

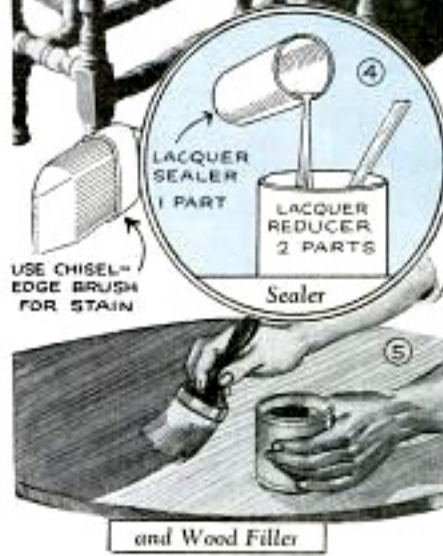
There's Lasting Beauty in a WOOD FINISH



HOW does the expert produce the soft glow of finely finished wood? How does he give his work that unmistakable professional appearance? He will tell you that there are over twenty operations in a top-rate job of hand-rubbed finishing, and that most of these steps have to do with careful and intelligent attention to small details, simple things that one is apt to overlook. The other operations have to do with applying the right materials in the proper sequence.

Sanding: In starting with any article not previously finished, you first go over the piece thoroughly with fine steel wool, then No. 7-0 sandpaper, Fig. 1. A helpful trick is to use a large piece of old inner tubing or other flexible pad, wrapping the sandpaper around it to reach into crevices more easily. Clean up all tool marks. Dust off with a dusting brush as in Fig. 2, or with compressed air if available. Sand and re-sand. A thorough sanding job is the beginning of a good finish.

Staining: First apply a thin glue sizing, allow it to dry and sand lightly. Water-soluble aniline dyes which are best for staining mahogany, for example, have been transferred to anhydrous solvents. Water stains of this type are non-grain-raising, have a clear color and tone and do not clog the pores because they are completely dissolved. The water stain will accentuate the beauty of the grain more than most oil stains. Walnut and mahogany will respond beautifully to this treatment but when you





use other woods and endeavor to give them a walnut or mahogany finish, you are obliged to consider the wood, rather than the color of the finish. If, for instance, you are using one of the Philippine woods which are often mis-called Philippine "mahogany," you are not dealing with mahogany at all. It is said to require extra work and care in the finishing. Some finishers say that it requires excessive sanding to lay the grain properly, absorbs excessive amounts of finishing materials, and remains lifeless. To imitate mahogany, select birch. Using the proper stains and procedure sequence certain pieces of this wood will finish in a remarkably close simulation. Likewise, selected cherry can be finished to match walnut.

Spray the stain very lightly on a thoroughly wet surface—unless the directions with the stain preparation advise differently. Or, use a sponge or large brush to apply thinly, but delicately. Then allow to dry, scrutinize the result, and re-apply, if necessary. Wood, such as mahogany, darkens with age. It may be a light salmon pink when freshly cut, and change to a sherry with time. Your job, therefore, is to achieve this sherry tone immediately. Naturally dark stains are positively out. The object is to bring out grain by intensifying it with successive light applications of stain, Fig. 3.



First Sealer Coat: Allow the stain to dry for four hours or more. The sealer coat, Fig. 4, consists of alcohol, 4 parts, to four-pound-cut white shellac, 1 part, or, use lacquer sealer, 1 part, to lacquer reducer, 2 parts. The sealer coat brings out the highlights and makes it more transparent. If possible, spray it on as in Fig. 8.

