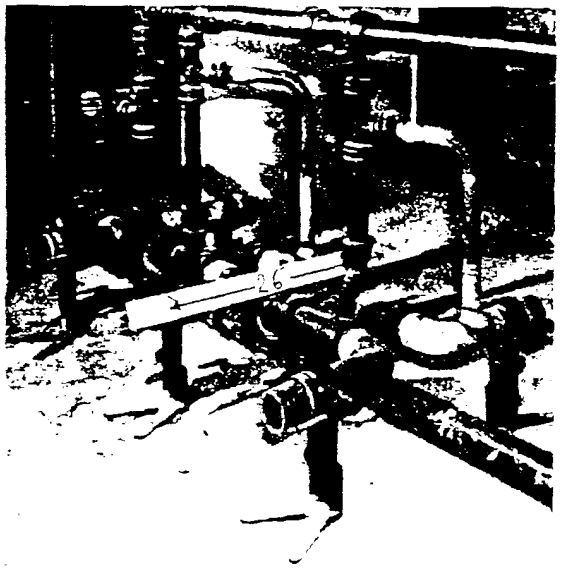
Proper Maintenance of Public Toilet Rooms Made Easier With Wall-Hung Plumbing Fixtures

IN all public toilet rooms one of the most difficult problems in connection with these facilities is maintaining proper cleanliness after the installation has been placed in use. Many persons shudder at the thought of having to use such facilities usually because they expect, and very often get, conditions that are a disgrace and more important, dangerous to health. To a large degree, this problem can be solved by easing and simplifying the surface maintenance of such utilities.

One of the prime requisites therefore is the proper planning and installation of such facilities so as to avoid the underlying causes that permit such situations to develop. The first rule then is the avoidance of inaccessible floor areas or areas difficult to clean easily. The second and probably more important aspect to avoid is the possibility of spillage seeping around the joint between the fixture and flooring. In this event, a very unhealthy situation soon develops that no amount of surface cleaning will cure. The only corrective means then available is ripping out and replacing the installation.

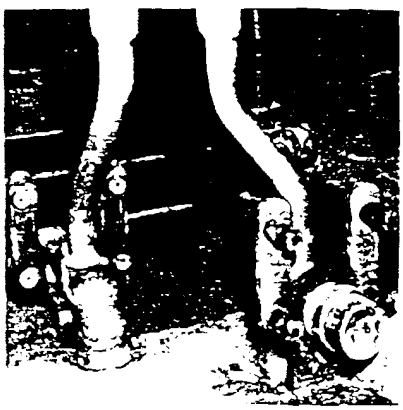
The solution fortunately enough is a simple one, requiring only that wall-hung fixtures be used in place of the more conventional floor fixtures. Cleaning presents no problem as the entire floor area is easily accessible to an ordinary floor mop. The floor itself is not likely to present areas through which seepage can occur inasmuch as there is no need for breaks in the continuity of the floor material.



A battery of flexible lead connected wall hung closets with the cast-iron soil line above the slab as installed in the U. S. Army Medical Depot, St. Louis.

LUNDER PHOTO

A detail of two of the closets installed in Famous & Barr's new department store. Note inverted lead bends vented with lead pipe.



Wall-hung fixtures of course present problems of installation that are not encountered with floor fixtures. Ample support of the wall-hung fixtures is absolutely necessary and the piping connecting the fixture to the soil line must be flexible. The need for this flexibility is even more pronounced in wall-hung fixtures than for other fixture connections because of the greater rigidity with which they are held in place.

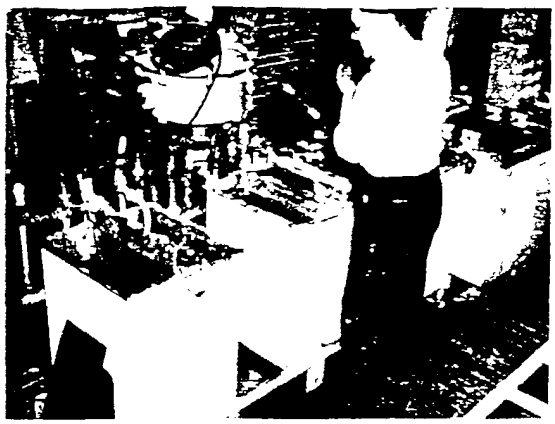
These two problems of installation are in fact no problem at all if installation is made in the same or similar manner as that used in two recently completed public toilet rooms in St. Louis, Mo. The two installations differed in one important respect, the horizontal cast iron waste serving all fixtures was under the concrete slab in one case and on top of it in the other.

