X-RAY PROTECTION

The healing arts have benefited immeasurably from the use of X-ray as a tool for diagnosis and therapy. In recent years the increased use of X-ray itself has become something of a hazard. Operating personnel, as well as occupants of nearby premises, may unknowingly be exposed to dangerous amounts of radiation unless adequate shielding is used.

Since liability insurance for the doctor usually covers only the patient, the doctor's responsibility towards these occupants or personnel becomes a major consideration when X-ray equipment is installed.

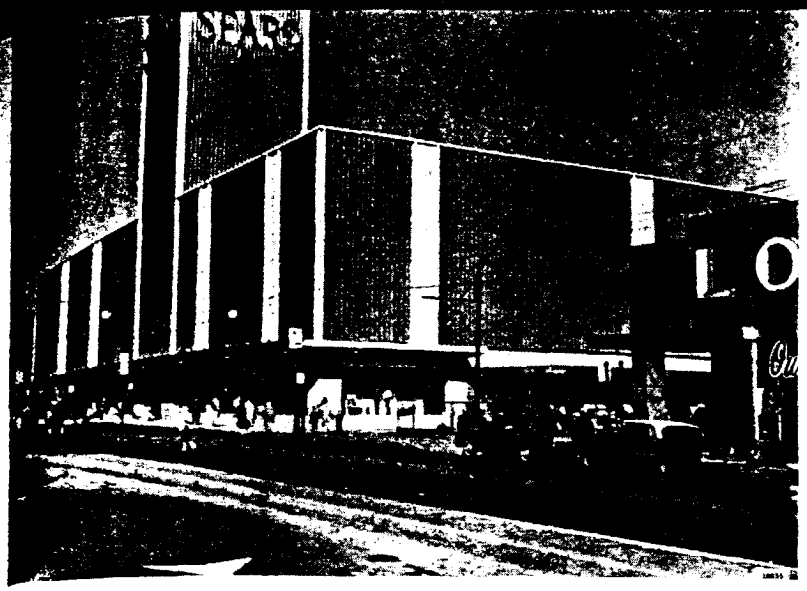
A typical illustration of the problems to be met may be found in the recent move made by Drs. S. C. Wishner & Son, Chiropractors, of New York City from their old quarters to new and larger offices. In the chiropractor's art, knowledge of the osseus structure of the patient's body is essential. This knowledge determines the type, direction and weight of those pressures which the doctor exerts in order to correct spinal maladjustments and balance. In this study X-ray is of course invaluable. Furthermore, X-ray facilities on the premises result in lower costs, in time saving, and in closer supervision of techniques.

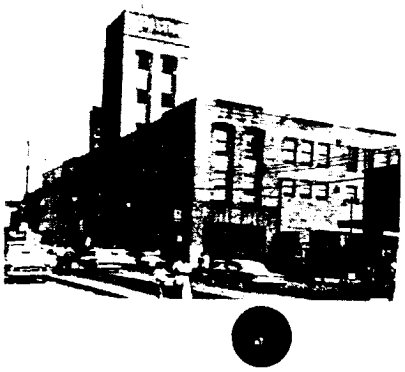
In this case a "turret collimator" type of machine was chosen. The major problem involved in mounting the machine was the matter of space. The only available wall was subject to the hazards noted above as well as enclosing the only space available as a dark room. Accordingly, a partition made of a simple frame of 2-inch by 3-inch studs was set out from this wall about 3 feet as shown in the photograph. Sheet lead, of the proper thickness was then fastened to the back of this frame and finished, both sides, with $\frac{3}{8}$-inch thick plywood.

A plywood "sandwich" with the lead laminated in it would serve the same purpose. The resulting assembly, easily fabricated and installed, serves as not only protection in this case but as the supporting surface upon which the film cassette is mounted in use.

It should be repeated that none of this should be attempted without professional help. In the case of industrial applications, the State Department of Labor will have jurisdiction but, in most cases, application should be made to the appropriate regulatory agency, usually the State Department of Health where a list of qualified Radiation Consultants can probably be obtained. Reference may also be made to "Handbook 76" as published by the U. S. Department of Commerce, National Bureau of Standards.

In the office where the X-ray screen was erected (left) the beams were directed towards a doorway. The lead was fastened only at the edges (right) to prevent any penetration which could result in leaks.





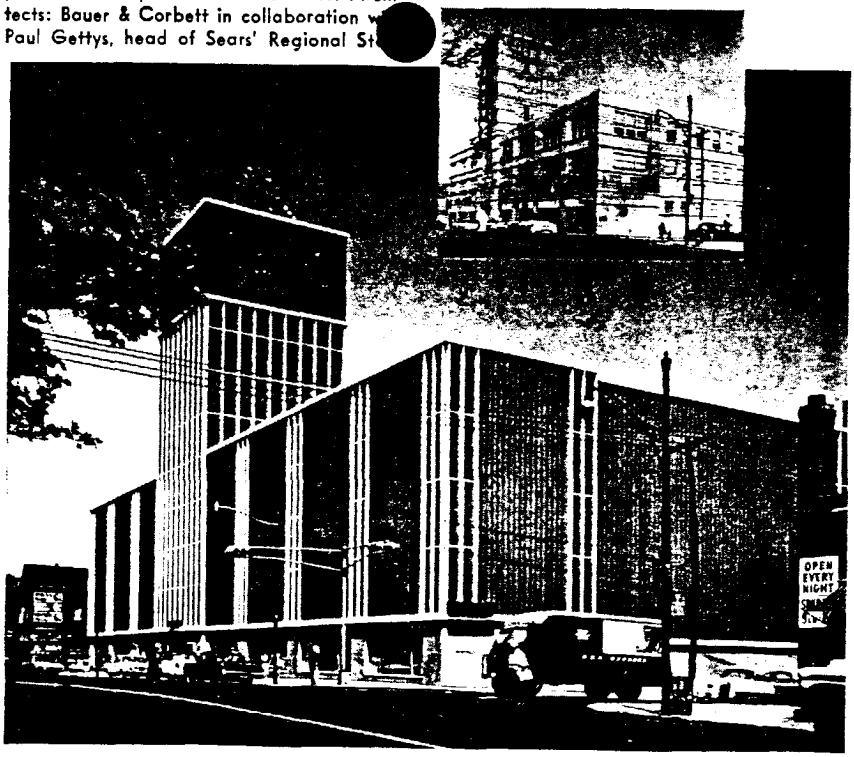
Over 26,000 sq. ft. of blue and white *Vitralume* porcelain enameled aluminum panels were needed to cover the walls of this Sears store in Pittsburgh, Pennsylvania. Architects: Scarlett & Mitchell.

