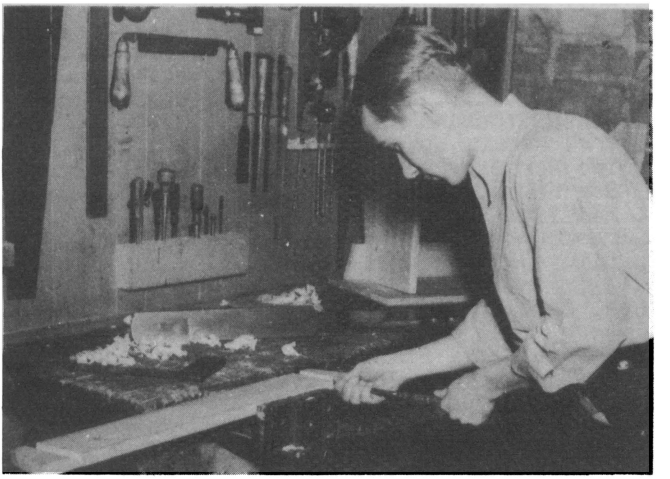
FARM HANDICRAFT

II—Woodwork

4-H CLUB CIRCULAR 55

COLUMBIA, MO. FEBRUARY, 1938



COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE AND THE UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

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CONTENTS*

* The Leader's Guide on Farm Handicraft II - Wood Work is to be used with this 4-H club circular.

FARM HANDICRAFT II - WOOD WORK*

INTRODUCTION

Nearly every day the farmer has occasion to use common tools in making some needed appliance or in making repairs or adjustments to his machinery, buildings or other equipment. A few good tools, kept sharp and in good condition, enable a farmer to do such jobs quickly and efficiently,and thus contribute much to the orderly operation of his farm.

If a boy develops the habit of properly using and caring for tools, he probably will use tools with profit and satisfaction to himself when he is older.

In presenting the handicraft wood work project, two major objectives have been kept in mind. One is that the boys and girls shall make appliances or articles which are valuable and which can be used about the farm or the home. The other and more important objective is that the members in making these articles shall acquire knowledge, skill and habits in the proper and efficient use of common tools. This may be contrasted with costly delays, bungled jobs, minor accidents and habits of "tinkering", too often developed by young people who have no systematic guidance in farm shop work. Acquiring knowledge and skill in the use of needed tools tends to give one an interest in making the needed repairs, which results in increased efficiency from properly kept farm equipment and machinery. To avoid the "bungled jobs" also means more pleasure in living on the farm, a more cheerful attitude, which is itself a boost to character building and an economic and social step forward for the farm family.

THE FARM SHOP

Organization of the Shop.

1 . Location.-The shop may be located where a dry protected room, or part of a room, can be set aside for this purpose. The location and type of room will vary greatly on different farms. One end or side of a garage or a machine shed usually makes a good shop if it is well lighted. Sometimes a part of an old house or granary can be used. The main requirement is a place in which a work bench can be located and tools kept in an orderly fashion. In addition to good lighting, it is desirable to have an old stove in good repair to provide heat in cold weather.

2 . Arrangement.-If possible, a work bench should be built. The tools can be arranged in a cabinet or a box, or simply hung on a board over the bench or at some other convenient place in the shop. It is a good plan to paint black outlines behind the tools so they can be easily returned to

*Prepared by Mack M. Jones, Professor of Agricultural Engineering, and Marion W. Clark, Extension Specialist in Agricultural Engineering, in collaboration with T. T. Martin and E. T. Itschner, State Club Agents.

their proper places after use.

The main points to be considered in shop arrangement are: (a) Safety, (b) Lighting, (c) Care of tools, (d) Convenience and (e) Cleanliness.

3. General Care of Tools.-Tools should be kept clean and dry, and where they may be readily found when needed. A light coat of oil should be kept on all tools that are not used frequently enough to prevent rusting. Rust may be removed from the tool by rubbing with oil, a soft brick or pumice stone. All cutting tools should be kept sharp. Sharp tools increase the speed and improve the quality of work done. Wood working tools are difficult to keep sharp if used on gritty surfaces. Such surfaces should therefore be brushed or cleaned well before working. A plane should not be used on sand-papered surfaces without first thoroughly cleaning the surface of grit. Planes should be placed on their sides when not in use, or the cutting edge be otherwise protected. One common error among shop students is to set planes up in the same position as they are held when working. This frequently dulls and nicks the blade as they are often set upon nails, metal objects and dirty surfaces. Care should be taken to keep sharp cutting edges from coming in contact with metal objects.

Tools should be used for the purpose for which they are designed. For example, a wrench should not be used instead of a hammer for pounding, nor a wood chisel instead of a "crow" or pinch-bar for prying.

4. Tools.-While it is desirable to have a complete set of tools, certain tools which are used frequently may be too expensive to be practical for a small shop. Workers are frequently handicapped, however, by too few and poorly kept tools. The following are the more common and useful woodworking tools: Hammer, Rip Saw, Cross Cut Saw, Coping Saw, Screw Driver, Wood Chisel, Jack Plane, Brace and Bits, Hand Drill with Drill Bits and Square.

Important points to be observed and definite directions for the proper use of each of these tools are given in the back of this circular. Directions for the use of any one tool should be studied by the member before he attempts the use of that tool in this project.

High quality tools should be purchased. This does not necessarily mean, however, that the highest priced tools need be bought.

TERMS AND DEFINITIONS

The club member will need to become familiar with some of the more common terms used in the project which are described below.

1. Working Drawing.-A working drawing is a drawing

which shows dimensions and gives all information necessary to guide one in the correct construction of an article.

2. Board Measure.-The size of a board is designated by its thickness, width and length, for example a 1 x 4 - 10 . Such a board is 1 inch thick, 4 inches wide and 10 feet long. If one called for this board at a lumber yard he would usually be sold a board that had been mill finished and is, therefore, somewhat thinner and narrower than the nominal dimensions. The board would be about 13/16 inch thick, about 3 and 13/16 inches wide, and would very likely be slightly over 10 feet long.

Lumber is sold by the board foot, which is the amount of lumber in a piece 1 inch thick, 1 foot wide and 1 foot long. The board feet in a piece of lumber may be found by multiplying the thickness in inches (for all lumber 1 inch or more) by width in feet, and by length in feet. A 1 x 4 ten feet long would be equal to 1 x 1/3 x 10, or 3 1/3 board feet (4 inches equals 1/3 foot). At 6c per board foot it will cost 20¢. Lumber under 1 inch thickness is commonly sold by the square foot. (Lumber prices are often stated in terms of 1,000 board or square feet, such as $60.00 per M.)

Lumber is graded and sold as "common" or "select". The coarser and more defective part of the lumber is called common lumber and is classed as No. 1, 2, 3 or 4. The better pieces of lumber are from the best trees and the better part of the tree. This lumber is graded as A, B, C and D. Thus, one may buy a select B piece of yellow pine, or if not such good lumber is needed, a piece of common No. 2. The member should learn to work with soft wood before attempting any of the more complicated or expensive articles of hardwood. Common hardwoods are black walnut, oak and hard maple.

3. Bill of Material.-A bill of material should be complete enough to guide the buyer in purchasing all materials. It should show the number of pieces of lumber required, kind of lumber and dimensions. It should list all needed hardware, paint, glue, etc.

SUGGESTED ARTICLES TO MAKE

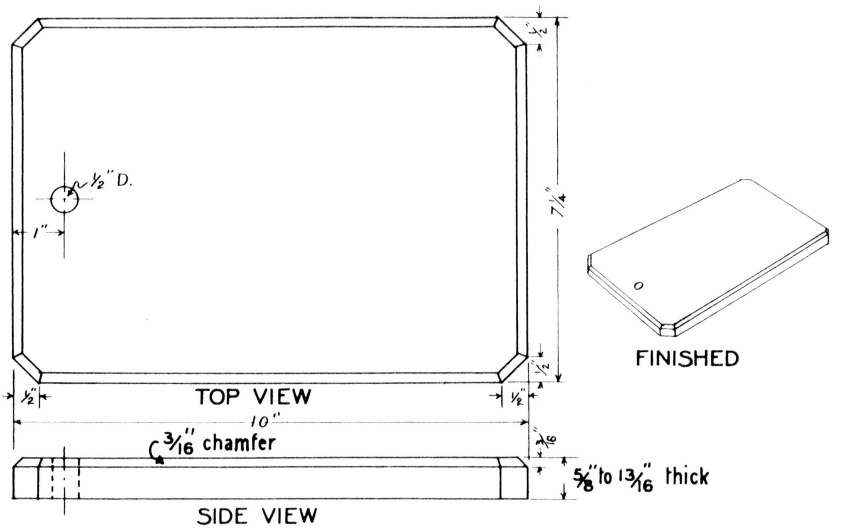
Plans for making the following articles are included in this circular:

A-Type Hog House	Bread Board	Nail and Tool Box
Barn Medicine Case	Broom Holder	Saw Horse
Bench Vise and Stop	Dog House	Tool Rack
Blue Bird House	Foot Stool	Two Horse Evener
Book Rack	Milk Stool	Work Bench
Book Shelves		

Bread Board

Lumber required: 1 pc. non-resinous lumber 1" x 8" - 10" (A larger board may be used if desired.

This is a useful article in the household and an excellent project to develop fundamental skills. Time should be taken to study the charts on proper use of each tool before that tool is used on this project, even if the member has used the tool on other work before.

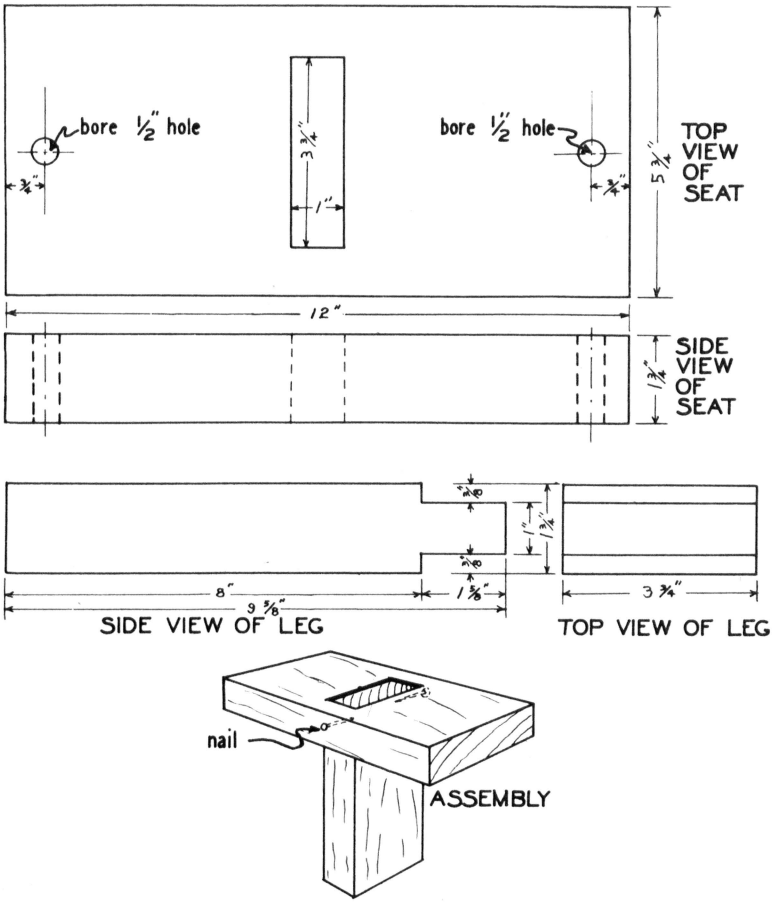


Secure a piece of non-resinous lumber, such as soft pine or hard maple, 1" x 8" - 12". Square up the stock. This is done by selecting the best face and planing (study page 27 before using plane) it to a smooth, true surface. Plane with the grain. Use the try square as directed on page 32 to determine when the face is true. Select the best edge and plane it straight and square to the working face. Mark an end square by use of the square, drawing a line across the working face. Saw slightly outside the line (study page 38 on proper use of saw) and plane to the line. This gives a working face, an edge, and an end that are straight, squared and properly smoothed. Reduce the board to finished dimensions as shown in the drawing ($7\frac{1}{4}$ inches wide, 10 inches long and between 5/8 and 13/16 inches thick). Mark off the proper width $7\frac{1}{4}$ inches across the face from the working edge, turn the board over and mark off the unplaned side in like manner. If the mark is made with a pencil outside a straight edge, plane out the mark to give proper dimensions, but if the mark is made with a marking gauge, leave half the mark. Check to see that the edge is squared. To reduce to the proper thickness (between 5/8 and 13/16) mark all four edges, measuring from the working face. Plane to the lines. Reduce the board to the proper length (10") by measuring from the working end and drawing a line across both faces by aid of the square. Saw just outside the mark and use a sharp plane to reduce to the proper length and smooth the end. Make a mark on the edge of the board $\frac{1}{2}$" back from the corner, and another mark on the end $\frac{1}{2}$" back from the corner. Draw a line on the face connecting the two

points, then from the points draw a line across the edges with the aid of the square. Saw the corner off and dress down with the plane. Treat all four corners in like manner. Make a mark on the working face 3/16 inch from the edge completely around the board. Make another such mark (on the edges and ends) 3/16 inch from the face. Make the chamfer by planing carefully to the lines. Bore a 1/2 inch hole in the board (study page 33 proper use of brace and bit) the center of the hole to be 1 inch from the end and midway between the sides.

Sandpaper the board (study page 24) and apply a light coat of linseed oil to prevent absorption of moisture. The edges, or both the edges and chamfer may be enameled or lacquered if desired. (Finishing, reference, page 23).

