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HAND MADE FURNITURE

AND

HOW TO MAKE IT

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Designed for the use of those seeking either a pleasant and profitable occupation or such furniture for their homes as shall express their own artistic taste, and stand for sturdy honesty of purpose, simple beauty, comfort and durability.

Albert G. Glidden

HAND MADE FURNITURE SHOP,
Spokane, Wash.

GENERAL.

There is probably no home in which the comfort, convenience or artistic appearance could not be improved by the addition or replacing of some pieces of furniture. The reason is simple. They are furnished with store furniture, and store furniture is made to sell; the designs limited by the capabilities of the machines which make it; made of the cheapest materials; put together in the quickest, rather than the best way, and then finished up with the crudest varnish and stain to make a fine appearance. It is a depressing sight to see this furniture on moving day, piled on the sidewalk, scratched, broken, dingy, all its fine pretense of beauty gone forever. On the other hand, the chairs, tables, sideboards and other pieces that have come down to us through generations were all made by hand, put together by hand and finished by hand in the days when there was no machinery and the workman was an artist. The result is that instead of finding its way to the scrap heap this old furniture is as good today as ever, after two or three hundred years of wear and tear and removal from place to place half round the world. Hampered by no limitations of machinery these designers set the standard for the world for all times. Such furniture is worth while, and is an everlasting inspiration to the home-maker and worker.

Our new style, variously known as "Arts and Crafts," "Mission," "Craftsman," etc., is especially adapted to hand work, and while differing from the rich old oak and mahogany of our fathers' in form and finish, is like them in all the qualities of beauty and durability and is far more comfortable. A home furnished in this style not only expresses the artistic taste of its inmates but also exerts an influence of sturdy honesty of purpose, simplicity and absence of all gaudy pretense, which both its frank, straight lines and freedom from anything to hide or mar the natural beauty of the wood so forcibly express. It is a style of which we can never tire and of which no other can take the place. It will last for generations, for every part is as strong as the wood of which it is made. You can make it and make it better than you can buy in any store, for it is made in the most natural way, after the most natural design, of the most natural material.

Of course, it cannot be hoped that the mere reading of any book can make an expert cabinet maker of an inexperienced workman, but the instructions contained in this book will enable any one to make furniture, Handsome, comfortable, durable furniture. The length of time required on each of the

exercises will, of course, vary with the individual workman and his aptitude for the work. All that can be said as to the number of times the exercises should be performed is simply to keep at each one until you are satisfied with the results. You can judge as well as any one when your work is good. Time spent in practice is time well spent, for you are learning to make something which will be with you for years to come.

Most people know more or less about the use of tools and to some it will seem that we are unnecessarily explicit about things which to them are matters of course, but as we are writing for those who have had no experience whatever in the use of tools, as well as others, we have begun with the rudiments and taken one after another in the order most likely to assure rapid progress. For the same reason we have avoided, in so far as possible, technical terms and trade names, though in some cases it has been necessary to use the customary terms, as no others will express the meaning. For instance, the use of the word "square," as applied to our work, does not always mean rectangular but oftener means at right angles to adjoining surfaces. Thus, when we say "saw square" or "plane square" we mean to make your surface straight and true and at right angles with some other surface. The term "right angles" will be easily understood by reference to Fig. 1. Whenever two lines meet they form an angle, and having

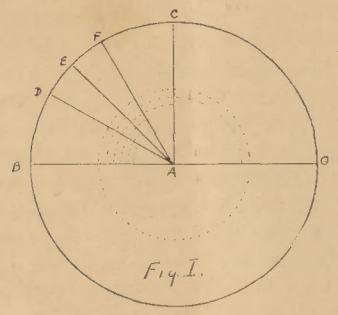

Fig I.

