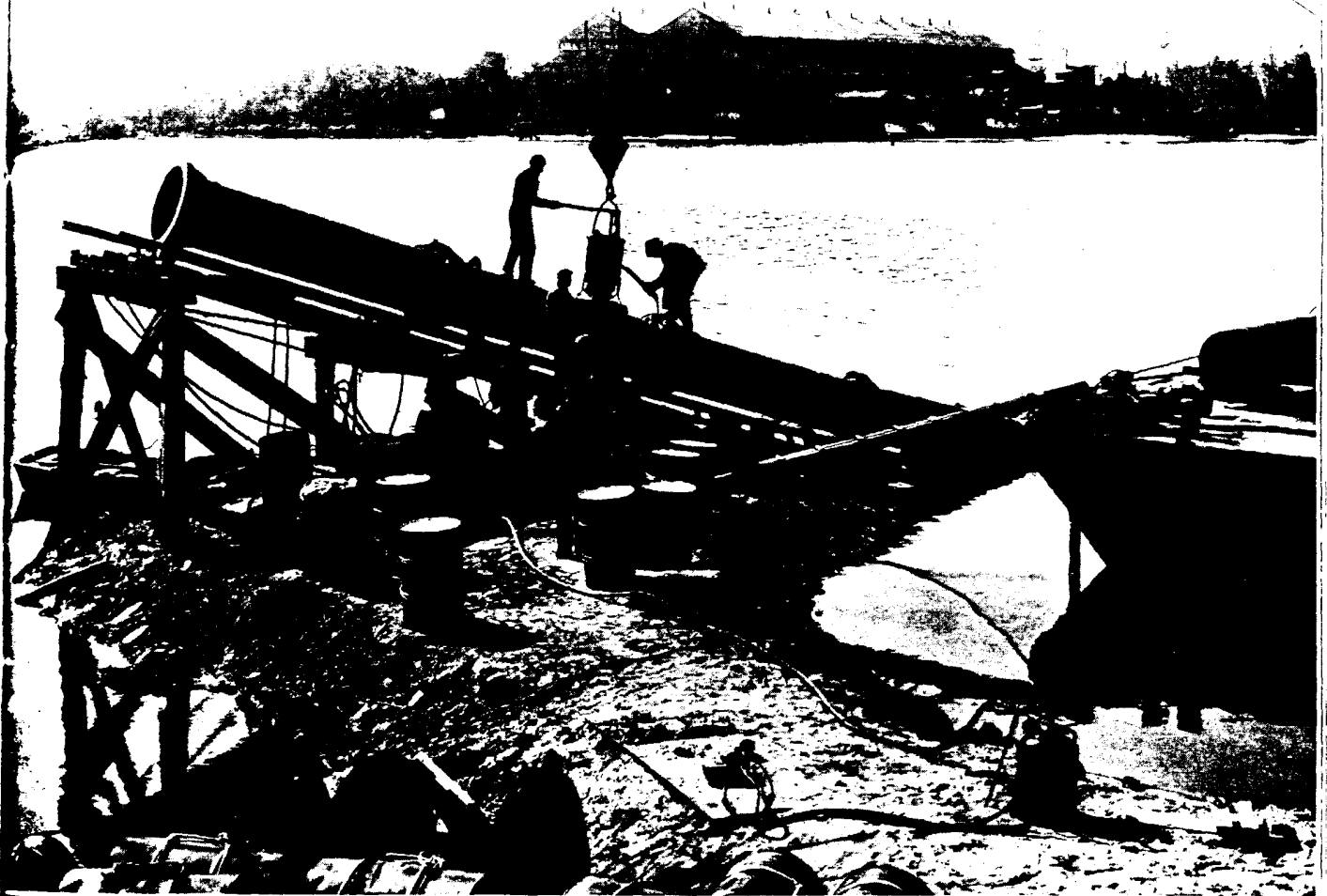


LEAD

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COURTESY BALTIMORE BUREAU OF WATER SUPPLY, ENGINEERING DIVISION

Pouring a joint in the sub-aqueous cast-iron water main, Curtis Creek, Baltimore, Md.

