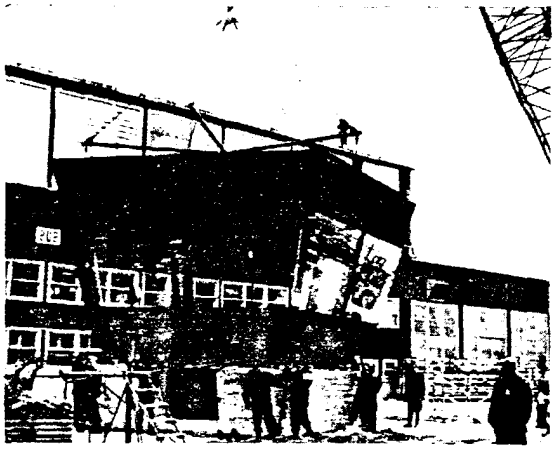
Lead sculpture.
See page 6.

lead

LEAD INDUSTRIES ASSOCIATION, INC.

292 MADISON AVENUE, NEW YORK, N. Y. 10017

Workers begin final installation of a prototype aircraft control tower cab. The cab, pentagonal in shape, is said to be the first pre-fabricated, pre-erected unit of its type ever built specifically for use in air traffic control.



Jet Noise CAN'T GET INSIDE

The airplane really isn't very new. Leonardo da Vinci invented a workable model. That was in 1512. It might have flown what's more, if sufficient motive power had been available. A modern jet engine for example. You may be sure, however, had there been jet engines at the time, the squawks by the good burghers of 16th century Florence about the noise would probably have been audible in the 20th century.

Complaints about jet engine noise are not necessarily new but now something is being done about it. When the Federal Aviation Agency recently commissioned the firm of I. M. Pei and Associates, architects of New York City, to design a prototype airport control tower, reduction of airborne noise took top priority. Stringent requirements for minimizing effects of airborne noise on tower personnel resulted in the use of sheet lead in roof components. Lead was chosen because its high density, good damping capacity and freedom from stiffness make it the best sound isolating material available. At the same time it eliminated the need for bulky, difficult to assemble and less efficient sound barrier panels. Laymon Miller, acoustical consultant with the firm of Bolt, Beranek and Newman, says lead in combination with other materials permits highest possible sound attenuation for a given surface weight, without loss of structural integrity.

Thus far, over 50 tons of 1-lb. per sq. ft., 1/16 in. thick lead have been used in the towers based on the original design. The roof section of the structure consists of a 2 in. layer of insulation on top of the steel roof deck followed by the lead and an asbestos board underlayment for the neoprene roofing surface. About 35 units will be used before the project is finished. They are the first prefabricated structures ever built specifically for aircraft control operations.

MOVE IT ELECTRICALLY!

In the case of The Lau Blower Company we are talking about air, of course.

At Dayton, Ohio some 245,000 square feet under roof are being used to produce approximately 40 per cent of Lau's entire production of fans and blowers. Air handling is their business, and on every side you can see why Lau is considered a giant in the industry. Other plants are located in Cleveland, California, Indianapolis, and Canada. The Indianapolis plant alone produces more than one million propeller fans of assorted sizes each year.

Here at Dayton the most modern methods are being employed and plant management is constantly seeking better techniques for production facilities. A case in point is the recent decision to "go electric" in material handling equipment—specifically fork lift and in-plant trucks. "The comfort and conveninece of our employees is one of our continuing efforts and electric trucks certainly make a contribution to this, with their lack of noise and dirt", said the manager. Of course, other practical considerations are to be counted on the plus side, too, according to management. These are such things as precise controllability, low operating costs, low maintenance costs, and long equipment life.