the direction of one line and the degree of the angle we know the direction of the other line. Thus in Fig. 1 all the lines meet at (a). Taking the line (a-b) as our base and wishing to find any other line of which we have the degree of angle we draw a circle around (a). The size of the circle does not make any difference. A circle is divided into 360 degrees, therefore, if we are given an angle of 90 degrees, we know that it is a quarter of the circle and drawing a line from (a)

to the outer rim of the circle a quarter of the way around we have the line (a-c) which forms an angle of 90 degrees with the line (a-b). In the same way an angle of 30 degrees would be formed by a line drawn from (a) to the outer rim of the circle 1-12th of the way round from (b) (a-d). Forty-five degrees would be 1-8th of the way round (a-e), 60 degrees 1-6th of the way round (a-f), 180 degrees half way round, and so on. The angle of 90 degrees is spoken of as a right angle and in our work one line of the angle is said to be square to the other. We also use the term in speaking of angles 1 in 6, or 2 in 6, etc. You will understand this if you will take your steel square and place your rule diagonally across it and when, for instance, we say 1 in 6 we would mean to place your rule 6 in. from the corner of the square on one arm and 1 in. from the corner on the other arm of the square; 2 in 6 would mean keep the rule at 6 in. on one arm and move the other end of the rule 2 in. from the corner on the other arm. In other words, an angle may be said to give the degree of slant.

We have included in this book a few designs for pieces of furniture in order to show the method of assembling the parts and the most convenient way of laying out and beginning a piece of work. In this connection we wish to impress upon you the importance of laying out the whole of a piece of work before you begin to cut it at all. You will appreciate this as you proceed.

In our cuts we have made no attempt at fine drawing but have used the fewest possible lines for the sake of plainness and only so much shading as is necessary. Single lines usually designate the outline of solid parts. Dotted lines show the outlines of parts lying beneath the surface, or in other words, as if seen through the object, and are used merely to show the location of parts which would really be invisible. Wavy lines are generally used where only a part of a piece is shown and designate that the piece is really longer than drawn but the part beyond the wavy line is not necessary in the illustration. We have used shading to show end grain in some cases but more often to show where a part is cut away, as in the side of a tenon, etc. Dimensions are shown by arrow pointed lines. Where these lines point in opposite directions with the figures between them, or point toward each other with the figures at the end of one arrow, they give the distance in both cases between the arrow points.

The choice of wood depends largely on the purpose for which it is to be used and personal taste. You will probably have no occasion to use other woods than fir, oak and

mahogany, with possibly some pine. Fir is soft and likely to splinter if not carefully handled, but is easy to work, the grain is wavy and beautiful and it can be finished to equal oak in beauty. Oak is harder but more durable and admits of a very high polish. It is much stronger and therefore, except where proportion requires size, the parts can be made much smaller than when using fir. As, for instance, in chair and table legs, braces, etc. Oak also bends better than fir but it is necessary to steam it for this purpose and unless you have proper steam box and clamps to hold it until dry, we do not advise attempting to bend the parts. Mahogany has been the most highly prized of these three woods until recently, and is the most expensive, but oak has largely taken its place in fine furniture of this style, as it is more in keeping with the straight lines. Pine is soft, light and not so likely to splinter as fir, but has little grain and is not used extensively except in concealed parts where strength is not essential. In most lumber, and especially that with much flake or grain, you will find that the grain does not lay flat on the surface, but comes up to the surface at an angle and in planing it is important to cut in the direction of this grain, not against it, as in the latter case it will chip up and leave nicks in the surface instead of cutting smooth. In using the scraper on fir you have to be carefnl or it will cut deeper in the soft grain of the wood than on the flake, and make a wavy surface instead of a flat one. This, however, can be avoided with a little care.

We trust that with these suggestions the following may be quite clear to you, but if there is any point on which you are not quite clear, or if there is any advice you would like we would be very glad to hear from you and to assist you in any way that our experience will permit.

Chapter I.

TOOLS.

Right here and now we want to say, **keep your tools sharp**. Many beginners are discouraged with the result of their work when the fault is entirely with the dullness of their tools. A dull tool cannot do good work no matter how skillful the workman may be. Therefore, we say again, keep all tools sharp all the time. With this in mind, let us see what tools are necessary for our purpose and how to sharpen, use and care for them.

THE SAW.

The saw comes first in use and perhaps in importance. There are several kinds, but you will need only one 24-inch rip saw, about 7 tooth (to an inch) for sawing with the grain; one 20-inch cross-cut saw, 10 tooth, for sawing across the grain; one 12-inch back saw, 12 tooth, for sawing a perfectly straight, narrow smooth cut (kerf); one 12-inch compass saw, 8 tooth, for sawing curves.

