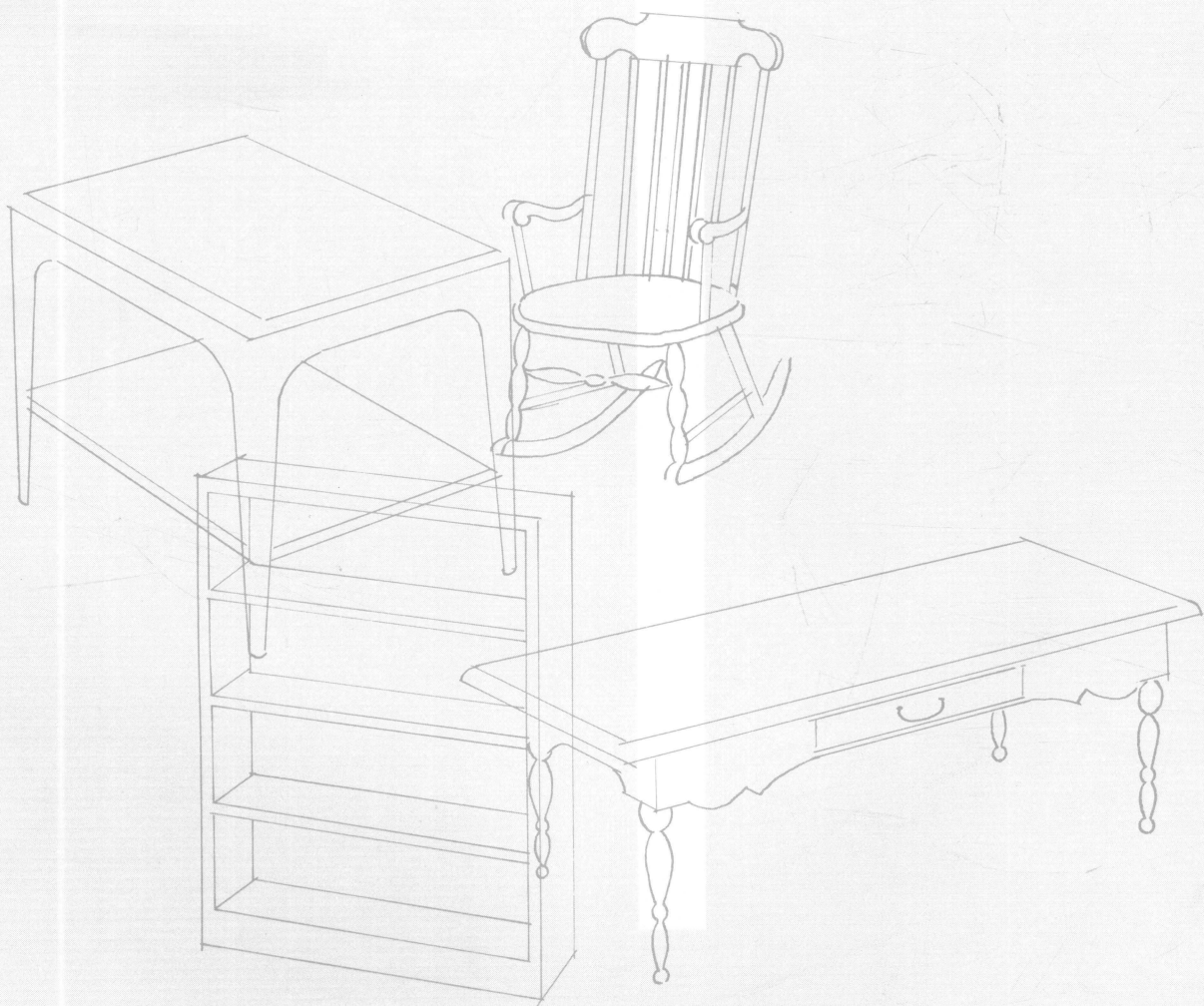


# FINISHING FURNITURE . . .

old and new



## STEPS IN REFINISHING A PIECE OF FURNITURE

1. Evaluate piece of furniture to be refinished.
2. Consider materials, space, time and money to be used.
3. Examine old finish—clean if necessary to determine the condition.
4. Remove the old finish.
5. Complete any repairs needed.
6. Sand only to smooth surface.
7. Stain if desired—seal.
8. Fill if needed—seal.
9. Apply coats of selected finish.
10. Polish and/or wax if desired.

Follow the same steps omitting 3, 4, and 5 if a piece of unfinished furniture has been purchased and is to be finished.

### CAUTION

*Any cloths or papers used with inflammable materials such as paint and varnish removers and any product containing oil, turpentine or other solvent should be burned with care or placed in an air-tight container. Do not leave in a pile.*

ACKNOWLEDGMENT—This bulletin was prepared by Doris Snook and Dorothy Lawrence, Extension Specialists, Housing and Furnishings, The Ohio State University.

# FINISHING FURNITURE . . .

## old and new

### THE PIECE OF FURNITURE

Refinishing furniture at home is a craft enjoyed by many people. It may be done to restore an old piece of furniture, or it may be to replace a damaged finish on a relatively new piece of furniture.

Considering all your resources, you may find it more economical to refinish the furniture yourself than have it done by a professional. The therapeutic value, the pride in accomplishment, the development of a skill, and the possibility of stimulating family interest in a worthwhile activity should not be overlooked.

Before starting to refinish a piece of furniture consider it carefully in terms of your reasons for doing it. It may have a high sentimental value with or without a useful purpose.

Unless the design and construction are good, the furniture may not be worth refinishing. Good design means such things as (1) good proportion, that is a pleasing relationship between height, width, and depth; (2) good shape, or a pleasing use and combination of straight and curved lines; (3) good scale—not too big nor too small in relation to the space and other furnishings in your room.

Poor construction will also limit the value of the piece. It should be strong enough to serve some purpose. Generally, loose joints can be tightened and corners can be blocked at home. Removing warp, repairing splits or breaks, or replacing or tightening veneer require some special tools and skills which the amateur may not have. If repairs are made outside the home, will they cost more than the piece is worth? Will it look patched up?

