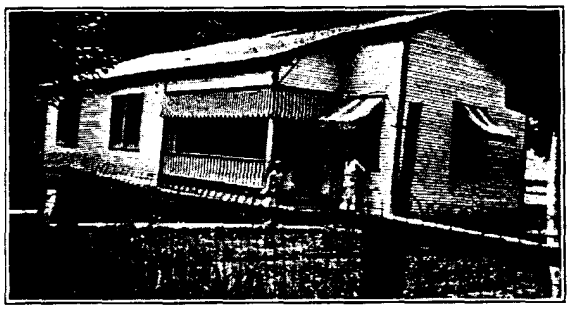
Pure White Lead Paint Pleases Large Coal Company

MILBURN By-Products Coal Company of Milburn, W. Va., has painted 111 houses, office and administration buildings with pure white lead and oil paint. As a result, Mr. A. A. Gallagher, General Manager of the Company, says, "This is the first time our houses have been painted with a pure lead and oil paint, and the work was so satisfactory it is more than probable that we will never return to the use of other paint." The pure white lead paint was tinted to a light gray for the bodies of the houses and to a dark gray for the trim. Two coats of paint were applied by Mr. M. L. Bennett, painting contractor, of Huntington, W. Va.

Experiences like this are the strongest testimonial any material can hope to get. The cost of materials and labor for painting a large number of houses runs into many thousands of dollars. Those responsible for the work must be sure of the results. When pure white lead and oil paint is selected, as in this case, the first cost is reasonable, though it may be a little higher than paints of considerably less merit. But after the first painting the cost will be materially less. Pure white lead paint lasts longer, meaning fewer repaintings and distributing the cost of each over a greater number of years. Pure white lead paint leaves such an excellent surface for repainting that only a simple cleaning of the surface is necessary before applying the new paint. This means two large savings. No scraping or burning off of old cracked or peeling paint is necessary, which reduces the labor of repainting by about half. Because the old paint does not have to be removed one less new coat is necessary, again reducing the cost of labor and also of materials.



One of the white lead painted houses of the Milburn By-Products Coal Co., Milburn, W. Va.

The experience of large users of paint like the Milburn By-Products Coal Company may well be considered by all users of paint, for the problems are the same, the weaknesses of poor paints and the advantages of pure white lead paint simply being multiplied many fold in the case of the large user. Painting contractors, too, should study the advantages to them of using pure lead and oil paint. Every time they do a job with pure lead paint they know it will be a job that will reflect favorably on them and bring old customers back along with new ones. It is also a protection against the unskilled man or poor painter who will slap on any kind of paint with no knowledge of its merits or how best to use it.

Painting these Milburn, W. Va., houses with pure white lead paint has been a great source of satisfaction to the Company owning them.

Highway Departments Rely Heavily on Lead in Paints

CONTINUING the discussion of State Highway Department paint specifications begun in the January issue of LEAD, study of paints specified for field coats on steel structures is more complicated than in the case of priming coats, because of the greater latitude allowed through alternative formulae, necessitated by color and other requirements. Nevertheless, lead paints again heavily predominate. For first field coat 13 out of 40 states require pure lead paints and nine more include them as optional. Nineteen states either require or permit lead-zinc paints and five more allow red lead or blue lead paints containing high proportions of the lead pigments. In the case of finish coats, 12 states either require or allow pure lead paint, 22 states lead-zinc paints, and 11 permit paints containing considerable quantities of red lead.

One very important point is the composition of the white lead-zinc oxide paints specified. The average of all these paints is over 70 per cent white lead. This indicates the high proportion of white lead engineers feel must be included in mixed paint to

give satisfactory results, and places the white lead content higher than is found in any but the best mixed paint.

State Highway Department specifications for timber paint are also illuminating. Only one state out of 41 fails to specify a lead base paint. Nine specify pure lead paints either for the priming coat or all coats and 37 states specify white lead-zinc oxide paints. Only seven states definitely allow other than lead paints as alternatives, although a few specifications are not clear on this point. The average white lead content of the lead-zinc paints is high, just as it was in metal paints, averaging over 68 per cent. These data again reveal the reliance placed on the lead pigments by well informed engineers who have huge investments to protect with paint, and the interests of taxpayers to serve.

