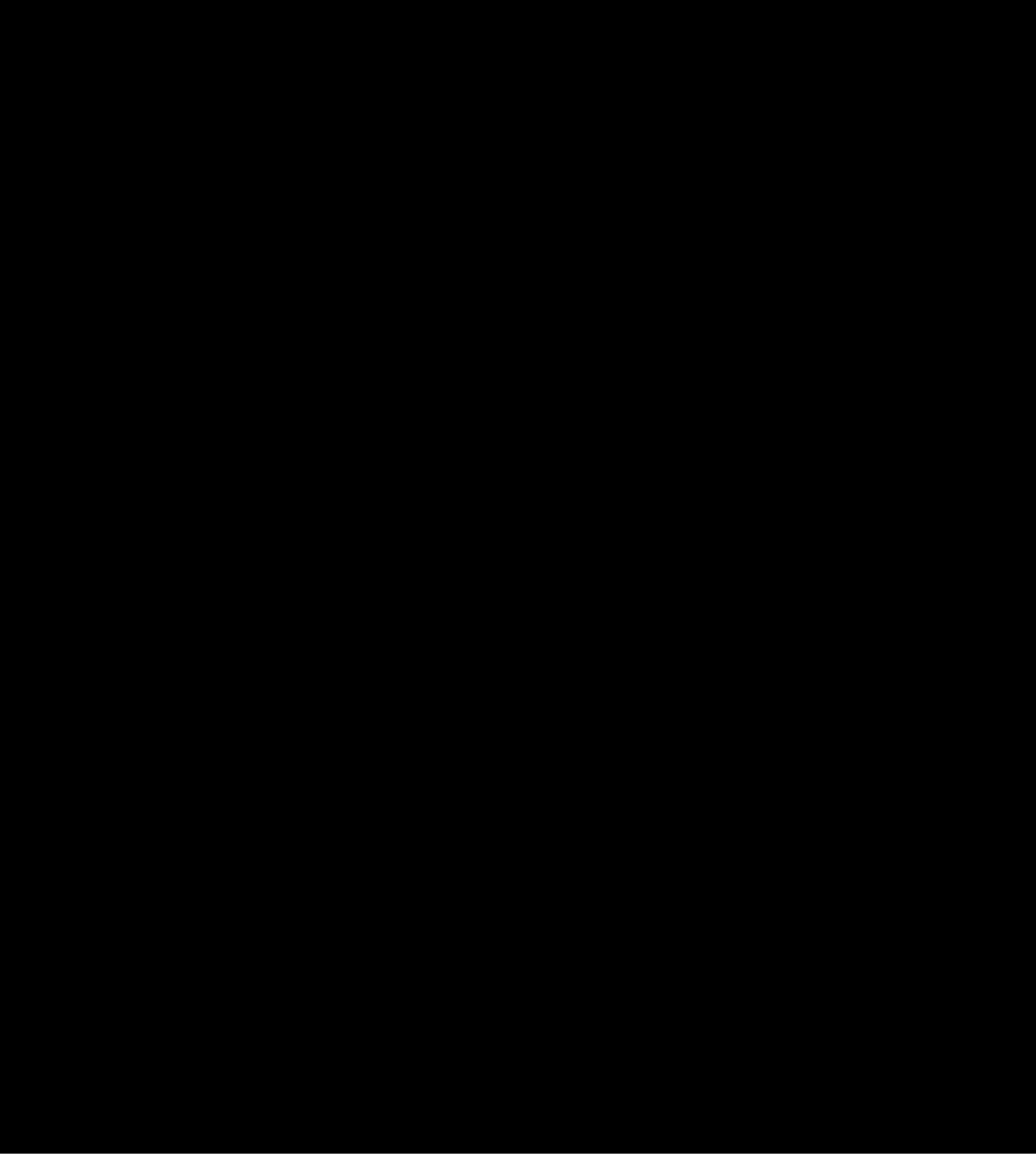


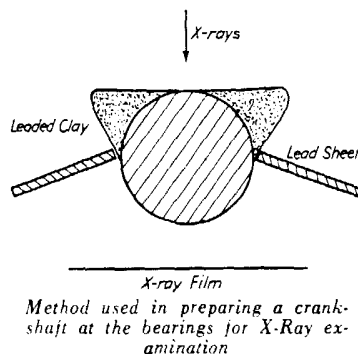


Lead Important in Ford Motor Company X-Ray Testing

AN outstanding example of the use of industrial radiography, and how lead makes possible its utilization, was recently reviewed in the March, 1940, Bulletin of the American Society for Testing Materials, in a discussion of radiographic methods as employed by the Ford Motor Company in testing cast parts. Although popular conception usually limits the use of X-rays and radiography to the medical profession, they are highly important in industry. As a consequence lead becomes of vital importance to the users of this method, since lead is the most effective practical guard and shield against X-rays, and can be used for blocking purposes.

Modern automobiles utilize large tonnages of cast parts. Before any newly developed cast part may be put into production, however, it must show definite manufacturing advantages, when cast, over an adequate forging or assembled unit. Also the casting must have the suitable structure, strength, hardness, or other properties required by the use to which it is to be subjected.