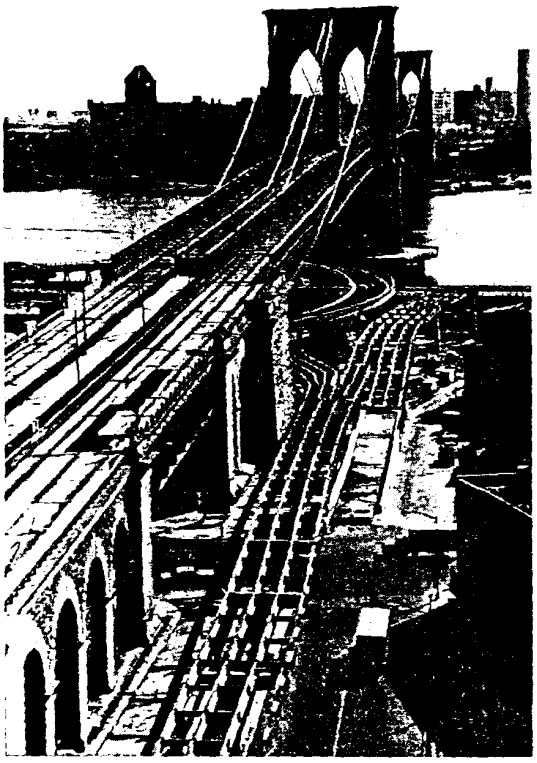
One of the "old-timer" electrics still handling skids of stampings throughout the Lau plant.

The move to battery-powered vehicles in this plant started when management visited an industrial show of electric vehicles sponsored by the Dayton Power and Light Company. They reported the show was enlightening, to say the least. It was here they learned that some of the old shortcomings of electrics were just no longer in the picture: slow speeds, short battery life, limited capacity of batteries, poor performances on ramps, etc. For the first time it was learned that the new batteries, the new electronic controls, and the new charging techniques were eliminating all those difficulties. And so—

Lau is *on the move—electrically!*

Stacked coil steel is no challenge for this electric truck which will now work as long as two full shifts on one battery charge.

A "walkie" electric truck equipped to handle dies. Controls are so sensitive that precise maneuvering required here is no problem.



The Brooklyn Bridge . . .

LEAD PIGMENTS TIE A NEW APPROACH RIBBON

For the past several months, motorists passing up and down the major highway along Manhattan's East River have noticed a growing ribbon of orangish-red steel working its way toward the approach ramp of the Brooklyn Bridge. Planned and supervised by the New York City Department of Highways, the new approach ramp is part of an overall plan to ease traffic congestion on City streets in the area and on the bridge itself.

The Brooklyn Bridge has been painted with a three coat system of lead in oil paints since it was built in 1883.

This ramp, which is on the south side of the bridge is for traffic heading to Brooklyn. An additional ramp on the north side is planned to handle vehicles coming from Brooklyn. Lead pigmented paints will be utilized on both ramps, as well as having been on the Brooklyn Bridge itself since it was erected in 1883.

Many motorists, indeed, even some City officials have commented on the bright orange steelwork (which happens in this case to be a red lead in oil primer) and suggested that the entire structure be painted that color. This of course won't be done for the sake of uniformity and because this primer is not formulated to be used also as a finish coat.

Marine atmospheres, such as exist here require extra corrosion protection, that's why lead pigments are used in each coat on the structural steel. Lead pigments in the paint system provide economical, long range protection.

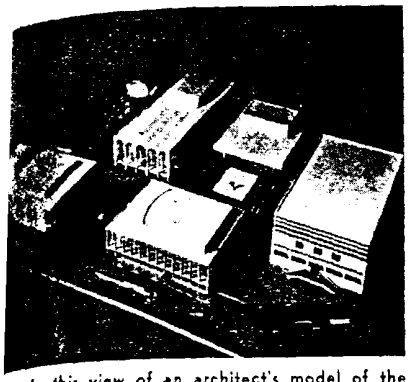
It is interesting to note that when it opened on May 24, 1883, tolls were fixed as follows:

Foot passage	1 cent
RR car passage	5 cents
1 horse & vehicle	10 cents
2 horses & vehicle ...	20 cents
Neat cattle, each	5 cents
Sheep, & hogs, each ..	2 cents

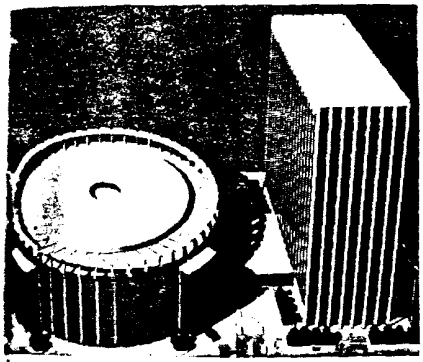
Part of orange ribbon which is access ramp to Brooklyn Bridge. Orange is lead primer used to protect steel during fabrication.