Milk Stool



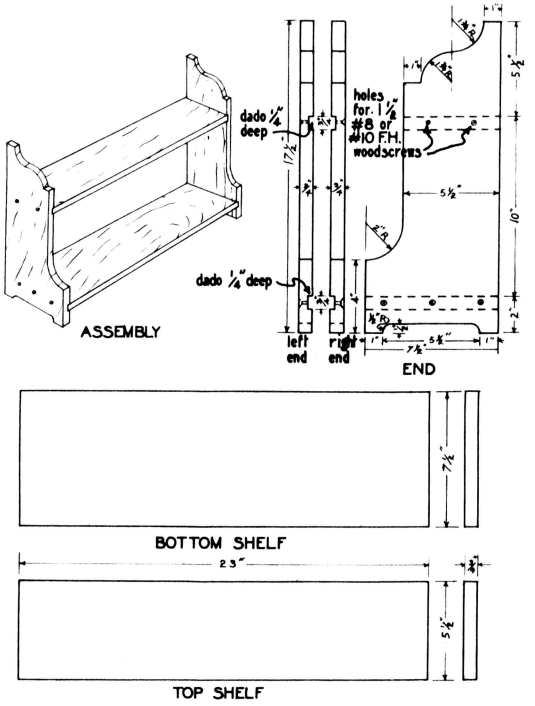
Lumber required: 1 pc. 2" x 6" - 1'. 1 pc. 2" x 4" - 1'.

Make out complete bill of materials for the job before starting. Square up one end of the 2" x 4" piece. For a distance of 1 3/4 inches from one end, reduce the stock to 1 inch thick x 3 3/4 inches forming a tenon or tongue. This is done by first carefully marking out the tenon and working it to size with a saw, or saw and chisel. Use care not to over-saw or cut too deep. (See pages 35 and 36 on use of wood chisel). Be careful not to split any part of the working stock.

Square up the 2" x 6" making it 12 inches long. In the center of this piece form a mortise (or square cornered hole, 1" x 3 3/4". Mark off the place for the mortise on both faces of the stock. Use a large auger bit to bore out the center of the hole, and a chisel or chisel and file to finish it. Care should be taken not to make the mortise too large. Work carefully when mortise and tenon are about the proper size in order that a snug fit be obtained. Drive one nail through each edge of the seat and into the tenon to make it secure. (See page 37 on use of the nail hammer). Paint white or other suitable color. (Reference, page 23 on finishing).

Book Shelves

Lumber required: 1 pc. 1"x8"-5'. 1 pc. 1"x6"-2'.



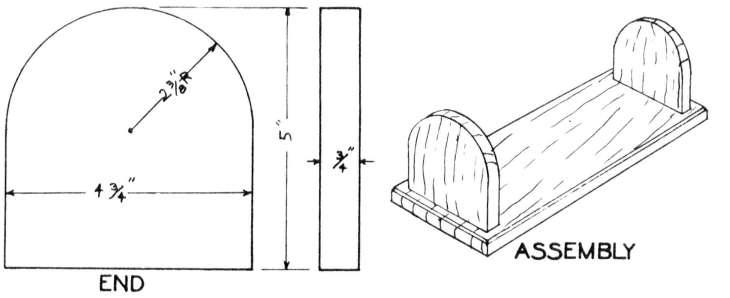
Make out complete bill of materials for job before starting.

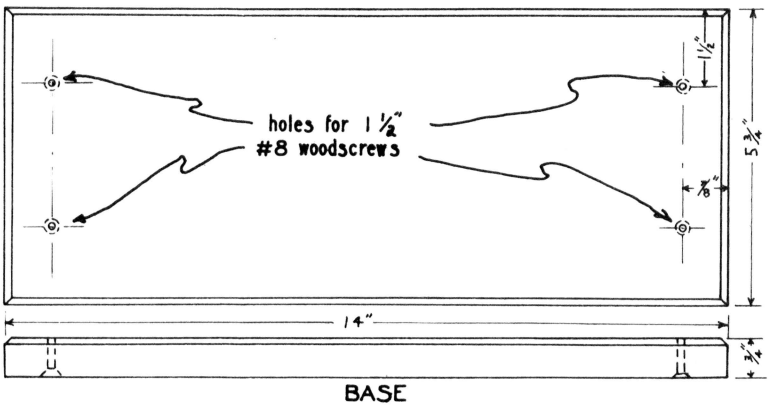
A set of book shelves is needed by most members to provide an orderly method of keeping school books, and the shelves add a neat, attractive piece of furniture to the home.

Make the shelves of oak, walnut or other suitable wood. Carefully square up the stock and plane all surfaces smooth.

In sawing the curved ends, use a coping or compass saw. Saw close to the lay-out line and leave only a little smoothing to be done with a half-round file. Filing should be done with full-length, moderately slow strokes. Pressure should be released or the file lifted slightly on the back stroke. Short, rapid, jerky strokes are the mark of a poor workman. Splintering while sawing may be prevented by clamping a piece of thin scrap lumber behind the work, and sawing through both pieces at once. Square up and dress the pieces for the shelves, then cut the dadoes in the end pieces to fit snugly. Sandpaper smooth before assembling. Fasten together with 1½-inch No. 8 or 10 flat head wood screws, countersunk flush with the surface. (Study chart, page 39 on use of screws and screw driver). Finish by staining or oiling and then waxing. (See "Finishing" reference, page 23 for other finishing suggestions).

Book Rack



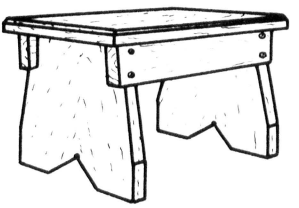


Lumber required: 1 piece 1" x 6" - 2'

Make complete bill of material before starting the exercise.

The book rack may be made of oak or walnut. Make to the dimensions shown on the working drawing. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. After dressing the stock, mark out the ends carefully on both sides, and saw with the coping or compass saw. (Alternate method--saw to line as closely as possible, using straight cuts; round with plane). (Reference, page 38). Put together with No. 8 flat head screws, countersunk slightly below the surface (reference, page 39). The finish may be made by staining or oiling, and then waxing (reference, page 23).

Foot Stool



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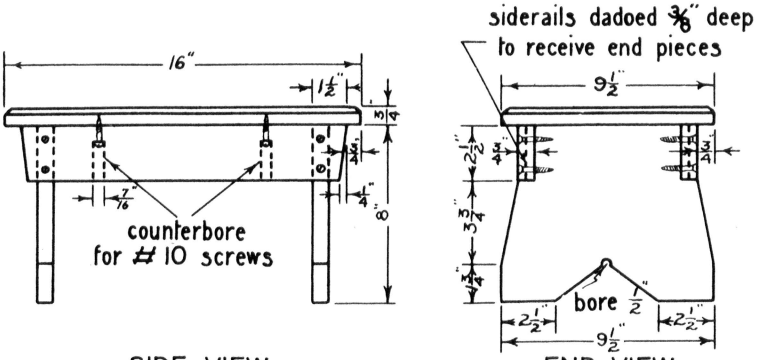


SIDE VIEW

END VIEW

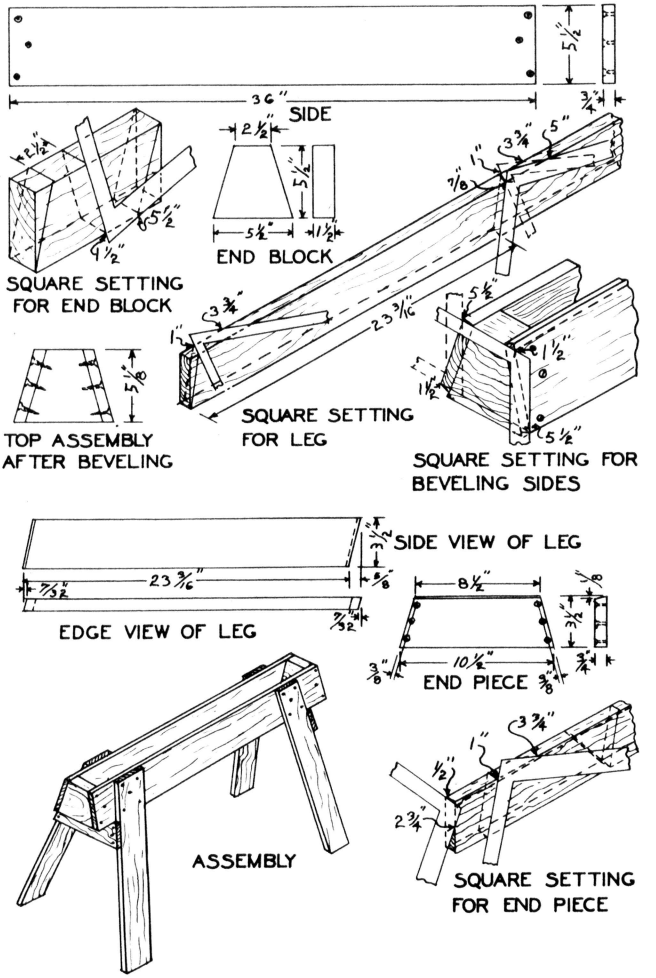
Lumber required: 1 piece 1" x 10" -3'
1 piece 1' x 4" - 2½'

Make complete bill of materials before starting the exercise.

The foot stool should be made of oak, walnut or other suitable hard wood to the dimensions shown in the drawing. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. Study the working drawing. Dress the two pieces of stock to appropriate dimensions. Make the cuts carefully and accurately after marking. Dado the side rails to fit the end pieces.

Plane and sandpaper all outside surfaces smooth before assembling. (Reference, page 24). Fasten the side rails to the ends with No. 8 or 10 flat head screws, countersunk flush with the surface, or with round or oval head ornamental screws. (Reference, page 39). Finish by staining or oiling, then waxing; or by applying other standard finishes. (Reference, page 23).

Saw Horse



Lumber required: 1 pc. 1" x 6" - 6'
1 pc. 2" x 6" - 1'
1 pc. 1' x 4" - 10'

Make complete bill of materials before starting the exercise.

No. 1 yellow pine may be used to make the open top saw horse. Mill finished lumber will not require planing to a smoother finish, nor to exact widths and thicknesses shown in the working drawing. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions.

Cut the 1"x6"-36" pieces for the top, then the 2"x6" end blocks. Mark and saw carefully so that little or no finishing of sawed surfaces will be necessary. (Reference, page 38). In cutting the end blocks, first mark off 2-1/2 inches across the top and mark off the angles at the ends of the block with a square or T-level. The square should be set on figures proportional to 6 and 22, such as 3 and 11, or 1-1/2 and 5-1/2 as shown on page 11. Saw the two blocks exactly the same and put the top together with No. 10 flat head screws, countersunk flush with the surface. (Reference, page 39). Mark off the bevel of the two top pieces and plane as shown on page 11. Also plane 2 x 6 end block flush with sides. Saw out the legs by first marking accurately entirely around the stock with the square set to 1 and 3-3/4 for edge marks and to 7/8 and 5 for side marks. This will leave the end of the board, from which a leg is cut, just right for the end of the next leg. Mark the location for the legs on the top already assembled and place the legs in position accurately, then secure each leg with No. 10 flat head wood screws. Bevel the top edge of the 1' x 4" end piece. The proper bevel can be obtained by marking on the ends with the square, using the proportional setting of 4 and 22 or 1/2 and 2-3/4. The ends of the pieces can then be marked off by using the setting of 1 and 3-3/4 as indicated. Because of variation in the thickness of stock and slight errors in marking or sawing, the club member may check his materials and workmanship by placing the marked brace in position and seeing how it fits. Any needed corrections can then be made.

If all legs do not fit down on the floor after assembling, proceed as follows: Place the horse on a level surface and hold it down firmly on three legs; place a thin piece of wood, such as a rule, against a leg and mark all the way around it on top of the thin piece; mark all legs in the same manner; cut the legs off to the marks.

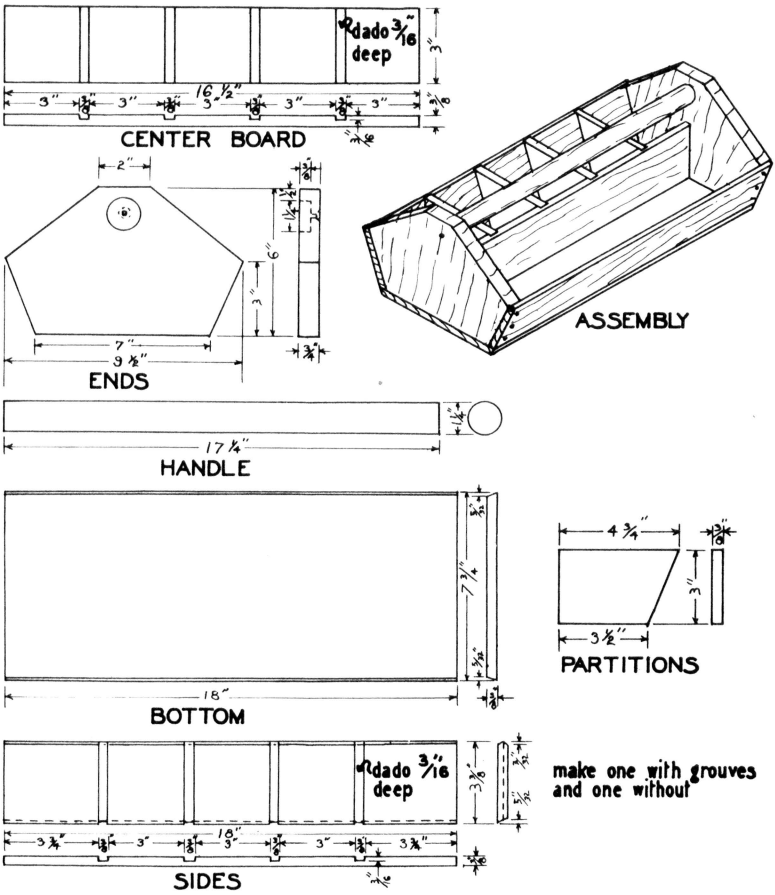
Nail and Tool Box.