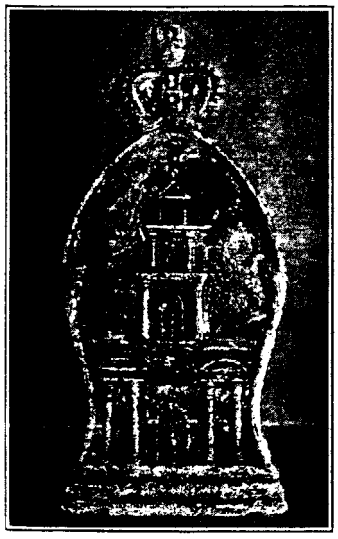
The widespread use of pure lead paint, or paint containing a high percentage of lead pigments, on so many state highways of the Union with widely varying geographical and climatic conditions varying all the way from the salt air of the sea coast, rain and burning desert sun, to frost and sleet, is an impressive testimonial to the extraordinarily great durability of the lead pigments.

NOTE—A 16-page mimeographed report giving in detail State Highway Departments' specifications regarding paint pigments may be obtained from the Lead Industries Association at a nominal cost of $1.00.

Lead Fire Marks Record Early Insurance Practice

IN the early days of this country and in England, there were no municipal fire departments and, as a protection to themselves, insurance companies gave financial support toward the maintenance of volunteer companies. They then placed markers on houses insured by them, so the fire fighters would know at a glance when they arrived at a fire whether to attempt putting it out or not. Unlucky the uninsured man with no marker on his house if it caught fire for, failing to find a fire-mark, firemen would not lift a hand to fight a fire.

Most of the early fire-marks were made of ornamental lead on a wood backing. The ornamentation on the lead was to distinguish which company had insured the house, each company having a different design. Two of the best known are illustrated here, the earliest dating from the first part of the 18th century. Marks were used until late in the 19th century because there are some that use a steam fire-engine design and steam engines are only of comparatively recent appearance.



An English lead fire-mark dating from the 18th Century. From the collection of Gayle T. Forbush, The Insurance Library Association of Boston.

The mark bearing the clasped hands, which is illustrated, is that of the Philadelphia Contributionship for the Insurance of Houses from Loss by Fire. It is easy to see why, with a name like that, fire-marks were necessary. This was the first fire insurance company in America, organized in 1752, the idea having originated with Benjamin Franklin, who was the first to sign the Articles of Association. Marks for this company were made by John Stow, of the firm of Pass & Stow, who also recast the Liberty Bell. Although the practical usefulness of fire-marks has passed, a considerable demand of late years has induced the company to reproduce the mark and they may now occasionally be seen, mostly on houses in the vicinity of Philadelphia. The remarkable state of preservation of the old lead markers, even to the detail of the ornamentation, certainly speaks well for lead. If these old markers lasted so long, it is easy to conclude how long lead roofs, leader-heads and other architectural leadwork will last, but there is enough architectural leadwork still in use even older than the fire-marks to speak for itself.

Fire-mark of The Philadelphia Contributionship for the Insurance of Houses from Loss by Fire. From the same collection.

