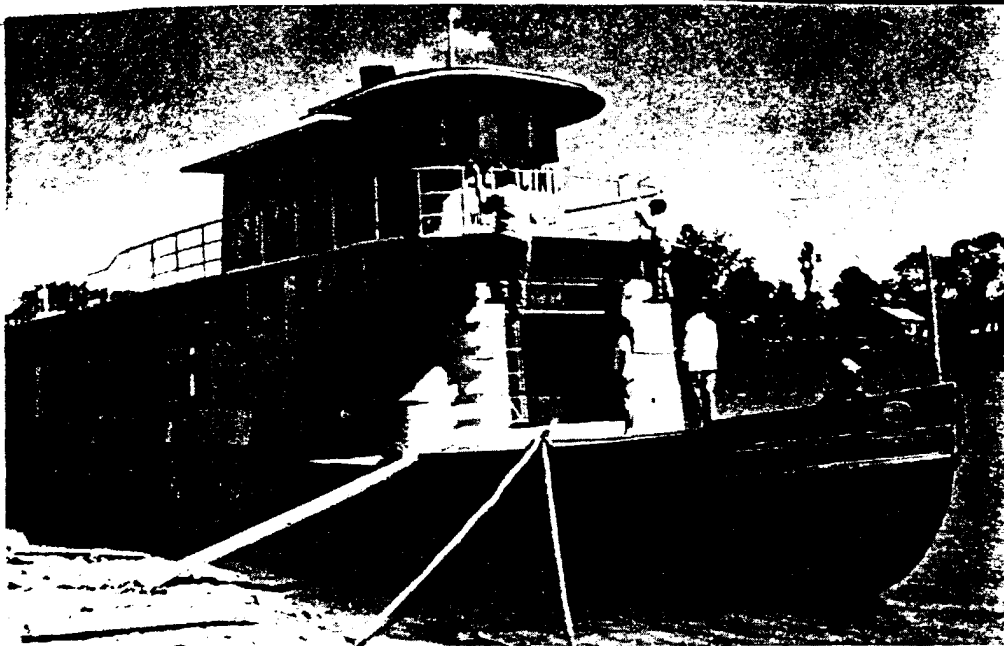




lead

LEAD INDUSTRIES ASSOCIATION, INC.

292 MADISON AVENUE, NEW YORK 17, N.Y.



The compact mercy ship *Messenger of Health* visits the Indian villages of Tabasco Province, Mexico, to provide the latest medical methods and equipment for fighting tuberculosis. The ship houses staff living quarters, laboratories, clinic rooms and an x-ray room completely shielded by lead sheet bonded between enameled metal facing panels.

This Mexican equivalent of our Chrysler seal is sold to finance the work of the Institute Against Tuberculosis in Mexico, sponsors of the floating clinic.

Shielding the 'Messenger'

Sheet lead walls for a clinical x-ray room and enameled metal wall panels are making their contributions to the humanitarian work of the clinic ship, *Mensajero de la Salud* (*Messenger of Health*). The 55 ft. long ship, operated by the Institute Against Tuberculosis in Mexico, travels the rivers and streams of Tabasco Province in a fight against tuberculosis among the impoverished Indian population.

X-ray examination is essential in the treatment of t.b. and the x-ray room aboard the ship is shielded with $\frac{1}{8}$ in.

lead sheet bonded between enameled panel facings. This barrier protects personnel and prevents the radiation from fogging film in the adjacent darkroom. Sheet lead offers the most effective and economical protection available for an installation where deck space and weight are at a premium.