Lumber required:

1 pc.	1"	x 10"	- 1'
1 pc.	½"	x 8"	- 1½'
1 pc.	½"	x 4"	- 6'
1 pc.	2"	x 2"	- 1½'

Use No. 1 yellow pine or oak for the ends, bottom and hand grip. Use white pine or other suitable thin material for the sides and nail compartments. Plane broad surfaces only where necessary to make them true. Reference, page 27. (Mill planed lumber is smooth enough for a tool box). The

thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. Make the box according to the working drawing. The two end pieces may be clamped together and the edges of both pieces finished together. Use a piece of broom handle for the hand grip or make a round handle from a piece of 2-inch yellow pine or



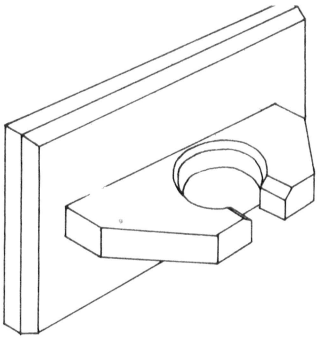
oak. First make the handle square; then plane down the corners until it is 8-sided; then make it 16-sided and finally round. Fasten the main parts together with flat head wood screws, countersunk flush with the surface. (Reference, page 39). Fasten the nail compartments together with finish nails. Apply a good coat of linseed oil or paint.

Broom Holder

Lumber required: 1 piece 1" x 6" - 1'.

Make a complete bill of materials before starting this exercise.

The broom holder may be made of white pine or cypress. Square up and dress the 1"x6"-1'. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. Mark and saw accurately (reference, page 38). Work the back board to dimensions, chamfer the top edge, and lay out the centers for the screws on the back. Lay out the holder as shown in the drawing. At the center of the holder lay out a 2-inch circle with a compass or pair of dividers. Draw lines for the entrance and cut out the circle with a coping saw. Smooth with a file. Cut off the corners as shown, and smooth with a plane. Round the edges of the circle on top to prevent cutting broom fibers.



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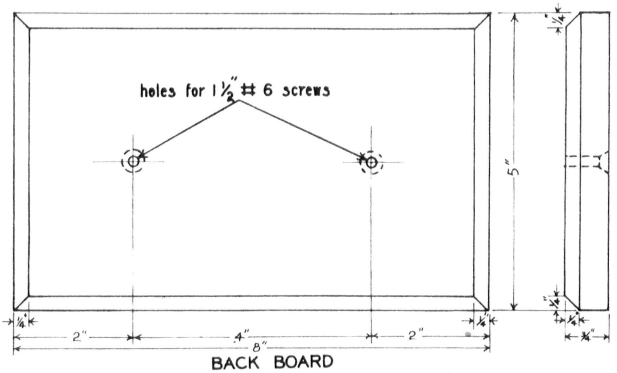
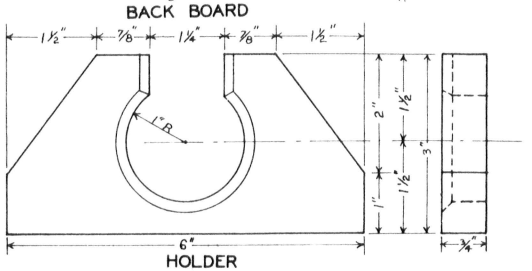
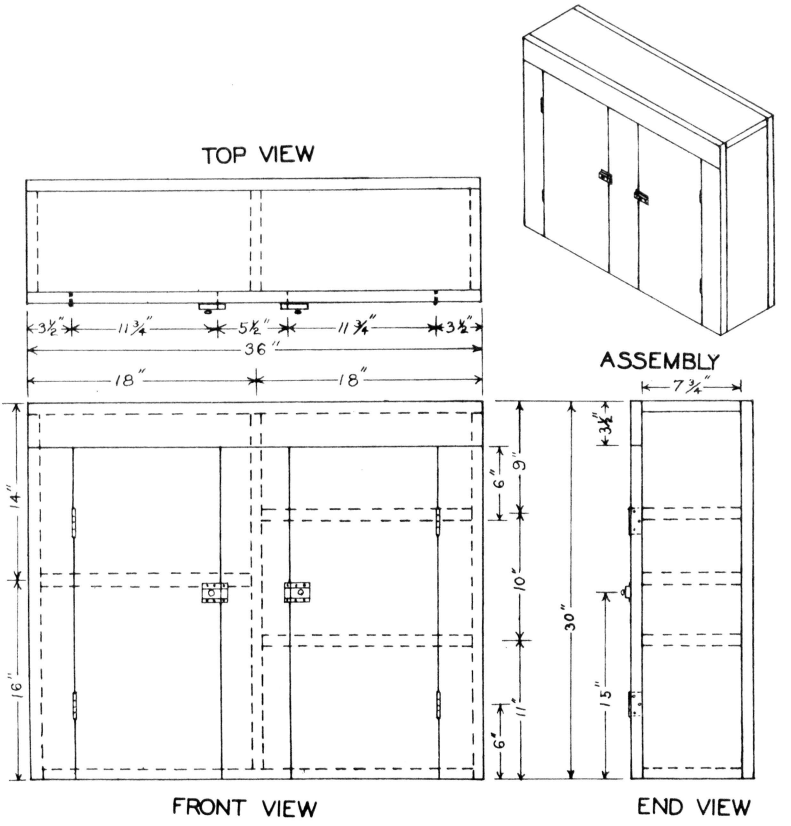




Sandpaper and finish to harmonize with woodwork where it is to be used, or stain and varnish. Reference, page 23.

Barn and Medicine Case*



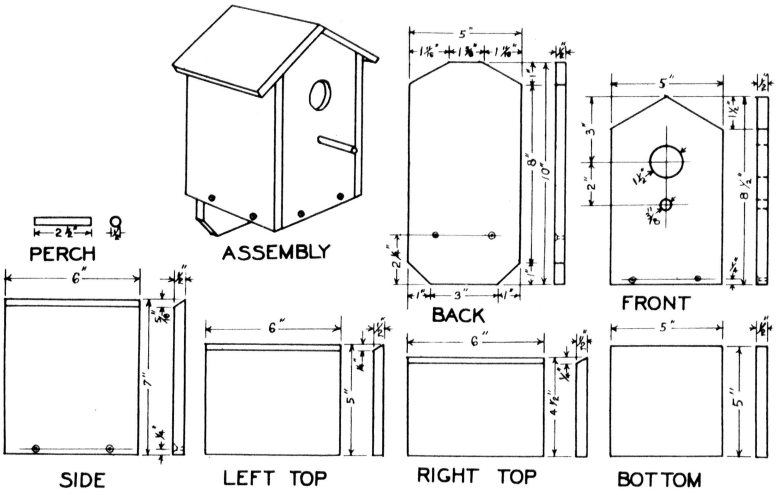
Lumber required:
1 pc. 1" x 6" - 8'
1 pc. 1" x 8" - 8'
1 pc. 1" x 8" -10'
1 pc. 1" x 4" - 8'
1 pc. 1" x 6" -10'
1 pc. 1" x 12" - 5'

Make a complete bill of materials before starting the exercise.

The medicine case may be made of No. 1 yellow pine and made according to the working drawing shown. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. The work should be carefully and accurately planned, then accurately executed. Six penny finishing nails or No. 6 wood screws may be used to put the case together. Small hinges, small knobs and buttons may be used on the doors. The case may be finished by sandpapering and painting.

*Used through courtesy of Michigan State Agricultural College.

Blue Bird House



Lumber required: 1 piece 1" x 6" - 4'.

Make complete bill of materials before starting on exercise.

Plans should be studied and the blue bird house made according to the working drawings. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. Weather resistant material, such as cedar should be used to make the bird house and no paint or finishing should be used. It is very important that the blue bird house be protected from house cats by tin bands or something similar being placed around the pole below the house. The house should be put up early in the spring. It may be taken down during the winter if desired.

Work Bench*

Lumber required (for a bench 4 ft. long):

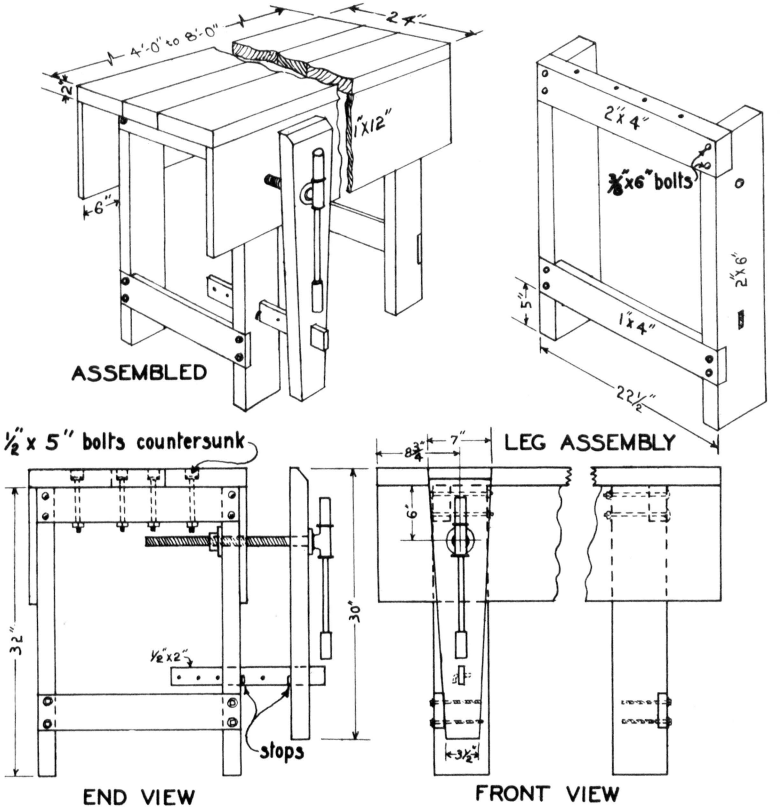
1 pc. 2" x 6" - 1'
1 pc. 2" x 4" - 8'
1 pc. 1" x 4" - 4'
1 pc. 1" x 12" - 8'
1 pc. 2" x 10" - 8'
1 pc. 2" x 8" - 3'
1 pc. 1" x 2" - 2'

Make a complete bill of materials before starting the exercise.

The work bench is one of the most important items of

*Used through courtesy of the University of Wisconsin.

equipment in the shop. It makes for orderly, systematic work, saves time and promotes good workmanship. It may be made of yellow pine, but the vise should be of hard, strong material, such as oak or birch. The vise screw can be pur-



chased at the local hardware store. Mortise one leg for the sliding vise stop. (Reference, page 35). Attach the top boards to the leg assembly, then the drop sides and the vise. Plug the counter sunk holes on the top with wood plugs and leave a smooth, even surface on top of the bench.

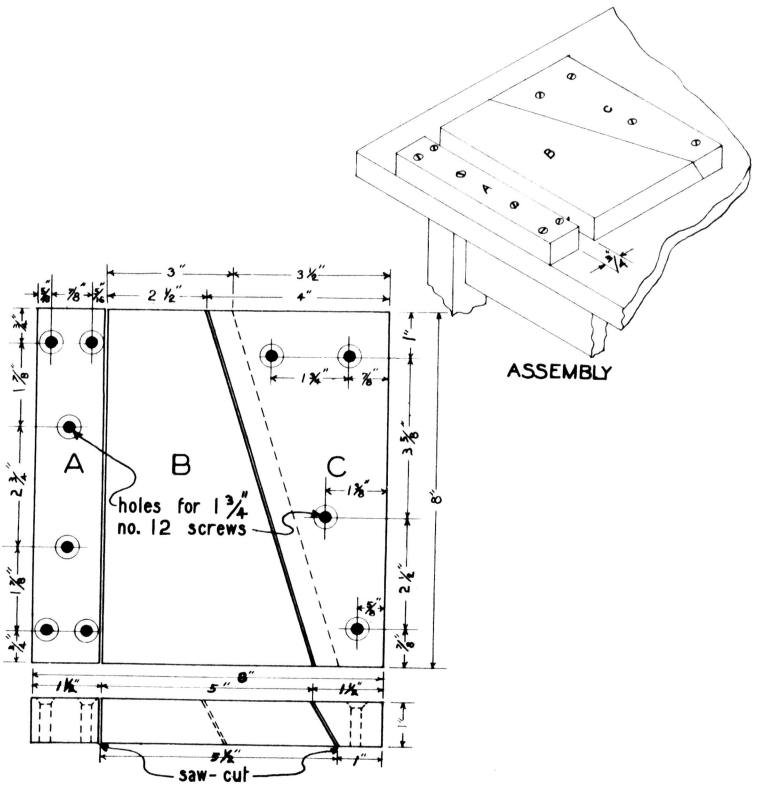
Bench Vise and Stop

Lumber required: 1 pc. 1" x 8" -1'.

Make complete bill of materials before starting exercise.

The bench vise and stop may be made of oak or No. 1 yellow pine. Make according to working drawing. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. Mill planed

lumber is smooth enough, and planing need be done only when necessary to true up the stock. The two pieces with beveled edge may be ripped from one piece of stock by sawing at the



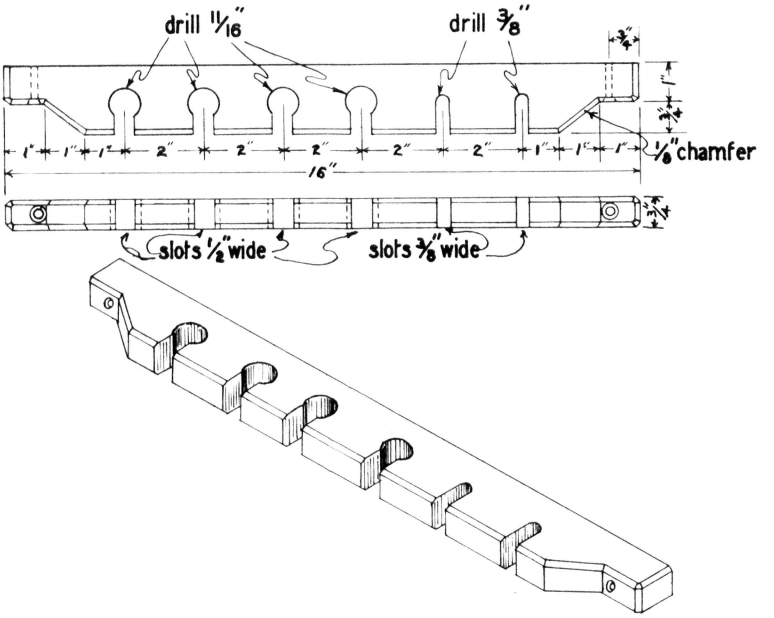
proper angle. Drill and countersink holes to receive No. 10 flat head screws to fasten to the top of the bench. No finish is required.

