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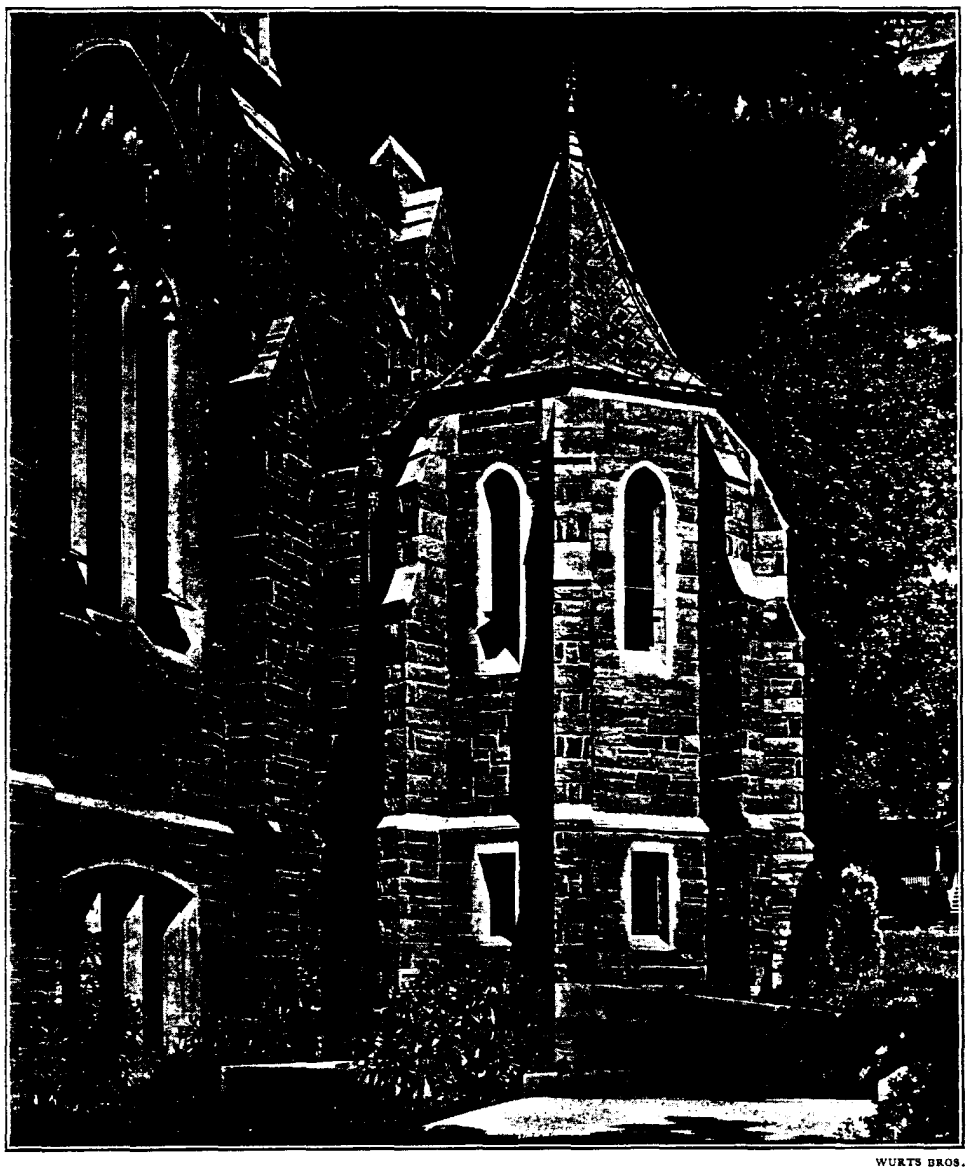

WURTS BROS.