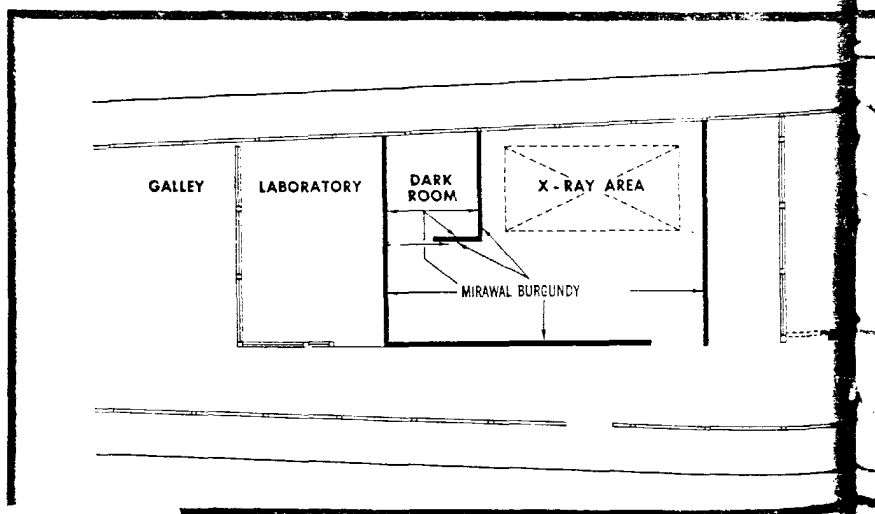
Cabin walls are made from colorful porcelain enameled panels faced on both sides. Tropical dampness and insects ruled out the use of wood, and the porcelain enameled surface pre-

vents corrosion, can be easily hygienically clean and offers an important advantage in providing bright, cheerful surroundings to reassure skeptical patients.

Indians were afraid

This last is very important, as the ship's first trip was a failure; the Indians were afraid of the doctors and nurses who were sticking them with "sharp nails." After explanatory pictures were shown on the trip, the ship and its work have been a welcome.

Deck plan of the *Messenger of Health*. The lead shielding around the x-ray room is shown by the heavy line. In addition to the hospital facilities indicated here there are staff and crew cabins. The high premium on space dictated the use of compact, dense lead sheets for x-ray shielding.



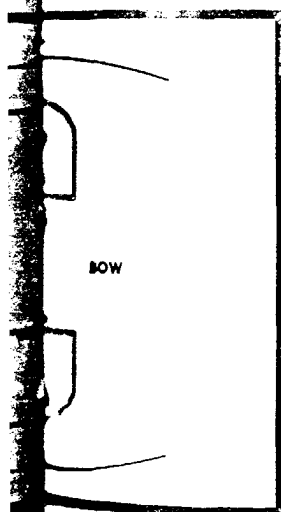
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of Health'

The sponsoring Institute, a non-profit project, largely financed by the sale of a stamp much like our familiar Christmas seal, is concerned primarily with the Indians because of the high incidence of t.b. and because Europeans who originally gave the Indians the disease have done little to fight it.

The lead x-ray shielding and the panels used throughout the superstructure of the *Messenger* were supplied by the Mexican associate of Mirawal company, Port Carbon, Pa., La Cantera, of Mexico City.



LEAD SHOWS PROMISE FOR TREATING COTTON

Treatment of materials to improve one or more of their natural properties is common practice. In the textile field treatment of cotton with plumbous lead chromate to increase its weathering stability is well known and commercially practiced. Tobacco shade cloth treated in this way is a good example. Cotton treated with lead chromate has an orange color which may be objectionable in some applications.

A few years ago the Agricultural Research Service of the United States Department of Agriculture sponsored a systematic study of the treatment of cotton with various inorganic oxides and salts. The work was conducted at the Texas Woman's University and at the outset involved a literature survey of some 700 references.

A systematic screening of oxides and salts of metallic elements was then undertaken. Compounds were selected from various groups of the Periodic Table. Seventy-four of these compounds, selected on the basis of their apparent insolubility, were applied to cotton which was then subjected to a battery of tests for evaluation.

These resulted in selection of nine of the compounds for further study. A second series of tests was conducted on these nine compounds and on lead chromate, already known to perform well in improving weatherability. Among these nine outstanding compounds was plumbous lead hydroxide.

