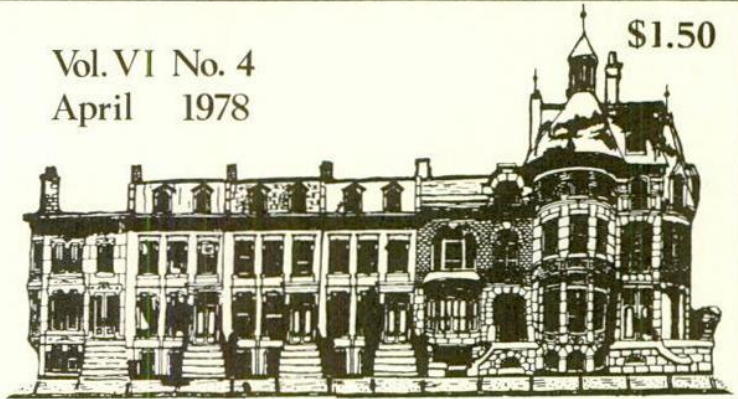


THE OLD-HOUSE JOURNAL

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Restoration And Maintenance Techniques For The Antique House

Window Glass

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Coming Next Month

SOLAR HEATER FOR THE OLD HOUSE

By H. Weber Wilson

OF ALL THE MATERIALS that make up an old house, window glass is probably the most taken for granted. Without a complete pane in every window, a building today is considered a derelict, yet just a few hundred years ago window glass was something only the well-to-do could afford. Today we can so easily obtain glass in all shapes, sizes, colors and textures that it is hard to realize that without it, a house would be little better than a cave.

WINDOW GLASS has come a long way since the discovery in about 3000 B.C. that heating sand (silica) and soda produces a liquid which will cool into a hard, transparent material with many utilitarian purposes. For the first few thousand years, however, glass was only worked as a viscous liquid--the craftsmen taking long "pulls" as if from a pot of taffy, and wrapping them around a clay mould.

THIS "CORE-WINDING" process produced beautiful bowls and other vessels, but it wasn't until about 50 B.C., when glass blowing was discovered, that flat glass became a possibility.

SHEET GLASS was still centuries away, although some Romans saw the possibilities of using "cast" glass in windows.

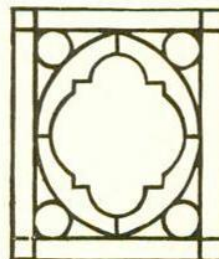
The pieces they installed were 1/2 in. thick or more and almost opaque. This early window-fill was also of such uneven thickness--and was so full of air bubbles, pits and other imperfections--that for many generations after St. Paul one had no choice but to "see through a glass darkly."

AND GLASS was usually too expensive to be used for such mundane purposes as windows. By the year 1100 A.D., a square foot of glass cost \$1.50. The average weekly wage was 25¢.

BUT IT WAS THE PEOPLE of the Dark Ages who saw the luminating possibilities of glass in window openings. Stained glass windows began to decorate churches and cathedrals around the year 1000, and reached their aesthetic high point in the 13th and 14th centuries. Small pieces of colored glass were held together with lead strips called "came" and figures, scenes, and decorative details were painted on the glass.

THE RESULTING RELIGIOUS ARTWORK did not serve as windows in the practical sense, as they were normally placed high above eye level and were designed to be looked at, not through.

[\(Continued on pg. 42\)](#)



A Log Farmhouse Lovingly Restored

HIGH IN THE POTOMAC HIGHLANDS of West Virginia, the 123-year-old log farm house of Mr. and Mrs. Robert Snyder has a special meaning for the whole family. This log house has not only belonged to the patrimony for over a hundred years, but it is continually the witness of a common effort by the whole family for its restoration.

THE HOUSE ORIGINALLY on the site was built in 1853. Noah Snyder, the present owner's grandfather, purchased the property in 1856. In the late 1860's two other log cabins on the property were moved and added to the main house--one aligned with the original house and the other placed at a right angle. Some time around 1870 the three separate units were joined together to form a single "L" shaped house, all weatherboarded, painted white and under a metal roof.

THE PRINCIPAL RESTORATION of the house began in 1973 when Bobby Snyder and two of his friends, after completing their studies in New York, decided to test their knowledge. Bobby's great-grandfather Noah's farm gave him the perfect opportunity as he was also anxious to restore the farm for his parents to live in in their retirement. They had spent the past 35 years overseas and had not had the time to modify the farm for their future needs.



WHEN THEY BEGAN, the farm was a typical representation of a poor 19th century mountain farm dwelling in a definite state of neglect. Since the fireplaces had been plugged, now there was only makeshift kinds of heating. There was no insulation, the mortar between the logs was crumbled and the windows were not what one could call weatherproof. The wooden floors of the living room, downstairs bathroom, porches and kitchen were weathered and uneven.



The fireplace in the dining room (the old kitchen) contains the fireplace that Bobby's great grandmother used for cooking. The original chairs were re-woven with oak splits and are gathered around the original walnut table.

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There was no liveable space on the second floor which had been used as a storeroom for papers, antiques, furniture and other accumulated artifacts for the past twenty years.

IT TOOK A GOOD BIT OF REFLECTION—but they eventually decided to take down the boards covering the interior walls and ceiling of the living room. Visiting relatives, spending vacations at the farm, helped with the labor. As dust flew everywhere, they found that the space between logs and boards had been an animal cemetery for everything from squirrels to rats.

IT WAS EXCITING TO DISCOVER the primitive appearance of the room as it was several generations ago. The logs were still whitewashed, and the mortar between them was crumbling. They called in a local plasterer who was reputed to be skilled in matching old mortar. After much back-and-forth, they selected a composition of plaster and cement mixed with carbon black giving a dark grey.