OUR LADY OF SORROWS CHURCH IN SOUTH ORANGE, N. J., HAS A HARD LEAD ROOF, FINIAL, GUTTERS AND DOWN-PIPE

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LEAD INDUSTRIES ASSOCIATION

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Lead Flashing for Color Harmony and Hard Service

LEAD flashing is generally associated in the average mind with monumental buildings and expensive homes. This is natural as lead is essentially used for flashing on such structures built with an eye to beauty and permanence. But they are not the only kind of buildings on which lead flashing is used for reasons of appearance and actual economy.

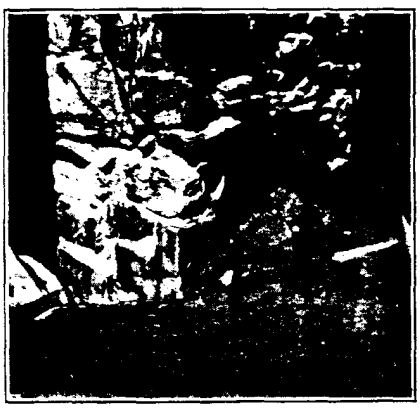
A Vermont log cabin with lead flashing

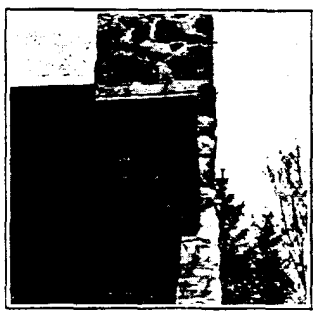
The log cabin shown in an accompanying illustration is a fine example of this condition. It is a sportsman's retreat high in the Vermont mountains, simple, serviceable, and not extravagantly built. Yet lead was chosen for all flashing where the chimneys from the stove and great open fireplace pierce the roof, in spite of the fact that its first cost is slightly greater than other materials that might have been used.

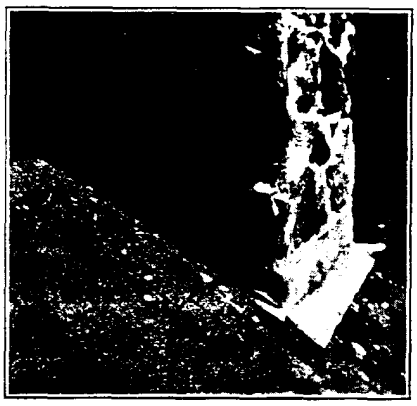
The choice was based on several reasons, according to its owner, Alexander B. R. Drysdale, of Bennington. Lead blends admirably with the silver gray color of the peeled spruce logs and fieldstone chimneys, and forms a pleasant contrast to the red asphalt shingle roof which was used for a dash of color. It is soft and pliable and easy to install. It is non-rusting and requires no repair or maintenance, which makes it a real economy. Due to the fact that lead flashing is both more resistant to atmospheric corrosion and thicker than other materials used for flashing, longer life may be expected of it.

The cabin was built ten years ago and the lead has withstood the ravages of all kinds of weather, for the climate of Vermont is about as severe as any to which building materials can be subjected. Annual temperatures range from 25 degrees below zero to nearly 100 degrees above. During the long winter deep snow is continually on the roof, melting underneath only when the camp is occupied and fires burning within. Alternate thawing and freezing in the spring is also a rigorous test.