PADS ABOUT TOWN

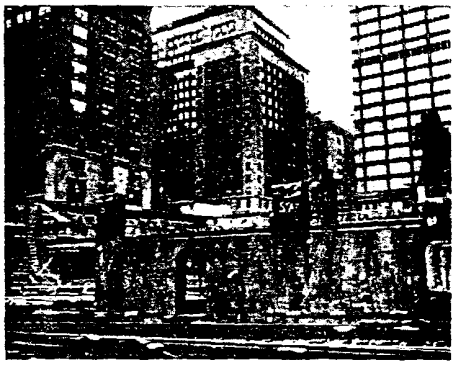
a round-up of uses of lead-asbestos antivibration pads in New York



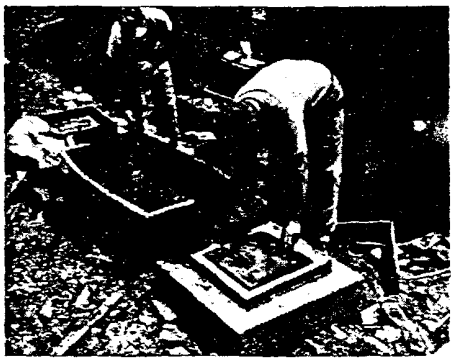
In this view of an architect's model of the Lincoln Center complex, the upper building in the center is the new Metropolitan Opera House and the lower (nearer) is the Philharmonic Hall. Both are built on lead pads to isolate them from the Broadway Subway —diagonal at lower right. Federal and New York City funds paid for these buildings. Other recently built structures financed by the city have also used lead-asbestos pads: additions to Brooklyn College and the new New York City Public Health Labs.



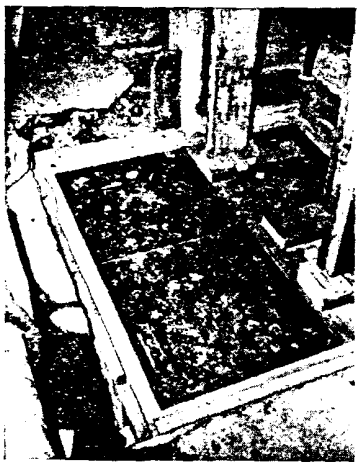
The new Madison Square Garden Center, to be completed this Fall, occupies the site of the old Pennsylvania Station. The striking circular structure is a 13-story high sports and entertainment center. A total of 325 lead pads in its foundation will separate the roar of the crowd from the roar of the trains in the busy station facility.



A spanking new office building now stands on this site at 277 Park Ave. The main trackage of the Grand Central Terminal is quite evident. Note the steel columns, from a 1917 apartment house, marked "stay." These have lead-asbestos pads in the footings and were re-used in the erection of the new building. The Union Carbide building, also resting on pads is in the background, right.



Less spectacular, but also typical of lead pad use, these small pads were used to isolate a new apartment house in the Bronx from railroad trackage near Grand Concourse.



Close up of pads for one of the new columns at 277 Park Ave. All columns of the building were isolated, 4500 sq. ft. of pads in all.

LIA26488

"Man Emerging" shown nearing completion. Produced by a remarkable high relief technique, the panel is five feet wide and has almost three feet of depth. The effect is that of a free-standing form. One of the dancing figures and the girl's head are in the background—all are lead.

He Starts With A Sheet

The uninitiated observer, however much he enjoys and appreciates sculpture, has only the dimmest notion of the processes by which it is made. He is aware, vaguely, that a lead or bronze cast figure entails sketches and studies, small-scale clay models, armatures, mold making and parting, casting, and finishing of the final piece.

Sculptors themselves, of course, are familiar with these processes and their technical problems. The artist may chafe or bear up stoically, but he has to put up with them—or *did* have to put up with them. Dave Alan of Devco, Fairfield, N. J., is opening up a new, shorter path between concept and completion of statuary.

