Parading Fuses Soldered Automatically

Soldered parts untouched by the venerable soldering iron are being produced today by modern, fully automated machines. Pressured by the high cost of labor, many manufacturers are finding that machine soldering is faster, cheaper and gives uniform high quality joints.

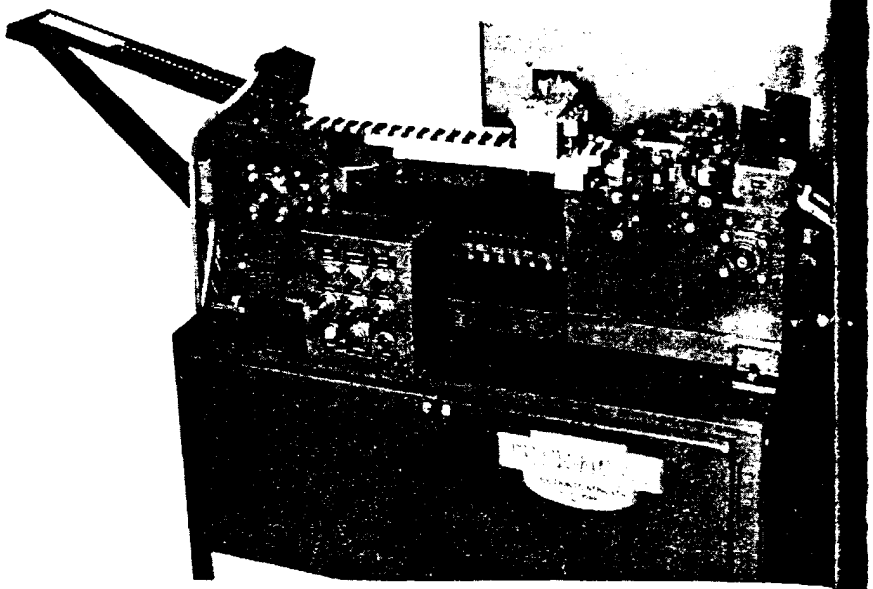
First automatic soldering ever done was on "tin" cans . . . a process dating back many years. Preforms — shaped chunks of solder and flux that fit conveniently for easier soldering — was another early step towards higher production rates.

Another big push was given to automatic soldering by the introduction of small size radio sets and electronic equipment using printed circuits. Machines dipping printed circuit cards held in racks can complete hundreds of junctions in one operation (see story at right).

The past couple of years has seen an accelerated use of automatic machines. One such machine, recently introduced by Induction Heating Corporation of Brooklyn, N. Y., soft-solders fuse ends at a production rate of six joints in five seconds. Considerable skilled labor was formerly required for this job. Only preparation of the fuses is required with the new machine. The operator simply puts the pieces together — placing a soft solder washer in each end of the fuse cap — and stacks the assembled fuse into the machine's magazine.

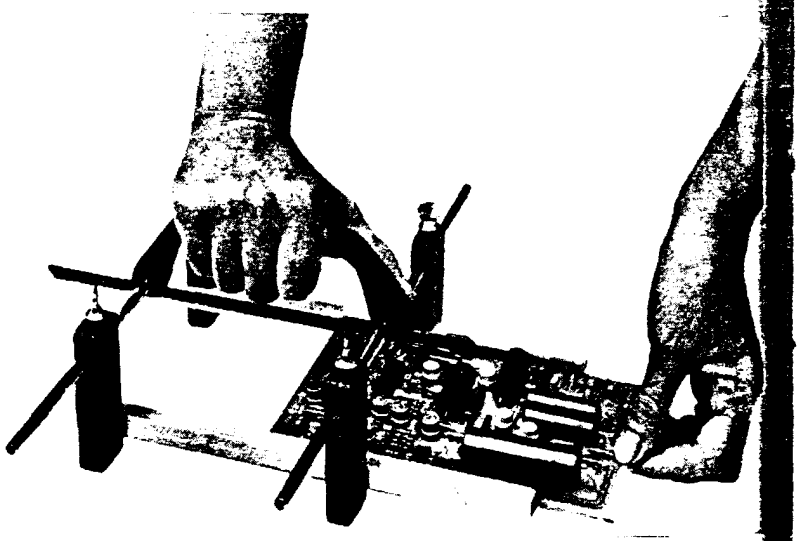
Instead of a soldering iron, the actual soldering operation is carried out by induction heating coils. Low voltage coils with an output rating of 7½ KW do the job.