Lead in Plumbing Code Protects Home Owner and Plumber

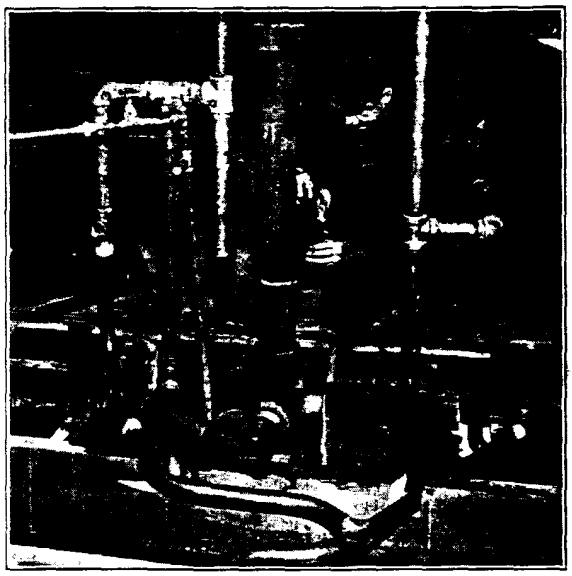
REMODELING the old Cusack House in Poughkeepsie, N. Y., to make a modern apartment building, illustrates admirably the excellent plumbing code of that progressive manufacturing and agricultural center of 40,000 in the beautiful Hudson Valley, and the important part lead plays in it. The code is designed to give the tenant and building owner every possible protection for both health and pocketbook and at the same time to shield the competent and skilled plumber from competition of the handy-man.

In a brief article it is impossible to deal with all the desirable features of the Poughkeepsie plumbing code, after which other codes have been modeled, so it is necessary to confine the discussion here to the code's relation to lead. Outstanding are the following provisions:

"All waste pipe under bathroom floors must be lead and all joints shall be wiped."

"No iron closet bends shall be used."

By requiring lead pipe under the floor a material flexible enough to take up settlement and provide for expansion and contraction without failure is used; the most durable piping material is placed in the most inaccessible location where failure might ruin walls and ceilings below; flexibility of lead pipe minimizes the number of joints that must be made and the cutting of joists; and health is protected by



Lead wastes and 4 in. bend, independently connected to the stack. More cutting of joists than is usually necessary with lead is shown here because the work is remodeling and building and plumbing were not planned simultaneously.

Lead wastes, as required by the Poughkeepsie plumbing code, in the remodeled Cusack House.

the use of smooth bore lead pipe which prevents accumulation of foreign matter which may adhere to the wall of other pipe materials, at times completely blocking the back vent and reducing the bore of the waste to such an extent as to create a bad condition of siphonage at the trap. This condition causes formation of noxious gases and permits their access to the building, creating an unsanitary condition. An installation like that required in Poughkeepsie will outlast almost any building if it is properly installed, and rigid inspection assures proper installation and adherence to code requirements in Poughkeepsie. Although the Cusack House was originally erected in 1910, practically all of the original lead work is being used again in remodeling because it is as good as new. To have lead wastes costs no more than less durable waste systems, so the permanence and freedom from repair of lead mark the saving to the owner.

From the plumbers' standpoint the Poughkeepsie requirements are a great protection because only a skilled mechanic can install lead work. This naturally eliminates from competition with the bona fide plumber the man who can just handle a monkey wrench. At the same time it gives protection to the building owner because he can be sure that the work will be done by thoroughly competent men.

Poughkeepsie's plumbing code also requires that all small water services be made of lead pipe. That city's practice in this respect will be described in more detail in a future issue of LEAD.

Lead Reduces Sound Transmission of Doors and Walls

LEAD as a sound insulating material in doors and partitions has shown up extremely well in recent laboratory tests,* bearing out results of earlier work which indicated that mass plays a preponderant role in sound reduction. Other factors being equal, sound reduction is shown to be dependent upon the weight per unit area of a partition or door.

The theory seems to be that sound waves generated on one side of a partition strike the wall which causes it to act as a plate clamped at its edges and which, in turn, is set in vibration. The partition then becomes a piston, forcing sound waves to be set up on the other side. The greater the weight per unit area of a door or partition the greater the reduction of sound passing through it. Of course, weight or mass is not the only determining factor as the nature of the construction material itself also influences the results. The table shows the results of tests on various kinds of doors, and, of course, merely shows the overall variation in sound reduction due to changes in all variables but expressed as a function of weight only.