The wood used in the piece of furniture can help to determine its value as well as the method used to refinish it. Solid woods are probably the easiest and most satisfactory to refinish. Veneers of furniture woods require special care, particularly in removing an old finish and in sanding the surface. Although chips or breaks in the veneers can be replaced, this requires care and "know-how."

Cleaning the finish of an old piece of furniture may be necessary to reveal its condition before you start to work on it.

To remove dirt and old wax, use a cloth dampened with turpentine or a commercial wax remover. You can wash badly soiled furniture if you do it carefully. Use a mix-

ture of 1 quart of hot water, 3 tablespoons boiled linseed oil and 1 tablespoon turpentine. Keep the mixture hot (Fig. 1). Wipe the surface with a soft cloth wrung out of this solution. Be sure to wring the cloth well, especially when wiping veneered surfaces. Polish with a soft dry cloth. Wash and dry small areas at a time.

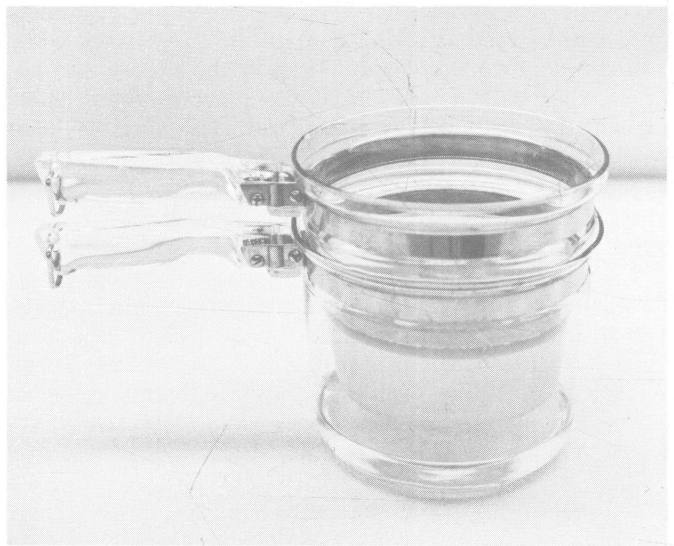


FIG. 1—Mixtures containing linseed oil and turpentine are inflammable. To heat such mixtures, use a double boiler or combination of pans with hot water in the bottom one and the cleaning mixture in the top.

If the finish is in good condition when cleaned, a fresh coat of the same material might be applied. Tests will show whether a clear finish is varnish, shellac, or lacquer. In an area free from wax, rub a small spot with denatured alcohol. Since shellac is thinned with alcohol, the alcohol will soften shellac. Do the same with lacquer thinner to determine if the finish is lacquer. Turpentine will soften varnish.

See section on finishes for methods of treatment and application.

If the old finish is sticky, rough, cracked, chipped or badly stained it will need to be removed.

## PAIN T AND VARNISH REMOVERS

Commercial removers range from a thin liquid to a paste. One the consistency of syrup will stick to surfaces better and remain wet longer than a thin one. Many of these products contain solvents and so will not raise the grain or mar the wood. When used correctly they will not destroy the patina of an old piece of furniture. Their action is a little faster on the transparent finishes than on paints and enamels, but the process in their use is the same. These removers also act more slowly on old finishes than on newer ones and some removers are more effective than others. Time, patience, and some testing are needed for satisfactory results.

These paint and varnish removers should be used in a well ventilated room and away from an open flame. Always follow the directions on the container. It's wise to remove the finishes from the lower part of a piece of furniture first because some removers will cause streaks in a finish if they run down over it. These streaks are difficult to remove.

Use an old paint brush to apply the remover. Allow it to stand on the surface until the finish, or at least the first layer of finish, appears to be loosening. Do not allow the remover to become dry. The paraffin or wax in the remover acts as a seal to slow down evaporation. With a dull putty knife, remove the loosened layer of finish. Always work with the grain of the wood. Wipe off the surface and apply another coat if any old finish remains. Shiny spots indicate the old finish is not all off. The surfaces from which all finish is removed will appear dull.

Pieces of burlap, a stiff-bristle brush, steel wool, or coarse cord will help to remove old finish from turned or carved areas.

Directions on some containers suggests what to use as a wash following the remover. If no suggestion is made, it is advisable to wipe the surface with a cloth dipped in either denatured alcohol or turpentine. New finishes will not dry satisfactorily over either some old finishes or remover left on the surface. Always allow the surface to dry thoroughly for at least 24 hours.

FIG. 2—Wrap abrasive papers around blocks for use on flat surfaces and around balls or other round objects for use on curved surfaces.



## ABRASIVES

Abrasive paper, steel wool, and powders are used to smooth, finish, and polish surfaces of furniture.

### PAPERS

Flint—garnet—silicon carbide (carborundum)  
aluminum oxide (production)

Uses	Grade
Smoothing	Medium 1/0 to 3/0
Finishing and polishing	Fine or very fine 7/0 to 10/0 (waterproof for polishing)

### STEEL WOOL

Uses	Grade
Smoothing	0 to 000
Finishing and polishing	0000

### POWDERS

Uses	Grade
	<i>Pumice Stone</i>
Polishing	FFF or FFFF
	<i>Rottenstone</i>
Polishing	One grade

## Smoothing and Finishing

Sanding or smoothing with an abrasive is a most important process in finishing or refinishing furniture. The purpose is to smooth a surface, not remove it, and to bring out the sheen of the wood, not to damage the mellow layer of wood. If the surface is not smoothed enough, the finish may not be satisfactory.

Wrap abrasive paper around a block of wood, the under side of which is covered with 3 or 4 thicknesses of felt or other soft cloth. A black-board eraser makes a satisfactory block (Fig. 2).

