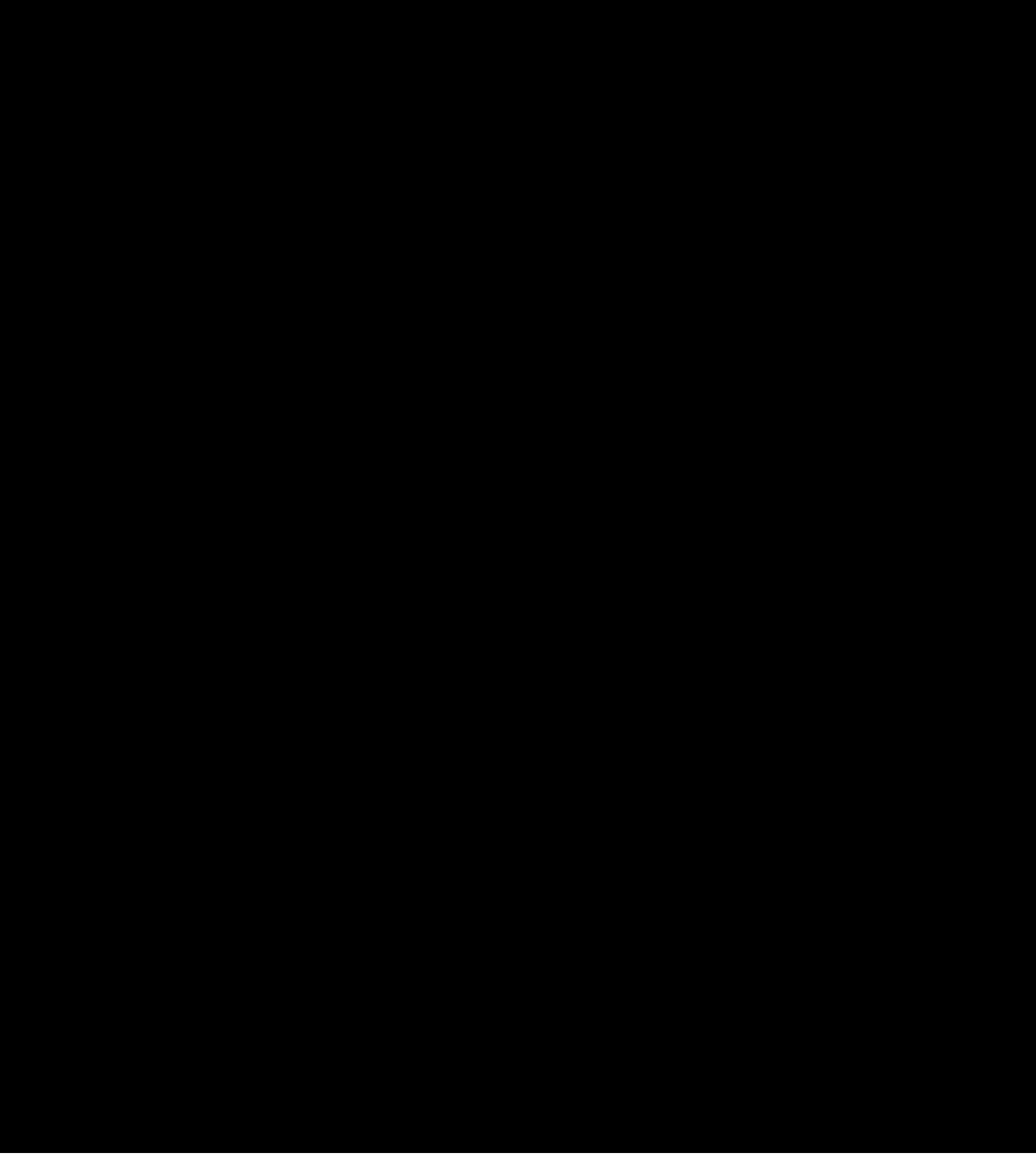




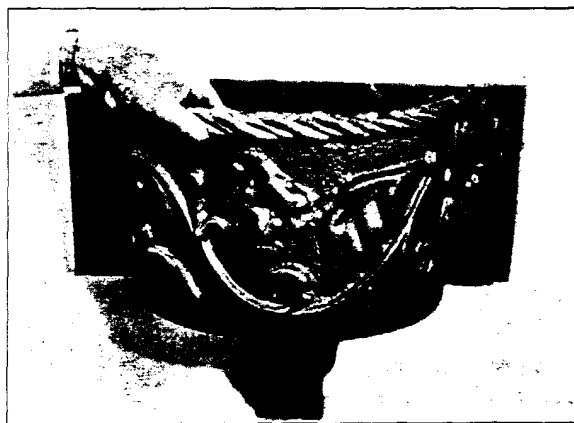
Charming Hand-Wrought Leadwork on Western Residence

WHEN Architect Arthur L. Loveless designed the Roy J. Kinnear residence in the exclusive Broadmoor district of Seattle, Washington, he selected hand-wrought leadwork for the finishing touches on exterior design.

In line with his specifications, hand-beaten lead rain leader boxes were installed wherever downspouts were prominent. These were made of six-pound lead, with a small percentage of antimony added for rigidity. As shown in the illustrations, the leaf and vine pattern, used throughout, formed a very pleasing design. This portion of the lead box was formed by beating with small wooden mallets; the rough-



Seattle residence on which lead was used extensively for decorative and practical purposes



A beautiful hand-beaten hard lead leader-head

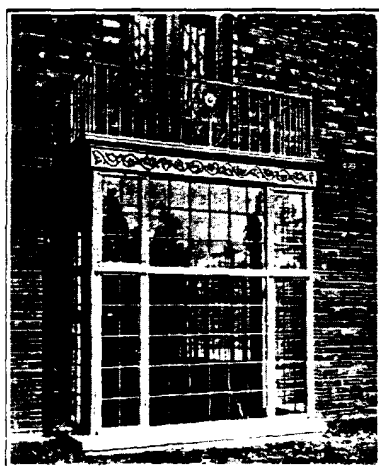
ened surface was beaten with a metal hammer; and four strands of lead wire, twisted together, and lead-burned into place, made up the braid across the top of the box. Dog-ears were provided for sup-

porting to the wall, and after installation the bolts which went through these were covered with lead to prevent rust stain.

Architectural specifications also called for a lead panel for the frieze over a leaded bay window on the main wing of the house. This panel, made of eight-pound hard lead, was formed in five sections, and was also hand-beaten in a similar design to the lead roof drain boxes. After assembly the sections were burned together, to make the joints invisible.