Material	*Thickness (in.)*	*Weight (area)*	*Log (wt. area)*	*Aver. Reduc.*
Wood	2.6	6.85	0.836	30.2
Wood	2.8	7.00	0.845	30.7
Wood	3.0	7.65	0.884	31.5
Wood, steel sheathed	3.0	9.60	0.984	33.0
Wood, steel sheets	3.0	11.60	1.065	35.6
Wood, lead sheets enclosed.	3.0	15.30	1.185	37.3

It can therefore be seen that lead, with a higher specific gravity and less elasticity than other common construction materials, is well suited for sound insulation work. It is possible to concentrate a large mass in a small space by placing a sheet of lead at the center of a door or partition. For instance, taking mass only into consideration a sheet of lead only ⅛ in. thick at the center of a wood door would have a sound reducing effect equivalent to many times that thickness of wood.

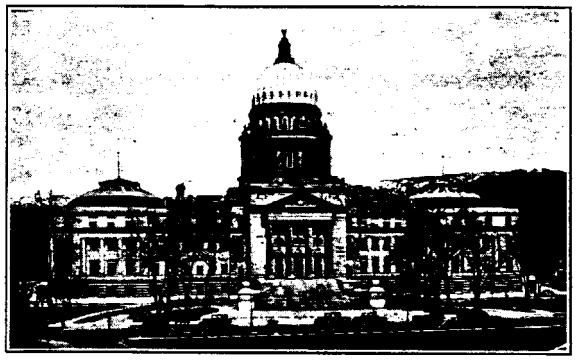
Lead-lined doors are already available on the market from manufacturers of X-ray insulating equipment, as they have long been standard to stop X-rays.

* "Weight as a Determining Factor in Sound Transmission" by Paul E. Sabine, Riverbank Laboratories, Geneva, Ill., published in The Journal of the Acoustical Society of America, Vol. IV, No. 1, Part 1, July, 1932.

A Hard Lead Covered Dome for Idaho's Capitol

ONE of the domes on the Idaho State Capitol at Boise has been completely covered with 4-lb. antimonial sheet lead. In the photograph it is the dome on the right. The dome itself is concrete and originally was uncovered. However, it had cracked and become leaky, making some kind of protection necessary. State officials wisely selected hard lead for the purpose.

By using lead the harmony of building materials was maintained, for the soft gray of lead is neutral and blends with other materials. Likewise it does not stain adjacent masonry and with age develops a natural, genuine and desirable patina. Antimonial lead is the most durable of the common metals when exposed to the atmosphere, and consequently a lead covered roof is free from usual maintenance expenses and will outlast almost any building. Europe has many lead roofs several hundred years old, the Pantheon in Rome, which was erected in 123 A.D., having one.



Idaho State Capitol, Boise, Idaho, before one of its concrete domes was covered with hard lead.

Idaho is one of the most important metal producing states in the Union, with large deposits of gold, silver, zinc and lead. In lead production the famous Coeur d'Alene district of northern Idaho ranks second in importance only to southeastern Missouri. It was fortunate that the state was able to turn to one of its own leading products for use on the Capitol building and still select the highest quality material for the purpose.

Lead Service Pipe Has a Great Record in Milwaukee

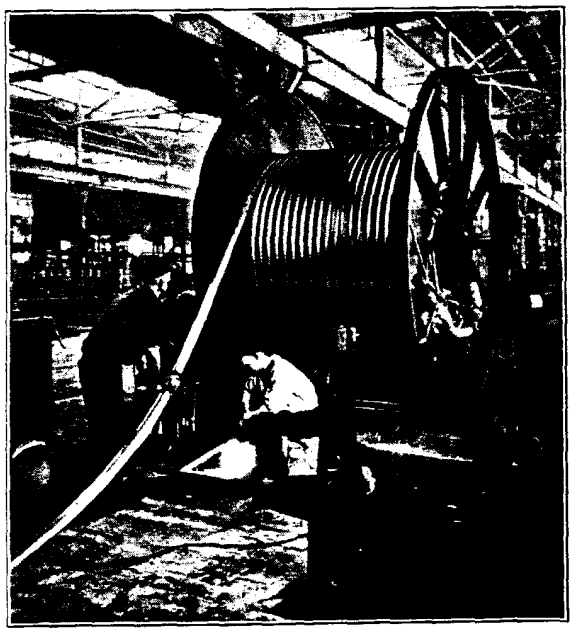
MORE than 5,000,000 feet—nearly a thousand miles—is the amount of lead pipe underground in the City of Milwaukee, Wis., supplying water to residents and industries. That the city still uses this durable and reliable service pipe material after 60 years' experience with it is ample proof of the satisfactory performance and economy in operation resulting from lead pipe's permanent character. Milwaukee is generally recognized as one of the best managed large municipalities in the United States, with efficient, economically sound municipal functions and an impregnable financial condition.