Tool Rack

Lumber required: 1 pc. 1" x 2" - 1½'.

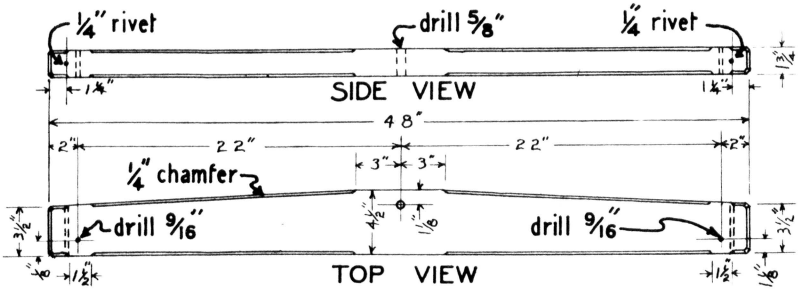
Make a complete bill of materials before starting on the exercise.

Make the tool rack of No. 1 yellow pine or any other suitable wood to the dimensions shown in the working drawing. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. Lay out the work very carefully before boring the holes and cutting the slots. (Reference, page 33). Saw carefully to the lines so that a minimum of smoothing will be required. (Reference, page 38). Drill and countersink holes in the ends to receive No. 10 flat head wood screws for fastening to



the wall or into a cabinet. (Reference, page 39). Smooth the sawed surfaces of the slots with a wood file.

Two Horse Evener



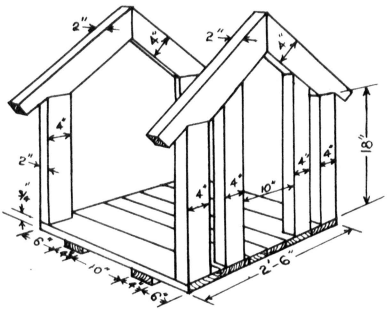
Lumber required: 1 pc. 2" x 6" - 4'.

Make a complete bill of materials before starting the exercise.

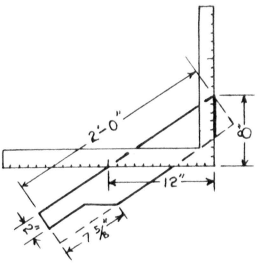
A good two-horse evener is a piece of equipment that will find ready application on the farm. The evener should be made of oak, hickory, osage orange, ash or red elm. The ends may be bound with a metal cap, strap iron or just a rivet. A rivet or 1/4-inch bolt should be put through the end to clamp the binder to the evener. If a wagon evener is desired, the strap iron may extend entirely across the back edge of the evener from one end to the other.

Note: If osage orange is used, it will be difficult to prevent severe season cracking unless it is thoroughly seasoned. Even then it is often advisable to keep the evener well oiled for some time.

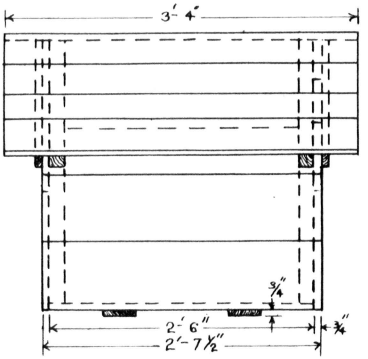
Dog House



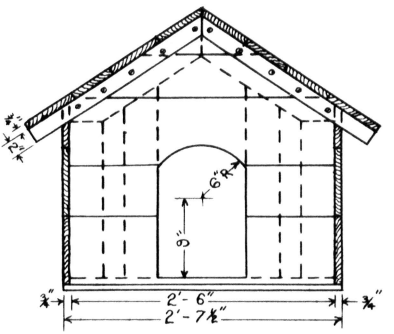
DETAIL OF FRAMEWORK



LAYOUT OF RAFTERS SHOWING ROOF SLOPE



SIDE VIEW



END VIEW

Lumber required:
1 pc. 2" x 4" - 8'
1 pc. 2" x 4" -10'
1 pc. 1" x 4" -10'
5 pc. 1" x 6" -10'
3 pc. 1" x 6" - 8'
1 pc. 1" x 2" - 8'

Make a complete bill of materials before starting the project.

The dog house may be made of No. 1 or No. 2 yellow pine, according to the dimensions shown on the working drawing. Cut out and put the floor together, then cut the frame work and proceed with the sides and roof. The thickness of the parts may vary slightly if the stock does not dress conveniently to the exact dimensions. Check the lumber required, plan the work accurately and execute it carefully, just as you would a larger building. The roof and floor may be run

out farther in front with another set of rafters and studding at the end to form a porch where the dog may lie. This will call for more lumber and may not, in some cases, be worth the added cost. Individual judgment may be used regarding this. This dog house is so arranged that the top can be readily removed for cleaning. After the sides and ends are completed, a 1" x 4" is screwed into place on the gable as shown, and the top nailed to these pieces. Then to remove the top, the screws are simply removed from the 1" x 4"'s.

A common weakness of farm buildings is the lack of sufficient nails in the joints. A rough guiding rule for the use of nails in a joint is: Nails should not be spaced closer together than 1/3 of their length; nor closer to the edge of a board than 1/4 of their length. The spacing will, of course, depend a great deal on the material. If the material does not split easily, more nails than the rule specifies can be used to strengthen the joints.

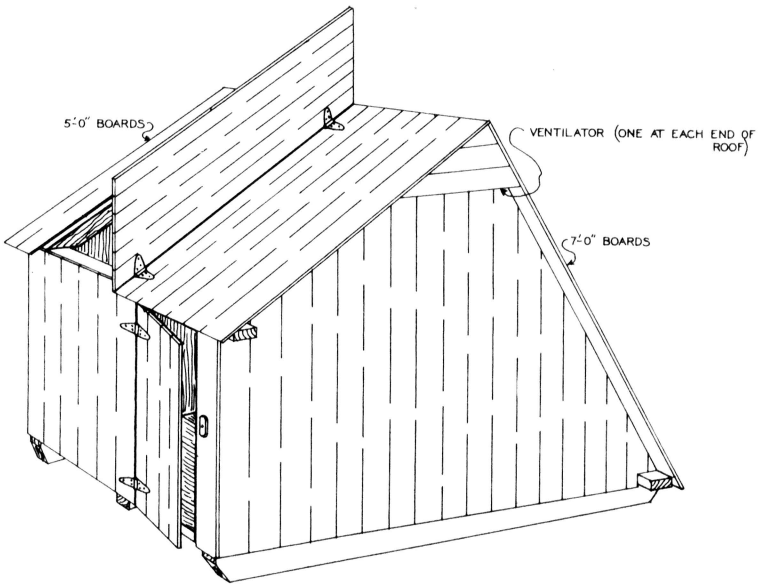
Modified "A" Hog House

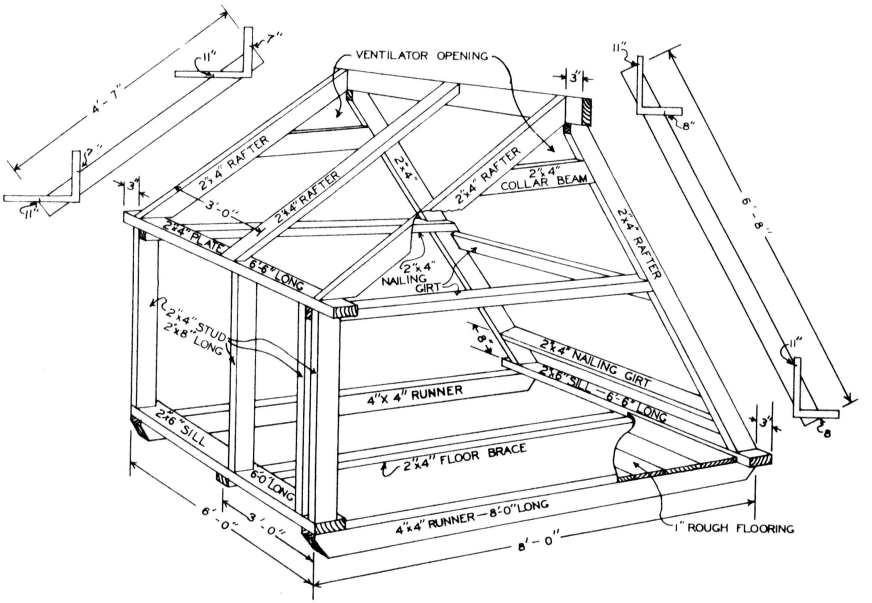
Bill of Material

No.	Size	Purpose
2	4" x 4" x 8'	Runners
1	2" x 6" x 6'	Front Sill
1	2" x 6" x 6'6"	Rear Sill
1	2" x 4" x 8'	Floor Brace
4	2" x 4" x 2'8"	Studs
2	2" x 4" x 6'6"	Plate Ridge
4	2" x 4" x 6'	Nailing Girts
2	2" x 4" x 6'8"	Rear Rafters
3	2" x 4" x 4'7"	Front Rafters
2	2" x 4" x 1'10"	Collar Beams
16	1" x 6" x 12'	Roof
12	1" x 6" x 3'	Siding, Front
3	1" x 6" x 12'	Siding, Ends
7	1" x 6" x 10'	Siding, Ends
7	1" x 6" x 8'	Siding, Ends
10	1" x 10" x 6'	Floor
1	1" x 4" x 12'	Door Battens

Hardware — 1 pr. 6" and 1 pr. 8" hinges, 1 hasp with screws, 2 lbs. 16d spikes, 2 lbs. 8d nails, 3 lbs. 6d nails, 1/2 gallon creosote for floor and skids, 1 gallon paint.

MODIFIED "A" HOG HOUSE





FURNITURE FINISHING

There are many different kinds and degrees of furniture finishing which range from simple painting, or oiling and waxing, to very delicate varnish finishes. The general principles of finishing are given, and two or three finishes outlined in detail for use of the members. Any other finishes desired by the member and approved by the leader may be used.

All surfaces should be thoroughly cleaned and smoothed, usually by planing and sandpapering. Sandpapering with No. 1 sandpaper and followed by No. 0 gives a surface smooth enough for most finishes. (See use of sandpaper, page 23).

It is very important that paints and varnishes be applied in a place free from dirt and dust. This is particularly true of varnishes.

Simple Finishes

The simple finishes which are economical and comparatively easily applied, and yet attractive and effective, consist simply of (1) smoothing the article as previously described, (2) oiling or staining, and (3) waxing with a good quality of furniture or floor wax.

Fine Finishes

If a fine finish is to be applied to a new piece of coarse grained wood, such as oak or ash, it may be desirable to use a filler first. This material with directions for use can be secured at any reliable hardware or paint store. After the filler is applied, the wood may be stained and varnished. Two or three coats of varnish may be applied, rubbing down the surface after a coat has dried and before the next coat is applied. Varnishing should be done, as previously mentioned, in a room that is as free from dust as possible. A new brush, or one which has never been used in anything except varnish, should be used for the application of the varnish. Paints are usually applied to cheaper wood and outside surfaces. Directions for the best use of paint are usually found on the container.

Refinishing.

Very often it is desirable to refinish or repair some piece of furniture around the house. This does not vary greatly from finishing new surfaces, except for getting the material cleaned and smoothed.

This process will usually consist of (1) Removing old finish, paint or varnishes, by the use of a woodscraper or some such tool, being careful not to scar the wood beneath the paint. (Reference on use of scraper, page 40). Paint remover may be used on some articles. This material is often highly inflammable and should be used cautiously. (2) Remove grease spots or discolorations and any glue left on

the surface. (3) Remove dents and fill holes and cracks. (4) Sandpaper to get smoother finish. (5) Apply the new finish.

Grease spots may be removed by applying a cloth dampened with benzine. (Caution: benzine is explosive). This will also remove most of the discolorations.

Glue may be removed by scraping or by applying a piece of damp cloth and then placing a hot iron over the cloth. If glue is not removed, it acts as a filler and will prevent the finish from entering the wood.

Small dents may be removed by applying a piece of damp muslin over the dent and placing a hot iron on the cloth. This may have to be repeated several times and the surface will become rough and will require sandpapering before completing.

Holes and cracks may be filled by several different methods, depending upon the size or extent of such blemishes. If the hole is very large, a piece of wood similar to the rest of the surface should be carved out and fitted in place. Small holes or cracks can be filled with a thick paste made by mixing fine sawdust of the wood with ordinary glue. Care should be exercized not to get the glue on the surrounding surface.

A very satisfactory mixture for filling cracks in wood may be made by mixing corn starch and wheat flour, one part of each, and then adding one part of linseed oil and one part of Japan drier. This mixture will take any finish that the wood may have applied to it.

After all this work is done to any piece of furniture it should be sandpapered and prepared for finish as previously outlined.

Suggestions on the Use of Sandpaper.

Sandpaper should be used by placing the sheet around a block of wood about 3 x 5 inches. This gives a good firm surface to back the paper and provides a convenient means of holding it. In a few places which cannot be reached by this block, sanding may be done by using a smaller block or without the use of the block for a very small area. When using sandpaper, always sand with the grain, except, of course, while sanding the ends.

Sandpapering should not be attempted until all work with cutting tools, such as planes and scrapers, is completed.

Care of Brushes.

