



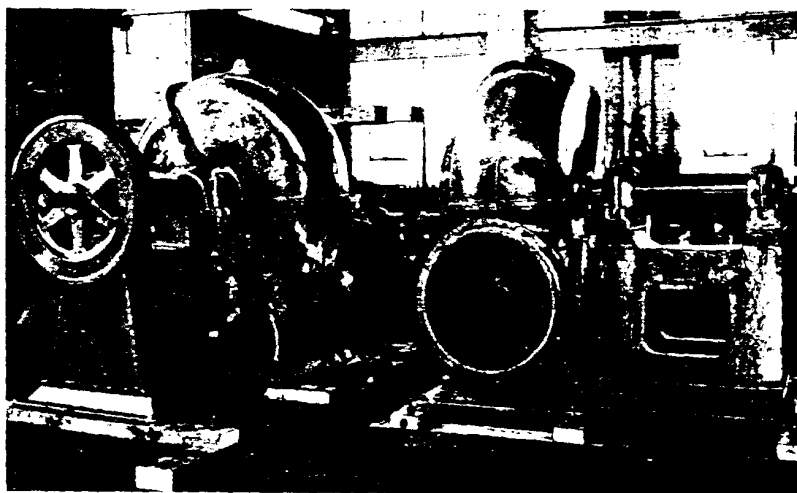
Solid Lead Housing For Fans Moving Corrosive Vapors

FINE examples of two fabrication processes to which lead is adaptable are shown in the accompanying photograph of two large blower fans. These fans, of a type used in the chemical industries for moving corrosive gases, are now in use in a Mid-

western chemical plant for handling sulphuric acid vapor. Since lead is highly resistant to corrosion by sulphuric acid, the parts which are in contact with the vapor are made of or covered with lead.

The fan housings are castings made

Large fans with cast lead housings and lead covered impellers for use in handling highly corrosive gases and vapors.



U. S. PIPE AND FOUNDRY CO.

of lead alloyed with about 5 per cent of antimony which greatly increases the strength and stiffness of the metal. Casting was done in dry sand molds, using a special sand adapted to the high density of lead. Flanged cast lead rings are bolted to the inlet and delivery openings and are intended to be welded or "burned" to the sheet lead flues or ducts which convey the gases.

The impellers are fabricated of steel plates welded to the shaft. The steel is covered with $\frac{1}{4}$ in. of lead homogeneously bonded; that is, the lead is actually fused to the steel structure. The homogeneous bonding process is also used for applying lead linings to steel vessels for chemical processes operating under vacuum or at high temperatures.

Fans of this type are still in operation in sulphuric acid plants after more than 25 years of continuous service. The solid lead housing and lead covered impellers present the greatest possible practical resistance to the corrosive action of the acid vapors. The accompanying photographs, however, are of new fans and were taken in the shop of the United States Pipe and Foundry Co. of Burlington, New Jersey, where they were manufactured.

Lead-Walled Gay-Lussac Tower Part of Sulphuric Acid Manufacturing Plant

The final unit through which the gasses produced by burning sulphur pass in a plant manufacturing sulphuric acid is known as a Gay-Lussac Tower. This tower operates to conserve nitrogen trioxide gas and return it, dissolved in concentrated acid, to the Glover tower where it combines with water and burner gas to produce more concentrated acid. Both of these towers, as well as the condensing chambers through which the fumes pass on their way from one tower to the other, are constructed of lead.

Large amounts of sulphuric acid are used in the manufacture of fertilizer and it is common practice for fertilizer manufacturers to operate

sulphuric acid plants. Part of the plant of one such installation is pictured in the accompanying photographs which show construction work on a new Gay-Lussac tower for the Acme Fertilizer Co. of Wilmington, Delaware.

