting or jointer blade and the outside cutter of a dado head. Both blades are hollow ground and the teeth should never be set. It will be noticed that the teeth of the dado cutter are in sections consisting of eight cutting teeth with a cleaner or raker tooth between and separated by deep gullets. On the jointer blade the raker tooth precedes the four cutting teeth in the same section. On both types of blades the cleaner tooth is filed straight across and the best practice requires that its edge be approximately 1/32 below the cutting circle of the crosscut teeth. The inside cut-

ters of the dado head are filed the same as the cleaner tooth on the outside cutters. The cutting teeth on the outside cutter of the dado head are generally in sections of eight teeth each. These must be filed the same way, that is, alternate sections of eight teeth are filed from opposite sides of the blade, as the teeth of any one section are beveled the same and from only one side.

Final Touching Up on Both Hand and Circular Saws

After filing, the teeth of both hand and circular saws should be lightly dressed with an oil stone as in Fig. 14, to true up any chance inequality in the

Fig. 14. Light Dressing with Oil Stone

set, and to make the blade cut more smoothly. The gullets of large diameter circular ripping blades should be rounded occasionally with a small round file. See Fig. 13. This is known as "gumming" and is not of any particular importance on blades smaller than 10 in. in diameter. In filing, care should be taken not to run the three-cornered file deeply into the gullet.

Figs. 4 and 6 show vises that may be made from pieces of hardwood to hold both the circular and straight blades for filing. In the case of both hand saw and circular blade vises, the edge of the vise should contact against the entire surface of the saw blade just below the teeth. These home made vises will serve as well as the ready-made one in Fig. 3.

CORD WOOD SCALE

The commonly accepted dimensions and contents of a cord of wood (usually firewood) when cut for selling purposes are as follows:

16 cu. ft.=1 cord ft.
8 cord feet or 128 cu. feet=1 cord.
A cord of wood is generally piled:

8 ft. long
4 ft. high
4 ft. wide

OHLEN-BISHOP Gold Medal Lumber Scale

Size in Inches	LENGTHS							
	10	12	14	16	18	20	22	24
	Contents in Board Feet Per Each Piece							
1x2	1⅔	2	2⅓	2⅔	3	3⅓	3⅔	4
1x3	2½	3	3½	4	4½	5	5½	6
1x4	3⅓	4	4⅔	5⅓	6	6⅔	7⅓	8
1x5	4⅙	5	5⅚	6⅔	7½	8⅓	9⅙	10
1x6	5	6	7	8	9	10	11	12
1x7	5⅚	7	8⅙	9⅓	10½	11⅔	12⅚	14
1x8	6⅔	8	9⅓	10⅔	12	13⅓	14⅔	16
1x10	8⅓	10	11⅔	13⅓	15	16⅔	18⅓	20
1x12	10	12	14	16	18	20	22	24
1x14	11⅔	14	16⅓	18⅔	21	23⅓	25⅔	28
1x16	13⅓	16	18⅔	21⅓	24	26⅔	29⅓	32
1x18	15	18	21	24	27	30	33	36
1x20	16⅔	20	23⅓	26⅔	30	33⅓	36⅔	40
1¼x4	4⅙	5	5⅚	6⅔	7½	8⅓	9⅙	10
1¼x6	6¼	7½	8¾	10	11¼	12½	13¾	15
1¼x8	8⅓	10	11⅔	13⅓	15	16⅔	18⅓	20
1¼x10	10 5/12	12½	14 7/12	16⅔	18¾	20⅚	22 11/12	25
1¼x12	12½	15	17½	20	22½	25	27½	30
1½x4	5	6	7	8	9	10	11	12
1½x6	7½	9	10½	12	13½	15	16½	18
1½x8	10	12	14	16	18	20	22	24
1½x10	12½	15	17½	20	22½	25	27½	30
1½x12	15	18	21	24	27	30	33	36
2x4	6⅔	8	9⅓	10⅔	12	13⅓	14⅔	16
2x6	10	12	14	16	18	20	22	24
2x8	13⅓	16	18⅔	21⅓	24	26⅔	29⅓	32
2x10	16⅔	20	23⅓	26⅔	30	33⅓	36⅔	40
2x12	20	24	28	32	36	40	44	48
2x14	23⅓	28	32⅔	37⅓	42	46⅔	51⅓	56
2x16	26⅔	32	37⅓	42⅔	48	53⅓	58⅔	64
2½x12	25	30	35	40	45	50	55	60
2½x14	29⅙	35	40 5/6	46⅔	52½	58⅓	64⅙	70

Helpful Hints on Hand Saws

Canvas Sheath Protects Handsaw

Handsaws can be protected against rusting by keeping them in a canvas sheath, made from one piece cut a little longer than the blade and wide enough to be doubled over and sewed at the edge as shown.

Quick Remedy for Saw That "Runs"

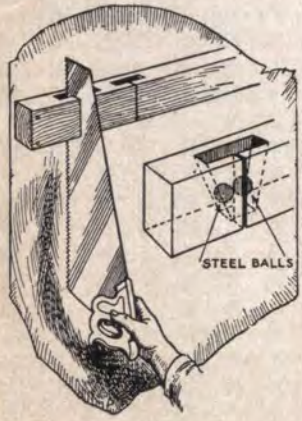
When a few teeth of a saw are set out a little more on one side than on the other, causing the saw to "run" slightly, place it on the bench with the defective side up and give one light rub the entire length of the blade with an oilstone, which will usually prove to be an effective cure. Of course, a saw in bad condition cannot be made to function correctly by this treatment.

Pulling Newly Filed Saw over Edge of a Scrap Board to Remove Burrs from Teeth

Old Saw Blade Provides Lumber Grip On Sawhorse

An old saw blade, screwed to the side of a sawhorse so that the teeth project a little above the top edge of the crossmember, makes a good grip for holding boards. Thumbscrews on bolts that fit slots cut in the blade hold the saw on the horse and permit quick removal.

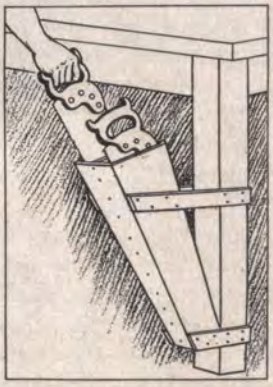
Hanger Holds Saw Securely



Handsaws can be conveniently held by a hanger made from a length of 2 by 4-in. stock. Mortises with two sides beveled are cut to accommodate two steel balls, and a saw cut is made through the center of the mortise to receive the saw.

The saw is pushed up in the slot between the balls. A slight downward jerk causes the balls to pinch the blade, holding it in position.

A Scabbard for Your Saws



This scabbard, made of ¾-in. stock and fastened to a bench leg or other convenient place, holds your saws out of the way and safe against damage. The sides should be slightly larger than the saw blades while the width of the top and bottom depends on the number of saws to be accommodated. Cleats can be used to hold the scabbard to the bench leg.

Hand Saws--Yesterday and Today!

For centuries a hand saw was only an elongated, flat piece of metal with a series of small notches cut in one edge so it could be used to drag across, and eventually cut off, wood. It had a piece of wood with a hole fastened to the end so it could be drawn back and forth by hand.

Even in recent years the developments and improvements in the hand saw were commonplace. The steel was made tougher and longer wearing. Blades were made narrower and thinner, and given high finishes. Teeth were made smaller and varied in style. Handles were reshaped to fit the grip. So-called departures were attempted such as making handles out of many varieties of wood as well as other materials. These refinements were all, of course, in a beneficial direction and all rendered the hand saw a nicer tool to own and use.

Sawing Remained Laborious

But to the hand and arm of the man who must supply the power that drives the hand saw, these various improvements brought no great advantage over even the earliest saws. The fact remained that every time a hand saw tooth struck the wood it transmitted a "tooth blow" to the muscle and bone of the arm.

Then Came a Discovery

Every one knows that a hand saw can keep right on sawing until it gets too dull or out of set to cut. But when the arm begins to tire from the vibration, sawing becomes inefficient and soon it comes to a complete stop.

Ohlen-Bishop recognized this, and decided that something could and should be done about it. Extensive studies were made, and many devices tried, tested, and compared. Then came the discovery **—cushions of live rubber!** The blade was securely mounted in the handle but with the drive actually floating on five of these cushions. Then the blade and handle were redesigned by a complete departure from the traditional.

The result is the Ohlen-Bishop Zephyr "44"—**a new era hand saw that gets more work done and is far easier to use.**—scientific tests **prove it.**

THE OHLEN-BISHOP ZEPHYR "44"

Streamlined . . . Shock-Proof

A blade of matchless Ohlen-Bishop special analysis saw steel. Perfectly ground and polished to a flashing lustre. The "44" is straight back, lightweight, taper ground 4 full gauges. Teeth are bevel filed. Handle is rich, thoroughly seasoned walnut. Furnished in 24" and 26" lengths, crosscut, 7, 8, 9, 10, and 11 points; rip, 5½ points.

Buy Where You See This Display

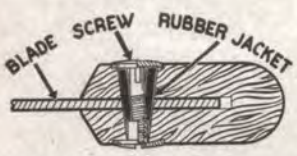
The New Ohlen-Bishop Zephyr

The First Great Improvement in Hand Saws

STREAMLINED Every line of the Zephyr has been scientifically designed for the greatest speed and efficiency in cutting and for greatest ease to the user.
The result is a saw very light in weight. The handle has smooth flowing lines. Neat and trim—and thoroughly practical. Even the trademark is modern and suggests the speed of the Zephyr. It's a saw you will be proud to carry with you—and enjoy using.

The result is the ZEPHYR "44"—a Shock Absorbing Hand Saw that can be used far longer and more continuously without exhaustion. The blade is securely mounted in five cushions of live rubber. These cushions not only make the saw shock-proof, but also prevent loosening of the handle screws.

The Zephyr Shock-Proof Feature



Sectional view of the Zephyr handle showing Ohlen-Bishop rubber jacketed screws that absorb shock.
NOTE: The blade does not come in contact with the metal screws at any point. The Zephyr Shock-Proof feature is fully covered by patents applied for.

SHOCK-PROOF Ohlen-Bishop recognized that constantly recurring "tooth blows" to the hand, wrist, and arm of the user cause fatigue and slow down the work. It was decided that something could and should be done about it. Extensive studies were made and many devices tried and compared. After countless tests, it was conclusively proved that a definitely greater feeling of ease and resiliency was experienced by the user when the "tooth blows" were cushioned by live rubber.

THE STEEL Longer, more dependable wear, less filing and setting is assured in the ZEPHYR. It is made of Ohlen-Bishop High Grade Special Analysis Steel—developed and perfected through 85 years of making fine saws.

THE TEMPER Toughness and Spring is the life of a Hand Saw. In the ZEPHYR the Ohlen-Bishop quality tempering process to the correct degree of hardness provides an edge and set-holding ability that cannot be excelled.

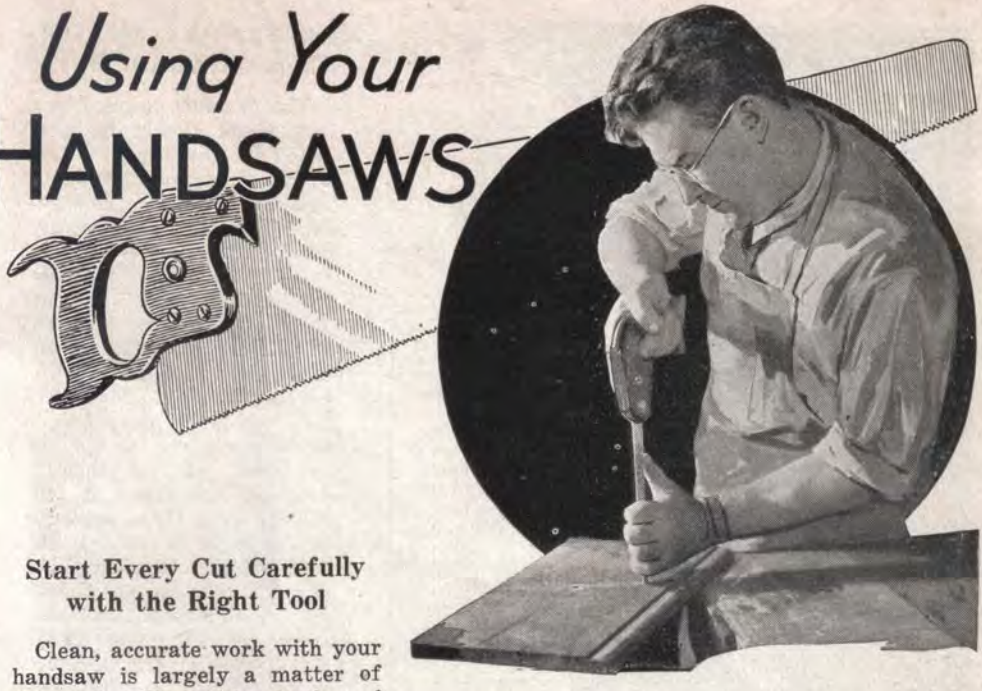
THE GRINDING The ZEPHYR will never bind in the cut, it is accurately taper ground, 4 full gauges from the tooth edge to the back, the saw will run free and make a straight, smooth cut. It will please the carpenter who wants to do careful work.