LEAD INDUSTRIES ASSOCIATION

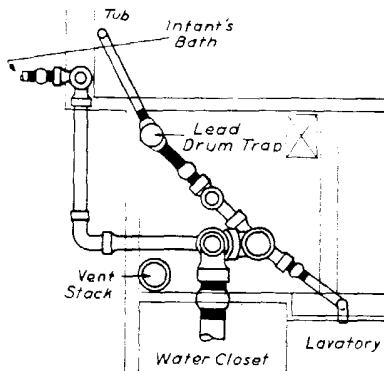
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LIA25490

St. Louis Hospital Benefits By Using Lead and Soil Pipe

HOSPITAL plumbing, more than plumbing in any other type of building perhaps, brings out the essential nature of good installation and materials. While plumbing in any kind of building may be a great aid to health and comfort if it is good, or a potential danger if it is not, this condition is emphasized even more in hospitals where life itself may be said to revolve about the plumbing system. In hospitals the plumbing is subjected to more concentrated and constant use.



Plan of lead and cast-iron roughing-in in the nursery on the ninth floor. Lead vents omitted to avoid confusion

the waste matter, if not properly handled, is of a more dangerous nature, and leaks, stoppages, or plumbing out of use can not be tolerated.

Firmin Desloge Hospital, built in St. Louis, Mo., in 1931, is a good example of what hospital plumbing should be with advantage to everyone, even to the extent of reducing building costs. Soil, waste and vent systems in this hospital are all cast-iron and lead pipe, the work of skilled mechanics with quality materials. All closet bends and connections to wall hung closets are extra-heavy lead and all branch waste and vent pipe is L (C) weight lead. All drum traps on bath wastes are 4 x 10 in. extra-heavy lead. Shower floors are lined with 4 lb. sheet lead and all roof flashings are also 4 lb. lead. All main soil, waste and vent pipes and inside leaders are cast-iron jointed with lead. The 6 in. water service likewise is cast-iron calked with lead.

Firmin Desloge Hospital, in which lead and cast-iron plumbing was found to be more economical in addition to the well recognized fact of being better



W. C. RUNDER, INC.

Every architect will recognize in this kind of plumbing the very best that could be put into it both as to materials and workmanship. Unfortunately we are unable to publish photographs of the lead work for it has been concealed now for seven

SPECIFY **SEAL OF LEAD INDUSTRIES' MATERIAL APPROVAL**

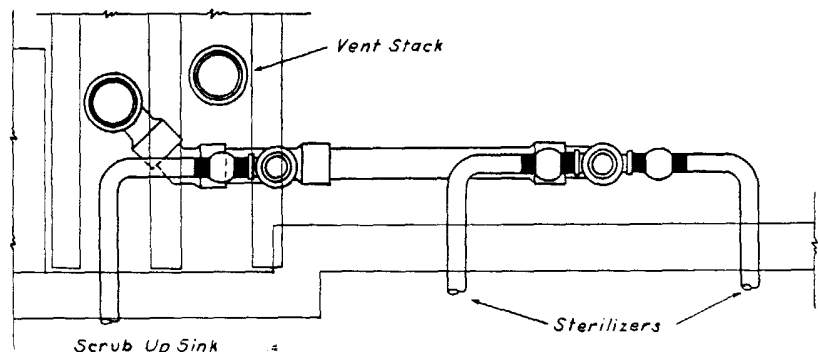
years where, according to A. F. Leveling, chief engineer and building superintendent of the hospital, the plumbing has never leaked, stopped up or given one bit of trouble of any kind.

One of the most interesting features of this job to architects should be the fact that it was originally laid out for another type of plumbing system. It was found, however, that such a system would be impossible to install under the conditions and that lead and soil pipe, making an infinitely better job, could be installed in less space at a great saving.