In the first named case, lead bends providing the necessary flexibility for such type installations with flexible lead vent connections were installed in the public toilet room of the new south side store of Famous and Barr Co., a large department store in St. Louis. The bends were caulked with lead into the horizontal cast-iron soil line running under the concrete slab. Ample support for the wall-hung closets was provided by American Foundry & Mfg. Co. adjustable closet support No. 5, type 1935. The Mid-City Plumbing Co. of St. Louis were the plumbing contractors.

A battery of wall-hung closets with the main horizontal cast-iron soil line on top of the concrete slab was installed in the U. S. Army Medical Depot, St. Louis. By rolling or offsetting the cast-iron Y's and with the aid of lead bends, a minimum of horizontal space was required for the piping layout. Thus it was possible to have the waste outlet for the wall-hung closets at the proper height and at the same time, maintain the necessary fall in the soil line. Such installations are particularly suited to new toilet rooms in older buildings.

The adjustable closet supports were model No. 1, type 1935, manufactured by the American Foundry & Mfg. Co. The plumbing contractor was the E. J. Fischer Co. of St. Louis.

Lead's Part In Phonograph Record Manufacture



One of the steps in phonograph record production. The "metal master" disc is removed from lead lined cleaning and plating tanks after being nickel plated.

TRANSFORMING a lump of shellac or plastic into a disc capable of reproducing sound is a long and intricate procedure in which lead plays an unlauded but important role. Stripped of most of the technical complexities, here are the basic steps for making fine recordings.

The operation begins with the making of the original recording on a special lacquered disc known as the "master."

The first step in reproduction is to metallize the grooved surface of the "master" disc so that it will conduct electricity. The method now most often used is the deposition of a silver mirror on the "master" disc by reduction of a silver nitrate solution. After silvering, the disc is given a nickel plate of about 0.0002 in. thickness, followed by a preliminary copper plate in an acid copper bath. In the next step, a thickness of copper far greater than that usually encountered by the average plater is put on the disc—0.050 to 0.070 in. This is the trickiest part of the process, for the copper must have a smooth surface entirely free of lumps and nodules. It must be hard and springy without being brittle and must have a well-controlled and constant thickness gradation from the edges to the center. Finally, it is desirable to produce these shells as rapidly as possible. To those familiar with the problems of plating, this is quite an order!

It is here, in the plating operation, that lead plays a doubly important role. Anode electrical contact is maintained by a sheet of lead usually alloyed with 1 percent silver placed under the anodes and connected to the positive bus bar by an insulated strip of lead. A second important function is the maintenance of electrolyte purity. Any products of corrosion from the plating tanks themselves, are eliminated by using lead as the tank lining material. Lead's importance here is based on its chemical inertness to the corrosive attack of acid copper electrolytes which average about 32 oz. of copper sulphate and 8 oz. of sulphuric acid per gal.: a corrosive combination with which no other common metal can cope.

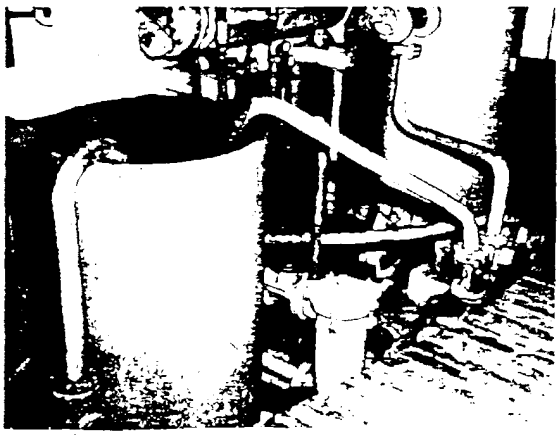
Inasmuch as electrolyte purity is vital to successful record plating, the acid electrolyte is conducted in lead pipes to a continuous filtering unit which constantly removes any foreign particles from the bath. A typical lead lined electrolyte filtering unit is illustrated. The electrolyte circulates continuously through the plating and purifying sections shown in the accompanying illustrations.