A brush should never be allowed to rest upright on its bristles. If work is stopped for a few minutes, the surplus paint may be removed from the brush by wiping it on the edge of the pail. The brush should be laid flat across the top

of the paint pail or on a smooth clean surface. If the work is stopped overnight, the brush should be placed in a can of turpentine or raw linseed oil, in the case of paint brushes; or turpentine and paint thinner, in the case of varnishes. This can best be done by use of a small hole through the handle and a small wire hook on the side of the can. The bristles should be covered by the liquid, but should not touch the bottom of the can. When a job is done, the brush should be cleaned thoroughly with turpentine, benzine, kerosene or gasoline, and then washed with warm soap suds. It should then be given a shake to straighten out the bristles, wrapped in heavy paper while still damp and then laid away or hung up in a dry, cool place.

Handling the Paint Brush.

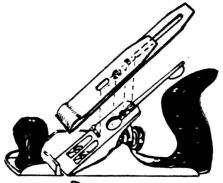
The brush should be held firmly, but lightly with the long part of the handle resting between the thumb and finger. The fingers should not extend down on the bristles. The bristles should be dipped into the paint about 1/3 of their length, then the excess paint removed by gently tapping the brush against the side of the pail or by wiping it over the inside edge of the pail.

The paint or varnish should be applied to the surface with long, sweeping strokes, usually with the grain of the wood, and the strokes should be "feathered", that is, the brush should be brought down against the surface gradually at the beginning of the stroke and lifted gradually at the end of the stroke. The paint should be brushed out well to form an even coating.

Blistering.

Blistering occurs on newly painted surfaces and is caused by moisture in the wood. As the moisture comes out of the wood, small blisters are formed in the undried paint. As these blisters dry, the paint cracks and peels off. Blistering can be prevented by having the wood thoroughly dry before painting. Peeling will occur also when the priming coat is not properly thinned with turpentine to cause good penetration.

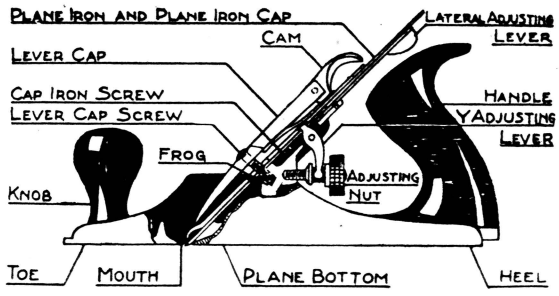
HOW TO SET THE PLANE



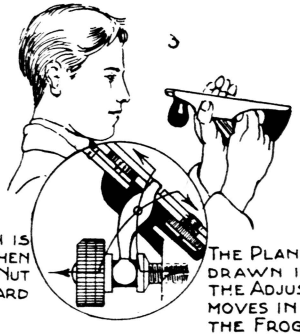
TO PUT THE PLANE TOGETHER LAY THE PLANE IRON, BEVEL SIDE DOWN, ON THE FROG. BE SURE THE ROLLER ON THE LATERAL ADJUSTING LEVER, THE END OF THE Y ADJUSTING LEVER AND THE HEAD OF THE PLANE IRON CAP SCREW ARE CORRECTLY SEATED

SLIP THE LEVER CAP UNDER THE LEVER CAP SCREW AND PRESS DOWN THE CAM. IF THE PLANE IRON IS IN THE CORRECT POSITION THE CAM WILL EASILY SNAP IN PLACE. IF THE CAM WILL NOT SNAP IN PLACE EASILY, SLIGHTLY LOOSEN THE LEVER CAP SCREW.

IF THE PLANE IRON IS NOT FIRMLY HELD WHEN THE CAM IS IN PLACE SLIGHTLY TIGHTEN THE LEVER CAP SCREW.

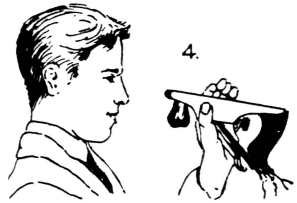


TO ADJUST FOR THE THICKNESS OF THE SHAVING SIGHT ALONG THE BOTTOM OF THE PLANE AND TURN THE ADJUSTING NUT UNTIL THE CUTTING EDGE PROJECTS ABOUT THE THICKNESS OF A HAIR.

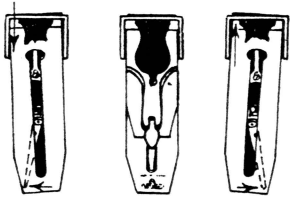


THE PLANE IRON IS PUSHED OUT WHEN THE ADJUSTING NUT MOVES OUT TOWARD THE HANDLE.

THE PLANE IRON IS DRAWN IN WHEN THE ADJUSTING NUT MOVES IN TOWARD THE FROG.



TO ADJUST FOR THE EVENNESS OF THE SHAVING SIGHT ALONG THE BOTTOM OF THE PLANE AND MOVE THE LATERAL ADJUSTING LEVER TOWARD THE RIGHT OR THE LEFT.

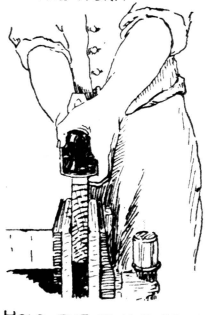


KNOB, LEVER CAP AND PLANE IRON CAP REMOVED TO SHOW THE ACTION OF THE LATERAL ADJUSTING LEVER.

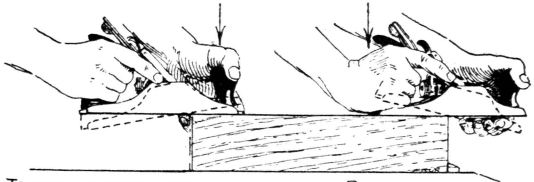
Courtesy of Stanley Tools, New Britain, Connecticut

HOW TO USE THE PLANE

TO START PLANING TAKE AN EASY BUT FIRM POSITION DIRECTLY BACK OF THE WORK

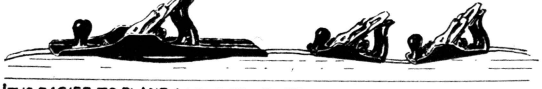


HOLD THE PLANE SQUARE WITH THE WORK FACE OF THE WORK



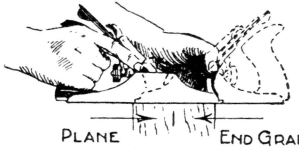
TO CUT A SMOOTH STRAIGHT EDGE THE PLANE IS PUSHED WITH THE GRAIN. THAT IS IN THE UP HILL DIRECTION OF THE FIBRES. TO KEEP THE PLANE STRAIGHT PRESS DOWN ON THE KNOB AT THE BEGINNING OF THE STROKE AND ON THE HANDLE AT THE END OF THE STROKE. AVOID DROPPING THE PLANE AS SHOWN BY THE BROKEN LINES. IT ROUNDS THE CORNERS

TO OBTAIN A SMOOTH SURFACE PLANE WITH THE GRAIN. IF THE GRAIN IS TORN OR ROUGH AFTER THE FIRST STROKE REVERSE THE WORK.
IF THE GRAIN IS CROSS OR CURLY SHARPEN THE PLANE IRON CAREFULLY, SET THE PLANE IRON CAP AS NEAR THE CUTTING EDGE AS POSSIBLE AND ADJUST THE PLANE IRON TO TAKE A VERY THIN EVEN SHAVING.

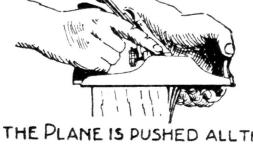


IT IS EASIER TO PLANE A LONG EDGE STRAIGHT WITH A LONG PLANE THAN WITH A SHORT ONE. A LONG PLANE BRIDGES THE LOW PARTS AND DOES NOT CUT THEM UNTIL THE HIGH SPOTS ARE REMOVED.

AT THE END OF THE STROKE THE WEIGHT OF THE BODY SHOULD BE CARRIED EASILY ON THE LEFT FOOT.



PLANE END GRAIN HALF WAY FROM EACH EDGE.

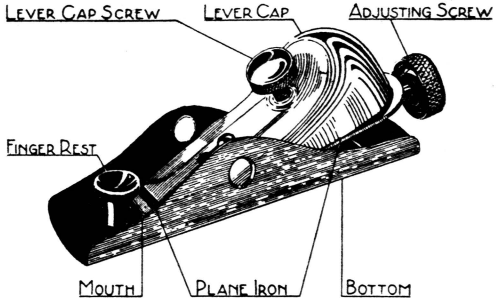


IF THE PLANE IS PUSHED ALL THE WAY THE CORNERS WILL BREAK

Courtesy of Stanley Tools, New Britain, Connecticut

HOW TO ADJUST AND USE THE BLOCK PLANE

TO ADJUST THE PLANE IRON, VERTICALLY, FOR THE THICKNESS OF THE SHAVINGS, SIGHT ALONG THE PLANE BOTTOM AND TURN THE ADJUSTING SCREW FORWARD TO PUSH THE PLANE IRON OUT, OR TURN IT BACK TO PULL THE PLANE IRON IN.

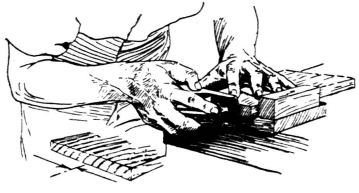


KEEP YOUR PLANE SHARP

TO ADJUST THE PLANE IRON LATERALLY FOR EVENNESS OF SHAVINGS, LOOSEN THE LEVER CAP SCREW. SIGHT ALONG THE PLANE BOTTOM, PRESS THE PLANE IRON TO THE RIGHT OR TO THE LEFT AND TIGHTEN THE LEVER CAP SCREW.

THE BLOCK PLANE HAS A SINGLE PLANE IRON SET AT A LOWER ANGLE THAN THE PLANE IRON OF THE SMOOTH PLANE, ENABLING IT TO CUT END GRAIN BETTER THAN OTHER PLANES. BECAUSE OF THE LOW ANGLE THE PLANE IRON IS SET BEVEL UP.

THE BLOCK PLANE IS USED TO PLANE SMALL PIECES AND TO PLANE THE ENDS OF MOULDINGS, TRIM AND SIDING



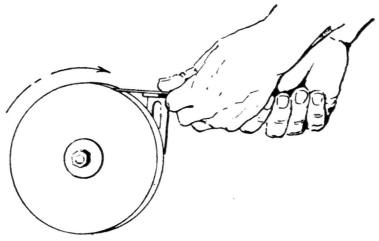
THE BLOCK PLANE IS A TOOL USED IN ONE HAND. THIS MAKES IT EASY TO USE WHEN THE WORK CANNOT BE TAKEN TO A VISE.

THE BLOCK PLANE IS THE HANDIEST TOOL FOR PLANING CORNERS AND CHAMFERS ON SMALL PIECES OF WOOD.

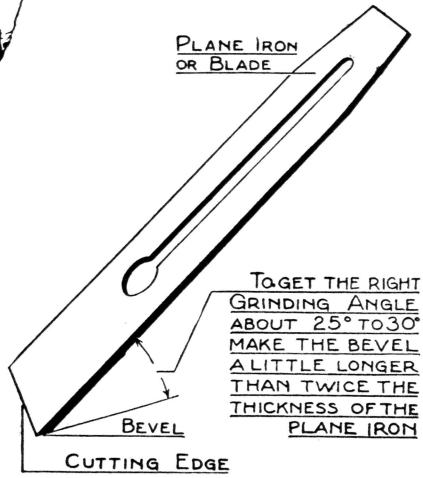
THE BLOCK PLANE IS INDISPENSABLE IN SHAPING THE HULLS AND SPARS OF MODEL BOATS AND THE PARTS OF MODEL AIRPLANES

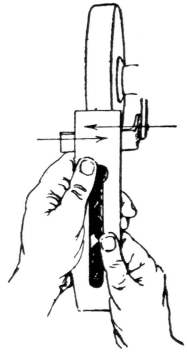
Courtesy of Stanley Tools, New Britain, Connecticut

HOW TO GRIND PLANE IRONS, WOOD CHISELS, & SIMILAR TOOLS



GRINDING STRAIGHTENS THE EDGE AND RESTORES THE BEVEL PREPARATORY TO SHARPENING BY WHETTING ON THE OIL STONE
THE GRIND STONE SHOULD TURN TOWARD THE PLANE IRON.
USE THE GUIDE AS IT ASSURES A FLAT EVEN BEVEL
KEEP THE PLANE IRON COOL TO PREVENT BURNING, OR SOFTENING THE STEEL BY FREQUENT DIPPING IN WATER
STONES RUNNING IN WATER OR OIL ARE PREFERABLE.





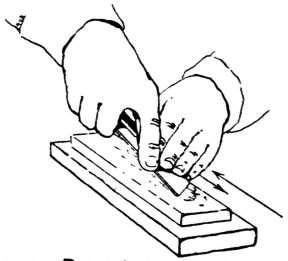
MOVE THE PLANE IRON FROM SIDE TO SIDE TO GRIND ALL PARTS OF THE BEVEL AND TO KEEP THE WHEEL TRUE.
THE EDGE SHOULD BE STRAIGHT AND ALMOST AT RIGHT ANGLES TO THE SIDES OF THE PLANE IRON.