All lead work is in pleasing harmony with the architecture of the Kinnear home. It adds a touch of beauty to the rain leaders which so often are a bane to the architect; and it lends its charm in the frieze over the bay window, as well as in leaded glass, and in chimney and roof flashings wherever exposed to view.

The value of lead in providing a quiet softening tone, richness of design, and permanence of installation, as well as the fact that it will not stain adja-



Hand-beaten hard lead frieze over bay window



Sections of hard lead frieze before assembly



Hard lead leader-heads on a residence



Hard lead bay window frieze assembled in shop

cent paint or masonry, have all been capitalized by the architect in this modern residence.

Frank Edmands of Seattle, Washington, designed and made the decorative lead work according to specifications by Architect Arthur L. Loveless.

Home construction such as this affords an excellent opportunity for the progressive sheet metal man who is willing to devote a little time to the study and practice of lead work. A detailed paper on lead "burning" will gladly be supplied upon request.

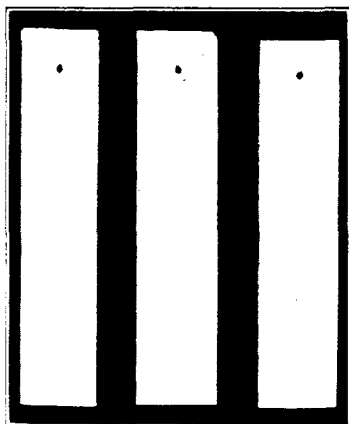
Superior Visibility of White Paints at Night

MANY engineers, including highway engineers in particular, are faced with a dual painting problem, protection of structures and safety. For instance, bridges, fences, posts and other structures along highways must be so painted that they will be clearly visible in the beams of automobile headlights at night. From the standpoint of protection these structures cannot be better painted than with priming coats of red lead or blue lead and top coats of white lead paint. Besides furnishing the utmost durability obtainable from paint they have a safety factor in their favor which paints of a metallic sheen sometimes used as a protective coating do not possess.