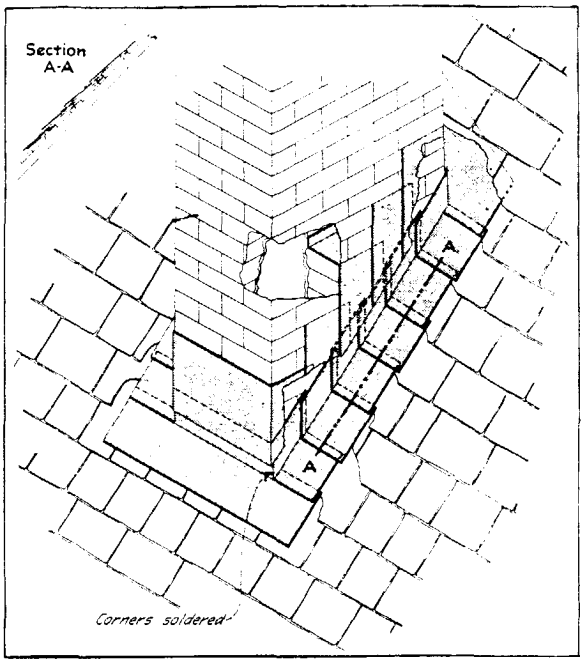
The best practice to follow in installing lead chimney flashing of this kind is to see that the cap flashing extends clear through to the flue lining and is there bent up an inch or two. The base flashing should be interwoven with the shingles and it is preferable to fasten it by the use of cleats rather than nails, although if the nail holes are covered by shingles there is no objection to using nails. The cap flashing should be dressed down over the base flashing and overlap by at least four inches the bottom edge being hemmed for rigidity. Minimum weights of soft lead that it is advisable to use are 3 lb. lead for cap and 4 lb. for base flashing. It should be born in mind that these weights are minimums and that the heavier the lead used the better, particularly in the case of base flashing, but the cost will naturally increase accordingly. Hard lead should weigh 2½ lb. for cap and 3 lb. for base flashings. Hard lead has the advantage of double the strength and is slightly more resistant to atmospheric corrosion than soft lead, although it is more expensive. It is recommended for general roofing purposes, gutters, valleys and large expanses of flashing in preference to soft lead for these reasons.







Details of lead chimney flashing on a Vermont cabin



How to install lead chimney flashing

Bullets from a Lead Roof in Old England

IN an old book, "Diary of Lady Willoughby," which tells of the English revolution in the reign of Charles I, there is the following entry dated Monday, October 20, 1644, which contains an interesting reference to lead:

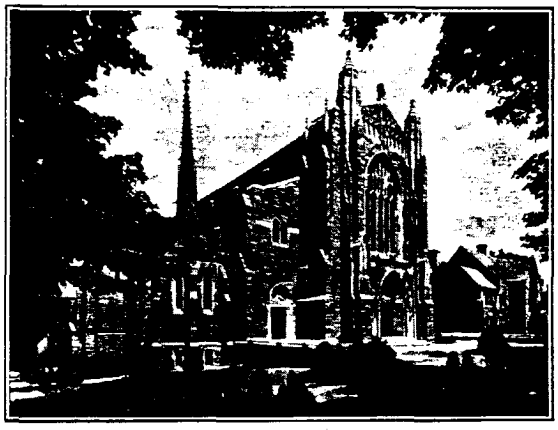
"Lieutenant General Cromwell wrote a Letter acquainting the Governour that if any violence were offered these Men, the best in the House should not expect Quarter. The Countesse of Winchester's Gentlewoman and Waiting-woman were killed by a Cannon-shot. Sir Marmaduke Rawdon declared to the Marquesse who proposed to surrender, he would not, so long as a dog, or a cat or rat did remaine: yet it would seeme there was not much Danger of such Extremity, there being found in the Castle vast store of Wheat and 300 Flitches of Bacon, and forty-thousand pounds weight of Cheese, besides Beef. They took off the Lead from the Turrets, to use for Bullets: and the Marchionesse with her Ladies did helpe to cast them."

Lead roofs are expected to give the utmost protection from the elements, but, as in this case, they have frequently gone a step further in the line of protection.

A Hard Lead Roof of Interesting Pattern

NEWLY erected Our Lady of Sorrows Church in South Orange, N. J., the work of noted Boston architects, Maginnis and Walsh, has an attractive hard lead roof, gutters, finial and down-pipe on the baptistry. The interesting diagonal treatment of the roof was accomplished by soldering false lead seams to the sheets in the desired design. On large areas this falsework should, of course, be broken at the real seams, which are loose-locked, so that expansion and contraction of the lead will not be impeded. Another way of constructing the lead work is to cut the sheets with diagonal edges, making loose-locked seams along these edges, and soldering the falsework to the upper sheets along the seams. In this way the falsework will not impede expansion and contraction and the real joints will be concealed. Otherwise the roof is installed as any lead batten roof with loose-locked seams and sheets held by cleats. The West Hoboken Roofing & Cornice Works, Union City, N. J., were the roofing contractors on this job.