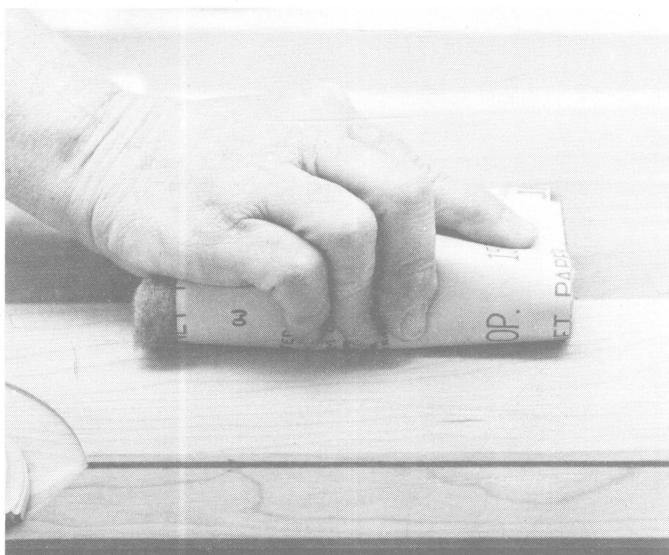


FIG. 3—Always move abrasives parallel to the grain of the wood.

Always move all abrasives parallel to the grain of the wood. If there are inlays of veneer or sections where the grain runs another direction, cover these with masking or adhesive tape to protect them from scratches. Rub lightly with just enough pressure to smooth the surface or polish the finish (Fig. 3).

After each application of an abrasive, wipe the surface first with a dry cloth and then with a tack rag. This is a treated cloth that picks up fine particles of dust that a dry cloth will not collect. You can purchase a tack rag at paint or automobile supply stores, or you can make one at home. To do this, wash a square (2 feet) of closely woven cheesecloth in several changes of water. Wring it out the last time just enough to prevent drip. Either dip it in turpentine or pour turpentine on it. Shake it out loosely. Sprinkle enough varnish over the cloth to make it quite yellow. Fold the edges to the center and twist and wring the cloth to force out the water and allow the turpentine and var-



FIG. 4—Wipe surface each time an abrasive is used and just before any finish is applied.

nish to saturate the cloth. Shake it out. The cloth should be sticky enough to pick up dust and other foreign particles but not to leave moisture on the surface of the furniture. If the tack rag dries out, sprinkle it with a few drops of water and turpentine. If it is too moist, shake it in the air a few minutes. You can use it indefinitely, over and over again. Always store it either in a tight small glass jar or wrapped tightly in aluminum foil.

Steel wool is good for finishing after the surface is smoothed. Use steel wool on veneered surfaces and on turned, carved, or round areas.

## Polishing

This is the final process and follows the application of all kinds of finishes. See section on Wood Finishes.

The waterproof papers and powders are used with oil as a lubricant for polishing. Use a light oil such as paraffin oil, mineral oil, or boiled linseed oil. Dip a soft wool pad (pieces of blanket or felt) first in the oil and then in the powder and rub lightly on the surface to be polished. Another method is to mix the oil and pumice to a consistency of a thin batter. Then dip the soft cloth into this mixture.

This polishing will produce a soft satin sheen. A high gloss is not generally desired on furniture in the home, but may be obtained by rubbing a finish with rottenstone and water.

## MINOR REPAIRS ON UNFINISHED WOOD

Problems and methods of treatment suggested apply to furniture wood from which the finish has been removed. Treatment of finished surfaces is considered under the section on Finishes.

## Tightening Joints

### REGLUING

If a piece of furniture needs regluing in some or all of its joints, three things are essential for successful results: 1) clean, dry surface, 2) right kind of glue, 3) clamps.

1. All old finish, old glue, paint, dust, wax, oil, or grease must be removed from the surfaces to be reglued. Hot vinegar will remove some old glues. Wood must be thoroughly dry before new glue is applied. Allow 24 hours between washing or soaking and regluing. If the surfaces are slightly roughened the holding power of the glue will be increased. Glue should be applied and dried in temperatures of 70° to 75° F.

If a furniture joint is loose, but does not need to come completely apart, remove the old glue and work the new glue down around the joint with a swab or small pointed stick. You can sometimes use a small wedge-shaped piece of wood to spread the surfaces.

When one section of the joining is too small to fit tightly into the other piece, a thin strip of fabric placed over the small section will help to tighten it. Saturate the fabric with glue. Trim the edges so they do not extend beyond the edge of the joint.

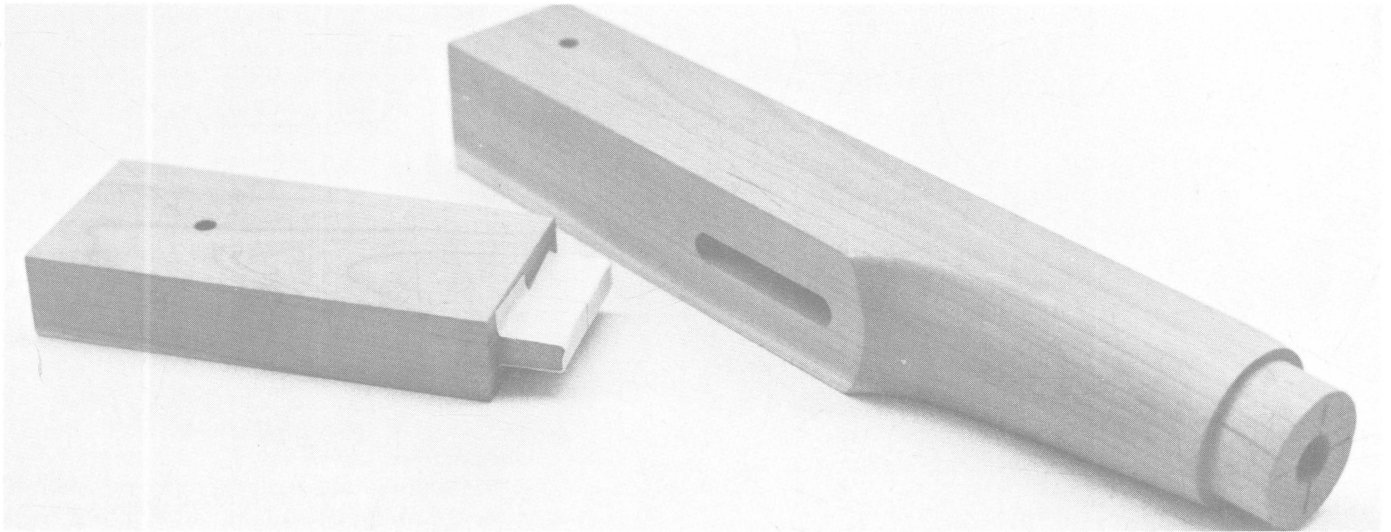


FIG. 5—Applying tape is one method of tightening a loose joint.