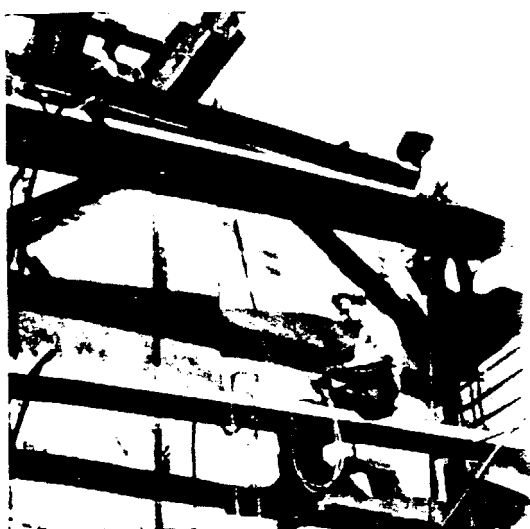
The new tower is supported by a steel structure which replaces an old one built of wood. It is 11 ft. square and 43 ft. high and is topped by a 24 in. cylindrical lead vent stack which extends 26 ft. higher. The bottom and lower 15 in. of the walls are of 24-lb. sheet lead and the remainder of the walls are of 15-lb. lead. The vent stack is of 10-lb. lead.

The pictures show how the sheets

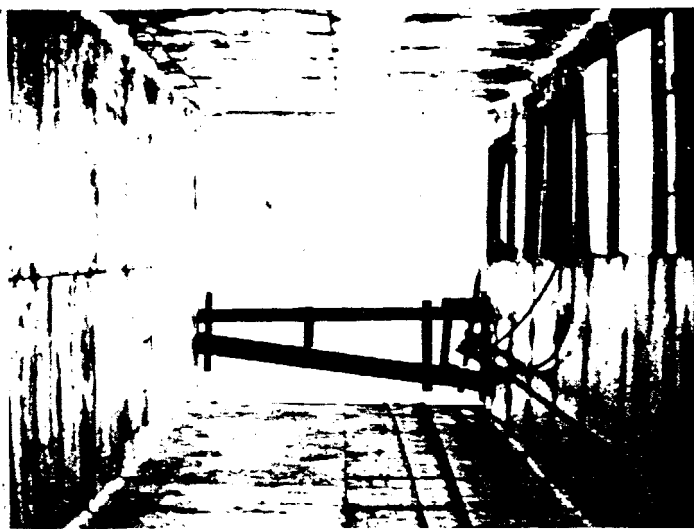
of lead are hoisted to the top of the framework as they are unrolled. Lead straps are welded to the sheet at the levels of the steel structural members to which they are bolted for support of the walls. The sheets are lapped

Acid nozzles used in the Gay-Lussac Tower are fine examples of the lead burner's art.





Workmen attaching lead straps for securing sheet lead to the steel frame.



Looking up through the tower just before the last sheet of lining was placed.

and joints are welded after all the lead is in place.

After the leadwork is completed the tower will be lined with acid resistant brick and filled with a ceramic packing material over which the acid

trickles to expose a maximum of liquid surface to the gas from the chambers. The top or roof of the tower is also of sheet lead supported on steel crosspieces and all connecting ducts and acid nozzles are of lead.

The nozzles, four of which are shown on page two, are provided with bell-shaped lead caps which form a gas-tight seal when immersed in water contained between a double curb around the openings.

Exhibition Of Water Works Antiques Shows Ancient Leadwork in Perfect Condition

AN unusual and interesting exhibit was presented at the convention of the American Water Works Association in St. Louis, Missouri, during the week of May 6 to 10, 1946. The water department of that city displayed a collection of water works antiques which ranged from an ancient electric pump motor to examples of long buried pipes, fittings, valves and services.

Some of the articles exhibited were loaned by the Mueller Co. of Decatur, Ill., and among these were several examples which illustrated the durability of lead pipe, both underground and in plumbing installations. Three of the pieces were from the home of Gen. Mariano Guadalupe Vallejo in Sonora, California, built about 1840. One of these was a section of lead water main with a service tap consisting of a brass stop cock wiped to the main and to the service pipe. An-