Each new casting, therefore, is made



first in experimental form and subjected to extensive physical and service tests. It is in these preliminary tests that radiography has become so effective. Also, radiographic methods and technique have been standardized, so that the maximum speed and sensitivity are consistently secured. Rapid methods are desirable at this development stage so as not to delay establishment of production longer than necessary.

Carefully controlled radiographic tests allow the detection of all gross defects, as well as small defects such as gas pockets or shrink cracks.

As an example of this procedure, for instance on the bearings of a crankshaft, the preparation is shown by the accompanying drawing. Standard radiographic clay, to which fine powdered lead has been added, is used as the blocking medium. Since the rays have difficulty in passing through the lead clay, the parts covered by the clay are not recorded on the X-ray film or plate. This allows selection and delineation of the subject radiographed. The absorption of X-rays in the blocking clay is regulated by the amount of lead powder added so that it is approximately twice that of the steel absorption. Lead sheets $\frac{1}{4}$ in. thick are generously used to block off stray rays which might be harmful to the examiner.

The time required for preparing a crankshaft is 15 min. with an exposure time of $2\frac{1}{2}$ min. for the $2\frac{1}{4}$ in. bearing section. If necessary two crankshafts may be examined simultaneously. Two high-speed intensifying screens are employed in a lead-lined cassette using ultra speed film.

Castings having unduly varying thicknesses of material sections, as in a cast camshaft, are examined by immersion in a saturated lead salt solution, with or without the use of the lead-lined cassette depending on the thickness of the sections. However, since the sensitivity in this use is somewhat reduced due to the unavoidable X-ray scattering in the solution, it is customary to expose the part to a higher average density than is used for objects such as the crankshaft.

Radiographic methods like these are an important part in the development of improved foundry methods for the Ford Motor Company and other industrial plants. This effective utilization of radiography is but one more example of the important part that lead plays, in one form or another, in industrial development.

We are grateful to Don M. McCutcheon, Research Engineer, Chemical and Metallurgical Department, Ford Motor Company, for information concerning this use of lead and radiography.



Experimental cast camshaft radiographed by immersion in a solution of soluble lead salts
COURTESY A. S. T. M. BULLETIN

Paint Maintenance in New York Apartment Buildings

STRESSING the use of pure white lead and oil for exterior and interior apartment building paint maintenance, the recent Apartment Superintendent's Manual, prepared by Clement E. Merowit & Co., Inc., of New York City, is a noteworthy contribution to apartment management literature and information on the proper selection and application of paint.

The Merowit Company, operators of many Manhattan apartment buildings, prepared the manual specifically as a guide for their own building superintendents. However, the excellent and useful information contained has resulted in widespread interest in management circles. Within a few weeks after the first public reference to the manual, requests began to pour in for copies and permission to use portions of the text.

Under the specification of the manual all wooden frames, sash and sills, basement doors and all other exterior wood work are painted with white lead and oil. Fire escapes, railings, lamps, window guards and bars, kalemein doors and sash, cellar entrance doors and all other exposed metal

work on roofs and elsewhere are primed with red lead and finished with white lead, tinted to desired colors. All paint materials must be delivered to the job in the original unopened containers.

Concerning the importance of proper paint upkeep for apartments, Hugh Lehnacker, Maintenance Director of the Company, has summed up several vital points.

"Many management companies have and use excellent specifications for building maintenance. However, these are frequently of a temporary nature only, that is, written for each individual job. We felt that there was a real need for a standard manual dealing with specifications for the operation and maintenance of buildings. Not only would this result in time savings, but should increase management efficiency and produce better results at less cost.

"Paint, naturally, plays an important part in apartment management. In a tremendous number of cases it is the actual appearance of exterior and interior surfaces that mean renting success. Poor appearing paint

or cracking surfaces can depress rental values to a large extent. Considering this importance, it is only logical that the highest type of materials and workmanship should be employed. The actual cost of painting is not high at all in comparison with the renting values which must be protected. This, moreover, is the main reason why apartment operators cannot afford to experiment with various paints. In such a standard specification as our manual it is to our advantage to select materials which we know, from past experience and the acid test of time, will perform efficiently and economically. In paint we look for decorative beauty, durability and economy. We know that lead and oil will give us these important characteristics, and consequently it is specified in the manual. Experimentation with other materials might mean possible trouble, with which we cannot afford to take a chance. This is not to say that we are disinterested in thoroughly tried technical improvement. It does mean, however, that we prefer to be conservative on this score."

Lead is a Highly Workable Artistic Medium

LEAD finds a great many uses in the arts. For hundreds of years architects have availed themselves of the soft beauty of ornamental lead leader-heads, gutters, cresting, fleches and other details. Lead figures have graced many of the lovely gardens, large and small, of the old and new world.

The lead mask shown here represents one of the uses of lead in the arts. It was beaten from sheet lead by Mrs. R. W. Stubbs, a student in the extension course in sculpture at the University of Oregon under the instruction of Oliver Lawrence Barrett, Associate Professor of Sculpture.

Lead is ideal as a medium for art work of this kind. Highly responsive to forming and artistic manipulation, whether by hand work or casting, the grey patina is especially suited to strong highlights and delicate finishes.