2. **Plastic resin glue** (white liquid) dries hard quickly, is easily applied, is elastic and transparent. It can stain some woods slightly if allowed to dry on the surface.

The **urea-formaldehyde resin-glue** has high resistance to humidity and fungus. It has value if furniture is to be exposed to excessive moisture.

**Casein glue** is strong and hardens quickly. It penetrates the wood and is especially good for oily woods such as pine, spruce, teak, and yew. It is good to use if surfaces do not fit together too well. It is not waterproof and may stain woods light in color.

The **animal or hide glues** are strong but need to be applied hot. They have no particular advantage over the plastic resin or casein glues.

3. Freshly glued furniture must be held firm and in alignment while the glue is hardening. When you check the joints to see that they are in proper position, apply a wood clamp, a C clamp, or a tourniquet. Put blocks of soft wood between the clamps and the furniture.

To apply a tourniquet successfully, use a heavy cotton clothesline. Place the rope twice around the reglued section. Be sure a pad of felt or other such material is between the rope and the furniture. Tie the ends of the rope, and twist the rope with a stick to tighten it.

Wipe off any glue that oozes out when the joinings are tight. Keep clamps or tourniquets in place at least 24 hours.

#### USING BLOCKS AND HARDWARE—

A loose mortise and tenon joint can be tightened by inserting a wood screw through the mortise into the end of the tenon. Countersink the head of the screw and fill the hole with a piece of dowel.

If a chair rung or other round section is too small for its original hole in the frame, clean out the hole with a drill, then insert and glue a dowel that fits the hole. When the glue is thoroughly dry, drill a hole in the dowel to fit the end to be inserted. Glue according to directions.

Shims, wedge-shaped pieces of hardwood the same width as the joint, can be driven into the side of the loose joining. Apply glue before driving the shim in permanently.

Corner blocks attached with glue and wood screws can strengthen some slightly loosened or worn joinings, particularly those where the seat is attached to the frame of a chair or sofa. These blocks must fit evenly and tightly into the corner. They ought to be about 1½ inches thick and at least 3 inches long on each side. It is necessary to drill holes through the block at an angle so the screws will go into the furniture frame. Countersink the screw heads.

Thin metal plates and braces in various sizes, shapes, and weights are available at many hardware or department stores. These can be used on the under side of surfaces to reinforce weak or loose joints.



FIG. 6—Apply a tourniquet to hold reglued loose joinings. Keep it in place 24 hours.

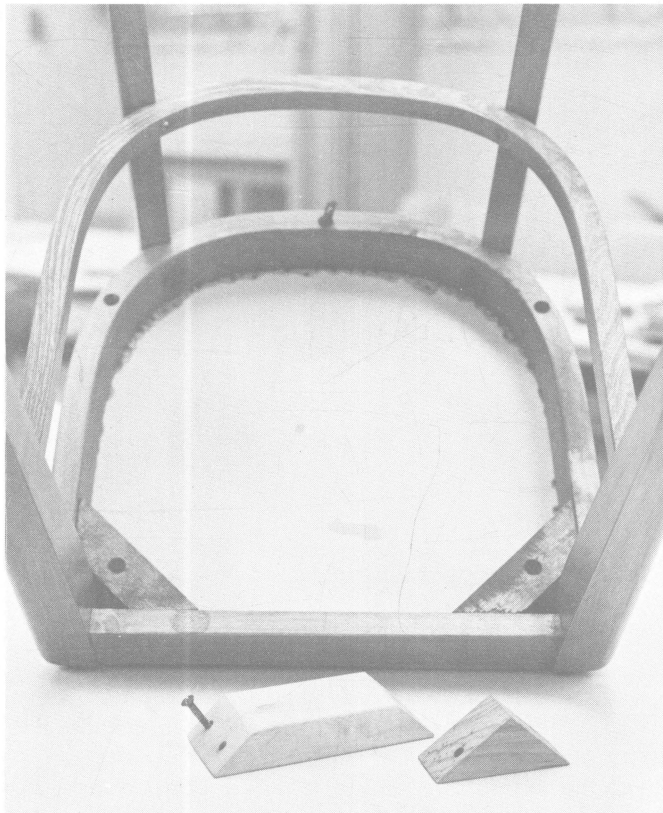


FIG. 7—Corner blocks may be of different sizes and shapes to fit into various shaped corners.

### Removing Dents (on unfinished wood)

A dent in solid wood can be raised. Place several layers of cloth (such as blanket) dampened with water over the surface. Press with a hot iron. The steam causes the wood to swell and return to the level of the surrounding area. Repeat the operation if necessary.

Do not use this process on veneers. Be careful if you are doing this near glued joints. The steam might loosen them, particularly if animal glue has been used.

When the area is dry, smooth it with an abrasive.

### Filling Small Holes and Cracks

If a surface is to be stained, do this before filling holes or cracks. Then purchase the filler in color to match the stained wood.

Be sure the crack or hole to be filled is free of all dirt, grease, or old finish.

Wood dough or putty is a strong permanent filler. It comes in wood colors but has no grain. It can be sanded or drilled and will hold nails or screws. It is most satisfactory when used in an inconspicuous place or under an opaque finish. If used to fill a large area, apply it in layers, since it shrinks slightly as it dries.

Stick shellac or lacquer is available in a variety of wood colors. It has no grain, but when used in small spots may not be noticeable. You can scratch the surface with a razor blade or needle to imitate the wood grain.

Melt the end of the stick of shellac or lacquer with either a soldering iron or the heated blade of an old knife.

If an old knife is used and is heated in a gas flame, wipe off any soot formation before touching the stick. The soot can discolor the shellac. Never heat the shellac or lacquer directly in the flame. Hold the stick so that when shellac or lacquer melts it drops into the hole or crack. As it hardens, press it down with a wet finger or the blade of a small spatula. When it is thoroughly hard, even the surface with a sharp knife, chisel, or razor blade. Then rub with a fine abrasive.