Hard lead roofs, properly installed, may be expected to last indefinitely, because they are made of the common metal most resistant to atmospheric



WURTS BROS.

Our Lady of Sorrows Church, South Orange, N. J.

corrosion and are thicker than other metal roofs. Pleasing color and freedom from staining adjacent materials are also important factors.

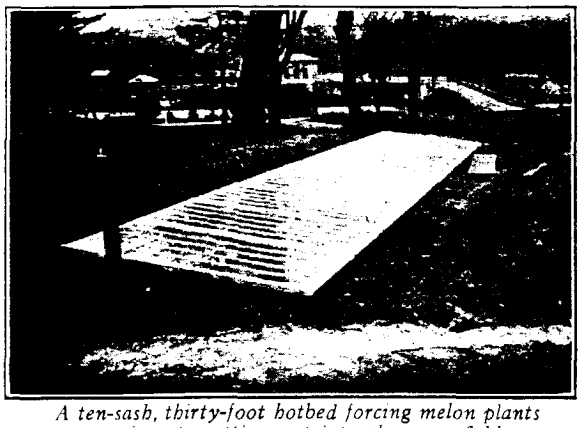
Many fine buildings of Europe stand under lead roofs that are centuries old. On pages 4 and 5 of the July issue of LEAD are listed seven advantages of lead for sheet metal work as seen by one of America's leading architectural firms.

Lead-Covered Cable for Hotbed Heating

By Maurice W. Nixon *

LEAD has recently invaded the field of agriculture. Seed germination and plant growth are greatly enhanced by proper soil temperatures, and it has been found practical to install lead-sheathed resistance wires in hotbeds and greenhouse benches to supply the necessary heat to the soil.

The photographs on this page were taken of a 30-ft. hotbed made at Schuylerville, Saratoga County, New York. The cables were laid in a two-inch layer of sand which made a good medium to distribute the heat uniformly between the cables. The six-inch layer of fine mellow soil was easily heated to about 80° F., at which temperature melon seeds germinated and the young seedlings grew very rapidly and were ready for transplanting in record time.



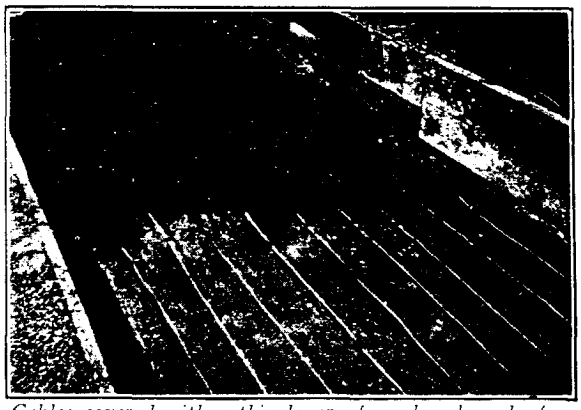
A ten-sash, thirty-foot hotbed forcing melon plants previous to setting out into the open field

This system of soil heating originated in Sweden. Due to the universal application, the use of electric heat in hotbeds rapidly spread through Germany and Holland, where an aggregate of many acres are now heated by imbedded resistance cables. Many experimental projects to investigate the possibilities of electric heat for hotbeds have been conducted in various agricultural experiment stations in America. In some places the practice has become an established gardening operation.