Besides the extensive use of lead in the plumbing for the Firmin Desloge Hospital, hard lead was also employed to fashion the ornamental trim of the chapel steeple, the ridge and other parts of the main roof, affording an excellent example of two wide-spread applications of lead, one essentially practical and of great benefit in sanitation, and the other both practical and ornamental from a construction standpoint. Furthermore, for ornamentation, fine lead work adds distinction.

A. J. Widmer and Associates, Inc. were the architects and the Hercules Construction Co. were the builders for this hospital.

C. Y. Lucas, who operates the Mid-City Plumbing and Heating Co., in St. Louis, was mechanical engineer and plumbing superintendent responsible for the planning of this job for the plumbing contractor, J. A. McBride Mechanical Equipment Co., with whom he was connected at the time.



Plan of lead and cast-iron wastes for typical surgical dressing rooms on the third to seventh floors inclusive of Desloge Hospital. Lead vents have been omitted in the drawing for clarity

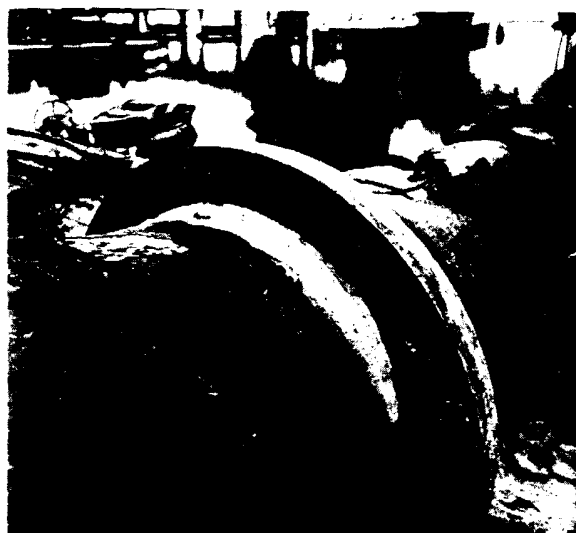
Lead Joints Prove Dependable Under Severe Strain

THE installation of a 30-in. sub-aqueous cast-iron water main under Curtis Creek in Baltimore, Md., is another excellent example of the serviceability and the practicability of lead for calking joints under unusual and difficult conditions. It was necessary to lay 1,200 ft. of this line under water, the depth varying from zero to 50 ft. The operation was begun in September, 1937, and completed in April, 1938. The under-water section of the piping consisted of 100 12-ft. lengths of Metropolitan Type No. 2 cast-iron pipe, and about 150 ft. of standard bell and spigot pipe, each joint requiring approximately 150 lb. of calking lead for its completion.

The main was constructed by laying two or three lengths of pipe at a time on a skidway, inclined at 30 deg. to the horizontal, located at one shore. The joints were poured, calked and then the pipe pulled, as construction progressed, across the bed of Curtis Creek to the opposite shore. A pulling force of not greater than 15 tons was used, although experimental tests demonstrated that the joints were capable of withstanding a much higher stress.

After reaching its final position the line was subjected to air pressure tests to reveal possible leaks. Final tests on the main required that a hydrostatic pressure of 175 lb. per sq. in. be maintained for ten minutes. The contractor

Close-up view of Metropolitan Type No. 2 joint, used in Baltimore main calked with lead

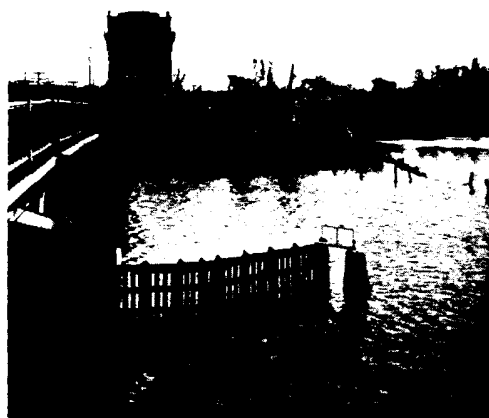


built the water pressure up to 177 lb. per sq. in. and in ten minutes, without any further pumping, pressure dropped only 3 lb.