WHILE IN THE MIDST of demolition, they decided to redo the living room floor, which was composed of boards on sleepers. The old floor, warped and uneven, was taken up and replaced with rock and dirt fill covered by a 4-in. layer of concrete. This was topped with paving bricks, chosen for durability and a color that complemented the rusticity of the logs.

CLEANING OLD WHITEWASH off the logs was quite simple: They brought a hose into the house and hosed it off. It was tedious, however, digging out the residue encrusted in the cracks. Ceiling and walls then received a coat of boiled linseed oil. The result of this operation was remarkable: The logs changed from a pale brown to a honey color marbled by the natural grain of the pine. The feeling in the entire room became much warmer. Too, hand hewing marks—the work of earlier Snymers—became much more visible.

IMPORTANT CHANGES were made in the kitchen. Originally, it had been separated from the



Back view showing the three original log houses, plus (at the right) the recent addition that houses the furnace, water-pump and hot-water heater.

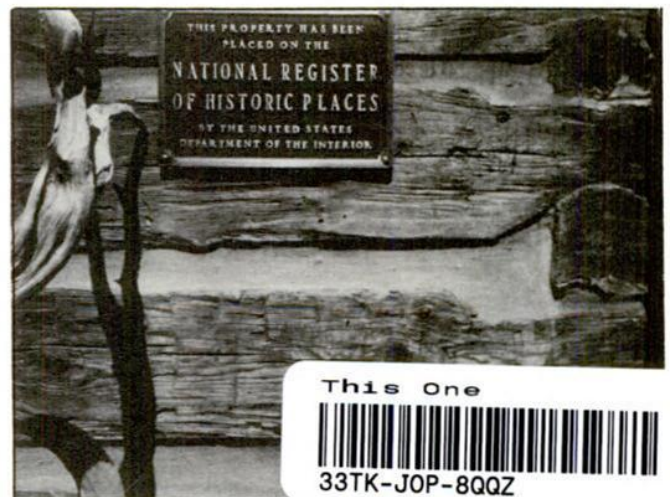
rest of the house. Annie and Bobby decided to saw an opening in the logs on the north wall, giving access to a breezeway that they converted to the kitchen. To give additional access to the main living room, they added a vestibule-walkway enclosed by French windows and door. The old kitchen was then turned into the dining room.

SO MANY TASKS were completed by Annie and Bobby (and their relatives) that they can't be described in one article. Among the projects: Stripping "Civil War Gray" paint from mantels and door frames; removing weatherboards from the exterior to expose the logs; building a split-rail chestnut fence; adding another ten rows of bricks to the chimneys for aesthetic reasons; refinishing and repairing the house's furniture; rebuilding the porch on a new brick platform; repainting the roof its original barn red.

ALTHOUGH MANY PROJECTS remain, they provide a splendid reason for the family to reunite in the summer at Noah Snyder's Farm. ■ ■



Spinning wheel belonged to Bobby's great-grandmother and African artifacts were brought back from overseas by his parents.



The Noah Snyder Farm was put on the National Register of Historic Places June 10, 1975.

Stopping The Burglar With A Do-It-Yourself Alarm System

By Ronald W. Pilling, Baltimore, Md.



HE'S AFTER YOUR TELEVISION, your stereo, your jewelry, and if he is sophisticated enough, he's after your antiques. "He" is the sneak-thief. Although often associated with downtown neighborhoods, he is also thriving these days in the suburbs and in many small towns. The homeowner can secure his property to some extent with hefty locks. But many restorationists are investing in the added security of an alarm system.

THE MAJORITY OF BURGLARIES are perpetrated by amateur thieves—desperate and careless criminals who are probably more scared than their intended victims. Residential alarm systems capitalize on this, as their clanging bells, blinding lights and whooping horns are intended to put to flight the terrified intruder.

ALL BURGLAR ALARMS have three components: A master control, a means of detection, and a warning device. The most space-age of those on the market is the ultrasonic motion detector, a system that projects an inaudible field of sound waves throughout your chosen room. The control analyzes the wave patterns, reacting to any motion in the field, and activates any combination of ear-splitting alarms.

THIS SYSTEM IS EASIEST to install—you just plug it in and aim it. It is not inexpensive, however. Montgomery Ward lists a 3M ultrasonic alarm in their catalog for \$150. It only protects a limited area—normally just the room in which you put it. There is another major drawback: The crook has to be inside the house to set it off. In addition, the motion detector is subject to false alarms caused by moving curtains or pets who wander into the sonic field.

Wireless Systems

OTHER WIRELESS SYSTEMS include those with small radio broadcasting detectors at each window and door. Since there is no wire to run, installation is simple. Again, this device is subject to false alarms (in this case from random radio signals). Neither is it

cheap, with each window switch costing \$40 and up.

ALL MAJOR ALARM INSTALLATION companies, such as ADT, rest their reputations on the standard wired system. The detection loop consists of wires leading into various detectors: Magnetic switches, foil tape for window glass, pressure-sensitive door mats, and vibration detectors. Current circles the loop perpetually, and when the circuit is broken (or closed, depending on the type of system used), the alarm goes into action.

Wired Systems

WE CHOSE JUST such a wired system after deciding that a burglar alarm would be a wise investment. We installed it ourselves—at about one-quarter the cost of a professionally installed alarm. We used a system marketed by Radio Shack, and manufactured by Universal Security Instruments, 2829 Potee Street, Baltimore, Md. 21225.

EACH WINDOW AND DOOR is armed with a magnetic switch mounted on the frame. Several basement windows are further protected by foil tape. The master control box hangs on the wall in the vestibule (we have two pairs of front doors). The master control includes the electronic components, a powerful 8-in. bell, the battery which powers the system, and a key-operated on-off switch, all in a tamper-proof steel box.