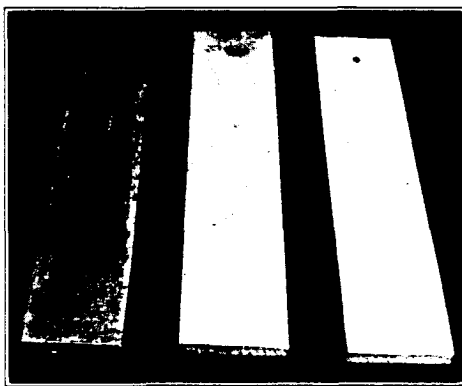
Tests have shown, and are partially illustrated here, that paints with a metallic lustre are slightly more visible in the direct rays of artificial light; at an angle to the rays, flat white lead paint is the more visible. When the angle of incidence gets up to about 20 deg. metallic paint is practically invis-

ible, yet the visibility of the flat lead paint is unaffected. As practically all structures along a road are at an angle to the beams of automobile headlights, it is obvious that flat white lead paint is the safest thing to use. Even bridges, whose structural members are almost, but not quite, directly ahead of approaching cars need this safe painting because these same structural members generally slope backward, which has the same effect. Even semi-gloss white lead paint is better in this respect than metallic paint. The reason is the mirror like surface of metallic paint.

Hence, there seems to be no reason to use anything but lead paint, for it gives the best protection to the painted surface, and the highest degree of safety. These tests are readily checked by observation along highways at night. They would also hold true for the painting of street cars, busses and anything else that should be clearly visible under artificial light to reduce the hazard of accidents at night.



Camera perpendicular to panels



*Panels tilted back 45 deg.
Paint with metallic sheen on panel at left,
semi-gloss white lead center, flat white lead
right in each photograph,*



Camera 45 deg. to side of panels

Lead "Cartilage" for Ears of Mounted Animals

By: John W. Hope*

LEAD has found a useful place in mounting specimens of large mammals. The word "mounting" is used advisedly to signalize the great advance in the art of reproducing animals that by no stretch of the imagination can be called "stuffing."

To mount an animal the skin, which comes from the field salted, dried and as stiff as a board, is re-

cept, of course, that it must be done slowly and carefully, due to a certain amount of adhesion of the two surfaces. After the cartilage is removed, a replica of it is made in lead.

The cartilage is then soaked in luke-warm water until it becomes pliable and will return to its normal shape. Flattened over a piece of sheet lead, its outline is scribed and cut out. The lead is then gradually hammered into the correct shape with its flutes and convolutions by the use of a curiously shaped wooden tool fashioned by the artisan best to suit his purpose.

When the lead shape is complete, it is given as rough a surface as possible and knife-edged on the outer extremities. It is then ready to insert into the ear-case of the skin, to which it is cemented with a special paste. (See cover illustration.) As the butts of the ears will vary according to the position they are to assume when finished, that portion is usually modelled with papier maché under the skin during the final adjustment.

The advantages of this method are that lead is a medium which permits the making of an exact replica of the cartilage; with the cartilage of the ear removed, there is no shrinkage or curling of the ear.



COURTESY AMERICAN MUSEUM OF NATURAL HISTORY

laxed, shaved to a minimum of thickness and tanned to a soft, durable leather. The form of the animal is carefully sculptured in clay. A plaster of Paris mould is then made of the sculptured form, this mold being used to make a light, durable reproduction of the form in papier maché, known as the mannikin, upon which the skin is finally fitted.