Filler: Allow sealer coat to dry at least four hours. Sand thoroughly, dust thoroughly. A secret is to use filler, regardless of the character of the wood. Experts do. The filler for the job should be of inert material and it should be a shade darker than the stain, Fig. 5. Add pigment as desired—for brown mahogany, use Van Dyke brown or burnt umber;



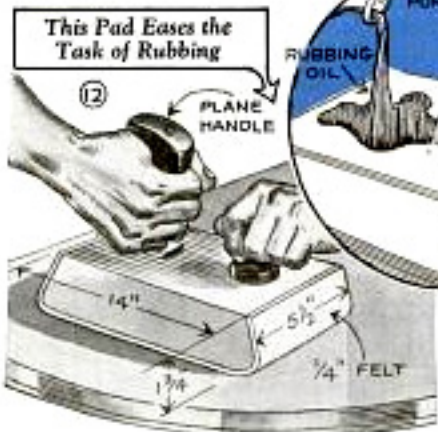
for red mahogany, use burnt sienna and Van Dyke brown; reduce with naphtha and brush on with the grain. In 4 to 8 min., wipe across the grain with circular motion, using burlap. On turned parts proceed as in Fig. 7. Wipe until completely clean. Dry overnight, preferably in a warm room. Do not rush—the old wood masters never did.

Second Sealer Coat: Spray on as in Fig. 8 if possible. Make this coat slightly heavier—a little less reducer. Dry at least one hour. Sand with No. 7-0 sandpaper and don't forget to remove dust.

Glazing: To achieve an antique finish,

with certain parts highlighted at the corners of flat surface, around grooves, legs, and knobs—apply glazing stain, rubbing it off except in the parts just mentioned. Allow to dry overnight. Or, for an antique look on the piece, use a special antique stain in the staining process. The dealer in decorators' or wood finishers' supplies will tell you which.

Finish Coats: Clear lacquers are generally preferred by professional finishers. Good lacquers are quick-drying, resist water, heat, alcohol, scratches and are easily washed with soap and water and polished. The new synthetic varnishes which have a Bakelite base, are excellent, too. Also, shellac with a polishing-off wax will give you good service. But most satisfactory as a rule, is good lacquer. Three coats, with 48 hrs. between each coat, and sanding between each—is the usual procedure. Use an air brush for lacquer, if possible. Apply a gloss lacquer for the first two coats, then a flat type for the third to give extra body. Lacquer all over—front, back, inside. For a less dull effect, use a soft cloth or felt dipped in rubbing oil, Fig. 11, then in American

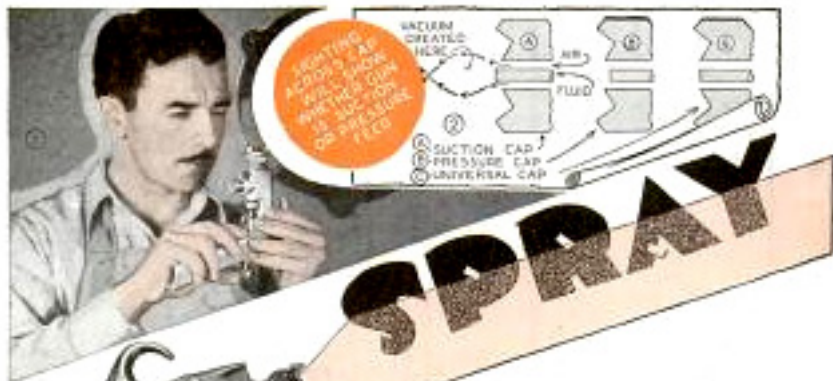


ground Italian pumice stone and rub gently. For a still duller effect, use pulverized pumice and water. Wash off and dry with chamois. Polish with paste wax. When the wax has been absorbed, wax some more, rub some more, wax and rub and so on and on as long as possible. The pad shown in Fig. 12 will help out on this job. The

beauty grows in direct proportion to the amount of rubbing you do.

French Polishing: This is an interesting antique finish in which there is a maximum of hand rubbing. Sandpaper, stain, etc., omit lacquering and instead apply raw linseed

oil. Let it dry 24 hours. Sandpaper again using No. 7-0 paper. Dust. Dissolve French polish or shellac gum with alcohol to a very thin liquid. Apply with pad, using circular motion, Figs. 9 and 10, adding just a drop of raw linseed oil, now and then. When the surface of the article has been gone over in small sections, this way, about four times, set it aside and allow to dry 48 hours. Repeat the process at intervals of 48 hours as long as you like, except that the final rub-down ought to take place six days after the preceding, just to give the second to the last coat time to season. The beauty grows with each polishing.



