LEAD

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HIGHLIGHTS

- Housing authority official tells why lead and soil makes a better plumbing installation.
- The Lead Industries Association Standard for Lead Traps and Bends is now revised and simplified.
- Two churches—one always painted with white lead with excellent results—the other changed from white lead, met with trouble, and is now relying again on white lead only.
- A large drug store solves its waterproofing problem for a soda fountain with an economical sheet lead installation.
- Three charming old New England homes of historic Portsmouth, N. H., are portrayed in this month's Portfolio of American Landmarks.
- Prominent aircraft manufacturer devises new melting pot for zinc using molten lead to assure uniform heat transfer.

One of the northwest's outstanding housing projects, the Silver Bow project in Butte, Montana, uses all lead waste to the vent connections, lead bends, drum traps, lead roof flashing and service pipe goosenecks. Approximately 40,000 lb. of lead products are used in the plumbing for the Silver Bow project. Walter Arnold is the architect; Lovering Construction Co., general contractor and George A. Green Plumbing & Heating Co., plumbing contractor

New SIMPLIFIED STANDARD for Lead Traps and Bends

- **Establishes one uniform wall thickness of 1/8 in. for all sizes and shapes of lead fittings.**
- **Eliminates obsolete and little-used fittings.**
- **Simplifies dimensions.**
- **Greatly reduces the number of items in the standard list.**
- **Maintains the same close control of metal purity, wall thickness, concentricity and weight previously in effect in the Lead Industries Association Standard.**

EFFECTIVE JANUARY 1, 1941

HIGHEST quality installations serving well and economically for many years are expected of lead in plumbing. Lead Industries Association standards were originally adopted to assure dependable materials to fully realize this expectation. The new standard for lead fittings strengthens this assurance of quality and dependability.

It reduces the number of items stocked and sold, simplifying purchase and sale, and reducing handling cost. Specifying and selecting the right fitting for a job is made easier. Uniform wall thickness assures fittings of proper weight insuring lead's lasting, trouble-free service. Home owner, architect, jobber and plumber can all benefit by using the new standard list and by specifying and purchasing only lead fittings bearing the Seal of Approval, indicating they meet the new association standard.

WALL THICKNESS OF ALL TRAPS AND BENDS IS 0.125 IN.
MINIMUM TRAP SEAL IS 2 IN.

NOTES

Inlet dimensions listed first in all cases.

Traps and bends meeting this standard in all other respects, but having greater nominal wall thickness than 1/8 in., are considered as meeting the standard and may be stamped with the Lead Industries' Seal of Approval if they are clearly stamped with their wall thickness or weight per running foot.

Traps and bends meeting this standard in all other respects, but having dimensions different from those listed, are considered as meeting the standard and may be stamped with the Lead Industries' Seal of Approval if they are clearly stamped with their inlet and outlet dimensions.

S-traps are included in this standard to assure their quality when used, but their inclusion is not to be considered as an endorsement of this patten of trap.

1/2 S or P TRAPS

SHORT				LONG			
Inside Diameter In.	Dimensions In.	Total Weight Lb.	Oz.	Inside Diameter In.	Dimensions In.	Total Weight Lb.	Oz.
1 1/4	4 1/2 x 7	4	0	1 1/4	4 1/2 x 14	5	9
1 1/2	4 1/2 x 7	4	15	1 1/2	4 1/2 x 14	6	12
2	4 1/2 x 8	7	2	2.	4 1/2 x 14	9	3

FULL S TRAPS

1 1/4	4 1/2 x 7	4	9	1 1/4	4 1/2 x 19 1/2	7	6
1 1/2	4 1/2 x 7	5	10	1 1/2	4 1/2 x 19 1/2	8	14
2	4 1/2 x 8	8	5	2	4 1/2 x 19 1/2	12	4

DRUM TRAPS

Inside Diameter In.	Inside Depth In.
4	8
4	9
4	10

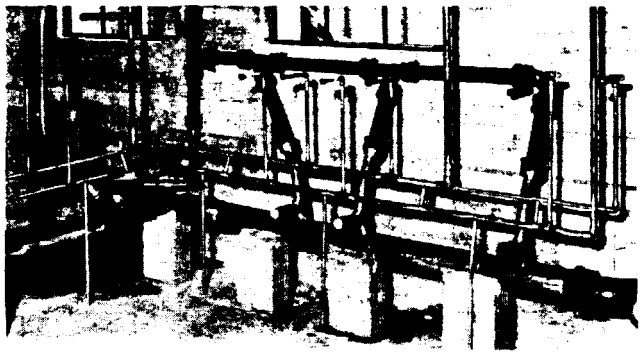
BENDS

Inside Diameter 1 1/2 in.