After plating, the "master" disc is separated by hand from the electroformed metal mold and we now have a copper negative, known as the "metal master." After centering and punching, the "metal master" is tested to find the musical center. It is then trimmed to size and any remaining silver film removed by electrocleaning. After a final polish on a rotating spindle the "metal master" is complete.

The next step is the formation of a "mother" disc. This is a positive plate and is made in approximately the same manner as the metal master, that is, by plating first with nickel and then copper. As before, a silver film betwen the two discs provides for easy separation after the plating operation is completed.

Now, for the first time, the record is played to check for "ticks" or other imperfections. At this stage of the operation it is possible to correct some imperfections by using fine engraving needles in the hands of skilled craftsmen.

The next and last plating process involves the production of a negative for making the finished record. And here again the process is identical to that described for making the "metal



Electrolyte purity is vital to successful record plating and to maintain its purity, is continuously circulated through lead pipe and the lead lined filtering unit shown at left.

STAR PHOTOS

master" and the "mother." The final product, called the "stamper," requires great care and rigorous control to achieve proper results; hence the purity of the plating baths is particularly vital in this operation. The final step in production of the "stamper" is chrome plating in which lead also plays an important part. The anodes and tank lining normally employed for chromium plating are made of either antimonial lead, tin-lead or other lead base alloys.

The finished "stamper" is fastened to the dies of a record press where it may be alternately heated or cooled by steam or cold water passing through internal channels. The main job of making a record is finished and from now on it is simply a matter of filling the mold with record shellac or plastic and pressing out discs as long as the "stamper" holds out and as long as the public will buy.

Actually plating operations for the record industry represent only a small proportion of the total lead and special lead alloys used in the plating industry. Practically all chromium plating is done in lead lined tanks and with lead anodes, the lead in this case being alloyed with other metals. Nickel plating requires lead linings and also uses lead pipe coils for heating the plating baths. Conversely, lead lined anodizing tanks for treating aluminum use lead coils for cooling the bath, usually by circulating brine or refrigerants such as Freon.

Lead Has Two Useful Functions In Betatrons— New Source of High Energy X-Rays

A NEW atomic big gun, the world's largest betatron, has recently gone into action at the University of Illinois. It is capable of flinging electron particles of electricity at 300,000,000 electron volts to produce X-rays and other effects. Manufacturing the meson particles naturally found in cosmic rays is one of the jobs it is expected to do. The new betatron is one of the largest atom smashers of any sort actually operating although larger billion volt atom machines are under construction.

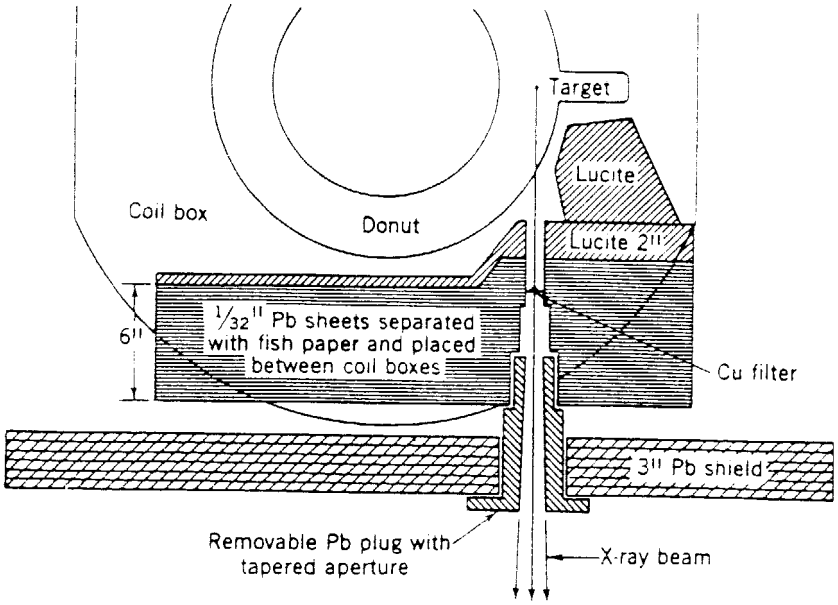
The difference between an ordinary X-ray machine and the betatron is that the electrons are accelerated by magnetic induction instead of by direct application of high voltage. The result is that the electrical insulation no longer is the limiting factor in the acceleration of the electrons and they can be given energies in the betatron not previously obtainable by any other man-made means.