### Treating Spots and Stains

Some minor surface scars are evidence of age and may not need to be removed.

Dark spots and stains (not grease or oil stains) may be treated as follows: dissolve 2 ounces of oxalic acid and 2 ounces of tartaric acid in 1 quart of hot water. Use a glass or enamel container and remember that these acids are poison. They may be purchased at a drug store. Apply this hot solution to the spot and surrounding area. Allow to remain 15 to 20 minutes. Wash off the surface with ammonia water (1 part household ammonia to 10 parts water). Then wash with clear water and allow to dry 24 hours. Repeat if necessary. Smooth the surface.

If a piece of furniture, particularly pine or maple, appears very gray or faded after paint and varnish remover has been used, wash the entire piece following the same procedure suggested for treating spots.

Treat grease or oil spots with a solvent such as carbon tetrachloride, benzene, or other such special cleaner. (Caution: These materials should be used in a well ventilated place, away from an open flame.) Rub the solvent into the spot with a brush or steel wool. Wipe it off with a blotter or soft absorbent paper. Allow to dry thoroughly and repeat as often as necessary. Surface finishes will not adhere to oily surfaces.

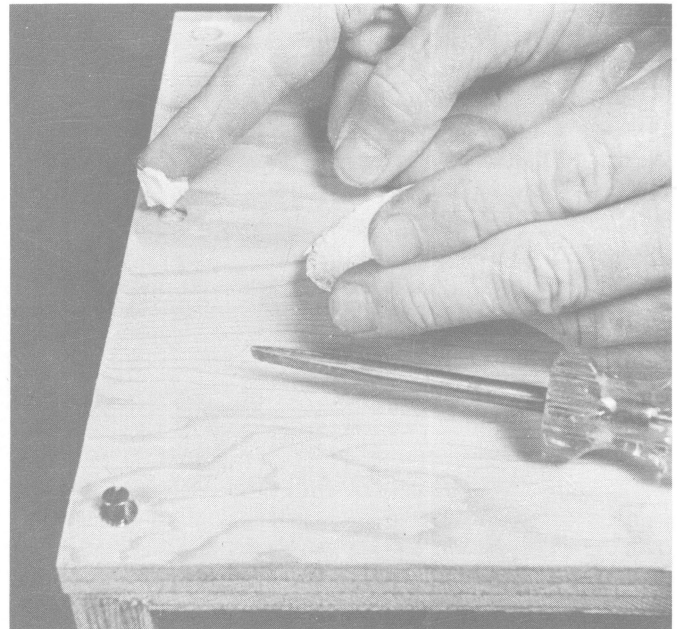


FIG. 8—Fill all holes before the final smoothing and just prior to the first finish coat.

## STAINS

Such woods as gum, poplar, or basswood are often stained because they have little grain or natural beauty. Stains are not usually used on such woods as mahogany, walnut, cherry, maple, or birch. A clear natural finish will darken them slightly and enhance their natural beauty and grain. Stains can be used, if necessary, to match other pieces of furniture in the room.

In refinishing a piece of furniture that has been stained, you may need to restain it to get an even color or the desired tone. If more than one kind or color of wood has been used, some staining is usually necessary.

Oil stains are easiest to use and are generally available. They may be purchased ready-to-use in containers of various sizes. Wood and other color pigments in an oil base are available. If the tone is too dark add more turpentine to lighten it.

You can easily mix an oil stain at home. Purchase the colors in oil, in tubes, or in cans and mix them with 3 parts linseed oil, 1 part turpentine and  $\frac{1}{2}$  part Japan Drier.

These stains in the wood tones are most satisfactory on the soft and close grained woods. They are not readily absorbed by hard woods, and the surface may remain sticky. Stains may clog the pores of an open-grained wood and make undesirable lines and streaks. When a color is used on such open-grained woods as oak, ash, chestnut, or Philippine mahogany, the limed, pickled or heather effect results.

Apply the stain to the wood with a brush or soft cloth. Experiment on the inside or underneath until you obtain the desired tone. If the color is too dark, wipe it off with a cloth dipped in turpentine. Wipe the surface with a soft cloth and allow to dry 24 hours.

The varnish stain is a varnish to which the coloring has been added. It stains and varnishes in one operation. It hides the grain of the wood. A satisfactory result is not always easy to obtain.

Water, spirit, and non-grain raising stains are available in some markets. These require special skill in blending and using.

Apply a sealer coat to the wood surfaces after the stain has dried. This is to prevent the stain from bleeding into finishing coats and to prevent liquids entering the stained wood and causing it to fade or gray. This coat should be thin, applied with a brush, allowed to dry 24 hours, then smoothed lightly with an abrasive paper or steel wool.

If the final finish is to be shellac, use shellac for this sealer coat. Mix 1 part white shellac (4-pound cut) with 8 parts denatured alcohol.

If the final finish is to be varnish, use a mixture of 1 part varnish and 1 part turpentine.

## WOOD FILLERS

Varnish or shellac, when used for finishing woods, fill the pores of the wood to some degree. The open-grained woods such as ash, chestnut, oak, hickory, mahogany, or walnut require a paste filler if a *very* smooth surface is desired.