Other functions performed by the machine are sizing of the fuses and an automatic continuity check. Sizing not only insures complete uniformity of length, it guarantees 100 per cent electrical contact of the caps to the fuse links.



Fast Soldering of Printed Circuits

Manual soldering with a hot iron is much too slow for printed circuit manufacture. Today, whole printed circuit boards are soldered all at once. A hundred or more junctions can be made in three seconds flat with modern methods. After inserting the assembled board into an adjustable rack, the operator simply dips the board into the solder pot. Rack shown is the DIP-RAC from Defiance Printed Circuit Corp.



LIA26253

NEW USES AHEAD FOR PZT

Inventor Murray demonstrates a scale the size of a tuna can. The small PZT unit (above) replaces all the beams, linkages and springs of a conventional scale and produces a reading in volts (below). In use, the scale would be calibrated in pounds, ounces, or tons, of course.

Lead zirconate-titanate, a ceramic material that looks like a piece of fired pottery, was discovered a couple of years ago to be piezoelectric — the best such material to date, in fact. Since its discovery PZT (as it is commonly known) has been making rapid strides to overtake its predecessors.

Like some naturally piezoelectric crystals, PZT generates electricity when squeezed and changes shape when subjected to electric stress. But unlike natural crystals or conventional piezoelectric synthetics, PZT stands high temperature and high pressure, and has a high conversion efficiency.

These advantages make many new uses possible. "New product ideas are being generated so fast that evaluation of their merits is quite a problem," says one major lead zirconate-titanate producer.

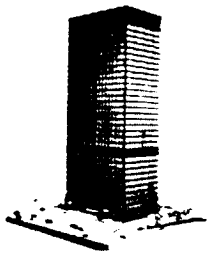
Probably the wildest suggestion so far has been to embed a piece of the ceramic in the heels of women's shoes. Every step would generate enough current to light a neon bulb at her toes. A more serious idea is a spark lighter for oil and gas furnaces and clothes dryers using the same principle as the spark pump ignition system.

New applications for PZT are coming in from many sources. Jerome Murray, head of Jerome Murray Corp. and a busy professional inventor, has developed a PZT weighing device and an auto speedometer among others. Simple in construction and potentially low in cost, these devices have large prospective markets.

The PZT scale is as reliable and accurate as a doctor's scale. Besides the obvious use in bathroom scales (under observation by scale manufacturers) industrial uses are anticipated. Extremely accurate and compact, the PZT scale could be installed in many locations in industry where standard scale mechanisms won't fit. Automatic weighing right in a packing machine, for example, or in a fork lift truck, are potential applications.

NEXT ISSUE —

PZT in air conditioners and the possibility of "picture frame" TV



C.I.L. House, Montreal, Quebec, Canada (courtesy Canadian Industries Limited).

View of several footings — far right, pads beside leveled footing — center, pads being adjusted—lower left, column base plate in position.

Canadian Skyscraper

FLOATS ON LEAD PADS

Workmen apply asphaltum to pad before installation . . . and position pad to receive base plate.

Rapidly rising to take its place on the skyline of Montreal, the 34 story C. I. L. House at 630 Dorchester Boulevard West, will present its newly finished face to the old City sometime around May, 1962.

Designed by the associated architectural firms of Skidmore, Owings & Merrill of New York, and Greenspoon, Freedlander & Dunne of Montreal, the building's exterior will consist mainly of glass and metal. It's to be one of the first examples of "total design" in Montreal, where the architects design all of the interior spaces for principal tenants.