WHEN TO GRIND A PLANE IRON OR A CHISEL

Courtesy of Stanley Tools, New Britain, Connecticut

HOW TO WHET PLANE IRONS, WOOD CHISELS, & SIMILAR TOOLS

WHET THE PLANE IRON ON THE OIL STONE TO PRODUCE THE REAL SHARP CUTTING EDGE



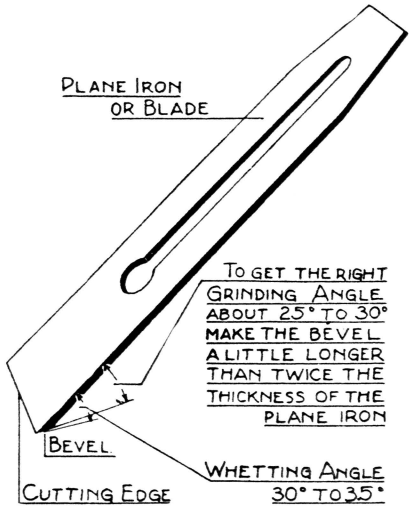
HOLD THE PLANE IRON IN THE RIGHT HAND WITH THE LEFT HAND HELPING
PLACE THE BEVEL ON THE STONE WITH THE BACK EDGE SLIGHTLY RAISED
MOVE THE PLANE IRON BACK AND FORTH

TO KEEP THE BEVEL STRAIGHT

BE SURE THE HANDS MOVE PARALLEL TO THE STONE SO THAT THE ANGLE BETWEEN THE PLANE IRON AND THE STONE WILL STAY THE SAME THROUGHOUT THE STROKE

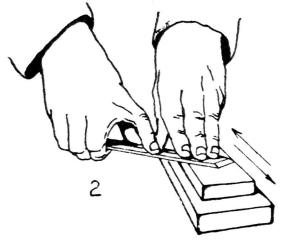
USE ENOUGH OIL TO KEEP THE SURFACE OF THE STONE MOIST IT KEEPS THE STONE SHARP BY PREVENTING PARTICLES OF STEEL FILLING THE PORES OF THE STONE TRY TO WEAR THE STONE EVENLY.

PLANE MARKS WILL SHOW LESS ON A FINISHED SURFACE IF THE CORNERS OF THE PLANE IRON ARE SLIGHTLY ROUNDED

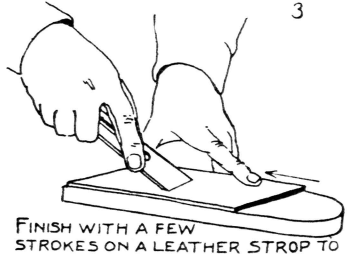


ROCKING THE PLANE IRON PRODUCES A ROUNDED BEVEL THAT WILL NOT CUT WELL.

A BEVEL ON THE FLAT SIDE OF THE PLANE IRON PREVENTS THE CAP IRON FITTING TIGHT SHAVINGS WILL CLOG THE PLANE



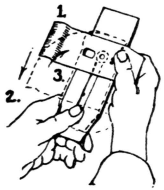
REMOVE THE WIRE OR FEATHER EDGE BY TAKING A FEW STROKES WITH THE FLAT SIDE OF THE PLANE IRON HELD **FLAT** ON THE STONE AVOID THE SLIGHTEST BEVEL ON THIS SIDE
IF A NICK OR A SHINY EDGE OF BLUNTNESS CAN BE SEEN REPEAT BOTH PROCESSES OF WHETTING



FINISH WITH A FEW STROKES ON A LEATHER STROP TO PRODUCE A KEENER EDGE.

Courtesy of Stanley Tools, New Britain, Connecticut

HOW TO ASSEMBLE THE DOUBLE PLANE IRON

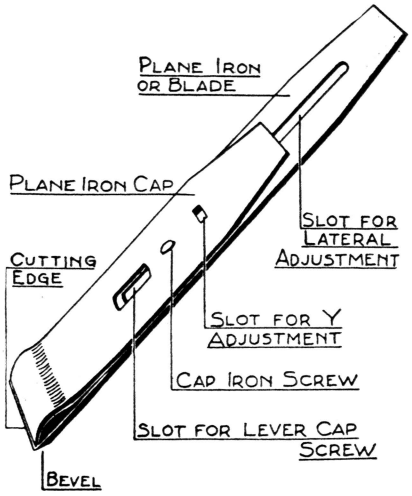


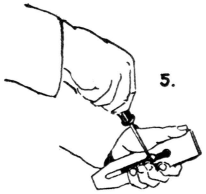
TO PUT THE PLANE IRON AND THE PLANE IRON CAP TOGETHER. 1-LAY THE PLANE IRON CAP ON THE FLAT SIDE OF THE PLANE IRON, AS SHOWN, WITH THE SCREW IN THE SLOT. 2-DRAW THE PLANE IRON CAP BACK. 3-TURN IT STRAIGHT WITH THE PLANE IRON.

4-ADVANCE THE PLANE IRON CAP UNTIL THE EDGE IS JUST BACK OF THE CUTTING EDGE OF THE PLANE IRON. THE PLANE IRON CAP MUST NOT BE DRAGGED ACROSS THE CUTTING EDGE.

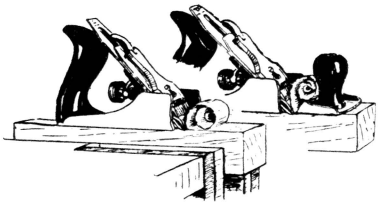
THE PLANE IRON CAP SHOULD EXTEND 1/16" BACK OF THE CUTTING EDGE FOR GENERAL WORK. ON CROSS GRAINED OR CURLY WOOD IT SHOULD BE AS NEAR TO THE CUTTING EDGE AS POSSIBLE.

DOUBLE PLANE IRON

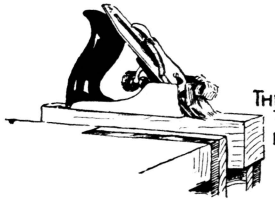




5-HOLD THE PLANE IRON AND THE PLANE IRON CAP FIRMLY AND TIGHTEN THE SCREW TO HOLD THE TWO PARTS TOGETHER



THE PLANE IRON CAP BREAKS AND CURLS THE SHAVING. TOGETHER WITH THE TOE OF THE PLANE IT PREVENTS THE WOOD SPLITTING AHEAD OF THE CUTTING EDGE PRODUCING A SMOOTH SURFACE. THE PLANE IRON CAP ALSO SERVES TO STIFFEN THE PLANE IRON.

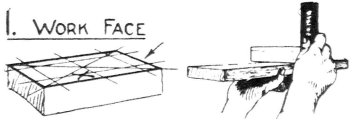


THE PLANE IRON CAP AND THE TOE REMOVED THE WOOD SPLITS AHEAD OF THE CUTTING EDGE LEAVING A ROUGH SURFACE.

Courtesy of Stanley Tools, New Britain, Connecticut

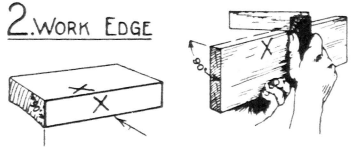
HOW TO USE THE TRY SQUARE

1. Work Face



Plane one broad surface smooth and straight. Test it crosswise, lengthwise, and from corner to corner. Mark the Work Face X.

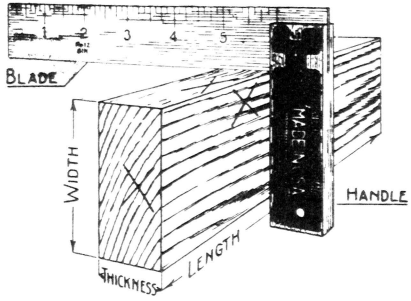
2. Work Edge



Plane one edge smooth, straight and square to the work face. Test it from the Work Face. Mark the Work Edge X.

3. Work End

Plane one end smooth and square. Test it from the Work Face and Work Edge. Mark the Work End X.

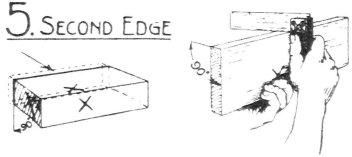


Hold the handle of the Try Square tight against the stock when testing ends, edges or scribing lines. For the use of the Marking Gauge see Stanley Chart No 111. For the use of the Plane see Stanley Chart No 116.

4. Second End

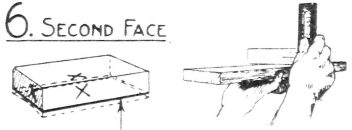
Measure length and scribe around the stock, a line square to the Work Edge and Work Face. Saw off excess stock near the line and plane smooth to the scribed line. Test the Second End from both the Work Face and the Work Edge.

5. Second Edge



From the Work Edge gauge a line for width on both faces. Plane smooth, straight, square and to the gauge line. Test the Second Edge from the Work Face.

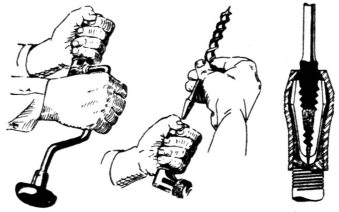
6. Second Face



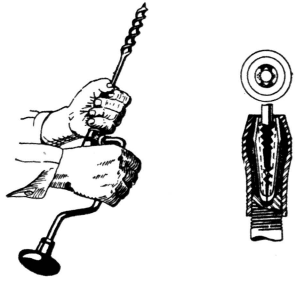
From the Work Face gauge a line for thickness around the stock. Plane the stock to the gauge line. Test the Second Face as the Work Face is tested

Courtesy of Stanley Tools, New Britain, Connecticut

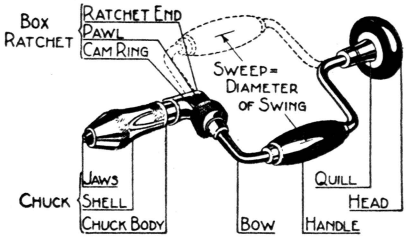
HOW TO USE THE BIT BRACE



TO PLACE THE BIT IN THE CHUCK: GRASP THE CHUCK SHELL; TURN THE HANDLE TO THE LEFT UNTIL THE JAWS OPEN WIDE ENOUGH FOR THE TAPER SHANK OF THE BIT TO PASS THE ENDS OF THE CHUCK JAWS;

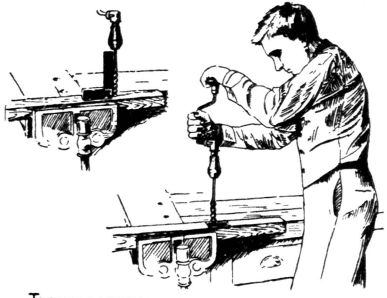


INSERT THE BIT SHANK; HOLD THE CHUSK SHELL, AND TURN THE HANDLE TO THE RIGHT UNTIL THE BIT IS HELD FIRMLY IN THE JAWS. THE TAPER SHANK SHOULD BE WELL INTO THE JAWS. THE CORNERS SHOULD FIT INTO THE V GROOVES.

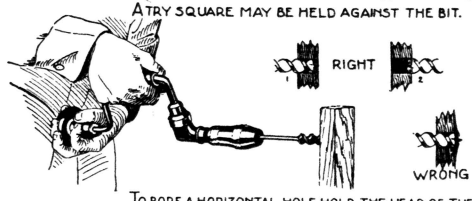


TO OPERATE THE RATCHET TURN THE CAM RING. TURNING THE CAM RING TO THE RIGHT WILL ALLOW THE BIT TO TURN RIGHT AND GIVE A RATCHET ACTION WHEN THE HANDLE IS TURNED LEFT. TURN THE CAM RING LEFT TO REVERSE THE ACTION.

THE RATCHET BRACE IS INDISPENSABLE WHEN BORING A HOLE IN A CORNER, OR WHERE SOME OBJECT PREVENTS MAKING A FULL TURN WITH THE HANDLE.



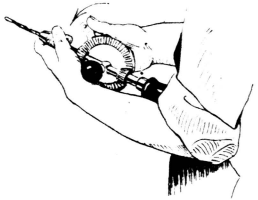
TO BORE A VERTICAL HOLE, HOLD THE BRACE AND BIT PERPENDICULAR TO THE SURFACE OF THE WORK. TEST BY SIGHT. COMPARE THE DIRECTION OF THE BIT TO THE NEAREST STRAIGHT EDGE OR TO SIDES OF THE VISE. A TRY SQUARE MAY BE HELD AGAINST THE BIT.



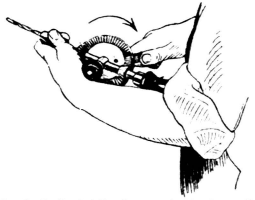
TO BORE A HORIZONTAL HOLE, HOLD THE HEAD OF THE BRACE CUPPED IN THE LEFT HAND, WITH THE BACK OF THE HAND AGAINST THE STOMACH AND WITH THE THUMB AND FORE FINGER AROUND THE QUILL. THIS GIVES PERFECT CONTROL OF THE BRACE.
TO BORE THRU WITHOUT SPLINTERING THE SECOND FACE, STOP WHEN THE SPUR IS THRU AND FINISH BORING FROM THE SECOND FACE.

Courtesy of Stanley Tools, New Britain, Connecticut

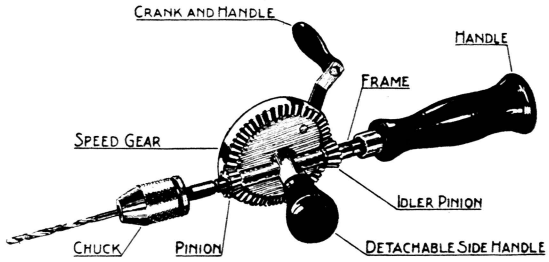
HOW TO USE THE HAND DRILL



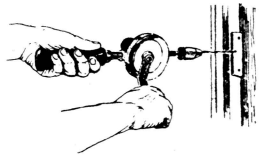
TO PLACE THE DRILL IN THE CHUCK, OPEN IT ONLY SLIGHTLY MORE THAN THE DIAMETER OF THE DRILL. THIS HELPS TO CENTER IT. INSERT THE DRILL. TIGHTEN THE CHUCK BY PUSHING FORWARD ON THE CRANK WITH THE RIGHT HAND, WHILE HOLDING THE CHUCK SHELL TIGHT WITH THE LEFT THUMB AND FORE FINGER.



TO REMOVE THE DRILL, HOLD THE CHUCK SHELL TIGHT WITH THE LEFT THUMB AND FORE FINGER, AND TURN THE CRANK BACKWARD, WITH THE RIGHT HAND, AS SHOWN BY THE ARROW.