The ease of manipulation makes lead particularly useful in art classes, both for demonstrating by the instructor and work by the students. Nevertheless the beauty of lead, especially when used with designs specifically adapted to its qualities, makes lead a preferred art metal in its own right.



Lead mask beaten from sheet lead

Preservation of Poetic Shrines



The Craigie-Longfellow House in Cambridge, Mass., a yellow and white mansion faced with clapboard. Four white pilasters lead the eye upward to the roof-line crowned by Italian balustrade. This historical dwelling was originally built for John Vassal in 1759, later belonged to Dr. Andrew Craigie, and finally was Henry Wadsworth Longfellow's wedding gift to his bride in 1843. Pure white lead and oil, both white and tinted yellow, protects this old mansion

EWING GALLOWAY



Emerson House, in Concord, Mass., a square white clapboard house of sturdy New England timbers. Ralph Waldo Emerson, the great American Essayist, made this home a literary center from 1835 until his death in 1882. Pure white lead and oil has preserved this American landmark both in the past and today as a memorial to its most distinguished owner

EWING GALLOWAY

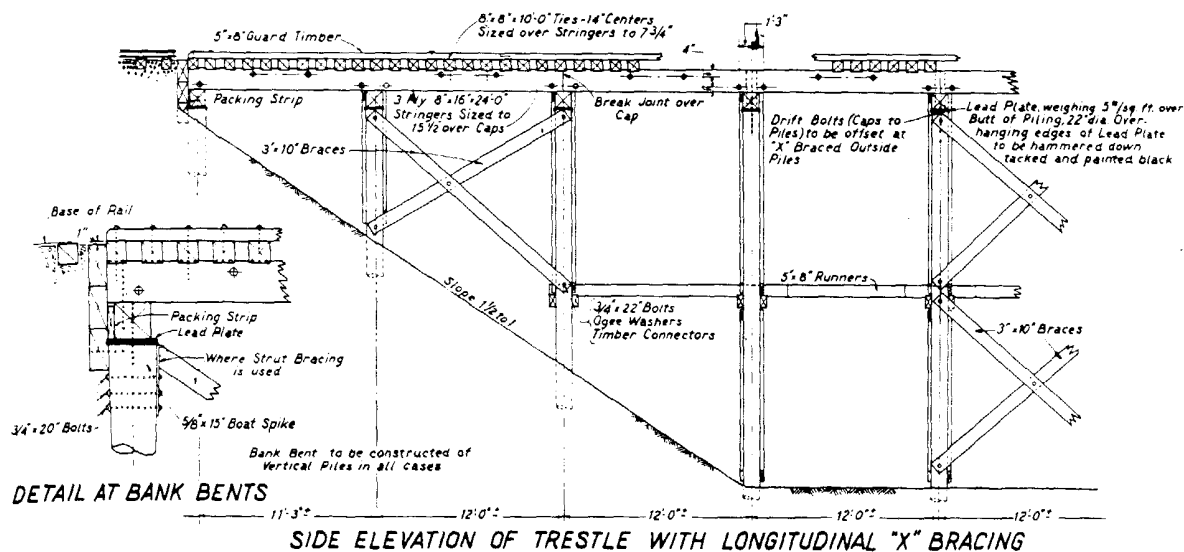


The Poe Cottage, built in 1816 on the hills above New York City, a simple six room cottage of shingles and clapboard. Here, Edgar Allan Poe lived and wrote many great stories reflecting the sorrow and melancholy of his later years. Poe cottage is preserved for the future with pure white lead and oil paint by the City of New York

EWING GALLOWAY



THIS IS NO. 2 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.



Typical installation details of a trestle bridge showing the application of sheet-lead pile caps

Sheet Lead Standard Protection for Wood Piles and Posts on N. Y. Central R. R. System

BY adopting a standard specification calling for the use of sheet-lead pile caps, the New York Central Railroad has solved what, in the past, has been a vexing and costly maintenance and construction problem. Wood piles and posts for railway bridges, trestles, docks, piers, moorings or similar uses are generally subject to rot deterioration at the crown or top of the post, where the grain structure of the wood allows fairly easy moisture penetration even though waterproofing provisions have been made or the tops painted. Moreover, since the pile crowns in many cases bear a heavy load, any such deterioration must be avoided.

Past Experience with Lead Caps

The New York Central Railroad, after many years of experimentation and tests, found that sheet lead caps covering the crowns proved highly satisfactory as moisture proofing protection. Such caps were installed on piles for the Cincinnati to Chicago division of the Big Four Railroad in 1935 and, when last inspected in 1939, showed clearly the efficiency of this

type of protection. The caps were similar to those installed by the Lackawanna Railroad over the tops of piles in the Hoboken, New Jersey, ferry slip and described in LEAD, September, 1935.

N. Y. Central Installation Practice

Lead caps are required and shown in detail in drawings covering general notes on the New York Central System. Standard Timber Open Deck Pile Trestle for E60 Loading. Tops of all piles are covered with 5-lb. sheet-lead plates 22 in. in diameter and weighing 16.8 lb. apiece. Tops of piles are thoroughly brushed with hot creosote before applying the lead cap, and the whole unit painted afterwards. For end bent or panel, 118 lb. of sheet lead are required while 84 lb. are used on inter bent or panel.