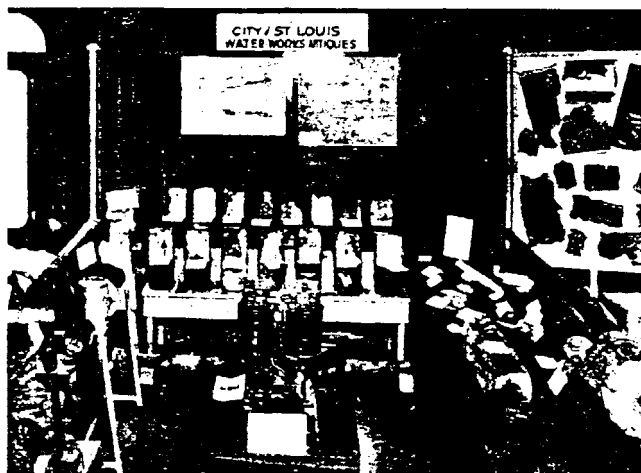
other was a piece of lead water supply pipe with what appears to be a bath cock or sink faucet wiped to it. The third is a lead lavatory waste. All three of these examples of lead work are in perfect condition except

for the unavoidable scars and dents acquired in their removal and subsequent handling. They were in use for 85 years and were removed when the estate was converted to a park.

Other lead articles included a lead water service gooseneck with 55 years of service to its credit and several old drive ferrules with brass to lead wiped joints still in perfect condition.

This exhibit of water works an-

Exhibit of water works antiques presented by the St. Louis Water Department at the AWWA conventions.





Ancient lead work exhibited by St. Louis Water Department. upper left, a 55 year old service gooseneck, next below, a sink waste 85 years old, right center and next right, indoor and underground lead work in use for 85 years. Other examples show wiped joints and brasswork of antique patterns.

EUGENE TAYLOR

tiques showed ancient things which have been abandoned such as wood water mains. It also showed ancient lead work which is almost identical

with work being done today. It indicates that water works men who are always willing to accept something new if it is better than their present

equipment, continue to use lead for water services and goosenecks because of its unquestioned record for endurance and economical maintenance.

Wood Tanks For Acid Pickling Solution Have Steel Tie Rods Encased in Lead Pipe

SHOWN herewith is an interesting type of pickling tank of wood construction in which lead is used to preserve the strength of the rods. Some pickling solutions which are highly corrosive to iron and steel can be successfully handled in wood tanks but wood tanks must be tightly bound with steel ties. The immersion and withdrawal of the pickled articles causes considerable splashing and spilling of the solution which will quickly destroy the ties unless they are protected. In this case the necessary protection is provided by encasing the tie rods in lead pipe which is highly resistant to corrosion by the pickling solution.

This tank, though rectangular in plan, has curved sides so that the tie rods can be made to exert great pressure on the wood staves without causing the walls to buckle. Thus in effect a tank of rectangular shape which is better adapted to the shape of the

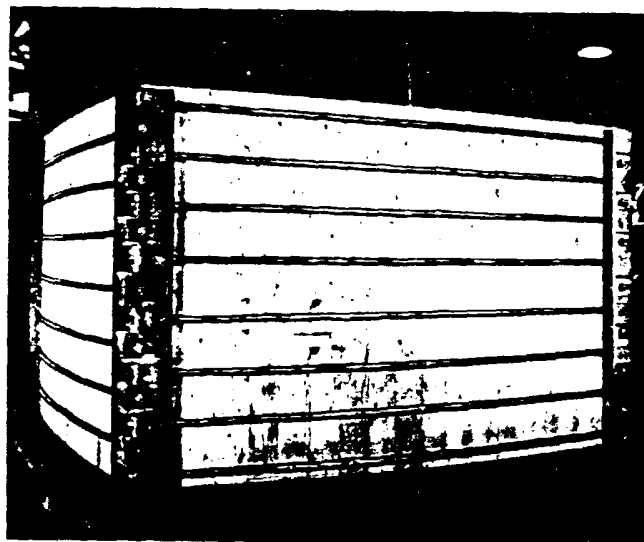
work it is to handle, can be constructed on the same principle as a cylindrical tank.

The heavy corner pieces are steel castings which, since they are farthest

removed from the splash and drip of the pickling solution are left exposed. The tie rods in their jackets of lead pipe will retain their strength and can be expected to last the life of the wooden staves.

The tank shown was manufactured by the Hauser-Stander Tank Co. of Cincinnati, Ohio, for a fabricator of steel specialties.