TEETH and SET The skill of Ohlen-Bishop veteran saw craftsmen assures that every ZEPHYR has teeth accurately uniform in size and perfectly even in set. The saw comes to you ready to use. Gives long service before needing any attention.

THE HANDLE—BALANCE
The ZEPHYR stream-lined handle is made of thoroughly seasoned walnut, highly polished. Its grip fits the hand the most naturally and comfortably of any saw. The stream lining of the handle in conjunction with the blade has made possible a balance that feels right through every cut. The full force of the stroke carries direct to the tooth edge.

GUARANTEE Every ZEPHYR carries the words "Fully Guaranteed" over the Ohlen-Bishop signature. That means complete satisfaction or replacement—a guarantee that protects you and insures greater value for your money.

Using Your HANDSAWS

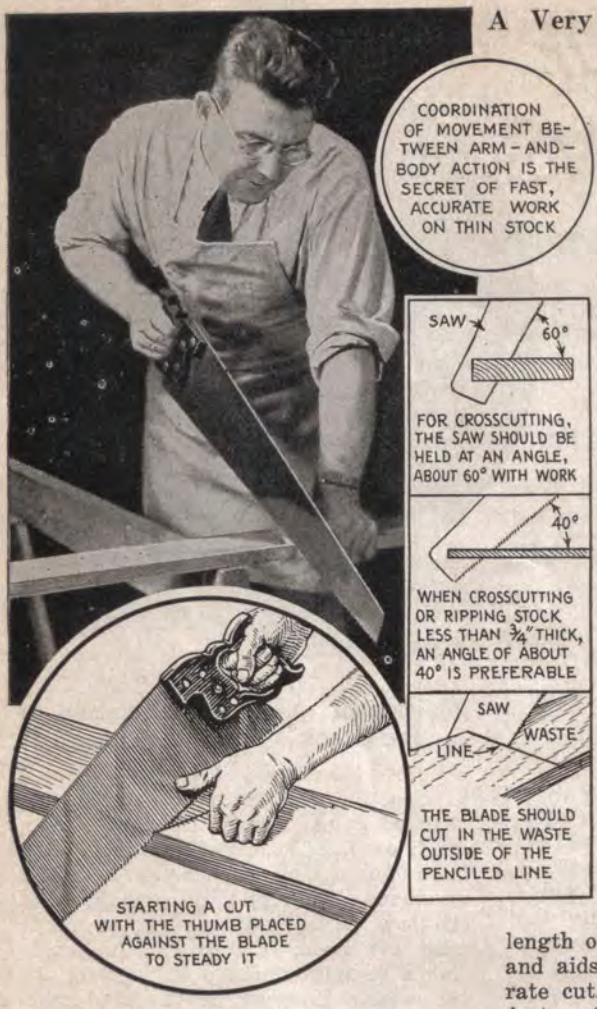


Start Every Cut Carefully with the Right Tool

Clean, accurate work with your handsaw is largely a matter of proper handling and selection of the tool best adapted to the work at hand. For example, a saw with teeth filed for crosscutting should not be used for ripping cuts lengthwise of the grain. It is essential that the teeth be filed and set for the purpose for which the saw is intended. Also, the manner in which the saw is held and started into the work determines, to a certain extent, how much or how little you are able to accomplish with it. When using either a rip or a crosscut saw, the work of moving the blade through the wood is not done with arm action alone, but by an easy swing of both body and arm. This coordination of movement is the secret of fast, accurate work. Your eye should always be in line with the blade when starting the cut, for only in this way can the angle of the blade with the work be gauged accurately. Start the saw by steadying it with the thumb, which is rested against the side of the blade. Light, short strokes will start the teeth cutting. Properly starting the blade will avoid the necessity of twisting it to hold the gauge line. This is especially necessary if you are using a saw with a very light set.

Position of the Saw in Relation to the Stock You Are Cutting

Your work should always be laid out so that the saw teeth cut outside the penciled gauge lines with the teeth on one side just cutting the edge of the line. To produce smooth work with a minimum of effort, it is essential that the saw be held at the proper angle with the wood. Ordinarily, this angle should be approximately 60 degrees with the work. However, if you are crosscutting or ripping soft wood less than ¾ in. thick, the saw will cut much smoother when held at an angle of 40 degrees. The greater the number of teeth in contact with the wood, the less the necessary angle with the vertical assuming that the work is in a horizontal position. On any special sawing job, a few trial strokes will determine the angle at which the saw runs the best. Accurate line work with the handsaw cannot be done unless the work is supported at the proper height on a solid bench or table. Small, short pieces of stock are best handled in a bench hook, using a short backsaw. Sometimes it is handier to hold the work in a bench vise, especially when sawing down shoulder and cheek cuts of tenons.



A Very Light Pressure for the Most Accurate Work

The pressure applied to a saw blade should be governed by the type of saw, the kind of work, and the position in which the sawing is done. If you are cutting light stock in a bench hook, the weight of the backsaw is sufficient. As the saw moves forward, the direction of the movement, and the manner of holding the tool adds a certain amount of pressure aside from the weight of the saw. If the blade is properly sharpened it will require very little pressure of the hand to make it cut fast and smooth in any kind of wood. The strokes should always be straight and uniform. Rocking the blade and increasing the pressure just before reaching the end of the downward stroke will cause inaccurate work. The secret of making a true cut across the grain in hard or soft wood is using either a fine-tooth panel or backsaw, and holding the blade at an angle of about 30 degrees with the horizontal. In this position, a greater length of the blade is kept in the wood, and aids materially in making an accurate cut. The hand pressure should be just sufficient to keep the saw from chattering.

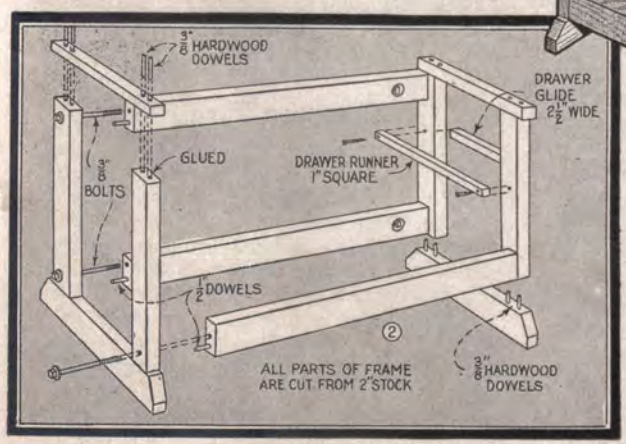
How to Prevent Decay in Wood

The simplest method of preventing wood from decaying is to keep it dry. Keeping wood dry entails protecting it from the quite generally recognized decay hazards created by the contact of wood with the ground, by leaks, and by actual contact of wood and water. It also entails protecting wood from such generally unrecognized decay hazards as are caused by relatively small amounts of water that get into the wood and cannot get out. Water is usually held in the wood by some type of covering or by lack of ventilation or drainage. Many of the unrecognized decay hazards are at joints that are exposed to the weather and at surfaces where the wood is in contact with other materials. Very frequently it is cheaper and easier to change the construction details so as to keep the moisture out than to follow poor design and rely on especially decay-resistant or treated wood.

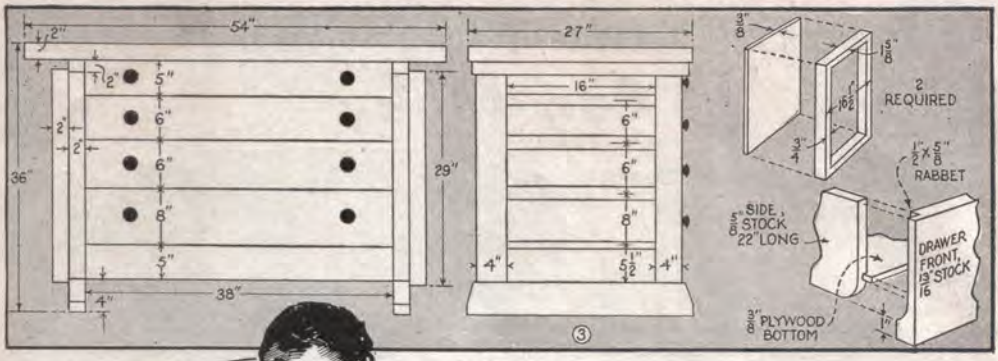
Essential and Fine Things You Can Make

An Easily Made Work Bench of Ideal Convenience

For the average craftsman, who wants a general utility bench that is solid and has plenty of drawer space for tools, a cabinet type of bench, made of maple, as illustrated in Figs. 1 to 3 incl., will fill the bill. The ends are first made up, and are joined to the rails with ⅜-in. machine bolts. The rails are fitted with dowel guides, no glue is used, and the nuts on the machine bolts are mortised into the rails. Holes for the nuts are centered at least 4 in. from the ends. The drawer runners are screwed to the end uprights. For guides, 2½-in. strips of ½-in. stock are nailed to the runners. Front and back rails are absent as the drawer fronts overlap the space ordinarily taken up by the rail. The corner construction of the drawers is shown in the detail of Fig. 3 and also in Fig. 5. The top is built up from several separate pieces doweled and glued together, and then planed and sanded smooth on both sides. The assembled top is simply set over short dowel pins, holes being drilled in the underside of the top. A tool compartment at each end to hold saws, hammers, squares, etc., consists of a frame of ¾-in. stock screwed to a piece of ⅜-in. plywood and hinged to the leg. If you wish to use a vise with jaws wider than 6 in., increase the length of the top to 60 in., which will allow a 9 in. overhang at each end, and provide ample room for attaching an ordinary vise of the rapid-acting or wood-screw type.



(Figure 3 on next page)



Template Helps in Building Uniform Picket Fence

When building a picket fence, a piece of wallboard with one edge cut to the curvature of the fence top between adjacent posts, makes a good template for getting a uniform sweep of the fence. The template is nailed to the edge of a suitable length of 2 by 4-in. stock and placed on the top rail of the fence. If the fence is to be made of only two different lengths of pickets, a guide line for the lower row can be marked on the template with a heavy pencil.

Glue Solution Cleans Woodwork

Enameled woodwork can be easily cleaned with a glue solution. Thoroughly mix 3 tablespoonfuls of powdered glue in 10 qt. of warm water. Rubbing the wood with this solution will remove dirt quickly.

Turning Kink for Soft Wood

When soft wood is turned in a lathe, the tailstock center has a tendency to enlarge the hole in the end of the stock, which causes it to chatter before the turning has been completed. A simple remedy for this trouble is to locate the center hole in the stock with a center punch and then drive a small hollow brass rivet into it. This provides a temporary bearing for the tailstock center, which can be cut away from the finished turning.

Closet Shelves Fitted with Doors

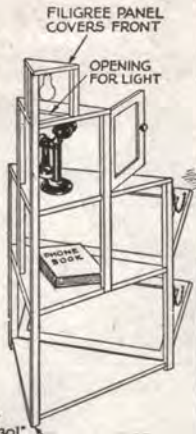
Doors hinged to closet shelves keep out dust and improve appearance. The doors are made of plywood or wallboard and are attached with small hinges. A wood strip fastened behind the door at the top provides a base for the hinge screws and keeps the door from swinging in too far when shutting it. Small latches are used to keep the doors closed.

Tablespoon Tack Puller

A handy tack puller, which is not only easy to handle, but will also collect the tacks as they are withdrawn, may be made from an old tablespoon. A small portion at the end of the spoon bowl is filed away and a narrow V-shaped notch is cut in it, after which the flattened end of the bowl is ground to a sharp edge so that it will slip under tack heads easily. After doing this, a receptacle to receive the pulled tacks is formed by wrapping several turns of tape around the spoon bowl, the space between the tape and the bottom of the bowl serving as the receptacle. This arrangement is particularly useful in removing tacks from walls or other vertical surfaces.

This Neat Telephone Stand Fits Any Corner

With the exception of a scrollsaw, no special tools are required to make this corner phone stand, the entire job being completed with a hammer, saw and plane. Plywood panels in open filigree are a feature, and the sections are offset, with a light in the top one, the phone in the next below, and the phone catalog and other items in larger compartments below. The panel concealing the phone swings to the left so that the instrument can be drawn out conveniently with the right hand. The plan, Fig. 6, is simply a right-angled triangle with a 26-in. base, the phone compartment being 18 in. across the front and the light compartment 8 in. wide. Fig. 2 shows a perspective of the framework construction from the rear. The three corner posts are of 1½ by 1½-in. stock. The selection of the wood is a matter of individual taste. Philippine mahogany, maple, birch, and even white pine, are suitable if the job is to be stained. If painted, any kind of easily worked wood, such as poplar, will be satisfactory. Install the tops and shelves, as indicated, allowing for the back panels so that the stand will fit close to the wall. There should be an opening beneath the light to illuminate the phone.