Dimensions In.	Total Weight Lb.	Oz.
4 x 7	2	12
4 x 12	4	1
4 x 15	4	13
4 x 18	5	10
4 x 20	6	2
7 x 7	3	8
7 x 12	4	13
7 x 15	5	10
7 x 18	6	6
7 x 20	6	15
3 in.		
5 1/2 x 10	7	3
5 1/2 x 12	8	3
5 1/2 x 15	9	12
5 1/2 x 18	11	4
5 1/2 x 20	12	4
10 x 10	9	8
10 x 12	10	8
10 x 15	12	0
10 x 18	13	8
10 x 20	14	8
4 in.		
5 1/2 x 10	9	5
5 1/2 x 12	10	10
5 1/2 x 15	12	10
5 1/2 x 18	14	10
5 1/2 x 20	16	0
10 x 10	12	5
10 x 12	13	10
10 x 15	15	10
10 x 18	17	10
10 x 20	18	15

Lead Soil Pipe Solves Problem of Cramped Space in Baylor University Dormitory

PLUMBING in a recently erected girls' dormitory at Baylor University, Waco, Texas, shows strikingly how lead helps to solve plumbing installation problems arising from cramped or too little space. In the basement of this building two laundry trays and a slop sink are installed, in addition to a complete bathroom and two extra lavatories. The bathroom has a 16-in. raised floor but the other fixtures are installed where the floor is not raised. Because of the elevation at which the cast-iron sewer enters the building there is not sufficient drop between the laundry tray and slop sink outlets and the sewer to install cast iron with proper pitch for drainage. The necessary cast-iron fittings would have taken up too much space.



Rough plumbing in basement of new dormitory at Baylor University, showing how 4-in. lead soil pipe was used to get proper pitch

GILDERSLEEVE

To solve this problem, 4-in. lead pipe was run in the basement from the sewer and lead fixture connections provided to it. The vertical space required was thus reduced tremendously, permitting installation of the fixtures at the desired elevation and maintaining the required pitch in the horizontal pipe for proper drainage.

Lead fixture connections were also provided for the nearby lavatories and the water closet was connected to a lead bend.

The entire building accommodates 175 girls and has 75 bathrooms. A lead and soil system was used throughout in accordance with Waco practice. The building, consisting of four stories and basement, with kitchen and dining room, was completed in three and a half months. Birch D. Easterwood & Son were the architects, and the Hill Plumbing Co., of Waco, the plumbing contractor.

Improved Zinc Melting Pot for Martin Aircraft Company Relies on Lead

A UNIQUE melting pot, the operation of which is greatly dependent on lead, has recently been developed by the Glenn L. Martin Company, Baltimore, Md., and is reported to be the solution to a trying industrial problem—the efficient melting of zinc.

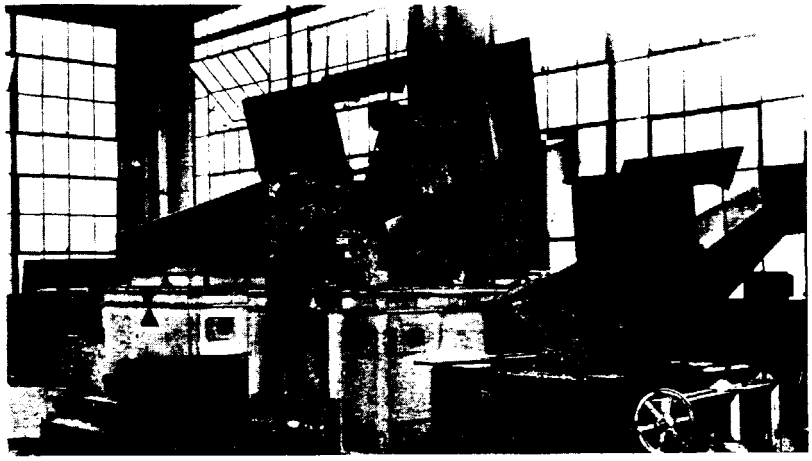
Heretofore, zinc had been melted simply by putting it in a pot and putting fire under the pot. In this system, however, heat would concentrate at certain points, the zinc alloying with the pot metal at those points, and the melted product would usually turn up with impurities from the contact. Moreover, the pots have been short-lived, eroding at the points of maximum heat, a factor of additional equipment expense. In order to produce better metal for die-making and to reduce the cost of pot replacement the Martin Company research staff developed a double-boiler type of melter. They built a large pot with a combustion chamber underneath, and covered it with refractory material. In this, lead is melted. An inner pot containing the zinc is immersed in the lead. The molten lead keeps the heat evenly distributed over the surface of the zinc pot, minimizing any tendency of the zinc to alloy with the pot.