SEARS

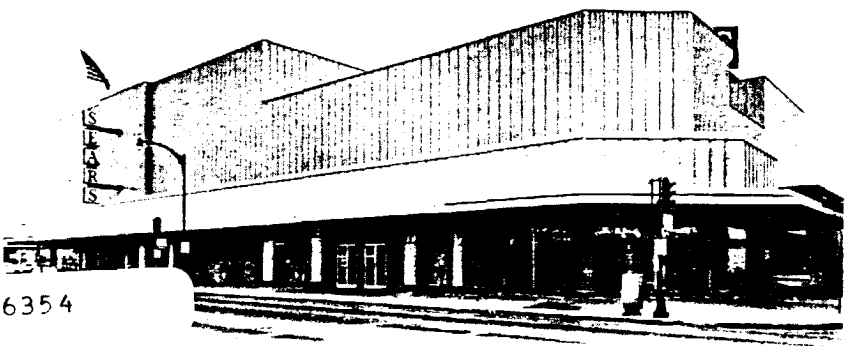
SPRUCES UP WITH LEADED PORCELAIN

This Newark, New Jersey store is an example of what can be done to beautify a 34-year-old structure. Leaded porcelain on aluminum panels are turquoise — trim is white. Architects: Bauer & Corbett in collaboration w Paul Gettys, head of Sears' Regional St

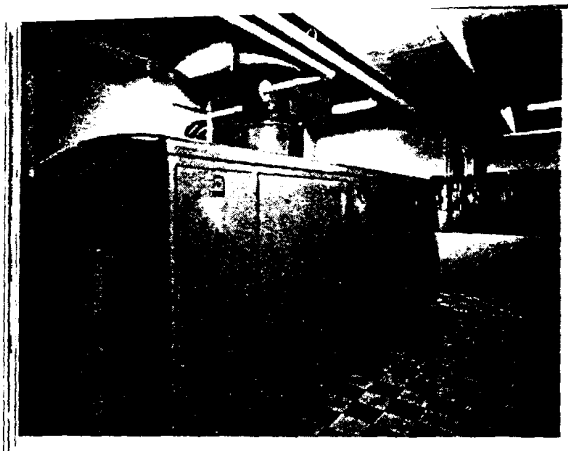
To retain its modern image and provide more attractive surroundings for its shoppers, Sears Roebuck & Co., largest mail order-retail chain in the country is constantly refurbishing its 741 stores. Some of these stores are shown in the accompanying photos in the before and after stages of "face-lifting." Leaded porcelain enameled aluminum panels, manufactured by the H. H. Robertson Co., Pittsburgh, Pa., and Connersville, Ind., in a variety of colors, were used to spruce up these stores. These installations are typical of the many that have been made using Robertson's *Vitralume* panels.



Sears' store at Main & Wheeler, Houston, Texas. Over 36,000 sq. ft. of leaded porcelain on aluminum went into this facelifting operation. Architects: Harper & Kemp.



LIA26354



QUIETING A WHIRLWIND

air intake ducts for stationary power turbines have to block sound yet remain flexible — leaded vinyl does it

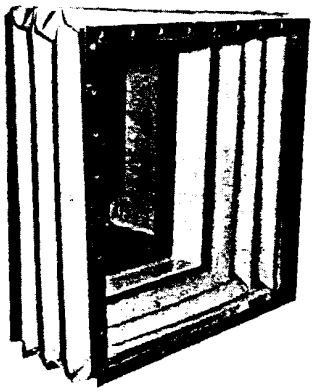
This unit measures 5 x 16 feet, weighs 15,000 lb. and produces 750 kw. of electric power — enough for 1000 homes and in a package occupying ¼ the floor space and weight of a comparable diesel-generator set.

There was a time when a modest steam engine could power a whole plant, but the demand for power over the years has shown an ever steepening growth. Today most operations and processes require so much power that conventional power sources require enormous amounts of space. The happy exception is the internal combustion gas turbine, first cousin to the jet engine.

As built by Solar Division of International Harvester Company, a 750 kilowatt unit complete with controls requires only 80 square feet of floor space. Its appetite for combustion air is a healthy 11,000 cubic feet a minute when operating at rated load. The recommended scheme for obtaining the outside air is through a duct to the turbine package with provision for trapping any foreign material which might damage the high speed compressor blades at the turbine's intake.

Since the air intake manifold is usually separate from the turbine-generator unit, a flexible section is installed at the point of connection to the turbine. This connection arrangement allows for slight relative movements, makes installation a lot less critical, and lowers the surface area able to actively radiate noise.

In designing a flexible connection between the manifold and power unit proper, Solar engineers were faced with a typical engineering dilemma: Flexible materials are usually light and "transparent" to noise; good sound barrier materials are usually heavy and not suited to flexibility requirements. They found a solution in lead-loaded flexible vinyl sheet.



Close up shows the flexible leaded vinyl formed into a bellows.

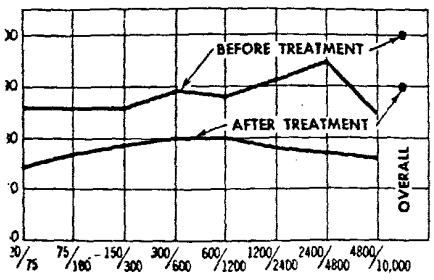
The material they used, Coustifab leaded vinyl, is 0.055 inches thick and weighs 0.87 pounds per square foot. Tough but limp, the material is heavy enough to present a substantial barrier to noise transmission. On the other hand, its flexibility permits it to be formed and to adapt itself to slight misalignment or even shifting after installation.