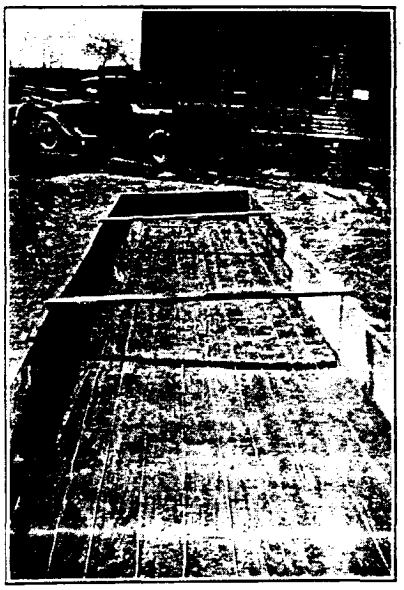
According to the General Cable Corporation, a manufacturer of special soil-heating cable, the cable is constructed of a special resistance wire served in opposite directions with a double wrap of saturated cotton. This is wrapped with a layer of 2½ mil paper tape and encased in a 3/64 in. lead sheath. The approximate outside diameter is 0.196 in. and the weight 105 lb. per thousand feet.

When making a hotbed the entire outfit should be made on a well-drained layer of cinders or other porous non-absorbing material having a good heat-insulating value. The sidewalls should also be banked with cinders to prevent excessive loss of heat through the earth. The heating cables should be imbedded in a layer of sand which will carry the heat from the

Box built on a layer of cinders and banked with cinders. Burlap bags and a thin layer of sand are spread over them



Cables covered with a thin layer of sand and ready for applying top-soil



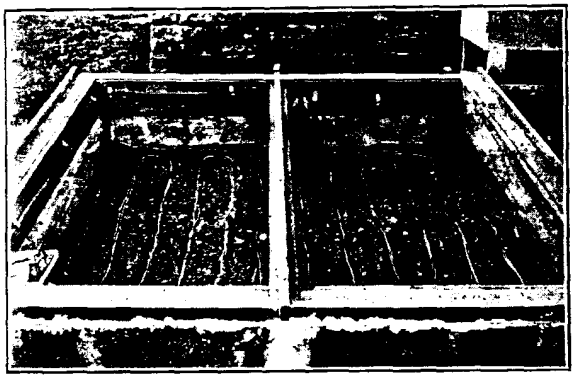
Heating cables laid out on the sand, properly spaced

* Rural Electrification Expert of the Empire State Gas and Electric Association, co-operating with Cornell University.

cable rapidly and tend to reduce the temperature gradient between adjacent cables and thereby make the temperature uniform near the surface of the soil. About six inches of fine, mellow soil over the sand then forms the media in which the seeds germinate and little plants grow. Old burlap grain or fertilizer bags spread over the cinders will prevent the sand filtering down through them. One or two sash may be used, depending upon the season and weather.

The cables should be spaced about six inches apart for best operation, and about 150 watts input provided per sash (3 x 6 feet). It is well to design the heating unit to have a lower degree of heat available for use in warm weather or when less heat is desired. A thermostat makes it possible to hold the soil within reasonable temperature limits and to vary the soil temperature according to the kind of plants being forced and the season.

There are many advantages of electricity for soil heating. A few of the most important are enumerated:



COURTESY NATIONAL RURAL ELECTRIC PROJECT

Electric hotbed at the University of Maryland with cable in place

1. Permanent installation—hotbed frame will last several years before decay makes replacement necessary. Only necessary to renew topsoil.
2. Always ready to use.
3. Easy to control moisture, due to excellent drainage which should be provided.
4. Low operating and maintenance cost.
5. May be converted into cold frame merely by turning off power.
6. Independent of outside temperature.
7. Uniform temperature regulation possible by use of thermostat.
8. Temperature does not fall off after four to six weeks as is characteristic of manure hotbeds.
9. Free from ammonia fumes.

This same type of soil heater may be modified somewhat and used in greenhouse benches for rooting cuttings or forcing plants in cases where a few degrees of heat is desirable above that supplied. Many other uses for lead-sheathed, low-wattage heating cable are being developed for farm, garden and greenhouse use.

COURTESY UNION ELECTRIC MAGAZINE

Lead-covered heating cable in a florist's cutting bench

WURTS BROS.