He starts with a sheet of lead. He likes to call what he does to it "manipulation" and that covers two methods of working it:

High Relief — The first of these produces a very high relief panel, except that it doesn't strike the viewer as relief. Shown working on "Man Emerging" he gives an idea of the scale on which the figure is proportioned. No photo can do justice to the full round effect which the actual work projects. Part of the reason is that the contours extend 18 inches forward and 15 inches backward from the plane of the panel.

This piece started as a sheet of lead 16 feet high and 5 wide, $\frac{1}{4}$-inch thick throughout. This was bolted into the steel support structure shown. Then, a full size sketch was made on the lead in chalk and two men began the rough forming with mallets and hardwood tools. Both sides were worked. When deformation hardened the lead, it was heated and annealed in the hard area.

When it was roughly completed, Mr. Alan started the solitary work of developing the details and nuances. Using progressively finer wood tools, he sharpened expressive lines, textured surfaces, and brought the piece to completion.

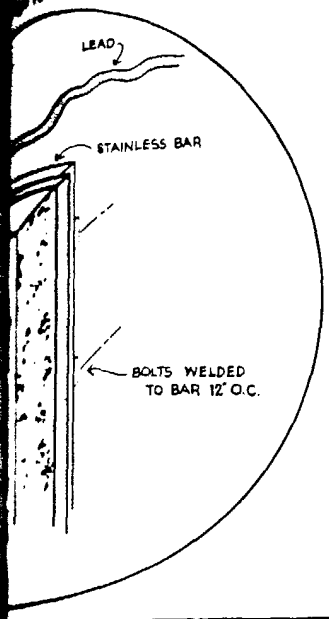
"Direct working in lead is gratifying," he says, "because the desired form and effect are rather quickly achieved once you master the handworking techniques. The hand textured finish enhances the overall appearance and gives a one-of-a-kind feeling, full of warmth and depth of feeling. And it's a practical and economical method, too."

For a permanent, invisible mo
ing of these high relief pieces,
Alan removes them from the w
ing frame and bends the edge sur
under, until it is parallel to the
face plane. Then, stainless steel b
with studs welded to them are pla
in the concealing fold. Nuts on
inside of the bearing wall clamp
whole piece in place.

Free standing forms — Carryi
the sheet technique further, he is n
completing a group of three danci
figures which will stand in a po
and fountain. Each 14 feet high, th
are made by constructing a conve
tional armature, modeling thin she
lead over it to the finished form. a
filling the voids between the armatu
and the lead with an inert castin
material. Hand working develops t
desired texture here, too, and this
supplemented by manipulating th
lead sheet to produce shadow hig
lighting.

The inert backing for the lead
a casting material which reinfor
it. The result of quite extensive
perimentation, it has excellent rig
ity and bonding characteristics.

...relief panel mounting detail (see story).



... dancing figures, partially completed, ... some of the armature.

...atherability is good and it has a ...efficient of expansion similar to ...t of the lead itself. Dave laugh...ly calls it his witch's brew—and, ...derstandably, prefers that its com...ition remain a "deep, dark secret." ...No stranger to traditional tech...ques, Mr. Alan produced the life...e girl's head, *(cover photo)*, by ...sting lead. But of his current work ...two companion high relief panels, ...four-foot-high frieze, a board room ...all, two lobby wall plaques, and the ...ree dancing figures planned, com...issioned, or in progress—all make ... of the sheet techniques.

...Devco of 36 Pier Lane West, Fair...field, Essex County, New Jersey, ...makes and procures architectural ...art. It maintains branches in Flo...rence, London, Paris, and Istanbul. ...Man Emerging" was commis...sioned by M. Devrishian Associ...ates, Architects, in conjunction ...with Moses Realty Company.

View of the Depue plant of New Jersey Zinc Company during erection. Absorption towers are to the left of the 200-foot stack.

Largest Precipitator . . . has 154 lead pipes

Lead's excellent resistance to corrosion by sulfuric acid causes it to be used in a wide variety of chemical equipment in the chemical industry. One of the largest and most complex of these is the electrostatic mist precipitator and the largest precipitator yet is now going into operation.