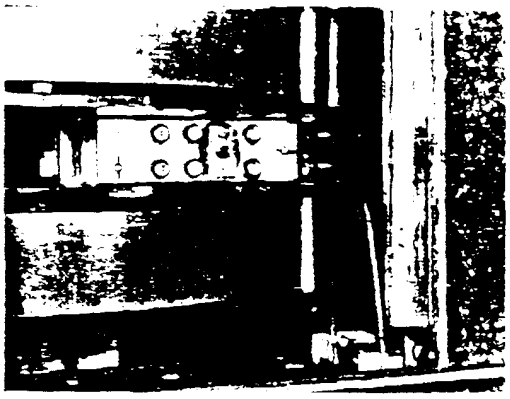
When high energy electrons strike a target such as platinum or tungsten, X-rays are produced having a very high penetrating power. Betatrons in the 24 million electron volt range are being used to great advantage in thick section radiography where high penetration is needed. The small focal spot inherent with the betatron and not with other X-ray machines is nearly the ideal point source. This makes possible magnification of the objects being examined without sacrificing the clarity of the radiograph.

Radiation of such high penetration is exceedingly dangerous to operating personnel should they be accidentally exposed to it. Protection from the powerful rays is effectively achieved by utilizing the excellent radiation absorption characteristics of lead. The following thicknesses have been found equivalent for reducing to half value high energy radiation produced by the betatron: 6 in. of concrete, 1½ in. of steel, ½ in. of lead (these values are rounded off for field use and are not recommended for more exacting calculations).

The 300 million volt betatron is used solely for physics research at the University of Illinois in Champaign. But a 22 million volt betatron is being applied to medical treatments at the University of Illinois in Chicago. During medical deep therapy treatment, lead up to 9 in. thick is being used to completely shield the patient from harmful radiation from the betatron. Because of the tremendous magnetic energy involved, ⅔ of the 9 in. is made up of laminated lead sheets 1/32 in. thick (2 lb.) separated with fish paper to reduce eddy cur-

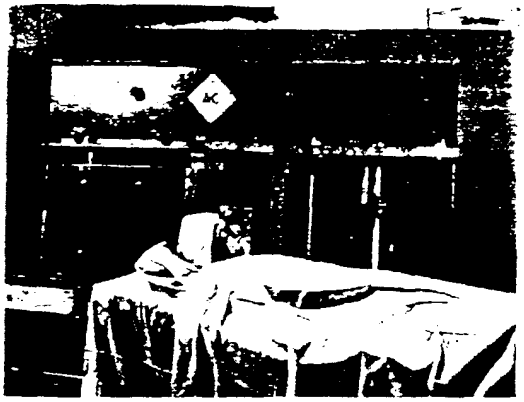
Schematic top view of the 22 MV betatron showing the lead collimating and shielding arrangements and removable lead aperture plug.





Left
The 3-in. lead shield moved to one side to display the 9-in. thick lead collimator.

Right
Tumor therapy with the 22 MV betatron at the University of Illinois medical school.



rent flow in the immediate vicinity of the alternating current magnet poles. By being arranged in this manner, the lead serves the dual purpose of acting as a collimator as well as an absorption medium for rays emitted in directions other than that desired. The lead also restricts the beam cone to the desired treatment area and serves to protect the patient from a general body dose.

Outside of the betatron itself is another 3 to 4 in. thick lead shield made up of laminated ½ in. thick sheets. Fitted with a tapered steel faced lead plug at the ray outlet, this shield is laminated sheet lead (without paper) only because it is more convenient to handle as separate sheets and is somewhat more dense in rolled form than a single casting.