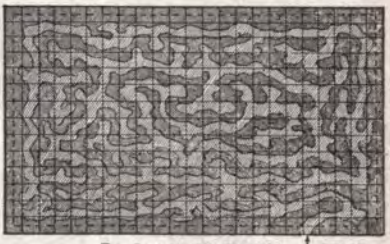


Fig. 3 LOWER PANELS

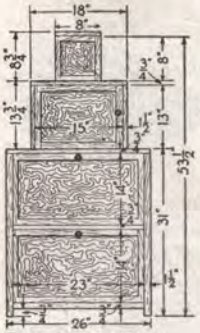


Fig. 1 FRONT VIEW

Fig. 2

METHOD OF BRACING PANEL
Fig. 5

Fig. 4 LIGHT PANEL

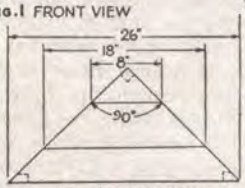


Fig. 6 TOP VIEW

Use ¼-in. plywood for the panels. Intricate as the pattern seems in the squared layouts, Fig. 3, it can be cut out entirely without stopping the saw. Note that the cut in each case begins at the edge and winds around toward the middle, where it starts back again and follows the original cut with a ½-in. space between them. The filigree is then braced with a strip across the back, as in Fig. 5, and installed in the frame, which is to be hinged to the stand. The two lower panels drop forward and are held horizontally by chains.

Making It Easier to Reach Low Shelves of Refrigerator

If your refrigerator is raised by mounting it on a small, strong cabinet, you can reach the lower shelves with less stooping than necessary when the refrigerator is set on the floor. Also, extra storage space will be provided in which to keep kitchen supplies. The cabinet has a frame of 2 by 4-in. hardwood, or heavier, depending on the weight of the refrigerator, and is fitted with two paneled doors.

Imitation WOOD INLAY *Turned from Scrap Stock*

Beautifully finished and highly attractive, these lamps, hat stands, and other turnings, cost practically nothing, as scrap stock can be used in making them. The trick lies in gluing alternate layers of dark and light-colored wood on a core and then turning down the resulting block to expose the different woods. All you need is the wood, some glue and varnish, plus a small lathe and a couple of chisels and clamps. First make a core 1 in. square and from 6 to 15 in. long, depending on the design and shape of the lamp base desired. Then drill a ⅝-in. hole through the center for the lamp cord. For the longer designs, it is better to split the core and groove out the insides of both pieces with a gouge or a dado head, then glue them together again. The core should be of dark wood, such as mahogany, walnut or cherry. When it is cut to size and planed smooth, add the first layer of wood, which should be light-colored. Prepare four pieces of this wood, 1¼ in. thick and of suitable dimensions to cover each side of the core. First glue pieces on opposite sides. Clamp the assembly and allow to dry. When thoroughly dry, true up the edges with a plane and glue pieces on the two other sides. Plenty of pressure should be applied in clamping, or an uneven contact is likely to result and there will be gaps or open joints between the different woods after the block has been turned. The second layer is applied in the same way, using a dark wood of the same thickness. Continue using alternate layers of light and dark wood until the desired thickness is obtained, as shown in the lower detail.

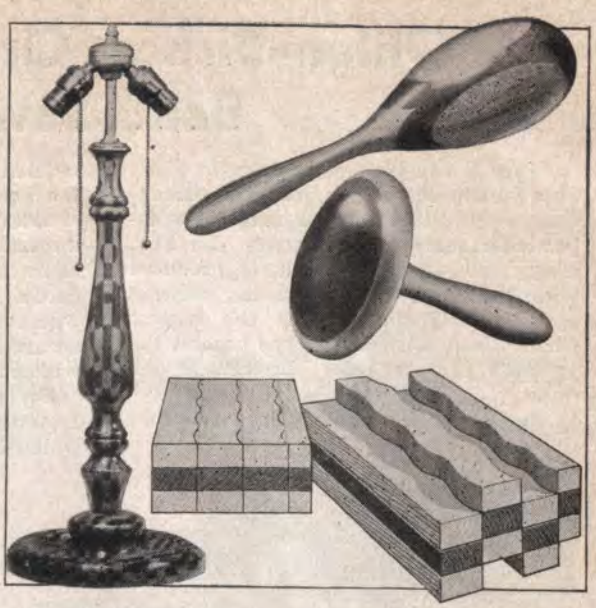
Forming of the Lamp Base

The base of the lamp can be made in "sandwich" form by gluing three or four layers of different wood on each other. The base is glued onto the bottom of the block so that both can be turned at the same time. A groove should also be cut in the base to receive the lamp cord. When the turning is finished, apply a wood filler. Then follow with three or four coats of varnish, sandpapering between successive coats. The final coat is rubbed with pumice or powdered rottenstone and rubbing oil. A coat of wax gives a very rich luster. The result is a handsome imitation inlay lamp that is difficult to dis-

tinguish from genuine inlay work. In addition to lamps, such articles as darning eggs, hat sets and smoking stands, in fact any article of wood that is turned, can be made by this method.

Another Method for Unique Effects

Another method of imitation wood inlay is shown in the accompanying illustration. Pieces of light and dark wood are selected and planed smooth and to the same thickness as a great deal of the finished effect depends upon this. The pieces of dark and light wood are glued together and placed between clamps to harden. After the pieces have dried, they are run through a bandsaw. Any series of wavy lines may be cut along their length and need not be regular in order to bring out the finished effect. After finishing all the sawing, the alternate vertical rows are moved up the thickness of one board and the pieces again glued. When dry, the protruding pieces are cut off, and the piece is ready for the lathe. It should be remembered that one row more than the thickness of the finished block of wood is required because the rows are moved up and then cut off. By carefully following the two methods described, beautiful effects in imitation wood inlay can be produced, and skill in turning depends on practice.



Rubber-Head Tacks Hold Round Stock for Sawing

Small round stock, such as dowel rod, is rather difficult to saw unless it is held in a vise, which takes considerable time if it is done frequently. To save time, rubber-head tacks may be driven into the bench top near one edge where they will not interfere with other work, and used to hold the stock. A thin strip of wood can be placed under the work, on one side of the tacks as an aid in keeping the work square with the saw.

Gummed Paper Tape Used As Depth Gauge On Hand Saw

To easily determine the depth of a number of cross cuts to be made with a hand saw, stick a short piece of gummed paper tape to the saw blade at the required depth of the cut and saw the stock until the top surface just touches the bottom edge of the tape.

Making Your Crosscut Saw Run Easily

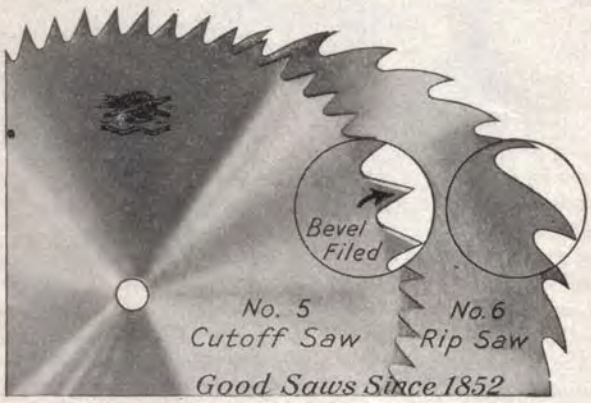
Have you ever gone out with a newly filed crosscut saw to cut down trees, and found that it pulled just as hard as it did before it was filed? If so, the difficulty was probably due to the kind of wood you were cutting. In most cases, a few drops of oil or gum solvent spread over the saw will remedy the trouble. If the timber being cut is of the coniferous species, such as pine, balsam, spruce or hemlock, a few drops of gasoline or naphtha on the saw will usually do the trick. This dissolves the gum and resin that accumulate on the saw blade. Frequent applications may be necessary to keep the saw running smoothly. However, if the timber is of a hardwood variety, such as oak, poplar, ash, elm, maple or the soft woods such as willow, basswood and aspen, a lubricant should be used instead of the solvent. In this case, use a few drops of good oil, such as sweet oil, gun oil or even light machine oil.

Ohlen-Bishop Circular and Band Saws

Every Ohlen-Bishop Circular or Band Saw purchased for your shop is guaranteed to give the longest and most dependable service your money can buy. Every saw, however small, is produced with the same manufacturing, testing, and finishing methods as the largest Ohlen-Bishop Saw of its type used in the greatest lumber mills throughout the country.

Accuracy and durability are the first requisites of every Ohlen-Bishop saw for the home workshop. You will find your circular saw to be the most valuable and important tool in your shop. With four basic saws you are enabled to do cross-cutting, ripping, edging, and grooving with the utmost precision. You can make accurate glue joints direct from the saw without sanding.

For good work done easier, better, and faster—consult your dealer about the Ohlen-Bishop Saws you need.



No. 5 Cutoff Chromsaw

Accurately toothed for cutting across the grain. Filed and set, ready for use.

No. 6 Rip Chromsaw

A much coarser tooth for cutting with the grain. Filed and set, ready for use.

No. 7 Combination Chromsaw

A practical saw for either cross-cutting, ripping, or mitreing. This saw has two outstanding advantages—it operates on less power and is easy to sharpen and set.

Chromsaw Dado Head

This groover is ideally toothed to cut grooves any direction of the grain. Outside cutters are 1/8" in thickness. Inside cutters are furnished in 1/16", ⅛", and ¼" thickness and any number may be added to obtain a groove of the desired width. Ohlen-Bishop Dados are all highly finished and sharpened, ready for use.

No. 9 Combination Chromsaw

A very popular saw for use when only one saw is desired for cross-cutting, rip-

ping, and mitreing. Has four cutting teeth and one raker to each group. Gullets are large and deep for easy clearance. Of course, if a great deal of either cross-cutting or ripping is to be done it is best to use special saws for the purpose. The combination saw can not be fed as fast as either of the others.

No. 10 Jointer Chromsaw

The ideal saw for ripping, crosscutting, or mitreing in every kind of wood. Special Ohlen-Bishop hollow grinding gives a much greater clearance than average and permits a fast hand feed without heating or binding in the kerf. Cuts remarkably clean, thus saving extensive finishing for glue joints and precise fitting.

Narrow Band Saws

All Ohlen-Bishop Bands are hardened and tempered carefully to give the maximum toughness. They will not break under any reasonable usage. The teeth are scientifically shaped and spaced for fast, accurate sawing. Carefully filed and set.

Ohlen-Bishop extra thin gauge band saws are ideal for wheels of small diameter to withstand sharp bends. Special bands are also furnished for cutting aluminum, asbestos, bakelite, fibre, sheet-metal, tubing, and soft metals.

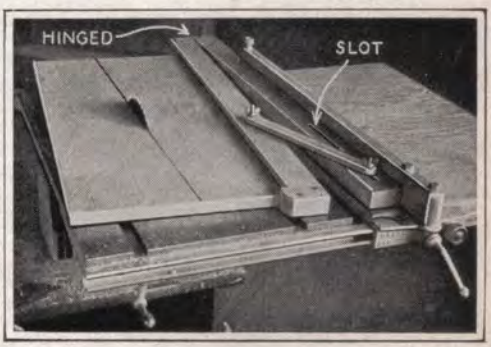
Specifications of Ohlen-Bishop Narrow Wood Cutting Band Saws

Width, Inches	Gauge	Points per Inch
1/8	22	7
1/8	25	7
3/16	22	7
3/16	25	7
1/4	22	6
1/4	25	7
3/8	22	6
3/8	25	7
1/2	22	6
1/2	25	7
5/8	21	4
3/4	20	4
3/4	21	5
1	20	4
1 1/4	20	3
1 1/2	20	3

Ideas to Increase the Uses of Your Circular Saws

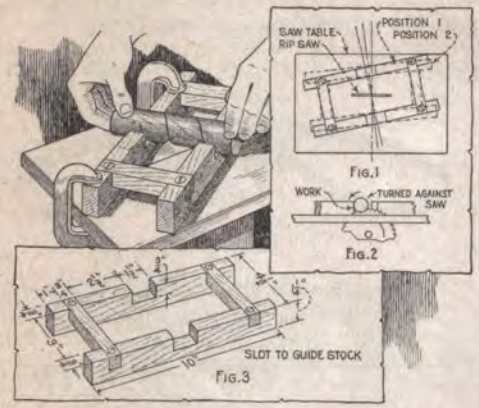
Circular-Saw Cuts Made at Angle with Aid of Jig

For making straight cuts that are not parallel to the edge of the work on a circular saw, this jig assures accuracy. It consists of two wood arms hinged together at one end, and fitted with a tie bar at the other end to lock the adjustment. In use, the jig is placed next to the ripping fence with the edge of the work resting against one arm, which carries a cleat across the end to fit over the edge of the work as shown.