It is reported that molten zinc of an exceptionally high degree of purity results and that the inner pot will now last indefinitely.

The new melting pot is one more example of how lead, although playing a minor role, is responsible for much progress and success in industry.

Plant view of the improved melting pot for zinc, designed by the Glenn L. Martin Co. Lead makes its operation practical.

COURTESY GLENN L. MARTIN CO.



No. 5

Historic Portsmouth, N. H., Contains Many Fine Examples of Early New England Homes

AT AN early date in American history, Portsmouth, N. H., took its place as one of New England's most important and prosperous seaports. An excellent natural harbor at the mouth of the Piscataqua River, a fertile country-side and a seemingly inexhaustible supply of timber were the contributing factors in its early development and rise to importance. From Colonial Days to the early part of the nineteenth century, this development was continuous and rapid. Clipper trade with the far east and Europe was at its height: ship owners and traders sometimes became wealthy over-night and with this new found prosperity they built mansions. Fortunately, many of these beautiful colonial homes of Portsmouth remain in excellent condition today.

It is no accident that has allowed these early colonial mansions to remain for so many years in good condition. They were framed with tremendous oak beams of a strength sometimes far exceeding the structural need. Also, the exterior refinement of architectural detail has been protected from the rigorous New England winters by pure white lead and oil paint. Because the majority of Colonial Portsmouth homes have been painted periodically with pure white lead paint for the best part of two centuries, these homes today present a beautiful fresh surface free from any paint failure. Three of these celebrated landmarks of old Portsmouth are pictured here.

THIS IS NO. 5 IN OUR REPRESENTATIVE SERIES OF AMERICAN LANDMARKS PROTECTED FOR THE FUTURE TODAY, AS MANY HAVE BEEN FOR THEIR ENTIRE LIFE, WITH PURE WHITE LEAD PAINT.

The Langley Boardman House, built about 1800. The perfect door heads, the exquisite front door with its oval panels inlayed with whale bone, and the general refinement of detail, lead authorities to believe that Langley Boardman, a cabinet maker by trade, designed his own house. The oval staircase stretching from the first to the third floor of the interior reveals a grace and symmetry of form rarely seen in modern homes. Pure white lead paint protects this excellent prototype of the Colonial town house

Governor John Langdon, first president of the United States Senate and governor of New Hampshire, built this mansion in 1784. The interior as well as the exterior illustrate the skill the early craftsmen had attained in creating the fully developed charm of the colonial mansion. This magnificent example of early American architecture retains all its original beauty with pure white lead and oil

The John Paul Jones House, built about 1759 by Captain Gregory Purcell. After the death of Captain Purcell, his widow ran a boarding house in which Captain John Paul Jones is believed to have spent the happiest years of his life while he was studying naval theory. Today the house is a public museum owned by the Portsmouth Historical Society. Pure lead paint tinted to a colonial yellow protects the 181 year old exterior of this American landmark

Housing Authority Official Tells Why Lead Plumbing is Best

A shop view at Lincoln Park Homes, Denver U. S. H. A. Housing Project. All lead frames were prepared in the shop in the modern production method of lead-working
MILE HIGH

A LETTER, written by James A. Brownlow, vice president of the Denver Housing Authority, tells clearly from a naturally informed source the benefits derived from lead in modern plumbing. It refers to Lincoln Park Homes, built under the auspices of the United States and Denver Housing Authorities, a $3,500,000 project with a plumbing and heating contract totaling $232,000.

In his letter Mr. Brownlow says. "This is a lead and soil job. The lead bears the Lead Industries' Seal of Approval. . . . I cannot speak too highly of the materials being used or the workmanship displayed on this job. Denver has been what is ordinarily known as a lead town for a great many years; however, some years ago there was a gradual replacement of lead and soil. This condition is again being overcome and architects are specifying lead and soil in most of the major construction projects in this area. This change is due to a great extent to the universal knowledge that lead properly installed is far superior to any other material which may be used, . . . to the far-sightedness of the lead manufacturers in producing a product which really meets the specifications and standards called for and which serves the purpose for which it is installed. . . . St. Anthony's Hospital, Crippled Children's School, Capitol Annex, and the Housing Project are but a few of the large construction jobs that have installed or are installing lead at this time. With this continued cooperation, you may be assured that the use of lead will continue to grow in the City of Denver and surrounding areas, and we feel that due to the fine results obtained here an example will be set for other cities to follow."