Keeping pace with the advances that were made in developing the body form of the animal went a search for materials that would enable the craftsman to reproduce more accurately those parts that were beyond the power of the sculptor to include in his modelled form and which must be done while the skin is being applied to the mannikin. Chief among these were the sheath-like ears of deer and antelope, which have a thin underlying cartilage between the inner and outer layers of skin.

Formerly these cartilages were simply allowed to dry in the ears, holding their shape as best they could, and due to their tendency to shrink and shrivel, the results were not very satisfactory.

Today the cartilages are removed, much in the same manner as a hand is pulled from a glove, ex-



Marking outline of cartilage on sheet lead

Hammering lead "cartilage" to shape

The completed mount. Note life-like expression of the ears



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* Staff preparator, Dept. of Preparation and Exhibition, The American Museum of Natural History.

as the lead retains this shape; and should the ear of the finished specimen be accidentally hit, it will not break or crack as in the old method when the dry cartilage was left in but instead, will, with the tanned skin and lead insert, merely bend and can readily be straightened back to normal with the fingers—no damage resulting.

White Lead Protection for Oil Well Casings

MANY years ago the casing of a certain oil well in Pennsylvania began to leak after several years in use. When the casing was pulled up it was found to be perforated with holes at the level of a seam of soft coal through which it passed, but where the maker's name was branded on the pipe in white lead the letters stood out in bold relief. It was concluded that the sulphur, which had so adversely affected the pipe, had no appreciably bad effect on white lead as sulphur gases form insoluble compounds with lead.

As a result a new string of pipe was given several coats of white lead paint and lowered carefully into place to avoid injury to the paint. This was not difficult as the walls of the hole stood up well and careful handling kept them from scraping off the paint. A rope twister instead of pipe tongs was used to screw the casing together without injury to the white lead.

W. R. Osborne, a driller of forty years' experience, who reports this incident believes that the casing is still in operation. He thinks it an idea that might prove of practical value to others.

This is a reminder of the way in which the value of a baked red lead priming coat on underground oil and gas lines was discovered. When an oil company took up some sections of badly corroded pipe it noticed that numbers painted on the pipe with red lead had preserved the metal underneath. Upon investigation it was learned that the numbers were painted on while the pipe was still hot. This led to the use by this company of a red lead priming coat baked on the pipe at about 300° F.

The priming coat is applied in the shop where conditions are favorable for easy application. It may be followed by a finishing coat of any of the bituminous materials commercially used for pipe line protection.

More Lead-Calked Joints a Century Old

If only one or two isolated cases of lead-calked joints in cast iron water mains that had served with integrity for a hundred years or more were known, they might be considered as exceptional examples of service. But recently in a number of cities old mains have been opened up for inspection and many examples of century old lead joints now exist. The photograph shows a section of 10-inch cast iron main in New York City laid between 1830 and 1840. This bell and spigot pipe was joined with the usual lead joint, lead poured in hot, and calked. This main is in East Broadway, close to a street car track, where it must have been subjected to considerable vibration. It extends for about three-quarters of a mile. Yet these joints have successfully passed a century-long test, and lead is the only jointing material that can show such a record.

Leaded joints owe their permanence to the natural durability of lead and to the fact that lead is soft



COURTESY U. S. PIPE & FOUNDRY CO.

Century old cast-iron pipe and leaded joints, New York City

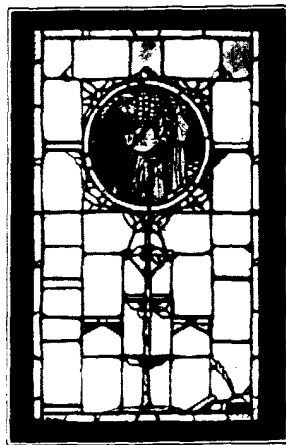
and pliable, allowing movement in the joints caused by settling without cracking them. Likewise flexible lead joints remove the danger of excessive strains resulting from subsidence being placed upon the pipe itself, and thus lead joints actually aid in the longevity of the pipe.