Paste wood fillers are available in natural grayish color or in some wood tones. If the natural filler is purchased,

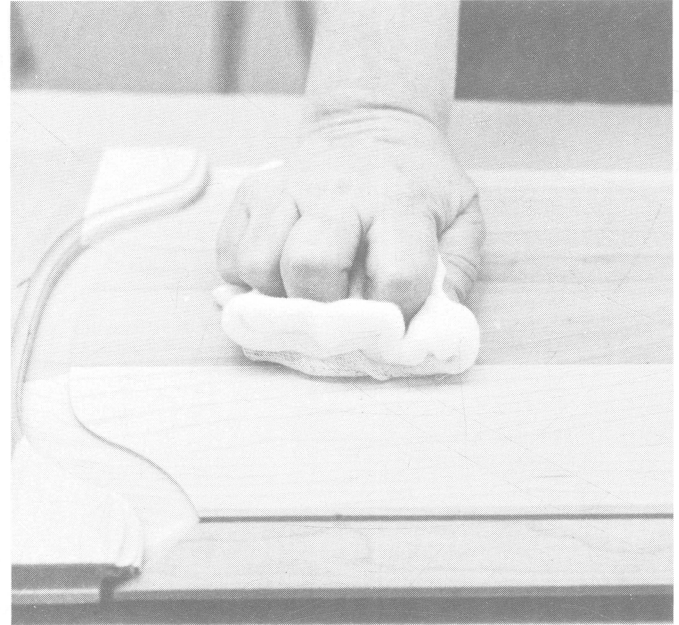


FIG. 9—Work across the grain of the wood to force the filler into the pores of the wood.

it can be colored with oil colors as it is thinned. These fillers when hardened will not absorb stain. The filler should be darker than the pores of the wood or the stain because it lightens as it dries. This could show through a transparent finish.

Thin fillers with turpentine to a brushing consistency. The larger the wood pores, the thicker the filler may be. Brush the filler onto the wood, moving across the grain to force the filler into the wood pores. As soon as the filler loses its shiny appearance, wipe the surface with a coarse cloth such as burlap. If it does dry too hard to be wiped off, use steel wool dipped in turpentine to remove it from the surface. Allow to dry 24 hours and then smooth with an abrasive paper or steel wool.

If the surface is not as smooth as desired after one application of filler, put on as many additional coats as necessary. Make each one thinner than the previous one. Smooth with an abrasive paper or steel wool after each application has set 24 hours. Wipe the surface with a tack rag after each smoothing.

Apply a sealer coat; see directions under Stains. The surface is now ready for the finish.

## WOOD FINISHES

*(Application and Treatment)*

Finishes applied to wood furniture may be opaque or transparent. Which one you use depends on the wood and its condition, the desired results and the use and care of the piece of furniture.

**General Guides to Success with Wood Finishes are:**

- Provide good ventilation.
- Keep dust at a minimum.



Work in normal to low humidity for best drying.

Room temperature of 70° to 75° F. is most satisfactory.

Allow space and time—short cuts and speed may ruin finishes.

Use right materials—too much substitution may be expensive in the long run.

Follow directions on labels.

Experiment and test in inconspicuous areas.

Complete the necessary steps in preparation for a good finish.

Apply at least one coat of finish to underneath sides of table tops and leaves to prevent an uneven absorption of moisture. This moisture can cause warping. Make this application even when refinishing old furniture.

## Opaque Finish

Advantages of an opaque finish are: 1) to cover woods with no natural beauty of color or grain, 2) to cover a variety of woods or poor quality woods used in one piece of furniture, 3) to make a piece of furniture harmonize in color with other furnishings in the room, 4) to replace a finish used on a particular style of furniture, 5) to serve as a base for certain kinds of trims or decorations.

High or low gloss enamel can be applied to either old or new wood. For best results remove any old finish. However, if an old finish, transparent or opaque, is perfectly smooth, not chipped or cracked and not too thick, a new coat of enamel may be put on over it. Be sure all wax, furniture polish, dirt, and dust have been removed. Cut all gloss or slickness by rubbing lightly with 1/0 abrasive paper. The surface must be thoroughly dry. A primer and/or undercoat are recommended. Follow the directions on the container of enamel.

With the wide variety of tints and tinting machines provided by manufacturers, there is little reason to mix paints at home. However, if this is desirable, don't mix different brands or types of paint. Use the same kind of tinting color as the brand of paint.

Two thin coats will look better and wear longer than one heavy coat. It is advisable to allow even the "quick drying" enamels to dry at least over night. Since enamel is varnish with pigment, follow the directions for applying and polishing varnish to get a soft, satin finish.

An antiqued finish is the result of putting a glaze over enamel and wiping it off in such a way as to produce highlights. When the enamel is thoroughly dried, use an old paint brush to apply a thin glaze coating. You can purchase liquid glaze, or make it by mixing 3 parts turpentine and 1 part varnish. Add raw umber oil color for a brown tone, raw sienna for a reddish tone, and lamp black to darken the glaze if desired. For a frosty effect on pastel enamels, add white primer or enamel to the glaze. Work on one surface at a time. With a soft cloth, use a circular motion to wipe off this glaze. Leave the center of a flat surface and top of raised areas light. Keep turning the cloth to a clean section and blending this coating so the outer and lower areas are darkest. Only a very small

amount of the glaze should remain on the surface. If too little comes off, dampen the cloth with turpentine. The glaze should dry at least overnight and then be protected with a coat of wax or a thin coat of clear varnish or white shellac.

## Transparent Finishes

The big advantage of transparent finishes is to bring out the natural color and grain of wood. This means they are best used on furniture well made of good quality furniture wood such as walnut, cherry, mahogany, maple, birch, oak, pecan, pine, or redwood.

There are two kinds of transparent finishes, those that penetrate the wood such as linseed oil and penetrating sealers and those that remain on the surface as shellac, varnish, lacquer, or plastic. Wax may be used as a finish or as a protective coating over other finishes.

### PENETRATING FINISHES

The penetrating finishes 1) cannot be used over any other finish, 2) require less skill in application, 3) sink into the wood, thus increasing the resistance to scratches, heat, moisture, acids, alkalis and alcohols, 4) can be patched in areas receiving much use and wear.

Penetrating finishes darken and give depth to walnut, bring out the yellow in birch and maple, the red in cherry, and the dark red in mahogany. (Oil on Philippine Mahogany produces a dead or dull appearance.) They tend to complement oak whether it is stained or filled with either a natural or a tinted filler.

Be sure the surface is smooth, dry, and free of dust. Use a tack rag (see section on Abrasives) just before the first coat of oil or penetrating sealer.

**Linseed Oil**—This is one of the oldest finishes known. It requires patience, time, and energy for rubbing. Combine 1 part boiled linseed oil and 1 part turpentine.