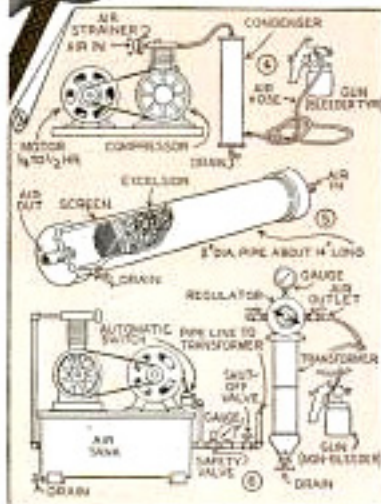
SPRAY



FINISHING becomes the easiest part of the job when done with a spray gun. Not only is spraying many times faster than hand brushing, but it also gives superior work and permits the use of fast-drying lacquers and synthetic enamels.

Many different arrangements are used in spray finishing. The simplest practical setup is the portable unit shown in Fig. 4. The condenser, Fig. 5, can be made from 2-in. pipe and can be arranged to drain from either the bottom or end. The condenser smooths out pulsations in the air supply, and also extracts the water and oil which form when the air is compressed. A more elaborate setup where the unit is to be stationary is shown in Fig. 6. In this arrangement, air is first pumped into a storage tank. An automatic switch on the tank turns off the motor when the pressure reaches 100 lbs., and turns it on again when the pressure drops to 80 lbs. Since the full 80 lbs. pressure is seldom needed, the main air line must be piped to a transformer. The transformer consists of two parts. The upper part is a regulator, which can be adjusted to deliver any required air pressure; the bottom part is a condenser as already described.

The spray gun for the portable installation shown in Fig. 4 must be of the bleeder type. The unit shown in Fig. 6 takes a non-bleeder gun. A bleeder gun is constructed to pass air at all times and must be used when air is taken direct from the compressor or where the compressing unit



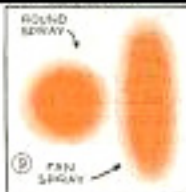
THE MODERN FINISHING METHOD



A TYPICAL HOMESHOP INSTALLATION

does not have some form of pressure control. A non-bleeder gun can be made a bleeder type by tying back the trigger, as shown in Fig. 10, to pass air but not pulled so far as to pass fluid. Two or three other features of gun construction must be considered. Most important of these is whether the gun shall be suction or pressure feed. In the suction feed, the fluid is pulled to the nozzle of the gun by the vacuum created by the air; in the pressure feed, air is introduced into the paint cup to force the fluid to the nozzle. Pressure feed is useful and necessary for heavy fluids; suction feed is practical for average fluids and is simpler and less expensive.

Most guns can be used with either pressure or suction feed.



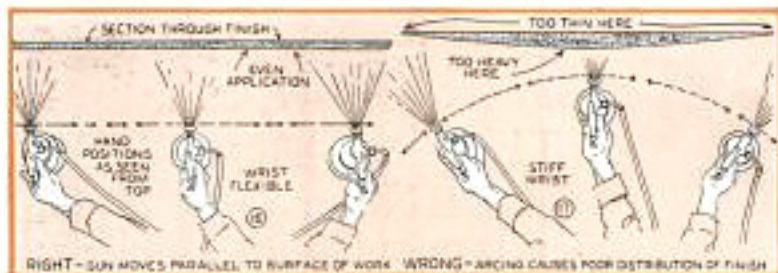


Fig. 3 shows a gun arranged for suction feed. By fitting a pressure feed cup and a different cap, the gun can be used with pressure feed. Many workers neglect the second feature—changing the cap—but it is of considerable importance. If you sight across the nozzle of a suction-feed gun, as shown in Fig. 1, you will notice that the fluid tip projects about $\frac{1}{16}$ in. beyond the air cap. This arrangement, as shown at A, Fig. 2, creates the vacuum necessary to draw the fluid to the nozzle. B shows the pressure cap, which extends beyond the fluid tip. This cap will not work with suction feed. The cap shown at A (suction feed) will work with pressure feed but gives poorer atomization of the fluid. The cap shown at C is a universal design used for either suction or pressure feed, but less effective with either than a true



IT IS A GOOD WORKING DISTANCE.

suction or pressure cap.