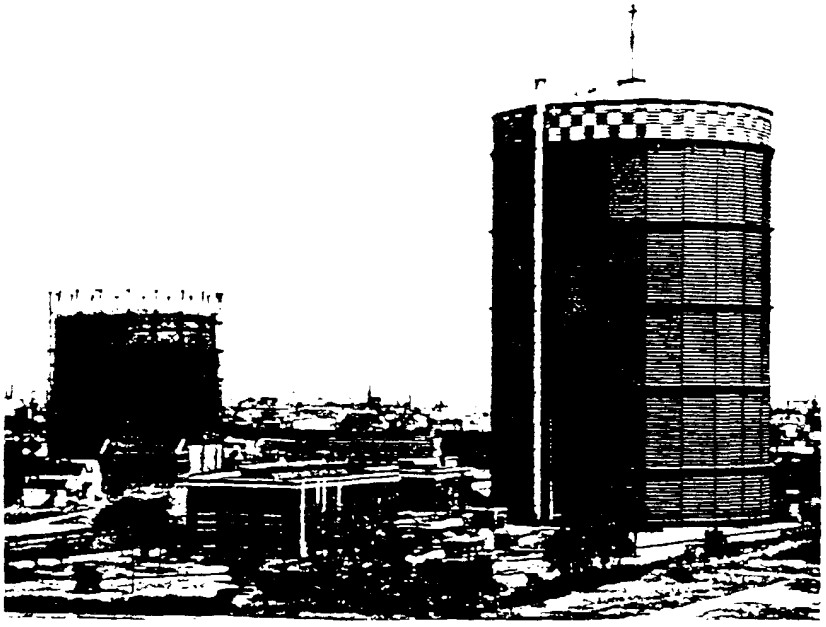
Red Lead Protects Chicago Gas Holders

THE Peoples Gas Light and Coke Company relies on red lead base paint to protect its seventeen gas holders in the City of Chicago. These holders, comprising both water seal and waterless types, are a vital part of an extensive gas distribution system containing approximately 3,700 miles of mains serving more than 910,000 customers.

In addition to the initial two full coats of red lead paint applied after erection, the Peoples' holders receive touch-up coats of red lead primer approximately every five years as part of the regular maintenance painting procedure.

The ten million cubic foot waterless holder at Calumet was the latest to be repainted. All rusted areas of this 3,100 ton structure were thoroughly wire brushed and received a touch-up coat of red lead base primer before the full coat of green finish paint was applied. Approximately 125 gallons of red lead paint were required for this job. The crown and top 30 feet of the shell was painted in orange and white checker board pattern in accordance with Civil Aeronautics Authority Specification for daytime marking of tall structures. This orange paint is a basic lead chromate type conforming to the requirements of Federal Specification TT-P-56 (International Orange).

The Calumet holder, placed in service in 1929, is one of four 10 million cubic feet holders now operated by The Peoples Gas Light and Coke Company which are surpassed only by the 15 million cubic foot holder at North Shore Station. It is a 24 sided octagonal waterless type of standard de-



Two of the seventeen red lead protected gas holders of the Peoples Gas Light and Coke Co., Chicago.

sign with riveted construction. Latest design on this type of holder uses all welded construction. Government approval is now being sought for construction of a seventeen million cubic foot capacity waterless type holder at 1780 Marcey Street, Chicago. Construction will proceed if and when proper authorization is secured.

The Peoples Gas Light and Coke Company was incorporated in 1855 and began the manufacture and distribution of gas seven years later. Since 1907 the Company has been the only one supplying gas to the public in Chicago. By amendment to its charter, it has acquired the authority to manufacture and distribute gas for fuel purposes, to distribute natural gas, and to distribute gas in any territory annexed to the City of Chicago.

Red lead base primers are used to protect gas holders in all sections of the country. A widely accepted formula for this purpose is one containing seventy-five percent red lead and twenty-five percent iron oxide in the pigmentation. This type of pigmentation is usually used with a vehicle containing equal parts of synthetic resin (alkyd) and raw linseed oil. Primers of this type used with suitable finish paints assure economical long term protection in industrial environments, a particularly tough service condition for metal protective paints.

Lead Has Variety of Uses In Long Island Development

"I WANT my home to last a lifetime"—is a sentiment echoed by nearly every new home owner. At the same time they want a home that will be a good financial investment, one that once built will require a minimum of repair and maintenance.

Maxwell Snedden, builder of "Wantagh Crest" homes in Wantagh, Long Island has tried to provide just such assurances by using the best of construction materials coupled with fine architecture and careful workmanship. And contributing its share toward a safe and sound investment is lead. Lead bends, calking lead and lead shower pans guarantee a long life and trouble-free service. Lead-containing exterior paints help beautify as well as protect the outside wood trim and other painted surfaces.

"Wantagh Crest" is a development of 100 ranch style homes with attached garages and full basements. Designed in a modern, comfortable style by Mattern and York, architects, each home has three bedrooms and two baths, one with a tub and the other with a stall shower.

The shower stall, a "luxury" feature usually found in more costly homes, is guarded for a lifetime from floor damage due to seeping water by a lead shower pan. The stall, 4 ft. 4 in. long and 2 ft. 6 in. wide, is lined with a sheet of 4-lb. lead. The upstand is about 6 in. with the corners folded in pig-ear fashion.