None of the compounds was found to be a panacea but all contributed to improvement of certain properties. The lead hydroxide resulted in white treated cotton as compared with the orange of lead chromate. Both showed good retention of the added material on the cloth after leaching and laun-

dering and after three months of outdoor weathering. The lead chromate aided the stability to outdoor weathering and to actinic degradation materially, but the lead hydroxide did not. Both were effective in retaining wet breaking strength after exposure to atmosphere contaminants and improving stability to heat degradation. Both reduced flammability but the lead hydroxide was outstanding among all the materials tested in this respect. Both lead chromate and hydroxide improved thermal stability and the hydroxide excelled in water repellency.

Good water repellent

The Agricultural Research Service report covering these tests concluded that all nine compounds in the second and more severe set of tests showed attributes that warranted for the investigation under practical conditions. Of lead hydroxide finished cotton, it said, "Lead hydroxide finished cotton was a white fabric which differed from the other whites in having no resistance to weathering, although it was found to have very good resistance to atmospheric contaminants. This fabric had the added virtue of possessing the best resistance to burning of any of the nine experimental compounds, together with good to very good water repellency."

There are literally hundreds of lead compounds available commercially or in experimental quantities with a great variety of interesting properties. They range from organo-metallic anti-knock compounds, through paint pigments and driers, and ceramic fluxes, to lead hydroxide, one possible application of which has just been described. Among these interesting chemicals may be an answer to your problems.



Battery-powered pool cover keeps out children and prevents accidents when pool is unattended.

BATTERY POWERED LIFEGUARD

TOT, 3, DROWNS IN BACKYARD POOL

These are words that strike fear into the hearts of all parents who may own or live in the neighborhood of an unprotected swimming pool. Fortunately, a new invention is being marketed that — with the help of a lead-acid battery — is capable of completely sealing a swimming pool in a matter of one or two minutes.

With swimming pools being built at a rate of 60,000 per year, concern for safety around unattended pools is rapidly assuming importance. And safety was a prime consideration in the concept and design of the Pool-Deck,® a sturdy all-metal cover which folds like an accordion beyond the edge of

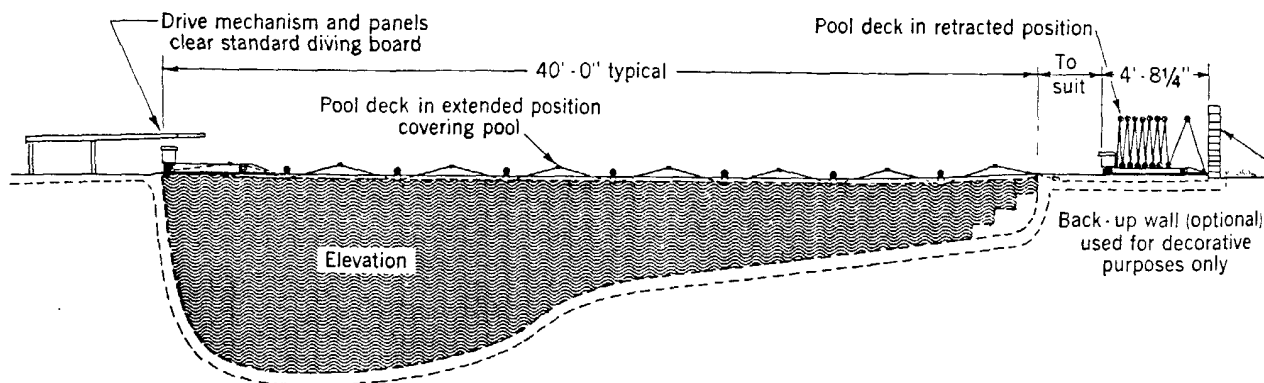
the pool while you're swimming — yet keeps children out and prevents accidents when unfolded and automatically locked in place.

Operating on 6 or 12-volt lead-acid battery power, or house current, this permanent aluminum cover cannot be moved without the owner's removable push-button switch cord. The 12-volt battery system is recommended, and, says Pool-Deck's Sales Manager, Edward Clark, "We have been using lead-acid batteries with great success. Life factors are very good, and we have enjoyed complete satisfaction with their use."