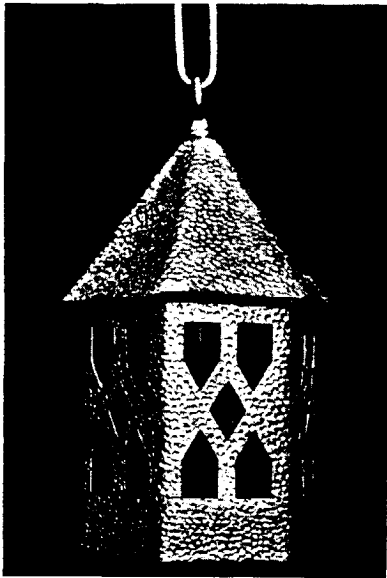
Advantages of Lead

Because of the durability of sheet lead there is no question of the long life of the caps. Moreover, lead is extremely resistant to corrosion from salt air, and may be used with com-

plete effectiveness on docks and other structures. Being malleable, the plates are easily formed over the pile caps, making a quick, but efficient and economical installation, paying for itself in a short time by saving on maintenance costs.

Typical Standard Specification

Although individual installation factors will materially affect a specification for lead pile caps, a general provision is very simple in wording and will follow these outlines. "Tops of all piles shall be covered with sheet lead weighing not less than 4 lb. per sq. ft. Lead shall be dressed down over the sides of the piles at least 2 in. and nailed around the lower edge. Tops of piles shall be sealed with red-lead paste before applying lead covers. Similarly bottoms of timber cap sills shall be heavily coated with red lead where they come in contact with the sheet-lead cap. Lead washers shall be used under drift bolt heads. If drift bolts are inserted in piles before timber cap sills are set in place, the sheet lead covers may be soldered to the bolts."



Low-Cost Ornamental Lead Lighting Fixtures Now Featured

A NEW line of lead lanterns has recently been developed to meet the demand for low cost ornamental lighting fixtures.

For centuries lead has been closely identified with beautiful ornamental metal work, lighting fixtures being one of the most popular applications. However, ornamental lead work of this type in the past has been fairly expensive and restricted consequently to homes in the higher price brackets. These modern lead fixtures, however, have been so reduced in price that they meet the budgetary requirements of all home owners and builders, yet

retaining lead's beauty and charm.

Everlasting, since lead does not corrode or rust away, the lanterns are made in various standard models and designs with plain or beaten finishes. Both wall-hung and drop chain fixtures are available, as well as special designs. Also, to insure that nothing but lead is exposed to the elements all bracket and chain parts are finished with a heavy lead coating. Thus any deterioration is eliminated and there is no danger of staining on outside walls. The new lead fixtures are the development of the Products Research Company, Stamford, Conn.

White Lead and Oil Paint for \$2,500-Home Development

HUGUENOT LAWNS, a development of numerous small \$2,500 homes embodying, despite their low cost, excellent construction practice is builder Edmund J. McCormick's solution to one of the current housing problems.

Located in Staten Island, N. Y., only 45 minutes from lower Manhattan, these homes are in easy reach of the congested business sections and yet provide a comfortable, country-like atmosphere for the medium income group.

Realizing the need for a home combining really low cost with beauty and

utility, Mr. McCormick created a design and a set of specifications that not only brought the home cost down considerably below the average but at the same time gave the customer the advantages of pure white lead paint and many other nationally advertised products. Homes are of a modified Cape Cod design having a living room, two bedrooms, dining alcove, kitchen and bath with a space in the basement for a 24 x 12-ft. recreation room.

In spite of the low price of \$2,500 set on these houses, first class materials have been used throughout. Great care was taken in the design and in the

specifications of these homes to provide the maximum in comfort and service within the reach of the lower income family. One of the problems facing Mr. McCormick was the selection of an exterior paint that would properly meet all the requirements for a home of this type. It had to provide utmost beauty and durability combined with initial low cost and minimum maintenance. Pure white lead and oil was found to be the paint best filling these needs. Its original cost is low; it produces an excellent job; and, most important in a low cost home, it wears down gradually and evenly leaving a good repaint surface even if neglected.

Authorities agree that one of the most pressing housing problems in metropolitan areas today is to provide adequate, homelike shelter for the family of medium low income, so limited that they cannot afford the average development home, and yet not low enough to qualify for U. S. H. A. Housing Projects. Frequently families belonging to this group must live in sub-standard dwellings or apartments less attractive and livable than those enjoyed by families of even less income who may live in one of the Housing Projects. Developments such as Huguenot Lawns are one solution.

Architect Harry L. Brumond's rendering of the typical \$2,500 home built at Huguenot Lawns and painted with white lead

KNICKERBOCKER PHOTOGRAPHERS



Your money ahead when you paint with
White Lead



STROKES from the PAINT BRUSH

JUST as the strength of a structure is no greater than its foundation, so the value and success of a paint job is no greater than the priming coat. Regardless of surface the priming coat is the most important coat of paint applied. Unless this coat is of a quality that will furnish a tough, adhering film, securely anchored to the surface on which it is applied, succeeding coats of paint may fail, no matter what their quality per se. On the priming coat rests the successful decoration of a home and, carried to a further conclusion, may mean the success or failure of the builder.