Mr. Frank J. Murphy, Superintendent of the Division of Water Meters and Services of the Milwaukee Department of Public Works, says, "Our first water service, which was installed in November, 1873, has been in constant service and as far as our records show, has occasioned no trouble at all. Milwaukee has always used extra strong (AA) lead pipe. Our experience of sixty years with lead pipe water services in ⅝ in. to 1¼ in. sizes has been highly satisfactory."

Average water pressure in Milwaukee is 52 lbs. per square inch. Water is supplied to individual services through a gridiron system of cast-iron mains ranging from 6 in. to 54 in. in diameter. Water supply is drawn at a point a little more than a mile out in Lake Michigan. There have been 133,407 lead water services laid in Milwaukee since the first one was installed in 1873. About 648,000 people, of whom 66,000 are outside the city, are supplied with water.

Milwaukee is one of America's great cities, so that conditions governing the performance of service pipe are exacting. Paved streets and sidewalks are expensive to tear up for repairs to buried pipes and it causes delays and inconvenience to business and passenger vehicles, not to mention interruption of water supply. Street cars and heavy traffic subject the pipes to much vibration and the chances of ground movement and subsidence are extreme due to large amounts of building and excavation constantly in progress in big cities.

Under these conditions it is not economical to gamble with service pipe materials whose durability has not been absolutely proven. Lead service pipe has established an enviable and well-known record in actual service under all sorts of conditions in great cities all over the world for many years, just as it has in Milwaukee.



Inspecting oil-filled lead-sheathed cable for the Columbia River crossing of the Northwestern Electric Co.

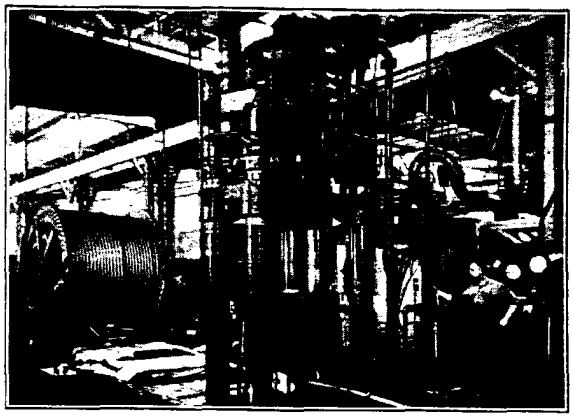
Lead-Sheathed, 115,000 v. Submarine Cable

THE Northwestern Electric Co. installed lead-sheathed submarine cable during the past summer under the Columbia River to bring power into Portland, Oregon. At the point of crossing an island in the river divides it into two channels, 3,460 feet and 1,360 feet in width. Six lengths of cable, three for each channel, a little longer than the channel width were required. Cables were laid four feet apart on the river bed rather than in a trench as it was felt they would thus be more accessible. The experience of the company with other submarine cables indicated that the chances of mechanical injury if so laid were slight.

The November, 1932, issue of LEAD erroneously stated that a cable under the East River at New York was the first oil-filled submarine cable ever installed

in this country. The Columbia River cable was laid slightly prior to the New York cable and is oil-filled 115,000 v. cable. It was manufactured by the General Electric Co. Overall diameter of the cable is 3.80 in. and the lead sheath, which has an inside diameter of 2.497 in., is 5/32 in. thick. Two per cent tin was added to the lead to give it additional strength.