A leakage test required that the main under the normal distribution system pressure of 80 lb. per sq. in. should lose not more than 50 gal. per in. of diameter per mile per 24 hr., which was equivalent to a 375 gal. loss in 24 hr. for this particular installation. Results of the test showed an actual loss of only 21 gal., or less than 3 gal. per in. of diameter per mile, in the 24-hour period, or about 6 per cent of the allowable leakage.

This installation further demonstrates the superiority of lead calked joints. Despite the great stress on the pipe line, the flexibility and water-tight qualities of the lead joints produced exceedingly satisfactory results. With such a record under trying conditions, the merit of using lead calking for joints in cast-iron pipe under ordinary conditions is obvious. The Seal of Approval on calking lead assures high quality.

Leon Small, water engineer, Baltimore Bureau of Water Supply, was in charge of this installation. J. M. Kinneer is assistant water engineer.



Left, piles indicate location of the main as it is pulled under water

Right, testing equipment used to determine how great a pulling force could be used with lead joints



PHOTOS COURTESY
BALTIMORE BUREAU OF
WATER SUPPLY,
ENGINEERING DIVISION

Lead Shower Pans Provide Dependable Waterproofing

DURING the summer vacation, Princeton University's undergraduate Cottage Club has undergone extensive renovation and the plumbing has come in for a major share of this work. Lead pans have been placed under the stall shower floors. One battery of three showers is on the second floor over an expensive ornamental ceiling. Such costly decoration must have the positive protection against leakage best provided by properly installed lead pans. Lead weighing 6 lb. per sq. ft. was used.

Usually even a battery of showers can be lined with a single sheet of lead without seams, as was the case at Princeton, because lead can be obtained in large sheets. A suggested specification for lead shower pans follows:

Specification for Lead Shower Pan

Shower stall (room) floors shall be completely lined with a 4 lb. (6 lb., 8 lb.) sheet lead pan turned at least 6 in. up to walls all around. (Strips of lead 5 ft. high and lapping inside the upstand of the floor pan 4 in. shall be provided at each corner extending 3 in. on each side of the corner.) Corners of pans shall be folded tight against



ORREN JACK TURNER

Cottage Club, Princeton University, in which lead shower pans figured heavily in remodeling work

the upstands and soldered. Tops of upstands shall be set back $\frac{1}{4}$ in. into notches in studs. (Tops of upstands shall be dressed tightly against masonry walls.) In rooms too large to be covered by a single sheet of lead, seams joining sheets shall be lapped at least $\frac{1}{2}$ in. in direction of flow and soldered, with solder sweated between the sheets to the depth of the overlap. Concrete under pans shall be brought

to a smooth finish with a mixture of cement and sand, and the lead well coated on both sides with a good grade of asphaltum. (Wood floors under pans shall be firm and even with nail heads set, and made of well-seasoned $\frac{7}{8}$ in. boards covered with asphalt-impregnated building paper weighing at least 15 lb. per square. Inside of pans on wood floors shall be well coated with a good grade of asphaltum.) A cement and sand mixture shall be used inside pans as foundation for tile. Pans shall be graded to the floor drain to which they shall be securely soldered (clamped). The trap flange shall be countersunk and weep holes provided in the drain just above the lead. The trap shall be plugged and pan filled with water as a test before installing tile. If pans are left open without immediately installing tile they shall be protected by heavy building paper until tiled over.

When shower walls are marble, as in the Cottage Club, they are set inside the pan, and where the upstand is thus left exposed it is covered by a marble base-board. Eldredge Snyder of New York was the architect for this remodeling and Schelling, Busch and Snyder, also of New York, were the general contractors. The plumbing contractor was Elling Bros. of Somerville, N. J.