HERE'S HOW IT WORKS: When leaving the house, the system is activated with a key after the last door is closed. This means that the master control box must hang outside the last guarded door. If a would-be thief disturbs a circuit, the bell issues a window-rattling warning, and keeps ringing until it is turned off with a key. At night, the alarm can be turned on with a switch from inside, preparing each of the detectors for a possible intrusion.

WE LIKED THE RADIO SHACK system because it offers thorough protection at a reasonable

price. The basic alarm sells for \$70, and in addition to the master control box it has six magnetic switches, wire, window and door decals, and a "panic button." This button can be mounted anywhere in the house, and when pushed it sets off the alarm. Thus, if an intruder gets into the house without setting off the system and you hear him, pressing the "panic button" will set off a racket that will send him on his way.

Flexible System

YOU CAN PUT AS MANY detectors on the system as you need—and install additional bells or sirens so that the alarm will deafen everyone within four blocks. Any detector intended for a 12-v., closed-circuit system will work. Installation can be done gradually. You can begin with a simple loop on a couple of doors and windows, and as restoration work proceeds from room to room, you can add more detection apparatus.

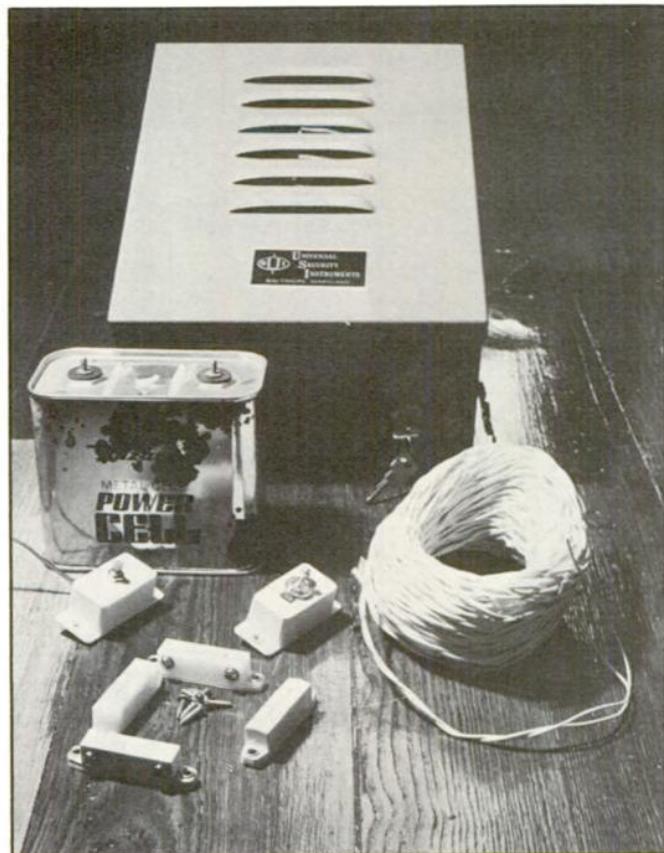
HEAT DETECTORS can also be wired into the alarm. The manufacturer has a broader selection of peripheral devices than Radio Shack. USI will send a catalog and installation hints if you write to them.

OF COURSE, it is necessary to run wire from switch to switch, beginning and ending at the master control box. This makes the wired system the most tedious of all to install. Tedious—but not difficult. As it is a low-voltage system, you need use only light bell wire, and the detection loop is only a one-wire circuit. It's easy to slip this thin wire behind baseboards, etc., and even if you have to gouge out the plaster to get the wire to a window sill, only a very thin slot is necessary. In fact, with a little ingenuity you can make the whole system almost invisible.

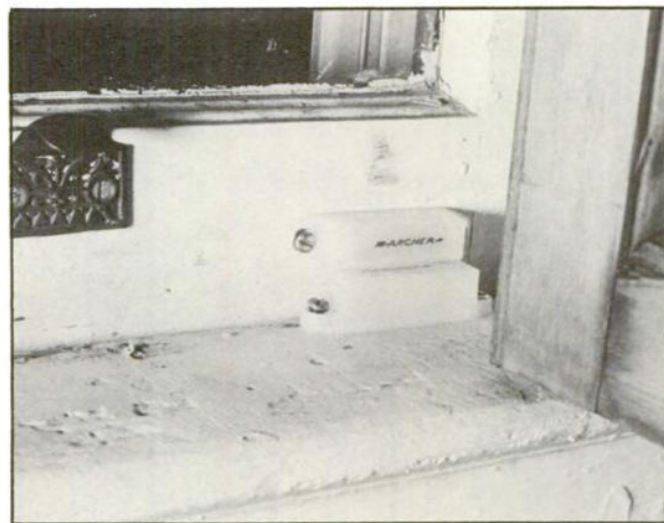
ALTHOUGH THE FIRST FLOOR will be your major concern, don't forget that other doors and windows may be accessible. Your opponent may be a "second-storey man" or a "porch climber." The switches are cheap, so plan one at every window and door with even the remotest chance of intrusion.

THE SYSTEM IS TOUGH for a crook to disarm. If all the wires are well-concealed, he won't be able to find them and short-circuit the detector. If he severs a wire, the alarm goes off. If he tries to meddle with the master control box, his ears will ring for days. The odds are, though, that after seeing the decals on your doors and windows, the thief will just walk away, looking for an easier target.

YOU CAN EASILY become a fanatic about protection when you see all the devices you can attach to your system. There's a hospitable-looking doormat which, when stepped on, lets the prowler know he should depart. A vibration detector will trigger the alarm when the wall to which it is attached vibrates. You can even devise your own detectors. For example, if you securely attach a wire to a valuable object, so that the wire has to be broken in order to make off with the prize, a thief will trigger the alarm. ■■



Basic components of the wired system: Master control box (top) contains battery, bell and electronic components. Magnetic switches are in foreground. System is turned on by key in bottom of master control box. A trusted neighbor should have a spare key in case alarm goes off while you are away.