This point is worthy of particular attention concerning modern small home development projects, springing up all over the United States in various sizes, from but a few to many hundreds of homes in the same project. Most of these homes are in the low-cost range of price, furnishing comfortable, attractive habitations for people with a modest income to whom owning a home is a great pleasure, unless maintenance cost due to poor selection or application of materials does not soon make home an expensive and prohibitive luxury. Consequently, it is of great importance for the home owner to have good paint on his house, and for the developer to use only the best. The operative builder's market is good only as long as his customers remain satisfied.

Advantages of Styling

From the standpoint of decoration, painting is a most important factor in development building for it is the only means of providing decoration which may be changed economically at any time to suit the owner's desire. Materials which do not at first require painting ultimately become dated in styling. The owner must either accept the fact that he may grow tired of the type of home or must go to somewhat large expense to change his styling.

The builder must consider this point and provide an excellent priming coat on which the lasting beauty of first and redecoration depends. Unfortunately, in development building, narrow budgets may create a temptation to skimp on the quality of paint used, a temptation augmented by the fact that to the novice, the average buyer, all paint looks alike when freshly applied. It is next to impossible for the unexpert to detect a high quality paint from a low quality paint, many times even after the paint has been exposed for a few months, a period long enough for a speculative builder to sell his product.

Avoiding Failures

Such a practice on the part of the development builder is short-sighted. Where his operations comprise many homes built successively, the sale of his later homes is dependent upon the appearance of those already purchased and in use. It is noteworthy that this practice is usually one of fly-by-night builders, not of those who try to establish a growing business in one locality based on sound reputation and building practice.

Considering how easy it is to avoid painting headaches, there is all the more reason for saving home owners the risk of unfortunate paint experience within a short time after their purchase. The type of paint failures associated with low-grade paint is such that the only remedy is to burn off the old paint, a costly procedure, and then to apply an entirely new paint job. With high quality paint there is no such danger and it is well worth the output of a few cents more where necessary to obtain a high quality paint which will pay dividends to both the owners and developer.

Cost Analysis

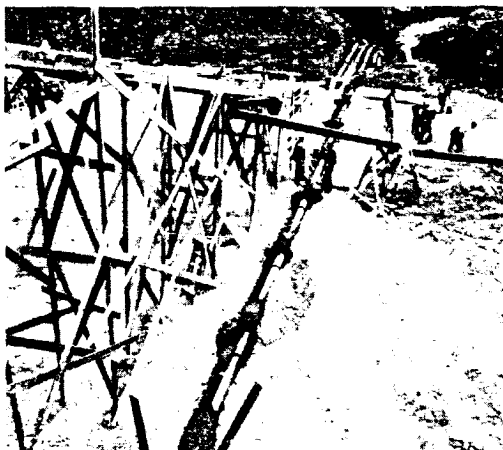
In this respect it is interesting to note the following in the common

argument and theory that the *best* must naturally be the most expensive. In paint it is the white lead content that determines the quality of the paint. It is axiomatic that "the higher the lead content the better the paint" with pure white lead and oil the highest quality paint obtainable. Nevertheless, the double advantage to the home developer in using pure white lead and oil paste is manifest when one considers the low cost of this material when reduced to a gallonage basis and also the cost per square foot applied. Today, pure white lead paint costs about \$2.40 per gallon, a price which is lower than prepared paints accepted as high grade. The reason for this economy is that, although white lead is one of the highest priced paint pigments, the pure white lead and oil when mixed to paint consistency is unusually low in price. In determining the cost per square foot applied, white lead applies easier and in less time than paints containing inert "draggy" pigments. Consequently, the initial cost of a white lead job is less. Also, white lead is the most durable paint pigment used providing longer life with maximum decoration and protection, and reducing the final cost per year of a paint job.

Paint a Sales Talk

All these advantages of high quality paint are selling points for the development builder. It is peculiar that so many builders who make a virtue in advertisements, displays, and brochures as to the quality of their plumbing, insulation, flooring and other parts, have not realized that they have in high quality paint a practically untold, yet powerful sales argument. In many home products, people are sold by and recognize brand names. In paint, however, white lead is the only material and ingredient that the average person universally recognizes as a high quality material.

Cast Iron Mains Calked with Lead in New Cincinnati Systems



At left, a view of the 8-in. effluent pipe line and, at right, 8-in. effluent, influent and overflow lines for the new Cincinnati control reservoir



FORTY tons of 8-in. cast-iron water main with lead-calked joints are installed for the intake and output distributing mains, as well as overflows, from the new Three Mile Road control reservoir in Cincinnati, Ohio. This reservoir, with a capacity of 1,000,000 gals., is employed to serve two Cincinnati suburbs, and draws on the main Cincinnati water supply.

Since the new mains are laid under the concrete bottom of the reservoir where any future repairs would be extremely difficult, it was necessary to provide a system excluding any possible change of pipe or joint failure.