Smooth vertical lines of the tower will extend unbroken through its full height by the machinery floors, located at the 10th and 33rd story levels.

To isolate the building from vibration which would be transmitted through the columns from the nearby underground railroad tracks or the subway now contemplated, lead-asbestos anti-vibration pads were installed between the concrete footings and base plates which support the steel framework.

Footings were poured in 4000 psi concrete, with tops recessed and level to hold the lead pads and column base plates. These base plates rest freely upon the pads, and neither is anchored in any manner to the footing. The recesses serve merely to hold the lead pads in place.

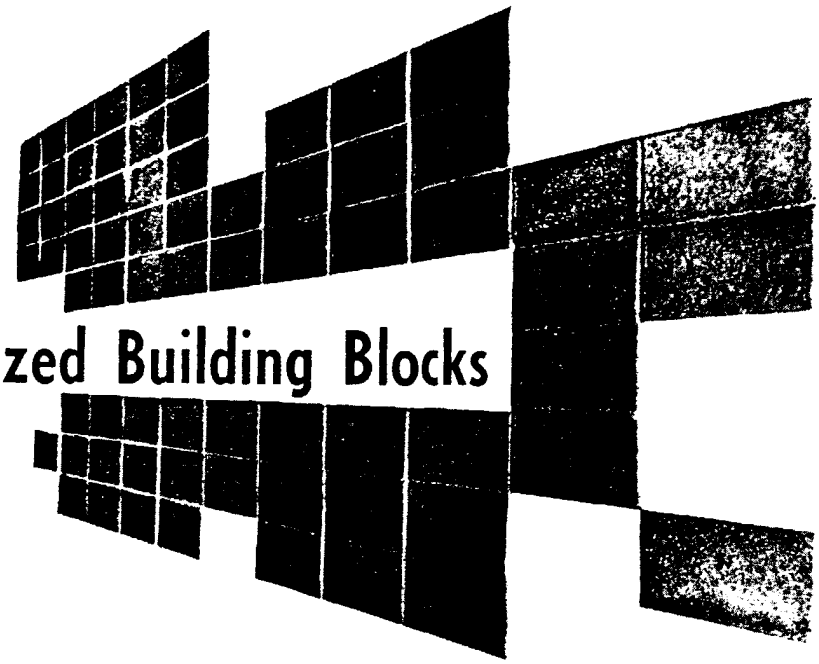
Largest pads used were nearly eig feet on a side, and for handling pu poses were fabricated in two piec about four by eight feet each. The were designed to extend 1-in. on sides beyond the column base plat which stand upon them. Working stre on the pads is expected to run abo 1000 psi.

Approximately 1-in. thick, the pa consist of 2 layers of $\frac{1}{8}$-in. lead su rounding 2 layers of asbestos ceme board $\frac{3}{8}$-in. thick, with a 20-gage g vanized iron sheet in the center. Tot area of pads used for the job w 1,411 sq. ft. Before they were laid position, asphaltum was applied to t bottom to keep lime in the "gree footings from attacking the lead cove

Several other buildings in Montre are using lead-asbestos pads for vibr tion isolation, among them: Place Vi Marie, located diagonally across t corner from the C.I.L. House. T Canadian National Railway's Montre Station, and the adjoining Queen Eliz beth Hotel.

. . . . on the horizon

Bantamweight Glazed Building Blocks



Textured surface and gentle color shading offer wall beauty and vandal resistance in a lobby of the Edgemere Houses in Rockaway, L. I. Wall shown is layed up of experimental lightweight lead glazed block made at Alfred University.

LIGHTWEIGHT building products that can be erected rapidly and cheaply are the preference of today's builder — a man beset with high labor costs. Also, building owners prize surfaces that require no painting and a minimum of cleaning. Now, structural clay research has led to a new product which meets the demands of builder and owner alike. Extremely lightweight clay building blocks glazed with lead-bearing ceramic are good for both exterior and interior use. They will soon be available in production quantities.