Lead shower pan, coated both sides with asphaltum, in Cottage Club. Marble partitions have been installed, lapping inside the pan upstands which will be covered with marble baseboards and a double stile, capped

ORREN JACK TURNER

Dignified Signature Plates for Architects



Lead signature plate on a residence in Greenwich, Conn.
DAYTON SNYDER

AN interesting and deserving application of lead, recently developed, is its use for architects' name plates. Unquestionably, architecture is one of the most important of all arts. Yet, unlike painters, sculptors and other artists, few architects sign their

work, leaving a permanent record of their accomplishments.

Lead name plates, as designed by Kenneth Lynch and Son, Inc., Long Island City, N. Y., are cast in a standard 2 x 8 in. size, with the architect's name and the date of construction in

lettering designed in accordance with the architect's preference. Special sizes, borders and other features may also be obtained.

The name plates are so designed that they may be used in conjunction with all building materials and the attractive color of lead is one which harmonizes with any type of construction. A further advantage lies in the fact that rain-water does not dissolve out the lead and produce unsightly stains on the adjacent materials. Furthermore, the appearance of the lead name plate improves with age.

Thus, lead, with its centuries of tradition in architecture, now provides a means for dignified and unobtrusive identification of today's architecture in years to come when the present period is being studied and photographed.

White Lead Aids in Low Cost Development Building

IN Sycamore Estates, a new low-price development at Livingston, N. J., all exterior painting has been done with pure white lead and oil. These houses, ranging in price from \$4,500 to \$5,000, have all been bought by satisfied customers, the crucial test of development building.

Low-priced homes are being erected all over the country today, and the competition in this field of endeavor is necessarily keen. In this respect, each additional selling point is another step towards success in building enterprises.

However, "eighty per cent of impressions we remember register on our minds through the eyes" and it is the painted exterior of the Cape Cod, Dutch Colonial, or other style homes which first attracts the prospective buyer. An attractive paint job is very similar to a well-designed package and increases the saleability of the home. This point is well brought out in the Sycamore Estates' houses. These small homes are cheerful and attractive in their exterior paint treatment, white being used for the bodies augmented by shutters, flower boxes, trim and

sash of varied decorative colors. Furthermore, through painted wood construction, the home owner is offered the possibility of changing the decorative styling of his home and renewing its freshness in the future easily and economically.

White lead may be used as a selling point just as non-corrosive sheet metal work, plumbing or other parts of a home, particularly since white lead is most widely recognized by the public as a high quality paint material. It offers the owner a home free from

paint failures and early repainting. White lead similarly protects the builder, for, sometimes, in the case of large developments, the early failure of cheap paint on the homes first built has been a great handicap in selling the houses built at a later date.

It is truly practical to use pure white lead and oil, not only for the selling points obtained and the protection given the builder, but also because the economy of the paint, the high coverage, and ease of application combine to lower the cost of the finished job.

General view of some of the homes at Sycamore Estates, where pure white lead and oil was used for painting



Western Home Shows Originality in Varied Lead Work



Left, general view of the Alameda, Cal., home which features many interesting applications of lead work



Right, porch deck on rear of Alameda house, showing lead lantern and part of lead leader

THE attractive Alameda, Cal., home shown in the accompanying photographs demonstrates some of the many applications of lead work that provide a wealth of charm and simple beauty for houses in every price range and style throughout the country. In this home, designed by Paul V. Tuttle, of Oakland, Cal., lead is featured in the flashing, gutters, leaders, leaderheads, came window, and also in lead lanterns and ornamental wall brackets for flower pots.

Lead Industries' Seal of Approval lead pipe forms the leaders. The gutters and leaderheads are made from sheet lead, hand-wrought to a simple but attractive design, with joints in the leaderheads made by lead burning. This method of joining lead, widely used in the chemical industries for it provides a truly homogeneous bond,



View of the front entry with lead gutters, leader and leaderhead, and ornamental lead lanterns

is interesting from an ornamental standpoint also. The finished joint forms a molding similar in design to the rope motif on the edge of the gutters.