A large wood tank with tie rods encased in lead pipe as protection against acid pickling solution.



HAUSER STANDER TANK CO

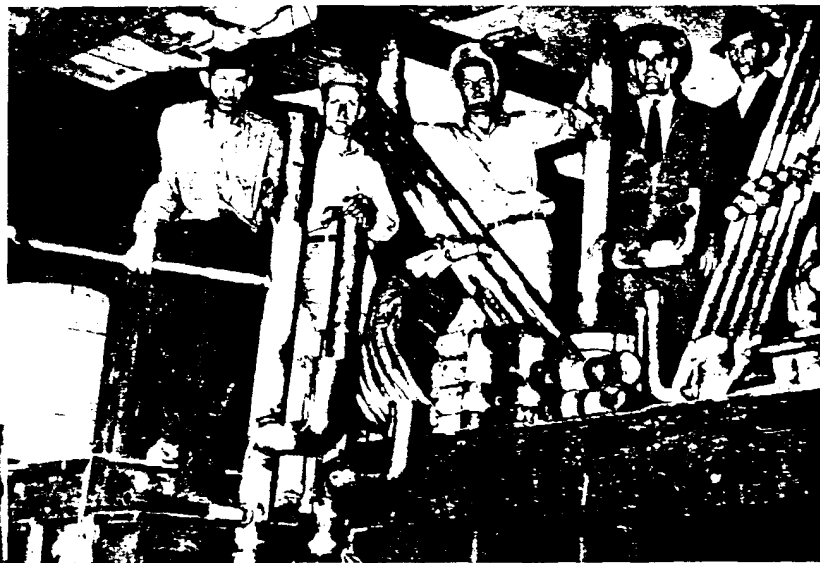
Large Scale Housing Project Uses All-Lead Unit Plumbing Installation

THE oft repeated criticism of the building industry, that it is reluctant to take advantage of modern methods of mass production, is being refuted by the plumbing trade in many instances. Numerous examples of the use of shop fabricated roughing in units are at present appearing in widely separated parts of the country. This practice, which makes use of lead for the major portion of the roughing in, not only speeds construction but provides an installation better than that furnished by more conventional methods and one which meets the approval of city health authorities and inspection departments.

One of the latest projects in which unit plumbing is being used is in Waco, Texas. The present plan of the project includes 125 houses. Although

the plumbing layouts in the various houses are not all identical, the work has been planned so that a minimum number of shop fabricated units can be combined on the site to make each individual installation. Main stacks are prepared with closet bend and

bath and lavatory waste connections attached and with calking ferrule in place for securing to cast iron groundwork. Also sink outlets are wiped to vertical wastes and vents so that there is a minimum of joints to be made on the job. The lead stacks are continued through the roof and support is provided by wiped flanges resting on headers located at points where vertical stacks are joined. Ingenious use was made of the heavy pasteboard



Shop fabricated standardized units of plumbing rough work ready for speedy assembly in buildings of a 125-unit housing project.

Field work of assembling units in place takes little more time than laying out work for a conventional installation.

tubes in which larger sizes of lead pipe is shipped. Where possible these tubes were left on the pipe to serve as protection until construction is completed.

The Lane Plumbing Co. of Waco, plumbing contractor for this project, found that all lead unit plumbing is speedy and economical. The plumbers like it because they are able to work comfortably in the shop where weather conditions do not create handicaps. The other tradesmen like it because it allows the plumbers to complete their work in the shortest possible time and thus with the least interference with structural work.

Lead plumbing is universally acceptable to city health and inspection departments. Thus lead Unit Plumbing provides a sound workable basis for the introduction of prefabrication into what has been heretofore the most difficult subassembly.



Lead Calked Cast Iron Water Main Moved Under Pressure With No Leaks

THE lead calked joint used in connecting sections of cast iron pipe is not only one of the oldest joining methods; it is still one of the most efficient types of joint for cast iron pressure pipe. In addition to its simplicity and economy the lead calked joint possesses the characteristic of being easily restorable to its original tightness and effectiveness should it be disturbed or moved once it is in place. Indeed it will endure movement to a surprising degree without requiring any restoration.