Lead bearing glazes will be the preferred glazes for these blocks. The reason? — lead glazes flow easily over rough, porous clay surfaces without need for critical temperature control. Compatibility with many different colors is another important advantage.

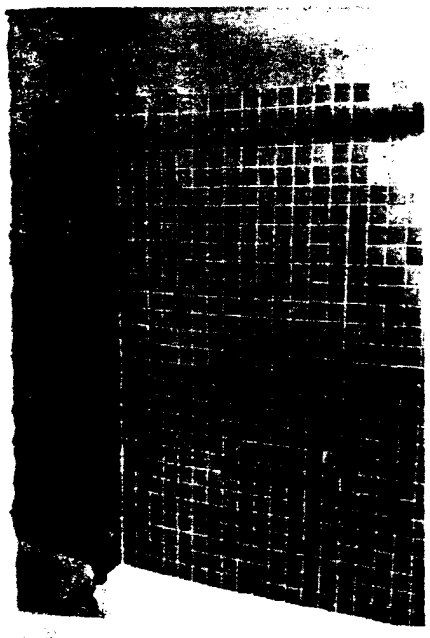
Two major brick and tile producers are set to market these blocks in the next few months. Installed costs won't be known until actual introduction but best guesses are that they should be lower than other types of colorful, self-cleaning walls.

Key to reduced costs will be the extreme lightness of the blocks. Made light by the inclusion of puffed clay, blocks passing all structural standards have been made less than one-quarter the weight of the conventional product. Cost saving advantages of the light block will be faster and cheaper construction and lower shipping costs.

First application of this type of lightweight building product is at the Edgemere Houses in Rockaway, L. I. — built by the New York State Division of Housing and Community Renewal. Lead glazed tile manufactured for the housing commission by Alfred University's Ceramic Laboratories have been experimentally installed in one lobby of this development. Vandalism, a major problem of housing authority projects, is discouraged by the hard, stippled glazed surface. Cleaning of the glaze is easy also. A beautiful rough textured surface in many shades of green avoids any possibility of an institutional look in the wall.

A great future is seen for the material. Combined with new water impermeable mortars, one-block-thick walls could be constructed with glaze both interior and exterior at tremendous savings. Lightweight precast glazed panels is another possibility for even faster construction. All in all, lightweight clay structural units are expected to open up a new era in building with masonry products.

Edgemere Houses also sport a bathroom equipped in glazed tile made of lightweight clay. Large units — 2' 6" x 2' 6" — assembled from individual tiles allow rapid installation.



The library at Cornell is designed for graduate and faculty use and will house more than two million volumes, making it seventh among college libraries in the United States. In addition to the usual catalog, reference and circulation departments, provision has been made for reception, reading, study and exhibit rooms for the Wason collection on China and southeast Asia; the Icelandic collection; a rare book department; a map, microtext and newspaper department plus the university archives and regional history department.

Lead Goes to School

Two university libraries recently used the same novel solution to a roofing problem

Cornell University and Rutgers University libraries have one thing in common — the prominence of their roofs. In neither case was this without design. But in the former there was a particular reason. Both buildings were done by the same architects: Warner, Burns, Toan and Lunde of New York City. Both are air conditioned. But, because the John M. Olin library at Cornell rises seven floors, cooling equipment had to be housed on top. Hence the "Hat" as it has been called.

The "Hat" is a weatherproof decorative feature which encloses space for machine rooms and storage. This in contrast to the usual treatment of heavy enclosing walls of masonry.

The decorative feature of the assembly is achieved by use of batten and seam joints in patterns. Material used throughout is lead coated copper. The herringbone pattern evident in the photograph serves a double function. It allows expansion of the material and contributes stiffness to the sheet metal. Lead-coated copper avoids staining the adjacent structure and presents a pleasing uniform color which blends well with other building materials.