The lanterns, fashioned by hand from hard sheet lead, provide a small but very decorative addition to the ornamentation of this home. Their silver-gray patina blends admirably with the stuccoed walls, and, with the gutters and leaders, provide an attractive contrast with the tile roof. Color styling is a feature of modern building that has acquired nation-wide attention. The color of lead, admired through centuries, blends with any type of construction or color scheme and it should be remembered that lead work does not stain adjacent paint, masonry, or other building materials. Such staining disfigures otherwise ar-



Left, a close-up of the stained glass window constructed by Stagnaro Art Glass Works, Oakland, Cal.

Right, rear terrace showing lead flower-pot brackets, lantern and other ornamental lead work



PHOTOS BY
MURPHY STUDIO

tistic homes and should be avoided.

Whether in low, moderate, or high-priced houses lead, with a combination of desirable qualities, offers architects and builders a practical solution to the problem of designing homes which must fall within a definite price range and yet must be distinctive.

By using ornamental lead work a decorative touch may be added to the appearance of a house that is certain to please the owner and is also an advantage in selling speculative homes. Furthermore, since many of the parts so treated are essential features of a well-constructed house, the added

charm of fine lead work is a real economy.

The lead gutters, leaders and leader-heads were installed by W. F. McNamara, of San Francisco, who also made the lead lanterns. The general contractor for this home was Charles W. Falk of Oakland.

Eastern Residence Displays Fine Architectural Lead Work

ALTHOUGH building on the Pacific coast, as exemplified by the home in the preceding article, may be quite different than in the east, due to variations in climatic and other conditions, lead work fulfills its practical and ornamental purposes with equal serviceability and attractiveness.

Shown in the accompanying illustrations is a Georgian residence at Purchase, N. Y., at the opposite end of the country from the house in Alameda, Cal., and of equally different design, which demonstrates the adaptability of lead very clearly. This home, built in 1928, includes in its applications of architectural lead work parapet wall flashing and ridge roll flashing, lead roofs on the dormer windows and over the expansive bays, ornamental lead urns and leaderheads, lead chimney caps and other parts of the building.

Leigh French, Jr., of New York, the architect for this home has used lead work in many of the buildings he has designed and has achieved excellent results with this metal for flashings and ornamental work. Lead chimney caps which are now attracting the attention of architects throughout the country, have been employed by Mr. French for a number of years and have been found to be thoroughly serviceable.

The gray band of lead formed by the chimney cap provides an attractive crown for any type chimney and by completely waterproofing the top prevents moisture from seeping into the joints where, upon freezing, it may cause cracking and crumbling of the mortar and deterioration of the chimney itself. Details of lead chimney cap installations were given in the May and July, 1938, issues of LEAD.

Besides the attractiveness given modern dwellings by the use of lead work, sheet lead embodies many other advantages, both for the architect and the home owner. The use of sheet lead for flashings means durable, completely watertight joints which will not result in complaints to plague the architect or in stained walls and ceilings causing annoyance and expense to the home owner. There is no danger of staining from lead work to cause ugly disfiguration of adjacent building materials, and the neutral gray color is pleasing with any construction materials. Furthermore, since sheet lead is comparable in price to other sheet metals used for similar purposes, these advantages may be realized very economically.

For your assistance the Lead Industries Association will be glad to help you prepare specifications and details for your lead installations.



General view of the Purchase, N. Y., residence where sheet lead was used extensively for flashing and ornamental work



View showing lead-covered bays, lead urns and lead-roofed dormers and chimney caps

Lead Riveting for Fastening Chemical Tank Linings

A NEW method has been developed by the Texas Company, whereby lead linings are riveted to the steel shells of vessels used in conjunction with oil refining. This new method is claimed to support the load uniformly over the entire surface and reduce the possibility of damage due to undue and uneven stress.