Examples of such movement are commonly found where it has been necessary to move or lower cast iron water mains to make way for grading incident to changes in streets and roads or buildings. Such changes are often made while mains are in service under pressure without causing leaks or breaks of any kind.

A recent case where such movement was accomplished occurred in Denver, Colorado, where a 55-year-old water main four blocks long was lowered 3 feet and moved horizontally two feet without a single leak.

This operation, which was necessitated by a change in street grade, was accomplished by digging a ditch to the new low level alongside the main and clearing away the earth under the pipe except for bulkheads at intervals of 24 feet. The earth bulkheads were then cut away a few inches at a time, lowering the pipe gradually to its new position.

Because of the inherent flexibility of the lead calked joints in this line the movement was accomplished without a single leak although pressure and service to consumers was maintained. However, as a precaution against possible development of leaks all joints were recalked before the ditch was backfilled.

Had there been any leaks the simple procedure of recalking would have stopped them. This means of restoring joints to their original pressure-tight condition is not available if

water mains have been laid with hard brittle jointing materials which will not yield without breaking and cannot be recalked. The slight increase

in initial cost of the main when lead is used buys many years of economical maintenance.

Spectacular operations like moving a long main under pressure without leaks are, of course, the exception, but long trouble-free service is the rule for lead calked cast iron water mains.

Twelve-inch lead calked cast iron water main in Denver, Colorado, after being lowered 3 ft. and moved horizontally 2 ft. under pressure, lies in a perfectly dry ditch indicating total absence of leaks.



A joint in the 55-year old main after recalking and ready for backfill is exactly as good as it was when first installed.



A Portfolio of American Landmarks

No. 37

Westport, Connecticut, On The Boston Post Road

WESTPORT, Connecticut, one of the charming villages on the Boston Post Road, like all other American communities bears many of the marks of modern times. The road has become U. S. Highway No. 1. Chain stores and filling stations cater to the needs of resident and traveler, but these changes have not, by any means, destroyed the quiet village atmosphere which surrounds the lovely old houses which, by their owners' intelligent maintenance, have been preserved for the use and enjoyment



The Marvin House, circa 1812, stately and imposing, is now a busy office. Present owners continue the use of pure white lead paint which helped to preserve the sturdy structure.

of the present generation.

Two of these houses, the Jessup House and one at present the property of the Christian Science Society, face each other across the busy highway and for all their age occupy important places in the daily life of the com-

munity. Another has become the office of a busy manufacturing concern, with a factory nearby.

These three houses, like so many other old New England homes are, at present, as they were in the past, painted with pure white lead paint.

Jessup House, built in 1807, is unusual in plan and decoration. However, like so many others it is protected by pure white lead paint.

This house, built at the same time and by the same builder as the Jessup House, is now used as a place of worship. It also is painted with pure white lead paint.



PHOTOS BY DAYTON SNYDER

THIS IS NO. 37 OF A SERIES REPRESENTATIVE OF THE MANY AMERICAN LANDMARKS IN VARIOUS SECTIONS OF THE COUNTRY THAT ARE PRESERVED FOR THE FUTURE WITH PURE WHITE LEAD AND OIL PAINT. MANY OF THEM HAVE ALWAYS BEEN PROTECTED WITH THIS RELIABLE MATERIAL ACCORDING TO AVAILABLE RECORDS.

Lead Roofing And Flashing on Cupola Ensure Permanence And Freedom From Stain

THE use of sheet lead roofing and flashing on the cupola shown in the accompanying photograph provides the perfect solution for two problems peculiar to details of this type. The first one, of course, is to provide for a permanent watertight covering for the tower and for the deck at the level of the corner urns. The second one is to protect the white painted surfaces from staining as the result of corrosion of the roofing material.

The corrosion resistance of lead plus the fact that sheet lead used for roofing is much thicker than any other roofing sheet metal ensures that the seldom visited topmost part of the building will not develop undetected leaks to encourage deterioration of the structure. The workability of lead which allows it to be easily formed to unusual shapes also simplifies the installation.