The new unit is at the New Jersey Zinc Co. plant at Depue, Illinois. The unit employs 154 lead pipes. Each pipe is 10-inch in diameter and 15 ft. long. All of them have 10-lb lead, 5/32-inch thick, walls. Walls of the upper and lower chambers are also of 10-lb sheet lead. The walls are reinforced with cage-type steel strap construction. (For another interesting example of the use of cage construction, see LEAD, Vol. 30, No. 2, "Bottoms Up.") The 2,310 running feet of pipe and the upper and lower collection chambers comprise over 100,000 lb of lead.

The SO_2 gas used as raw material for the production of sulfuric acid is first passed through a scrubber where dust particles are removed. The gas then passes to the lead precipitator.

Since the gases from the scrubbing tower contain a small amount of sulfuric acid as a fine mist, it must be removed before the SO_2 gases are admitted to the contact section of the plant. The physical nature of this mist is such that it cannot be removed by scrubbing so a mist precipitator is provided.

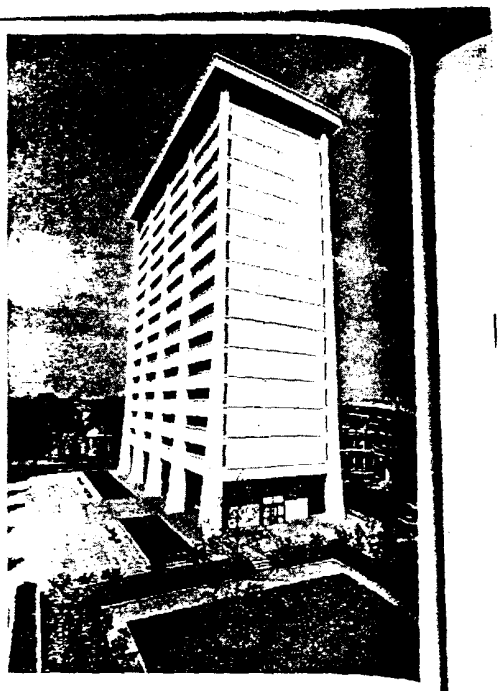
The mist precipitator is a device for producing a strong electrostatic field in a group of pipes through which the gases pass. The electrostatic charge imparted to the mist particles causes them to travel through the gas and collect on the side walls of the pipes. The resulting weak acid solution runs down the pipe walls and from the precipitator through a seal leg to the liquor collection tank.

It is of the *utmost importance* that the mist precipitators function at all times when gas is being delivered to the converter. The contact mass in the converter can be damaged if the H_2SO_4 mist is allowed to pass into it for any appreciable length of time.

The precipitator was designed and supplied by Western Precipitation Group of Joy Manufacturing Co.; the entire sulfuric acid plant installation was designed and built by Chemical Construction Corporation; the lead work was done by Larry Goad and Co., St. Louis.

Reflections Of Harvard

Overall view of building.



When Harvard University was founded in Newtowne, Massachusetts in 1636, Boston was a village and Cambridge didn't even exist. The last few decades, however, have wrought more changes than the more than three centuries preceding them.

No longer is it possible to move out in ever widening circles from Harvard Yard. As is happening elsewhere in our increasingly urban society, the economics of land use have finally required that Harvard's buildings "go up in the air."

One of the first buildings to mark this new phase is the William James Hall of the Behavioral Sciences by architect Minoru Yamasaki and Associates of Birmingham, Michigan. The building is set back more than 60 feet from the street with an asymmetrically placed entrance flanked by lead lined reflecting pools between which one walks into the building.

Closeup of shimmering pool.

More than 13 tons of 6 lb. (3/32 inch thick) lead was used to completely line both pools. All joints were burned. Lead sheets were laid on top of asphalt impregnated building felt. Top surfaces were painted with a cold applied brush coat of a bituminous coating compound which is standard protection against temporary corrosive attack from free lime in fresh mortar, concrete, fill or grout.