Lead, due to its high resistance to corrosion by many common chemicals, is a metal of great importance in a large number of our greatest industries. This is especially true in the petroleum industry where sulphuric acid, a highly corrosive chemical under certain conditions, is widely used in treating processes. In the oil refinery chemical sheet lead is employed to protect the steel shell and roof of vessels such as agitators, mixers, and separators from the deleterious action of this acid.

The method of fastening the lead to the steel walls and roof is an important factor. A practice widely used in the past has been to use vertical battens spaced about four feet apart. These battens are half oval steel bars which clamp the lead to the steel plate by means of countersunk plow bolts. A strip of lead is then laid over the batten and burned to the lining proper.

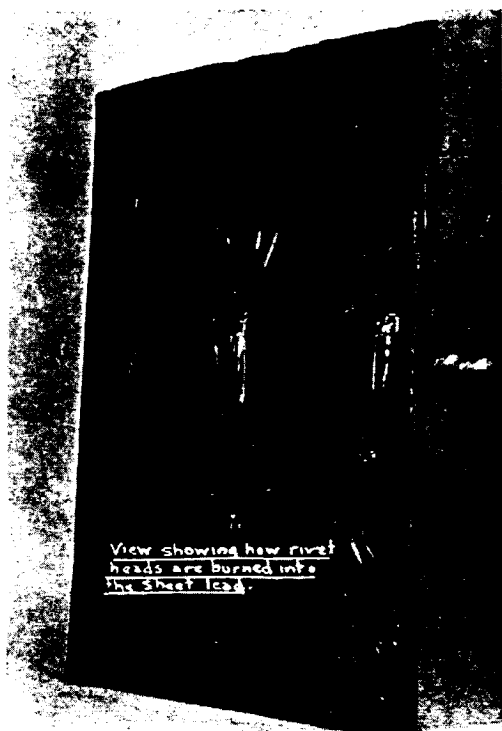
The new method utilizes lead rivets of the same composition as the lining. The spacing between rivets varies from 5 to 8 in., so that each rivet need carry only a small fraction of the entire load. The rivet size depends upon two factors, the thickness of the steel plate and the weight of lead used.

In lining vessels in this manner the head of the rivet may be formed on either the lead or the steel side, although the latter is better practice, allowing a more thorough job and elimi-

nating the danger of the rivet die cutting through the lead lining. During the driving of the rivet, the sheet lead is drawn up against the steel as in riveting two pieces of steel. The rivet head on the lead side is then scraped and burned into the sheet lead lining, thus maintaining a homogeneous sheet and eliminating leakage around the rivets.

Although the relative cost of this method has not been definitely established, it is estimated that it is more economical than the former system. Rivets allow faster fabrication and reduce the amount of lead "burning" required. Also, in new installations, the rivet holes may be punched in the fabricating shop, a further reduction in labor time and costs.

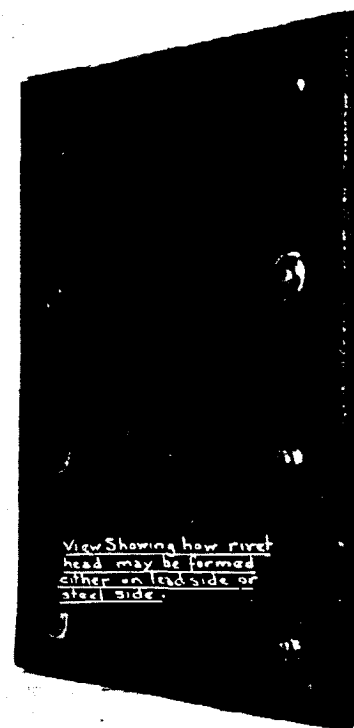
We are grateful to the Texas Company for information and photographs concerning this use of lead.



View showing how rivet heads are burned into the sheet lead.

Two views showing how the lead rivets are formed and "burned" on either side of the lining

PHOTOS
COURTESY THE
TEXAS COMPANY



View showing how rivet head may be formed either on lead side or steel side.

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