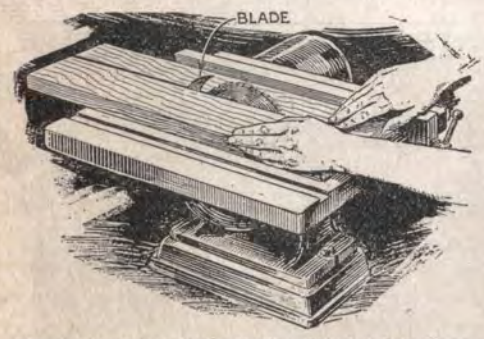


Cutting Spirals on a Power Saw

This jig for cutting spirals on a power saw eliminates the tedious work of cutting them with a handsaw. First, make a hardwood cradle to support and guide the work as shown in Fig. 3. The guide slots in the sides of the cradle are made

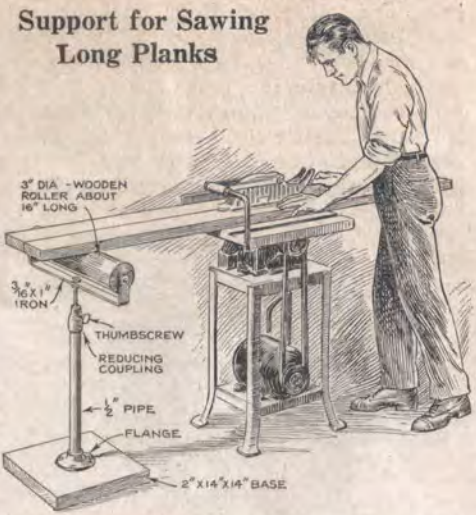


wide enough to allow the work to turn without pinching. Clamp the cradle upon a saw table at an angle, Fig. 1, placing the slots off the center of the saw as much as the diameter of the work, as in Fig. 2. This is important, as it causes the revolving saw to press the stock against the side of the slots, eliminating chatter and any tendency for the work to be kicked out of position. The pitch of the spiral is governed by the angle between the saw and cradle. Stand to the rear of the saw, steady the work with your left hand, and turn it slowly in the same direction the saw is running. If a double spiral is desired, start the end of the first spiral directly on top of the stock and the second one will then start on the opposite side.



Blade Attached to Table Behind Circular Saw Keeps the Work from Pinching It

Support for Sawing Long Planks



Handling Long Work on a Small Saw Is Made Easier by Using This Adjustable Roller Support

For supporting long planks while ripping them on a small circular saw, an adjustable roller will be of great help. It can be made from a length of ½-in. pipe screwed into a floor flange which is mounted on a wooden base. The top of the pipe is fitted with a reducing coupling which is drilled and tapped for a thumbscrew. A wooden roller, about 3 in. in diameter and 16 in. long, is pinned between the ends of a U-shaped bracket made of flat iron, to which a length of iron rod is attached as indicated. In use, the rod, which is slipped into the reducing coupling on the pipe, can be pulled out to the height of the saw table and held in this position by tightening the thumbscrew.

How To Tell When Lumber Is Dry

Regardless of how experienced he is, no man can tell simply by a visual inspection, by lifting it, or by the feel of the wood, whether it is adequately dried. How then can he tell when lumber is adequately seasoned? A rough check can be made rather simply. Select a half dozen flat or plain-sawed boards from the lumber pile and cut a sample from each. The sample should measure 1 inch along the grain and be cut so as to include the entire width of the board. It should be cut at least a foot from the

end of the board. Trim the sample so that it will measure exactly 6 inches in width and place it in a warm, dry place —under the cookstove, in the warming oven, or on a radiator—and leave it 48 hours or longer, then measure the 6-inch dimension to determine how much it has shrunk. If the wood is classed C in freedom from shrinkage, it should not shrink more than one-eighth of an inch. If it is to be used for interior trim or finish, nor over twice that amount (one-fourth of an inch) if it is to be used for framing, coverage, or where it is exposed to the weather. Woods classed as B in freedom from shinkage should not shrink over three thirty-seconds of an inch, and class A woods not over one-sixteenth of an inch if they are to be used for interior trim, finish, or floors, nor over twice that amount (one-eighth of an inch) if they are to be used exposed to the weather. For lumber under 6 inches wide use 3-inch samples. The shrinkage limits should be half those for 6-inch samples. Edge-grain or quarter-sawed lumber shrinks only about one-half as much as plain or flat-sawed lumber and if it is not possible to obtain a flat-grain sample, an edge-grain sample may be used, in which event the shrinkage should not be over half that shown for flat grain. It is best, however, not to use edge-grain samples or samples shorter than 6 inches; not only are they more difficult to measure, but they do not give so reliable an indication of the adequacy of seasoning.

Jointing, Setting and Filing the Various Types of Circular Saws

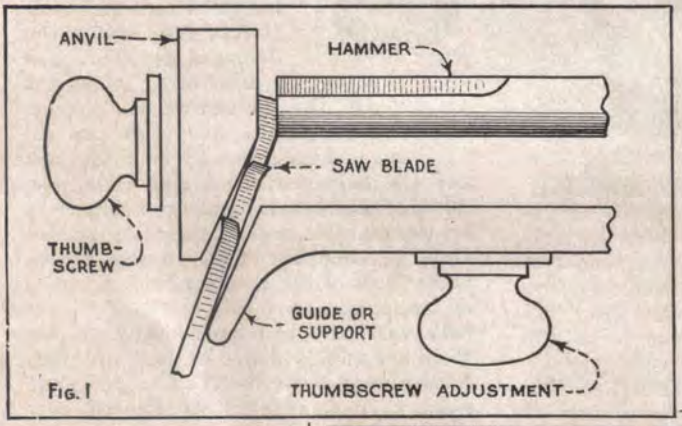
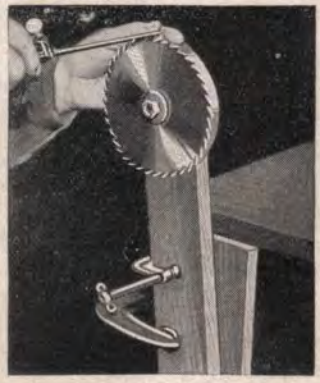


FIG. 1

Fig. 1 Shows the Three Parts of Setter Used for Circular Saws; Photos Show, Left, Holder for Saws While Filing; Right a Setter in Use

On most of the popular workshop saws, a combination rip and crosscut blade is regularly furnished. However, many owners still prefer separate blades



for ripping and crosscutting, and it is true that the common ripping blade is considerably faster in the cut. Another excellent saw is that known as the "jointer" blade, which is hollow-ground and runs without set. While slow, it cuts extremely smooth and clean in either rip or crosscut. It is especially fine for trimming end grain and eliminates much hand work. While the essentials of filing the blades

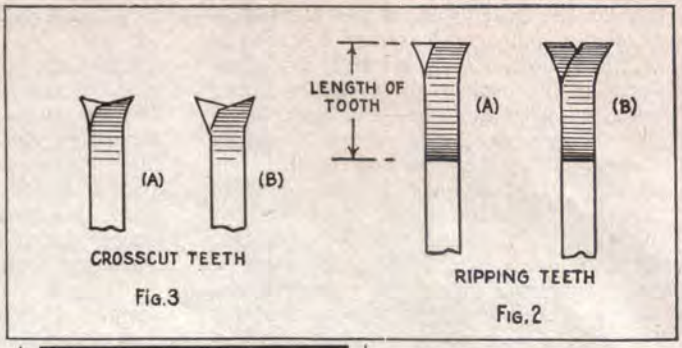
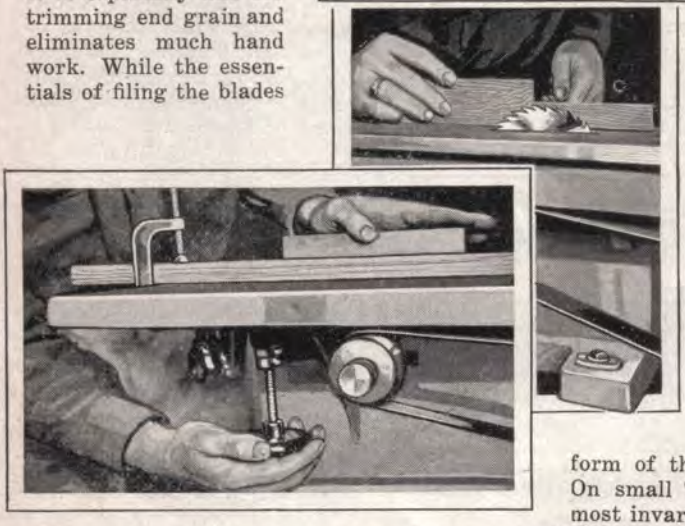


Fig. 3 Fig. 2



Figs. 2 and 3, Proper Set and Tooth Shape of Crosscut and Ripsaws; Center, How Sides of Filed Teeth Are Dressed Down Evenly and, Below, How Saw Table Is Let Down Slowly When Jointing

apply to the various styles of saw blades, there are certain exceptions to be observed in each particular case, such as the angle of the file, the coarseness of the set, etc. As it is impossible to give rules covering all cases of saw filing, the amateur should give his blade a careful examination before he attempts to file it. In this way he will, if a keen observer, learn much about the method of sharpening the blade he has in hand. The form of the teeth, before they have been filed, is the best guide, and the aim of the filer should be to preserve this original form.

Each Operation Must Be Done With Precision

First you must remember that the three principal operations, namely, jointing, setting and filing, all contribute equally to the success of the job. If any of them is omitted or carelessly executed, you will have an ill-running saw, no matter how painstaking you are with the other two. First examine the set of the teeth. Unless they have been damaged by striking a nail or other metal, the form of the set can be easily seen. On small blades, the teeth are almost invariably set by bending them and the bent portion is generally one-third of the length, unless it has been set for special uses. The teeth of the ripping blade are filed square across, while those of the crosscut blade are filed at an angle (beveled) with the blade both vertically and horizontally. If the teeth are merely dulled by long use, they must always be set before filing. If damaged, they should first be jointed, then brought to a point, after which they are again jointed off lightly, repointed by light filing, and the gullets cut down to give the proper clearance. The set should be put in after the preliminary jointing and pointing. **In any case, the set is a major consideration, and as a rule it should be done first after a light jointing.**

Jointing Methods and Precautions

Although jointing is easy to do, it is nevertheless of considerable importance, as it determines to a great extent the behavior of the blade while in the wood. **This is even more true of the circular saw**

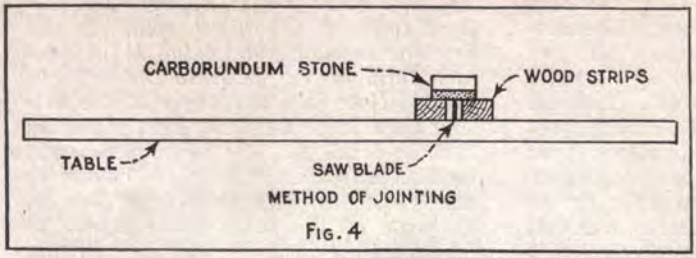


FIG. 4

Fig. 4 Shows How Wood Strips and "CARBORUNDUM" Stone Are Used for Jointing and the Photos Show Side-Dressing and Filing Operations

than of the handsaw. Fig. 4 shows a simple method of accurately jointing a small circular saw on the arbor. Get two narrow strips of wood the length of the saw table and clamp them down, one on either side of the blade. Put the blade on the arbor so that it will run backward. Raise the table until the teeth are just below the top edges of the strips. Hold a carborundum stone, coarse side down, on the strips directly over the blade and start the motor. Lower the table slowly with the handscrew until the teeth of the saw strike the stone. Give the handwheel an additional half turn, then stop the motor and examine the saw. This operation strikes the teeth off evenly so that they will run in the same arc. Carefully continue this procedure until each tooth comes in contact with the stone, which will be sufficient. Never take off more than is necessary to even the teeth. On a table without an elevating screw, revolve the saw blade by pulling the belt by hand while adjusting the height.

Setting "Do's" and "Don'ts"

Fig. 1 shows the three principal parts of a saw set adapted to setting a circular saw. It will be seen from this that any adjustment of either the anvil or guide will change the form and coarseness of the set. With the better makes of saw sets, it is possible to adjust them very accurately to any depth desired. The set is best adjusted by placing the tool over the teeth while the blade is on the arbor. Make a trial adjustment and set several successive teeth, bending them in the same direction as before. Sight across the teeth edgewise to best determine what has happened. **Remember that the power-driven saw does not require the same amount of set as the handsaw.** Fig. 2, detail A, shows the correct medium set for a ripping blade. Where the blade is to be used almost exclusively in soft wood, the depth of the set, that is with relation to the length of the tooth, may be slightly greater, but the width across the points should never be as great as that shown at B, where a "valley" appears between two adjacent teeth. The formation of a valley must be carefully avoided, as this will cause the ripping blade to vibrate excessively and "run" in the cut with greatly lessened capacity. Any discrepancy of this kind may be taken out by resetting the blade with the tool properly adjusted.

Use Care in Operating Setting Tool

For all ordinary purposes, the coarseness of the set should never exceed that shown in the detail A of Fig. 2. If the saw is to be used mostly for hardwood,

the set may even be less. After checking over the setting, bend each alternate tooth in the same direction, so that two adjacent teeth will be set on opposite sides of the blade. Be sure to reset the teeth on which the trial setting was made so that they will be uniform with the rest. After every second tooth has been set on one side, reverse the set or the blade, whichever is most convenient, and finish the remaining teeth. Two precautions must be carefully observed, namely, that the adjustment of the tool does not shift while setting, and also, that the tool does not slip when the pressure is applied, causing the hammer or plunger of the tool to pinch off the points of the teeth. Always hold the tool firmly, with the guide bearing against the blade when setting each tooth. When setting a combination blade, omit setting the cleaner tooth.