Installation of a lead shower pan is very simple. First, the wooden flooring or platform is examined to see that it is smooth and free from any projections such as nail heads that might injure the lead. It is good practice to line the platform next with ordinary tarred building paper to act as a cushion for the lead which is then laid in, the sides dressed up against the walls and, if desired, nailed along the top edges to the studs. Then the pan is soldered to the drain pipe below the "weep" holes.

One of the more than 100 attractive ranch style homes in "Wantagh Crest," a Long Island, N. Y. development.

The step that follows is one that is often inadvertently omitted—painting the lead with asphaltum. This is a particularly important step because the thin layer of asphaltum halts any action on the lead by free lime in the "green" concrete which is poured on the pan as a base for the tile. "Cured" concrete has no effect on lead, but until all the free lime is converted to carbonate, lead in direct contact with concrete may react chemically. The best insurance against this possibility is to paint the lead with a water-proofing material such as asphaltum and thus protect it until the concrete is thoroughly cured.

A further guarantee of continued satisfaction with the lead in the plumbing system at "Wantagh Crest" is that the 200 lead bends used in the development are stamped with the Lead Industries Association "Seal of Approval." This means that the bends have been carefully manufactured and conform to the rigid mechanical, dimensional and chemical specifications established by the Lead Industries Association. All of the lead work was done "on the job," by JK Heating Company, Amityville, Long Island, New York.

Lead always plays an important part in the modern plumbing system. It is flexible and able to "give" without fracturing as the house settles. It is corrosion-proof and unaffected by the variety of corrosive liquids and gases to which plumbing is customarily subjected. Furthermore, when plumbing is inaccessible, when it must be depended upon to give a lifetime of service without repairs and without having to tear part of the house down, lead is always preferred.

Lead vent stack flashings. *Lead shower pans.* *Lead water closet bends.*

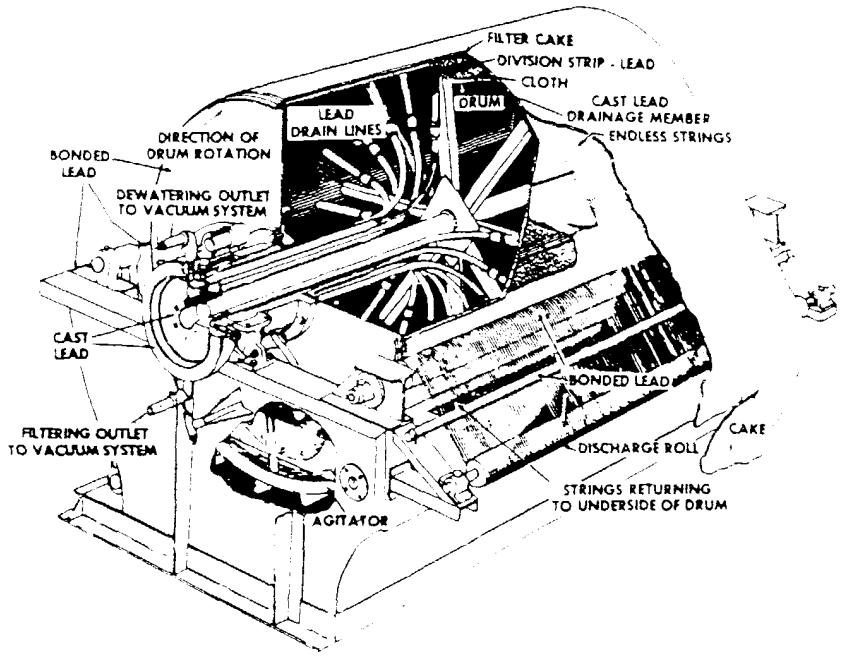
The varied ways in which lead is used in Wantagh Crest, a Long Island, N. Y., housing development.

Bonded and Cast Lead Featured In New Vacuum Filters

THE separation of solids from fluids is encountered in most chemical processing using equipment ranging from simple laboratory funnel and paper to complex industrial filter presses. One of the newer developments in industrial filtration is the continuous type rotary drum cake filter. Several varieties of this type are on the market, differing chiefly in the method of removing the filter cake and the materials of construction used. Almost invariably when sulphuric acid is the filtrate, the filter is built using either bonded lead lining (lead bonded to steel) or cast hard lead wherever the corrosive is encountered.