Magnetic switch guards each door and window. Magnet in top half keeps switch in bottom half closed in normal position. Wires are brought into bottom half—and are concealed to prevent tampering.

But this was the precursor to installing glass as an invisible plane between the interior and exterior environments.

FROM THIS EARLY USE of stained glass in churches, the wealthier class began to put similar windows in their homes, often replacing religious motifs with heraldic symbols and other secular decorative patterns. The less wealthy saw the value of glazed windows, and the well known casement type window made of diamond shaped "quarries" or "quarrels" held by lead strips emerged as the first widely used domestic window.

BUT THE QUALITY of this glass had advanced little beyond that of ancient times, being thick, wavy, and invariably of a greenish tinge due to the iron oxide found in most sand. Indeed, the search for a clear or "water-white" glass became one of the great scientific challenges of the Middle Ages.

THE VENETIANS eventually discovered that the secret was to add "decolorizers"--instead of trying to make glass from something other than sand--and succeeded in making a greyish glass which was nearly transparent when blown very thin. This glass they called "cristallo" and the formula and other glass manufacturing secrets were jealously guarded on the island of Merano where Venetian glass production was kept isolated.

EVENTUALLY the secret of making clear glass spread across Europe and with it came improved production methods which made possible the increased use of glass in residential windows. It was discovered that if glass was blown, and the end of the resulting bubble cut off, it could be spun or twirled so that centrifugal

force would produce a flat disc. The best quality glass made in this fashion became known as "crown" glass, and if produced in 4 or 5 ft. diameters, had a considerable thin, flat area which could be cut into panes or other useful sections.

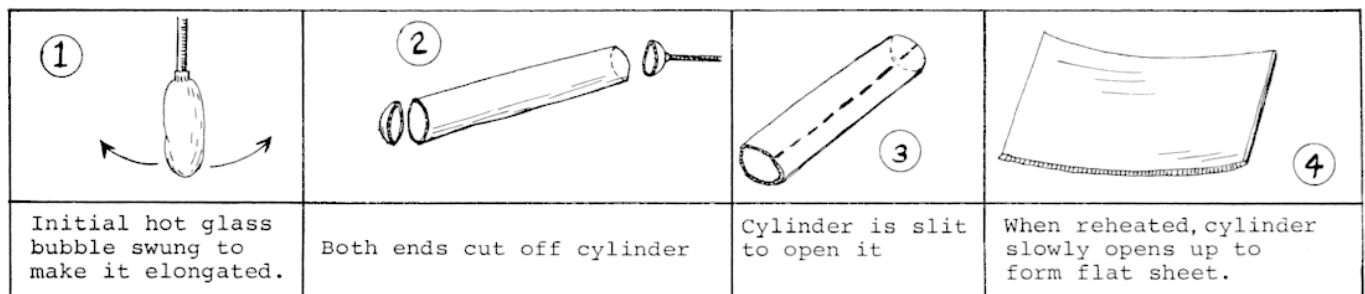
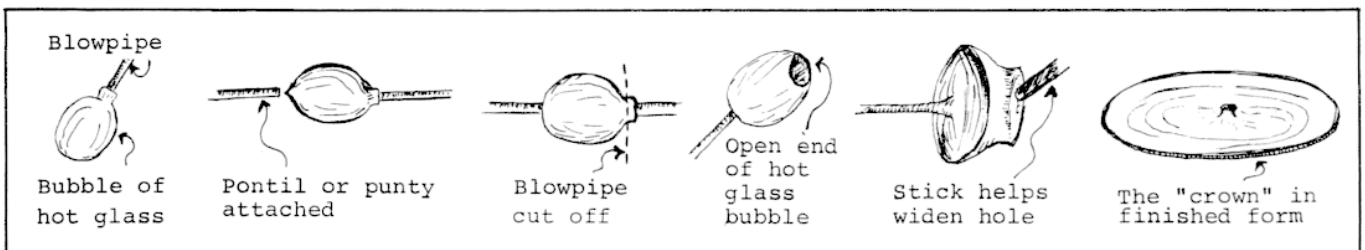
THE CENTER OF THE GLASS DISC, where the iron "pontil" or "punky" had been attached, was considerably thicker and more irregular. It was not suitable for looking through, but in deference to the cost of manufactured glass, it was used with other "bulls-eyes" to make up a panel section, or set above an entranceway to let light into the otherwise dark central hall.

IN LATE VICTORIAN TIMES, the spun glass "roundels" again became popular, but usually in colored glass. Also referred to as "bullions," these special decorative pieces are frequently found in both simple leaded art glass windows as well as many produced by Tiffany studios.

CUTTING UP THE LARGE SPUN CROWNS into segments formed natural "fan lights" which were widely employed because of the small amount of wasted glass that resulted. These semicircular windows were very popular in the Classical revival movement that took over domestic architectural design beginning in the late 17th century. But even at this time, in both Europe and the American colonies, window glass was still considered a luxury.

GLASS MANUFACTURING in America was the first industry tried--but one of the last to succeed. Among the settlers in Jamestown in 1608 were eight Polish and Dutch glass makers who tried but failed to produce glass profitably. Some window panes were produced by Caspar Wispar in New Jersey in 1739, but it wasn't until 1792

Two Methods of Producing Early Flat Glass



that glass manufacturing was successful in America.

DURING THIS TIME window glass was expensive but not scarce in the colonies. Flat glass was a heavy product that packed well, and helped by favorable tariff rates, was a staple cargo aboard the vessels that called on the ports of the New World. The first Pilgrim houses were built without panes, but by the mid-1600's it was not unusual for a timber frame dwelling to boast casement windows with traditional leaded quarries.