Preparation and Set-Up for Filing

The blade is now ready for filing. It is better to use new files. Never attempt to sharpen a blade with a file clogged with an accumulation of dirt and grease. Make a support for the blade as shown in some of the photos. Saw out a disk of wood, about ½ in. less in diameter than the blade, and if the hole in the blade is ½ in., drill a hole of equal size in the center of the disk. Get a length of 1 by 4-in. stock and drill a ½-in. hole near one end. Put a short ½-in. bolt through the hole, place the disk over this and tighten the blade to the disk. Clamp the support to a table or bench with a suitable clamp or hold it in a vise. Never attempt to hold the saw itself in a vise when filing, for even though the jaws of the vise are of wood, the set is likely to be altered or taken out altogether in places, making it necessary to reset the entire blade.

Different Filing Methods for Different Types of Saws

When sharpening the ripping blade, the file stroke must be made straight across, with the file held at right angles to the blade. Take care to bring each tooth to a point and keep the original form. When filing crosscut teeth, the file must be held at an angle with the blade both vertically and horizontally, so that the teeth will be shaped at an angle (beveled) as shown in details A and B, Fig. 3. Detail B shows the medium form of the crosscut tooth on the combination blade, and detail A the common form of the teeth on the crosscut blade. Note that the angle of the cutting edge in detail B is slightly greater than in detail A. The common crosscut tooth is sharpened with the file held more nearly square with the blade than in the case of the combination blade. A deeper valley on the combination cutting teeth will make the blade cut faster in a ripping cut and be in no way a hindrance when crosscutting. This deeper valley allows the cleaner teeth to sever the lengthwise fibers of the wood when making the ripping cut.

Exact Filing Procedure

When filing the crosscutting teeth, run the file cut down into the gullet to keep the original form of the teeth and to prevent the formation of a shoulder in subsequent filings. Although it takes longer, the best method of filing accurately is to disregard the pointing of each individual tooth and adopt a uniform stroke of the file. For instance, give each alternate tooth two one-way strokes with as uniform a pressure as possible. Continue this until one complete set of teeth have been given two strokes of the file. Turn the blade around and repeat with the other set. In this sense the word "set" indicates all the teeth bent one way on the same blade. When finished, turn the blade back again and bring the teeth very carefully to a point, taking care not to alter their shape. Bring the other set to a point in the same manner. This makes four operations, and while it is not always done, owing to the time required, this method enables one to turn out as nearly perfect a job of saw filing as is possible by hand methods. While filing, it is essential to have the blade in the very best available light so that the result of each stroke may be seen readily, especially when pointing the teeth. Always use a flat file when sharpening the cleaner teeth of the combination and jointer blades and make the stroke straight across as in filing the ripping tooth. Give the cleaner teeth one extra stroke with the file after bringing to an edge. This will bring the cutting edge to the correct position, which should be very slightly less than the arc of the cutting teeth.

"Gumming" May Be Necessary

It will perhaps be well to add a word concerning what is commonly known as "gumming." This operation consists in filing the round gullets between ripping teeth, to obtain maximum tooth clearance and prevent breakage. After the first two filings of a ripping blade, the gullets should be filed with a small round file of suitable diameter. The stroke is made straight across, and it is best done after setting and filing. Two strokes of the file in each gullet should be sufficient at each filing of the saw. The cutting teeth of combination, crosscut and jointer blades are more or less automatically gummed by each filing, owing to the slightly rounded corners of the file used, and as a rule need no further attention on the smaller blades.

Always Finish By Dressing Teeth

After the filing is finished, the teeth will need to be dressed, to bring the cutting points in line so that the saw will cut clean and smooth. To do this, tighten the blade on the arbor, running the right way, and bring up the rip guide. Lay the "CARBORUNDUM" stone against the guide, with the edge up and the fine side next the saw. Do not allow the stone to strike the upcoming teeth but only those going down. Leave the guide free so that it may be easily moved by hand. Start the motor and bring the stone against the teeth very slightly, allowing it to touch only the sides of the points. Keep the stone flat against the guide. Repeat the operation on the other side of the blade. Be very careful not to take off too much. Grind down just enough to even the points and bring them in line. Where the rip-guide assembly will not permit this procedure, lay the blade on a flat surface and rub the teeth lightly with the fine side of the stone, as shown in Fig. 4.

Refitting Dado Heads

A small dado head may be accurately jointed and filed by using practically the same method as for the saw blade. To joint the head, use the strips clamped to the saw table as before, and assemble all the separate cutters on the arbor so that they run backward. Use the coarse side of the stone, as before, in jointing. If this is done carefully, no harm will result to the stone either in this operation or in that of jointing the saw blade, if both are run backward. Remove the head and carefully file the two outside cutters. Note the shape of the cutting teeth and take care not to alter their shape. Remember that the original form of the tooth is the very best guide in filing it. When the filing is complete, give each cleaner tooth an additional stroke with the flat file, as on the combination and jointer blades. Assemble all the inside cutters on the arbor, running backward, and joint them again very lightly. Remove and file the top of each tooth straight across, just back of the cutting edge, to remove the rounded portion caused by jointing. Carefully done, these simple operations will put the small dado head in excellent shape.

Truing Up An Oilstone

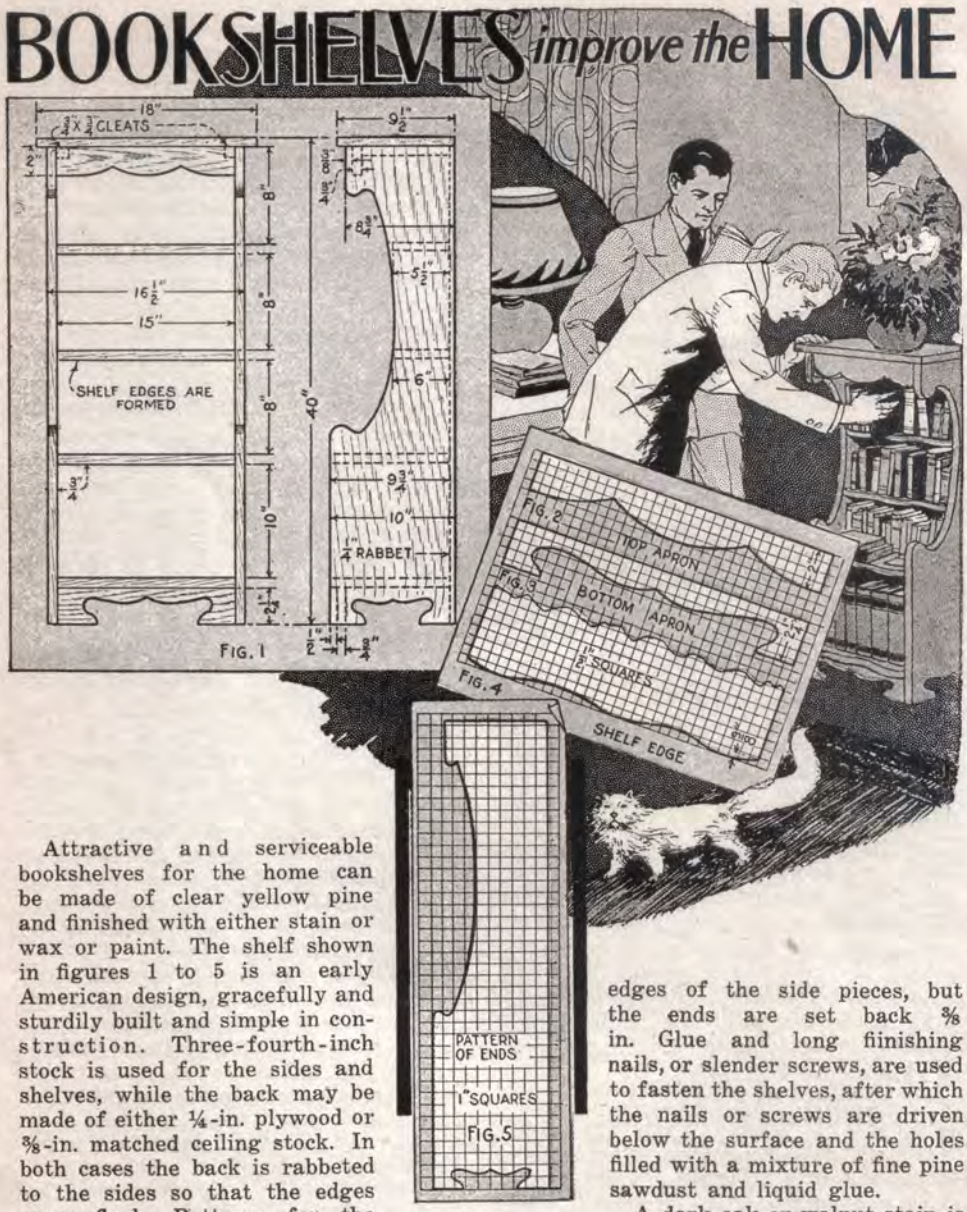
Oilstones are easily and quickly trued up without running the risk of spoiling them, as is often the case when they are held against an emery wheel, by grinding them on a planed cast-iron surface covered with a mixture of emery and water. Rubbing the stone back and forth across this surface will soon produce a smooth, true face.

Decay Resistance Factor of Wood

The natural decay resistance of all woods lies in the heartwood, which is the wood in the interior of the tree extending from the pith to the sapwood. The decay resistance of the species so far as affected by grade therefore depends upon the proportion of heartwood in the grade. While this is true of all species, it is of practical importance only in woods with medium or high decay-resistant heartwood.

The lower grades usually contain more heartwood than do the select grades. If decay resistance is really needed for the purpose at hand the higher board grades, No. 1 and No. 2, are more decay resistant than are the select grades, except in the case of the special select grades known as all heart. The full decay resistance of grades below No. 2 is to some extent adversely affected by the presence of decay that may have existed in the tree or log before it was sawn into lumber. Under conditions conducive to decay, such original decay may spread, although some types of decay, notably peck in cypress and red heart in pine, are definitely known to cease to function once the lumber is properly seasoned.

BOOKSHELVES *improve the* HOME



Attractive and serviceable bookshelves for the home can be made of clear yellow pine and finished with either stain or wax or paint. The shelf shown in figures 1 to 5 is an early American design, gracefully and sturdily built and simple in construction. Three-fourth-inch stock is used for the sides and shelves, while the back may be made of either ¼-in. plywood or ⅜-in. matched ceiling stock. In both cases the back is rabbeted to the sides so that the edges come flush. Patterns for the aprons, shelf edges, and ends are given in Figs. 2, 3, 4, and 5. The aprons are simply glued and nailed into place, ⅜-in. from the front edge. The front edges of the shelves are slightly curved. The bulges of the curve are in line with the front edges of the side pieces, but the ends are set back ⅜ in. Glue and long finishing nails, or slender screws, are used to fasten the shelves, after which the nails or screws are driven below the surface and the holes filled with a mixture of fine pine sawdust and liquid glue.

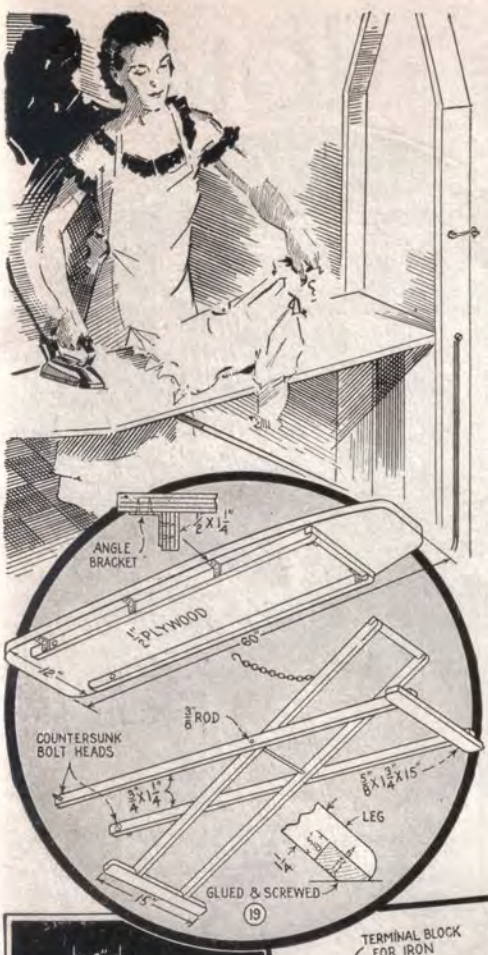
A dark oak or walnut stain is applied over the entire case, and is followed by several coats of wax. However, attractive finishes and colors, to match other furniture in the room, may be used. Either finish requires a well sanded surface in order to make a good-looking job.

Two Convenient Ironing Boards

A light ironing board can be made of ½-in. plywood, as in Fig. 19. The X-legs, attached to the board, can be folded up and laid flat between two parallel braces beneath the board. The legs are best made of spruce for strength and lightness. Bolts with countersunk heads secure one pair of legs under the large end of the ironing board and a chain is installed so that, when hooked up, the legs will not collapse when the ironing board is lifted to slip a garment over it.

* * *

A second type of ironing board is shown in Figs 20 and 21. In homes not provided with a built-in ironing board this will serve as a good substitute and can be placed in a convenient location with a wall plug near by. As can be seen from the illustrations, this board is a combination sliding and pivoting affair, and fits in a shallow case permanently attached to the wall.