The "Herringbones" themselves are simply crimps in the material. The pattern is interrupted on approximately forty-two inch centers by alternating batten and standing seam joints running vertically. As a result, not only is rain water confined between the battens but is slowed in its course by the irregular pattern in the metal. At the corner columns (an example of which is visible in the photograph) the entire vertical surfaces of the column are sheathed in lead-coated copper.

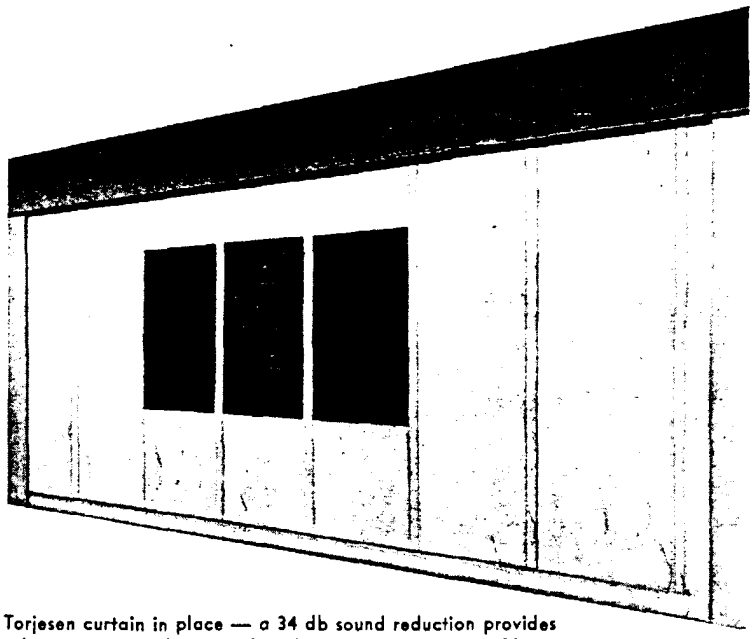
These are the *visible* surfaces where this reliable metal has been used. Elsewhere the same material has been used for window head and sill flashings, floor flashings, entrance step flashings, and planter box linings. All sheet metal work was done by Cashier & Co., Syracuse, N. Y.

In the Douglass College library at Rutgers University a similar treatment to the "hat" was used for a different purpose. Here the sharply sloping roof covers the ends of roof joists. It also provides air space, a higher ceiling, a plenum for the air conditioning. However, the decorative possibilities are again not overlooked and the exterior surfaces are covered with lead-coated copper. This time the patterning is done with batten seams only at the corners and on approximately twenty-two foot centers thereafter. These are doubled in each case to form a rain gutter between them, an unusual treatment in itself.

Between the doubled battens standing seams occur on approximately two foot centers. Sheet metal work done by The New Brunswick Roofing & Metal Co., N. J. Here, as at Cornell, a purely utilitarian function has caused no compromise with beauty and both buildings have gained from the presence of good design and quality materials.

Rutgers Library provides space for 150,000 volumes on two floors and a mezzanine and features an outdoor reading deck and an entrance by way of suspension bridge. Extremely compact design with centralized staff and service areas permit operation and control with maximum efficiency and a minimum of personnel.

ACOUSTICAL PRIVACY ON A ROLLER



Torjesen curtain in place — a 34 db sound reduction provides adequate privacy between the adjoining rooms separated by it.

Both rising construction costs and new architectural ideas have spurred the development of flexible room planning for schools, conference rooms, hotel meeting rooms and similar areas. A typical "flexible" arrangement can be used as one large meeting room or split up into a number of smaller areas. To do this easily and quickly, yet provide acoustical privacy comparable to conventional small rooms, designers have had to do some nimble thinking.

Of the many basic approaches to the problem three have made use of some form of lead as an acoustical material. The Acousti-Flex curtain (LEAD, Vol. 25, No. 1) makes use of lead wire woven into a fabric as the sound barrier. Accordion folding doors employing leaded vinyls are now being increasingly used as acoustical partitions — LEAD plans to present details of some of these installations in later issues.