Lead surfaces were also covered with a slip sheet before application of fill and finish. The sheet lead was carried up the sides of the pools and into reglets cast in the cheek walls. Ends were then secured by lead wool calked into place.

These pools, along with other furniture and paving patterns in the forecourt, provide an elegant setting for the building.

Actually this forecourt is also a roof over a busy underground area devoted to research, examination, storage and utility rooms. The trouble-free use of these areas, without restriction from the above ground pools, was assured by installation of sheet lead membrane waterproofing.

One feature expediting the job, according to O. G. Kelley of Boston who handled the lead work, was the amount of shop work done. Plumbing was roughed in accurately, and fittings were temporarily installed and coordinated with the lead lining.

Fittings were then removed and boots or collars of lead were burned to them in the shop before final installation.

Detail of shop fabricated fitting after installation.

Overall coordination of this and other work was handled by the George A. Fuller Company as general contractors in cooperation with Harvard authorities.

The presence of water as a part of the design concept of this building is particularly appropriate. It illustrates the increasing awareness of the part water plays in our lives.

Man has always been aware of the fact water is vital to his very existence. But the tranquil effect of still water in a pool or the living thing a shimmering surface or a leaping fountain becomes, point up the fact that water is not only vital to our lives but can have an influence on our behavior as well.

Leaded Porcelain . . .

SIGNS of the TIMES

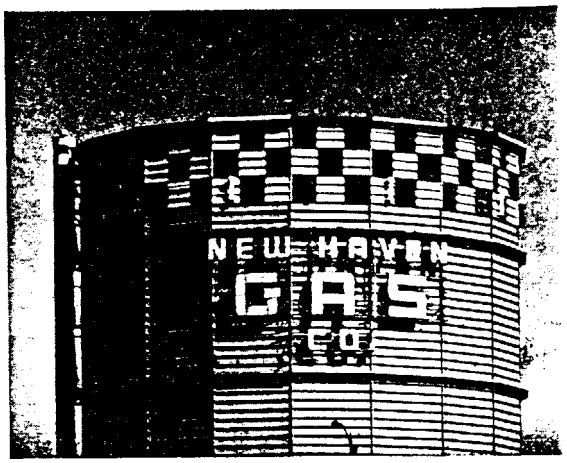
To a porcelain enameler, shape can mean everything. Sometimes it means he can't risk putting his porcelain enamel on steel parts—intricate shapes may pose serious production problems. Of course, leaded porcelain enamels for aluminum would be ideal for coating such highly formed parts. But these enamels cannot satisfactorily be applied to steel.

Now however, some porcelain enamelers have found an answer to the problem—porcelain enameled aluminized steel. Possessing the strength of steel yet the low-temperature enameling characteristics of aluminum, aluminized steel affords enamelers the advantages of both materials without the customary drawbacks.

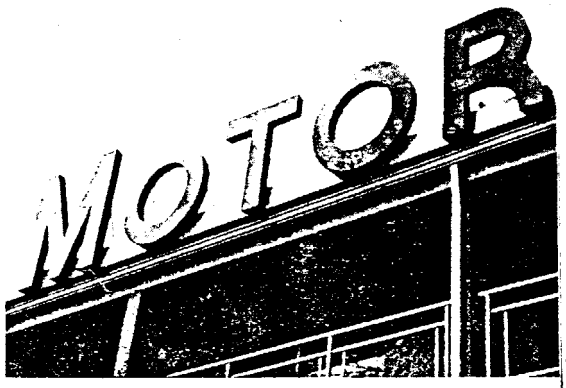
Signs are one of the more interesting applications for porcelain enameled aluminized steel. Large or small, exterior signs such as those shown here have always posed a special problem. The metal backings are usually quite severely formed or drawn, or both. And, being metal, they always presented a potential corrosion problem. The marriage of low-temperature leaded porcelain with aluminized steel has now practically eliminated corrosion and maintenance considerations.

One porcelain enameler who has been supplying a lot of porcelain enameled aluminized steel lately is Mr. Robert Goodman of Porce-Len-Inc., Hamden, Connecticut. Mr. Goodman, Vice President of the enameling firm, says outdoor sign companies are enthusiastic about "P.E. aluminized" as he calls it, because the maintenance costs are almost non-existent (as far as the porcelain enameled parts are concerned, maintenance is not required, but other parts of the sign may be damaged by storms or vandalism, for instance the illuminator mechanism, or the translucent glass or plastic letter facing).