The lengths of cast-iron pipe were installed with concrete haunches before testing in order to anchor the pipe line for the pressure test. After testing the entire main was embedded in

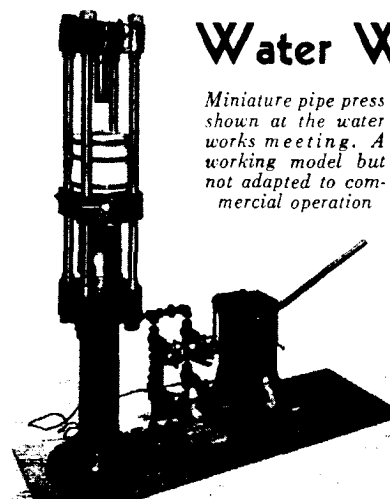
poured concrete. All joints were poured to a depth of about 2½ in. with about 15 lb. of lead used for each joint. In all, approximately 3,500 lb. of calking lead is installed, all bearing the Lead Industries Seal of Approval.

Although the main will operate under a pressure of only 75 lb. per sq. in., the entire line was tested under a constant water pressure of 300 lb. per sq. in. for a period of two hours, at the end of which time there had been no loss in pressure and the water tightness of the joints proved.

Installation practice such as this is a virtual necessity if the immense investment in waterworks is to be fully protected. First of all the pipe material used must be durable. Certainly, no other material for large mains has the long record of faithful and efficient

service as cast-iron pipe. In the second place it is absolutely essential to have permanently water-tight and flexible joints. True under all conditions, this point is especially important in a case such as this where the entire line is encased, under water, in concrete. The excellent results of the pressure tests, as well as the countless previous examples of the efficiency and durability of lead joints under operating difficulties, justifies its selection in all instances. Many lead jointed cast-iron water mains are still in service in cities throughout the country often over 100 years old.

Carl Eberling is the superintendent of the Cincinnati Water Works under whose supervision the installation was made by plumbing contractor William Helmer, also of Cincinnati.



Miniature pipe press shown at the water works meeting. A working model but not adapted to commercial operation

Water Works Exhibit Features Model Pipe Press

AN unusual feature of the American Water Works Association convention this year was the manufacture of real lead pipe right before the eyes of interested engineers in the exhibit booth of the Lead Industries Association. And interested many of them were, for most water works engineers have specified tons of lead water service pipe while few have had the opportunity to see it made. The exhibit showed, through the use of a small scale lead extrusion press operating on exactly the same principal as the huge presses used commercially, just

how lead pipe is made and how the process contributes to its desirable features.

In making lead pipe, huge hydraulic presses exerting pressures up to as high as 45,000 lb. per sq. in. and total pressures of 1,000 tons are used. Extending down from the head of the press is a cylindrical steel ram with a hole through the center. Into the bottom of this ram, a steel die is fitted, having a circular hole at its center equal in diameter to the outside diameter of the pipe to be made. Below this is a cylinder containing lead

which has been poured from a melting kettle and allowed to solidify. However, a steel rod or core having a diameter equal to that of the inside of the pipe to be made is fastened to the center of the cylinder bottom and extending up through the hole in the die. This leaves an annular space equal to the pipe wall between the core and die.

Hydraulic pressure is applied under

the lead-containing cylinder forcing it up against the ram which fits snugly into the cylinder and squeezing the lead out through the annular opening. Since the lead in the cylinder was a solid mass of cast lead surrounding the core, it comes out absolutely seamless and in great lengths.

The only differences between the exhibit press and commercial presses

were differences of size and power. The exhibit press stood only about 5 ft. high and exerted a total pressure of 20 tons. Hydraulic pressure was applied through a hand operated instead of power driven pump. The whole operation from melting of the ingot lead to the finished pipe, which on the model press had an inside diameter of $\frac{3}{8}$ in., was performed in the booth.

Styling for the Future Produced with Pure White Lead

FOR hundreds of years homes have been built with lumber and decorated with paint. Today this fashion is at the height of its popularity, three small examples being the attractive homes shown in the accompanying photographs. Located in South Gate, Calif., and Lakeview, Ore., these small houses are of frame construction with exteriors of Certigrade red cedar shingles painted with pure white lead and oil.

In this day and age of new materials, methods, and styles there must be good reason why this combination of materials still remains a leader in the building field.

Lumber and paint make beautiful, comfortable, long lasting homes at just about the lowest construction costs possible — stylish homes anyone is proud to own always. The beautiful Colonial landmarks still standing in good condition after over 200 years service are proof of this. But more than durability and low cost, lumber and paint provide other advantages which no other combination of materials can render so easily and economically. With lumber construction the beauty of the home may be kept

The beauty of the shadow line produced by double-coursed Certigrade shingles is enhanced with pure white lead on this Lakeview, Ore., small home



permanently fresh and youthful by the use of paint. Color schemes can be selected to give even the most modest home an air of complete individuality even though they may be in a large development and based on a very similar plan. Moreover, whereas restyling homes that are not designed for paint decoration is expensive, in many cases prohibitive, a brand new appearance can be given the painted home at any time by simply a change of color scheme.

In order to obtain the utmost from paint styling, however, the paint used should first of all be durable to retain the homes good appearance for the

longest time; it should have the proper weather wear to allow restyling at minimum cost without excess surface preparation; lastly, it should be inexpensive. All these advantages are found to their greatest degree in pure white lead. For years white lead has been the choice of the experts whose job it is to know paint and past performance has justified their selection. No other paint has as long a record of performance under all conditions of surface or climatic conditions as white lead. With all these advantages, however, pure white lead and oil costs less than any other materials approaching its desirable characteristics.