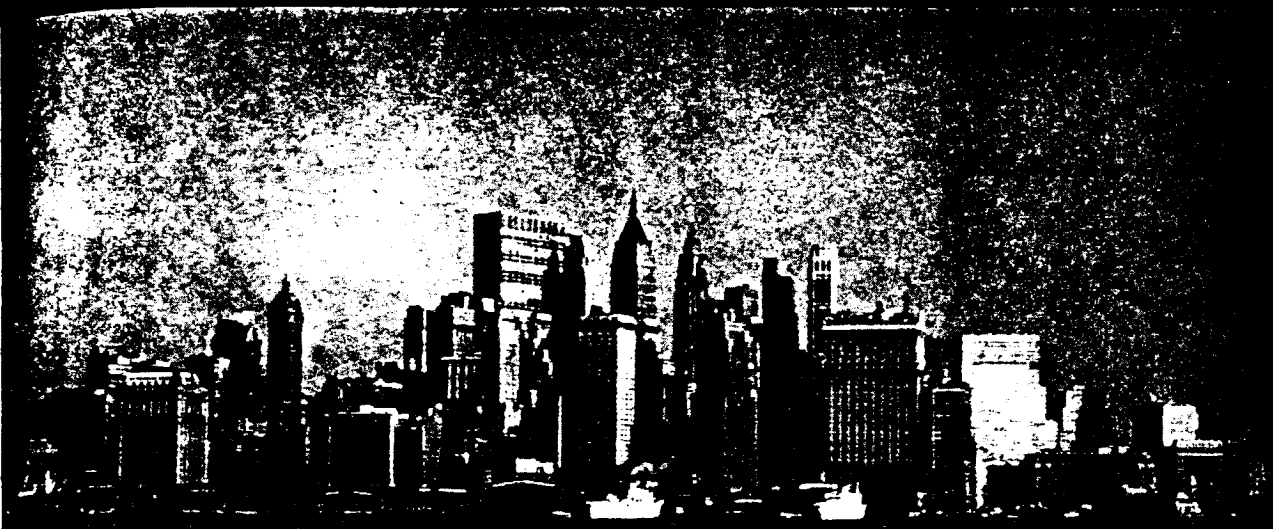
Noting that fences often serve only to heighten the challenge rather than to protect a child intent upon "taking a dip," Clark points out that the pool

cover offers the additional bonus of much lower chemical and cleaning costs. Also, in some areas of the country, installation of a Pool-Deck cover allows year-round use, and where pools must be heated, reduces heating costs to a minimum.

A wide choice of colors that harmonize with pool and patio surroundings is available. The Pool-Deck is so designed that it does not interfere with a standard height diving board, and there is no limit to the distance it can be run beyond the edge of the pool — with no tracks, chains or cables to disfigure the pool area. Manufactured in Bakersfield, California, the Pool-Deck has been approved by the Department of Building and Safety of Los Angeles, California.



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LEAD ANODES PROVE OUT IN BRACKISH WATER

LEAD ANODES have proven themselves for impressed current cathodic protection systems in soil burial, salt water, and in industrial waste systems. Corrosion engineers, however, are necessarily a conservative group and until now have not sanctioned the use of lead anodes in brackish waters. The science of corrosion control is so full of inconsistencies and paradoxes that it is wise not to predict behavior under untested conditions.

Now, however, it can be said that the anodes are effective in corrosion protection under these conditions, too. A year-long test in the Hudson River

(North River Pier) showed that lead anodes are less expensive to use than other types.