Says one of the outdoor sign companies who have several of Mr. Goodman's porcelain enameled aluminized signs in use, "Of course, initial costs of the signs will be higher than would non-porcelain signs, but that is quickly offset by the reduced labor costs for maintenance, and we expect these signs to be in use for many more years."



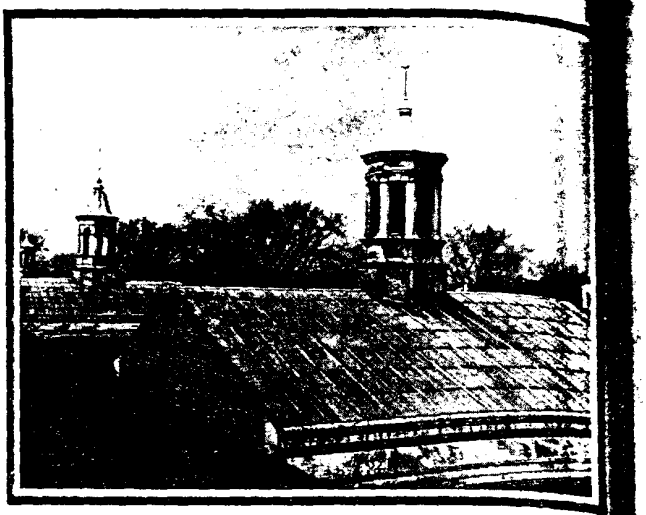
High Signs — Gas holder in New Haven, Connecticut, has huge porcelain enameled aluminized steel letters. Sign looks crisp and new even after many years service because porcelain enamel finish resists corrosion.



Sign of hospitality — Motor lodges and hotels around the country have used porcelain enameled aluminized steel signs because of extreme durability and low maintenance costs.

Company Signs — Always look attractive and help convey image of good housekeeping.

Cupolas like this one on either side of the Museum as well as the roof sections are hard lead.



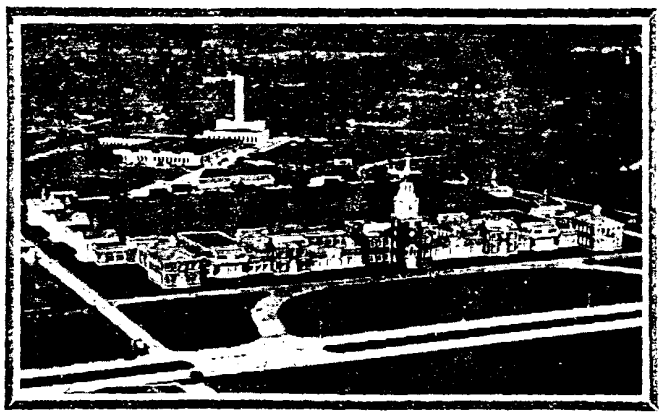
Ford had a better idea . . . in roofing

Where else in all America can one stand in the room where Noah Webster wrote his dictionary, walk 20 feet to the home of Robert Frost and, finally, cross the street to the Court House where Abraham Lincoln practiced law?

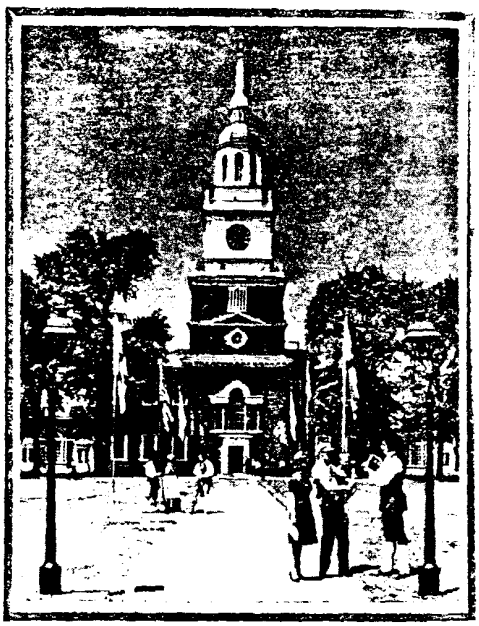
Where else but at the Henry Ford Museum and Greenfield Village in Dearborn, Michigan. Here, not reproductions but actual buildings, brought from far and wide, have been grouped. Founded in 1929 by Henry Ford, the 260 acre indoor-outdoor museum complex houses historically significant technological, educational and artistic Americana. All of the buildings built to house these exhibits, as well as many of those transplanted here, are the finest examples of colonial architecture in America. In other words, the jewel boxes are fitting containers for the jewels.