Close up of lead roughing for a double bathroom in the Denver project
MILE HIGH

There is little that could be added to this analysis of lead's part in plumbing. The amount of lead used in the project bears out the fact that the written opinions of Mr. Brownlow are put in practice and not merely theoretical. In the Lincoln Park Homes there are 357 extra-heavy lead bends, 349 extra-heavy lead drum traps, 14,110 lb. of lead waste pipe, 3,230 lb. of wiping solder, 27,200 lb. of calking lead, and 6,200 lb. of 6-lb. sheet lead for roof flashings made up by the plumbers. Temple H. Buell is the architect and W. T. Hedgecock executive director of the Denver Housing Authority. Whiteley-Palmer Co., of Logan, Utah, is plumbing contractor, with J.M. Whiteley supervising the job.

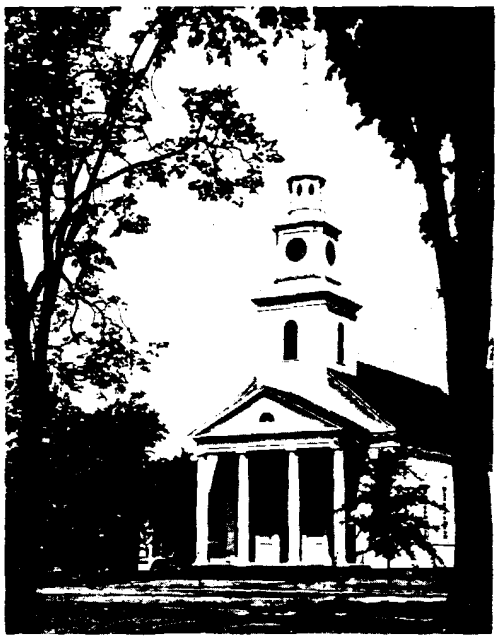
Churches - East and West - Rely on White Lead

ALTHOUGH the Lutheran St. Paulus Church of San Francisco, Cal., and the First Church of Christ, Longmeadow, Mass., represent two widely different architectural types on opposite coasts, nevertheless the same careful attention has been paid to their painting, a good practice for which all churches all over the country are noted.

Built in 1892, the Lutheran St. Paulus church exemplifies the Gothic type of architecture generally associated with European cathedrals. Elaborate systems of arches and windows are set off by ornate wood trim. Sidewalls are of smooth-finished, matched weatherboarding, while the foundation and lower walls are constructed of brick. The recent painting of the church was done with white lead, the church fathers having learned a bitter lesson in painting practice since the previous painting had been done with inefficient material. Naturally, the result was that the whole structure had to have the failed paint job burned off before repainting with time-tested white lead. Confidence has been expressed by those connected with this job that now there will be no further difficulties.

Redecoration was done by Ferdinand Terheyden & Bros., painting contractor, under the supervision of Otto G. Hinterman, architect.

The First Church of Christ, the Congregational Church of Longmeadow, Mass., is representative of many simi-



The beautiful Longmeadow Congregational Church, Longmeadow, has preserved its charm and freshness for years with white lead

STANDARD PHOTO SERVICE

The St. Paulus Lutheran Church, San Francisco, Calif., now decorated with pure white lead paint after unfortunate experience with another type of material

lar churches in England. Built in 1768, it is regarded as one of the best examples of Colonial church architecture. Its long history starts with Stephen Williams, the celebrated boy-captive of the Indians, who later became the first pastor of the church. Through the years this church has watched the nation's growth and for years to come its charm and historical significance will be preserved by the pure white lead paint protecting it.

Once again, the importance of the priming coat is evident. One church has had its unfortunate experience. In the other, the Longmeadow church, from 1768 up to the present, all records indicate that pure white lead and oil has been the only paint used on this structure. Assuming that it has been regularly painted throughout its life, the original white lead priming coat is still adhering to the wood. The excellent condition of the church today after 170 years is testimony to the success inherent with a pure white lead paint program, regardless of location.