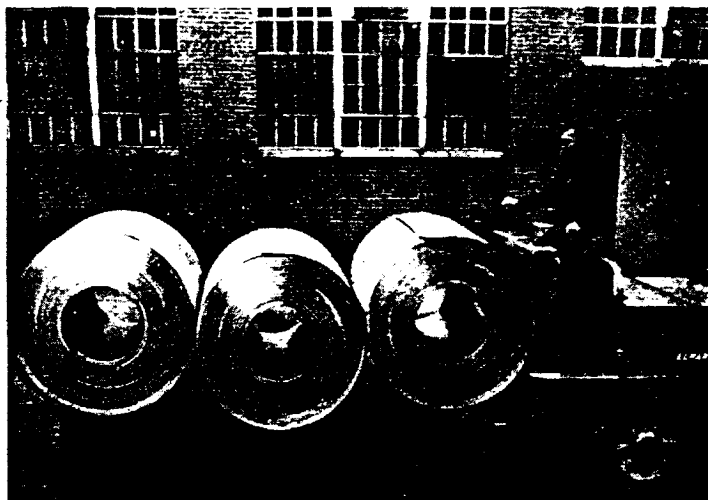
For the year test period a continuous current of 40 amperes was forced through the lead anode — a rod of lead-silver alloy nine feet long and an inch in diameter — to “concentrate” corrosion of the pier and dock facilities on it. At the end of the year the rod was found to be about 1/16 inch smaller in diameter. Most of the “missing” metal had adhered to the anode in the form of a dense lead peroxide coating. The weight loss amounted to only 0.088 pounds per ampere year.

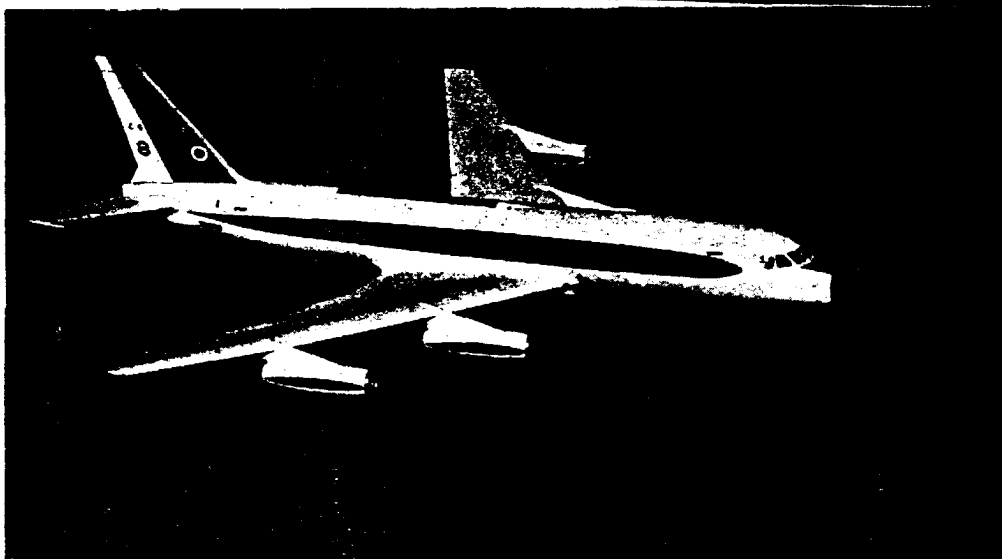
In the test period a total of 87,500 kilowatt hours of power had been forced through the system. At 2¢ per kilowatt hour, the electric bill was \$1,750. In addition, about \$37 worth of anode material was “lost” — a total cost of \$1,787. This is less expense than the cost of competitive systems.

Still another advantage of the lead anode is its ruggedness. It will withstand considerable physical abuse — an important consideration when minor accidents might break a different anode with the possibility of a long period before the loss of protection was noticed.

Truck lifts and hauls 20 tons

Nothing unusual in this picture of a battery-powered truck hauling sheet metal. Nothing until you notice its size (the driver is a muscular 5'11"). Powered by a 600 amp-hr lead-acid battery, the truck can lift and move 20 tons at a time. It is called model LL by manufacturer Elwell-Parker Electric Company of Cleveland. Elpar will announce a similar 50 ton model soon.