The third approach to conveniently movable partitions is still more novel in its use of leaded vinyl sheet. The Torjesen acoustical curtain can best be likened to a large window shade which rolls up or down at the touch of a switch. With a ten foot ceiling, half a minute suffices to "install" or "remove" the acoustical wall, no matter how wide. By using a sheet of leaded vinyl plastic weighing 3 lb. per sq. ft. (it's about 1/8" thick), the manufacturer of the curtain has been able to attain an average sound transmission class of 34 by Riverbank Laboratories test. This is about the same degree of acoustical privacy that could be attained with a solid inch of sand plaster as a wall.

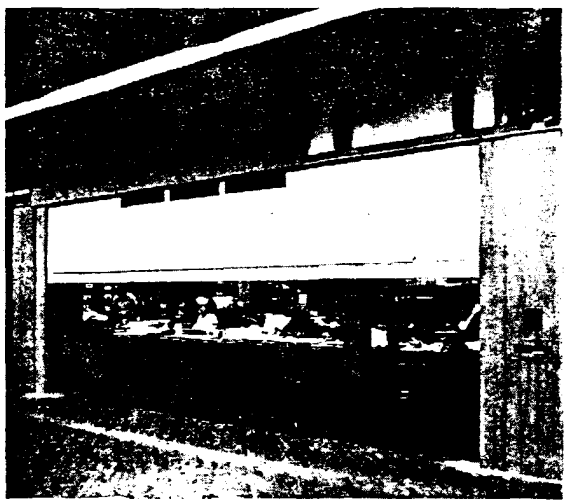
One of the problems that designers have found tough to lick is sealing the edges of such a wall. The Torjesen curtain stops these sound leaks with vinyl pressure seals built right into the jams. At the floor, the curtain's weighted bottom hem also maintains a tight seal — without any floor track or other appurtenance.

All the mechanism, including the drive motor and guide roller, are housed in the overhead enclosure which is 18" square. Of course, in new construction this may be located in the ceiling itself so that no head room at all is lost. Jams at the sides extend only 8¼" into the room and are less than 3" thick.

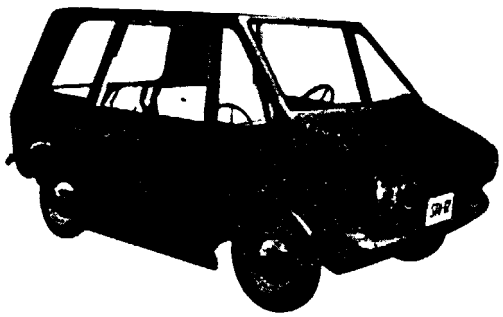
Since many of the installations are expected to be in schools and meeting rooms where the use of a blackboard can be expected, the curtain has an optional feature of flexible chalk panels. These areas provide a convenient writing surface which disappears along with the wall when it is rolled up. The illustration shows the good legibility attained with ordinary chalk.

The Torjesen curtain, announced only a few weeks ago, is now being installed at Chicago's Teachers College and in other schools. The approximate installed cost is $10 per square foot. It is made by Torjesen, Inc., 209 25th St., Brooklyn 32, New York.

Going . . . gone! This test installation in the manufacturer's plant shows all the working parts which are normally hidden by the building walls and ceiling.



Brand New Auto Uses Battery Power



Two issues ago LEAD pictured the experimental "Voltaram." The Stuart electric family car shown here is now going into production by the same manufacturer. Weighing 1200 lb., including batteries, it will carry two adults and two or three children in comfort at speeds up to 35 mph. Its low gear ratio provides ample power for hills and grades. After about 35 miles of driving, charging from any 110 volt power outlet refuels it through a built-in charger.