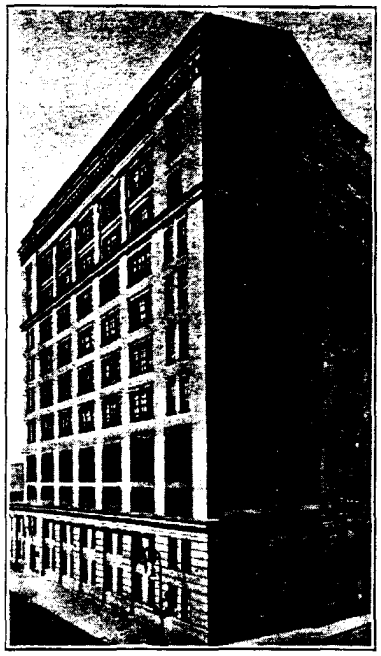
Each cable is 750,000 cir. mil. hollow core, single conductor cable insulated with 0.560 in. of wood pulp paper. Over this is a copper shielding tape interlocked with one paper tape, and then the lead sheath. Over the sheath are two layers of tarred jute and asphalt, hard drawn copper wire armor, and a layer of tarred jute, asphalt and whiting. The cable weighs 20 lbs. per foot.



Sheathing 115,000 v. oil-filled submarine cable with lead in an extrusion press for the Columbia River crossing of the Northwestern Electric Co.

Lead Anti-Vibration Mats to Perform Exacting Service

PREVENTION of the transmission of vibration plays an important part in the New York Central Railroad's West Side improvements in New York, a $150,000,000 project in its entirety. Lead-asbestos anti-vibration mats are called upon to do a large share of the vibration insulation. Present freight tracks are to be removed from the street and placed out of the way on an elevated structure. At one point this viaduct must completely pierce one end of the Bell Telephone Laboratories Building. As the building houses a vast number of sensitive instruments and costly and delicate research work is constantly in progress, it is essential that both noise and vibration, which will necessarily be set up by passing trains, be absolutely excluded from the laboratories.



How the Bell Telephone Laboratories Building will provide for railroad tracks passing through it.

To this end the structure carrying the tracks, though passing right through the building between the second and fifth floors, is entirely divorced from the building, and rests on separate foundations. This method of course prevents any direct transmission of vibration from the viaduct to the building. However, if these were the only precautions taken, vibration could pass down the viaduct columns to the ground and thence up the building columns and into the building.

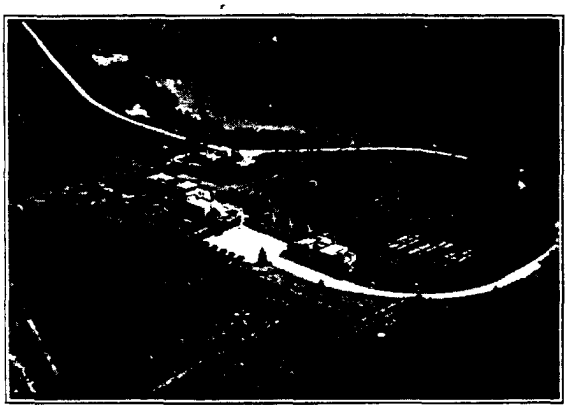
So the railroad adopted a method of preventing vibration which it has successfully employed for many years in other terminal developments. A lead-asbestos anti-vibration pad is to be placed on the foundation under the grillage on which each column footing rests. The pads consist of top and bottom layers of 8 lb. sheet lead, large enough entirely to isolate each grillage from the foundation. Between the lead sheets are sandwiched two layers of asbestos board ¼ in. thick, and a central sheet of 20 gauge galvanized steel. The lower lead sheet is large enough to be turned up over the top sheet around the edges and soldered to make a watertight envelope.

It is indeed a high tribute to this type of vibration insulation that it should be adopted for so exacting a task. The identical system will also be used in connection with other buildings, such as the National Biscuit Building, along the same tracks.

This method of vibration isolation was developed by the New York Central some years ago. Having thoroughly proven its efficiency, it has in more recent years been adopted by other railroads, architects and engineers, and an adaptation has been successfully applied to heavy machinery settings. The Association will supply more complete data upon request.