Some Possibilities of Leaded Glass

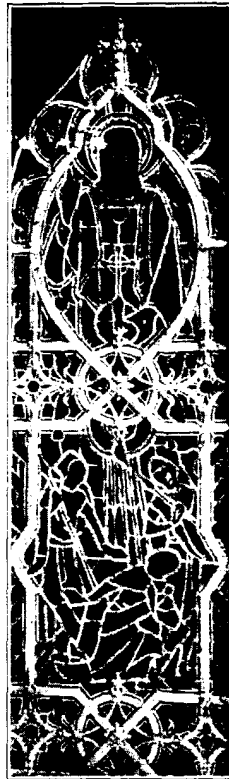
THE medieval glazier who first conceived of a lead strip and colored pieces of glass as companionable elements in shaping a translucent colored picture, gave birth to an art that beautified the medieval cathedral and later adorned the mansions of the nobility and merchant princes. Today the old time art of leaded and stained glass flourishes with renewed vigor under the impulse of a brilliant revival in architecture, adding new beauty to the American home and office building. The discerning architect and his client may encourage the same noble, sincere craftsmanship that gave the windows of the middle ages their romantic and imperishable charm.

Readily flexible and almost instantaneously reactive to the soldering iron of the craftsman, lead invites innumerable delightful excursions in the artistic play of the imagination. We often find the designer of ecclesiastical windows between times shaping intimate personal motifs and using them as inserts in the windows of a library, music room, stair hall or even in a nursery, where little Red Riding Hood or old Mother Hubbard can find a congenial resting place among the lead lines of a window as well as in the printed pages of a story book.

The scope and variety of subjects is almost unlimited and artists like Nicola D'Ascenzo of the D'Ascenzo Studios have gladly availed themselves of the opportunity to use the fluent and supple lead line for artistic effects.



A residential library window, "Monk Illuminating a Manuscript"



Portion of chancel window, St. Paul's Church, Chestnut Hill, Pa.



"Faun Playing a Harp," door panel, Musical Arts Building, Philadelphia

In his "Monk Illuminating a Manuscript" we have a refreshing example of free leading; charming in its "old world" picturesque and decorative ensemble and most appropriate for the library window. In the "Caravel" window a different method is used. Sheet lead forms the principal decorative motif, the pattern of the ships being cut out of the sheet lead in silhouette and the surface hand-tooled to create a repoussé finish. This method has been used with excellent artistic effect in the areas of stair hall windows.

"Faun Playing a Harp," originally designed for the Musical Arts Building in Philadelphia, presents a further development in silhouette lead motifs with interesting surface modelling produced by the soldering iron alone, an example of lead glazing in which each strip of lead is a line drawing indispensable to the design.

In the accompanying reproduction of a fragment of the chancel window of St. Paul's Church, Chestnut Hill, extra wide leads were used to define the medallions and the outlines of the figures as well, and these heavy lead lines of the window were gilded with gold leaf. The window really performs a double duty.

During the day its rich colors dominate

the chancel, while at night the lights of the interior reflect from its pattern of gilded lead, creating a harmony of decoration between the reredos and the window, which would remain under ordinary conditions black.

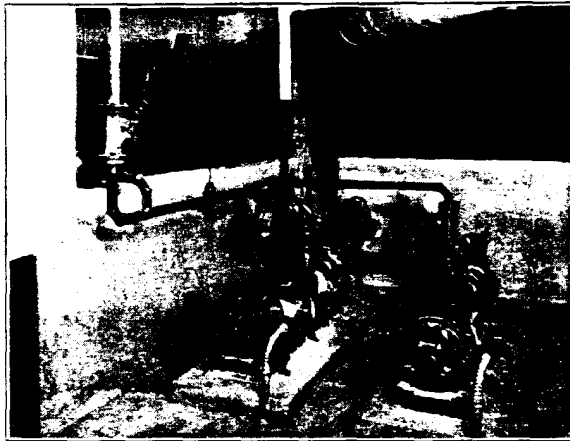


"Caravel" window in a residence at Merion, Pa.