The air cap of an external-mix gun has three holes in it. The central hole passes the air which breaks up or atomizes the fluid. The two outer or horn holes pass air which forms the atomized fluid into a definite pattern. When air passes through the center hole only, the pattern is round, as shown in Fig. 9; when air passes through all three holes, the pattern is the familiar fan spray. The longer dimension of the fan spray, Fig. 9, is called, somewhat incorrectly,

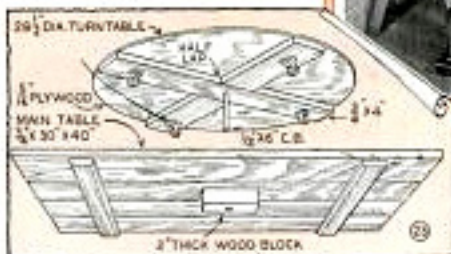
its width. This pattern can be moved to any angle by turning the air cap, the pattern being always opposite to the position of the horn holes. Thus, if the horn holes are horizontal, the long dimension of the fan pattern will be vertical. This is the



adjustment usually used. Most guns make a fan pattern only, but better quality guns make both fan and round patterns. When the gun is of the internal-mix type, that is, the air and paint are mixed inside the cup, the air cap is slotted to give the same fan spray. Between external and internal mix guns, external mix is the most prevalent and practical.

The first operation in spray finishing calls for the making of a pattern. Hold the nozzle of the gun about 6 in. away from a sheet of cardboard or paper, as shown in Fig. 8, and pull the trigger. The resulting pattern shows whether the gun is prop-

Right, work suspended on strings for finishing. Below, construction of a simple turntable



erly adjusted to go ahead with the work. Fig. 11 shows the perfect pattern—a long oval, with the paint evenly distributed and finely atomized at the edges. The heavy-center pattern, Fig. 12, is

SPRAYING RECOMMENDATIONS *

- SHELLAC** Use 3-lb. cut. Can be used either suction or pressure feed.
- VARNISH** Use spraying varnish at can consistency. Thin brushing varnish 25%. Hold nozzle 8 to 10 in. from work.
- LACQUER** Reduce 25 to 150%, depending upon type. Hold nozzle 6 to 8 in. from work. Apply full wet coats.
- SYNTHETICS** Spray mist coat, first coat. While still tacky, apply full wet coat. Average synthetic works best pressure feed, but can be thinned as required for suction feed.
- PAINT** Oil paints and enamels should be thinned as required. Hold nozzle 8 to 10 in. from work.

*With maintained air pressure between 22-28 lbs.

COMMON FAULTS

- DRY SPRAY** The sandy, "orange peel" effect encountered when spraying lacquer and synthetics is usually caused by holding nozzle too far from work so that only a dry dust is deposited on the work. Correct by working closer, increasing fluid or reducing air.
- PINHOLES** Caused by holding gun too close to work, or, excessive air pressure, or, heavy fluid; also can be caused by work improperly filled.
- BLUSHING** Blushing is a whitish cast on lacquer caused by absorption of moisture. Seldom encountered except during summer. Correct by adding retarder to lacquer.
- SAGS** Sags or curtains are caused by too much material on work. Correct by working gun faster or decreasing fluid.



STENCILING IS DONE WITH ROUND SPRAY

poorly atomized, caused by insufficient pressure. The peanut pattern shown in Fig. 13 gives good distribution, but is poorly shaped. It is caused by the clogging of one of the horn holes. The pattern shown in Fig. 14 is usually caused by a dirty gun, resulting in a partial clogging of the fluid tip. The split pattern, Fig. 15, results when too much air pressure is used, and is corrected by reducing pressure or increasing the flow of material. Of the various patterns, the one shown in Fig. 12 will give most trouble to the home-shop owner. This fault is one of equipment—there is not enough pressure to break up the paint which is being sprayed. To some extent, this can be corrected by cutting down the amount of fluid delivered to the nozzle (your gun should have an adjustment for this), but the only true remedy is to install a larger compressor or use a smaller gun.