AROUND THE BEGINNING of the 18th century a new manufacturing technique greatly advanced the production of flat glass. Instead of spinning roundels, hot glass was blown into an elongated bubble, which then had both ends cut off. This left a cylinder or "muff" of glass which, when slit down one side and reheated, would open up into a rectangular sheet. The broad glass, as it was sometimes called, was streakier, less brilliant, and more brittle than spun glass, but it had a more even thickness, and its great efficiency in producing window panes is apparent.

WINDOW PANES became standardized at 6 in. wide and 8 in. high and were set in narrow wooden "mullions" or "muntins" within a sash which could slide up and down. All this happened gradually with the first use of multipanes appearing four wide and two, three, or four rows high in each sash. Then the 12-over-12 windows gained acceptance as "proper"--until glass became available in larger panes and the 6-over-6 window became the vogue.

WINDOWS WERE OFTEN UPGRADED to meet architectural fashion, so dating a house strictly by the number of panes per sash is not reliable. But old glass per se can be quite easily spotted due to its optical irregularities and the peculiar metallic iridescence that comes only from long years of weathering. Another tell-

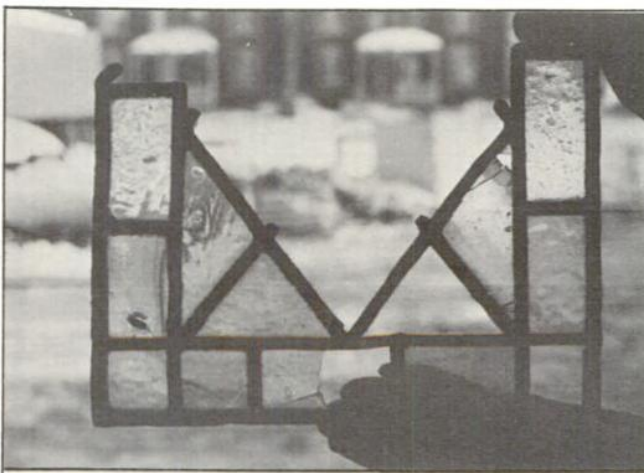
tale sign of age is glass that has turned pink, lavender or yellow. Often termed desert glass, this phenomenon is caused by the sun's ultraviolet rays reacting with manganese which was used in old glass as a decolorizer.

THROUGH THE MIDDLE of the 19th century, then, most windows contained basically the same thin, hand-blown, often very irregular glass. It took the industrial revolution to bring about the next dramatic change--the production of relatively inexpensive plate glass which made possible all manner of changes in architecture and the use of glass as a decorative element.

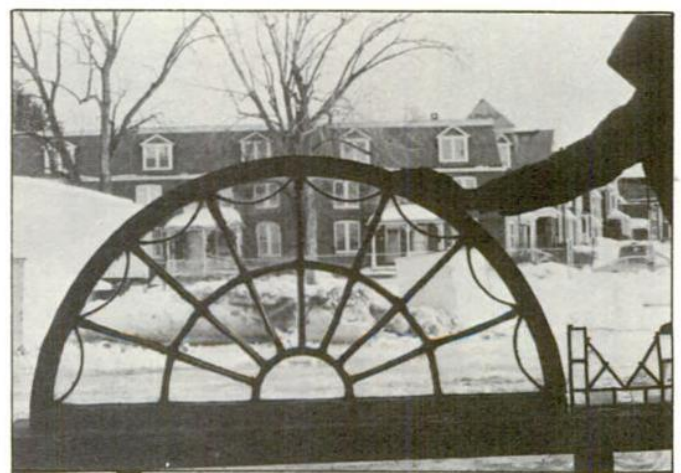
UNLIKE BLOWN GLASS, plate glass was machine-made. It began with the same basic ingredients but, instead of being fashioned by hand, it was poured onto a metal table, then flattened with a multi-ton roller, and slowly annealed or cooled until emerged as a sheet of very hard glass with uniform thickness and very few imperfections. Not yet transparent, plate glass then went through an even more complex procedure--the grinding and polishing of each surface so that the sheet became not only brilliantly shiny but almost optically perfect as well.

PLATE GLASS was not new in the late 1800's, but it took the advent of the machine age to devise machinery which could properly grind and polish sheets of glass as large as 10 ft. x 20 ft. and not do more harm than good.

IN 1880, not a single sheet of profitable plate glass had been produced in the United States. By 1883, however, the cost of plate had been cut in half, thanks mostly to the fledgling Pittsburgh Plate Glass Co. whose "Works No. 1" were located at Creighton, Pennsylvania. By the turn of the century, the American glass industry had made quantum jumps in the quantity, quality, and variety of window glass available to homeowners and shopkeepers.



A 19th century reproduction of a medieval-type window. Note the typically geometrically shaped pieces of thick, irregular glass. Windows such as these were designed to set in casements and let in light; looking through them was rather impossible.