Consistent with this effort on the part of Mr. Ford and his architects is the quality of the materials used throughout. The work of roofers and craftsmen, working with hard lead, played an important part in the construction of the Museum. Hard lead was used in forming all flashings in connection with slate roofs and gutter linings, covers for tops of all exposed wood cornices, coverings for all wood railing caps, and roofing on all pitched gable roofs and tower decks in addition to many other details.

The original story of this Museum was published in LEAD, July 1931, two years after its opening. The accompanying aerial photograph, taken about that time, can be compared with a recent close up of the replica of Independence Hall. Trees more than 60 feet tall mark the tremendous changes which have occurred in the past 38 years. The lead however, aside from the development of its characteristic silver-gray patina, has remained unaffected by the years. As an additional bonus, Museum officials report very little maintenance work has been required over that length of time.



AERIAL VIEW OF MUSEUM IN 1929



. . . CLOSEUP OF CENTRAL PORTION 38 YEARS LATER

Interesting Odds 'N' Ends about Lead

Replica Of Famed Schooner "AMERICA" Sails With 20 Tons Of Lead Aboard –

Approximately 20 tons of pig lead have gone into The F. & M. Schaefer Brewing Company's full-scale replica of the internationally-known racing schooner, "America," whose singular victory over the best English sailing vessels in 1851 served as the forerunner of the America's Cup Series.

Pictured are two workmen of Goudy and Stevens, designers and builders of yachts and commercial vessels, separating part of America's 15-ton lead keel from a mold at the company's East Boothbay, Maine, construction facility. Another five tons of lead was used as ballast for the big schooner.

For whom the bell doesn't toll . . . Balky doorbell at your house? One LEAD reader passes along this tip. The doorbell button, if located so as to take a severe weathering, is probably the culprit. The contacting brass strips inside the button corrode and fail to make a conductive electrical contact. After three minor repair jobs (disassembling the button, shining the surfaces with steel wool) and attempts to waterproof it, he simply tinned the contacting faces with ordinary solder, leaving a heavy layer on the faces. More than a year of trouble-free operation now backs him up. (Previous record: 6 months.) Ask not for whom the bell tolls. If you have a soldering iron, it can toll for you.

. . . by any other name . . . Users of lead and other nuclear shielding materials are now able to make use of a new computer retrieval system for neutron data. Developed at Lawrence Radiation Lab of the Univ. of California, it's called 'Computer oriented system and newly organized storage-to-retrieval apparatus.' Considering that that is quite a mouthful, its whimsical developers expect it to become better known by its initials—COSA NOSTRA!

Incidentally—Lead, the other morning, was an unwilling party to mayhem but arrived triumphantly a bit later to help save the day. It started with a phone call to police from a Bronx, New York landlady. An obstreperous tenant had hit her over the head with a lead pipe. When police arrived they captured the tenant—who was armed. The police had much less to fear than they might have. They were wearing lead-lined, bullet-proof vests according to a recent issue of *The New York Times*.

A Little Bit Off The Top! – When the "top" is an ultra-highspeed gyroscope a "little bit" is very little indeed. Balancing these precision instruments calls for hairsplitting adjustment. A technique that won U.S. Patent 3,301,090 calls for two lead electrodes on opposite sides of the gyro, connected by a glass tube containing lead fluoborate solution. When the balance needs altering, an electric current, in the right direction, removes a milligram or so from one electrode and electroplates it on the other.

Pb

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lead

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