General Dynamics/Convair 880 jet airliner: big, beautiful, fast...and quiet, thanks in part to leaded neoprene sound barriers.

LEAD-NEOPRENE CURTAIN LOCKS OUT JET NOISE

When General Dynamics/Convair engineers designed the famous 880 jet airliner, they took pains to build in a quiet, vibration-free ride. In-flight stability was achieved in the aerodynamic design. Extra heavy aluminum skin was specified. Acoustic padding with fiber glass and damping tapes has been strategically located inside the airframe. But one serious sound leak could not be handled by these routine precautions — the design and location of the convenience pods (familiar to travellers as the overhead compartment where lights, air vents and oxygen masks are located) threatened to cause a troublesome path for engine noise.

To block this path and lock out the noise, the 880's designers employed a

limp sheet of leaded neoprene backed with fabric. Placed inside the pods, the barrier curtain forms a natural continuation of the inner sound barrier walls of the aircraft.

Leaded neoprene was chosen because it meets the requirements for a limp, flexible, non-porous barrier with sufficient sound stopping power in a minimum weight per square foot. Flexibility is highly important in this application because of the irregular shape of the pod. In addition to this, the barrier must give a snug fit to ventilation ducts and wire bundles in each compartment.

The material chosen for this application is a nylon with tightly adherent neoprene synthetic rubber loaded with 75 per cent of finely divided lead. It

weigh 0.35 pounds per square foot. It was engineered to Convair specs by Chemical Rubber Products of Beacon, New York. Such a barrier is capable of a 13 decibel reduction of transmitted noise. This is the nine-frequency average (125-4000 cps); its effect on high-frequency jet engine noise is considerably greater.

How well has the soundproofing worked? Among the many records for speed which the 880 has achieved stands another sort of "record": the 880 is generally acknowledged to be the quietest of the big airliners in service. Travel editor Lucia Lewis of the *Chicago Daily News* said, "Though all jets are quiet and vibration free, the Convair seems to me the most quiet one I have flown yet."

COLD LOGIC

The printed circuit being lowered into the bath of liquid helium (at 452° below zero Fahrenheit) is a logic unit of a new brain being developed at General Electric. The basic circuit elements — called cryotrons — are superconductive switches made of extremely thin layers of lead deposited on glass. Since these switches operate literally as fast as lightning, the new brain can perform unusually complex operations that should allow it to "think" more like the human brain than any computer now in existence.



Started in 1907, the Washington Cathedral is a magnificent example of 14th Century English Gothic Style. Its lead roof is in perfect keeping with this tradition. Notice that though decades have elapsed between laying the oldest and newest sections of roofing there is no undesirable difference in appearance.



WASHINGTON CATHEDRAL — *Unique test of lead roofing*

In building work of all kinds there are many points in the exterior surface which are prone to inroads of the weather unless protected. Inadequate short-lived materials at these points not only allow the structure to become damp, they can lead to damage of the building materials which would normally be enclosed in the finished construction. Many of these points are found in the roof sections.

As a roofing material lead has been a traditional choice for upward of a thousand years. However, the requirements of modern construction, the rigors of temperate climates with their sudden changes from hot to icy cold, and, most important, the presence of corrosive elements in today's industrial atmosphere, make demands on building materials which were unknown to builders of ancient temples or medieval cathedrals.