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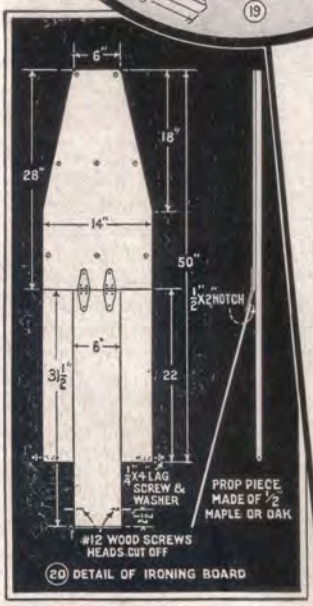
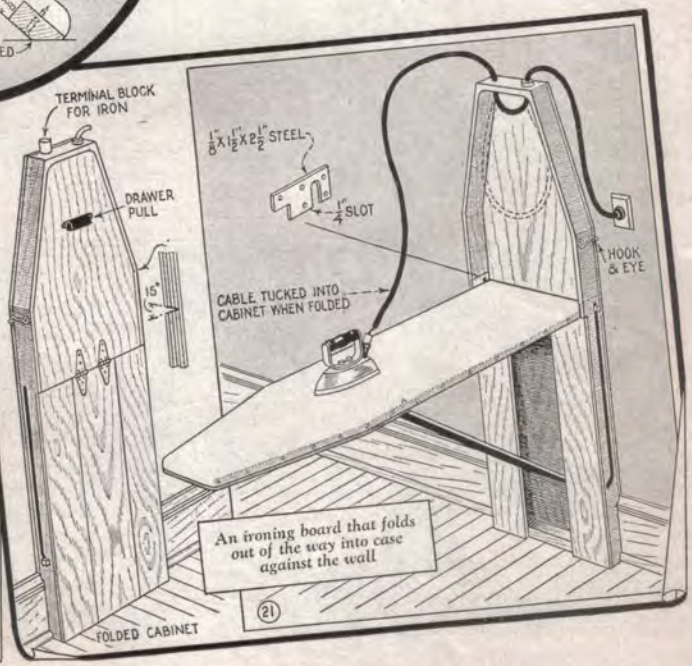
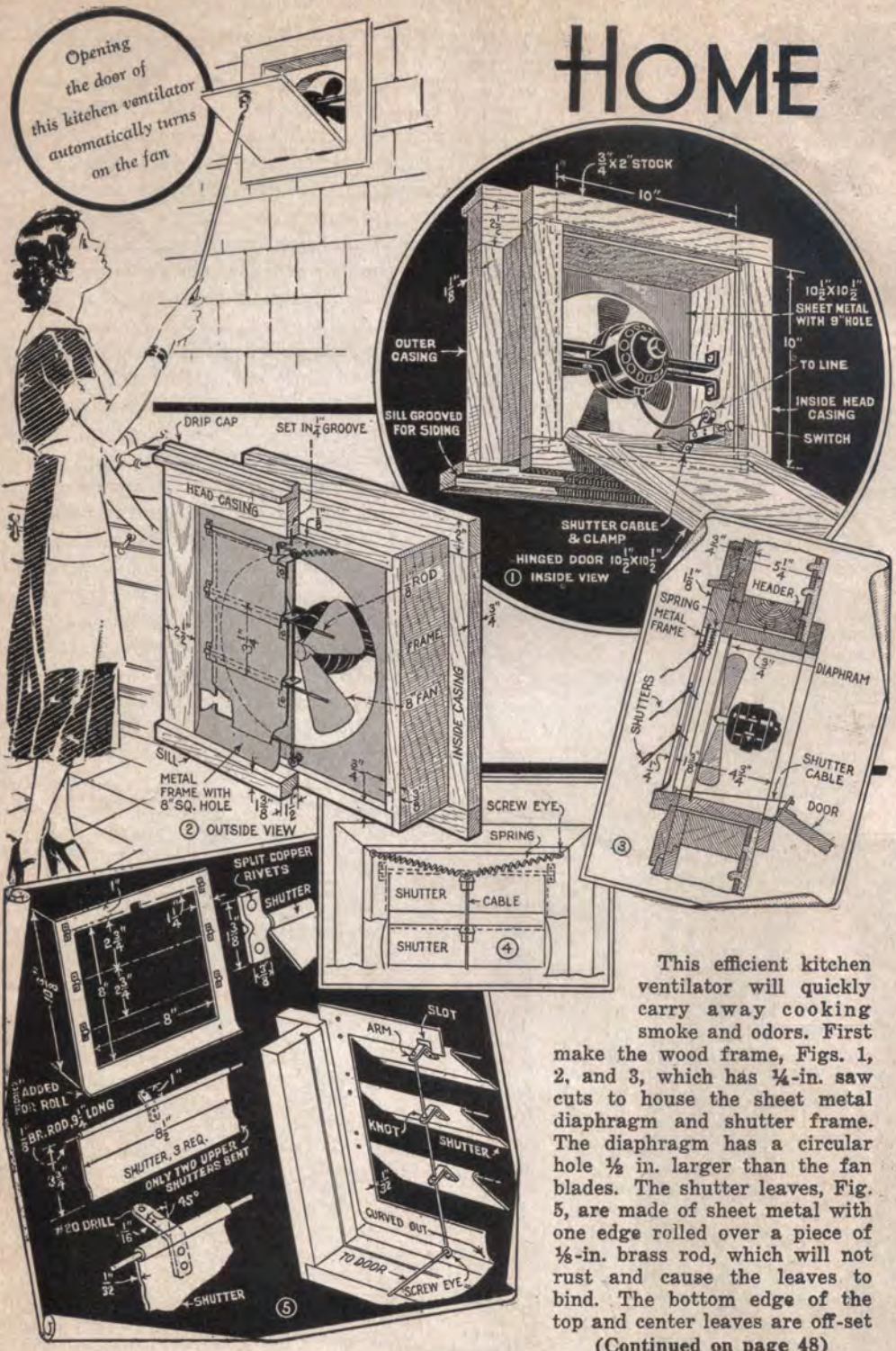


20 DETAIL OF IRONING BOARD



An ironing board that folds out of the way into case against the wall
21

HOME

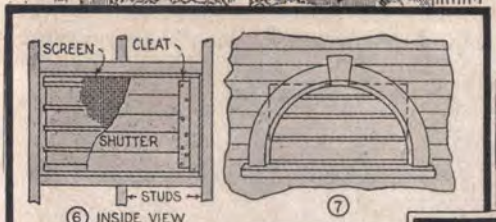


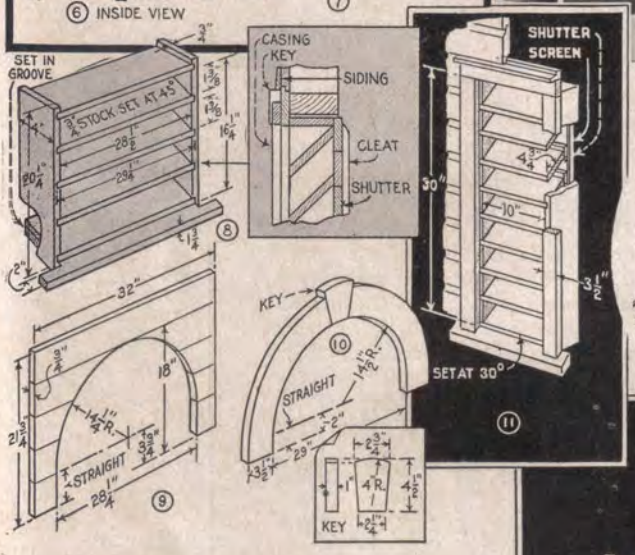
This efficient kitchen ventilator will quickly carry away cooking smoke and odors. First make the wood frame, Figs. 1, 2, and 3, which has ¼-in. saw cuts to house the sheet metal diaphragm and shutter frame. The diaphragm has a circular hole ½ in. larger than the fan blades. The shutter leaves, Fig. 5, are made of sheet metal with one edge rolled over a piece of ⅛-in. brass rod, which will not rust and cause the leaves to bind. The bottom edge of the top and center leaves are off-set

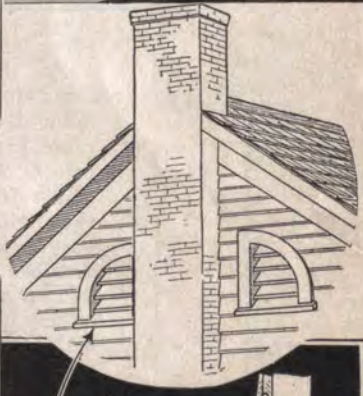
(Continued on page 48)

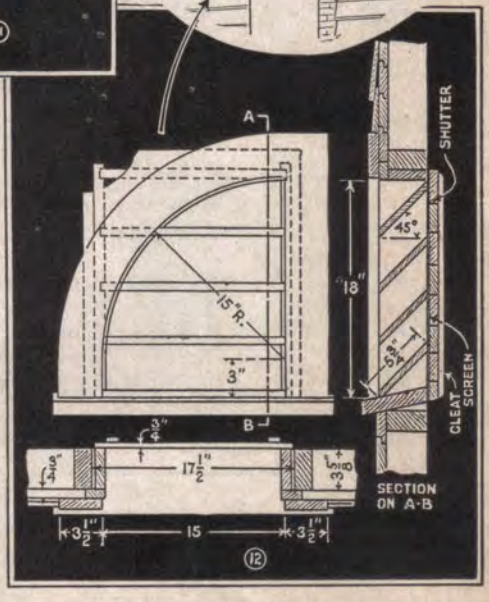
IMPROVEMENTS

Louvers assure circulation of air through attics









Attractive Louvers Not Hard to Make

Attics without ventilation become hot in summer, holding the heat over night and causing the rooms below to become very warm. Installing an attractive louver in each end of the attic will remedy this trouble. The type shown in Fig. 7 is suitable for Colonial houses. The construction of the louver is not difficult as shown in Figs. 6 to 10. The leaves and sill are all housed in grooves. If a chimney runs up the center of the gable, two quarter-round louvers, as in Fig 12, may be used. For English type houses

(Continued on page 48)

Kitchen Ventilator

slightly so that they will overlap the rolled edge of the leaf underneath. Fig. 5 also shows the copper or brass straps used to mount the leaves on the frame. Strap-iron arms operate the leaves. Woven picture wire should be used to link the leaves together by knotting at each of the holes in the arms so that the cable will pull in either direction. Unless the leaves are made of rather heavy metal, it is advisable to add a return spring as in Fig. 4. A small metal angle is screwed to the door to fasten the cable, Fig. 3. This should be located and the cable length adjusted so that the leaves of the shutter and the door will open at the same time. A spring switch may be purchased and installed as shown in Fig. 1. Closing the door pushes the plunger in and thus shuts off the fan.

Attractive Louvers

a long, narrow louver as in Fig. 11 is most suitable. On this type, where many leaves are used, an angle of 30° gives the best appearance, but the leaves must be fitted with back strips to prevent the rain from driving in.

For the complete plans and specifications on practically any object for the home that you might like to make we refer you to the craft magazines listed below. They each have existing blue prints for a great many projects which they will be glad to furnish you for a very nominal charge. Any of these publications will also welcome a letter from you, at any time, asking for the solution to any particular "knotty" problem you may run against in woodworking. When you write, address the Home Workshop Editor.

Popular Mechanics, 200 E. Ontario St., Chicago, Ill.

Popular Homecraft, 737 N. Michigan Ave., Chicago, Ill.

The Home Craftsman, 115 Worth St., New York City.