Conveying Salt Water in Hard Lead Pipe

THERE is a growing trend among municipalities and educational institutions to erect aquariums of their own where students and local residents may have opportunities to study not only the marine life of the neighboring area but of the entire world. As a result a number of fine aquariums and marine laboratories have been constructed in recent years which include the great Shedd Aquarium in Chicago (Lead, Nov., 1930), the Wood's Hole Oceanographic Laboratory at Wood's Hole,

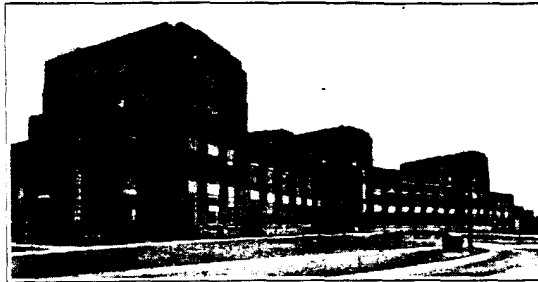
COURTESY O. G. KELLEY & CO.



Salt water reservoir with hard lead pumps, pipes and valves

Mass., and the Scripps Oceanographic Laboratory at La Jolla, Calif. Now Wellesley College, at Wellesley, Mass., has completed one of the newest and most up to date.

Lead must of necessity play an important part in equipping these aquariums. Fish from the ocean must have uncontaminated salt water in which to live and salt water is highly corrosive to most pipe materials. Not so to lead, however, a fact known for years and recently corroborated by impartial tests reported in a paper of the Institute of Metals, London, a brief summary of which was



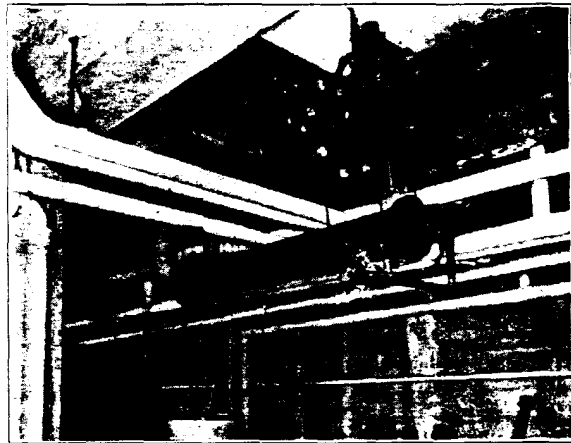
Sage Hall, Wellesley College, which houses the aquarium

Aquarium is handled in lead pipes, pumps and valves. The method is well illustrated in the accompanying photographs. Salt water is pumped from a reservoir by hard lead pumps, its flow controlled

printed in Lead, March, 1931. Lead, both antimonial and soft, stood well ahead of all common pipe materials in resistance to salt water corrosion in these tests and was surpassed only by two much more expensive metals.

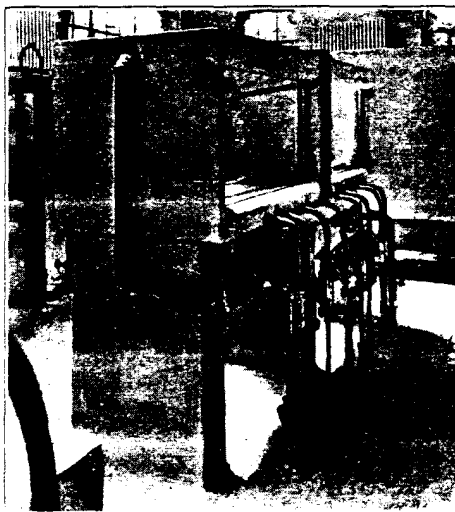
Therefore, all the salt water in the Wellesley

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Salt water heating units constructed of 8 inch steel pipe with homogeneous lead linings

COURTESY O. G. KELLEY & CO.



Lead supply and return system on front of exhibition tank

by hard lead valves, and it is transported in 8 per cent antimonial lead pipe. This pipe is self-supporting on 5 foot centers. The salt water passes through three electrically controlled heating units to regulate its temperature. They are composed of 8 inch steel pipes with homogeneous lead linings. At the exhibition tanks a by-pass system is provided so that either fresh or salt water may be fed to each tank. Tanks are pre-cast concrete and the lead joints are made with two companion flanges packed in glycerine and litharge. Again hard lead valves control the flow at

the tanks. The supply enters the tanks at the top and sea water is withdrawn from a lower level.