There were two principal uses for the leaded plastic sheet in this project. It was formed into a bellows measuring 30" x 30" inside and spanning 11 inches between the manifold and the power unit. It was also used in conjunction with absorptive glass fiber and the sheet metal enclosure around the turbine to reduce the noise transmitted through the enclosure. The detailed drawing shows how this enclosure wall is made up.

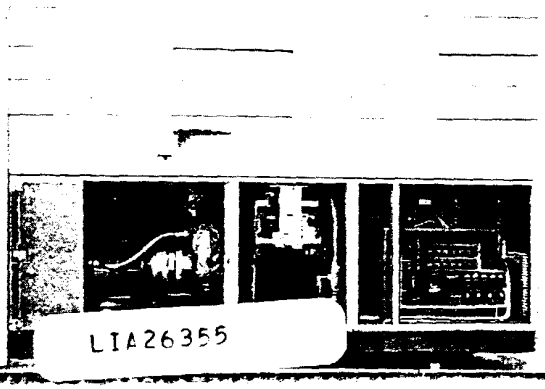
Though the turbine unit is quite small in view of its power rating, it is a giant in terms of power output. As might be expected, it is impossible to produce this much power without producing some unwanted noise also. By using the leaded vinyl, Solar engineers were able to pull the peak noise level down 10 decibels in the 10-10000 cps band. In more subjective terms, the leaded vinyl treatment has made it possible to easily converse in the room where the turbine unit is running.

Coustifab is a product of the Cordo Division of Ferro Corporation, 34 Smith Street, Norwalk, Conn.

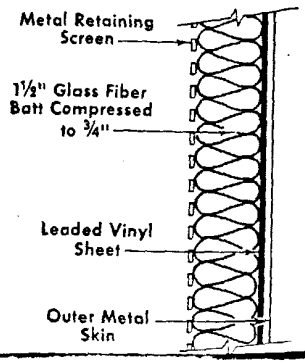
"Before" and "After" noise test results show that a considerable reduction was achieved.

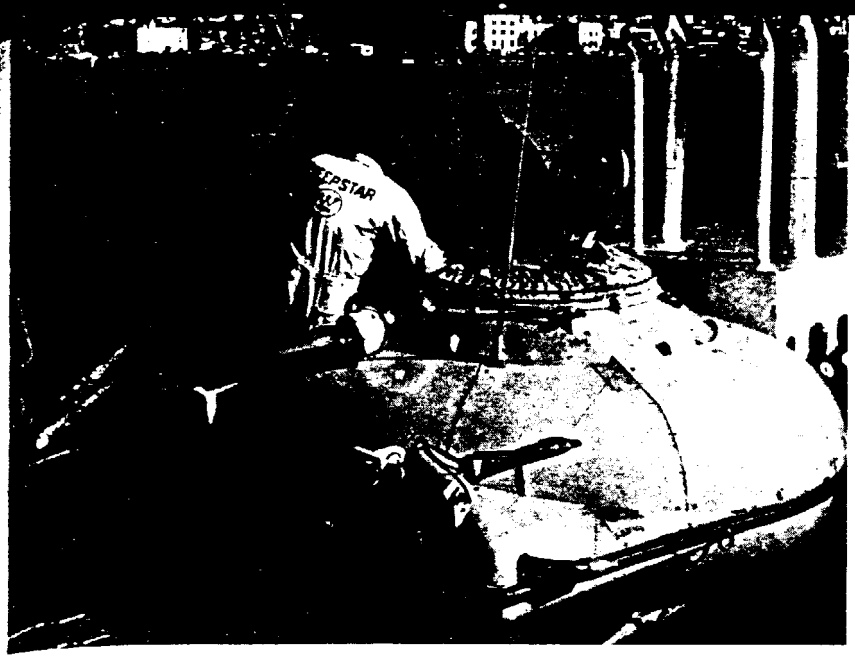


Side view of the turbo-generator unit. The turbine area has acoustical treatment.



Section through the acoustically treated enclosure wall.





The original Diving Saucer, shown here on deck between dives, carries two men to depths of 1000 feet.

TARGET: TWO MILES DOWN

As every schoolboy knows, three quarters of the world is covered by water. But in the light of the population explosion and diminishing resources the more startling statement of that fact is that *three quarters of the world is unexplored!* Scant wonder, then, that new underseas vehicles are today receiving serious consideration.

One such device has already proven itself in concept. Through more than four years of service and almost 200 dives, the famous Diving Saucer invented by Capt. Cousteau has scored a number of successes. Now a new and larger version, the Deepstar, is being built by the Underseas Div. of Westinghouse Electric Corp. in conjunction with Capt. Cousteau. Both these craft rely on lead acid batteries for power.

Named for its shape, obviously, the Diving Saucer has a hull made by welding the edges of two steel saucers together. Propulsion and steering are achieved by pumping water through two nozzles which can be aimed in any direction. The saucer has been used to depths of 1000 feet.

Though similar in appearance, Deepstar will have a spherical steel hull accommodating three men (the saucer carried two). Much of the auxiliary equipment like lights and the batteries themselves will be carried outside the spherical pressure hull in the fairing which gives Deepstar its characteristic shape. Ready to dive, Deepstar will weigh about 9 tons and will be about 18 feet long and 7 feet high. Her design diving depth is 12,000 feet — two sea miles down.