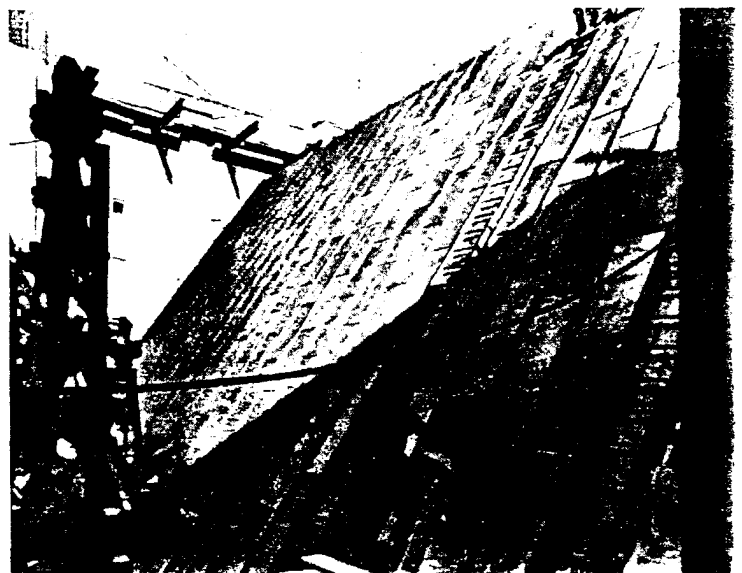
The Washington Cathedral in Washington, D.C. offers an ideal test of lead's ability to withstand weathering without evidence of any change. It has been under construction intermittently since 1907. Lead was originally specified for roofing on this fine example of English Gothic architecture and today's new alloy of antimonial lead is being installed as new work progresses.

In this case the span of almost forty years experience on the same building finds lead on top. In turn this lead roof has justified the architect's confidence by providing maintenance free protection since the first sheet of three pound hard lead was installed. Photographs show an aerial view of the entire church and a detail view of the roof being installed using battens 24" o.c. and sheets approximately four feet long held in place by copper cleats folded into lateral seams. Philip Frohman is the architect, Geo. A. Fuller the General Contractor and the Mathy Co. the roofer, all of Washington, D.C.



Another view of the cathedral.

The laying of sheets of 3 lb. hard lead continues. Note the vertical battens and horizontal flat loose lock seams.

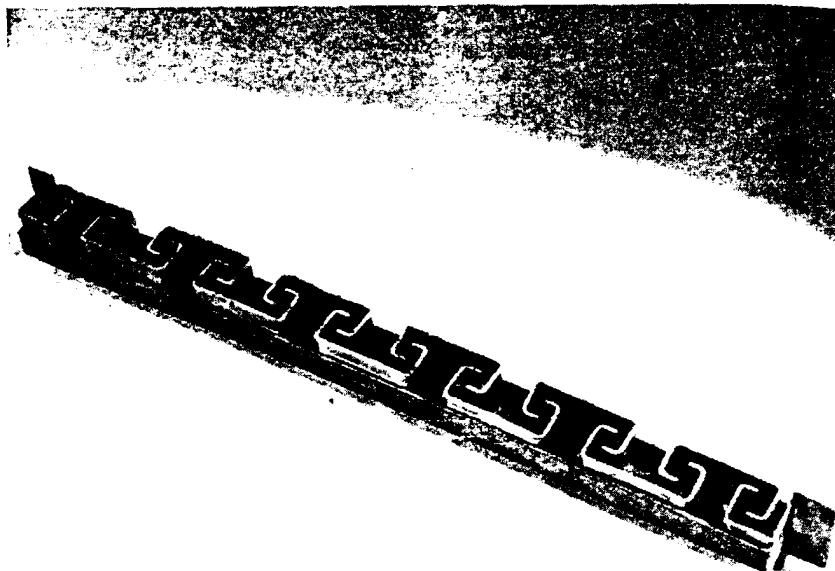


Aztec Leadwork?

Though it may look like an Aztec art object, the two-foot section of formed lead sheet shown here was trimmed from an X-ray room ventilator.

Normally, stock size ventilators are used but on a special job, Bar-Ray Products Company of Brooklyn had to cut down the size of their regular unit.

This eye-catching piece of scrap resulted. Note how air can flow through the ventilator while X-rays, traveling in straight-line paths, cannot.



lead

LIBRARY OF TECHNICAL INFORMATION

The following publications are available free of charge unless otherwise noted. Send request to the LEAD INDUSTRIES ASSOCIATION, 292 MADISON AVENUE, NEW YORK 17, N. Y.

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