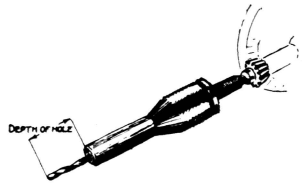


THE HAND DRILL IS USED FOR THE RAPID DRILLING OF SMALL HOLES, IN BOTH WOOD AND METAL. HOLES IN WOOD SHOULD BE STARTED WITH AN AWL TO HELP CENTER AND LOCATE THE DRILL. HOLES IN METAL SHOULD BE CENTER PUNCHED. WHEN DRILLING THROUGH METAL, RELIEVE THE PRESSURE SLIGHTLY BEFORE BREAKING THROUGH, TO AVOID BREAKING THE DRILL. DRILL POINTS FOR WOOD ARE MADE IN EIGHT SIZES FROM 1/16" TO 1 1/64". TWIST DRILLS PRINCIPALLY FOR METAL ARE MADE IN A VAST RANGE OF SIZES.

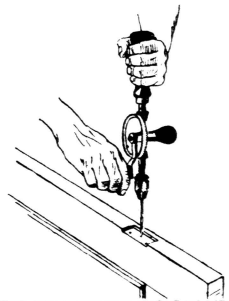


HOLD THE DRILL STRAIGHT. DO NOT WOBBLE WHILE TURNING, IT MAKES THE HOLE OVER-SIZE AND IS LIKELY TO BREAK THE DRILL.

IT IS SOME TIMES DESIRABLE TO HOLD THE DRILL BY THE SIDE HANDLE AND PRESS THE BODY AGAINST THE FRAME HANDLE LIKE A BREAST DRILL.



TO DRILL HOLES OF UNIFORM DEPTH, MAKE A DEPTH GAUGE. CUT A PIECE OF WOOD OR DOWEL THE RIGHT LENGTH, SO THE DRILL WILL PROJECT THE DESIRED DEPTH WHEN THE PIECE OF WOOD IS DRILLED AND SLIPPED OVER THE DRILL.

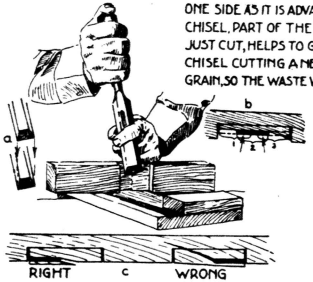


HOLD THE DRILL STEADY IN THE DIRECTION DESIRED AND EXERT AN EVEN PRESSURE. TURN THE CRANK AT A CONSTANT SPEED AND NOT TOO FAST.

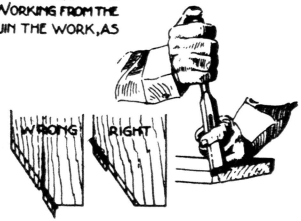
Courtesy of Stanley Tools, New Britain, Connecticut

HOW TO USE THE CHISEL FOR VERTICAL CUTS

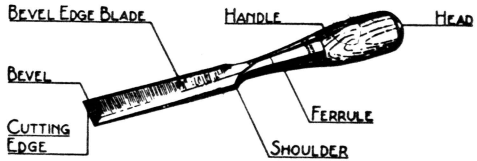
To cut, vertically, across the grain (a) the chisel should be slightly tilted to one side to give a sliding action to the cutting edge, or it may be held straight and moved to one side as it is advanced. (b) If the surface is wider than the chisel, part of the chisel pressed against the portion just cut, helps to guide and keep in line the part of the chisel cutting a new portion of the surface. (c) Cut with the grain, so the waste wood will split away from the guide line.



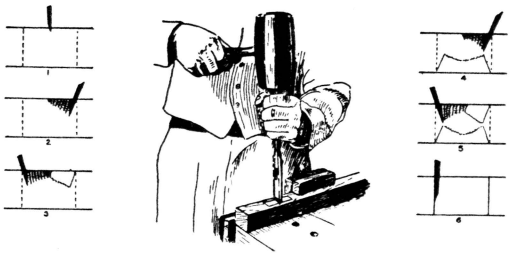
To cut, vertically, a slanting corner use the chisel in the same manner as in vertical cutting across the grain. Always work from the edge toward the end, so the wood will split away from the line. Working from the end toward the edge will split and ruin the work, as it is cutting against the grain.



KEEP YOUR CHISEL SHARP



To clean the corners of a tenon, notch, dado or rabbet: grasp the chisel by the blade, near the edge; raise one corner of the cutting edge by tilting the handle away and draw the chisel toward you. The work is held by the left hand while the chisel edge and one corner, guided by the right hand, act like a knife.



The mallet may be safely used on the chisel when the cutting edge is across the grain. When the edge is with the grain, the use of the mallet is very likely to split the wood. The mallet may be used on the chisel to beat out a mortise, to cut the ends of a mortise (when the bulk of the material has been bored out), when the wood is hard and in roughing out (when there is a large amount of material to be removed).

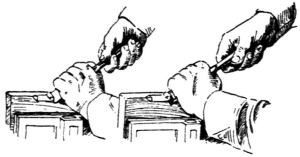
To cut a concave curved corner: hold the bevel side of the chisel against the work with the left hand; with the right hand press down and draw back at the same time, giving a sweeping curved direction to the cut. Always work with the grain from the edge toward the end.

Courtesy of Stanley Tools, New Britain, Connecticut

HOW TO USE THE CHISEL FOR HORIZONTAL CUTS

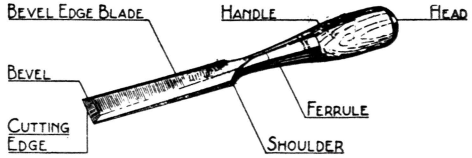
To cut, horizontally, with the grain: the chisel is held slightly turned to one side and then pushed from the worker. It is held with the bevel down for a roughing cut and with the bevel up for a paring cut.

To cut, horizontally, across the grain, with the work held in the vise; press the fore finger and thumb together on the chisel to act as a brake. To avoid splintering the corners, cut half way from each edge toward the center. Remove the center stock last



To cut a chamfer: hold the chisel inclined to one side parallel to the slope of the chamfer and cut as in chiseling horizontally with the grain.

KEEP YOUR CHISEL SHARP

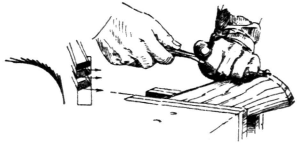


To cut across the grain with the work held against the bench hook, the heel of the left hand steadies the work while the fingers press the chisel firmly against the wood.

The chisel is controlled with the left hand, pressing firmly on the chisel and the wood. The power is applied with the right hand. The chisel is held slightly turned so the edge slides across the work or the chisel is moved to the right and left as it is advanced, to give a sliding action to the cutting edge. This is easier than a straight thrust and leaves a smoother surface on the work. AT ALL TIMES KEEP BOTH HANDS BACK OF THE CUTTING EDGE.

To cut a straight, slanting, corner is the same as horizontal chiseling. The work is held in the vise with the guide line horizontal.

To cut a chamfer on end grain, the chisel is moved sideways across the corner of the work, held so that the chisel makes a sliding horizontal cut

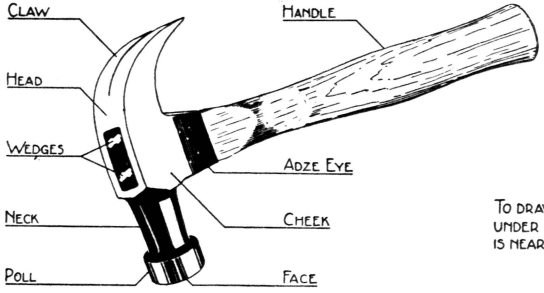


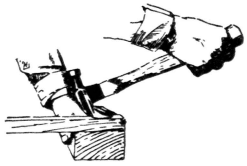
To cut a round corner, the chisel is moved sideways across the work making a series of cuts close together, each one tangent to the curve.

If the work is wide the chisel is held bevel down, so the handle will clear the work and the blade will not dig in too deep, as it is pushed forward.

HOW TO USE THE NAIL HAMMER

GRASP THE HAMMER HANDLE FIRMLY NEAR THE END.

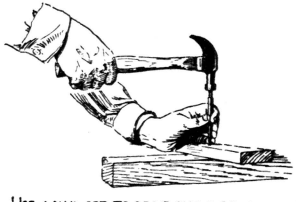


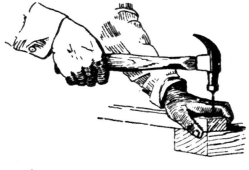


TO DRAW A NAIL SLIP THE CLAW OF THE HAMMER UNDER THE NAIL HEAD; PULL UNTIL THE HANDLE IS NEARLY VERTICAL AND THE NAIL PARTLY DRAWN

THE BLOW IS DELIVERED THROUGH THE WRIST, THE ELBOW AND THE SHOULDER, ONE OR ALL BEING BROUGHT INTO PLAY, ACCORDING TO THE STRENGTH OF THE BLOW TO BE STRUCK. REST THE FACE OF THE HAMMER ON THE NAIL, DRAW THE HAMMER BACK AND GIVE A LIGHT TAP TO START THE NAIL AND TO DETERMINE THE AIM.

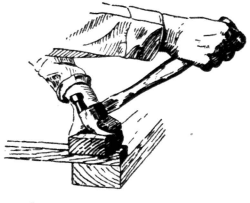
IF THE PULL IS CONTINUED, UNNECESSARY FORCE IS REQUIRED THAT WILL BEND THE NAIL, MAR THE WOOD AND PERHAPS BREAK THE HAMMER HANDLE.





STRIKE THE NAIL SQUARELY TO AVOID MARRING THE WOOD AND BENDING THE NAIL. KEEP THE FACE OF THE HAMMER CLEAN TO AVOID SLIPPING OFF THE NAIL. IF A NAIL BENDS DRAW IT AND START A NEW ONE IN A NEW PLACE.

USE A NAIL SET TO DRIVE NAILS BELOW THE SURFACE OF ALL FINE WORK. TO PREVENT THE NAIL SET SLIPPING OFF THE HEAD OF THE NAIL, REST THE LITTLE FINGER ON THE WORK AND PRESS THE NAIL SET FIRMLY AGAINST IT. SET NAILS ABOUT 1/16" BELOW THE SURFACE OF THE WOOD.



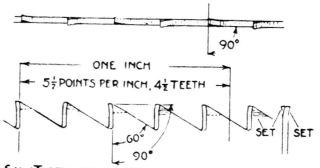
SLIP A PIECE OF WOOD UNDER THE HEAD OF THE HAMMER TO INCREASE THE LEVERAGE AND TO RELIEVE THE UNNECESSARY STRAIN ON THE HANDLE.

ALWAYS STRIKE WITH THE FACE OF THE HAMMER. IT IS HARDENED FOR THAT PURPOSE. DO NOT DAMAGE THE FACE BY STRIKING STEEL HARDER THAN ITSELF. DO NOT STRIKE WITH THE CHEEK AS IT IS THE WEAKEST PART.

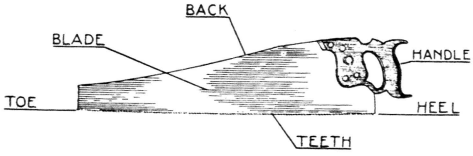
A BELL FACE HAMMER IS SLIGHTLY MORE CONVEX THAN A PLAIN FACE HAMMER. WITH IT A NAIL CAN BE DRIVEN FLUSH OR SLIGHTLY BELOW THE SURFACE OF THE WORK WITHOUT LEAVING HAMMER MARKS IN THE WOOD.

Courtesy of Stanley Tools, New Britain, Connecticut

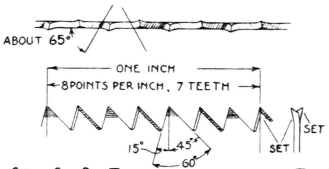
HOW TO USE HAND SAWS



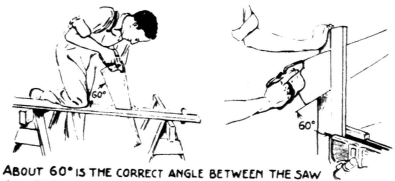
RIP SAW TEETH ARE SHAPED LIKE CHISELS. THEY CUT LIKE A GANG OF CHISELS IN A ROW.



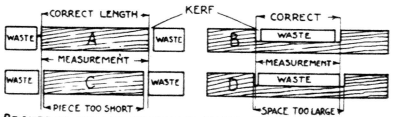
THE SIZE OF A SAW IS DETERMINED BY THE LENGTH OF THE BLADE IN INCHES. SOME POPULAR SIZES ARE 24" AND 26".
THE COARSENESS OR FINENESS OF A SAW IS DETERMINED BY THE NUMBER OF POINTS PER INCH
A COARSE SAW IS BETTER FOR FAST WORK AND FOR GREEN WOOD.
A FINE SAW IS BETTER FOR SMOOTH ACCURATE CUTTING AND FOR DRY SEASONED WOOD.
5½ AND 6 POINTS ARE IN COMMON USE FOR RIP SAWS.
7 AND 8 POINTS ARE IN COMMON USE FOR CROSS CUT SAWS.
SAW TEETH ARE SET, EVERY OTHER TOOTH IS BENT TO THE RIGHT AND THOSE BETWEEN TO THE LEFT, TO MAKE THE KERF WIDER THAN THE SAW. THIS PREVENTS THE SAW FROM BINDING IN THE KERF OR SAW CUT.
QUALITY SAWS IN ADDITION ARE TAPER GROUND, BEING THINNER AT THE BACK THAN AT THE TOOTHED EDGE.
KEEP SAW TEETH SHARP AND PROPERLY SET.



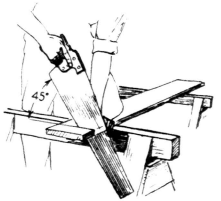
CROSS CUT SAW TEETH ARE LIKE KNIFE POINTS. THEY CUT LIKE TWO ROWS OF KNIFE POINTS AND CRUMBLE OUT THE WOOD BETWEEN THE CUTS.



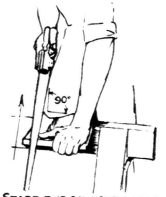
ABOUT 60° IS THE CORRECT ANGLE BETWEEN THE SAW AND THE WORK FOR RIP SAWING.