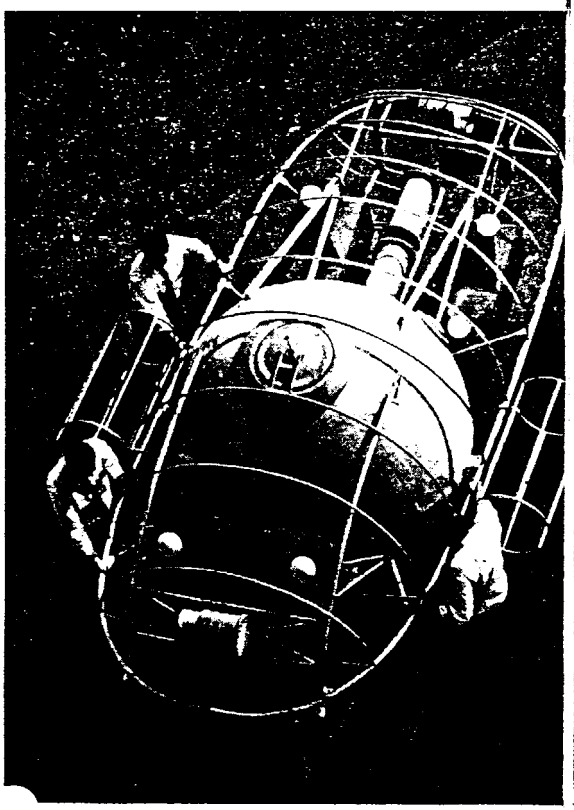
At this depth the pressure exceeds 5000 psi. In order to withstand it the steel pressure hull is 1¼ inches thick. Space inside the steel sphere is precious and the batteries will be outside exposed directly to the pressure.

Each of the 62 battery cells is in a plastic case with a plastic pyramidal oil seal on top of it. The dimensions of the cells are about 6¼ inches square by about 15½ inches high. The rating is 400 ampere hours (10 hour rate), at 120 volts.

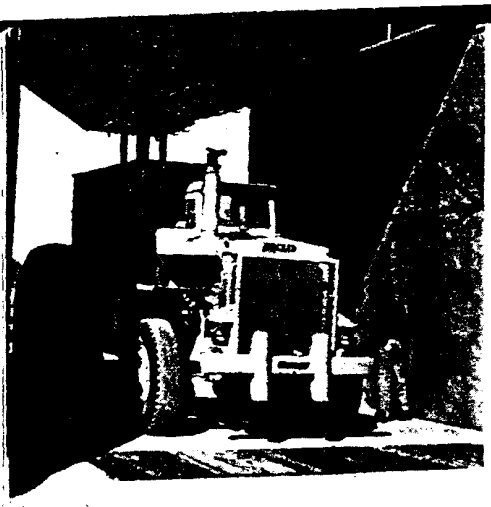
Surprisingly propulsion is not the heaviest load the batteries carry. The lights used for photography include 5000, 1000, and two 500 watt sources. Even at these high current drains, however, the battery will provide all the power needed for a typical four hour work period below. In addition to the work period, about two hours will be required for the descent and another two for the ascent, making a typical dive about eight hours long.

Both dive and ascent are controlled by ballasting or dropping ballast and no power is required from the battery. The cells are grouped into three batteries of 1000 pounds each and, in an emergency, one of these can be dropped for faster ascent.

Deepstar, shown here in a full-scale mock-up without its outer fairing in place, will carry a crew of three to depths of 12,000 feet. The three leod-acid batteries can be seen near the bow (bottom of picture) and just abaft the spherical steel pressure hull. The pyramids and white balls are pressure seals for the batteries.



LET LEAD WEIGHT

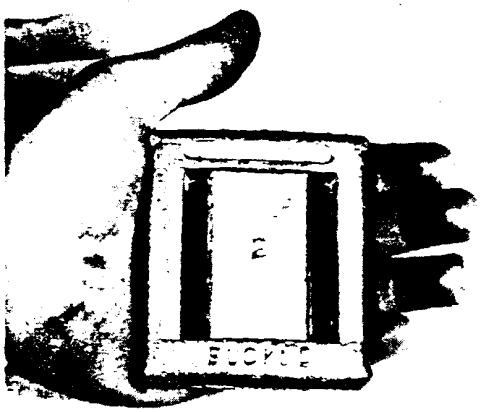


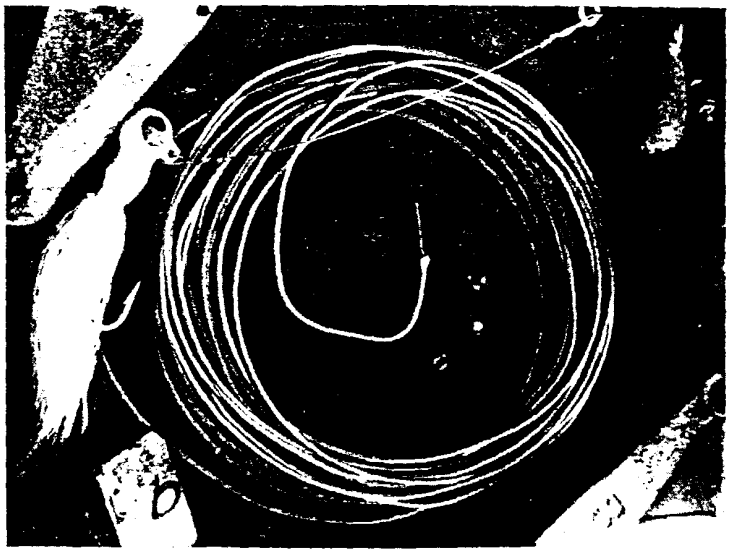
At the other extreme, 50 tons of lead shot pour into this hopper in two minutes. The load is used in a torture test of tires by Goodyear at its sun-baked Texas proving ground.

The recent round-up of lead applications as weight ("Wheels, Keels, and Other Weighty Matters") in LEAD brought forth some other interesting uses. Several are, appropriately, connected with summer sports.

For indoor fish fans lead is the simple way to hold aquarium plants in place. Here the young lady snips a thin strip from a scrap of sheet lead, pinches it in place around the stem of a water plant, and watches with satisfaction as a pet fish wanders over to inspect the new greenery. Inert in fresh or saltwater, the lead does not corrode or pose any toxicity problem to the fish.

And for those who like to imitate fish, the skin-diver's weight buckle is indispensible. This one was cast by Anchor Alloys, Inc. of Brooklyn, N. Y.





Leads go fishing — Sinkers, dipsies, split shot and a cast lead-headed bucktail are familiar to all Isaac Walton fans. The coiled line in the center is for those who know the big ones sometimes swim deep. Ashaway Line & Twine Mfg. Co. makes it by braiding nylon around a lead wire for deep trolling.

Hospitals use lead weights, too. The technique used for water plants in aquariums helps balance crutches and makes a small, convenient weight package to aid in therapeutic exercise. It's easy to do a neat, tidy job with nothing more than sheet lead, scissors, and adhesive tape.