This can be applied either hot or cold. If the hot application is desired, heat the mixture in the top of a double boiler—never on a direct flame. With a soft brush or cloth apply a generous coat to the prepared wood surface. Allow to stand about 30 minutes. Wipe off the excess with a clean soft cloth and rub until the surface is dry. A piece of soft wool, blanket, or felt is good for rubbing. If the surface is sticky, remove the oil with a cloth dipped in turpentine. It may be necessary to use steel wool dipped in turpentine. Let dry at least 24 hours and then repeat. Continue adding coats of oil until no more will soak in and continue rubbing until a satin sheen is developed. Additional coats may be applied at intervals of several weeks or months.

The piece of furniture can be used between coats of oil and turpentine. An application of this mixture will clean and freshen the appearance when needed. Wax the surface if desired. Remove wax completely with turpentine or commercial wax remover before applying another application of oil.

**Penetrating Sealer**—Many commercial penetrating sealers are on the market. These contain oil and some resin or wax. They are available in various weights. Use the thin or lightweight for furniture. Heavier ones are more suitable for floors. Those with a high percentage of Tung oil penetrate the furniture woods best and build up less on the surface. These sealers are clear or in some wood tones. They may be mixed to lighten or darken them. Or if you want to darken the wood, stain it first and then apply a clear sealer.

Follow specific directions on the container since manufacturers and their products differ. Some general suggestions are: 1) pour a small amount from the container into a clean flat dish or pan; 2) keep the lid on the container; 3) if the can has been opened and a scum has formed, strain the sealer through a piece of nylon hose; 4) do not pour any unused quantity back into the can.

Nylon hose is good to use to apply the sealer to the wood surface. Rub to force it into the wood. Use a clean dry cloth and wipe off any excess not immediately absorbed. Let dry at least 24 hours. Rub surface with 000 steel wool. Dust, wipe with tack rag, and apply second coat of sealer. Allow plenty of time to dry between coats and continue to apply as many coats of the sealer as needed. Dull spots or streaks indicate more sealer is necessary. The final finish should be even, with some gloss but not a hard shiny appearance. If the finish becomes hard and shiny, too much sealer has built up on the surface rather than penetrating it. Do not rub the final coat with steel wool, but polish with pumice and oil. See sections on abrasives. This finish may be waxed if desired.

You may put on additional coats to renew a worn surface. The sealer can be applied just to an area receiving much use such as a table top or the entire piece can be treated. If you have used wax, it must be completely removed before another coat of penetrating sealer can be applied.

## SURFACE FINISHES

Shellac, varnish, lacquer, and plastics remain on the surface of the wood. These can be applied to any properly prepared surface. The right conditions of ventilation, humidity, temperature, and freedom of dust are especially important when these finishes are applied.

**Shellac**—Shellac is not waterproof. Moisture and liquids turn it white so it is not the best finish for tables, cabinets, chests, or stands. It may be used to finish picture frames, chair frames, or display racks.

Always use fresh shellac and thin it with denatured alcohol or a special shellac thinner. White shellac is best for light woods and is easiest to apply smoothly. A *very small* amount of orange shellac added to the white can bring out some highlights of the wood.

On raw wood, unstained or unfilled, apply first a wash coat made by mixing 1 part shellac (4-pound cut) and 8 parts thinner. For the following coats mix 3 parts shellac and 2 parts thinner.

Prepare the mixture of shellac and thinner in a jar that can be closed to prevent evaporation.

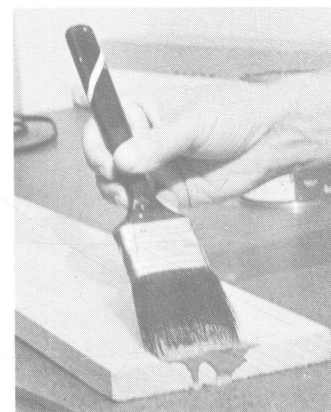


FIG. 10—Evenly distribute finishing material through the bristles of a brush (left). Don't have an excess amount of finish in the bristles (right).

Rotate the jar to mix. Don't shake it. Apply the mixture with a clean brush in a long stroke, following the grain of the wood. Use the tip of the brush to go back over the surface one time to pick up any surplus. Allow to dry thoroughly. One test is to make a thumb print. If the print can be seen, the surface is not dry enough. Rub *lightly* with steel wool. Dust thoroughly and repeat as many coats as desired, probably four or more. Allow the finish coat to dry at least overnight, and then polish with pumice and oil. (See section on Abrasives.) Wax if desired.

Never put water on a shellac finish. If it is old, it can sometimes be restored or revived by treating with a mixture of 2 parts paraffin oil and 1 part white shellac. Be sure all wax has been removed. Rub with the grain of wood, using a cloth or steel wool (000) dipped in the oil-shellac mixture. Wipe dry and re-wax if desired.

**Varnish**—Varnish protects wood, is easily cleaned but will show scratches and is one of the most difficult finishes for the amateur to apply. A minimum of three coats is necessary for a satisfactory finish.

Varnishes on the market differ in the degree of gloss and resistance to moisture, heat and alcohol. Read can labels carefully and select the best kind for the job.

On a dry day, apply varnish to wood properly prepared in a dust-free room where there is good circulation of fresh air at a temperature of about 70° F.

A wash coat of half varnish and half turpentine makes a good base for future coats. Use gloss varnish for each coat, or if you prefer you may apply dull varnish as the final coat.

Each application must be *thoroughly* dried and then rubbed with steel wool or a very fine abrasive paper. Use oil and pumice to rub the final coat. (See section on Abrasives.) Wax if desired.

**Never shake varnish.** Rotate a can to mix, either before or after it has been thinned. Pour varnish into a small container and keep the can closed. Don't pour unused varnish back into the original can. Dip the clean varnish brush into the varnish until it is evenly distributed through the bristles. Hold the brush at an angle so all ends of the bristles touch the surface. Do not use pressure but quickly apply a coat of varnish to an area 6 inches to 8 inches long and two strokes wide. Then wipe both sides of the brush on the edge of the container. Hold the brush straight up and down and, using just the tip, go over the varnished surface with long strokes to remove any bubbles. After each stroke scrape the brush to remove any varnish picked up. On a large surface, start at the edge and end the stroke in the center.