Lead greyhounds guard this gate on an estate at Old Westbury, Long Island

Lead Sheets, Believed World's Heaviest, Resist Ammonium Sulphate

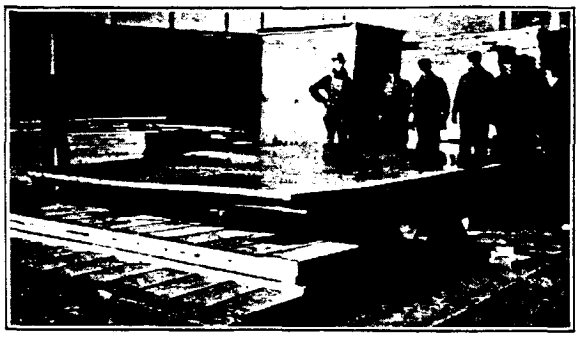
SOME of the heaviest sheets of lead that have ever been rolled are now being used by a large steel company on saturators in its coke plant. These sheets are 1¼ in. thick and weigh about 75 lb. to the square foot. They measure 9 by 20 ft.

The reason for using lead is to resist the corrosive action of ammonium sulphate, which is recovered in

This saturator in a by-product coke plant is lined with lead to resist corrosion by ammonium sulphate

large quantities as a by-product of coke. Sulphuric acid is the medium used to remove the ammonia from the gases and form the valuable fertilizer ammonium sulphate. Lead is highly resistant to the action of both of these corrosives.

This is only one of many uses of lead wherever corrosive agents must be handled. Manufacturers and consumers of sulphuric acid are the largest users of lead in the chemical industries, but the list of other commercially important corrosives with which this metal is employed is long. Not only has it been found advisable to use lead for equipment, but industrial plants often use it for structural purposes



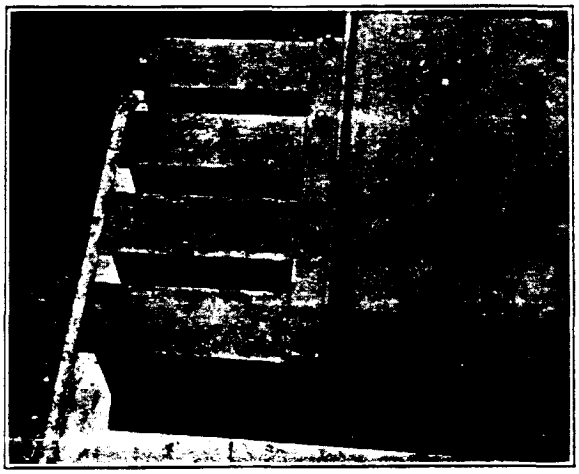
What are probably the heaviest sheets of lead ever rolled loaded on a flat car for shipment

because of corrosive gases in the air. That is why many industrial plants have found lead flashing and lead-covered skylight glazing bars economical. In addition sheet lead is often used on factory floors where spills of corrosive liquids might create hazardous or unsanitary conditions if they were allowed to soak into wood or concrete and cause deterioration of materials other than lead.

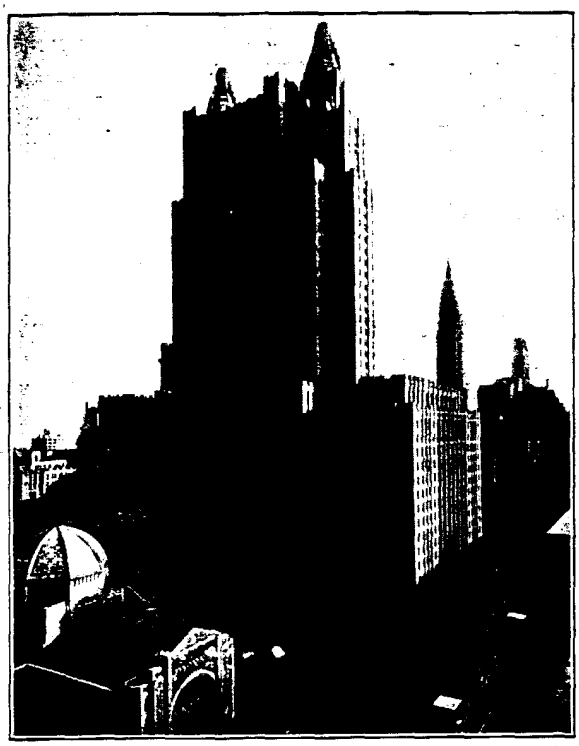
Waldorf-Astoria Rests Upon Lead Anti-Vibration Pads