Prize-Winning Factory Uses Lead Sheathed Cable

The Rollway Bearing Company has recently completed a new plant near Syracuse, N. Y. that has been cited by *Factory* magazine as one of the ten best plant designs of the year.*

The plant was specifically designed for maximum operating efficiency while handling a wide range of bearing orders that vary both in quantity and quality requirements. The design permits maintenance and operating costs to be cut to the bone. Despite this, the initial construction cost of the 221,000 sq. ft. layout was a low 10 dollars per square foot.

In line with the high efficiency, dependability and low upkeep goals, engineers of Bec Electric Company, Inc., Syracuse, N. Y., selected and installed some 1900 ft. of lead sheathed paper cable to the electric power main between the public utility power line and the plant.

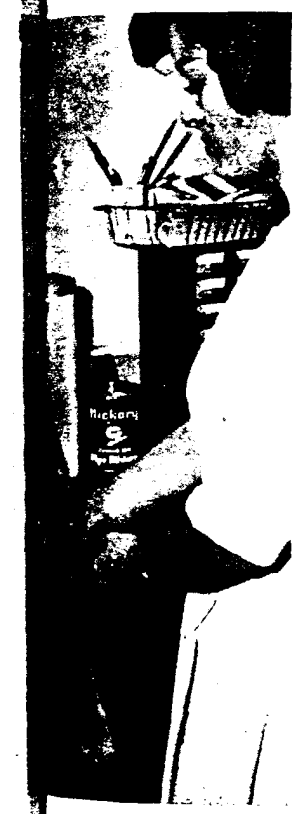
The lead sheathed cable supplied by Phelps Dodge Copper Products Corp. consisted of 1700 ft. of 3-conductor, paper-lead cable and 240 ft. of 250 MCM paper-lead cable. Operating voltage was 15 kv. for both types of cable.

The chief reason that Bec Electric selected lead sheathed paper insulated cable for the Rollway plant was that paper-lead cable has an unrivaled record of dependable performance at minimum cost for operating voltages up to 245 kv. in the United States and as high as 500 kv. in Europe.

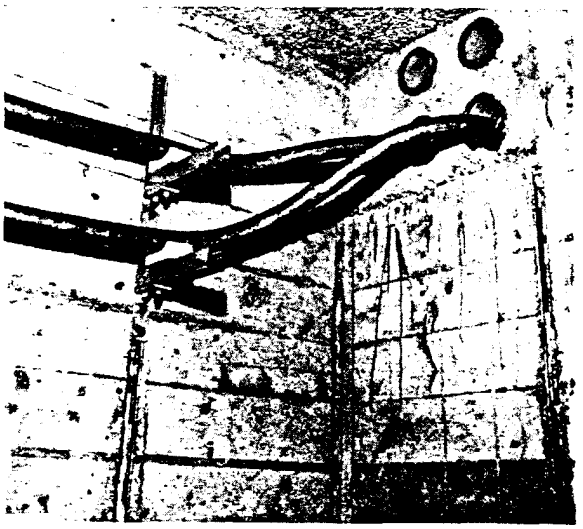
One of the interesting features of the plant design was the use of a special underground chamber through which the power cable enters the plant. Availability of this workspace permits inspection of the cable, repairs if necessary, and greatly simplifies installation of additional cables in the system.

The designer, engineer, builder was Cunningham-Limp Company, Detroit.

*Factory, May, 1964, page 92



The two lead sheathed, paper insulated power cables enter the plant through this special underground room. The spare conduits are for future expansions.



Pans At Pan Am

The total population of the new Pan Am building in the middle of the already crowded mid-town Grand Central area is 25,000. This many people going somewhere, all about the same time, is something to give the most sanguine city planner considerable food-for-thought. Transportation, for example, is one problem. Additional facilities have already been provided in the area, not only for greatly increased sub-surface travel but for street traffic as well. Even aerial traffic has been considered: the building hopes to have an operating heliport above the top floor within the foreseeable future.

Food of a different kind is just as great a problem: food for a small army of hungry people each day, all with varying tastes and a wide range of incomes. And all needing to be served within a relatively short space of time. Restaurant Associates, up on 57th Street in New York, feel they have done more than their share in solving this problem. This firm of designers has recently completed a total of three restaurants, all on the main floor of the building near the main entrance on 45th Street. The largest of these, the Trattoria, will serve a daily total of 3,000; the Zum Zum Room, 1,000; and Charlie Brown's Ale and Chop House, 2,000 daily—for a grand total of 6,000 diners.

The designers have spared no effort to make these three restaurants not only the most attractive but the most efficient in the area. Since the kitchen is the focal point in the operation of any restaurant, a great deal of care has been expended there. Stainless steel counter surfaces are unbroken by joints, gleaming copper soup kettles have been set up off the floor on low platforms and quarry tile floors present the perfect surface for ease of maintenance and spotless cleanliness. Waterproofing under these floors becomes a major problem too since they are directly over the tracks of the New York Central Railroad where they fan out at the terminal.