After obtaining a good pattern, you are all set to spray. The very first rule to remember is always to keep your gun at right angles to the surface being finished, Fig. 16. This requires a flexible wrist, and demands a little attention until the right movement becomes automatic. Fig. 17 shows the common fault of the beginner. Arcing in this manner causes poor distribution of the finishing material. Learn how to "trigger" your gun. The start and finish of a stroke on a flat-wall surface must be feathered off. If you are working on a flat surface which can be covered with one stroke, start the fluid before you hit



the work, and stop it immediately after running beyond the work. Overlap your strokes about one-half, that is, the edge of the second stroke should come to about the center of the first stroke. Keep the gun in motion.

A second point to be considered is the distance from the gun to the work. This varies with different materials and guns, but 8 in. is a good general average. Spraying distances for certain materials can be checked readily by spanning the fingers from the gun nozzle to the work, as shown in Fig. 18.

Cleanliness is of prime importance in spray finishing. Strain any doubtful material through a tea



Cardboard strips can be used for a large percentage of spraying jobs where masking is necessary

strainer or cloth, Fig. 19. Always clean the gun after using it. This operation is very simple, and is done by simply placing the fluid tube in a jar of thinner and pulling the trigger, as shown in Fig. 21. Some workers also alternate this by holding two fingers lightly over the nozzle, as shown in Fig. 20. When the trigger is pulled, the thinner surges violently in the cup and exerts a powerful cleaning action.

While spray finishing can be done anywhere in the shop, it is best to reserve and equip a certain space for the work. Fig. 7

shows a typical installation. Fig. 22 shows a simpler arrangement. A turntable on which work can be placed and rotated is a worth-while item, and can be made easily as shown in Fig. 23. An exhaust fan is a nice feature, but not strictly necessary in the home shop where only one piece at a time is finished. Most workers get along nicely by opening two windows of the basement, thus creating a cross current which quickly carries away fumes caused by the spraying of the finishing material. Notice that on the portable outfit shown in Fig. 22, the motor, compressor and condenser are combined in one unit. The set-up shown in Fig. 7 is a larger stationary installation using a transformer, the top of which can be seen behind the worker.

Portable equipment has a nice feature in that it can be moved to any location. Thus, if you want to stencil a border on the kitchen wall, Fig. 24, it's no trick to pick up the equipment and carry it upstairs. The stenciling operation shown here is done with the usual paper or metal stencils, holding a strip of cardboard against the wall to catch any overspray. Stencils should be worked with a round spray. If your gun does not have this adjustment, a round spray can be made by blocking off the horn holes with friction tape, as shown in Fig. 25. Fig. 26 shows how a strip of cardboard is used to catch overspray when finishing woodwork. Similar methods can be used to protect windows and other surfaces. Where clean separation is required, as in two-tone color work, masking tape should be used to cover areas which are not to be painted.

Glass Drilled with Silicon-Carbide



I have found that a pointed piece of silicon-carbide is superior to a steel drill for making holes in glass. When chucked in a drill press or hand drill,

the silicon-carbide will penetrate the glass faster than a drill without the chances of chipping it. The pointed end of the carbide should be dipped in water occasionally.

—Nicholas Biebel, Buffalo, N. Y.

Desk Slide Instantly Converts into Drawing Board



Office workers who occasionally need a sketching board will find this combined desk slide and drawing board worth-while. It is made from 3/8-in. material, doubled to fit in the slide slot of the desk. Three pieces are hinged together so that, when the slide is pulled out, one section drops down to support the outer section at any angle.

Saw Vise Serves as Depth Gauge

Fastened to a hand-saw blade to limit the depth of the cut, a small saw vise serves nicely as an emergency depth gauge. Remove the vise from its bench clamp and place the jaws on the saw blade,



making the distance from tip of teeth to the jaws equal to the depth of the cuts you wish to make. Start the cuts with the point of the saw where you can see the line easily and finish with the portion of the blade under the jaws.