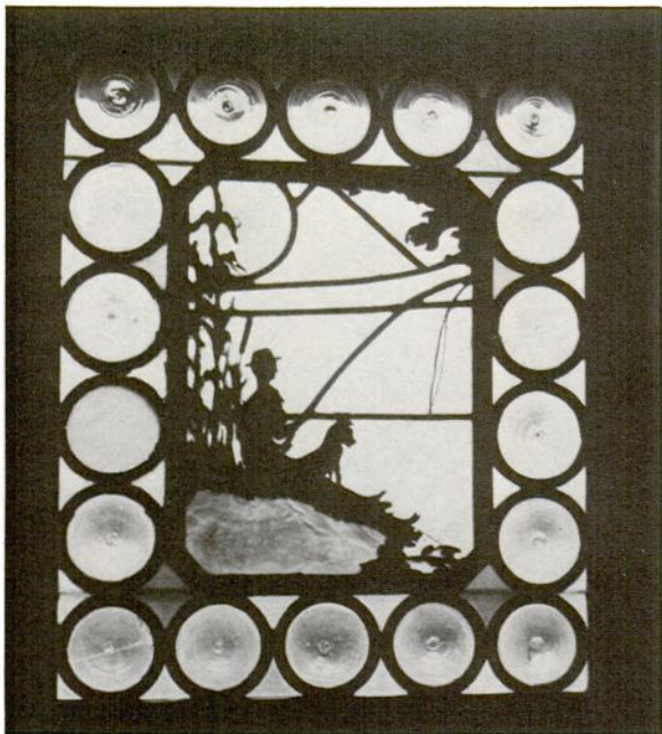


A typical Georgian style fanlight from above a front door. When glass was a scarce commodity, segmental windows such as this made very efficient use of crown glass, which was clear enough to see through although frequently wavy.

PLATE CONTINUED to be an expensive item and was never the primary glazing material of middle class houses. But it was used extensively for commercial purposes, and the resultant all-glass store fronts transformed the streetscapes of American cities and towns. Common window glass was also undergoing significant improvements, as attested by the adoption of heretofore unbelievably large window panes. Today we think nothing of houses with windows 3 ft. x 4 ft. or larger, not to mention the all steel and glass of modern high-rises; just 100 years ago, such expanses of glass would have been considered extravagant beyond belief.

DURING THIS ERA of increased quality and quantity and decreased price, glass also experienced a short but dazzling period when decorative windows were an accepted--even expected--part of any architectural project. Best known are the colorful stained glass windows (called "leaded art glass" windows by the firms that sold them) but there were several other special decorative methods employed, especially using only "white" (clear) glass.

THE EXTRA FANCY applications of bevelling, etching, and cutting will be discussed in a following article. Here are listed several additional glass treatments which are often overlooked but add significantly to the architectural appeal of Victorian and post-Victorian buildings.



A leaded art glass window from the early 20th century using a border of roundels. In medieval times, the entire panel might have been composed of thick centers of spun crowns. These roundels have tiny pontil marks and finished edges, attesting to their being "modern" although handblown.

Types Of Fancy Glass

SANDBLASTING produced a smooth, milky finish and was often used to give special border effects, especially for interior glass partitions of commercial buildings. In houses, many different stencilled patterns were sandblasted onto transom windows and door lights. Sandblasted glass has a frosted look similar to etched glass, but the surface remains even, the sand only dulling it not eating into the glass as is the case when acid is used.

GLUE CHIP GLASS looks like frost has settled on the pane. This rough but elegant surface was obtained by first grinding or sandblasting the glass and then coating it with glue. When the glass was heated, the glue shrank and shrivelled off, each flake taking a sliver of glass with it. Often the same sheet was treated a second time, creating a "double chip" glass. This glass is especially attractive when the edge is bevelled and polished.

ROLLED AND FIGURED GLASS was made in a vast assortment of ornamental patterns, the objective being to provide a source of light while still retaining privacy. The pattern was pressed or rolled onto one side of a piece of plate glass while it was still in the plastic state. The resulting figured glass was not further polished, but it can be a very interesting decorative touch when used with discretion. Figured glass can be found in colors other than white, almost always pale tones.

BENT GLASS is produced by taking a flat sheet of plate glass, heating it over a mould of the curve desired, and allowing the hot glass to sag into the desired shape. It must be carefully cooled, after which it is as strong as flat plate. Any special detail work must be done while the glass is still flat, and due to the risk of breakage, fancy curved panels that include cut and polished designs are not frequently found.

ROLLED GLASS PATTERNS

From a late 19th century
Pittsburgh Plate Glass Catalog



REPLACING SANDBLASTED GLASS means having a duplicate made, but most cities have at least one specialty shop which does modern reproductions. Check the Yellow Pages under "Carved" glass if there are no listings under "Sandblasting." A few calls to local stained glass studios will also often turn up the names and numbers of these studios.

ANOTHER POSSIBILITY is talking to the local monument (tombstone) maker. They do a lot of sandblasting and may be able to help if you come up with the stencil design.

GLUE CHIP GLASS is being produced by the Boulder Art Glass Co., 1920 Arapaho, Boulder, Colorado 80302. They also do specialty sandblasting.

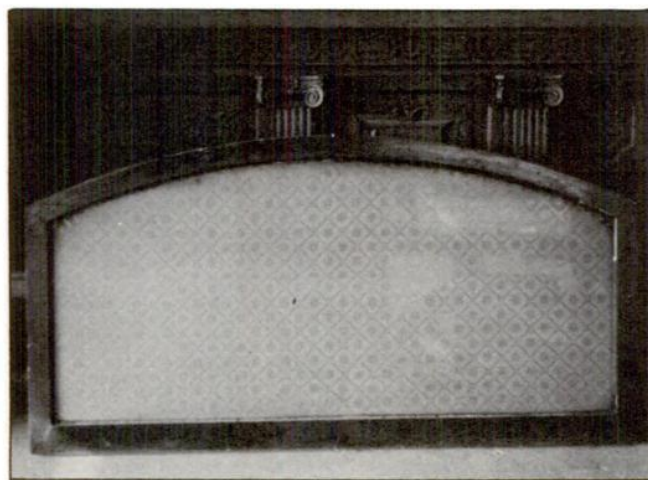
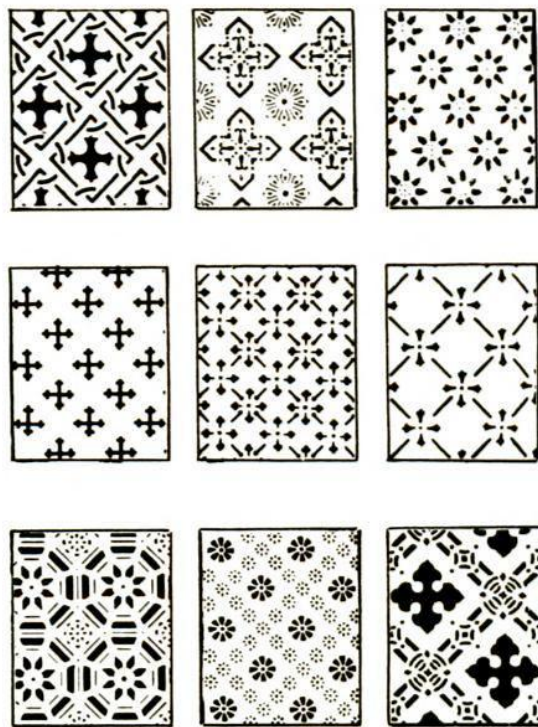
ROLLED AND FIGURED GLASS was once a common product of glass shops, but both its use and availability have greatly declined. Larger glass shops will often have at least smaller panes of old stock, and with some searching, its likely you can find at least a close match to the pattern you need.