FAMED for many years was the old Waldorf-Astoria Hotel at 34th Street and Fifth Avenue, New York, where now rises the Empire State Building, and equally famed was its genial host, Oscar. On October 1, two and a half years after the razing of its old building, the Waldorf and Oscar greeted the public from a magnificent new edifice, towering forty-seven stories on the entire block bounded by Park and Lexington Aves. and 49th and 50th Sts.

Many unusual steps have been taken for the com-



A lead-asbestos anti-vibration pad under a grillage of the new Waldorf-Astoria Hotel



THE NEWS STUDIO

New Waldorf-Astoria Hotel, New York

fort and convenience of the guests. There are lofty rooms with open fireplaces. A private railway siding is served directly by the hotel's elevators for those fortunate enough to own private railroad cars. Guests are protected from vibration set up by trains entering and leaving Grand Central Terminal a few blocks to the south traversing tracks among which the foundations of the building are set.

This protection against vibration is provided by the use of a lead-asbestos anti-vibration pad under each of the column footings. These pads are the same as those described in the November, 1930, and July, 1931, issues of LEAD. They have been successfully used by the New York Central Railroad for a number of years and prevent vibration from the tracks being transmitted up through the building steel. About 160,000 pounds of 8 lb. sheet lead were required for this purpose in the Waldorf.

The Waldorf also has used lead Cowing Pressure Relieving Joints, which will be described in an early issue of LEAD, to prevent disfiguration of its stone façade and to avoid the necessity of making future repairs to it.

Mr. F. B. Freeman is chief engineer of the New York Central Railroad, which supervised the construction of the foundations and installation of the anti-vibration pads. Schultze and Weaver were the architects, and the Thompson-Starrett Co. general contractors.

An Average Life of Eight Years for This White Lead Paint

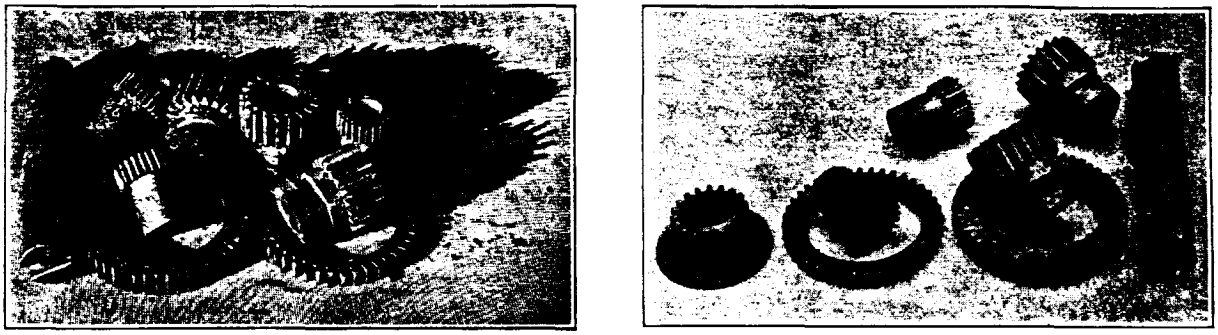
NO elaborate theories are needed as proof of white lead paint's remarkable durability and protective qualities. Not only on monumental buildings, great industrial enterprises and elsewhere, for which many tons of white lead are bought annually by experienced and trained buyers, but on millions of homes all over the world white lead daily proves its worth.