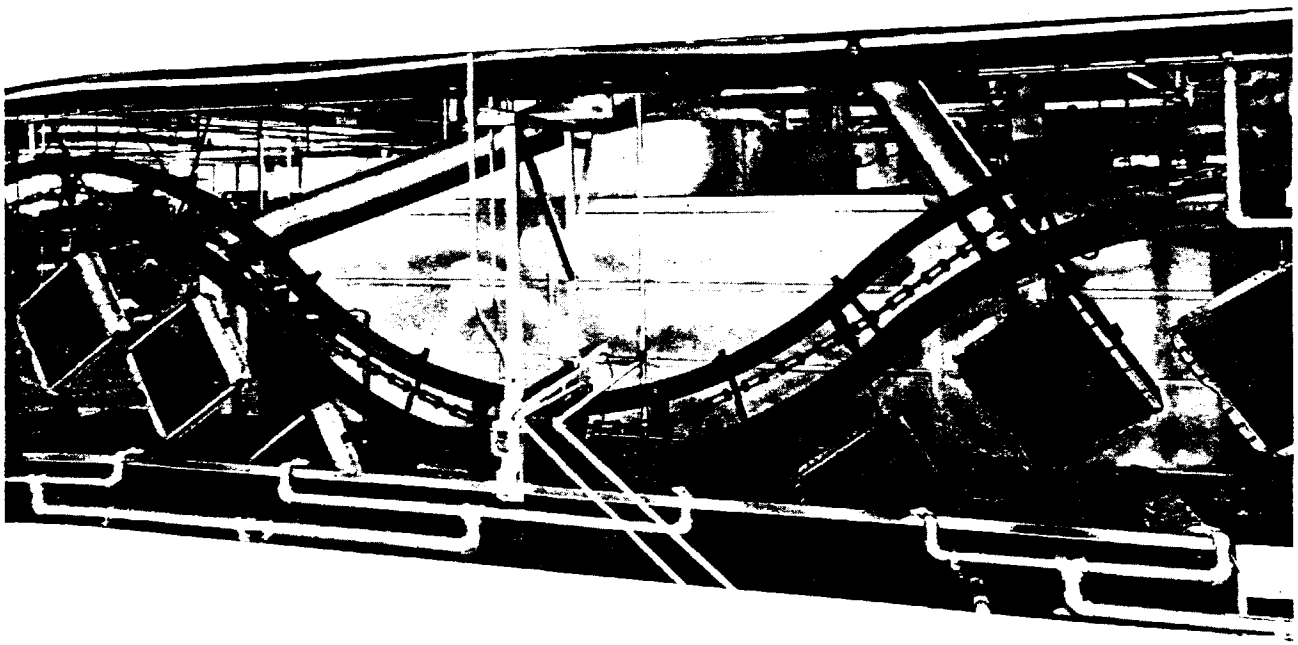
In line with a specification which that railroad, many years ago, found to be most effective — the top of the slab under all areas subject to moisture conditions is covered with 8-pound lead membrane waterproofing. Not only are kitchen areas protected in this manner but all areas in the bar, at service units, in freezers and under the garbage refrigerator. A total of about 35 tons of 8 lb. lead sheet was used with all edges lapped and burned. Asphaltum protection is standard in the form of a heavy brush coat on any lead surface in contact with fresh cement or concrete. Edges at walls were turned up four inches all around.

The lead work was done by the John F. Abernethy Company: architects for the building were Emery Roth & Sons: James Ruderman was the structural engineer: and the general contractor was Diesel Construction Company, all of New York City.

Lead pans, or waterproofing membranes, underlie the floors of the Pan Am Building's famous eateries.

LIA26359

Making Ends Meet...



Finished automotive radiators here emerging from dip painting show the high degree of automation use by Modine.

With Solder

"There are nearly 200,000 linear inches (more than 3 miles) of joints in the average automobile radiator, and every inch is a potential joint failure." In these words, Mr. Vince Betko, Mngr. of Quality Control for Modine Manufacturing Co. of Racine, Wisconsin, sums up the main problem of making a good radiator.

Of course the problem doesn't stop there. Each car, truck, bulldozer or tractor calls for a different radiator design. For instance, in one month the Modine La Porte, Indiana plant built 280 different radiator models for 33 customers. However, one thing all these units had in common was the assurance that the metal-to-metal joints were reliable. And to achieve this sort of reliability, Modine counts on lead-tin solders.

Production of a typical radiator starts with a brass strip, about 2" wide, this is precleaned and then dip coated with a low-tin solder. As it leaves the bath one side is wiped clean. This strip is subsequently formed into tubing — with the heavy solder coating to the outside.

Meanwhile, thin copper strip of varying widths (depending on the desired cooling capacity of the radiator) is punched with holes and cut into the proper lengths. This forms the fins.

Next, the fins are slipped into a slotted jig which may hold anywhere from 6 to 14 fins per inch. The number of slots in the jig determines the number of fins per inch that will be in the finished radiator core. For greater heat transfer more fins are used to increase cooling area.

The solder-coated tubing is then inserted through the holes in the fins (which now line up perfectly). At this point, the radiator begins to assume its familiar shape. To lock the core in this position, it is placed in an oven where, at a temperature in excess of 600° F., each fine is bonded to the solder coated tubes without need of an additional application of solder. Naturally, at the same time, solder on the tube seams melts and seals them tight along their entire length.

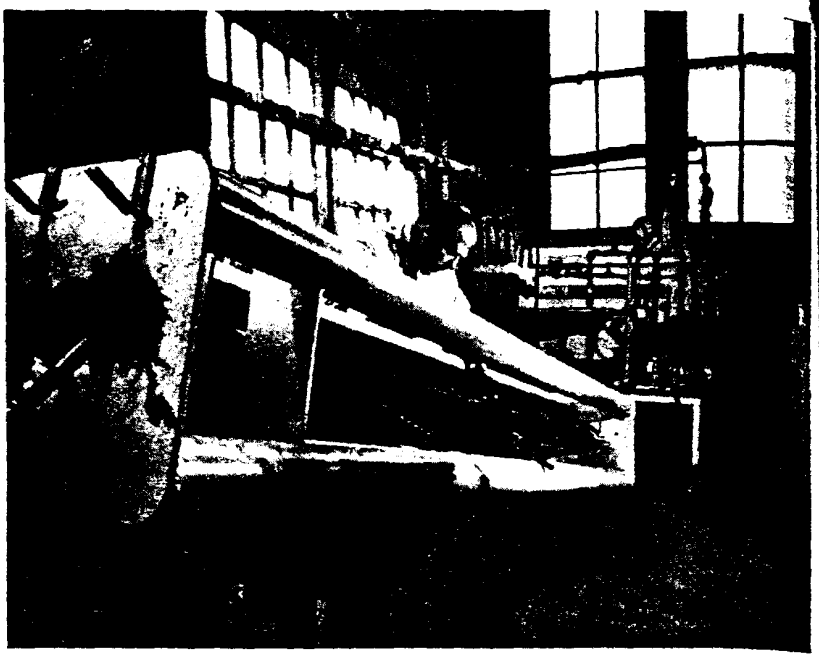
From the oven, the core moves to another station where header base plates are attached by dip or flow soldering. A slight modification of the solder composition lowers the melting point and permits Modine to carry on additional soldering operations without unsoldering previously completed solder joints.