BENT GLASS can usually be ordered from a large glass shop, although the cost is high, about \$40-\$50 just for the set-up of preparing the mould. There are really no standard sizes in curved panes, as each replacement usually requires a new pane be made in order to be the exact fit. Measurements are very important when ordering: Normally the width across the curve is given first, then the height, or straight dimension. Be sure to double check the measurement details with whomever takes your order.

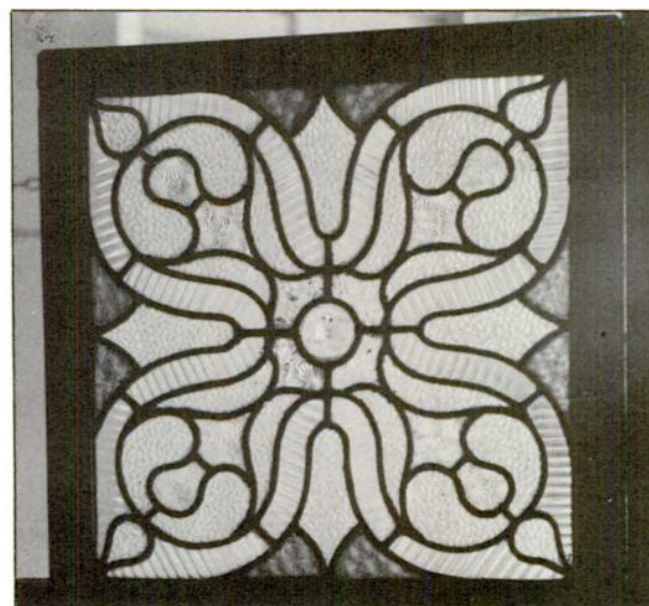
IF YOU HAVE TROUBLE finding bent glass, try B&L Antiqueries, 25011 Little Mack, St. Clair Shores, Michigan 48080, or Heritage Art Glass Company, 1404 E. 3rd, Tulsa, Oklahoma 74120. ■

Etched Glass Patterns

These patterns for etched glass panels are from a late 19th century catalog of the Pittsburgh Plate Glass Company.



A transom light salvaged from an 1880's house. The pattern was sandblasted onto the glass using a stencil.



This c. 1900 window, originally in a front door, combines three different types of white patterned glass with a pale yellow middle and a white roundel in the center.

Avoiding Hazards From Lightning

By Frederick Herman, A.I.A.

HERE ARE TWO SUBJECTS about which people are greatly misinformed and which they fear: Snakes and lightning. Since snakes don't have much application to old-house restoration, I'll confine my remarks to lightning—and when it's advisable to install lightning rods.

THE QUESTION OF whether you need lightning rods on your old house is not a simple one to answer. A U.S. Government publication, for example, declares: "Experience has proved that when the equipment (lightning rods) is carefully selected and installed the protection is almost complete." This does not tell you, however, whether you need lightning rods in the first place and, if so, WHERE you need them.

FIRST POINT to recognize is that the needs of city dwellers are far different from those of a homeowner in the country. Second, today's houses are built far differently (as regards conductivity) than they were in Benjamin Franklin's day when lightning rods were first developed.

LIGHTNING ROD SYSTEMS provide a path of low resistance for the harmless discharge of a lightning bolt to the ground. In Franklin's time, houses contained no such paths. Today's houses are filled with such paths in the form of metal plumbing lines. Plumbing vent stacks usually extend above the roof—and the soil lines to which they are connected are well grounded in the earth. Too, there is a maze of electrical wiring—all of which has to be grounded according to the requirements of building codes. If you are the owner of a TV antenna you have what is in fact a grand lightning rod (assuming the unit has been properly installed).

CITY DWELLERS usually are surrounded by structures and things such as power lines that are much more attractive to lightning than a small home. What might be much more threatened than your house could well be that lovely tall old tree in your yard. Unless you are really ter-



rified of lightning and feel that you need protection to calm your nerves, city dwellers might as well dispense with lightning rods.

Hazards In The Country

IF YOU LIVE OUT IN THE COUNTRY, the hazards are more real. Most of the damage done by lightning occurs in rural areas. In his book "Lightning Protection," J. C. Marshall states that lightning is "a major cause of farm-building fires and is responsible for about 80% of all livestock losses due to accidents."

ONE SHOULD, however, keep a sense of perspective. Lightning is not a sinister force wreaking unspeakable havoc across the land. Yet, annual losses in the U.S. run to around 600 killed, 1,500 injured and \$100 million in property damages (including forest fires and livestock losses). Worldwide, losses run to 6,000 killed and \$1 billion in property. While these are small numbers compared with the annual highway carnage, and damages from earthquakes and other natural disasters, the losses are still appreciable. (Fatalities from lightning, for example, are far greater than from shark attacks, which caused such mass hysteria a couple of years ago.) None of the statistics mean much, of course, if you happen to be a victim.