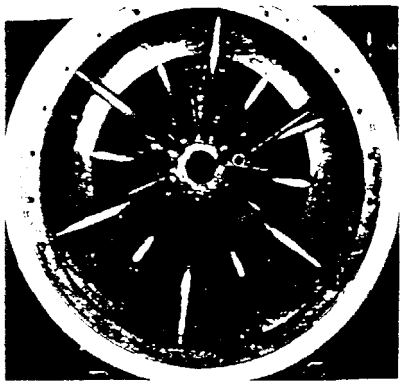
This is how the rotary vacuum drum filter works: A horizontal cylinder, sealed at both ends, is designed so that sections beneath its surface may be evacuated. The surface consists of screen cloth or perforated plates covered by filter cloth or other fluid permeable material. The drum is rotated through the mixture to be filtered where it picks up a "cake" or layer of solids while at the same time drawing the liquid filtrate into evacuated drainage lines. The filter cake may then be blown, scraped or pulled from the drum. The string-discharge type filter manufactured by Filtration Engineers Inc. of Newark, New Jersey, employs a set of circumferential cords wound around the drum beneath the cake which automatically pull off the cake as the drum rotates.

Construction details of a continuous type rotary drum cake filter, one of the newer developments in industrial filtration manufactured by Filtration Engineers, Inc., Newark, N. J.

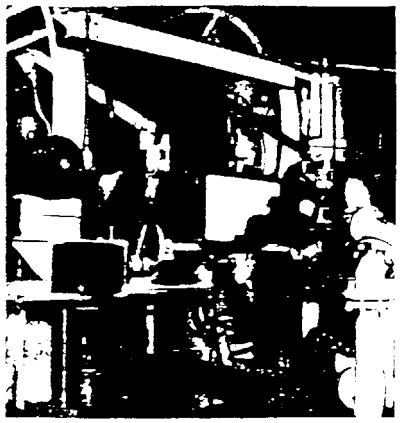


Rotary vacuum drum filters are available in diameters ranging from 1 to 14 ft. and in face widths from 6 in. to 20 ft. The filter shown in the drawing used for filtering nickel slurry from a sulphuric acid solution is 6 ft. in diameter and 6 ft. long and is constructed of steel bonded with 5/32 in. of lead on all exterior surfaces of the drum shell and ends. A layer of lead 5/32 in. thick is equivalent in thickness to 10-lb. sheet lead. The drainage member lying in each drainage compartment on the face of the filter drum is made of cast antimonial lead. The filter cloth is fastened by calking cord made of cotton or synthetic fiber which is wedged into grooves made of antimonial lead. Inside the drum, the drainage lines for carrying off the acid filtrate are made of lead pipe held in position by steel supports.

Lead piping and valves are generally used to conduct the corrosive mixture to the filter and to carry away the corrosive filtrate. Note the cast hard lead valves, lead pipe and lead



Left
Lead drainage pipes in a rotary drum filter for clarifying a sulphuric acid brightening solution.



Right
A Swenson rotary drum filter equipped with lead inlet and outlet piping and lead valves.

lined pipe used with the Swenson lead-protected rotary drum filter illustrated. This installation is used for separating sodium sulphate from a viscose rayon spinning bath.

The tank in which the filter drum rotates and which contains the corrosive slurry is constructed of steel plate bonded with 5 32 in. lead. The filter valve, packing rings and valve ring are cast from antimonial lead. Discharge and return rolls for controlling the discharge string as well as the belt rolls are also made of steel bonded with 5 32 in. lead.

The 3 ft. by 6 ft. rotary drum filter manufactured by Oliver United Filters, Inc., is used for clarifying a sulphuric acid brightening solution in a large plating shop. The steel tank is entirely lead lined inside and the drum shell and heads are bonded with $\frac{1}{4}$ in. of lead. The filtering screens are discs of cast 6 percent antimonial lead as is the $11\frac{3}{4}$ in. diameter lead valve. Drainage pipes as illustrated are chemical lead 15 16 in. I.D. and 1-3 16 in O.D. Sluice pipes are also of lead. The discharge plate is lead and the steel receiver is lead lined. Division strips are lead bars.