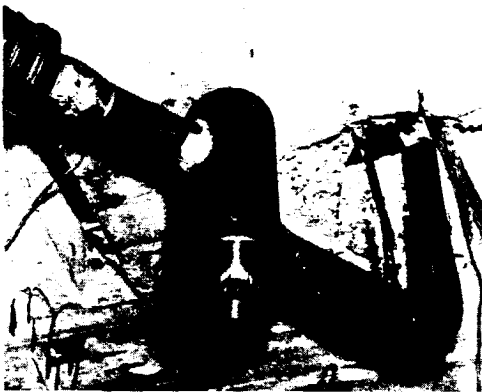


Two small homes in South Gate, Calif., show the charm of small homes built with lumber and decorated with white lead

ART STREIB



Lead Plumbing Essential for All Types of Buildings



A general view of the addition to the Mississippi Baptist Hospital, Jackson, Miss., and a detail of a typical lead bath and shower trap. J. M. Spain of Jackson was the architect

HIATT STUDIO



A HOSPITAL in Mississippi, a school in Minnesota, a private residence in Connecticut, a public housing project in Texas, a hotel in Montana—buildings of various sizes, purposes, and types of construction, yet all are dependent to a large extent on lead plumbing. They are only a few random examples of the adaptability of lead to all conditions.

Efficiency and cost usually determine the choice of materials in any plumbing system, and in both these respects lead is advantageous. However, their importance and effect may depend on the type of installation.

In hospitals there is greater danger of the spread of disease than in other structures, a potentiality which may easily become a reality with faulty plumbing. Clogged pipes may cause siphonage and water pollution; weak joints may open up allowing contamination from waste and the escape

of noxious sewer gas. Dangerous anywhere, these hazards are all the more important in institutions designed to cure the sick.

In hospitals money should be spent for nursing the sick, and maintenance cost must necessarily be avoided. Plumbing failures, too, may occur in operating-room systems and other parts where repairs seriously interfere with hospital routine.

In schools there is the added factor of concentrated usage which with ordinary materials, results in increased clogging and corrosion. Rusting is accelerated by the abnormal wetness and, in its turn, increases potential clogging. Naturally, since lead does not rust, its advantage is obvious. Another increasingly important feature in school installations is the laboratory plumbing. For instance, in the new South West High School, Minneapolis, Minn., not only the regu-

lar system but the laboratory plumbing is installed with lead. Over 6,000 lb. of lead products for wastes, vents, closet and urinal connections and drum traps are installed in the new school designed by Minneapolis Board of Education, Architectural Division, with Lang & Rauglund associate architects. G. M. Orr Co. were the engineers and E. H. Enger architect for the Minneapolis Board of Education. Plumbing contractor was the Harris Brothers Plumbing Co. Chemical waste and vent systems benefit by lead's resistance to most commonly used chemicals. Also laboratory table tops, similar to those in many large company and commercial laboratories, may be economically covered with sheet lead.

Low maintenance is important in housing projects as well as in schools and hospitals. Repair bills mean less money to care for the sick, to educate the nation's youth, and to house ade-

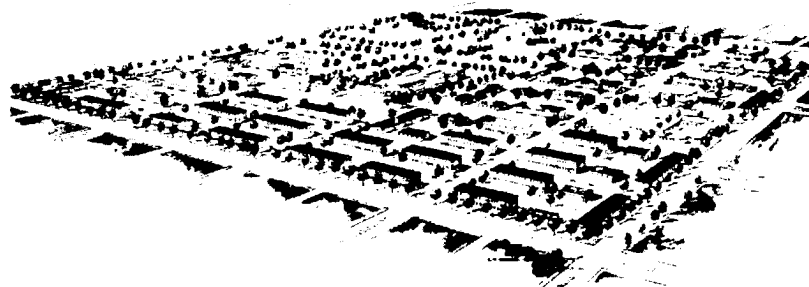
At left, some of the lead frames ready for installation in the remodeled Missoula Hotel, Missoula, Mont., and at right, small-home lead roughing following the principles of Stamford's Double-Lifetime Home

LEFT—MCKAY ART CO.; RIGHT—DAYTON SNYDER



quately persons who, until today, have not had the advantages of good shelter and sanitation. Disproportionate maintenance costs in housing projects raise rents to a point where such figures no longer serve to provide low cost housing. Either that or the taxpayers' equity in the project would be lessened, and more money must be raised.

Housing projects, too, demand the same essentials of adequate plumbing required in residences and hotels. In residences the occupant himself usually suffers most from a poor plumbing job. From a health standpoint, however, such suffering is accentuated in hotels and housing projects, for improper plumbing in one room may cause health hazards in many other parts of a building. It is against public health and safety to install plumbing which may possibly cause sewer-gas infiltration, cross connections or



Architects rendering of the Alamo U. S. H. A. housing project, El Paso, Texas, Frazer and Benner, and Trost & Trost, architects, with Associates Wm. G. Wuehrmann, O. H. Thorman, Percy W. McGhee and Gilbert Satrang

back siphonage. Hotel managements may incur great financial loss, either by clients leaving or by damage suits, facts borne out by past experience.