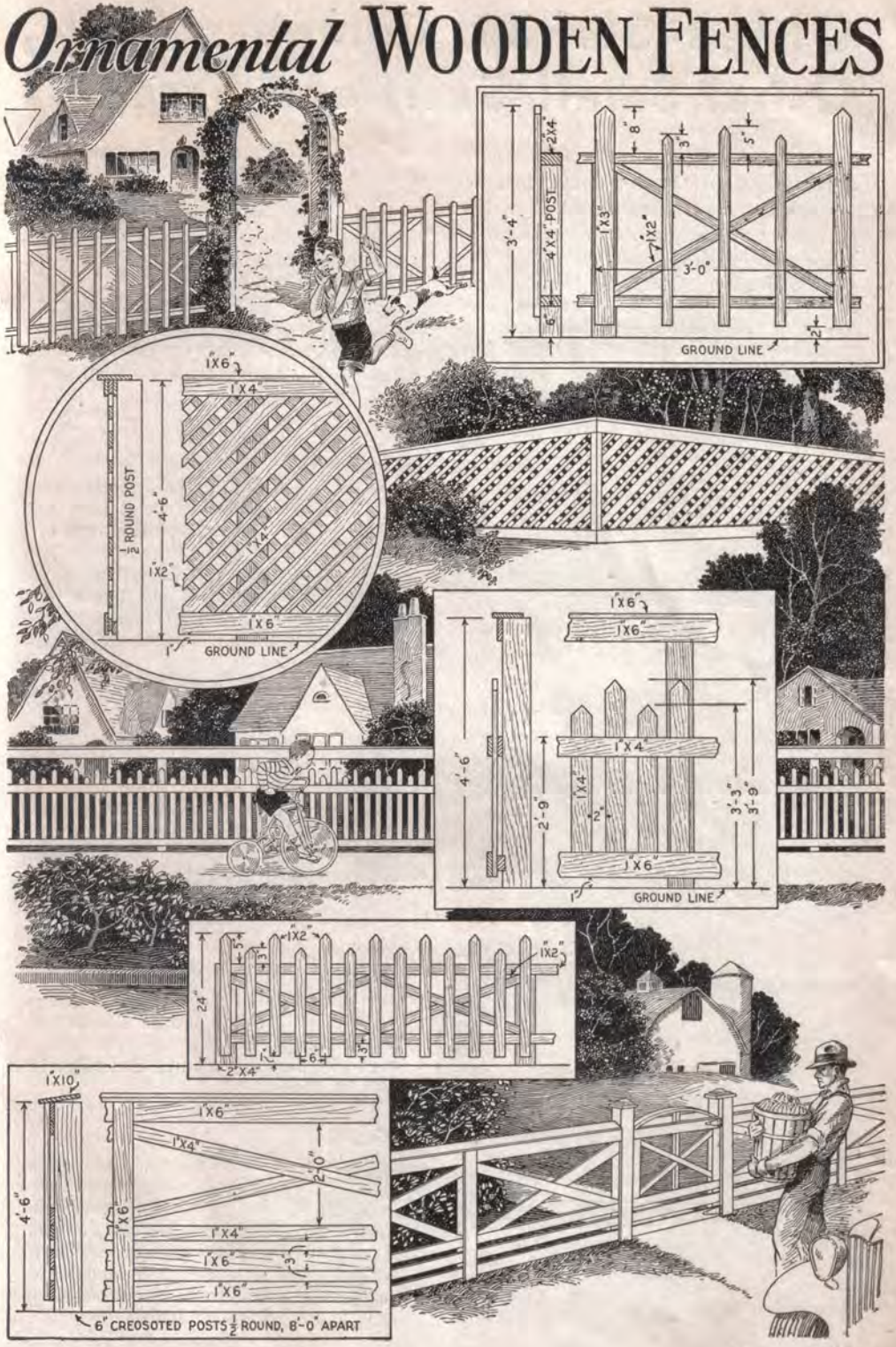
Popular Science Monthly, 353 Fourth Ave., New York City.

The Model Craftsman, 110 West 42nd St., New York City.

Modern Mechanix and Inventions, 1501 Broadway, New York City.

Better Homes and Gardens, 17th and Locust Sts., Des Moines, Iowa.

Ornamental WOODEN FENCES



Ohlen-Bishop Compass Saws, Other Small Saws and Scrapers

For the many small operations such as described in the foregoing chapter, the saws and scrapers described below are essential, and in many cases absolutely indispensable.

Ohlen-Bishop Compass Saws, Nest Saws, Back Saws, Mitre Saws, and others of this class are all made from a special analysis steel. This steel has been thoroughly tested and perfected over many years to give more than the longest and toughest service that will ever be demanded.

Blades of these saws are taper ground for fast and easy sawing. In every individual case their toothing is scientifically designed to give the greatest possible cutting efficiency.

All handles have been carefully designed to permit the easiest pressure control straight to the cutting edge. They are all tooled from selected hardwood, highly polished.

No. 1 Compass Saw

Spring steel blade with straight slot, hand filed and set. Apple handle, carved and polished, attached with saw screw and medallion. Full weatherproof lacquered. Blade taper ground. 8 points per inch. Lengths, 12 and 14 inches.

No. 23 Interchangeable Compass Saw

Spring steel blades, taper ground, hand filed and set. Beech handle, plain grip finished in weatherproof lacquer, attached with wing nut and nickel screw. 8 points to the inch. Lengths, 12 and 14 inches.

No. 21 Metal Cutting Compass Saw

Tapered blade, with straight slot, toothed and tempered for metal. Runs without set. Beech handle finished in weatherproof lacquer. Nickel trimmed. 14 points per inch. Lengths, 12 and 14 inches.

No. 19 Keyhole Saw

Spring steel blade, with straight slot, tapered to sharp point, thin back. Hardwood handle finished in weatherproof lacquer. Saw screw and medallion. 10 points per inch. Lengths, 10 and 12 inches.

No. 16 Keyhole and Pad Saw

Malleable japanned handle, adjustable thumb screws, spring steel blade. 10 points per inch.

No. 1 Pattern Makers Saw

Blade 7½ by 1¼. Extremely thin for small, accurate work. Open handle, of hardwood finished in weatherproof lacquer. 2 nickel plated screws. Length, 7½ inches.

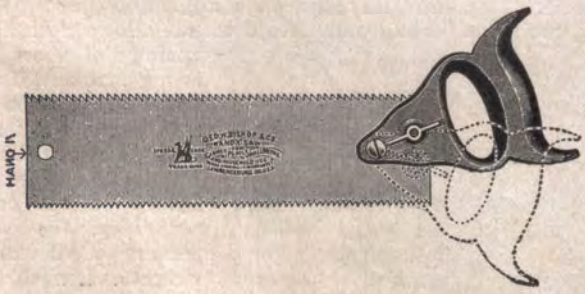
No. 2 Pattern Makers Saw

Necessary for tenoning, dovetailing, and for other fine, accurate work. Blade 26 gauge. 17 points to the inch. Polished brass back, hardwood handle finished in weatherproof lacquer. 2 nickel plated screws. Lengths, 8 and 10 inches.

No. 5 Dovetail Saw

Polished round handle of hardwood on level with back. Blade 1½" under back. Used for tenoning, dovetailing, and other fine work. Lengths, 8, 10, and 12 inches.

No. 9 Handy Saw



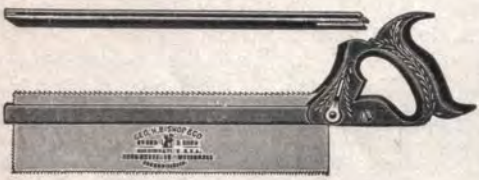
Two saws in one. The usefulness and convenience of this saw for panel, back, cabinet, pattern maker, small mitre, and household use proves it a necessity. The handle is so constructed and attached to the blade to allow it to be swung on its pivot to one side or the other, and held firmly in its respective positions for crosscut and rip sawing. Crosscut 13 points. Rip 9 points. Length, 12 inches.

No. 88 Mitre Box Saw

Special analysis steel blade, hardened and tempered, hand filed and set, tooth edge 2 inches shorter than length of blade. Hardwood handle finished in weatherproof lacquer.

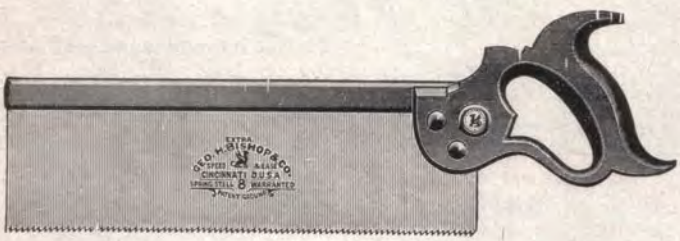
Length Inches	Width Under Back, In.	Points To Inch	Screws
18	4	11	3
20	4	11	3
22	4	11	3
24	4	11	3
26	4	11	3
28	5	11	3
30	5	11	3
30	6	11	3

No. 10 Patent Back Saw



Back, dovetailing, ripping, crosscutting, and depth cutting saw. The back of the saw constitutes the slot through which the blade slides enabling the operator to move, space, and adjust it any desired width or distance from edge of back. Special analysis steel blade, hardened and tempered, hand filed and set. One side for crosscutting, reverse side for ripping. Applewood handle, carved and finished in weatherproof lacquer. Crosscut 13 points, rip 9 points. Lengths, 12 and 14 inches.

No. 8 Back Saw



High quality steel blade, hardened and tempered with blued steel back, hand filed and set, ready for use. Extra choice quality. Applewood handle finished in weatherproof lacquer. Lengths, 10, 12, 14 and 16 inches.

No. 75 Flooring Saw

Curved blade 18" long, 4¾" wide. 11 point. Has hardwood adjustable handle fitted with nickel plated screw, bolt, and wing nut. Adjustment allows full advantage of short or long strokes. Used for cutting through floors and siding without boring. Back cutting edge used to square cut-out corner. Ideal for carpenters and millwrights. Length, 18 inches.

No. 3 Stairbuilders Saw

Hardwood frame, slotted to receive blade. Blade adjustable to cut ¾" slot. Fastened to frame with two nickel plated screws. Blade 1⅝ inches deep. Lengths, 6 and 8 inches.

No. 2 Cabinet Scraper

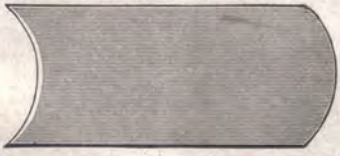
Long hardwood handle finished in weatherproof lacquer. Can be used with both hands. Blade 3" x 3". Beveled edge. Fastened to handle with wing nut. Any style blade can be held in this handle. Blade, 3 x 3.

No. 8 Scraper

Dressed edge fully polished. Made of highly tempered saw steel. Size range from 2 x 4 to 2⅞ x 6.

No. 13 Cabinet Scraper

This scraper designed for curves and cabinet making. Its unique shape adapts it for use on curved surfaces of varying degrees. Dimensions, 3 x 5.



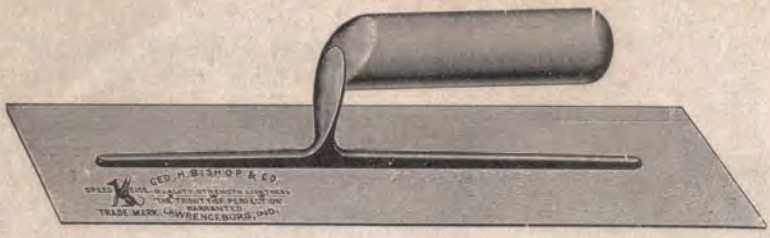
No. 14 Cabinet Scraper

Two straight edges, also concave and convex curves. This scraper is an ideal tool for cabinet making, joinery, and pattern making. Size range from 2½ x 5 to 3 x 6.

No. 12 Wall Scraper

A handy and useful tool for painters and paper hangers. Hardwood handle fastened with two screws. Has beveled edge, 5 inches in length.

BF-6 Plastering Trowel

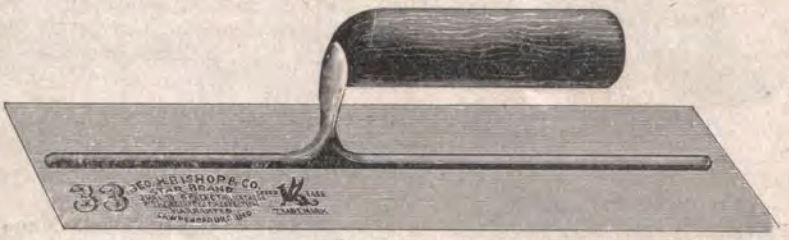


Lengths	10½	11	11½	12
Widths	4½	4¾	4¾	5
Rivets	10	10	10	10

Finishing type. Greyhound spring steel blade. This trowel is light and flexible. Tempered and ground accurately. Tapered hardwood handle. The blade is well balanced and will hold a parallel edge.

Browning type, extra long mounting. Greyhound spring steel blade. Slightly heavier than a finishing trowel blade. Tempered and accurately ground. Balanced for speed and ease. Tapered hardwood handle.

B-33 Plastering Trowel



Lengths	10½	11	11½	12
Widths	4½	4¾	4¾	5
Rivets	10	10	10	10

Important Points in Construction and Maintenance

Wood has stood the test of time as a building material. On every hand one finds proof of the permanence that is obtained when wood construction is properly used. Being a material that the inexperienced as well as the experienced man can work and being low-priced, wood has been used too frequently in shoddy construction.

Defects which show up in buildings are frequently ascribed to the material used when in reality they should be ascribed to the design, installation, or maintenance of the building. When defects show up it is natural that the first reaction should be to turn to another wood or some other material as a means of avoiding the defect in the future. Before doing so, however, it is well to be sure that the wood has not been misused or that a simple change in design, fabrication, or methods will not correct the trouble or that even more serious trouble will not be encountered by turning more or less blindly to another wood or another material the drawbacks of which are unknown or have not been carefully considered.

It is important to realize that in wood construction more unsatisfactory service results from the failure to use dry wood and to keep it dry than from any other cause. It is moisture and the changes in moisture content that are largely responsible for decay, plaster cracks, air leakage, pulling of fastenings, vibration of floors, peeling of paint, and the warping and sticking of doors and windows. The man who pays the bill should insist on dry lumber. He can and will get it when he knows its importance. He should assure himself that the dealer from whom he buys has purchased dry lumber and kept it properly piled and protected from the weather while in his yards. Having obtained dry lumber, he should keep it dry.

A Few "Don'ts" and "Do's" for Saw Users

Don't press or force a hand saw through any cut whatever. Your Ohlen-Bishop Hand Saw is a scientifically designed tool with a very delicate balance. Given a careful start, and a long, smooth stroke, it will bite into the wood at the correct speed by itself.

Don't saw an old board with the paint side turned up. This grinds abrasive paint particles into the cut and tends to dull any saw quickly.