The nonstaining characteristics of lead are due partly to the fact that

corrosion of lead is extremely slow and partly to the fact that, in normal atmosphere, the products of that very slight corrosion are white and cannot stain. This beautifully white cupola can be expected to remain white except for the normal accumulation of dust and dirt.

The lead work on this tower was done by Mr. Robert H. Watson, a plumbing and sheet metal contractor of Elkhart, Indiana, who learned his



The following articles and reprints contain information, drawings and specifications on the use of lead products helpful to architects, engineers and others in the construction industry. They are available, free of charge, upon request to the Lead Industries Association, 420 Lexington Avenue, New York 17, N. Y.

PROPERTY PROTECTION WITH WHITE LEAD PAINT

A 28 page booklet on the protective value, durability and beauty of pure white lead paint with quantity estimating tables, formulas and mixing and tinting instructions for exterior and interior use.

RED LEAD FOR STRUCTURAL WORK

By Dr. L. L. Carrick, Director, Red Lead Research, Lead Industries Association.

A discussion of the rust inhibitive qualities of red lead paint and the best means of making use of those qualities for the protection of structural metal. Reprinted from *Engineering News Record*, April 6, 1943.

LEAD CARRIES ITS WEIGHT

By Fred P. Peters

An interesting resume of many of the long established uses of lead plus information on a number of recently developed adaptations of the properties of lead to special purposes. Reprinted from *Scientific American*, June, 1944.

SOME PAINTING PROBLEMS AND THE ANSWERS

By Dr. F. L. Browne, Senior Chemist, Forests Products Laboratory, Madison, Wis.

Reprinted from the *National Real Estate Journal*, Sept., 1939.

NEW LEAD COATING PROCESS ELIMINATES USE OF ZINC ALLOYS

By W. Yonkman, Engineer, Western Electric Co.

A description of a successful hot dip lead coating process with complete instructions for changing over from hot dip galvanizing using the same equipment. Reprinted from *Product Engineering*, May, 1944.

LEAD COATINGS ON STEEL

By Harold A. Knight, News Editor, Metals and Alloys

A thorough discussion of hot dip and electroplated coatings on steel sheet, wire and fabricated products including the technique of application, thickness of coatings, uses and advantages. Reprinted from the November, 1944 issue of *Metals and Alloys*.

COMMERCIAL STANDARDS:

Calking Lead, CS94-41
Lead Pipe, CS-95-41
Lead Traps and Bends, CS96-41

Official publications by the Government Printing Office of the above Commercial Standards as promulgated by the U. S. Department of Commerce through the National Bureau of Standards, effective June 25, 1941.

FEDERAL SPECIFICATION WW-P-325

For Pipe, Bends and Traps, LEAD

Part 5 of Section IV of the Federal Standards Stock Catalog, official publication by the Government Printing Office.

STAMFORD'S DOUBLE LIFETIME HOME

A complete analysis of hard lead flashing, white lead paint, lead plumbing, plywood and red cedar. Certified shingle details and installation methods. Reprinted from *American Builder*, July, 1939.

LEAD X-RAY SHIELDING

Graphic chart based on recommendations of the International Commission on X-Ray and Radium Protection giving thicknesses of lead for respective voltages in millimeters, inches and pounds per square foot.

MATERIALS AND METHODS OF X-RAY PROTECTION

By George Singer, Acting Chief Radiation Section, National Bureau of Standards, Washington, D. C., and George C. Lawrence, Ph.D., National Research Council of Canada

A discussion of the materials suitable for use in shielding X-ray installations giving methods of and graphs for computing required thickness of barriers, based on tube current and distance as well as tube voltage. Reprinted from *Industrial Radiography* Vol. IV, No. 2, Fall, 1945.

LEAD, A METAL OF MANY USES IN THE THEATRE

By J. Leland Benson

A discussion of the many ways, both utilitarian and decorative, in which lead is or can be used in the theatre. Reprinted from *Theatre Catalog 1945 Edition*.



Sheet lead roofing and flashing will not only keep this structure dry but make sure that the brilliant whiteness of the woodwork will not be marred by unsightly stains.

trade in England. The chimney flashings on this building are also of sheet lead stepped at each brick course and cut back at an angle in the English manner.

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