These saws are sharpened when you buy them and we do not advise you to attempt to file your saws until you have learned by practice how to do it properly. Have them sharpened by an expert, for while it is very simple it requires skill, acquired only from experience. Do not neglect it, however. A dull saw leaves a ragged edge and take double effort.

If you desire to file your saws get an old one to practice on. It is not a difficult thing to learn, and while opinions differ as to just how the work should be done there are a few essentials which must be observed. The following is the result of long experience and careful study and will give satisfactory results:

You will need to purchase a saw vise (one with rubber in the jaws will prevent noise), also a slim 7-inch taper file for 7 and 8 tooth saws, 5-inch slim taper file for 10 and 12 tooth, and a fairly long, flat mill file for jointing; a saw set of any of the standard patterns, and then proceed as follows: Fasten the saw vise to something steady, clamp the saw in it, teeth up, take the steel square, or other straight edge and hold it with the edge along the teeth of the saw. If the teeth do not all just touch the edge of the square they are not of equal length and require what is called "jointing." To do this take the

flat mill file and lay it flat along the points of the teeth, filing as if to dull them until they are all equal in length, which you test with the square as before. The next step is to "set" the saw. This consists in bending the points of alternate teeth to right and left. This is done with the saw set. Have the salesman show you how to operate whatever kind you buy. The teeth should be bent only just enough to clear, do not set too deep, only the point should be bent, or half the tooth at most; set the tooth toward the side on which the point is; this will be every other tooth one way and alternate ones the other way; set one side first, then the other side. Your saw is now ready for filing. Select the size of file given above for the particular saw, commence at the butt (handle end) with the first tooth set away from you and file every alternate tooth. Keep the file level, that is, the handle and point at the same height when the saw is straight up on edge. You will notice that the teeth of your Cross-cut, Back and Compass saws are filed on an angle. This angle is entirely at the discretion of the owner. It is essential, however, that the bevel be filed on the front of the tooth. It will give very satisfactory results if you make it about 45 degrees. Keep the angle precisely the same on all the teeth. When you have filed the teeth on one side turn the saw around and file those on the other side. As to the shape of the teeth there is much difference of opinion, but until you have some reason to change keep it the same as when you bought the saw. Now take the saw out of the vise, lay it on a flat board and rub the sides of the teeth with the oil stone until they are perfectly even. To file the Rip saw proceed as above, except file straight across, not at an angle. File every tooth exactly the same size and shape and your saw will run true and easy.

THE USE OF THE SAW.

The use of the saw is constant and important. Saw true always, whether the results make any difference or not. In this way you will train your eye and hand. Do not saw without a mark. Use a hard pencil so as to make a narrow line. In all cases when joining mark with a knife or marking awl. Remember that nearly always the sawed edge will have to be smoothed with the plane, and allow for this in such cases. Start your saw by a few short strokes, as it is likely to "jump" if you use too long a stroke before the cut is started. As soon as it is started use a full stroke. Do not saw in little jerks, but be careful not to pull the saw all the way out of the cut, as this will mar your work and may break the saw. Your Rip saw

and your Cross-cut saw should be held at an angle of about 45 degrees. With the Compass saw you will generally have to hold it straight through the board in order to follow the curve. The Back saw is used flat down on the work, though you may raise or lower the butt a little in starting. It will take practice to learn to saw "square," that is, so the cut is at right angles with the surface of the plank. Most beginners are inclined to tip the butt of the saw away from them as the cut gets nearer to them. Be careful about this. It is necessary to bring the butt in as the cut gets nearer. Of course, this does not apply to the Back saw, as that cuts straight down. In this case be sure to start true to your mark and hold the saw exactly at right angles to the surface of your work so as to cut square.

A saw properly set and filed does not require grease to make it run smoothly but should be wiped off after using with an oily cloth to prevent rust.

THE PLANE.

The plane may be of wood or iron or a combination of the two. We recommend a No. 3 Bailey iron plane (block) for smoothing; a No. 5 Bailey iron plane (jack) for heavier cutting and jointing; a wooden plow 1-4 inch; a wooden plow 1-2 inch; a wooden rabbet plane 1-4 to 7-8 inch. If you care to spend the money a wood and iron jointer, not less than 24 inch long is also valuable, but with care you can do this work with your No. 5 jack plane. The dealer will also show you Stanley Nos. 45 and 55 planes. These are expensive, but very convenient, as they will take the place of the rabbet and plow, and will also cut mouldings, reeding, etc. Have the dealer show you how to take apart and put together whatever planes you buy.