Final step is attachment of the brass top and bottom pans and the terne metal side strips. At Modine's La Porte plant, heat for this operation is applied with a torch. Of course, each radiator is given a thorough checkout for leaks, and most are then dip painted, packaged for shipment and palletized.

In some cases, Modine even solder-coats the fins in a radiator assembly. "This is done," says Mr. Betko, "to achieve a higher corrosion resistance for the entire radiator, and at the same time, the solder-coated fins give better bond assurance for heavy duty applications."

CALKED LEAD JOINTS

can "take it" in modern waste system service



Automatic appliances using large volumes of water at higher temperatures make greater demands than ever on waste system joints today. But here's good news for officials concerned with plumbing codes: Tests are bearing out more and more that the best type of joint for cast-iron bell and spigot soil and waste pipes — under today's conditions — is the very same calked lead joint that authorities have preferred for over 100 years.

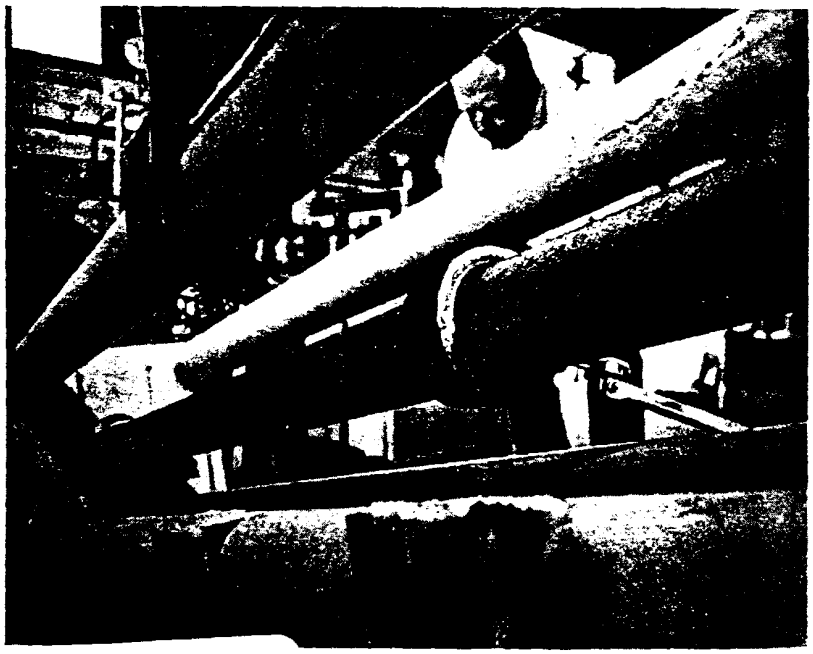
Here's how conventional lead-tarred oakum joints are being tested in independent research for the International Lead Zinc Research Organization associated with Lead Industries Association, conducted by Harold A. Montgomery, assistant professor of mechanical engineering, Purdue University:

Test system is filled with cold water at 10 psi. Then hot water at 10 psi. is circulated through system until joint reaches temperature of 170° F. at outer surface of hub. Next, hot water is immediately replaced by circulating cold water at 10 psi., circulation continuing until joint reaches room temperature. Alternation of hot and cold cycles is repeated 20 times.

Rarely if ever would such severe conditions be encountered in an ordinary waste system. Yet conventional calked lead joints came through with no sign of leakage, and even more rigorous testing is now under way. Says Prof. Montgomery in his interim report: "It is my considered opinion, based on the results achieved so far, that the conventional lead-tarred oakum joint is satisfactory for practically all installations."

Copies of the research findings to date are available upon request to the Lead Industries Association, 292 Madison Avenue, New York, New York 10017.

Prof. Montgomery takes a temperature reading on a lead-tarred oakum joint (above). Jointed pipe is end-clamped in the test rig so that longitudinal movement cannot occur, in simulation of an extremely rigid field condition. Lateral movement — a most significant cause of joint leaks — is not controlled, and has been quite pronounced, averaging 0.056 inch in tests to date, yet no leakage has occurred. In background is equipment for controlling water flow recording temperatures, pressures. Closeup (below) shows lead calking.



LIA 26361

Interesting Odds 'N' Ends... about Lead

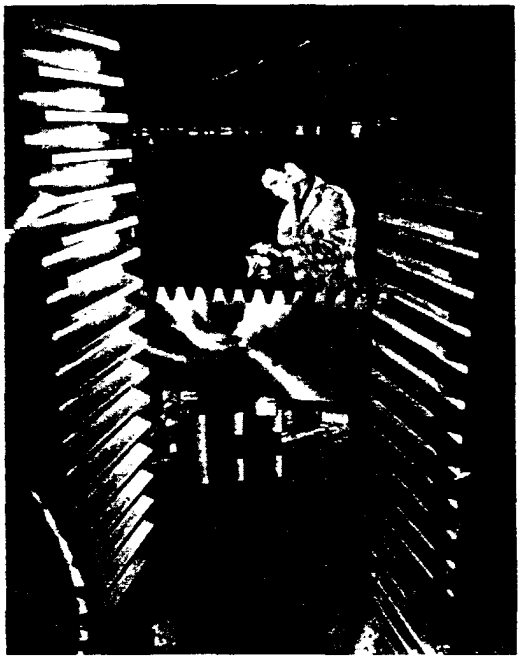
Diphenylbis (p-allylphenyl) lead can, with care, be brominated to diphenyl (p-allylphenyl) [(p-2,3-dibromopropyl) phenyl] lead without rupturing the lead-carbon bond. If you are in a position to realize that this is a pretty nifty trick, you may also be interested in the new 112-page book which (on page 34) gives this information along with appropriate references. "Organolead Chemistry" is a concise review of the literature from January 1953 to July 1963 prepared under the auspices of the International Lead Zinc Research Organization. The ten principal sections of the book cover tetraalkyllead and its compounds, hexaorganodileads, organolead salts, metal compounds and hydrides, biological properties, applications and analysis. Tabulated data and comprehensive reference citations are also given. To obtain a free copy, outline your interest on your company letterhead and send it to Lead Industries Association, Inc., 292 Madison Avenue, New York, N. Y. 10017.