Sheet Lead Forms an Economical and Efficient Fountain Waterproofing

PROBABLY the largest lead-lined soda-fountain pit in the southwest was recently installed in a new store of Skillern & Son, Inc., one of the country's biggest retail distributors of drugs and sundries. This is a waterproofing job of a nature similar to that installed for the Grand Central Terminal branch of Liggett's Drug Stores in New York City (LEAD, July, 1939).

The Skillern installation comprises a pit 54 ft. 9 in. long and 7 ft. 6 in. wide, completely lined with 4-lb. sheet lead turned up around the edges to form a leakproof pan. All seams in the pan were lead burned. The lead was laid over old concrete which had been ground smooth with a terrazzo machine. The lead was coated with asphaltum to protect it against the free lime in green cement, and a new concrete floor poured on top of the lead. Duck boards are used on top of this concrete in the usual manner. The pan and floor are graded to the drains so that any moisture collecting under the concrete will drain from the pan.

Sheet lead waterproofing under the soda fountain of the Skillern Drug Store, Dallas, Texas

No matter whether a shower pan, a refrigerator pan, or the lining for an entire room, sheet lead makes a quick, neat, highly efficient and economical waterproofing. Flexibility of the sheet lead takes up any building movement or settlement and the pan fits snugly

against the underflooring; this eliminates the danger of void spaces underneath which may result in cracked flooring and leaks when the finished floor is laid and walked on.

For waterproofing pans 4-lb., 6-lb., or 8-lb. sheet lead should be used with seams preferably lead burned, although they may be soldered if necessary. Sheets may be as large as can be conveniently handled. Lead sleeves burned to the pan, or flashings, should be provided around pipes passing through the floor and pan to make these joints perfectly watertight.

The installation for the Skillern Stores was made by the Spencer Plumbing Company, of Dallas, Texas.

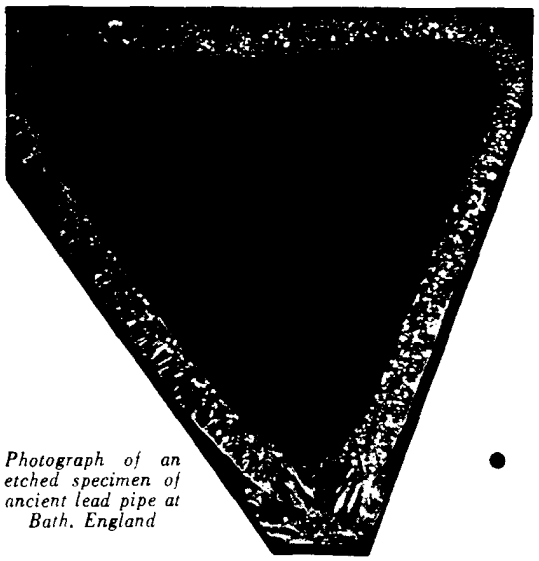
Service Pipe...Today and 2000 Years Ago

READERS of "LEAD" and others who have visited the Lead Industries Association exhibits at various conventions have shown particular interest in the Association's samples of old Roman water pipe. Of special interest has been the remarkable state of preservation of the old pipes, a testimonial to the exceptional durability of lead, since they were cut from water lines which had served for hundreds of years, despite the crude method of manufacture.

Now, still further evidence of this durability is furnished by samples at the Museum of Bath, in Bath, England, reported by the director of Mellowes & Co., Ltd., in Sheffield. Included in their relics are samples of great antiquity from cities like Bath, Exeter, Augst in Switzerland, and many others.

An original sample from Bath, installed about 76 A.D., has been examined metallographically and the photograph of the etched specimen is reproduced here. The good condition of the pipe is clearly shown and a study of the crystalline structure confirms the previously purported method of Roman manufacture. When molten lead cools and solidifies, the change of state is always accompanied by the formation of crystals, each with a main axis starting from the point where the metal first cools and growing out into the metal still in a molten state until stopped by some obstruction, generally another crystal in process of formation. Thus, the crystalline formation of the etched specimen shows that the Roman method was to cast the lead in flat sheets about ½ in. thick, bending the flat sheets into a triangular or D-shaped pipe and fusing the joint by pouring more molten lead upon it.

Today, the development of the extrusion process to its present high degree of efficiency plus the quality assurance of the Lead Industries' Seal of Approval affords water-works engineers lead service pipe in which the unsurpassed durability, proved by even the crudely made Roman pipe, and other advantages of lead—flexibility, non-clogging, non-staining, easy bends and smooth inner wall with less resistance to flow—are combined to the highest extent for maximum service at a very economical long-term cost.