Salt water for this aquarium was brought by

tank car from the ocean at Cape Cod, thirty-six miles away. All the lead-work was done by O. G. Kelley & Co., of Everett, Mass., and New York.

Metallic Packing for Automobile Water Pumps

A RECENTLY developed metallic packing, consisting of lead alloy tubing with a core of flax, graphite and oil, has been found by automotive engineers to be an excellent packing for automobile water pumps. It is made in several sizes.

The packing is very simply installed by wrapping it about the pump shaft, in two layers if necessary, and then tightening the stuffing box nut hard. In this way a leak-proof bearing is formed, which will not score the pump shaft and which requires practically no attention thereafter. A split ring type of this packing is also supplied for use by motorists should leaks develop on the road. The rings are merely slipped in on top of whatever kind of packing is already there, and repair the trouble until such time as the entire stuffing box can be repacked conveniently.

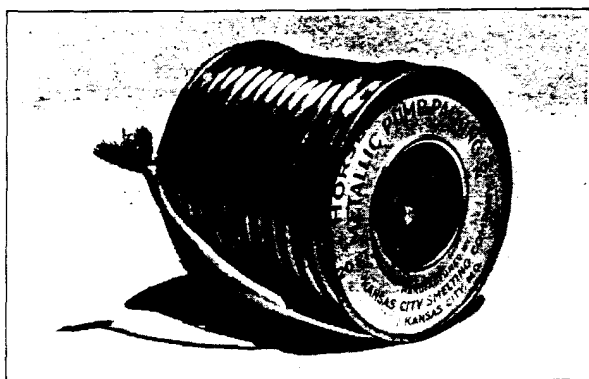
Factory type units are also illustrated. These units are made of the same material that is supplied to the automobile replacement trade but are pre-formed to fit the stuffing box so that they may be used on the assembly line. The twin unit is used on the Chevrolet and the larger unit was developed for the Packard.

This metallic packing, being composed of lead, is unaffected by the action of anti-freeze mixtures. The resilient core takes care of expansion and contrac-



Factory type metallic packing units. Smaller is for Chevrolet and larger was developed for Packard

tion due to temperature variations. This type of packing forces its way into irregularities in scored shafts and forms a metallic bearing at points usually occupied by water and mushy particles of flax. The Kansas City Smelting Company of Kansas City, Mo., is the manufacturer of the packing illustrated.



Metallic packing as supplied for garage mechanics' tool kits

Publications Available from the Lead Industries Association

The following publications may be obtained from the Lead Industries Association upon request:

USEFUL INFORMATION ABOUT LEAD—104 pp., cloth bound—contains complete information on lead and its uses, with extensive tables of properties and chapters on lead alloys, lead compounds, lead mining and smelting, and history of lead. 50 cents postpaid.

LEAD PIPE—24 pp. brochure—contains complete data on lead pipe, with tables of new standard sizes and weights recently adopted, suggestions and precautions for the proper use of lead pipe, and brief descriptions of methods of manufacture and history of lead pipe. No charge.

SHEET LEAD WELDING PROCEDURE—4 pp. reprint—practical discussion with illustrations of various types of welded or "burned" joints. No charge.

SHEET LEAD SHIELDING X-RAY ROOMS—4 pp. reprint—practical discussion with drawings and illustrations of methods of lining X-Ray rooms with lead. No charge.

400 SHEET LEAD SPANDRELS—2 pp. reprint—detailed description, with drawings, of method used to install hard lead spandrels on Downtown Athletic Club Building, New York. No charge.

BRITISH TESTS DEMONSTRATE LEAD'S SUPERIOR DURABILITY—1 p. reprint—tabulated results of tests conducted in England and reported in a paper of the Institute of Metals, London, showing relative corrodibility of various common metals under atmospheric and also under sea water exposure. No charge.

LEAD—Back numbers can be obtained in so far as supplies are available. No charge.

Please make requests on business letterheads.

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.