No matter what the installation, these hazards may be avoided by installing lead plumbing, a system known to continue the performance of

adequate venting and trapping of fixtures for the longest possible time. An installation made in a sanitary manner with lead remains sanitary. Rustproof, non-clogging, corrosion resistant, with bonded joints and easy bends—lead provides utmost durability at low initial cost and minimum maintenance.



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.

1—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.

2—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.

3—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.

4—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.

5—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.

6—SUMMARY OF NOTES ON LEAD ROOFING

Reprinted from Sheet Metal Worker.

7—SHEET LEAD SHIELDING X-RAY ROOMS

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

8—PLUMBING CODES—AN ANALYSIS AND SURVEY By Robert Dick, Member, Research Committee, American Society of Sanitary Engineering.

A detailed study of modern plumbing ordinances, their purpose, deficiencies, proposed remedies and future outlook.

9—LASTING LEADWORK IN MODERN PLUMBING By T. N. Thomson, Technical Editor, Plumbing and Heating Journal.

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

10—LEAD PUT IN AT SCREW PIPE COST ON COM-MODORE PERRY PROJECT

Reprinted from Plumbing and Heating Business, Jan., 1940.

***11—HOW LUMBER AND PAINT KEEP YOUR HOME ALWAYS IN STYLE**

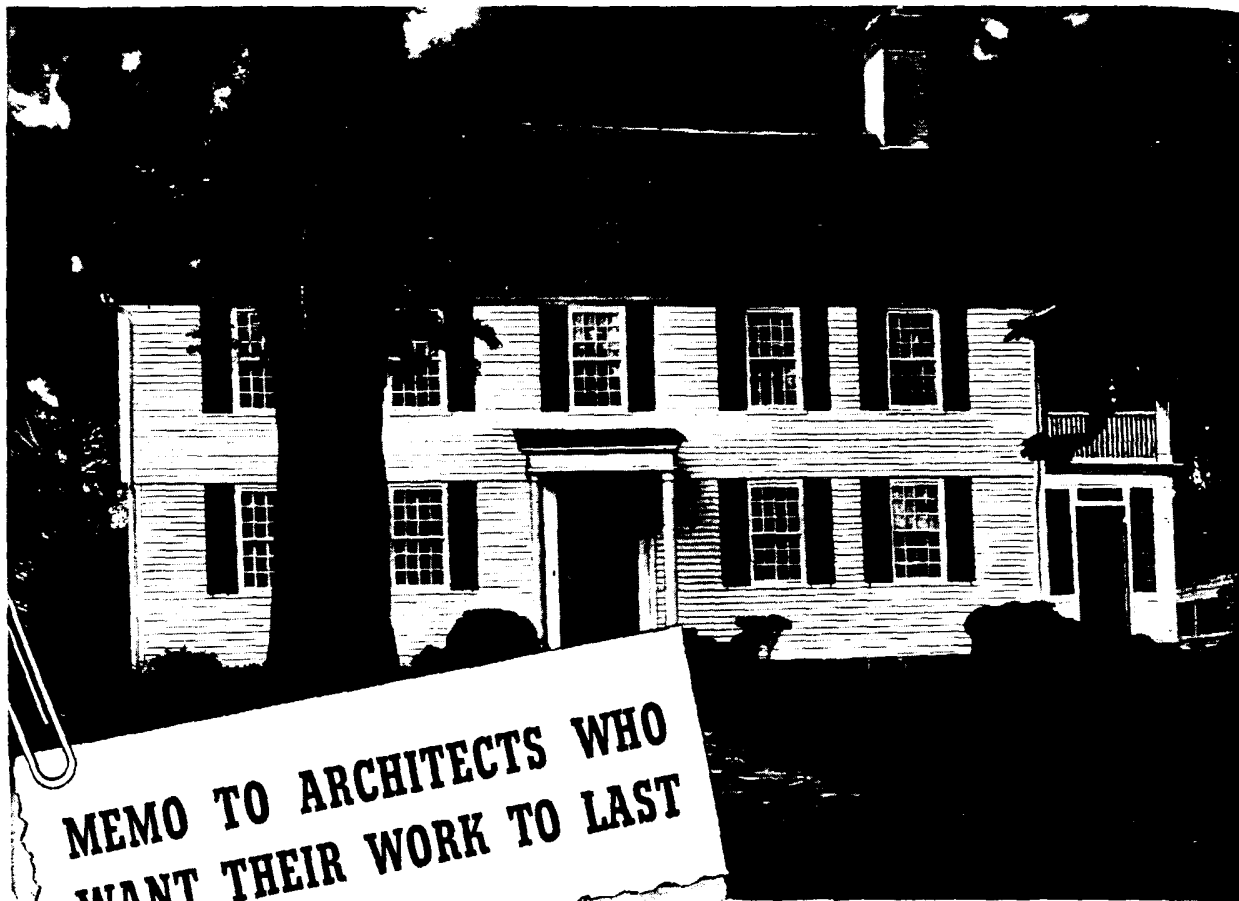
A brief digest of the advantages of painted lumber homes with color-styling suggestions and other interesting information.

***12—LEAD CHIMNEY CAPS**

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

* Not previously listed.

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