Photograph of an etched specimen of ancient lead pipe at Bath, England

Fire-Retardant Paint Relies on White Lead for Normal Qualities

ALTHOUGH no paint has yet been achieved which will provide fireproof protection to inflammable surfaces under sustained heat of fire intensity, recent experiments conducted under the auspices of the United States Department of Agriculture indicate that a formula composed of finely ground borax, white lead and raw linseed oil assures the utmost in heat resistance. The fire repellant properties of this coating can well retard the spread of small fires which otherwise might assume dangerous proportions, in many cases affording reasonable protection to surfaces where further insulation is impractical or costly.

According to the Forest Products Laboratory, borax alone in combination with linseed oil does not provide the hiding power and adhesion necessary for an effective coating, so a high percentage of white lead is added to the mixture to increase its opacity and assure the durability of the paint. It must be emphasized, however, that even with the white lead present borax paints do not have the great durability of pure white lead and oil, and, for this reason are not recommended for exterior application. There is a tendency also toward yellowing from the borax content which somewhat restricts its decorative usefulness. However, when a paint with fire resistant qualities is desired, a pure white lead and borax paint is reported to be the most successful for all requirements.

The heat resistant formula which has stood up best under the initial experiments is composed of 41 per cent (by weight) white lead, 32 per cent borax, 22.8 per cent raw linseed oil, 3.6 per cent turpentine, .6 per cent japan drier. The borax is first ground in linseed oil to a paste consistency, and then white lead and oil mixed according to regular formulas is added.

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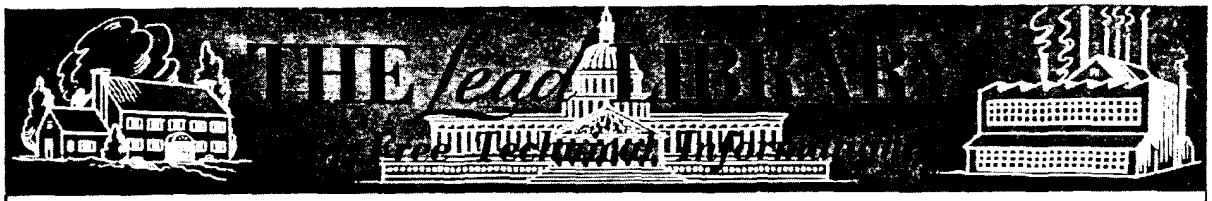

The following articles and reprints contain information, drawings and specifications on the use of lead products helpful to architects, engineers and others in the construction industry. They are available, free of charge, upon request to the Lead Industries Association, 420 Lexington Avenue, New York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

WHAT TO EXPECT FROM WHITE LEAD PAINT

An attractive 28-page booklet with charts, formulas, and mixing instructions covering some of the problems of painting and how white lead meets these problems.

PAINTING YOUR HOME by Dr. F. L. Browne, Senior Chemist, Forests Products Laboratory, Madison, Wisc.

A discussion of house painting reprinted from American Forests, May, 1939.

SOME PAINTING PROBLEMS AND THE ANSWERS

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

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

STAMFORD'S DOUBLE LIFETIME HOME

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

SHEET LEAD INSTALLATION DETAILS

A detailed analysis of the principles and application of lead flashing and sheet lead work for small homes. Reprinted from Sheet Metal Worker, June, 1939.

SHEET LEAD SHIELDING X-RAY ROOMS

A discussion of X-ray protection and installation methods reprinted from Sheet Metal Worker.

PLUMBING CODES—AN ANALYSIS AND SURVEY—Part II by Bob Dick

This paper, delivered at the annual meeting of the American Society of Sanitary Engineering in Wilmington, Del., in August, 1940, constitutes the most complete and up to date study of plumbing codes available. Everyone interested in plumbing codes should have a copy.

LASTING LEADWORK IN MODERN PLUMBING

By T. N. Thompson, Technical Editor, Plumbing and Heating Journal.

Reprinted from Plumbing and Heating Journal, Feb., 1939.

HOW LUMBER AND PAINT KEEP YOUR HOME ALWAYS IN STYLE

A brief digest of the advantages of painted lumber homes with color-styling suggestions and other interesting information.

LEAD CHIMNEY CAPS

Notes on the installation and advantages of lead chimney-cap protection, reprinted from American Artisan, May, 1940.

*NEW SIMPLIFIED STANDARD FOR LEAD TRAPS AND BENDS

File size leaflet with new standards for lead traps and bends as well as existing standards for lead pipe and calking lead, and other informative data.

* Not previously listed.

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