Here is an example—the home of Mrs. N. J. Perfield at Sumner, Wash. The owner states that she has always insisted on painters using pure white lead and linseed oil on her home, built forty years ago. The house has been painted only six times in all those years, the last time in 1930. Obviously white lead paint has given an average life of nearly eight years on this home and kept the wood in excellent condition.

Such durability, which minimizes repainting, would justify a considerable additional expenditure for each painting as the cost not only of paint but of labor as well recurs less frequently than with other paints. But white lead is no more expensive than other good house paints. In fact, at present it costs about $2.60 a gallon for materials, considerably less than any other paints which can be compared with it in point of service. Also, white lead wears by gradual chalking, so that at repaint time the surface is ideal to receive the new coat without expensive removal of old cracked paint films.

White lead paint has averaged an eight-year life for forty years on this home

Metal Cleaning Process Uses Thin Lead Film

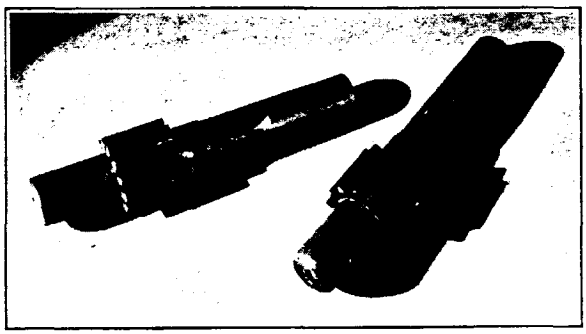


Parts before and after cleaning by the Bullard-Dunn Process

A LEAD film solves the difficult problem of cleaning scale and oxides from metal surfaces thoroughly without pitting, etching or hydrogen embrittlement in the Bullard-Dunn Process, recently discovered by the Bullard Company of Bridgeport, Conn. The process is simple and inexpensive. After parts to be cleaned have been freed of grease and oil they are made cathodes in a sulphate-chloride bath. Lead plates are used for anodes. Solution temperature is maintained at 150 to 170° F. Electrolysis of the water causes formation of hydrogen between the metal surface and scale, but a small amount of lead in the solution is deposited as a microscopically thin film on the metal itself as soon as it is exposed. This prevents any attack on the metal and any absorption of hydrogen which would cause embrittlement. As lead will not deposit on lead in this electrolyte at the current densities used, prolonged immersion does not increase the thickness of the lead film. There is only a deposit of lead sponge or powder easily removed by rinsing. High hydrogen over-voltage of the lead film causes automatic shifting of the current densities from cleaned surfaces as they appear so that remote parts and recesses are as thoroughly cleaned as the more exposed areas. If parts are to be welded or electroplated with other metals, the lead deposit can be thoroughly and quickly removed by treating anodically in an alkaline bath at 200° F.

Current densities of 60 to 75 amperes per square foot are sufficient and a standard 6-volt direct current generator is used. No close control of the temperature, the chemical strength of the solution or the current density is required.

The use of this process in regular production has shown the following results. Physical dimensions are unchanged regardless of the length of treatment. The number of grinding wheels required is materially lessened as a result of thorough cleaning prior to final grinding. The life of polishing wheels has been increased as much as 300 per cent and also due to complete removal of scale the "salt spray life" of electrodeposited coatings has been increased from 25 hours maximum to a minimum of 400 hours. Life of products has been increased as a result of complete cleaning in a process which does not attack the metal surface.



Similar parts, one cleaned by the lead film process, the other before treatment, showing excellent results

Another Air-Conditioned Train

AS a result of the popularity of the Columbian, first air-conditioned train, which the Baltimore & Ohio has been running all summer with air-conditioning equipment, the same road has been operating for some time a second train, similarly equipped, over the same run between New York and Washington. The air-conditioning equipment is operated from storage-batteries when the train is at rest or running slowly.

The Lead Industries Association invites inquiries on any subject relating to lead and will be glad to cooperate in the solution of your lead problems.

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