The attractive economics of battery-powered driving get off to a good start with the purchase price of the Stuart — $1600. The inherently durable qualities of electric vehicles are well known, perhaps even legendary. The number of moving parts is astonishingly small. No antifreeze is needed for there is no radiator, no oil change because there is no crankcase. The upshot is trouble-free driving at less than a cent a mile.

Stuart Motors, Inc., is located at 317 N. Church St., Kalamazoo, Mich.

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.

The materials you buy — lead

Descriptive information about lead from mine to finished products. Reprinted from "New York Purchasing Review," January, 1959.

Corrosion Data — lead & alloys

Chart form presentation of the corrosion resistance of lead and its alloys to 188 common chemical materials over the normal temperature range. Reprinted from "Chemical Engineering," February, 1953.

Methods of lead lining tanks

Four page review of corrosion performance and fabrication methods for lead in process vessels and piping. Considers five ways of using lead. Reprinted from "Chemical Engineering," January 9, 1961.

Materials of construction reviews

Lead and lead alloys in design and construction for research and engineering use. Bibliographies for 1961, 1959, 1958 and 1957 are available (editions are not cumulative). Reprinted from "Industrial and Engineering Chemistry."

Lead-asbestos anti-vibration pads

Gives specification, drawings, and reviews recent applications of lead-asbestos anti-vibration pads for buildings.

Lead work for modern plumbing

$2.00 Postpaid, $1.50 per copy in quantities of 10 or more.

Profusely illustrated with over 140 photographs and drawings, the textbook presents clearly to the plumbing student the necessary tools, procedures and the methods required for lead work.

Design engineering data

Twelve-page publication summarizes all main lead uses, tabulates data.

Red lead technical letters

No. 12 Seven formulations and schedules for painting highway structural steel.

No. 13 L.I.A. Formula 9-2. A single Red Lead Primer for Rusted, Weathered or New Galvanized Steel.

No. 14 Describes the formulation of red lead-coumarone primer for seawater immersion — ship hulls, fixed marine instaliations.

Lead in modern industry

(Request on company letterhead, please)

A fully illustrated 230 page, cloth bound book describing all phases of the production and use of lead, lead alloys and lead compounds.

Truck costs in a jiffy

Three nomographs permit estimation of costs for gas or battery powered industrial trucks in two or three minutes. Depreciation, operating costs, and maintenance are appraised separately for all unusual types of operation.

Building construction bulletins

No. 1 Specifications for Lead Waste Connections for Plumbing Fixtures with Integral Traps (Water Closets — Pedestal Urinals — Service Sinks).

No. 2 Specification for Lead Shower and Safe Pans.

No. 3 Specification for Lead Chemical Laboratory Drainage Systems.

Seamless terne for roofing

Illustrated four-page architectural specification also provides data on strength and weight characteristics and color advantages of terneplate as roofing.

Oilless bearings — helicopters

Reprint from "Design News" shows use of lead-teflon bearings in helicopter. Photos and drawings included.

Nuclear materials

Eight-page reprint from "Materials in Design Engineering" inspects current fuels, controls, moderators, reflectors and shielding.

Decorative finishes for lead

Informative four-page reprint from "Metal Finishing" (1949) describes methods for all finishes and plating methods for lead.

Cutting press vibration

Describes use of lead-asbestos anti-vibration pads to reduce newspaper press vibrations. One-page reprint from "Publication Management" for April, 1961.

Quiet please!

Two-page reprint explaining lead's function as soundproofing material. From "Modern Sanitation and Building Maintenance" April, 1961.

NEW LISTINGS

Porcelain enameling aluminum

Reprint from "Precision Metal Molding," May, 1961, gives design tips, typical frit formulations, and surface characteristics for aluminum enamels.

Amazing new spark plug pump

Eight-page reprint from "Popular Science" describes piezoelectric leaded ceramic and its use in gas engines.

All about lead welding

Reprint of the chapter on lead welding from American Welding Society's "Welding Handbook." Concise but comprehensive.

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