TO SHARPEN PLANES.

To sharpen planes use the oil stone, and oil that will not gum. The jack and jointer have a cap iron on the blade; remove this and rub the bevelled side of the blade on the stone with either a spiral or figure eight motion. Some workmen hold the bevel flat on the stone, others prefer to raise the blade onto the edge a little so as to make a second bevel just at the sharp edge. This gives a stronger cutting edge. We prefer the latter method. Either way will turn up a feather edge on the other side, and to remove this turn the blade over on the flat or long side and rub it perfectly flat on the stone. Repeat

the process until the edge is very sharp and perfectly smooth. Do not scratch your stone with the corner of the blade. Put your plane together again keeping the cap iron 1-32 to 1-16 of an inch back from the cutting edge.

TO USE THE PLANE.

To use the plane sight along the bottom and set the blade so it just shows. If you want to cut deeper you can set it deeper after trying it. Stand back of your plane, rather than over it, so you push it away from you instead of across in front of you. In this way you will cut truer and with less effort. Avoid a rocking motion. Hold the heel firmly down with the right hand and the front with the left hand. At the beginning of the stroke hold the front down squarely and at the end of the stroke ease up on the front and hold the heel down. When the plane runs off the end of the work at the end of the stroke, as you reach the end lift the front so that it does not drop over the end and make it low. Always plane square, whether it makes any difference or not, for the sake of habit.

CHISELS.

Chisels are of several kinds and lengths. For our use we prefer as most convenient one each 1-8, 1-4 and 1-2 inch butt chisels (short blade). You will have little or no use for anything wider than 1-2 inch.

TO SHARPEN CHISELS.

To sharpen chisels proceed as with the plane blade, except hold the bevel flat on the stone. Do not raise on the edge at all, as this should be thin and very keen.

TO USE THE CHISEL.

To use the chisel keep the flat side towards the mark. For chisel work always mark with a knife. Always leave a margin next the line until the finishing cuts. If you cut right to the line in the beginning you are likely to mar the edge of your cut, and also in soft wood the bevel of the chisel forces it a little towards the flat side. When cutting across the grain hold the chisel very flat on the work or it will "dig in."

THE MARKING GAUGE.

The marking gauge is made in several patterns. The simplest will do. In its use you need little instruction. Always

tip it a little in the direction you are moving it. If held straight up it will try to follow the grain. Hold the guide firmly and flat against the work.

THE SCREW DRIVER.

The screw driver should be of the very best. For our work we recommend one each 1-8 and 1-4 inch, fairly long.

Always bore holes for screws. The hole should be about two-thirds the diameter of the screw. Put a little soap on the screw and it will drive easier and be less likely to split your work. When it is nearly all the way in and begins to go harder loosen the screw driver after each turn by a little back twist and it will be less likely to slip out or mar the screw head.

THE BIT BRACE.

The bit brace should be of the ratchet pattern and rather small. Oil the working parts occasionally.

BITS.

Bits are of various patterns. For our work get one each 3-32, 1-8 and 3-16 inch gimlet bits; one each 1-4, 3-8, 1-2, 5-8, 3-4 and 1 inch auger bits and one counter sink.

The gimlet bits you will use principally for screw holes. Be careful not to bend them. The auger bits are for larger holes. When using them it is a good plan, if you intend to bore all the way through, to stop as soon as the worm is through and bore in from the other side. You are less likely in this way to raise the grain around the hole.

TO SHARPEN BITS.

To sharpen bits use a slip stone (a thin oil stone). Rub the sharpened edges on the inside keeping the angle the same as when new.

THE NAIL SET.

The nail set is a small steel punch, hollowed a little on the end. It is for sinking nail heads below the surface of the work. Always incline the nail set in the same direction as the nail so it will not slip off and mar your work.

THE HAMMER.

The hammer should be fairly light. Get one ball pein (round face) claw hammer, rather small; one riveting hammer (small). Use the claw hammer for all ordinary work