Complex and well-engineered units, rotary drum vacuum filters such as those described above must operate under conditions corrosive to most metals and also must have sufficient strength to support the weight of the filtering area. Corrosion, which can be a serious and certainly expensive problem has been solved by using lead as the corrosion resistant material. The modern method of combining the long-established corrosion resistance of lead with the strength characteristics of steel is to specify a bonded lead lining. Bonded lead or "homogeneous" lead lining is a fabricating technique that is finding increasingly wider acceptance in industry today, because it can best cope with the higher operating temperatures and pressures plus corrosive conditions so often encountered in modern chemical engineering practice.

The following articles and reprints contain information, drawings and specifications on the use of lead products helpful to architects, engineers and others in the construction industry. They are available, free of charge, upon request to the Lead Industries Association, 420 Lexington Avenue, New York 17, N. Y.

THE USE OF LEAD IN THE PULP AND PAPER INDUSTRY
Detailed description of various applications of lead in the modern pulp and paper mill. Covers all phases of paper pulp manufacture and treatment including sulphite acid manufacture, acid puping, bleaching and stock handling.
Reprinted from "Paper Trade Journal," Oct. 26, 1950.

LEAD IN MODERN PLUMBING— WHY, WHERE, HOW IT IS USED
A 24 page booklet containing descriptive information as well as four pages of detailed drawings for plumbing installations in various type houses.

METAL PROTECTIVE RED LEAD PAINTS
The versatility of red lead in protective primers to meet a wide range of surface conditions, drying schedules and economic demands is described.
Reprinted from "Paint and Varnish Production," January, 1951.

A STUDY OF PAINTS FOR ENCLOSED STRUCTURAL MEMBERS IN STEEL HOUSING CONSTRUCTION
A reprint of a paper which was read before the General Meeting of the American Iron and Steel Institute, May 25-26, 1949, which sponsored the work. The study included some 34 kinds of paint systems.

AN INVESTIGATION OF PRIMERS FOR MARINE ATMOSPHERIC ENVIRONMENTS
Results of an investigation of synthetic vehicles and red lead mixed pigment primers over an exposure period of three and one-half years in a rigorous marine atmosphere. Reprinted from "Official Digest," published by The Federation of Paint and Varnish Production Clubs.

RED LEAD TECHNICAL LETTERS
A series of technical letters issued by the Red Lead Division, Lead Industries Association. The numbers and titles follow. (Available separately.)
Technical Letter No. 3—Red Lead Primers for Atmospheric Exposure
Technical Letter No. 4—Red Lead Paints for Marine Exposures
Technical Letter No. 5—Red Lead-Vinyl and Coumarone Type Paints

NEW MARINE PRIMERS
An article on newly developed paint primers for metals exposed to marine atmospheres written expressly for the person who is not a paint technologist. Reprinted from "Marine Engineering and Shipping Review," March, 1949.

PHYSICAL AND CORROSION CHARACTERISTICS OF LEAD IN THE CHEMICAL INDUSTRY
A detailed discussion of the use of lead in the chemical industry presented before the National Association of Corrosion Engineers Conference, April 11-14, 1949.

NEW DEVELOPMENTS EXPAND USE OF LEAD CONSTRUCTION
Improvements in lead fabrication and installation methods are described and illustrated in a reprint from "Materials & Methods," May, [illegible]. The article shows how lead-supplied equipments have continued to keep pace with developments in the chemical and allied industries.

CORROSION FORUM
A series of one page articles on the use of lead as a material of chemical construction in contact with the following chemicals, available separately: [illegible] Hydrochloric Acid, Hydrofluoric Acid, Industrial Alcohol, Sulphuric Acid, Sodium Chloride, Sulphur, [illegible] Phosphoric Acid, Chromic Acid, Copper Sulphate, Citric Acid.
Reprinted from "Chemical Engineering."

FEDERAL SPECIFICATION WW-P-325 For Pipe, Bends and Traps, LEAD
Part 3 of Section IV of the Federal Standards Stock Catalog, official publication by the Government Printing Office.

FEDERAL SPECIFICATION TT-P-86a Paint: Red-Lead-Base, Ready-Mixed
Covers four types of red lead base paints including two fast drying formulations. Many intended applications listed.

LEAD WELDING
An informative as well as practical guide to lead welding. Reprinted from the "Welding Handbook, Third Edition," published by the American Welding Society.

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.

PRINTED IN U.S.A.
BY THE PUBLISHERS PRINTING CO.
NEW YORK CITY