Ask for the saws made of SPECIAL ANALYSIS STEEL—perfected over 85 years' manufacturing experience to do the job demanded.

Don't let heavy waste ends hang free to break off by themselves. Support them with the hand until the cut is completely through. This will prevent any possible splitting in the work.

Don't lay a hand saw flat on your work bench or any other hazardous place when you are through with it. If you do this any heavy or hard tool may be unintentionally laid or dropped on the saw thereby damaging a tooth or many teeth. Hang your saw up, preferably with the blade hanging free.

Look for the Ohlen-Bishop guarantee on every saw you buy—it means a thoroughly dependable product backed by a thoroughly dependable maker.

Don't try to press the feed when a saw bites into a knot. The composition of every knot is much harder and more concentrated than the rest of the board. It should consequently be fed far slower.

Don't pour water over an overheated circular saw to cool it. Doing this may cause the saw to either crystallize or warp. The best remedy is to remove the cause of the overheating. But if the saw must be cooled, allow it to continue running and apply machine oil to the sides with an oil can. This will cool the saw slowly and without damage.

Every time you buy a saw, buy one that you can be proud of—it will add a real joy to your work.

Don't knock off the waste by twisting the hand saw quickly sideways. Doing this may take the set out of a whole series of teeth, or can even break a tooth off.

Don't force any small, pointed saws such as compass and keyhole through the work. They are made for delicate cutting and any forcing whatever will make them buckle quickly.

Use good saws kept in good condition. You can easily buy more wood to do a job over again but you can't buy back the time lost in spoiling a job with inferior saws not kept sharp.

Don't put your saw carelessly in your tool box in contact with other tools. It should be provided with a separate compartment or cover. For the saw is a tool very easily damaged.

Don't force the feed into a circular saw. Simply feed the material with a light, yielding pressure. The saw will eat its own way through.

Don't crowd the work against a band saw when cutting sharp curves. Turn the work very slowly to avoid any possibility of binding. For this is one of the greatest causes of band saw breakage.

When buying a hand saw, try an Ohlen-Bishop in your hand. Its very feeling of lightness and balance will tell you much about its superior design.

EXPLANATION

of a Few of the More Technical Terms Used in This Book and Elsewhere in Woodworking

Arbor—The complete assembly which makes up the mounting and drive of a circular saw.

Bastard Sawing—The plain sawing of a log into the greatest possible number of boards.

Blemish—Small defect in the grain or surface of a board which lowers its grade in salability.

Bolter Saw—A special saw used in saw mills to trim slabs (originally produced in squaring logs) down to a smooth rectangular timber called a "lath bolt"—from which lath are then sawed.

Brazing—The secure joining of the ends of two pieces of metal or the two ends of one piece of metal (such as a band saw cut to length) by a process very similar to soldering except with the use of a torch and silver solder. The result is a joint very tough and very flexible.

Burr—The fine, sharp (and usually ragged) edge of metal that is left on the edges of saw teeth after they have been filed.

Butt—The end of the blade of any hand saw or small saw which is toward the handle (opposite from the "point").

Casing—The wall "stoppers" nailed up in preparation for a window or door frame in building.

Center Hole—The hole in any circular saw through which the mandrel is inserted and mounted.

Chattering—The rattling or hacking sound made by a saw when it is not being started or fed into the wood with sufficient pressure.

Check or Checking—The fine cross splitting or cracking that occurs in wood when it seasons or weathers. Practically always present and may become a structural defect if pronounced enough.

Clear Stock—Sound lumber with no knots, blemishes, or discolorations.

Cleaner Tooth—The single tooth, as in a combination circular saw, which follows the cutting teeth in the kerf and lifts out small shavings. Always filed straight across and not beveled.

Collar—The small circle of greater thickness that surrounds the center hole of hollow ground and special circular saws.

Countersink—To bore or chip a shallow hole as wide and deep as the head of a bolt, screw, or dowel, so that in the finished job the tops of the bolt or screw heads will be level with the surface of the board.

Crosscut—Qualifying term applied to any hand or small saw toothing which is specifically designed to cut across the grain.

Cull—A term applied to the lowest grade of **salable** lumber. Usually full of knots and blemishes, but one-half of one side of each board must be usable.

Cutting Teeth—The teeth, as in a combination circular saw, which are beveled and set alternately and which slice into the sides of the cut and determine the width of the kerf.

Dado Head—A grooving saw unit consisting of two outside saw plates (toothed very similarly to the combination saw and usually ⅛" in thickness) together with any number of inside two-bladed cutters. This unit may be varied to cut grooves of any desired width measurable by sixteenths. In the woodworking industry this is called a "gaining head."

Edger Saw—A special saw used in saw mills for trimming the edges of boards after they have been cut from logs.

Flat Sawing—A term sometimes applied to bastard sawing.

Gauge—A descriptive word meaning the thickness of metal. A very uncertain term to use in a blanket way. When you specify 20 gauge steel, for instance, four different suppliers may furnish you with four different thicknesses varying by several thousandths. This is because there are a number of different gauges in use every day. Examples — United States Standard, Brown and Sharpe, Birmingham and Stubbs, and Zinc Scale. In the Saw Industry the Birmingham and Stubbs Gauge is used.

Gullet—The hollow between the bases of the teeth of any type of saw.

Gumming—The process of rounding and smoothing out the gullets of a saw after the teeth have been filed.

Hollow Grinding—A special process of bringing the plate of a circular saw (such as a jointer) down to a gauge several graduations thinner than the tooth edge and collar. This makes possible a faster feed with much less heating and no binding in the kerf. A hollow ground saw never needs to be set.

Jointing—The process of bringing all the teeth of any saw to the same length by running a mill file lightly over their points.

Jointer Saw—A hollow ground circular saw especially designed for making extraordinarily smooth cuts which may be glued direct from the saw.

Kiln-dried—A term applied to lumber which has been seasoned in a specially designed oven-like storage. Kiln-dried lumber is usually of somewhat better quality than air seasoned lumber and can be delivered much more promptly.

Kerf—The name commonly used for the cut or slice made by any saw.

Lath Saw—A special saw used in saw mills to rip lath bolts up into laths. (See bolter saw)

Mandrel—The shaft upon which the circular saw rotates.

Point and Teeth—The tip of the tooth on any saw. Also a term applied to specify the coarseness of toothing on any hand saw. Example—8 pt. saw means 8 tooth tips to the inch.

Plywood — Thin wood flats usually made up of a number of veneer-like layers with grains running alternately opposite for strength. These layers are glued together.

Random Widths—Any odd dimension widths of lumber such as the lumber dealer may happen to have in stock.

Radial Shrinkage—In lumber this is the shrinkage which occurs in the direction opposite to the way the annual rings run.

Rip Saw—Term applied to any saw used to cut with, or in the same direction as, the grain.

Rift Sawing—A term applied to the process of cutting boards out of quarter sections of logs.

Running—The tendency of any saw to pull to one side and run off the guide line. The cause is more set on one side than the other, or because in filing there is left more bevel on the one side than the other.

Shake — A natural (not man-made) split in a log or timber. If this split is across the center it is called a "heart-shake"; if radial, a "star-shake."

Slasher Saw—A special saw used in large saw mills for cutting to desired lengths the slabs that are taken off the sides of logs when they are squared.

Spacer—A small length of wood placed between stacked boards to prevent warping and allow air drying. Also a thickness of paper placed between the cutters of a worn Dado Head to bring it up to the specified width within a few thousandths of an inch.

Specific Gravity — The ratio of the weight of a body to that of an equal volume of some standard substance. For instance, the weight of a certain volume of wood in relation to exactly the same volume of water.

Set—The amount of alternate bending consecutively given the teeth of any saw. Also the common name of the instrument used in setting a saw.

Taper Ground — A special grinding process used on hand saws to produce a blade thinner at the back than at the tooth edge. This is so the tooth edge will be considerably thicker than any other part of the blade to prevent any possible binding in the kerf.

Tangential Shrinkage—In lumber this is the shrinkage which occurs in the same direction as the annual rings run. Usually about twice as much as radial shrinkage.

Turnery—A term applied to all the cases where wood is rotated on a lathe and tooled to any shape or size.

Trimmer Saw—A special saw used in saw mills for trimming the ends of boards to produce boards of the desired length after they have been cut from the logs.

Turnings—Term applied to any object of wood which is produced by tooling on a lathe.

Volumetric Shrinkage—The total decrease in cubic contents which may occur in a piece of wood with kiln drying or air seasoning.

Essential Information About Lumber

Ease of Working

Wood in general is easy to cut, shape, and fasten with ordinary tools directly on the building site. For some purposes the difference between woods in ease of working is negligible, but for others the smoothness and facility with which it can be worked have a decided influence on the quality and cost of the finished job. In general, along with the tendency toward splitting in nailing, warping and twisting, and the weight in handling, ease of working is of first importance to the worker and indirectly to the one who pays the bill. The load-carrying capacity and wear resistance of the harder and denser woods should not be sacrificed unduly for the ease of working of the softer woods, but a reasonable balance must be drawn in selecting wood for a specific use. A skilled carpenter working with lumber that is well seasoned and manufactured can get good results from even the more refractory woods, whereas an unskilled worker stands the best chance of getting good results from the easier working woods. The condition of the cutting edges of tools is of first importance because unsuitable or dull tools may lose for any species of wood the advantage it may have because of its ease of working.

Paint Holding

The advantage that lies in being able to produce a change and variety of effects by the painting of wood can be realized with fullest economy by taking into account three factors, namely, (1) the kind of paint, (2) the circumstances of its application, and (3) the kind of wood. The different kinds of wood vary considerably as to their painting characteristics, particularly for outdoor exposure.

Paint holds better on edge-grained or quarter-sawn pieces than it does on flat-sawn pieces. Knots in both the white and yellow pines do not retain paint so well as the sound knots of the cedars, hemlocks, white fir, or western larch. Among flat-grained boards, the bark side (the side nearest the bark of the log) is more satisfactory to paint than the pith side.

Nail-Holding Power

As a rule, fastenings are the weakest link in all forms of construction and in all materials; therefore the resistance which is offered by the wood itself to the withdrawal of nails is important. Usually, the denser and harder the wood the greater is the inherent nail-holding power.

The size, type, and number of nails have a marked effect on the strength of the joint. The resistance to withdrawal of nails increases almost directly with the diameter; that is, if the diameter of the nail is doubled the holding power is doubled, providing the nail does not split the wood when it is driven. The lateral resistance of nails increases as the 1½ power of the diameter. Of the three nails most commonly used, plain, cement-coated, and barbed, the cement-coated nail has, in well-seasoned wood, the highest holding power and the barbed nail the lowest. New or specialized types of nails are introduced on the market from time to time, some of them giving substantially improved results. One of these new nails is minutely pitted or etched in such a way as to increase the holding power even more than does the cement-coating just mentioned.

The moisture content of the wood at the time of nailing is extremely important for good nail holding. If nails are driven into wet wood they will lose about three-fourths of their full holding power when the wood becomes dry. So large is this loss that siding, barn boards, or fence pickets are very likely to become loose when nails are driven into green wood even when the best of nails and nail-holding woods are used. Barbed nails are better adapted for use with wet or poorly dried wood than either plain or cement-coated nails when for some unavoidable reason wood in such a condition must be used. The first and most important rule in obtaining good joints and high nail-holding power is to use well-seasoned wood.

The splitting of wood by nails greatly reduces their holding power. Even if the wood is split only slightly around the nail there is considerable loss in holding power. Because of hardness and

texture characteristics some woods split more in nailing than do others. The heavy, dense woods, such as maple, oak, and hickory, split more in nailing than do the lightweight woods, such as basswood, spruce, and true firs. The non-uniform-textured woods, like southern yellow pine and Douglas fir, split more than do the uniform-textured woods like northern white pine, sugar pine, or ponderosa pine. The most common means taken to reduce splitting is the use of smaller nails. The number of small nails must be increased, of course, to maintain the same gross holding power. Blunt-pointed nails are now available on the market, and sharp-pointed nails can be blunted, a handful at a time, on a grindstone or emery wheel. Blunt-pointed nails have a smaller tendency to split wood than do sharp-pointed nails. Too much blunting, however, results in a loss of holding power.

The old-fashioned cut nail with its blunt point has less tendency to split than does the modern pointed nail. Cut nails, however, do not have the holding power of the modern pointed nail.

How Dry Should the Wood Be When Installed?

The installation of wood at the proper dryness means practically no serious shrinkage later. Wood at the time of installation should therefore be seasoned to about the average moisture content that it will have in service. The moisture content of interior trim at the time of installation should be in most parts of the United States between 5 and 10 percent; in the damp southern coastal regions, where the humidity is high, the moisture content should be between 8 and 13 percent; and for the dry southwestern region, where the humidity is low, the moisture content should be between 4 and 9 percent. The moisture content of sheathing, framing, siding, and exterior trim at the time of installation should be between 9 and 14 percent moisture in most parts of the United States, and between 7 and 12 percent in the dry southwestern regions.

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If one or two of your friends (who also work with wood) look through your copy of "Saw Efficiency" and decide they would like to have a copy for their own use, clip out the blanks below for them to use. Or if you know of someone who has for some time desired just such a volume of information as is packed into this book, send us his name and address on one of these blanks. We will be glad to send him a copy.

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