Varnish may develop hairline checks. These may be caused by exposure to sunlight, sudden changes in temperature, or too much moisture in the wood when the varnish was applied. To treat these checks, first remove any wax, then wash with the mixture on page 3. Thoroughly dry the surface. Use either a smooth, clean pad of cloth or a pad of steel wool (000) dipped in a mixture of 2 Tablespoonfuls boiled linseed oil, 1 Tablespoonful turpentine and 1½ Tablespoonful varnish. Keep this mixture hot in a double boiler. Rub with the grain of the wood on a small area at a time. When the finish begins to smooth out and stiffen, wipe off all excess with a dry lintless cloth. When dry, re-wax if desired.

A cloudy appearance on varnish may be caused by grease, smoke, or dirt collection on the surface. This can be treated by removing any wax and washing with the mixture on page 3. Rub the surface with a cloth or steel wool dipped in a mixture of half linseed oil and half turpentine. Wipe dry and polish with a clean cloth. If this treatment does not remove the cloudy milky appearance, it may be due to an inferior quality of varnish and can only be improved by removing the varnish and refinishing the surface.

White spots or rings on varnished surfaces can sometimes be completely removed or may become less noticeable. If the spot has gone through the finish or is not affected by the treatment, the only other alternative is to remove the varnish and refinish the surface. Some suggested treatments are listed.

1. Dip a soft cloth in oil and pumice stone.
2. Dip a soft cloth first in oil and then in salt.
3. Sprinkle cigar or cigarette ashes on spot. Dip cloth in oil or solvent cleaning wax and rub ashes over the spot.
4. Dip cloth in spirits of camphor or household ammonia.
5. Follow directions on commercial spot or scratch removers.

Always rub lightly and with the grain of the wood. Wipe the surface dry and re-wax if desired.

Scratches can be made less noticeable by rubbing the scratch with a piece of nut meat such as walnut or pecan, or by applying a bit of oil stain that matches the wood. Use a toothpick or swab to put the stain in the scratch. Wipe off the edges. Let dry and repeat if necessary. Polish with pumice and oil. (See section on Abrasives.) Wax if desired.

If "fish eyes" or "pits" appear in a new surface finish such as varnish or lacquer, they may be caused by silicones found in some types of spray-on waxes or polishes. If it is known that these materials have been applied, use many clean rags to wipe off paint and varnish or wax removers. Use a clean section of the rag each time and then destroy the rag so there is no transfer of this material.

Special removers and wood sealers to overcome the problem are available from companies and supply houses which handle wood finishing products. These may not be found on the local market.

**Lacquer**—Lacquer dries so quickly that skill is necessary to brush it on. If space and equipment are available, it may be sprayed on. Ventilation is very important since lacquers give off strong fumes. If lacquer is used in finishing furniture at home, follow the directions on the container and rub it between coats as suggested for varnish. In place of turpentine, use lacquer thinner.

A lacquer finish can be cleaned and treated for spots and scratches the same as varnish.

**Plastics**—Plastic coatings are on the market and provide a hard, clear, water-resistant surface finish. Follow the manufacturer's directions for application. Rub the surface between coats as recommended for varnish.

**Wax**—Paste wax can be used as a final finish over all other finishes. It serves as a good protector, especially for the surface finishes such as shellac, varnish, and lacquer. It forms a hard surface which may water spot if water is allowed to stand on it. This can be repaired by rubbing with turpentine and re-waxing.

To apply this paste wax, place a chunk of it between folds of cheese cloth. Rub this over the surface in a circular motion just enough to leave a thin film. Allow to dry a few minutes and polish with a clean, soft woolen cloth. This rubbing produces heat which hardens the wax and produces a soft luster. Two or three thin coats of well polished wax produce a good surface. If a thumb print shows, more polishing is needed.

Occasional rubbing with a soft cloth will brighten a wax surface without the addition of new wax.

A cream wax with a solvent base can be used to clean a waxed surface. The solvent will soften the soil which can be wiped off. The thin film of wax left on the surface can then be polished. You can put a coat of paste wax over this if you desire.

You can use turpentine or a commercial wax remover when or if you decide to remove all wax.

Do not use a furniture polish containing oil on a waxed surface. It will soften, streak and dull the wax.

## BRUSHES

Clean brushes are necessary. Rub a new brush back and forth across the fingers to remove all dust and loose bristles. Wash, rinse, and dry before using. Wash in a cleaning fluid such as carbon tetrachloride or warm water and soap.

When a job has been finished the brush should be cleaned, dried, wrapped in aluminum foil and stored flat or hung by the handle. Soak it in the solvent used to thin the finish.

Finish	Solvent
Shellac	Denatured alcohol
Varnish	Turpentine
Enamel	Turpentine
Penetrating sealers	Turpentine
Lacquer or plastic	Lacquer thinner

If work is stopped for a few hours, suspend the brush in a can of the proper solvent. Never let the brush rest upright on the bristles. Insert a wire through a hole in the brush handle. Rest the wire on the edges of the can containing enough solvent to cover the bristles of the brush.

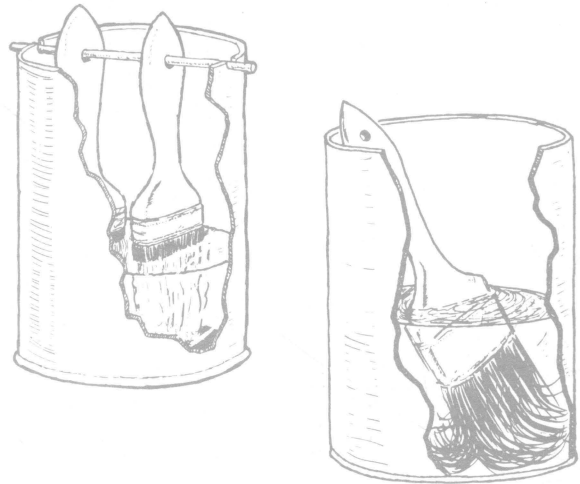


FIG. 11—A good way to store brushes (left above) and a wrong way (right). Below is a brush properly wrapped for storage.