IN EVALUATING NEED for lightning protection, rural dwellers should bear in mind that you are protecting two different things: You and your property. Lightning protection is usually more intended for the safety of the occupants

of a structure rather than for the prevention of material loss.

REGARDING your own protection, common sense can help as much as a lightning rod. If you are indoors during an electrical storm, not much can happen to you if you avoid the obvious like not operating electrical tools, and not picking that moment to keep a firm grip on a radiator or to take a bath. (Both the radiator and the bathtub are connected to the grounded plumbing system—which is a likely path for any lightning bolt.)

AS FOR YOUR HOUSE, the old saying is largely true: If the shadows of the trees fall on the roof of your house, the house is safe from lightning strikes. (The house is safe—but the trees aren't.) If your house stands in solitary splendor, by all means get a lightning rod system installed.

Menace To Outbuildings

BARNs, SILOS AND OUTBUILDINGS are more threatened as they contain very few of the conductive materials (piping and electrical wiring) that provide some protection to dwellings. Here, lightning rods may be a good investment.

THERE IS NOT MUCH you can do about livestock wandering around in a thunderstorm. About the only precaution you can take is to make sure that your wire fences are properly grounded. Lightning bolts can travel as much as two miles along non-grounded wire fences—and woe to the animal (or person) standing next to such a fence that gets hit.

AND OF COURSE, if you find yourself outside during a thunderstorm, don't stand under trees or upright in open fields or on beaches.

Checking Out The System

IF YOU BUY AN OLD HOUSE that is equipped with lightning rods, first thing to do is to call an expert on lightning rods. This is emphatically NOT a do-it-yourself project. You are dealing with electrical forces that can exceed 200,000 amps, reach a million volts, turn the sap in living trees to steam, heat wood to ignition temperature, melt wires and rods, and leap a mile or more through the air.

YOU ARE PROBABLY BETTER OFF without a lightning rod system than an improperly installed one or one that has been allowed to deteriorate. If in doubt, get rid of the thing until you can get an expert to put in a proper one. A close visual inspection should show whether or not the conductors are all in one piece, whether or not someone laid a new roof over the top of them (don't laugh—I have seen it), whether the whole system is firmly fastened in place, and whether the system is properly grounded. Proper grounding in deep soils of moist loam over clay or similar soils means an in-ground conductor 8-10 ft. long. In dry soils the problem gets far more complicated.

A piece of pipe stuck a foot or two into the ground is first rate evidence that your system is defective!

Trees In Peril

SOMETIMES OVERLOOKED, but just as important as protection for your building, is protecting major trees on your property. This, unfortunately, is a complicated—and not inexpensive—project. You just don't stick one lightning rod in a tree and call it quits. On the other hand, a hundred-year-old tree can't be repaired like a house can. Too, the damage lightning causes to trees is usually much greater than the damage caused to a house. Special attention should also be given to trees close to your house—which might send limbs through your roof if they were struck.

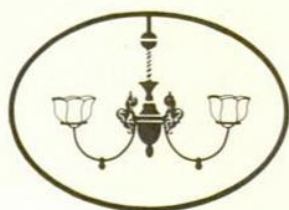
HERE ARE SOME guidelines should you opt to have lightning rods installed. They are taken from a U.S. Government publication "Lightning Protection For The Farm."

- HAVE the work done only by an experienced installer. Installation of a lightning protection system IS NOT a do-it-yourself job.
- DON'T be hurried into buying a lightning protection system. It is an installation of vital importance and should be bought from a responsible company. Check and record the identification of the lightning protection salesman. Verify his connection with a responsible company.
- OBTAIN the names of three customers for whom the company has made installations and check with them as to quality of work.
- DON'T allow work to begin without proof that the company carries Workmen's Compensation Liability Insurance.
- PERSONALLY verify that the rods, cables, ground rods and connectors used in the system carry the Underwriters' Laboratories label, and that the lightning arrestors carry the manufacturer's name.
- MAKE sure that you sign an application blank for a U/L "Master Label." The installer should have the form. You will receive the "Master Label" plate (4 x 2½ in. brass plate) in the mail from Underwriters' Laboratories through the manufacturer of the equipment.
- INSIST on a contract listing all of the parts in the system.

IF YOU WANT to bone up on technical details before contacting an installer, you could consult the book "Lightning Protection" by J. L. Marshall published by John Wiley and Sons in 1973. ■■

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Products For The Old House



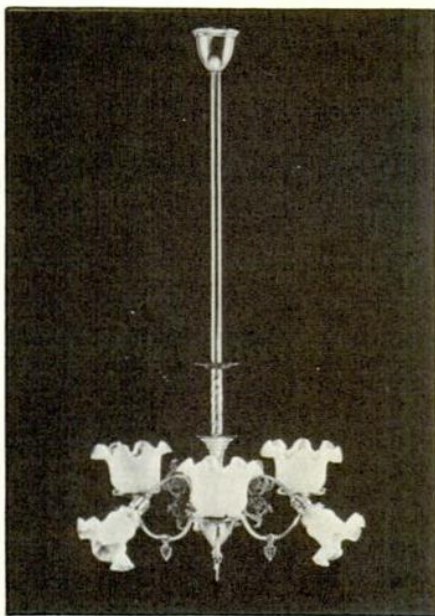
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Chimney Brushes

ANYONE WHO uses a fireplace or stove to burn a lot of wood eventually requires either a chimney sweep or a chimney brush--if you plan to do it yourself.

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THE FULL RANGE of Hyde Tools is pictured and explained--tools for scraping, puttying, and knives for craft projects.

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