Cheaper by the mile: driving, that is! Annual price rises seem almost to be a natural law. Gasoline is a happy exception: in 1953 it cost 1.78¢ per mile, today only 1.66¢. And that cost includes the tax. At the pump 1953's 28¢ per gallon price tag included 7¢ (33⅓%) tax: today's 30¢ gallon includes 10¢ (50%) tax. Despite the lowering of the actual cost of gasoline from 21 to 20¢ a gallon since 1953, today's product is better. It delivers an average of 19.8 miles per gallon versus 17 which the 1953 product averaged. Lead antiknock compounds contribute to these new economy records.

SECOND INTERNATIONAL LEAD CONFERENCE

. . . has been scheduled for Holland in October 1965. Separate groups will meet to discuss cable sheathing, batteries, and general applications of lead. Each three-day session will have simultaneous translation (al a United Nations) and will include visits to works in Holland, Belgium, and Germany. Papers are invited. Brief outlines may be submitted to Lead Development Association, 34 Berkeley Square, Londone W1, before October 30 of this year.

Blue glow in outer space — Chances are that, as an automobile owner, you use some tetramethyl lead as an anti-knock compound in the gasoline you buy. NASA used some too — about 7.5 quarts or roughly the amount you'd get in 2000 gallons of gasoline. They fired it 60 miles straight up and expelled it in outer space. Through a complex reaction of the lead with atomic oxygen existing there a blue glow was created and photographed. NASA specialists are studying the photos and learning more about the tenuous winds and turbulences of the atmosphere's fringe.



Big wheel! — These three toothed sections of precision-forged steel are part of a set of 28 that will be joined to form the polar axis gear — 264 feet in circumference — of a giant radio telescope. The gear segments are forged of leaded steel by Alco Products, Inc. at Latrobe, Pa. Alco's Hi-Qua-Led steel was used because it provides a 40 per cent reduction in gear-cutting time. The teeth are cut to exacting specifications (a tolerance of 1/1000 inch from tooth to tooth) by Philadelphia Gear Corp., King of Prussia, Pa., which designed and manufactured the telescope's drive system. The six-foot-long segments are 20 inches wide and 19 inches thick.

CHANGE OF ADDRESS OR NEW READER

Use this side of the coupon if you have recently changed your address or if you would like to be added to the mailing list for LEAD

CHANGE OF ADDRESS **ADD ME TO YOUR MAILING LIST** (please circle one)

PLEASE CHECK INTEREST

From _____
Name, title

_____
Company

_____
Street

_____
City, zone, state

To _____
Name, title

_____
Company

- ☐ Architectural & building
- ☐ Design Engineer
- ☐ Ceramics
- ☐ Radiation
- ☐ Other (please specify) _____

LIA26362

lead

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.

NEW LISTINGS

High speed lead plating

Ten-page reprint delves into new methods for electroplating lead at high rates. It tabulates essential data including performance ratings for test coatings.

GENERAL

Discovering the beauty of lead
New uses for lead
Design engineering data

BATTERIES

The picture book of power batteries

Pictorial presentation of the variety of trucks and tools powered by batteries.

Electric delivery trucks
Truck costs in a jiffy

Three nomographs for estimating costs of gas or battery powered industrial trucks.

The choice of battery systems

CONSTRUCTION

Pools and planters

Description and design details of seven modern lead lined pools and planters.

Lead wall reduces noise

Effectiveness of partition construction in reducing noise is described and evaluated.

Removable walls with lead lining
Isolation of buildings from vibrations
Silver anniversary roofs
Building construction bulletins

2. Specifications—lead shower and safe pans
3. Specifications—chemical laboratory drainage systems.

Lead work for modern plumbing

$2 postpaid, $1.50 per copy in orders of 10 or more.

Profusely illustrated 164 page text presenting clearly to the plumbing student the necessary tools, procedures and methods.

Lead plumbing
Seamless terne for roofing
Sheet lead for roofing and flashing
Lead as a concrete filler
Lead-asbestos antivibration pads
Permanent color for lightweight block

ENGINEERING

Importance of lead in glass

Comprehensive report and survey on use of lead in glass. Bibliography of over 600 references.

New data for electroceramics research

Provides liquidus and sub-solidus in the system PbO-BaO-MgO-SiO_2.

Soldering and soldering alloys

Detailed survey of solders. 8 page reprint.

Lead sheathing for power cable

24-page design guide for lead sheathed power cable.

Transformer noise reduction
Materials of construction reviews
Corrosion data — lead & alloys
Methods of lining lead tanks
Cutting press vibrations
Nuclear materials
Radiation protection
Low temperature enamels for steel
Thermal expansion data — lead compounds, two papers I, II
PbO-Fe_2O_3 Phase Relations
Dielectric behavior of Pb-, Ba-, Sr-hafnate systems
Lead to control sound and vibration
Anodes for ship protection
Lead glazes for brick
New class of lead-base alloys
Continuous extrusion press for cable sheathing

FINISHES

Decorative finishes for lead
Red lead based paint systems

Properties and compositions for 24 formulations and systems for a wide variety of uses and exposures. 31 pages.

Lead molybdate opacified enamels

UPON REQUEST, THE LEAD INDUSTRIES ASSOCIATION WILL BE GLAD TO MAIL "LEAD" REGULARLY, FREE OF CHARGE, TO THOSE INTERESTED, AND WILL COOPERATE WITHOUT OBLIGATION IN THE SOLUTION OF YOUR LEAD PROBLEMS.

Reproduced by letterpress from lead type.

PRINTED IN U.S.A.
PUBLISHERS PRINTING — ROGERS KELLOGG CORP.
LONG ISLAND CITY 1, N. Y.

Mail to: Lead Industries Assn., Inc., 292 Madison Ave., New York 17, N. Y.

Name, Title

Company

Street

City, Zone, State

Please send

TO

REQUEST

LIA26363