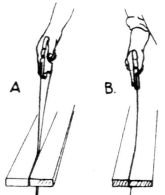
BE SURE TO SAW CAREFULLY ON THE WASTE SIDE OF THE LINE, AS AT A AND B. SAWING ON THE LINE OR ON THE WRONG SIDE OF THE LINE MAKES THE STOCK TOO SHORT AS AT C OR THE OPENING TOO LARGE AS SHOWN AT D.



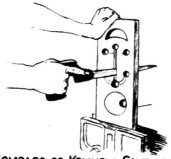
ABOUT 45° IS THE CORRECT ANGLE BETWEEN THE SAW AND THE WORK FOR CROSS CUT SAWING.



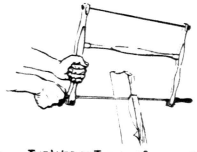
START THE SAW CUT BY DRAWING THE SAW BACKWARD. HOLD THE BLADE SQUARE TO THE STOCK. STEADY IT AT THE LINE WITH THE THUMB.



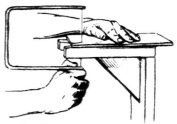
A. IF THE SAW LEAVES THE LINE TWIST THE HANDLE SLIGHTLY AND DRAW IT BACK TO THE LINE
B. IF THE SAW IS NOT SQUARE TO THE STOCK, BEND IT A LITTLE AND GRADUALLY STRAIGHTEN IT. BE CAREFUL NOT TO PERMANENTLY BEND OR KINK THE BLADE.



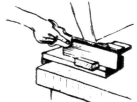
COMPASS OR KEYHOLE SAWS ARE USED TO CUT CURVED OR STRAIGHT SIDED HOLES.



THE WEB OR TURNING SAW IS USED TO CUT IRREGULARLY CURVED SHAPES BY HAND.



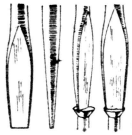
THE COPING SAW IS USED TO CUT IRREGULAR SHAPES AND INTRICATELY CURVED PATTERNS IN THIN WOOD.



THE BACK SAW IS A THIN CROSS CUT SAW WITH FINE TEETH, STIFFENED BY A THICK BACK. A POPULAR SIZE IS 12" WITH 14 PTS PER INCH. IT IS USED FOR FINE ACCURATE WORK.

Courtesy of Stanley Tools, New Britain, Connecticut

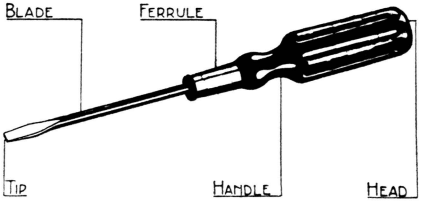
HOW TO USE THE SCREW DRIVER



SELECT A SCREW DRIVER OF LENGTH AND TIP FITTED TO THE WORK. SCREW DRIVERS ARE SPECIFIED BY THE LENGTH OF THE BLADE. THE TIP SHOULD BE STRAIGHT AND NEARLY PARALLEL SIDED. IT SHOULD ALSO FIT THE SCREW SLOT AND BE NOT WIDER THAN THE SCREW HEAD.

IF THE TIP IS TOO WIDE IT WILL SCAR THE WOOD AROUND THE SCREW HEAD. IF THE SCREW DRIVER IS NOT HELD IN LINE WITH THE SCREW IT WILL SLIP OUT OF THE SLOT AND MAR BOTH THE SCREW AND THE WORK.

IF THE TIP IS ROUNDED OR BEVELED IT WILL RAISE OUT OF THE SLOT SPOILING THE SCREW HEAD. REGRIND OR FILE THE TIP TO MAKE IT AS SHOWN ABOVE.

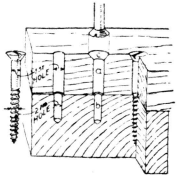


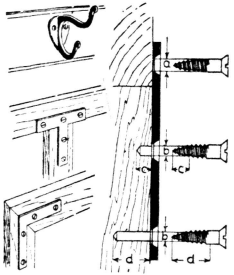
USE THE LONGEST SCREW DRIVER CONVENIENT FOR THE WORK. MORE POWER CAN BE APPLIED TO A LONG SCREW DRIVER THAN TO A SHORT ONE, WITH LESS DANGER OF ITS SLIPPING OUT OF THE SLOT.
HOLD THE HANDLE FIRMLY IN THE PALM OF THE RIGHT HAND WITH THE THUMB AND FORE FINGER GRASPING THE HANDLE NEAR THE FERRULE. WITH THE LEFT HAND STEADY THE TIP AND KEEP IT PRESSED INTO THE SLOT WHILE RENEWING THE GRIP ON THE HANDLE FOR A NEW TURN.

IF NO HOLE IS BORED FOR THE THREADED PART OF THE SCREW THE WOOD IS OFTEN SPLIT OR THE SCREW IS TWISTED OFF. IF A SCREW TURNS TOO HARD, BACK IT OUT AND ENLARGE THE HOLE.
A LITTLE SOAP ON THE THREADS OF THE SCREW MAKES IT EASIER TO DRIVE.

TO FASTEN TWO PIECES OF WOOD TOGETHER WITH SCREWS:

1. LOCATE THE POSITIONS OF THE SCREW HOLES.
2. BORE THE FIRST HOLES IN THE FIRST PIECE OF WOOD VERY SLIGHTLY LARGER THAN THE DIAMETER OF THE SCREW SHANK AS AT a.
3. BORE THE SECOND HOLES SLIGHTLY SMALLER THAN THE THREADED PART OF THE SCREWS, AS AT b. BORE AS DEEP AS HALF THE LENGTH OF THE THREADED PART.
4. COUNTERSINK THE FIRST HOLES TO MATCH THE DIAMETER OF THE HEADS OF THE SCREWS, AS AT c.
5. DRIVE THE SCREWS TIGHTLY IN PLACE WITH THE SCREW DRIVER.





TO FASTEN HINGES OR OTHER HARDWARE IN PLACE WITH SCREWS:

1. LOCATE THE POSITION OF THE PIECE OF HARDWARE ON THE WORK.
2. RECESS THE WORK TO RECEIVE THE HARDWARE, IF IT IS NECESSARY.
3. LOCATE THE POSITIONS OF THE SCREWS.
4. SELECT SCREWS THAT WILL EASILY PASS THRU THE HOLES IN THE HARDWARE, AS AT a.
5. BORE THE PILOT HOLES (SECOND HOLE) SLIGHTLY SMALLER THAN THE DIAMETER OF THE THREADED PART OF THE SCREWS, AS AT b.
6. DRIVE THE SCREWS TIGHTLY IN PLACE.

IF THE WOOD IS SOFT, BORE AS DEEP AS HALF THE LENGTH OF THE THREADED PART OF THE SCREW, AS AT c. IF THE WOOD IS HARD (OAK) THE SCREW SOFT (BRASS), OR IF THE SCREW IS LARGE, THE HOLE MUST BE NEARLY AS DEEP AS THE SCREW, AS AT d. HOLES FOR SMALL SCREWS ARE USUALLY MADE WITH BRAD AWLS OR MACHINE DRILLS. FOR LARGER SCREWS BORE THE HOLES WITH THE BITS SPECIFIED FOR THE SECOND HOLES, IN THE TABLE.

FLAT HEAD — LENGTH OVER ALL

ROUND HEAD — LENGTH TO BOTTOM OF HEAD

SIZES OF WOOD BITS TO BORE HOLES FOR WOOD SCREWS

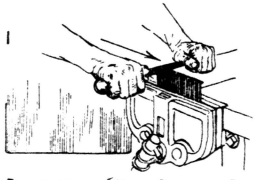
NUMBER OF SCREW		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	26	28	30
DECIMAL DIAMETER OF SCREW		.0578	.0710	.0842	.0973	.1105	.1236	.1368	.1500	.1631	.1763	.1894	.2026	.2158	.2289	.2421	.2552	.2684	.2816	.2947	.3210	.3474	.3737	.4000	.4263	.4526
FRACTIONAL DIAMETER (NEAREST 64TH)		1/16 − 1/64	5/64 + 1/64	5/64 + 1/64	3/32 + 1/64	3/32 + 1/64	7/64 + 1/64	7/64 + 1/64	9/64 − 1/64	9/64 − 1/64	5/32 + 1/64	11/64 + 1/64	11/64 + 1/64	13/64 − 1/64	13/64 − 1/64	15/64 − 1/64	15/64 + 1/64	1/4 + 1/64	17/64 + 1/64	9/32 + 1/64	19/64 − 1/64	5/16 − 1/64	21/64 − 1/64	11/32 − 1/64	3/8 − 1/64	25/64 + 1/64	29/64 − 1/64
FIRST HOLE	GIMLET OR TWIST BIT 1/32	2	3	3	4	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	11	12	12	13	14	15
	AUGER BIT 1/16								3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	7	7	8
SECOND HOLE	GIMLET OR TWIST BIT 1/32			2	2	2	3	3	4	4	4	5	5	6	6	7	7	8	8	9	9	10	11	12	13	
	AUGER BIT 1/16													3	3	3	3	4	4	4	4	5	5	6	6	

EXACT SIZES CANNOT BE GIVEN FOR THE HOLES FOR WOOD SCREWS, AS WOOD BITS ARE GRADUATED BY 32NDS AND 16THS OF AN INCH. TWIST BITS FOR WOOD AND GIMLET BITS ARE MARKED BY 1/32". AUGER BITS USUALLY ARE MARKED BY 1/16". BRAD AWLS AND MACHINE DRILLS ARE USED TO MAKE HOLES FOR SMALL SCREWS.

Courtesy of Stanley Tools, New Britain, Connecticut

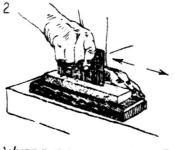
HOW TO SHARPEN AND USE THE HAND SCRAPER

1



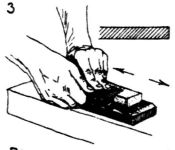
TO SHARPEN THE HAND SCRAPER: FILE THE EDGES SQUARE AND STRAIGHT BY DRAWFILING WITH A SMOOTH MILL FILE. ROUND THE CORNERS SLIGHTLY.

2

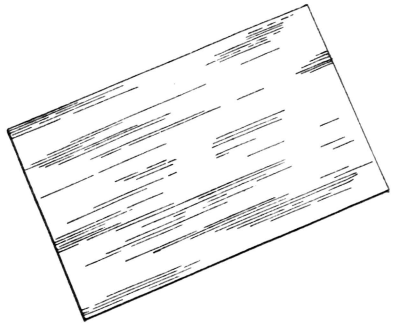


WHET THE EDGE, HOLDING THE BLADE SQUARE TO THE SURFACE OF THE OIL STONE. SOME PREFER TO HOLD THE SCRAPER SQUARE TO THE EDGE OF THE OIL STONE.

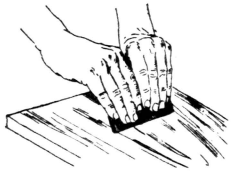
3



REMOVE THE BURR BY WHETTING THE SCRAPER FLAT ON THE OIL STONE. THE EDGES SHOULD BE VERY SMOOTH AND SHARP.



THE HAND SCRAPER IS USED FOR THE FINAL SMOOTHING BEFORE SANDPAPERING. IT REMOVES THE SLIGHT RIDGES LEFT BY THE PLANE. IT IS ALSO USED TO SMOOTH SURFACES THAT ARE DIFFICULT TO PLANE BECAUSE OF CURLY OR IRREGULAR GRAIN

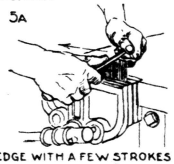


THE HAND SCRAPER CAN BE EITHER PUSHED OR PULLED AS THE GRAIN OF THE WOOD DEMANDS OR WHICHEVER IS MORE CONVENIENT.

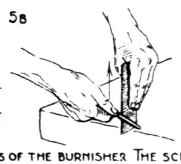
4

DRAW THE EDGE WITH THREE OR FOUR FIRM STROKES OF THE BURNISHER HELD FLAT ON THE SCRAPER.

5A



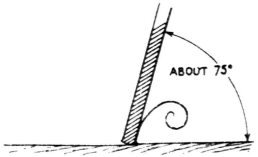
5B



5C

TURN THE EDGE WITH A FEW STROKES OF THE BURNISHER. THE SCRAPER CAN BE HELD IN ANY OF THE THREE WAYS SHOWN ABOVE. DRAW THE BURNISHER TOWARD YOU THE FULL LENGTH OF THE BLADE, WITH A SLIDING STROKE.

TO TURN THE EDGES OUT, THE BURNISHER IS HELD AT 90° TO THE FACE OF THE BLADE FOR THE FIRST STROKE. FOR EACH OF THE FOLLOWING STROKES, TILT THE BURNISHER SLIGHTLY UNTIL AT THE LAST STROKE IT IS HELD AT ABOUT 85° TO THE FACE OF THE BLADE. A DROP OF OIL ON THE BURNISHER HELPS



THE HAND SCRAPER IS HELD FIRMLY BETWEEN THE THUMB AND FINGERS AT AN ANGLE OF ABOUT 75° AND SPRUNG TO A SLIGHT CURVE, BY PRESSURE OF THE THUMBS. DUST, INSTEAD OF A SHAVING, INDICATES A DULL SCRAPER.

Courtesy of Stanley Tools, New Britain, Connecticut

References.

"Woodwork for Beginners" by Griffith Manual Arts Press, Peoria, Illinois.

" Essentials of Woodworking", by Griffith Manual Arts Press, Peoria, Illinois.

"Manual of Farm Shop Work", Mack M. Jones, Cooperative Store, Columbia, Missouri.

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"Disston Saw Tool and File Manual" Henry Disston and Sons Inc., Philadelphia, Pennsylvania.

"The Farm Work Shop", E. C. Atkins and Co., Indianapolis, Indiana.