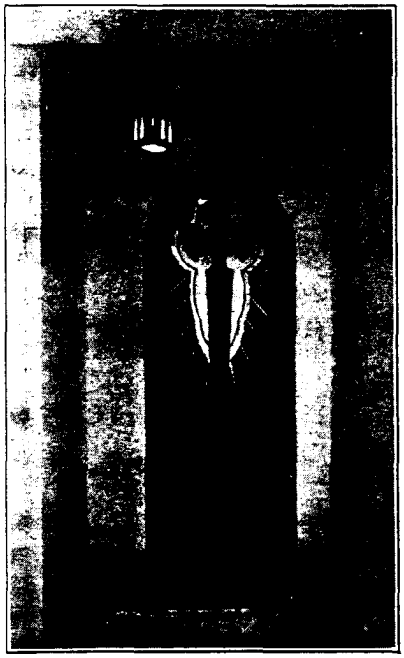
Unusual Lead Work on a Unique Home

NEAR Easton, on Maryland's famous "Eastern Shore," is the beautiful home of Mr. and Mrs. Glenn Stewart, on which lead for both practical and ornamental purposes has been used extensively by Mr. William Draper Brinckloe, the architect. This unusual home has a hard lead batten roof, and ornamental leader-heads, gutters and downspouts of hard lead. But aside from these more or less conventional applications, the architect has gone a step further and created some more unusual and extremely appropriate uses for lead.



Aerial view of the Glenn Stewart estate on the eastern shore of Maryland.

Outstanding among these are the lighting fixtures. Only a few architects and craftsmen have recognized the distinctive possibilities of lead for this purpose but they have achieved enviable results. The fixtures in the Maryland residence are cut from sheet lead, with bottoms and in some cases tops made of wood covered with lead. Brackets are wrought iron and the wires are carried in ordinary iron pipe. Light shines through colored silk, shellacked and attached to glass or celluloid. In the case of exterior lanterns stained glass was used. The fixtures were executed by Mr. Carroll McT. Elder of Bozman, Maryland, from Mr. Brinckloe's designs.



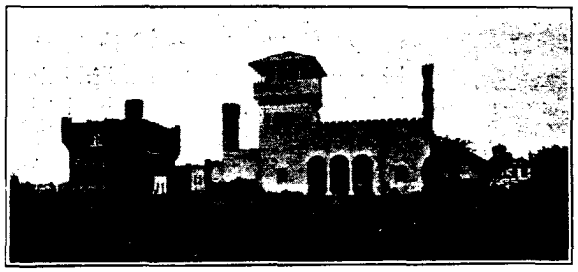
Cast lead sun-burst on a door and a hand-wrought lead lighting fixture.

The whole effect is charming, for lead weathers to a beautiful patina in the case of exterior lanterns and does not stain adjacent paint or stone, while in interiors the neutral gray color harmonizes with any decorative scheme and the metal glows softly in the light. Delicate tracery may be cut from lead that would look fragile and cheap in other metals.

Another rather unusual use was to cast a sun-burst of lead which was fastened to one of the doors. The model was clay from which a plaster-of-Paris mold was made. A local plumber then cast the lead. Wall sun-dials and panels of lead carrying the house street number may be made in exactly the same way.

Lead is so easy to work that, as its traditional decorative possibilities become more generally realized in this country, it will be widely used for purposes such as those mentioned.

Wide-awake plumbers and sheet metal men will recognize in this kind of work an opportunity profitably to fill in what would otherwise be idle, wasted time.



The Glenn Stewart "Castle," near Easton, Md. Note the hard lead leader head and downspout. The hard lead roof is not visible in the photograph.

Chemical Plumbing, Leadburning and Oxy-Acetylene Welding—By E. B. Partington, 445 pp., illustrated, published by The British Oxygen Company, Ltd., Angel Road, Edmonton, N. 18, London, England. Price 5s. 6d. This recent book contains complete and useful information on lead burning and its application to chemical, ornamental, domestic plumbing, battery and other lead work. Also chapters on welding of iron and steel and non-ferrous metals and alloys other than lead.

The Lead Industries Association invites inquiries on any subject relating to lead and will be glad to cooperate without obligation in the solution of your lead problems.

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